Montana State University- New Dining Hall
Bid Packages: Shell Bid PPA A/E #15-0103

GENERAL CONTRACTOR/CONSTRUCTION MGR.
LANGLAS & ASSOCIATES
1019 East Main
Bozeman, MT 59716
(406) 585.3420 Contact: Roger Davis, rdavis@langlas.com

ARCHITECT
MOSAIC ARCHITECTURE, P.C.
428 North Last Chance Gulch
Helena, MT 59601
Ph. 406-449-2013 Contact: Matt Aune, matta@mosaicarch.com Jeff Downhour, jeff@mosaicarch.com

CIVIL ENGINEER
TD&H ENGINEERING
234 East Babcock
Bozeman, Montana 59715
Ph. 406-586.0277 Contact: Ahren Hastings Ahren.hastings@tdhengineering.com

STRUCTURAL, MECHANICAL/PLUMBING, ELECTRICAL ENGINEERING
MORRISON MAIERLE, INC.
2880 TECHNOLOGY BLVD. WEST
P.O. BOX 1113
BOZEMAN, MT 59771-1113
(406) 587-0721 Structural Contact: Brian Aschim baschim@m-m.net Mechanical contact: Erik Renna, erenna@m-m.net Electrical Contact: Ryan Maroney rmaroney@m-m.net

LANDSCAPE ARCHITECT
CIVITAS
1200 BANNOCK ST.
DENVER, CO 80204
Ph. 303-571-0053 Contact: Robin Rooney rooney@civitas.com

PROJECT NOTICES

PERMITTING
See General Requirements from GCCM for permitting requirements. Mechanical and Electrical sub-contractor to obtain permits for that portion of work and include cost in bids.

MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS
The 2014 Montana Public Works Standard Specifications are hereby incorporated into this document.

SOILS REPORT
There is a soils report available for the project included in the project manual.
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INVITATION FOR BIDS
Montana State University New Dining Hall – Tenant Improvement
Montana State University Campus
Bozeman, MT

RECEIPT OF PROPOSALS

Sealed bids will be received by Montana State University (MSU) and Langlas and Associates at 1019 E. Main St.
Suite 101 Bozeman, MT 59715 no later than 1 pm on Wednesday, February 22nd, 2017. The bids will be reviewed by Langlas and Associates and MSU in accordance with the Specifications and the Contract Documents prepared by Mosaic Architecture. The scopes of work being bid at this time are CSI Divisions 6-14, 22, 23, and 26-28.

Bids shall be submitted on the form provided with the Contract Documents and in accordance with the "Instructions to Bidders" in the Contract Documents.

OBTAINING CONTRACT DOCUMENTS

On Tuesday, January 31st, 2017, bidding documents will be on file at Montana plans exchanges as listed in the “INSTRUCTIONS TO BIDDERS” and physical sets may be obtained on February 1st, 2017, at Langlas and Associates office located at 1019 E. Main Street Suite 101, Bozeman, MT (406) 585-3420 upon deposit of $100.00 per set. Plans are also available at www.langlas.com. The password can be obtained by contacting Langlas. Please ask for Matt Drake or Roger Davis for plan information.

Documents remain the property of the Architect and must be returned. Full refund of deposit will be made for complete sets that are returned in acceptable condition: without notes, marks, or mutilations, and within 15 calendar days after the opening of proposals. Plan holders that do not submit a proposal will forfeit their deposit.

PROPOSAL GUARANTEE

Bid Package Bids do not need to be accompanied by bid security. A performance and payment bond may be required before contract award. Please fill out the bid form correctly to include the additional amount for a performance and payment bond. If the Proposal is accepted, the Bidder may be asked to execute the Contract and fill acceptable Performance and Labor & Material Payment Bonds no later than ten (10) days after the Award of the Contract.

OWNER RIGHTS RESERVED

Montana State University, hereinafter called the Owner, reserve the right to reject any or all proposals and to waive any formality or technicality in any proposal in the interest of the Owner.

END OF INVITATION FOR BIDS
INVITATION FOR BIDS
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Montana State University Campus
Bozeman, MT

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END OF INVITATION FOR BIDS
INSTRUCTION TO BIDDERS

All Bidders interested in supplying product for, and/or performing work on the MSU NEW DINING HALL – Tenant Improvements located in Bozeman, Montana, shall be subject to the requirements contained within the collective Bid Documents, which are outlined below.

1. Bid Addenda, if any.
2. Instructions to Bidders
3. General Requirements
4. Individually Numbered Bid Package Scopes, Instruction to Bidders, Bid Form, and General Requirements
5. Plan Drawings, prepared by Mosaic Architects, dated 1/20/17.

The designation of responsibility in the scopes of work takes precedence over the designation of responsibility on the drawings or specifications. If any conflict exists between these documents, precedence shall be determined by the order in which they are listed above. For example, if a conflict exists between the Plans and Specifications, Bidder is to follow the Specifications and include such requirements in his/her bid, unless requirements are altered by subsequent Bid Addenda issued during the bidding process.

Complete Bid Documents may be obtained at the Bozeman Builders Exchange and also at:

Langlas & Associates
1019 E. Main St. Suite 101
Bozeman, MT 59715

Complete Bid Documents may be viewed at the following locations as well:

Billings, MT Plans Exchange
406-652-1311
Helena, MT Plans Exchange
406-442-4162

Bozeman, MT Plans Exchange
406-586-7653
Kalispell, MT Plans Exchange
406-755-5888

Butte, MT Plans Exchange
406-782-5433
Missoula, MT Plans Exchange
406-549-5002

Great Falls, MT Plans Exchange
406-453-2513
Bozeman Builders Exchange
1105 Reeves Rd. W.
Bozeman, MT 59718
406-586-7653

During the bidding phase, all questions concerning the project, Bid Documents, bidding process, scope related items, plan discrepancies, pre-bid Requests for Information, product substitutions, etc. shall be directed to the Construction Manager designated. Do not contact Mosaic or their Consultants with any questions during the bid process for any reason.

Langlas & Associates
Roger Davis, Senior Project Manager
1019 East Main Street, Suite #101
Bozeman, MT 59715
Ph. 406-585-3420     Fax 406-585-4110
E-mail: rdavis@langlas.com
Bidders shall submit all questions to Construction Manager in writing via fax or email. Questions will be answered in a timely manner, and may be used to generate Bid Addenda for distribution to all Bidders at the discretion of the Construction Manager, Owner and Design Team. Oral, telephonic, or other form of communication other than a formal Bid Addenda shall not be construed as to alter the Bid Documents.

PRODUCT/ASSEMBLY/SYSTEM SUBSTITUTIONS
A. Where the Bid Documents stipulate a particular product, substitutions will be considered up to 5 days before receipt of bids.
B. When a request to substitute a product is made, Architect may approve the substitution and will issue an Addendum to known bidders.
C. The submission shall provide sufficient information to determine acceptability of such products. Substitution request shall clearly indicate any deviation from specifications for substituted item.
D. Provide complete information on required revisions to other work to accommodate each proposed substitution.
E. Provide products as specified unless substitutions are submitted in this manner and accepted. Bidding products not specified or not formally approved as substitutions is done solely at the risk of the bidder.

Sealed bids for all scopes of work on this project shall be submitted on the Bid Form(s) provided within this package and are due no later than February 22nd, 2017 at 1:00 pm MST at Langlas & Associates Office at 1019 E. Main St. Suite 101 Bozeman, MT 59715. Bids shall be delivered by U.S. Mail, commercial carrier, or by hand to the address shown above and shall be clearly marked as follows:

Bidders Name and Address
Project: Montana State University New Dining Hall – Bozeman, MT
Address: Langlas & Associates
C/O Montana State University
1019 E. Main St. Suite 101
Bozeman, MT 59715

Bid Date: {insert bid date according to this publication or subsequent addendum}
Bid Package: {insert applicable Bid Package Number(s)}

Bids submitted on any form other than the one(s) provided within this package will be rejected.

Faxed bids will not be accepted. Faxed modifications to previously received sealed bids are acceptable, may be sent to (406) 585-4110, and shall clearly state the same information as shown above, in addition to indicating Bidders additive or deductive modification to the previously submitted bid. Do not indicate total bid amount on faxed modifications. Faxed modifications need to be received 5 minutes prior to bid time. Bidders are responsible for receipt of fax and ensuring fax modification is received and accepted.

Bids shall remain valid for a period of sixty (60) days following the Bid Date and may not be revoked during this time.

Bids will be opened and read aloud in the presence of the Construction Manager, Owner, and Architect. Tabulated bid results will be available as soon as possible and will be posted at the office of the Construction Manager and MSU.

Bids will be evaluated on the basis of the information requested on the Bid Form(s) as well as a post-bid scope and qualifications review by the Construction Manager following tabulation of the bid results. Construction Manager shall make recommendations to the Owner whether or not to accept bids from the apparent low bidders for each bid package depending upon Construction Manager’s findings during the qualification process. In the event that Construction Manager recommends against accepting an apparent low bid based on substantiated information and/or Owner elects not to accept such bid, the second bidder will be contacted for scope and qualification review. Such process shall continue until a qualified subcontractor/supplier is recommended by Construction Manager and/or accepted by Owner.
The CM and Owner may make such investigations as they deem necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish all such information and data for this purpose as may be requested. The CM and the Owner reserve the right to reject any proposal if the evidence submitted by, or the investigation of, such Bidder fails to satisfy the CM and/or the Owner that such Bidder is properly qualified to carry out the obligations of the Subcontract and complete the work contemplated therein.

The CM and the Owner reserve the right in awarding subcontracts to consider the competency, responsibility, and suitability of the Bidder, as well as the amount of the proposals.

The CM and the Owner also reserve the right to reject any or all proposals, or waive any irregularities or informalities in the proposals received.

The CM will designate a set of documents as the record documents (as-built drawings) to be kept on-site. Any changes in work that deviate from the Contract Documents will be expected to be recorded on this set of Documents by the Subcontractor responsible for the scope of work affected. Any changes that the Subcontractor makes that vary from the Contract Documents shall be recorded within a Seventy-two (72) hour period after the change occurs in the field, by the Subcontractor, on the above mentioned Record Documents. The Record Documents will be reviewed weekly by the CM for compliance to this Article. If Documents are not being kept up to date, CM reserves the right to withhold progress payments and/or final payment to the Subcontractor, until the change(s) is (are) recorded in the Record Set of Documents.

The CM shall promptly pay each Subcontractor/Supplier, upon receipt of payment from the Owner, out of the amount paid to the CM on account of such Subcontractor's/Supplier's work, the amount to which said Subcontractor/Supplier is entitled. The CM requires each Subcontractor/Supplier to make prompt payments to its 2nd Tier Subcontractors or Suppliers in a similar manner. Joint check agreements may be used and can be accommodated by the CM. Progress and final payment to the Subcontractor/Supplier will only be processed upon receipt of a properly executed pay request from the Subcontractor/Supplier, on the CM's “Subcontractor’s request for payment, certificate and interim waiver of claim and lien” form (Attached). This pay request must be received by the CM on or before the 25th of the month. Applications received after the 25th of the month will be held unprocessed until the following pay period.

Prior to commencing work, Subcontractor shall furnish and thereafter maintain certificates of insurance in accordance with the requirements. Certificates of insurance and the policies represented thereby shall not be cancelled or modified until thirty (30) days after written notice has been given to CM of such cancellation or modification. Required coverage’s shall be maintained without interruption from the date the Subcontractor commences work on the Project until no sooner than the date of the Subcontractor’s receipt of final payment.
### Performance Bond

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<th><strong>CONTRACTOR:</strong></th>
<th><strong>SURETY:</strong></th>
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<td>(Not earlier than Construction Contract Date)</td>
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<td>Modifications to this Bond:</td>
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(Any additional signatures appear on the last page of this Performance Bond.)

**FOR INFORMATION ONLY — Name, address and telephone**

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**OWNER’S REPRESENTATIVE:**

(Architect, Engineer or other party:)

| « » « » « » « » « » « » |
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**ADDITIONS AND DELETIONS:**
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

**ELECTRONIC COPYING** of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.
§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety’s obligation under this Bond shall arise after

.1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor’s performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner’s notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety’s receipt of the Owner’s notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner’s right, if any, subsequently to declare a Contractor Default;

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

.3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety’s obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety’s expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner’s concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.
§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
.2 additional legal, design professional and delay costs resulting from the Contractor’s Default, and resulting from the actions or failure to act of the Surety under Section 5; and
.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety’s liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.
§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL
Company: ____________________________ (Corporate Seal)
Signature: __________________________
Name and Title: _______________________
Address: ____________________________

SURETY
Company: ____________________________ (Corporate Seal)
Signature: __________________________
Name and Title: _______________________
Address: ____________________________
AGREEMENT made as of the «  » day of «  » in the year «  »
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status and address)

«  »
«  »

and the Construction Manager:
(Name, legal status and address)

«  »
«  »

for the following Project:
(Name and address or location)

«Sample 133 2009 replaces A121»
«  »

The Architect:
(Name, legal status and address)

«  »
«  »

The Owner’s Designated Representative:
(Name, address and other information)

«  »
«  »
«  »
«  »
«  »
«  »

The Construction Manager’s Designated Representative:
(Name, address and other information)

«  »
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The Architect’s Designated Representative:
The Owner and Construction Manager agree as follows.
## TABLE OF ARTICLES

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<td>SCOPE OF THE AGREEMENT</td>
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### ARTICLE 1   GENERAL PROVISIONS

#### § 1.1 The Contract Documents

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to the execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract and are as fully a part of the Contract as if attached to this Agreement or repeated herein. Upon the Owner’s acceptance of the Construction Manager’s Guaranteed Maximum Price proposal, the Contract Documents will also include the documents described in Section 2.2.3 and identified in the Guaranteed Maximum Price Amendment and revisions prepared by the Architect and furnished by the Owner as described in Section 2.2.8. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. If anything in the other Contract Documents, other than a Modification, is inconsistent with this Agreement, this Agreement shall govern.

#### § 1.2 Relationship of the Parties

The Construction Manager accepts the relationship of trust and confidence established by this Agreement and covenants with the Owner to cooperate with the Architect and exercise the Construction Manager’s skill and judgment in furthering the interests of the Owner; to furnish efficient construction administration, management services and supervision; to furnish at all times an adequate supply of workers and materials; and to perform the Work in an expeditious and economical manner consistent with the Owner’s interests. The Owner agrees to furnish or approve, in a timely manner, information required by the Construction Manager and to make payments to the Construction Manager in accordance with the requirements of the Contract Documents.

#### § 1.3 General Conditions

For the Preconstruction Phase, AIA Document A201™–2007, General Conditions of the Contract for Construction, shall apply only as specifically provided in this Agreement. For the Construction Phase, the general conditions of the contract shall be as set forth in A201–2007, which document is incorporated herein by reference. The term “Contractor” as used in A201–2007 shall mean the Construction Manager.

### ARTICLE 2   CONSTRUCTION MANAGER’S RESPONSIBILITIES

The Construction Manager’s Preconstruction Phase responsibilities are set forth in Sections 2.1 and 2.2. The Construction Manager’s Construction Phase responsibilities are set forth in Section 2.3. The Owner and...
Construction Manager may agree, in consultation with the Architect, for the Construction Phase to commence prior to completion of the Preconstruction Phase, in which case, both phases will proceed concurrently. The Construction Manager shall identify a representative authorized to act on behalf of the Construction Manager with respect to the Project.

§ 2.1 Preconstruction Phase

§ 2.1.1 The Construction Manager shall provide a preliminary evaluation of the Owner’s program, schedule and construction budget requirements, each in terms of the other.

§ 2.1.2 Consultation

The Construction Manager shall schedule and conduct meetings with the Architect and Owner to discuss such matters as procedures, progress, coordination, and scheduling of the Work. The Construction Manager shall advise the Owner and the Architect on proposed site use and improvements, selection of materials, and building systems and equipment. The Construction Manager shall also provide recommendations consistent with the Project requirements to the Owner and Architect on constructability; availability of materials and labor; time requirements for procurement, installation and construction; and factors related to construction cost including, but not limited to, costs of alternative designs or materials, preliminary budgets, life-cycle data, and possible cost reductions.

§ 2.1.3 When Project requirements in Section 3.1.1 have been sufficiently identified, the Construction Manager shall prepare and periodically update a Project schedule for the Architect’s review and the Owner’s acceptance. The Construction Manager shall obtain the Architect’s approval for the portion of the Project schedule relating to the performance of the Architect’s services. The Project schedule shall coordinate and integrate the Construction Manager’s services, the Architect’s services, other Owner consultants’ services, and the Owner’s responsibilities and identify items that could affect the Project’s timely completion. The updated Project schedule shall include the following: submission of the Guaranteed Maximum Price proposal; components of the Work; times of commencement and completion required of each Subcontractor; ordering and delivery of products, including those that must be ordered well in advance of construction; and the occupancy requirements of the Owner.

§ 2.1.4 Phased Construction

The Construction Manager shall provide recommendations with regard to accelerated or fast-track scheduling, procurement, or phased construction. The Construction Manager shall take into consideration cost reductions, cost information, constructability, provisions for temporary facilities and procurement and construction scheduling issues.

§ 2.1.5 Preliminary Cost Estimates

§ 2.1.5.1 Based on the preliminary design and other design criteria prepared by the Architect, the Construction Manager shall prepare preliminary estimates of the Cost of the Work or the cost of program requirements using area, volume or similar conceptual estimating techniques for the Architect’s review and Owner’s approval. If the Architect or Construction Manager suggests alternative materials and systems, the Construction Manager shall provide cost evaluations of those alternative materials and systems.

§ 2.1.5.2 As the Architect progresses with the preparation of the Schematic Design, Design Development and Construction Documents, the Construction Manager shall prepare and update, at appropriate intervals agreed to by the Owner, Construction Manager and Architect, estimates of the Cost of the Work of increasing detail and refinement and allowing for the further development of the design until such time as the Owner and Construction Manager agree on a Guaranteed Maximum Price for the Work. Such estimates shall be provided for the Architect’s review and the Owner’s approval. The Construction Manager shall inform the Owner and Architect when estimates of the Cost of the Work exceed the latest approved Project budget and make recommendations for corrective action.

§ 2.1.6 Subcontractors and Suppliers

The Construction Manager shall develop bidders’ interest in the Project.

§ 2.1.7 The Construction Manager shall prepare, for the Architect’s review and the Owner’s acceptance, a procurement schedule for items that must be ordered well in advance of construction. The Construction Manager shall expedite and coordinate the ordering and delivery of materials that must be ordered well in advance of construction. If the Owner agrees to procure any items prior to the establishment of the Guaranteed Maximum Price, the Owner shall procure the items on terms and conditions acceptable to the Construction Manager. Upon the
establishment of the Guaranteed Maximum Price, the Owner shall assign all contracts for these items to the
Construction Manager and the Construction Manager shall thereafter accept responsibility for them.

§ 2.1.8 Extent of Responsibility
The Construction Manager shall exercise reasonable care in preparing schedules and estimates. The Construction
Manager, however, does not warrant or guarantee estimates and schedules except as may be included as part of the
Guaranteed Maximum Price. The Construction Manager is not required to ascertain that the Drawings and
Specifications are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful
orders of public authorities, but the Construction Manager shall promptly report to the Architect and Owner any
nonconformity discovered by or made known to the Construction Manager as a request for information in such form
as the Architect may require.

§ 2.1.9 Notices and Compliance with Laws
The Construction Manager shall comply with applicable laws, statutes, ordinances, codes, rules and regulations, and
lawful orders of public authorities applicable to its performance under this Contract, and with equal employment
opportunity programs, and other programs as may be required by governmental and quasi governmental authorities
for inclusion in the Contract Documents.

§ 2.2 Guaranteed Maximum Price Proposal and Contract Time
§ 2.2.1 At a time to be mutually agreed upon by the Owner and the Construction Manager and in consultation with
the Architect, the Construction Manager shall prepare a Guaranteed Maximum Price proposal for the Owner’s
review and acceptance. The Guaranteed Maximum Price in the proposal shall be the sum of the Construction
Manager’s estimate of the Cost of the Work, including contingencies described in Section 2.2.4, and the
Construction Manager’s Fee.

§ 2.2.2 To the extent that the Drawings and Specifications are anticipated to require further development by the
Architect, the Construction Manager shall provide in the Guaranteed Maximum Price for such further development
consistent with the Contract Documents and reasonably inferable therefrom. Such further development does not
include such things as changes in scope, systems, kinds and quality of materials, finishes or equipment, all of which,
if required, shall be incorporated by Change Order.

§ 2.2.3 The Construction Manager shall include with the Guaranteed Maximum Price proposal a written statement
of its basis, which shall include the following:
.1 A list of the Drawings and Specifications, including all Addenda thereto, and the Conditions of the
Contract;
.2 A list of the clarifications and assumptions made by the Construction Manager in the preparation of
the Guaranteed Maximum Price proposal, including assumptions under Section 2.2.2, to supplement
the information provided by the Owner and contained in the Drawings and Specifications;
.3 A statement of the proposed Guaranteed Maximum Price, including a statement of the estimated Cost
of the Work organized by trade categories or systems, allowances, contingency, and the Construction
Manager’s Fee;
.4 The anticipated date of Substantial Completion upon which the proposed Guaranteed Maximum Price
is based; and
.5 A date by which the Owner must accept the Guaranteed Maximum Price.

§ 2.2.4 In preparing the Construction Manager’s Guaranteed Maximum Price proposal, the Construction Manager
shall include its contingency for the Construction Manager’s exclusive use to cover those costs considered
reimbursable as the Cost of the Work but not included in a Change Order.

§ 2.2.5 The Construction Manager shall meet with the Owner and Architect to review the Guaranteed Maximum
Price proposal. In the event that the Owner and Architect discover any inconsistencies or inaccuracies in the
information presented, they shall promptly notify the Construction Manager, who shall make appropriate
adjustments to the Guaranteed Maximum Price proposal, its basis, or both.

§ 2.2.6 If the Owner notifies the Construction Manager that the Owner has accepted the Guaranteed Maximum Price
proposal in writing before the date specified in the Guaranteed Maximum Price proposal, the Guaranteed Maximum
Price proposal shall be deemed effective without further acceptance from the Construction Manager. Following
acceptance of a Guaranteed Maximum Price, the Owner and Construction Manager shall execute the Guaranteed Maximum Price Amendment amending this Agreement, a copy of which the Owner shall provide to the Architect. The Guaranteed Maximum Price Amendment shall set forth the agreed upon Guaranteed Maximum Price with the information and assumptions upon which it is based.

§ 2.2.7 The Construction Manager shall not incur any cost to be reimbursed as part of the Cost of the Work prior to the commencement of the Construction Phase, unless the Owner provides prior written authorization for such costs.

§ 2.2.8 The Owner shall authorize the Architect to provide the revisions to the Drawings and Specifications to incorporate the agreed-upon assumptions and clarifications contained in the Guaranteed Maximum Price Amendment. The Owner shall promptly furnish those revised Drawings and Specifications to the Construction Manager as they are revised. The Construction Manager shall notify the Owner and Architect of any inconsistencies between the Guaranteed Maximum Price Amendment and the revised Drawings and Specifications.

§ 2.2.9 The Construction Manager shall include in the Guaranteed Maximum Price all sales, consumer, use and similar taxes for the Work provided by the Construction Manager that are legally enacted, whether or not yet effective, at the time the Guaranteed Maximum Price Amendment is executed.

§ 2.3 Construction Phase
§ 2.3.1 General
§ 2.3.1.1 For purposes of Section 8.1.2 of A201–2007, the date of commencement of the Work shall mean the date of commencement of the Construction Phase.

§ 2.3.1.2 The Construction Phase shall commence upon the Owner’s acceptance of the Construction Manager’s Guaranteed Maximum Price proposal or the Owner’s issuance of a Notice to Proceed, whichever occurs earlier.

§ 2.3.2 Administration
§ 2.3.2.1 Those portions of the Work that the Construction Manager does not customarily perform with the Construction Manager’s own personnel shall be performed under subcontracts or by other appropriate agreements with the Construction Manager. The Owner may designate specific persons from whom, or entities from which, the Construction Manager shall obtain bids. The Construction Manager shall obtain bids from Subcontractors and from suppliers of materials or equipment fabricated especially for the Work and shall deliver such bids to the Architect. The Owner shall then determine, with the advice of the Construction Manager and the Architect, which bids will be accepted. The Construction Manager shall not be required to contract with anyone to whom the Construction Manager has reasonable objection.

§ 2.3.2.2 If the Guaranteed Maximum Price has been established and when a specific bidder (1) is recommended to the Owner by the Construction Manager, (2) is qualified to perform that portion of the Work, and (3) has submitted a bid that conforms to the requirements of the Contract Documents without reservations or exceptions, but the Owner requires that another bid be accepted, then the Construction Manager may require that a Change Order be issued to adjust the Contract Time and the Guaranteed Maximum Price by the difference between the bid of the person or entity recommended to the Owner by the Construction Manager and the amount and time requirement of the subcontract or other agreement actually signed with the person or entity designated by the Owner.

§ 2.3.2.3 Subcontracts or other agreements shall conform to the applicable payment provisions of this Agreement, and shall not be awarded on the basis of cost plus a fee without the prior consent of the Owner. If the Subcontract is awarded on a cost-plus a fee basis, the Construction Manager shall provide in the Subcontract for the Owner to receive the same audit rights with regard to the Subcontractor as the Owner receives with regard to the Construction Manager in Section 6.11 below.

§ 2.3.2.4 If the Construction Manager recommends a specific bidder that may be considered a “related party” according to Section 6.10, then the Construction Manager shall promptly notify the Owner in writing of such relationship and notify the Owner of the specific nature of the contemplated transaction, according to Section 6.10.2.

§ 2.3.2.5 The Construction Manager shall schedule and conduct meetings to discuss such matters as procedures, progress, coordination, scheduling, and status of the Work. The Construction Manager shall prepare and promptly distribute minutes to the Owner and Architect.
§ 2.3.2.6 Upon the execution of the Guaranteed Maximum Price Amendment, the Construction Manager shall prepare and submit to the Owner and Architect a construction schedule for the Work and submittal schedule in accordance with Section 3.10 of A201–2007.

§ 2.3.2.7 The Construction Manager shall record the progress of the Project. On a monthly basis, or otherwise as agreed to by the Owner, the Construction Manager shall submit written progress reports to the Owner and Architect, showing percentages of completion and other information required by the Owner. The Construction Manager shall also keep, and make available to the Owner and Architect, a daily log containing a record for each day of weather, portions of the Work in progress, number of workers on site, identification of equipment on site, problems that might affect progress of the work, accidents, injuries, and other information required by the Owner.

§ 2.3.2.8 The Construction Manager shall develop a system of cost control for the Work, including regular monitoring of actual costs for activities in progress and estimates for uncompleted tasks and proposed changes. The Construction Manager shall identify variances between actual and estimated costs and report the variances to the Owner and Architect and shall provide this information in its monthly reports to the Owner and Architect, in accordance with Section 2.3.2.7 above.

§ 2.4 Professional Services
Section 3.12.10 of A201–2007 shall apply to both the Preconstruction and Construction Phases.

§ 2.5 Hazardous Materials
Section 10.3 of A201–2007 shall apply to both the Preconstruction and Construction Phases.

ARTICLE 3  OWNER’S RESPONSIBILITIES

§ 3.1 Information and Services Required of the Owner
§ 3.1.1 The Owner shall provide information with reasonable promptness, regarding requirements for and limitations on the Project, including a written program which shall set forth the Owner’s objectives, constraints, and criteria, including schedule, space requirements and relationships, flexibility and expandability, specific equipment, systems sustainability and site requirements.

§ 3.1.2 Prior to the execution of the Guaranteed Maximum Price Amendment, the Construction Manager may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner’s obligations under the Contract. Thereafter, the Construction Manager may only request such evidence if (1) the Owner fails to make payments to the Construction Manager as the Contract Documents require, (2) a change in the Work materially changes the Contract Sum, or (3) the Construction Manager identifies in writing a reasonable concern regarding the Owner’s ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Construction Manager and Architect.

§ 3.1.3 The Owner shall establish and periodically update the Owner’s budget for the Project, including (1) the budget for the Cost of the Work as defined in Section 6.1.1, (2) the Owner’s other costs, and (3) reasonable contingencies related to all of these costs. If the Owner significantly increases or decreases the Owner’s budget for the Cost of the Work, the Owner shall notify the Construction Manager and Architect. The Owner and the Architect, in consultation with the Construction Manager, shall thereafter agree to a corresponding change in the Project’s scope and quality.

§ 3.1.4 Structural and Environmental Tests, Surveys and Reports. During the Preconstruction Phase, the Owner shall furnish the following information or services with reasonable promptness. The Owner shall also furnish any other information or services under the Owner’s control and relevant to the Construction Manager’s performance of the Work with reasonable promptness after receiving the Construction Manager’s written request for such information or services. The Construction Manager shall be entitled to rely on the accuracy of information and services furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.
§ 3.1.4.1 The Owner shall furnish tests, inspections and reports required by law and as otherwise agreed to by the parties, such as structural, mechanical, and chemical tests, tests for air and water pollution, and tests for hazardous materials.

§ 3.1.4.2 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The surveys and legal information shall include, as applicable, grades and lines of streets, alleys, pavements and adjoining property and structures; designated wetlands; adjacent drainage; rights-of-way, restrictions, easements, encroachments, zoning, deed restrictions, boundaries and contours of the site; locations, dimensions and necessary data with respect to existing buildings, other improvements and trees; and information concerning available utility services and lines, both public and private, above and below grade, including inverts and depths. All the information on the survey shall be referenced to a Project benchmark.

§ 3.1.4.3 The Owner, when such services are requested, shall furnish services of geotechnical engineers, which may include but are not limited to test borings, test pits, determinations of soil bearing values, percolation tests, evaluations of hazardous materials, seismic evaluation, ground corrosion tests and resistivity tests, including necessary operations for anticipating subsoil conditions, with written reports and appropriate recommendations.

§ 3.1.4.4 During the Construction Phase, the Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner’s control and relevant to the Construction Manager’s performance of the Work with reasonable promptness after receiving the Construction Manager’s written request for such information or services.

§ 3.2 Owner’s Designated Representative

The Owner shall identify a representative authorized to act on behalf of the Owner with respect to the Project. The Owner’s representative shall render decisions promptly and furnish information expeditiously, so as to avoid unreasonable delay in the services or Work of the Construction Manager. Except as otherwise provided in Section 4.2.1 of A201–2007, the Architect does not have such authority. The term “Owner” means the Owner or the Owner’s authorized representative.

§ 3.2.1 Legal Requirements. The Owner shall furnish all legal, insurance and accounting services, including auditing services, that may be reasonably necessary at any time for the Project to meet the Owner’s needs and interests.

§ 3.3 Architect

The Owner shall retain an Architect to provide services, duties and responsibilities as described in AIA Document B103™–2007, Standard Form of Agreement Between Owner and Architect, including any additional services requested by the Construction Manager that are necessary for the Preconstruction and Construction Phase services under this Agreement. The Owner shall provide the Construction Manager a copy of the executed agreement between the Owner and the Architect, and any further modifications to the agreement.

ARTICLE 4 COMPENSATION AND PAYMENTS FOR PRECONSTRUCTION PHASE SERVICES

§ 4.1 Compensation

§ 4.1.1 For the Construction Manager’s Preconstruction Phase services, the Owner shall compensate the Construction Manager as follows:

§ 4.1.2 For the Construction Manager’s Preconstruction Phase services described in Sections 2.1 and 2.2:

(Insert amount of, or basis for, compensation and include a list of reimbursable cost items, as applicable.)

§ 4.1.3 If the Preconstruction Phase services covered by this Agreement have not been completed within ««» (««») months of the date of this Agreement, through no fault of the Construction Manager, the Construction Manager’s compensation for Preconstruction Phase services shall be equitably adjusted.

§ 4.1.4 Compensation based on Direct Personnel Expense includes the direct salaries of the Construction Manager’s personnel providing Preconstruction Phase services on the Project and the Construction Manager’s costs for the mandatory and customary contributions and benefits related thereto, such as employment taxes and other statutory employee benefits, insurance, sick leave, holidays, vacations, employee retirement plans and similar contributions.


§ 4.2 Payments
§ 4.2.1 Unless otherwise agreed, payments for services shall be made monthly in proportion to services performed.

§ 4.2.2 Payments are due and payable upon presentation of the Construction Manager’s invoice. Amounts unpaid ( ( ) days after the invoice date shall bear interest at the rate entered below, or in the absence thereof at the legal rate prevailing from time to time at the principal place of business of the Construction Manager.

(Insert rate of monthly or annual interest agreed upon.)

ARTICLE 5 COMPENSATION FOR CONSTRUCTION PHASE SERVICES
§ 5.1 For the Construction Manager’s performance of the Work as described in Section 2.3, the Owner shall pay the Construction Manager the Contract Sum in current funds. The Contract Sum is the Cost of the Work as defined in Section 6.1.1 plus the Construction Manager’s Fee.

§ 5.1.1 The Construction Manager’s Fee:
(State a lump sum, percentage of Cost of the Work or other provision for determining the Construction Manager’s Fee.)

§ 5.1.2 The method of adjustment of the Construction Manager’s Fee for changes in the Work:

§ 5.1.3 Limitations, if any, on a Subcontractor’s overhead and profit for increases in the cost of its portion of the Work:

§ 5.1.4 Rental rates for Construction Manager-owned equipment shall not exceed ( ) percent ( ( ) %) of the standard rate paid at the place of the Project.

§ 5.1.5 Unit prices, if any:
(Identify and state the unit price; state the quantity limitations, if any, to which the unit price will be applicable.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Units and Limitations</th>
<th>Price per Unit ($0.00)</th>
</tr>
</thead>
</table>

§ 5.2 Guaranteed Maximum Price
§ 5.2.1 The Construction Manager guarantees that the Contract Sum shall not exceed the Guaranteed Maximum Price set forth in the Guaranteed Maximum Price Amendment, as it is amended from time to time. To the extent the Cost of the Work exceeds the Guaranteed Maximum Price, the Construction Manager shall bear such costs in excess of the Guaranteed Maximum Price without reimbursement or additional compensation from the Owner.

(Insert specific provisions if the Construction Manager is to participate in any savings.)

§ 5.2.2 The Guaranteed Maximum Price is subject to additions and deductions by Change Order as provided in the Contract Documents and the Date of Substantial Completion shall be subject to adjustment as provided in the Contract Documents.

§ 5.3 Changes in the Work
§ 5.3.1 The Owner may, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions. The Owner shall issue such changes in writing. The Architect may make minor changes in the Work as provided in Section 7.4 of AIA Document A201–2007, General
Conditions of the Contract for Construction. The Construction Manager shall be entitled to an equitable adjustment in the Contract Time as a result of changes in the Work.

§ 5.3.2 Adjustments to the Guaranteed Maximum Price on account of changes in the Work subsequent to the execution of the Guaranteed Maximum Price Amendment may be determined by any of the methods listed in Section 7.3.3 of AIA Document A201–2007, General Conditions of the Contract for Construction.

§ 5.3.3 In calculating adjustments to subcontracts (except those awarded with the Owner’s prior consent on the basis of cost plus a fee), the terms “cost” and “fee” as used in Section 7.3.3 of AIA Document A201–2007 and the term “costs” as used in Section 7.3.7 of AIA Document A201–2007 shall have the meanings assigned to them in AIA Document A201–2007 and shall not be modified by Sections 5.1 and 5.2, Sections 6.1 through 6.7, and Section 6.8 of this Agreement. Adjustments to subcontracts awarded with the Owner’s prior consent on the basis of cost plus a fee shall be calculated in accordance with the terms of those subcontracts.

§ 5.3.4 In calculating adjustments to the Guaranteed Maximum Price, the terms “cost” and “costs” as used in the above-referenced provisions of AIA Document A201–2007 shall mean the Cost of the Work as defined in Sections 6.1 to 6.7 of this Agreement and the term “fee” shall mean the Construction Manager’s Fee as defined in Section 5.1 of this Agreement.

§ 5.3.5 If no specific provision is made in Section 5.1.2 for adjustment of the Construction Manager’s Fee in the case of changes in the Work, or if the extent of such changes is such, in the aggregate, that application of the adjustment provisions of Section 5.1.2 will cause substantial inequity to the Owner or Construction Manager, the Construction Manager’s Fee shall be equitably adjusted on the same basis that was used to establish the Fee for the original Work, and the Guaranteed Maximum Price shall be adjusted accordingly.

ARTICLE 6  COST OF THE WORK FOR CONSTRUCTION PHASE

§ 6.1 Costs to Be Reimbursed

§ 6.1.1 The term Cost of the Work shall mean costs necessarily incurred by the Construction Manager in the proper performance of the Work. Such costs shall be at rates not higher than the standard paid at the place of the Project except with prior consent of the Owner. The Cost of the Work shall include only the items set forth in Sections 6.1 through 6.7.

§ 6.1.2 Where any cost is subject to the Owner’s prior approval, the Construction Manager shall obtain this approval prior to incurring the cost. The parties shall endeavor to identify any such costs prior to executing Guaranteed Maximum Price Amendment.

§ 6.2 Labor Costs

§ 6.2.1 Wages of construction workers directly employed by the Construction Manager to perform the construction of the Work at the site or, with the Owner’s prior approval, at off-site workshops.

§ 6.2.2 Wages or salaries of the Construction Manager’s supervisory and administrative personnel when stationed at the site with the Owner’s prior approval.

(If it is intended that the wages or salaries of certain personnel stationed at the Construction Manager’s principal or other offices shall be included in the Cost of the Work, identify in Section 11.5, the personnel to be included, whether for all or only part of their time, and the rates at which their time will be charged to the Work.)

§ 6.2.3 Wages and salaries of the Construction Manager’s supervisory or administrative personnel engaged at factories, workshops or on the road, in expediting the production or transportation of materials or equipment required for the Work, but only for that portion of their time required for the Work.

§ 6.2.4 Costs paid or incurred by the Construction Manager for taxes, insurance, contributions, assessments and benefits required by law or collective bargaining agreements and, for personnel not covered by such agreements, customary benefits such as sick leave, medical and health benefits, holidays, vacations and pensions, provided such costs are based on wages and salaries included in the Cost of the Work under Sections 6.2.1 through 6.2.3.

§ 6.2.5 Bonuses, profit sharing, incentive compensation and any other discretionary payments paid to anyone hired by the Construction Manager or paid to any Subcontractor or vendor, with the Owner’s prior approval.
§ 6.3 Subcontract Costs
Payments made by the Construction Manager to Subcontractors in accordance with the requirements of the subcontracts.

§ 6.4 Costs of Materials and Equipment Incorporated in the Completed Construction
§ 6.4.1 Costs, including transportation and storage, of materials and equipment incorporated or to be incorporated in the completed construction.

§ 6.4.2 Costs of materials described in the preceding Section 6.4.1 in excess of those actually installed to allow for reasonable waste and spoilage. Unused excess materials, if any, shall become the Owner’s property at the completion of the Work or, at the Owner’s option, shall be sold by the Construction Manager. Any amounts realized from such sales shall be credited to the Owner as a deduction from the Cost of the Work.

§ 6.5 Costs of Other Materials and Equipment, Temporary Facilities and Related Items
§ 6.5.1 Costs of transportation, storage, installation, maintenance, dismantling and removal of materials, supplies, temporary facilities, machinery, equipment and hand tools not customarily owned by construction workers that are provided by the Construction Manager at the site and fully consumed in the performance of the Work. Costs of materials, supplies, temporary facilities, machinery, equipment and tools that are not fully consumed shall be based on the cost or value of the item at the time it is first used on the Project site less the value of the item when it is no longer used at the Project site. Costs for items not fully consumed by the Construction Manager shall mean fair market value.

§ 6.5.2 Rental charges for temporary facilities, machinery, equipment and hand tools not customarily owned by construction workers that are provided by the Construction Manager at the site and costs of transportation, installation, minor repairs, dismantling and removal. The total rental cost of any Construction Manager-owned item may not exceed the purchase price of any comparable item. Rates of Construction Manager-owned equipment and quantities of equipment shall be subject to the Owner’s prior approval.

§ 6.5.3 Costs of removal of debris from the site of the Work and its proper and legal disposal.

§ 6.5.4 Costs of document reproductions, facsimile transmissions and long-distance telephone calls, postage and parcel delivery charges, telephone service at the site and reasonable petty cash expenses of the site office.

§ 6.5.5 That portion of the reasonable expenses of the Construction Manager’s supervisory or administrative personnel incurred while traveling in discharge of duties connected with the Work.

§ 6.5.6 Costs of materials and equipment suitably stored off the site at a mutually acceptable location, subject to the Owner’s prior approval.

§ 6.6 Miscellaneous Costs
§ 6.6.1 Premiums for that portion of insurance and bonds required by the Contract Documents that can be directly attributed to this Contract. Self-insurance for either full or partial amounts of the coverages required by the Contract Documents, with the Owner’s prior approval.

§ 6.6.2 Sales, use or similar taxes imposed by a governmental authority that are related to the Work and for which the Construction Manager is liable.

§ 6.6.3 Fees and assessments for the building permit and for other permits, licenses and inspections for which the Construction Manager is required by the Contract Documents to pay.

§ 6.6.4 Fees of laboratories for tests required by the Contract Documents, except those related to defective or nonconforming Work for which reimbursement is excluded by Section 13.5.3 of AIA Document A201–2007 or by other provisions of the Contract Documents, and which do not fall within the scope of Section 6.7.3.

§ 6.6.5 Royalties and license fees paid for the use of a particular design, process or product required by the Contract Documents; the cost of defending suits or claims for infringement of patent rights arising from such requirement of
the Contract Documents; and payments made in accordance with legal judgments against the Construction Manager resulting from such suits or claims and payments of settlements made with the Owner’s consent. However, such costs of legal defenses, judgments and settlements shall not be included in the calculation of the Construction Manager’s Fee or subject to the Guaranteed Maximum Price. If such royalties, fees and costs are excluded by the last sentence of Section 3.17 of AIA Document A201–2007 or other provisions of the Contract Documents, then they shall not be included in the Cost of the Work.

§ 6.6.6 Costs for electronic equipment and software, directly related to the Work with the Owner’s prior approval.

§ 6.6.7 Deposits lost for causes other than the Construction Manager’s negligence or failure to fulfill a specific responsibility in the Contract Documents.

§ 6.6.8 Legal, mediation and arbitration costs, including attorneys’ fees, other than those arising from disputes between the Owner and Construction Manager, reasonably incurred by the Construction Manager after the execution of this Agreement in the performance of the Work and with the Owner’s prior approval, which shall not be unreasonably withheld.

§ 6.6.9 Subject to the Owner’s prior approval, expenses incurred in accordance with the Construction Manager’s standard written personnel policy for relocation and temporary living allowances of the Construction Manager’s personnel required for the Work.

§ 6.7 Other Costs and Emergencies

§ 6.7.1 Other costs incurred in the performance of the Work if, and to the extent, approved in advance in writing by the Owner.

§ 6.7.2 Costs incurred in taking action to prevent threatened damage, injury or loss in case of an emergency affecting the safety of persons and property, as provided in Section 10.4 of AIA Document A201–2007.

§ 6.7.3 Costs of repairing or correcting damaged or nonconforming Work executed by the Construction Manager, Subcontractors or suppliers, provided that such damaged or nonconforming Work was not caused by negligence or failure to fulfill a specific responsibility of the Construction Manager and only to the extent that the cost of repair or correction is not recovered by the Construction Manager from insurance, sureties, Subcontractors, suppliers, or others.

§ 6.7.4 The costs described in Sections 6.1 through 6.7 shall be included in the Cost of the Work, notwithstanding any provision of AIA Document A201–2007 or other Conditions of the Contract which may require the Construction Manager to pay such costs, unless such costs are excluded by the provisions of Section 6.8.

§ 6.8 Costs Not To Be Reimbursed

§ 6.8.1 The Cost of the Work shall not include the items listed below:

.1 Salaries and other compensation of the Construction Manager’s personnel stationed at the Construction Manager’s principal office or offices other than the site office, except as specifically provided in Section 6.2, or as may be provided in Article 11;

.2 Expenses of the Construction Manager’s principal office and offices other than the site office;

.3 Overhead and general expenses, except as may be expressly included in Sections 6.1 to 6.7;

.4 The Construction Manager’s capital expenses, including interest on the Construction Manager’s capital employed for the Work;

.5 Except as provided in Section 6.7.3 of this Agreement, costs due to the negligence or failure of the Construction Manager, Subcontractors and suppliers or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable to fulfill a specific responsibility of the Contract;

.6 Any cost not specifically and expressly described in Sections 6.1 to 6.7;

.7 Costs, other than costs included in Change Orders approved by the Owner, that would cause the Guaranteed Maximum Price to be exceeded; and

.8 Costs for services incurred during the Preconstruction Phase.
§ 6.9 Discounts, Rebates and Refunds
§ 6.9.1 Cash discounts obtained on payments made by the Construction Manager shall accrue to the Owner if (1) before making the payment, the Construction Manager included them in an Application for Payment and received payment from the Owner, or (2) the Owner has deposited funds with the Construction Manager with which to make payments; otherwise, cash discounts shall accrue to the Construction Manager. Trade discounts, rebates, refunds and amounts received from sales of surplus materials and equipment shall accrue to the Owner, and the Construction Manager shall make provisions so that they can be obtained.

§ 6.9.2 Amounts that accrue to the Owner in accordance with the provisions of Section 6.9.1 shall be credited to the Owner as a deduction from the Cost of the Work.

§ 6.10 Related Party Transactions
§ 6.10.1 For purposes of Section 6.10, the term “related party” shall mean a parent, subsidiary, affiliate or other entity having common ownership or management with the Construction Manager; any entity in which any stockholder in, or management employee of, the Construction Manager owns any interest in excess of ten percent in the aggregate; or any person or entity which has the right to control the business or affairs of the Construction Manager. The term “related party” includes any member of the immediate family of any person identified above.

§ 6.10.2 If any of the costs to be reimbursed arise from a transaction between the Construction Manager and a related party, the Construction Manager shall notify the Owner of the specific nature of the contemplated transaction, including the identity of the related party and the anticipated cost to be incurred, before any such transaction is consummated or cost incurred. If the Owner, after such notification, authorizes the proposed transaction, then the cost incurred shall be included as a cost to be reimbursed, and the Construction Manager shall procure the Work, equipment, goods or service from the related party, as a Subcontractor, according to the terms of Sections 2.3.2.1, 2.3.2.2 and 2.3.2.3. If the Owner fails to authorize the transaction, the Construction Manager shall procure the Work, equipment, goods or service from some person or entity other than a related party according to the terms of Sections 2.3.2.1, 2.3.2.2 and 2.3.2.3.

§ 6.11 Accounting Records
The Construction Manager shall keep full and detailed records and accounts related to the cost of the Work and exercise such controls as may be necessary for proper financial management under this Contract and to substantiate all costs incurred. The accounting and control systems shall be satisfactory to the Owner. The Owner and the Owner’s auditors shall, during regular business hours and upon reasonable notice, be afforded access to, and shall be permitted to audit and copy, the Construction Manager’s records and accounts, including complete documentation supporting accounting entries, books, correspondence, instructions, drawings, receipts, subcontracts, Subcontractor’s proposals, purchase orders, vouchers, memoranda and other data relating to this Contract. The Construction Manager shall preserve these records for a period of three years after final payment, or for such longer period as may be required by law.

ARTICLE 7   PAYMENTS FOR CONSTRUCTION PHASE SERVICES
§ 7.1 Progress Payments
§ 7.1.1 Based upon Applications for Payment submitted to the Architect by the Construction Manager and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Construction Manager as provided below and elsewhere in the Contract Documents.

§ 7.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

« »

§ 7.1.3 Provided that an Application for Payment is received by the Architect not later than the « » day of a month, the Owner shall make payment of the certified amount to the Construction Manager not later than the « » day of the « » month. If an Application for Payment is received by the Architect after the application date fixed above, payment shall be made by the Owner not later than « » ( « » ) days after the Architect receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)
§ 7.1.4 With each Application for Payment, the Construction Manager shall submit payrolls, petty cash accounts, receipts of invoices or invoices with check vouchers attached, and any other evidence required by the Owner or Architect to demonstrate that cash disbursements already made by the Construction Manager on account of the Cost of the Work equal or exceed progress payments already received by the Construction Manager, less that portion of those payments attributable to the Construction Manager’s Fee, plus payrolls for the period covered by the present Application for Payment.

§ 7.1.5 Each Application for Payment shall be based on the most recent schedule of values submitted by the Construction Manager in accordance with the Contract Documents. The schedule of values shall allocate the entire Guaranteed Maximum Price among the various portions of the Work, except that the Construction Manager’s Fee shall be shown as a single separate item. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Construction Manager’s Applications for Payment.

§ 7.1.6 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. The percentage of completion shall be the lesser of (1) the percentage of that portion of the Work which has actually been completed, or (2) the percentage obtained by dividing (a) the expense that has actually been incurred by the Construction Manager on account of that portion of the Work for which the Construction Manager has made or intends to make actual payment prior to the next Application for Payment by (b) the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values.

§ 7.1.7 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

1. Take that portion of the Guaranteed Maximum Price properly allocable to completed Work as determined by multiplying the percentage of completion of each portion of the Work by the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values. Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.9 of AIA Document A201–2007;

2. Add that portion of the Guaranteed Maximum Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work, or if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing;

3. Add the Construction Manager’s Fee, less retainage of « » percent (« » %). The Construction Manager’s Fee shall be computed upon the Cost of the Work at the rate stated in Section 5.1 or, if the Construction Manager’s Fee is stated as a fixed sum in that Section, shall be an amount that bears the same ratio to that fixed-sum fee as the Cost of the Work bears to a reasonable estimate of the probable Cost of the Work upon its completion;

4. Subtract retainage of « » percent (« » %) from that portion of the Work that the Construction Manager self-performs;

5. Subtract the aggregate of previous payments made by the Owner;

6. Subtract the shortfall, if any, indicated by the Construction Manager in the documentation required by Section 7.1.4 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner’s auditors in such documentation; and

7. Subtract amounts, if any, for which the Architect has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201–2007.

§ 7.1.8 The Owner and Construction Manager shall agree upon (1) a mutually acceptable procedure for review and approval of payments to Subcontractors and (2) the percentage of retainage held on Subcontracts, and the Construction Manager shall execute subcontracts in accordance with those agreements.

§ 7.1.9 Except with the Owner’s prior approval, the Construction Manager shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 7.1.10 In taking action on the Construction Manager’s Applications for Payment, the Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Construction Manager and shall not be deemed to represent that the Architect has made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with Section 7.1.4 or other supporting data; that the Architect has made
exhaustive or continuous on-site inspections; or that the Architect has made examinations to ascertain how or for what purposes the Construction Manager has used amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner’s auditors acting in the sole interest of the Owner.

§ 7.2 Final Payment
§ 7.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Construction Manager when

1. the Construction Manager has fully performed the Contract except for the Construction Manager’s responsibility to correct Work as provided in Section 12.2.2 of AIA Document A201–2007, and to satisfy other requirements, if any, which extend beyond final payment;

2. the Construction Manager has submitted a final accounting for the Cost of the Work and a final Application for Payment; and

3. a final Certificate for Payment has been issued by the Architect.

The Owner’s final payment to the Construction Manager shall be made no later than 30 days after the issuance of the Architect’s final Certificate for Payment, or as follows:

§ 7.2.2 The Owner’s auditors will review and report in writing on the Construction Manager’s final accounting within 30 days after delivery of the final accounting to the Architect by the Construction Manager. Based upon such Cost of the Work as the Owner’s auditors report to be substantiated by the Construction Manager’s final accounting, and provided the other conditions of Section 7.2.1 have been met, the Architect will, within seven days after receipt of the written report of the Owner’s auditors, either issue to the Owner a final Certificate for Payment with a copy to the Construction Manager, or notify the Construction Manager and Owner in writing of the Architect’s reasons for withholding a certificate as provided in Section 9.5.1 of the AIA Document A201–2007. The time periods stated in this Section supersede those stated in Section 9.4.1 of the AIA Document A201–2007. The Architect’s not responsible for verifying the accuracy of the Construction Manager’s final accounting.

§ 7.2.3 If the Owner’s auditors report the Cost of the Work as substantiated by the Construction Manager’s final accounting to be less than claimed by the Construction Manager, the Construction Manager shall be entitled to request mediation of the disputed amount without seeking an initial decision pursuant to Section 15.2 of A201–2007. A request for mediation shall be made by the Construction Manager within 30 days after the Construction Manager’s receipt of a copy of the Architect’s final Certificate for Payment. Failure to request mediation within this 30-day period shall result in the substantiated amount reported by the Owner’s auditors becoming binding on the Construction Manager. Pending a final resolution of the disputed amount, the Owner shall pay the Construction Manager the amount certified in the Architect’s final Certificate for Payment.

§ 7.2.4 If, subsequent to final payment and at the Owner’s request, the Construction Manager incurs costs described in Section 6.1.1 and not excluded by Section 6.8 to correct defective or nonconforming Work, the Owner shall reimburse the Construction Manager such costs and the Construction Manager’s Fee applicable thereto on the same basis as if such costs had been incurred prior to final payment, but not in excess of the Guaranteed Maximum Price. If the Construction Manager has participated in savings as provided in Section 5.2.1, the amount of such savings shall be recalculated and appropriate credit given to the Owner in determining the net amount to be paid by the Owner to the Construction Manager.

ARTICLE 8 INSURANCE AND BONDS
For all phases of the Project, the Construction Manager and the Owner shall purchase and maintain insurance, and the Construction Manager shall provide bonds as set forth in Article 11 of AIA Document A201–2007.

(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A201–2007.)

<table>
<thead>
<tr>
<th>Type of Insurance or Bond</th>
<th>Limit of Liability or Bond Amount ($0.00)</th>
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User Notes:
ARTICLE 9   DISPUTE RESOLUTION
§ 9.1 Any Claim between the Owner and Construction Manager shall be resolved in accordance with the provisions set forth in this Article 9 and Article 15 of A201–2007. However, for Claims arising from or relating to the Construction Manager’s Preconstruction Phase services, no decision by the Initial Decision Maker shall be required as a condition precedent to mediation or binding dispute resolution, and Section 9.3 of this Agreement shall not apply.

§ 9.2 For any Claim subject to, but not resolved by mediation pursuant to Section 15.3 of AIA Document A201–2007, the method of binding dispute resolution shall be as follows:

(Check the appropriate box. If the Owner and Construction Manager do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.)

[ ] Arbitration pursuant to Section 15.4 of AIA Document A201–2007
[ ] Litigation in a court of competent jurisdiction
[ ] Other: (Specify)

§ 9.3 Initial Decision Maker
The Architect will serve as the Initial Decision Maker pursuant to Section 15.2 of AIA Document A201–2007 for Claims arising from or relating to the Construction Manager’s Construction Phase services, unless the parties appoint below another individual, not a party to the Agreement, to serve as the Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

ARTICLE 10   TERMINATION OR SUSPENSION
§ 10.1 Termination Prior to Establishment of the Guaranteed Maximum Price
§ 10.1.1 Prior to the execution of the Guaranteed Maximum Price Amendment, the Owner may terminate this Agreement upon not less than seven days’ written notice to the Construction Manager for the Owner’s convenience and without cause, and the Construction Manager may terminate this Agreement, upon not less than seven days’ written notice to the Owner, for the reasons set forth in Section 14.1.1 of A201–2007.

§ 10.1.2 In the event of termination of this Agreement pursuant to Section 10.1.1, the Construction Manager shall be equitably compensated for Preconstruction Phase services performed prior to receipt of a notice of termination. In no event shall the Construction Manager’s compensation under this Section exceed the compensation set forth in Section 4.1.

§ 10.1.3 If the Owner terminates the Contract pursuant to Section 10.1.1 after the commencement of the Construction Phase but prior to the execution of the Guaranteed Maximum Price Amendment, the Owner shall pay to the Construction Manager an amount calculated as follows, which amount shall be in addition to any compensation paid to the Construction Manager under Section 10.1.2:

1. Take the Cost of the Work incurred by the Construction Manager to the date of termination;
2. Add the Construction Manager’s Fee computed upon the Cost of the Work to the date of termination at the rate stated in Section 5.1 or, if the Construction Manager’s Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum Fee as the Cost of the Work at the time of termination bears to a reasonable estimate of the probable Cost of the Work upon its completion; and
3. Subtract the aggregate of previous payments made by the Owner for Construction Phase services.
The Owner shall also pay the Construction Manager fair compensation, either by purchase or rental at the election of the Owner, for any equipment owned by the Construction Manager which the Owner elects to retain and which is not otherwise included in the Cost of the Work under Section 10.1.3.1. To the extent that the Owner elects to take legal assignment of subcontracts and purchase orders (including rental agreements), the Construction Manager shall, as a condition of receiving the payments referred to in this Article 10, execute and deliver all such papers and take all such steps, including the legal assignment of such subcontracts and other contractual rights of the Construction Manager, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Construction Manager under such subcontracts or purchase orders. All Subcontracts, purchase orders and rental agreements entered into by the Construction Manager will contain provisions allowing for assignment to the Owner as described above.

If the Owner accepts assignment of subcontracts, purchase orders or rental agreements as described above, the Owner will reimburse or indemnify the Construction Manager for all costs arising under the subcontract, purchase order or rental agreement, if those costs would have been reimbursable as Cost of the Work if the contract had not been terminated. If the Owner chooses not to accept assignment of any subcontract, purchase order or rental agreement that would have constituted a Cost of the Work had this agreement not been terminated, the Construction Manager will terminate the subcontract, purchase order or rental agreement and the Owner will pay the Construction Manager the costs necessarily incurred by the Construction Manager because of such termination.

§ 10.2 Termination Subsequent to Establishing Guaranteed Maximum Price
Following execution of the Guaranteed Maximum Price Amendment and subject to the provisions of Section 10.2.1 and 10.2.2 below, the Contract may be terminated as provided in Article 14 of AIA Document A201–2007.

§ 10.2.1 If the Owner terminates the Contract after execution of the Guaranteed Price Amendment, the amount payable to the Construction Manager pursuant to Sections 14.2 and 14.4 of A201–2007 shall not exceed the amount the Construction Manager would otherwise have received pursuant to Sections 10.1.2 and 10.1.3 of this Agreement.

§ 10.2.2 If the Construction Manager terminates the Contract after execution of the Guaranteed Maximum Price Amendment, the amount payable to the Construction Manager under Section 14.1.3 of A201–2007 shall not exceed the amount the Construction Manager would otherwise have received under Sections 10.1.2 and 10.1.3 above, except that the Construction Manager’s Fee shall be calculated as if the Work had been fully completed by the Construction Manager, utilizing as necessary a reasonable estimate of the Cost of the Work for Work not actually completed.

§ 10.3 Suspension
The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2007. In such case, the Guaranteed Maximum Price and Contract Time shall be increased as provided in Section 14.3.2 of AIA Document A201–2007, except that the term “profit” shall be understood to mean the Construction Manager’s Fee as described in Sections 5.1 and 5.3.5 of this Agreement.

ARTICLE 11 MISCELLANEOUS PROVISIONS
§ 11.1 Terms in this Agreement shall have the same meaning as those in A201–2007.

§ 11.2 Ownership and Use of Documents
Section 1.5 of A201–2007 shall apply to both the Preconstruction and Construction Phases.

§ 11.3 Governing Law
Section 13.1 of A201–2007 shall apply to both the Preconstruction and Construction Phases.

§ 11.4 Assignment
The Owner and Construction Manager, respectively, bind themselves, their agents, successors, assigns and legal representatives to this Agreement. Neither the Owner nor the Construction Manager shall assign this Agreement without the written consent of the other, except that the Owner may assign this Agreement to a lender providing financing for the Project if the lender agrees to assume the Owner’s rights and obligations under this Agreement. Except as provided in Section 13.2.2 of A201–2007, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.
§ 11.5 Other provisions:

« »

ARTICLE 12   SCOPE OF THE AGREEMENT

§ 12.1 This Agreement represents the entire and integrated agreement between the Owner and the Construction Manager and supersedes all prior negotiations, representations or agreements, either written or oral. This Agreement may be amended only by written instrument signed by both Owner and Construction Manager.

§ 12.2 The following documents comprise the Agreement:

.1 AIA Document A133–2009, Standard Form of Agreement Between Owner and Construction Manager as Constructor where the basis of payment is the Cost of the Work Plus a Fee with a Guaranteed Maximum Price

.2 AIA Document A201–2007, General Conditions of the Contract for Construction

.3 AIA Document E201™–2007, Digital Data Protocol Exhibit, if completed, or the following:

« »

.4 AIA Document E202™–2008, Building Information Modeling Protocol Exhibit, if completed, or the following:

« »

.5 Other documents:

(List other documents, if any, forming part of the Agreement.)

« »

This Agreement is entered into as of the day and year first written above.

OWNER (Signature) CONSTRUCTION MANAGER (Signature)

« »« » (Printed name and title) (Printed name and title)
SUBCONTRACTOR AGREEMENT

Contractor: LANGLAS & ASSOCIATES, INC. BOZ
1019 EAST MAIN STREET
SUITE 101
BOZEMAN, MT 59715
(406) 585-3420

Subcontractor: ACME CONSTRUCTION, INC.
SAMPLE STREET
BOZEMAN, MT 59815
(XXX) XXX-XXXX

Project: MSU Dining Hall
Bozeman, MT 59771

THIS SUBCONTRACT AGREEMENT is effective as of 2/26/2017, between Contractor and Subcontractor. The parties agree as follows:

1. **Subcontractor shall furnish**
   all necessary labor, materials, tools, equipment (including safety equipment) and coordination with other trades required for completion of the following Work

   A complete job of all work per Plans and Specifications by Mosaic Architecture dated . Complete contract documents further defined by attached Exhibit A, Contract Document Index.

   **Contract Includes:**
   All labor, material and equipment necessary for complete scope of work including, but not limited to, items specifically called out in Exhibit "B", Bid Package Description.

   Subcontractor agrees to requirements listed in Exhibit "C", General Requirements for all Bid Packages, as attached to this contract and issued in Addendum 1.

   1% Montana Gross Receipts Tax will be deducted from all Subcontractor payments and Subcontractor can apply for tax credit for the 1% with the State of MT.

   in the construction of the above-named Project in accordance with the terms and provisions of the contract documents, including the invitation to bidders, the instructions to bidders, the proposal, the contract, all plans, specifications, the general conditions, the special conditions, the bond, addenda.

2. **Scope of Work**
   Whether or not enumerated in the plans or specifications, the Work includes:
   (a) Any item of labor, services and material described in or reasonably inferred from the plans and specifications or customarily furnished as a part of performing work of the type required by this Subcontract, or to make the work comply with any law, ordinance or regulation, including but not limited to all scaffolding and equipment necessary or required for the performance of the Work, and all items and/or quantities that may be required by the actual conditions of the site.
   (b) All plans, drawings, permits and fees required by law, regulations, ordinances or building codes.

   Subcontractor shall provide, at its own expense, all ventilation, storage space, test samples, models, guarantees, permits, licenses, unloading facilities and services, temporary utilities, protection of adjacent work that has been installed by other trades, repair or replacement of work damaged by Subcontractor, and all other items necessary for the proper performance of the Work. Subcontractor shall pay for all inspection fees, royalties, and license fees relating to the Work and shall make all necessary arrangements and agreements so as not to infringe any patents, trademarks, and copyrights.

   PERFORMANCE AND PAYMENT BONDS ARE NOT REQUIRED

   All Work shall be performed in a skillful and workmanlike manner with material, equipment, etc. being new and of the best kind and grade for the purpose intended.

3. **Payment**
   The Contractor agrees to pay the Subcontractor, the total sum of TBD

   for actual work performed to the satisfaction of Contractor, subject to additions and deductions by Change Order. Progress
payments will be made monthly in an amount equal to the estimated value of the labor, materials, and equipment incorporated into the construction and the estimated value of the materials and equipment suitably stored at the Project site, less previous payments and less retainage; progress payments shall not become due to the Subcontractor until ten (10) days after receipt by the Contractor of his payment from the Owner for such labor, materials, and equipment. Unless Subcontractor submits its written application in a form satisfactory to Contractor at least five (5) days prior to the thirtieth (30th) day of each month, no progress payment shall be payable for such payment period. All payment applications are subject to audit by Contractor and any payment may be withheld or denied pending substantiation by audit. Any estimate by Contractor of the value of Work performed during a payment period or of the amount any deduction, offset or counterclaim relating to the Work shall be binding on Subcontractor.

Retainage in a sum equal to five percent (5%) of each progress payment shall be withheld, without interest, by Contractor until final payment. Final payment shall become payable thirty (30) days after final completion and acceptance of the Project.

Prior to each payment Subcontractor shall submit from each of its sub-Subcontractors and suppliers written lien releases. Acceptance of any progress payments by Subcontractor shall constitute a release of Contractor from any other liability, except retainage, arising or incurred during the payment period. Acceptance of final payment by Subcontractor constitutes a general release of Contractor and its surety. All payments are subject to withholding by Contractor, without interest, of any amount reasonably necessary to fully protect Contractor against any actual or potential liability or damage directly or indirectly relating to the Work or this Subcontract, or against Subcontractor's breach or threatened breach hereof. Payments may be withheld on account of (1) defective work not remedied, (2) claims filed, (3) failure of Subcontractor to make payments for labor, materials, or equipment, (4) damage to the Contractor or another Subcontractor, or (5) persistent failure to carry out the Work in accordance with the Contract Documents. No payment shall be construed as an acceptance of defective or incomplete Work, and subcontractor shall remain responsible and liable for strict compliance with this Subcontract and the Prime Contract.

Subcontractor hereby waives and releases any and all claims and causes of action for payment in addition to the contract price.

4. **Mutuality of Documents.**

Subcontractor hereby acknowledges that it has carefully reviewed and examined all documents directly or indirectly relating to this Subcontract, that any and all known ambiguities and discrepancies have previously been clarified and/or corrected, and that no conditions exist which would affect the progress, performance or price of this Subcontract. Subcontractor further acknowledges that Plumbing, Mechanical, Fire Protection, and Electrical Drawings are diagrammatical in nature and may require detailed coordination with these trades in the normal course of completing Subcontractor's work. Such coordination is included in the price of this Subcontract Agreement.

5. **Laws, Regulations, Etc.**

The Work shall strictly comply with all federal, state, and local laws, rules, regulations, statues, ordinances and directives (hereafter designated as “Laws”), including but not limited to labor laws, laws covering safety, licensing laws and bonding laws. Subcontractor agrees to indemnify and save Contractor, and Owner harmless from and against any and all claims, loss or expense caused or occasioned directly or indirectly by its failure to comply fully with any and all such Laws.

6. **Extra Work or Change Orders.**

Subcontractor shall, within seven (7) days after discovery of a required scope modification or receipt of a request by Contractor, submit a complete and detailed price quotation for proposed changes. No extra work, alterations or deviations from this Subcontract shall be performed or allowed without the written change orders signed by Contractor, and no obligation, express or implied, is assumed by Contractor for any work done without such written consent. Any change or adjustment in the subcontract price shall be agreed to by Contractor and Subcontractor and shall be set forth in such change order; if no such agreement can be reached, Subcontractor shall perform the extra work and Contractor will pay for such work performed and materials furnished by Subcontractor in an amount equal to the actual cost thereof plus zero percent (0%) of said cost in which event Subcontractor shall prepare daily time and material invoices which shall be submitted to Contractor on a daily basis. In no event shall Subcontractor's overhead and profit percentages exceed the maximum allowed to Contractor or Subcontractor in Contractor's agreement with Owner. Daily time and material invoices shall include any direct out-in-pocket material and labor costs, plus the percentage markup. Contractor and Subcontractor agree that any such extra, changed or additional work performed by Subcontractor shall be performed pursuant to and in accordance with all the terms and conditions of this Subcontract. Any extension of time needed as the result of the proposed change orders shall be requested by Subcontractor, in writing, prior to the issuance of such change order and shall be incorporated therein. Ordinary field modifications which do not substantially increase Subcontractor's cost of this Subcontract will be performed without any price or time adjustment. No change orders shall vary, abrogate, avoid or otherwise affect the terms, conditions or provisions of this Subcontract except as specifically set forth in the change order.

7. **Scheduling.**

Time is of the essence in the performance of the work specified in this Subcontract. Subcontractor agrees to prosecute the work, at such times and in such order as the Contractor considers necessary to avoid any delay in the completion of the Project as a whole. Subcontractor shall comply with the following schedule:

Per Bid Documents and as scheduled by Project Manager or Jobsite Superintendent. Contact Roger Davis at 585.3420.

If no schedule is set forth above, Subcontractor agrees to begin the work within 3 calendar days after being notified in writing by the Contractor to proceed and to complete work no later than calendar days after notice to proceed by Contractor.

Subcontractor shall timely submit all samples, drawings and information required for approval by Contractor no more than twenty (20) days from award or as otherwise stated in this Agreement, and to place all orders for materials in ample time for delivery, and
to employ sufficient men and equipment to complete the Work in ample time for Contractor to complete its work in accordance with the construction schedule.

If in the opinion of Contractor the Subcontractor falls behind in the progress schedule, Subcontractor shall take such steps as may be necessary to improve the subcontract work progress, and Contractor may require Subcontractor to increase the number of shifts and/or over-time operations, days of work, work weekends and holidays, and/or increase the equipment or tools being used, and to submit for approval such supplementary schedule or schedules as may be necessary to demonstrate the manner in which the agreed rate of progress will be regained, all without additional cost to Contractor. If Subcontractor should delay or threaten to delay the progress or performance of this Subcontract, or cause any delay or actual or potential damage or liability to Contractor, then Subcontractor may be deemed in breach of this Subcontract and shall indemnify and hold Contractor harmless from any penalties, liability and/or damages, and shall promptly pay to Contractor any such costs, penalties, liabilities or damages so incurred, including attorney fees.

Subcontractor shall fully cooperate and coordinate the Work with Contractor and any other contractor or subcontractor at the Project in scheduling and performance of work so as to avoid conflict or interference with the work of others. Subcontractor shall bear the costs of all damages to other subcontractors and shall be directly responsible to such other contractors or Subcontractor.

The Contractor shall not be liable to the Subcontractor for delay to the Subcontractor's work by the act, neglect or default of any person, or by reason of fire or other casualty, or on account of riots or of strikes, or other combined action of the workmen or others, or on account of any acts of God, or any other cause beyond Contractor's control, or on account of any circumstances caused or contributed to by the Subcontractor.

In the event any other subcontractor should interfere with the Work or damage Subcontractor, Subcontractor shall neither seek nor be entitled to any compensation from Contractor, but will seek its damages directly from such other party. Subcontractor acknowledges that the contract price herein is based on the fact that Contractor is not liable to Subcontractor, absent any actual fraud or intentional and active tortious act, for any damages or costs due to delays, accelerations, nonperformance, interferences with performance, suspensions or changes in the performance or sequence of Subcontractor's work.

8. Safety.

Subcontractor shall, at its own expense, conform to the basic safety policy of Contractor including Subcontractor Site Safety Requirements and Procedures manual attached to this Agreement, comply with all specific safety requirements promulgated by any governmental authority and comply with all state and federal safety laws, including, but not limited to the Montana Safety Culture Act, the Montana Safety Act, Occupational Safety and Health Act of 1970 or its successor, and the Construction Safety Act of 1969 or its successor, as the same may be amended from time to time. In addition, Subcontractor agrees to require its employees and sub-subcontractors to abide by all other safety requirements imposed by Contractor or the project Owner. In the event of a dispute over any safety regulation, Subcontractor and its employees shall follow the instructions given by Contractor's job superintendent. If Subcontractor causes Contractor to incur any fine or penalty resulting from the failure of Subcontractor or its employees or sub-subcontractors to comply with OSHA regulations or the Construction Safety Act, Subcontractor hereby authorizes Contractor to reduce the amount due Subcontractor under this Subcontract Agreement by the amount of such fine or penalty. Subcontractor understands that fines and penalties imposed on Contractor because of Subcontractor violations of OSHA regulations may be cumulative, so that the fine imposed on Contractor for a Subcontractor violation may be substantially larger than the fine imposed on the Subcontractor. Because of the potential civil and criminal costs to Contractor, Contractor shall have the right to immediately terminate this Subcontract Agreement, without the written notice required by Section 16, Breaches, below, if Subcontractor, or its employees or Sub-subcontractors willfully violates any safety law or regulation. In the event of such termination, Contractor shall have all of the rights and remedies set forth in Section 16, Breaches, below. Subcontractor agrees to permanently and immediately remove any employee who willfully violates any safety law or regulation upon request by Contractor's job superintendent. Subcontractor hereby agrees to indemnify and save Contractor harmless from all citations, suits (whether such citation or suit be rightfully or wrongfully brought), penalties, losses, damages, costs, and expenses including reasonable attorney fees, arising in whole or in part from the failure or alleged failure of Subcontractor to fully comply with the Montana Safety Culture Act, the Montana Safety Act, Occupational Safety and Health Act of 1970 or its successor, as the same may be amended from time to time. In addition, Subcontractor agrees to require its employees or sub-subcontractors to comply with OSHA regulations or the Construction Safety Act, the Montana Safety Act, Occupational Safety and Health Act of 1970 or its successor, as the same may be amended from time to time.

9. Clean-up.

Subcontractor shall keep the Project free from all rubbish, debris, and any other waste materials. Upon completion of the work, Subcontractor shall perform whatever additional clean-up work is so directed by Contractor, at no additional cost.

10. Material, Tools and Equipment.

Subcontractor shall be solely responsible for the receipt, delivery, unloading, storage, warehousing, protection, and insurance upon all materials, tools and equipment it is to furnish, install, or provide under this Subcontract.

11. Indemnification.

Contractor shall not be liable for any loss or casualty incurred or caused by Subcontractor; Subcontractor assumes all risk of loss for all of its work regardless of whether Subcontractor had previously been paid for the same, and for all of its materials, tools and equipment.

To the fullest extent permitted by law, Subcontractor hereby agrees to defend and hold Contractor harmless from, and indemnifies Contractor against any and all liability, costs, damages, attorney fees, and expenses from any claims or causes of action arising on or near the Project, or relating to performance of this Subcontract or the Work, including: (a) claims relating to its subcontractors, its suppliers or its employees, and (b) claims or disputes of any person or entity for damages from any cause
directly or indirectly relating to any action or failure to act by Subcontractor, its representatives, its employees, its subcontractors or its suppliers, including but not limited to inaccurate surveys, failure to properly perform or interpret tests, and inspection errors, to the extent that the liability, damages, losses or costs are caused by the negligence, recklessness, or intentional misconduct of a third party or of Subcontractor or its officers, employees or agents.

The Subcontractor agrees to indemnify the contractor against and hold the contractor harmless for any and all expenses, suits, and actions (including attorney’s fees) for or on account of any injury to any person, or any death at any time resulting from such injury, or any damage to any property, which may arise (or which may be alleged to have arisen) out of or in connection with the work covered by this Subcontract, to the extent such injury, death or damage may be (or may be alleged to be) attributable to the negligence, recklessness, or intentional misconduct of Subcontractor or Subcontractor’s representatives, its employees or its agents. The Subcontractor agrees to reimburse the Contractor for all sums which the Contractor may pay or be compelled to pay in settlement of any claim hereunder, including any claim under the provisions of any worker’s compensation law or any plan for employees’ benefits which the Contractor may adopt.

Contractor may retain any and all monies due or to become due to Subcontractor, under this or any other contract, sufficient to save itself harmless and protect itself against any such liability or damage, including attorney fees.

Subcontractor acknowledges that specific consideration has been received by it for these indemnifications.

12. Insurance.

Subcontractor shall maintain full and complete insurance and additional insured status on its work for a minimum of one year after final payment, until the end of the warranty period, or such other longer period as may be required by the Contract Documents, in the following amounts:

**Workers Compensation:** Claims for damages because of bodily injury, occupational sickness or disease or death of employees

- Workers Compensation Statutory
- Each Accident $1,000,000
- Disease Policy Limit $1,000,000
- Disease-Each Person $1,000,000

Worker’s Compensation, including occupational disease and employer’s liability insurance shall cover all Subcontractor’s employees and company owners directly engaged in the performance of this Subcontract. Montana Contractors Exemption only allowed for company owners not directly performing work at the jobsite

**Commercial General Liability:** Claims for damages because of bodily injury or property damage to third parties.

Insurance shall include:

- Premises-Operations
- Products-Completed
- Contractual Liability
- Personal and Advertising Injury
- No Exclusion for Blanket Explosion, Collapse, and Underground Property Damage
- Operations of Independent Contractors
- No exclusion for injury to subcontractor’s employees
- No exclusion for residential, habitational or multi-family work
- Per project aggregate limit endorsement
- Waiver of subrogation in favor of contractor
- Minimum Policy Limits:
  - General Aggregate $2,000,000
  - Products/Completed Operations $2,000,000
  - Personal & Advertising Injury $1,000,000
  - Each Occurrence Limit $1,000,000

In respect to the Commercial General Liability insurance which Subcontractor is obligated to purchase by the foregoing provisions, Subcontractor agrees to cause, at its sole expense, General Contractor, to be named as Additional Insured’s under said policy or policies of insurance for both ongoing and completed operations using ISO Forms CG 3287 and CG 3290 or equivalent. Subcontractor’s insurance policy shall be considered primary insurance without recourse to or contribution from any similar insurance carried by subcontractor.

**Automobile Liability:** Claims for damages because of bodily injury or death of any person, or any property damage arising out of the ownership or use of any motor vehicle.

Insurance shall include:

- Owned, hired, and non-owned vehicles
- Limits of $1,000,000 or greater
Combined single limit for each occurrence for bodily injury and death, or property damage.

Subcontractor shall provide notice of any material change, non-renewal or cancellation of insurance within 30 days of such change or notice. Maintenance of proper insurance coverage is a material element of this agreement and failure to maintain or renewal coverage by Subcontractor or its lower tier subcontractors may be treated as a material breach of contract. However, failure to maintain required insurance does not modify or release Subcontractor from any other obligation under this contract.

Failure to Subcontractor to maintain complete insurance and to require its Subcontractors to do so may be deemed a material breach allowing Contractor to either terminate this Subcontract or to procure such insurance at Subcontractor's sole expense; in neither case, however, shall Subcontractor's liability be lessened. Subcontractor agrees to pay to Contractor, on demand, all losses incurred by Contractor due to failure to Subcontractor or its subcontractors to maintain complete insurance coverage.

All liability insurance shall be maintained with a company rated at least "-A" by A.M. Best Co. All certificates of insurance, with additional insured endorsements attached, must be filed and approved with Contractor prior to scheduled commencement of the Work.

13. **Assignment.**

Subcontractor shall not assign this Subcontract or any monies due hereunder without Contractor's written consent.

14. **Liens and Encumbrances.**

Subcontractor agrees to promptly pay all of its laborers, materials suppliers and sub-subcontractors and, in the event any of them file a lien against the project, to promptly remove the lien, by payment or bond.

15. **Taxes, Charges, Etc.**

Subcontractor shall pay the following taxes and fees, which are included in the Contract price:

None apply.

16. **Labor Relations.**

Subcontractor shall take all necessary action to assure harmonious labor relations at the Project and to avoid or that will permit the work to be carried on harmoniously and without delay, and that will not cause any disturbance, interference, or delay to the progress of the Project. Subcontractor agrees to discharge any employee objected to by Contractor upon reasonable grounds.

In the prosecution of all work covered by this Subcontract, or on this Project, the Subcontractor agrees to recognize and comply with all agreements of the Contractor with local building trade councils and/or separate unions concerning labor and working conditions and otherwise, applicable to this work, insofar as these agreements do not conflict with or violate any local, state or federal laws or properly constituted orders or regulations.

The Subcontractor agrees that where his work or the Contractor's work is stopped or delayed or interfered with by strikes, slow-downs, or work interruptions resulting from the acts or failure to act of the employees of the Subcontractor or by any breach of the provisions above, then the Contractor, at his option, may terminate this Subcontract; the Contractor shall have the remedies provided for herein even though the Subcontractor's employees may be engaging in work stoppage solely as a result of a labor dispute involving the Contractor or others and not in any manner involving the Subcontractor. Whether or not this Subcontract is terminated, Subcontractor shall be liable to Contractor for all damages, costs and expenses, including attorney fees, incurred by reason of any delay, interference, injury or damages suffered as a result thereof.

17. **Breaches.**

Occurrence of any of the following conditions may be deemed by Contractor to be a material breach of this Subcontract by Subcontractor:

(a) Subcontractor fails to comply with any one of the provisions of this Subcontract, or fails to perform in accordance with the Prime Contract.

(b) Subcontractor fails to properly prosecute and perform any part of its work in a timely manner.

(c) Subcontractor becomes involved in labor disputes, or is listed or causes Contractor to be listed by the administrator of any union trust fund or by any union as delinquent in payment of wages or fringe benefits.

(d) Subcontractor is adjudged a bankrupt, or makes a general assignment for the benefit of creditors, or a receiver is appointed to take over Subcontractor's business or assets, or Subcontractor becomes insolvent, is unable to, or fails to, pay its obligations as they mature.
In case of breach, Subcontractor and its surety company shall be liable to Contractor for any and all additional costs, expenses, attorney fees and other damages, both liquidated and unliquidated, which directly or indirectly result from Subcontractor's breach or threatened breach. Subcontractor shall also be responsible and liable for all costs and expenses, including attorney fees, and any assessment of liquidated or other damages incurred by Contractor if Contractor pursues any extra, change, addition, claim or dispute against any other party on behalf of Subcontractor or as a result of Contractor's defending or taking part in any action or proceeding which directly or indirectly relates to acts or omissions of Subcontractor or its subcontractors or suppliers.

If Subcontractor is in breach of this Subcontract, the Contractor shall have the right to notify Subcontractor by certified mail of the breach. If the Contractor determines that Subcontractor has not remedied and cured the default or defaults in his performance within three (3) days, then the Contractor may, at its option, without releasing or waiving its rights and remedies against the Subcontractor's sureties and without prejudice to any other right it may be entitled to hereunder or by law, terminate this Subcontract and take possession of the work and all materials, tools, equipment, and appliances of the Subcontractor and finish the Subcontractor's work by whatever means, method or agency which the Contractor may, in its sole discretion, choose, or without terminating this Subcontract, take any steps the Contractor deems advisable to secure any labor, materials, equipment, and services, and shall have a lien on and may take over all of Subcontractor's equipment, tools, appliances and materials and may prosecute the work to completion. In the event that the Contractor deems any of the foregoing remedies necessary, the Subcontractor agrees that it shall not be entitled to receive any further payment until after the Project shall have been completed. Moreover, all monies expended and all of the costs, losses, damages and extra expenses, including all management, administrative and other overhead and other direct and indirect expenses (including attorney's fees) incurred by the Contractor incident to such completion, shall be deducted from the Subcontract sum herein stated, and if such expenditures, together with said costs, losses, damages and extra expenses, exceed the unpaid balance of the Subcontract sum, the Subcontractor agrees to pay promptly to the Contractor, on demand, the full amount of such excess, including costs of collection, attorney's fees and interest thereon at the maximum legal rate of interest per annum until paid.

The Contractor's determination of the Subcontractor's default or defaults and the Contractor's decision as to the Subcontractor's failure to remedy and cure said default or defaults upon notification of their existence, made by the Contractor in good faith, shall be conclusive as to the Contractor's right to proceed as herein provided. The liability of the Subcontractor hereunder shall extend to and include the full amount of any and all sums paid, expenses and losses incurred, damages sustained, and obligations assumed by the Contractor in good faith under the belief that such payments or assumptions were necessary or required, whether actually necessary or required or not, (a) in completing the work and providing labor, materials, equipment, supplies and other items therefor or reletting the Subcontract, and (b) in settlement, discharge or compromise of any claims, demands, suits and judgments pertaining to or arising out of the work hereunder. A sworn itemized statement thereof or the checks or other evidence of payment shall be prima facie evidence of the fact and extent of Subcontractor's liability.

In addition to the cost of completion paid by Contractor, Subcontractor agrees to pay an amount equal to twenty percent (20%) of such cost of completion to cover Contractor's overhead in respect thereto. Whenever any monies are expended or costs or expenses are incurred by Contractor on behalf of or on account of Subcontractor, which Subcontractor should have paid and for which Subcontractor is required to reimburse Contractor, or if Contractor continues or completes the Work after default by Subcontractor, Subcontractor shall pay to Contractor interest at the maximum rate permitted by law from the time said monies are expended or said costs or expenses are incurred until the same are paid to Contractor by Subcontractor. Nothing herein contained shall be construed as requiring Contractor to make any such expenditures, advance any such monies, or incur any such expenses.

18. **Termination for Convenience.**

Upon seven days written notice to the Subcontractor, the Contractor may, without cause and without prejudice to any other right of Contractor, terminate the Subcontract. In such case the Subcontractor shall be paid for (without duplication of any item):

1. completed and acceptable Work executed in accordance with the Subcontract prior to the effective date of termination;
2. reasonable expenses directly attributable to termination.

The Subcontractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from the termination.

19. **Notice.**

Any notice which Contractor desires to or is required to give to Subcontractor may be delivered to Subcontractor's representative or may be delivered or mailed to Subcontractor at the address set forth in this Subcontract. Such notice shall be deemed served upon actual delivery or upon being deposited in the United States mail so addressed, and postage thereon prepaid.

20. **Subcontractors and Suppliers.**

At the time of commencing the Work, Subcontractor shall submit to Contractor a complete written list of all sub-subcontractors and suppliers and their current addresses. Subcontractor further agrees to notify Contractor of any additions, deletions or changes in said list within five (5) days of any such changes.
21. **Guarantee.**
Subcontractor agrees to guarantee its work for a period of one (1) year from the date of completion of the Project. Subcontractor shall remove, replace and/or repair at its own expense defective workmanship, materials and equipment which shall fail to develop ratings, capacities or characteristics required by this Subcontract, or the Contract documents, at any time within a period of one (1) year after acceptance of the Project or within such longer period thereafter as may be provided in the Prime Contract and related documents, if due to Subcontractor's negligence or error. Subcontractor shall also pay all costs necessary to remove, replace and/or repair any other work which may be damaged in removing, replacing or repairing any portion of the Work for which Subcontractor is responsible.
Contractor may demand assurance, by bond or otherwise, from Subcontractor that it will abide by its guarantee and warranty as specified herein and as might otherwise be specified to a greater extent in the Prime Contract.

22. **Governing Law.**
The validity, interpretation and performance of this Subcontract shall be governed by the laws of the State of Montana. If any term or provision of this Subcontract is found invalid, it shall not affect the valid enforcement of all remaining terms and provisions of this Subcontract.

23 **Contract Modifications.**
This Subcontract cannot be changed, modified or amended except in writing executed by all parties. This Subcontract supersedes all prior representations, understandings or agreements except as expressly stated herein. This Subcontract shall be binding upon the heirs, successors, administrators and assigns of the parties hereto.

24. **Failure to Sign Agreement.**
In the event Subcontractor has failed to sign and return to Contractor a copy of this Subcontract after having received a copy hereof from Contractor, and the Subcontractor enters upon performance of the Work, such performance shall be deemed Subcontractor's consent and agreement to be bound by all the terms and conditions of this Subcontract.

25. **Attorney Fees.**
In the event Contractor is required to employ an attorney or bring legal action to enforce this Subcontract or to take any action in respect thereto, or to defend any action arising out of Subcontractor's operations hereunder, Subcontractor agrees in any such event to pay Contractor's reasonable costs and attorney fees, including costs and fees on any appeal.

26. **Miscellaneous.**
None.

CONTRACTOR                                   SUBCONTRACTOR

Signature ___________________________________               Signature _______________________________________

(Stephen T. Langlas)                        

Title: President ___________________________               Title ___________________________
for the following PROJECT:

(Name and location or address)

THE OWNER:

(Name, legal status and address)

THE ARCHITECT:

(Name, legal status and address)

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ARTICLE 1   GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor’s bid or proposal, or portions of Addenda relating to bidding requirements.

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect’s consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect’s consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect’s duties.

§ 1.1.3 THE WORK

The term “Work” means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor’s obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect’s consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.
§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 CAPITIALIZATION
Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION
In the interest of brevity the Contract Documents frequently omit modifying words such as “all” and “any” and articles such as “the” and “an,” but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE
§ 1.5.1 The Architect and the Architect’s consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect’s or Architect’s consultants’ reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect’s consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM
If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER
§ 2.1 GENERAL
§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner’s approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term “Owner” means the Owner or the Owner’s authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic’s lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner’s interest therein.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER
§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner’s obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner’s ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or
the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner’s control and relevant to the Contractor’s performance of the Work with reasonable promptness after receiving the Contractor’s written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3 OWNER’S RIGHT TO STOP THE WORK
If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 OWNER’S RIGHT TO CARRY OUT THE WORK
If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner’s expenses and compensation for the Architect’s additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR
§ 3.1 GENERAL
§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term “Contractor” means the Contractor or the Contractor’s authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect’s administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.
§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor’s review is made in the Contractor’s capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor’s notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor’s best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor’s employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other
facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor’s employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 WARRANTY
The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor’s warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES
The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS
§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor’s cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect’s determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume
the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES
§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,
.1 Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
.2 Contractor’s costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
.3 Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor’s costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 SUPERINTENDENT
§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner’s consent, which shall not unreasonably be withheld or delayed.

§ 3.10 CONTRACTOR’S CONSTRUCTION SCHEDULES
§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner’s and Architect’s information a Contractor’s construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect’s approval. The Architect’s approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor’s construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.
§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE
The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES
§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect’s approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect’s approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect’s approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor’s responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be
required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional’s written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 USE OF SITE
The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 CUTTING AND PATCHING
§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor’s consent to cutting or otherwise altering the Work.

§ 3.15 CLEANING UP
§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor’s tools, construction equipment, machinery and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 ACCESS TO WORK
The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS
The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.
§ 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect’s consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers’ compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner’s representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor’s rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor’s failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.
§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION
Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect’s consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Architect’s evaluations of the Contractor’s Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor’s submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect’s action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect’s professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect’s review of the Contractor’s submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect’s review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect’s approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner’s review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect’s responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect’s response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect’s decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.
§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect’s response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS
§ 5.1 DEFINITIONS
§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term “Subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term “Subcontractor” does not include a separate contractor or subcontractors of a separate contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term “Sub-subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK
§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor’s Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS
By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor’s Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may
be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS
§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor’s rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor’s compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor’s obligations under the subcontract.

ARTICLE 6  CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
§ 6.1 OWNER’S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS
§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner’s own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to those including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term “Contractor” in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner’s own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner’s own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY
§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor’s construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor’s Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that
the Owner’s or separate contractor’s completed or partially completed construction is fit and proper to receive the Contractor’s Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor’s delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor’s delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER’S RIGHT TO CLEAN UP
If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7   CHANGES IN THE WORK
§ 7.1 GENERAL
§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.2 CHANGE ORDERS
§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:
   .1 The change in the Work;
   .2 The amount of the adjustment, if any, in the Contract Sum; and
   .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES
§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:
   .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
   .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
   .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor’s agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor’s agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

1. Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers’ compensation insurance;
2. Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
3. Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
4. Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
5. Additional costs of supervision and field office personnel directly attributable to the change.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect’s professional judgment, to be reasonably justified. The Architect’s interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 MINOR CHANGES IN THE WORK
The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.
ARTICLE 8   TIME
§ 8.1 DEFINITIONS
§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term “day” as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 PROGRESS AND COMPLETION
§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME
§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor’s control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9   PAYMENTS AND COMPLETION
§ 9.1 CONTRACT SUM
The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 SCHEDULE OF VALUES
Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor’s Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT
§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor’s right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

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§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner’s title to such materials and equipment or otherwise protect the Owner’s interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor’s knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor’s Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect’s reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect’s evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect’s knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor’s right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect’s opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect’s opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

1. defective Work not remedied;
2. third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a separate contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor’s portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor’s Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days’ written notice to the Owner and Architect,
§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor’s list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect’s inspection discloses any item, whether or not included on the Contractor’s list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor’s written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the
Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect’s knowledge, information and belief, and on the basis of the Architect’s on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect’s final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor’s being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner’s property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days’ prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys’ fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

1. liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
2. failure of the Work to comply with the requirements of the Contract Documents; or
3. terms of special warranties required by the Contract Documents.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

1. employees on the Work and other persons who may be affected thereby;
2. the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor’s Subcontractors or Sub-subcontractors; and
3. other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.
§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor’s obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor’s organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor’s superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor’s written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor’s reasonable additional costs of shut-down, delay and start-up.
§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect’s consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor’s fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner’s fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 EMERGENCIES
In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor’s discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS
§ 11.1 CONTRACTOR’S LIABILITY INSURANCE
§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor’s operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

.1 Claims under workers’ compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor’s employees;
.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor’s employees;
.4 Claims for damages insured by usual personal injury liability coverage;
.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
.6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
.7 Claims for bodily injury or property damage arising out of completed operations; and
.8 Claims involving contractual liability insurance applicable to the Contractor’s obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor’s completed operations coverage, until the expiration of the period for correction
of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days’ prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect’s consultants as additional insureds for claims caused in whole or in part by the Contractor’s negligent acts or omissions during the Contractor’s operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor’s negligent acts or omissions during the Contractor’s completed operations.

§ 11.2 OWNER’S LIABILITY INSURANCE
The Owner shall be responsible for purchasing and maintaining the Owner’s usual liability insurance.

§ 11.3 PROPERTY INSURANCE
§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder’s risk “all-risk” or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an “all-risk” or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect’s and Contractor’s services and expenses required as a result of such insured loss.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or
otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or
companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that
would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 BOILER AND MACHINERY INSURANCE
The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by
law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner;
this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work,
and the Owner and Contractor shall be named insureds.

§ 11.3.3 LOSS OF USE INSURANCE
The Owner, at the Owner’s option, may purchase and maintain such insurance as will insure the Owner against loss
of use of the Owner’s property due to fire or other hazards, however caused. The Owner waives all rights of action
against the Contractor for loss of use of the Owner’s property, including consequential losses due to fire or other
hazards however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other
special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such
insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent
to the site by property insurance under policies separate from those insuring the Project, or if after final payment
property insurance is to be provided on the completed Project through a policy or policies other than those insuring
the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section
11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate
policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that
includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable
conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision
that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days’
prior written notice has been given to the Contractor.

§ 11.3.7 WAIVERS OF SUBROGATION
The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-
subcontractors, agents and employees, each of the other, and (2) the Architect, Architect’s consultants, separate
contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees,
for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to
this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of
such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the
Architect, Architect’s consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-
subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for
validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of
subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even
though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay
the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the
property damaged.

§ 11.3.8 A loss insured under the Owner’s property insurance shall be adjusted by the Owner as fiduciary and made
payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any
applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of
insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for
validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss,
give bond for proper performance of the Owner’s duties. The cost of required bonds shall be charged against
proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the

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User Notes: (1416317762)
Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner’s exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12   UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Architect’s request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect’s examination and be replaced at the Contractor’s expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner’s expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor’s expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect’s services and expenses made necessary thereby, shall be at the Contractor’s expense.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor’s obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.
§ 12.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor’s correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor’s liability with respect to the Contractor’s obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner’s rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.
§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner’s expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect’s services and expenses shall be at the Contractor’s expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

1. Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

2. An act of government, such as a declaration of national emergency that requires all Work to be stopped;
§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days’ written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner’s obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days’ written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE
§ 14.2.1 The Owner may terminate the Contract if the Contractor
.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor’s surety, if any, seven days’ written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:
.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
.2 Accept assignment of subcontracts pursuant to Section 5.4; and
.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect’s services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE
§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.
§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:

1. that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or

2. that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner’s convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner’s convenience, the Contractor shall:

1. cease operations as directed by the Owner in the notice;

2. take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

3. except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner’s convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term “Claim” also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS

Claims by the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor’s Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.
§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES
The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

1. damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

2. damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party’s termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION
§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker’s sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner’s expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.
§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor’s default, the Owner may, but is not obligated to, notify the surety and request the surety’s assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic’s lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 MEDIATION
§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 The parties shall share the mediator’s fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be held in confidence and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 ARBITRATION
§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 CONSOLIDATION OR JOINDER
§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an
additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.
List of Contract Forms for Subcontract Administration

The following is a list of Contract Administration Forms to be used in this Project. No others will be accepted unless noted otherwise. Hard copies of these forms will be available at the first scheduled preconstruction meeting. Electronic forms are available through Langlas & Associates. Contact Matt Drake at mattdrake@langlas.com

- Change Order Request- Langlas COR Form, per specification 00 7200
- Construction Change Directive- Langlas CCD Form or emailed directive, per specification 00 7200
- Construction Change Order- Langlas Subcontract Change Order Form, per specification 00 7200
- Proposal Request- AIA G704 as issued by Architect
- Application and Certificate for Payment- Per specification 00 7210
- Certified Payroll- US Department of Labor Form WH347 or Subcontractors own form contained identical information
- RFI and Submittal Distribution- RFI’s, submittals and closeout documentation will be handled electronically. Subcontractors will be required to submit Information Requests and Submittal information electronically. Further instruction will be available at the first scheduled preconstruction meeting.

END OF LIST OF CONTRACT FORMS
INSURANCE REQUIREMENTS PACKET:

Before commencing work, the Subcontractor shall procure and maintain in force the insurance coverage’s outlined below, and provide evidence of such coverage by submitting to Langlas & Associates, Inc. an original and appropriate Certificate of Insurance (See attached sample). The insurance carrier or carriers must be rated at least A- or better by A.M. Best or an acceptable State Fund for Workers Compensation Coverage.

**Workers Compensation & Employers Liability:** Shall extend to all employees and company owners directly engaged in named insured’s operations except for company owners not directly performing work at the jobsite and 2nd tier subcontractors. Proof of coverage to be provided in the following limits:

- **Workers compensation Statutory**
  - Employers Liability Limits $1,000,000 Each Accident
  - $1,000,000 Disease- Policy Limit
  - $1,000,000 Disease- Each Employee

**Commercial General Liability Insurance:** Claims for damages because of bodily injury or property damage to third parties. Insurance shall include:

- Premises-Operations
- Products-Completed Operations
- Contractual Liability
- Personal and Advertising Injury
- No Exclusion for Blanket Explosion, Collapse, and Underground Property Damage:
  - Operations of Independent Contractors
- No exclusion for injury to subcontractor’s employees
- No exclusion for residential, habitational or multi-family work
- Per project aggregate limit endorsement
- Waiver of subrogation in favor of contractor

**Minimum Policy Limits:**

- General Aggregate $2,000,000
- Products/Completed Operations $2,000,000
- Personal & Advertising Injury $1,000,000
- Each Occurrence Limit $1,000,000
In respect to the public liability and property damage insurance which Subcontractor is obligated
to purchase by the foregoing provisions, Subcontractor agrees to cause, at its sole expense,
Langlas & Associates, Inc., to be named as Additional Insured’s under said policy or policies of
insurance for both ongoing and completed operations using ISO Forms CG 3287 and CG 3290 or
equivalent.

Subcontractor's insurance policy shall be considered primary insurance without recourse to or
contribution from any similar insurance carried by subcontractor. Subcontractor shall maintain
coverage and additional insured status for a minimum of one year after final payment, until the
end of the warranty period, or such other longer period as may be required by the Contract
Documents.

Automobile Liability: Claims for damages because of bodily injury or death of any person, or
any property damage arising out of the ownership or use of any motor vehicle. Insurance
coverage shall include comprehensive Automobile Liability insurance including owned, hired
and non-owned vehicles with limits of $1,000,000 or greater, combined single limit for each
occurrence for bodily injury and death, or property damage.

Cancellation Notice: Subcontractor shall provide notice of any material change, non-renewal or
cancellation of insurance within 30 days of such change or notice. Maintenance of proper
insurance coverage is a material element of this agreement and failure to maintain or renewal
coverage may be treated as a material breach of contract. However, failure to maintain required
insurance does not modify or release Subcontractor from any other obligation under this contract.

Certificates:
Depending on the Langlas & Associates office location providing the subcontract agreement, the
certificate holder/additional insured shall respectively read:

Billings Office: Bozeman Office:
2270GrantRd. 1019 E. Main St. Suite 101
Billings, MT  59102  Bozeman, MT  59715

If you have any questions regarding the insurance requirements, please contact our agent:

First West, Inc.
Bryan Hall
1905 Stadium Drive
Bozeman, MT 59715
bryan@fstwest.com
406-587-5111
CERTIFICATE OF LIABILITY INSURANCE

PRODUCER
First West, Inc.
406-587-5111
PO Box 1800
1900 Stadium Dr
Bozeman, MT 59715
Bryan D. Hall, CIC

CONTACT
406-587-9162

NAME:

PHONE:

FAX:

EMAIL:

ADDRESS:

INSURER(A) AFFORDING COVERAGE

INSURED
SUBCONTRACTOR'S NAME
ADDRESS
CITY, ST ZIP

1) Does the named insured match the name on your subcontract agreement?

COVERAGE
CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

A
GENERAL LIABILITY

X CLAims-Made
X OCCUR

X POLICY NUMBER

01/01/13
01/01/14

X OCCURRENCE

1,000,000

X DAMAGE TO RENTED PREMISES BUT OCCURRING

100,000

X MED EXP (Per person)

5,000

X PERSONAL & ADV INJURY

1,000,000

X GENERAL AGGREGATE

2,000,000

X PRODUCTS - COMP/OP AGG

2,000,000

X UM/WM

2,000,000

B
AUTOMOBILE LIABILITY

X ANY AUTO

X ALL OWNED Autos

X SCHEDULED Autos

X NON-OWNED Autos

X UMBRELLA LIABILITY

X EXCESS LIABILITY

X OCCUR

X CLAims-Made

X POLICY NUMBER

01/01/13
01/01/14

X EACH OCCURRENCE

X AGGREGATE

X EACH ACCIDENT

X EACH OCCURANCE

X EACH ACCIDENT

X EACH OCCURRENCE

X EACH ACCIDENT

X EACH OCCURENCE

X EACH ACCIDENT

C
WORKERS COMPENSATION

M N/A

POLICY NUMBER

01/01/13
01/01/14

7) Is Langlas & Associates, Inc. an additional insured for both Ongoing and Completed Operations? Is it noted?

CERTIFICATE HOLDER
Langlas & Associates, Inc.
2270 Grant Rd
Billings, MT 59102

CANCELLATION

ACORD 25 (2010/05)

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Contract Modification Procedures for Modification of Subcontract Agreement

Outlined below are administrative and procedural requirements for handling and processing Subcontract modifications to Contract Sum or Contract Time.

MINOR CHANGES IN THE WORK

Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, “Architect’s Supplemental Instructions” or similar form. These will be distributed by the Construction Manager to Subcontractors accordingly.

PROPOSAL REQUESTS

Owner-initiated Proposal Requests: Architect will issue a detailed description of proposed change in the Work that may require adjustment to the Contract Sum or the Contract Time on AIA G704 or similar. If necessary, the description will include supplemental or revised Drawings and Specifications. These documents will be distributed by the Construction Manager to Subcontractors accordingly.

1. Proposal Requests issued by Architect or Construction Manager are not instructions either to stop work in progress or to execute the proposed change.
2. Within the time specified in the Proposal Request or as requested by Construction Manager, submit an itemized quotation estimated cost adjustments to the Contract Sum or Contract Time necessary to execute the change. This quotation is to be completed on the Construction Manager’s “Change Request Form” or Subcontractors own form containing identical information. Submit this form to Construction Manager for review.

SUBCONTRACTOR-INITIATED PROPOSALS

If latent or changed conditions require modifications to the Subcontract, Subcontractor may initial a claim by submitted a Change Request Form to the Construction Manager.

1. Include all the information required by the Change Request Form including a description of the change, reference RFI(s), and the effect on Contract Sum and Contract Time.
2. Include a detailed, itemized list of materials, quantities and unit costs.
3. Include a detailed breakdown on labor requirements and corresponding wage rates.
4. Include a detailed breakdown of equipment, delivery charges, 2nd tier subcontract modifications and/or other requirements.
5. Show any applicable credits for labor, material or equipment as separate line items from additional costs.
6. Sign, date and transmit document to Construction Manager for review.

Upon submission of the Change Request Form by Subcontractor, Construction Manager will review the proposed change with the Owner’s Representative, Architect and any of the Architects Consultants to review the content and merit of the proposed change. Upon Owner acceptance of the change, Construction Manager will issue to Subcontractor a Construction Change Directive or Subcontract Change Order

CONSTRUCTION CHANGE DIRECTIVE

Upon acceptance of the proposed change in Contract Sum or Contract Time, Construction Manager may issue a Construction Change Directive either in the form of a signed CCD Form or an email directing the Subcontractor to proceed with the work in question. This directive and associated adjustments to Contract Sum or Contract Time will be included in subsequent Change Order.

1. Subcontractor is not to proceed with any change in work without written documentation from Construction Manager as outlined above.
SUBCONTRACT CHANGE ORDER

Pending issue of Prime Contract Change Order by Architect, Construction Manager will issue to Subcontractor a formal signed change order summarizing the change in work and subsequent modification to Contract Sum and/or Contract Time.

1. Upon receipt of a signed Subcontractor Change Order, Subcontractor may include the change as a separate line item on their AIA billing document.
2. Change Order can be billed out on a basis of percentage of change order work completed.

END OF SUBCONTRACT MODIFICATION PROCEDURES
MONTANA
PREVAILING WAGE RATES FOR BUILDING CONSTRUCTION SERVICES 2017

Effective: January 7, 2017

Steve Bullock, Governor
State of Montana

Pam Bucy, Commissioner
Department of Labor and Industry

To obtain copies of prevailing wage rate schedules, or for information relating to public works projects and payment of prevailing wage rates, visit ERD at www.mtwagehourbopa.com or contact:

Employment Relations Division
Montana Department of Labor and Industry
P. O. Box 201503
Helena, MT 59620-1503
Phone 406-444-5600
TDD 406-444-5549

The Labor Standards Bureau welcomes questions, comments, and suggestions from the public. In addition, we’ll do our best to provide information in an accessible format, upon request, in compliance with the Americans with Disabilities Act.

MONTANA PREVAILING WAGE REQUIREMENTS

The Commissioner of the Department of Labor and Industry, in accordance with Sections 18-2-401 and 18-2-402 of the Montana Code Annotated (MCA), has determined the standard prevailing rate of wages for the occupations listed in this publication.

The wages specified herein control the prevailing rate of wages for the purposes of Section 18-2-401, et seq., MCA. It is required that each employer pay (as a minimum) the rate of wages, including fringe benefits, travel allowance, zone pay and per diem applicable to the district in which the work is being performed as provided in the attached wage determinations.

All Montana Prevailing Wage Rates are available on the internet at www.mtwagehourbopa.com or by contacting the Labor Standards Bureau at (406) 444-5600 or TDD (406) 444-5549.

In addition, this publication provides general information concerning compliance with Montana’s Prevailing Wage Law and the payment of prevailing wages. For detailed compliance information relating to public works contracts and payment of prevailing wage rates, please consult the regulations on the internet at www.mtwagehourbopa.com or contact the Labor Standards Bureau at (406) 444-5600 or TDD (406) 444-5549.

PAM BUCY
Commissioner
Department of Labor and Industry
State of Montana
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A. Date of Publication January 7, 2017

B. Definition of Building Construction
For the purposes of Prevailing Wage, the Commissioner of Labor and Industry has determined that building construction occupations are defined to be those performed by a person engaged in a recognized trade or craft, or any skilled, semi-skilled, or unskilled manual labor related to the construction, alteration, or repair of a public building or facility, and does not include engineering, superintendence, management, office or clerical work.

The Administrative Rules of Montana (ARM), 24.17.501(2) – 2(a), states “Building construction projects generally are the constructions of sheltered enclosures with walk-in access for housing persons, machinery, equipment, or supplies. It includes all construction of such structures, incidental installation of utilities and equipment, both above and below grade level, as well as incidental grading, utilities and paving.

Examples of building construction include, but are not limited to, alterations and additions to buildings, apartment buildings (5 stories and above), arenas (closed), auditoriums, automobile parking garages, banks and financial buildings, barracks, churches, city halls, civic centers, commercial buildings, court houses, detention facilities, dormitories, farm buildings, fire stations, hospitals, hotels, industrial buildings, institutional buildings, libraries, mausoleums, motels, museums, nursing and convalescent facilities, office buildings, out-patient clinics, passenger and freight terminal buildings, police stations, post offices, power plants, prefabricated buildings, remodeling buildings, renovating buildings, repairing buildings, restaurants, schools, service stations, shopping centers, stores, subway stations, theaters, warehouses, water and sewage treatment plants (buildings only), etc.”

C. Definition of Public Works Contract
Section 18-2-401(11)(a), MCA defines “public works contract” as “...a contract for construction services let by the state, county, municipality, school district, or political subdivision or for nonconstruction services let by the state, county, municipality, or political subdivision in which the total cost of the contract is in excess of $25,000...”.

D. Prevailing Wage Schedule
This publication covers only Building Construction occupations and rates. These rates will remain in effect until superseded by a more current publication. Current prevailing wage rate schedules for Heavy Construction, Highway Construction, and Nonconstruction Services occupations can be found on the internet at www.mtwagehoubopa.com or by contacting the Labor Standards Bureau at (406) 444-5600 or TDD (406) 444-5549.

E. Rates to Use for Projects
ARM, 24.17.127(1)(c), states “The wage rates applicable to a particular public works project are those in effect at the time the bid specifications are advertised.”

F. Wage Rate Adjustments for Multiyear Contracts
Section 18-2-417, MCA states:

“(1) Any public works contract that by the terms of the original contract calls for more than 30 months to fully perform must include a provision to adjust, as provided in subsection (2), the standard prevailing rate of wages to be paid to the workers performing the contract.

(2) The standard prevailing rate of wages paid to workers under a contract subject to this section must be adjusted 12 months after the date of the award of the public works contract. The amount of the adjustment must be a 3% increase. The adjustment must be made and applied every 12 months for the term of the contract.

(3) Any increase in the standard rate of prevailing wages for workers under this section is the sole responsibility of the contractor and any subcontractors and not the contracting agency.”
G. Fringe Benefits
Section 18-2-412, MCA states:

“(1) To fulfill the obligation...a contractor or subcontractor may:

(a) pay the amount of fringe benefits and the basic hourly rate of pay that is part of the standard prevailing rate of wages directly to the worker or employee in cash;

(b) make an irrevocable contribution to a trustee or a third person pursuant to a fringe benefit fund, plan, or program that meets the requirements of the Employee Retirement Income Security Act of 1974 or that is a bona fide program approved by the U. S. department of labor; or

(c) make payments using any combination of methods set forth in subsections (1)(a) and (1)(b) so that the aggregate of payments and contributions is not less than the standard prevailing rate of wages, including fringe benefits and travel allowances, applicable to the district for the particular type of work being performed.

(2) The fringe benefit fund, plan, or program described in subsection (1)(b) must provide benefits to workers or employees for health care, pensions on retirement or death, life insurance, disability and sickness insurance, or bona fide programs that meet the requirements of the Employee Retirement Income Security Act of 1974 or that are approved by the U. S. department of labor.”

Fringe benefits are paid for all hours worked (straight time and overtime hours). However, fringe benefits are not to be considered a part of the hourly rate of pay for calculating overtime, unless there is a collectively bargained agreement in effect that specifies otherwise.

H. Prevailing Wage Districts
Montana counties are aggregated into 4 districts for the purpose of prevailing wage. The prevailing wage districts are composed of the following counties:

Montana Prevailing Wage Districts
I. Dispatch City
ARM, 24.17.103(11), defines dispatch city as “...the courthouse in the city from the following list which is closest to the center of the job: Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, and Missoula.” A dispatch city shall be considered the point of origin only for jobs within the counties identified in that district (as shown below):

- **District 1 – Kalispell and Missoula:** includes Flathead, Lake, Lincoln, Mineral, Missoula, Ravalli, and Sanders;
- **District 2 – Butte and Helena:** includes Beaverhead, Broadwater, Deer Lodge, Glacier, Granite, Jefferson, Lewis and Clark, Liberty, Madison, Pondera, Powell, Silver Bow, Teton, and Toole;
- **District 3 – Bozeman and Great Falls:** includes Blaine, Cascade, Chouteau, Fergus, Gallatin, Golden Valley, Hill, Judith Basin, Meagher, Park, Petroleum, Phillips, Sweet Grass, and Wheatland;
- **District 4 – Billings:** includes Big Horn, Carbon, Carter, Custer, Daniels, Dawson, Fallon, Garfield, McCon, Musselshell, Powder River, Prairie, Richland, Roosevelt, Rosebud, Sheridan, Stillwater, Treasure, Valley, Wibaux, and Yellowstone.

J. Zone Pay
Zone pay is not travel pay. ARM, 24.17.103(24), defines zone pay as “...an amount added to the base pay; the combined sum then becomes the new base wage rate to be paid for all hours worked on the project. Zone pay must be determined by measuring the road miles one way over the shortest practical maintained route from the dispatch city to the center of the job.” See section I above for a list of dispatch cities.

K. Computing Travel Benefits
ARM, 24.17.103(22), states “'Travel pay,' also referred to as 'travel allowance,' is and must be paid for travel both to and from the job site, except those with special provisions listed under the classification. The rate is determined by measuring the road miles one direction over the shortest practical maintained route from the dispatch city or the employee's home, whichever is closer, to the center of the job.” See section I above for a list of dispatch cities.

L. Per Diem
ARM, 24.17.103(18), states “'Per diem’ typically covers costs associated with board and lodging expenses. Per diem is paid when an employee is required to work at a location outside the daily commuting distance and is required to stay at that location overnight or longer.”

M. Apprentices
Wage rates for apprentices registered in approved federal or state apprenticeship programs are contained in those programs. Additionally, Section 18-2-416(2), MCA states “...The full amount of any applicable fringe benefits must be paid to the apprentice while the apprentice is working on the public works contract.” Apprentices not registered in approved federal or state apprenticeship programs will be paid the appropriate journey level prevailing wage rate when working on a public works contract.

N. Posting Notice of Prevailing Wages
Section 18-2-406, MCA provides that contractors, subcontractors and employers who are “...performing work or providing construction services under public works contracts, as provided in this part, shall post in a prominent and accessible site on the project or staging area, not later than the first day of work and continuing for the entire duration of the project, a legible statement of all wages and fringe benefits to be paid to the employees.”

O. Employment Preference
Sections 18-2-403 and 18-2-409, MCA requires contractors to give preference to the employment of bona fide Montana residents in the performance of work on public works contracts.

P. Projects of a Mixed Nature
Section 18-2-408, MCA states:

“(1) The contracting agency shall determine, based on the preponderance of labor hours to be worked, whether the public works construction services project is classified as a highway construction project, a heavy construction project, or a building construction project.

(2) Once the project has been classified, employees in each trade classification who are working on that project must be paid at the rate for that project classification”
Q. Occupations Definitions
You can find definitions for these occupations on the following Bureau of Labor Statistics website:
http://www.bls.gov/oes/current/oes_stru.htm

R. Welder Rates
Welders receive the rate prescribed for the craft performing an operation to which welding is incidental.

S. Foreman Rates
Rates are no longer set for foremen. However, if a foreman performs journey level work, the foreman must be paid at least the journey level rate.
# WAGE RATES

## BOILERMAKERS

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$30.25</td>
<td>$30.30</td>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
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<td>$30.30</td>
</tr>
<tr>
<td>4</td>
<td>$30.25</td>
<td>$30.30</td>
</tr>
</tbody>
</table>

**Duties Include:**
Construct, assemble, maintain, and repair stationary steam boilers, boiler house auxiliaries, process vessels, and pressure vessels.

**Travel:**
- All Districts
  - 0-120 mi. free zone
  - >120 mi. federal mileage rate/mi.

**Special Provision:**
Travel is paid only at the beginning and end of the job.

**Per Diem:**
- All Districts
  - 0-70 mi. free zone
  - >70-120 mi. $55.00/day
  - >120 mi. $70.00/day

## BRICK, BLOCK, AND STONE MASONS

<table>
<thead>
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<th>Wage</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
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<td>$26.58</td>
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<td>$13.19</td>
</tr>
<tr>
<td>4</td>
<td>$26.22</td>
<td>$13.19</td>
</tr>
</tbody>
</table>

**Travel:**
- All Districts
  - 0-45 mi. free zone
  - >45-60 mi. $25.00/day
  - >60-90 mi. $55.00/day
  - >90 mi. $65.00/day

## CARPENTERS

<table>
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<th>Benefit</th>
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</thead>
<tbody>
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</tr>
<tr>
<td>4</td>
<td>$22.50</td>
<td>$11.82</td>
</tr>
</tbody>
</table>

**Duties Include:**
Install roll and batt insulation, and hardwood floors.

**Zone Pay:**
- All Districts
  - 0-30 mi. free zone
  - >30-60 mi. base pay + $4.00/hr.
  - >60 mi. base pay + $6.00/hr.

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CEMENT MASONs AND CONCRETE FINISHERs

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</tr>
<tr>
<td>District 4</td>
<td>$19.22</td>
<td>$10.36</td>
</tr>
</tbody>
</table>

Duties Include:
Smooth and finish surfaces of poured concrete, such as floors, walks, sidewalks, or curbs. Align forms for sidewalks, curbs, or gutters.

Zone Pay:
All Districts
0-30 mi. free zone
>30-60 mi. base pay + $2.95/hr.
>60 mi. base pay + $4.75/hr.

CONSTRUCTION EQUIPMENT OPERATORS GROUP 1

<table>
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</tr>
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</tr>
<tr>
<td>District 4</td>
<td>$25.41</td>
<td>$12.05</td>
</tr>
</tbody>
</table>

This group includes but is not limited to:
Air Compressor; Auto Fine Grader; Belt Finishing; Boring Machine (Small); Cement Silo; Crane, A-Frame Truck Crane; Crusher Conveyor; DW-10, 15, and 20 Tractor Roller; Farm Tractor; Forklift; Form Grader; Front-End Loader, under 1 cu. yd; Oiler, Heavy Duty Drills; Herman Nelson Heater; Mucking Machine; Oiler, All Except Cranes/Shovels; Pumpman.

Zone Pay:
All Districts
0-30 mi. free zone
>30-60 mi. base pay + $3.50/hr.
>60 mi. base pay + $5.50/hr.

↑ Back to Table of Contents
### CONSTRUCTION EQUIPMENT OPERATORS GROUP 2

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<tr>
<td>District 4</td>
<td>$26.20</td>
<td>$12.05</td>
</tr>
</tbody>
</table>

This group includes but is not limited to:
Air Doctor; Backhoe\Excavator\Shovel, up to and incl. 3 cu. yds; Bit Grinder; Bituminous Paving Travel Plant; Boring Machine, Large; Broom, Self-Propelled; Concrete Travel Batch; Concrete Float & Spreader; Concrete Bucket Dispatcher; Concrete Finish Machine; Concrete Conveyer; Distributor; Dozer, Rubber-Tired, Push, & Side Boom; Elevating Grader\Gradall; Field Equipment Serviceman; Front-End Loader, 1 cu. yd up to and incl. 5 cu. yds; Grade Setter; Heavy Duty Drills, All Types; Hoist\Tugger, All; Hydralift Forklifts & Similar; Industrial Locomotive; Motor Patrol (except finish); Mountain Skidder; Oiler, Cranes\Shovels; Pavement Breaker, EMSCO; Power Saw, Self-Propelled; Pugmill; Pumpcrete\Grout Machine; Punch Truck; Roller, other than Asphalt; Roller, Sheepsfoot (Self-Propelled); Roller, 25 tons and over; Ross Carrier; Rotomill, under 6 ft; Trenching Machine; Washing /Screening Plant.

**Zone Pay:**
- **All Districts**
  - 0-30 mi. free zone
  - >30-60 mi. base pay + $3.50/hr.
  - >60 mi. base pay + $5.50/hr.

↑ Back to Table of Contents

### CONSTRUCTION EQUIPMENT OPERATORS GROUP 3

<table>
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<th>District</th>
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</tr>
<tr>
<td>District 4</td>
<td>$27.95</td>
<td>$12.05</td>
</tr>
</tbody>
</table>

This group includes but is not limited to:
Asphalt Paving Machine; Asphalt Screed; Backhoe\Excavator\Shovel, over 3 cu. yds; Cableway Highline; Concrete Batch Plant; Concrete Curing Machine; Concrete Pump; Cranes, Creter; Cranes, Electric Overhead; Cranes, 24 tons and under; Curb Machine\Slip Form Paver; Finish Dozer; Front-End Loader, over 5 cu. yds; Mechanic\Welder; Pioneer Dozer; Roller Asphalt (Breakdown & Finish); Rotomill, over 6 ft; Scraper, Single, Twin, or Pulling Belly-Dump; YO-YO Cat.

**Zone Pay:**
- **All Districts**
  - 0-30 mi. free zone
  - >30-60 mi. base pay + $3.50/hr.
  - >60 mi. base pay + $5.50/hr.

↑ Back to Table of Contents
CONSTRUCTION EQUIPMENT OPERATORS GROUP 4

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<tr>
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<td>All Districts</td>
</tr>
<tr>
<td>2</td>
<td>$28.95</td>
<td>$12.05</td>
<td>0-30 mi. free zone</td>
</tr>
<tr>
<td>3</td>
<td>$28.95</td>
<td>$12.05</td>
<td>&gt;30-60 mi. base pay + $3.50/hr.</td>
</tr>
<tr>
<td>4</td>
<td>$28.95</td>
<td>$12.05</td>
<td>&gt;60 mi. base pay + $5.50/hr.</td>
</tr>
</tbody>
</table>

This group includes but is not limited to:
Asphalt/Hot Plant Operator; Cranes, 25 tons up to and incl. 44 tons; Crusher Operator; Finish Motor Patrol; Finish Scraper.

CONSTRUCTION EQUIPMENT OPERATORS GROUP 5

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
<th>Zone Pay:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$29.95</td>
<td>$12.05</td>
<td>All Districts</td>
</tr>
<tr>
<td>2</td>
<td>$29.95</td>
<td>$12.05</td>
<td>0-30 mi. free zone</td>
</tr>
<tr>
<td>3</td>
<td>$29.95</td>
<td>$12.05</td>
<td>&gt;30-60 mi. base pay + $3.50/hr.</td>
</tr>
<tr>
<td>4</td>
<td>$29.95</td>
<td>$12.05</td>
<td>&gt;60 mi. base pay + $5.50/hr.</td>
</tr>
</tbody>
</table>

This group includes but is not limited to:
Cranes, 45 tons up to and incl. 74 tons.

CONSTRUCTION EQUIPMENT OPERATORS GROUP 6

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
<th>Zone Pay:</th>
</tr>
</thead>
<tbody>
<tr>
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<td>$12.05</td>
<td>All Districts</td>
</tr>
<tr>
<td>2</td>
<td>$30.95</td>
<td>$12.05</td>
<td>0-30 mi. free zone</td>
</tr>
<tr>
<td>3</td>
<td>$30.95</td>
<td>$12.05</td>
<td>&gt;30-60 mi. base pay + $3.50/hr.</td>
</tr>
<tr>
<td>4</td>
<td>$30.95</td>
<td>$12.05</td>
<td>&gt;60 mi. base pay + $5.50/hr.</td>
</tr>
</tbody>
</table>

This group includes but is not limited to:
Cranes, 75 tons up to and incl. 149 tons; Cranes, Whirley (All).
### CONSTRUCTION EQUIPMENT OPERATORS GROUP 7

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
<th>Zone Pay:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>All Districts</td>
</tr>
<tr>
<td>District 1</td>
<td>$31.95</td>
<td>$12.05</td>
<td>0-30 mi. free zone</td>
</tr>
<tr>
<td>District 2</td>
<td>$31.95</td>
<td>$12.05</td>
<td>&gt;30-60 mi. base pay + $3.50/hr.</td>
</tr>
<tr>
<td>District 3</td>
<td>$31.95</td>
<td>$12.05</td>
<td>&gt;60 mi. base pay + $5.50/hr.</td>
</tr>
</tbody>
</table>

This group includes but is not limited to:
- Cranes, 150 tons up to and incl. 250 tons; Cranes, over 250 tons—add $1.00 for every 100 tons over 250 tons;
- Crane, Tower (All); Crane Stiff-Leg or Derrick; Helicopter Hoist.

### CONSTRUCTION LABORERS GROUP 1 / FLAG PERSON FOR TRAFFIC CONTROL

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
<th>Zone Pay:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>All Districts</td>
</tr>
<tr>
<td>District 1</td>
<td>$18.75</td>
<td>$7.92</td>
<td>0-15 mi. free zone</td>
</tr>
<tr>
<td>District 2</td>
<td>$18.75</td>
<td>$7.92</td>
<td>&gt;15-30 mi. base pay + $0.65/hr.</td>
</tr>
<tr>
<td>District 3</td>
<td>$18.75</td>
<td>$7.92</td>
<td>&gt;30-50 mi. base pay + $0.85/hr.</td>
</tr>
<tr>
<td>District 4</td>
<td>$18.75</td>
<td>$7.92</td>
<td>&gt;50 mi. base pay + $1.25/hr.</td>
</tr>
</tbody>
</table>

### CONSTRUCTION LABORERS GROUP 2

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
<th>Zone Pay:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td>All Districts</td>
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<tr>
<td>District 1</td>
<td>$18.72</td>
<td>$8.82</td>
<td>0-15 mi. free zone</td>
</tr>
<tr>
<td>District 2</td>
<td>$18.47</td>
<td>$6.95</td>
<td>&gt;15-30 mi. base pay + $0.65/hr.</td>
</tr>
<tr>
<td>District 3</td>
<td>$15.88</td>
<td>$4.17</td>
<td>&gt;30-50 mi. base pay + $0.85/hr.</td>
</tr>
<tr>
<td>District 4</td>
<td>$17.31</td>
<td>$4.44</td>
<td>&gt;50 mi. base pay + $1.25/hr.</td>
</tr>
</tbody>
</table>

This group includes but is not limited to:
- General Labor; Asbestos Removal; Burning Bar; Bucket Man; Carpenter Tender; Caisson Worker; Cement Mason Tender; Cement Handler (dry); Chuck Tender; Choker Setter; Concrete Worker; Curb Machine-lay Down; Crusher and Batch Worker; Heater Tender; Fence Erector; Landscape Laborer; Landscaper; Lawn Sprinkler Installer; Pipe Wrapper; Pot Tender; Powderman Tender; Rail and Truck Loaders and Unloaders; Ripraper; Sign Erection; Guardrail and Jersey Rail; Spike Driver; Stake Jumper; Signalman; Tail Hoseman; Tool Checker and Houseman and Traffic Control Worker.
CONSTRUCTION LABORERS GROUP 3

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>District 1</td>
<td>$19.80</td>
<td>$7.92</td>
</tr>
<tr>
<td>District 2</td>
<td>$19.80</td>
<td>$7.92</td>
</tr>
<tr>
<td>District 3</td>
<td>$19.80</td>
<td>$7.92</td>
</tr>
<tr>
<td>District 4</td>
<td>$19.80</td>
<td>$7.92</td>
</tr>
</tbody>
</table>

This group includes but is not limited to:
Concrete Vibrator; Dumpman (Grader); Equipment Handler; Geotextile and Liners; High-Pressure Nozzelman; Jackhammer (Pavement Breaker) Non-Riding Rollers; Pipelayer; Posthole Digger (Power); Power Driven Wheelbarrow; Rigger; Sandblaster; Sod Cutter-Power and Tamper.

Zone Pay:
All Districts
0-15 mi. free zone
>15-30 mi. base pay + $0.65/hr.
>30-50 mi. base pay + $0.85/hr.
>50 mi. base pay + $1.25/hr.

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CONSTRUCTION LABORERS GROUP 4

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>District 1</td>
<td>$20.15</td>
<td>$7.96</td>
</tr>
<tr>
<td>District 2</td>
<td>$20.15</td>
<td>$7.92</td>
</tr>
<tr>
<td>District 3</td>
<td>$22.20</td>
<td>$7.92</td>
</tr>
<tr>
<td>District 4</td>
<td>$20.15</td>
<td>$7.92</td>
</tr>
</tbody>
</table>

This group includes but is not limited to:
Hod Carrier***; Water Well Laborer; Blaster; Wagon Driller; Asphalt Raker; Cutting Torch; Grade Setter; High-Scaler; Power Saws (Faller & Concrete) Powderman; Rock & Core Drill; Track or Truck Mounted Wagon Drill and Welder incl. Air Arc.

***Hod Carriers will receive the same amount of travel and/or subsistence pay as bricklayers when requested to travel.

Zone Pay:
All Districts
0-15 mi. free zone
>15-30 mi. base pay + $0.65/hr.
>30-50 mi. base pay + $0.85/hr.
>50 mi. base pay + $1.25/hr.

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DRYWALL APPLICATORS

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>District 1</td>
<td>$22.50</td>
<td>$11.82</td>
</tr>
<tr>
<td>District 2</td>
<td>$22.50</td>
<td>$12.11</td>
</tr>
<tr>
<td>District 3</td>
<td>$22.50</td>
<td>$11.82</td>
</tr>
<tr>
<td>District 4</td>
<td>$22.50</td>
<td>$11.82</td>
</tr>
</tbody>
</table>

Duties Include:
Drywall and ceiling tile installation.

Zone Pay:
All Districts
0-30 mi. free zone
>30-60 mi. base pay + $4.00/hr.
>60 mi. base pay + $6.00/hr.

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### ELECTRICIANS: INCLUDING BUILDING AUTOMATION CONTROL

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>District 1</td>
<td>$29.28</td>
<td>$13.09</td>
</tr>
<tr>
<td>District 2</td>
<td>$30.50</td>
<td>$12.77</td>
</tr>
<tr>
<td>District 3</td>
<td>$30.50</td>
<td>$12.37</td>
</tr>
<tr>
<td>District 4</td>
<td>$32.74</td>
<td>$13.45</td>
</tr>
</tbody>
</table>

**Duties Include:**
Electrical wiring; equipment and fixtures; street lights; electrical control systems. Installation and/or adjusting of building automation controls also during testing and balancing, commissioning and retro-commissioning.

**Travel:**
- **District 1**
  - No mileage due when traveling in employer’s vehicle.
  - The following travel allowance is applicable when traveling in employee’s vehicle:
    - 0-10 mi. free zone
    - >10-45 mi. $0.585/mi. in excess of the free zone.
    - >45 mi. $75.00/day
- **Districts 2 & 3**
  - No mileage due when traveling in employer’s vehicle.
  - The following travel allowance is applicable when traveling in employee’s vehicle:
    - 0-08 mi. free zone
    - >08-50 mi. federal mileage rate/mi. in excess of the free zone.
    - >50 mi. $66.00/day
- **District 4**
  - No mileage due when traveling in employer’s vehicle.
  - The following travel allowance is applicable when traveling in employee’s vehicle:
    - 0-18 mi. free zone
    - >18-60 mi. federal mileage rate/mi.
    - >60 mi. $75.00/day

### ELEVATOR CONSTRUCTORS

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>District 1</td>
<td>$49.66</td>
<td>$35.61</td>
</tr>
<tr>
<td>District 2</td>
<td>$49.66</td>
<td>$35.61</td>
</tr>
<tr>
<td>District 3</td>
<td>$49.66</td>
<td>$35.61</td>
</tr>
<tr>
<td>District 4</td>
<td>$49.66</td>
<td>$35.61</td>
</tr>
</tbody>
</table>

**Travel:**
- **All Districts**
  - 0-15 mi. free zone
  - >15-25 mi. $39.63/day
  - >25-35 mi. $79.26/day
  - >35 mi. $84.90/day or cost of receipts for hotel and meals, whichever is greater.
FLOOR LAYERS

No Rate Established

Lay and install carpet from rolls or blocks on floors. Install padding and trim flooring materials.

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GLAZIERS

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>District 1</td>
<td>$18.67</td>
<td>$2.97</td>
</tr>
<tr>
<td>District 2</td>
<td>$19.00</td>
<td>$2.50</td>
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<tr>
<td>District 3</td>
<td>$20.82</td>
<td>$2.61</td>
</tr>
<tr>
<td>District 4</td>
<td>$20.82</td>
<td>$2.61</td>
</tr>
</tbody>
</table>

Travel:
All Districts
No travel established.

Per Diem
Districts 1, 2 & 3
$25/day

District 4
No per diem established.

† Back to Table of Contents

HEATING AND AIR CONDITIONING

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>District 1</td>
<td>$25.97</td>
<td>$12.53</td>
</tr>
<tr>
<td>District 2</td>
<td>$28.04</td>
<td>$17.38</td>
</tr>
<tr>
<td>District 3</td>
<td>$28.04</td>
<td>$17.38</td>
</tr>
<tr>
<td>District 4</td>
<td>$28.04</td>
<td>$17.38</td>
</tr>
</tbody>
</table>

Duties Include:
Testing and balancing, commissioning and retro-commissioning of all air-handling equipment and duct work.

Travel:
All Districts
0-50 mi. free zone
>50 mi.
  • $0.25/mi. in employer vehicle.
  • $0.65/mi. in employee vehicle.

Per Diem:
All Districts
$65/day

† Back to Table of Contents
## INSULATION WORKERS - MECHANICAL (HEAT AND FROST)

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$34.17</td>
<td>$19.47</td>
</tr>
<tr>
<td>2</td>
<td>$34.17</td>
<td>$19.47</td>
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<tr>
<td>3</td>
<td>$34.17</td>
<td>$19.47</td>
</tr>
<tr>
<td>4</td>
<td>$34.17</td>
<td>$19.47</td>
</tr>
</tbody>
</table>

Duties Include:
Insulate pipes, ductwork or other mechanical systems.

<table>
<thead>
<tr>
<th>Travel:</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Districts</td>
</tr>
<tr>
<td>0-30 mi. free zone</td>
</tr>
<tr>
<td>&gt;30-40 mi. $20.00/day</td>
</tr>
<tr>
<td>&gt;40-50 mi. $30.00/day</td>
</tr>
<tr>
<td>&gt;50-60 mi. $40.00/day</td>
</tr>
<tr>
<td>&gt;60 mi. $45.00/day plus</td>
</tr>
<tr>
<td>$0.56/mi. if transportation is not provided.</td>
</tr>
<tr>
<td>$0.20/mi. if in company vehicle.</td>
</tr>
<tr>
<td>&gt;60 mi. $80.00/day on jobs requiring an overnight stay plus</td>
</tr>
<tr>
<td>$0.56/mi. if transportation is not provided.</td>
</tr>
<tr>
<td>$0.20/mi. if in company vehicle.</td>
</tr>
</tbody>
</table>

↑ Back to Table of Contents

## IRONWORKERS - STRUCTURAL STEEL AND REBAR PLACERS

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$27.21</td>
<td>$23.16</td>
</tr>
<tr>
<td>2</td>
<td>$27.25</td>
<td>$22.06</td>
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<tr>
<td>3</td>
<td>$27.25</td>
<td>$20.83</td>
</tr>
<tr>
<td>4</td>
<td>$27.25</td>
<td>$20.83</td>
</tr>
</tbody>
</table>

Duties Include:
Structural steel erection; assemble prefabricated metal buildings; cut, bend, tie, and place rebar; energy producing windmill type towers; metal bleacher seating; handrail fabrication and ornamental steel.

<table>
<thead>
<tr>
<th>Travel:</th>
</tr>
</thead>
<tbody>
<tr>
<td>District 1</td>
</tr>
<tr>
<td>0-45 mi. free zone</td>
</tr>
<tr>
<td>&gt;45-60 mi. $35.00/day</td>
</tr>
<tr>
<td>&gt;60-100 mi. $60.00/day</td>
</tr>
<tr>
<td>&gt;100 mi. $80.00/day</td>
</tr>
</tbody>
</table>

Special Provision:
When the employer provides transportation, travel will not be paid. However, when an employee is required to travel over 70 miles one way, the employee may elect to receive the travel pay in lieu of the transportation.

<table>
<thead>
<tr>
<th>Districts 2, 3 &amp; 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-45 mi. free zone</td>
</tr>
<tr>
<td>&gt;45-85 mi. $55.00/day</td>
</tr>
<tr>
<td>&gt;85 mi. $85.00/day</td>
</tr>
</tbody>
</table>

↑ Back to Table of Contents

## MILLWRIGHTS

<table>
<thead>
<tr>
<th>District</th>
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<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$32.00</td>
<td>$11.82</td>
</tr>
<tr>
<td>2</td>
<td>$32.00</td>
<td>$12.11</td>
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<tr>
<td>3</td>
<td>$32.00</td>
<td>$11.82</td>
</tr>
<tr>
<td>4</td>
<td>$32.00</td>
<td>$11.82</td>
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</table>

<table>
<thead>
<tr>
<th>Zone Pay:</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Districts</td>
</tr>
<tr>
<td>0-30 mi. free zone</td>
</tr>
<tr>
<td>&gt;30-60 mi. base pay + $4.00/hr.</td>
</tr>
<tr>
<td>&gt;60 mi. base pay + $6.00/hr.</td>
</tr>
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</table>

↑ Back to Table of Contents
### PAINTERS: INCLUDING PAPERHANGERS

<table>
<thead>
<tr>
<th>District</th>
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<th>Benefit</th>
</tr>
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<td>$23.60</td>
<td>$9.35</td>
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<tr>
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<td>$8.76</td>
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<tr>
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<td>$23.73</td>
<td>$8.76</td>
</tr>
<tr>
<td>District 4</td>
<td>$21.05</td>
<td>$9.56</td>
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<table>
<thead>
<tr>
<th>Travel:</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Districts</td>
</tr>
<tr>
<td>0-120 mi. free zone</td>
</tr>
<tr>
<td>&gt;120 mi. $45.00/day</td>
</tr>
</tbody>
</table>

### PILE BUCKS

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
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<td>$29.00</td>
<td>$11.82</td>
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<tr>
<td>District 2</td>
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<td>$12.11</td>
</tr>
<tr>
<td>District 3</td>
<td>$29.00</td>
<td>$11.82</td>
</tr>
<tr>
<td>District 4</td>
<td>$29.00</td>
<td>$11.82</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Zone Pay:</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Districts</td>
</tr>
<tr>
<td>0-30 mi. free zone</td>
</tr>
<tr>
<td>&gt;30-60 mi. base pay + $4.00/hr.</td>
</tr>
<tr>
<td>&gt;60 mi. base pay + $6.00/hr.</td>
</tr>
</tbody>
</table>

**Duties Include:**
Set up crane; set up hammer; weld tips on piles; set leads; insure piles are driven straight with the use of level or plum bob. Give direction to crane operator as to speed and direction of swing. Cut piles to grade.

### PLASTERERS

<table>
<thead>
<tr>
<th>District</th>
<th>Wage</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
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<td>$19.22</td>
<td>$10.36</td>
</tr>
<tr>
<td>District 2</td>
<td>$21.73</td>
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<tr>
<td>District 3</td>
<td>$19.52</td>
<td>$10.36</td>
</tr>
<tr>
<td>District 4</td>
<td>$19.22</td>
<td>$10.36</td>
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</table>

<table>
<thead>
<tr>
<th>Zone Pay:</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Districts</td>
</tr>
<tr>
<td>0-30 mi. free zone</td>
</tr>
<tr>
<td>&gt;30-60 mi. base pay + $2.95/hr.</td>
</tr>
<tr>
<td>&gt;60 mi. base pay + $4.75/hr.</td>
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</tbody>
</table>
PLUMBERS, PIPEFITTERS, AND STEAMFITTERS

<table>
<thead>
<tr>
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<tbody>
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<tr>
<td>District 4</td>
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</table>

**Duties Include:**
Assemble, install, alter, and repair pipe-lines or pipe systems that carry water, steam, air, other liquids or gases. Testing of piping systems, commissioning and retro-commissioning. Workers in this occupation may also install heating and cooling equipment and mechanical control systems.

**Travel:**

- **District 1**
  - 0-30 mi. free zone
  - >30-50 mi. $25.00/day
  - >50-75 mi. $40.00/day
  - >75 mi. $75.00/day

- **District 2 & 3**
  - 0-40 mi. free zone
  - >40-80 mi. $35.00/day
  - >80 mi. $85.00/day

**Special Provision:**
If transportation is not provided, mileage at $0.35/mi. with a separate free zone of 20 miles is added to the amounts above. However, if the employee is traveling more than 75 miles/day, only subsistence will be required.

- **District 4**
  - 0-70 free zone
  - >70 mi.
    - On jobs when employees do not work consecutive days: $0.55/mi. if employer doesn’t provide transportation. Not to exceed two trips.
    - On jobs when employees work any number of consecutive days: $100.00/day if employer doesn’t provide transportation.

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**ROOFERS**

<table>
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**Travel:**
- **District 1**
  - 0-50 mi. free zone
  - >50 mi. $0.35/mi.
- **District 2**
  - 0-25 mi. free zone
  - >50 mi. $0.35/mi.
- **District 3**
  - 0-30 mi. free zone
  - >50 mi. $0.25/mi.
- **District 4**
  - 0-30 mi. free zone
  - >50 mi. $0.25/mi.

**Per Diem:**
- **District 1**
  - $56.00/day
- **District 2**
  - Employer pays for room + $25.00/day.
- **District 3**
  - Employer pays for room + $25.00/day.
- **District 4**
  - $50.00/day.

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**SHEET METAL WORKERS**

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<tr>
<td>District 4</td>
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<td>$17.38</td>
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**Travel:**
- **All Districts**
  - 0-50 mi. free zone
  - >50 mi.
    - $0.25/mi. in employer vehicle
    - $0.65/mi. in employee vehicle

**Per Diem:**
- **All Districts**
  - $65.00/day

Duties Include:
Testing and balancing, commissioning and retro-commissioning of all air-handling equipment and duct work. Manufacture, fabrication, assembling, installation, dismantling, and alteration of all HVAC systems, air veyer systems, and exhaust systems. All lagging over insulation and all duct lining. Metal roofing.
### SPRINKLER FITTERS

<table>
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<td>District 4</td>
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**Travel:**
- All Districts
  - 0-60 mi. free zone
  - >60-80 mi. $17.50/day
  - >80-100 mi. $27.50/day
  - >100 mi. $80.00/day

**Duties Include:**
Duties include but not limited to any and all fire protection systems: Installation, dismantling, inspection, testing, maintenance, repairs, adjustments, and corrections of all fire protection and fire control systems, including both overhead and underground water mains, all piping, fire hydrants, standpipes, air lines, tanks, and pumps used in connection with sprinkler and alarm systems.

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### TAPERS

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<tr>
<td>District 4</td>
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<td>$8.76</td>
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</table>

**Travel:**
- All Districts
  - 0-120 mi. free zone
  - >120 mi. $45.00/day

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### TEAMSTERS GROUP 2 (TRUCK DRIVERS)

**No Rate Established**

This group includes but is not limited to:
- Combination Truck and Concrete Mixer and Transit Mixer
- Dry Batch Trucks
- Distributor Driver
- Dumpman
- Dump Trucks and similar equipment
- Dumpster
- Flat Trucks
- Lumber Carriers
- Lowboys
- Pickup
- Powder Truck Driver
- Power Boom
- Serviceman
- Service Truck/Fuel Truck/Tireperson
- Truck Mechanic
- Trucks with Power Equipment
- Warehouseman
- Partsman
- Cardex
- Warehouse Expeditor
- Water Trucks

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### TELECOMMUNICATIONS EQUIPMENT INSTALLERS

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**Duties Include:**
Install voice; sound; vision and data systems. This occupation includes burglar alarms, fire alarms, fiber optic systems, and video systems for security or entertainment.

**Travel:**
- **All Districts**
  - The federal mileage rate/mi. in effect when travel occurs if using own vehicle.

**Per Diem:**
- **All Districts**
  - Employer pays for meals and lodging up to $65.00/day. When jobsite is located in Big Sky, West Yellowstone, and Gardiner, lodging and meals will be provided by the employer for all actual and reasonable expenses incurred.

### TILELAYERS, TERRAZZO AND MARBLE FINISHERS

<table>
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<td>4</td>
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**Duties Include:**
Finish work on hard tile, marble, and wood tile to floors, ceilings, and roof decks

**Travel:**
- **All Districts**
  - 0-60 mi. free zone
  - >60-75 mi. $30.00/day
  - >75-215 mi. $65.00/day
  - >215 mi. $80.00/day

### TILELAYERS, TERRAZZO AND MARBLE SETTERS

<table>
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</tr>
<tr>
<td>4</td>
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**Duties Include:**
Apply hard tile, marble, and wood tile to floors, ceilings, and roof decks

**Travel:**
- **All Districts**
  - 0-60 mi. free zone
  - >60-75 mi. $30.00/day
  - >75-215 mi. $65.00/day
  - >215 mi. $80.00/day
SECTION 01 1000
SUMMARY

PART 1 GENERAL - SEE ALSO GCCM GENERAL REQUIREMENTS. IN AREAS WHERE GENERAL REQUIREMENTS CONFLICT WITH THIS SECTION, GCCM GENERAL REQUIREMENTS TAKE PRECEDENCE.

1.01 PROJECT
A. Project Name: Montana State University - New Dining Hall - 100% CD Set.
B. Owner's Name: Montana State University: P.O. Box 172760, Bozeman, Montana 59717-2760, (406) 994-5413.
C. Architect's Name: Mosaic Architecture.
D. The project consists of the construction of new dining facility on the campus of Montana State University. This bid package consists of shell package and all related site work.

1.02 CONTRACT DESCRIPTION
A. Contract Type: General Contractor Construction Manager based on a Stipulated Price as described in Document 00 5200 - Agreement Form.

1.03 OWNER OCCUPANCY
A. Owner intends to utilize the project and the project site upon Substantial Completion.
B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations. Coordinate with GCCM (Langlas Construction).
C. Schedule the Work to accommodate Owner occupancy and campus events with GCCM.

1.04 CONTRACTOR USE OF SITE AND PREMISES
A. SEE ALSO GCCM GENERAL REQUIREMENTS. IN AREAS WHERE GENERAL REQUIREMENTS CONFLICT, GCCM GENERAL REQUIREMENTS TAKE PRECEDENCE.
B. Construction Operations: Limited to areas noted on Drawings.
C. Work on this contract is expected to be done during regular business hours Monday through Friday. Any variation from this will require prior approval of Facilities Services.
D. All work must be coordinated with the Owner at all times and Owner must be informed about any work scheduling 48 hours in advance of work being conducted and shall require Owner's approval.
E. General: Limit use of premises to construction activities in areas indicated; allow for Owner occupancy and use by the public. Confine operations to areas within contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.
F. Contractor shall conduct all of his work in such a manner as to minimize the inconvenience and disruption of Owner's daily schedule.
G. Confine operations at the site to the areas permitted under the contract. Portions of the site beyond the areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work while engaged in project construction.
H. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials to the areas designated by the Owner. If additional storage is necessary, obtain and pay for such storage off-site.
I. Contractor shall establish a staging area for storage of materials and equipment.
J. All contractor employees shall abide by Montana State University parking regulations. Temporary parking permits may be purchased from the University Police Office in the Huffman Building at 7th and Kagy.

K. The contractor is to coordinate with Montana State University for the location of the job site trailer office which is at the option of the contractor.

L. Keep driveways and entrances serving the premises clear and available to the Owner and the Owner's employees at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.

1.05 SAFETY REQUIREMENTS

A. General: The safety measures required by the Contract Documents are not meant to be inclusive. The Contractor shall be solely responsible for safety on a 24 hour per day, 7 days-per-week basis and shall take whatever additional measures are necessary to ensure the health and safety of the buildings’ occupants, or pedestrians at or near the construction site and access routes and of all other persons in all areas affected by the contractor's activities. Prior to the start of construction, the contractor shall submit to the Owner, a detailed written plan specifying the safety procedures that will be followed. Include the following: Verbaige, size and location of warning signs, construction sequence as related to safety, use of barricades, employee policies as related to safety, and delivery of materials as to related by safety. Revise the safety plan as required during construction and re-submit to the Owner's representative.

B. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.

C. Comply with Federal, State, local and Owner Fire and safety requirements.

D. Advise Owner whatever work is expected to be hazardous or inconvenient (including objectionable odors) to Owner's employees or the building occupants.

E. Construction materials or equipment shall be placed so as not to endanger the work or prevent free access to all emergency devices or utility disconnects.

F. Maintain the proper rated fire extinguishers within easy access where power tools, sanding or other equipment is being used.

G. The contractor shall erect and maintain, as required by law, conditions and progress of the work, warning signs, barricades and other reasonable safeguards for safety and protection.

H. All personnel shall comply with Montana State University Tobacco Use Policy.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
PART 1  GENERAL

1.01  SECTION INCLUDES
   A.  Section includes administrative and procedural requirements for substitutions.

1.02  DEFINITIONS
   A.  Substitutions: Changes in products, materials, equipment and methods of construction from
       those required by the contract documents and proposed by Contractor.

1.03  SUBMITTALS
   A.  Substitution Requests: Submit three copies of request for consideration. Identify product or
       fabrication or installation method to be replaced. Include Specification Section number and title
       and drawing numbers and titles.

   1.  Documentation: Show compliance with requirements for substitution and the following, as
       applicable.

      a.  Statement indicating why specified product or fabrication or installation cannot be
          provided, if applicable.

      b.  Coordination information, including a list of changes or modifications needed to other
          parts of the work and to construction performed by Owner and separate contractors
          that will be necessary to accommodate proposed substitution.

      c.  Detailed comparison of significant qualities of proposed substitution with those of the
          work specified. Include annotated copy of applicable specification section. Significant
          qualities may include attributes such as performance, weight, size, durability, visual
          effect, substantial design characteristics, warranties and specific features and
          requirements indicated. Indicate deviations, if any, from the work specified.

      d.  Product data, including drawings and descriptions of products and fabrication and
          installation procedures.

      e.  Samples, where applicable or requested.

      f.  Certificates and qualification data, where applicable and requested.

      g.  List of similar installations for completed project names and addresses and names
          and addresses of Architects and Owners.

      h.  Material test reports from qualified testing agency indicating and interpreting test
          results for compliance with requirements indicated.

      i.  Research reports evidencing compliance with building code in effect for project, from
          ICC-ES.

      j.  Detailed comparison of Contractor's construction schedule using proposed
          substitution with products specified for the Work, including effect on the overall
          contract time. If specified product or method of construction cannot be provided
          within the contract time, include letter from manufacturer, on manufacturer's
          letterhead, stating date of receipt of purchase order, lack of availability, or delays in
          delivery.

      k.  Cost information, including a proposal of change, if any, in the contract sum.

      l.  Contractors certification that proposed substitution complies with requirements in the
          contract documents except as indicated in substitution request, is compatible with
          related materials, and is appropriate for applications indicated.

      m.  Contractors waiver of rights to additional payment or time that may subsequently
          become necessary because of failure of proposed substitution to produce indicated
          results.

   2.  Architect's Action: If necessary, Architect will request additional information or
       documentation for evaluation within 7 days of receipt of a request substitution. Architect
       will notify Contractor of acceptance or rejection of proposed substitution within 15 days of
       receipt of request, or seven days of receipt of additional information or documentation,
       whichever is later.
a. Forms of Acceptance: Addendum, Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the work.
b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.04 QUALITY ASSURANCE
   A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturer.

PART 2 PRODUCTS

2.01 SUBSTITUTIONS
   A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
      1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied.
         a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
         b. Requested substitution will not adversely affect Contractor's construction schedule.
         c. Requested substitution has received necessary approvals of authorities having jurisdiction.
         d. Requested substitution is compatible with other portions of the work.
         e. Requested substitution has been coordinated with other portions of the work.
         f. Requested substitution provides specified warranty.
         g. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
         h. Requested substitution will provide identical visual effect to specified products in every regard.
      2. Substitution for Convenience: Not allowed.

PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL - SEE ALSO GCCM GENERAL REQUIREMENTS. IN AREAS WHERE GENERAL REQUIREMENTS CONFLICT WITH THIS SECTION, GCCM GENERAL REQUIREMENTS TAKE PRECEDENCE.

1.01 SECTION INCLUDES
A. Preconstruction meeting.
B. Progress meetings.
C. Construction progress schedule.
D. Daily construction reports.
E. Submittals for review, information, and project closeout.
F. Submittal procedures.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING
A. Owner will schedule a meeting after Notice of Award.
B. Attendance Required:
   1. Owner
   3. GCCM (GCCM).
   4. All Major Sub-Contractors.
C. Agenda:
   1. Execution of MSU Facilities-GCCM Agreement.
   2. Submission of executed bonds and insurance certificates.
   4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
   5. Designation of personnel representing the parties to Contract and Mosaic Architecture.
   6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   7. Scheduling.
D. Langlas & Associates will record minutes and distribute copies within two days after meeting to participants, with one copy to North Western Energy, participants, and those affected by decisions made.

3.02 PROGRESS MEETINGS
A. Schedule and administer meetings throughout progress of the Work at weekly intervals, unless deemed unnecessary by all in attendance.
B. Attendance Required:
   1. GCCM.
   2. MSU Facilities.
   4. GCCM's Superintendent.
C. Agenda:
   1. Review minutes of previous meetings.
   2. Review of Work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
6. Maintenance of progress schedule.
7. Corrective measures to regain projected schedules.
8. Planned progress during succeeding work period.
10. Effect of proposed changes on progress schedule and coordination.
11. Other business relating to Work.

D. Langlas & Associates will record minutes and distribute copies within two days after meeting to participants, with two copies to North Western Energy, participants, and those affected by decisions made.

3.03 CONSTRUCTION PROGRESS SCHEDULE
A. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.
C. Within 10 days after joint review, submit complete schedule.
D. Submit updated schedule with each Application for Payment.

3.04 SUBMITTALS FOR REVIEW
A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.
   5. LEED submittals and reports.
B. Submit to Mosaic Architecture for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
C. Samples will be reviewed only for aesthetic, color, or finish selection.
D. LEED information.
E. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.05 SUBMITTALS FOR INFORMATION
A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. LEED submittals and reports.
   3. Certificates.
   4. Test reports.
   5. Inspection reports.
   6. Manufacturer's instructions.
   7. Manufacturer's field reports.
   8. Other types indicated.
B. Submit for Mosaic Architecture's knowledge as contract administrator or for MSU Facilities.

3.06 SUBMITTALS FOR PROJECT CLOSEOUT
A. Submit Correction Punch List for Substantial Completion.
B. Submit Final Correction Punch List for Substantial Completion.
C. When the following are specified in individual sections, submit them at project closeout:
   1. Project record documents.
   2. Operation and maintenance data.
3. Warranties.
5. Other types as indicated.

D. Submit for MSU Facilities's benefit during and after project completion.

3.07 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Documents for Review:
   1. Small Size Sheets, Not Larger Than 8-1/2 x 11 inches: Submit the number of copies that GCCM requires, plus one copy that will be retained by Mosaic Architecture.

C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Mosaic Architecture.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to GCCM unless specifically so stated.

3.08 SUBMITTAL PROCEDURES

A. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related Work.
   2. Generic, non-project specific information submitted as shop drawings do not meet the requirements for shop drawings.

B. Transmit each submittal with a copy of approved submittal form.

C. Transmit each submittal with approved form.

D. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

E. Identify Project, GCCM, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

F. Apply GCCM's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

G. Schedule submittals to expedite the Project, and coordinate submission of related items.

H. For each submittal for review, allow 15 days excluding delivery time to and from the GCCM.

I. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

J. Provide space for GCCM and Mosaic Architecture review stamps.

K. When revised for resubmission, identify all changes made since previous submission.

L. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

M. Submittals not requested will not be recognized or processed.

END OF SECTION
SECTION 01 3514.01
LEED-NC 2009 CREDIT SUMMARY

PART 1 GENERAL

1.01 DEFINITIONS

B. Required: Achievement of this credit is essential for certification of this project.
C. Preferred: Achievement of this credit would be desirable but is not mandatory.
D. Not Required: Achievement of this credit is not expected or not possible for this project.

PART 2 CREDIT SUMMARY

2.01 CERTIFICATION TO BE ACHIEVED: SILVER, REQUIRING MINIMUM OF 50 POINTS.

2.02 SUSTAINABLE SITES (SS): TBD POINTS TO BE ACHIEVED

A. SS Prerequisite 1 - Required - No points - Construction Activity Pollution Prevention.
   1. During Construction:
      a. Preventive measures and remediation are specified in Section 01 5713.
B. SS Credit 1 - Required - 1 point - Site Selection.
C. SS Credit 2 - Required - 5 points - Development Density & Community Connectivity.
D. SS Credit 4.1 - Required - 6 points - Alternative Transportation: Public Transportation Access.
   1. The project is located on a site that meets the criteria for Option 2, Bus Stop Proximity.
E. SS Credit 4.2 - Undecided - 1 point - Alternative Transportation: Bicycle Storage & Changing Rooms.
   1. Secure bicycle storage and shower and changing facilities are to be provided.
F. SS Credit 4.4 - Required - 2 points - Alternative Transportation: Parking Capacity.
   1. Preferred parking spaces have been provided, in the quantity required, without adding new parking.
G. SS Credit 5.1 - Undecided - 1 point - Site Development: Protect or Restore Habitat.
   1. The project site has previously been developed:
      a. At least 50 percent of the site area not occupied by the building is to be covered with native or adapted vegetation.
H. SS Credit 5.2 - Required - 1 point - Site Development: Maximize Open Space.
I. SS Credit 6.1 - Required - 1 point - Stormwater Design: Quantity Control.
   1. The site design reduces runoff rate and quantity by at least 25 percent.
J. SS Credit 6.2 - Required - 1 point - Stormwater Design: Quality Control.
   1. Natural on-site stormwater treatment to remove sediment is provided:
K. SS Credit 7.1 - Undecided - 1 point - Heat Island Effect: Non-Roof.
L. SS Credit 7.2 - Required - 1 point - Heat Island Effect: Roof.
   1. The roofing design reduces thermal gradient differences by:
      a. Using high reflectance and high emissivity roofing for at least 75 percent of roof area.
      1) White elastomeric sheet roofing meeting the requirements is specified in Section 07 5300.
M. SS Credit 8 - Required - 1 point - Light Pollution Reduction.

2.03 WATER EFFICIENCY (WE): 7 POINTS TO BE ACHIEVED.

A. WE Prerequisite 1 - Required - No points - Water Use Reduction, 20% Reduction.
B. WE Credit 1.1 - Required - 2 points - Water Efficient Landscaping: Reduce by 50%.
C. WE Credit 3.1 - Required - 2 points - Water Use Reduction, 30% Reduction.
2.04 ENERGY & ATMOSPHERE (EA): 15 POINTS TO BE ACHIEVED.
   A. EA Prerequisite 1 - Required - No points - Fundamental Commissioning of Building Energy Systems.
   B. EA Prerequisite 2 - Required - No points - Minimum Energy Performance.
   C. EA Prerequisite 3 - Required - No points - Fundamental Refrigerant Management.
   D. EA Credit 1 - Required - 12 points - Optimize Energy Performance.
   E. EA Credit 4 - Required - 2 points - Enhanced Refrigerant Management.
   F. EA Credit 5 - Required - 1 points - Measurement & Verification.
   G. EA Credit 6 - Required - 1 points - Green Power.
      1. The MSU Facilities intends to or has already entered into a contract for electricity from renewable sources, but that is not part of the construction contract.

2.05 MATERIALS & RESOURCES: 5 POINTS TO BE ACHIEVED.
   A. MR Prerequisite 1 - Required - No points - Storage & Collection of Recyclables.
   B. MR Credit 2.1 - Required - 2 point - Construction Waste Management, Divert 50% from Disposal.
      1. Construction procedures and measurement of diverted waste are specified in Section 01 7419. This section requires the GCCM to perform the measurement and computation.
      2. Waste prevention and disposal procedures specific to certain types of work are specified in many sections.
   C. MR Credit 2.2 - Required - 1 point - Construction Waste Management, Divert 75% from Disposal.
      1. Same as for MR Credit 2.1, but increased quantity.
   D. MR Credit 4.1 - Required - 1 point - Recycled Content: 10% (post-consumer plus 1/2 pre-consumer).
      1. The definition of recycled content for the purposes of the contract documents is included in Section 01 6000; qualifying products do not include plumbing, HVAC, electrical, or communications equipment, piping, conduit, ductwork, or wiring.
      2. GCCM's reporting and measurement requirements are specified in Section 01 3515 and Section 01 6000; calculation of project totals is not the responsibility of GCCM.
   E. MR Credit 4.2 - Required - 1 point - Recycled Content: 20% (post-consumer plus ½ pre-consumer).
      1. Same as for MR Credit 4.1, but increased quantity.
   F. MR Credit 5.1 - Required - 1 point - Regional Materials: 10% Extracted, Processed & Manufactured Regionally.
      1. For the purposes of the contract documents, the term "regionally-sourced" is used instead of "regional materials" and is defined in Section 01 6000 in the same way as for this credit.
      2. GCCM's reporting and measurement requirements are specified in Section 01 3515 and Section 01 6000; calculation of project totals is not the responsibility of GCCM.
   G. MR Credit 7 - Not Required - 1 point - Certified Wood.
      1. For the purposes of the contract documents, the term "sustainably harvested wood" is used instead of "certified wood" and is defined in Section 01 6000 in the same way as for this credit.
      2. Specific wood products that must be sustainably harvested are specified in the appropriate section(s).
         a. Lumber framing, sheathing, blocking, curbing, and miscellaneous carpentry are specified in Section 06 1000.
         b. Finish woodwork is specified in Section 06 2000.
         c. Custom cabinets are specified in Section 06 4100.
         d. Wood veneer paneling is specified in Section 06 4216.
3. GCCM’s reporting and measurement requirements are specified in Section 01 3515 and Section 01 6000; calculation of project totals is not the responsibility of GCCM.

2.06 INDOOR ENVIRONMENTAL QUALITY: 12 POINTS TO BE ACHIEVED.
A. EQ Prerequisite 1 - Required - No points - Minimum IAQ Performance.
B. EQ Prerequisite 2 - Required - No points - Environmental Tobacco Smoke (ETS) Control.
C. EQ Credit 1 - Required - 1 point - Outdoor Air Delivery Monitoring.
D. EQ Credit 3.1 - Required - 1 point - Construction IAQ Management Plan, During Construction.
E. EQ Credit 3.2 - Required - 1 point - Construction IAQ Management Plan, Before Occupancy.
F. EQ Credit 4.1 - Required - 1 point - Low-Emitting Materials, Adhesives & Sealants.
   1. Architectural joint sealants; specified in Section 07 9200.
G. EQ Credit 4.2 - Required - 1 point - Low-Emitting Materials, Paints & Coatings.
   1. Interior paints and stains are specified in Section 09 9123.
H. EQ Credit 4.3 - Required - 1 point - Low-Emitting Materials, Flooring Systems.
   1. Adhesives used in connection with carpet systems.
I. EQ Credit 4.4 - Required - 1 point - Low-Emitting Materials, Composite Wood & Agrifiber Products.
J. EQ Credit 5 - Required - 1 point - Indoor Chemical & Pollutant Source Control.
   1. At High Volume Entryways: Permanent grilles or grates to capture dirt, etc., are provided.
   2. Rooms Where Hazardous Gases or Chemicals May Be Present: Independent exhaust is provided for each room; this is a design solution involving building construction and HVAC.
   3. Chemical Mixing and Drainage: Separate plumbing drains are provided for environmentally appropriate disposal.
K. EQ Credit 6.1 - Required - 1 point - Controllability of Systems: Lighting.
L. EQ Credit 6.2 - Required - 1 point - Controllability of Systems: Thermal Comfort.
   1. HVAC Controls: Individual controls are to be provided for at least 50 percent of occupants in regularly occupied areas.
M. EQ Credit 7.1 - Required - 1 point - Thermal Comfort: Design.
N. EQ Credit 7.2 - Required - 1 point - Thermal Comfort: Verification.
O. EQ Credit 8.2 - Required - 1 point - Daylight & Views, Views for 90% of Spaces.

2.07 INNOVATION & DESIGN PROCESS (ID): ___ POINTS TO BE ACHIEVED.
A. ID Credit 1.1 - Required - 1 point - Innovation in Design: Public Education.
B. ID Credit 1.2 - Preferred - 1 point - Innovation in Design: Waste management.
C. ID Credit 1.4 - Preferred - 1 point - Innovation in Design: Radon Mitigation.
D. ID Credit 2 - Required - 1 point - LEED(tm) Accredited Professional.

2.08 REGIONAL PRIORITY (RP): 2 POINTS TO BE ACHIEVED.
A. RP Credit 1.1 - Undecided - 1 point - Region Specific Environmental Priority : Development density Region.
B. RP Credit 1.2 - Undecided - 1 point - Region Specific Environmental Priority : Protect and restore habitat Region.

END OF SECTION
PART 1 GENERAL

1.01 PROJECT GOALS
A. This project has been designed to achieve the LEED Silver (minimum 50 points) rating as defined in the LEED(r) Green Building Rating System(tm) for New Construction and Major Renovations, 2009 Edition.
B. GCCM is not responsible for the application for LEED certification, nor for determination of methods of achieving LEED credits unless specifically so indicated.
C. Many of the LEED credits can be achieved only through intelligent design of the project and are beyond the control of the GCCM. However, certain credits relate to the products and procedures used for construction. Therefore, the full cooperation of the GCCM and subcontractors is essential to achieving final certification.
D. GCCM shall familiarize himself with the relevant requirements and provide the necessary information and instruction to all subcontractors and installers.
E. Since GCCM and subcontractors may not be familiar with LEED requirements, this section includes a summary of the products and procedures intended to achieve LEED credits.
   1. Some credits are marked PREREQUISITE; these must be achieved regardless of the level of certification; many are dependent on proper performance by GCCM and subcontractors.
   2. Other credits involve quantifying percentages by weight and cost; these require careful recordkeeping and reporting by the GCCM.

1.02 RELATED REQUIREMENTS
A. Sections that include requirements intended to achieve LEED credits include, but are not limited to, the following:
B. Section 01 3516 - LEED Submittal Forms: Procedures for using the forms.
   1. 01 3516.01 - LEED Material Cost Summary Form; to report material only cost categories for computations necessary for MR Credits 3, 4.1, 4.2, 5.1, 5.2, and 6.
   2. 01 3516.02 - LEED Wood-Containing Product List; for documentation of wood and wood-based products used on project; MR Credit 6.
   3. 01 3516.03 - LEED Metal-Containing Product List; for documentation of steel and other metals used on project; MR Credits 4.1 and 4.2.
   4. 01 3516.04 - LEED New Product Content Form; for content percentages for recycled, rapidly renewable, and certified wood credits, with material cost; MR Credits 4.1, 4.2, and 6; used in conjunction with Wood-Containing and Metal-Containing Product Lists as well as separately.
   5. 01 3516.05 - LEED New Product Source Form; for documenting source of new products; MR Credit 5.1 and 5.2.
   6. 01 3516.06 - LEED Reused Product Form; for documenting type, source, and cost of reused products; MR Credits 3, 5.1, and 5.2.
   7. 01 3516.07 - LEED Prohibited Content Installer Certification: for each installer to certify compliance with VOC requirements for adhesives and sealants, including duct sealers, and to certify no use of urea-formaldehyde-containing wood products; EQ Credits 4.1 and 4.4.
C. Section 01 5713 - Temporary Erosion and Sediment Control: Preventive measures and remediation; SS PREREQUISITE 1.
D. Section 01 5721 - Indoor Air Quality Controls:
E. Section 01 6000 - Product Requirements: Overall project requirements for:
   1. Recycled content; MR Credits 4.1 and 4.2.
2. Regionally-sourced products; MR Credits 5.1 and 5.2.
   a. GCCM is required to provide any particular minimum percentage of regionally-sourced products; however, to collect the information necessary to determine whether these credits can be achieved, GCCM is required to submit the LEED New Product Source Form for every product for which application for payment is made.
3. Certified (sustainably harvested) wood; MR Credit 6.

F. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: List of product categories having VOC content restrictions, evidence required, and reporting requirements.

G. Section 01 7000 - Execution and Closeout Requirements:
   1. Dust control and basic surface drainage; SS Prerequisite 1.

H. Section 01 7419 - Construction Waste Management and Disposal:
   1. Construction and demolition waste management; MR Credit 2.1 and 2.2.

I. Section 01 9113 - General Commissioning Requirements:

J. Section 03 3000 - Cast-in-Place Concrete:
   1. Recycled content replacing Portland cement; MR Credit 4.1.

K. Section 06 1000 - Rough Carpentry:
   1. Requirement to use sustainably harvested wood; MR Credit 6.

L. Section 06 2000 - Finish Carpentry:
   1. Requirement to use sustainably harvested wood; MR Credit 6.

M. Section 06 4100 - Architectural Wood Casework:
   1. Requirement to use sustainably harvested wood; MR Credit 6.

N. Section 06 4216 - Wood-Veneer Paneling:
   1. Requirement to use sustainably harvested wood; MR Credit 6.

O. Section 07 5050 - Vegetated Roof Components - Base Bid:
   1. For vegetated roof; SS Credit 7.2.

P. Section 07 5300 - Elastomeric Membrane Roofing:
   1. White membrane roofing; SS Credit 7.2.

Q. Section 07 5400 - Thermoplastic Membrane Roofing:
   1. White membrane roofing; SS Credit 6.2.
   2. White membrane roofing; SS Credit 7.2.
   3. For vegetated roof; SS Credit 6.2.
   4. For vegetated roof; SS Credit 7.2.

R. Section 07 9200 - Joint Sealants: LEED-VOC-compliant sealants; EQ Credit 4.1.

S. Section 08 4313 - Aluminum-Framed Storefronts:
   1. Daylighting; EQ Credit 8.1 and 8.2.

T. Section 08 4413 - Glazed Aluminum Curtain Walls:
   1. Daylighting; EQ Credit 8.1 and 8.2.

U. Section 08 5113 - Aluminum Windows:
   1. Daylighting; EQ Credit 8.1 and 8.2.

V. Section 08 8000 - Glazing:
   1. Daylighting; EQ Credit 8.1 and 8.2.

W. Section 09 2116 - Gypsum Board Assemblies:
   1. Deck-to-deck sealed partitions around certain rooms where hazardous gases or chemicals may be present; EQ Credit 5.
   2. Deck-to-deck sealed partitions around copy/print/fax rooms: EQ Credit 5.2.

X. Section 09 6813: Carpet tile complying with CRI Green Label Plus requirements; EQ Credit 4.3.
Y. Section 09 9123 - Interior Painting: LEED-VOC-compliant interior opaque paints and coatings; EQ Credit 4.2.
Z. Section 10 5100 - Lockers:
   1. Lockers near bicycle entrance; SS Credit 3.2.
AA. Section 12 4813 - Entrance Floor Mats and Frames:
AB. Section 12 9313 - Bicycle Racks: Bicycle Racks:
   1. Bicycle racks; SS Credit 3.2.
AC. Section 22 4000 - Plumbing Fixtures:
   1. Showers near bicycle entrance; SS Credit 3.2.
AD. Section 31 3700 - Riprap:
   1. For erosion and sedimentation control; SS PREREQUISITE 1.
AE. Section 32 9300 - Plants:

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for additional submittal procedures.
B. LEED Submittal/Report: For each product with the notation "show quantity on LEED submittal or report," submit a report with the following information:
   1. Submit with each Application for Payment; update the Report each period with latest period shown separately:
   2. Identify each product with:
      a. Name and manufacturer.
      b. Specification section number.
      c. Applicable Credit(s).
      d. Net weight per unit.
      e. Quantity installed.
      f. Material cost per unit.
      g. Total material cost.
   3. Attach evidence of compliance from either the manufacturer or an independent agency.

1.04 INFORMATION SOURCES
B. Bay Area Air Quality Management District (BA AQMD); 939 Ellis Street, San Francisco, California 94109. Tel: (415) 771-6000. www.baaqmd.gov.
C. Center for Resource Solutions (CRS); Presidio Building, 49 P.O. Box 29512, San Francisco, CA 94129. Tel: (415) 561-2100. Fax: (415) 561-2105. www.resource-solutions.org or www.green-e.org.
E. South Coast Air Quality Management District (SCAQMD); 21865 E. Copley Drive, Diamond Bar, CA 91765. Tel: (909) 396-2000. www.aqmd.gov.

PART 2 PRODUCTS (NOT USED)
PART 3 EXECUTION - NOT USED

END OF SECTION
LEED SUBMITTAL FORMS

1.01 PURPOSE

A. These forms are for the GCCM’s and sub-contractor’s use in submitting documentation to be used to determine whether particular credits have been achieved. The cooperation of subcontractors, suppliers, and manufacturers is required. Sub-Contractors to provide completed forms for all items included as part of their work to the GCCM for review and approval.

B. These forms apply to the following LEED Credits:
   1. MR Credits 4.1 and 4.2 - Recycled Content.
   2. MR Credits 5.1 and 5.2 - Regional Materials.
   3. MR Credit 6 - Rapidly Renewable Materials.
   4. MR Credit 7 - Certified Wood.
   5. IEQ Credit 4 - Low-Emitting Materials.

1.02 FORMS

A. 01 3516.01 - LEED Material Cost Summary Form: Certification by GCCM.
B. 01 3516.02 - LEED Wood-Containing Product List: Certification by GCCM.
C. 01 3516.03 - LEED Metal-Containing Product List: Certification by GCCM.
D. 01 3516.04 - LEED New Product Content Form: Including separate reporting of wood, steel, rapidly renewable, and recycled content; data certification by manufacturer of product; cost and quantity certification by GCCM.
E. 01 3516.05 - LEED New Product Source Form: Data certification by manufacturer of product; cost and quantity certification by GCCM.
F. 01 6116.01 - Accessory Material VOC Content Certification Form: Certification by each installer working on project regardless of product type.

1.03 PROCEDURES

A. All LEED submittal forms are to be submitted by GCCM; certifications are to be made by indicated party.
B. Where a LEED Submittal is called for, fill out and submit the appropriate form.
   1. Fill out one form for each different brand name product and each different manufacturer of a lot of commodity products.
   2. Where required attachments are specified, attach the documentation to the back of the form.
C. Each form must be signed by the entity capable of certifying the information.
   1. Certification signatures must be made by an officer of the company.
   2. For products, certification must be made by the manufacturer not the supplier.
   3. For custom fabricated products, certification by the fabricator is acceptable.
D. Submit the completed forms in accordance with the requirements of Section 01 3000 - Administrative Requirements, as information submittals.
   1. Give each form a unique submittal number.
   2. Do not combine LEED forms with product data or shop drawing submittals.

END OF SECTION
LEED MATERIAL COST SUMMARY FORM

A. Identification:
   1. Project Name: ____________________________________________
   2. Project No.: ____________________________________________
   3. Mosaic Architecture: _____________________________________

B. This form applies to the following LEED Credits:
   1. MR Credits 4.1 and 4.2 - Recycled Content.
   2. MR Credits 5.1 and 5.2 - Regional Materials.
   3. MR Credit 6 - Rapidly Renewable Materials.
   4. MR Credit 7 - Certified Wood.

C. Procedure:
   1. Because the above listed credits require computations based on the material costs for the project, the GCCM is required to submit the following cost breakdown, in addition to any cost breakdown specified elsewhere.
   2. Costs are to be material costs excluding labor, overhead, and profit, but including delivery, storage, and handling charges. Revise cost summary whenever materials actually installed change due to contract modifications or GCCM preference.

.03 $ ______ TOTAL COST OF ALL MATERIALS
.04 $ ______ TOTAL COST OF PLUMBING, HVAC, ELECTRICAL, AND COMMUNICATIONS
.05 $ ______ TOTAL COST OF ARCHITECTURAL EQUIPMENT IN DIVISIONS 11 THROUGH 14
.06 $ ______ TOTAL COST OF WOOD AND WOOD-BASED MATERIALS, INCLUDING TEMPORARY CONSTRUCTION ITEMS THAT WILL NEITHER BE INCORPORATED INTO THE WORK NOR RETURNED TO THEIR SUPPLIER FOR RE-USE.

.07 CERTIFIED BY: (GCCM)
   A. Print Name: ______________________________________________
   B. Signature: ______________________________________________
   C. Title: ______________________ (officer of company), Date: ____________

END OF SECTION
SECTION 01 3516.03
LEED METAL-CONTAINING PRODUCT LIST

LEED METAL-CONTAINING PRODUCT LIST

1.01 LEED SUBMITTAL FORM

A. Identification:
   1. Project Name: ____________________________
   2. Project No.: ______________________________
   3. Mosaic Architecture: ______________________

B. This form applies to LEED Credits MR 4.1 and 4.2 (recycled content).

1.02 STEEL-CONTAINING PRODUCTS

A. Rationale: Although all steel contains reused steel, steel products often cannot be traced to a certain mill lot and, even when they can, the mill's certificate usually does not indicate the proportion of new to reused steel.

B. Procedure: Determine recycled steel content by estimating the proportion of reused steel based on trade association surveys of mill practices multiplied by the quantity of steel by weight in the product.
   2. If the mill source cannot be identified, the product will be considered to have the lowest reused steel content reported in referenced mill practices survey.
   3. For each steel-containing product provided for this project, submit "LEED New Product Content Form". At minimum, submit for the following products. Initial those for which the material content form is attached.

C. Steel-Containing Product List:
   1. ___ Steel piling and permanent shoring.
   2. ___ Concrete reinforcement (bars, mats, wire, mesh), anchor plates.
   3. ___ Structural steel framing members, plates.
   4. ___ Steel structural components of pre-engineered products.
   5. ___ Miscellaneous steel fabrications made from rolled shapes, including equipment supports.
   6. ___ Bar joists and girders.
   7. ___ Steel decking.
   8. ___ Light gage steel framing and trusses.
   9. ___ Steel stairs and ladders.
   10. ___ Steel handrails and railings.
   11. ___ Miscellaneous formed steel fabrications.
   12. ___ Steel wall and roof panels.
   13. ___ Steel sheet metal flashing and trim.
   14. ___ Steel doors and frames.
   15. ___ Non-load-bearing steel framing (studs, ceiling framing, shaftwall)
   16. ___ Suspended ceiling grid.
   17. ___ Steel wall louvers and vents.
   18. ___ Steel access flooring.
   19. ___ Steel flagpoles.

1.03 CERTIFICATION

A. ___ All other steel- and cast iron-containing products used on this project are shown on the attached list.
B. ___ I certify that there are no other steel-containing products used on this project that exceed 1 percent of total material cost less material cost attributed to mechanical and electrical.

C. ___ I certify that there are no other cast iron-containing products used on this project that exceed 1 percent of total material cost less material cost attributed to mechanical and electrical.

D. CERTIFIED BY: (GCCM)
1. Print Name: __________________________________________
2. Signature: ____________________________________________
3. Title: ________________________ (officer of company), Date: _________________

END OF SECTION
SECTION 01 3516.04
LEED NEW PRODUCT CONTENT FORM

.01 LEED SUBMITTAL FORM

A. Identification:
   1. Project Name: __________________________________________
   2. Project No.: __________________________________________
   3. Mosaic Architecture: ____________________________________
   4. Product Name: __________________________________________ (brand name, model number, etc.)
   5. Manufacturer: www.________________________
      a. Contact: ____________________________ tel: __________________________
   6. Supplier/Sub: www.________________________
      a. Contact: ____________________________ tel: __________________________
   7. Applicable Specification Section Number(s) ______________________

B. This form applies to LEED Credits MR 4.1 and 4.2 (recycled content), MR 6 (rapidly renewable content), and MR 7 (certified wood).

.02 PRODUCT CERTIFICATION

   1. Product is FSC-trademarked.
   2. _____ FSC Chain-of-Custody certificate number is ______________________
   3. FSC: Forest Stewardship Council Chain-of-Custody number or physical trademark; computation of less than 100 percent certified content in accordance with FSC policy.

B. Rapidly Renewable Content: ________ percent by weight.
   1. Description of Rapidly Renewable Content: __________________________________
   2. Definition: Made from plants that are harvested not more than 10 years after planting.

C. Steel Content: ________ percent by weight.
   1. _____ Steel Mill Source is: _______________________________________________
   2. _____ Mill letter describing mill process and typical re-used steel content is attached.

D. Other Content: (Percentages by weight may not add up to more than 100 percent.)
   1. Pre-Consumer/Post-Industrial Recycled Content: ________ percent by weight.
   2. Post-Consumer Recycled Content: ________ percent by weight.
   3. Description of Recycled Content: __________________________________________
   4. Definition: Recycled content is defined in accordance with FTC regulations, found in 16 CFR 260.13; see www.ecfr.gov.

E. Total Weight: __________________ per ____________ (unit).

F. CERTIFIED BY: (Manufacturer)
   1. Print Name: __________________________________________
   2. Signature: __________________________________________
   3. Title: ____________________________________ (officer of company), Date: _________________

.03 COST CERTIFICATION

A. Unit Cost: $ __________ per __________ (same unit as above); No. of Units Installed: _____

B. OR (enter cost either above or below, not both)

C. Total Installed Material Cost of This Product: $ ______________

D. CERTIFIED BY: (GCCM)
   1. Print Name: __________________________________________
2. Signature: ____________________________________________

3. Title: __________________________ (officer of company), Date: __________________

END OF SECTION
.01 LEED SUBMITTAL FORM

A. Identification:
   1. Project Name: __________________________________________
   2. Project No.: ____________________________________________
   3. Mosaic Architecture: ____________________________________
   4. Product Name: ________________________________ (brand name, model number, etc.)
   5. Manufacturer: __________________________________________
      www.________________________
      a. Contact: ____________________________________________
      tel:__________
   6. Supplier/Sub: __________________________________________
      www.________________________
      a. Contact: ____________________________________________
      tel:__________
   7. Applicable Specification Section Number(s) ______________________

B. This form applies to LEED MR Credits 5.1 and 5.2 for new products only; see separate form for reused products.

.02 PRODUCT CERTIFICATION

A. The following percentages of this product were processed in the locations indicated. (Indicate N/A in first column if process is not applicable.)

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Harvest, Extraction, Recovery, or Manufacturing Process</th>
<th>City/County, State, Country</th>
<th>Distance From Project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Raw Material __________________:</td>
<td>__________________________</td>
<td>______________________</td>
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<tr>
<td>%</td>
<td>Raw Material __________________:</td>
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<td>%</td>
<td>Raw Material __________________:</td>
<td>__________________________</td>
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<td>%</td>
<td>Manufactured at: (primary)</td>
<td>__________________________</td>
<td>______________________</td>
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<tr>
<td>%</td>
<td>Manufactured at: (primary)</td>
<td>__________________________</td>
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<td>%</td>
<td>Manufactured at: (secondary)</td>
<td>__________________________</td>
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<td>%</td>
<td>Manufactured at: (secondary)</td>
<td>__________________________</td>
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<td>Manufactured at: (final)</td>
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<td>Manufactured at: (final)</td>
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<td>__________________________</td>
<td>______________________</td>
</tr>
</tbody>
</table>

B. CERTIFIED BY: (Manufacturer)
   1. Print Name: ____________________________________________
   2. Signature: ____________________________________________
   3. Title: ______________________ (officer of company), Date: ________________

.03 COST CERTIFICATION

A. Unit Cost: $___________ per _________ (unit); No. of Units Installed: ______
B. OR (enter cost either above or below, not both)
C. Total Installed Material Cost: $ _____________
D. CERTIFIED BY: (GCCM)
   1. Print Name: _____________________________
   2. Signature: ______________________________
   3. Title: ______________________ (officer of company), Date: ________________

END OF SECTION
.01 LEED SUBMITTAL FORM

A. Identification:
   1. Project Name: ____________________________________
   2. Project No.: ____________________________________
   3. Mosaic Architecture: ________________________________ (brand name, model number, etc.)
   4. Product Name: ____________________________________ (brand name, model number, etc.)
   5. Source Firm: ____________________________________
      www.________________
      a. Contact: _____________________________________
      tel:________________
   6. Supplier/Sub: ____________________________________
      www.________________
      a. Contact: _____________________________________
      tel:________________
   7. Applicable Specification Section Number(s) ______________________

B. This form applies to LEED MR Credits 3.

.02 PRODUCT CERTIFICATION

A. Product Description: ____________________________________
B. Explain source: _____________________________________
C. City/County, State: ____________________________________
D. Country: __________________________________________
E. Distance From Project: ________________________________
F. CERTIFIED BY: (Source Firm)
   1. Print Name: _____________________________________
   2. Signature: ______________________________________
   3. Title: ________________________ (officer of company), Date: _________________.

.03 COST CERTIFICATION

A. Unit Cost: $________ per _________ (unit); No. of Units Installed: ______
B. OR (enter cost either above or below, not both)
C. Total Installed Material Cost: $________________________
D. CERTIFIED BY: (GCCM)
   1. Print Name: _____________________________________
   2. Signature: ______________________________________
   3. Title: ________________________ (officer of company), Date: _________________

END OF SECTION
SECTION 01 3516.07
LEED PROHIBITED CONTENT INSTALLER CERTIFICATION

.01 LEED SUBMITTAL FORM

A. Identification:
   1. Project Name: Montana State University - New Dining Hall - 100% CD Set
   ___________________________________________
   2. Project No.: PPA #15-0103
   ___________________________________________
   3. Mosaic Architecture: ABC Architect

B. This form applies to the following LEED credits:
   1. Credit IEQ 4.1; VOC content of field-installed adhesives and sealants.
   2. Credit IEQ 4.4; added-urea-formaldehyde content of composite wood and agrifiber
      products, defined as particleboard, plywood, medium density fiberboard, wheatboard,
      strawboard, panel substrates, door cores, and laminating adhesives; applies to
      manufacturers/suppliers and installers.

C. Procedure:
   1. Because installers are allowed and directed to choose accessory materials suitable for the
      applicable installation, each installer of work on this project is required to certify that
      his/her use of these particular materials complies with the contract documents and to
      provide documentation showing that the products used do not contain the prohibited
      content.
   2. Volatile organic compounds (VOCs) are defined by the U.S. EPA and state and local
      regulations applicable to this project. See Contract Documents for minimum criteria.

.02 PRODUCT CERTIFICATION

A. _____ Adhesives: I certify that the installation work of my firm on this project has not required
   the use of any adhesives.

B. OR (certify either the above or the below, not both)

C. _____ Adhesives: I certify that my firm has NOT installed any adhesive with VOC content
   exceeding that specified in Section 01 6000 on this project; product data and MSDS sheets for
   all adhesives used, whether specified or not, are attached.

D. _____ Joint Sealants: I certify that the installation work of my firm on this project has not
   required the use of any gappable or pourable joint sealants.

E. OR (certify either the above or the below, not both)

F. _____ Joint Sealants: I certify that my firm has NOT installed any joint sealant with VOC content
   exceeding that specified in Section 07 9200 on this project; product data and MSDS sheets for
   all joint sealants used, whether specified or not, are attached.

G. _____ Composite Wood and Agrifiber Products: I certify that the work of my firm on this project
   has not required the use of any composite wood or agrifiber products, as defined above.

H. OR (certify either the above or the below, not both)

I. _____ Composite Wood and Agrifiber Products: I certify that the composite wood and agrifiber
   products, as defined above, furnished or installed by my firm DO NOT contain any ADDED
   urea-formaldehyde binder; product data and MSDS sheets for products used, whether
   specified or not, are attached.

J. CERTIFIED BY: (Installer/Manufacturer/Supplier Firm)
   1. Firm Name: ___________________________________________
   2. Print Name: ___________________________________________
   3. Signature: ___________________________________________
   4. Title: ______________________ (officer of company), Date: ______________________

END OF SECTION
SECTION 01 4000
QUALITY REQUIREMENTS

PART 1  GENERAL

1.01  SECTION INCLUDES

A. References and standards.
B. Control of installation.
C. Tolerances.
D. Testing and inspection agencies and services.
E. Mock-ups.

1.02  REFERENCE STANDARDS


1.03  REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
C. Obtain copies of standards where required by product specification sections.
D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
E. Should specified reference standards conflict with Contract Documents, request clarification from Mosaic Architecture before proceeding.
F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Mosaic Architecture shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04  TESTING AND INSPECTION AGENCIES AND SERVICES

A. GCCM shall employ and pay for services of an independent testing agency to perform other specified testing.
B. Employment of agency in no way relieves GCCM of obligation to perform Work in accordance with requirements of Contract Documents.
C. GCCM Employed Agency:
2. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Mosaic Architecture before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

A. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.

B. Notify Architect fifteen (15) working days in advance of dates and times when mock-ups will be constructed.

C. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.

D. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

E. Accepted mock-ups shall be a comparison standard for the remaining Work.

F. Where mock-up has been accepted by Mosaic Architecture and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Mosaic Architecture.

3.03 TESTING AND INSPECTION

A. Testing Agency Duties:
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Mosaic Architecture and GCCM of observed irregularities or non-conformance of Work or products.
   5. Perform additional tests and inspections required by Mosaic Architecture.
   6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the Work.
3. Agency may not assume any duties of GCCM.
4. Agency has no authority to stop the Work.

C. GCCM Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.
   4. Notify Mosaic Architecture and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
   5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by GCCM beyond specified requirements.
   6. Arrange with MSU Facilities's agency and pay for additional samples, tests, and inspections required by GCCM beyond specified requirements.

D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Mosaic Architecture.

E. Re-testing required because of non-conformance to specified requirements shall be paid for by GCCM.

3.04 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

B. If, in the opinion of Mosaic Architecture, it is not practical to remove and replace the Work, Mosaic Architecture will direct an appropriate remedy or adjust payment.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Temporary utilities.
   B. Temporary telecommunications services.
   C. Temporary sanitary facilities.
   D. Temporary Controls: Barriers, enclosures, and fencing.
   E. Security requirements.
   F. Waste removal facilities and services.
   G. Project identification sign.
   H. Field offices.

1.02 TEMPORARY UTILITIES
   A. GCCM will provide the following:
      1. Electrical power and metering, consisting of connection to existing facilities.
      2. Water supply, consisting of connection to existing facilities.

1.03 TELECOMMUNICATIONS SERVICES
   A. GCCM will provide, maintain, and pay for telecommunications services to field office at time of
      project mobilization.
   B. Telecommunications services shall include:
      1. Personal computer dedicated to project telecommunications, with necessary software and
         laser printer.

1.04 TEMPORARY SANITARY FACILITIES
   A. GCCM will provide and maintain required facilities and enclosures. Provided at time of project
      mobilization.
   B. Maintain daily in clean and sanitary condition.

1.05 BARRIERS
   A. GCCM will provide barriers to prevent unauthorized entry to construction areas, to prevent
      access to areas that could be hazardous to workers or the public, to allow for owner's use of
      site and to protect existing facilities and adjacent properties from damage from construction
      operations and demolition.
   B. GCCM to provide barricades and covered walkways required by governing authorities for public
      rights-of-way and for public access to existing building.
   C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.06 FENCING
   A. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates
      with locks.

1.07 EXTERIOR ENCLOSURES
   A. Provide temporary insulated weather tight closure of exterior openings to accommodate
      acceptable working conditions and protection for Products, to allow for temporary heating and
      maintenance of required ambient temperatures identified in individual specification sections,
      and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware
      and locks.
1.08 FENCING
   A. GCCM to provide 6 foot (1.8 m) high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.09 SECURITY
   A. GCCM to provide security and facilities to protect Work, existing facilities, and MSU Facilities's operations from unauthorized entry, vandalism, or theft. All sub-contractors to coordinate security needs with GCCM. Each sub-contractor is responsible for securing on site tools and equipment.

1.10 VEHICULAR ACCESS AND PARKING
   A. Coordinate access and haul routes with governing authorities and MSU Facilities.
   B. Provide and maintain access to fire hydrants, free of obstructions.
   C. Provide means of removing mud from vehicle wheels before entering streets.
   D. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.11 WASTE REMOVAL
   A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
   B. Provide containers with lids. Remove trash from site periodically.
   C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
   D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.12 PROJECT IDENTIFICATION
   A. Provide project identification sign of design and construction indicated on Drawings.
   B. Erect on site at location indicated.
   C. No other signs are allowed without MSU Facilities permission except those required by law.

1.13 FIELD OFFICES
   A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table.
   B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.
   C. Locate offices a minimum distance of 30 feet from existing and new structures.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 5713
TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Prevention of erosion due to construction activities.
B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
C. Restoration of areas eroded due to insufficient preventive measures.
D. Compensation of MSU Facilities for fines levied by authorities having jurisdiction due to non-compliance by GCCM.

1.02 REFERENCE STANDARDS

G. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; Current Edition.
H. USDA TR-55 - Urban Hydrology for Small Watersheds; USDA Natural Resources Conservation Service; 2009.

1.03 PERFORMANCE REQUIREMENTS

A. Comply with all requirements of U.S. Environmental Protection Agency for erosion and sedimentation control, as specified for the National Pollutant Discharge Elimination System (NPDES), Phases I and II, under requirements for the 2003 Construction General Permit (CGP), whether the project is required by law to comply or not.
B. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.
C. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
D. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
E. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
   1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
   2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.
F. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
1. Control movement of sediment and soil from temporary stockpiles of soil.
2. Prevent development of ruts due to equipment and vehicular traffic.
3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to MSU Facilities.

G. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
   1. Prevent windblown soil from leaving the project site.
   2. Prevent tracking of mud onto public roads outside site.
   3. Prevent mud and sediment from flowing onto sidewalks and pavements.
   4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to MSU Facilities.

H. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to MSU Facilities; remove deposited sediments; comply with requirements of authorities having jurisdiction.
   2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.

I. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to MSU Facilities; remove deposited sediments; comply with requirements of authorities having jurisdiction.

J. Open Water: Prevent standing water that could become stagnant.

K. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. LEED Submittals: Submit all submittals required in this section in accordance with procedures specified in Section 01 3515.

C. Erosion and Sedimentation Control Plan:
   1. Submit within 2 weeks after Notice to Proceed.
   2. Include:
      a. Site plan identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.
      b. Site plan showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.
      c. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
      d. Schedule of temporary preventive measures, in relation to ground disturbing activities.
      e. Other information required by law.
      f. Format required by law is acceptable, provided any additional information specified is also included.
   3. Obtain the approval of the Plan by authorities having jurisdiction.
   4. Obtain the approval of the Plan by MSU Facilities.

D. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.
E. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

PART 2 PRODUCTS

2.01 MATERIALS

A. Mulch: Use one of the following:
   1. Straw or hay.
   2. Wood waste, chips, or bark.
   3. Erosion control matting or netting.

B. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.

C. Bales: Air dry, rectangular straw bales.
   1. Cross Section: 14 by 18 inches, minimum.
   2. Bindings: Wire or string, around long dimension.

D. Bale Stakes: One of the following, minimum 3 feet long:
   1. Steel U- or T-section, with minimum mass of 1.33 lb per linear foot.
   2. Wood, 2 by 2 inches in cross section.

E. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
   1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D4751.
   2. Permittivity: 0.05 sec^-1, minimum, when tested in accordance with ASTM D4491.
   3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.
   4. Tensile Strength: 100 lb-f, minimum, in cross-machine direction; 124 lb-f, minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.
   5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632/D4632M.
   6. Tear Strength: 55 lb-f, minimum, when tested in accordance with ASTM D4533.
   7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.
   8. Manufacturers:
      c. Propex Geosynthetics: www.geotextile.com

F. Silt Fence Posts: One of the following, minimum 5 feet long:
   1. Steel U- or T-section, with minimum mass of 1.33 lb per linear foot.
   2. Softwood, 4 by 4 inches in cross section.
   3. Hardwood, 2 by 2 inches in cross section.

G. Gravel: See Section 32 1123 for aggregate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.02 PREPARATION

A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.03 SCOPE OF PREVENTIVE MEASURES

A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.
B. Construction Entrances: Traffic-bearing aggregate surface.
   1. Width: As required; 20 feet, minimum.
   2. Length: 50 feet, minimum.
   3. Provide at each construction entrance from public right-of-way.
   4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.

C. Linear Sediment Barriers: Made of silt fences.
   1. Provide linear sediment barriers:
      a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
   2. Space sediment barriers with the following maximum slope length upslope from barrier:
      a. Slope of Less Than 2 Percent: 100 feet.
      b. Slope Between 2 and 5 Percent: 75 feet.
      c. Slope Between 5 and 10 Percent: 50 feet.
      d. Slope Between 10 and 20 Percent: 25 feet.
      e. Slope Over 20 Percent: 15 feet.

D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
   1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
   2. Straw bale row blocking entire inlet face area; anchor into pavement.

E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.

F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.

G. Soil Stockpiles: Protect using one of the following measures:
   1. Cover with polyethylene film, secured by placing soil on outer edges.
   2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.

H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
   1. Wood Waste: Use only on slopes 3:1 or flatter; no anchoring required.

I. Temporary Seeding: Use where temporary vegetated cover is required.

3.04 INSTALLATION

A. Traffic-Bearing Aggregate Surface:
   1. Excavate minimum of 6 inches.
   2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
   3. Place and compact at least 6 inches of 1.5 to 3.5 inch diameter stone.

B. Silt Fences:
   1. Store and handle fabric in accordance with ASTM D4873.
   2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
   3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
   4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
   5. Install with top of fabric at nominal height and embedment as specified.
   6. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
7. Fasten fabric to wood posts using one of the following:
   a. Four nails per post with 3/4 inch diameter flat or button head, 1 inch long, and 14 gage, 0.083 inch shank diameter.
   b. Five staples per post with at least 17 gage, 0.0453 inch wire, 3/4 inch crown width and 1/2 inch long legs.
9. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.

C. Straw Bale Rows:
   1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
   2. Install bales so that bindings are not in contact with the ground.
   3. Embed bales at least 4 inches in the ground.
   4. Anchor bales with at least two stakes per bale, driven at least 18 inches into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
   5. Fill gaps between ends of bales with loose straw wedged tightly.
   6. Place soil excavated for trench against bales on the upslope side of the row, compacted.

D. Temporary Seeding:
   1. When hydraulic seeder is used, seedbed preparation is not required.
   2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
   3. If temporary mulching was used on planting area but not removed, apply nitrogen fertilizer at 1 pound per 1000 sq ft.
   4. On soils of very low fertility, apply 10-10-10 fertilizer at rate of 12 to 16 pounds per 1000 sq ft.
   5. Incorporate fertilizer into soil before seeding.
   6. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch deep.
   7. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
   8. Repeat irrigation as required until grass is established.

3.05 MAINTENANCE
A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.
B. Repair deficiencies immediately.
C. Silt Fences:
   1. Promptly replace fabric that deteriorates unless need for fence has passed.
   2. Remove silt deposits that exceed one-third of the height of the fence.
   3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
D. Straw Bale Rows:
   1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
   2. Remove silt deposits that exceed one-half of the height of the bales.
   3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
E. Clean out temporary sediment control structures weekly and relocate soil on site.
F. Place sediment in appropriate locations on site; do not remove from site.
3.06 CLEAN UP

A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Mosaic Architecture.

B. Clean out temporary sediment control structures that are to remain as permanent measures.

C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION
SECTION 01 5721
INDOOR AIR QUALITY CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Construction procedures to promote adequate indoor air quality after construction.
B. Building flush-out after construction and before occupancy.
C. Testing indoor air quality before commencement of construction; existing building areas only.
D. Testing indoor air quality after completion of construction.
E. Testing air change effectiveness after completion of construction.

1.02 PROJECT GOALS
A. Dust and Airborne Particulates: Prevent deposition of dust and other particulates in HVAC ducts and equipment.
   1. Cleaning of ductwork is not contemplated under this Contract.
   2. GCCM shall bear the cost of cleaning required due to failure to protect ducts and equipment from construction dust.
   3. Establish condition of existing ducts and equipment prior to start of alterations.
B. Airborne Contaminants: Procedures and products have been specified to minimize indoor air pollutants.
   1. Furnish products meeting the specifications.
   2. Avoid construction practices that could result in contamination of installed products leading to indoor air pollution.
C. Ventilation: HVAC system has been designed to achieve the minimum requirements for ventilation specified in ASHRAE 62.1 with air change effectiveness of 0.9 or greater.

1.03 RELATED REQUIREMENTS
A. Section 01 3515 - LEED Certification Procedures: LEED credits relating to indoor air quality.
B. Section 01 4000 - Quality Requirements: Testing and inspection services.
C. Section 23 4000 - HVAC Air Cleaning Devices: HVAC filters.
D. Section 23 0593 - Testing, Adjusting, and Balancing for HVAC: Testing HVAC systems for proper air flow rates, adjustment of dampers and registers, and settings for equipment.
E. Section 23 0130.51 - HVAC Air Duct Cleaning: Cleaning air ducts, equipment, and terminal units.

1.04 REFERENCE STANDARDS
C. ASTM D5197 - Standard Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology); 2009.
E. EPA 600/4-90/010 - Compendium of Methods for the Determination of Air Pollutants in Indoor Air; April 1990.
1.05 DEFINITIONS

A. Adsorptive Materials: Gypsum board, acoustical ceiling tile and panels, carpet and carpet tile, fabrics, fibrous insulation, and other similar products.
B. Contaminants: Gases, vapors, regulated pollutants, airborne mold and mildew, and the like, as specified.
C. Particulates: Dust, dirt, and other airborne solid matter.
D. Wet Work: Concrete, plaster, coatings, and other products that emit water vapor or volatile organic compounds during installation, drying, or curing.

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. LEED Submittals: Submit all submittals required in this section in accordance with procedures specified in Section 01 3515.
C. Indoor Air Quality Management Plan: Describe in detail measures to be taken to promote adequate indoor air quality upon completion; use SMACNA (OCC) as a guide.
   1. Submit not less than 60 days before enclosure of building.
   2. Identify potential sources of odor and dust.
   3. Identify construction activities likely to produce odor or dust.
   4. Identify areas of project potentially affected, especially occupied areas.
   5. Evaluate potential problems by severity and describe methods of control.
   6. Describe construction ventilation to be provided, including type and duration of ventilation, use of permanent HVAC systems, types of filters and schedule for replacement of filters.
   7. Describe cleaning and dust control procedures.
D. Interior Finishes Installation Schedule: Identify each interior finish that either generates odors, moisture, or vapors or is susceptible to adsorption of odors and vapors, and indicate air handling zone, sequence of application, and curing times.
E. Duct and Terminal Unit Inspection Report.
F. Air Contaminant Test Plan: Identify:
   1. Testing agency qualifications.
   2. Locations and scheduling of air sampling.
   3. Test procedures, in detail.
   4. Test instruments and apparatus.
   5. Sampling methods.
G. Air Contaminant Test Reports: Show:
   1. Location where each sample was taken, and time.
   2. Test values for each air sample; average the values of each set of 3.
   3. HVAC operating conditions.
   4. Certification of test equipment calibration.
   5. Other conditions or discrepancies that might have influenced results.
H. Ventilation Effectiveness Test Plan: Identify:
   1. Testing agency qualifications.
   2. Description of test spaces, including locations of air sampling.
   3. Test procedures, in detail; state whether tracer gas decay or step-up will be used.
   4. Test instruments and apparatus; identify tracer gas to be used.
   5. Sampling methods.
I. Ventilation Effectiveness Test Reports: Show:
   1. Include preliminary tests of instruments and apparatus and of test spaces.
   2. Calculation of ventilation effectiveness, E.
   3. Location where each sample was taken, and time.
   4. Test values for each air sample.
5. HVAC operating conditions.
6. Other information specified in ASHRAE Std 129.
7. Other conditions or discrepancies that might have influenced results.

PART 2 PRODUCTS

2.01 MATERIALS

A. Low VOC Materials: See other sections for specific requirements for materials with low VOC content.

PART 3 EXECUTION

3.01 CONSTRUCTION PROCEDURES

A. Prevent the absorption of moisture and humidity by adsorptive materials by:
   1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
   2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
   3. Provide sufficient ventilation for drying within reasonable time frame.

B. Begin construction ventilation when building is substantially enclosed.

C. When working in a portion of an occupied building, prevent movement of air from construction area to occupied area.

D. HVAC equipment and ductwork may NOT be used for ventilation during construction:
   1. Provide temporary ventilation equivalent to 1.5 air changes per hour, minimum.
   2. Exhaust directly to outside.
   3. Seal HVAC air inlets and outlets immediately after duct installation.

E. Do not store construction materials or waste in mechanical or electrical rooms.

F. Prior to use of return air ductwork without intake filters clean up and remove dust and debris generated by construction activities.
   1. Inspect duct intakes, return air grilles, and terminal units for dust.
   2. Clean plenum spaces, including top sides of lay-in ceilings, outsides of ducts, tops of pipes and conduit.
   3. Clean tops of doors and frames.
   4. Clean mechanical and electrical rooms, including tops of pipes, ducts, and conduit, equipment, and supports.
   5. Clean return plenums of air handling units.
   6. Remove intake filters last, after cleaning is complete.

G. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.

H. Use other relevant recommendations of SMACNA (OCC) for avoiding unnecessary contamination due to construction procedures.

3.02 BUILDING FLUSH-OUT

A. GCCM's Option: Either full continuous flush-out OR satisfactory air contaminant testing is required, not both.

B. Perform building flush-out before occupancy.

C. Do not start flush-out until:
   1. All construction is complete.
   2. HVAC systems have been tested, adjusted, and balanced for proper operation.
   3. Inspection of inside of return air ducts and terminal units confirms that cleaning is not necessary.
   4. New HVAC filtration media have been installed.

D. Building Flush-Out: Operate all ventilation systems at normal flow rates with 100 percent outside air until a total air volume of 14,000 cubic feet per square foot of floor area has been supplied.
1. Obtain MSU Facilities's concurrence that construction is complete enough before beginning flush-out.
2. Maintain interior temperature of at least 60 degrees F and interior relative humidity no higher than 60 percent.
3. If additional construction involving materials that produce particulates or any of the specified contaminants is conducted during flush-out, start flush-out over.
4. If interior spaces must be occupied prior to completion of the flush-out, supply a minimum of 25 percent of the total air volume prior to occupancy, and:
   a. Begin ventilation at least three hours prior to daily occupancy.
   b. Continue ventilation during all occupied periods.
   c. Provide minimum outside air volume of 0.30 cfm per square foot or design minimum outside air rate, whichever is greater.

E. Install new HVAC filtration media after completion of flush-out and before occupancy or further testing.

3.03 AIR CONTAMINANT TESTING

A. GCCM's Option: Either full continuous flush-out OR satisfactory air contaminant testing is required, not both.
B. Perform air contaminant testing before starting construction, as base line for evaluation of post-construction testing.
C. Perform air contaminant testing before occupancy.
D. Do not start air contaminant testing until:
   1. All construction is complete, including interior finishes.
   2. HVAC systems have been tested, adjusted, and balanced for proper operation.
   3. New HVAC filtration media have been installed.
E. Indoor Air Samples: Collect from spaces representative of occupied areas:
   1. Collect samples while operable windows and exterior doors are closed, HVAC system is running normally as if occupied, with design minimum outdoor air, but with the building unoccupied.
   2. Collect samples from spaces in each contiguous floor area in each air handler zone, but not less than one sample per 25,000 square feet; take samples from areas having the least ventilation and those having the greatest presumed source strength.
   3. Collect samples from height from 36 inches to 72 inches above floor.
   4. Collect samples from same locations on 3 consecutive days during normal business hours; average the results of each set of 3 samples.
   5. Exception: Areas with normal very high outside air ventilation rates, such as laboratories, do not need to be tested.
   6. When retesting the same building areas, take samples from at least the same locations as in first test.
F. Outdoor Air Samples: Collect samples at outside air intake of each air handler at the same time as indoor samples are taken.
G. Analyze air samples and submit report.
H. Air Contaminant Concentration Limits:
   1. Formaldehyde: Not more than 27 parts per billion.
   2. PM10 Particulates: Not more than 50 micrograms per cubic meter.
   3. Total Volatile Organic Compounds (TVOCs): Not more than 500 micrograms per cubic meter.
   4. Chemicals Listed in CAL (CDPH SM) Table 4-1, except Formaldehyde: Allowable concentrations listed in Table 4-1.
   5. Carbon Monoxide: Not more than 9 parts per million and not more than 2 parts per million higher than outdoor air.
I. Air Contaminant Concentration Test Methods:
3. Total Volatile Organic Compounds (TVOC): EPA 625 Method TO-1, TO-15, or TO-17; or EPA 600 Method IP-1.
4. Chemicals Listed in CAL (CDPH SM) Table 4-1, except Formaldehyde: ASTM D5197, or EPA 625 Method TO-1, TO-15, or TO-17.
5. Carbon Monoxide: EPA 600 Method IP-3, plus measure outdoor air; measure in ppm; report both indoor and outdoor measurements.

J. Air Contaminant Concentration Determination and Limits:
   1. Carbon Monoxide: Not more than 9 parts per million and not more than 2 parts per million higher than outdoor air.
   2. Airborne Mold and Mildew: Measure in relation to outside air; not higher than outside air.
   3. Formaldehyde: Not more than 50 parts per billion.
   4. Formaldehyde: Measure in micrograms per cubic meter, in relation to outside air; not more than 20 micrograms per cubic meter higher than outside air.
   5. Total Volatile Organic Compounds (TVOC): Not more than 500 micrograms per cubic meter.
   6. Total Volatile Organic Compounds (TVOC): Measure in micrograms per cubic meter, in relation to outside air; not more than 200 micrograms per cubic meter higher than outside air.
   7. Particulates (PM10): Not more than 50 micrograms per cubic meter.
   8. Total Particulates (PM): Measure in micrograms per cubic meter, in relation to outside air; not more than 20 micrograms per cubic meter higher than outside air.

3.04 VENTILATION EFFECTIVENESS TESTING
   A. Perform ventilation effectiveness testing before occupancy.
   B. Do not begin ventilation effectiveness testing until:
      1. HVAC testing, adjusting, and balancing has been satisfactorily completed.
      2. Building flush-out or air contaminant testing has been completed satisfactorily.
      3. New HVAC filtration media have been installed.
   C. Test each air handler zone in accordance with ASHRAE Std 129.
   D. If calculated air change effectiveness for a particular zone is less than 0.9 due to inadequate balancing of the system, adjust, and retest at no cost to MSU Facilities.

END OF SECTION
SECTION 01 5813
TEMPORARY PROJECT SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Project identification sign.

1.02 QUALITY ASSURANCE
A. Sign Painter: Experienced as a professional sign painter for minimum three years.
B. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Shop Drawing: Show content, layout, lettering, color, foundation, structure, sizes and grades of members.

PART 2 PRODUCTS

2.01 SIGN MATERIALS
A. Structure and Framing: New, wood, structurally adequate.
B. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4 inch thick, standard large sizes to minimize joints.
C. Rough Hardware: Galvanized.
D. Lettering: Exterior quality paint, contrasting colors.

2.02 PROJECT IDENTIFICATION SIGN
A. One painted sign, 48 sq ft area, bottom 6 feet above ground.
B. Content:
   1. Project title, logo and name of MSU Facilities as indicated on Contract Documents.
   3. Name of Prime GCCM and major Subcontractors.
C. Graphic Design, Colors, Style of Lettering: Designated by Mosaic Architecture.

PART 3 EXECUTION

3.01 INSTALLATION
A. Install project identification sign within 30 days after date fixed by Notice to Proceed.
B. Erect at designated location.
C. Install sign surface plumb and level, with butt joints. Anchor securely.

3.02 REMOVAL
A. Remove signs, framing, supports, and foundations at completion of Project and restore the area.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. General product requirements.
B. Sustainable design-related product requirements.
C. Transportation, handling, storage and protection.
D. Product option requirements.
E. Substitution limitations and procedures.
F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS
A. Section 01 3515 - LEED Certification Procedures: Requirements for LEED reports.
B. Section 01 4000 - Quality Requirements: Product quality monitoring.
C. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.
D. Section 01 7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting packaging and substitutions.

1.03 QUALITY ASSURANCE
A. Source Limitations: To the fullest extent possible, provide products of the same kind and from a single source.
B. Compatibility of Options: When the contractor is given the option of selecting between two or more products for use on the project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
C. Nameplates: except for the required labels and operating data, do not attach or imprint manufacturer's or producers nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.
   1. Labels: Locate required product labels and stamps on concealed surface or where required for observation after installation, on an accessible surface that is not conspicuous.
   2. Equipment Nameplates: Provide a permanent nameplate on each item of service connected or power operated equipment. Locate on an easily accessible surface which is inconspicuous in occupied space. The nameplates shall contain, as applicable, the following information and other essential operating data:
      a. Name of product and manufacturer
      b. Model and serial number
      c. Capacity
      d. Speed
      e. Rating
D. Greenseal GS-36: Commercial Adhesives; Green Seal, Inc; 2009.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING
A. Should space on site be inadequate for storage of equipment and materials to be incorporated in the work, the contractor and all sub-contractors will be required to provide off-site storage for such materials and equipment.
   1. Locations and facilities for off-site storage shall be identified for the Owner and Architect.
   2. Off-Site storage shall be governed by the requirements of Article 9.3.2 of the General Conditions.
B. Deliver, store and handle products in accordance with the manufacturers recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.
   1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
   2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
   3. Deliver products to the site in the manufacturers original sealed container and other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
   4. Inspect products upon delivery to ensure compliance with the construction documents and to ensure that products are undamaged and properly protected.
   5. Store products in a manner that will facilitate inspection and measurement of quantity or counting of units.
   6. Store heavy materials away from the project structure in a manner that will not endanger the supporting construction.
   7. Store products subject to damage by the elements above ground, under cover in a weather tight enclosure with ventilation adequate to prevent condensation.

1.05 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Submit within 15 days after date of Notice to Proceed.
   2. For products specified only by reference standards, list applicable reference standards.

B. Product Data Submittals: Submit manufacturer’s standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

E. LEED Submittals: Use forms provided in Section 01 3516.

PART 2 PRODUCTS

2.01 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. Where all other criteria are met, GCCM shall give preference to products that:
   1. If used on interior, have lower emissions, as defined in Section 01 6116.
   2. If wet-applied, have lower VOC content, as defined in Section 01 6116.
   3. Are extracted, harvested, and/or manufactured closer to the location of the project.
   4. Have longer documented life span under normal use.
   5. Result in less construction waste.
   6. Are made of vegetable materials that are rapidly renewable.
   7. Have a published GreenScreen Chemical Hazard Analysis.

C. Regionally-Sourced Products:
   1. Overall Project Requirement: Provide materials amounting to a minimum of 10 percent of the total value of all materials (excluding plumbing, HVAC, electrical, elevators, and other equipment) that have been extracted, harvested, or recovered, as well as manufactured, within a radius of 500 miles from the project site.
      a. This provision is applicable to LEED Credit MR 5.1; show quantity on LEED report.
b. This provision is applicable to LEED Credit MR 5.2; show quantity on LEED report

2. Specific Product Categories: Provide regionally-sourced products as specified elsewhere.

3. LEED Submittals: Indicate location of manufacture; in all cases indicate location of final assembly; for harvested products, indicate location of harvest; for extracted (i.e. mined) products, indicate location of extraction; for products involving multiple manufacturing steps, indicate all locations of manufacture or assembly; provide manufacturer or supplier certification of location information.

D. Products with Rapidly Renewable Material Content:
   1. Definition: Materials made from plants that are typically harvested within 10 years or less after planting.
   2. Overall Project Requirement: Provide materials amounting to a minimum of 2.5 percent of the total value of all materials and products used on the project.
   3. Specific Product Categories: Provide renewable material content as specified elsewhere.
   4. Calculations: Where information about renewable material content is required to be submitted and an item is not made completely of rapidly renewable material, calculate content by dividing the renewable material content by weight by the total weight of the item.
   5. LEED Submittals: State unit cost, renewable material content percentage, quantity installed, total material cost, and total renewable material value; attach evidence of contents from either manufacturer or an independent agency.

E. Products with Recycled Content:
   1. Overall Project Requirement: Provide products with recycled content such that the sum of post-consumer recycled content plus one-half of the post-industrial recycled content constitutes at least 10 percent of the total value of all products installed, except mechanical and electrical components.
      a. This provision is applicable to LEED Credit MR 4; show quantity and calculations on LEED report.
   2. Specific Product Categories: Provide recycled content as specified elsewhere.
   3. Calculations: Where information about recycled content is required to be submitted:
      a. Determine percentage of post-consumer and post-industrial content separately, using the guidelines contained in 16 CFR 260.7(e).
      b. Previously used, reused, refurbished, and salvaged products are not considered recycled.
      c. Wood fabricated from timber abandoned in transit to original mill is considered reused, not recycled.
      d. Determine percentage of recycled content of any item by dividing the weight of recycled content in the item by the total weight of all material in the item.
      e. Determine value of recycled content of each item separately, by multiplying the content percentage by the value of the item.
   4. LEED Submittals: State unit cost, post-consumer and post-industrial content percentages, quantity installed, total material cost, and total recycled content value; attach evidence of contents from either manufacturer or an independent agency.

F. Sustainably Harvested Wood:
   1. Definition: Wood-based materials include but are not limited to structural framing, dimension lumber, flooring, wood doors, finishes, and furnishings that are permanently installed in the project. Wood and wood-based products not permanently installed in the project are not included in the definition.
   2. Overall Project Requirement: Provide a minimum of 50 percent of all wood-based materials made of sustainably harvested wood.
      a. This provision is applicable to LEED Credit MR 6/7; show quantity on LEED report and submit certificates.
   3. Specific Wood-Based Fabrications: Fabricate of sustainably harvested wood when so specified elsewhere.
4. Certification: Provide wood certified or labeled by an organization accredited by one of the following:
5. LEED Submittals: State unit cost of each wood-based item, quantity installed, quantity certified as sustainably harvested, total wood-based material cost, and total sustainably harvested value; provide letter of certification signed by supplier of each item, indicating compliance with the specified requirements and identifying the certifying organization.
   a. Include the certifying organization’s certification numbers for each certified product, itemized on a line-item basis.
   b. Attach copies of invoices bearing the certifying organization’s certification numbers.

2.02 PRODUCT OPTIONS
A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.03 MAINTENANCE MATERIALS
A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION
3.01 SUBSTITUTION PROCEDURES
A. Bid Description specifies time restrictions for submitting requests for substitutions during the bidding period and the documents required. Comply with requirements specified in Section 00 2113.
B. Substitutions may be considered when a product becomes unavailable through no fault of the GCCM.
C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
D. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to MSU Facilities.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.
E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

3.02 TRANSPORTATION AND HANDLING
A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
D. Transport and handle products in accordance with manufacturer’s instructions.
E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
B. Store and protect products in accordance with manufacturers’ instructions.
C. Store with seals and labels intact and legible.
D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
E. For exterior storage of fabricated products, place on sloped supports above ground.
F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
G. Comply with manufacturer’s warranty conditions, if any.
H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
I. Prevent contact with material that may cause corrosion, discoloration, or staining.
J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION
SECTION 01 6116
VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- Requirement for installer certification that they did not use any non-compliant products.
- VOC restrictions for product categories listed below under "DEFINITIONS."
- All products of each category that are installed in the project must comply; MSU Facilities’s project goals do not allow for partial compliance.

1.02 RELATED REQUIREMENTS

- Section 01 3000 - Administrative Requirements: Submittal procedures.

1.03 DEFINITIONS

- VOC-Restricted Products: All products of each of the following categories when installed or applied on-site in the building interior:
  1. Adhesives, sealants, and sealer coatings.
  2. Carpet.
  3. Carpet tile.
  4. Resilient floor coverings.
  5. Wood flooring.
  6. Paints and coatings.
  7. Insulation.
  8. Gypsum board.
  10. Cabinet work.
  11. Wall coverings.
  12. Composite wood and agrifiber products used either alone or as part of another product.

- Interior of Building: Anywhere inside the exterior weather barrier.

- Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

- Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.04 REFERENCE STANDARDS

- CAL (CHPS LEM) - Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
- GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.
- GreenSeal GC-03 - Anti-Corrosive Paints; Green Seal, Inc.; 2007
- GreenSeal GS-11 - Paints; Green Seal, Inc.; 1993.
- GreenSeal GS-36 - Commercial Adhesives; 2011.
- SCAQMD 1113 - South Coast Air Quality Management District Rule No.1113; current edition.
- SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition.
- SCS (CPD) - SCS Certified Products; current listings at www.scscertified.com.
1.05 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Evidence of Compliance: Submit for each different product in each applicable category.
   C. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.
   D. Installer Certifications Regarding Prohibited Content: Require each installer of any type of product (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of his products, or 2) that such products used comply with these requirements.

1.06 QUALITY ASSURANCE
   A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 MATERIALS
   A. All VOC-Restricted Products: Provide products having VOC content of types and volume not greater than those specified in State of California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers.
      1. Evidence of Compliance: Acceptable types of evidence are:
         f. Current certification by any other agencies acceptable to CHPS.
         g. Report of laboratory testing performed in accordance with CHPS requirements for getting a product listed in the Low-Emitting Materials Product List; report must include laboratory's statement that the product meets the specified criteria.
      2. Product data submittals showing VOC content are NOT acceptable forms of evidence.
   B. Adhesives and Joint Sealants: Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168.
      1. Evidence of Compliance: Acceptable types of evidence are:
         a. Report of laboratory testing performed in accordance with requirements.
   C. Aerosol Adhesives: Provide only products having volatile organic compound (VOC) content not greater than required by GreenSeal GS-36.
      1. Evidence of Compliance: Acceptable types of evidence are:
         a. Current GreenSeal Certification.
   D. Paints and Coatings:
      1. Provide coatings that comply with the most stringent requirements specified in the following:
         b. USGBC LEED Rating System, edition as stated in Section 01 3515; for interior wall and ceiling finish (all coats), anti-corrosive paints on interior ferrous metal, clear wood stains and finishes, sanding sealers, other sealers, shellac, and floor coatings.
            1) Architectural Paints and Coatings: Do not exceed VOC content limits established in GreenSeal GS-11.
2) Anti-Corrosive and Anti-Rust Paints: Do not exceed VOC content limits established in GreenSeal GC-03.

3) Clear Wood Finishes, Floor Coatings, Stains, Primers and Shellacs: Do not exceed the VOC content limits established in SCAQMD Rule No. 1113.

2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

3. Evidence of Compliance: Acceptable types of evidence are:
   a. Report of laboratory testing performed in accordance with requirements.

E. Carpet and Adhesive: Provide products having VOC content not greater than that required for CRI Green Label Plus certification.
   1. Evidence of Compliance: Acceptable types of evidence are:
      b. Report of laboratory testing performed in accordance with requirements.

F. Carpet Tile and Adhesive: Provide products having VOC content not greater than that required for CRI Green Label Plus certification.
   1. Evidence of Compliance: Acceptable types of evidence are:
      b. Report of laboratory testing performed in accordance with requirements.

G. Carpet Tile and Adhesive: Provide products having VOC content as specified in Section 09 6813.

   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Published product data showing compliance with requirements.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

   A. MSU Facilities reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to MSU Facilities.

   B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by GCCM.

END OF SECTION
SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL - SEE ALSO GCCM GENERAL REQUIREMENTS. IN AREAS WHERE GENERAL REQUIREMENTS CONFLICT WITH THIS SECTION, GCCM GENERAL REQUIREMENTS TAKE PRECEDENCE.

1.01 SECTION INCLUDES
A. Examination, preparation, and general installation procedures.
B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
C. Cutting and patching.
D. Surveying for laying out the work.
E. Cleaning and protection.
F. Starting of systems and equipment.
G. Demonstration and instruction of MSU Facilities personnel.
H. Closeout procedures, including GCCM's Correction Punch List, except payment procedures.

1.02 RELATED REQUIREMENTS
A. Section 01 3000 - Administrative Requirements: Submittals procedures, Electronic document submittal service.
B. Section 01 4000 - Quality Requirements: Testing and inspection procedures.
C. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.
D. Section 01 7900 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
   3. Submit surveys and survey logs for the project record.
C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   5. Work of MSU Facilities or separate Contractor.
D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.04 QUALIFICATIONS
A. For survey work, employ a land surveyor registered in Montana and acceptable to Mosaic Architecture. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.

1.05 PROJECT CONDITIONS
A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
   1. Minimize amount of bare soil exposed at one time.
   2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
   3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
   4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

F. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

G. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

H. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.06 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After MSU Facilities occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of MSU Facilities's activities.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.
D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION
A. Clean substrate surfaces prior to applying next material or substance.
B. Seal cracks or openings of substrate prior to applying next material or substance.
C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 LAYING OUT THE WORK
A. Verify locations of survey control points prior to starting work.
B. Promptly notify Mosaic Architecture of any discrepancies discovered.
C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
D. Promptly report to Mosaic Architecture the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Mosaic Architecture.
F. Utilize recognized engineering survey practices.
G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations; and ________.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations.
H. Periodically verify layouts by same means.
I. Maintain a complete and accurate log of control and survey work as it progresses.

3.04 GENERAL INSTALLATION REQUIREMENTS
A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 ALTERATIONS
A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Mosaic Architecture before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.
B. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
   2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
   3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
      a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
      b. Provide temporary connections as required to maintain existing systems in service.
   4. Verify that abandoned services serve only abandoned facilities.

3.06 PROGRESS CLEANING
A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK
A. Protect installed work from damage by construction operations.
B. Provide special protection where specified in individual specification sections.
C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
G. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.08 SYSTEM STARTUP
A. Coordinate schedule for start-up of various equipment and systems.
B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
D. Verify that wiring and support components for equipment are complete and tested.
E. Execute start-up under supervision of applicable GCCM personnel and manufacturer’s representative in accordance with manufacturers’ instructions.
F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.09 DEMONSTRATION AND INSTRUCTION

A. See Section 01 7900 - Demonstration and Training.
B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.
E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

3.10 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.
B. Testing, adjusting, and balancing HVAC systems: See Section 23 0593 - Testing, Adjusting, and Balancing for HVAC.

3.11 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.
B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
E. Clean filters of operating equipment.
F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, drainage systems, and ______.
G. Clean site; sweep paved areas, rake clean landscaped surfaces.
H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.12 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Mosaic Architecture.
B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the GCCM's Correction Punch List for GCCM's Notice of Substantial Completion.
C. Notify Mosaic Architecture when work is considered ready for Mosaic Architecture's Substantial Completion inspection.
D. Submit written certification containing GCCM's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Mosaic Architecture's Substantial Completion inspection.
E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Mosaic Architecture's and GCCM's comprehensive list of items identified to be completed or corrected and submit to Mosaic Architecture.
F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to MSU Facilities-occupied areas.

G. Notify Mosaic Architecture when work is considered finally complete and ready for Mosaic Architecture’s Substantial Completion final inspection.

H. Complete items of work determined by Mosaic Architecture listed in executed Certificate of Substantial Completion.

END OF SECTION
SECTION 01 7419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. MSU Facilities requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
   1. Aluminum and plastic beverage containers.
   2. Corrugated cardboard.
   3. Wood pallets.
   4. Clean dimensional wood: May be used as blocking or furring.
   5. Land clearing debris, including brush, branches, logs, and stumps; see Section 31 1000 - Site Clearing for use options.
   6. Concrete: May be crushed and used as riprap, aggregate, sub-base material, or fill.
   7. Bricks: May be used on project if whole, or crushed and used as landscape cover, sub-base material, or fill.
   8. Asphalt paving: May be recycled into paving for project.
   9. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
   10. Glass.
   11. Gypsum drywall and plaster.
   13. Carpet, carpet cushion, carpet tile, and carpet remnants, both new and removed: DuPont (http://flooring.dupont.com) and Interface (www.interfaceinc.com) conduct reclamation programs.
   15. Plastic sheeting.
   16. Rigid foam insulation.

E. LEED Certification for this project is dependent on diversion of 75 percent, by weight, of potential landfill trash/waste by recycling and/or salvage.

F. GCCM shall submit periodic Waste Disposal Reports; all landfill disposal, incineration, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.

G. GCCM shall develop and follow a Waste Management Plan designed to implement these requirements.

H. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.

I. Regulatory Requirements: GCCM is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.
1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. Section 01 5000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

C. Section 01 6000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

D. Section 01 7000 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

E. Section 31 1000 - Site Clearing: Handling and disposal of land clearing debris.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

C. Landfill Alternatives Proposal: Within 10 calendar days after receipt of Notice of Award of Bid, or prior to any trash or waste removal, whichever occurs sooner, submit a projection of trash/waste that will require disposal and alternatives to landfilling, with net costs.
   1. Submit to Mosaic Architecture for MSU Facilities's review and approval.
   2. If MSU Facilities wishes to implement any cost alternatives, the Contract Price will be adjusted as specified elsewhere.
   3. Include an analysis of trash/waste to be generated and landfill options as specified for Waste Management Plan described below.
   4. Describe as many alternatives to landfilling as possible:
      a. List each material proposed to be salvaged, reused, or recycled.
      b. List the proposed local market for each material.
      c. State the estimated net cost resulting from each alternative, after subtracting revenue from sale of recycled or salvaged materials and landfill tipping fees saved due to diversion of materials from the landfill.

D. Waste Management Plan: Include the following information:
   1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.
   2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
   3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
   4. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
   5. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
   6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.

E. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
   1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
   2. Submit Report on a form acceptable to MSU Facilities.
   3. Landfill Disposal: Include the following information:
      a. Identification of material.
      b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
      c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   4. Incinerator Disposal: Include the following information:
      a. Identification of material.
      b. Amount, in tons or cubic yards, of trash/waste material from the project delivered to incinerators.
      c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   5. Recycled and Salvaged Materials: Include the following information for each:
a. Identification of material, including those retrieved by installer for use on other projects.
b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.

6. Material Reused on Project: Include the following information for each:
   a. Identification of material and how it was used in the project.
   b. Amount, in tons or cubic yards.
   c. Include weight tickets as evidence of quantity.

7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 2 - NOT USED

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES
   A. See Section 01 3000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
   B. See Section 01 5000 for additional requirements related to trash/waste collection and removal facilities and services.
   C. See Section 01 6000 for waste prevention requirements related to delivery, storage, and handling.
   D. See Section 01 7000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION
   A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
   B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, MSU Facilities, and Mosaic Architecture.
   C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
   D. Meetings: Discuss trash/waste management goals and issues at project meetings.
      1. Pre-bid meeting.
      2. Pre-construction meeting.
      3. Regular job-site meetings.
   E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
      1. Provide containers as required.
      2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
      3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
   F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
   G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified
materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION
SECTION 01 7800
CLOSEOUT SUBMITTALS

PART 1 GENERAL - SEE ALSO GCCM GENERAL REQUIREMENTS. IN AREAS WHERE GENERAL REQUIREMENTS CONFLICT WITH THIS SECTION, GCCM GENERAL REQUIREMENTS TAKE PRECEDENCE.

1.01 SECTION INCLUDES
A. Project Record Documents.
B. Operation and Maintenance Data.
C. Warranties and bonds.

1.02 RELATED REQUIREMENTS
A. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
B. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.
C. Individual Product Sections: Specific requirements for operation and maintenance data.
D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS
A. Project Record Documents: Submit documents to Mosaic Architecture with claim for final Application for Payment.
B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Mosaic Architecture will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by MSU Facilities, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Mosaic Architecture comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.
C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with MSU Facilities's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS
A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Addenda.
   3. Change Orders and other modifications to the Contract.
B. Ensure entries are complete and accurate, enabling future reference by MSU Facilities.
C. Store record documents separate from documents used for construction.
D. Record information concurrent with construction progress.
E. Record Drawings: Legibly mark each item to record actual construction including:
   1. Field changes of dimension and detail.
   2. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA
A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES
A. For Each Product, Applied Material, and Finish:
   1. Product data, with catalog number, size, composition, and color and texture designations.
   2. Information for re-ordering custom manufactured products.
B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
D. Additional information as specified in individual product specification sections.
E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
F. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS
A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.
B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
E. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
F. Provide servicing and lubrication schedule, and list of lubricants required.
G. Include manufacturer's printed operation and maintenance instructions.
H. Include sequence of operation by controls manufacturer.
I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
J. Provide control diagrams by controls manufacturer as installed.
K. Provide GCCM's coordination drawings, with color coded piping diagrams as installed.
L. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
M. Include test and balancing reports.
N. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for MSU Facilities's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
D. Prepare data in the form of an instructional manual.
E. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
G. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Mosaic Architecture, Consultants, GCCM and subcontractors, with names of responsible parties.
H. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
I. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
J. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
K. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
L. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.
M. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Mosaic Architecture, GCCM, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

3. Part 3: Project documents and certificates, including the following:
   a. Shop drawings and product data.
   b. Air and water balance reports.
   c. Certificates.

N. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

O. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Mosaic Architecture, Consultants, and GCCM with name of responsible parties; schedule of products and systems, indexed to content of the volume.

3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with MSU Facilities's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

E. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.

F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of GCCM and equipment supplier; and name of responsible company principal.

G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION
SECTION 01 7900
DEMONSTRATION AND TRAINING

PART 1  GENERAL
1.01  SUMMARY

A. Demonstration of products and systems to be commissioned and where indicated in specific specification sections.

B. Training of MSU Facilities personnel in operation and maintenance is required for:
   1. All software-operated systems.
   2. HVAC systems and equipment.
   3. Plumbing equipment.
   4. Electrical systems and equipment.
   5. Conveying systems.
   6. Landscape irrigation.
   7. Items specified in individual product Sections.

C. Training of MSU Facilities personnel in care, cleaning, maintenance, and repair is required for:
   1. Roofing, waterproofing, and other weather-exposed or moisture protection products.
   2. Finishes, including flooring, wall finishes, ceiling finishes.
   3. Fixtures and fittings.
   4. Items specified in individual product Sections.

1.02  RELATED REQUIREMENTS

A. Section 01 7800 - Closeout Submittals: Operation and maintenance manuals.

B. Section 01 9113 - General Commissioning Requirements: Additional requirements applicable to demonstration and training.

C. Other Specification Sections: Additional requirements for demonstration and training.

1.03  SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures; except:
   1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority.
   2. Submit one copy to the Commissioning Authority, not to be returned.
   3. Make commissioning submittals on time schedule specified by Commissioning Authority.
   4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of overall Training Plan; submit in editable electronic format, Microsoft Word 2003 preferred.

B. Draft Training Plans: MSU Facilities will designate personnel to be trained; tailor training to needs and skill-level of attendees.
   1. Submit to Commissioning Authority for review and inclusion in overall training plan.
   2. Submit not less than four weeks prior to start of training.
   3. Revise and resubmit until acceptable.
   4. Provide an overall schedule showing all training sessions.
   5. Include at least the following for each training session:
      a. Identification, date, time, and duration.
      b. Description of products and/or systems to be covered.
      c. Name of firm and person conducting training; include qualifications.
      d. Intended audience, such as job description.
      e. Objectives of training and suggested methods of ensuring adequate training.
      f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
      g. Media to be used, such as slides, hand-outs, etc.
      h. Training equipment required, such as projector, projection screen, etc., to be provided by GCCM.
C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
   1. Include applicable portion of O&M manuals.
   2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
   3. Provide one extra copy of each training manual to be included with operation and maintenance data.

D. Video Recordings: Submit digital video recording of each demonstration and training session for MSU Facilities's subsequent use.
   1. Format: DVD Disc.
   2. Label each disc and container with session identification and date.

1.04 QUALITY ASSURANCE

A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
   1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
   2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL

A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by MSU Facilities.

B. Demonstrations conducted during Functional Testing need not be repeated unless MSU Facilities personnel training is specified.

C. Demonstration may be combined with MSU Facilities personnel training if applicable.

D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.
   2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL

A. Commissioning Authority will prepare the Training Plan based on draft plans submitted.

B. Conduct training on-site unless otherwise indicated.

C. MSU Facilities will provide classroom and seating at no cost to GCCM.

D. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Commissioning Authority.

E. Provide training in minimum two hour segments.

F. The Commissioning Authority is responsible for determining that the training was satisfactorily completed and will provide approval forms.

G. Training schedule will be subject to availability of MSU Facilities's personnel to be trained; re-schedule training sessions as required by MSU Facilities; once schedule has been approved by MSU Facilities failure to conduct sessions according to schedule will be cause for MSU Facilities to charge GCCM for personnel "show-up" time.
H. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
1. The location of the O&M manuals and procedures for use and preservation; backup copies.
2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
3. Typical uses of the O&M manuals.

I. Product- and System-Specific Training:
1. Review the applicable O&M manuals.
2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
4. Provide hands-on training on all operational modes possible and preventive maintenance.
5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
6. Discuss common troubleshooting problems and solutions.
7. Discuss any peculiarities of equipment installation or operation.
8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
9. Review recommended tools and spare parts inventory suggestions of manufacturers.
10. Review spare parts and tools required to be furnished by GCCM.
11. Review spare parts suppliers and sources and procurement procedures.

J. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION
SECTION 01 9113
GENERAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. OPR and BoD documentation are to be developed by the Owner and design team and shall be issued to the commissioning authority for review and uploaded to the LEED Document Registry.

1.02 DEFINITIONS

A. BoD: Basis of Design: A document that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.

B. CxA: Commissioning Authority.

C. OPR: Owner’s Project Requirements: A document that details the functional requirements of a project and the expectations of how it will be used and operated. These include project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.

D. Systems, Sub-Systems, Equipment and Components: Where these terms are used together or separately, they shall mean "As-built" systems, sub-systems, equipment and components.

1.03 COMMISSIONING TEAM

A. Members appointed by Contractor: individuals, each having the authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated action. The commissioning team shall consist of, but not be limited to, representatives of the General Contractor, Mechanical Contractor, Sheet metal Contractor, Electrical Contractor, Temperature Control Contractor, and the Test and Balance Contractor including installers, suppliers, and specialists deemed appropriate by the CxA.

B. Members Appointed by Owner:

1. CxA: The designed person, company, entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process.

2. Representatives of the facility user and operation and maintenance personnel.

3. Architect and engineering professionals.

1.04 SUBMITTAL REQUIREMENTS FOR COMMISSIONING

A. Normal Submittals:

1. The expected chain of communication for submittals is Contractor to A/E (for approval), who returns all submittals to the contractor and approved submittals for equipment being commissioned to the CA.

2. The Commissioning Authority will review the submittals for completeness and request additional information from contractor if required.

B. Data for Commissioning:

1. The contractor shall supply the CA requested information about commissioned equipment or systems.

2. Typically this includes manufacturer installation and start-up, operating, troubleshooting and maintenance procedures, details of any owner-contracted tests (if any), fan and pump curves, factory testing reports (if any), and warranty information, including responsibilities of the Owner to keep the warranty in force clearly identified. In addition, the installation and checkout materials that are shipped inside the equipment and the field check-out forms to be used by the factory or field technicians shall be submitted to the CA.

3. This data request may be mad prior to normal submittals and the contractor shall expedite such information ahead of normal submittals if so requested.
4. Note: Most of the information is contained in the regular O&M manual submittals, however, this information will be required PRIOR to the regular O&M submittal.

C. Contractor's responsibility for deviations in submittal from requirements of the contract documents is not relieved by the CA's review.

1.05 PREREQUISITIES TO SUBMITTAL COMPLETION

A. Commissioning as described in Division 01 and 23 must be complete as a requirement for Substantial Completion, unless approved in writing by the Owner. This includes all functional testing, O&M manuals and training.

B. In order for FPTs to be complete (and for Substantial Completion to be granted) all systems must be installed and operating, and test and balance (TAB) work must be complete (exceptions to this are planned controlled system training performed after occupancy and any required seasonal or approved deferred testing). This includes, but is not limited to (for all systems):
   1. Completion of all functional testing.
   2. Submission of final approved TAB report.
   3. Transmittal of approved O&M manuals to Owner.
   4. Completed and approved training of Owner's personnel.
   5. All identified deficiencies corrected or approved by the Owner, in writing.
   6. Submittal of requested building automation system (BAS) trend data log.

END OF SECTION
SECTION 02 2210 – TREE PROTECTION

PART 1 - GENERAL

1.0 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General conditions, Supplementary Conditions, apply to work of this section.

1.1 DESCRIPTION

The work in this section includes protection, trimming and maintenance of existing trees, shrubs and groundcover that are affected by execution of the Contract Documents, whether temporary or permanent construction.

A. The Contractor assumes responsibility for all coordination of work within the Critical Root Zone (CRZ) of protected trees.

B. Plant protection applies to all trees to remain within the Limit of Work as well as those, which are adjacent to the Limit of work and could be affected by new construction. Work to include:

1. Protection of existing trees and indicated vegetated areas.
2. Watering of existing trees and vegetated areas to be protected.
3. Maintenance of existing and newly installed tree and vegetation protection elements including but not limited to fencing, organic bark mulch, landscape fabric, cabling, and signage.
4. Pruning of existing trees to be protected
5. Removal of pruning debris and other excess material not used. On-site chipping and re-use of pruned material is encouraged.

C. Contractor shall perform all tree protection installation and removal, and any necessary pruning work required for construction under the supervision of the Owner.

1.2 RELATED WORK DESCRIBED ELSEWHERE

A. Section 01500 – Temporary Facilities and Controls
B. Section 31 1000 – Site Clearing
C. Section 02810 - Irrigation System
D. Section 02900 - Landscaping
E. Section 02935 – Lawns and Grass

1.3 DEFINITIONS

A. Tree Protection Zone: Area surrounding individual trees or groups of trees to remain during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

B. Drip Line: The areas encompassing the base of the tree as delineated by an imagined vertical line drawn from the farthest extent of the branches to the ground.

C. Diameter at Breast Height (DBH): Diameter at breast height as measured at four and one-half feet (4'-6") above the existing grade at the base of the tree.

D. Critical Root Zone (CRZ): An area up to one and one-half the radius of the drip line of the tree.
1.4 REFERENCED STANDARDS


D. Alex Shigo, Tree Pruning, Shigo & Tree Associates, LLC, 1989.


G. ANSI A300: Standards for Tree Care Operations, American National Standards Institute.

H. International Society of Arboriculture Best Management Practices publications


1.5 QUALITY ASSURANCE

A. Tree Service Firm Qualifications: An experienced tree service firm with a minimum of five years of experience that has successfully completed tree protection and trimming work similar to that required for this project.

B. Arborist Qualifications: An arborist certified by ISA or licensed in the jurisdiction where the project is located.


1. Owner’s representative shall be notified 24 hours in advance of all pruning, thinning and tree protection work.

D. Pre-Construction Conference: Conduct conference at project site to comply with requirements in ANSI A300 Division 1, Section “Project Management and Coordination.”

1. Before tree protection and trimming operations begin, meet with representatives of authorities having jurisdiction, Owner’s Arborist, Landscape Architect, consultants, and other concerned entities to review tree protection and trimming procedures and responsibilities.

1.6 SUBMITTALS

A. Product Data: For each type of product indicated below.

B. Product samples:

1. Tree protection area signage.
2. Cabling materials.
3. Landscape fabric.
4. Organic bark mulch.

C. Tree Pruning Schedule: Written schedule from arborist detailing scope and extent of pruning of trees to remain that are affected by construction.

D. Tree Protection Plan: Contractor shall submit a tree protection plan that confirms that use of the tree protection fencing plan provided in the Contract Documents. Contractor shall notify the Owner of all work activities within the CRZ of trees to be protected, anticipated work methods, proposed tree and root avoidance techniques, and Arborist's on-site confirmation of CRZ for each tree.

1.7 JOB CONDITIONS

A. Site Work Restrictions: In order to prevent excessive soil compaction and destruction of soil structure, no site work will be performed in cases where equipment or traffic must pass over wet soils or if wet soils must be handled or manipulated within the Tree Protection Zone in order for the work to progress. Wet soil is defined as any soil within 85 percent of field capacity (saturation).

B. Utilities

1. Utility locates are required prior to digging and any construction activities.

2. Coordinate work with Owner, including irrigation manager, in order to prevent damage to underground sprinkler system.

1.8 MAINTENANCE

A. Water will be available on site. Provide necessary hoses and other watering equipment required to complete work.

B. Maintain existing plantings and trees by watering, cultivating, weeding, and spraying as necessary to keep landscape in a vigorous, healthy condition.

C. Coordinate watering schedules with irrigation contractor during installation and until final acceptance. Provide deep root watering to newly installed trees.

PART 2 – PRODUCTS

2.0 MATERIALS

A. Topsoil Depth: Natural or cultivated surface-soil layer containing composted organic matter, sand, silt and clay particles; friable, pervious, and black or darker shade of brown, gray or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than two inches in diameter; and free of weeds, roots and toxic and other non-soil materials.

B. Filter Fabric: Manufacturer’s standard, non-woven, pervious, geotextile fabric of polypropylene, nylon, or polyester fibers.

C. Chain-Link Fence:

1. Fencing shall be galvanized chain link as specified below, six feet minimum height. Plastic fencing and wood stakes, or snow fencing are not acceptable.
2. Includes posts, braces, supports and mesh that may be salvaged materials or other used material to form a minimum six foot high enclosure.

3. Posts shall be a minimum diameter of 1-1/2-inch steel pipe.

4. Mesh shall be two inches by two inches by 11 gauge minimum chain link fabric.

5. Use of concrete or metal post piers is permitted.

E. Signage: Provide weather resistant 8-1/2 inches by 11 inches fluorescent green or yellow signs that identify Tree Protection Zone and list restrictions.

F. Cabling: Cabling materials shall meet the ANSI A300 standards for cabling of trees.

G. Tree Tags: Rack track shaped aluminum engraved numbered tags.

H. Organic Mulch: Shall be free from weed seed, sawdust and splinters and shall not contain resin, tannin, wood fiber or other compounds detrimental to plant life. Bagged mulch shall have moisture content not in excess of 22%. Bulk mulch shall have a size range of ½ inch to 1-1/4 inch with a maximum of 20% passing a ½ inch screen. Re-use of organic debris generated during the project is encouraged.

I. Mycorrhizae Fungal Inoculants: “mycogrow gel” as manufactured by Fungi Perfecti, Olympia, WA, 1-800-780-9162, or approved alternate.

J. Slow Release Fertilizer: Osmocote Plus, 15-9-12, or approved alternate.

K. Anti-Desiccant: Protective film emulsion for protection of plant surfaces during transport. Permeable to permit transpiration, as manufactured by Wilt Pruf, Inc., P.O. Box 4280, Greenwich, Connecticut, 06830, or approved alternate. Mixed and applied in accordance with manufacturer’s instructions.

L. Staking and Guying

1. Tie Wire: 12-gauge, galvanized wire

2. Metal posts: 8’-0” t-stakes

3. Nylon strap: three inches wide, 12 inches long white or black nylon strap with one ½” brass grommet in each end or Landscape Architect approved equivalent.

PART 3 - EXECUTION

3.0 INSTALLATION OF TREE PROTECTION FENCING

A. Prior to the start of any construction activity install temporary fencing at the designated tree protection zones to protect existing trees and vegetation to remain from construction damage. Maintain temporary fence and remove when construction (including irrigation and planting) is complete. Owner shall approve fence installation prior to mobilization of the site.

1. Install chain-link fence according to ASTM F 567 and manufacturer’s written instructions. All fencing to be locked securely and only entered with owner’s permission and in consultation with the Owner’s Arborist.

2. Place concrete or metal piers to minimize pedestrian and vehicle circulation and landscape impacts.
3. Provide diagonal bracing to vertical posts at corners of enclosures and wherever needed to ensure rigidity of the fencing.

4. If chain link fabric is used versus chain link panels the chain-link fabric shall be tight to grade at the bottom edge and stretched uniformly between posts. Top of fabric shall be a minimum of six feet above grade. Install fabric to form completely closed area around tree(s). Attach fabric to posts 12 inches on center with 11 gauge wire ties securely fastened, or with bolted ring clips and to top rail not over three feet on center.

B. Fencing shall be installed as follows: In the vicinity of coniferous trees, fenced area shall include an area of a radius from the trunk equal to one and one-half times the radius of the drip line of the tree. In the vicinity of deciduous trees, fenced area shall include an area of a radius from the trunk equal to one and one-half times the radius of the drip line of the tree. For areas with shrubs plants, fenced area shall include the entire edge of the planted area.

C. Area within tree protection fencing must be mulched with organic bark mulch to a depth of four inches.

D. Attach orange flag strips 12 inches long at three feet on center along the fence, five feet above grade.

E. Place tree protection signs at thirty-foot intervals along fence with a minimum of one sign if the fence is less than 30 feet in length.

3.1 FENCE MAINTENANCE AND REMOVAL

A. Maintain fence in specified location and in good condition until completion of site operations and of delivery of equipment and material, except where directed otherwise in writing by Owner's representative.

B. Fencing shall be immediately repaired when damaged.

C. Remove protection fencing at Substantial Completion.

3.2 USE OF AREA WITHIN FENCE

A. Do not use area within fence for operation, storage, vehicles, or foot traffic. Contractor shall notify Owner’s representative 24 hours in advance of the need to move a tree protection fence or access inside of it.

B. Do not alter grades within the required protective fence line except as directed during the fine grading operations at the conclusion of site development.

C. Control soil moisture within the protected area. Prevent flooding, ponding, erosion, or excessive wetting of the soil and root systems caused by dewatering operations. Protect root areas from leachate, concrete, oil, fuel, lubricating oil, and from other contaminants.

3.3 USE OF AREA ADJACENT TO FENCE

A. Do not store materials potentially harmful to tree roots within 20 feet of protected areas. Potentially harmful materials include, but are not limited to petroleum products, cement and concrete materials, cement additives, lime, paints coating, waterproofing agents, from coatings, detergents, acids, and cleaning agents.
B. Notify owner’s representative of all heavy equipment work to be performed within the CRZ.

1. Tie-back all flexible limbs and branches, which may be damaged during construction, under the direction of the Owner’s representative.

2. Use compaction mitigation strategies such as planking, mulch, or plating as directed by the Owner’s representative.

3.4 DAMAGES FOR LOSS OR INJURY TO TREES

A. Trees removed or damaged and deemed unviable, during demolition or construction, are to be replaced following consultation with Owner’s Arborist or Owner’s representative.

B. Trees removed during demolition or construction are to be replaced following consultation with Owner’s Arborist or Owner’s Representative. Appraised values of existing trees have been determined according to industry standards and will be provided by the Owner if applicable.

C. Contractor is to replace any and every tree lost or irreparably damaged as a result of failure of the Contractor to protect or to adequately maintain existing trees. Trees that fail to fully foliate in the spring following completion of construction operations may be presumed to have been lost due to construction operations.

D. In the event of injuries to the crown, trunk or root system of any tree to remain that are the result of the Contractor’s failure to protect and/or maintain such tree, the Owner’s Representative may elect to retain the tree and hold the Contractor liable for compensation.

E. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to Owner’s Arborist’s written instructions. Work required by the Owner’s Arborist shall be performed by the Contractor at no additional cost to the Owner.

F. Trees, which are removed without authorization, shall be replaced with a tree of the same size and species. If a tree of the same size and species is not available the Owner’s Representative shall provide alternatives. If a tree cannot be replaced because the size exceeds the maximum which can be relocated using latest technology, the Contractor shall compensate the Owner at amount equal to the appraised value.

G. Should replacement work of large trees be required as a result of Contractor’s failure to protect or maintain trees, a subcontractor specializing in relocating large trees shall conduct all replacement work. Submit qualifications of tree relocation Contractor to the Owner’s Representative. The cost of the subcontractor will be at the Contractor’s expense.

H. Completely remove and dispose of any tree killed or irreparably damaged as a result of Contractor’s failure to protect or maintain trees. Remove those trees damaged or killed as a result of vandalism, natural acts or other causes. Removal and disposal shall include stumps and roots to a depth of two feet below finished grade.

3.5 PRUNING OF EXISTING TREES

A. Limbs and branches that have been broken shall be cut off cleanly above the nearest crotch in accordance with International Society of Arboriculture (ISA) standards. Cut limbs and branches greater than one-half inch in diameter. Sterilize equipment with alcohol prior and during trimming and pruning operation. All pruning of damaged trees shall be carried out to the complete satisfaction of the Owner’s Representative.
B. The Contractor shall provide a ISA certified professional to assess and recommend treatment of any damage to trunks or major limbs three inches in diameter or over.

C. All existing trees to be saved shall be limbed and pruned by a ISA certified Arborist. Limbs shall be pruned to ensure safety and promote health of the tree. Inform the Owner’s Representative prior to commencement of pruning.

3.6 EXCAVATION

A. Install shoring or other protective support systems to minimize sloping or benching of excavations.

B. Do not excavate within Tree Protection Zones, unless otherwise indicated.

C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks and comb soil to expose roots. Work shall be performed under the supervision of the Owner’s representative.

1. Redirect roots into backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately three inches back from new construction.

2. Do not allow exposed roots to dry out before placing permanent backfill. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with approved soil.
   a. Straw Mulch: Thoroughly wet excavated sub-grade where roots of existing trees to remain have been exposed. Apply four inches of wet organic bark mulch on horizontal area and wet burlap mats along exposed trench sides.
   b. Watering and Maintenance: Thoroughly and evenly water protected areas at a rate not to exceed two inches per hour during dry periods. Coordinate water procedures and schedules with the Owner’s Representative or the Project Manager. Maintain root protection procedures throughout the term of the Contract, as required.

D. Where utility trenches are required within tree protection zones, tunnel under or around roots by drilling, auger boring, pipe jacking, or digging by hand.

1. Root Pruning: Do not cut roots larger than 1” without notifying Owner’s representative; Cut roots smaller than 1” in accordance with ISA standards.

3.7 POST CONSTRUCTION TREE MAINTENANCE

A. Ensure that existing trees remaining on the project site shall be in as good condition at completion of the work as at the commencement of the work. If such a condition does not exist at the completion of the work, assume responsibility to provide corrective actions or replacement with new material as directed by the Owner’s Representative.

END OF SECTION 02 2210
PART 1 – GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of each Contract, including General Conditions and Supplementary Conditions, apply to work of this section.

1.02 DESCRIPTION

The work of this section consists of all items necessary to install the proposed irrigation system as indicated on the plans, and the protection and splicing required to maintain all parts of the existing irrigation system in operation, with the exception of those parts designated to be removed or abandoned. This includes required sleeves for pipe and wire, back-flow prevention devices, reconnections, and miscellaneous modifications to the existing irrigation distribution lines including, but not limited to:

A. Automatic controller and remote control valves.
B. Lawn and planting beds sprinkler system.
C. Connection to proposed irrigation water source and power supply.

1.03 RELATED WORK DESCRIBED ELSEWHERE

A. Site Clearing Section 02230
B. Earthwork/Restoration Section 31 0000
C. Landscaping Section 02900
D. Lawns and Grass Section 02935

1.04 QUALITY ASSURANCE

A. Qualifications of Installer

Provide at least one person who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of materials of installation and who shall direct all work performed under this section. All work of this section and related work listed above shall be performed by the same CONTRACTOR.

B. Codes and Standards

1. In addition to complying with all pertinent codes and regulations, comply with the latest rules of the National Electrical Code for all electrical work and materials.

2. Comply with National Plumbing code at all connections to potable water systems.

3. Where provisions of pertinent codes and standards conflict with the requirements of this section of these Specifications, the more stringent provisions shall govern.

1.05 SUBMITTALS
A. **Material List**

Before any irrigation system materials are delivered to the job site, submit to the ENGINEER a complete list of all irrigation system materials to be furnished and installed.

1. Show manufacturer’s name and catalog number for each item, furnish complete catalog cuts and technical data, and furnish the manufacturer’s recommendations as to method of installation. Where materials proposed differ from those specified, furnish complete shop drawings and design calculations to demonstrate equivalent performance of the proposed installation.

2. Do not permit any irrigation system component to be brought onto the job site without prior approval by the ENGINEER. Provide one sample of each element of the system to the ENGINEER for approval (sprinkler heads, valves, couplings, etc.). These samples will be returned to the CONTRACTOR, and if approved, may be used in the project.

B. **Shop Drawings**

CONTRACTOR shall submit Five (5) copies of the proposed sprinkler layout in a schematic form to the ENGINEER for approval. Any modifications to these proposed drawings will be returned to the CONTRACTOR for the preparation of five (5) copies of the final revised layout. The material list will be coordinated with the final shop drawings by the CONTRACTOR. Show all sleeve locations.

C. **Field Verification**

CONTRACTOR shall field verify all dimensions, existing and proposed conditions, and as required to provide one complete and operable system. Proposed system shall be laid out above ground using locate flags to show location of all sprinkler heads, valves, and sleeve locations. This layout shall be signed off on by MSU Irrigation Manager before any excavation shall begin.

D. **As-built Drawings**

Provide a complete set of Mylar reproducible as-built shop drawings to the ENGINEER for approval prior to final payment.

1.06 **PRODUCT HANDLING**

A. **Protection**

Use all means necessary to protect irrigation system materials before, during, and after installation and to protect the installed work and materials of all other trades.

B. **Replacements**

In the event of damage, immediately make all repairs and replacements necessary to the approval of the ENGINEER and at no additional cost to the OWNER.

1.07 **PERFORMANCE REQUIREMENTS**

A. **Minimum Requirements**

The following shall be the minimum requirements of the system. They are not intended to
limit the overall intent, which is to obtain a fully operational and completely automatic sprinkler system. Specific requirements of this project manual shall apply to all elements typically. Conflicts between the drawings and the project manual or between specific and general performance of material requirements shall be assumed to be the most expensive.

B. Project Zones

Refer to the drawings for the general zones to be served by this system.

1. Irrigation layout must be adaptable to the future modification of the system to smaller heads, more intense head arrays and minimal spraying over the sidewalks. This should be accomplished by running the laterals near sidewalk edges whenever possible, and by positioning the mains with this future intent.

2. CONTRACTOR will advise himself of all existing and proposed site conditions and related planting and grading as required to coordinate and schedule with the work of other contractors.

3. Heads shall be positioned to prevent damage from spraying on the building envelope and/or causing inside flooding in any and all cases.

4. Organize zones to allow walking across the area on dry sidewalk while the irrigation system is on.

PART 2 - MATERIALS

2.01 PIPE

A. Plastic Pipe

1. Plastic pipe shall be rigid non-plasticized Schedule 40 PVC IPS solvent-welded conforming to ASTM D-1784 and D-2241 standard specifications for PVC plastic pipe. The pipe shall be homogeneous throughout and free from visible cracks, holes, foreign materials, blisters, deleterious material, wrinkles, and dents.

2. All pipes shall be continuously and permanently marked with the following information:

   Manufacturer’s name or trademark, size, schedule and type of pipe, working pressure at 73 deg. F and National Sanitation Foundation (N.S.F.) approval.

3. All main lines shall be a minimum of two inches (2") in diameter.

4. All lateral lines shall be a minimum of one and one-half inches (1-½") in diameter.

5. All plastic pipe fittings to be installed shall be molded fittings manufactured of the same material as the pipe, rated as a pressure fitting (no DWV fittings shall be allowed) and shall be suitable for solvent weld, slip joint ring-tite seal, or screwed connections. All pipe six inches (6") in diameter and above shall be Schedule 40 PVC IPS gasket end. All smaller pipes shall be Schedule 40 PVC IPS solvent-welded.

6. Slip fitting socket taper shall be so sized that a dry unsoftened pipe end, conforming to these specifications, can be inserted no more than halfway into the socket. Plastic saddle and flange fittings will not be permitted. Only schedule 80 pipe may be threaded.
7. When connection is plastic to metal, plastic male adapters shall be used. The male adapter shall be hand tightened, plus one turn with a strap wrench. Joint compound shall be Teflon Tape on Water Based Teflon Paste.

8. All mainline pipes shall be traceable via purple or blue-colored 14 gauge single strand direct burial wire attached to the pipe. The tracer wire shall surface at and be secured to the controller. This is not necessary for lateral pipelines with irrigation heads attached.

B. Pipe Sleeves

Pipe sleeves shall be Schedule 40 PVC pipe, six-inch (6") diameter unless noted otherwise, or equal approved by ENGINEER.

1. Installation

Provide empty sleeves along all pathways as noted on the drawings or every 100 feet. Extend sleeves at least one foot (1’) beyond pavement on both sides. Sleeves shall be installed 18 inches below finished grade. Cap ends of empty sleeves with duct tape.

2. Sleeve Location Marking

a. New Pavement

The location of each sleeve must be marked along both of the extreme edges of any new pavement installed over the sleeve. This shall be accomplished by pressing the end section of a two-inch (2”) pipe into the uncured pavement surface to make an imprint.

b. Existing Pavement

For sleeves pushed under existing pavement, sleeve locations shall be marked along the extreme edges of the pavement on both sides where the sleeve emerges from under the pavement. Markings shall consist of scoring the surface of the existing pavement with a 2” O.D. core drill just enough to make the impression of a circle in the pavement surface.

2.02 RISERS/SWING JOINTS

A. Flexible Risers

Stationary Pop-up and Surface Sprinkler Heads shall be installed using “funny pipe” or four-piece swing joints. Sprinkler Heads with one-half inch (1/2”) and/or three-quarter inch (3/4”) inlets shall connect with “funny pipe” exclusively, in lengths no longer than three feet (3’). Sprinkler Heads with one-inch (1”) inlets shall connect with four-piece swing joints only.

1. Installation with “funny pipe”, which is one-half inch (1/2”) low density, polyethylene pipe, rated 80 PSI at 100 deg. F, must use Teflon-taped barbed street ells. Use of flexible pipe such as “funny pipe” is limited to connecting laterals to irrigation heads.

2. Four-piece swing joints shall consist of an assembly using three (3) one inch (1”) Marlex street elbows, with a 1” SCH 80 Nipple of required length to set head at grade.

B. Rigid Risers

All risers for shrub spray heads, bubblers, etc., that are in shrub or flowerbed areas and
planters, shall be schedule 80 PVC plastic pipe, unless otherwise specified or shown on the plans. The risers shall be of sufficient height so as not to cause any interruption of the stream from the sprinkler nozzle when the plant material has reached its optimum growth.

2.03 VALVES

A. Ball Valves

1. All manual ball valves, sizes 1-1/2” inches and smaller, shall be all bronze double with integral taper seats and with rising stem.

2. All valves 2” and larger shall be gate valves.

3. All ball valves shall be full port, with chromium or stainless ball with Teflon seats 150 PSI rated, Hammond, or approved equal.

B. Pressure Reducing Valves

Provide pressure-reducing valves on main lines only, Watts, Series U5, U5B ½” to 2” Standard Capacity, or approved equal.

C. Gate Valves

1. All manual gate valves, sizes four-inch (4”) and smaller, shall be made in the U.S.A., brass body, threaded, non-rising stem, full port, 200 PSI/13.8 bar non-shock cold working pressure up to 180 deg. F./82 deg. C., NSF/ANSI 61-8 compliant: NIBCO model TI-8 or approved equal.

2. All gate valves of 6-inch (6”) size or larger shall be at least 150 PSI rated, AWWA-C509 resilient wedge gate valve, made in the U.S.A., featuring non-rising stem, iron body, epoxy coated interior, mechanical joint with appropriate size gaskets for corresponding pipe as per drawing.

D. Quick-Coupler Valves

Provide Rain Bird #3 DNP Quick Coupler valves.

E. Automatic Remote Control Valves

Automatic control valves shall consist of:

1. Rain Bird PESB Series, 24 volt, contamination resistant valve with a pressure operating range of 20-200 psi and a 0.25 to 200 gpm flow range. Glass-filled nylon construction, one-piece solenoid with captured plunger, flow control handle adjusts, manual internal and external bleeds, nylon screen scrubber and purple flow control handles for easy identification of non-potable water systems or approved equal.

F. Back-Flow Preventers

Back-flow on potable systems only shall be Rain Bird Model DCA2–0-OR or approved equal.

2.04 VALVE BOXES

All remote control valves, pressure regulating valves, manual control valves, zone shut-off valves,
gate valves or globe valve filters and drains, unless otherwise indicated, shall be installed in a valve access box of proper size as required for easy access to the valve. Valve box to be Carson, with round, locking green cover ten inches (10”) in diameter for quick coupler valves, and 10” x 15” standard for all others unless described otherwise in the contract drawings, or approved equal. All round valve boxes shall be supported underneath the bottom edges with two bricks (minimum). All rectangular valve boxes shall be supported underneath the bottom edges with three bricks (minimum).

2.05 AUTOMATIC IRRIGATION CONTROLLER

A. Controller Type

The automatic controller shall be 120 volt input, soft-wired, 26.5 volt output, with the number of valve stations and in the type and model number indicated on the plans, and shall be a Rain Bird ESP SAT LS or ESP SAT LW. Wall or pedestal mount type must be pre-approved by the ENGINEER and OWNER for the site situation. Controller station size and quantity specified per drawing. Station wiring and timing schedule specified per drawing. All station wiring must be terminated in a Rain Bird ESPSATOB24 mounted in the pedestal or wall mounted wire trough. All controllers must be equipped with a Rain Bird RMK450NARR with a University licensed and authorized frequency, hooked to a Rain Bird Maxilink Ant 01 or Antenex Directional Yagi Model Y4503/Y4505 or University approved substitute.

B. Electrical Power

Power for the controllers shall be the responsibility of the sprinkler installer. Meet all electrical specifications for installation of controllers and power to the controllers. The controllers must be wired to the power source in the pedestal or wall via an Isobar Ultra 4 surge protector and a two-receptacle Ground Fault Interrupter (GFI) outlet. A pigtail that can reach from the controller to the outlet is required. Power source must be pre-approved by Owner prior to connection.

C. Sleeves

1. Provide minimum of six inches (6”) diameter sleeves under paved areas as necessary to run all control wiring and piping for sprinkler zones. Coordinate with concrete work prior to forms being set.

2. No sleeving shall be put in tunnel walls. All main lines fed from the tunnel shall be cored, and sized to fit link seals for that pipe size. Each mainline shall be sealed using 2 link seals, one on the inner wall and one on the outer wall. No fittings allowed within 3’-0” of outer tunnel wall.

D. Location

After pre-approval by the ENGINEER and OWNER, locate controllers on outside walls of buildings or on pedestals at locations that will maximize the view of the zones serviced by each controller. Verify locations with the ENGINEER to avoid compromising buildings systems and/or appearance concerns.

Pedestals controllers must be mounted to a concrete slab of dimensions 1.5’ x 1.5’ x 0.33’. Each pedestal slab shall have a minimum of 2 electrical sweep 90’s poured into it. First, one 1” sweep shall hold 120V direct bury power wires, second, one 2” sweep shall hold valve control and flow meter wires- additional or larger sweeps shall be installed as needed to
avoid wire damage. Two bollards consisting of three inch (3") steel pipe filled with concrete and anchored in concrete shall be installed against the edge of the slab in front and in back of the controller. The bollards shall be primed and painted with a black, epoxy-based paint. The concrete at the top of the pipe must be domed and finished to a smooth, even surface, without concrete residue on the outside surface of the pipe.

E. **Flow Meter**

A MaxiCom-compatible flow meter must be installed at every point of connection. This may be either a Rain Bird Brass Insert Sensor (FS350B) for pipe three inches or larger, or a Rain Bird PVC Tee Sensor of the appropriate size: FS150P for 1-1/2" pipe, FS200P for 2' pipe, and FS300P for 3" pipe. The flow meter must be directly connected to the controller using PE43 communication cable (the blue/blue white wire pair must be used for the flow meter/pulse transmitter connection) and a PT 322 pulse transmitter. All splices using this type of cable must meet Rain Bird MaxiCom standards. Programming and hook up of the PT322 shall be completed by MSU Irrigation Employee.

F. **Certified Installation**

All MaxiCom components must be ordered and installed by a MaxiCom-certified installer.

### 2.06 IRRIGATION HEADS

A. **Rotary Sprinklers**

Rotary sprinkler heads shall be Model I-20 R Series, manufactured by Hunter Industries, San Marcos, California; or Rain Bird 5000 Series PLPCSAMNP, 5505 NP; or 8005NP Series, manufactured by Rain Bird Sprinkler Mfg. Corp., Glendora California or approved equal. Height specified should be reflective of height of vegetation irrigated.

B. **Spray Heads**

Spray head sprinklers shall be Rain Bird Model Nos. 1800 Series SAM or with variable arc nozzles (VAN) or MPR nozzles, manufactured by Rain Bird Sprinkler Mfg. Corp., Glendora California or approved equal. Height specified should be reflective of height of vegetation irrigated.

C. **Bubblers**

All bubbler zones must be controlled by a Rain Bird PESB Series Valve incorporating a Rain Bird PRS regulator. There must be a Rain Bird WYE Filter System installed directly downstream of the valve, located inside the valve box in a manner that allows easy maintenance. The bubbler heads must be Rain Bird 1300A-F Series mounted on Rain Bird 1804 SAM Spray Bodies or approved equal.

D. **Drip Irrigation**

No drip irrigation systems are allowed at Montana State University.

### 2.07 CONTROL CABLE

A. **Type**

All electrical control and ground wire shall be Baron irrigation control cable or approved equal, 14-gauge unless otherwise indicated on the drawings. All wiring to be used for
connecting the automatic remote control valve to the automatic controllers shall be Type “UF”, 600 volt, solid copper, single conductor wire with PVC or polyethylene insulation and bear UL approval for direct underground burial feeder cable.

B. Insulation

Insulation shall be four-sixty-fourths inch (4/64") thick minimum covering of ICC-l00 compound for positive waterproofing protection. All control or “hot” wires shall be red and all common or “ground” wires shall be white. A black extra wire shall be included in the wiring run for every four (4) wires installed.

C. Code Compliance

Verification of wire types and installation procedures shall be checked to conform to local codes.

D. Splices

All splices are to be completed within valve boxes using one-piece, jelly-filled, water-proof wire connectors with 20 expansion coils per splice, allowing work to be completed at ground level. All splices shall be located on as-built drawings.

E. Trench Installation

1. Tape and bundle all wiring at ten-foot (10’) intervals.

2. Attach tracer wire to main line pipe only at ten-foot (10’) intervals.

3. All 120 volt wiring shall be in conduit with marker tape installed in the ditch six inches (6") above the conduit.

4. All wiring under pavement and through sleeves shall be in conduit.

5. Tie a loose twenty-inch (20") loop in wiring at all changes in direction greater than 30 degrees. Untie all loops after making connections.

2.08 VAULTS

A. Water Service Connection

A vault shall be installed at domestic water service connection. Vault shall house domestic water back-flow preventers, blowout assembly and isolation valves. Vault must comply with applicable code(s).

B. Location

Review location of vault with ENGINEER prior to installation.

2.09 OTHER MATERIALS

A. Tools To Be Furnished

1. Supply as part of this contract the following tools:
a. Two keys for each automatic controller

b. Two quick-coupler keys, Rain Bird Model 33K with matching hose swivels.

2. The above equipment shall be turned over the OWNER at the conclusion of the project. Before final inspection can occur, evidence that the OWNER has received materials must be shown to the ENGINEER.

B. Concrete

Provide and coordinate installation of all concrete thrust blocks. Refer to Division 3 for concrete requirements. Provide thrust blocks for all lines larger than 3-inch diameter, at all tees and ells.

C. Other Materials

All other materials not specifically described but required for a complete and proper irrigation system installation, shall be new, first quality of their respective kinds, and subject to the approval of the ENGINEER.

PART 3-EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection

1. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that such work is complete to the point where this installation may properly commence.

2. Verify that irrigation system may be installed in strict accordance with all pertinent codes and regulations, the original design, the referenced standards, and the manufacturer’s recommendations.

B. Discrepancies

1. In the event of discrepancy, immediately notify the ENGINEER.

2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 FIELD MEASUREMENTS

Make all necessary measurements in the field to ensure precise fit of items in accordance with the original design.

3.03 TRENCHING AND BACKFILLING

A. General

1. Perform all trenching required for the installation of items where the trenching is not specifically described in other sections of these specifications.
2. Make all trenches in accordance with OSHA Requirements with sufficient width to provide free working space at both sides of the trench and around the installed item as required for gluing, joining, backfilling, and compacting while minimizing width of trenches.

3. The CONTRACTOR will be required to conduct his work so that trenches will remain open a minimum possible time.

B. Depth

1. Trench as required to provide the elevations shown on the Plans.

2. Trench to sufficient depth to give a minimum of eighteen inches (18") of fill above the top of the pipe measured from the adjacent finished grade under driveways and sidewalks.

3. All mainline and control cables shall have a minimum cover of eighteen inches (18") above the pipe or wire. All laterals shall have a minimum cover of twelve inches (12") above the pipe.

4. All sleeves shall be installed at a depth on line and grade with existing or proposed irrigation lines. Sleeves with excessive or shallow invert depth will be rejected.

C. Correction of Faulty Grades

Where trench excavation is inadvertently carried below proper elevations, backfill with material approved by the ENGINEER and then compact to provide a firm and unyielding sub grade to the approval of the ENGINEER and at no additional cost to the OWNER.

D. Trench Bracing

1. Properly support all trenches in strict accordance with all pertinent rules and regulations.

2. Brace, sheet, and support trench walls in such a manner that they will be safe and that the ground alongside the excavation will not slide or settle, and that all existing improvements of every kind will be fully protected from damage.

3. In the event of damage to such improvements, immediately make all repairs and replacements necessary to the approval of the ENGINEER and at no additional cost to the OWNER.

4. Arrange all bracing, sheeting, and shoring so as to not place stress on any portion of the completed work until the general construction thereof has proceeded far enough to proved sufficient strength.

E. Removal of Trench Bracing

Exercise care in the driving and removal of sheeting, shoring, bracing, and timbering to prevent collapse or caving of the excavation faces being supported.

F. Grading and Stockpiling Trenched Material

1. Control the stockpiling of trenched material in a manner to prevent water from running into the excavation.
2. Do not obstruct surface drainage but provide means whereby storm and wastewater are diverted into existing gutters, other surface drains, or temporary drains.

G. Methods

1. All trench excavation shall be made by open cut. During excavation, material suitable for backfilling shall be piled in an orderly manner, a sufficient distance from the banks of the trench to avoid overloading, and to prevent slides or cave-ins. All material not required for backfill or not suitable for backfill shall be removed from the site by the CONTRACTOR. Banks of trenches shall be kept as nearly vertical as possible, and shall be properly sheeted and braced as may be necessary to prevent caving.

2. The CONTRACTOR shall provide, place and maintain all necessary barricades, warning signs, and other safety devices to prevent pedestrians from falling in open trenches.

3. Trench widths in paved streets or in areas where proximity to other structures requires vertical cuts, shall not be wider than is required for proper handling, jointing and bedding of the pipe.

4. The bottom of the trenches shall be accurately graded to line and grade, and provide uniform bearing and support for each section of the pipe on undisturbed soil, at every point along its entire length. Depressions for joints shall be dug after the trench bottom has been graded, and shall be only of such length, depth, and width as required for properly making the particular type joint. Care shall be taken not to excavate below the depths indicated.

5. Where rock occurs in trench excavation, the rock shall be removed to a depth of six inches (6") below the established grade line, and to a width of twelve inches (12") greater than the outside diameter of the pipe to be installed in the trench.

6. No water shall be permitted to rise or stand in trenches not yet backfilled until after the pipe has been placed, tested and covered with backfill for a depth of at least ten inches (10"). Any pipe having its alignment or grade changed as a result of a flooded trench shall be removed and re-laid after the trench is graded once again at not additional cost to the OWNER.

H. Pavement Removal

1. Where excavation of trenches requires the removal of pavement, the pavement shall be cut in a straight line along the edge of the excavation by use of a spade-bit air hammer, concrete saw or similar approved equipment to obtain straight, square and clean break. After backfilling and sub grade preparations are completed, the pavement section and surfacing shall be replaced.

2. Excess material, including rock, broken concrete, bituminous materials, debris, or other materials not suitable for backfill, shall be removed from the site and disposed of by the CONTRACTOR.

3.04 BORING

A. Locations

Boring shall be used to route pipe, wiring, or both under structures such as walks or curbs where trenching is impractical. Sleeves shall be installed in all bored holes.
B. Method

Boring shall be accomplished with a drill, auger, water jet, or any other instrument approved by the ENGINEER capable of producing a precise hole. Boring shall not disturb overlaying structures or cause settlement and damage to those structures.

### 3.05 SLEEVES

A. Locations

Sleeves shall be installed wherever routing of a pipe, wiring, or both crosses a paved area or passes through a bored hole.

B. Methods

1. Sleeves laid in open trenches shall be uniformly and evenly supported by undisturbed soil on the trench bottom. Backfill shall conform to standards hereinafter specified.

2. Sleeves installed in borings shall be forced through and shall have a snug fit throughout the length of the bored hole. Sleeves cracked or broken shall not be accepted.

### 3.06 BACKFILL

A. Material

Backfill material shall be free of clods, lumps of frozen material, or stones larger than one-inch (1") in their maximum dimension. The bedding and select material under, around and six inches (6") above the top of the pipe shall be placed by hand in maximum layers of six inches (6") and carefully compacted in a manner which will not displace the pipe. Compaction of the select backfill shall be at least ninety percent (90% ) of the maximum density as determined by AASHTO T-180. Water settling will not be allowed.

B. Inspection

The trenches shall not be backfilled until inspection has been completed and the pipe installation, including the grade, alignment and jointing has been found to be in compliance with the requirements of the plans and specifications.

C. Around and Over the Pipe

1. Select backfill material consisting of sand, fine gravel or select earth, free of large lumps or rocks larger than three-quarters of an inch (¾") shall be used in backfilling around and over the installed pipe.

2. The select material shall be obtained from the excavation material removed from the trench and shall be processed by screening, sifting, or selective sorting, so as to produce the type of backfill herein specified. The CONTRACTOR may at his option and expense provide an acceptable imported material.

3. This backfill material shall be carefully deposited around and over the pipe in layers not more than six inches (6") thick, loose measurement, unless otherwise permitted by the ENGINEER, wetted to optimum moisture content and uniformly compacted to at least ninety-five percent (95%) of the maximum density obtainable at optimum moisture.
content as determined by ASTM D698 (latest revision), until the pipe has a cover depth of at least one foot (1').

D. Remainder of Trench Backfill

1. The remaining depth of the trench shall be backfilled with excavation material removed from the trench, which shall be wetted or dried to near optimum moisture content.

2. This material shall be carefully deposited in layers not to exceed six inches (6") in compacted thickness and compacted to at least ninety-five percent (95%) of the maximum density as determined by ASTM D698 (latest revision). The method of compaction selected by the CONTRACTOR shall not cause damage of any nature to the installed pipe. Replace topsoil on trench fill and compact to eighty-five percent (85%) of maximum density at optimum moisture.

3. The use of water settlement for this portion of the trench backfilling is permissible if the specified density can be obtained and the backfill material is suitable for this type of trench compaction.

3.07 INSTALLATION OF PIPING

A. General

1. Layout the piping system in strict accordance with the Plans.

2. Where piping is shown on the Plans to be under paved areas but running parallel and adjacent to planted areas, the intention is to install the piping in the planted areas.

B. Line Clearance

1. All lines shall have a minimum clearance of four inches (4") from each other, and six inches (6") from lines of other trades, except through pipe sleeves.

2. Parallel lines shall not be installed directly over one another.

C. Inspection of Pipe and Fittings

Carefully inspect all pipe and fittings before installation, removing all dirt, scale, and butts and reaming as required; install all pipe with stamped markings oriented up to allow visual inspection and verification.

D. Plastic Pipe

1. Plastic pipe shall be installed in a manner so as to provide for expansion and contraction as recommended by the manufacturer.

2. All plastic pipe joints shall be solvent-weld joints or gasket fit joints. Only the solvent cement recommended by the pipe manufacturer shall be used and it must be a two-part system consisting of primer and cement. No single part cement system shall be used. All plastic pipe and fittings shall be installed as outlined and instructed by the pipe manufacturer and it shall be the CONTRACTOR's responsibility to make arrangements with the pipe manufacturer for any field assistance that may be necessary. The CONTRACTOR shall assume full responsibility for the correct installation.
3. All plastic (PVC) to metal joints shall be made with plastic threaded male adaptors into metal threaded female fittings.

4. The solvent-weld joints shall be made on dry pipe.

5. The solvent-weld joints shall be allowed to set at least 24 hours before pressure is applied to the system on PVC pipe.

E. Copper Pipe

Direct buried copper pipe connections shall be made using silver solder.

F. Thrust Blocks

Provide concrete thrust blocks for all pipes as shown on the plans. All thrust blocks shall bear directly on undisturbed earth. Center the pipe in the middle of the thrust block.

3.08 INSTALLATION OF EQUIPMENT

A. General

1. All fittings, valves, etc., shall be carefully placed in the trenches with concrete thrust blocks, placed where required.

2. All sprinklers, having adjustable nozzles, shall be adjusted for proper and adequate distribution of the water over the coverage pattern of the sprinkler.

3. All nozzles on stationary pop-up sprinklers or stationary spray heads shall be tightened after installation. All sprinklers having an adjusting screw, adjusting stem or adjusting friction collars shall be adjusted as required for the proper arc of coverage, radius, diameter and/or discharge.

4. All control wires shall be clearly labeled by station, using weatherproof material, at the controller and at the valve ends. Mark the underside of all valve box covers, indicating the valve controller station number. All markings shall be made in a neat and legible manner using white enamel paint.

5. All control or "hot" wires shall be red and all common or "ground" wires shall be white. A black extra wire shall be included in the wiring run for every four (4) wires installed.

B. Sprinkler Heads

1. Install lawn sprinkler heads where indicated on the plans and in strict accordance with the manufacturer's recommendations and as necessary to provide complete uniform coverage and precipitation.

2. Upon completion of installation, reset all lawn sprinkler heads flush with grade and firmly anchored with soil.

C. Master Automatic Control Valves

A master automatic control valve shall be installed at the point of connection to the main for any remotely controlled portion of the irrigation system. In cases where there are multiple
points of connection, a master valve shall be installed for each, with no more than three points of connection allowed.

### 3.09 TESTING AND INSPECTION

**A. Covering or Enclosing Work Prior to Inspection**

Do not allow or cause any of the work in this section to be covered up or enclosed until it has been inspected, tested, and approved by the OWNER’s Representative.

**B. Flushing**

Before backfilling the mainline, and with all control valves in place, but before lateral pipes are connected, completely flush and test the mainline and repair for all leaks; flush out each section of lateral pipe before sprinkler heads are attached.

**C. Testing**

1. Make all necessary provisions for thoroughly bleeding the line of air and debris.

2. After valves have been installed, test all live water lines hydrostatically for leaks at a pressure of one hundred fifty (150) psi for a period of two (2) hours, with all couplings exposed and with all pipe sections center loaded.

3. Furnish all necessary testing equipment and personnel.

4. Correct all leaks and retest until acceptance by the ENGINEER.

**D. Final Inspection**

1. Thoroughly clean, adjust, and balance all systems.

2. Demonstrate the entire system to the ENGINEER and OWNER, proving that all remote control valves are opening and closing on command, that all heads are properly adjusted for radius and arc of coverage, that all emitters are functioning, and that the installed system is workable, clean, and efficient.

3. Existing irrigation system(s) or portions of systems which have had their performance altered by any of the work related to this project shall be repaired or adjusted using materials and installation methods in accordance with this specification and in a manner to restore head-to-head sprinkler coverage, uniform precipitation rates, control zone integrity, and elimination of the spraying of water on building walls and sidewalks.

### 3.10 PAVEMENT REPLACEMENT

Pavement replacement shall utilize the same materials and design as the original pavement.

### 3.11 CLEANUP

Upon completion of the work, the entire site shall be cleared of all debris, and ground surfaces shall be finished to smooth, uniform slopes and shall present a neat and workmanlike appearance. Cleanup shall be considered an incidental item, and no additional payment shall be made for any cleanup item. All improvements or other obstructions removed during construction shall be replaced in a condition at least equal to their existing condition.
3.12 MAINTENANCE

A. The CONTRACTOR shall, for a period of one (1) year after completion and final acceptance of the work, maintain and repair any trench or boring settlement which may occur, and shall make suitable repairs to any pavements, or other structures which may become damaged as a result of settlement. All such maintenance and repair shall be at the CONTRACTOR’s expense.

B. The CONTRACTOR shall inform the OWNER of the location and the nature of all damage done to the existing irrigation system not slated for demolition within eight hours of the occurrence of the damage.

C. The CONTRACTOR shall maintain the existing and proposed irrigation system in operation during the construction period. Upon completion of the proposed irrigation work the CONTRACTOR shall balance and adjust the entire (new and existing) system.

3.13 AS-BUILT DRAWINGS, CHARTS AND EQUIPMENT MANUALS

A. Record Drawings

1. Record accurately on one set of black and white prints of the site plan all installed work including both pressure and non-pressure lines.

2. Upon completion of each increment of work, transfer all such information and dimensions to the print. The dimensions shall be recorded in a legible and workmanlike manner.

3. Dimension from two permanent points of reference (buildings, monuments, sidewalks, curbs, pavement, etc.). Locations shown on as-built drawings shall be kept day-to-day as the project is being installed. All dimensions noted on drawings shall be one-eighth-inch (1/8”) in size (minimum).

4. Show locations and depths of the following items:
   - Point of connection
   - Routing of pressure lines (max. dimension=one hundred feet {100’} along lines)
   - Gate valves
   - Sprinkler control valves
   - Quick coupling valves
   - Routing of control wires
   - Sprinkler heads
   - Other related equipment

5. Maintain as-built drawings on site at all times.

6. Make all notes on drawings in pencil (no ball point pen).

B. Controller Charts

1. ENGINEER must approve as-built drawings before charts are prepared.

2. Provide one controller chart for each controller supplied showing the area covered by automatic controller, of the maximum size controller door will allow.
3. The chart is to be a reduced drawing of the actual as-built system.

4. Chart shall be black line print and different colored shading used to show area of coverage for each station.

5. When completed and approved, the chart shall be hermetically sealed between two pieces of plastic.

6. The chart shall be mounted using Velcro or equal type of semi-permanent fastening device.

7. These charts must be completed and approved prior to final acceptance of the irrigation system by the OWNER.

C. **Operation and Maintenance Manuals**

1. Prepare and deliver to the ENGINEER within ten calendar days prior to completion of construction, all required and necessary descriptive material in complete detail and sufficient quantity, properly prepared in two (2) individually bound copies of the operations and maintenance manual. The manual shall describe the material installed and shall be in sufficient detail to permit operating personnel to understand, operate and maintain all equipment. Spare parts lists and related manufacturer information shall be included for each equipment item installed. Each complete, bound manual shall include the following information:

   a. Index sheet stating CONTRACTOR’s address and telephone number, duration of guarantees period, list of equipment with names and addresses of local manufacturer representatives.

   b. Complete operating and maintenance instructions on all major equipment.

   c. System start-up and shut down instructions.

2. In addition to the above maintenance manuals, provide the maintenance personnel with instructions for system operation and show written evidence to the OWNER at the conclusion of the project that this service has been rendered.

### 3.14 **GUARANTEE**

A. **Warranty**

1. The entire irrigation and water system shall be guaranteed to give satisfactory service for a period of one year from the date of acceptance by the OWNER.

2. Should any trouble develop within the time specified above due to inferior or faulty materials or workmanship, the trouble shall be corrected at no expense to the OWNER.

3. Any and all damages resulting from faulty materials or workmanship shall be repaired by the CONTRACTOR to the satisfaction of the OWNER, at no cost to the OWNER.

End of Section 02 2810
SECTION 02 2900 – LANDSCAPING

PART 1 - GENERAL

1.0 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General conditions, Supplementary Conditions, apply to work of this section.

1.1 DESCRIPTION

A. The work in this section includes landscape construction, protection of existing site and landscape conditions and landscape maintenance during construction.

B. See drawings for extent of landscaping.

1.2 RELATED WORK DESCRIBED ELSEWHERE

A. Section 01500 – Temporary Facilities and Controls
B. Section 02210 – Tree Protection
C. Section 31 1000 – Site Clearing
D. Section 02810 - Irrigation System
E. Section 02935 – Lawns and Grass

1.3 QUALITY ASSURANCE

A. Comply with applicable Federal, state and local regulations governing landscape materials and work.

B. Owner’s representative reserves right to review and reject materials at growing site and as delivered to site.

C. Observation at growing site does not preclude right of rejection at job site. Remove rejected materials from site immediately.

D. Personnel: Employ only qualified personnel familiar with required work.

E. Contractor’s Responsibilities: Landscape Contractor to coordinate activities with all other trades. Landscape Contractor to also secure utility locates prior to commencing work involving excavation or digging.

1.4 REFERENCED STANDARDS


D. Alex Shigo, Tree Pruning, Shigo & Tree Associates, LLC, 1989.


J. International Society of Arboriculture (ISA) Best Management Practices publications

1.5 SUBMITTALS

A. File Certificates of Inspection of plant material by Federal, State and local authorities with Landscape Architect, if required.

B. Submit within 30 days after award of contract, complete list of materials to be furnished under this section and confirmed sources for materials.

C. Requests for substitutions shall be submitted in writing to the Landscape Architect prior to award of contract.

D. Provide and pay for material testing. Submit the following materials certification and text report.

1. Topsoil
   a. pH factor
   b. Mechanical analysis
   c. Percentage of organic content
   d. Recommendations on type and quantity of additives required to establish satisfactory pH factor and supply of nutrients to bring topsoil to satisfactory level for planting.
   e. Identify source location of topsoil proposed for use on the project if imported from off-site.

2. Organic Additives
   a. Loss of weight by ignition
   b. Moisture absorption capacity
   c. Percentage of organic matter
   d. pH factor
E. Submit the following material samples, in a size within reason to evaluate material thoroughly:

1. Mulch
2. Erosion control fabric
3. Edging

1.6 PRODUCT PREPARATION, DELIVERY, AND STORAGE

A. Preparation and Protection

1. Ball and Burlapped (B&B) Plants: Dig and prepare shipment in a manner that will not damage roots, branches, shape, and future development.

2. Container Grown Plants: Deliver plants in container sufficiently rigid to hold ball shape and protect root mass.

3. Use all means necessary to protect and maintain materials before, during and after installation and to protect the installed work and materials of all other trades.

4. All seed shall be delivered in the original bags certifying purity, germination, common, and botanical name for each species, and percent weed seed. Owner’s representative shall inspect all seed prior to application. Untagged seed bags shall be rejected. Immediately make all replacements necessary to the approval of the Owner’s representative and at no additional cost to the Owner.

5. Deliver all products, as specified, to site in original, sealed containers bearing manufacturer’s guaranteed statement of analysis.

B. Delivery

1. Deliver packaged materials in sealed containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery and while stored on site.

2. Deliver only plant materials that can be planted in one day unless adequate storage and watering facilities are available on job site.

3. Protect root balls by heeling in with mulch if not planted within 24 hours of delivery.

4. Protect during delivery to prevent damage to roots at all times. Cover all materials during transport.

5. Notify Land Owner’s representative of delivery schedule 48 hours in advance so plant material may be observed upon arrival at job site and can be inspected immediately after being unloaded at site.

6. Remove rejected plant material immediately from site.

7. Do not lift, move, adjust to plumb, or otherwise manipulate plants by trunk or stems. Avoid damage or stress by proper handling. Plant material dropped on the ground, rather than gently placed into the storage area or planting bed, will be rejected.
C. Storage

1. Plant material shall be stored in a shady and secure location, and shall be watered regularly prior to planting to prevent drying out of the rootball.

2. Seed, fertilizer, herbicide, hydromulch, and tackifier shall be kept in dry storage away from contaminants, at a weatherproof location.

1.7 JOB CONDITIONS

A. Site and Plant Protection

1. Care must be exercised to minimize disturbance or compaction of areas adjacent to any project. Trees shall be protected as specified in the project manual. (Section 02210 – Tree Protection)

2. In order to prevent excessive soil compaction and destruction of soil structure, no site work will be performed in cases where equipment or traffic must pass over wet soils or if wet soils must be handled or manipulated in order for the work to progress. Wet soil is defined as any soil within 90 percent of field capacity (saturation).

3. Do not move equipment over existing landscape or newly placed structures without approval of the Owner or Owner’s Representative.

4. Provide board roading as required to protect paving. Protect other improvements from damage, with protection boards, ramps and protective sheeting.

B. Planting Restrictions

1. Perform actual planting per referenced standards.

2. Owner’s representative must approve all bedding plants and ground covers.

3. Plant materials must be installed with spacings that allow, at maturity, a maximum of 30 percent canopy overlap or inter-fingering. This does not apply to species of widely disparate mature sizes, such as between a large tree and understory shrubs, because their canopies do not grow together.

4. Trees that are medium and small at maturity must be planted no closer than fifteen feet to any building, sidewalk or paved surface unless otherwise indicated on the drawings. Trees that are large at maturity cannot be placed closer than 20 feet to any building, sidewalk or paved surface unless otherwise indicated on the drawings. Owner must approve exceptions to these requirements.

C. Utilities

1. Utility locates are required prior to digging and any construction activities.

2. Coordinate work with Owner, including irrigation manager, in order to prevent damage to underground sprinkler system.

1.8 WARRANTY
A. Warranty plant material for one year after final acceptance. Replace dead or dying materials not in vigorous, thriving condition as soon as weather permits and on notification by Owner's representative. Replace plants, including trees, which in opinion of Owner's representative have partially died, thereby compromising shape, size or symmetry.

B. Replace plants with same kind and size as originally planted, at no cost to Owner. Provide one-year warranty on replacement plants. Trees should be replaced at start of next planting or digging season. In such cases, remove dead trees immediately. Protect irrigation system and other piping conduit or other work during replacement. Repair damage immediately.

C. Warranty excludes replacement of plants after final acceptance because of injury by storm, drought, drowning, hail, freeze, insects, or disease. Materials damaged by “Acts of God” prior to final acceptance are responsibility of Contractor.

D. At end of warranty period, remove staking and guying materials from the site.

1.9 MAINTENANCE

A. Water will be available on site. Provide necessary hoses and other watering equipment required to complete work.

B. Maintain plantings and trees by watering, cultivating, weeding, spraying, cleaning, and replacing as necessary to keep landscape in a vigorous, healthy condition.

C. Coordinate watering schedules with irrigation contractor or Owner's representative during installation and until final acceptance. Provide deep root watering to newly installed trees.

D. Mowing: Mow newly planted grass area weekly after initial growth reaches two and one-half inches.

E. Weeding: Remove weeds and foreign grasses in planted areas at least once per week. Herbicides may be used only when approved by the Owner's Representative.

F. Fencing: Provide four (4') foot tall orange plastic snow fencing and metal tee fence post spaced at a maximum of eight (8') feet apart around all walks at seeded areas. Maintain until lawn is accepted.

G. Tree Replacement

Trees removed during demolition or construction are to be replaced following consultation with Owner’s Arborist or Owner’s Representative. Appraised values of existing trees have been determined according to industry standards and will be provided by the Owner if applicable.

PART 2 – PRODUCTS

2.0 PLANTS

A. General

Plant quality must be equal to well formed No. 1 grade nursery stock. Listed plant heights are from tops of root balls to nominal tops of plants. Plants shall be specimen quality, typical of their species or variety.
B. Shrubs and Ground Covers

Plants shall be nursery grown, healthy and vigorous, of normal habit of growth for the species, free from disease, insect eggs, and larvae. Specified sizes are before pruning and measured with branches in normal position. Plants shall be well rooted and established in the container.

C. Ornamental and Shade Trees

Trees shall be healthy, vigorous, full-branched, well-shaped, trunk diameter, and height requirements as specified. Root balls shall be firm, neat and slightly tapered and well burlapped. Trees with loose or damaged root balls at time of planting shall be rejected. Root balls should meet the American Standard for Nursery Stock, Edition approved 1985 by American National Standards Institute, Inc. (Z6O.1) standard.

D. Special Requirements

Shade trees are to be procured a minimum of 30 days prior to scheduled installations. Trees to be shipped in enclosed truck or the branches/leaves protected by appropriate fabric during shipping. Trees are to be healed in at job site or at Contractor’s holding facility and maintained until site is ready. Owner’s representative will review trees at holding area prior to planting.

E. Collected Trees

Direct planting from the collection site is preferred. Coordinate with Owner for utility locates and scheduling of sidewalk closures or other logistical issues. If necessary, spray field grown trees immediately prior to digging with anti-desiccant. Insure adequate coverage to trunks, branches and foliage.

2.1 SOIL PREPARATION MATERIALS

A. Soil Amendments: Soil amendments are not to be used unless approved by Owner.

B. Topsoil

1. Friable, fertile, dark, loamy soil, free of clay lumps, stones and other extraneous material and reasonably free of weeds and foreign grasses, with a pH of 5.0 to 8.0.

2. Organic matter shall be four to 12 percent total dry weight.

3. Provide tests for certification.

C. Sharp Sand

Sharp sand shall be clean, washed and fine aggregate and shall meet ASTM C33 standards.

D. Peat Moss

Peat moss shall be commercially produced, sterilized, reed-sedge peat, equivalent to Martins Peat, Big Fork, Montana. Peat must have a pH between five and seven and organic matter content not less than 90 percent.

E. Fertilizer
1. Type A – as recommended by testing agency.

2. Type B – Scotts “Osmocote” at a 14-14-14 ratio, incorporated into the soil according to instructions on the bag.

2.2 MISCELLANEOUS MATERIALS

A. Edging: Steel Edging: Standard commercial-steel edging, rolled edge, fabricated in sections of standard lengths, with loops stamped from or welded to face of sections to receive stakes.

Provide edging where indicated on the drawings to separate landscape materials.

Where edging is down grade of slope or crosses a swale, provide 1/2" diameter holes on down slope sections of edging, 30" on center, located at mid-height of edging.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Border Concepts Inc.
b. Collier Metal Specialties, Inc.
c. J.D. Russell Company

Edging Size: 3/16 inch (6.4 mm) wide by 6 inches (125 mm) deep

Stakes: Tapered steel, a minimum of 12 inches (300 mm) long.

Accessories: Standard tapered ends, corners, and splicers.

Finish: Galvanized Steel

B. Mulch

1. Shredded, medium grade, Douglas fir bark with a chip size of one and one-half inch to two and one-half inch average, free of wood chips and sawdust, as manufactured by Model Log Homes, 75777 Gallatin Road, Gallatin Gateway, Montana, 59730 (or approved equal).

2. One and one-half inch round, native, washed, river rock.

3. Owner’s representative approved equal.

C. Landscape Fabric

Heavy, professional grade, spun-bonded nylon landscape fabric with six-inch anchoring pins. Woven fabric is unacceptable.

Weed Barrier Fabric: A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. (101g/sq. m) minimum, composed of fibers formed into a stable
network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally-encountered chemicals, alkanes, and acids. Water permeable and unaffected by U.V. light, freezing, and thawing.

D. Anti-Desiccant

1. Protective film emulsion for protection of plant surfaces during transport. Permeable to permit transpiration, as manufactured by Wilt Pruf, Inc., P.O. Box 4280, Greenwich, Connecticut, 06830. Mixed and applied in accordance with manufacturer’s instructions.

2. Owner’s representative approved equal.

E. Staking and Guying

1. Tie Wire: 12-gauge, galvanized wire

2. Metal posts: 8'-0" t-stakes

3. Nylon strap: three inches wide, 12 inches long white or black nylon strap with one ½" brass grommet in each end or Landscape Architect approved equivalent.

F. Drainage Fill

No drainage without Owner's written permission.

G. Native Topsoil

Refer to Montana Standard Specifications Subsections 203.80 Topsoil Salvaging and placing, 610.00 Topsoiling and 713.06 Topsoil Material.

H. Imported Topsoil

In the event sufficient quantities of native topsoil cannot be salvaged from the site, the Contractor shall provide imported topsoil to supplement the project requirements. The Contractor shall provide topsoil that meets or exceeds the quality of the native topsoil material available on site. Contractor shall provide source and analysis information to the Owner's Representative, for his approval, prior to delivery. The Contractor shall incorporate into the topsoil, amendments necessary to provide topsoil fertility and quality, equal to or exceeding the characteristics of the native topsoil.

PART 3 - EXECUTION

3.0 INSPECTION

Examine sub-grade and verify conditions under which work is to be performed. Notify General Contractor and Owner’s representative of unsatisfactory conditions.

3.1 BED PREPARATION

A. Scarify all sub-grade of bed areas to six inches, all areas.

B. Contractor shall spread topsoil evenly throughout bed after thoroughly mixing soil, amendments and fertilizer together on site.
C. Remove any debris and rocks larger than one inch.

3.2 SHRUB AND GROUNDCOVER PLANTING

A. Provide one-foot deep top soil in all shrub beds.

B. Place plants in a position on bed areas before removal from containers. Obtain approval from Owner’s representative of plant layout in the field. Owner’s representative reserves the right to shift locations of plants prior to planting.

C. Remove all materials (burlap, twine, wire, etc.) from entire root ball on all B&B plants.

D. Plant all plants as located, setting plants with the root flare even with the tops of bed grades. Backfill with native soil and compact soil carefully around each plant ball. Water thoroughly to eliminate air pockets. Carefully prune plants to remove dead or broken branches and hand-rake bed areas to smooth even surfaces.

3.3 TREE PLANTING

A. Ornamental Trees and Shrubs

1. Stake locations for approval by Owner’s representative.

2. Plant in pits two times wider than ball for trees and shrubs.

3. Fill material should be the native soil removed from the hole. No planting mix or soil amendments should be used.

4. Glazed sides of mechanically dug holes should be roughened or scarified to allow root penetration.

5. Remove all materials (burlap, twine, wire, etc) from entire root ball.

6. Carefully settle by watering to prevent pockets.

7. Root collar shall not be planted below finish grade level.

B. Root Balls

1. Root balls shall be properly located in relationship to adjacent soil as required by referenced standards.

2. Balls set too deep or too shallow shall be carefully removed and replanted as required by the Owner’s representative.

3.4 TREE MOVING AND TRANSPLANTING

A. Tree moving and transplanting shall be done in accordance with standards outlined in ANSI A300: Standards for Tree Care Operations, American National Standards Institute.

B. All tree moving and/or transplanting operations shall be coordinated with the Owner prior to commencement of work.
3.5 PERENNIAL PLANTING

A. Prepare planting beds as indicated on drawings. Provide one foot of thoroughly mixed and prepared soil consisting of 50 percent sand loam topsoil; 25 percent coarse pumice, 3/8 inch size; and 25 percent peat moss. Thoroughly mix in 20 pounds of Scott, Ortho or Lilly-Miller nitrogen fertilizer per cubic yard with formulation of 10-20-10.

B. Replace existing soil with planting mix.

C. Space plants as indicated on drawings. Obtain approval of plant layout from Owner’s representative before planting. Owner’s representative reserves the right to change the location of plants prior to planting.

3.6 LANDSCAPE FABRIC

After planting has been completed and approved by the Owner’s representative, install landscape fabric across planting beds. Sheets of fabric should have a minimum six-inch overlap. At the bed margins, fabric should be installed under the bottom of the edging. Fabric lapping outside the edging should be trimmed to below grade and buried when the edging is backfilled. Fabric should be well anchored with 6 inch staples pounded flush with the grade. Plant openings must be large enough to allow for future growth.

3.7 TOP DRESSING

After landscape fabric has been installed and accepted by the Owner’s representative, top dress bed areas with mulch, as indicated on drawings, a minimum of three inches deep. Fabric must not be exposed or protrude above the mulch or edging. Mulch should be clean, whether organic or mineral mulch, and should be free of debris and soil.

3.8 TREE WRAPPING

Tree wrapping will not be accepted.

3.9 PRUNING OF NEW TREES

A. Follow referenced standards and prune material as directed by Owner’s representative.

B. Do not cut back terminal branches. Properly remove sucker growth from the base and badly broken or bruised branches. Thin native trees more heavily than nursery grown plants.

3.10 TREE SAUCERS

Form a four inch high saucer around each new tree for deep watering. Contractor is responsible for deep watering until final acceptance.

3.11 TREE GUYING AND STAKING

A. Stake and guy trees immediately following planting operation. Take precautions during guying operation to prevent damage or injury to branches and roots. Orient all stakes within each cluster or row of trees in the same direction or as directed by Owner’s representative.
B. Trees of over one inch caliper must be staked with woven nylon straps and wire. Tension on ties should be adequate to support tree, but slack enough to permit movement and the development of reaction wood. Ties cannot be fastened tightly to trunks; free movement or slack equal to at least twice the caliper must be allowed.

3.12 PLANTING BED EDGING

Install edging per manufacturer’s directions. Set edging as indicated in true lines as designed with top of edging one inch above finish grade.

3.13 CLEANUP

A. Keep premises neat and orderly including organization of storage areas. Remove trash and debris from excavated planting areas, preparing beds, or planting plants from site daily as work progresses. Keep paved areas clean by sweeping or hosing.

B. Repair all damage caused by landscape operations.

END OF SECTION 02 2900
SECTION 02 2935 – LAWNS AND GRASS

PART 1 - GENERAL

1.0 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General conditions, Supplementary Conditions, apply to work of this section.

1.1 DESCRIPTION

A. Work in this section includes:
   1. Furnishing all plants, labor, equipment;
   2. Performing all operations to finish grade topsoil;
   3. Prepare seed and sod beds;
   4. Sod all lawn areas; and
   5. Maintenance and protection of all sodded and seeded areas.

B. All areas within the contract limits, except surfaces occupied by paving and areas indicated to be undisturbed shall be hydroseeded or sodded as shown on Plans. Areas repaired due to Contractor damage shall be hydroseeded.

1.2 RELATED WORK DESCRIBED ELSEWHERE

C. Section 02810 - Irrigation System

D. Section 02900 - Landscaping

The Montana Department of Transportation Standard Specification for road and bridge construction, 1987 Edition, Section 610, roadside development shall govern the work as if bound herein. Where provisions of this section and the referenced standard conflict, this section shall govern.

1.3 QUALITY ASSURANCE

A. Qualification of Workmen

Provide at least one person who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of materials being installed and the best methods for their installation and who shall direct all work performed under this section.

B. Contractor Qualifications

The Contractor shall have at least two (2) years of weed control spraying experience. Proof of experience will be required. The Contractor must have a valid Montana Commercial Herbicide Applicator’s License.

C. Chemical Registration

All weed control chemicals must be registered with the Environmental Protection Agency and the State of Montana.

D. Equipment Requirements
The Contractor shall furnish, operate, and maintain suitable and adequate equipment necessary to perform the above operations in an approved and workman-like manner without delays. Spray nozzles shall be raindrop or similar drift control type.

E. Liability and Contractor's Responsibilities

Weather conditions must be such that no damage outside the sprayed area will occur and the Contractor will cease spraying whenever the application of spray could cause such damage.

The Contractor agrees to hold harmless the Owner and Landscape Architect and/or Engineer against any and all claims for damage arising from operations covered in this proposal.

F. Time of Application

Because of varied climatic conditions, it will be the Contractor's responsibility to coordinate spraying activities to achieve the best results. To avoid possible chemical exposure and general alarm among campus users, time of application must not coincide with other nearby outside campus activities. If nearby activity encroaches during spraying operations, spraying must cease immediately until people leave the area.

1.4 PRODUCT HANDLING

A. Protection

1. Use all means necessary to protect and maintain materials before, during, and after installation and to protect the installed work and materials of all other trades.

2. All seed shall be delivered in the original bags certifying purity, germination, common, and botanical name for each species, and percent weed seed. Owner shall inspect all seed prior to application. Untagged seed bags shall be rejected. Immediately make all replacements necessary to the approval of the Owner's Representative and at no additional cost to the Owner.

3. Deliver chemical fertilizers and herbicides, as specified, to site in original, sealed containers bearing manufacturer's guaranteed statement of analysis.

B. Storage

Seed, fertilizer, herbicide, hydromulch, and tackifier shall be kept in dry storage away from contaminants, at a weatherproof location.

C. Notice to Proceed

The Contractor shall not proceed with seeding or sodding operations until the irrigation system has been tested and approved by the Owner's Representative.

D. Schedules

Install lawn seed mixes during the specified time periods. If special conditions exist that may warrant a variance in the specified plant dates or conditions, a written request shall be submitted to the Owner's Representative stating the special conditions and proposed variance.
The Contractor shall provide a weed control plan and schedule prior to bed preparation, for approval of the Owner’s Representative.

E. Substitutions: Requests for substitutions shall be submitted in writing to the Owner’s Representative prior to award of contract.

1.5 SPECIAL LANDSCAPE PROVISIONS

A. Water: Water will be available on site. Provide necessary hoses and other watering equipment required to complete work.

B. Maintenance

i. Until final acceptance, and until as approved stand of grass is achieved, maintain plantings by watering, cultivating, mowing, weeding, spraying, cleaning and replacing as necessary to keep lawns in a vigorous, healthy condition.

ii. Watering: Water as necessary to keep top two inches of soil moist. Coordinate with Irrigation Contractor.

iii. Mowing: Mow newly planted grass area weekly after initial growth reaches 2-½ inches.

iv. Weeding: Remove weeds and foreign grasses in planted areas at least once per week. Herbicides may be used only when approved by the Owner’s Representative.

v. Fencing: Provide four (4’) foot tall orange plastic snow fencing and metal tee fence post spaced at a maximum of eight (8’) feet apart around all walks at seeded and sodded areas. Maintain until lawn is accepted.

1.6 CONDITION OF SURFACES

Lawn areas will be left at ± 0.1 feet of finish grade as shown on plans.

1.7 ACCEPTANCE

The work will be accepted when a completed stand of grass at the three-leaf stage or beyond is achieved and all provisions of Section 3.5.C, “Performance” have been met as approved by the Owner and Owner’s Representative.

PART 2 - MATERIALS

2.1 GRASS SEED

A. General

1. Seed shall be used only in areas where an irrigation system is absent or has been removed.

2. All seed shall be:

   a. Free from noxious weed seeds, and re-cleaned;

   b. Grade A recent crop seed;
c. Treated with appropriate fungicide;
d. Delivered to the site in sealed containers with dealer’s guaranteed analysis.

B. Irrigated Grass Seed Mixture: Seed at the minimum rate of three (3) pounds per one thousand (1000) square feet (130 lbs./acre).

<table>
<thead>
<tr>
<th>Name of Grass</th>
<th>Proportion by Weight</th>
<th>Percent Purity</th>
<th>Percent Germination</th>
</tr>
</thead>
<tbody>
<tr>
<td>'Midnight' Kentucky bluegrass</td>
<td>25%</td>
<td>95%</td>
<td>85%</td>
</tr>
<tr>
<td>'Rugby II' Kentucky bluegrass</td>
<td>25%</td>
<td>95%</td>
<td>85%</td>
</tr>
<tr>
<td>'Ram I' Kentucky bluegrass</td>
<td>25%</td>
<td>95%</td>
<td>85%</td>
</tr>
<tr>
<td>'Delaware' Dwarf Peren. Rye Grass</td>
<td>25%</td>
<td>95%</td>
<td>85%</td>
</tr>
</tbody>
</table>

C. Non-irrigated Grass Seed Mixture: must be ‘Kitty Hawk’ turf-type tall fescue seeded at three (3) pounds per thousand (1000) square feet (130 lbs./acre).

2.2 SOD

A. General

1. Sod all areas where site is substantially disturbed.

2. Sod shall be from a commercial sod farm located in the Gallatin Valley.

3. Sod type, condition and source shall be approved by the Owner’s Representative.

B. Sod Characteristics

Sod shall be well-established lawn turf grasses similar to the seed mix described in 2.1 B.

Sod shall be vigorous, well-rooted, healthy turf, well hydrated and possessing excellent color.

Sod shall be free from disease, insect pests, weeds, other grasses, stones, and any other harmful or deleterious matter.

C. Sod Handling

Cut sod in uniformly wide strips, uniformly 1-1/2 inches thick with clean cut edges.

Sod shall be rolled or folded prior to lifting. Handling of sod shall be done in a manner that will prevent tearing, breaking, drying, or any other damage.

Sod shall be installed in place on the site not more than 24 hours after cutting.

2.3 FERTILIZER

A. Soil Testing

1. Verify fertilization needs by sampling and testing soil prior to purchasing fertilizer. The test sample shall be obtained by sampling six different locations at the project site. Soil from sampled locations shall be mixed in equal parts to provide a compiled sample for testing.
Testing by an approved laboratory shall include:

a. A test for soil pH,

b. A test for electrical conductivity (EC),

c. A test for the amount of nitrogen, phosphorus and potassium present (NPK),

d. A test to determine the amount of organic matter present (OM).

2. Results of tests shall be reviewed by the Owner and Engineer prior to purchase of fertilizer. If test results are typical for the general campus area, fertilization operations may commence as specified. If test results are not typical for the general campus area, Owner will provide modified formulation and application rate specifications by Change Order.

B. Formulation

1. Fertilizer shall be manufactured by Anderson ProTurf, or equal approved by the Owner. Application rates shall be in accordance with manufacturer recommendations. Fertilizer shall be complete, uniform in composition, dry and free flowing. The fertilizer shall be delivered to the site in the original waterproof containers, each bearing the manufacturer's statement of analysis.

2. Fertilizer to be spread on areas to be seeded shall be commercially prepared by Anderson ProTurf or an equal product pre-approved by the Owner. Fertilizer shall be a slow release, Poly-S urea, and shall contain the following percentages by weight:

   10% Nitrogen
   20% Phosphorus
   10% Potassium
   12% Sulfur

3. Grow-in Fertilizer shall be a slow-release, Poly-S urea, and shall be formulated as 25-3-4-Fe-2% and commercially prepared by Anderson ProTurf or equal approved by the Owner.

C. Special Protection

If stored at the site, protect fertilizer from the elements at all times.

2.4 Mulch

Wood cellulose fiber for hydromulch – Weyerhauser, Conweb, or approved equal.

2.5 Mulch Tackifier

Mulch tackifier must be natural, non-asphaltic, vegetable gum with gelling and hardening agents, Terra Tack or approved equal.

2.6 Water

Water shall be clean irrigation quality water.
2.7 Pre-Planting Herbicide

Roundup, provide compatible surfactant and drift control agents as required.

2.8 Post-Emergent Herbicide

"TRIMEC" 2.4.D.M.C.P.P. DICAMBA (BANVIL) manufactured by P.B.I. Gordon 816-421-4070 distributed by Wilbur Ellis Company (406)-248-1176 or West Chemical Agricultural Chemicals, Inc., (406)-252-3834, or other appropriate control which best fits the weed problem and necessary applications.

2.9 Native Topsoil

Refer to Montana Standard Specifications Subsections 203.80 Topsoil Salvaging and placing, 610.00 Topsoiling and 713.06 Topsoil Material.

2.10 Imported Topsoil

In the event sufficient quantities of native topsoil cannot be salvaged from the site, the Contractor shall provide imported topsoil to supplement the project requirements. The Contractor shall provide topsoil that meets or exceeds the quality of the native topsoil material available on site. Contractor shall provide source and analysis information to the Owner's Representative, for his approval, prior to delivery. The Contractor shall incorporate into the topsoil, amendments necessary to provide topsoil fertility and quality, equal to or exceeding the characteristics of the native topsoil.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection

Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

Verify that seeding may be completed in accordance with the original design and the reference standards.

B. Discrepancies

1. In case of discrepancy, immediately notify the Owner's Representative.

2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 FINISHING

A. Topsoil Spreading

Contractor shall provide a 6" minimum compacted, depth of topsoil on all lawn areas. Topsoil shall be graded smoothly and evenly. Lawn area sub grade particularly on slopes shall be roughed and scarified 6" minimum depth to except and bind with the finish layer of topsoil. Topsoil shall be spread in a non-muddy, unfrozen condition. Surface finish shall be +/- 0.1 foot. Compaction of the topsoil layer shall be ±85% maximum dry density. Refer to...
B. Finish Grading

Grade lawn areas to finish grades, filling as needed or removing surplus dirt and floating areas to a smooth uniform grade. All lawn areas shall slope to drain minimum 2% slope. Where no grades are shown, surfaces shall have a smooth and continual grade between existing or fixed controls (such as walks, curbs, catch basins, and elevations at steps or building). Loosen and fine rake areas to receive seed or sod to break up lumps and produce a smooth, even grade, free from unsightly variations, ridges, or depressions. Remove stones one inch or larger, sticks, roots or other debris exposed during this operation. All finish grades shall meet the approval of the Owner’s Representative before grass seed is sown or sod is placed.

C. Weed Control

1. Prior to application of seed or sod, the bed shall be roughed up to a depth of 1/8th inch.

2. Moisten the seedbed to a depth of 1” to promote germination of any seeds contained in the topsoil. If rhizomatous grasses, field bindweed (morning glory) or noxious weeds are evident, the Contractor shall be required to eliminate those undesirable plants prior to seeding or sodding, at the discretion and direction of the Owner’s Representative.

3. Spray areas showing weed growth with approved herbicides, mow, and remove clippings prior to final grading. Seeding and sodding shall be executed 72 hours following Roundup application.

3.3 PLANTING

A. Preparation

1. Hydroseed bed preparation shall pertain to the preparation of the surface of the ground to receive the seed. The ground shall be hand or machine raked to remove all debris, clods, rocks, and other material larger than 1 inch, to a depth of 4 inches. Such debris, clods, rocks, and other material so removed shall be disposed of off the immediate property. Hydroseed bed preparation shall not commence until the moisture conditions make the ground area and soil friable.

2. If there has been a time lapse following the placement of the topsoil to allow it to become settled and compacted on the surface, the areas to be seeded shall be thoroughly worked to a depth of 3 to 4 inches so as to provide a surface of such condition that it will allow application of the seed in compliance with these specifications.

3. Hydroseed beds shall be permitted to settle or firmed by rolling before seeding.

4. Initial application of fertilizer shall be applied evenly at the rate of 600 lbs. of material per Acre prior to seeding and incorporate into the prepared seedbed ½” deep by light raking.
1. Immediately prior to the application of the seed, the soil shall be loose to a depth of at least 1 inch and free from all material as specified. If soil is too loose or dry for good handling, it should be moistened and rolled lightly.

2. Hydroseed all irrigated areas as shown on the plans. Irrigated areas may be seeded any time between April 15 and June 1, and August 10 and September 10, provided the irrigation system is operational. Hydroseed all dry land areas as shown on the plans. Seed to overlap limits of irrigated lawn by one half the distance between sprinkler head and limits of coverage between April 1 and May 15, and September 20 and October 30.

3. Lawn grass shall be sown at 3 pounds per 1000 square feet, (130 lbs./acre) using approved methods that allow for the even precise hydroseeding and incorporation of the seed into the top ½-inch of the prepared seedbed. If seed can be drilled, reduce rate to 60 pounds per acre. A drill type seeder with spacing greater that 3½” is not acceptable. When seed is drilled and the surface is unduly loose, the seedbed shall be compacted by an agricultural roller, cultipacker, or compactor not more than 24 hours after seeding.

4. Apply tackifier on all slopes greater than 4 to 1 at a rate of 100 pounds per acre.

5. Seed and mulch shall be applied in separate and distinct operations except that a minimal amount of mulch may be added to the seed slurry as a visual aid during the seeding process. Mulch applied with seed shall not exceed of mulch for each five (5) gallons of water. This mulch shall be deducted from the total quantity to be applied. The application of the seed slurry shall be made with the equipment having a built-in agitation system and operating capacity sufficient to agitate, suspend, and homogeneously mix slurry containing water, seed, and mulch. The slurry shall be sprayed over the soil in a uniform coat. Wherever practical, the slurry shall be applied normal to the surface being treated to effectively drill the seed in to the seedbed. Hydromulch application shall follow seeding as soon as practical, with consideration for minimal soil erosion through washing. All seeded areas shall be mulched before work is terminated on any day.

C. Mulching

1. Mulch all hydroseeded areas. Topsoil or seed that washes out for reasons attributable to the Contractor’s activities or failure to take proper precautions shall be replaced at the Contractor’s expense.

2. All structures shall be protected from hydraulic application of mulch material. Any material deposited on walks, streets, inlets, or other structures, shall be removed.

1. Mulch shall not be applied in the presence of free surface water, but may be applied on damp ground.

2. Organic mulch shall be mixed with water at a rate of one pound of mulch (dry weight) to one gallon of water, hydraulically applied as per manufacturer’s recommendations at a rate of 2000 pounds per acre.

D. Tackifier

Mulch tackifiers shall be mixed with water at a rate specifically by the manufacturer and shall be applied at a minimum rate of 40 pounds per acre.
3.4 SOD INSTALLATION

A. Preparation

Bed preparation shall be similar to that required for seedbed preparation.

B. Application

1. Sod may be placed at any time when the ground is not frozen.

2. A string or line of boards may be used as a guide for setting the first course of sod across the area. Each course is matched against the edge of this course, staggering successive courses. All work should be done on boards laid on top of the sod to avoid footprints or other injuries to the surface.

3. All sod is to be laid on topsoiled areas. The joints shall be butting.

4. Lay sod across slope.

5. Roll or lightly tamp, with suitable wooden or metal tamper, all new sod sufficiently to set or press sod into underlying soil.

6. Before sod is laid, apply fertilizer specified, at the rate of six (6) pounds per 1000 square feet.

7. After sod installation is completed, clean up and thoroughly moisten areas of newly laid sod.

3.5 STAKING AND FENCING

A. General

All newly sodded or seeded areas are to be fenced so as to prevent trampling by foot or vehicular traffic. Fencing shall be removed by Contractor when Owner has determined that the lawn area is successfully established, as dictated in this section.

B. Materials

1. Posts to be five-foot minimum, six foot maximum green steel t-posts.

2. Fencing to be four-foot Tenax in guardian orange, length variable. Color substitutions allowed only with the direction and approval of the Project Manager.

C. Performance

1. Staking shall not be performed without prior identification of underground utilities, including but not limited to irrigation.

2. Stakes shall be installed every 16 feet or less, using a t-post driver.

3. Fencing to be attached to posts with nylon fence ties, zip ties or flexible wire.

3.6 MAINTENANCE

A. General
Maintain original grades of all lawn areas after commencement of planting and during maintenance period until final acceptance of the job, but in no case less than forty-five (45) days.

B. Work Included

1. All irrigated areas shall be watered as required to establish a mature stand of grass.

2. All areas shall be watched closely so that they are not permitted to dry out or to form puddles of water, or to be washed by over-application.

3. Mow all seeded lawn at 2½" each time its height reaches 3½". Maintain through a minimum of three mowings to provide an even stand over the entire seeded area, until final inspection and acceptance.

4. Provide a "grow-in" fertilizer, as specified, for all irrigated lawns. Apply six weeks after seed germination. In the case of fall seeding, apply prior to May 1, the following year.

5. Apply post emergence herbicide per the manufacturer's recommendations and application rates, whenever and wherever weed growth jeopardizes or inhibits the development of a mature grass lawn. Apply herbicide in late spring or early summer. Apply only when mean high temperatures are between 60° and 85° F with wind velocities less than five (5) miles per hour. Prior to application, Contractor shall notify Owner, in writing, of the proposed schedule for applying herbicides. Written notice shall include the following items:

a. Date of proposed application
b. Specific area of proposed application
c. Proposed herbicide for application
d. Proposed concentration and application rate.

The application area must be signed with Owner-approved signs informing the public of the application and duration of restricted use.

C. Performance

1. Establish a dense lawn of permanent grasses, free from lumps and depressions. Any part failing to show uniform cover and grades free from lumps and depressions shall be redone, and such replacement shall continue until a dense lawn is established. Scattered bare spots will not be allowed. Adequate germination shall equate to 11 to 15 seedlings per square foot over 95 percent of area seeded for native grass areas.

2. Finish grades at the edges of sidewalks, curbs or other hard surface boundaries must be at a level such that the established turf surface will be one (1) inch below the plane of the hard surface for a minimum distance of six (6) feet from the edge.

3. Maintain entire lawn area until the above performance is achieved throughout the project.

D. Replacements
1. Any area that fails to produce an adequate stand of grass shall be re-sodded or reseeded by the Contractor at no additional expense to the Owner.

2. Replacements required because of vandalism or other causes beyond the control of the Contractor are not part of the Contract.

3. For acceptance, the established grass will be judged by the stand's fullness, health, maturity and number of weeds present. Determination and acceptance of grass areas shall be made by the Owner's Representative.

E. Extension of Maintenance Period

Continue the maintenance period at no additional cost to the Owner until all previously noted deficiencies have been corrected, at which time the final inspection shall be made.

3.7 CLEAN-UP

Keep premises neat and orderly including organization of storage areas. Remove trash and debris resulting from lawn preparation from site daily as work progresses. Leave paved areas in a broom clean condition by sweeping or hosing.

END OF SECTION 02 2935
SECTION 03 0510
CONCRETE COLOR ADDITIVE

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Requirements for Color Additive Used In:
   1. Cast-In-Place Concrete specified in section 03 3000.

1.02 RELATED REQUIREMENTS
A. Section 07 9000 - Joint Protection

1.03 REFERENCE STANDARDS
A. ASTM C 309 - Standard Specification for Liquid Membrane Forming Compounds for Curing Concrete, American Concrete Institute.
B. ASTM C 979 - Standard Specification for Pigments for Integrally Colored Concrete.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's specifications and instructions for color additives and curing compound.
C. Samples for Concrete Color Selection: Color additive manufacturer's color chart or sample chip set; indicate color additive number and required dosage rate. Submittals are for general verification of color and may vary somewhat from concrete finished in the field according to the specification.

1.05 QUALITY ASSURANCE
A. Mock-Up: Provide full-scale mock-up to demonstrate methods of obtaining consistent visual appearance.
B. Mock-Up may remain.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Color Additive: Comply with manufacturer's instructions. Deliver to site or batch plant in original, unopened packaging. Store in dry conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Concrete Color Additives: Provide products manufactured by Davis Colors, 7101 Muirkirk Road, Beltsville, MD 20705; ASD. Tel: (800) 800-6856 or (301) 210-3400. Fax: (301) 210-4967; or 3700 E. Olympic Boulevard, Los Angeles, CA 90023; ASD. Tel: (800) 800-6856 or (323) 269-7311. Fax: (323) 269-1053; Web Site: www.daviscolors.com.
B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COLORS:
A. Concrete Colors: Provide cement, aggregate and color additives as required to match Jet Black (Carbon) 8084.

2.03 MATERIALS
A. Colored Concrete Additive: Made with pure, concentrated mineral pigments especially processed for mixing into concrete and complying with ASTM C 979.
B. Curing Compound for Colored Concrete: Davis Colors W-1000 Clear Cure & Seal; complying with ASTM C 309.
2.04 MIXES

A. Concrete Mix: Mix color additives in accordance with manufacturer's instructions, until color additives are uniformly dispersed throughout mixture and disintegrating bags, if used, have dis-integrated.

PART 3 EXECUTION

3.01 FLOORS AND PAVING

A. Trowel Finish: Do not over-trowel or start troweling late.

END OF SECTION
SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drawings and General Provisions of the Contract, Including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.
B. ACI Publications as listed throughout. The Contractor must have a current copy of ACI SP-15 (05) "Field Reference Manual" for concrete construction on site.
C. Concrete for composite floor construction.
D. Structural reinforced concrete foundations, walls and columns.

1.02 SUMMARY

A. This section specifies cast-in-place concrete footings, foundations, and walls including formwork, reinforcement, concrete materials, mix design, placement procedures, finishes and curing.

1.03 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans.
B. Embedded Items: Items other than reinforcement placed in the concrete pertaining to anchorages or connections such as anchor rods, embedment plates, and the like.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: For each type of manufactured materials and product required.
C. Design Mixes: Concrete Mix Design for each concrete mix. Include alternate mix designs when characteristics of materials, product conditions, weather, test results, or other circumstances warrant adjustments.
   1. Indicate amounts of mix water to be withheld for later addition at project site.
D. Steel Reinforcement Placing Drawings: Details of fabrication, bending, and field placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement". Include material grade, sizes, quantities, spacing, splice locations and laps, bending diagrams, arrangement, mechanical couplers, and supports of concrete reinforcement.
   1. Include elevation view(s) of grade beams.
E. Control Survey: Prepared by or under the supervision of the Contractor. Verify plan location and elevation of grid control for concrete construction and all concrete embedments before concrete placement. Survey and report are the Contractor's responsibility.
F. Concrete Delivery Tickets: Submit upon request.
G. Material Certificates and/or Test Reports: Signed by manufacturers or qualified testing agency certifying that each of the following items complies with requirements:
   1. Concrete Mix Design.
   2. Steel Reinforcement and reinforcement accessories.
   3. Curing materials and agents.
   4. Waterstops
   5. Bonding agents.
H. LEED Submittal:
   1. Product Data for Credit MR4.1 and MR 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content.
      a. Include statement indicating costs for each product having recycled content.
2. Design Mixtures for Credit ID1.1: For each concrete mixture containing fly ash as a replacement for portland cement or other portland cement replacements and for equivalent concrete mixtures that do not contain portland cement replacements.

I. Minutes of Pre-Installation Meeting.

J. Sustainable Design Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used; use LEED New Product Content Form.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: An experienced and qualified installer who has completed concrete work similar in material, design and extent to that indicated for this project and whose work has resulted in construction with a record of successful in-service performance. A qualified installer who employs, on project, personnel qualified as ACI-Certified Flatwork Technician and Finisher and a supervisor who is ACI-Certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1. Manufacturer must be certified according to the National Ready Mixed Concrete Association's Certification of Ready Mixed Concrete Production Facilities.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician - Grade 1, according to ACI CP-01 or an approved equivalent certification program.

2. Personnel performing laboratory tests shall be ACI Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade 1. Testing Agency Laboratory supervisor shall be an ACI Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

E. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code - Reinforcing Steel".

F. Quality Control and Construction Tolerances: Comply with the information presented in the following publications, unless more stringent provisions are indicated:

1. ACI 301, "Specification for Structural Concrete".

2. ACI 117, "Specification for Tolerances for Concrete Construction and Materials".

3. Control Survey: Verify plan location and elevation of all embedments before concrete placement (see submitted section).

G. Concrete Laboratory: Engage in a qualified independent agency to perform material, evaluation tests and to design concrete mixes.

H. Pre-Installation Conference: Conduct conference at project site to comply with requirements in Division 1 Section "Project Management and Coordination".

1. Before concrete work begins, review concrete design mixture and examine procedures for ensuring quality of concrete materials and construction. Review subgrade approval, placement operations, testing, consolidations, construction joints and curing.

2. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
   a. Contractor's Superintendent
   b. Independent Testing Agency
   c. Ready-Mix Concrete Manufacturer
d. Concrete Sub-Contractor  
e. Special Inspector  
f. Owner's Representative

1.06 DELIVERY, STORAGE AND HANDLING  
A. Deliver, store, and handle reinforcement to keep clean (completely free of mud and oils) and prevent bending.

PART 2 PRODUCTS

2.01 FORM-FACING MATERIALS  
A. Smooth Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practical sizes to minimize of joints.  
1. Metal or other approved panel materials.  
2. Exterior grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:  
   a. Structural 1, B-B, or better, mill oiled and edge sealed.
B. Rough-Formed Finished Concrete: Plywood, lumber, metal or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
C. Pan-Type Forms: Glass-Fiber-Reinforced Plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.
D. Chamfer or Rustication Strips: Wood, metal, PVC, or rubber strips, size as detailed.
E. Form Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.  
F. Form Ties - Non-Exposed Concrete: Factory-Fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.  
   1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of the exposed concrete surface.  
   2. Furnish ties that, when removed, will leave holes not larger than 1 inch in diameter in concrete surface.  
   3. Furnish ties with integral water - barrier plates in walls indicated to receive waterproofing.
G. Form Ties - Exposed Concrete (as indicated): Factory-Fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties with re-usable plastic CONES, designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.  
   1. Caulk all panel joints smooth at all form panel abutments.  
   2. Layout forms for consistent even spacing of ties to create vertical and horizontal alignment of cones.  
   3. Cones to b 1" to 1 1/4" wide and 1" to 1 1/2" deep. Do not fill cone holes.

2.02 STEEL REINFORCEMENT  
A. Recycled Content of Steel Products: Provide products with an average recycle content of steel products so post-consumer recycled content plus one-half of post-consumer recycled content is not less than 25 percent.
B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
C. Low Alloy Steel Reinforcing Bars (Deformed Bars): ASTM A 706/A 706M, deformed. Use when welding is indicated.
D. Plain Steel Wire: ASTM A 82, as drawn.
2.03 REINFORCEMENT ACCESSORIES
   A. Bar Supports: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening, reinforcing bars. Manufacturer bar supports according to CRS's "Manual of Standard Practice" from steel wire or plastic as follows:

2.04 CONCRETE MATERIALS
   A. Portland Cement: ASTM C 150, Type I/II.
   B. Fly Ash: ASTM C 618 except loss on ignition less than 1.0 percent and calcium oxide content less than 30 percent (Class F preferred if available).
   C. Normal Weight Aggregate: ASTM C 33, uniformly graded as follows:
      1. Class: Severe weathering region, Class 3S for all aggregate.
      2. Nominal Maximum Course Aggregate Size: 3/4 inch for elevated slabs, 1 inch for all other concrete applications.
      3. Fine Aggregate (Sand): Free of materials with deleterious reactivity to alkali in cement.
   D. Water: potable and complying with ASTM C 260.

2.05 ADMIXTURES
   A. Chemical Admixtures: Provide admixtures certified by manufacturer to contain less than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.
   C. Water reducing Admixture: ASTM C 494, Type A.
   D. Water Reducing and Set Retarding Admixture: ASTM C 494, Type D.
   E. Water reducing and Set Accelerating Admixture: ASTM C 494, Type E.
   F. Color Pigment: ASTM C 979, synthetic mineral oxide pigments that are non fading and resistant to lime and other alkalis.
      1. Color: As specified by Architect from supplier full range.

2.06 FIBER REINFORCEMENT
   A. Synthetic Fiber: Fibrillated polypropylene fibers engineered and designed for use in concrete complying with ASTM C 116, Type III, 3/4 to 1/2 inches long.

2.07 WATERSTOPS
   A. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers for adhesive bonding to concrete.
      1. Available Products: Subject to compliance with requirements, products that may be incorporated into the work include, but are not limited to, the following:
         a. Volclay Waterstop-RX; Colloid Environmental Technologies Co.
         b. Conceal CS-231; Concrete Sealants Inc.
         c. Swellstop; Greensreak.

2.08 CURING MATERIALS
   A. Moisture Retaining Cover: ASTM C 171, polyethylene film on white burlap-polyethylene sheet.
   B. Clean Water Borne, Membrane Forming Curing Compound: ASTM C 309; Type 1, Class B, 18 to 25 percent solids, non dissipating.
   C. Water: Potable.

2.09 RELATED MATERIALS
   A. Bonding Agent; ASTM C 1059, Type II, non-redispersable, acrylic emulsion or styrene butadiene.
B. Epoxy Bonding Adhesive: ASTM C 881, two component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
   1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardness concrete.

2.10 REPAIR MATERIALS

A. Patching Mortar - Polymer modified cementitious mortar.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Poly-Patch, by Euclid Chemical Co.
      b. Sikatop 122; by Sitka Chemical Co.
      c. EMACO R310, by Master Builders.

B. Repair Mortar: A system for overlay and patching of concrete subject to wheel traffic or moderate chemical exposure.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Emaco R310, by Master builders inc.
      b. Euco # 456S Mortar, by Euclid Chemical Co.

C. Methylmethacrylate:
   1. Products: Subject to compliance with requirements, provide one of the following:

D. Epoxy Injection: Two-component low-viscosity epoxy adhesive for pressure injection grouting.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. SCB Concersive Series, by Masterbuilders, Inc.
      b. Eucopoxy Injection Resin, by Euclid Chemical Co.

E. General: Applicable for use on floor slabs covered by flooring materials only.

F. Repair Underlayment (Beneath Floor Covering): Cement-based, polymer-modified, self-leveling product that can be applied in thickness from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
   1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
   2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
   3. Aggregate: Well-graded, sashed gravel, 1/8 to 1/4 inch of coarse sand as recommended by underlayment manufacturer.
   4. Compressive Strength: Not less than 4000 psi in 28 days when tested according to ASTM C 109/C 109M.

G. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thickness from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
   1. Cement Binder: ASTM C 150, Portland cement or hydraulic or blended hydraulic or blended hydraulic cement as defined in ASTM C 219.
   2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
   3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
   4. Compressive Strength: Not less than 4000 psi at 28 days when tested in according to ASTM C 109/C 109M.

H. Repair Topping: Self-leveling, polymer-modified high strength topping.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Thin-Top Patch, by Euclid Chemical Co.
      b. Topping 112, by Master Builders, Inc.
2.11 CONCRETE MIXES

A. Prepare design mixes for each type and strength of concrete proportioned by either laboratory trial mix or field test data or both:
   1. Proportion normal-weight concrete according to ACI 301.
   2. Use a qualified independent testing agency for preparing and reporting proposed mix designs for laboratory trial mixes.

B. Foundation Walls, Foundation Pilasters, Piers, Pile Caps, Grade Beams and Concrete Walls. Proportion normal weight concrete mix to comply with key perimeters as follows:
   1. As indicated in drawings.

C. Footings Cast on Grade (Use Class A at Contractor’s Option): Proportion normal weight concrete mix to comply with key parameters as follows:
   1. As indicated in drawings.

D. Interior-Slab-On-Grade and Elevated Slabs: Proportion normal weight concrete mix to comply with key parameters as follows:
   1. As indicated in drawings.

E. Matt Foundations: Proportion normal weight concrete mix to comply with key parameters as follows:
   1. As indicated in drawings.

F. Cementitious Material: Include percentage, by weight, of cementitious materials other than portland cement in concrete as follows except that the minimum content may be waived for cold weather placement:
   1. Fly Ash: 10 percent minimum, 40 percent maximum.

G. Air Content: Add air entraining admixtures at manufacturer's prescribed rate to result in concrete at point of placement having and air content as described within tolerance of plus 1.5 or minus 1.0 percent.

H. Limit Water Soluble, chlorine-ion content in hardened concrete to 0.15 percent by weight of cement.

I. Admixtures: Use admixtures according to manufacturer's written instructions.
   1. Use Water-Reducing Admixture in concrete for placement and durability.
   2. Use Water-Reducing Admixture when required by high temperatures, low humidity or other adverse placement conditions.
   3. Use set retarding admixture in drilled pier content when temporary casing is withdrawn.

2.12 ADJUSTMENT TO CONCRETE MIXES

A. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.

B. Mix design adjustments may be requested by the contractor when characteristics of materials, use of admixture, job conditions, methods of placement, weather, test results, or other circumstances warrant such adjustments provided, there are no additional costs to the Owner and adjustments are accepted by the Engineer.

C. If, during the progress of work, the contractor desires to use materials other than those approved originally, or if materials from the source originally approved change in characteristics, additional tests shall be made with new materials which will produce concrete meeting specified requirements.
   1. These additional tests shall be made by the Testing Agency, at the expense of the Contractor. No concrete made from such different materials shall be used in the work until approved by Engineer.

D. If, during the progress of the work, it is impossible to secure concrete of the required workability and strength with the materials being furnished by the vendor, the Engineer may order such changes in the proportions or materials, or both, as may be necessary to secure the desired
properties, subject to the specified requirements. Any changes ordered shall be made at the Contractor's expense - no extra compensation will be allowed for such changes.

**2.13 FABRICATING REINFORCEMENT**

A. Fabricate steel reinforcement according to "CRSI's "Manual of Standard Practice".
   1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.

**2.14 CONCRETE MIXING**

A. Ready-Mixed Concrete: Measure, batch, mix and deliver concrete according to ASTM C 94 and ASTM C 1116. Furnish batch ticket information itemizing actual weights or volumes of all materials comprising the mix (total water content must include fine aggregate moisture).
   1. When air temperature is between 85 and 90 degrees F, reduce mixing and delivery time from 90 to 75 minutes; when air temperature is above 90 degrees F, reduce mixing and delivery to 60 minutes.

**PART 3 EXECUTION**

**3.01 FORMWORK**

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads, and construction loads that might be applied, until concrete structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 or as indicated.
   1. Lateral alignment tolerance for foundation walls and grade beams: plus 1/4 inch, minus 1/4 inch.
   2. Level alignment/elevation at top of foundation walls and grade beams: plus 1/4 inch, minus 3/8 inch.
   3. Level alignment/flatness at top of foundation walls and grade beams: 1/4 inch/10 foot straightedge.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
   1. Class A, 1/4 inch: Foundation walls and grade beams.
   2. Class B, 1 inch: Footings.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. For all concrete exposed to view PROVIDE SMOOTH CAULK FILLING AT ALL FORM-PANEL JOINTS TO RESULT IN SMOOTH WALL SURFACE.

F. Fabricate forms for easy removal without hammering and prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.
   1. Do not use rust-stained steel form-facing material.

G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

H. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted on forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

I. Chamfer all exterior corners and edges of permanently exposed concrete.

J. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in this work. Determine sizes and locations from trades providing such items.

K. Clean forms and adjacent surfaces to receive concrete. Remove all chips, wood, sawdust, dirt, and other debris just before placing concrete.
L. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

M. Coat contact surfaces of forms with foam-release agent, according to manufacturer's written instructions, before placing reinforcement. Do not containment reinforcing with form-release agent.

### 3.02 EMDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install and accurately hold anchor rods perpendicular to the theoretical bearing surface. As constructed tolerances, as compared to Design Plans, are as follows:

2. Install and accurately hold embedment plates flush with concrete face. As constructed tolerances, as compared to Design Plans, as follows:

### 3.03 REMOVING AND REUSING FORMS

A. General: Formwork for sides and beams, walls, columns, and similar parts of work that does not support weight of concrete may be removed after cumulatively curing not less than 50 deg F for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28 day design compressive strength.

2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Engineer.

### 3.04 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing and tying reinforcement.

B. Clean reinforcement of loose rust and mill scale, soil, ice, oils and other foreign materials.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain specified location or minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, away from exposed concrete surfaces.

E. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.

### 3.05 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer.
1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated.

2. Form from preformed galvanized steel, plastic keyway-section forms, or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.

3. Locate joints where indicated.

4. Space vertical joints as indicated.

5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces where indicated.

C. Contraction Joints in Slabs-on-Grade: Construct weakened plane contraction joints, sectioning concrete into areas as follows:
   1. Sawed Joints: Construct contraction joints with power saws. Soft cut 1/8 inch wide joints in concrete when cutting action will not tear, abrade, or otherwise damage surface but before concrete develops random contraction cracks - generally within 8 hours of concrete finishing.

D. Isolation Joints in Slab-on-Grade: After removing formwork, install joint filler at slab junctions with vertical surfaces, such as column pedestals, and foundation walls unless indicated otherwise. Joint filler must cover the full depth of slab except where sealant reservoir is required on the top edge.
   1. Hold joint filler 1/2 inch below slab surface and seal.

3.06 WATERSTOPs

A. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths possible.

3.07 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement and embedded items are complete, that control survey verifies specified tolerances are achieved, and that required inspections have been performed.

B. Before placing concrete, water withheld at batch plant, if any, may be added at project site to reach slump limits indicated. In no case shall the water/cementitious ratio be exceeded.
   1. Do not add water after compressive test specimens have been taken.
   2. Do not re-temper more than once per ACI 301 criteria.
   3. Confirm batch/time of delivery for placement within allowable ACI 301 criteria of 90 minutes maximum or 300 drum revolutions.

C. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. Deposit concrete to avoid segregation.
   1. Deposit concrete in wall forms in horizontal layers no deeper than 36 inches and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.
   2. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
   3. Do not use vibrators to transport concrete inside forms. Quickly insert and slowly withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer, then slowly withdraw at an approximate rate of 3 seconds per vertical foot. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, hold duration of vibration time as necessary to consolidate concrete and complete embedment of reinforcement and other embedded items.

D. Cold-Weather placement: Comply with ACI 306.1-02 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When air temperature has fallen to or is expected to fall below 40 degrees F, for several consecutive days, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents in the concrete mix.

E. Hot-Weather Placement: Place concrete according to recommendations in ACI 305.1-06 and as follows, when hot weather conditions exist:
   1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Shading and sprinkling aggregate stock piles and/or using chilled mixing water or chopped ice may be used to control temperature, provided water equivalent(s) are calculated to total amount of mixing water.
   2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient temperature before placing concrete.
   3. May fog spray forms and steel reinforcement before placing concrete.

3.08 FINISHED FORMED SURFACES
A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347R limits for class of surface specified.
B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch in height.
   1. Apply to concrete surfaces exposed to public or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, or painting.
C. Rubbed Finish: Apply the following to smooth-formed finished as cast concrete where indicated:
   1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
   2. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.
D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.09 FINISH SLABS
A. General: Comply with recommendations in ACI 302.1R for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces during finishing operations. Coordinate finish with architectural finish plans or intended use.
B. Surface tolerances for slabs are as follows: (Anticipate some grinding at construction joints).
   1. Finish surface such that the gap at any point between concrete surface and an unleveled freestanding 10 foot long straightedge, resting on two high spots and placed anywhere on the surface, does not exceed the following:
      a. Plus 1/4 inch, minus 1/4 inch - slabs on grade.
   2. Finish surface such that any single spot measured does not exceed the following:
      a. Plus 1/2 inch, minus 1/2 inch - slab on grade.
3. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 155M), for randomly trafficked floor surface:
   a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
   b. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slab on grades.
   c. Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and the levelness, F(L) 17; for suspended slabs.
   d. Specified overall values of flatness, F(F) 45; and of levelness, F(L) 35; with minimum local values of flatness, F(F) 30; and of levelness, F(L) 24.

C. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power driven trowel. Continue troweling passes and re-straighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph applied coatings or floor covering.
   1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with floor materials or treatments.
   2. Alternate Finish: Apply finish required for special coverings in accordance with specifications for such coverings.

3.10 MISCELLANEOUS CONCRETE ITEMS
   A. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.
   B. Steel Pan Stairs: Provide concrete fill for steel pan treads, stair landings, and associated items. Cast-in inserts and accessories as shown on the drawings. Screed, tamp, and trowel finish concrete surface.

3.11 CONCRETE PROTECTION AND CURING
   A. General: Protect freshly placed concrete from premature drying and excessive cold and hot temperatures. Comply with ACI 306R for cold weather protection and with recommendations in ACI 305R for hot weather protection during curing.
   B. Formed Surfaces: Cure formed concrete surfaces, including sides of beams or walls, and other similar surfaces. If removing forms before end of three days curing period, continue curing by applying curing compound.
   C. Unformed Surfaces: Cure by covering for three days or applying curing compound beginning immediately after concrete placement.
   D. Evaporation Retarder: Apply evaporation retarder to concrete slab surfaces in warm, dry, or windy conditions before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or drying concrete, but before float finishing.
   E. Slab Surfaces: Begin curing immediately after finishing concrete by the following method:
      1. Moisture-Retaining Cover Curing: Immediately after finishing, cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped and sealed. Cure for at least seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape. Comply with cover manufacturer's recommendation.

3.12 JOINT FILLER
   A. Prepare, clean, and install joint filler according to manufacturer's written instructions and in accordance with Division 07 Section - Joint Sealants.
      1. Defer joint filling as long as possible, preferably after concrete has aged at least three months. Do not fill joints until construction traffic has permanently ceased.
      2. Saw cut sealant reservoir (final pass) where detailed on plans. Remove dirt, debris, saw cutting and sealers from joints; leave contact faces of joint clean and dry.
3.13 CONCRETE SURFACE REPAIRS

A. Defective Concrete: The contractor is solely responsible for the concrete work being within tolerances and quality appearance. Surfaces exceeding tolerances shall be corrected by an industry acceptable method, submitted by the contractor for review by the engineer. Where satisfactory correction of work cannot be accomplished, the contractor shall remove all defective concrete, as directed. Full cost of removal of non-conforming concrete and its replacement with concrete meeting the specified tolerances shall be borne by the contractor. Repair and patch defective areas when approved by the Engineer. Remove and replace concrete that, in the engineer's judgement, cannot be successfully repaired or patched.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing. Employ same source of cement and aggregate as used in the parent concrete.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
   1. Immediately after removal of forms remove wooden cones or cut of metal ties at least 1-1/2 back from all exterior surfaces exposed to view or which are to be finished.
   2. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete, but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with a bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent. Hammer the grout into the hole until dense and an excess of paste appears on the surface. Trowel smooth with heavy pressure.
   3. If voids exist around reinforcement, chip to provide a clear space at least 3/8 inch wide all around the steel to afford proper ultimate bond thereto. For areas less than 1-1/2 inch deep, the patch may be made in the same manner as described above for filling form tie holes, care being exercised to use adequately dry (non-trowlable) mixtures and to avoid sagging. Thicker repairs shall require build up in successive days, each layer being applied (with slurry, etc) as described.
   4. Repair defects on surfaces exposed to view by blending with portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Batch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
   5. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by the Engineer.

D. Repair all cracks as follows:
   1. Repair isolated random cracks on horizontal surfaces exposed to freeze thaw less than 0.020 inch wide, using mythylmethacrylate product specified.
   2. Repair isolated random cracks on horizontal surfaces exposed to freeze thaw 0.020 to 0.040 inch wide, route and seal with specified sealant product.
   3. Repair isolated random cracks on all horizontal surfaces more than 0.040 inch wide, using epoxy injection.
   4. Repair isolated random cracks on vertical surfaces more than 0.025 inch wide, using epoxy injection.
   5. Use epoxy-based mortar for structural repairs, where directed by the engineer.
   6. Use pressure injected epoxy for structural repairs, where directed by the engineer.

E. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.

3.14 FIELD QUALITY CONTROL
A. Testing and Inspection Agency: Owner will engage a qualified independent testing and inspection agency to sample materials, performed tests, and inspections and submit reports sampling and testing for quality control includes items specified below.
   1. The contractor must advise the Testing and Inspection Agency at least 36 hours in advance of concrete placement.
   2. Inspection tasks are outlined in Structural General Notes on Plans.

B. Concrete Testing: Testing of composite samples of fresh concrete obtained according to ASTM C 1172 shall be performed according to the following requirements:
   1. Testing Frequency: Obtain at least one composite sample for each 50 cu. yd. or fraction thereof of each concrete mix placed each day for all daily placements over 5 C.Y.
      a. When frequency of testing will provide fewer than five compressive-strength tests for concrete mix, testing shall be conducted from at least five randomly selected batches.
   2. Testing Location: Final fresh concrete properties shall be tested and recorded or samples taken at point of use i.e. test materials as placed.
   3. Slump: ASTM C 143; one tests at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
   4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample at point of placement, but not less than one test for each day's pour of each concrete mix.
   5. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below or when 80 deg F and above, and one test for each composite sample.
   6. Compression Test Specimens: ASTM C 31/C 31M; cast; from material at point of placement, and laboratory cure one set of three standard cylinder specimens for each composite sample.
   7. Compressive-Strength Tests: ASTM C 39; test one laboratory-cured specimen at 7 days and two at 28 days, maintain one specimen in reserve for each sample.
      a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at age indicated.
      b. Strength of each concrete mix will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

C. The concrete testing technician must immediately inform the contractors project superintendent of sample test results.
   1. Concrete incorporated in the work that does not comply with all specified fresh concrete properties is subject to rejection and replacement at the contractor’s expense.

D. Testing results shall be reported in writing to Engineer, Concrete Manufacturer, and Contractor within 48 hours of testing. Reports of tests shall contain project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in work by grid designation and elevation, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for 28 day tests.

E. Nondestructive Testing: impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as a sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Engineer.
G. Correct deficiencies in the work, that test reports and inspections indicate does not comply with the contract documents, as directed by the engineer.

END OF SECTION
SECTION 03 3010
ANCHORAGES TO CONCRETE

PART 1 GENERAL

1.01 SUMMARY
A. This section includes anchorages to concrete and grouted masonry.
B. Related Sections: The following sections contain requirements that relate to this section.
   1. Division 01 Section "Quality Control" for independent testing agency procedures and administrative requirements.
   2. Division 03 Section "Cast-In-place Concrete" for concrete work.

1.02 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's published data.
C. Shop Drawings detailing fabrication of cast-in-place anchors and anchorage assemblies.
   1. Indicate details of cuts, connections, splices, holes and other pertinent data.
   2. Indicate welds by standard AWS symbols, show size, length and type of weld.
   3. Indicate type, size, and length of rods or components.
D. Anchor Rod Setting Plan:
   1. Draw Anchor Rod and Embedment Setting Plans at scale matching that of structural plans. Show all grid lines. Show all columns graphically and label each column size. For columns that change in size above lowest level, show only the label corresponding to the lowest length of column. Dimension the exact location of each column relative to the nearest grid. Show each anchor bolt graphically and label the size, projection and type. Dimension the location of each anchor bolt relative to the associated column. Indicate top of concrete and bottom of base plate elevation. Use exaggerated scale on column and anchor bolt as necessary to clearly and legibly show dimension.
E. Mill test report signed by manufacturer certifying that their products or materials comply with requirements.
   1. Steel, include chemical and physical properties.
   2. Rods, nuts and washers, including mechanical properties and chemical analysis.
   3. Shear stud connectors.
   4. Adhesives.

1.03 QUALITY ASSURANCE
A. Fabricator Qualification: Engage a firm experienced in fabricating structural steel similar to that indicated for his project and with a record of successful in service performance, as well as sufficient production capacity to fabricate structural steel without delaying work.
B. Comply with applicable provisions of the following specifications and documents.
   1. AISC 360-05 "Specifications for Structural Steel Buildings".
C. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code-Steel".
   1. Present evidence that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.04 DELIVERY, STORAGE, AND HANDLING
A. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms or other supports. Protect steel members and packages materials from erosion and deterioration.
   1. Store fasteners in a protected place. Clean and re-lubricate bolts and nuts that become dry and rusty before use.
2. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.05 SEQUENCING

A. Supply anchorage items to be embedded in or attached to other construction without delaying the work. Provide setting diagrams, templates, instructions, and directions, as required, for installation.

PART 2 PRODUCTS

2.01 CAST-IN-PLACE CONCRETE ANCHORS

A. Steel Plates, Bars, Angles and Channels
   1. Carbon Steel: ASTM A 36 (ASTM A 36M)

B. Deformed Bars: ASTM A 706, Grade 60, deformed (use where indicated to be welded).

C. Shear Connectors/ Headed Anchor Studs: ASTM A 108, Grade 1015 through 1020, headed stud type, cold finished carbon steel, AWS D1.1, Type B.

D. Anchor Rods, Bolts, Nuts and Washers: As follows:
   2. Washers: ASTM A 36 (ASTM A 36M)

E. Welding Electrodes: Comply with AWS requirements.

F. Polished: Finish.

2.02 POST INSTALLED CONCRETE ANCHORS

A. Adhesive Set Anchors
   1. Anchors and adhesive shall be evaluated and meet the requirements of ASTM E 512.
   2. Adhesive anchors set for seismic resistance shall be continually inspected by the Project Special Inspector.

B. Concrete Heavy Duty Screw Anchors:
   1. Screw anchors to adhere to ACI 355.2 listing for Cracked and Un-cracked Concrete Anchors. Anchors that satisfy these requirements require periodic inspection only. All others will require continual inspection by the Project Special Inspector.
   2. Screw anchors shall meet the requirements of ASTM E 512.

C. Mechanical Expansion Anchors:
   1. Mechanical Expansion Anchors to be continually inspected by the Project Special Inspector unless the anchor adheres to ACI requirements for Cracked and Un-cracked Concrete Anchors.

END OF SECTION
SECTION 03 3519
COLORED CONCRETE STAIN FINISH

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Water-Based concrete stain for concrete surfaces.

1.02 RELATED REQUIREMENTS
A. Section 03 3000 - Cast-in-Place Concrete: Concrete mix design; bonding and chemical admixtures; mixing; placement; finishing of concrete surface to tolerance: floating, troweling, and similar operations; frequency and treatment of control joints.

1.03 REFERENCE STANDARDS
A. ACI 301 - Specification for Structural Concrete for Buildings.
B. ACI 302.1 - Guide for Concrete Floor and Slab Construction.
C. ACI 303.1 - Standard Specifications for Cast-In-Place Architectural Concrete.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
C. Samples for Concrete Color Selection: Manufacturer's color chart or sample chip set; indicating color number and application rate.
D. LEED Submittal:
   1. LEED Report: VOC content of all interior opaque coatings actually used.

1.05 MOCK-UPS
A. Construct mock-up(s) of stamped concrete to serve as basis for evaluation of workmanship.
   1. Number of Mock-Ups to be Prepared: One.
   2. Use same materials and methods for use in the work.
   3. Locate where directed.
B. Obtain approval of mock-up by Mosaic Architecture before proceeding with work.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Acceptable Manufacturer: L.M. Scofield Company, which is located at: 4155 Scofield Rd; Douglasville, GA 30134; www.scofield.com.
B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS
A. Water-Based Concrete Stain: LITHOCHROME Tintura is a high performance, self-priming, low-odor, reactive polymer stain for use on interior or exterior, vertical or horizontal concrete and other cementitious surfaces that is designated for use as a primer/basecoat beneath clear solvent or waterborne acrylic, urethane or epoxt sealers.
   1. Description: A unique self-crosslinking system of acrylic and inorganic silicate polymers that penetrate, strengthen, and tightly bind color to cementitious surfaces.
   2. Conformance: Contains no VOC's and Complies with applicable air quality management regulations.
PART 3 EXECUTION

3.01 EXAMINATION
   A. Examine surfaces and areas to receive concrete stain.

3.02 PREPARATION
   A. Clean surfaces thoroughly prior to installation.
   B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   C. Stain must only be used on dry concrete that is above grade or on ground that is well-drained. Do not use on damp concrete, concrete slabs on damp ground, or on concrete that will be constantly exposed to moisture.
   D. If recommended by the manufacturer, perform a Moisture Vapor Emission Rate (MVER) test of the concrete or cementitious substrate. The MVER must be less than 5 pounds per 1000 square feet per 24 hours (2.5 kg/100 m²/24 hr) for successful application of LITHOCHROME Chemstain Classic and sealing with SCOFIELD Selectseal Plus.
   E. Protect adjacent surfaces with plastic sheeting during color staining and sealing.

3.03 APPLICATION
   A. Water-Based Concrete Stain: Apply LITHOCHROME Tintura as recommended by the manufacturer to achieve the color and finish required to match the approved mock-up.
      1. Apply by brush, roller, HVLP, airless, or pump-spray application. Remove overspray immediately with hot water and industrial detergent. Dried material will be difficult to remove.
      2. Stain is designed to penetrate surfaces. If applied heavily over tape, it will crawl and stain under the tape. When tape masking is used, spray application of multiple light coats is recommended.
      3. Apply additional coats if required to produce artistic effects required to match the approved mock-up. Allow to dry for at least 12 hours before application of sealer.
      4. All chemically stained surfaces must be protected from traffic until they are sealed.
      5. Apply sealer as recommended by the manufacturer at the rate required to match the mock-up.

3.04 PROTECTION
   A. Do not allow traffic on finished surfaces for the following periods after application:
      1. Foot Traffic: Minimum 24 hours.
      2. Heavy Traffic: Minimum 72 hours.
   B. Protect finished work from damage during construction and ensure that, except for normal weathering, work will be without damage or deterioration at time of Substantial Completion.

END OF SECTION
PART 1  GENERAL

1.01  SUMMARY
A. This section specifies procedures for placement of elevated, concrete slabs on composite steel floor deck supported by non-shored structural steel framing including installation shear connectors/headed anchor studs.

1.02  RELATED REQUIREMENTS
A. Section 03 3000 - Cast-in-Place Concrete.
B. Section 05 3100 - Steel Decking.

1.03  SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Submit a plan of the primary structural steel framing for each floor, indicating top of steel elevations that vary outside those specified.
C. Copies of welding certificates for welding procedures and personnel.
D. Submit for review and approval of the proposed sequence of concrete placement indicating construction joint locations and area placement sequence.
E. Submit plan of project indicating final top of concrete elevations.

1.04  QUALITY ASSURANCE
A. Installer Qualifications: A qualified and experienced installer who has completed elevated concrete slab work similar in material, design, and extent to that indicated for this project and whose work has a record of successful in-service performance.
B. Pre-Installation Conference: Conduct conference at project site to comply with requirements in Division 01 Section "Project Meetings".
   1. Before placing concrete, review concrete mix design and examine procedures for ensuring quality of concrete materials and placement, review detail requirements, structural steel tolerances, headed anchor stud installation, placement operations, construction joint locations, testing, work progress schedule, etc. Coordinate agenda items with Mosaic Architecture.
   2. Required representatives of each entity directly involved with elevated slab placement to attend, include the following:
      a. Contractor's Superintendent
      b. Contractor's Sub-Contractor
      c. Concrete Testing Agency
      d. Mosaic Architecture.
C. Construction Tolerances: Reference the following:
   1. See Division 03 3300 Cast-In-Place Concrete Slabs

PART 2  PRODUCTS

2.01  CONCRETE MATERIALS, MIX AND REINFORCEMENT
A. See Division 03 3000 "Cast-In-Place Concrete Slabs."

2.02  STEEL DECK
A. See Division 05 3100 "Steel Deck."

2.03  SHEAR CONNECTORS (HEADED ANCHOR STUDS)
A. See Division 051200 Section "Structural Steel Framing."

2.04  CURING MATERIALS
A. See Division 03 3000 "Cast-In-Place Concrete Slabs."
PART 3  EXECUTION

3.01  STEEL DECK AND CLOSURE PLATES
A. Inspect deck before concrete placement to ensure that all deck is attached and all headed anchor studs are installed. Check perimeter of proposed placement to ensure that all permanent edges such as closure angles (pour stops), reinforcements or embedments and the like are installed.

3.02  ERECTED BEAM ELEVATIONS
A. Check top of steel elevation at midspan, when cambered, and at each end of the framing member and/or on top of columns before placing concrete. Variations that exceed plus 1/2 inch or minus 1/2 inch will require corrective action as determined by the Engineer.

3.03  SHEAR CONNECTOR (HEADED ANCHOR STUD)
A. Environmental Conditions: Deck and member must be clean and dry. Ambient temperature must be above 10 deg F.
B. Field install studs by automatic end welding or double pass SMAW (stick) welding through steel deck onto beam or girder flanges in compliance with the AWS D1.1 Structural Welding Code.
C. Align studs with a member centerline in one row except that pairs may be installed if the total number required cannot be placed at the minimum spacing in a single row.
D. Where deck span is perpendicular to beam, space studs along the length of the member, symmetrical about midspan, within the following:
   1. Minimum Spacing: 12 inches.
   2. Maximum Spacing: 36 inches.
   3. Distribution: Plans indicate total stud count and segment/length distribution.
E. Where steel deck is perpendicular to beam, space studs along the length of the member, symmetrical about midspan, within the following:
   1. Minimum Spacing: 12 inches.
   2. Maximum Spacing: 36 inches.
   3. Install studs in deck flute towards the supported end of the steel beam, centered between the stiffener rib and the flute wall.
   4. When required number of studs yields spacing more than minimum but less than maximum, begin a minimum spacing at supported end and change to maximum spacing near midspan. See plans for stud count.

3.04  STEEL REINFORCEMENT
A. In addition to WWR coverage over the entire floor area, add rebar at slab perimeter, around openings, at collectors and so forth as indicated on plans.
B. Maintain reinforcing in position during concrete placement by installing positioning devices as required.
   1. Reinforcing must run over the top of the shear connectors on all beam lines. Chair reinforcing from deck at 36 inch maximum spacing.

3.05  CONSTRUCTION JOINTS
A. Place concrete in largest manageable plan area to minimize jointing.
B. Where construction joints are required, locate joints near column lines and perpendicular to deck span (parallel to beams) at approximate 1/4 deck span or 2 foot - zero inches minimum away from beam. Place no concrete over that nearest beam in the front placement. Unless additional reinforcing is indicated, extend WWR reinforcing at least 1 foot - 4 inches through joint.
   1. Coordinate location of joints with structural drawings.

3.06  CONCRETE PLACEMENT
A. General: See Division 03 3000 Section - Cast-in-Place Concrete Slabs.
B. The composite steel deck must be clean before concrete placement - dirt, wire, ceramic debris and any other foreign material must be completely removed.

C. When concrete is placed, deck, beams, and girders will deflect under the fluid load. The intent of the design is for cambered beams and girders to deflect from a cambered to a level condition under the weight of the uniform specified slab thickness. The contractor should anticipate such deflection and its effect on concrete placing, volume and screeding operations.
   1. Temporary shoring of steel beams is not a design or construction phase requirement.

D. Non-cambered beams and girders will also deflect under fluid load of concrete. Anticipate these elements to deflect up to 1/2 inch at midspan, therefore, the slab thickness must be increased to result in a level surface. The contractor should anticipate such deflection and its effect on concrete placing, volume and screeding operations.
   1. Temporary shoring of steel beams is not a design or construction phase requirement.

E. Wrap all columns with 1/2 inch joint filler material or sheet foam over the full slab depth.

F. Before final screeding a particular area, deposit concrete uniformly over the entire tributary width and length of beams or girders supporting that area.

G. Deposit and consolidate concrete slabs on a clean, dry deck in a continuous operation within limits of construction joints, until completing placement of an area.

H. Consolidate concrete during placement operations so that concrete is thoroughly worked around studs, reinforcement, other embedded items and into corners.

I. Check slab thickness and elevation at midpoint of each bay - adjust concrete volume if required and repeat strike off and floating.

3.07 FINISHING SLABS, CONCRETE PROTECTION, CURING AND SURFACE REPAIRS

A. General: See Division 03 3000 Section "Cast-In-Place Concrete Slabs."

B. Surface tolerances for slabs are as follows:
   1. Finish surface such that the gap at any point between concrete surface and an unleveled freestanding 10 foot-long straightedge, resting on two high spots and placed anywhere on the surface, does not exceed the following:
   2. Finish surface such that any single spot measured does not exceed the following:

3.08 FIELD QUALITY CONTROL

A. Testing and Inspection Agency: Owner will engage a qualified independent testing agency to perform blend tests, inspections, and submit reports. Testing procedure and frequency for quality control includes items specified below.
   1. The contractor must advise the testing and inspection agency at least 24 hours in advance of concrete placement.

B. Shear Connectors (Headed Anchor Studs) Testing:
   1. Pre-Production Testing by Installer: Install five-headed anchor studs and bend 30 degrees from original position, as described below, for each production period or change in set-up. If stud welds break, adjust setup or procedures to achieve successful bends. Production installation of shear connectors (studs) can only be performed after trial studs are successful.
   2. Inspection and Testing: Perform bend tests on at least 10 percent of total studs installed. Bend studs 15 degrees from original position by hammer impact on stud head or by placing a pipe lever over the stud. When ambient temperature is below 50 degrees F, bend testing by the lever method is preferred.
   3. Replace studs when welds crack during bend testing.
   4. If more than 10 percent of tested stud welds crack, notify Mosaic Architecture. Replace failed studs and re-test.

C. Cast-In-Place Concrete:
1. Reference Division 03 3000 Section "Cast-In-Place Concrete Slabs."
2. After finishing and curing operations, do not load or allow foot traffic on floor area for at least 24 hours.
3. Within 36 hours of placing concrete, the contractor shall measure and record top-of-slab elevations at supporting columns, at midspan or girders (on column lines) and at two intermediate points of each framing bay.

D. If data indicates that slab placement is in conformance with specified thickness, flatness and levelness, begin next placement using identical methods.
E. If data indicates that slab placement is not in conformance with specified thickness, flatness and levelness, use data collected from slabs already placed to determine required adjustments to placing methods.

END OF SECTION
SECTION 03 4500
PRECAST ARCHITECTURAL CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Architectural precast concrete copings.
B. Supports, anchors, and attachments.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Admixtures.
B. Section 07 9005 - Joint Sealers: Perimeter joints with sealant and backing.

1.03 REFERENCE STANDARDS

A. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).
B. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2011.
G. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2012.
K. IAS AC157 - Accreditation Criteria for Fabricator Inspection Programs for Reinforced and Precast/Prestressed Concrete; 2010.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's information on accessory products, including pigments, admixtures, inserts, plates, etc.
C. Shop Drawings: Indicate layout, unit locations, configuration, unit identification marks, reinforcement, integral insulation, insulated panel system connectors, connection details, support items, location of lifting devices, dimensions, openings, and relationship to adjacent materials. Provide erection drawings.
   1. Include details of mix designs.
D. Samples: Provide one sample on site, 24" long, profiled to match project coping, illustrating surface finish, color and texture.

E. LEED Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete, mix design(s) used showing the quantity of Portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used; use LEED New Product Content Form.

F. LEED requirements: all aggregate and cement to be sourced within 500 miles of project site.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications:
   1. Plant certified under Precast/Prestressed Concrete Institute Plant Certification Program; product group and category A1 - Architectural Precast Concrete.

1.06 MOCK-UP

A. Include mock-up panel with typical window.
B. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Handling: Lift and support precast units only from support points.
B. Protect units to prevent staining, chipping, or spalling of concrete.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Architectural Precast Concrete:
   1. Any manufacturer holding a PCI Group A Plant Certification for the types of products specified; see www.pci.org.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PRECAST UNITS

A. Precast Architectural Concrete Units: Comply with PCI MNL-120, PCI MNL-122, PCI MNL-123, PCI MNL-135, and ACI 318.
   1. Design Loads: Static loads, anticipated dynamic loading, including positive and negative wind loads, thermal movement loads, and erection forces as defined by applicable code.
   2. Calculate structural properties of units in accordance with ACI 318.
   3. Accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
   4. Provide connections that accommodate building movement and thermal movement and adjust to misalignment of structure without unit distortion or damage.

2.03 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi).
   1. Epoxy coated in accordance with ASTM A775/A775M.

2.04 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
C. Water: Clean and not detrimental to concrete.
D. Admixtures: Air entrainment as specified in Section 03 3000.
2.05 SUPPORT DEVICES  
A. Connecting and Support Devices; Anchors and Inserts: ASTM A36/A36M steel; hot-dip galvanized in accordance with ASTM A153/A153M.  
   1. Clean surfaces of rust, scale, grease, and foreign matter.

2.06 MIX  
A. Concrete: Minimum 5000 psi, 28 day strength, air entrained to 5 to 7 percent in accordance with ACI 301.

2.07 FABRICATION  
A. Fabricate in conformance with PCI MNL-117 and PCI MNL-135.  
B. Fabricate and handle epoxy-coated reinforcing bars in accordance with ASTM D3963/D3963M.  
C. Maintain plant records and quality control program during production of precast units. Make records available upon request.  
D. Use rigid molds, constructed to maintain precast unit uniform in shape, size, and finish.  
E. Maintain consistent quality during manufacture.  
F. Fabricate connecting devices, plates, angles, items fit to steel framing members, inserts, bolts, and accessories. Fabricate to permit initial placement and final attachment.  
G. Embed reinforcing steel, anchors, inserts plates, angles, and other cast-in items.  
H. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.  
I. Minor patching in plant is acceptable, providing structural adequacy and appearance of units is not impaired.

2.08 FINISH - PRECAST UNITS  
A. Finish Type A: Smooth steel form finish with not visible form lines. Ensure exposed-to-view finish surfaces of precast units are uniform in color and appearance.

2.09 FABRICATION TOLERANCES  
A. Conform to PCI MNL-117 and PCI MNL-135, except as specifically amended below.

2.10 SOURCE QUALITY CONTROL  
A. Provide testing of concrete mix.  
B. Take one concrete test cylinders for every 20 cu yd of concrete placed; make and cure in accordance with ASTM C31/C31M.  
C. Take one air entrainment test cylinders for each set of exterior concrete test cylinders taken.  
D. Take water absorption test in accordance with PCI MNL-117.

PART 3 EXECUTION  
3.01 EXAMINATION  
A. Verify that building structure, anchors, devices, and openings are ready to receive work of this section.

3.02 ERECTION  
A. Erect units without damage to shape or finish. Replace or repair damaged panels.  
B. Erect units level and plumb within allowable tolerances.  
C. Align and maintain uniform horizontal and vertical joints as erection progresses.  
D. When units require adjustment beyond design or tolerance criteria, discontinue affected work; advise Mosaic Architecture.  
E. Fasten units in place with mechanical connections.  
F. Exposed Joint Dimension: 1/2 inch. Adjust units so that joint dimensions are within tolerances.
G. Seal perimeter and intermediate joints in accordance with Section 07 9005.

3.03 TOLERANCES

A. Erect members level and plumb within allowable tolerances. Conform to PCI MNL-135, except as specifically amended below.
   1. Maximum Plumb Variation Over Height of Structure or 100 ft (whichever is less): Plus or minus 1/2 inch.
   2. Exposed Joint Dimension: Plus or minus 3/16 inch.

END OF SECTION
SECTION 04 2001
MASONRY VENEER

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Clay Facing Brick.
B. Mortar and Grout.
C. Reinforcement and Anchorage.
D. Flashings.
E. Installation of Lintels.
F. Accessories.
G. Ties and Anchors

1.02 RELATED REQUIREMENTS
A. Section 05 4000 - Cold-Formed Metal Framing: Steel stud backup for masonry veneer.
B. Section 07 9200 - Joint Sealants: Sealing control and expansion joints.
C. Section 07 9005 - Joint Sealers: Backing rod and sealant at control and expansion joints.

1.03 REFERENCE STANDARDS
E. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale); 2014.
H. BIA Technical Notes No. 7 - Water Penetration Resistance - Design and Detailing; 2005.
I. BIA Technical Notes No. 28B - Brick Veneer/Steel Stud Walls; 2005.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data for masonry units, fabricated wire reinforcement, and mortar.
C. Samples: Submit two samples of facing brick units to illustrate color, texture, and extremes of color range.
D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
E. Mix Design: For mortar include description of type and proportions of ingredients.
   1. Include test reports, per ASTM C 780, for mortar mixes required to comply with specifications.
F. Cold Weather Procedures: Detailed description of methods, materials and equipment to be used to comply with cold-weather requirements.
G. LEED Submittal:
1. Product Data for MR 5: Regional Materials. For products that have been extracted, harvested or recovered, as well as manufactured within 500 miles of the project site. ALL MATERIALS AS REQUIRED TO BE SOURCED AND MANUFACTURED WITHIN 500 MILES OF PROJECT SITE.

2. Product Data for Credit MR4.1 and Credit MR4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

H. Shop Drawings: For the following:
   1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
   2. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

1.05 QUALITY ASSURANCE

A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from a single manufacturer for each cementitious component and from one source or producer for each aggregate.

C. Testing Service: Owner will engage a qualified independent testing agency to perform testing indicated below. Payment for these services will be made by the Owner. Retesting of materials that fail to meet specified requirements shall be done at the contractor's expense.
   1. Mortar Test (Property Specifications): For each mix required, per ASTM C 780 and table 2103.7(2) IBC 2006.

1.06 MOCK-UP

A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high for each type/coursing area; include mortar and accessories and structural backup in mock-up. Multiple mock-ups may be necessary to show full extent of sourcing and joints.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

B. Handle and store ceramic glazed masonry units in protective cartons or trays. Do not remove from protective packaging until ready for installation.

1.08 FIELD CONDITIONS

A. Cold and Hot Weather Requirements: Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 BRICK UNITS

A. Manufacturers:
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Facing Brick: ASTM C216, Type FBS, Grade SW.
   1. Manufacturer: Mutual Materials;
   2. Color and Texture:
      b. Texture: Smooth.
      c. Norman Face Brick- 3-5/8” x 2-1/4” x 11-5/8”.

2.02 MORTAR AND GROUT MATERIALS
A. Mortar Aggregate: ASTM C144.
B. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
   1. Color(s): As selected by Mosaic Architecture from manufacturer's full range. Expect the color to be in the dark grey range.
   2. Manufacturers:
      b. Substitutions: See Section 01 6000 - Product Requirements.
C. Water: Clean and potable.
D. Accelerating Admixture: Nonchloride type for use in cold weather.
E. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity.

2.03 REINFORCEMENT AND ANCHORAGE - SEE STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION
A. Manufacturer's of Brick Ties:
   1. Manufacturers:
      a. WIRE-BOND; www.wirebond.com
      b. Hohman & Barnard, Inc.; www.h-b.com
      c. Substitutions: See Section 01 6000 - Product Requirements.
B. Brick Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B, sized to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face and allow vertical adjustment of up to 1-1/4 inch.
   1. Anchor Plate: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
   2. Vertical Spacing: 16" O.C.
   3. Horizontal Spacing: 16" O.C.
   4. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
   5. Seismic Feature: Provide lip, hook, or clip on end of wire ties to engage or enclose not less than one continuous horizontal joint reinforcement wire of 0.1483 inch diameter.
C. Dovetail Anchors for Concrete: Dovetail slots 1" 22 ga. galvanized 12 ga. x 1" triangular tie, conforming to ASTM A82. Size as applicable.
D. Anchors specifically noted on the plans shall supersede duplicate notes of this specification.

2.04 FLASHINGS
A. Rubberized Asphalt Flashing: Self-adhering polymer-modified asphalt sheet; 0.025 inch total thickness; with cross-linked polyethylene top and bottom surfaces.
   1. Manufacturers:
      a. Carlisle; Product CCW-705-TWF, Thru Wall Flashing.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.05 ACCESSORIES
A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding.
C. Weep Vent Material:
   1. Description: Non-woven mesh with M-notched bottom. Color to match mortar selected by Architect.
   2. Size: 3/8" x 2-1/2"h x 3-1/2"w.
3. Place weep vents in head joints at exterior wythe of cavity wall located immediately above ledges and flashing, spaced 24 inches on center, unless otherwise shown. Install with notched side down. Leave the side of the brick units forming the vent space unbuttered and clear of mortar. Slide vent material into joint once the brick units forming the weep vent are in place.
4. Submit two samples of weep vent material, actual size and color, and manufacturer's product data sheet.
5. Manufacturers:
   a. CavClear Weep Vents as manufactured by Archovations, Inc; P.O. Box 241; Hudson, WI 54016, 888-436-2620

D. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
E. Termination Bars and reglets: Stainless steel; compatible with membrane and adhesives.
F. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that field conditions are acceptable and are ready to receive masonry.
   B. Verify that related items provided under other sections are properly sized and located.
   C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 COURSING
   A. Establish lines, levels, and coursing indicated. Protect from displacement.
   B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
   C. Brick Units:
      2. Coursing: Three units and three mortar joints to equal 8 inches for modular brick.

3.03 PLACING AND BONDING
   A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
   B. Remove excess mortar as work progresses.
   C. Interlock intersections and external corners, except for units laid in stack bond.
   D. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
   E. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
   F. Isolate top joint of masonry veneer from horizontal structural framing members or support angles with compressible joint filler.

3.04 WEEPS/CAVITY VENTS
   A. Install weeps in veneer walls at 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.
   B. Install cavity vents in veneer walls at 32 inches on center horizontally below shelf angles and lintels and at top of walls.
   C. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

3.05 CAVITY MORTAR CONTROL
   A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
B. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.06 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER
A. Seismic Reinforcement: Connect veneer anchors with continuous horizontal wire reinforcement before embedding anchors in mortar.

3.07 MASONRY FLASHINGS
A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches into adjacent masonry or turn up at least 8 inches to form watertight pan at non-masonry construction.
B. Extend metal flashings through exterior face of masonry and turn down to form drip.
C. Extend EPDM flashings to within 1/4 inch of exterior face of masonry.
D. Lap end joints of flashings at least 6 inches and seal watertight with flashing sealant/adhesive.
E. Where the flashing is not continuous, such as over and under openings in the wall and on each side of vertical expansion joints, the ends of the flashing should be extended both sides and turned up into the head joints at least 1” at the ends, to form a dam.

3.08 LINTELS
A. Install loose steel lintels over openings unless shown otherwise on drawings.
B. Maintain minimum 8 inch bearing on each side of opening.

3.09 CONTROL AND EXPANSION JOINTS
A. Do not continue horizontal joint reinforcement through control or expansion joints.
B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
C. Size control joint in accordance with Section 07 9005 for sealant performance.
D. Form expansion joint as detailed on drawings.

3.10 BUILT-IN WORK
A. As work progresses, install built-in metal door frames and other items to be built into work and furnished under other sections.
B. Install built-in items plumb, level and true to line.
C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
D. Do not build into masonry construction organic materials that are subject to deterioration.

3.11 TOLERANCES
A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
C. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
E. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.

3.12 CUTTING AND FITTING
A. Cut and fit for pipes and conduit. Coordinate with other sections of work to provide correct size, shape, and location.
B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.
3.13 CLEANING
   A. Remove excess mortar and mortar smears as work progresses.
   B. Replace defective mortar. Match adjacent work.
   C. Clean soiled surfaces with cleaning solution.
   D. Use non-metallic tools in cleaning operations.

3.14 FIELD QUALITY CONTROL
   A. Mortar Verification Proportion: For each mix provided shall conform to ASTM C 270 and Table 2103.7(1) in IBC 2009.

3.15 REPAIRING, POINTING, AND CLEANING
   A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
   B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up all joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
   C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
   D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
      1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
      2. Test cleaning methods on sample wall panel, leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning and masonry.
      3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
      4. Wet wall surfaces with water before applying cleaners: remove cleaners promptly by rinsing surfaces thoroughly with clean water.
      5. Clean brick by bucket-and-brush hand-cleaning method described in "BIA Technical Notes 20."
      6. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

END OF SECTION
SECTION 05 1200
STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY
A. Section Includes:
   1. Structural Steel.
   2. Field-Installed Shear Connectors.
B. Related Requirements:
   1. Section 05 3100 "Steel Decking" for field installation of shear connectors through deck.
   2. Section 05 5000 "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame miscellaneous steel fabrications and other steel items not defined as structural steel.

1.03 DEFINITIONS
A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
B. Seismic-Load-Resisting System: Elements of structural-steel frame designated as "SLRS" or along grid lines designated as "SLRS" on Drawings, including columns, beams, and braces and their connections.
C. Heavy Sections: Rolled and built-up sections as follows:
   1. Shapes included in ASTM A 6/A 6M with flanges thicker than 1-1/2 inches (38 mm).
   2. Welded built-up members with plates thicker than 2 inches (50 mm).
   3. Column base plates thicker than 2 inches (50 mm).
D. Protected Zone: Structural members or portions of structural members indicated as "Protected Zone" on Drawings. Connections of structural and nonstructural elements to protected zones are limited.
E. Demand Critical Welds: Those welds, the failure of which would result in significant degradation of the strength and stiffness of the Seismic-Load-Resisting System and which are indicated as "Demand Critical" or "Seismic Critical" on Drawings.

1.04 COORDINATION
A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.05 PREINSTALLATION MEETING
A. Preinstallation Conference: Conduct conference at Project site.

1.06 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Shop Drawings: Show fabrication of structural-steel components.
   1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
   2. Include embedment Drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.

4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.

5. Identify members and connections of the Seismic-Load-Resisting System.

6. Indicate locations and dimensions of protected zones.

7. Identify demand critical welds.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint qualified by testing, including the following:
   1. Power source (constant current or constant voltage).
   2. Electrode manufacturer and trade name, for demand critical welds.

D. Delegated-Design Submittal: For Special Moment Frame (SMF) structural-steel connections indicated to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.07 INFORMATIONAL SUBMITTALS

A. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

B. Qualification Data: For Installer fabricator, shop-painting applicators, professional engineer, and testing agency.

C. LEED Submittal:
   1. MR Credit 2: Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill.
   2. Product Data for Credit MR4.1 and Credit MR4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

D. Welding certificates.

E. Mill test reports for structural steel, including chemical and physical properties.

F. Product Test Reports: For the following:
   1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
   2. Direct-tension indicators.
   3. Tension-control, high-strength, bolt-nut-washer assemblies.
   4. Shear stud connectors.
   5. Shop primers.

G. Survey of existing conditions.

H. Source quality-control reports.

1.08 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD. Specific to this project, the selected fabricator may not sub-contract any portion of this specification section to another fabricator - regardless of intended subcontract fabricators qualifications.

B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
   1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M.
FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

D. Comply with applicable provisions of the following specifications and documents:
   1. AISC 303.
   2. AISC 341 and AISC 341s1.
   3. AISC 360.
   4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 bolts."

1.09 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
   1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
   1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
   2. Clean and lubricate bolts and nuts that become dry or rusty before use.
   3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

PART 2 PRODUCTS

2.01 STRUCTURAL STEEL MATERIALS

A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so post-consumer recycled content plus one-half of pre-consumer recycled content is not less than 50 percent.

B. W-Shapes: ASTM A 992/A 992M.

C. Channels, Angles (M), (S) Shapes: ASTM A 36/A 36M.

D. Plate and Bar: ASTM A 36/A 36M, unless indicated in the Drawings as “Grad 50”, then provide ASTM A 572/A 572M, Grade 50 (345).

E. Cold Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.

F. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
   1. Weight Class: as indicated in the Drawings.
   2. Finish: Black except where indicated to be galvanized.

G. Welding Electrodes: Comply with AWS requirements. Use E70XX electrodes unless noted otherwise or required by WPS.

2.02 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts or tension control, bolt nut washer assemblies with spline ends; ASTM A 562, Grade DH, (ASTM A 563M, Class 10S) heavy hex carbon steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel washers with plain finish.

B. Tension Control, High Strength Bolt Nut Washer Assemblies: Where “A325-SC” tension-control, slip critical bolts are called out in the Drawings, provide ASTM F 1852, Type 1, round head assemblies, consisting of structural bolts and spline ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.
   1. Finish: Plain

C. Shear Connectors: ASTM A 108, Grade 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

D. Unheaded Anchor Rods: ASTM F 1554, Grade grade as indicated in the drawings.
5. Finish: Plain.

E. Headed Anchor Rods: ASTM F 1554, Grade 36, straight.
   1. Finish: Plain.

F. Threaded Rods: ASTM A 36/A 36M or ASTM A 572/A 572M, Grade 50 (345), as indicated in the Drawings.
   2. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
   3. Finish: Plain.

G. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.

2.03 PRIMER
A. Primer: SSPC-Paint 25, Type 1, zinc oxide, alkyd, linseed oil primer.
B. Primer: Fabricators standard lead and chromate free, non-asphaltic, rust-inhibiting primer complying with MPI # 79 and compatible with topcoat.

2.04 GROUT
A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory packaged, non-metallic aggregate grout, non-corrosive and non-staining, mixed with water to consistency suitable for application and a 30 minute working time.

2.05 FABRICATION
A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.
   1. Camber structural-steel members where indicated.
   2. Fabricate beams with rolling camber up.
   3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
   4. Mark and match-mark materials for field assembly.
   5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
   1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to [SSPC-SP 1, "Solvent Cleaning."] [SSPC-SP 2, "Hand Tool Cleaning."] [SSPC-SP 3, "Power Tool Cleaning."]

F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
   1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
   2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
   3. Weld threaded nuts to framing and other specialty items indicated to receive other work.
2.06 SHOP CONNECTORS

A. High Strength Bolts: Shop install high strength bolts according to RCSC's "Specification for Structural Joints using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
   1. Joint Type: as indicated in the Drawings.

B. Weld Connectors: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
   1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.07 SHOP PRIMING

A. Shop prime steel surfaces except the following:
   1. Surface embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
   2. Surface to be field welded.
   3. Surfaces to be high strength bolted and slip critical connections.
   4. Surfaces to receive sprayed fire resistive materials (applied fire proofing).
   5. Galvanized surfaces.

B. Prepare slip critical (listed as A325-SC in the drawings connection surfaces to satisfy Class A fraying surface requirements of RCSC's "Specification for Structural Joints using ASTM A 325 or A 490 Bolts.

C. Surface Preparations: Clean surface to be painted. Remove loose rust and mill scale and spatter, slag or flux deposit. Prepare surfaces according to the following specifications and standard.
   1. SSPC-SP-2, "Hand Tool Cleaning."

D. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at a rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surface.

2.08 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
   1. Provide testing agency with access to places where structural steel work is being fabricated and produced to perform tests and inspections.

B. Bolted Connections: Shop bolted connections will be inspected according to RCSC's "Specification for Structural Joints using ASTM A 325 or A 490 Bolts" and AISC 341-10 "Seismic Provisions for Structural Steel Buildings."

C. Welded Connections: In addition to visual inspection, shop welded connections will be tested and inspected according to AWS D1.1/D1.1M and AISC 341-10 CHJ 360-10 CHN and the following inspection procedures, at testing agency option:
   1. Liquid Penetrate Inspection: ASTM E 165.
   2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will be accepted.
   4. Radiographic Inspection: ASTM E 94.

D. In addition to visual inspection, test and inspect shop-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
   1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
   2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.
E. Prepare test and inspection reports.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify with steel erector present, elevations of concrete and masonry bearing surfaces and locations of anchor rods, bearing plates and other embedment for compliance with requirements.
   1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.
   1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.03 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and in compliance with AISC "Code of Standard Practice for Steel Buildings and Bridges." AISC 303 and AISC 360.

   1. Set plates for structural members on wedges, shims, or setting nuts as required.
   2. Weld plate washers to top of baseplate.
   3. At the braced frame baseplates, if setting/leveling nuts are used, shim with steel and back-off leveling nuts prior to snug tightening anchor rods and grouting below baseplate.
   4. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
   5. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
   1. Level and plumb individual members of structure.
   2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection unless approved by Architect in writing. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must been larged to admit bolts.

H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.
3.04 FIELD CONNECTIONS

A. High Strength Bolts: Install high strength bolts according to RCSC’s "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
   1. Joint Type: Snug tightened, Pretensioned slip critical.

B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality and methods used in correcting welding work.
   1. Comply with AISC 303 and AISC 360 for bearing, alignment adequacy of temporary connections, and removal of paint on surface adjacent to field welds.
   2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.

3.05 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
   1. Verify structural-steel materials and inspect steel frame joint details.
   2. Verify weld materials and inspect welds.
   3. Verify connection materials and inspect high-strength bolted connections.
   4. Perform Pre-Installation Verification Testing of Bolted Assemblies Prior to Steel Erection.

B. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
   1. Provide testing agency with access to places where structural steel work is being fabricated and produced to perform tests and inspections.

C. Bolted Connections: Shop bolted connections will be inspected according to RCSC’s "Specification for Structural Joints using ASTM A 325 or A 490 Bolts" and AISC 341-10 "Seismic Provisions for Structural Steel Buildings."

D. Welded Connections: In addition to visual inspection, shop welded connections will be tested and inspected according to AWS D1.1/D1.1M and AISC 341-10 CHJ 360-10 CHN and the following inspection procedures, at testing agency option:
   1. In addition to visual inspections, field welds will be tested and inspected according to AWS D1.1/D 1.1M and the following inspection procedures, at testing agency's option:
      a. Liquid Penetrant Inspection: ASTM E 165.
      b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will be accepted.
      c. Ultrasonic Inspection: ASTM E 164.
      d. Radiographic Inspection: ASTM E 94.

E. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
   1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
   2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

F. Prepare test and inspection reports.

3.06 REPAIRS AND PROTECTION

A. Touch-up Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
   1. Clean and prepare surfaces by SSPC-SP 2 hand tool cleaning or SSPC-SP 3 power-tool cleaning.
B. Touch-Up Painting: Cleaning and touchup painting are specified in Section 09 9000 Interior Painting and Section 09 9600 Exterior Painting.

END OF SECTION
SECTION 05 3100
STEEL DECKING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Roof deck.
   2. Composite floor deck, roof deck (without concrete).

B. Related Requirements:
   1. Section 033000 "Cast-in-Place Concrete" for normal-weight structural concrete fill over steel deck.
   2. Section 051200 "Structural Steel Framing" for shop- and field-welded shear connectors.
   3. Section 055000 "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of deck, accessory, and product indicated.

B. Shop Drawings:
   1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.03 INFORMATIONAL SUBMITTALS

A. LEED Submittal:
   1. MR Credit 2: Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill.
   2. Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer pre-consumer recycled content.
      a. Include statement indicating costs for each product having recycled content.
   3. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.

B. Shop Drawing: Show layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments of other construction.

C. Product certificates.

D. Welding certificates.

E. Field quality-control test and inspection reports.

F. Research/Evaluation Reports: For steel deck.

1.04 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."

B. Fire-Test-Response Characteristics: Where indicated, provide steel deck units identical to those tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
   1. Fire-Resistance Rating: Indicated by design designations of applicable testing and inspecting agency.
   2. Steel deck units shall be identified with appropriate markings of applicable testing and inspecting agency.

C. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specifications for the Design of Cold-Formed Steel Structural Members."
D. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so post-consumer recycled content plus one-half of post-consumer recycled content is not less than 25 percent.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

PART 2 PRODUCTS
2.01 PERFORMANCE REQUIREMENTS
A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

2.02 ROOF DECK (NON-COMPOSITE DECKING)
A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. ASC Profiles, Inc.; a Blue Scope Steel company.
   2. Canam United States; Canam Group Inc.
   4. Roof Deck, Inc.
   5. Verco Manufacturing Co.
   6. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.
B. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
   1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230), G60 (Z180) zinc coating.
   2. Deck Profile: As indicated.
   3. Cellular Deck Profile: As indicated, with bottom plate.
   4. Profile Depth: As indicated.
   5. Design Uncoated-Steel Thickness: As indicated.
   6. Span Condition: As indicated.
   7. Side Laps: Overlapped.

2.03 ROOF DECK
A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 30, and with the following:
   1. Galvanized and Shop Primed Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (G90 or better) zinc coating; cleaned, pretreated and primed with manufacturer's standard baked on, rust inhibitive primer.
   2. Deck Profile: Type WR, wide rib.
   3. Profile Depth: As indicated on drawings.
   4. Design Uncoated Steel Thickness: As indicated on drawings.

2.04 COMPOSITE FLOOR DECK
A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. ASC Profiles, Inc.; a Blue Scope Steel company.
   2. Canam United States; Canam Group Inc.
   4. Roof Deck, Inc.
5. Verco Manufacturing Co.
6. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.

B. Composite Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with "SDI Specifications and Commentary for Composite Steel Floor Deck," in SDI Publication No. 31, with the minimum section properties indicated, and with the following:
   1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230), G60 (Z180) zinc coating.
   2. Profile Depth: As indicated.
   3. Design Uncoated-Steel Thickness: As indicated.
   4. Span Condition: As indicated.

2.05 ACCESSORIES
  A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
  B. Mechanical Fasteners: Corrosion resistant, low velocity, power actuated or pneumatically drive carbon fasteners; or self drilling, self threaded screws.
  C. Side Lap Fasteners: Corrosion resistant, hexagonal washer head; self drilling, carbon steel screws, No. 10 minimum diameter.
  D. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359 inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
  E. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), of same material and finish as deck, and of thickness and profile indicated.
  F. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
  G. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck. For drains, cut holes in the field.
  H. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck, with 3-inch- (76-mm-) wide flanges and level recessed pans of 1-1/2-inch (38-mm) minimum depth. For drains, cut holes in the field.

PART 3 EXECUTION
3.01 EXAMINATION
  A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
  B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL
  A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 30, manufacturer's written instructions, requirements in this section, and as indicated.
  B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
  C. Locate deck bundles to prevent overloading of supporting members.
  D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
  E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

I. Alternate fasteners from those indicated in the Drawings will not be considered without following the substitutions procedures outlined in the Division 1 specification sections.

3.03 ROOF DECK INSTALLATION

A. Fasten roof-deck panels to steel supporting members as indicated in the Drawings.

B. Side-Lap and Perimeter Edge Fastening: As indicated in the Drawings.

C. End Bearing: Install deck ends over supporting frame as indicated in the drawings, with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:
   1. End Joints: Lapped 2 inches (51 mm) minimum.

D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and mechanically fasten flanges to top of deck. Space mechanical fasteners not more than 12 inches (305 mm) apart with at least one fastener at each corner.
   1. Install reinforcing channels or zees in ribs to span between supports and mechanically fasten.

E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Mechanically fasten to substrate to provide a complete deck installation.
   1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.

3.04 FLOOR DECK INSTALLATION

A. Fasten floor-deck panels to steel supporting members as indicated in the Drawings.

B. Side-Lap and Perimeter Edge Fastening: As indicated in the Drawings.

C. End Bearing: Install deck ends over supporting frame as indicated in the drawings, with a minimum end bearing of 1-1/2 inches (38 mm), with end joints as follows:
   1. End Joints: Lapped 2 inches (51 mm) minimum.

D. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations unless otherwise indicated.

E. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

3.05 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field welds will be subject to inspection.

C. Testing agency will report inspection results promptly and in writing to contractor and Architect.

D. Remove and replace work that does not comply with specified requirements.

E. Additional inspecting, at contractors expense, will be performed to determine compliance of corrected work with specified requirements.

3.06 PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
B. Repair Painting: Wire brush and clean rust spots, welds, abraded areas on top of surface of prime painted deck immediately after installation and apply repair paint.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Formed steel stud exterior wall and interior wall framing.
B. Exterior wall sheathing.
C. Formed steel joist and purlin framing and bridging.
D. Water-resistive barrier over sheathing.

1.02 PERFORMANCE REQUIREMENTS
A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated:
   1. Design Loads: As indicated on drawings.
   2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
      a. Exterior Non-Loading Bearing Framing: Horizontal deflection of 1/600 of the wall height.

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.
C. LEED Submittals:
   1. MR Credit 2: Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill.
   2. Product Data for Credit MR4.1 and MR Credit 4.2: For products having recycled content, documentation indicating percentage by weight of post-consumer and pre-consumer recycled content.
   3. Include statement indicating costs for each product having recycled content.
   4. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.
D. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading welds, and type and location of fasteners, and accessories or items required of related work.
E. Welding Certificates.
F. Qualification data.
G. Product test reports.
H. Research/evaluation reports.

1.04 QUALITY ASSURANCE
A. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements.
C. Fire Test Response Characteristics: Where indicated, provide cold formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
D. AISI Specifications and Standards: Comply with AISI "North American Specifications for the Design of Cold Formed Steel Structural Members" and its "Standard for Cold Formed Steel framing - General Provisions."
PART 2 PRODUCTS

2.01 MATERIALS
A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so post-consumer recycled content plus one-half of pre-consumer recycled content is not less than 25 percent.

B. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated of grade and coating weight as follows:
   1. Grade: ST50H
   2. Coating: G60.
      b. SCAFCO Steel Stud Mfr Co
      c. Substitutions: See Section 01 6000 - Product Requirements.

2.02 EXTERIOR NON-LOAD BEARING WALL FRAMING
A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
   1. Minimum Base Metal Thickness: As indicated on drawings.
   3. Section Properties: As indicated on drawings.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with un-stiffened flanges, and same minimum base metal thickness as steel studs.

C. Vertical Deflection Clips: Manufacturer standard by-pass clip, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment of stud web. Provide service load capacity as indicated in the drawings.

2.03 FRAMING ACCESSORIES
A. Fabricate steel framing accessories from steel sheet, ASTM A 1003/A 103M, Structural grade, Type H, metallic coated, of same grade and coating weight used for framing members, unless otherwise indicated.

B. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot dip process according to ASTM A 123/A 123M.

C. Power Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM R 1190 conducted by a qualified independent testing agency.

   1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

2.04 MISCELLANEOUS MATERIALS
A. Galvanized Repair Paint: SSPC-Paint 20 or DOD-P-21035.

B. Cement Grout: Portland cement, ASTM C 150, Type 1; and clean, natural sand, ASTM C 404. Mix ratio of 1 part cement of 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

C. Shims: Load bearing, high density multimonomer plastic, nonleaching.

D. Sealer Gaskets: Closed cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

PART 3 EXECUTION

3.01 PREPARATION
A. Install sealer gaskets to isolate the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations.
3.02 INSTALLATION OF STUDS
A. Install cold formed metal framing according to AISC's "Standard for Cold Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.
B. Install cold formed metal framing and accessories plumb, square and true to line, and with connections securely fastened.
C. Install framing members in one piece lengths.
D. Install temporary bracing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
E. Install insulation - "thermal insulation" in built up exterior framing members, such as headers, sills, boxed joists, and multiple studs at opening that are inaccessible on completion of framing work.
F. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
G. Erection Tolerances: Install cold formed metal framing level, plumb and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet as follows:
   1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.03 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION
A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as follows: See drawings.
C. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.
D. Isolate non-load bearing steel stud framing from building structure to prevent transfer of vertical loads while providing lateral support.
   1. Connect vertical deflection clips to bypassing studs and anchors to primary building structure.
E. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.
   1. Bridging: Cold rolled steel channel, welded or mechanically fastened to webs of punched studs.
   2. Bridging: Combination of flat, steel sheet straps of widths and thickness indicated and stud track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
   3. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners and stud girts, to provide a complete and stable curtain wall framing system.

3.04 FIELD QUALITY CONTROL
A. Field and shop welds will be subject to testing and inspecting.
B. Remove and replace work where test results indicate that it does not comply with specified requirements.
C. Additional testing and inspecting, at contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
3.05 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, that ensure that cold-formed metal framing is without damage or deterioration at time of substantial completion.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INC
   A. Shop fabricated steel items.

1.02 RELATED REQUIREMENTS
   A. Section 05 5100 - Metal Stairs.
   B. Section 05 5213 - Pipe and Tube Railings.
   C. Section 09 9113 - Exterior Painting: Paint finish.

1.03 REFERENCE STANDARDS
   J. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric); 2014.
   K. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
   P. ASTM B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold-Finished Bar, Rod, and Wire (Metric); 2012.
   S. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
V. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).
X. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. LEED Submittal:
   1. Product data for MR Credit 4.1 and MR Credit 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content.
   2. Include statement indicating costs for each product having recycled content.
   3. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.
C. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
D. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL
A. Steel Sections: ASTM A36/A36M.
B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
C. Plates: ASTM A283.
E. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, plain.
F. Bolts, Nuts, and Washers embedded in concrete at exterior: 316 Stainless steel.
G. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
H. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
I. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION
A. Fit and shop assemble items in largest practical sections, for delivery to site.
B. Fabricate items with joints tightly fitted and secured.
C. Continuously seal joined members by intermittent welds and plastic filler.
D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS
A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
   1. Side Rails: 3/8 x 2 inches members spaced at 20 inches.
   2. Rungs: one inch diameter solid round bar spaced 12 inches on center.
   3. Space rungs 7 inches from wall surface.
B. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.
C. Tree surrounds: grate and tree protectors as detailed: A606 (corten) steel plate, fabricated in thicknesses indicated on drawings.
D. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.
E. Lintels: As detailed; prime paint finish.
F. Elevator Hoistway Divider Beams: Beam sections; prime paint finish.
G. Exterior steel stairs: hot dip galvanized steel, detailed as shown on drawings.
H. Exterior steel stair treads: hot dip galvanized steel grating.
I. Supported Angles: Miscellaneous Cabinetry Countertop Support Angles Where Detailed and Attached to Wall Type: Support angles for miscellaneous channel header support for movable partitions and overhead mounted toilet partitions.
J. Downspout Chains: 3/8" galvanized steel chain.
K. Channel Support Framing: Overhead partitions and movable partitions.

2.04 FINISHES - STEEL
A. Prime paint steel items.
   1. Exceptions: Galvanize items to be embedded in concrete, items to be imbedded in masonry, and items specified for galvanized finish.
   2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
B. Prepare surfaces to be primed in accordance with SSPC-SP2.
C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
D. Prime Painting: One coat.
E. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.
   F. A606 (corten): natural finish left to naturally oxidize.

2.05 FABRICATION TOLERANCES
A. Squareness: 1/8 inch maximum difference in diagonal measurements.
B. Maximum Offset Between Faces: 1/16 inch.
C. Maximum Misalignment of Adjacent Members: 1/16 inch.
D. Maximum Bow: 1/8 inch in 48 inches.
E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that field conditions are acceptable and are ready to receive work.
3.02 PREPARATION
   A. Clean and strip primed steel items to bare metal where site welding is required.
   B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION
   A. Install items plumb and level, accurately fitted, free from distortion or defects.
   B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
   C. Field weld components as indicated on drawings.
   D. Perform field welding in accordance with AWS D1.1/D1.1M.
   E. Obtain approval prior to site cutting or making adjustments not scheduled.
   F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 TOLERANCES
   A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
   B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION
SECTION 05 5100
METAL STAIRS

PART 1 GENERAL

1.01 SECTION INCLUDES
  A. Stairs with grating treads.
  B. Prefabricated stairs.
  C. Structural steel stair framing and supports.
  D. Handrails and guards.

1.02 RELATED REQUIREMENTS
  A. Section 03 3000 - Cast-in-Place Concrete: Concrete fill in stair pans; mesh reinforcement for landings.
  B. Section 05 5213 - Pipe and Tube Railings: Metal handrails for the stairs specified in this section.
  C. Section 09 9113 - Exterior Painting: Paint finish.

1.03 REFERENCE STANDARDS
  A. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
  C. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.

1.04 SUBMITTALS
  A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
  B. Product Data: Provide data on all materials, connectors, and finishes.
  C. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
     1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
  D. LEED Submittal:
     1. Product data for Credit MR 4.1 and Credit MR 4.2: Indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.
     2. Include statement indicating costs for each product having recycled content.
     3. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.
  E. Welders’ Certificates.
  F. Shop Drawings for Ladders:
     1. Plan and section of ladder installation.

1.05 QUALITY ASSURANCE
  A. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," for class of stair designated, unless more stringent requirements are indicated.
     1. Preassembled Stairs: Commercial class.
2. Industrial-Type Stairs: Industrial class.

B. Welder Qualifications: Show certification of welders employed on the Work, verifying AWS qualification within the previous 12 months.

PART 2 PRODUCTS

2.01 METALS

A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the complete work, provide materials without seam marks, roller marks, roller marks, rolled trade names or blemishes.

B. Recycled Content of Steel Products: Provide products with average recycled content of steel products so post-consumer recycled content plus one-half of pre-consumer recycled content is not less than 25 percent.

C. Steel Plates, Shapes and Bars: ASTM A 36/A 26M.

D. Steel tubing: ASTM A 500 (cold formed).

E. Rolled Steel Floor Plate: ASTM A 768/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.

F. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

G. Uncoated, Cold-rolled Steel Sheet: ASTM A 1008/A 1008M, structural steel, Grade 25, unless another grade is required by design loads, exposed.

H. Uncoated, Hot Rolled Steel Sheets: ASTM A 1011/A 1011M, steel, Grade 30 unless another grade is required by design loads.

2.02 METAL STAIRS - GENERAL

A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.

1. Regulatory Requirements: Provide stairs and railings complying with the most stringent requirements of local, state, and federal regulations; where requirements of the contract documents exceed those of regulations, comply with the contract documents.

2. Dimensions: As indicated on drawings.

3. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.

4. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.

5. Separate dissimilar metals using paint or permanent tape.

B. Metal Jointing and Finish Quality Levels:

1. Architectural: All joints as inconspicuous as possible, whether welded or mechanical.
   a. Welded Joints: Continuously welded and ground smooth and flush.
   b. Mechanical Joints: Butted tight, flush, and hairline; concealed fastenings only.
   c. Exposed Edges and Corners: Eased to small uniform radius.
   d. Metal Surfaces to be Galvanized.

2. Industrial: All joints made neatly.
   a. Welded Joints: Welded on back side wherever possible.
   b. Welds Exposed to Touch: Ground smooth.
   c. Bolts Exposed to Touch in Travel Area: No nuts or screw threads exposed to touch.

C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

2.03 METAL STAIRS WITH GRATING TREADS

A. Jointing and Finish Quality Level: Industrial, as defined above.
B. Risers: galvanized closure plate.

C. Treads: Steel bar grating.
   1. Grating Type: Welded.
   2. Bearing Bar Depth: 1 inch, minimum.
   3. Top Surface: Standard.
   6. Anchorage to Stringers: End plates welded to grating, bolted to stringers.

D. Stringers: Rolled steel channels.
   1. Stringer Depth: 12 inches.
   2. End Closure: Sheet steel of same thickness as risers welded across ends.

E. Railings: Steel pipe railings. Detail railings as indicated on drawings.

2.04 ALUMINUM FIXED SHIPS LADDERS

A. Acceptable Manufacturer: Precision Ladders, LLC, which is located at: P. O. Box 2279; Morristown, TN 37816-2279; Toll Free Tel: 800-225-7814; Tel: 423-586-2265; Fax: 423-586-2091; Email: request info (info@PrecisionLadders.com); Web: www.PrecisionLadders.com

   1. Aluminum Fixed Ships Ladder SL-04 as manufactured by Precision Ladders LLC.
   2. Capacity: Unit shall support a 1000 lb (680 Kg) loading without failure, and individual treads shall withstand a 1,000 lb (1361 Kg) loading without failure.
   3. Performance Standard: Units shall be designed and manufactured to meet or exceed ANSI A14.3 and OSHA 1910.27.

C. Components:
   1. Ladder Stringer: 5 inch by 2 inch by 3/16 inch (64 mm by 27 mm by 3 mm) extruded 6005-T5 aluminum channel. Pitch: 60 degrees.
   2. Ladder Tread: 5 3/16" inch by 1 1/8 inch by 1/8 inch (57 mm by 19 mm by 6 mm) extruded 6005-T5 aluminum with deeply serrated top surface. Ladder and tread width 36 inches.
   3. Ladder Mounting Bracket: 8-1/2 inch by 2 inch by 3 inch by 1/4 inch thick (216 mm by 51 mm by 76 mm by 6 mm) aluminum angle.
   4. Railings:
      a. 1 1/4" schedule 40, 6005-T5 aluminum pipe with internal aluminum fittings.
   5. Rest Platform:
      a. Material: Ladder tread material.
      b. Platform Size: 36 inches by 48 inches (762 mm by 1219 mm) standard.
      c. Toe Boards. 6005 T-5 aluminum.
      d. Handrails: 1-1/4 inches (32 mm) aluminum square tube 42 inches (1067 mm) high.
   6. Floor Brackets: Floor bracket at foot of each stringer, 3 by 2 by 1/4 inch (76 by 51 by 6 mm).

2.05 SHOP FINISHING

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
B. Do not prime surfaces in direct contact with concrete or where field welding is required.
C. Prime Painting: Use specified shop- and touch-up primer.
   1. Preparation of Steel: In accordance with SSPC-SP 2, Hand Tool Cleaning.
   2. Number of Coats: One.
PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that field conditions are acceptable and are ready to receive work.

3.02 INSTALLATION
   A. Install components plumb and level, accurately fitted, free from distortion or defects.
   B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
   C. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1/D1.1M.
   D. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.
   E. Obtain approval prior to site cutting or creating adjustments not scheduled.
   F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.03 TOLERANCES
   A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
   B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Wall mounted handrails.
B. Stair railings and guardrails.
C. Balcony railings and guardrails.

1.02 RELATED REQUIREMENTS
A. Section 03 3000 - Cast-in-Place Concrete: Placement of anchors in concrete.
B. Section 05 5100 - Metal Stairs: Attachment plates for handrails specified in this section.

1.03 REFERENCE STANDARDS
C. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
C. Submit design calculations for railing assemblies.
D. LEED Submittal:
   1. MR Credit 2: Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill.
   2. Product Data for Credit MR4.1 and Credit MR4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

PART 2 PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS
A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.
B. Design railing assembly, wall rails, and attachments to resist lateral force per IBC requirements.
C. Allow for expansion and contraction of members and building movement without damage to connections or members.
D. Dimensions: See drawings for configurations and heights.
E. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.

F. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

2.02 STEEL RAILING SYSTEM

A. Steel Pipe: ASTM A 53/A 53M, Grade B Schedule 40, galvanized finish.

B. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.

C. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.

D. Exposed Fasteners: No exposed bolts or screws.

2.03 FABRICATION

A. Accurately form components to suit specific project conditions and for proper connection to building structure.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

D. Welded Joints:
   1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
   2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
   3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

C. Anchor railings securely to structure.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.


END OF SECTION
SECTION 05 7000
ORNAMENTAL RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Lighted Handrail Assembly.

1.02 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations
   3. Installation instructions and methods
   4. Description of materials, components, fabrication, and finishes
C. Shop Drawings: Submit manufacturer's shop drawings, including plans, elevations, sections, and details, indicating materials, components, sizes, dimensions, tolerances, hardware, finishes, options, accessories, and installation. Show details of attaching railing system to supports.
D. Maintenance Instructions: Submit manufacturer's maintenance and cleaning instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Decorative Metal Railings:
   1. Atlantis Rail System; www.atlantisrail.com
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 RAILING SYSTEMS
A. SunRail™ Access Easy System: Pre-engineered, component-based, stainless steel handrail, and posts ornamental railing system.
   1. Posts: Stainless steel structural Tube, 2-inch (50 mm) diameter, Type 316 stainless steel, 4 foot (1219 mm) O.C. maximum.
   2. Handrail: Stainless steel structural tubing, 1-1/2 inch (38 mm) diameter, Type 316 stainless steel. Attached to 2 inch (50 mm) posts with specified connectors and appropriate spacing to comply with ADA Standards.
   3. Stainless Steel Finish:
      a. Polished.
   4. Electrical Components: Micro Star LED Lighting; LEDs encased in Type 316 stainless steel housings; 1/4-inch (6 mm) diameter by 7/8-inch (22 mm) long installed in railings.
B. Decorative metal railings – upright posts, anchors and top rail to be custom fabricated as indicated on drawings.
   1. Cable system: Feeney Standard Cable Rail Assembly or approved equal.
      a. Quick-Connect SS fitting
      b. 1x19, 316 grade stainless steel, 3/16”.
      c. Threaded Terminal Fitting (factory swagged).
      d. Snug-Grip Washer Nuts with Dome End Caps in stainless steel finish

PART 3 EXECUTION

3.01 PREPARATION
A. Take field measurements after permanent end terminations are in place and prior to preparation of shop drawings and fabrication, to ensure fitting of work.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
3.02 INSTALLATION
   A. Install railing system in accordance with manufacturer's instructions.
   B. Install railing system plumb, level, square, true to line, and rigid.
   C. Attach railing system securely in place using fasteners supplied or approved by manufacturer. Embedded anchor plates and supporting steel shall be provided by another trade and coordinated with the railing supplier.
   D. Attach railing system to supports approved by manufacturer.
   E. Install LED lighting components in accordance with manufacturer's instructions.

3.03 CLEANING
   A. Remove temporary coverings and protection of adjacent work areas.
   B. Clean railing system promptly after installation in accordance with manufacturer's instructions.
   C. Do not use harsh cleaning materials or methods that would damage glass or finish.
   D. Do not use abrasive cleaners.

3.04 PROTECTION
   A. Protect installed components and finishes from damage after installation.

END OF SECTION
SECTION 05 7500
DECORATIVE FORMED METAL

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Interior fabrications made of formed metal sheet, secondary supports, and anchors to structure, including:
   1. Decorative-Aluminum Perforated Metal Panel Screen Wall Panels
   2. Decorative-Stainless Steel Quilted Wall Panel.
   3. Metal base.

1.02  SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data - Sheet Metal Material: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Specimen warranty.

C. Shop Drawings: Show layout and elevations, dimensions and thickness of panels, connections, details and location of joints, sealants and gaskets, method of anchorage, number of anchors, supports, reinforcement, trim, flashings, and accessories.
   1. Indicate substrates and adjacent work with which the fabrications must be coordinated.
   2. Include large-scale details of anchorages and connecting elements.

D. LEED Submittal:
   1. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
   2. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.

PART 2  PRODUCTS

2.01  MANUFACTURERS

A. Metal Composite Material Sheet Manufacturers:
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02  DECORATIVE ALUMINUM PERFORATED PANELS

A. Manufacturer: McNichols Company

B. Sheet Size: 4'-0" x 8'-0" - See Drawings

C. Edging: Aluminum Hemmed Edging.

D. Mounting Hardware: See Drawings.

E. McNichols R Quality Perforated Metall Round Hole, Aluminum Type 3003-H14, .125 Gauge, Mill Finish, 1/2" Holes o 11/16" Centers, Staggered Pattern, 48% Open Area.

2.03  DECORATIVE-STAINLESS STEEL QUILTED WALL PANEL

A. Manufacturer: McNichols Company.

B. Sheet Size: 4'-0" x 8'-0" - See Drawings.

C. Trim: 24 gauge 304 stainless steel divide trim molding.

D. Finish: Polished.
E. Mounting: Glue-On application.
F. McNichols Quality Designer Textured Metal, Stainless Steel-Type 304, 3" Diamond Quilt Pattern, Satin # 4 Surface Finish, 22 Gauge.

2.04 STEEL BASE
A. 6" - 16 gauge Hot Rolled Steel Base.
B. Finish: Black Ceramic Coating.
C. Mounting: Glue-On application.

PART 3 EXECUTION
3.01 INSTALLATION - METAL FABRICATIONS
A. Locate and place decorative formed sheet metal items level and plumb; align with adjacent construction. Cut, drill and fit as required to install.
B. Do not cut or abrade sheet metal finishes that cannot be completely restored in the field. Return such items to manufacturer or fabricator for required alterations and refinishing or provide new items.
C. Use concealed anchorages where possible. Provide washers where needed on bolts or screws to protect metal surfaces and make weathertight connection.
D. Form tight joints with exposed connections accurately fitted together. Provide reveals and openings for sealants and joint fillers indicated.

3.02 CLEANING
A. Restore finishes damaged during installation and construction period. Return items that cannot be refinished in the field to manufacturer or fabricator. Refinish entire unit or provide new units.
B. Remove protective film after installation of joint sealers, after cleaning of adjacent materials, and immediately prior to completion of work.
C. Remove temporary coverings and protection of adjacent work areas.
D. Clean installed products in accordance with manufacturer's instructions.

END OF SECTION
SECTION 06 1000
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Rough opening framing for doors, windows, and roof openings.
B. Roof-mounted curbs.
C. Preservative treated wood materials.
D. Fire retardant treated wood materials.
E. Communications and electrical room mounting boards.
F. Concealed wood blocking, nailers, and supports.
G. Miscellaneous wood nailers, furring, and grounds.
H. Plywood backer for wood finishes.

1.02 RELATED REQUIREMENTS
A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 05 1200 - Structural Steel Framing: Prefabricated beams and columns for support of wood framing.

1.03 REFERENCE STANDARDS
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
H. PS 1 - Structural Plywood; 2009.
J. WWPA G-5 - Western Lumber Grading Rules; 2011.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. MR Credit 2: Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill.
C. Wood shall be fire treated as required.

1.05 DELIVERY, STORAGE, AND HANDLING
A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS
A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Douglas Fir-Larch, unless otherwise indicated.
2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.

3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

4. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

B. Lumber fabricated from old growth timber is not permitted.

C. Provide sustainably harvested wood; see Section 01 6000 - Product Requirements for requirements.

2.02 DIMENSION LUMBER

A. Grading Agency: Western Wood Products Association (WWPA).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Stud Framing:
   2. Grade: as indicated on drawings.

E. All wood used in contact with concrete will be pressure treated.

F. Roof nailers, roof coping sub-framing, roof curb nailers:
   1. Lumber S4S, No. 2 or better grade.
   2. Pressure treated.
   3. Verify lumber requirements with roofing manufacturer requirements. Most stringent requirements apply.

G. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, fire treated; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

B. Plywood Backing for Wood Finish: PS 1 A-D plywood, fire treated; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2.04 ACCESSORIES

A. Fasteners and Anchors:
   2. Anchors: Bolt or ballistic fastener for anchorages to steel.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
PART 3  EXECUTION

3.01  PREPARATION
A. Coordinate installation of rough carpentry members specified in other sections.

3.02  INSTALLATION - GENERAL
A. Select material sizes to minimize waste.
B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03  BLOCKING, NAILERS, AND SUPPORTS
A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
B. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
E. Provide the following specific non-structural framing and blocking:
   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Handrails.
   4. Grab bars.
   5. Towel and bath accessories.
   6. Wall-mounted door stops.
   7. Chalkboards and marker boards.
   8. Wall paneling and trim.
   9. Joints of rigid wall coverings that occur between studs.

3.04  INSTALLATION OF CONSTRUCTION PANELS
A. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
   1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
   2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
   3. Install adjacent boards without gaps.

END OF SECTION
SECTION 06 2000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Finish carpentry items.
B. Wood casings and moldings.
C. Hardware and attachment accessories.

1.02 RELATED REQUIREMENTS
A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
C. Section 06 4100 - Architectural Wood Casework: Shop fabricated custom cabinet work.
D. Section 08 1416 - Flush Wood Doors.
E. Section 09 9113 - Exterior Painting: Painting and finishing of finish carpentry items.

1.03 REFERENCE STANDARDS
B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
C. BHMA A156.9 - American National Standard for Cabinet Hardware; 2010.
D. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
F. WDMA I.S. 4 - Industry Specification for Preservative Treatment for Millwork; 2013.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Provide the information required by AWI/AWMAC/WI (AWS).
C. MR Credit 2: Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Protect work from moisture damage.

PART 2 PRODUCTS

2.01 WOOD-BASED COMPONENTS
A. Wood fabricated from old growth timber is not permitted.

2.02 LUMBER MATERIALS
A. Softwood Lumber: [Fir] species, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.
B. Hardwood Lumber: [Oak] species, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish. Tongue and Groove Profile.

2.03 FASTENINGS
A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.
B. Fasteners: Of size and type to suit application; galvanized finish in concealed locations and chrome finish in exposed locations.
C. Concealed Joint Fasteners: Threaded steel.

2.04 ACCESSORIES
A. Primer: Alkyd primer sealer.
B. Wood Filler: Water base, tinted to match surface finish color.

2.05 FABRICATION
A. Shop assemble work for delivery to site, permitting passage through building openings.
B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

2.06 SHOP FINISHING
A. Sand work smooth and set exposed nails and screws.
B. Apply wood filler in exposed nail and screw indentations.
C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
D. Finish work in accordance with AWI/AWMAC/WI (AWS), Section 5 - Finishing for grade specified and as follows:

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify adequacy of backing and support framing.
B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.02 INSTALLATION
A. Install work in accordance with AWI/AWMAC/WI (AWS) requirements for grade indicated.
B. Set and secure materials and components in place, plumb and level.
C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
D. All hardware wall finish to be tongue and groove with hidden fasteners.

3.03 TOLERANCES
A. Maximum Variation from True Position: 1/16 inch.
B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION
SECTION 06 4100
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Specially fabricated cabinet units.
   B. Countertops.
   C. Cabinet hardware.
   D. Factory finishing.
   E. Preparation for installing utilities.

1.02 RELATED REQUIREMENTS
   A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
   B. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
   C. Section 05 5000 - Steel Fabrications for Countertop Support Braces.

1.03 REFERENCE STANDARDS
   A. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
   D. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
   F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, fastening methods, jointing details, accessory listing, hardware location and schedule of finishes.
   C. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.

1.05 DELIVERY, STORAGE, AND HANDLING
   A. Protect units from moisture damage.

1.06 FIELD CONDITIONS
   A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS
2.01 CABINETS
   A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI (AWS) for Custom Grade.

2.02 WOOD-BASED COMPONENTS
   A. Wood fabricated from old growth timber is not permitted.
   B. Provide wood harvested within a 500 mile radius of the project site.
2.03 LUMBER MATERIALS
A. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

2.04 PANEL MATERIALS
A. Hardwood Faced Plywood: HPVA HP-1; graded in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, core of particleboard, medium density fiberboard, strawboard, or engineered combination; type of glue recommended for specific application; thickness as required; face veneer as follows:
   1. Exposed Surfaces: Grade AA, see drawings, plain sliced, slip matched.
   2. Semi-Exposed Surfaces: Grade A, see drawings, rotary cut, random matched.
   3. Concealed Surfaces: Grade B, see drawings, rotary cut, random matched.
B. Particleboard: ANSI A208.1; medium density industrial type as specified in AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, composed of wood chips bonded with interior grade adhesive under heat and pressure; sanded faces; thickness as required; use for components indicated on drawings. No VOC.
C. Medium Density Fiberboard (MDF): ANSI A208.2, type as specified in AWI/AWMAC Architectural Woodwork Quality Standards illustrated; Medite II as manufactured by Sierra Pine. FSC wood products certified. No added formaldehyde. formaldehyde free adhesives. Composed of wood fibers pressure bonded with moisture resistant adhesive to suit application; sanded faces; thickness 3/4 inch for all cabinet boxes, drawer, and door fronts.
D. Marine-grade plywood. A-grade veneer overlaid with a Medium Density Overlay (MDO). See cabinet details for details where marine-grade plywood will be used.

2.05 LAMINATE MATERIALS
A. Manufacturers:
   1. Formica Group Inc: www.formica.com
   2. Wilsonart; www.wilsonart.com
   3. Nevamar; www.nevamar.com
   4. Pionite; www.pionite.com
   5. Arborite; www.arborite.com
   6. Substitutions: See Section 01 6000 - Product Requirements.
B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.
C. Plastic Laminate Schedule:
   1. PL-1: Arborite - Color: Tatami Nezumi - P124
   2. PL-2: Not Used
   3. PL-3: Formica - Color: Black 909-90 (Gloss)
   4. PL-4: Wood Look - T.B.D.
   5. PL-5: Formica 7197-58 Dovewhite

2.06 COUNTERTOPS
A. Quartz Countertops
   1. QTZS1: Dupont; www.dupont.com
      a. Zodiac
      b. Color: Cloud White
   2. QTZS2: Dupont; www.dupont.com
      a. Zodiac
      b. Color: Mystic Black
B. Solid Surface Countertop
   1. SSM1: Dupont - Corian
      a. Color: Arrowroot
b. Alternate to QTZS1.

2. SSM2: Dupont - Corian
   b. Alternate to QTZS2.

C. Stainless Steel Countertops
   1. SS2: Stainless Steel

2.07 ACCESSORIES
A. Adhesive: Type recommended by fabricator to suit application.
B. Fasteners: Size and type to suit application.
C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
D. Concealed Joint Fasteners: Threaded steel.
E. Grommets: Standard plastic grommets for cut-outs, in color to match adjacent surface.

2.08 HARDWARE
A. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards or multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch spacing adjustments.
B. Drawer and Door Pulls: "U" shaped 1/4" x 4" wire handles, stainless steel with stain brushed nickel finish.
C. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with satin finish.
D. Catches: Magnetic.
E. Drawer Slides:
   1. Type: Full extension, heavy duty 150 lbs rated slides.
   2. Static Load Capacity: Heavy Duty grade.
   4. Stops: Integral type.
   5. Features: Provide self closing/stay closed type with soft-close assembly.
F. Hinges: European style concealed self-closing type, all way adjustable, 120 degree opening, commercial grade, steel with satin finish.

2.09 SHOP TREATMENT OF WOOD MATERIALS
A. Stain, Shellac, Varnish and Finishing Materials.

2.10 FABRICATION
A. Cabinet Style: 3/4 inch base panel thickness, full overlay.
B. Cabinet Doors and Drawer Fronts: 3/4 inch base panel thickness, flush overlay.
C. Drawer Construction Technique: Dovetail joints.
D. Assembly: Shop assemble cabinets for delivery to site in units easily handled and permit passage through building openings.
E. Edging: Fit shelves, doors, exposed edges with specified edging. Do not use more than one piece for any single length.
F. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
G. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
   1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
H. Mechanically fasten back splash to countertops as shown at 16 inches on center.
I. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

2.11 COUNTERTOPS

A. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
   1. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
   2. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
   3. NSF approved for food contact.
   5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
   6. Skirts: As indicated on drawings.
   7. Fabricate in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 11 - Countertops, Premium Grade.

B. Stainless Steel Countertops: ASTM A666, Type 304, stainless steel sheet; 16 gage, 0.0625 inch nominal sheet thickness.
   1. Finish: 4B satin brushed finish.
   2. Edge and Backsplash Sink Details: As indicated on drawings.

C. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin over continuous substrate.
   1. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
   2. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with the MIA Dimension Stone Design Manual.
   3. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
   4. NSF approved for food contact.

2.12 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.
B. For opaque finishes, apply wood filler in exposed nail and screw indentations and sand smooth.
C. On items to receive transparent finishes, use wood filler matching or blending with surrounding surfaces and of types recommended for applied finishes.
D. Finish work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Section 1500, nitrocellulose Lacquer, Transparent.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.
B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
B. Use fixture attachments in concealed locations for wall mounted components.
C. Use concealed joint fasteners to align and secure adjoining cabinet units.
D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
E. Secure cabinets to floor using appropriate angles and anchorages.
F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 ADJUSTING
A. Adjust installed work.
B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING
A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION
SECTION 07 1113
BITUMINOUS DAMPPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Bituminous dampproofing.

1.02 RELATED REQUIREMENTS
A. Section 31 2323 - Fill.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide properties of primer, bitumen, and mastics.
C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
D. LEED Report: Submit for products that meet VOC content limits of 500 g/L for bituminous coatings and mastics as required by the U.S. EPA Architectural Coating rule.

1.05 QUALITY ASSURANCE
A. Deliver materials to site in manufacturer's original, unopened containers and packaging with labels clearly identifying product name and manufacturer.
B. Store materials in a clean dry area in accordance with manufacturer's instructions.
C. Store in temperatures of 40 degrees F and above to facilitate handling.
D. Do not store at temperatures above 90 degrees F for extended periods.
E. Keep away from sparks and flames.
F. Protect materials during handling and application to prevent damage or contamination.

1.06 FIELD CONDITIONS
A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until dampproofing has cured.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Acceptable Manufacturers:
   4. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.
C. Verify that items that penetrate surfaces to receive dampproofing are securely installed.

### 3.02 PREPARATION

A. Protect adjacent surfaces not designated to receive dampproofing.
B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.
C. Do not apply dampproofing to surfaces unacceptable to manufacturer.
D. Apply mastic to seal penetrations, small cracks, or minor honeycomb in substrate.

### 3.03 APPLICATION

A. Perform work in accordance with NRCA Roofing and Waterproofing Manual.
B. Apply bitumen with roller. Minimum two coats.
C. Apply from 2 inches below finish grade elevation down to top of footings.
D. Seal items projecting through dampproofing surface with mastic. Seal watertight.
E. Immediately backfill against dampproofing to protect from damage.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Below grade waterproofing and dampproofing.

1.02 RELATED REQUIREMENTS
A. Section 07 11 13 - Bituminous Dampproofing.
B. Section 31 223 16 - Excavation.
C. Section 31 23 23 - Fill: Backfilling.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Specimen warranty.
C. Test Reports: Evaluation service reports or other independent testing agency reports showing compliance with specified requirements.
D. Installer Qualifications: Include minimum of 5 project references.
E. Executed warranty.
F. Warranty: Submit manufacturer warranty and ensure forms have been completed in MSU Facilities's name and registered with manufacturer.

1.05 QUALITY ASSURANCE
A. Installer Qualifications: Company specializing in performing work of this type and approved by the membrane manufacturer.
B. Manufacturer's Field Services: Provide the services of a representative accredited by the sheet manufacturer to examine substrates before starting installation, periodically review installation procedures, and review final installed systems.

1.06 DELIVERY, STORAGE, AND PROTECTION
A. Deliver products to project site in original packaging with labels intact.
B. Store products in manner acceptable to membrane manufacturer.
C. When products must be stored for extended periods, keep out of direct sunlight and at temperatures above minus 20 degrees F (minus 30 degrees C).
D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Manufacturer’s Limited Product Warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. All Products of This Section:
   1. Tremco Barrier Solutions; www.tremcobarringsolutions.com
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 APPLICATIONS
A. Foundation Wall Waterproofing or dampproofing: Install membrane to all walls below grade, from bottom of wall to grade level, and in locations indicated on the drawings.

2.03 MATERIALS
A. Foundation Wall Waterproofing or dampproofing Membrane: Polymer-Enhanced Asphalt Liquid-Applied Membrane.
   1. Product: Watchdog H3
      a. Color: Black.
      b. Solids: 64% +/- 3% (percent by weight).
      c. Density: 8.2 +/- .1 lbs/gal.
      e. Application Temperature: Minimum 20 Degrees F.
      f. Application Thickness: 60 mils (wet).
      g. Cure Time: 16-24 hrs.
      h. Adhesion to Concrete: ASTM C-836.
      i. Elongation: >1800 per ASTM D-412.
      k. Water Vapor Absorption: <1 perm, ASTM E-96.
      a. Type: Polypropylene body with needle punched nonwoven monofilament.
      b. Size: roll 4’ x 50’
      c. Thickness: 0.44 inches.
      d. Water flow rate: 165 gpm/foot square
      e. Tensile strength: 100 per D4632
      f. Core compressive strength: 15,000 psf per D1621
      g. Recycled content: 77%
      h. Core flow rate: 17 gpm/ foot square.

B. Accessories as recommended by product manufacturer’s installation instructions.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that substrates are sound enough to retain fasteners and suitable for bonding of sealant.
B. Verify that there are no active leaks within area to be covered.
C. Verify that perimeter foundation drainage system has been properly installed.
D. Verify that finish grade elevations are clearly marked.
E. Do not begin installation until substrates have been properly prepared.
F. If substrate preparation is the responsibility of another trade, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION
A. Clean surfaces "broom clean" prior to installation.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   1. Remove projections larger than 1/4 inch (6 mm); remove sharp edges.
   2. In concrete and masonry, patch cracks and holes so that they provide suitable substrate as recommended by membrane manufacturer.
C. Mark a chalk line at anticipated grade level on walls prior to starting installation.

3.03 WATERPROOFING INSTALLATION
A. Install in accordance with manufacturer's recommended procedure.
B. Do not install when:
   1. Concrete has been cured for less than 3 days.
   2. Standing water is present.

3.04 FIELD QUALITY CONTROL
A. Provide the services of a manufacturer's representative to inspect substrates for suitability for installation, to review procedures during construction, and to review the finished work.

3.05 PROTECTION
A. Do not leave installed membrane exposed to sunlight for more than 30 days after installation; to cover, complete backfill operation or cover with protection board.
B. Prior to backfilling, inspect DELTA®-MS for tears and other damage and repair.
C. Take care when backfilling to avoid damage to membrane; replace membrane damaged during backfillin.
D. Protect installed products until completion of project.
E. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION
SECTION 07 2100
THERMAL INSULATION

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Board insulation and integral vapor retarder at cavity wall construction, perimeter foundation wall, underside of floor slabs, over roof deck, and exterior wall behind metal and brick wall finish.
B. Batt insulation and vapor retarder in exterior wall, ceiling, and roof construction.
C. Mineral fiber safing at roof deck to wall joint.

1.02 RELATED REQUIREMENTS
A. Section 05 4000 - Cold-Formed Metal Framing: Board insulation as wall sheathing.
B. Section 07 2119 - Foamed-In-Place Insulation: Plastic foam insulation other than boards.
C. Section 07 2500 - Weather Barriers: Separate air barrier and vapor retarder materials.
D. Section 09 2116 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.

1.03 REFERENCE STANDARDS
H. Leadership in Energy and Environmental Design: LEED
   1. Materials and Resources (MR) Credit 4.1 - Recycled Content 5%.
   2. Materials and Resources (MR) Credit 4.2 - Recycled Content 10%.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
C. Manufacturer’s Certificate: Certify that products meet or exceed specified requirements.
D. LEED Submittal: Provide documentation indicating how the requirements of Credit 4.1 and 4.2 will be met.
   1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
   2. Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
   3. Product Data for Credit: For products with low VOC emission certified by GreenGuard Environmental Institute.
1.05 SYSTEM DESCRIPTION

A. Design Requirements: Provide products that have been manufactured, fabricated and installed to the following criteria:
   1. Fire-Test-response Characteristics: provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test methods indicated below or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
      a. Surface Burning Characteristics (ASTM E84).

B. Performance Requirements: Provide products that have been manufactured, fabricated and installed to the following criteria:
   2. Recycled Glass Content: 25%.

1.06 QUALITY ASSURANCE

A. Obtain each type of building insulation through a single source.

B. Installer Qualification: Utilize an installer having demonstrated experience on projects of similar size and complexity.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Insulation:
   7. Urethane Technology Co; www.urethanetechnology.com
   8. Dow; www.building.dow.com
   9. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FORMALDEHYDE-FREE BUILDING INSULATION

A. JM Formaldehyde-Free Unfaced batts
   3. Critical Radiant Flux (ASTM E970): Greater than 0.11 btu/ft2 x s(0.12 W/cm2).
   4. Water Vapor Sorption (ASTM C1104): 5% or less.
   5. Odor Emission (ASTM C1304): Pass
   8. Recycled Content: Certified by Scientific Certification Systems contain minimum of 20% post-consumer and 5% pre-consumer recycled glass product, on a average of manufacturer's products.
   9. Prove through documentation that products complies with CIWMB Section 01 5712 for indoor air quality.
10. Thickness: See drawings.

2.03 FOAM BOARD INSULATION MATERIALS

A. Extruded Polystyrene Board Insulation: Extruded polystyrene board; ASTM C578; with either natural skin or cut cell surfaces, and the following characteristics:
1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
3. R-value: 1 inch of material at 72 degrees F: 5, minimum.
4. Board Size: 48 x 96 inch.
5. Board thickness: See drawings.
7. Thermal Conductivity (k factor) at 25 degrees F: 0.18.
10. Water Absorption, Maximum: 0.3 percent, by volume.
11. Manufacturers:
12. Substitutions: See Section 01 6000 - Product Requirements.

B. Extruded Polystyrene Board Insulation with nailers: Extruded polystyrene board; ASTM C578; with either natural skin or cut cell surfaces, including factory installed wood nailers, and the following characteristics:
1. Flame Spread: 25 or less.
2. Smoke Developed: 450 or less, ASTM E84
3. Thickness: 3 1/2”
4. R Value: 14.6 at 40 degrees
5. Edges: square
7. Raceways: provide electrical raceways at 18” and 48” continuous horizontal. Provide vertical raceway each 12’ and on either side of windows or other openings.
8. Manufacturer: Big Sky Insulation, Foam Control Nailstrip or equal.

C. Polyisocyanurate Board Insulation with Facers Both Sides: Rigid cellular foam, complying with ASTM C1289; Type I, aluminum foil both faces; Class 1, non-reinforced foam core.
1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
3. Compressive Strength: 16 psi or as indicated on drawings.
5. Board Thickness: 2 inch.
8. Manufacturers:
   b. Carlisle Coatings & Waterproofing, Inc; R2+ Silver: www.carlisleccw.com/sle.
9. Substitutions: See Section 01 6000 - Product Requirements.

2.04 FIBER BOARD INSULATION MATERIALS

A. Mineral Fiber Board Insulation: Rigid or semi-rigid mineral fiber, ASTM C612 or ASTM C553; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
1. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
2. Thickness: 4 inches barrier as indicated on drawings.
3. Manufacturers:

2.05 ACCESSORIES
   A. Sheet Vapor Retarder: Black polyethylene film for above grade application, 10 mil thick.
   B. Wall Vapor Barrier Tape: Bright aluminum self-adhering type, acrylic adhesive, 2 inch wide.
   C. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
   D. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
   B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 PREPARATION
   A. Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

3.03 INSTALLATION
   A. General: Comply with insulation manufacturer's written instructions applicable to products and application indicated.
      1. Install insulation that is undamaged, dry and unsoiled and that has not been left exposed at anytime to ice and snow.
      2. Extend insulation in thickness indicated to envelope entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
      3. Water Piping Coordination: If water piping is located on the inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
      4. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.
   B. Installation of General Building Insulation:
      1. Seal joints between closed cell (non-breathing) insulation units by applying adhesive, mastic or sealant to edges of each unit to form a tight seal as units are shoved in place. Fill voids in completed installation with adhesive, mastic or sealant as recommended by insulation manufacturer.
      2. Set vapor retarder faced units with vapor retarder to warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
         a. Tape ruptures in vapor retarder and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
      3. Install glass-fiber blankets in cavities formed by framing members according to the following requirements:
         a. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
         b. Place blankets in cavities formed by framing members to produce friction fit between edges of insulation and adjoining framing members.
c. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.


5. Board Insulation Installation: Install insulation where indicated:
   a. Cut and friction fit insulation between vertical or Z-shaped framing.
   b. Alternatively install insulation on impaling pins or with suitable adhesives.
   c. Place pins 3 inches - 5 inches from edge of insulation.

6. Loose-Fill Insulation: Place loose fill insulation into spaces and onto surfaces as shown, either by pouring or by machine blowing to comply with ASTM C1015. Level horizontal applications to uniform thickness as indicated, lightly settle to uniform density but not compact excessively.
   a. Stuff glass-fiber, loose fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40% of normal maximum volume equaling a density of approximately 2.5 pcf (40 kg/M3).

C. Installation of Vapor Retarders:
   1. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates including those filled with loose-fiber insulation.
   2. Seal vertical joints in vapor retarders over framing by lapping not less than 2 wall studs. Fasten vapor retarders to framing at top, end and bottom edges, at perimeter of wall openings; and at lap joints. Space fasteners 16 inches O.C.
   3. Seal overlapping joints in vapor retarders with adhesives or vapor retarder tape according to vapor retarder manufacturer's instructions. Seal butt joints and fastener penetrations with vapor retarder tape. Locate all joints over framing members or other solid substrates.
   4. Provide caulking bead beneath vapor retarder at the wall plate to slab joint to seal joint
   5. Provide caulking bead at beneath vapor retarder at wall top plate to deck joint.
   6. In areas where voids are filled with spray foam insulation, install and tape seal vapor retarder in place prior to spray foam installation. Lap foam over end of vapor retarder sheet a minimum of 1”.
   7. Firmly attach vapor retarders to substrates with mechanical fasteners or adhesives as recommended by vapor retarder manufacturer.
   8. Seal joints caused by pipes, conduits, electrical boxes and similar items penetrating vapor retarders with vapor retarder tape to create an airtight seal between penetrating objects and vapor retarder.

3.04 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Adhere a 6 inch wide strip of polyethylene sheet over construction, control, and expansion joints with double beads of adhesive each side of joint.
   1. Tape seal joints.
   2. Extend sheet full height of joint.

B. Apply adhesive to back of boards:

C. Install boards horizontally on foundation perimeter.
   1. Place boards to maximize adhesive contact.
   2. Install in running bond pattern.
   3. Butt edges and ends tightly to adjacent boards and to protrusions.

D. Extend boards over expansion joints, unbonded to foundation on one side of joint.

E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

F. Immediately following application of board insulation, place protective boards over exposed insulation surfaces.
   1. Install boards horizontally from base of foundation to top of insulation.
2. Butt boards tightly, with joints staggered from insulation joints.

3.05 BOARD INSTALLATION AT EXTERIOR WALLS

A. Adhere a 6 inch wide strip of polyethylene sheet over expansion joints with double beads of adhesive each side of joint.

B. Install boards horizontally on walls.
   1. Butt edges and ends tightly to adjacent boards and to protrusions.
   2. Fasten boards with preassembled screw/stress plate fasteners type and length as recommended by manufacturer. Spacing shall be a minimum of 16 inches on center at perimeter and 24 inches on center in field. Drive fasteners so the stress plate is tight and flush with the board surface. Do not overdrive or countersink. Stress plates can bridge gap between boards if allowed by manufacturer. Do not fasten more than two boards with one stress plate.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

D. Place 6 inch wide polyethylene sheet at perimeter of wall openings, from adhesive vapor retarder bed to window and door frames. Tape seal in place to ensure continuity of vapor retarder and air seal.

3.06 BOARD INSTALLATION AT CAVITY WALLS

A. Secure impale fasteners to substrate at a frequency as follows:
   1. 6 per insulation board.

B. Install boards to fit snugly between wall ties.
   1. Place membrane surface against adhesive.

C. Install boards horizontally on walls.
   1. Butt edges and ends tightly to adjacent boards and to protrusions.
   2. Place impale fastener locking discs.
   3. Fasten boards with preassembled screw/stress plate fasteners type and length as recommended by manufacturer. Spacing shall be a minimum of 16 inches on center at perimeter and 24 inches on center in field. Drive fasteners so the stress plate is tight and flush with the board surface. Do not overdrive or countersink. Stress plates can bridge gap between boards if allowed by manufacturer. Do not fasten more than two boards with one stress plate.

D. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

E. Place 6 inch wide polyethylene sheet at perimeter of wall openings, from adhesive vapor retarder bed to window and door frames. Tape seal in place to ensure continuity of vapor retarder and air seal.

3.07 BOARD INSTALLATION OVER LOW SLOPE ROOF DECK

3.08 BATT INSTALLATION

A. Install insulation and vapor retarder in accordance with manufacturer's instructions.

B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

E. At metal framing, place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over member face.

F. Tape seal tears or cuts in vapor retarder.

G. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane. Tape seal in place.
3.09 PROTECTION
   A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Foamed-in-place insulation below Northwest entry landing deck with thermal fire barrier.
B. Foamed-in-place insulation below deck at east side mezzanine level outdoor deck with thermal fire barrier.
C. Foamed-in-place insulation in miscellaneous cavities of junctions between multiple components to achieve a thermal and air seal.
D. Foamed-in-place insulation at junctions of dissimilar wall and roof materials to achieve a thermal and air seal, with protective overcoat.
E. Primer for foamed in place insulation at galvanized steel where insulation applied at continuous insulation: northwest entry landing deck and east side mezzanine decking.
F. Protective cementitious overcoat.

1.02 REFERENCE STANDARDS


1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide product description, insulation properties, overcoat properties, and preparation requirements.
C. Certified Test Reports: With product data, submit copies of certified test reports showing compliance with specified performance values, including R-Values, fire performance and sound abatement characteristics.
E. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.
F. Certificates: Certify that products of this section meet or exceed specified requirements.
G. LEED Submittal: Provide documentation that product passes CIWMB for indoor air quality. NOTE: IF PROPOSED PRODUCT DOES NOT MEET LEED INDOOR AIR QUALITY REQUIREMENTS, PRODUCT MUST BE INSTALLED PRIOR TO BUILDING ENCLOSURE. COORDINATE WITH GCCM.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.
B. Applicator Qualifications: Company specializing in performing work of the type specified, with minimum three years documented experience.
C. Fire Performance Characteristics: provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which
insulation is a part, have been determined by testing, per methods indicated below, by a testing agency acceptable to authorities having jurisdiction.


PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Foamed-In-Place Insulation:
   6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Foamed-In-Place Insulation: Low-density, flexible, open celled, water vapor permeable polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
   1. Aged Thermal Resistance: R-value of 3 (deg F hr sq ft)/Btu, minimum, when tested at 1 inch thickness in accordance with ASTM C518 after aging for 180 days at 41 degrees F.
   2. Required thermal performance:
      a. Northwest exit landing below deck: R-30 with 20 minute thermal fire barrier.
      b. Mezzanine level east outdoor deck below metal deck: R-20 with 20 minute thermal fire barrier.
      c. Misc. Locations at junctions, deck flutes etc. - provide 2" minimum thickness if space allows. In smaller areas, fill entire cavity.
   3. Air Permeance: 0.004 cfm/sq ft, maximum, when tested at intended thickness in accordance with ASTM E2178 or ASTM E283 at 1.5 psf.
   4. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
   6. LEED Submittal: Provide documentation that product passes CIWMB for indoor air quality.
      NOTE: IF PROPOSED PRODUCT DOES NOT MEET LEED INDOOR AIR QUALITY REQUIREMENTS, PRODUCT MUST BE INSTALLED PRIOR TO BUILDING ENCLOSURE. COORDINATE WITH GCCM.
   7. Products:
      e. Substitutions: See Section 01 6000 - Product Requirements.

2.03 ACCESSORIES

A. Primer: Vinyl wash primer or as required by insulation manufacturer. Provide at Northwest entry deck and east mezzanine deck on galvanized deck surface. Provide primer to maximize foam adhesion.

B. Overcoat: Type as recommended by manufacturer. type, spray applied; flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify work within construction spaces or crevices is complete prior to insulation application.
   B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation or overcoat adhesion.

3.02 PREPARATION
   A. Mask and protect adjacent surfaces from over spray or dusting.
   B. Apply primer in accordance with manufacturer's instructions.

3.03 FOAM-IN-PLACE INSULATION APPLICATION
   A. Apply insulation in accordance with manufacturer's instructions.
   B. Apply to a minimum cured thickness of 4 inch.
   C. Apply overcoat monolithically, without voids to fully cover foam insulation, to achieve fire rating required.
   D. Patch damaged areas.

3.04 FOAM-IN-PLACE MASONRY INSULATION APPLICATION
   A. General: Install foamed in place insulation from interior or as specified, prior to installation of interior finish work and after all masonry and structural concrete work is in place, comply with manufacturer's instructions.

3.05 PROTECTION
   A. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION
SECTION 07 2500
WEATHER BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Weather barrier membrane (DuPont Tyvek Drainwrap Commercial Wrap).
B. Seam Tape (DuPont Tyvek Tape).
C. Flashing (DuPont FlexWrap, DuPont FlexWrap NF, DuPont StraightFlash, DuPont StraightFlash VF, and/or DuPont Thru-Wall Flashing).
D. Fasteners (DuPont Tyvek Wrap Caps).
E. Weather Barrier for rainscreen wall at A606 (Corten) panel wall system: see 07 4213.50 Flat Metal Wall Panels.

1.02 RELATED REQUIREMENTS
A. Section 05 4000 - Cold-Formed Metal Framing: Water-resistive barrier under exterior cladding.
B. Section 06 1000 - Rough Carpentry: Water-resistive barrier under exterior cladding.
C. Section 07 2100 - Thermal Insulation: Vapor retarder installed in conjunction with batt insulation.
D. Section 07 5400 - Thermoplastic Membrane Roofing: Vapor retarder installed as part of roofing system.
E. Section 07 9005 - Joint Sealers: Sealant materials and installation techniques.
F. Section 09 2116 - Gypsum Board Assemblies: Water-resistive barrier under exterior cladding.

1.03 DEFINITIONS
A. Air Barrier: Air tight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces. Note: For the purposes of this specification, vapor impermeable air barriers are classified as vapor retarders.
B. Vapor Retarder: Air tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.
1. Water Vapor Permeance: For purposes of conversion, 57.2 ng/(Pa s sq m) = 1 perm.

1.04 REFERENCE STANDARDS

1.05 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on material characteristics.
C. Samples: Weather Barrier Membrane, minimum 8-1/2 inches x 11 inches.
D. Manufacturer’s Installation Instructions: Indicate preparation.

PART 2 PRODUCTS

2.01 MANUFACTURER
A. DuPont; 4417 Lancaster Pike, Chestnut Run Plaza, Wilmington, DE 19805; 1-800-44-TYVEK; www.tyvek.com.
B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Basis of Design: Spunbonded polyolefin, non-woven, non-perforated, weather barrier is based upon DuPont Tyvek DrainWrap and related assembly components.

B. Performance Characteristics:
   1. Air Penetration: 0.001 cfm/ft² at 75 Pa, when tested in accordance with ASTM E2178. Type I per ASTM E1677. <0.04 cfm/ft² at 75 Pa, when tested in accordance with ASTM E2357.
   2. Drainage: ASTM E2273 >98%.
   3. Water Vapor Transmission: 50 perms, when tested in accordance with ASTM E96, Method B.
   4. Water Penetration Resistance: 210 perms, when tested in accordance with AATCC Test Method 127.
   5. Basis Weight: 2.7 oz/yd², when tested in accordance with TAPPI Test Method T-410.
   6. Air Resistance: Air Infiltration at >1500 seconds, when tested in accordance with TAPPI Test Method T-460.
   7. Tensile Strength: 30/30 Ibs/in., when tested in accordance with ASTM D882, Method A.
   8. Tear Resistance: 7/9 Ibs., when tested in accordance with ASTM D1117.

C. Interior Vapor Retarder:
   1. On inside face of studs of exterior walls, under cladding, use mechanically fastened vapor retarder sheet. 10 mil.

D. Exterior Vapor Retarder at Flat Metal Wall Panel:
   1. Vapro Shield Reveal/Shield Self Adhered Vapor Permeable Membrane.
      b. Water Vapor Permeability: ASTM E96: 40 Grains/Hour/SF.
      c. Water Vapor Transmission: ASTM E398: 511.93 g/m²*24 Hour.

2.03 ACCESSORIES

A. Seam Tape: 3 inch wide, DuPont Tyvek Tape for commercial applications.

B. Fasteners: DuPont Tyvek Wrap Cap Screws, as distributed by DuPont: 1-5/8 inch rust resistant screw with 2 inch diameter plastic cap or manufacturer approved 1-1/4 inch or 2 inch metal gasketed washer.

C. Sealants:
   1. Refer to Section 07 9005 Joint Sealants.

D. Flashings:
   1. DuPont FlexWrap, as distributed by DuPont: flexible membrane flashing materials for window openings and penetrations.
   2. DuPont StraightFlash, as distributed by DuPont: straight flashing membrane materials for flashing windows and doors and sealing penetrations such as masonry ties, etc.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions are ready to accept the work of this section.

3.02 PREPARATION

A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

B. Clean and prime substrate surfaces to receive adhesives in accordance with manufacturer's instructions.
3.03 INSTALLATION - VAPOR BARRIER
A. Install materials in accordance with manufacturer's instructions.
B. Vapor Retarders: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
C. Mechanically Fastened Sheets - Vapor Retarder On Interior:
   1. When insulation is to be installed in assembly, install vapor retarder over insulation.
   2. Seal seams, laps, perimeter edges, penetrations, tears, and cuts with self-adhesive tape, making air tight seal.
   3. Locate laps at a framing member; at laps fasten one sheet to framing member then tape overlapping sheet to first sheet.
   4. Seal entire perimeter to structure, window and door frames, and other penetrations.
   5. Where conduit, pipes, wires, ducts, outlet boxes, and other items are installed in insulation cavity, pass vapor retarder sheet behind item but over insulation and maintain air tight seal.

3.04 INSTALLATION - WEATHER BARRIER
A. Install weather barrier over exterior face of exterior wall substrate in accordance with manufacturer recommendations.
B. Install weather barrier prior to installation of windows and doors.
C. Start weather barrier installation at a building corner, leaving 6-12 inches of weather barrier extended beyond corner to overlap.
D. Install weather barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers. Maintain weather barrier plumb and level.
E. Sill Plate Interface: Extend lower edge of weather barrier over sill plate interface 3-6 inches. Secure to foundation with elastomeric sealant as recommended by weather barrier manufacturer.
F. Window and Door Openings: Extend weather barrier completely over openings.
G. Overlap Weather Barrier:
   1. Exterior Corners: Minimum 12 inches.
   2. Seams: Minimum 6 inches.
H. Weather Barrier Attachment:
   1. Attach weather barrier to studs through exterior sheathing. Secure using weather barrier manufacturer recommended fasteners, space 12-18 inches vertically on center along stud line, and 24 inch on center, maximum horizontally.

3.05 SEAMING
A. Seal seams of weather barrier with seam tape at all vertical and horizontal overlapping seams.
B. Seal any tears or cuts as recommended by weather barrier manufacturer.

3.06 OPENING PREPARATION
A. Flush cut weather barrier at edge of sheathing around full perimeter of opening.
B. Cut a head flap at 45 degree angle in the weather barrier at window head to expose 8 inches of sheathing. Temporarily secure weather barrier flap away from sheathing with tape.

3.07 FLASHING
A. Cut 7 inch wide DuPont FlexWrap a minimum of 12 inches longer than width of sill rough opening. Apply primer as required by manufacturer.
B. Cover horizontal sill by aligning DuPont FlexWrap edge with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6 inches. Secure flashing tightly into corners by working in along the sill before adhering up the jambs.
C. Fan DuPont FlexWrap at bottom corners into face of wall. Firmly press in place. Mechanically fasten fanned edges. Mechanical fastening is not required for DuPont FlexWrap NF.

D. Apply 9-inch wide strips of DuPont StraightFlash at jambs. Align flashing with interior edge of jamb framing. Start DuPont StraightFlash at head of opening and lap sill flashing down to the sill.

E. Spray-apply primer to top 6 inches of jambs and exposed sheathing.

F. Instal DuPont FlexWrap at opening head using same installation procedures used at sill. Overlap jamb flashing a minimum of 2 inches.

G. Coordinate flashing with window installation.

H. On exterior, install backer-rod in joint between window frame and flashed rough framing. Apply sealant at jambs and head, leaving sill unsealed. Apply sealants in accordance with sealant manufacturer's instructions and ASTM C 1193.

I. Position weather barrier head flap across head flashing. Adhere using 4 inch wide DuPont StraightFlash over the 45 degree seams.

J. Tape top of window in accordance with manufacturer recommendations.

3.08 THRU-WALL FLASHING/WEATHER BARRIER INTERFACE AT WIDOW HEAD

A. Cut flap in weather barrier at window head.

B. Prime exposed sheathing.

C. Install lintel as required. verify end dams extend 4 inches minimum beyond opening.

D. Install end dams bedded in sealant.

E. Adhere 2 inches minimum thru-wall flashing to wall sheathing. Overlap lintel with thru-wall flashing and extend 1/4 inch minimum beyond outside edge of lintel to form drip edge.

F. Apply sealant along thru-wall flashing edges.

G. Fold weather barrier flap back into place and tape bottom edge of thru-wall flashing.

H. Tape diagonal cuts of weather barrier.

I. Secure weather barrier flap with fasteners.

J. Openings and Penetrations in Exterior Weather Barriers:
   1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto weather barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
   2. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with at least 4 inches wide; do not seal sill flange.
   3. At openings to be filled with non-flanged frames, seal weather barrier to all sides of opening framing, using flashing at least 9 inches wide, covering entire depth of framing.
   4. At head of openings, install flashing under weather barrier extending at least 2 inches beyond face of jambs; seal weather barrier to flashing.
   5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
   6. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.

3.09 FIELD QUALITY CONTROL

A. Do not cover installed weather barriers until required inspections have been completed.

B. Obtain approval of installation procedures by the weather barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.

3.10 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.
SECTION 07 2600
UNDER-SLAB VAPOR BARRIER

PART 1 GENERAL

1.01 SUMMARY
A. Products supplied under this section:
   1. Vapor barrier and installation accessories for installation under concrete slabs.
B. Related Sections:
   1. Section 03 30 00 Cast-in-Place Concrete

1.02 REFERENCE STANDARDS
A. American Society for Testing and Materials (ASTM):
   1. ASTM E1745-11 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
   2. ASTM E1643-11 Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
B. Technical Reference - American Concrete Institute (ACI):
   1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

1.03 SUBMITTALS
A. Quality control/assurance:
   1. Summary of test results per paragraph 9.3 of ASTM E1745.
   2. Manufacturer’s samples and literature.
   3. Manufacturer’s installation instructions for placement, seaming, penetration repair, and perimeter seal per ASTM E1643.
   4. All mandatory ASTM E1745 testing must be performed on a single production roll per ASTM E1745 Section 8.1.
   5. Contact vapor barrier manufacturer to coordinate a review of the vapor barrier installation either by digital review or in person.

PART 2 PRODUCTS

2.01 MATERIALS
A. Vapor barrier shall have all of the following qualities:
   1. Maintain permeance of less than 0.01 Perms [grains/(ft2 · hr · inHg)] as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).
   2. Other performance criteria:
      a. Strength: ASTM E1745 Class A.
      b. Thickness: 15 mils minimum.
   3. Provide third party documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1.
B. Vapor barrier products:
   3. Approved Alternate: Viper Vaporcheck II 15 mil approved.

2.02 ACCESSORIES
A. Seams:
B. Penetrations of Vapor barrier:
C. Perimeter/edge seal:
   4. Sealing the perimeter with one-sided seam tape is prohibited.

PART 3 EXECUTION

3.01 PREPARATION

A. Ensure that subsoil is approved by Architect or Geotechnical Engineer.
   1. Level and compact base material.

3.02 INSTALLATION

A. Install vapor barrier in accordance ASTM E1643.
   1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.
   2. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, waterstops, or any other site condition requiring early termination of the vapor barrier. At the point of termination, seal vapor barrier to the foundation wall, grade beam or slab itself. Seal vapor barrier to the entire perimeter wall or footing/grade beam with double sided StegoTack Tape, per manufacturer’s instructions. Ensure the concrete is clean and dry prior to adhering tape.
   3. Overlap joints 6 inches and seal with manufacturer’s seam tape.
   4. Apply seam tape/Crete Claw to a clean and dry vapor barrier.
   5. Seal all penetrations (including pipes) per manufacturer’s instructions.
   6. If non-permanent stakes are driven through vapor barrier, repair as recommended by vapor barrier manufacturer.
   7. Repair damaged areas with vapor barrier material of similar (or better) permeance, puncture and tensile.

END OF SECTION
SECTION 07 4213
STANDING SEAM METAL SIDING PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Metal Wall Panels over Outside-Insulated Framed Wall System: Single skin concealed fastener metal wall panels applied over rigid insulation and wall framing specified in Division 05 Section "Cold Formed Metal framing" with exterior sheathing specified in Division 07 Section "thermal Insulation". Metal wall panel installation specified in this section.

1.02 RELATED REQUIREMENTS
A. Section 05 4000 - Cold-Formed Metal Framing: Wall panel substrate.
B. Section 07 2100 - Thermal Insulation.
C. Section 07 2500 - Weather Barriers: Weather barrier under wall panels.
D. Section 07 9005 - Joint Sealers.

1.03 REFERENCE STANDARDS
A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

1.04 PERFORMANCE REQUIREMENTS
A. Air Infiltration: Maximum 0.06 cfm/sq ft per ASTM E 283 at a static air-pressure difference of 1.57 lbf/ sq ft, using minimum 10 x 10 foot test panel that includes side joints.
B. Water Penetration, Static Pressure: No uncontrolled water penetration per ASTM E 331 at a minimum static differential pressure of 6.24 lbf/sq ft, using minimum 10 x 10 foot test panel that includes side joints.

1.05 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate dimensions, layout, joints, construction details, methods of anchorage.
C. Samples: Submit two samples of wall panel, 4 inch by 4 inch in size illustrating finish color, sheen, and texture.
D. LEED Submittals:
   1. MR Credit 2: Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill.
   2. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
3. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.

1.06 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
   B. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years of experience.

1.07 ADMINISTRATION REQUIREMENTS
   A. Preinstallation Meeting: Conduct preinstallation meeting at site attended by Owner, Architect, manufacturer's representative, and other trade contractors.
      1. Coordinate building framing in relation to metal wall panel assembly.
      2. Coordinate installation of building air and water barrier behind metal wall panel assembly.
      3. Coordinate window, door and louver, and other openings and penetrations of metal wall panel assembly.

1.08 DELIVERY, STORAGE, AND HANDLING
   A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
   B. Store prefinished material off ground and protected from weather. Prevent twisting, bending, or abrasion, and provide ventilation to stored materials. Slope metal sheets to ensure drainage.

1.09 WARRANTY
   A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
   B. Correct defective work within a five year period after the Date of Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.
   C. Correct defective work within a five year period after the Date of Substantial Completion, including defects in water tightness and integrity of seals.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Design is based on Magna-Loc manufactured by Metal Sales, Inc.
   B. Other Acceptable Manufacturers:
      1. Metal Sales; TLC-3 Panel; www.metalsales.us.com
      2. Bridger Steel.
      3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MANUFACTURED METAL PANEL
   A. Panel: Pac-Clad Redi-Roof Standing Seam Metal Roof Panel: roof panel applied horizontally on wall surface. 18 inch panel coverage, non-striated. 1 9/16 inch panel height. Panels installed with rolled seam turned down under seam.
   B. Material: Aluminum-zinc alloy coated steel sheet, ASTM A792, Class AZ50 designation, 0.23 inch (24 gauge base thickness). Total coated thickness of 0.023 inches.
   D. Recycled content: minimum 36%, minimum 18% post-consumer.
   E. Concealed fastener clips, designed for movement.
   F. Internal and External Corners provided by wall system manufacturer: 24 ga. Same material and finish as exterior sheets; profile to match drawings; shop cut and factory mitered to required angles.
   G. Trim: All wall panel trim - same material and finish as exterior sheets; 24 ga. Brake formed to required profiles. See Section 07540 for roof flashing & trim.
H. Anchors: Galvanized steel.

2.03 MATERIALS
A. Precoated Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M Structural Steel (SS) or Forming Steel (FS), with G90/Z275 coating; continuous coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.
B. Exterior Finish Coating: Panel manufacturer's standard polyvinylidene fluoride (PVF) top coat, over epoxy primer.
C. Panel Back Coating: Panel manufacturer's standard polyester wash coat.

2.04 ACCESSORIES
A. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.
B. Sealants: Shall be as recommended and supplied by panel manufacturer.
C. Fasteners: As supplied or recommended by panel manufacturer; with soft neoprene washers, steel, hot dip galvanized. Fastener cap same color as exterior panel.
D. Field touch-up paint as recommended by panel manufacturer.

2.05 FABRICATION
A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
B. Form pieces in longest practicable lengths.

2.06 FABRICATION
A. Wall panel system components shall be fabricated in the factory for field assembly to the greatest extent possible.
B. Fasteners: Self-tapping screws and other acceptable fasteners recommended by panel manufacturer.
C. Sealants: Manufacturer's standard type suitable for use with installation of system; non-staining.
D. Field Touch-up Paint: As recommended by panel manufacturer.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that building framing members are ready to receive panels.
B. Verify that weather barrier has been installed over substrate completely and correctly.

3.02 METAL WALL PANEL INSTALLATION
A. General: Install metal panels in accordance with approved shop drawings and manufacturer’s recommendations. Install metal panels in orientation, sizes, and locations indicated. Anchor metal wall panels and other components securely in place. Provide for thermal and structural movement.
B. Attach panels to metal framing using recommended clips, screws, fasteners, sealants, and adhesives indicated on approved shop drawings.
   1. Fasten metal wall panels to supports with fasteners and spacing recommended by manufacturer.
   2. Dissimilar Materials: Where elements of metal wall panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by manufacturer.
C. Joint Sealers: Install joint sealants where indicated on approved shop drawings.

3.03 TOLERANCES
A. Maximum Offset From True Alignment Between Adjacent Members Butting or In Line: 1/16 inch.
B. Maximum Variation from Plane or Location Indicated on Drawings: 1/4 inch.

3.04 CLEANING
   A. Remove site cuttings from finish surfaces.
   B. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Metal Wall Panels over Outside-Insulated Framed Wall System: Single skin exposed fastener metal wall panels applied as exterior cladding over wall framing specified in Division 05 Section "Cold Formed Metal framing" with exterior sheathing specified in Division 07 Section "thermal Insulation".

1.02 RELATED REQUIREMENTS
   A. Section 07 2100 - Thermal Insulation.
   B. Section 07 2500 - Weather Barriers: Weather barrier under wall panels.
   C. Section 07 9005 - Joint Sealers.

1.03 REFERENCE STANDARDS
   A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

1.04 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings: Indicate dimensions, layout, joints, construction details, methods of anchorage.
   D. LEED Submittal:
      1. MR Credit 2: Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill.
      2. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
      3. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.

1.05 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
   B. Installer Qualifications: Company specializing in performing the work of this section with minimum [3] years of experience.
1.06 ADMINISTRATION REQUIREMENTS
A. Preinstallation Meeting: Conduct preinstallation meeting at site attended by Owner, Architect, manufacturer's representative, and other trade contractors.
   1. Coordinate building framing in relation to metal wall panel assembly.
   2. Coordinate installation of building air and water barrier behind metal wall panel assembly.
   3. Coordinate window, door and louver, and other openings and penetrations of metal wall panel assembly.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
B. Store prefinished material off ground and protected from weather. Prevent twisting, bending, or abrasion, and provide ventilation to stored materials. Slope metal sheets to ensure drainage.

1.08 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Correct defective work within a [two] year period after Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.
C. Correct defective Work within a five year period after Substantial Completion, including defects in water tightness and integrity of seals.

PART 2  PRODUCTS
2.01 MANUFACTURERS
A. Metal Sales; T10-C Panel; www.metalssales.com.
B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MANUFACTURED METAL PANELS
A. T10-C Wall Panel System: Preformed and prefinished metal panel system of square ribs 6" O.C. profile; 24 gage, 30" panel coverage, 1-1/2" rib height.
   1. Color: Dark Charcoal Grey
B. Internal and External Corners provided by wall system manufacturer: 22ga. Same material and finish as exterior sheets; profile to match drawings; shop cut and factory mitered to required angles.
C. Trim: All wall panel trim - same material and finish as exterior sheets; 22ga. Brake formed to required profiles. See Section 07540 for roof flashing & trim.
D. Anchors: Galvanized steel.

2.03 MATERIALS
A. Precoated Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M Structural Steel (SS) or Forming Steel (FS), with G90/Z275 coating; continuous coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.
B. Exterior Finish Coating: Panel manufacturer's standard polyvinylidene fluoride (PVF) top coat, over epoxy primer.
C. Panel Back Coating: Panel manufacturer's standard polyester wash coat.

2.04 ACCESSORIES
A. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.
B. Sealants: Shall be as recommended and supplied by panel manufacturer.
C. Fasteners: As supplied or recommended by panel manufacturer; with soft neoprene washers, steel, hot dip galvanized. Fastener cap same color as exterior panel.
D. Field touch-up paint as recommended by panel manufacturer.
2.05 FABRICATION
   A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
   B. Form pieces in longest practicable lengths.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that building framing members are ready to receive panels.
   B. Verify that weather barrier has been installed over substrate completely and correctly.

3.02 INSTALLATION
   A. Install panels on walls and soffits in accordance with manufacturer's instructions.
   B. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint. Allow to dry prior to installation.
   C. Seal and place gaskets to prevent weather penetration. Maintain neat appearance.

3.03 TOLERANCES
   A. Maximum Offset From True Alignment Between Adjacent Members Butting or In Line: 1/16 inch.
   B. Maximum Variation from Plane or Location Indicated on Drawings: 1/4 inch.

3.04 CLEANING
   A. Remove site cuttings from finish surfaces.
   B. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

END OF SECTION
SECTION 07 4213.50
FLAT METAL WALL PANEL

PART 1  GENERAL

1.01  SECTION INCLUDES
A. Random lengths of 11 gage flat A606 (Corten) Steel Panels over Outside-Insulated Framed Wall System: Single skin exposed fastener metal wall panels applied as exterior cladding over sub-girt system Rainscreen Attachment specified in 07 4800, wall framing specified in Division 05 Section "Cold Formed Metal framing" with exterior sheathing specified in Division 07 Section "thermal Insulation".

1.02  RELATED REQUIREMENTS
A. Section 05 4000 - Cold-Formed Metal Framing.
B. Section 07 2100 - Thermal Insulation.
C. Section 07 2500 - Weather Barrier.
D. Section 07 4800 - Rainscreen Attachment System

1.03  SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate dimensions, layout, joints, construction details, methods of anchorage.
C. Panel Sample: (3) 10"x10" indicating final oxidized finishes.
D. LEED Submittal:
   1. MR Credit 2: Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill.
   2. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
   3. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.

1.04  ADMINISTRATION REQUIREMENTS
A. Preinstallation Meeting: Conduct preinstallation meeting at site attended by Owner, Architect, manufacturer's representative, and other trade contractors.
   1. Coordinate building framing in relation to metal wall panel assembly.
   2. Coordinate installation of building air and water barrier behind metal wall panel assembly.
   3. Coordinate window, door and louver, and other openings and penetrations of metal wall panel assembly.

1.05  DELIVERY, STORAGE, AND HANDLING
A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
B. Store material off ground and protected from weather. Prevent twisting, bending, or abrasion, and provide ventilation to stored materials. Slope metal sheets to ensure drainage.

PART 2  PRODUCTS

2.01  SUPPLIER
A. (A606) Corten Flat Sheets; Western States Metal Roofing.
   1. Alan Bendawald; alan@metaldeck.com

2.02  MATERIALS
A. Corten Flat Sheets.
2. Sizes: See drawings.
3. Cold-Rolled Steel Sheets.
5. Cold-Rolled shall be finish:
   a. Type 1: naturally oxidized finish. Applied oil retarder applied at bright orange phase of oxidation.
   b. Type 2: naturally oxidized finish. Applied oil retarder applied at medium orange phase of oxidation.
   c. Type 3: naturally oxidized finish. Applied oil retarder applied at dark orange phase of oxidation.

2.03 ACCESSORIES
   A. Fasteners: Ceramic coated fasteners as shown on drawings.
   B. Sub-framing: Rainscreen Attachment system as specified in 07 4800.
   C. Weather Barrier: Vapro Shield RevealShield self adhered vapor permeable membrane.
      2. Water Vapor Permeability: ASTM E96: 40 grains/hour/sf
      3. Water Vapor Transmission: ASTM E398: 511.93 g/m2*24 hour

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that building framing members are ready to receive panels.
   B. Verify that weather barrier has been installed over substrate completely and correctly.
   C. Verify the Rainscreen Attachment System is installed correctly.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Aluminum Soffits.
B. Aluminum trim and accessories.

1.02 RELATED REQUIREMENTS
A. Section 05 4000 - Cold-Formed Metal Framing: Panel support framing.
B. Section 07 2500 - Weather Barriers: Weather barrier behind rainscreen wall system.
C. Section 07 6200 - Sheet Metal Flashing and Trim: Metal flashing components integrated with this wall system.
D. Section 07 9005 - Joint Sealers.

1.03 REFERENCE STANDARDS
A. ASTM D 958 - Practice for Determining Temperatures of Standard ASTM molds for Test Specimens of Plastics.

1.04 PERFORMANCE REQUIREMENTS
A. Components: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall as calculated in accordance with applicable code.
B. Movement: Accommodate movement within system without damage to components or movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; deflection of structural support framing.
C. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
D. Preinstallation Meeting:
   1. Owner
   2. Architect
   3. Installer

1.05 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
C. Shop Drawings: Indicate dimensions, layout, joints, expansion joints, construction details, methods of anchorage, and interface with adjacent materials.
D. LEED Submittal: Provide documentation of how the requirements of Credit will be met:
1. MR Credit 2: Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill.

2. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

3. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.

E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

F. Manufacturer's Certification: Certify products meet and exceed specified requirements.

G. Closeout Submittal: Provide manufacturer maintenance instructions that include recommendations for periodic cleaning and maintenance of components.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualification: Company specializing in manufacturing products specified in this section with at least five years documented experience.

B. Installer: Company specializing in performing work of this section and approved by manufacturer.

1. Install system in strict compliance with manufacturer's installation instructions.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Finish areas designated by Architect.

2. Do not proceed with remaining work until workmanship, color, and gloss are approved by Architect.

3. Refinish mock-up area as required to produce acceptable work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage and Handling: Store materials in clean, dry, interior area in accordance with manufacturer's instructions.

C. Deliver panels, components, and other manufactured items without damage or deformation.

D. Protect panels during transportation, handling, and installation from weather, excessive temperatures and construction operations.

E. Handle panels in strict compliance with manufacturer's instructions and recommendations, and in a manner to prevent bending, warping, twisting, and surface damage.

1. Store panels vertically with top of panel down, storage of panels horizontally is not permitted.

F. Store panels covered with suitable weather tight and ventilated covering.

G. Provide storage of panels to ensure dryness, with positive slope for drainage of moisture.

H. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage.

I. Remove strippable protective covering from aluminum panel prior to installation.

1.08 SITE CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecast weather conditions permit assembly of this Work to be performed according to manufacturer's installation instructions and warranty requirements.
B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before panel fabrication and indicate measurements on Shop Drawings.
   1. Coordinate with construction schedule.

1.09 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Mayne Coatings Corp. limited warranty against cracking, peeling and gloss/color retention within the guidelines stated by the American Aluminum Manufacturer's Association (AAMA).
   1. Woodgrains: AAMA 2604 (5 year Florida) 15 year manufacture's warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Acceptable Manufacturer: Mayne Coatings Corp., which is located at: 27575-50th Ave, Langly, BC Canada V4W OA2; www.maynecoatings.com.
B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS
A. Extruded Aluminum Soffits: Longboard Wood Grain Aluminum Siding and Soffits with Aluminate bonded film finish is extruded aluminum with integrated venting system.
   1. 6 inch V Groove Siding and Soffit.
   2. Length: single runs from roof edge to curtain wall WITHOUT seams. Lengths vary from approximately 6 feet to nearly 24 feet in length. Contractor to field verify required lengths prior to ordering.
B. Accessories: Prefinished aluminum. Provide with matching accessories and starter strips as required:
   2. Inside corner trim.
   3. Outside corner trim.
   4. Craftsman Closer Trim
   5. U Cap for mitered corner panel to panel trim.
   6. Starter strip as required

2.03 FINISHES
A. Comply with NAAMM's - Metal Finishes Manual for Architectural and Metal Products, for recommendations of designating finishes.
B. Super Durable Powder Coatings: Aluminate Premium Wood Finishes use a polyurethane powder coat with ink based wood grain patterns sublimated into the base powder effectively tattooing the powder. The combined effect creates all the aesthetic of real wood while offering the same environmental advantages of powder coated finishes.
   1. Wood Grained:

2.04 FABRICATION
A. Prepare surfaces, pre-treat and coat components in accordance with AAMA 2604 and 2605 Quality Standards and applicable European standards for coating material specified.
B. Wrap and packaged coated components using methods suitable for transit and covered site storage without damage.

PART 3 EXECUTION

3.01 EXAMINATION
A. Do not begin installation until colors have been verified.
B. Verify framing members are ready to receive panel system.
C. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION
A. Protect adjacent work areas and finish surfaces from damage during installation.
B. Prepare surfaces using methods recommended by manufacturer for achieving the best result for the material under the project conditions.

3.03 INSTALLATION
A. Install in accordance with manufacturer's installation instructions.
B. Fasten soffit panels to structure; aligned, level and plumb.
C. Locate joints over supports.
D. Use concealed fasteners unless otherwise approved by Architect.
E. Install soffits, and accessories in accordance with best practice, with all joint members plumb and true.

3.04 FIELD QUALITY CONTROL
A. After installation of soffit panels, check entire surface for obvious flaws and defects.
B. Replace and repair any problem areas, paying close attention to the substrate for causes of the problem.

3.05 CLEANING
A. After application of soffits, clean as necessary to remove all fingerprints and soiled areas.
B. Upon completion of soffit application, clean entire area, removing all scrap, packaging, and unused materials related to this work.

END OF SECTION
SECTION 07 4293.33
PLASTIC SOFFIT PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. This section includes requirements for supply and installation of plastic board exterior soffits.

1.02 RELATED REQUIREMENTS
A. Section 05 4000 - Cold-Formed Metal Framing: Stud wall framing system.
B. Section 07 2100 - Thermal Insulation.
C. Section 07 6200 - Sheet Metal Flashing and Trim.
D. Section 07 9200 - Joint Sealants: Sealing joints between metal wall panel system and adjacent construction.

1.03 REFERENCE STANDARDS
A. Underwriters Laboratories Inc; Standard Method of Test for Surface Burning Characteristics of Flooring, Wall Coverings, and Miscellaneous Materials and Assemblies.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordinate installation of electrical outlets in soffits and color of cover plates to match soffit.
B. Coordinate work of subcontractors with components penetrating soffits to arrange for appropriate board movement allowances and trims at the intersection.

1.05 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit manufacturer's product data and installation instructions for each type of product specified.
C. Samples for Initial Selection: Submit color samples for plastic boards and accessories visible in the final installed work.
D. LEED Submittal:
   1. MR Credit 2: Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill.
   2. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
   3. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.
E. Maintenance Material Submittals: Supply spare materials for Owner's maintenance use.
   1. Supply one manufacturer's touch-up pen for each colour on the project.
   2. 5% of installed boards in manufacturer's standard maximum board lengths.

1.06 QUALITY ASSURANCE
A. Installer Qualifications: Company specializing in performing the work of this Section with minimum 3 years experience.

1.07 MOCK-UP
A. Mock-Ups: Prepare a full size mock-up of plastic boards on the project site for Mosaic review. Include each type of product and accessories, one outside corner and intersection with exterior wall.
1.08 DELIVERY, STORAGE, AND HANDLING
   A. Storage and Handling Requirement: Avoid exposure to ketones, cyclic ethers, and aromatic hydrocarbons.

1.09 WARRANTY
   A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
   B. Manufacturer's Warranty: 15 year limited warranty for exterior soffits from vinyl peeling, board warping, board splitting, and excessive discoloration.

PART 2 PRODUCTS
2.01 MANUFACTURERS
   B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE CRITERIA
   A. Board Materials meeting the following requirements:
      1. UV Resistance: 97% UV Reflected minimum.
      2. Water Absorption (to DIN 53495): 0.04% maximum.
      3. Impact Resistance (H Sphere Hardness Test): 120 N/mm².
      4. Shear Strength: 5.5 KJ/m².
      5. Coefficient of Expansion: 8x10⁵k.

2.03 MATERIALS
   A. Extruded rigid boards (soffits) with transparent PVDF layer over a transparent polymethylmethacrylate (PMMA) layer over a decorative PMMA film with wood appearance factory applied on extruded PVC board substrate.
   B. Board Profile: 6 inches.
   C. Board Length: 19 feet.

2.04 FINISHES
   A. Finish with Wood Appearance:
      1. REF 9 - Carmel Zebrawood.
   B. Integral Colour Finish:
      1. REF Blanco
   C. Texture:
      1. Embossed Wood Grain Appearance.

2.05 ACCESSORIES
   A. Manufacturer's recommended PVC and aluminum accessories, with factory applied protective and decorative film, colour to match board finish.
   B. Fasteners: Galvanized for exterior locations, pan head washer screws, length to penetrate framing by 19 mm minimum.
   C. Sealant: Type as recommended by manufacturer, colour matching boards.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify soffit framing are braced or sheathed to resist racking loads in accordance with IBC requirements.
   B. Verify soffit framing has adequate fastener withdrawal resistance before beginning of installation of products specified.
3.02 PREPARATION
   A. Prior to installation, randomly mix board bundles to maximize wood grain variation appearance and minimize pattern repeats.
   B. Select boards of longest possible lengths.

3.03 INSTALLATION
   A. Install soffits in accordance with manufacturer's installation instructions, and as indicated in construction documents.
   B. Securely attach soffits using methods and materials recommended by board manufacturer for wind load.
   C. Scribe and cut as required to fit abutting walls and adjacent surfaces, and to accommodate other materials where penetrating through boards. Secure boards and accessories in place, rigid, plumb, and square as follows:
      1. Install work with joints concealed behind corner trims and other manufacturer's trim accessories.
      2. Locate fasteners in center of elongated slots without binding boards, to allow for thermal movement. Allow board expansion/contraction gaps as recommended by manufacturer, with consideration given to the temperature at time of installation.
      3. Select each board to avoid the appearance of repeating wood grain pattern.
      4. Install boards with end joints concealed by H-shaped trim or perimeter trims.
   D. Where aluminum trims are cut on site, apply sealants to edges. Install sealant in accordance with sealant manufacturer's instructions.

3.04 CLEANING
   A. Cleaning: Where dirt or other contaminants occur on soffits, perform cleaning of boards in accordance with manufacturer's instructions.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Provide a thermally broken, rainscreen attachment system for attachment of exterior cladding Corten Flat Panel installed over continuous exterior insulation.

1.02 RELATED REQUIREMENTS
   A. Section 05 4000 - Cold-Formed Metal Framing.
   B. Section 07 2100 - Thermal Insulation.
   C. Section 07 2500 - Weather Barrier.

1.03 SYSTEM DESCRIPTION
   A. System assembly shall include the following components from the substrate out:
      2. Weather Resistant/Air Barrier over substrate.
      3. Continuous insulation.
      4. Thermally broken rainscreen attachment system.
      5. Exterior cladding.

1.04 DESIGN REQUIREMENTS
   A. Structural Design: Exterior-insulated rainscreen wall assembly capable of withstanding effects of load and stresses from dead loads, wind loads, ice loads (if applicable) as indicated on Structural General Notes on Structural Drawings, and normal thermal movement without evidence of permanent defects of assemblies or components.
      1. Thermal Movements: Provide assemblies that allow for thermal movements resulting from the following maximum ambient temperatures by preventing overstressing of components and other detrimental effects:
         a. Temperature Change (range): 120 degrees Fahrenheit ambient.
   B. Performance Requirements:
      1. Rainscreen Attachment System Performance: Comply with ANSI/ASHRAE 90.1-2010 definition of continuous insulation (c.i.).
      2. No thermal bridges other than fasteners and service openings.
      3. Thermal Performance:
         a. Continuous framing profiles (including C- or Z-shaped sections or furring) penetrating insulation not allowed.
      4. Structural Performance:
         a. Wind Load Performance – Attachment system must show the following results when tested in accordance with ASTM E330-02.
            1) 90 pound per square foot negative and positive pressure held for 60 seconds, system components shall not experience failure or gross permanent distortion.
         b. Wind cycling (air pressure cycling) performance – Attachment system must show conformance to the following results when tested in accordance with ASTM E1886-05.
            1) A total of 4,500 air pressure cycles. Cycles must include 50 cycles at a maximum pressure of 90 pounds both positive and negative. Average cycle time must not be less than 3.25 seconds for both negative and positive cycles. Cladding weight supported during test must be a minimum of 11.5 pounds per square foot. No damage or deformation must be seen at end of test.
         c. Gravity load (dead load) performance – Attachment system must demonstrate resistance to deflection under shear loading, applied parallel to the wall assembly and directly to the attachment system. Testing must be conducted using calibrated...
equipment by an IAS accredited third party laboratory. Deflection not to exceed 0.050 inches at 150 pounds per square foot.

5. Framing Members:
   a. Test framing components to AAMA TIR- A8-[04] – Section 7.2 to determine structural performance and effective moment of inertia for each perforated component. Minimum Effective Moment of Inertia: 0.0066 in4.
   b. Localized bending stress for eccentrically loaded framing members must be evaluated with the maximum effective length of resisting element not more than 12 inches.

6. Fasteners:
   a. Minimum Safety Factor of 3 for both tension and shear values.
   b. Combined tension and shear shall be evaluated according to an interaction formula. Sum of terms shall not exceed 1.0.

1.05 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit manufacturer’s product literature and descriptions of testing performed on system components to indicate meeting or exceeding specified performance.
C. Shop Drawings:
   1. Submit connection details to the cladding manufacturer, showing interface of rainscreen attachment system to substrate and panels with adjacent construction.
   2. Show system installation and attachment, including fastener size and spacing.
D. LEED Submittal:
   1. MR Credit 2: Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill.
   2. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
   3. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.
E. Test Reports:
   1. Test to the following standards and provide written test reports by a third party:
      a. AAMA TIR-A8-[04]: Structural Performance of Composite Thermal Barrier Framing Systems – Section 7.2.
      b. ASTM E330.
      c. ASTM E1233.
      d. Gravity load test report, performed by IAS accredited third party.
    2. Comprehensive three-dimensional thermal modeling report indicating framing systems impact on exterior insulation rated R-value.

1.06 QUALITY ASSURANCE
A. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience.
B. Pre-Installation Meeting:
   1. Discuss sequence and scheduling of work and interface with other trades.
   2. Review metal wall framing assemblies for potential interference and conflicts and coordinate layout and support provisions for interfacing work.
C. Mock-Up: Coordinate mock-up materials and requirements with Mosaic Architecture. Approved mock-up may remain as part of work.
1.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials and components in manufacturers' original, unopened and undamaged containers or bundles, fully identified. Exercise care to avoid damage during unloading, storing and installation.

B. Store, protect and handle materials and components in accordance with manufacturer recommendations to prevent damage, contamination and deterioration. Keep materials clean, dry, and free of dirt and other foreign matter, and protect from damage due to weather or construction activities.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Attachment System: Ten (10) year Limited Warranty.
   1. Covers components of the attachment system, including structural failure of components when all the materials and components are supplied and installed per manufacturer's requirements.
   2. Includes labor to remove and reinstall façade finish panels, finish closures and façade finish accessories necessary to access defective material.

PART 2 PRODUCTS

2.01 RAINSCREEN ATTACHMENT/SUPPORT FRAMING SYSTEM

A. Comply with ANSI/ASHRAE 90.1-2010 definition of continuous insulation (c.i.).

   1. ASTM A653 Galvanized steel is not acceptable.

C. Steel Classification: Structural Steel (SS), Grade 50, 50 ksi Yield.

D. Vertical Girt: Vertical girt with pre-punched attachment holes, directly attached on top of rigid insulation [directly to substrate] at regular spacing, with engineered thermally isolated washer assembly and fasteners.
   1. Steel Thickness: Minimum 0.046-inch thick (18 gauge).
   2. Profile Depth: 0.75 inches.
   3. Girt Fastening Face, Width: 2-inches.
   4. Finish: Painted black at open joint panel assembly.

E. Fasteners:
   1. Sufficient length to provide solid attachment through rigid insulation to structure as required by manufacturer.
   2. Thermal Isolating Washers: Minimum 0.125 inch thick Polyoxymethylene copolymer (POM) washers with integral centering lip to act as a thermal break between wall anchor fasteners and girt.
      a. Tensile Yield Strength: 9.57 ksi per ISO 527.
      b. Melting Temperature: 329 degrees Fahrenheit per ISO 3146.

F. Steel stud framing substrate: Self-drill hex-washer-head stainless steel with 1,000 hour salt-spray rated thermoset polyester coating.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions for compliance with manufacturer requirements for installation conditions affecting performance of the work.

3.02 RAINSCREEN ATTACHMENT SYSTEM INSTALLATION

A. Installation:
1. Install vertical girts in vertical orientation in strict accordance with manufacturer’s installation instructions.
2. Do not use shims to plumb the wall between the vertical girt and insulation.
3. Minimum length of installed cut girt is 24-inches and shall be attached with at least two (2) fasteners.
4. Mount box girts, fastened up to 32 inches on center (as determined by the manufactures engineering calculations) over installed rigid insulation, using one wall anchor per pre-punched attachment hole at spacing indicated on engineering calculations.
   a. Check plumb of vertical girts both parallel and perpendicular to the structure.
   b. Tighten screws that attach vertical girt through insulation to substructure to a snug tight condition and not stripped. Do not over-torque beyond manufacturer’s recommendation. If installed using hand tools, verify for each installer at beginning of project using snug-tight criteria. Do not use stripped holes.
   c. Where obstructions are present and unavoidable (i.e. window openings), use laser or chalk line to restart girt.
   d. Locate vertical girt at jamb conditions and outside corner conditions.
   e. Use shearing instruments (i.e. snips, nibbler, etc.) for cutting metal framing components. Saws are not recommended, as the sparks produced during cutting will damage the anti-corrosion coating. If sparks are generated during cutting, be sure the portion of the component to be installed on the building is protected from sparks and that any stockpile near the cutting station is also protected.
   f. The systems components should not be cut while installed on the building, unless using a shearing instrument.
   g. Replace thermal isolator pieces that break during installation.
   h. Provide a 3/8” – 1/2” gap between girts for expansion when multiple lengths of vertical girts are installed.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fully Adhered hypalon membrane roofing system.
B. Bid Option: Fully Adhered KEE roof membrane in lieu of hypalon membrane.
C. Fully Adhered, PVC Pedestrian Traffic Coating Membrane (at main floor Northwest exit way only)

1.02 SCOPE OF WORK

A. Contractor shall submit proposal to provide all labor, material, equipment, and tools as required work in this section and related sections.
B. Contractor shall provide new fully adhered roof membrane system and flashings in accordance with manufacturer requirements and as per specified in the section. Note; it is the contractors responsibility to verify all the job site conditions, including but not limited to roof measurements, roof access, core cuts, etc. The owner will not pay for any extra work if the con-tractor failed to ascertain or verify the job condition prior to submitting a bid. It will be the contractor’s responsibility to comply with all manufacturer requirements. (i.e. minimum flashing heights). The contractor shall include in their bid any modification required by the manufacturer of the membrane in order to provide the owner with the 20 year NDL warranty as per this specification. (Peel stops required for 90 mph wind speed warranty).
C. At all drain locations: the contractor shall test all drains and associated piping prior to starting roofing operations. If the drains and piping are not functioning properly, the contractor is to notify the owners’ representative and the owner will be responsible for cleaning the associated drain piping. The owner can not assume any financial responsibility for drain and associated pipe repairs if this procedure is not followed prior to starting roofing operations. At the completion of the roofing, all drains and associated piping are to be functioning properly. See plans for additional wall scuppers to be installed.
D. Contractor shall obtain the necessary building permit as required by state, local and agencies.
E. Install 2 layers of polyisocyanurate (R30 total) minimum insulation mechanically attached where noted on plans.
F. Install a 1/4” per foot positive slope Poly ISO taper system for areas noted on plans.
G. Install 1/2” glass fiber cover board fully adhered per manufactures recommendations where noted on plans.
H. Wrap parapets and all roof edges past the nailers with membrane to outside and install new manufactured edge-metal. (Install weldable metal on all cutter edges per details).
I. Install walk-off pads as indicated on plans.
J. Provide manufacturer’s 20-year no-dollar-limit warranty.
K. Provide Category 5 and Color-fast warranties on the Manufactured metal.

1.03 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA’s “The NRCA Roofing and Waterproofing Manual” for definition of terms related to roofing work in this Section.

1.04 PERFORMANCE REQUIREMENTS

A. General Performance: Installed membrane roofing and base flashing shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.
B. Material Compatibility: Provide materials that are compatible with one another under conditions of service and application required as demonstrated by testing or field experience.
C. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing agency to resist uplift pressures calculated according to ASCE7/SEI7.
   1. Corner Uplift Pressure: 75 lbf/sq. ft.
   2. Perimeter Uplift Pressure: 75 lbf/sq. ft.

1.05 GENERAL DESCRIPTION
   A. Membrane roofing utilizing a hypalon or fleece back off-white KEE thermoplastic membrane fully adhered. Membrane type at contractor's option.

1.06 SPECIAL CONDITIONS
   A. This specification must be followed without variation as it applies to only the building roofs having deck structures capable of supporting the guidelines set forth herein.
   B. All deviations from this specification require review before any specification change is valid.

1.07 DESIGN CONSIDERATIONS
   A. Membrane that could be subjected to chemical discharge not listed on the membrane manufacturer's chemical resistance publication.
   B. Membrane that could be subjected to unusual wear and tear may require the inclusion of walk-boards.
   C. Compliance with EPA and OSHA requirements as published by Local, State and Federal authorities.

1.08 RELATED REQUIREMENTS
   A. Section 05 3100 - Steel Decking.
   B. Section 07 6200 - Sheet Metal Flashing and Trim: Counterflashings, reglets.
   C. Section 07 7100 - Adjustable Deck Pedestals: Prefabricated roofing expansion joint flashing.
   D. Section 22 1006 - Plumbing Piping Specialties: Roof drains.

1.09 REFERENCE STANDARDS

1.10 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: For each type of product indicated.
   C. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
   D. Samples for Verification.
   E. Rib system sample of color chosen.
   F. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by membrane roofing system manufacturer to install manufacturer's product.
   G. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
   H. Submit evidence of compliance with performance requirements.
   I. Research/evaluation reports.
J. Qualification Data: For Installer and manufacturer.
K. Field quality-control reports.
L. Maintenance Data: For roofing system to include in maintenance manuals.
M. Source Limitations: Obtain components for membrane roofing system from same manufacturer as membrane roofing.
N. LEED Submittal:
   1. Product Data for Credit MR4.1 and Credit MR4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
   2. SRI data on all colors specified.
O. Warranties: Special warranties specified in this Section.
P. Inspection Reports: Copy of roofing system manufacturer's inspection reports, in progress and completed of roofing installation.

1.11 QUALITY ASSURANCE
A. Installer Qualifications: A qualified firm with ten years experience installing thermoplastic membrane for proposed material approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty. Contractor must have a place of business within three hours of project by land.

B. Manufacturer Qualifications: A qualified manufacturer with twenty (20) years experience manufacturing the same membrane without formulation changes. The roofing membrane and system shall be identical to that used for this project and which can show evidence of these materials being satisfactorily used on at least three (3) projects of similar size, scope and type within such a period.

C. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
   1. Exterior Fire-Test Exposure: Class A; for application and roof slopes indicated.

1.12 PROJECT CONDITIONS
A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.13 WARRANTY
A. Special Warranty: Manufacturer's standard form, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks. (NDL).
   1. Warranty Period: 20 years from date of Substantial Completion, and shall not include exclusions for ponding water.
   2. 90 mph wind rider.
3. 1.5 inch hail rider.
4. Supply owner with the Category 5 wind and color -fast warranty on Manufactured metal.

B. Special Project Warranty: Submit roofing Installer's warranty, signed by Installer, covering the Work of this Section, including all components of membrane roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards and walkway products, for the following warranty period:
1. Warranty Period: 20 years from date of Final Acceptance.

PART 2 PRODUCTS

2.01 THERMOPLASTIC ROOF MEMBRANE

A. HYPALON ROOF:
1. Hypalon CSPE roof membrane as manufactured by Burke Rubber Company, 2250 South 10th Street, San Jose, CA 95112. (408) 29-3500. www.burkind.com
2. Basis of Design: Hypalon, CSPE thermoplastic membrane
4. Scrim: polyester
5. Color: white
6. Thickness: 0.045 inches
7. Role width: 61 inches
8. Specific gravity: 1.65
9. Tensile Strength, psi: 800 per ASTM D412
10. Elongation %: 400 per ASTM D412
11. Tear Resistance, lb: 6 per ASTM D1004
13. Water absorption, % weight gain: 5 per ASTM D471 7 days
14. Low temperature brittleness: -40 degrees farenheit per ASTM D1790

B. BID OPTION IN LIEU OF HYPALON ROOF MEMBRANE:
   a. Thickness: 50 mils (1.1 mm), nominal.
   b. Color:
      1) White.
   c. Inter-ply Reinforcement to be 18 x 21 / 1,100 x 1,100 denier weft reinforced polyester knit fabric coated with an adhesive coat to promote a molecular bond between the base fabric and the front and back coats.
4. Tensile Strength: ASTM D-882: 9,500 lbs. (668 kgf/cm2).
12. Oil Resistance: Mil-C-2069C: No swelling, cracking, leaking.

C. PVC Pedestrian Traffic Coating Membrane: Duradek Ultra; polyester reinforced PVC membrane with ultra-violet resistance, for fully-adhered installation with heat-welded seams and perimeter attachment.
1. Sheet Width: 72 inches (1828.8 mm) or 60 inches (1524.0 mm)
2. Overall Sheet Thickness: 0.060 inch (1.5 mm).
3. PVC Film Thickness: 0.050 inch (1.3 mm).
4. Coefficient of Friction: >0.50
5. Color: Ultra Classic Series: Steel
7. Provide Surface Conditioners, Adhesives, Sealants, Fillers, and Cleaners as required for proper installation.

2.02 AUXILIARY MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.
2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
   a. Plastic Foam Adhesives: 50 g/L.
   b. Gypsum Board and Panel Adhesives: 50 g/L.
   c. Multipurpose Construction Adhesives: 70 g/L.
   d. Fiberglass Adhesives: 80 g/L.
   e. Contact Adhesive: 80 g/L.
   f. Other Adhesives: 250 g/L.
   g. PVC Welding Compounds: 510 g/L.
   h. Adhesive Primer for Plastic: 650 g/L.
   i. Single-Ply Roof Membrane Sealants: 450 g/L.
   j. Non-membrane Roof Sealants: 300 g/L.
   k. Sealant Primers for Nonporous Substrates: 250 g/L.
   l. Sealant Primers for Porous Substrates: 775 g/L.

B. Laminated Metal: 24 GA. hot dipped G-90 laminated with polymeric coating supplied by System Manufacturer. Indicated on drawings as "weldable metal".

C. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as KEE sheet membrane.

D. Bonding Adhesive: Manufacturer's standard, solvent based for Fleece back 290 or CR20.
1. 190 bonding adhesive for bareback membranes.

E. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors. (Counter flash for 20 yr warranty).

F. Metal Battens: Manufacturer's standard, aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1 inch wide by 0.05 inch thick (25 mm wide by 1.3 mm thick), pre-punched.

G. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.

H. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

I. Walk-off pads: Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resistant, surface-textured walkway rolls, approximately 5/32 inch thick and 30" wide, and acceptable to membrane roofing system manufacturer. Similar to FiberTite Mellow Yellow walkways. Hot air weld the entire perimeter of the walkway to the roofing membrane.

J. COVERBOARD
2. Fasteners: Factory-coated steel fasteners and metal plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.

2.03 DECK SHEATHING AND COVER BOARDS
A. Deck Sheathing: Gypsum sheathing, ASTM C1396/C1396M, Type X special fire resistant type, paper face, 5/8 inch thick.
   1. Product: Securock, distributed by Carlisle.
B. Coverboard: cover board approved by roofing manufacturer and required for hail warranty, complying with ASTM C1325.

2.04 INSULATION
A. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, fiber reinforced felt both faces; Grade 2 and with the following characteristics:
   1. Compressive Strength: 20 psi.
   3. Tapered Board: Slope as indicated; applied on top of Base Boards with minimum thickness 1/2" inch at roof drains; fabricate of fewest layers possible.

2.05 ACCESSORIES
A. Prefabricated Roof Accessories:
   1. Corners and Seams: Same material as membrane, in manufacturer's standard thicknesses.
   2. Penetrations: Same material as membrane, with manufacturer's standard cut-outs, rigid inserts, clamping rings, and flanges.
   3. Walkway Rolls: Sure-Flex Heat Weldable Walkway Rolls; 80 mils (0.080 inch) thick; gray membrane.
      a. Hypalon: Burke Hypalon Walk Mat (M531). Thickness = 0.125 inches, 30" widths.
         Quantity as required to cover areas shown on roof plan.
      c. PVC: Carlisle Sure-Flex Walkway rolls. 60 mil minimum thickness. 36" width.
B. Membrane Adhesive: As recommended by membrane manufacturer.
C. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
D. Sealants: As recommended by membrane manufacturer.
E. Cleaner: Manufacturer's standard, clear, solvent-based cleaner.
F. Edgings and Terminations: Manufacturer's standard edge and termination accessories.
   1. Fascia - upper roof: ATAS International - Rapid-LOK Fascia with 4" vertical face dimension.
      a. Prefinished steel: 24 gauge
      b. 20 gauge continuous cleat
      c. 6" splice panels at each joint
      d. Wind rating warranty: 120 mph
      e. Finish: PVFD per AAMA 2605-13
      f. Color: to match metal siding color, metallic dark charcoal grey.
   2. Custom Fascia System at lower roofs: Custom manufactured in profile indicated.
      a. Prefinished steel: 24 gauge
      b. 20 gauge continuous cleat
      c. 6" splice panel at each joint
      d. Section length: minimum 12 feet
      e. Finish: PVFD per AAMA 2605-13
      f. Color: to be selected to match metal siding color: metallic dark charcoal grey.
3. Termination Bar:
   a. At exposed areas: Metal Era - CB175 with CF-175 finished cover metal. Metal Era, 1600 Airport Road, Waukesha, WI 53188. 1-800-373-9156. www.metalera.com
   b. At non-exposed areas: standard 1 1/4" aluminum anodized termination bar

PART 3 EXECUTION

3.01 MATERIAL DELIVERY, HANDLIN AND STORAGE
   A. Deliver all materials and/or packages to the jobsite in manufacturer's original, unopened containers, with legible labels and in sufficient quantity to allow for continuity of work.
   B. Select and operate material handling equipment in a safe manner, guarding against damage to existing construction or newly applied roofing and conforming to manufacturer's recommendations of handling and storage.
   C. Provide appropriate protection to those materials subject to degradation from weather conditions, i.e., moisture, wind, extreme cold or heat as per manufacturer's recommendations. Store materials a minimum of 8 inches off the ground. Cover materials at all times with tarps or approved covers.
   D. Remove all damaged materials from construction site.

3.02 JOB CONDITIONS
   A. Provide special protection on newly completed roofing to avoid unusual wear and tear during installation. All entrances to roof area will require 6' x 6' platform of insulation and plywood during construction.
   B. Protect building walls, rooftop units, windows and other vulnerable components during installation.

3.03 INSULATION INSTALLATION
   A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
   B. Comply with membrane roofing system manufacturer's written instructions for installing roof insulation.
   C. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction. Loose lain to be retained by top cover board fasteners.
   D. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together and fasten to roof deck per manufactures details.
   E. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof. 1. 3” corners, 6” perimeter, 12” field in low rise adhesive per manufactures details.

3.04 MEMBRANE ROOFING INSTALLATION
   A. Fully adhered membrane roofing over area to receive roofing and install according to roofing system manufacturer's written instructions.
   B. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
   C. Mechanically fasten membrane roofing securely at terminations, penetrations, and perimeter of roofing.
   D. Apply membrane roofing with side laps shingled with slope of roof deck where possible.
   E. One peel stop required 18” from the perimeters and corner fastened topside at 12” on center.
F. Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.
   1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.
   2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
   3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.

3.05 BASE FLASHING INSTALLATION
   A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
   B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.
   C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
   D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
   E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.06 EXAMINATION
   A. Verify that surfaces and site conditions are ready to receive work.
   B. Verify deck is supported and secure.
   C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
   D. Verify deck surfaces are dry and free of snow or ice.
   E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.07 PREPARATION, GENERAL
   A. Clean substrate thoroughly prior to roof application.

3.08 METAL DECK PREPARATION
   A. Install deck sheathing on metal deck:
      1. Lay with long side at right angle to flutes; stagger end joints; provide support at ends.
      2. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface.
      3. Tape joints.

3.09 INSULATION
   A. Apply vapor retarder to deck surface with adhesive in accordance with manufacturer's instructions.
      1. Extend vapor retarder under cant strips and blocking to deck edge.
      2. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.
   B. Ensure vapor retarder is clean and dry, continuous, and ready for application of insulation.
   C. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.
   D. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.
E. Lay boards with edges in moderate contact without forcing, and gap between boards no greater than 1/4 inch. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

F. Do not apply more insulation than can be completely waterproofed in the same day.

3.10 MEMBRANE APPLICATION

A. ALL MEMBRANES TO BE INSTALLED PER MANUFACTURE’S INSTRUCTIONS. HAVE COMPLETE INSTRUCTIONS ON SITE DURING ROOF INSTALLATION. MANUFACTURER’S INSTRUCTIONS TAKE PRECEDENCE OVER THESE SPECIFICATION FOR INSTALLTION METHODS.

B. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

C. Shingle joints on sloped substrate in direction of drainage.

D. Seam Welding:
   1. Seam Welding: Overlap edges and ends and seal seams by heat welding, minimum 2 inches.
   2. Cover all seams with manufacturer's recommended joint covers.
   3. Probe all seams once welds have thoroughly cooled. (Approximately 30 minutes.)
   4. Repair all deficient seams within the same day.
   5. Seal cut edges of reinforced membrane after seam probe is complete.

E. Mechanical Attachment:
   1. Apply membrane and mechanical attachment devices in accordance with manufacturer's instructions.

F. At intersections with vertical surfaces:
   1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
   2. Fully adhere flexible flashing over membrane and up to nailing strips.

G. Coordinate installation of roof drains and sumps and related flashings.

H. Daily Seal: Install daily seal per manufacturers instructions at the end of each work day. Prevent infiltration of water at incomplete flashings, terminations, and at unfinished membrane edges.

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

C. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.

3.12 CLEANING

A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

B. Remove bituminous markings from finished surfaces.

C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

D. Repair or replace defaced or damaged finishes caused by work of this section.

3.13 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION
SECTION 07 6100
LINEAR METAL SOFFITS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Fabricated linear metal soffits, including trim, flashings, counterflashing.
B. Matching trim and accessories.
C. Sealants for joints within sheet metal fabrications.

1.02 RELATED REQUIREMENTS
A. Section 05 4000 - Cold Formed Metal Framing: Metal framing for support of aluminum soffits.
B. Section 07 2100 - Building Insulation: Rigid thermal insulation installed behind siding.
C. Section 07 6200 - Flashing and Sheet Metal: Sheet metal gutters and downspouts.
D. Section 07 9000 - Joint Sealers: Sealants used in conjunction with aluminum soffit panel.

1.03 REFERENCE STANDARDS
A. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2015.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
C. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
   1. Innovation: Product data and certification letter indicating how exterior powder coatings support innovation LEED credit.
   2. No Volatile Organic Compounds: Product data and certification letter indicating that powder paint do not contribute to air pollution/ozone depletion and complies with environmental regulations.
   3. Chrome Free Pre-Treatment: Product data and certification letter indicating that your process does not contain chromates, cyanides or heavy metals.
D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
E. Verification Samples: For each finish product specified, two samples, minimum size 2 inches by 3-1/2 inches, representing actual product, color, and gloss.
F. Manufacturer's Certificates: Certify products meet and exceed specified requirements.
G. Closeout Submittal: Provide manufacturer's maintenance instructions that include recommendations for periodic cleaning and maintenance of components.

1.05 QUALITY ASSURANCE
A. Mock-up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Mosaic Architecture.
   2. Do not proceed with remaining work until workmanship, color, and gloss are approved by Mosaic Architecture.
   3. Refinish mock-up area as required to produce acceptable work.
1.06 DELIVERY, STORAGE, AND HANDLING
   A. Packaged and store products under cover in manufacturer's unopened packaging until ready for transport and installation.

1.07 WARRANTY
   A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
   B. Mayne Coatings Corp. limited warranty against cracking, peeling, gloss and color retention for Alluminate premium wood finishes.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Metal Sales Manufacturing Corporation, 545 South 3rd Street, Suite 200, Louisville, KY 40202
   B. Metal Sales Contact:
      1. Toll Free: 800.406.7387
      2. Phone: 502.855.4300
      3. Fax: 502.855.4200
      4. Web: www.metalsales.us.com
      5. E-Mail: info@metalsales.us.com
   C. Acceptable Manufacturer: Metal Sales manufacturing corporation, www.metalsales.us.com
   D. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS
   A. Linear metal soffit: Metal Sales TLC-3
      1. Size:
         a. Width: 12 inches, with center groove
      2. Length:
         a. 12 feet.
      3. Material: Aluminum-zinc alloy-coated steel sheet,
         a. ASTM A 792, AZ50 or AZ55 coating designation,
         b. structural quality, Grade 50, 0.0236 inch (0.60 mm) (24 gauge),
   B. Accessories:
      1. Provide with matching J metal edging, hat channel sub-framing, misc trim, as required.
   C. Finish:
      1. PVDF Kynar 500 polyester finish.
      2. Color: to be selected from manufacturers entire line.
   D. Water Penetration: No penetration at 12 psf when tested according to ASTM E 331.

2.03 FABRICATION
   A. Prepare surfaces, pre-treat and coat components in accordance with AAMA 2604 and 2605 Quality Standards and applicable European standards for the coating material specified.
   B. Wrap and package coated components using methods suitable for transit and covered site storage without damage.
   C. Hem exposed edges on underside 1/2 inch; miter and seam corners.

2.04 FACTORY FINISHING
   B. Primer Coat: On coated sheets, finish concealed side of sheet with primer compatible with finish system as recommended by finish system manufacturer.
PART 3 EXECUTION

3.01 EXAMINATION
   A. Do not begin installation until colors have been verified.
   B. If preparation is the responsibility of another installer, notify Mosaic Architecture of unsatisfactory preparation before proceeding.

3.02 PREPARATION
   A. Clean surfaces thoroughly prior to installation.
   B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the material under the project conditions.

3.03 INSTALLATION
   A. Install in accordance with manufacturer’s instructions.
   B. Install soffits and accessories in accordance with best practice, with all members plumb and true.
   C. Overlap and miter all trim corners.
   D. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Fabricated sheet metal items, including flashings, counterflashings, gutters, and downspouts.
   B. Reglets and accessories.

1.02 RELATED REQUIREMENTS
   A. Section 07 9005 - Joint Sealers.

1.03 REFERENCE STANDARDS
   B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

1.04 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
   C. LEED Submittal:
      1. Product Data for Credit MR4.1 and Credit MR4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
      2. Product Data for MR 5: Regional Materials. For products that have been extracted, harvested or recovered, as well as manufactured within 500 miles of the project site.
   D. Samples: Submit two samples 4 x 4 inch in size illustrating metal finish color.

1.05 QUALITY ASSURANCE
   A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
   B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 5 years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
   B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS
   A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage (0.0239) inch thick base metal, shop pre-coated with PVDF coating.
      1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
2. Color: As selected by Mosaic Architecture from manufacturer's full colors. Manufacturer must provide a dark metallic charcoal grey option.


2.02 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.
B. Underlayment: ASTM D226/D226M, organic roofing felt, Type I ("No. 15").
C. Primer: Zinc chromate type.
D. Protective Backing Paint: Zinc molybdate alkyd.
E. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.
F. Sealant to be Exposed in Completed Work: ASTM C920; elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear.
G. Sealant: Type specified in Section 07 9005.
H. Plastic Cement: ASTM D4586, Type I.
I. Reglets: Surface mounted type, galvanized steel; face and ends covered with plastic tape.

2.03 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
B. Form pieces in longest possible lengths.
C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
F. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.

2.04 GUTTER AND DOWNSPOUT FABRICATION

A. Gutters: Profile as indicated. Gutters to be formed from roof membrane system.
B. Downspouts: Round profile. Downspouts to be galvanized iron pipe, schedule 40
C. Gutters and Downspouts: Size indicated on drawings.
D. Accessories: Profiled to suit gutters and downspouts.
   1. Anchorage Devices: In accordance with SMACNA requirements.
   2. Downspout Supports: Brackets.
E. Downspout brackets: Custom Steel, see details
F. Downspout chains: 3/8" galvanized chain with galvanized anchors to concrete anchor. See details.
G. Seal metal joints.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.
B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.
C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION
A. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.
B. Apply plastic cement compound between metal flashings and felt flashings.
C. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
D. Seal metal joints watertight.
E. Secure gutters and downspouts in place using concealed fasteners.
F. Slope gutters 1/4 inch per 10 feet, minimum.
G. Connect downspouts to downspout boots. Grout connection watertight.

3.04 FIELD QUALITY CONTROL
A. See Section 01 4000 - Quality Requirements, for field inspection requirements.
B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION
SECTION 07 7100
ADJUSTABLE DECK PEDESTALS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Adjustable Deck Pedestals.

1.02 RELATED REQUIREMENTS
A. Section 07 5400 - Thermoplastic Membrane Roofing.

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.
C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.
D. LEED Submittal:
   1. Product Data for Credit MR4.1 and Credit MR4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
E. Manufacturer's Installation Instructions: Indicate special procedures, fasteners, supporting members, and perimeter conditions requiring special attention.

1.04 PROJECT CONDITIONS
A. There are no pedestal installation temperature restriction guidelines other than the practical considerations of working in any unsafe condition or inclement weather.
B. Deck supports specified are to be for used with pedestrian traffic only.
C. Pedestrian decks must be restrained by perimeter blocking or walls on all sides. Lateral movement greater than one tab width is unacceptable and will be rejected.
D. All decks shall be designed to not exceed the design capacity of the pedestal.
E. The substrate immediately below the pedestals shall provide positive drainage.

1.05 WARRANTY
A. At project closeout and upon request, Bison Deck Supports can provide to the Owner, an executed copy of the manufacturer's standard document outlining the terms, conditions and limitations of their limited warranty against manufacturing defect for a period of (5) years.
B. The contractor warrants that this work will remain free from defects of labor and materials used in conjunction with this work in accordance with the general conditions for this project or a maximum of (5) years.
C. Decks should not have lateral movement in excess of one tab width.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Bison Deck Supports; 1975 W. 13th Ave; Denver, CO 80204; Phone: 888-412-4766; www.bisondecksupports.com
B. VersiJack Adjustable Deck Pedetals, Height Adjustable and Index Sloping; Tournesol Siteworks; www.tournesolsiteworks.com
C. Substitutions: See Section 01 6000 - Product Requirements.
2.02 APPLICATION/SCOPE

A. Furnish and install a complete adjustable deck support system with a maximum cavity height of up to:
   1. Screwjack Pedestals maximum cavity height of 16 inches or up to 24 inches with additional bracing, see
   2. Deck supports are not designed for supporting decks that carry vehicular traffic or equipment including but not limited to snow removal equipment, ATV’s, forklifts or any motorized vehicles.
   3. Consult the manufacturer and a engineer regarding the following:
      a. When spacer tab condition or design requires spacing between decking tiles other than the standard spacing required by the manufacturer.
      b. When considering use of other than raised decks.
      c. When the required pedestal height exceeds the safe limits as determined by the manufacturer.
      d. When pedestal load capacity exceeds the maximum listed in this specification.
      e. When anticipating installation of any items with excess weight on top of the deck.
      f. When using Bison Deck Supports on grade. (soil).
      g. When greater than the listed weight rating per pedestal load capacity is required.

2.03 SCREWJACK DECK PEDESTALS

A. Typical Height Range 0-16 inches, Weight Bearing Design Capacity 1000 lbs/pedestal FS.2 Integral (3/16 inch) spacer tabs.

B. Pedestals: As applicable for roof slope condition:
   3. Model B3: 3 to 4-3/4 inches.
   5. Model B3 + C4: 7-3/4 to 9 inches.
   6. Model B4 + C4: 9 to 12 inches.
   7. Rotating Base:
      a. Size: 7-7/8 inch diameter x 3/16 inch top wall thickness.
      b. Bearing Surface Area: 48 square inches.
      c. Four (4) - 1/4 inch diameter holes for drainage and/or mechanical attachment.
   8. Top Unit: 5/32 inch thick plate with a 29 square inch bearing surface.
   10. Spacer tab: 4.5 mm thick for uniform spacing between pavers.
   11. Load Capacity: Maximum 1,000 lbs. per pedestal with a safety factor of 2 (FS2).

C. Fixed Height Pedestal Supports:
   1. Model HD50 - 1/2 inch tall, with spacer tabs, 4.5 mm.
   2. Model HD75 - 3/4 inch tall, with spacer tabs, 4.5 mm.
   3. Optional Insert Spacer Tabs: 1/8 inch or 4.5 mm.
   4. Bearing Surface Area: 14 square inches.

D. Leveler Disks:
1. Model LD4 - Placed beneath pedestals to compensate for slopes up to 1 inch per foot. Slope 1/4 inch per foot, may stack up to four under one pedestal for up to one inch of slope compensation. Center point thickness 3/8 inch.
2. Model PH5 - Top mounted adjusting leveler disk used for precise top leveling with incremental adjustment from zero to 5/8 inch per foot.

E. Shims:
   a. Material: 1/16 inch EVA.
   a. Material: 1/8 inch or 1/16 inch Flexible PVC.

F. Base Pads:
1. Model FBB: Pedestal base pad for on grade use, provides a large 12 inch x 12 inch x 1/4 inch base bearing surface for on grade installation.

PART 3 EXECUTION

3.01 EXAMINATION
A. Do not begin installation until substrates have been properly prepared.
B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
C. Verify all elevations, required pedestal heights and deck dimensions before commencing work.

3.02 PREPARATION
A. Establish accurate lines, levels and pattern.
B. The substrate surface that will receive the deck supports must be well compacted (on grade) and structurally capable of carrying the dead and live loads anticipated.
C. The substrate must be clean and free of projections and debris that could impair the performance of the pedestals or the total deck system.
D. Decks over roofing or waterproofing, verify that installation conforms to Section 1.71 of this section.
E. Installation requirements vary on each individual project site. Deck materials used, pattern, grid layout, starting point and finished elevation should be shown on plan view shop drawings which have been prepared and approved by the Architect.
F. Once a starting point and the finished elevation of the deck surface have been determined, the support system elevation (finished elevation minus deck material thickness) is established and marked around the perimeter using a transit “torpedo” water level or laser leveling device.
G. Precise measurements should be taken and deck area should be accurately defined. Mark off and square all outside edges with control lines (chalk or spray paint). Install two (2) lines that are perpendicular to each other across the deck area. Continue to mark a grid of lines in both directions marking the location of each pedestal. To assure a square layout, use the control lines as references to periodically check the layout during installation.

3.03 INSTALLATION
A. Install components in accordance with manufacturer's instructions.
B. If required, place a floating insulation base board or floating foundation base in the location on the grid of each pedestal.
C. Next, a deck support must be placed where each measured grid line meets the perimeter. Normally the deck support is positioned as close to the perimeter as possible, with the two remaining spacer tabs aligned with the grid line. Using the "top of pedestal" elevation marked on the perimeter, stretch a mason's line along and slightly ahead of the second row of deck supports. A laser leveling device may also be used for this purpose.

D. On larger decks, it is recommended that pedestals be pre-sorted and pre-set to the proper elevation and placed in position prior to installation of pavers and tiles.

E. As the deck supports located along the grid lines are loaded with pavers and tiles, fine vertical adjustment can be made by rotating the base or bottom of the deck support. Clockwise rotation of the pedestal base will raise the bearing surface of the deck. Counter-clockwise rotation will lower the top bearing surface.

F. Certain Bison pedestals have built in safety windows. If the "safety window" located in the screw cylinder become visible on these models, it indicates that the deck support is extended beyond the minimum required engagement of threads. A coupling unit must be added to achieve the desired height. Never use a pedestal when the safety windows are exposed. Always maintain adequate thread engagement. Never over extend any pedestal.

G. Slight irregularities in decking panel thickness can be compensated for by using one to two shim segments. Place on top of pedestals, under the corners of the decking paver. Use no more than (2) shims on top of the pedestal and always adhere 1/4 wedges with construction adhesive.

H. Stackable Fixed Height Pedestal: Complete deck and grid layout as instructed above. Stack no more than (4) fixed height pedestals together and place in lieu of adjustable pedestals where needed. Spacer tabs can be removed to accommodate perimeter and corner support locations.

I. Slope Compensation:
   1. Preferred Method: A base leveler disk can be used to level the pedestal base. Place one to four disks under the pedestal base to compensate for up to 1 inch per foot of slope. Compensate for slope by placing the disks, thickest edge (located on the edge by a small finger tab) at the down slope side of the deck support, one disk compensates for 1/4 inch per foot of slope. Using two to four disks, rotate one in relation to the other to create a level deck support.
   2. Shims may be used in multiples, whole or segmented and placed under the base to level the deck supports.
   3. Under a Pedestal: All shims under a pedestal must be adhered with construction adhesive. Shim no more than 1/8 inch beneath each pedestal.
   4. On top of pedestal: Use no more than 2 shims.
   5. Use top mounted adjusting leveler disk. PH5 to compensate for slopes up to 5/8 inch per foot. Turn the top leveler disk to expose a number of 1 to 5 percentage of the slope in the slight window (1 = less slope, 5 = more slope). Locate the arrow on top of the leveler disk that corresponds to the number in the slight window, place the deck support so that the numbered arrow point directly downhill.

3.04 DECK SUPPORT PLACEMENT AND FINAL ADJUSTMENT

A. Deck supports and the deck surface panels must be placed as the manufacturer directs in these written instructions.

B. Pedestals are designed to be rotated for final slight adjustment when pedestals are fully loaded. Deck supports should be leveled in each succeeding row as the installation proceeds. Final height adjustment or maintenance is easily made by simply rotating the base clockwise or counter-clockwise direction to raise or lower the deck surface material.

C. Additional sections of shims may be used and should be available for regular maintenance. Shims may be used in multiples, whole or segmented and placed under the base or on top of the pedestal to level the deck support. On top of pedestal, use construction adhesive to adhere sections to shims. Construction adhesive is not required when using whole shims on top of
pedestal. Beneath a pedestal, construction adhesive is always required when using sections of shims and/or whole shims.

3.05 PERIMETER CONTAINMENT

A. Any area of a deck that is not restrained by a parapet wall must be boxed in and contained. The deck panels will move in all sides are not adequately restrained. Perimeter framing and edging boards located at the outside of the deck perimeter must be installed to provide restraint. No movement should be allowed at the perimeter of the deck system greater than one tab width.

3.06 FIELD QUALITY CONTROL

A. Inspect often during installation to assure that grid spacer lines are being maintained in a straight and consistent pattern and that deck panels or pavers are level and not rocking.

B. Conform that deck pedestal height does not exceed the specified height for the pedestal line. Confirm that pedestal heights in excess of the maximum allowable height of 16 inches have been braced and that proper authorization has been received.

C. Unless otherwise specified in writing to allow for expansion, inspect to assure that all paver spacing between tiles and at perimeter containment does not exceed a tab width. Particular attention should be made to assure that all pedestrian entry or access points to the deck are level and that the deck surface tiles are not randomly raised or uneven creating a tripping or safety hazard.

3.07 IMMEDIATELY FOLLOWING INSTALLATION

A. Mosaic Architecture shall carefully inspect the deck system to be positive that:
   1. The new deck system is adequately blocked on all sides to contain the surface decking and related components.
   2. There is no more than tab width spacing between any deck panels and at all sides of the deck perimeter.
   3. There is no ballasting rock used to fill any perimeter voids.
   4. There is no "rocking" of deck panels as foot traffic is applied to the surface decking.
   5. All required spacer tabs are in place and visible.

3.08 ROUTINE MAINTENANCE AND CARE

A. Installer has the duty to instruct the deck owner about performing routine maintenance of the deck. Check for rocking pavers and adjust shim immediately. Pedestals can settle and may have to be realigned. Failure to do so can cause a tripping hazard. Periodically check spacer tabs and immediately replace broken tabs to limit deck movement. Make sure all the edge restraint stays intact and structurally sound.

END OF SECTION
PART 1 GENERAL

1.01 SUMMARY
A. Furnish materials, labor, transportation, services, and equipment necessary to furnish and install

1.02 RELATED REQUIREMENTS
A. Section 07 5419 - PVC Thermoplastic Single-Ply Roofing.

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data:
   1. Manufacturer's data sheets on each product to be used, including preparation instructions, installation methods, Storage and handling requirements and recommendations.
   2. Submit test results from an independent testing laboratory for compliance with performance requirements specified herein.
   3. Submit two copies of written instructions for recommended maintenance.
C. Shop Drawings:
   1. Layout drawings of each paved area showing the pattern of pavers, indicate pavers requiring cutting, indicate setting bed methods in each area, drainage patterns and drains and indicate and relationship of paving joints. Include details of setting beds, noting all materials and their thickness, show details at curbs and vertical surfaces.
   2. Details of custom (nonstandard) curbs and stair tread/risers, include methods of installation
D. Samples:
   1. Submit two complete sets of color chips representing manufacturer's full range of available colors and texture. Color will be selected by Architect / Engineer / Landscape Architect / Owner from manufacturer's available standard and custom colors
E. LEED Submittal:
   1. Product Data for Credit MR4.1 and Credit MR4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Tile Tech Pavers Inc, 888-380-5575 Phone: (213) 380-5560 Fax: (213) 380-5561; E-mail: sales@tiletechpavers.com Website: www.tiletechpavers.com
   1. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS
A. Concrete Pavers: Recycled-Glass Series pavers as manufactured by Tile Tech Pavers Inc.
   1. Color: Standard and custom range as manufactured by Tile Tech Pavers Inc.
   2. Size: Nominal 20"x20".
   3. Thickness: 2".
   5. Edge Finish: 3/16" bevel on all four (4) sides or straight edge
   6. Weight: 11 to 22 lbs per square foot depending on paver size & thickness

2.03 PRECAST MATERIAL REQUIREMENTS
B. Aggregates: All aggregates to meet ASTM C-33 specifications, cleaned and properly graded to size. Aggregate shall be blended to meet individual project requirements. And to meet ASTM C241 & HA 10 minimum.

C. Coloring: Pigments used shall be inorganic, alkali resistant and used per manufacturer's recommendations.

D. Color Blending: Factory-blend pre-cast paver that has a natural color range so products taken from on batch will have the same range as products from a separate batch.

E. Cleaner: Liquid neutral chemical cleaner with pH factor between 7 and 8, of formulation recommended by sealer manufacturer for type of precast paver used.

F. Sealer: Colorless, slip and stain resistant penetrating or acrylic sealer with pH factor between 7 and 10 that does not affect color or physical properties of precast paver surface.

PART 3 EXECUTION

3.01 EXAMINATION

A. Prior to starting work inspect the substrate to ensure that it has been properly prepared to accept the Tile Tech Pedestal System. The substrate and or surface shall be clean and free of any projections and debris which may impair the performance of the pedestal and or the deck system. Verify all elevations, required pedestal heights and deck dimensions. Commencement of work shall imply acceptance of surfaces & deck conditions.

3.02 INSTALLATION

A. Install in accordance with Tile Tech Pavers and other contributing manufacturer's instructions. Installation requirements vary for each individual project site. Decking paver or tile used, pattern, grid layout, starting point, and finished elevation should be shown on plan view shop drawings, which have been prepared and approved by the designer, installing contractor and/or owner.

B. Grid Layout and Elevations:

1. Once the starting point and the finished elevation of the deck surface have been determined, the “Top of Pedestal Elevation” (finished elevation less decking paver or tile thickness) is established and marked around the perimeter using a transit water level or laser leveling device.

2. Precise measurements should be taken and deck area should be accurately defined. Mark off and ‘square up’ all outside edges with control lines using "snapped" chalk lines. Mark two (2) lines that are perpendicular to each other across the deck area. Continue to mark a grid of lines in both directions marking the location of each pedestal. Use the control lines as references to periodically check and assure a square layout during installation.

3. Next, a pedestal must be placed where each measured grid line meets the perimeter. Remove two (2) spacer tabs in line with one another atop each pedestal system placed around the perimeter. Remove all four (4) spacer tabs at corners.

4. Adjust each pedestal height to the “Top of Pedestal Elevation” marked on the perimeter. Position the pedestal as close to the edge of the perimeter as possible, with the two remaining spacer tabs aligned with the grid line. Using the elevation marked on the perimeter, stretch a mason’s line along and slightly ahead of the second row of pedestals. A laser leveling device may also be used for this purpose.

5. On larger decks, it is recommended that Tile Tech Pedestal System be pre-assembled and pre-set to the proper elevation and placed in position prior to the installation of decking paver or tile.

6. As the pedestals located along the grid lines are loaded with pavers or tiles, fine vertical height adjustment can be made by inserting and rotating, from the top, a T-handle Hex Key in to the Uni-Insert™ of the Pedestal assembly. Clockwise rotation of the Uni-Insert™ will raise the bearing surface and the deck. Counter-clockwise rotation will lower the top bearing surface and deck.
7. Always maintain adequate thread engagement. Tile Tech Pedestal Uni-Insert™ contains a locking tab that will not allow the screw to extend past its maximum extension. Never use if the locking tab is broken. If the height required goes beyond the Uni-Insert™ limit recut PVC pipe to the correct height and re-assemble the pedestal using the correct size pipe.

8. Slight irregularities in decking paver or tile thickness can be compensated for by using one (1) to two (2) shim segments. Place on top of the pedestal, under the corner(s) of the decking paver or tile. Use no more than two (2) shims on top of the pedestal and always adhere quartered (1/4) wedges with construction adhesive.

C. Perimeter Containment:
   1. Any area of the pedestal deck that is not restrained by a parapet or foundation wall must be ‘boxed-in’ and contained. The deck panels will move if all sides are not adequately restrained. Perimeter framing and edging boards located at the outside of the deck perimeter must be installed to provide restraint. No movement should be allowed at the perimeter of the deck system greater than one tab width.

END OF SECTION
SECTION 07 7200
ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof hatches.
B. Fall Protection System: Guardian horizontal lifeline system (HLL) including anchor points, cable line, line terminations, and Absorbinator system.

1.02 RELATED REQUIREMENTS

A. Section 05 3100 - Steel Decking.
B. Section 07 6200 - Sheet Metal Flashing and Trim: Roof accessory items fabricated from sheet metal.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
C. FM (AG) - FM Approval Guide; Factory Mutual Research Corporation; current edition.
D. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used.
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Maintenance requirements.
C. Shop Drawings: Submit detailed layout developed for this project. Show dimensioned location and number for each type of roof accessory.
D. Submit complete system layout by system supplier indicating all required components and attachment details for a complete system.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.
B. Store products under cover and elevated above grade.

PART 2 PRODUCTS

2.01 ROOF FALL PROTECTION SYSTEM

A. Manufacturers - Fall Protection System:
   1. Guardian Fall Protection. www.guardianfall.com
   2. Substitutions: See Section 01 6000 - Product Requirements.
B. Horizontal lifeline fall restraint system: Manufacturer's horizontal lifeline system with shock absorption.
   1. Provide manufacture's design drawings for complete system rated at 5,000 pounds with worker capacity of up to 420 pounds.
   2. Provide complete OSHA compliant system.
   3. System to include anchor points with top anchor hardware. Provide anchor compatible with roof deck. Provide anchor points with height coordinated with insulation depths.
   4. Galvanized steel wire roof with 12,000 pound minimum breaking strength. Layout lifeline start and end points for a maximum of 100 foot section lengths.
5. Galvanized swags as required for wire rope terminations
6. Aborbinator attachment system to provide shock absorption. Provide complete system on each section of lifeline.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Do not begin installation until substrates have been properly prepared.
   B. If substrate preparation is the responsibility of another installer, notify Mosaic Architecture of unsatisfactory preparation before proceeding.

3.02 PREPARATION
   A. Clean surfaces thoroughly prior to installation.
   B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION
   A. Install in accordance with manufacturer’s instructions, in manner that maintains roofing weather integrity.

3.04 PROTECTION
   A. Protect installed products until completion of project.
   B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION
SECTION 07 8400
FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Firestopping systems.
B. Firestopping of all joints and penetrations in fire resistance rated and smoke resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 RELATED REQUIREMENTS
A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 09 2116 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.03 REFERENCE STANDARDS
C. ITS (DIR) - Directory of Listed Products; current edition.
E. FA (AG) - FM Approval Guide; Factory Mutual Research Corporation; current edition.
F. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
C. Product Data: Provide data on product characteristics, performance ratings, and limitations.
D. Sustainable Design Submittal: Submit VOC content documentation for all non-preformed materials.
E. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
G. Certificate from authority having jurisdiction indicating approval of materials used.
H. Installer Qualification: Submit qualification statements for installing mechanics.

1.05 QUALITY ASSURANCE
A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
   1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
   2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
   3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
C. Installer Qualifications: Company specializing in performing the work of this section and:
   1. Approved by Factory Mutual Research Corporation under FM 4991, or meeting any two of the following requirements:
   2. With minimum 3 years documented experience installing work of this type.
3. Able to show at least 5 satisfactorily completed projects of comparable size and type.
4. Licensed by authority having jurisdiction.

1.06 FIELD CONDITIONS
A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.
B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Subject to compliance with through penetration firestop systems (XHEZ), joint systems (XHBN) and perimeter firestop systems (XHDG) and any other appropriate section listed in Volume II of the UL Fire Resistance Directory, provide products of one or a combination of the following as required by condition of use:
   1. Hilti Construction Chemicals, Inc.
   2. Tremco Inc.
   3. 3M Fire Protection Products.

2.02 FIRESTOPPING ASSEMBLY REQUIREMENTS
A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the fire-resistance-rated systems.
B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
C. Firestopping materials are either "cast-in-place" or "post-installed". Provide cast-in-place firestop devices prior to concrete placement.
D. Firestopping:
   1. Use only firestop products that have been ASTM E814, UL 1479 or UL 2079 tested and approved for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements and fire-rating involved for each separate instance.
   2. Provide a firestop system with an "F" rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction joint assembly.
E. Sealants, caulking materials or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:
   1. Hilti CP 618 Firestop Putty Stick (non insulated).
   2. Hilti FS-One High Performance Intumescent Firestop Sealant
   3. Hilti FS 620 Fire Foam
   4. 3M Fire Barrier CP25 WB
   5. 3M Fire Stop Sealant 2000
   6. Tremco Tremstop Fire Sil Sealant
   7. Tremco Tremstop IA Intumescent Acrylic Firestop Sealant
F. Sealants or Caulking materials for use with sheet metal ducts, the following products are acceptable:
   1. Hilti CP 601s Elastomeric Firestop Sealant
   2. Hilti CP 606 Flexible Firestop Sealant
   3. Hilti CP 675 Firestop Board with Accessories
   4. Hilti-FS-ONE Intumescent Firestop Sealant
G. Sealants, caulking or spray materials for use with fire rated construction joints and other gaps, the following products are acceptable:
1. Hilti CP 601s Elastomeric Firestop Sealant
2. Hilti CP 606 Flexible Firestop Sealants
3. Hilti CP 604 Self-Leveling Firestop Sealant
4. Hilti CP 675 Firestop Board with Accessories
5. 3M Firestop Sealant 2000
6. Tremco Tremstop Silicone (Frye Sil) Sealant.

H. Pre-formed mineral wool designated to sit flutes of metal profile deck and gap between top of wall and metal profile deck; as a backer for spray material:
1. Hilti CP 777 Speed Plugs
2. Hilti CP 767 Speed Strips

I. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe (closed piping system) the following products are acceptable:
1. Hilti-FS-ONE Intumescent Firestop Sealant
2. Tremco Tremstop WBM Intumescent Firestop Sealant

J. Intumescent sealants, caulking materials for use with combustible plastic piping (open piping system), the following materials are acceptable:
1. Hilti-FS-ONE Intumescent Firestop Sealant
2. Tremco Tremstop WBM Intumescent Firestop Sealant

K. Foams, intumescent sealants or caulking materials for use with flexible cable or cable bundles, the following products are acceptable:
1. Hilti FS-ONE Intumescent Firestop Sealant
2. Hilti CP 620 Fire Foam
3. Hilti CP 601s Elastomeric Firestop Sealant
4. Hilti CP 606 Flexible Firestop Sealant

L. Non-curing, re-penetrable intumescent putty or foam materials for use with flexible cable or cable bundles, the following products are acceptable:
1. Hilti CP 617 Firestop Putty Pad
2. Hilti CP 618 Firestop Plug

M. Wall opening protective materials for use with UL listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:
1. Hilti CP 617 Firestop Putty Pad
2. Hilti CP 618 Firestop Plug

N. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping system), the following products are acceptable:
1. Hilti CP 643N Firestop Collar
2. Hilti CP 644 Firestop Collar
3. Hilti CP 645/648 Wrap Strips

O. Materials used for large openings and complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busway in raceway, the following products are acceptable:
1. Hilti CP 637 Firestop Mortar
2. Hilti FS 657 Fire Block
3. Hilti CP 620 Fire Foam
4. Hilti CP 675T Firestop Board
5. 3M Firestop Foam 2001
6. 3M Fire Barrier CS 195 Composite Sheet

P. Non-curing, re-penetrable materials used in large size/complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways and raceways, the following products are acceptable:
1. Hilti FS 657 Fire Block
2. Hilti CP 675T firestop Board

Q. Sealants or caulking materials used in openings between structurally separate sections of wall and floors, use the following products:
1. Hilti CP 672 Speed Spray
2. Hilti CP 601s Elastomeric Firestop Sealant
3. Hilti CP 606 Flexible Firestop Sealant
4. Hilti CP 604 Self-Leveling Firestop Sealant
5. Hilti FS ONE High Performance Intumescent Firestop Sealant
6. 3M Fire Barrier CP 25 WB

R. For blank openings made in fire rated wall or floor assemblies, where future penetration of pipes, conduits or cables is expected, the following products are acceptable:
1. Hilti FS 657 Fire Block
2. Hilti CP 658T Firestop Plug

2.03 MATERIALS

A. Firestopping Sealants: Provide only products having lower volatile organic compound (VOC) content than required by South West Coast Air Quality Management District Rule No. 1168.

B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing and Accessories: Type required for tested assembly design.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are ready to receive the work of this section.

B. Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

3.02 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

C. Install backing materials to arrest liquid material leakage.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer’s instructions, completely closing openings.

B. Do not cover installed firestopping until inspected by authorities having jurisdiction.

C. Install labeling required by code.

3.04 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.05 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

END OF SECTION
SECTION 07 9005
JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sealants and joint backing.
B. Hollow gaskets.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 08 8000 - Glazing: Glazing sealants and accessories.
C. Section 09 2116 - Gypsum Board Assemblies: Acoustic sealant.
D. Section 09 3000 - Tiling: Sealant used as tile grout.

1.03 REFERENCE STANDARDS

F. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data indicating sealant chemical characteristics.
C. LEED Report: Submit VOC content documentation for all non-preformed sealants and primers.
   1. VOC Method of Determining VOC Content as Calculated by 40 CFR 59 (EPA Method 24):
      b. Non-Membrane Roof Sealants.
      c. Single Ply Membrane Roof Sealants
      d. Sealants Primers for Non-Porous Substrates
      e. Sealants Primers for Porous Substrates
      f. Modified Bituminous Sealants Primers
D. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.06 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Correct defective work within a five year period after Date of Substantial Completion.
C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.
PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Gunnable and Pourable Sealants:
   9. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SEALANTS

A. Sealants and Primers - General: Provide products having volatile organic compound (VOC) content as specified in Section 01 6116.

B. General Purpose Exterior Sealant: Polyurethane; ASTM C920, Grade NS, Class 25 minimum; Uses M, G, and A; single component.
   1. Color: Match adjacent finished surfaces.
   2. Applications: Use for:
      a. Control, expansion, and soft joints in masonry.
      b. Joints between concrete and other materials.
      c. Joints between metal frames and other materials.
      d. Other exterior joints for which no other sealant is indicated.

C. Exterior Expansion Joint Sealer: Precompressed foam sealer; urethane with water-repellent;
   1. Face Color: Match exterior product color.
   2. Size as required to provide weathertight seal when installed.
   3. Provide product recommended by manufacturer for traffic-bearing use.
   4. Applications: Use for:
      a. Exterior wall expansion joints.

D. Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.
   1. Applications: Use for:
      a. Concealed sealant bead in sheet metal work.
      b. Concealed sealant bead in siding overlaps.

E. General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.
   1. Color: To be selected by Mosaic Architecture from manufacturer's standard range.
   2. Applications: Use for:
      a. Interior wall and ceiling control joints.
      b. Joints between door and window frames and wall surfaces.
      c. Other interior joints for which no other type of sealant is indicated.

F. Bathtub/Tile Sealant: White silicone; ASTM C920, Uses I, M and A; single component, mildew resistant.
   1. Applications: Use for:
      a. Joints between plumbing fixtures and floor and wall surfaces.
      b. Joints between kitchen and bath countertops and wall surfaces.

   1. Composition: Permanently tacky non-hardening butyl sealant.
   2. Applications: Use for concealed locations only:
      a. Sealant bead between top stud runner and structure and between bottom stud track and floor.
   1. Color: Color as selected.
   2. Applications: Use for:
      a. Joints in sidewalks and vehicular paving.

2.03 ACCESSORIES
A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
C. Joint Backing: Round foam rod compatible with sealant; ASTM D1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.
D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that substrate surfaces are ready to receive work.
B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION
A. Remove loose materials and foreign matter that could impair adhesion of sealant.
B. Clean and prime joints in accordance with manufacturer's instructions.
C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION
A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
B. Perform installation in accordance with ASTM C1193.
C. Perform acoustical sealant application work in accordance with ASTM C919.
D. Install bond breaker where joint backing is not used.
E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
G. Tool joints concave.
H. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch below adjoining surface.

3.04 CLEANING
A. Clean adjacent soiled surfaces.

3.05 PROTECTION
A. Protect sealants until cured.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Non-fire-rated hollow metal doors and frames.
B. Hollow metal frames for wood doors.
C. Fire-rated hollow metal doors and frames.
D. Thermally insulated hollow metal doors with frames.
E. Hollow metal borrowed lites glazing frames.

1.02 RELATED REQUIREMENTS
A. Section 08 7100 - Door Hardware.
B. Section 08 8000 - Glazing: Glass for doors and borrowed lites.
C. Section 09 9113 - Exterior Painting: Field painting.

1.03 REFERENCE STANDARDS
D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
J. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014.
L. ITS (DIR) - Directory of Listed Products; current edition.
N. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
O. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.
Q. NAAMM HMMA 850 - Fire-Protection and Smoke Control Rated Hollow Metal Door and Frame Products; 2014.
W. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
D. LEED Submittal:
   1. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.05 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
B. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes installation requirements.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Hollow Metal Doors and Frames:
   1. Curries, an Assa Abloy Group company: www.curries.com
   2. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com
   3. Republic Doors: www.republicdoor.com
   4. Steelcraft, an Allegion brand: www.allegion.com/us
   5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DESIGN CRITERIA
A. Requirements for Hollow Metal Doors and Frames:
   1. Steel used for fabrication of doors and frames shall comply with one or more of the following requirements; Galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
2. Accessibility: Comply with ICC A117.1 and ADA Standards.
3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
4. Door Edge Profile: Manufacturers standard for application indicated.
5. Typical Door Face Sheets: Flush.
7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Exterior Doors: Thermally insulated.
   1. Based on NAAMM HMMA Custom Guidelines:
      a. Comply with guidelines of NAAMM HMMA 860 for Hollow Metal Doors and Frames.
      b. Performance Level 2 - Moderate Duty, in accordance with NAAMM HMMA 805.
      c. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
   2. Core Material: Polyurethane, 1.8 lbs/cu ft minimum density.
   5. Insulating Value: U-value of 0.50, when tested in accordance with ASTM C1363.
   6. Weatherstripping: Refer to Section 08 7100.

B. Interior Doors, Non-Fire Rated:
   1. Based on NAAMM HMMA Custom Guidelines:
      a. Comply with guidelines of NAAMM HMMA 860 for Hollow Metal Doors and Frames.
      b. Performance Level 1 - Light Duty, in accordance with NAAMM HMMA 805.
      c. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
   2. Core Material: Manufacturers standard core material/construction and in compliance with requirements.

C. Fire-Rated Doors:
   1. Based on NAAMM HMMA Custom Guidelines: Comply with NAAMM HMMA 850 requirements for fire-rated doors.
      a. Comply with guidelines of NAAMM HMMA 860 for Hollow Metal Doors and Frames.
      b. Performance Level 1 - Light Duty, in accordance with NAAMM HMMA 805.
      c. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
   2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
      a. Provide units listed and labeled by UL (DIR) or ITS (DIR).
      b. Attach fire rating label to each fire rated unit.

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HOLLOW METAL DOORS AND FRAMES
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3. Core Material: Manufacturers standard core material/construction in compliance with requirements.
D. Panels: Same construction, performance, and finish as doors.

2.04 HOLLOW METAL FRAMES
A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
B. General:
   1. Comply with the requirements of grade specified for corresponding door.
      a. ANSI A250.8 Level 1 Doors: 16 gage frames.
      b. Frames for Wood Doors: Comply with frame requirements specified in ANSI A250.8 for Level 1, 18 gage
   2. Finish: Same as for door.
   3. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
   4. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.
   5. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into frame head, flush with top.
C. Exterior Door Frames: Face welded type.
   1. Weatherstripping: Separate, see Section 08 7100.
D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
   1. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch, maximum, above floor at 45 degree angle.
E. Door Frames, Fire-Rated: Face welded type.
   1. Fire Rating: Same as door, labeled.
F. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.
G. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.

2.05 ACCESSORIES
A. Glazing: As specified in Section 08 8000, factory installed.
B. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
C. Astragals for Double Doors: Specified in Section 08 7100.
   1. Fire-Rated Doors: Steel, shape as required for fire rating.
D. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.
E. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

2.06 FINISHES
A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify that opening sizes and tolerances are acceptable.
C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION
A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION
A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
B. Install fire rated units in accordance with NFPA 80.
C. Coordinate frame anchor placement with wall construction.
D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
E. Coordinate installation of hardware.
F. Coordinate installation of glazing.
G. Coordinate installation of electrical connections to electrical hardware items.
H. Touch up damaged factory finishes.

3.04 TOLERANCES
A. Clearances Between Door and Frame: Comply with related requirements of specified door and frame standards or custom guidelines indicated.
B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.05 ADJUSTING
A. Adjust for smooth and balanced door movement.

3.06 SCHEDULE
A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION
SECTION 08 1416
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Flush wood doors; flush and flush glazed configuration; fire rated and non-rated.

1.02 RELATED REQUIREMENTS
A. Section 08 1113 - Hollow Metal Doors and Frames.
B. Section 08 7100 - Door Hardware.
C. Section 08 8000 - Glazing.

1.03 REFERENCE STANDARDS
A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details. 1. Provide the information required by AWI/AWMAC/WI (AWS).
D. Specimen warranty.
E. Samples: Submit two samples of door veneer, 6 x 6 inch in size illustrating wood grain, stain color, and sheen.
F. Warranty, executed in MSU Facilities's name.

1.05 SUSTAINABILITY REQUIREMENTS
A. Door Construction:
   2. Stiles: Exposed surface same species as or compatible to face veneer. glued to core. No added urea-formaldehyde in wood components and adhesives. LEED Credit EQ 4.4.
   3. Top and Bottom Rails: mill option hardwood or SCL glues to core. 5", 8" and 12" optional. No added urea-formaldehyde in wood components and adhesives. LEED Credit EQ 4.1. EQ 4.4.
   4. Crossbanding: High-density fiberboard with no added urea-formaldehyde or sound hardwood veneer. LEED Credit 4.4.
   5. Adhesives: Glue lines for assembly between the plies of face, cross banding and core are to be Type 1 polyvinyl acetate (PVA). LEED Credit EQ 4.4.
B. FSC Certified Wood Doors:
   1. Core: FSC Certified Stave Lumber Core (SLC-5) with no added urea-formaldehyde. The core should consist of any combination of blocks or strips not more than 2-1/2" wide, of
one species of wood. Joints to be tight and staggered in adjacent rows and glued with LEED Credit MR 7, EQ 4.4.

1.06 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
B. Installed Fire Rated Door and Transom Panel Assembly: Conform to 1 for fire-rating as indicated.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Package, deliver and store doors in accordance with specified quality standard.
B. Accept doors on site in manufacturer's packaging. Inspect for damage.
C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.08 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Wood Veneer Faced Doors:
   3. VT Industries; www.vtindustries.com
   5. Lynden Doors Architectural (LD) Series; www.lyndendoor.com
   6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOORS
A. Doors: See drawings for locations and additional requirements.
   1. Quality Level: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WWI (AWS).
   2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at each location.
   2. Fire Rated Doors: Tested to 60 minutes and ratings as indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc. (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
   3. Wood veneer facing for field transparent finish as indicated on drawings.

2.03 DOOR AND PANEL CORES
A. Non-Rated Solid Core: Type particle EPS-UF core, plies and faces as indicated above.
B. Fire Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

2.04 DOOR FACINGS
A. Veneer Facing for Transparent Finish: Natural birch, veneer grade as specified by quality standard veneer grade in accordance with quality standard indicated, quarter cut, with book between leaves of veneer, running of spliced veneer leaves assembled on door or panel face.
B. Facing Adhesive: Type I - waterproof.

2.05 ACCESSORIES
A. Hollow Metal Door Frames: As specified in Section 08 1113.
B. Glazing: As specified in Section 08 8000.
C. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.
D. Door Hardware: As specified in Section 08 7100.

2.06 DOOR CONSTRUCTION
A. Fabricate doors in accordance with door quality standard specified.
B. Cores Constructed with stiles and rails:
C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
   1. Exception: Doors to be field finished.
E. Provide edge clearances in accordance with the quality standard specified.

2.07 FACTORY FINISHING - WOOD VENEER DOORS
A. Finish work in accordance with AWI/AWMAC/WW (AWS), Section 5 - Finishing for grade specified and as follows:
B. Factory finish doors in accordance with specified quality standard.
      a. Transparent:
         1) Stain: As selected by Mosaic Architecture.
         2) Sheen: Flat.
C. Seal door top edge with color sealer to match door facing.
D. Any field finishing must meet LEED standards for VOC.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify that opening sizes and tolerances are acceptable.
C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION
A. Install doors in accordance with manufacturer's instructions and specified quality standard.
   1. Install fire-rated doors in accordance with NFPA 80 requirements.
B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
C. Use machine tools to cut or drill for hardware.
D. Coordinate installation of doors with installation of frames and hardware.
E. Coordinate installation of glazing.

3.03 TOLERANCES
A. Conform to specified quality standard for fit and clearance tolerances.
B. Conform to specified quality standard for telegraphing, warp, and squareness.
3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.
B. Adjust closers for full closure.

END OF SECTION
SECTION 08 3100
ACCESS DOORS AND PANELS

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Wall access door and frame units.
B. Ceiling access door and frame units.
C. Furnishing and installing factory fabricated vault access doors.

1.02 REFERENCE STANDARDS
A. ITS (DIR) - Directory of Listed Products; current edition.

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
C. Shop Drawings: Indicate exact position of all access door units.
D. LEED Submittal:
   1. Product Data for Credit MR4.1 and Credit MR4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
E. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

1.04 WARRANTY
A. Manufacturer's standard warranty: Materials shall be free of defects in material and workmanship for a period of (5) five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

PART 2 PRODUCTS
2.01 ACCESS DOOR AND PANEL APPLICATIONS
A. Walls, Unless Otherwise Indicated:
   1. Material: Steel.
   2. Size: at water closets, 24"x30", Others, see Drawings.
   4. Tool-operated spring or cam lock; no handle.
   5. In All Wall Types: Surface mounted face frame and door surface flush with frame surface.
   6. FOR BIDDING PURPOSES - BID (5) 24"x30" WALL ACCESS DOORS AT WATER CLOSETS, PROVIDE (4) 24"X24" LOCATIONS TO BE DETERMINED.
B. Ceilings, Unless Otherwise Indicated: Same type as for walls.
   1. Material: Steel.
   2. Size in Other Ceilings: 12 by 12 inch, unless otherwise indicated.
   4. Standard duty, hinged door.
   5. Tool-operated spring or cam lock; no handle.
   6. FOR BIDDING PURPOSES - BID (6) CEILING ACCESS DOORS

2.02 WALL AND CEILING UNITS
A. Manufacturers:
4. Substitutions: See Section 01 6000 - Product Requirements.

B. Access Doors: Factory fabricated door and frame units, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies that units are to be installed in.
   1. Style: As indicated on drawings.
   2. Style: Exposed frame with door surface flush with frame surface.
      a. In Gypsum Board: Use drywall bead type frame.
   3. Door Style: Single thickness with rolled or turned in edges.
   4. Frames: 16 gage, 0.0598 inch, minimum.
   5. Steel Finish: Primed.
   6. Primed and Factory Finish: Polyester powder coat; color _____.
   7. Hardware:
      a. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
      b. Latch/Lock: Screw driver slot for quarter turn cam latch.

2.03 FLOOR UNITS

A. Manufacturers - Floor Access Doors:
   1. Bilco Company; Type TER/TRD, aluminum, 1 inch (25.4 mm) pan cover: www.bilco.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Access Door:
   1. Furnish and install where indicated on plans vault access door Type JD, size 6'-0" wide x 12'-0" length. Length denotes hinge side. The vault access door shall be double leaf. The vault access door shall be pre-assembled from the manufacturer.
   2. Performance Characteristics:
      a. Covers: Shall be reinforced to support a minimum live load of 300 psf with a maximum deflection of 1/150th of the span.
      b. Operation of the covers shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
      c. Operation of the covers shall not be affected by temperature.
   3. Covers: Shall be 1/4" steel diamond pattern.
   4. Frame: Channel frame shall be 1/4" steel with full anchor flange around the perimeter.
   5. Hinges: Shall be specifically designed for horizontal installation and shall be through bolted to the covers with tamperproof Type 316 stainless steel lock bolts and shall be through bolted to the frame with Type 316 stainless steel bolts and locknuts.
   6. Lifting Mechanisms: Manufacturer shall provide the required number and size of compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of the opening and to act as a check in retarding downward motion of the cover when closing.
   7. A removable exterior turn/lift handle with a spring loaded ball detent shall be provided to open the covers and the latch release shall be protected by a flush, gasketed, removable screw plug.
   8. Hardware:
      a. Hinges: Heavy forged brass hinges, each having a minimum 3/8" (9.5mm) diameter Type 316 stainless steel pin, shall be provided and shall pivot so the cover does not protrude into the channel frame.
      b. Covers shall be equipped with a hold open arm that automatically locks the covers in the open position.
      c. Covers shall be fitted with the required number and size of compression spring operators. Springs shall have an electrocoated acrylic finish.
      d. A type 316 stainless steel snap lock with fixed handle shall be mounted on the underside of the cover.
e. Hardware: Compression spring tubes shall be an anti-corrosive composite, all fasteners shall be Type 316 stainless steel material, and all other hardware shall be zinc plate and chromate sealed.


PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that rough openings are correctly sized and located.

3.02 INSTALLATION
A. Install units in accordance with manufacturer's instructions.
B. Install frames plumb and level in openings. Secure rigidly in place.
C. Position units to provide convenient access to the concealed work requiring access.

END OF SECTION
SECTION 08 3223
SLIDING/FOLDING GLAZED DOORS/WALLS

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Factory fabricated sliding glazed door/wall with head rail and operating hardware.
   1. Aluminum head rail frame system.
   2. Sliding door hardware system
   3. Glass pivot door and hardware

1.02 RELATED REQUIREMENTS
A. Section 05 5000 - Metal Fabrications: Steel lintels.
B. Section 06 1000 - Rough Carpentry: Rough opening framing.
C. Section 07 2100 - Thermal Insulation: Fibrous stuffing insulation at frame perimeter.
D. Section 08 7100 - Door Hardware: Cylinder locks.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide information on dimensions, frame and sill construction, glazing, and hardware.
C. Shop Drawings: Indicate opening dimensions, elevations of different types, and framed opening tolerances.
D. Manufacturer's Installation Instructions: Include complete preparation, installation, and cleaning requirements.

1.05 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in, and with not fewer than three years of experience, manufacturing products of the type specified.
B. Installer Qualifications: Company specializing in installation of products of the type specified, with not fewer than three years of experience.
C. Testing Agency Qualifications: Independent firm specializing in performing testing of the type specified in this section.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Deliver products to project site and store in manufacturer’s protective cartons until openings are ready for installation.
B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.07 FIELD CONDITIONS
A. Maintain this minimum temperature during and 24 hours after installation of sealants.

1.08 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN - SLIDING AND PIVOT GLASS DOOR AND WALL SYSTEMS
A. Sliding Top Hung, Non-Thermally Broken, with Monolithic Glazing:
   1. Basis of Design: DORMA Group, MUTO Comfort sliding door system, two panel, manual operation.

2.02 MANUFACTURERS
A. Sliding Glazed Doors/Walls:
B. Pivot Glazed Doors:
   1. DORMA USA, Inc: www.dorma.com

2.03 SLIDING/FOLDING GLAZED DOORS/WALLS AND PIVOT DOORS
A. All Glass Sliding Doors and Walls: Single-point stainless steel fittings for manually operable glass panels, factory fabricated; complete with support and anchorage devices, and glazing.
   1. Configuration: Interior, straight track, _____, bi-parting with right and left stacking, with locking swing panel door.
   2. Configuration: As shown on the drawings.
   4. Track System: Dorma XL 150 track system with sidelight attachment structure. 330 pound capacity rating. Provide with all required glass clamps, cushion stops, cover panels, end caps, and floor guides.
   5. Sidelite mounting: provide matching U channel sidelight floor mounting channels. Finish to match hardware.
   6. Track Cover Finish: Clear anodized.
   9. Provide accessories as required for complete installation.

B.

1.

2.04 FACTORY ASSEMBLY
A. Factory assemble sliding/folding operable panel frames as single unit, including head, jambs, and bottom sections; provide concealed fasteners.
   1. Sizes: Allow for tolerances of rough framed openings, clearances, and shims at perimeter of assemblies.
   2. Joints and Corners: Flush, hairline and waterproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.

2.05 ACCESSORIES
A. Glazing: Single glazed, clear, fully tempered, with glass thickness 1/2 inch.
B. Sliding/Folding Hardware: Provide manufacturer's standard hardware including carriages with sealed ball bearing rollers, and top or bottom tracks.

C. Door Hardware: Each door: H-Style, stainless steel, 1" diameter x 36" long Pull handle, to match fittings finish. Provide with two mounting points, mounting pads, door prep.

D. Locking Mechanisms: none

E. Anchors: Hot-dipped galvanized or stainless steel in accordance with project and manufacturer's installation requirements.

F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M, Type I.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Overhead sectional doors, electrically operated.
B. Operating hardware and supports.
C. Electrical controls.

1.02 RELATED REQUIREMENTS
A. Section 05 5000 - Metal Fabrications: Steel channel opening frame.
B. Section 07 9005 - Joint Sealers: Perimeter sealant and backup materials.

1.03 REFERENCE STANDARDS
C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.
C. Product Data: Show component construction, anchorage method, and hardware.
D. LEED Submittal:
   1. Product Data for MRc4.1 and MRc4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
E. Manufacturer's Installation Instructions: Include any special procedures required by project conditions.
F. Operation Data: Include normal operation, troubleshooting, and adjusting.
G. Maintenance Data: Include data for motor and transmission, shaft and gearing, lubrication frequency, spare part sources.
H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 WARRANTY
A. See Section 01 7800 - Closeout Submittals for warranty requirements.
B. Warranty: Manufacturer's limited door and operators System warranty for 10 year against delamination of polyurethane foam from steel face and all other components for 3 years or 20,000 cycles, whichever comes first.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Sectional Doors - Acceptable Manufacturer: Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax (972) 906-1499. Web Site: www.overheaddoor.com. E-mail: sales@overheaddoor.com.
   1. Overhead Door Thermacore Model 596.
B. Acceptable Manufacturers:
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 INSULATED SECTIONAL OVERHEAD DOORS

A. Insulated Steel Sectional Overhead Doors: 596 Series Thermacore Insulated Steel Doors by
   Overhead Door Corporation. Units shall have the following characteristics:
   1. Door Assembly: Metal/foam/metal sandwich panel construction, with PVC thermal break
      and weather-tight ship-lap design meeting joints.
      a. Panel Thickness: 2 inches (51 mm).
      c. Exterior Steel: 20 gauge, galvanized.
      d. End Stiles: 16 gauge with thermal break.
      e. Spring Counterbalance: Sized to weight of the door, with a helically wound, oil
         tempered torsion spring mounted on a steel shaft; cable drum of diecast aluminum
         with high strength galvanized aircraft cable. Sized with a minimum 7 to 1 safety
         factor.
         1) Standard cycle spring: 10,000 cycles.
      f. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
      g. Thermal Values: R-value of 17.40; U-value of 0.057.
      h. Air Infiltration: 0.08 cfm at 15 mph; 0.08 cfm at 25 mph.
      i. Sound Transmission: Class 26.
      j. Partial Glazing of Steel Panels:
         1) Aluminum Sash Section with DSB Glazing.
   2. Finish and Color:
      a. To be chosen from manufacturer's range of colors.
   3. Windload Design: Provide to meet the Design/Performance requirements specified.
   4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel
      races.
   5. Lock:
      a. Interior mounted slide lock with interlock switch for automatic operator.
   6. Weatherstripping:
      a. EPDM bulb-type strip at bottom section.
      b. Flexible Jamb seals.
      c. Flexible Header seal.
   7. Track: Provide track as recommended by manufacturer to suit loading required and
      clearances available.
      a. Size: 2 inch.
      b. Type: High Lift.
   8. Electric Motor Operation: Provide UL listed electric operator, size and type as
      recommended by manufacturer to move door in either direction at not less than 2/3 foot
      nor more than 1 foot per second. Operator shall meet UL325/2010 requirements for
      continuous monitoring of safety devices.
      a. Entrapment Protection: Required for momentary contact, includes radio control
         operaton.
         1) Pneumatic sensing edge up to 18 feet (5.5 m) wide. Constant contact only
            complying with UL 325/2010.
      b. Operating Controls:
         1) Push-button operated control stations with open, close, and stop buttons.
         2) Surface mounting.
         3) Interior location.
PART 3 EXECUTION

3.01 EXAMINATION
   A. Do not begin installation until openings have been properly prepared.
   B. Verify that wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.
   C. Verify that electric power is available and of the correct characteristics.
   D. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION
   A. Prepare opening to permit correct installation of door unit to perimeter air and vapor barrier seal.
   B. Apply primer to wood frame.

3.03 INSTALLATION
   A. Install door unit assembly in accordance with manufacturer's instructions.
   B. Anchor assembly to wall construction and building framing without distortion or stress.
   C. Securely brace door tracks suspended from structure. Secure tracks to structural members only.
   D. Fit and align door assembly including hardware.
   E. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.
   F. Install perimeter trim and closures.

3.04 TOLERANCES
   A. Maximum Variation from Plumb: 1/16 inch.
   B. Maximum Variation from Level: 1/16 inch.
   C. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch from 10 ft straight edge.
   D. Maintain dimensional tolerances and alignment with adjacent work.

3.05 ADJUSTING
   A. Adjust door assembly for smooth operation and full contact with weatherstripping.
   B. Have manufacturer's field representative present to confirm proper operation and identify adjustments to door assembly for specified operation.

3.06 PROTECTION
   A. Protect installed products from damage until Date of Substantial Completion.
   B. Do not permit construction traffic through overhead door openings after adjustment and cleaning.

END OF SECTION
SECTION 08 3815
DOUBLE-ACTING TRAFFIC DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Double-acting self-closing swinging traffic doors.
   B. Door frames.

1.02 RELATED REQUIREMENTS
   A. Section 08 1213 - Hollow Metal Frames: Flat-faced frame.

1.03 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Manufacturer's technical information for each type of door specified, including details about materials, components, profiles, gaskets, and finishes; include:
      1. Preparation and installation instructions and methods.
      2. Storage and handling requirements and recommendations.
      3. Operation and maintenance data.
   C. Shop Drawings: Show installation details of doors and frames, including elevations and attachment.
   D. Selection Samples: For each finish requiring color selection, submit color samples indicating full line of available colors and finishes.
   E. LEED Submittal:
      1. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages be weight of post-consumer and pre-consumer recycle content. Include statement indicating costs for each product having recycled content.
   F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in MSU Facilities's name and registered with manufacturer.

1.04 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.
   B. Installer Qualifications: Company specializing in performing type of work specified in this section with not less than three years of documented experience and approved by manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING
   A. Deliver product in manufacturer's original unopened packages with label legible and intact.
   B. Store doors at project site on edge or in upright position, under cover and elevated above grade, following manufacturer's instructions.

1.06 WARRANTY
   A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
   B. Provide two year manufacturer warranty for molded polyethylene doors against damage due to worker-ridden vehicle traffic; state limitations in executed warranty.

PART 2 PRODUCTS

2.01 RIGID AND SEMI-RIGID TRAFFIC DOORS
   A. Wood Core Double-Acting Traffic Doors: Wood core laminated with finish faces both sides, edges sealed or trimmed,
      1. Core: Solid oriented strand board; 3/4 inches thick, sustainable (FSC), and water resistant.
2. Finish: Same finish both sides.
3. Faces - Top Section: Aluminum, natural anodized with satin finish, 0.032 inch thick.
4. Faces - Bottom 48 inches: Stainless steel, Type 304 with No. 4 brushed satin finish, 18 gage, 0.0500 inch minimum base metal thickness.
5. Edge Trim: Manufacturer's standard extruded plastic channel trim applied before finish faces.
6. Manufacturers:

B. Spring Bumpers: Teardrop style, polyethylene; projecting 3 inches from door panel.
   1. Height: 18 inches. Provide bumpers on both sides of each door panel.
   2. Color: As selected by Mosaic Architecture from manufacturer’s standard selection.

2.02 ACCESSORY COMPONENTS
A. Frames: Provide hollow metal door frame, gauge and finish to match door frames in 08 113. See drawings. Coordinate door frame size with doors and hinge system.
B. Provide tamper proof fasteners and other hardware as recommended by manufacturer for complete installation.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that jambs and frames are square and plumb.
B. Verify that opening is ready to receive work and opening dimensions and clearances are as indicated on drawings.
C. If substrate preparation is responsibility of another installer, notify Mosaic Architecture of unsatisfactory conditions before proceeding.
D. Commencement of work by installer is acceptance of opening conditions.

3.02 INSTALLATION
A. Install doors with clearances, anchors, hardware, and accessories according to the manufacturer's instructions and as specified.
B. Install doors plumb, level, and properly aligned.

3.03 ADJUSTING
A. Clean and lubricate operating parts.
B. Adjust doors to open and close smoothly and freely without binding and for proper fit of seals.

END OF SECTION
SECTION 08 4313
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.
B. Aluminum doors and frames.
C. Weatherstripping.
D. Perimeter sealant.

1.02 ALUMINUM ALUMINUM STOREFRONT SYSTEM

A. Kawneer Trifab VG 451T Storefront System: 2" x 4-1/2" nominal dimension; Thermal; Center, Multi-Plane, Structural Silicone or Weatherseal Glazed; Screw Spline, Shear Block.

1.03 RELATED REQUIREMENTS

A. Section 07 9005 - Joint Sealers: Perimeter sealant and back-up materials.
B. Section 08 7100 - Door Hardware: Hardware items other than specified in this section.

1.04REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.

1.05 PERFORMANCE REQUIREMENTS

A. Design and size components to withstand the following load requirements without damage or permanent set, when tested in accordance with ASTM E 330, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
   2. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
B. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.

C. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at a reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E 283.

D. Water Leakage: None, when measured in accordance with ASTM E 331 with test pressure difference of 2.86 lbf/sq ft.

E. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

F. Air and Vapor Seal: maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and inner sheet of infill panel and heel bead of glazing compound.

G. Expansion/Contraction: provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details, and ________.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

D. LEED Submittal:
   1. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

E. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.

F. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.

G. Samples: Submit two samples illustrating finished aluminum surface, glass, infill panels, glazing material.

H. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

I. Warranty: Submit manufacturer warranty and ensure forms have been completed in MSU Facilities's name and registered with manufacturer.

1.07 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at Montana.

B. Manufacturer and Installer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum three years of documented experience.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.
1.09 FIELD CONDITIONS
A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.10 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Correct defective Work within a five year period after Date of Substantial Completion.
C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Aluminum-Framed Storefront and Doors:
      a. Basis of Design Product:
         1) Trifab VG 451T Storefront System.
         2) 2" x 4-1/2" System Dimension
         3) Glass: Exterior Glazed
         4) Frame extrusion and internal reinforcement to allow spans as indicated on drawings.
   6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS
A. Extruded Aluminum: Alloy and temper recommended by aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.
B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors and other components.
C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel or zinc coated steel or iron complying with ASTM B 663 or SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
D. Reinforcing Members: Aluminum, nonmagnetic stainless steel or zinc coated steel or iron complying with ASTM B 663 or SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
E. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome plated steel complying with ASTM B 633 for Type SC 3 severe service conditions, or zinc coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating, provide sufficient strength to withstand design pressure indicated.
F. Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking and non-migrating type recommended by sealant manufacturer for joint size and movement.
G. Tolerances: Reference to tolerance for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA aluminum standards and data.
2.03 STOREFRONT FRAMING SYSTEM

A. Thermal Barrier (Trifab VG 451T):
   1. Kawneer Isolock Thermal Break with 1/4 inch separation consisting of a two part
      chemically curing, high density polyurethane, which is mechanically and adhesively joined
      to aluminum storefront sections.
      a. Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in
         accordance with AAMA 505.

B. Brackets and Reinforcement: Manufacturer's standard high strength aluminum with
   nonstaining, nonferrous shims aligning system components.

C. Fasteners and Accessories: Manufacturer's standard corrosion resistant, non
   staining, non bleeding fasteners and accessories compatible with adjacent materials. Where exposed shall
   be stainless steel.

D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material
   and aluminum material to prevent galvanic action.

E. Packing, shipping, handling and unloading: Deliver materials in manufacturer's original,
   unopened, undamaged containers with identification labels intact.

F. Storage and Protection: Store materials protected from exposure to harmful weather
   conditions. Handle storefront material and components to avoid damage. Protect storefront
   material against damage from elements, construction activities and other hazards before,
   during and after storefront installation.

G. Doors: Glazed aluminum.
   2. Top Rail: 6 inches wide.
   5. Glazing Stops: Square
   6. Finish: Same as storefront.

2.04 MATERIALS


C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of
   ASTM A123/A123M.

D. Fasteners: Galvanized steel.

E. Exposed Flashings: 0.032 inch thick aluminum sheet; finish to match framing members.

F. Concealed Flashings: 0.018 inch thick galvanized steel.

G. Perimeter Sealant: Specified in Section 07 9005.

H. Glass: As specified in Section 08 8000.

I. Glazing Gaskets: type to suit application to achieve weather, moisture, and air infiltration
   requirements:
      1. Structural Sealant: ASTM C 1184, single component neutral curing silicone formulation
         that is compatible with system components with which it comes in contact, specifically
         formulated and tested for use as structural sealant and approved by a structural sealant
         manufacturer for use in aluminum framed systems indicated.
      2. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, uses NT, G, A and
         O; single component neutral curing formulation that is compatible with structural sealant
         and other system components with which it comes in contact; recommended by structural
         sealant; weatherseal-sealant, and aluminum framed system manufacturers for this use.

J. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.
2.05 FINISHES
   A. AAMA 2605 Permafluor Architectural Finish; Charcoal color
   B. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.06 HARDWARE
   A. Door Hardware: As specified in Section 08 7100.
   B. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
   C. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.
   D. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.

2.07 FABRICATION
   A. Framing Members: Fabricate components that, when assembles, have the following characteristics:
      1. Profiles that are sharp, straight and free of defects or formations.
      2. Accurately fit joints, make joints flush, hairline and weatherproof.
      3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
      4. Physical and thermal isolation of glazing from framing members.
      5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
      7. Fasteners, anchors and connection devices that are concealed from view to greatest extent possible.
   B. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
   C. Structural Sealant Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.
   D. Storefront Framing: Fabricate components for assembly using manufacturer's standard installation instructions.
   E. After fabrication, clearly mark components to identify their locations in project according to shop drawings.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify dimensions, tolerances, and method of attachment with other work.
   B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION
   A. Install wall system in accordance with manufacturer's instructions.
   B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
   C. Provide alignment attachments and shims to permanently fasten system to building structure.
   D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
   E. Provide thermal isolation where components penetrate or disrupt building insulation.
   F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
   G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
   H. Coordinate attachment and seal of perimeter air and vapor barrier materials.
I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
J. Install operating sash.
K. Set thresholds in bed of sealant and secure.
L. Install hardware using templates provided.
M. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES
A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 ADJUSTING
A. Adjust operating hardware and sash for smooth operation.

3.05 CLEANING
A. Remove protective material from pre-finished aluminum surfaces.
B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
C. Remove excess sealant by method acceptable to sealant manufacturer.

SEE DOOR HARDWARE 08 8700 FOR HARDWARE
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed curtain wall, with vision glazing and glass infill panels.
B. Perimeter sealant.

1.02 RELATED REQUIREMENTS

A. Section 05 1200 - Structural Steel Framing: Steel attachment members.
B. Section 07 9005 - Joint Sealers: Perimeter sealant and back-up materials.
C. Section 08 4313 - Aluminum-Framed Storefronts: Entrance framing and doors.
D. Section 09 2116 - Gypsum Board Assemblies: Metal stud and gypsum board wall at interior of curtain wall.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.
M. ASTM E413 - Classification for Rating Sound Insulation; 2010.
O. SSPC-Paint 25 - Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II; Society for Protective Coatings; 1997 (Ed. 2004).

1.04 PERFORMANCE REQUIREMENTS

A. Design and size components to withstand the following load requirements without damage or permanent set:
   1. Positive Design Wind Load: 40 lbf/sq ft.
   2. Negative Design Wind Load: 40 lbf/sq ft.
3. Deflection: No deflection in excess of L/175 of the span of any framing member at design load. At structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in framing members in excess of 1.2% of their clear spans shall occurs.

4. Measure performance by testing in accordance with ASTM E 330, using test loads equal to 1.5 times the design wind loads and 10 second duration of maximum pressure.

B. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated in accordance with building code and as indicated on structural drawings.

C. Movement: Accommodate the following movement without damage to components or deterioration of seals:
   1. Movement to curtain wall relative to perimeter framing.
   2. Deflection of structural support framing, under permanent and dynamic loads.

D. Thermal Resistance (U Factor): When tested to AAMA Specification 1503, the thermal transmittance (U Factor) shall be not more than 0.43.

E. Air Infiltration: Limit air infiltration through assembly to 0.60 cu ft/min/sq ft of wall area, measured at a reference differential pressure across assembly of 6.24 psf (300 Pa) as measured in accordance with ASTM E 283.

F. Condensation Resistance Factor: CRF of 71 for frame, 71 for Low-E glass when measured in accordance with AAMA 1503.1.

G. Water Leakage: None, when measured in accordance with ASTM E 331 at a test pressure difference of 12 lbf/sq ft (575 Pa) as defined in AAMA 501.

H. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

I. Sound Attenuation: STC of 31m minimum, from exterior to interior, calculated in accordance with ASTM E 413, tested in accordance with ASTM E 90, ASTM E 1425.

J. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

K. Design system to eliminate noises caused by wind and thermal movement, to prevent vibration harmonics, and to prevent "stack effect" in internal spaces.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage details, glazing, and infill.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

D. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

E. LEED Submittal:
   1. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

F. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.
G. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations; include load calculations at points of attachment to building structure.

H. Field Quality Control Submittals: Report of field testing for water leakage.

I. Warranty: Submit manufacturer warranty and ensure forms have been completed in MSU Facilities's name and registered with manufacturer.

1.06 QUALITY ASSURANCE
A. Manufacturer and Installer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS
2.01 MANUFACTURER
A. Kawneer Company, Inc. www.kawneer.com
   1. Product: Series 1600 Wall Series.
   2. Finish Color: Charcoal

B. Other Acceptable Manufacturer's:
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COMPONENTS
A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   2. Color: Charcoal in color.

B. Aluminum Framing Member: Tubular aluminum sections, thermally broken from the interior section insulated from the exterior, drainage holes and internal weep drainage system.
   1. Framing members for interior applications need not be thermally broken.
   2. Cross-Section: As indicated on drawings.

C. Doors: Glazed Aluminum
   2. Top Rail: 6 inches wide.
   5. Glazing Stops: Beveled.
   6. Finish: Same as curtain wall.
2.03 MATERIALS
A. Extruded Aluminum: ASTM B 221 (ASTM B 221M), 6063-T5 or T6 alloy.
B. Structural Temper Steel Sections: ASTM A 36/A 36M; galvanized in accordance with requirements of ASTM A 123/A 123M.
C. Structural Supporting Anchors Attached to Structural Steel: Design for bolted attachment.
D. Fasteners: Galvanized steel.
E. Exposed Fasteners: 0.032 inch thick aluminum sheet; finish to match framing members.
F. Concealed Flashing: 0.018 inch thick galvanized adhesive.
G. Weatherseal Sealant: Silicone, same as glazing adhesive.
H. Perimeter Sealant: Specified in Section 07 9000.
I. Glazing: As specified in Section 08 8000.
J. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
K. Glazing Accessories: As specified in Section 08 8000.
L. Touch-up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.04 FINISHES
A. AAMA 2605 Permafluor Architectural Finish; Charcoal color.

2.05 SOURCE QUALITY CONTROL
A. Source Quality: Provide aluminum curtain walls specified herein from a single source.
   1. Building Enclosure System: When aluminum curtain wall are part of the building enclosure system, including entrances, entrance hardware, windows, storefront framing and related products, provide building enclosure system products from a single source manufacturer.
   2. High Performance Organic Finish: AAMA 2604; multiple coats, thermally cured fluoropolymer system; color as scheduled.

2.06 FABRICATION
A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
C. Prepare components to receive anchor devices. fabricate anchors.
D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
E. Arrange fasteners and attachments to conceal from view.
F. Reinforce framing members for imposed loads.
G. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
   1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify dimensions, tolerances, and method of attachment with other related work.
B. Verify that curtain wall openings and adjoining air and vapor seal materials are ready to receive work of this section.
C. Verify that anchorage devices have been properly installed and located.

3.02 INSTALLATION
A. Install curtain wall system in accordance with manufacturer's instructions.
B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
C. Provide alignment attachments and shims to permanently fasten system to building structure.
D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
E. Provide thermal isolation where components penetrate or disrupt building insulation.
F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
G. Coordinate attachment and seal of perimeter air and vapor barrier materials.
H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
I. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES
A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.
B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.
C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch and minimum of 1/4 inch.

3.04 ADJUSTING
A. Adjust operating sash for smooth operation.

3.05 CLEANING
A. Remove protective material from pre-finished aluminum surfaces.
B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for wood, aluminum, and hollow metal doors.
B. Hardware for fire-rated doors.
C. Electrically operated and controlled hardware.
D. Lock cylinders for doors that hardware is specified in other sections.
E. Thresholds.
F. Weatherstripping, seals and door gaskets.

1.02 DESCRIPTION OF WORK

A. Definition: "Finish Hardware" includes items known commercially as finish hardware which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame.
B. Extent of finish hardware required is indicated on drawings and in schedule.
C. Types of finish hardware required include the following:
   1. Butt Hinges.
   2. Continuous Hinges
   3. Lock Cylinders and Keys.
   4. Lock and latch Sets.
   5. Dead Bolts.
   6. Exit Devices
   7. Door Closers.
   10. ADA Power Actuators.
   11. Overhead holders
   12. Door trim Units
D. Hardware must be in strict compliance with NW Energy standards.

1.03 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.
B. Section 08 1416 - Flush Wood Doors.
C. Section 08 4313 - Aluminum-Framed Storefronts: Hardware for same except cylinders; installation of cylinders.
D. Section 08 4413 - Glazed Aluminum Curtain Walls: Hardware for integral doors and frames except lock cylinders; installation of cylinders.

1.04 QUALITY ASSURANCE

A. Manufacturer: Obtain each type of hardware (latch and locksets) from a single manufacturer.
B. Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who have been furnishing hardware in the projects vicinity for a period of not less than 2 years and who is, or who employs an experienced architectural hardware consultant who is available, at reasonable times during the course of the work, for consultation about projects hardware requirements, to Owner, Architect or Contractor.
C. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard 80 and local building code requirements. Provide only hardware which has been tested and listed by UL or an approved testing agency for types and sizes of doors required and complies with requirements of door and door frame labels.
D. Where emergency exit devices are required on fire-rated doors (with supplementary marking on doors with labels indicating "Fire Door to be Equipped with Fire Exit Hardware" provide labels on exit devices indicating "Fire Exit Hardware").

E. The supplier shall be responsible to field check existing openings for proper application of sizes and strikes for all openings.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Hardware Schedule: Submit final hardware schedule in a vertical format as recognized by the Door and Hardware Institute (DHI). Horizontal schedule format will not be accepted. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish hardware.

1. Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door opening. Include the following information:
   a. Type, style, function, size and finish of each hardware item.
   b. Name and manufacturer of each item.
   c. Fastening and other pertinent information.
   d. Index to include location of hardware set cross-referenced to indications on drawings both on floor plans and in door and frame schedule.
   e. Explanation of all abbreviations, symbols, codes contained in schedule.
   f. Mounting location for hardware.
   g. Door and frame size and materials.
   h. Keying information.
   i. Wiring diagrams with theory operation.

C. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

D. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Montana State University name and registered with manufacturer.

E. LEED Submittals:
   1. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

1.06 PRODUCT HANDLING

A. Tag each item or package separately with identification related to final hardware schedule and include basic installation instructions with each type or package.

B. Inventory hardware jointly with representatives of hardware installer until each is satisfied that count is correct.

C. Deliver individually packaged hardware items at the proper times to the proper locations for installation.

D. Provide secure lock-up for hardware delivered to the project but not yet installed.

1.07 "OR EQUAL" PROVISION

A. The contractor shall be responsible for supplying the primary product listed as the quality standard or model, which is equal to the primary specified model in regards to specified function, quality, finish, sizes, accessories, options, durability, warranty, parts availability and listing approvals. If it is determined by the Architect at anytime during bidding, construction or installation and prior to final acceptance that the equal model submitted by the contractor is not equal to the primary specified model, the contractor shall assume all costs to replace the model submitted, with an approved equal submitted.
B. The bidders shall submit a list in their bids providing manufacturer and model for all equipment in this section, which they propose to provide. The Architect will determine if the items proposed meet the quality standards set by the specification.

PART 2 PRODUCTS

2.01 SCHEDULED HARDWARE

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware is indicated in the Finish Hardware Data Sheet and Hardware Schedule at the end of this section. Products are identified by using hardware designation numbers of the following:

1. Manufacturer's Product Designation:
   a. Butt Hinges: McKinney, Stanley or Hager
   b. Continuous Hinges: Hager
   c. Locksets: Schlage
   d. Exit Devices: Von Duprin
   e. Closers: LCN
   f. Overhead Holders: Glynn-johnson
   g. Kickplates: ives
   h. Floor/Wall Stops: Ivie
   i. Threshold/Weatherstrip: National Guard Products, Pemko

2.02 MATERIALS AND FABRICATION

A. MSU General Requirements:
1. All lockset will be of lever type
2. Shape of lever shall be easy to grasp with one hand and not require tight grasping, tight pinching, or twisting of wrist.
3. Provide each lockset with a curved lip strike 4 7/8" X 1 1/8" conform to ANSI A115.2. Finish shall match.
4. Provide locks and cylinders that will accept the small format 7 pin Medeco Keymark X4 interchangeable cores. For room remodels, match the existing keys system in the room. If during a room renovation you need to re-key the entire building, then Provide locks and cylinders that will accept the small format 7 pin Medeco Keymark X4 interchangeable cores.
5. Hardware supplier and/or Contractor to supply and install construction cores that will fit into the permanent locks and/or cylinders
6. Contractor will supply to Montana State University (MSU) Locksmith shop with a copy of the construction core master and core key.
7. Contractor will supply 3 keys per permanent core to be cut as directed by the MSU Locksmith Shop and to be delivered to the MSU Locksmith.
8. Contractor will turn over to MSU locksmith shop throw member for installed locks/cylinders.
9. Provide small format 7 pin Medeco Keymark X4 interchangeable permanent cores pinned as specified by Montana State University Locksmith shop.
10. Cores are to shipped to Montana State University Locksmith Shop.
11. Mounted at the appropriate height per ADA.
12. Montana State University Locksmith is to install permanent cores.
13. Electrified locks and exit devices shall be preferred over electric strikes. Electrified locks afford better security then electric strikes and this type of hardware allows for greater flexibility when making functional changes to openings in the future.
14. All door/hardware/electrical equipment must be accessible (i.e. The lock power supply must be accessible and the door to power supply must be accessible and allow the door to fully open.)
15. Exit devices outside trim to be equipped with levers.
16. All Hardware is to be installed per manufacturer’s specifications.
2.03 Hinges, Butt
A. Are to be a minimum of three ball bearing butt.
B. Are to be at least 4.5x4.5.
C. Hinges on outside door are to be a non-removable pin.
D. Aluminum doors to use a Heavy duty concealed geared continuous hinge.
E. No pivots are to be used on aluminum doors.
F. Acceptable Manufacturers:
   1. Stanley
   2. McKinney
   3. Hager

2.04 Continuous Hinges
A. Hinge shall be pinless assembly of three interlocking extrusions applied to the full height of the door and frame without mortising. The door leaf and jamb leaf shall be geared together for the entire length of the hinge with visible knuckle separations are not acceptable. Vertical door loads shall be carried on minimum 3/4" acetal bearings through a full 180 degrees. The door leaf and jamb leaf shall have a templated screw hole locations for future replacement need. All heavy duty hinges shall have a minimum of 32 bearings for a 7'-0" length.
B. Acceptable Manufacturer:
   1. Select Products
   2. Hager roton
   3. Markar

2.05 Cylindrical Lockset
A. Lockset must be extra heavy-duty.
B. Backset 2 ¾ inch or greater as need to accommodate frame, door or other hardware, with a 9/16 inch throw latch bolt.
C. Lockset provide for 7 pin interchangeable core for the Medeco Keymark X4.
D. Lockset to have solid shank with no opening for access to keyed lever keeper.
E. Keyed lever to be removable only after core is removed by authorized control key, to allow access to lever keeper.
F. Lockset and latches must conform to ANSI A156.2 Series 4000, Grade 1, and be UL listed.
G. All locksets shall be provided with a lever as per American Disabilities Act (ADA) requirements.
   2. Preferred alternative: Schlage ND Series, Rhodes Trim

2.06 Dead Bolt Tubular
A. No exposed mounting screw on exterior.
B. Full 1” stainless steel throw deadbolt.
C. Free turning, wrench-resistant, tapered cylinder ring.
D. Self-aligning.
E. Field reversible.
F. Backset 2 ¾ inch or greater as need to accommodate frame, door or other hardware.
G. ADA turn lever on interior.
H. Accommodates 7 pin interchangeable core for the Medeco Keymark X4.
I. Conform to ANSI A156.5-1992 Auxiliary Locks, Grade 1 and be UL listed.
   1. Preferred: Best 83T Deadbolt.
   2. Preferred alternative: Schlage B600 Deadbolt
2.07 CYLINDER
A. Are to accept the small format 7 pin Medeco Keymark X4 interchangeable core.
B. Are to have the proper tailpiece or cam for correct operation of lock.
   1. **Preferred:** Best Cylinder.
   2. **Preferred Alternative:** Medeco Keymark, Arrow, Falcon

2.08 CLOSERS AND DOOR CONTROL DEVICES
A. General Requirements:
   1. All manual closers shall carry a manufacturers ten (10) year warranty.
   2. All closers with electrical components shall carry a manufacturers two (2) year warranty.
   3. Fully hydraulic, rack and pinion action with high strength cast iron cylinders and one piece forged steel pistons.
   4. Fluid of a type requiring no seasonal adjustments.
   5. Hydraulic regulation controlled by tamper-proof, non-critical screw valves, adjustable with a hex wrench.
   6. Separate adjustments for backcheck, general speed, and latch speed.
   7. Closing power of non-sized cylinders shall be adjustable over a range of sizes.
   8. All closers for openings that must meet the minimum requirements of the ADA act.
   9. All manual closers shall provide or be adjustable to less than 5 pounds opening force on a 36" door leaf and delay closing time in accordance with the ADA.
10. All automatic operator systems shall include the following features and functions.
    a. Provisions for separate conduits to carry high and low voltage wiring in compliance with the National Electrical Code, section 725-31.
    b. The operator will be designed to prevent damage to the mechanism if the system is actuated while the door is latched or if the door is forced closed during the opening cycle.
11. Installation shall be in accordance with the templates and installation instructions packaged with the closers at the time of manufacture.
12. Installation shall be made with fasteners packaged with the closer by the manufacturer.
13. All electrical connections shall be made in accordance with the manufacturer’s recommendations.
14. Clean installed closer to remove dirt, debris, and marks incidental to installation work.
15. Installation instructions, service manual and templates are to be turned over to the MSU Locksmith Shop upon completion of the installation work.
16. Install and regulate all closers in accordance with the installation instructions packaged with the closers at the time of manufacture.
    a. **Preferred:** LCN 4040XP
    b. **Preferred Alternative:** Stanley ODC 100 Series

B. All electrohydraulic automatic operators shall include the following features or functions:
   1. Low-speed and low energy movement of the door leaf, making safety pads and/or guard rails unnecessary.
   2. Manual operation of the door without power assistance, permitting the continued use of the door in the event the operator mechanism fails.
   3. Second Chance Feature: When an obstruction or resistance to the opening swing is encountered the operator will pause at that point, and then attempt to continue opening the door. If the obstruction or resistance remains, the operator will again pause the door.
   4. Easily accessible main power and maintain hold-open switches will be provided on the operator.
   5. An electronically controlled clutch to provide adjustable opening force.
   6. A microprocessor to control all motor and clutch functions.
   7. An on-board power supply capable of delivering both 12VDC and 24VDC outputs up to a maximum of 1.0 amps combined load.
   8. All input and outputs power wiring shall be protected by a resettable circuit breaker.
2.09 ADA POWER DOORS
   A. Acuator:
      1. Hardwire low voltage with round stainless steel 4.5".
   B. Vestibule:
      1. Doors operate independent of one another.
      2. Dual Vestibule Push plates are expectable, like the BEA PBDGP Series.
      3. Card access attached to ADA power doors must work in conjunction with one another.

2.10 CATCARD ACCESS READERS
   A. There is to be a minimum of one door to have Card Access, this door is for the uses of the
      Facilities Services afterhours access to buildings. This is to be located at the Service Entrance
      to the building. If no Service Entrance, then door most convenient for Facilities Services
      Personel.
   B. Provide electrified locking hardware.
   C. Provide power supply for the locking hardware per locking hardware manufacture.
   D. When in conjunction with ADA power Door, outside actuator will be de-active when locking
      hardware is in the lock position.
   E. Owner will provide the reader and access control hardware.
   F. Coordinate wire requirement with owner.
   G. All catcard access doors must be coordinated with Auxiliaries IT, Campus IT, and MSU
      Locksmiths.

2.11 ELECTRICAL POWER TRANSFER (EPT) :
   A. When installing electrified locking hardware on new construction and major remodels, use
      EPT's.
   B. Two wires EPT: Are to be of 18 gauge wire, Up to 2 amp @ 24VDC, with a 16 amp Maximum
      Surge.
   C. Ten wires EPT: Are to be of 24 gauge wires, Up to 1 amp @ 24VDC, with a 16 amp Maximum
      surge.
      1. Preferred: Von Duprin

2.12 EXIT DEVICES
   A. Provide Rim type device.
   B. Devices are to be non-handed.
   C. Provide keyed lever trim.
   D. Concealed or surface vertical rod devices are not acceptable.
   E. Provide heavy duty ANSI grade 1 devices.
   F. Non-electric devices must be able to be field-converted on-site to electric operation by simply
      adding a new base assembly.
   G. Install according to manufactures instructions.

2.13 WIRING
   A. All wiring must be continued color even when it goes through a junction.
2.14 WEATHERSTRIP AND GASKETING
A. General: Except as otherwise indicated, provide continuous weather stripping at each leaf of every exterior door. Provide type, sizes and profiles shown or scheduled. Provide non-corrosive fasteners as recommended by manufacturer for application indicated.
B. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips is easily replaceable and readily available from stocks maintained by the manufacturer.
C. Acceptable Manufacturer;
   1. Pemko
   2. National Guard Products
   3. Zero

2.15 THRESHOLD
A. General: Except as otherwise indicated provide standard aluminum threshold unit of type, size and profile as shown or detailed.
B. Provide welded custom thresholds where scheduled and noted in the hardware sets. Provide cover plate where scheduled.
C. Provide thresholds that are 1" wider than depth of frame.
D. Acceptable Manufacturers:
   1. National Guard Products
   2. Pemko
   3. Zero

2.16 DOOR SILENCERS
A. All hollow metal door frames shall have a grey resilient type silencers. Quantity (3) on single door and quantity of (2) on pairs of door.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.
B. Verify that electric power is available to power operated devices and of the correct characteristics.

3.02 INSTALLATION
A. Install hardware in accordance with manufacturer's instructions and applicable codes.
B. Use templates provided by hardware item manufacturer.
C. Mounting heights for hardware from finished floor to center line of hardware item.

3.03 ADJUSTING
A. Adjust work under provisions of Section 01 7000.
B. Adjust hardware for smooth operation.

3.04 SCHEDULE - ATTACHED
SECTION 087100 - DOOR HARDWARE SCHEDULE

1.1 DOOR HARDWARE SCHEDULE

MANUFACTURERS:
(MK) McKINNEY MFG.
(SC) SCHLAGE LOCK CO.
(LOC) LOCKNETICS
(VO) VON DUPRIN
(LCN) LCN CLOSERS
(IV) IVES
(TR) TRIMCO
(PE) PEMKO MFG.
(ST) STANLEY
(GJ) GLYNN JOHNSON
(CR) CR LAURENCE
(FI) FIRST IMPRESSSIONS INTERNATIONAL

HARDWARE GROUP #1 - PRIVACY

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<th>Quantity</th>
<th>Description</th>
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<td>3</td>
<td>HINGES (MK) TA3786 – 4.5X4.5 US32D</td>
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<tr>
<td>1</td>
<td>LATCHSET (SC) ND405 – OME-619</td>
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<td>3</td>
<td>SEAL (PE) S88GR</td>
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<td>WALL STOP (TR) W1274CCS</td>
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HARDWARE GROUP #2

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<td>OFFICE LOCKSET (SC) ND50PD – OME – 619 ANSI F86</td>
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<td>3</td>
<td>SEAL (PE) S88GR</td>
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HARDWARE GROUP #3 – STOREROOMS UN-LOCKABLE

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<tr>
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<tr>
<td>1</td>
<td>CLASSROOM LOCKSET (SC) ND70PD – OME – 619 ANSI F86</td>
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<td>3</td>
<td>SILENCERS (TR) 1229A</td>
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HARDWARE GROUP #4 – STOREROOMS UN-LOCKABLE W/ CLOSER

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### HARDWARE GROUP #5 – DOUBLE PASSAGE

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<td>Hinges (MK) TA3786-4.5X4.5</td>
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<tr>
<td>2 EA</td>
<td>Push Plates: 8” X 36”</td>
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<td>2 EA</td>
<td>Closer (LCN) 4040XP – CUSH-N-STOP</td>
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<tr>
<td>4 EA</td>
<td>Kick Plates: 35”x 12” STAINLESS STEEL</td>
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<td>6 EA</td>
<td>Silencers (TR) 1229A</td>
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<tr>
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<td>Wall Stop (TR) W1274CCS</td>
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### HARDWARE GROUP #6 – DOUBLE EXTERIOR

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<td>1 EA</td>
<td>Panic Devices (VO) RIM STRIKE, ANSI A156.3, GRADE 1 WITH LEVER TRIM AND DOGGING (ON WEST DOOR LEAF)</td>
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<tr>
<td>1 EA</td>
<td>Auto Flush Bolt (IV) FB31P</td>
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<td>2 EA</td>
<td>Sweeps - PILE BRUSH TYPE</td>
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<td>1 SET</td>
<td>Gasket x LF OPENING</td>
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<td>1 EA</td>
<td>Threshold x Width of Opening - 1/2” MAX HEIGHT</td>
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<tr>
<td>2 EA</td>
<td>Closer (LCN) 4040XP w/ HOLD OPEN – CUSH-N-STOP</td>
<td>ALUM</td>
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<tr>
<td>4 EA</td>
<td>Kick Plates: 36”x 12” STAINLESS STEEL</td>
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<td>6 EA</td>
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<td>Floor Stop (TR)</td>
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### HARDWARE GROUP #7 - RESTROOMS

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<tr>
<td>1 EA</td>
<td>Closer (LCN) 4040XP – CUSH-N-STOP</td>
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<tr>
<td>2 EA</td>
<td>Push/Pull, IVES 8303, 4x16, 10” CENTERS</td>
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<td>2 EA</td>
<td>Kick Plates 12”x 35”</td>
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<td>3 EA</td>
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### HARDWARE GROUP #8 – EXTERIOR EXIT

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<tr>
<td>1 EA</td>
<td>Closer (LCN) 4040XP – CUSH-N-STOP</td>
<td>ALUM</td>
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<tr>
<td>1 EA</td>
<td>Panic Devices (VO) RIM STRIKE, ANSI A156.3, GRADE 1 WITH LEVER TRIM AND DOGGING</td>
<td>US32D</td>
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<tr>
<td>1 EA</td>
<td>Sweeps - PILE BRUSH TYPE</td>
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<tr>
<td>1 SET</td>
<td>Gasket x LF OPENING</td>
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<td>1 EA</td>
<td>Threshold x Width of Opening - 1/2” MAX HEIGHT</td>
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### HARDWARE GROUP #9- EXT ENTRY W/ PROX CARD

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<td>Closer (LCN) 4040XP- CUSH-N-STOP</td>
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<td>1 EA</td>
<td>Weather Seal (PE) S88</td>
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<td>Kick Plates 12”X35”</td>
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<td>ANSI F109</td>
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<td>DOOR CONTACT (VO) 679-05 HM</td>
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<td>1 EA</td>
<td>POWER SUPPLY (VO) PS873</td>
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COORDINATE INTERFACE OF ELECT STRIKE WITH PROX CARD READER SUPPLIED BY OWNER’S SECURITY CONSULTANT

**HARDWARE GROUP #11 – INTERIOR EXIT**

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<td>1 EA</td>
<td>RIM PANIC DEVICE (VO), RIM STRIKE, ANSI A156.3, GRADE 1 WITH LEVER TRIM AND DOGGING</td>
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<tr>
<td>1 EA</td>
<td>CLOSER (LCN) 4040XP CUSH-N-STOP ALUM</td>
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<td>1 EA</td>
<td>WALL STOP (TR) W1274CCS</td>
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**HARDWARE GROUP #12 –STOREROOM ALWAYS LOCKED W CLOSER**

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<tr>
<td>1 EA</td>
<td>STOREROOM LOCKSET (SC) ND80PD – OME – 619 ANSI F86</td>
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<tr>
<td>1 EA</td>
<td>CLOSER (LCN) 4040XP – CUSH-N-STOP ALUM</td>
</tr>
<tr>
<td>1 EA</td>
<td>SEAL (PE) S88GR</td>
</tr>
<tr>
<td>1 EA</td>
<td>WALL STOP (TR) W1274CCS</td>
</tr>
</tbody>
</table>

**HARDWARE GROUP #13 –DOUBLE MECHANICAL**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 EA</td>
<td>HINGES (MK) TA3786 – NRP – 4.5X4.5 US32D</td>
</tr>
<tr>
<td>2 EA</td>
<td>CLOSER (LCN) 4040XP – CUSH-N-STOP ALUM</td>
</tr>
<tr>
<td>1 EA</td>
<td>LOCKSET STORE ROOM LOCK(S) ND80PD- OME-619 ANSI F86</td>
</tr>
<tr>
<td>1 EA</td>
<td>SEAL (PE) S88GR</td>
</tr>
<tr>
<td>1 SET</td>
<td>FLUSH BOLTS (GJ) FB6/FB6W T&amp;B US15 (Inactive Leaf)</td>
</tr>
<tr>
<td>1 SET</td>
<td>ASTRAGAL (PE) 18061CP</td>
</tr>
</tbody>
</table>

**HARDWARE GROUP #14 –MEETING ROOM**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 EA</td>
<td>HINGES (MK) TA3786 – 4.5X4.5 US32D</td>
</tr>
<tr>
<td>1 EA</td>
<td>CLOSER (LCN) 4040XP – CUSH-N-STOP ALUM</td>
</tr>
<tr>
<td>2 EA</td>
<td>PULLS CR 54LPBS ANSI F86</td>
</tr>
<tr>
<td>1 EA</td>
<td>SEAL (PE) S88GR</td>
</tr>
</tbody>
</table>

**HARDWARE GROUP #15 –ACCESS DOOR – NO EXT. HARDWARE**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 EA</td>
<td>HINGES (MK) TA3386-NRP-4.5X4.5 US32D</td>
</tr>
<tr>
<td>1 EA</td>
<td>DEADBOLT SCHLAGE B600 SINGLE CYLINDER ANSI F86</td>
</tr>
<tr>
<td>1 EA</td>
<td>PULL HANDLE</td>
</tr>
<tr>
<td>1 EA</td>
<td>SWEEPS - PILE BRUSH TYPE</td>
</tr>
<tr>
<td>1 SET</td>
<td>GASKET X LF OPENING</td>
</tr>
<tr>
<td>Quantity</td>
<td>Item Description</td>
</tr>
<tr>
<td>----------</td>
<td>------------------</td>
</tr>
<tr>
<td>1</td>
<td>THRESHOLD X WIDTH OF OPENING- 1/2” MAX HEIGHT</td>
</tr>
<tr>
<td>1</td>
<td>WALL STOP (TR) W1274CCS</td>
</tr>
</tbody>
</table>

**HARDWARE GROUP #16 – DOUBLE INTERIOR STOREFRONT**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>HINGES (MK) TA3786-4.5X4.5</td>
</tr>
<tr>
<td>4</td>
<td>PULL HANDLES – FI WASATCH 1, 36” H STYLE PULL, 1” DIA. SS. BRUSHED FINISH</td>
</tr>
<tr>
<td>1</td>
<td>COMPRESSION BULB GASKET X LF OPENING</td>
</tr>
<tr>
<td>2</td>
<td>FLOOR STOP (TR) 125CKU</td>
</tr>
<tr>
<td>2</td>
<td>HOLDERS TR 1220-5 KICK DOWN HOLDER</td>
</tr>
</tbody>
</table>

**HARDWARE GROUP #17 – DOUBLE ACTING TRAFFIC DOORS**

All hardware for double acting doors to be provide by door supplier

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>UPPER HINGES: SELF-CLOSING V CAM HINGE</td>
</tr>
<tr>
<td>2</td>
<td>LOWER HINGES: PILLOW BLOCK DESIGN PIVOT</td>
</tr>
<tr>
<td>2</td>
<td>LOWER HINGE GUARDS</td>
</tr>
<tr>
<td>2</td>
<td>VISION PANEL</td>
</tr>
<tr>
<td>2</td>
<td>POLYETHYLENE SPRING BUMPERS WITH 3” PROJECTION, 12” HEIGHT</td>
</tr>
<tr>
<td>1</td>
<td>SANTOPRENE GASKET SET, FULLY GASKETED</td>
</tr>
</tbody>
</table>

**HARDWARE GROUP #18 – CHASE ACCESS**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>HINGES (MK) TA3786-NRP-4.5X4.5</td>
</tr>
<tr>
<td>1</td>
<td>DEAD BOLT SCHLAGE B6000 SINGLE CYLINDER</td>
</tr>
<tr>
<td>3</td>
<td>SILENCERS (TR) 1229A</td>
</tr>
</tbody>
</table>

**HARDWARE GROUP #19 – ELEVATOR SHAFT**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>HINGES (MK) TA3786-4.5X4.5</td>
</tr>
<tr>
<td>1</td>
<td>CLOSER (LCN) 4031 (PULL SIDE) 180 DEG. OPENING</td>
</tr>
<tr>
<td>1</td>
<td>PASSAGE LEVERSET (SC) ND105 – OME – 619</td>
</tr>
<tr>
<td>3</td>
<td>SEAL (PE) S88GR</td>
</tr>
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</table>

**HARDWARE GROUP #20 – DOUBLE STOREROOM**

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>HINGES (MK) TA3786 – NRP – 4.5X4.5</td>
</tr>
<tr>
<td>1</td>
<td>LOCKSET STORE ROOM LOCK(S) ND80PD- OME-619</td>
</tr>
<tr>
<td>1</td>
<td>SEAL (PE) S88GR</td>
</tr>
<tr>
<td>1</td>
<td>AUTO FLUSH BOLT (IV) FB31P</td>
</tr>
<tr>
<td>1</td>
<td>ASTRAGAL (PE) 18061CP</td>
</tr>
<tr>
<td>2</td>
<td>HOLDERS TR 1220-5 KICK DOWN HOLDER</td>
</tr>
<tr>
<td>2</td>
<td>KICK PLATES 12”x35” STAINLESS STEEL</td>
</tr>
</tbody>
</table>
MSU NEW DINING HALL

SECTION 084113 – ALUMINUM DOOR HARDWARE

1.1 ALUMINUM DOOR HARDWARE SCHEDULE

FINISHES: Hardware BRUSHED STAINLESS (US32D) – Alum #40 AAM12C22A44

HARDWARE GROUP #A1 - EXTERIOR ALUMINUM ENTRY EXTERIOR DOORS w OPERATOR

1 EA HINGES: HAGER 780-112HD ROTON GEARED CONTINUOUS HINGE
1 EA LOW POWER ASSIST OPERATOR/CLOSER, ANSI A156.19 WITH ACTUATORS (SLAP PLATE TYPE): LCN 4640 SERIES
1 EA PANIC DEVICES RIM STRIKE, ANSI A156.3, GRADE 1 WITH LEVER TRIM AND DOGGING
1 EA SWEEPS - PILE BRUSH TYPE
1 SET GASKET X LF OPENING
1 EA THERMAL ALUM. THRESHOLD X WIDTH OF OPENING- 1/2” MAX HEIGHT
1 EA CYLINDERS, BY HARDWARE SECTION, SCHLAGE PRIMUS GROUP 9
1 EA POWER SUPPLY
1 EA KEYED REMOVABLE MULLION (VON DUPRIN) KR4954 DARK BRONZE
1 EA CYLINDER FOR REMOVABLE MULLION – MORTISE W/ STRAIGHT CAM

HARDWARE GROUP #A2 - EXTERIOR ALUMINUM ENTRY EXTERIOR DOORS

1 EA HINGES: HAGER 780-112HD ROTON GEARED CONTINUOUS HINGE
1 EA CLOSER LCN 4040XP ANSI A156.4, GRADE 1
1 EA PANIC DEVICES RIM STRIKE, ANSI A156.3, GRADE 1 WITH LEVER TRIM AND DOGGING
1 EA SWEEPS - PILE BRUSH TYPE
1 SET GASKET X LF OPENING
1 EA THERMAL ALUM. THRESHOLD X WIDTH OF OPENING- 1/2” MAX HEIGHT
1 EA CYLINDERS, BY HARDWARE SECTION, SCHLAGE PRIMUS GROUP 9

HARDWARE GROUP #A3 - EXTERIOR ALUMINUM DOUBLE ENTRY INTERIOR DOORS

2 EA HINGES: HAGER 780-112HD ROTON GEARED CONTINUOUS HINGE
1 EA LOW POWER ASSIST OPERATOR/CLOSER, ANSI A156.19 WITH ACTUATORS (SLAP PLATE TYPE): LCN 4640 SERIES
1 EA POWER SUPPLY
1 EA CLOSER LCN 4040XP ANSI A156.4, GRADE 1
4 EA PUSH BAR: 1”x 36” LOOP PULLS

HARDWARE GROUP #A4 – EXTERIOR ALUMINUM EXIT ONLY

1 EA HINGES: HAGER 780-112HD ROTON GEARED CONTINUOUS HINGE
1 EA CLOSER LCN 4040XP, ANSI A156.4, GRADE 1
1 EA PANIC DEVICES RIM STRIKE, ANSI A156.3, GRADE 1 WITH LEVER TRIM AND DOGGING
1 EA SWEEPS - PILE BRUSH TYPE
1 SET GASKET X LF OPENING
1 EA THERMAL ALUM. THRESHOLD X WIDTH OF OPENING- 1/2” MAX HEIGHT

HARDWARE GROUP #A5 - SINGLE EXTERIOR ALUM

1 EA HINGES: HAGER 780-112HD ROTON GEARED CONTINUOUS HINGE
1 EA CLOSER LCN 4040XP ANSI A156.4, GRADE 1
1 EA PANIC DEVICES CONCEALED VERTICAL ROD, ANSI A156.3, GRADE 1 WITH LEVER TRIM AND DOGGING
1 SET GASKET X LF OPENING
1 EA THERMAL ALUM. THRESHOLD X WIDTH OF OPENING
1 EA SWEEP BRUSH PILE TYPE

HARDWARE GROUP #A6 - SINGLE EXTERIOR ALUM ENTRY

1 EA HINGES: HAGER 780-112HD ROTON GEARED CONTINUOUS HINGE
1 EA CLOSER LCN 4040XP ANSI A156.4, GRADE 1
1 EA PANIC DEVICES CONCEALED VERTICAL ROD, ANSI A156.3, GRADE 1 WITH LEVER TRIM AND DOGGING
1 SET GASKET X LF OPENING
1 EA THERMAL ALUM. THRESHOLD X WIDTH OF OPENING
1 EA SWEEP BRUSH PILE TYPE

HARDWARE GROUP #A7 - SINGLE INTERIOR ALUMINUM

3 EA HINGES - 4.5X4.5-NRP
1 EA CLASSROOM LOCKSET (SC) ND70PD – OME – 619 ANSI F86
1 EA SEALS
1 EA WALL STOP

HARDWARE GROUP #A8 - SINGLE INTERIOR ALUMINUM EXIT

1 EA HINGES: HAGER 780-112HD ROTON GEARED CONTINUOUS HINGE
1 EA CLOSER LCN 4040XP ANSI A156.4, GRADE 1
1 EA PANIC DEVICE, RIM STRIKE, ANSI A156.3, GRADE 1 WITH LEVER TRIM AND DOGGING
1 SET GASKET X LF OPENING

HARDWARE GROUP #A9 - EXTERIOR ALUMINUM ENTRY EXTERIOR DOORS w OPERATOR and ACCESS CONTROL
<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 EA</td>
<td>HINGES: HAGER 780-112HD-ETM-4 (ELECTRIFIED) ROTON GEARED CONTINUOUS HINGE</td>
</tr>
<tr>
<td>1 EA</td>
<td>LOW POWER ASSIST OPERATOR/CLOSER, ANSI A156.19 WITH ACTUATORS (SLAP PLATE TYPE): LCN 4640 SERIES</td>
</tr>
<tr>
<td>1 EA</td>
<td>ELECTRIFIED PANIC DEVICES RIM STRIKE (VO) 99L- EL, ANSI A156.3, GRADE 1 WITH KEYED LEVER TRIM</td>
</tr>
<tr>
<td>1 EA</td>
<td>SWEEPS - PILE BRUSH TYPE</td>
</tr>
<tr>
<td>1 SET</td>
<td>GASKET X LF OPENING</td>
</tr>
<tr>
<td>1 EA</td>
<td>THERMAL ALUM THRESHOLD X WIDTH OF OPENING- 1/2” MAX HEIGHT</td>
</tr>
<tr>
<td>1 EA</td>
<td>CYLINDERS, BY HARDWARE SECTION, SCHLAGE PRIMUS GROUP 9</td>
</tr>
<tr>
<td>1 EA</td>
<td>POWER SUPPLY - OPERATOR</td>
</tr>
<tr>
<td>1 EA</td>
<td>DOOR CONTACT (VO) 679-05 HM</td>
</tr>
<tr>
<td>1 EA</td>
<td>POWER SUPPLY (VO) PS873 – EXIT DEVICE</td>
</tr>
</tbody>
</table>

COORDINATE INTERFACE OF EXIT DEVICE AND CONTACT WITH PROX CARD READER SUPPLIED BY OWNER’S SECURITY CONSULTANT, SEE ELECTRICAL PLANS FOR DETAILS
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass.
B. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 9005 - Joint Sealers: Sealant and back-up material.
B. Section 08 1113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.
C. Section 08 1433 - Stile and Rail Wood Doors: Glazed lites in doors.
D. Section 08 4313 - Aluminum-Framed Storefronts: Glazing furnished by storefront manufacturer.
E. Section 08 4426 - Structural Glass Curtain Walls: Glass furnished as part of wall assembly.

1.03 REFERENCE STANDARDS

J. GANA (GM) - GANA Glazing Manual; 2009.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
C. Samples: Submit two samples __ by __ inch in size of glass and plastic units, showing coloration and design.
D. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
   1. For solar control low-e-coated glass, provide documentation demonstrating that manufacturer of coated glass is certified by coating manufacturer.
E. LEED Submittal:
   1. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer
recycled content. Include statement indicating costs for each product having recycled content.
2. Submit VOC content documentation for all non-performed sealants and primers.

1.05 QUALITY ASSURANCE
A. Perform Work in accordance with GANA Glazing Manual and GANA Sealant Manual for glazing installation methods.
B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1.06 FIELD CONDITIONS

1.07 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Sealed Insulating Glass Units: Provide a five (5) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.
C. Laminated Glass: Provide a five (5) year warranty to include coverage for delamination, including replacement of failed units.

PART 2 PRODUCTS

2.01 FLAT GLASS MATERIALS
A. Manufacturers:
   2. Substitutions: Refer to Section 01 6000 - Product Requirements.
B. Clear Float Glass (Type FG): Clear, heat strengthened.
   1. Comply with ASTM C 1036, Type 1, Transparent Flat, Class 1 clear, Quality Q3 (glazing select).
   2. 1/4 inch minimum.
C. Safety Glass (Type SG): Clear, fully tempered with horizontal tempering.
   1. Laminated with 0.030 inch thick plastic interlayer; comply with ASTM C 1172.
   2. Comply with ASTM C 1036, Type 1, Transparent Flat, Class 1 clear, Quality Q3 (glazing select) and ASTM C 1048.
   3. Comply with 16 CFR 1201 test requirements for Category II.
   4. 1/4 inch minimum thickness.
D. Spandrel Glass (Type SPG): Heat strengthened, green tinted.
   1. Ceramic fused frit of green color on back surface.
   2. Comply with ASTM C 1048, Condition B, spandrel glass one surface coated type II, pattern flat, Class II tinted heat absorbing and light reducing, Quality q7 decorative.
   3. 1/4 inch minimum thickness.
   4. Submit samples of color for approval.

2.02 SEALED INSULATING GLASS UNITS
A. Manufacturers: PPG Solarban 70XL Low E (2) + Clear
   1. Insulated Glass Units (Type T.1): Double pane with glass to elastomer edge seal. PPG Solarban 70XL
   2. Outdoor Appearance: Clear color, low-reflective glass.
   3. Place Low E coating on No. 2 surface within unit.
   4. Durability: Certified by an independent testing agency to comply with ASTM E 2190.
   5. Purge interpane space with dry hermetic air.
   6. Total unit thickness of 1 inch minimum. 1/2 inch air space and two 1/4 inch lites.
   7. Transmittance:
      a. Ultra-Violate: 6%
      b. Visible Light: 64%
      c. Total Solar Energy: 25%
8. Reflectance:
   a. Visible Light: 12%
   b. Total Solar Energy: 52%
9. U-Value:
   a. Winter Night-time: 0.28.
   b. Summer Day-time: 0.26.
10. Shading Coefficient: 0.32.
11. Solar Heat Gain Coefficient: 0.27.

B. Manufacturers: PPG Solarban 60 Solexia
1. Insulated Glass Units (Type T.2): Double pane with glass to elastomer edge seal, PPG Solarban 60 Solexia.
2. Outdoor Appearance: Clear color, low-reflective glass.
3. Place Low E coating on No. 2 surface within unit.
4. Durability: Certified by an independent testing agency to comply with ASTM E 2190.
5. Purge interpane space with dry hermetic air.
6. Total unit thickness of 1 inch minimum. 1/2 inch air space and two 1/4 inch lites.
7. Transmittance:
   a. Ultra-Violet: 10%
   b. Visible Light: 61%
   c. Total Solar Energy: 25%
8. Reflectance:
   a. Visible Light: 9%
   b. Total Solar Energy: 10%.
9. U-Value:
   a. Winter Night-Time: 0.29.
   b. Summer Day-Time: 0.27.
10. Shading Coefficient: 0.37.
11. Solar Heat Gain Coefficient: 0.32.
12. Light to Solar Gain: 1.91.

2.03 GLAZING COMPOUNDS

A. Manufacturers:
   5. Substitutions: Refer to Section 01 6000 - Product Requirements.

B. Polyurethane Sealant: Single component, chemical curing, non-staining, non-bleeding ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 20 to 35; clear color.

C. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; clear color.

2.04 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.
C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled and release paper; black color.

D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot ASTM C864 Option I; ASTM C864 Option II; black color.

E. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.

E. Install sealants in accordance with manufacturer's instructions.

3.03 INSTALLATION - EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)

A. Cut glazing tape to length and set against permanent stops, 3/16 inch below sight line. Seal corners by butting tape and dabbing with butyl sealant.

B. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapor seal.

C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

D. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.

E. Install removable stops, with spacer strips inserted between glazing and applied stops 1/4 inch below sight lines.

1. Place glazing tape on glazing pane of unit with tape flush with sight line.

F. Install removable stops, with spacer strips inserted between glazing and applied stops, 1/4 inch below sight line. Place glazing tape on glazing pane or unit with tape flush with sight line.

G. Fill gap between glazing and stop with silicone type sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch below sight line.

H. Apply cap bead of silicone type sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.04 INSTALLATION - INTERIOR WET/DRY METHOD (TAPE AND SEALANT)

A. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch above sight line.

B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

C. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.

D. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line.

E. Fill gaps between pane and applied stop with silicone type sealant to depth equal to bite on glazing, to uniform and level line.

F. Trim protruding tape edge.
3.05 FIELD QUALITY CONTROL
   A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.
   B. Monitor and report installation procedures and unacceptable conditions.

3.06 CLEANING
   A. Remove glazing materials from finish surfaces.
   B. Remove labels after Work is complete.
   C. Clean glass and adjacent surfaces.

3.07 PROTECTION
   A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

END OF SECTION
SECTION 08 8836.21
ELECTROCHROMIC TINTABLE GLASS - ALTERNATE BID

PART 1 GENERAL

1.01 ALTERNATE BID:
A. Alternate Bid will include all glazing in the following curtain wall and storefront frames:
   1. CW-1
   2. CW-4
   3. CW-5
   4. SF-1
   5. SF-12
   6. SF-i2

1.02 SECTION INCLUDES
A. SageGlass electrochromic (EC) tintable insulating glass units (IGUs) for dynamic light and heat control.

1.03 RELATED REQUIREMENTS
A. Section 08 4313 - Aluminum-Framed Storefronts: Supporting framework for EC tintable IGUs.
B. Section 08 4413 - Glazed Aluminum Curtain Walls: Supporting framework for EC tintable IGUs.
C. Section 26 0905 - Electrochromic Tintable Glass Controls - Sage: SageGlass EC tintable IGUs control system requirements.

1.04 ABBREVIATIONS AND ACRONYMS
A. EC - Electrochromic.
B. IGCC - Insulating Glass Certification Council.
C. IGCC/IGMA Certification Program.
D. IGMA - Insulating Glass Manufacturers Alliance.
E. IGU - Insulating Glass Unit.
F. LBNL (IGDB) - Lawrence Berkley National Laboratory (The International Glazing Database).

1.05 DEFINITIONS
A. Bite: Width dimension that edge of glass product is engaged into glazing channel.
B. Busbar: Thin strip of metal applied to glass that conducts electricity, and used to apply voltage across the EC surface of the IGU.
C. Fenestration: Openings in building's envelope including windows, doors, and skylights.
D. Frame Cable: Cable that runs through framing system and connects IGU pigtail to low voltage wiring on interior of building at either the Terminal Box or Control Panel.
E. Framing System: Basic rigid supporting structure of IGU.
F. Glazing Performance Characteristics and Criteria:
   1. Center of Glass Characteristics: Performance values that take only center portion of IGU into account and not framing members.
   2. Fenestration Performance: Performance based on total fenestration, including glass and framing members, with values that are validated and certified by NFRC.
   3. Clear: Inactive (Off) state, with highest visible light transmission.
   4. Tinted: Active (On) state, with lowest visible light transmission.
   5. Variable Tint: Intermediate levels of tint ranging from full tint to clear.
   6. Inboard Lite: Pane of IGU that faces interior of building.
   7. Outboard Lite: Pane of IGU that faces exterior of building.
G. Glazing System: Soft material used in framing system.
H. IGU Pigtail: Cable that extends from individual EC tintable IGUs.
I. IGU Surfaces: Based on two outboard laminated panes of glass, air space, and one inboard pane of glass.
   1. Surface 1: Outdoor surface of outboard laminated pane of glass.
   2. Surface 2: Indoor surface of outboard laminated pane of glass and facing laminating material.
   3. Surface 3: Outdoor surface of inboard laminated pane of glass and facing laminating material.
   4. Surface 4: Indoor surface of outboard laminated pane of glass and facing air space.
   5. Surface 5: Outdoor surface of inboard pane of glass and facing air space.
J. Laminated Glass (2-ply): Two sheets of monolithic glass bonded together with plastic interlayer by heat and pressure.

1.06 REFERENCE STANDARDS
M. GANA (GM) - GANA Glazing Manual; 2009.

1.07 ADMINISTRATIVE REQUIREMENTS
A. Coordination: Coordinate the installation of SageGlass IGUs as required for project configuration with the following related building elements:
B. Preinstallation Meeting: Conduct preinstallation meeting or teleconference to review procedures, schedules, safety, and coordination with other elements of Project. Require attendance of Mosaic Architecture, GCCM, glazing contractor, framing manufacturer, SAGE...
Electrochromics, Inc. SageGlass representative, electrical contractor, and other parties related to Work of this Section.

1.08 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit manufacturer's product data sheets including installation instructions.
C. Shop Drawings: Submit the following for SageGlass IGUs overall system in accordance with project configuration indicated.
   1. Support Framing System: Submit shop drawings of framing system and accommodations for cables, components, cable routing, location of connectors, and exits from framing system.
D. Samples: Submit manufacturer’s EC tintable IGU sample that provides the two end states, and no intermediate states.
E. Certificates: Certify that products of this section meet or exceed specified requirements in accordance with IGCC and IGMA.
   1. Submit certificate indicating that IGU that passed the testing requirement contains the EC system (coatings, bus bars, and wires, etc.) as indicated in this section.
F. Test Reports: Submit test report for IGU seal durability in accordance with ASTM E2190, and indicate that IGU contains the EC system (coatings, bus bars, and wires, etc.) as indicated in this section.
G. Manufacturer's Qualification Statement.
H. Installer Qualification Statement.
I. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in MSU Facilities's name and registered with manufacturer.
J. Specimen Warranty.

1.09 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five (5) years of documented experience, and having similar products installed and operating in at least five (5) different commercial architectural projects for at least five (5) years.
B. Installer Qualifications: Company specializing in performing the work of this section, approved by manufacturer, and capable of preparing data for glazed framing systems based on testing and engineering analysis of standard EC units used in assemblies similar to this project.

1.10 DELIVERY, STORAGE, AND HANDLING
A. Comply with manufacturer's instruction for receiving, handling, storing, and protecting materials.
B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
C. Store materials in original packaging, protected from exposure to harmful environmental conditions including static electricity, and at temperature and humidity conditions recommended by manufacturer.
D. Exercise care to prevent edge damage to glass, wiring, and coatings on glass.

1.11 FIELD CONDITIONS
A. Ambient Conditions: Ensure that substrate surface and ambient air temperature are at least 40 degrees F and rising, and remain above that temperature for at least 24 hours after application of sealants.

1.12 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Warrant SageGlass IGUs against defects in material or workmanship causing material obstruction of vision as a result of fogging or film formation of the internal glass as a result of failure of the hermetic seal for a period of ten (10) years from the date of manufacture of the SageGlass IGUs from the manufacturer.

C. Warrant SageGlass EC glass against defects in material or workmanship, resulting in failure to tint, for a period of five (5) years from the date of manufacture of the EC glass from the manufacturer.

D. Warrant SageGlass laminated glass products against lamination defects, such as edge separation or delamination that materially obstruct vision through the glass for a period of five (5) years from the date of manufacture of the EC glass from the manufacturer.

E. Manufacturer shall not be held responsible for any punitive, indirect, incidental or consequential damages, including without limitation, the cost to remove non-conforming product or the installation of replacement products.

PART 2 PRODUCTS

2.01 MANUFACTURERS

   1. Address: 2 Sage Way, Faribault, MN 55021.
   2. Telephone: (877) 724-3321.
   3. Fax: (507) 333-0145.
   4. E-mail: commercialsales@sageglass.com or archsolutions@sageglass.com.

2.02 PERFORMANCE REQUIREMENTS

A. Framing and Other Glazing Systems: Comply with the following requirements for framing used for SageGlass IGUs, and other adjacent non-EC tintable IGUs that are not considered part of this Work.
   1. Refer to Section(s) 08 4313, 08 4413, and 08 6300 for additional framing system requirements.
   2. Framing and glazing system compatibility shall be approved by SageGlass IGU manufacturer.
   3. Comply with the following for framing and IGUs:
      a. Edge Clearance: 1/4 inch.
      b. Bite Clearance: 5/8 inch.
      c. Face Clearance: 3/16 inch.
      d. Accommodate controls wiring for SageGlass IGUs. Refer to Section 26 0905 for requirements.
      e. Provide glazing materials compatible with SageGlass IGUs.
   4. Glazing and framing systems shall withstand normal thermal movements, wind loads, and impact loads, without failure; this includes loss due to defective manufacture, fabrication, installation, deterioration of glazing materials, and other construction defects.
      a. Normal Thermal Movement: Resulting from ambient temperature range of 120 degrees F and resultant temperature range within glass and glass framing members of 180 degrees F.
      b. Deterioration of Laminated Glass: Development of defects that include edge separation or delamination that obstructs vision through glass.
   5. Provide holes in framing system to run pigtails and frame cables, sized per manufacturer's requirements, with grommets to protect cables from damage.

B. Sizes and shapes of EC tintable IGU to comply with glazing manufacturer's guideline requirements and limitations as indicated.

C. Provide specified glass products in thicknesses and strengths as required to meet or exceed the criteria based on project loads and in-service conditions in accordance with ASTM E1300.
   1. Probability of failure not to exceed the following:
a. 8 breaks per 1,000 for glass installed vertically or not over 15 degrees from vertical plane and under wind action.

b. 1 break per 1,000 for glass installed 15 degrees or more from vertical plane and under action of wind, snow or both.

2.03 GLASS MATERIALS

A. Insulating Glass Units: Types as indicated; in compliance with ASTM E2188 and ASTM E2189 requirements.
   1. Durability: Certified by an independent testing agency to comply with ASTM E2190, IGMA TB-1201, and IGMA TM-4000.
   2. EC Glass Coating: Comply with requirements in accordance with ASTM C1376 and ASTM E2141.
   3. Low-E Coated Glass: Comply with quality requirements for cut size of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
   4. Sealed Cavity Spacer: Austenitic stainless steel; four legs filled with 3A molecular sieve and silica gel desiccant and sealed; spacer color - black; nominal width 0.45 inch.
      a. Cavity Width: 1/2 inch.
      b. Provide hermetically sealed IGU with dehydrated airspace, with polyisobutylene primary seal and secondary two part silicone edge seal; color black.

B. Perimeter Obscuration Band: Black color, less than 13/16 inch from edge of IGU, and applied to Surface 2.

C. Busbar: Provide along edge of glass in accordance with SageGlass IGU performance requirements indicated.
   1. For IGUs with one dimension of 60 inch or less, provide busbars along each longer edge of the glass pane applied to Surface 4.
   2. For IGUs with shorter dimension greater than 60 inch, provide busbar along each longer edge, and 1/8 inch wide conductor at centerline of glass pane applied to Surface 4.

D. Pigtails: Multi-conductor sheathed cable extending from edge of SageGlass IGU and terminated with weatherproof connector for connection to frame cable within glazing pocket.
   1. Pigtail Length: 6 inch, minimum.

2.04 ELECTROCHROMIC TINTABLE INSULATING GLASS UNITS

A. SageGlass IGU: Maximum size of 60 inch by 120 inch.
   1. Applications: As indicated on the drawings.
   2. Laminated Outboard Lite:
      a. Outer Ply, Glass Type: Surfaces No. 1 and 2, Kind FT - Fully Tempered float glass.
         1) Thickness: 0.16 inch, nominal.
         2) Glass Color: Class 1 - Clear.
         3) Transparent optical coating (SR2.0) applied to Surface No. 2.
      b. Inner Ply, Glass Type: Surfaces No. 3 and 4, Annealed float glass.
         1) Thickness: 0.087 inch.
         2) Glass Color: Class 1 - Clear.
         3) SageGlass EC coating applied to Surface No. 4.
   3. Inboard Lite:
      a. Glass Type: Surfaces No. 7 and 8, Kind FT - Fully Tempered float glass.
         1) Thickness: 1/4 inch.
         2) Glass Color: Class 1 - Clear.
   4. Overall Thickness of Double Glazed IGU: 1 inch.

B. SageGlass IGU Characteristics:
   1. Cavity space filled with air, 100 percent.
   2. Clear State, Characteristics (Center of Glass): Cavity space filled with air, 100 percent.
a. Visible Light Transmittance (VLT): 60 percent.
b. Visible Light Reflectance, Inside: No greater than 15 percent.
c. Visible Light Reflectance, Outside: No greater than 16 percent.
d. Thermal Transmittance (U-Value Summer): 0.32.
e. Thermal Transmittance (U-Value Winter): 0.32.
f. Solar Heat Gain Coefficient (SHGC): 0.42.
g. Shading Coefficient: 0.48.

3. Fully Tinted State, Characteristics (Center of Glass):
   b. Visible Light Reflectance, Inside: No greater than 10 percent.
   c. Visible Light Reflectance, Outside: 11 percent.
   d. Thermal Transmittance (U-Value Summer): 0.32.
   e. Thermal Transmittance (U-Value Winter): 0.32.
   f. Solar Heat Gain Coefficient (SHGC): 0.10.
   g. Shading Coefficient: 0.12.

4. Thermal and optical properties of manufacturer’s EC tintable IGU shall comply with requirements of NFRC and IGDB criteria.

5. Exterior reflected color, in compliance with the L*a*b* color space system, shall have a negative value of b* (blue) and not be positive (yellow) according to LBNL - WINDOW 6.3 calculations using appropriate NFRC approved LBNL (IGDB) data files.

C. Individual Pane Zoning of EC Tintable IGUs: Refer to drawings for specific locations, layout and required number of individual pane zones in each EC tintable IGU.

2.05 CONTROLS
   A. System Control Requirements:
      1. Provide system capable of providing up to 3 independently tintable zones in each pane to provide adequate light quality in the space.

2.06 ACCESSORIES
   A. Glazing Materials: Compatible with EC tintable IGU components.
   B. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864, Option I.
      1. Size: Length of 0.1 inch for each square foot of glazing or at least 4 inch long by width of glazing pocket space less 1/16 inch wide by height to suit glazing method, IGU pane weight and area.
   C. Edge Spacer Shims/Blocks: Silicone, with 50 to 60 Shore A durometer hardness; ASTM C864, Option I.
      1. Size: At least 3 inch long by one half the depth of the glazing stop by thickness to suit application, self adhesive on one face.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS
   A. Verify that site conditions are acceptable for installation of EC tintable IGU system components.
   B. Verify openings for installation of EC tintable IGUs are correctly sized and within acceptable tolerances.
   C. Verify that framing weep system is operating properly and in accordance with GANA (GM) recommendations.
   D. Verify that required minimum face and edge clearances are being maintained.
   E. Verify that glazing channels, weeps and recesses are clear and free of obstructions and ready for glazing.
   F. Verify that glazing pocket is dry where EC tintable IGUs pigtail and frame cable connection are required to be made.
G. Verify that framing system is sized appropriately for EC tintable IGUs thickness and proper precautions are taken to not over compress the edge seals upon installation.

H. Verify that EC tintable IGUs secondary seal is compatible with glazing sealants.

I. Verify frame channel dimensions are adequate for required cable runs to be made.

### 3.02 INSTALLATION

A. Install system components in accordance with SAGE Electrochromics, Inc. recommendations for IGU, sealants, gaskets and other glazing materials, pigtails, and frame cables and in compliance with more stringent requirements as indicated in GANA (GM).

B. Comply with framing manufacturer’s and referenced industry recommendations regarding installation of expansion joints and anchors, accommodation of thermal movement, glass openings, use of setting blocks and spacer shims, and weep system layout.

C. Install EC tintable IGUs in prepared glazing channels and framing members in compliance with glass manufacturer’s labels and glass orientation as indicated.

D. Active tintable areas of IGU shall extend from edge to edge of finished window system opening without visible light transmittance at full perimeter of IGU.

E. Protect IGU pigtails, frame and sensor cables from any damage during installation.
   1. Use grommets during installation to protect pigtails and cables routed through framing.
   2. When frame cable or connector is damaged during installation, replace in accordance with EC tintable IGU manufacturer's approved method.
   3. When IGU pigtall connector is damaged during installation, notify EC tintable IGU manufacturer for repair or replacement of damaged components using manufacturer's approved method.

F. Install cabling so that it will not be exposed to direct sunlight, even through glass. If installation in an exposed location is necessary, cover or paint cable using a latex water based paint in accordance with manufacturer's approved method.

G. Install setting blocks in glazing pocket as recommended by referenced glazing standards in the GANA (GM), IGMA and the EC tintable IGU manufacturer's glazing guidelines.

H. Install edge spacer shims at each side glazing pocket to prevent IGU's from moving horizontally upon installation.

I. Provide bite on glass, minimum edge and face clearances, and glazing material tolerances as indicated in GANA (GM) and as approved by manufacturer.

J. Provide fully functional weep system throughout IGU framing system as indicated in GANA (GM).

K. Distribute weight of IGU along entire bottom edge rather than only at corners.

L. Install IGU's in accordance with IGMA TM-3000, and as follows:
   1. For dry glazed systems, provide an adequate seal consisting of at least 4 lbs per inch and not exceeding 10 lbs per inch pressure applied to the edges of IGU's by gaskets or other acceptable glazing materials.

### 3.03 CLEANING

A. Clean IGU inside and outside surfaces immediately after installation and curing of sealants in accordance with EC glass manufacturer's requirements.
   1. Remove labels and markings from glass.

### 3.04 PROTECTION

A. IGU Argon Analyzer Testing: Do not allow the use of high voltage spark type inert gas analyzers on EC tintable IGUs as this may damage the film and controls, and potentially void the warranty.

B. Protect glass from edge damage during handling and installation.
C. Protect glass from coming into contact with contaminating construction related substances such as weld spatter, fireproofing, plaster, and concrete or mortar slurry.

D. Remove damaged glass that is broken, chipped, cracked, or damaged in any way, and replace with new materials.
   1. Damaged Glass: Glass with edge damage or other imperfections that when installed could weaken the glass and impair performance and/or appearance.

   END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal stud wall framing.
B. Fire rated area separation walls.
C. Metal channel ceiling framing.
D. Acoustic insulation.
E. Gypsum sheathing.
F. Gypsum wallboard.
G. Abuse Resistant Gypsum wallboard.
H. Joint treatment and accessories.
I. Textured finish system.
J. Water-resistive barrier over exterior wall sheathing.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 05 4000 - Cold-Formed Metal Framing: Exterior wind-load-bearing metal stud framing.
C. Section 06 1000 - Rough Carpentry: Building framing and sheathing.
D. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.
E. Section 07 2100 - Thermal Insulation: Acoustic insulation.
F. Section 07 2500 - Weather Barriers: Water-resistive barrier over sheathing.
G. Section 07 9005 - Joint Sealers: Acoustic sealant.
H. Section 09 2216 - Non-Structural Metal Framing.

1.03 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.
B. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
J. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.
K. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.
P. ASTM E413 - Classification for Rating Sound Insulation; 2010.

1.04 SYSTEM DESCRIPTION
A. Sound Transmission Characteristics: For gypsum board assemblies with STC ratings, provide materials and construction identical to those assemblies whose STC ratings were determined according to ASTM E 90 and classified according to ASTM E 413 by a qualified independent testing agency.

1.05 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
C. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
E. Test Reports: For stud framing products that do not comply with ASTM C645 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.
F. LEED Submittals:
   1. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
   2. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.

1.06 QUALITY ASSURANCE
A. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire rated assemblies.
   1. Maintain one copy of all installation standards at project site.

1.07 ENVIRONMENTAL REQUIREMENTS
A. Environmental Conditions: Establish and maintain environmental conditions for application and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer’s recommendations.
B. Minimum Room temperature: For non-adhesive attachment of gypsum board to framing, maintain not less than 40 degrees F. For adhesive attachment and finishing of gypsum board maintain not less than 50 degrees F, for 48 hours prior to application and continuously thereafter until drying is complete.
C. Ventilate building space to remove water not required for drying joint treatment materials. Avoid drafts during dry, hot weather to prevent materials from frying too rapidly.

PART 2 PRODUCTS

2.01 GYPSUM BOARD MATERIALS

A. Provide completed assemblies complying with ASTM C840 and GA-216.

B. Manufacturers:
   4. USG: www.usg.com
   5. Substitutions: See Section 01 6000 - Product Requirements.

C. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

D. Fire Resistant Type: Complying with Type X Requirements; UL or WH rated.
   1. At Assemblies Indicated with Fire Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X.
   2. Thickness: 5/8 inch.

E. Abuse-Resistant Gypsum Wallboard: ASTM C 1278 and ASTM C 1396, of types, edge configuration and thickness indicated below without paper facing and with fiber mesh reinforced backing; in maximum lengths available to minimize end-to-end butt joints.
   1. Application: High traffic Hallways.
   2. Thickness: 5/8 inch.

F. Ceiling Board: Special sag-resistant type.
   1. Application: Ceilings unless otherwise indicated.
   2. Core Type: Type X.

G. Water-Resistant Gypsum Backing Board: ASTM C 1396/C 1396M; ends square cut.
   1. Application: Ceilings in bathrooms.
   2. Core Type: Type X.

H. Abuse Resistant Gypsum Backing Board:
   1. Application: Walls in Lobby 0196LB and hallways 0132FF (dish drop) and 0109CO (corridor to restroom)
   2. Core Type: Type X, as indicated.

I. Gypsum Backing Board for Multi-Layer Application: ASTM C 442/ASTM C 1396 or where backing board is not available from manufacturer, gypsum wallboard, ASTM C 1396, of type edge configuration and thickness indicated below, in maximum lengths available to minimize end-to-end joints.

J. Glass-Mat Gypsum Sheathing Board: ASTM C 1396/C 1396M, moisture resistant type; sizes to minimize joints in place; fiberglass mat laminated to both sides and with manufacturer's standard edges; ends square cut.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Georgia-Pacific Gypsum; "DensGlass Sheathing" or comparable product by one of the following:
   a. CertainTeed Corp.
   b. National Gypsum Company
   c. USG Corporation
2. Application: Exterior sheathing, unless otherwise indicated.
   a. Core Type: Regular and Type X, as indicated.
   b. Thickness: 1/2 inch.
   c. Edges: Square, for vertical application.

2.02 ACCESSORIES
A. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
B. Acoustic Insulation: As specified in Section 09 8311.
C. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.
D. Water-Resistive Barrier: No. 15 asphalt felt.
E. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
F. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
G. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.
H. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.
I. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION
A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
   1. Laterally brace entire suspension system.
C. Studs: Space studs at 16 inches on center.
   1. Extend partition framing to structure where indicated and to ceiling in other locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
   3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
E. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
1. Orientation: Horizontal.
2. Spacing: As indicated.

F. Blocking: Install wood blocking for support of:
1. Framed openings.
2. Wall mounted cabinets.
3. Plumbing fixtures.
4. Toilet partitions.
5. Toilet accessories.
6. Wall mounted door hardware.

3.03 ACOUSTIC ACCESSORIES INSTALLATION
A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
1. Place one bead continuously on substrate before installation of perimeter framing members.
2. Place continuous bead at perimeter of each layer of gypsum board.
3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

3.04 GYPSUM BOARD INSTALLATION
A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

C. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.

D. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

E. Exterior Sheathing: Comply with ASTM C1280. Install sheathing with edges butted tight and ends occurring over firm bearing.
1. Paper-Faced Sheathing: Immediately after installation, protect from weather by application of water-resistive barrier.

F. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.

3.05 INSTALLATION OF TRIM AND ACCESSORIES
A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
1. Not more than 30 feet apart on walls and ceilings over 50 feet long.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.06 JOINT TREATMENT
A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
2. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
3. Level 3: Walls to receive textured wall finish.
4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
5. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.

B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.
   2. Taping, filling and sanding is not required at base layer of double layer applications.

C. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.07 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Metal partition, ceiling, and sofit framing.
B. Framing accessories.

1.02 RELATED REQUIREMENTS
A. Section 05 4000 - Cold-Formed Metal Framing: Structural load bearing metal stud framing and Exterior wall stud framing.
B. Section 06 1000 - Rough Carpentry: Wood blocking within stud framing.
C. Section 07 2100 - Thermal Insulation: Acoustic insulation.
D. Section 07 2100 - Thermal Insulation: Acoustic Insulation.
E. Section 09 2116 - Gypsum Board Assemblies: Metal studs for gypsum board partition framing.

1.03 REFERENCE STANDARDS
C. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data describing framing member materials and finish, product criteria, load charts, and limitations.
C. LEED Submittal:
   1. MR Credit 2: Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill.
   2. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
   3. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Metal Framing, Connectors, and Accessories:
   2. SCAFCO Steel Stud Mfr Co.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FRAMING MATERIALS
A. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
   1. Studs: C shaped with flat or formed webs with knurled faces.
2. Runners: U shaped, sized to match studs.
3. Ceiling Channels: C shaped.

B. Loadbearing Studs: As specified in Section 05 4000.
C. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
D. Partition Head to Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and braced with continuous bridging on both sides.
E. Tracks and Runners: Same material and thickness as studs, bent leg retainer notched to receive studs with provision for crimp locking to stud.
F. Furring and Bracing Members: Of same material as studs; thickness to suit purpose; complying with applicable requirements of ASTM C754.
I. Acoustic Insulation: As specified in Section 07 2100.
J. Acoustic Sealant: As specified in Section 09 2116.

2.03 FABRICATION
A. Fabricate assemblies of framed sections to sizes and profiles required.
B. Fit, reinforce, and brace framing members to suit design requirements.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify that rough-in utilities are in proper location.

3.02 INSTALLATION OF STUD FRAMING
A. Extend partition framing to structure where indicated and to ceiling in other locations.
B. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
C. Align and secure top and bottom runners at 24 inches on center.
D. At partitions indicated with an acoustic rating:
   1. Place one bead of acoustic sealant between runners and substrate, studs and adjacent construction.
   2. Place one bead of acoustic sealant between studs and adjacent vertical surfaces.
E. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
F. Align stud web openings horizontally.
G. Secure studs to tracks using crimping method. Do not weld.
H. Stud splicing is not permissible.
I. Fabricate corners using a minimum of three studs.
J. Double stud at wall openings, door and window jambs, not more than 2 inches from each side of openings.
K. Brace stud framing system rigid.
L. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.
3.03 CEILING AND SOFFIT FRAMING
   A. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
   B. Install furring independent of walls, columns, and above-ceiling work.
   C. Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.
   D. Space main carrying channels at maximum 72 inch on center, and not more than 6 inches from wall surfaces. Lap splice securely.
   E. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.
   F. Place furring channels perpendicular to carrying channels, not more than 2 inches from perimeter walls, and rigidly secure. Lap splices securely.
   G. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches past each opening.
   H. Laterally brace suspension system.

3.04 TOLERANCES
   A. Maximum Variation From True Position: 1/8 inch in 10 feet.
   B. Maximum Variation From Plumb: 1/8 inch in 10 feet.

END OF SECTION
SECTION 09 3000
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. This Section may include the following:
   1. Wall Tile.
   2. Floor Tile.
   3. Cementitious Backer Units.

1.02 RELATED REQUIREMENTS
A. Section 07 9005 - Joint Sealers.
B. Section 09 2116 - Gypsum Board Assemblies: Tile backer board.

1.03 REFERENCE STANDARDS
E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).
N. ANSI A118.1 - American National Standard Specifications for Dry-Set Cement Mortar; 2012 (Revised).

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: For each type of product indicated.

C. Samples for Verification:
   1. Full size units of each type and composition of tile and for each color and finish required.

D. LEED Submittal:
   1. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
   2. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.

E. Product Certificates: For each type of product, signed by product manufacturer.

F. Qualification Data: For Installer.

G. Material Test Report: For each tile-setting and grouting product and special-purpose tile.

1.05 QUALITY ASSURANCE

A. Single-Source Responsibility for Tile: Obtain each color, grade, finish, type, composition, and variety of tile from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the work.

B. Single-Source Responsibility for Setting and Grouting Materials: Obtain ingredients of a uniform quality from one manufacturer for mortars, grouts, and liquid applied membranes for each assembly indicated in the Product Data Sheets.

C. Installer Qualifications: Engage an experienced installer who has successfully completed tile installations similar in material, design, and extent to that indicated for project.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement of ANSI A137.1 for labeling sealed tile packages.

B. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

C. Handle tile with temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs and edges of other units. If despite these precautions coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.07 FIELD CONDITIONS

A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.

B. Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.

C. Maintain temperatures at 50 degrees F or more in tiled areas during installation and for 7 days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

PART 2 PRODUCTS

2.01 PRODUCTS, GENERAL


B. ANSI Standard for Tile Installation Materials: Comply with ANSI Standard referenced with products and materials indicated for setting and grouting.
   1. Provide tile trim and accessories that match color and finish of adjoining flat tile unless otherwise indicated in Product Data Sheet.
C. Factory Blending: For tile exhibiting color variations within the ranges selected during sample submittals, blend tile in factory and package accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples.

D. Mounting: Where factory-mounted tile is required, provide back-or-edge-mounted tile assemblies as standard from manufacturer unless another mounting method is indicated.
   1. Where tile is indicated for installation on exteriors or in wet areas, do not use back-or-edge-mounted tile assemblies unless tile manufacturer specifies that this type of mounting is suitable for these kinds of uses and has been successfully used in other projects.

2.02 TILE PRODUCTS
   A. See product data sheets at end of section.

2.03 GROUTING MATERIALS
   A. See product data sheets at end of section.

2.04 ELASTOMERIC SEALANTS
   A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that comply with requirements of Division 07 Section "Joint Sealers" including ASTM C 920 as referenced by Type, Grade, Class and Uses.
   B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.
   C. Multipart Pourable Urethane Sealant for Use T: Type M; Grade P; Class 25; Uses T,M,A and as applicable to joint substrates indicated, O.
   D. Products: Subject to compliance with requirements, provide one of the following:
      1. Multipart Pourable Urethane Sealant:
         b. "Vulkem 245"; Mameco International, Inc.
         d. "THC-900"; Tremco Corporation.

2.05 CEMENTITIOUS BACKER UNITS (GLASS MESH MORTAR UNITS)
   A. Proprietary backing units with glass fiber mesh reinforcing and water-resistant coating on both faces, over a core of aggregated portland cement slurry, 7/16 to 1/2 inch thick, weighing 3.0 to 3.8 psf.
   B. Mortar Unit Finishing Materials: Tape and joint compounds as recommended by manufacturer of cementitious backer units.
   C. Available Products: Subject to compliance with requirements, cementitious backer units which may be incorporated in the work include, but are not limited to, the following:
      1. "Wonder-Board"; Modulars Inc.
      2. "Durock Tile Backer Board"; Durabond Division; USG Industries, Inc.
      3. Denshield.

2.06 MIXING MORTARS AND GROUT
   A. Mix mortars and grouts to comply with requirements of referenced standards and manufacturers including those for accurate proportioning of materials, water, or additive content; type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortars and grouts of uniform quality with optimum performance characteristics for application indicated.
   B. Mortar and grout mixes to be stored in room temperature, out of direct sunlight. Only mix ingredients that are room temperature.
PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates and areas where tile will be installed, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
   1. Verify that substrates for setting tile are firm, dry, clean, and free from oil or waxy films and curing compounds.
   2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile that has been completed before installing tile.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Blending: For tile exhibiting color variations within the ranges selected during sample submittals, verify that tile has been blended in factory and packaged accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples. If not factory blended, either return to manufacturer or blend tiles at project site before installing.

B. Protective Coating: Where indicated under tile type as needed to prevent adhesion or staining of exposed tile surfaces by grout, protect exposed surfaces of tile against adherence of mortar and grout by precoating them with a continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces. Ensure that coating is compatible with tile and mortar/grout products, and is easily removable after grouting is completed without damaging grout or tile.

3.03 INSTALLATION - GENERAL

A. ANSI Tile Installation Standard: Comply with parts of ANSI 108 series of tile installation standards included under "American National Standard Specifications for Installation of ceramic Tile" that apply to type of setting and grouting materials and methods indicated.


C. Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions except as otherwise shown. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so that plates, collars, or covers overlap tile.

E. Tiles fitting around outside corners such as floors tiles around fixtures, cabinets, and ends of partitions; and wall tiles fitting around wall openings, shall have the intruding corner cut from the tile with a tile saw. Corner shall not be accommodated by snapping the tile into multiple pieces.

F. Jointing Pattern: Unless otherwise shown, lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths unless otherwise shown.

G. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw cut joints after installation of tiles. Locate joints in tile surfaces directly above joints in concrete substrates.

H. Grout tile to comply with the requirements of the following installation standards:
   1. For ceramic tile grouts latex-portland cement comply with ANSI A108.10.
I. Keep control and expansion joints free of mortar, grout, and adhesive.
J. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 FLOOR INSTALLATION METHODS
A. Per TCNA guidelines as noted in data sheets.
B. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile. Provide Schluter Reno - TK in anodized aluminum.

3.05 CLEANING
A. Cleaning: Upon completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
   1. Remove latex-portland cement and acrylic-portland cement grout residue from tile as soon as possible. Buff dry installation with cheese cloth.
   2. Tile shall not be cleaned with acid solutions.
   3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.

3.06 SCHEDULE
A. FLOOR TILE FT1:
   1. Tile Symbol/Abbreviation: FT1
   2. Style: Basalt Porcelain Floor Tile.
   3. Manufacturer: www.crossvilleinc.com
   4. Patterns: Straight Lay Installation
   5. Nominal Dimensions: 12” x 12” x 3/8”
   6. Color: Bedrock AV293
   7. Trim Units: Schluter - Reno at all floor edges.
   8. Extra Material: 1 percent of installed amount of full size tiles.
   9. GROUT:
      a. Manufacturer: Custom Building Products Prism
      b. Color: Natural Gray # 9
   10. INSTALLATION METHOD:
        a. TCA Number: TCNA F 128-07.

B. TILE CB1
   1. Tile Symbol/Abbreviation: CB1 - Coved Base
   2. Style: Basalt Porcelain Floor Tile.
   3. Manufacturer: Crossville; www.crossvilleinc.com
   4. Patterns: Straight Lay Installation
   5. Nominal Dimensions: 6”H x 12”W x 3/8” Universal Flat Top.
   6. Color: Bedrock AV293
   7. Trim Units: Schluter - Reno at all floor edges.
   8. Extra Material: 1 percent of installed amount of full size tiles
   9. GROUT:
      a. Manufacturer: Custom Building Products Prism
   10. INSTALLATION METHOD:
        a. TCA Number: TCNA F 128-07.

C. TILE T1A
   1. Tile Symbol/Abbreviations: T1A
2. Manufacturer: Imola; www.imolaceramica.com
3. Code: POP W
4. Collection: 298-Pop
5. Finish: Natural
6. Structure: Slate Cut
7. Surface Look: Glossy
8. Pattern: Running Bond
9. Nominal Dimension: 12.5 x 33.3 cm
10. Thickness: 7.8 mm
11. Color: 021 - White
12. Extra Material: 1 percent of installed amount of full size tiles
13. **GROUT:**
   a. Manufacturer: Custom Building Products Prism.
   b. Color: Varies - T.B.D.
   c. Joint Width: Max. 1/8” Grout Joints
14. **INSTALLATION METHOD**
   a. TCA Number: TCNA F 128-07.

D. **TILE T1B**
1. Tile Symbol/Abbreviation: **T1B**
2. Manufacturer: Imola; www.imolaceramica.com
3. Code: POP N
4. Collection: 298-Pop
5. Finish: Natural
6. Structure: Slate Cut
7. Surface Look: Glossy
8. Pattern: Running Bond
9. Nominal Dimensions: 12.5 x 33.3 cm
10. Color: 111 - Black
11. Extra Material: 1 percent of installed amount of full size tiles
12. **GROUT:**
   a. Manufacturer: Custom Building Products Prism.
   b. Color: Charcoal #60
   c. Joint Width: Max. 1/8” Grout Joint.
13. **INSTALLATION METHOD**
   a. TCA Number: TCNA F 128-07.

E. **TILE T1C**
1. Tile Symbol/Abbreviations: **T1C**
2. Manufacturer: Imola; www.imolaceramica.com
3. Code: Cool V.
4. Collection: 298 - POP
5. Finish: Natural
6. Structure: Slate Cut
7. Surface Look: Glossy
8. Patterns: Random Tile, Running Bond - See Drawings
9. Nominal Dimensions: 12.5 x 33.3 cm.
11. Extra Material: 1 percent of installed amount of full size tiles
12. **GROUT:**
   a. Manufacturer: Custom Building Products Prism.
   c. Joint Width: Max.1/8” Grout Joints
13. **INSTALLATION METHOD**:
a. TCA Number: TCNA F 128-07.

F. TILE T1D
1. Tile Symbol/Abbreviations: T1D
2. Manufacturer: Imola; www.imolaceramica.com
3. Code: Pop V
4. Collection: 298 - POP
5. Finish: Natural
6. Structure: Slate Cut
7. Surface Look: Glossy
8. Patterns: Running Bond - See Drawings
9. Nominal Dimensions: 12.5 x 33.3 cm
10. Color: 091 - Green
11. Extra Material: 1 percent of installed amount of full size tiles
12. GROUT:
   a. Manufacturer: Custom Building Products Prism.
   c. Joint Width: Max. 1/8" Grout Joints

G. TILE T2
1. Tile Symbol/Abbreviations: T2
4. Color: Downtown Hill (F02DOWNH10635).
5. Finish: Glazed Porcelain.
6. Patterns: See Drawings.
7. Nominal Dimensions: 6" x 35" x 5/16".
8. Extra Material: 1 percent of installed amount of full size tiles
9. GROUT:
   a. Manufacturer: Custom Building Products Prism.
   b. Color: Charcoal # 60.
   c. Joint Width: Max. 1/8" Grout Joints

H. TILE T3
1. Tile Symbol/Abbreviations: T3
3. Style: Tiki Glass Mosaic
5. Pattern: See Drawings.
7. Size: 7/8" x 7/8" Mosaic Tile.
8. Extra Material: 1 percent of installed amount of full size tiles
9. GROUT:
   a. Manufacturer: Custom Building Products Prism
   c. Joint Width: Max. 1/8" Grout Joints

I. TILE T5
1. Tile Symbol/Abbreviation: T5.
2. Manufacturer: Monocibec; www.monocibec.com
3. Style: Ethnos
5. Finish: Natural Surface.
6. Patterns: See Drawings.
7. Nominal Dimension: 10" x 20" x 10mm.
8. Extra Material: 1 percent of installed amount of full size tiles
9. **GROUT:**
   a. Manufacturer: Custom Building Products Prism.
   b. Color: Khaki # 186.
10. **INSTALLATION METHOD**
    a. TCA Number: TCNA F 128-07.

J. **TILE T7A**
1. Tile Symbol/Abbreviation: **T7A**
2. Manufacturer: Daltile; www.daltile.com
3. Style: Color Wave
5. Finish: Glass
6. Patterns: See Drawings.
7. Size: 1" x 6" x 5/16".
8. Extra Material: 1 percent of installed amount of full size tiles
9. **GROUT:**
   a. Manufacturer: Custom Building Products Prism.
10. **INSTALLATION METHOD:**
    a. TCA Number: TCNA F 128-07.

K. **TILE T7B**
1. Tile Symbol/Abbreviation: **T7B**.
5. Finish: Glass.
6. Patterns: See Drawings.
7. Size: 1" x 6" x 5/16".
8. Extra Material: 1 percent of installed amount of full size tiles.
9. **GROUT:**
   a. Manufacturer: Custom Building Products Prism.
10. **INSTALLATION METHOD:**
    a. TCA Number: TCNA F 128-07.

L. **TILE T7C**
1. Tile Symbol/Abbreviation: **T7C**
5. Finish: Glass.
6. Patterns: See Drawings.
7. Size: 1" x 6" x 5/16".
8. Extra Material: 1 percent of installed amount of full size tiles.
9. **GROUT:**
a. Manufacturer: Custom Building Products Prism.

10. INSTALLATION METHOD:
   a. TCA Number: TCNA F 128-07.

M. TILE T7D
   1. Tile Symbol/Abbreviation: T7D
   4. Color: CW30 Red Hot
   5. Finish: Glass.
   7. Size: 1" x 6" x 5/16".
   8. Extra Material: 1 percent of installed amount of full size tiles.
   9. GROUT:
      a. Manufacturer: Custom Building Products Prism.
   10. INSTALLATION METHOD:
       a. TCA Number: TCNA F 128-07.

N. TILE T7E
   1. Tile Symbol/Abbreviation: T7E.
   5. Finish: Glass.
   7. Size: 1" x 6" x 5/16".
   8. Extra Material: 1 percent of installed amount of full size tiles.
   9. GROUT:
      a. Manufacturer: Custom Building Products Prism.
   10. INSTALLATION METHOD:
       a. TCA Number: TCNA F 128-07.

O. TILE T8A
   1. Tile Symbol/Abbreviation: T8A
   5. Finish: Glossy.
   6. Patterns: See Drawings.
   7. Size: 2" x 8".
   8. Extra Material: 1 percent of installed amount of full size tiles.
   9. GROUT:
      a. Manufacturer: Custom Building Products Prism.
   10. INSTALLATION METHOD:
       a. TCA Number: TCNA F 128-07.

P. TILE T8B
   1. Tile Symbol/Abbreviation: T8B
5. Finish: Glossy.
6. Patterns: See Drawings.
7. Size: 2" x 8".
8. Extra Material: 1 percent of installed amount of full size tiles.
9. GROUT:
   a. Manufacturer: Custom Building Products Prism.
10. INSTALLATION METHOD:
    a. TCA Number: TCNA F 128-07.

Q. TILE T8C
1. Tile Symbol/Abbreviation: T8C.
5. Finish: Glossy.
6. Patterns: See Drawings.
7. Size: 2" x 8".
8. Extra Material: 1 percent of installed amount of full size tiles.
9. GROUT:
   a. Manufacturer: Custom Building Products Prism.
10. INSTALLATION METHOD:
    a. TCA Number: TCNA F 128-07.

R. TILE 11A
1. Tile Symbol/Abbreviation: T11A.
3. Style: Ceramic Wall Tile.
5. Finish: Matte.
6. Patterns: See Drawings.
7. Size: 4-1/4" x 4-1/4" x 5/16"
8. Extra Material: 1 percent of installed amount of full size tiles.
9. GROUT:
   a. Manufacturer: Custom Building Products Prism.
10. INSTALLATION METHOD:
    a. TCA Number: TCNA F 128-07.

S. TILE 11B
1. Tile Symbol/Abbreviation: T11B.
3. Style: Ceramic Wall Tile
4. Color: Matte Arctic White 0790
5. Finish: Matte.
7. Size: 4-1/4" x 4-1/4" x 5/16"
8. Extra Material: 1 percent of installed amount of full size tiles.
9. **GROUT:**
   a. Manufacturer: Custom Building Products Prism.

10. **INSTALLATION METHOD:**
    a. TCA Number: TCNA F 128-07.

T. **TILE 13**
1. Tile Symbol/Abbreviation: **T13**.
3. Style: Encaustic Cement Tile
4. Color: South Beach Palette (black, atmosphere, velvet sky, Malibu blue, maple sugar).
5. Pattern: Tangier
7. Size: 8" x 8" x 5/8".
8. Top Coat Sealant Required Per Manufacturer.
10. **GROUT:**
    a. Manufacturer: Custom Building Products Prism.

11. **INSTALLATION METHOD:**
    a. TCA Number: TCNA F 128-07.

**END OF SECTION**
SECTION 09 3033
TILE SETTING MATERIALS AND ACCESSORIES

PART 1  GENERAL

1.01  SECTION INCLUDES
A. Upcoupling membrane.
B. Setting materials: adhesives, mortars, grouts, and sealants.

1.02  RELATED REQUIREMENTS
A. Section 07 9005 - Joint Sealers.
B. Section 09 9300 - Tiling

1.03  REFERENCE STANDARDS

1.04  SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
C. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.05  MOCK-UP
A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.
B. Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.

1.06  DELIVERY, STORAGE, AND HANDLING
A. Store products in manufacturer's unopened packaging until ready for installation.
B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
C. Store materials in a dry, warm, ventilated weathertight location.

1.07  FIELD CONDITIONS
A. Maintain environmental conditions within limits recommended by manufacturer for optimum results. So not install products under environmental conditions outside manufacturer's absolute limits.

PART 2  PRODUCTS

2.01  MANUFACTURERS
B. Substitutions: See Section 01 6000 - Product Requirements.

2.02  UNCOUPLING MEMBRANE
A. Schuler-DITRA
   1. Description: 1/8 inch thick, orange, high-density polyethylene membrane with a grid structure of 1/2 inch by 1/2 inch square cavities, each cut back in a dovetail configuration,
and a polypropylene anchoring fleece laminated to its underside. Conforms to definition for uncoupling membranes in the Tile Council of North America handbook for Ceramic Tile Installation and is listed by UPC to meet or exceed the requirements of the "American National Standard Specifications for load bearing, bonded, waterproof membranes for thin-set ceramic tile and dimension stone installation A118.10 and is listed by UPC, and is evaluated by ICC-ES.

2. **Waterproofing Seaming Membrane:**
   a. Provide KERDI BAND SEAMS and Corners material 0.004 inch thick, orange polyethylene membrane, with polypropylene fleece laminated on both sides.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

#### 3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

#### 3.03 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION
SECTION 09 5100
SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Suspended metal grid ceiling system.
B. Acoustical units.

1.02 RELATED REQUIREMENTS
A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 21 1300 - Fire Suppression Sprinklers: Sprinkler heads in ceiling system.
C. Section 23 3700 - Air Outlets and Inlets: Air diffusion devices in ceiling.
D. Section 26 5100 - Interior Lighting: Light fixtures in ceiling system.

1.03 REFERENCE STANDARDS
D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.
E. CAL (CHPS LEM) - Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
F. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate grid layout and related dimensioning.
C. Product Data: Provide data on suspension system components.
D. Samples: Submit two samples 4 x 4 inch in size illustrating material and finish of acoustical units.
E. Manufacturer's Installation Instructions: Indicate special procedures.
F. Maintenance Materials: Furnish the following for MSU Facilities's use in maintenance of project.
G. LEED Submittal:
   1. MR Credit 2: Construction Waste Management: For products being recycled, documentation of total weight of project waste diverted from landfill.
   2. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

1.05 QUALITY ASSURANCE
A. Acoustical Testing Agency Qualifications: An independent testing laboratory, or an NVLAP-accredited laboratory with the experience and capability to conduct the testing
indicated, NVLAP-accredited laboratories must document accreditation, based on a "Certificate of Accreditation" and a "Scope of Accreditation" listing the test methods specified.

B. Source Limitations:
   1. Acoustical Ceiling Tile: Obtain each type through one source from a single manufacturer.
   2. Suspension System: Obtain each type through one source from a single manufacturer.

C. Source Limitations: Obtain each type of acoustical ceiling tile and supporting suspension system through one source from a single manufacturer.

D. Fire Test Response Characteristics: Provide acoustical tile ceiling that comply with the following requirements:
   1. Fire Resistance Rating: Indicate by design designations from UL’s "Fire Resistance Directory" or from listings of another testing and inspecting agency.
   2. Identify materials with appropriate markings of applicable testing and inspecting agency.

E. Surface Burning Characteristics: Provide acoustical tiles with the following surface burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84.
   1. Smoke Developed Index: 450 or less.

1.06 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified labels described content.
   1. Acoustical Ceiling Units: Full size tiles equal to 2.0 percent of quantity installed.
   2. Suspension System Components: Quantity of each concealed grid and exposed component equal to 2.0 percent of quantity installed.
   3. 8 ounces of each color of touch up paint.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acoustic Tiles/Panels:

2.02 ACOUSTICAL TILES, GENERAL

A. Recycled Content: Provide acoustical tiles with recycled content such as post-consumer recycled content plus one-half of pre-consumer recycled content constitutes a minimum of 50 percent by weight or as indicated for each specific tile.

B. Acoustical Tile Standard: Provide manufacturer's standard tiles of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectance, unless otherwise indicated.
   1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface per ASTM E 795.

C. Acoustical Tile Colors and Patterns: Match appearance characteristics indicated for each product type.

D. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical tiles treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.
   4. Substitutions: See Section 01 6000 - Product Requirements.
2.03 ACoustical Tiles for Acoustical Tile Ceiling "ACT1"

A. Products: Subject to compliance with requirements, provide one of the following:
   1. Armstrong World Industries, Inc; Health Zone Create
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Classification: Provide fire resistance rated tie complying with ASTM E 1264 for type, form, and pattern as follows:
   1. Type and Form: Type III, mineral base with painted finish; Form 2, water felted.
   2. Pattern: CE (perforated, small holes and lightly textured).

C. Color: Light Grey - (9D)
D. LR: Not less than 0.35.
E. NRC: Not less than 0.75.
F. CAC: Not less than 35.
G. Edge/Joint Detail: Square.
H. Thickness: 3/4 inch.
I. Modular Size: 24 inches x 24 inches.
J. Recycled Content: minimum 75%
K. Suspension system: 15/16" Prelude XL Aluminum Grid T System. GRID MUST BE AN ALUMINUM SYSTEM.

2.04 Ceiling Tile "ACT2"

A. Products: Subject to compliance with requirements, provide one of the following:
   1. Armstrong World Industries, Inc; Dune fine texture, angled tegular.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Color: white
C. Material: Mineral fiber.
D. Density: 0.5 to 0.7 lbs/cu ft
E. Fire rating: Class A
F. Humidity resistance: Armstrong HumiGuard Plus
G. Light reflectance: Not less than 0.80
H. NRC: Not less than 0.50
I. Size: 24" x 24"
J. Thickness: 5/8"
K. Edge: Angled Tegular
L. Suspension system: 15/16" Prelude XL Galvanized Steel T Grid. Contractor may substitute Prelude XL Aluminum system for steel (to match kitchen system).

2.05 Acoustical Tiles for Acoustical Tile Ceiling "ACT3"

A. Products: Subject to compliance with requirements, provide one of the following:
   1. Armstrong World Industries, Inc; Kitchen Zone
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Classification: Provide fire resistance rated tie complying with ASTM E 1264 for type, form, and pattern as follows:
   1. Type and Form: Type III, mineral base with painted finish; Form 2, water felted.
   2. Pattern: CE (perforated, small holes and lightly textured).

C. Color: White.
D. LR: Not less than 0.85.
E. CAC: Not less than 32.
F. Edge/Joint Detail: Square.
G. Thickness: 5/8 inch.
H. Modular Size: 24 inches x 48 inches.
I. Durability: must be rated for kitchen use, washable, scratch and stain resistant. Heat and humidity resistant.
J. Mold and mildew resistant coating
K. Suspension system: 15/16" Prelude XL Aluminum Grid T System. GRID MUST BE AN ALUMINUM SYSTEM.

2.06 CEILING TILE "ACT4"
A. Products: Subject to compliance with requirements, provide one of the following:
   1. Armstrong World Industries, Inc; Dune fine texture, square edge.
   2. Substitutions: See Section 01 6000 - Product Requirements.
B. Color: white
C. Material: Mineral fiber.
D. Density: 0.5 to 0.7 lbs/cu ft
E. Fire rating: Class A
F. Humidity resistance: Armstrong HumiGuard Plus
G. Light reflectance: Not less than 0.80
H. NRC: Not less than 0.50
I. Size: 48" x 24"
J. Thickness: 5/8"
K. Edge: Square Edge
L. Suspension system: 15/16" Prelude XL Galvanized Steel T Grid. Contractor may substitute Prelude XL Aluminum system for steel (to match kitchen system).

2.07 ACOUSTICAL TILES FOR ACOUSTICAL TILE CEILING "ACT5"
A. Products: Subject to compliance with requirements, provide one of the following:
   1. Armstrong World Industries, Inc; Health Zone Create
   2. Substitutions: See Section 01 6000 - Product Requirements.
B. Classification: Provide fire resistance rated tie complying with ASTM E 1264 for type, form, and pattern as follows:
   1. Type and Form: Type III, mineral base with painted finish; Form 2, water felted.
   2. Pattern: CE (perforated, small holes and lightly textured).
C. Color: Blue - (7G)
D. LR: Not less than 0.35.
E. NRC: Not less than 0.75.
F. CAC: Not less than 35.
G. Edge/Joint Detail: Square edge
H. Thickness: 3/4 inch.
I. Modular Size: 24 inches x 24 inches.
J. Recycled Content: minimum 75%
K. Suspension system: 15/16" Prelude XL Aluminum Grid T System. GRID MUST BE AN ALUMINUM SYSTEM.
2.08 ACOUSTICAL TILES FOR ACOUSTICAL TILE CEILING "GYP"

A. Products: Subject to compliance with requirements, provide one of the following:
   1. Armstrong World Industries, Inc;
   2. US Gypsum

B. Classification: Provide fire resistance rated tie complying with ASTM E 1264 for type, form, and pattern as follows:

C. Color: painted to match adjoining lay-in mineral tiles. White in kitchen area, Light grey at serveries.

D. LR: Not less than 0.35.

E. Edge/Joint Detail: Square edge

F. Thickness: 5/8 inch.

G. Modular Size: 24 inches x 24 inches.

H. Suspension system: 15/16" Prelude XL Aluminum Grid T System. GRID MUST BE AN ALUMINUM SYSTEM.

2.09 METAL SUSPENSION SYSTEM, GENERAL

A. See ceiling tile types for suspension system.

B. Recycled Content: Provide products made from steel sheet with average recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content is not less than 25 percent.

C. Metal Suspension System Standard: Provide manufacturer's standard metal suspension system of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.

D. Finishes and Colors: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory applied finish for type of system indicated.

E. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung" unless otherwise indicated. Comply with seismic design requirements.

F. Wire Hangers, Braces and Ties: Provide wire complying with the following requirements:
   2. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung" will be less than yield stress of wire, but provide not less than 0.106 inch diameter in size.

G. Hanger Rods: Mild steel, zinc coated or protected with rust inhibitive paint.

H. Angle Hangers: Angles with legs not less than 7/8 inch wide, formed with 0.04 inch thick, galvanized steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16 inch diameter bolts.

I. Seismic Struts: Manufacturer's standard compression struts designed to accommodate lateral forces.

J. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical tiles in place.

K. Exposed Steel Suspension System Type Prelude XL: Formed steel, commercial quality cold rolled; intermediate-duty.
   1. Profile: Tee; 15/16 inch wide face.
   2. Construction: Double web.

L. Exposed Aluminum Suspension System Type Prelude XL: Extruded aluminum; light-duty.
   1. Profile: Tee; 15/16 inch wide face.
2. Finish: Painted white at kitchen, painted grey at areas of ACT1 to match ACT color.

2.10 METAL SUSPENSION SYSTEM FOR ACOUSTICAL TILE CEILING
   A. Products: Subject to compliance with requirements, provide one of the following:
      1. Armstrong World Industries, Inc: Prelude 15/16 inch Suspension System steel and aluminum - see tile types.
   B. Perimeter Moldings: Same material and finish as grid.
      1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.

2.11 METAL EDGE MOLDINGS AND TRIM
   A. Roll-Formed, Sheet Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.
      1. Provide manufacturer's standard edge moldings that fit acoustical tile edge details and suspension system indicated and that match width and configuration of exposed runners, unless otherwise indicated.
   B. Extruded Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded aluminum edge moldings and trim profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements and the following:
      3. Cut ceiling tile at outside edge to match tegular shape.

2.12 ACOUSTICAL SEALANT
   A. Acoustical:
      2. USG Corporation: Sheetrock Acoustical Sealant

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify existing conditions before starting work.
   B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM
   A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.
   B. Provide seismic restraint as required by current edition of IBC, other applicable codes, and local authorities.
   C. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
   D. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
   E. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
   F. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

I. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

J. Do not eccentrically load system or induce rotation of runners.

K. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.
   2. Overlap and rivet corners.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions and to meet code requirements for seismic restraint.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Make field cut tile edges of same profile as factory edges. Duplicate tegular edge at cut edges where field is tegular. Field paint all cuts.

3.04 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Fabric-faced, fiberglass core acoustical panels.

1.02 RELATED REQUIREMENTS
   A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
   B. Section 26 5100 - Interior Lighting.

1.03 REFERENCE STANDARDS
   D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Sequence work to ensure that acoustical ceilings are not installed until building is enclosed, permanent heating system is available, dust generating activities have terminated, wet work is complete and dry, and work above ceilings is complete.

1.05 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Manufacturer's data sheets on each product to be used, including:
      1. Preparation instructions and recommendations.
      2. Storage and handling requirements and recommendations.
      3. Installation methods.
   C. Fabric Selection Samples: Manufacturer's full range of fabric samples illustrating available colors and textures.
   D. Verification Samples: Two samples, minimum size 8 by 8 inches, representing actual acoustical panel product.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Deliver products in manufacturer's unopened packaging and store unopened in fully enclosed space until ready for installation. Protect products from exposure to sunlight, moisture, and mechanical damage.
   B. Handle acoustical panels carefully to avoid soiling exposed surfaces or damaging surfaces and edges.

1.07 FIELD CONDITIONS
   A. Maintain temperature within 15 degrees Fahrenheit and relative humidity within 10 percent of design conditions for spaces of installation not less than 48 hours before installation begins and thereafter.

PART 2 PRODUCTS

2.01 ACOUSTICAL PANELS
   A. Manufacturers:

B. Provide panels comprising a compressible structural fiberglass core with non-woven polyester textile surface wrapped on edges; with properties as follows:
   1. Type 1 Panel Thickness: 1-1/8 inch.
   2. Type 2 Panel Thickness: 2 inches.
   4. Panel Sizes: Different sizes, in locations as indicated on the drawings.
   5. Edge Condition: One of the following:
      a. Square edge for lay-in.
   6. Noise Reduction Coefficient (NRC): Type 1 Minimum 0.85, measured in accordance with ASTM C423. Type 2 minimum 1.15, measured in accordance with ASTM C423.
   7. Sound Absorption Average: (SAA) 0.89, measured in accordance with ASTM C423.
   8. Surface Burning Characteristics: Flame spread index less than 25, smoke developed index less than 100; Class A, per ASTM E84 and ASTM E1264.
   9. Light Reflectance: LR-1 (0.75), measured in accordance with ASTM E1477.
   10. Moisture Resistance: Resistant to relative humidity up to 95 percent at 104 degrees F for 30 days.

2.02 ANCHOR SYSTEM
   A. Anchors, Clips, Fasteners, Support Channels and Hangers: Galvanized steel, size and type to suit application. Where ceiling is exposed structure, anchors may be exposed, paint to match structure. At gypsum ceilings, anchors must be hidden type. Anchors to be provided by panel manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that layout of hangers will not interfere with other work; make adjustments in layout as necessary.
   B. Do not begin ceiling installation until services above ceiling are complete except for final trim.
   C. Notify Mosaic Architecture of unsatisfactory conditions before proceeding.

3.02 PREPARATION
   A. Lay out system as shown on drawings.
   B. Locate system on room axis according to reflected floor plan.

3.03 INSTALLATION OF ACOUSTICAL PANELS
   A. Install acoustical panels in accordance with manufacturer's written instructions.
   B. Scribe and cut panels for accurate fit at perimeter and around penetrations.
   C. Hold tile field in compression when cutting. Match field cut edges with factory edges in accordance with manufacturer's instructions.
   D. Install acoustical panels after above-ceiling work is complete. Install panels level, in uniform plane, and free from warp, twist, and dents.
   E. Installation Tolerance: Maximum variation from flat and level surface is 1:1000.

3.04 PROTECTION
   A. Protect installed acoustical panel ceilings until Date of Substantial Completion.

END OF SECTION
SECTION 09 6419
ENGINEERED WOOD FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Engineered wood flooring will be installed on walls.
B. Engineered wood flooring of the following species:
   1. White Oak.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, wood species and colors available; and installation instructions.
C. Samples: Submit two samples 6 by 6 inch in size illustrating floor finish, color, and sheen.
D. LEED Submittal:
   1. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
   2. MR Credit 5: Local and Regional Materials: Product Data for Credit MR 5.1 and Credit MR 5.2. Submit data, including location and distance from project of material manufacturer and point of extraction, harvest or recovery for main raw material.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the type of work specified in this section.
   1. Minimum three years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Engineered Wood Flooring:
   2. Graf Brothers, P.O. Box 458, South Shore, KY 41175; www.grafbro.com
   4. Substitutions: Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Engineered Wood Flooring:
   1. Species: White Oak
   2. Grade: Select and Better.
      a. Grain Pattern: Rift and Quartered.
   5. Length: 5 feet and up.
   6. 1" x 6" V-Groove Tongue and Groove.
      a. 9-ply Baltic Birch.
      b. Wear Layer: 1/4 inch.
   8. Matching:
      a. Tongue and Groove Edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions that may be detrimental to proper or timely completion.

B. Install wood flooring only after interior temperature and humidity conditions can be maintained at conditions that mimic normal temperature and humidity conditions for the permanent system.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.

3.03 CLEANING AND PROTECTION

A. Protect from damage during construction operations. Promptly repair any damaged surfaces. Remove and replace work which cannot be satisfactorily repaired.

B. Clean flooring, prior to Substantial Completion, using materials recommended by the manufacturer to remove stains, dirt and debris prior to final acceptance.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring.
B. Installation accessories.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.

1.03 REFERENCE STANDARDS

F. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
C. Selection Samples: Submit manufacturer's complete set of color samples for Mosaic Architecture's initial selection.
D. LEED Report: Report recycled content and VOC emission of flooring; VOC content of adhesives.
E. Maintenance Materials: Furnish the following for MSU Facilities's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
2. Extra Flooring Material: 5% of each type and color.

F. LEED Submittal: Documentation of recycled content and location of manufacture.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
B. Store all materials off of the floor in an acclimatized, weather-tight space.
C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

1.06 FIELD CONDITIONS
A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS
2.01 LVT FLOORING
A. Manufacturers:
   1. Patcraft: www.patcraft.com

2.02 MATERIAL
A. **Floor Tile LVT 1**
   1. Product: Patcraft - Metallix Rectangle
   2. Collection Name: Mixed Materials
   3. Style Number: 1337V
   5. Wear layer Thickness: .039"
   6. Overall Thickness: .197"
   7. Finish: UV Urethane
   8. Installation: Glue Down
   10. Size: 9" x 36" 1337V
   11. Color: Pewter 00570
   12. Pattern: Brick

B. **Floor Tile LVT 2**
   1. Product: Patcraft - Metallix Rectangle
   2. Collection Name: Mixed Materials
   3. Style Number: 1337V
   5. Wear layer Thickness: .039"
   6. Overall Thickness: .197"
   7. Finish: UV Urethane
   8. Installation: Glue Down
   10. Size: 9" x 36" 1337V
   12. Pattern: Brick

C. **Floor Tile LVT 3**
   1. Product: Patcraft - Metallix Rectangle
   2. Collection Name: Mixed Materials
   3. Style Number: 1337V
   5. Wear layer Thickness: .039"
6. Overall Thickness: .197"
7. Finish: UV Urethane
8. Installation: Glue Down
10. Size: 9" x 36" 1337V
11. Color: Sulfur Oxide 00220

D. **Floor Tile LVT 4**
1. Product: Patcraft - Metallix Rectangle
2. Collection Name: Mixed Materials
3. Style Number: 1337V
5. Wear layer Thickness: .039"
6. Overall Thickness: .197"
7. Finish: UV Urethane
8. Installation: Glue Down
10. Size: 9" x 36" 1337V

E. **Floor Tile LVT 5**
1. Product: Patcraft - Metallix Rectangle
2. Collection Name: Mixed Materials
3. Style Number: 1337V
5. Wear layer Thickness: .039"
6. Overall Thickness: .197"
7. Finish: UV Urethane
8. Installation: Glue Down
10. Size: 9" x 36" 1337V.

2.03 **ACCESSORIES**

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
   1. VOC Content Limits: As specified in Section 01 6116.
   2. Provide only products having lower volatile organic compound (VOC) content than required by the more stringent of the South Coast Air Quality Management District Rule No.1168 and the Bay Area Air Quality Management District Regulation 8, Rule 51.

**PART 3 EXECUTION**

3.01 **EXAMINATION**

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
   1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
3.02 INSTALLATION
   A. Starting installation constitutes acceptance of sub-floor conditions.
   B. Install in accordance with manufacturer's written instructions.
   C. Spread only enough adhesive to permit installation of materials before initial set.
   D. Fit joints and butt seams tightly.
   E. Set flooring in place, press with heavy roller to attain full adhesion.
   F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
   G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
   H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.03 TILE FLOORING
   A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

3.04 CLEANING
   A. Remove excess adhesive from floor, base, and wall surfaces without damage.
   B. Clean in accordance with manufacturer's written instructions.

END OF SECTION
SECTION 09 6570
PROTECT-ALL COMMERCIAL FLOORING

PART 1 GENERAL

1.01 SUMMARY
A. Provide and install commercial resilient vinyl flooring per manufacturer’s installation requirements and recommendations.

1.02 SUBMITTALS
A. Product Data: Submit manufacturer’s current printed product literature, specifications, installation instructions, and field reports in accordance with Section 01 3300 - Submittal Procedures.
B. Shop Drawings: Submit shop drawings to indicate materials, details, and accessories.
   1. Submit a cut diagram indicating seam locations and roll direction. Use mitered seam layouts for corners when changing directions 180 degrees (e.g. when running material down corridors which bisect at a right angle), unless approved otherwise.
C. Samples: Submit duplicate 12” x 12” (300 mm x 300 mm) sample pieces of sheet material.
D. LEED Report: Report recycled content and VOC emission of flooring; VOC content of adhesives.
   1. For Flooring, report rapidly-renewable content and urea-formaldehyde content and provide product data sheet stating flooring material is certified compliant with the FloorScore Standard.

1.03 QUALITY ASSURANCE
A. Contractor will assure compliance with 2.02 Job Conditions to allow for proper installation.
B. Use Protect-All factory trained installers provided by local distributor.
C. Manufacturer provides a limited product warranty against manufacturing defects. Warranty does not in any way cover installation related issues.

PART 2 PRODUCTS

2.01 SAFETY FLOORING
A. **SV and SVB** - Protect-All Commercial Flooring as manufactured by Oscoda Plastics, Inc. www.protect-allflooring.com
   1. Protect-All sheets in 5'-0" x 8'-0". 1/4" thickness.
   2. Color: Dark Grey.
   3. Protect-All 2-part epoxy flooring adhesive.
   4. Protect-All cove base system with a minimum height of 6".
      a. Protect-All Rapid Weld or corner rod for the cove base system.
   5. Protect-All Rapid Weld.
   6. Protect-All Stainless Steel cove base cap.
   7. Protect-All Stainless Steel Corner Guard (2" x 2" x 4") on all outside corners.
   8. Protect-All Stainless Steel drain rings, corner guards, and transition strips provided by Oscoda Plastics.
      a. Protect-All Stainless Steel fasteners and anchors for drain rings, corner guards, and transition strips.
   9. Protect-All E-6100 sealant.
   10. Other installation materials as required amd supplied by Protect-All.
B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 INSTALLATION VERIFICATIONS
A. Manufacturer installation instructions for watertight applications along with required accessories, located at www.protect-allflooring.com.
B. Experience of installer pertaining to Protect-All Rapid Weld and heat welding the Protect-All system.

C. Provide representative samples of product depicting color and finished surface of installed flooring material. Include range samples, if variation of finish is anticipated.

D. Provide a mock-up showing cove base, corner, and drain details with welding example.

E. Provide documentation attesting to the successful use of product in wet areas.

F. Provide copy of manufacturer's product warranty.

2.03 VERIFICATION OF JOB CONDITIONS

A. Proper Substrate:
   1. Assure that the substrate material is suitable for installation of flooring as indicated by manufacturer. Approved substrate include: marine-grade or underlayment grade plywood, cement board, and concrete (non-gypsum based only), properly cleaned and prepared per manufacturer's guidelines.
      a. Protect-All is not to be installed over any existing finish, such as quarry tile, any paint, or any type of tile.
      b. Protect-All must not be installed in an "operating environment," meaning an environment that is not prepared to close entirely for the duration of the installation.
   2. Concrete substrates must be dry and free of curing compounds, sealers, hardeners, and other materials whose presence would interfere with bonding of adhesive. Determine adhesion and dryness characteristics by performing bond and moisture test recommended by floor covering manufacturer.
   3. Verify clean, dry, and structurally sound surface to accept adhesive, free of cracks, ridges, depression, scales, and foreign deposits of any kind.
   4. Use only cementitious patching and filling compounds (3500 psi). Consult manufacturer for details.
   5. Assure the levelness (FL 15), and flatness (FF20 5/16" in 10 feet) of surface is in compliance with manufacturer's guidelines.
   6. Verify the sub-floor surfaces (concrete, marine-grade or underlayment grade plywood, cement board) are ready for resilient flooring installation by testing moisture emission rate and alkalinity, in accordance with ASTM F 710; obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer. Reference ASTM F 710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
   7. The following standards apply:
      b. ASTM E 1643 - Standard Practice for Installation of Water Vapor Retarders used in contact with Earth or Granular Fill Under Concrete Slabs.
      d. ACI 302.1R-04 - Guide for Floor and Concrete Slabs.
      e. ACI 302.2R-06 - Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
      f. ASTM F710-08 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
      g. ASTM F 1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anthydrous Calcium Chloride.

B. Environmental Conditions
   1. The contractor and installer of product are responsible for providing and maintaining a proper installation environment.
   2. Installation area must be enclosed and watertight with all walls, wall finishes, doors, and floor penetration in place.
   3. Proper temperature acclimation of flooring material is required prior to installation at a minimum of 24 hours.
4. Assure confinement of space during installation and curing of adhesives to prevent other trades from damaging the product or compromising the adhesion.
5. Maintain a constant temperature during the installation and throughout the curing of adhesives.
6. Provide a secure area to store materials for installation.
7. Building must be completely enclosed and watertight, keeping the interior temperature at 70 degrees. This temperature should be maintained during the installation, and an additional 8 days after completion.
   a. Protect-All cannot have any heavy foot, or rolling load traffic until flooring adhesive has fully cured, 7-8 days.

C. Proper Drain and Other Floor Penetration Elevations:
   1. All drains to be installed level and 3/16" above the surface of the substrate with a proper slope of 1/8" - 1/4" per foot.
   2. When sloping to the drain area is specified, the slope should not be less than 36" in diameter and more than 3/8" in depth.
   3. All other penetrations should be installed 3/16" above substrates.
   4. Wall penetrations must be a minimum of 8" above the floor surface.

PART 3 EXECUTION

3.01 INSTALLATION
   A. Follow manufacturer recommendations for laying sheets out.
   B. Flooring must be cut tight to all penetrations.
   C. Adhere the floor materials using manufacturer's recommended adhesive for the particular substrate type, job conditions, and in compliance with spread rate and proper trowel size.
   D. Roll floor into adhesive with 100 Ib. roller immediately and a second time one hour later, as per manufacturer direction.
   E. Install stainless steel drain rings around all drains and other surface penetrations. Drain rings are to be routed into the floor surface and mounted flush with the top of the flooring. Secure drain rings using Stainless Steel fasteners and anchors to provide a mechanical bond to the substrate.
   F. Install cove base as recommended by manufacturer with proper adhesive and top sealant. Protect-All Rapid Weld or heat weld all seams.
   G. Install cove base cap fastening to wall a minimum of 8" O.C. using stainless steel fasteners.
   H. Protect-All Rapid Weld or heat weld all field material seams using manufacturer's welding material, proper tools, and installation methods.
   I. Stainless steel transitions as provided by manufacturer must be used in doorways and transition areas. Use stainless steel fasteners, and anchors to secure.
   J. All exposed edges are to be sealed with manufacturer must be used in doorways and transition areas. Use stainless steel fasteners, and anchors to secure.
   K. All exposed edges are to be sealed with manufacturer's E-6100 sealant.

3.02 CLEANING
   A. Refer to manufacturer's cleaning recommendations located at www.Protect-Allflooring.com.

END OF SECTION
SECTION 09 6613
RESILIENT BASE AND ACCESSORIES

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Resilient base

1.02 RELATED REQUIREMENTS
A. Section 09 6500 - Resilient flooring

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: For each type of product indicated.
C. LEED Submittal:
   1. Product Data for Credit EQ 4.1: For adhesives, including printed statement of VOC content.
D. Samples for Verification: For each type of product indicated, in manufacturer's standard-size samples but not less than 12" long, of each resilient product color, texture and pattern required.

1.04 QUALITY ASSURANCE
A. Fire-Test Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
   1. Critical Radiant Flux Clarification: Class 1, not less than 0.45 W/sq. ft.

1.05 PROJECT CONDITIONS
A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 degrees F or more than 95 degrees F, in spaces to receive resilient products during the following time periods.
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.
B. Until substantial completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 degrees F or more than 95 degrees F.
C. Install resilient products after other finishing operations, including painting, have been completed.

1.06 EXTRA MATERIALS
A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Furnish, not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

PART 2 PRODUCTS
2.01 RESILIENT BASE
A. Resilient Cove Base:
   1. Manufacturer's Subject to compliance with requirements, available manufacturer's offering products that may be incorporated into the work include, but are not limited to the following:
      a. Johnsonite - Traditional Cove Base
B. Resilient Base Standard; ASTM F 1861.
   1. Material Requirement: Rubber, minimum 10 percent natural rubber.
   3. Style: Cove with a toe.
C. Height: 6 inches
D. Lengths: 100'-0" coils
E. Outside Corners: Pre-Molded
F. Inside Corners: Pre-Molded.
G. Finish: Matte.
H. Color:
   1. RB-1: 44 Dark Brown B

2.02 INSTALLATION MATERIALS
A. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
   1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 EXECUTION
3.01 EXAMINATION
A. Examine substrates, with installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.
B. Verify that finishes of substrates comply with tolerances and other requirements specified in other sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION
A. Prepare substrates according to manufacturers written instructions to ensure adhesion of resilient products.
B. Do not install resilient products until they are the same temperature as the space where they are to be installed.
   1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
C. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.03 CLEANING
A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.

1.02 REFERENCE STANDARDS

A. CRI (CIS) - Carpet Installation Standard; Carpet and Rug Institute; 2009.
B. CRI (GLA) - Green Label Testing Program - Approved Adhesive Products; Carpet and Rug Institute; Current Edition.
C. CRI (GLC) - Green Label Testing Program - Approved Product Categories for Carpet; Carpet and Rug Institute; Current Edition.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: For each type of product.
   1. Include manufacturer's written specifications and lab documents for any physical testing.
   2. Include installation recommendations for each type of substrate as specified in carpet manufacturer's installation guidelines and/or Carpet & Rug Institute Installation Standard 2011, where applicable.
   3. Include carpet maintenance recommendations as outlined by the carpet manufacturer.
   4. Carpet Manufacturer shall also submit a plan for recycling the specified carpet at the end of the useful life of the carpet.
C. LEED Submittal:
   1. Product Data for Credit EQ 4.3 and 4.1:
      a. For carpet tile, documentation indicating compliance with testing and product requirements of CRI's “Green Label Plus” program and SCAQMD.
      b. For installation adhesive, documentation including printed statement of VOC content.
   2. Product Data for Credit MR 4:
      a. For carpet tile, documentation indicating pre-consumer, post-consumer, and total recycled content.
D. Manufacturer's Installation Instructions: Indicate special procedures.
E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.
B. Fire-Test-Response Characteristics: Provide products with a critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E 648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
C. Preinstallation Conference: Conduct conference at Project Site to comply with requirements in Division 01 Section "Project Management and Conditions" Review methods and procedures related to carpet tile installation including, but not limited to, the following:
   1. Review delivery, storage, and handling procedures.
2. Review ambient conditions and ventilation procedures.

1.05 DELIVERY, STORAGE, AND HANDLING
   A. Comply with CRI 104, Section 5, "Storage and Handling."

1.06 PROJECT CONDITIONS
   A. Comply with CRI 104, Section 7.2, Section 7.2, "Site Conditions; Temperature and humidity" and Section 7.12, Ventilation."
   B. Environmental Limitations: Do not install carpet tiles until wet work in spaces is complete and dry, and ambient temperatures and humidity conditions are maintained at the levels indicated for project when occupied for intended use.
   C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
   D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.07 WARRANTY
   A. Special Warranty for Carpet Tiles: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
   1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
   2. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, dimensional stability, excess static discharge, and delamination.
   3. Warranty Period: 10 years from date of substantial completion.

1.08 EXTRA MATERIAL
   A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

PART 2 PRODUCTS
2.01 MANUFACTURERS

2.02 MATERIALS
   A. CP1:
   2. Collection Name: Right Angle
   3. Style: Right Angle; Diverge 10330
   4. Product Type: Plank Modular.
   5. Construction: Multi-level Pattern Loop
   6. Fiber Content: Solution Q Extreme Nylon
   7. Dye Method: 100% Solution Dyed
   8. Gauge: 1/12
   10. Tufted Yarn Weight: 22 oz/yd2
   11. Pile Height: 3/32 inches.
   12. Size: 18 inches x 36 inches.
   13. Primary Backing: Non-Woven Synthetic.
14. Secondary Backing: High performance precoat laminated to a proprietary thermoplastic polyolefin compound with a fiberglass reinforced layer. Backing must contain a minimum of 40 percent recycled content and be SCS NSF 140 Platinum certified. Backing should be recyclable, PVC free, free of 4-PCH, brominated flame retardants, and phthalate plasticizers.
15. LokDots by Patcraft.
16. Installation: Monolithic

B. CP2:
2. Collection Name: Right Angle
3. Style: Right Angle; Diverge 10330
4. Product Type: Plank Modular.
5. Construction: Multi-level Pattern Loop
6. Fiber Content: Solution Q Extreme Nylon.
7. Dye Method: 100% Solution Dyed
8. Gauge: 1/12
10. Tufted Yarn Weight: 22 oz/yd2
11. Pile Height: 3/32 inches.
12. Size: 18 inches x 36 inches.
13. Primary Backing: Non-Woven Synthetic
14. Secondary Backing: EcoWorx
15. LokDots by Patcraft.
16. Installation: Monolithic

C. CP4:
2. Collection Name: Beyond The Door
4. Product Type: Modular.
5. Construction: Multi-Level Pattern Loop.
6. Fiber Content: Eco Solution Q Nylon.
7. Dye Method: 100% Solution Dyed
8. Gauge: 1/12
10. Tufted Yarn Weight: 32 oz/yd2
11. Pile Height: 3/32 inches.
12. Size: 24 inches x 24 inches.
13. Primary Backing: Non-Woven Synthetic
14. Secondary Backing: EcoWorx
15. LokDots by Patcraft.
16. Installation: Monolithic

2.03 ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Trowelable Adhesives: Water-resistant, moldew-resistant, nonstaining, premium grade, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation such as Shaw 5000 or Shaw 5100 or available equivalent where slab moisture does not exceed 85 percent per ASTM F 2170 or 5 lbs per
ASTM F 1869. Where slab moisture does not exceed 85 percent and antimicrobial protection is needed to pass AATCC 174, use Shaw 5036. Where moisture exceeds 85 percent or 5 lbs but does not exceed 90 percent or 10 lbs, use Shaw 5900 or available equivalent.

A. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
B. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
C. Adhesives shall comply with the testing and product requirements of the Carpet and Rug Institute Green Label Plus Program.

C. Patcraft glueless installation, LocDots as noted.
1. VOC Limits: Provide adhesives with VOC content not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 EXECUTION
3.01 EXAMINATION
A. Examine substrates areas, and conditions, with installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.
B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet tile manufacturer.
2. Subfloor finishes comply with requirements specified in Division 03 Section "Cast-In-Place Concrete" for slabs receiving carpet tile.
3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION
A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
B. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.
C. Clean metal substrates of grease, oil, soil and rust, and prime if directed by adhesive manufacturer's recommendation. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.
D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.03 INSTALLATION
A. General: Comply with CRI 104, Section 14, "Carpet Modules" and with carpet tile manufacturer's written installation instructions.
C. Maintain dye lot integrity. Do not mix dye lots in same area.
D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edging, threshold, and nosing. Bind and seal cut edges as recommended by carpet tile manufacturer.
E. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves and similar openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use non-permanent, nonstaining marking device.

G. Install pattern parallel to walls and borders, or as noted on plans.

H. Stagger joints of carpet tiles so carpet tile grid is offset from access flooring panel grid. Do not fill seams of access flooring panels with carpet adhesive; keep seams free from adhesive.

3.04 CLEANING

A. Remove excess adhesive without damage, from floor, base, and wall surfaces.

B. Clean and vacuum carpet surfaces.

C. Protect installed carpet tile to comply with CRI 104, Section 16, "Protection of Indoor Installations."

END OF SECTION
SECTION 09 7200
WALL COVERINGS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Surface preparation and prime painting.
B. Wall covering and borders.

1.02 RELATED REQUIREMENTS
A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS
C. ASTM F793 - Standard Classification of Wall Covering by Use Characteristics; 2010a.
D. FS L-P-1040 - Plastic Sheets and Strips (Polyvinyl Fluoride); Federal Specifications and Standards; Revision B, 1977.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on wall covering and adhesive.
C. LEED Submittal:
   1. Product Data for Credit EQ 4.1: For adhesives, including printed statement of VOC content.
D. Samples: Submit two samples of wall covering, ____ by ____ inch in size illustrating color, finish, and texture.
E. Maintenance Materials: Furnish the following for MSU Facilities's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Wall Covering Materials: 25 linear feet of each color and pattern of wall covering; store where directed.
   3. Package and label each roll by manufacturer, color and pattern, and destination room number.

1.05 QUALITY ASSURANCE
A. Fire-Test-Response Characteristics: As determined by testing identical wall coverings applied with identical adhesives to substrates according to test method indicated below by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Surface Burning Characteristics: As follows, per ASTM E-84.
      a. Flame Spread Index: 15 or less.
      b. Smoke Developed Index: 25 or less.

1.06 PROJECT CONDITIONS
A. Environmental Limitations: Do not deliver or install wall coverings until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
B. Lighting: Do not install wall covering until a permanent level of lighting is provided on the surface to receive wall covering.
C. Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by wall covering manufacturer for full drying time.
PART 2 PRODUCTS

2.01 WALL COVERINGS

A. General: Provide rolls of each type of wall covering from same print run or dye lot.

B. Wall Covering VWC-1:
   2. Pattern: Renaissance Conway Granite
   3. Color: Coconut
   4. Content: 100% Osnaburg
   5. Width: 52”/54”
   6. Repeat: Non-Match

2.02 ACCESSORIES

A. Adhesives: Mildew-resistant, nonstaining, strippable adhesive, for use with specific wall covering and substrate application: as recommended in writing by wall-covering manufacturer and with a VOC content of 50 g/L or less when calculated according to 40 CFR 59, subpart D (EPA Method 24).

B. Primer/Sealer: Mildew resistant, complying with requirements and recommendations in writing by wall covering manufacturer for intended substrate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are prime painted and ready to receive work, and conform to requirements of the wall covering manufacturer.

B. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.

3.02 PREPARATION

A. Fill cracks in substrate and smooth irregularities with filler; sand smooth.

B. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.

C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

D. Surfaces: Correct defects and clean surfaces that affect work of this section. Remove existing coatings that exhibit loose surface defects.

E. Marks: Seal with shellac those that may bleed through surface finishes.

F. Vacuum clean surfaces free of loose particles.

3.03 INSTALLATION

A. Apply adhesive and wall covering in accordance with manufacturer's instructions.

B. Use wall covering in roll number sequence.

C. Razor trim edges on flat work table. Do not razor cut on gypsum board surfaces.

D. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface. Butt edges tightly.

E. Horizontal seams are not acceptable.

F. Do not seam within 2 inches of internal corners or within 6 inches of external corners.

G. Install wall covering before installation of bases and items attached to or spaced slightly from wall surface.

H. Do not install wall covering more than 1/4 inch below top of resilient base.

I. Cover spaces above and below windows, above doors, in pattern sequence from roll.

J. Apply wall covering to electrical wall plates prior to replacing.
K. Wall covering is required behind fin tube cabinets.
L. Where wall covering tucks into reveals, or metal wallboard or plaster stops, apply with contact adhesive within 6 inches of wall covering termination. Ensure full contact bond.
M. Install termination trim.
N. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

3.04 CLEANING

A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.
B. Reinstall wall plates and accessories removed prior to work of this section.

END OF SECTION
SECTION 09 7733
GLASS FIBER REINFORCED PLASTIC PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Prefinished polyester glass reinforced plastic sheets and adhered to unfinished gypsum board.
   1. PVC Trim.

1.02 RELATED SECTIONS
A. Section 09 2116 - Gypsum Board.

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit sufficient manufacturer's data to indicate compliance with these specifications including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
C. Shop Drawings: Submit elevations of each wall showing location of paneling and trim members with respect to all discontinuities in the wall elevation.
D. Manufacturer's Material Safety Data Sheets (MSDS) for adhesives and sealants prior to their delivery to the site.
E. LEED Submittal:
   1. Product Data for MRc 4.1 and MRc 4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
   2. Product Data: Proof of VOC compliance for products and adhesives.

1.04 DELIVERY, STORAGE, AND HANDLING
A. Store panels flat, indoors, on a clean, dry surface. Remove packaging and allow panels to acclimate to room temperature for 48 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Glass Fiber Reinforced Plastic Panels:
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PANELS
A. Fiberglass reinforced thermoset resin panel sheets complying with ASTM D 5319.
   1. Dimensions:
      a. Panel Size: 4 by 8 feet.
      b. Panel Thickness: 0.10 inch.
      c. Surface Design: Embossed.
      e. Attachment Method: Adhesive only, with trim and sealant in joints.

B. Ceiling:
   2. Panel Thickness: 0.10 inch.
C. Moldings: PVC Extruded PVC Trim Profiles for .090 inch thick panels.
   1. M 350 Inside Corners
   2. M 360 Outside Corners
   3. M 365 Divison

2.03 ACCESSORIES
A. Fasteners: Non-staining nylon drive rivots.
   1. Match panel color.
   2. Length to suit project conditions.
B. Adhesive: Complying with ASTM C 557.
   1. Marlite C-551 FRP Adhesive - Water resistant, non-flammable adhesive.
C. Sealant:
   1. Marlite Brand MS-200 Clear Silicone Sealant.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify existing conditions and substrate flatness before starting work.
B. Verify that substrate conditions are ready to receive the work of this section.

3.02 INSTALLATION - WALLS
A. Install panels in accordance with manufacturer's instructions.
B. Cut and drill panels with carbide tipped saw blades, drill bits, or snips.
C. Apply adhesive to the back side of the panel using trowel as recommended by adhesive manufacturer.
D. Apply panels to wall with seams plumb and pattern aligned with adjoining panels.
E. Install panels with manufacturer's recommended gap for panel field and corner joints.
F. Seal gaps at floor, ceiling, and between panels with applicable sealant to prevent moisture intrusion.
G. Remove excess sealant after paneling is installed and prior to curing.

END OF SECTION
SECTION 09 7744
STAINLESS STEEL WALL PANELS

PART 1 GENERAL
1.01 SUMMARY
   A. Wall panels for wall protection.

1.02 SECTION INCLUDES
   A. Stainless Steel Wall Panels.

1.03 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Manufacturer's printed product data for each type of stainless steel wall panel system specified.
   C. Detail Drawings: Mounting details with the appropriate adhesives for specific project substrates.
   D. Manufacturer's Installation Instructions: Printed installation instructions for stainless steel wall panels.
   E. LEED Submittal:
      1. Product Data for Credit MR4.1 and Credit MR4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
      2. Product Data for MR 5: Regional Materials. For products that have been extracted, harvested or recovered, as well as manufactured within 500 miles of the project site.

1.04 DELIVERY, STORAGE, AND HANDLING
   A. Deliver materials in unopened factory packaging to the jobsite.
   B. Inspect materials at delivery to assure that specified products have been received.
   C. Store in original packaging in a climate controlled location away from direct sunlight.

1.05 PROJECT CONDITIONS
   A. Environmental Requirements: Products must be installed in an interior climate controlled environment.

1.06 WARRANTY
   A. Standard IPC Limited Lifetime Warranty against material and manufacturing defects.

PART 2 PRODUCTS
2.01 MANUFACTURERS
   A. Acceptable Manufacturers: IPC Door and Wall Protection Systems, Inpro Corporation; P.O. Box 406; Muskego, WI 53150; www.inprocorp.com.
      1. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MANUFACTURED UNITS
   A. Wall Panels:
      1. Stainless Steel Wall Panels
         a. Provide stainless steel wall panel system that include panels, outside/inside corners. Panel system shall include stainless steel panels that have been recessed overlap joints that maintain panel flatness and minimize panel protrusion.
         b. Panel Size: See Drawings. Panels must be cut at the factory.
         c. Panel Thickness: 18 gauge.
         d. Stainless Steel: Type 304
         e. Attachment: Adhesive.
2. Stainless Steel Outside Corners:
   a. 2" x 2", 16 gauge. Maximum height 96", edges shall have an 11 degree taper.
   b. Stainless Steel: Type 304.
   c. Attachment: Adhesive.
3. Stainless Steel Inside Corners:
   a. 2" x 2", 16 gauge. Maximum height 96", edges shall have an 11 degree taper.
   b. Stainless Steel: Type 304.
   c. Attachment: Adhesive.

2.03 MATERIALS
   A. Stainless Steel.
      1. Wall panels shall be manufactured from Type 304, 18 gauge, stainless steel.
      2. Outside and Inside Corners:
         a. 16 gauge Type 304 stainless steel.

2.04 COMPONENTS
   A. Attachment:
      1. Wall panels shall be adhered with field applied heavy duty adhesive.
   B. Corner Guards:
      1. Shall be adhered with field applied heavy duty adhesive.
   C. Finish:
      1. Stainless steel panels and corner guards shall have a No. 4 satin finish.

PART 3 EXECUTION

3.01 EXECUTION
   A. Examination:
      1. Examine areas and conditions in which the wall panel systems will be installed.
      2. Complete all finishing operations, including painting, before beginning installation of wall panel system materials.
      3. Wall surfaces shall be dry and free from dirt, grease and loose paint.

3.02 PREPARATION
   A. Clean surfaces of loose foreign matter.

3.03 INSTALLATION
   A. General: Locate the wall panels as indicated on the approved detail drawings for the appropriate substrate and in compliance with the IPC installation instructions. Install wall panels level and plumb at the height indicated on the drawings. Complete installation with inside and outside corners.

3.04 CLEANING
   A. At completion of the installation, clean surface in accordance with the IPC clean up and maintenance instructions.

END OF SECTION
SECTION 09 8311
ACOUSTICAL BATT INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Glass fiber acoustical insulation for interior walls, floors and ceiling in commercial buildings.

1.02 REFERENCE STANDARDS
C. E96 Test Method for Water Vapor Transmission of Materials
D. E196 Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees F.
E. C423 Test Method for Sound Absorption and the Sound Absorption Coefficient by the reverberation Room Method.

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Specimen warranty.
C. Test Reports: Certified test data from an independent test agency verifying that wall systems meet specified requirements for acoustical and fire performance.
D. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in MSU Facilities's name and registered with manufacturer.
E. LEED Submittal: Documentation of recycled content and location of manufacture.

1.04 QUALITY ASSURANCE
A. Installer Qualifications: Firm specializing in site-fabricated wall systems, with not less than 5 years of documented experience in installing wall systems of the type specified, and approved by the manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Protect insulation from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with the manufacturer's recommendations for handling, storage and protection during insulation.
B. Label insulation packages to include material name, production date and/or product code.
C. Store products in manufacturer's unopened packaging until ready for installation.

1.06 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Acoustical Batt Insulation:
   1. Owens - Corning
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SOUND ATTENUATION BATTS
A. Type: Unfaced glass fiber acoustical insulation complying with ASTM C 665, Type I.
B. Type II: Kraft faced glass fiber insulation complying with ASTM C 665.

C. Surface Burning Characteristics:
   1. Unfaced Insulation:
      a. Maximum Flame Spread: 10
      b. Maximum Smoke Developed: 10
      c. Thickness: See drawings
   2. Kraft Faced Insulation:
      b. Maximum Smoke Developed: Not rated.


E. Dimensional Stability: Linear stability less than 0.1%.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify that all casework, markerboards, door and window jambs, finished ceiling, and other finished items abutting acoustical wall systems have been installed.

C. If substrate preparation is the responsibility of another installer, notify Mosaic Architecture of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

A. Comply with manufacturer’s instruction for particular conditions of installation in each case.

B. Between Studs: Friction fit unfaced batt

END OF SECTION
SECTION 09 9000
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.
B. Interior paint and coatings systems (LEED-09 NC Compliant) including surface preparation.
C. Field application of paints, stains, varnishes, and other coatings.

1.02 RELATED REQUIREMENTS

A. Section 01 3515 - LEED Certification Procedures: LEED rating system definition.
B. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

B. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings; Fourth Edition.
C. Materials Safety Data Sheets/Environmental Data Sheets: Per manufacturer's MSDS/EDS for specific VOCs (calculated per 40 CFR 59.406). VOCs may vary by base and sheen.
D. South Coast Air Quality Management District (SCAQMD): Rule 1113 - Architectural Coatings.
E. Green Seal inc.:
   2. GC-03 - Environmental Criteria for Anti-Corrosive Paints.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide complete list of all products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
   4. Manufacturer's installation instructions.
   5. If proposal of substitutions is allowed under submittal procedures, explanation of all substitutions proposed.
C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.
   2. Where sheen is not specified, submit each color in each sheen available.
   3. Allow 15 days for approval process, after receipt of complete samples by Mosaic Architecture.
   4. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.
D. LEED Report: VOC content of all interior opaque coatings actually used.
E. Manufacturer's Instructions: Indicate special surface preparation procedures.
F. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.
1.05 QUALITY ASSURANCE
   A. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 5 years experience.
   B. Material Safety Data Sheets: At project site maintain file of MSDS sheets for each product used; become familiar with and follow manufacturer's stated application and safety requirements.

1.06 MOCK-UP
   A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.
   B. Mock-up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
      1. Finish entire wall surface for each paint color specified for verification of products, colors and sheens.
      2. Mosaic Architecture will designate finish area walls.
      3. Do not proceed with remaining work until Mosaic Architecture approves the mock-ups.

1.07 DELIVERY, STORAGE, AND HANDLING
   A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
   B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
   C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS
   A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
   B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
   C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
   D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
   E. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
   F. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.09 EXTRA MATERIALS
   A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.
   B. Furnish Owner with an additional one percent of each material and color, but not less than 1 gallon or 1 case, as appropriate.

PART 2 PRODUCTS
2.01 MANUFACTURERS
   A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
      1. Sherwin-Williams; www.sherwinwilliams.com
      2. Benjamin-Moore Company; www.benjaminmoore.com
      3. Pratt and Lambert Paints; www.prattandlambert.com
      4. Substitutions: See Section 01 6000 - Product Requirements.
2.02 PAINTS AND COATINGS - GENERAL

A. VOC Content of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits of VOC content, exclusive of colorants added to tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24); these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop;
   1. Flat Paints, Coatings, and Primers: VOC content of not more than 50 g/L.
   2. Nonflat Paints, Coatings and Primers: VOC content of not more than 150 g/L.
   3. Anti-Corrosive and Anti-Rust Paints applied to Ferrous Metals: VOC not more than 250 g/L.
   4. Floor Coatings: VOC not more than 100 g/L.

B. Volatile Organic Compound (VOC) Content for Exterior Paints and Coatings:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      b. Ozone Transport Commission (OTC) Model Rule, Architectural, Industrial, and Maintenance Coatings: www.otcair.org; specifically:
         1) Opaque, Flat: 50g/L, maximum
         2) Opaque, Nonflat: 150g/L, maximum
         3) Opaque, High Gloss: 250g/L, maximum
         4) Varnishes: 350g/L, maximum

C. Chemical Content: The following compounds are prohibited:
   1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
   2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2-dichlorobenzene, diethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.

   1. Provide ready mixed paints and coatings, except field-catalyzed coatings.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.03 PAINT SYSTEM

A. Provide Premium Grade systems (2 top coats) as defined in MPI Architectural Painting Specification Manual, except as otherwise indicated.

B. Where a specified paint system does not have a Premium Grade, provide Custom Grade system.

C. Where sheen is not specified or more than one sheen is specified, sheen will be selected later by Mosaic Architecture from the manufacturer's full line.

D. Provide colors as scheduled on Drawings.

2.04 EXTERIOR PAINT SYSTEM

A. Brick Units and precast sills:

B. Ferrous Metals: Primed, Gloss Acrylic, 2 Coat:
   1. Pro Industrial Pro-Cryl - Universal Acrylic Primer, B66-310 series.
2.05 INTERIOR PAINT

A. Brick Units:

B. Exposed steel substrates including structural steel, sprinkler piping and exposed ductwork:
   1. 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, (5.0 mils wet, 2.0 mils dry).
   3. 3rd Coat: S-W ProClassic Waterbased Acrylic Semi-Gloss, B31 Series, (4.0 mils wet, 1.3 mils dry per coat).

C. Gypsum Board:
   1. Applications include but are not limited to walls, ceilings, soffits, and bulkheads.
      a. Semi-Gloss: All restrooms and mop closets to receive Semi-gloss finish.
         1) 1st Coat: S-W Harmony Interior Latex Primer, B11 (4.0 mils wet, 1.3 mils dry)
         3) 3rd Coat: S-W Harmony Interior Latex Semi-Gloss, B10 Series (4.0 mils wet, 1.6 mils dry per coat).
      b. Eggshell: All other rooms.
         1) 1st Coat: S-W Harmony Interior Latex Primer, B11 (4.0 mils wet, 1.3 mils dry).
         2) 2nd Coat: S-W Harmony Interior Latex Egg-Shel, B9 Series.
         3) 3rd Coat: S-W Harmony Interior Latex Egg-Shel, B9 Series (4.0 mils wet, 1.7 mils dry per coat).

D. Waterproofing Concrete Slab Sealer
   3. H&C Concrete Sealer Wet Look Water Based.

2.06 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex Filler.

C. Fastener Head Cover Material: Latex Filler.

PART 3 EXECUTION

3.01 SCOPE - SURFACES TO BE FINISHED

A. Paint all exposed surfaces except where indicated not to be painted or to remain natural; the term "exposed" includes areas visible through permanent and built-in fixtures when they are in place.

B. Paint the surfaces indicated on the Drawings, and as follows:
   1. If a surface, material, or item is not specifically mentioned, paint in the same manner as similar surfaces, materials, or items, regardless of whether colors are indicated or not.
   2. Paint surfaces behind movable equipment and furnishings the same as similar exposed surfaces.
   3. Paint surfaces to be concealed behind permanently installed fixtures, equipment, and furnishings, using primer only, prior to installation of the permanent item.
   4. Paint back sides of access panels and removable and hinged covers to match exposed surfaces.
   5. Finish top, bottom, and side edges of exterior doors the same as exposed faces.
   6. Paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment occurring in finished areas to match background surfaces, unless otherwise indicated.

C. Do Not Paint or Finish the Following Items:
1. Items fully factory-finished unless specifically noted; factory-primed items are not considered factory-finished.
2. Items indicated to receive other finish.
3. Items indicated to remain naturally finished.
4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
5. Anodized aluminum.
6. Polished and brushed stainless steel items.
7. Concealed piping, ductwork, and conduit.

3.02 EXAMINATION
A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
C. Test shop-applied primer for compatibility with subsequent cover materials; report incompatible primer conditions and submit recommended changes for Mosaic Architecture’s approval.
D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
   3. Concrete Floors and Traffic Surfaces: 8 percent.

3.03 PREPARATION
A. Prepare surfaces as specified in MPI Architectural Painting Specification Manual and as follows for the applicable surface and coating; if multiple preparation treatments are specified, use as many as necessary for best results; where the Manual references external standards for preparation (e.g. SSPC standards), prepare as specified in those standards; comply with coating manufacturer’s specific preparation methods or treatments, if any.
B. Comply with manufacturer’s written instructions and recommendation in MPI Architectural Painting Specifications Manual applicable to substrates indicated.
C. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size and weight of item, provide surface applied protection before surface preparation and painting.
   1. After completing painting operation, use workers skilled in the trades involved to reinstall items that were removed. Remove surface applied protection if any.
   2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
D. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease and incompatible paints and encapsulant.
E. Concrete Substrates: Remove release agents, curing compounds, efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer’s written instructions.
F. Concrete Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer’s written instructions.
G. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.
H. Galvanized Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical method to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
I. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.
J. Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

K. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

L. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.04 APPLICATION

A. Apply products in accordance with manufacturer's instructions and as specified or recommended by MPI Manual, using the preparation, products, sheens, textures, and colors as indicated.
   1. Remove, refinish, or repaint work not complying with requirements.

B. Do not apply finishes over dirt, rust, scale, grease, moisture, scuffed surfaces, or other conditions detrimental to formation of a durable coating film; do not apply finishes to surfaces that are not dry.

C. Use applicators and methods best suited for substrate and type of material being applied and according to manufacturer's instructions.
   1. Brush Application: Use brushes best suited for the type of material applied; use brush of appropriate size for the surface or item being painted; produce results free of visible brush marks.
   2. Roller Application: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
   3. Spray Application: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
   4. Where application method is listed in the MPI Manual for the paint system that application method is required; otherwise any application method recommended by manufacturer for material used and objects to be painted is acceptable.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate; provide total dry film thickness of entire system as recommended by manufacturer.
   1. Number of coats and film thickness required are the same regardless of application method.
   2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance.
   3. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive dry film thickness equivalent to that of flat surfaces.

E. Apply finish to completely cover surfaces with uniform appearance without brush marks, runs, sags, laps, ropiness, holidays, spotting, cloudiness, or other surface imperfections.
   1. Before applying finish coats, apply a prime coat of material recommended by manufacturer, unless the surface has been prime coated by others; where evidence of suction spots or unsealed areas in first coat appear, recoat primed and sealed surfaces to ensure finish coat with no burn through or other defects due to insufficient sealing.
   2. Apply first coat to surface that has been cleaned, pretreated, or otherwise prepared as soon as practical after preparation and before subsequent surface deterioration.
   3. Do not apply succeeding coats until the previous coat has cured as recommended by manufacturer.
   4. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat will not cause the undercoat to lift or lose adhesion.
5. If manufacturer’s instructions recommend sanding to produce a smooth, even surface, sand between coats.
6. Before applying next coat vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
7. Pigmented (Opaque) Finishes: Provide smooth, opaque surface of uniform finish, color, appearance, and coverage.

3.05 CLEANING
A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent surfaces.
C. Protect work of other trades against damage from paint application. Correct damage work to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

3.06 SCHEDULE - COLORS
A. P1 - Benjamin-Moore OC-122 Cotton Balls
B. P2 - Benjamin Moore 2146-40 Pale Avocado
C. P3 - Sherwin-Williams 7069 Iron Ore
D. P4 - Sherwin-Williams 6380 Humble Gold
E. P5 - Sherwin-Williams 6842 Forward Fuchia
F. P6 - Sherwin Williams 6797 Jay Blue
G. P7 - Sherwin Williams 6782 Crusing
H. P8 - Sherwin Williams 6887 Navel
I. P9 - TBD
J. P10 - TBD

END OF SECTION
SECTION 10 1101
VISUAL DISPLAY BOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Markerboards and Tackboards.

1.02 RELATED REQUIREMENTS
A. Section 06 1000 - Rough Carpentry: Blocking and supports.
B. Section 09 2116 - Gypsum Board Assemblies: Concealed supports in metal stud walls.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's data on chalkboard, markerboard, tackboard, tackboard surface covering, trim, and accessories.
C. Shop Drawings: Indicate wall elevations, dimensions, joint locations, special anchor details.
D. Samples: Submit color charts for selection of color and texture of markerboard, tackboard, and trim.
E. LEED Submittal:
   1. Product Data for Credit MR4.1 and Credit MR4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
   2. Product Data indicating VOC compliance
F. Maintenance Data: Include data on regular cleaning, stain removal.

1.05 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Provide five year warranty for markerboard to include warranty against discoloration due to cleaning, crazing or cracking, and staining.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Visual Display Boards:
   2. Aarco Products Inc; www.aarcoproducts.com
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 VISUAL DISPLAY BOARDS
A. Markerboards: Porcelain enamel on steel, laminated to core.
   2. Steel Face Sheet Thickness: 24 gage, 0.0239 inch.
   3. Core: Particleboard, manufacturer's standard thickness, laminated to face sheet.
   4. Backing: Aluminum foil, laminated to core.
   5. Size: As indicated on drawings.
B. Tackboards: Fine-grained, homogeneous natural cork.
2. Color: As selected from manufacturer's full range.
3. Length: As indicated on drawings.
5. Frame Profile: As indicated on drawings

C. Combination Units and Units Made of More Than One Panel: Factory-assembled markerboards and tackboards in a single frame, of materials specified above.
1. Join panels of different construction with H-shaped extruded aluminum molding finished to match frame.
2. Configuration: As indicated on drawings.
3. Units Too Large to Ship Assembled: Fully assembled in factory, then disassembled for shipping.

2.03 MATERIALS
A. Porcelain Enameled Steel Sheet: ASTM A424/A424M, Type I, Commercial Steel, with fired-on vitreous finish.
B. Particleboard: ANSI A208.1; wood chips, set with waterproof resin binder, sanded faces.
C. Foil Backing: Aluminum foil sheet, 0.005 inch thick.

2.04 ACCESSORIES
A. Map Rail: Extruded aluminum, manufacturer's standard profile, with cork insert and runners for accessories; 1 inch wide overall, full width of frame.
B. Map Supports: Formed aluminum sliding hooks and roller brackets to fit map rail.
C. Chalk Tray: Aluminum, manufacturer's standard profile, one piece full length of chalkboard, molded ends, concealed fasteners, same finish as frame.
D. Mounting Brackets: Concealed.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that field measurements are as indicated.
B. Verify that internal wall blocking is ready to receive work and positioning dimensions are as indicated on shop drawings.

3.02 INSTALLATION
A. Install boards in accordance with manufacturer's instructions.
B. Secure units level and plumb.

3.03 CLEANING
A. Clean board surfaces in accordance with manufacturer's instructions.
B. Remove temporary protective cover at Date of Substantial Completion.

3.04 SCHEDULE
A. See drawings.

END OF SECTION
SECTION 10 1400
SIGNAGE

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Room Signs.
B. Restroom Signs.
C. Elevator Signs.
D. Stairwell Signs.
E. Specialty Signs.
F. Room and door signs.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign
styles, font, foreground and background colors, locations, overall dimensions of each sign.
C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication,
including room number, room name, other text to be applied, sign and letter sizes, fonts, and
colors.
   1. When room numbers to appear on signs differ from those on the drawings, include the
drawing room number on schedule.
   2. When content of signs is indicated to be determined later, request such information from
MSU Facilities through Mosaic Architecture at least 2 months prior to start of fabrication;
upon request, submit preliminary schedule.
   3. Submit for approval by MSU Facilities through Mosaic Architecture prior to fabrication.
D. Selection Samples: Where colors are not specified, submit two sets of color selection charts or
chips.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Basis-of-Design Product: Subject to compliance with requirements, manufacture offering
products that may be incorporated into the workinclude, but are not limited to:

2.02 GRAPHIC PROCESS
A. All signs shall be manufactured so that:
   1. Tactile characters shall be raised the required 1/32 inches from the sign face. Glue-on
letters or etched backgrounds are not acceptable.
   2. All text shall be accompanied by Grade 2 braille. Braille shall be separated 1/2 inch from
the corresponding raised characters or symbols. May be machine or hand placed. If hand
placed, Braille does not have to match the raised border color. Braille to comply with ANSI
A117.1.
   3. All letters, numbers and/or symbols and borders shall be Architectural Gray 3279 or
approved alternate. Background shall be White 225 or approved alternate. If a backer
plate is used it shall be Architectural Gray 3279, approved alternate, to match border
color. Characters and backgrounds shall have a non-glare finish and comply with ANSI
A117.1.
B. Plaque material shall be Special Purpose SP125 decorative thermosetting high pressure laminate or approved alternate. Material to be 1/8 inch thick laminate with melamine resin, surfacing and a phenolic resin core which provides resistance to abrasion, stains, alcohol, solvents, boiling water and heat. The material shall be NEMA rated and have flammability and smoke values that meet the standards for flammability of interior materials.

C. Font shall be Franklin Gothic Book, upper case letters and numbers. Character spacing and line weight to comply with ANSI A 117.1.

2.03 SIGN DESIGN
   A. The sign design is based on Montana State University Interior Signage Standard Catalog, current addition.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Site Verification of Conditions: Verify installation conditions previously established under other sections are acceptable for product installation in accordance with manufacturer's instructions.
   B. Scheduling of Installation by owner or its representative implies that substrate and conditions are prepared and ready for product installation. Proceeding with installation implies installer's acceptance of substrate and condition.

3.02 INSTALLATION
   A. Install in accordance with manufacturer's instructions.
   B. Install product in location indicated using mounting methods recommended by sign manufacturer and free from distortion, warp or defect adversely affecting appearance.
   C. Install product level, plumb, and at heights indicated.
   D. Install product at heights to conform to American with Disabilities Act Accessibility Guidelines and applicable local amendments and regulations.
   E. Install signs within the following tolerances and in accordance with manufacturer's recommendations:
      1. Interior Signs: Within 1/4 inch vertically and horizontally of intended location.

3.03 CLEANING, PROTECTION AND REPAIR
   A. Repair scratches and other damage which might have occurred during installation. Replace components where repairs were made but are still visible to the unaided eye from a distance of 5 feet.
   B. Remove temporary with provisions in Division 01, coverings and protection to adjacent work areas. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.

3.04 SIGN SCHEDULE
   A. Schedule: Refer to signage schedule and drawings for sizes, locations and layout of signage types, sign text copy and graphics.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Building identification signs - building mounted lettering

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
   1. When room numbers to appear on signs differ from those on the drawings, include the drawing room number on schedule.
   2. When content of signs is indicated to be determined later, request such information from MSU Facilities through Mosaic Architecture at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
   3. Submit for approval by MSU Facilities through Mosaic Architecture prior to fabrication.
D. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Basis-of-Design Product: Subject to compliance with requirements, manufacture offering products that may be incorporated into the work include, but are not limited to:
   1. Impact Signs, Inc: www.impact signs.com

2.02 SIGNAGE TYPES
A. Building Identification Signs:
   1. Use individual metal letters.
   2. Mount on outside wall in location shown on drawings.

2.03 SIGN MATERIALS/COMPONENTS
A. Materials and Components:
   1. Cast Aluminum letters, individual letter, individually mounted as indicated on drawings.
   2. Letter size: 16" high, 1" thickness.
   3. Finish: Aluminum clear brushed anodized.
   4. Font: Ribbon Condensed
   5. Text: "NEW DINING PAVILION" . Text to be used for bidding purposes only. Architect to provide final building name and text during submittal phase.
   6. Mounting: standard stud mounting, each letter individually mounted. Spacing and alignment tolerance +/- 1/16" letter to letter, 1/8" aggregate total.

2.04 ACCESSORIES
A. Concealed studs: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.
PART 3 EXECUTION

3.01 EXAMINATION
   A. Site Verification of Conditions: Verify installation conditions previously established under other sections are acceptable for product installation in accordance with manufacturer's instructions.
   B. Scheduling of Installation by owner or its representative implies that substrate and conditions are prepared and ready for product installation. Proceeding with installation implies installer's acceptance of substrate and condition.

3.02 INSTALLATION
   A. Install in accordance with manufacturer's instructions.
   B. Install product in location indicated using mounting methods recommended by sign manufacturer and free from distortion, warp or defect adversely affecting appearance.
   C. Install product level, plumb, and at heights indicated.
   D. Install product at heights to conform to American with Disabilities Act Accessibility Guidelines and applicable local amendments and regulations.
   E. Install signs within the following tolerances and in accordance with manufacturer's recommendations:
      1. Interior Signs: Within 1/4 inch vertically and horizontally of intended location.
      2. Alignment and spacing of letters: 1/16" letter to letter, 1/8" aggregate.

3.03 CLEANING, PROTECTION AND REPAIR
   A. Repair scratches and other damage which might have occurred during installation. Replace components where repairs were made but are still visible to the unaided eye from a distance of 5 feet.
   B. Remove temporary with provisions in Division 01, coverings and protection to adjacent work areas. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.

3.04 SIGN SCHEDULE
   A. Schedule: Refer to signage schedule and drawings for sizes, locations and layout of signage types, sign text copy and graphics.

END OF SECTION
SECTION 10 2113.19
PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Solid plastic toilet compartments.

1.02 RELATED REQUIREMENTS
A. Section 06 1000 - Rough Carpentry: Blocking and supports.
B. Section 10 2800 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
C. Manufacturer's Installation Instructions: Indicate special procedures.
D. LEED Submittal:
   1. Product Data for MRc4.1 and MRc4.2: For product having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Indicate statement indicating cost for each product having recycled content.
   2. Product Data for EQc4.4: Provide documentation that product meets VOC compliance.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Solid Plastic Toilet Compartments:
   1. Global Partitions; www.globalpartitions.com
   2. Bradley Partitions; www.badleycorp.com
   3. Accurate (High Recycled Content HDPE) Partitions; www.accuratepartitions.com
   4. Substitutions: Section 01 6000 - Product Requirements.

2.02 MATERIALS
A. Doors, Panels and Pilasters to be 1 inch thick with homogenous color throughout, constructed with high density polyethylene (HDPE) resins, which are, waterproof non-absorbent and have self-lubricating surface that resists marking from pens pencils and other writing instruments.
B. Color: #9205 Black (Global Partitions).

2.03 CONSTRUCTION
A. Doors, panels and pilasters shall be 1 inch thick with uniformly machined edges.
B. Doors and panels shall be 55 inches high and mounted at 14 inches above the finished floor.
C. Doors and panels to have an extruded aluminum heat sink strip attached to lower edge.
D. Pilasters shall be 81-1/2" high finished height. Pilasters shall include a mounting system comprised of a one piece 304 stainless steel with #4 fiish 3" high shoe with an integral plate at the bottom. The shoe shall be mounted to the floor utilizing concrete anchors supplied by Global Partitions. The concrete anchors shall be driven through the plate affixing it to the concrete floor. The concrete anchors shall have 2700 lbs. of holding strength when used in 5000 psi concrete flooring. The pilaster height shall be adjusted by utilizing the machine thread bolt supplied which is placed into metal inserts installed in the bottom of the pilaster at the manufacturing facility.
E. Pilasters are overhead braced with an extruded anti-grip aluminum handrail.

2.04 HARDWARE

A. Door Hardware:
   1. Heavy duty die-cast zamac hinge shall have gravity-acting cams and are fabricated from
die-cast aluminum alloy with a brushed finish and wrap around flanges. The cam is
constructed from a 3/4 inch diameter nylon rod and a 3/8 inch stainless steel pin. Slide
latch, strike/keeper and hinges are through-bolted onto doors and pilasters using stainless
steel vandal-resistant through bolts. Hinges are easily adjusted at the job site to a full
close or partially open position, as required. Keeper provides for emergency access into
the stall by lifting up on bottom of the door.

B. Panel and Pilaster Bracket:
   1. Aluminum stirrup brackets shall be 2" long made of heavy-duty anodized extruded
aluminum (6063-T5 Alloy). Stirrup brackets shall be 1/8 inch thick and mounted with
stainless steel, vandal-resistant screws. Panels shall be attached with stainless steel,
vandal-resistant through bolts. The attachment of brackets to the adjacent wall
construction shall be accomplished with 2-1/2" stainless steel vandal-resistant screws and
plastic anchors.

C. Pilaster shoes shall be of a one piece design and integral to the mounting system formed from
#304 stainless steel 3" high with #4 satin finish. Pilaster shoes are anchored to the pilaster with
#10 stainless steel, vandal resistant screws.

D. Headrail shall be made of heavy-duty anodized extruded aluminum (6063-T5 alloy). Headrails is
anti-grip and attaches to the top of pilaster with stainless steel, tamper-resistant screws.
Headrail is attached to the adjacent wall construction with a headrail bracket.

E. Headrail brackets shall be made of die cast aluminum alloy and shall be attached to the
adjacent wall construction with 2-1/2" stainless steel, tamper-resistant screws and plastic
anchors.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

B. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.

C. Attach panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

3.02 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16
inch.

B. Adjust hinges to position doors in partial opening position when unlatched. Return
out-swinging doors to closed position.

C. Adjust adjacent components for consistency of line or plane.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Corner guards.

1.02 RELATED REQUIREMENTS
A. Section 06 1000 - Rough Carpentry: Blocking for wall and corner guard anchors.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Indicate physical dimensions, features, anchorage details, and rough-in measurements.
C. Shop Drawings: Show locations, extent, and installation details of each system including method of attachment and adjacent construction.
D. LEED Submittal:
   1. Product Data for Credit MR4.1 and Credit MR4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
   2. Product Data indicating VOC compliance.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Wall and Corner Guards:
   5. Babcock Davis; www.babcockdavis.com
   6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COMPONENTS
A. Corner Guards - Surface Mounted: Stainless Steel, installed with adhesive.
   1. Material: 22ga. Type 304 or 430 Stainless Steel. Minimum recycled content of 70%.
   2. Width of Wings: 2 inches.
   3. Corner: Square.
   4. Length: As shown on drawings.
B. End wall Trim - Surface Mounted: Stainless Steel, installed with adhesive.
   1. Material: 22ga. Type 304 or 430 Stainless Steel. Minimum recycled content of 70%.
   2. Width of wall x 2 inch returns
   3. Length: as shown on drawings

2.03 FABRICATION
A. Fabricate components with tight joints, corners and seams.
B. Pre-drill holes for attachment.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.
B. Verify that field measurements are as indicated on Drawings.

3.02 INSTALLATION
A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to wall framing members only.
B. Position corner guard 4 inches above finished floor to 52 inches high.

3.03 TOLERANCES
A. Maximum Variation From Required Height: 1/4 inch.
B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

3.04 SCHEDULE
A. See drawings.

END OF SECTION
SECTION 10 2800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Accessories for toilet rooms, showers, and utility rooms.
   B. Electric hand/hair dryers.
   C. Grab bars.

1.02 REFERENCE STANDARDS
   C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

1.03 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
   C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS
2.01 MANUFACTURERS
   A. Toilet Accessories:
      3. Bobrick Inc; www.bobrick.com
      4. Substitutions: Section 01 6000 - Product Requirements.
   B. All items of each type to be made by the same manufacturer.

2.02 MATERIALS
   A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   B. Keys: Provide _______ keys for each accessory to MSU Facilities; master key lockable accessories.
   C. Stainless Steel Sheet: ASTM A666, Type 304.
   D. Stainless Steel Tubing: ASTM A269/A269M, Type 304 or 316.
   E. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
   F. Adhesive: VOC Compliant, low-odor, waterproof.
   G. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.
   H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.
2.03 FINISHES
A. Stainless Steel: No. 4 Brushed finish, unless otherwise noted.

2.04 TOILET ROOM ACCESSORIES
A. TPD-1: Toilet Paper Dispenser: Double roll, recessed and surface mounted with self trimming flange, with face formed with contemporary contours, radii and finish matching related accessories in manufacturer's design series. Provide one per toilet.
   1. Product: Model 5A00 Semi-Recessed Diplomat Series manufactured by Bradley Corporation.
B. PTD-1: Paper Towel Dispenser/Waste Receptacle: Semi-recessed with self trimming flange, with face formed with contemporary contours, radii and finish matching related accessories in manufacturer's design series. Provide one per restroom.
C. SD-1: Sensored Soap Dispenser: Deck mounted sensored soap dispenser.
   1. Product: Model 6315-KT0000 manufactured by Bradley Corporation.
D. MG-1: Mirrors: 6 mm thick float glass mirror.
   1. Size: As indicated on drawings.
   2. Frameless Mirror: Smooth ground finish at edges. Mount on standoffs as indicated on drawings.
   3. Backing: Full-mirror sized, minimum 0.30 inch galvanized steel sheet and nonabsorptive filler material.
E. SND-1: Napkin Dispenser: Surface mounted with self trimming flange, with face formed with contemporary contours, radii and finish matching related accessories in manufacturer's design series. Provide one per toilet in women's restroom.
F. Electric Hand Dryer Products:
   1. Dyson Airblade V; dysonairblade.com
   2. Color: T.B.D.
   3. Substitutions: Section 01 6000 - Product Requirements.
G. TA104A (36"), TA104B (42"), TA104C (Vertical): Grab Bars: Stainless steel, 1-1/4 inches outside diameter, minimum 0.05 inch wall thickness, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.
   1. Length and Configuration: As indicated on drawings.

2.05 SHOWER AND TUB ACCESSORIES
A. SCR-1: Shower Curtain Rod: Stainless steel tube, 1 inch outside diameter, 0.04 inch wall thickness, satin-finished, with 3 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for installation with exposed fasteners.
B. SC-1: Shower Curtain:
   1. Material: Cotton, machine washable, and mildew-resistant.
   3. Shower curtain hooks: Chrome-plated or stainless steel spring wire designed for snap closure.
C. Towel Bar: Stainless steel Type 304, 3/4 inch square tubular bar; rectangular brackets, concealed attachment, satin finish.
   1. Length: 18 inches.
2.06 UTILITY ROOM ACCESSORIES

A. MBH-1: Combination Utility Shelf/Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
   1. Drying rod: Stainless steel, 1/4 inch diameter.
   2. Hooks: 2, 0.06 inch stainless steel rag hooks at shelf front.
   3. Mop/broom holders: 3 spring-loaded rubber cam holders at shelf front.
   4. Length: Manufacturer's standard length for number of holders/hooks.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.
B. Verify exact location of accessories for installation.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.
B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on the drawings.
B. Install plumb and level, securely and rigidly anchored to substrate.
C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
D. Mounting Heights and Locations: As required by accessibility regulations, as indicated on drawings, and as follows:

3.04 SCHEDULE

A. See drawings.

END OF SECTION
SECTION 10 3100
MANUFACTURED FIREPLACES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Manufactured steel box fireplace.
B. Insulated chimney flue and associated roof flashings.

1.02 RELATED REQUIREMENTS
A. Section 23 1123 - Facility Natural-Gas Piping: Gas piping to fire box.
B. Section 26 2717 - Equipment Wiring.

1.03 REFERENCE STANDARDS

1.04 SYSTEM DESCRIPTION
A. Built-in firebox with concealed flue; rectangular shape; gas starter and circulating fan.

1.05 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide fire box cabinet dimensions, clearances required from adjacent dissimilar construction, applicable regulatory agency approvals, electrical characteristics of fan.
C. Shop Drawings: Indicate fire box rough opening dimensions, rough opening sizes for chimney flue, and fan size.
D. Manufacturer's Certificate: Certify that fireplace components meet or exceed UL (DIR) requirements.
E. Manufacturer's Instructions: Indicate installation procedures and component installation sequence, clearances and tolerances from adjacent construction, and _____.

1.06 REGULATORY REQUIREMENTS
A. Conform to applicable code for clearances from adjacent materials, chimney height above roof line requirements, and unit UL approval.
B. Listed by Underwriters Laboratories Inc. (UL) as complying with UL 127.
C. Products Requiring Electrical Connection: Listed and labeled by UL (DIR) or testing firm acceptable to authorities having jurisdiction, as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Manufactured Fireplaces:
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COMPONENTS
A. Pier-36TR Multi-Sided Gas Fireplace
   1. Controls: Smart-Stat
   2. Front: 36" Pier TR and TRB
   3. Front Width: 40-1/2 inches
   4. Height: 38 inches.
   5. Depth: 24 inches.
   7. BTU/Hour Input: 37,000.
PART 3  EXECUTION

3.01  VERIFICATION OF CONDITIONS
   A.  Verify that prepared openings are ready to receive work and opening dimensions are as indicated on drawings.
   B.  Verify that proper power supply and fuel source are available.

3.02  INSTALLATION
   A.  Install unit assembly in accordance with manufacturer's instructions and UL requirements.
   B.  Install chimney plumb through prepared openings using fire stop spacers.
   C.  Secure chimney in opening framing with appropriate fasteners.
   D.  Install roof flashings to ensure moisture is shed from chimney flue.

3.03  TOLERANCES
   A.  Maximum Variation of Chimney From Plumb:  1/2 inch.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Fire extinguishers.
   B. Fire extinguisher cabinets.

1.02 RELATED REQUIREMENTS
   A. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

1.03 REFERENCE STANDARDS
   B. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.04 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings: Indicate cabinet physical dimensions.
   C. Product Data: Provide extinguisher operational features.
   D. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.
   E. LEED Submittal:
      1. Product Data for Credit MR4.1 and Credit MR4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
      2. Product Data indicating VOC compliance.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Fire Extinguishers:
   B. Fire Extinguisher Cabinets and Accessories:
      4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FIRE EXTINGUISHERS
   A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
      1. Provide extinguishers labeled by UL (DIR) for the purpose specified and indicated.
   B. Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gage.
      1. Class: A:B:C.
      2. Size: 20 pound.
      3. Finish: Baked polyester powder coat, red color.
      4. Temperature range: Minus 40 degrees F to ___ degrees F.

2.03 WHEELED FIRE EXTINGUISHERS
   A. Wet Chemical Type Fire Extinguishers: Stainless steel tank, with pressure gage.
      1. Class: K.
      2. Size and classification as scheduled.
      4. Temperature range: Minus 20 degrees F to 120 degrees F.
2.04 FIRE EXTINGUISHER CABINETS
   A. Metal: Formed primed steel sheet; 0.036 inch thick base metal.
   B. Cabinet Configuration: Recessed type.
      1. Sized to accommodate accessories.
      2. Form cabinet enclosure with right angle inside corners and seams. Form perimeter trim and door stiles.
   C. Door: 0.036 inch thick, reinforced for flatness and rigidity; latch. Hinge doors for 180 degree opening with two butt hinge. Provide nylon catch.
   D. Door Glazing: Glass, clear, 1/8 inch thick float. Set in resilient channel gasket glazing.
   E. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.
   F. Finish of Cabinet Interior: White enamel.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify existing conditions before starting work.
   B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION
   A. Install in accordance with manufacturer's instructions.
   B. Secure rigidly in place.
   C. Place extinguishers in cabinets.

3.03 SCHEDULES
   A. See drawings.

END OF SECTION
 SECTION 10 5100
LOCKERS

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Wood Lockers with Plastic Laminate Doors.

1.02 RELATED REQUIREMENTS
A. Section 06 1000 - Rough Carpentry: Wood blocking and nailers.

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's published data on locker construction, sizes and accessories.
C. Shop Drawings: Indicate locker plan layout, numbering plan.
D. LEED Requirements: Provide products required by this section with attributes that contribute to the project sustainability goals:
   1. MR 4.1 and MR 4.2: Recycled Content.
E. Plastic Laminate: PL-1: Arborite - Color: Tatami Nezumi - P124 CA
F. Manufacturer's Installation Instructions: Indicate component installation assembly.
G. Maintenance Instructions: Submit manufacturer's maintenance instructions, including procedures for cleaning and polishing doors, end panels, and interior surfaces.

1.04 DELIVERY, STORAGE, AND HANDLING
A. Protect locker finish and adjacent surfaces from damage.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Lockers:
   1. Famous Lockers, Inc; www.famouslockers.com
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS
A. Double Tier Lockers:
   1. 60 inches high.
   2. 12 inches wide.
   3. 15 inches deep.
   4. Style: Double Tiered.
   6. Interior Body Parts:
      a. 3/4 inch thick
      b. Material: 3/4 inch thick, 45 pound, high density, industrial grade, particleboard core, covered on both sides with high impact, abrasion resistant, melamine.
      c. Melamine Panels: Thermofused and meet American Laminators Association standards as tested in accordance with NEMA for compliance to LD3-2005 High Pressure Laminate.
      d. Back Panel: Same material as interior body parts, except 1/2 inch thick.
      e. Exposed Edges: PLAM covered to match doors.
   7. Venting:
      b. Door Perimeter Gap: 1/8 inch.
8. Plastic Laminate Doors:
   a. Material: 3/4 inch thick, 45 pound, high density, industrial grade, particleboard laminated on the outside with high pressure laminate.
   b. Edges: Covered to match laminate on doors.
   c. PL-1: Arborite - Color: Tatami Nezumi - P124 CA

9. Plastic Laminate End Panels, Filler Panels, and Corner Fillers:
   a. Material: 3/4 inch thick, 45 pound, high density, industrial grade, particleboard with a laminated front and balance on rear.
   b. End Panels: Edges covered to match face of end panels.
   c. Filler Panels and Corner Fillers: Include melamine covered top cap.

10. Coat Hooks: 2 double-prong, [chrome], wall-mounted, in compartments 30 inches high or more.

11. Number Plates:
   a. Mount on front of door.

12. Hinges:
   a. Type: Concealed, self-closing, European style.

13. Locks:
   a. Padlock hasp.

14. Door Pull:
   a. Chrome Wire.

2.03 FABRICATION
   A. Fabricate locker parts square, rigid, and without warp, with finished faces (interior) flat and free of scratches and chips.
   B. Machine attachment holes accurately and free of chips.
   C. Attach fasteners as standard with manufacturer.
   D. Fabricate corners and fillers as required for installation.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that prepared bases are in correct position and configuration.
   B. Verify bases and embedded anchors are properly sized.

3.02 INSTALLATION
   A. Install in accordance with manufacturer's instructions.
   B. Install lockers plumb and square.
   C. Place and secure on prepared base.

3.03 CLEANING
   A. Clean locker interiors and exterior surfaces.

END OF SECTION
SECTION 11 1313
LOADING DOCK BUMPERS

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Dock bumpers of reinforced rubber with attachment frame.

1.02 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Indicate unit dimensions, method of anchorage, and details of construction.
   C. Manufacturer's Installation Instructions: Indicate special installation requirements.

PART 2 PRODUCTS
2.01 MANUFACTURERS
   A. Dock Bumpers:
      4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COMPONENTS
   A. Bumpers: Molded rubber, ozone resistant, nylon reinforced, minimum Shore A Durometer of 70, tensile strength of 950 to 1050 psi:
      1. Thickness From Wall: 3 inches.
      2. Vertical Height: 10 inches.
      3. Width: 5 inches.
      4. Profile: Rectangular.
   B. Attachment Hardware: 3/4 inch diameter galvanized bolts and expansion shields.

PART 3 EXECUTION
3.01 INSTALLATION
   A. Install dock bumpers in accordance with manufacturer's instructions.
   B. Set plumb and level.
   C. Secure angle end frames to concrete.

END OF SECTION
SECTION 11 1319.13
LOADING DOCK LEVELERS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Prefabricated steel leveler with guard rails.

1.02 RELATED REQUIREMENTS
A. Section 11 1313 - Loading Dock Bumpers.

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide materials and finish, installation details, roughing-in measurements, and operation of unit and safety lock device.
C. Shop Drawings: Indicate required opening dimensions, tolerances of opening dimensions, placement dimensions of safety lock device, perimeter conditions of construction.
D. Manufacturer's Installation Instructions: Indicate special requirements.
E. Operation Data: Provide operating instructions, identify unit limitations.
F. Maintenance Data: Provide unit maintenance information, lubrication cycles, spare parts manual.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Dock Levelers:
1. Basis of Design: Acceptable Manufacturer: Nova Technology, which is located at: N90 W14507 Commerce Dr.; Menomonee Falls, WI 53051; Toll Free Tel: 800-236-7325; Tel: 262-502-1591; Fax: 262-502-1511; Email:request info (sales@novalocks.com); Web:www.novalocks.com
2. Other Acceptable Manufacturers:
   d. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COMPONENTS
A. Dock Leveler:
2. Deck Width: 6'-0" inch.
3. Deck Length: 8'-0" inch.
4. Operating Range: 12 inches above dock level, 12 inches below dock level.
5. Capacity: 25,000 lbs.
7. Weather Seals: Brush
B. Vehicle Restraint: Mechanical lock, fabricated and welded steel plate construction, spring loaded to automatically latch when activated, to conform to ICC semitrailer vehicle bumper requirements for dimension and placement.
C. Structural: The platform is constructed of 1/4 inch thick four-way high tensile 50,000 minimum yield A572 safety tread plate. Platform is reinforced and supported by full length 6 inches (152 mm) high formed C channels welded to deck and front and rear header for firm structural support. Front and rear header plates are 1/2 inch thick by 7-inches (13 mm by 178 mm) high hot rolled steel. NOVA NHS series lips are four-way safety tread plate, the 25,000 pounds (11,339 Kg) Comparative Industry Rating (CIR) capacity is 1/2 inch (13 mm) thick. Hinge tubes are 1-3/4 inches (44 mm) OD by 5/16 inch (8 mm) wall, 1-7/8 inches (48 mm) OD by 3/8 inch
(9.5 mm) wall or 2-1/8 inches (54 mm) OD by 1/2 inch (13 mm) wall depending on CIR. All lip hinge pins are 1 inch (25 mm) diameter M1044 steel. Steel header gussets are standard on all models 35,000 pounds CIR and above. All units have grease fittings as standard. All platforms are designed to compensate for up to 4 inches (102 mm) of canted trailer bed.

D. Operation: Push-button depressed and held activating the hydraulic system that lifts the deck from a stored position. When the deck reaches the fully elevated position, the lip cylinder is activated extending the lip assembly. Release push-button when the lip is fully extended and the deck descends to the trailer bed. Lip will rest on the trailer bed and the deck will float with the trailer (12 inches (305 mm) above/below dock operating range). If a trailer departs prior to storing the leveler the velocity fuse will limit the movement of the deck within 1 inch (25 mm) to 3 inches (76 mm). After loading/unloading is complete, the attendant depresses the push-button lifting the leveler from the trailer bed. The push-button is held until the lip falls pendant and then released allowing the leveler to rest in the lip keepers.

E. Electrical: The hydraulic power unit motor is a 1.25 HP TENV at 120V or 208V single-phase or 208V, 230V, 460V, or 575V three-phase. The electrical control panel is NEMA 12 enclosure. All electrical components, connections and wiring are UL listed or recognized.

F. Hydraulics: The platform is raised by a main hydraulic cylinder; all hydraulic hoses are routed under the leveler platform, away from debris. The ramp cylinder is a hard chrome-plated double acting design with a 3-inch (76 mm) bore and is equipped with a velocity safety stop to limit free fall of a loaded platform to 3 inches (76 mm). Motor pump is mounted up for easy access and to clear debris in pit and includes a translucent reservoir for monitoring fluid level.

G. Recommended Safety Equipment: NOVA vehicle restraint systems help prevent unexpected trailer departure from the loading dock and minimize trailer creep during the loading/unloading process.

H. Warranty: In addition to the Standard Product Warranty provided with all NOVA Products, NOVA Technology guarantees materials, components and workmanship to be free of defects.

I. Pit Frame: Steel angle, 3 x 3 x 1/4 inch; welded corners, fitted with anchors 2”-0” inch oc for concrete embedment.

2.03 ACCESSORIES
   A. Dock Bumpers: Specified in Section 11 1313.

2.04 FINISHES
   A. Leveler Platform: Hot dip galvanized to 1.25 oz/sq ft finish.
   B. Leveler Frame: Hot dip galvanized to 1.25 oz/sq ft finish.
   C. Railing: Hot dip galvanized to 1.25 oz/sq ft finish.
   D. Pit Frame: Hot dip galvanized to 1.25 oz/sq ft finish.
   E. Vehicle Restraint: Yellow painted hook, galvanized steel operating mechanism.

PART 3  EXECUTION

3.01 EXAMINATION
   A. Verify that rough-in openings are acceptable.

3.02 INSTALLATION
   A. Install dock leveler and mechanical safety vehicle lock unit in prepared opening in accordance with manufacturer's instructions.
   B. Set square and level.

END OF SECTION
SECTION 11 40 00

FOODSERVICE EQUIPMENT

PART I  GENERAL

1.01  QUALIFICATIONS

A.  The Food Service Equipment Contractor, heretofore referred to as the “Contractor”, must meet the following conditions to be deemed eligible and acceptable on this project.

1.  Must be a current contractor license holder in the State where the project resides.  The use of any other companies’ license is not acceptable.

2.  Must be bondable in the amount of the Food Service Contract.

3.  Must be financially capable of purchasing the equipment specified from the manufacturers specified.

1.02  WORK COVERED

A.  Items of work included in this section are labor, material, tools, equipment, and transportation, and include:

1.  Furnishing, uncrating, assembly, setting-in-place and installation of all equipment as listed in equipment schedule and written specifications.

2.  Coordinating with work of other sections and providing support and accommodation of related work.

3.  Work involved in the making and installation of stands and supports for equipment.

4.  Cutting of all holes in equipment, including holes for pipes, drains, electrical outlets, required for this section.  Work shall include welded sleeves, collars, ferrules, grommets, or escutcheons.

5.  Repair and restore of all damages including paint replacement to building resulting from work of this section.

6.  Furnishing of all faucets, sink wastes, drain fittings, tail pieces and strainers for food service equipment sinks.

7.  Coordinate but do not install (unless specifically directed to do so in the technical specifications) Owner and Vendor supplied items noted on the drawings or in the specifications as NIKEC.  Provide rough-in information of said items as if the equipment is contractor furnished.

8.  Furnish mechanical and electrical devices that are an integral part of the equipment for installation by others.

1.03  RELATED WORK IN OTHER SECTIONS AND PERFORMED BY OTHER TRADES

A.  All electrical, gas, steam, water and waste service to rough-in points at fixture locations and final connections to fixtures shall include all material and labor necessary to pipe or wire the fixture complete ready for operation, the extensions of all indirect waste lines to floor sinks or standpipes, the interconnections of pipe or wiring from utility distribution systems; the interconnections of piping to water troughs with the appropriate controls, and interconnections of piping through solenoid valves and vacuum breakers, the interconnections of wiring from junction box to lights, door heaters, vents and refrigeration equipment, the interconnections of wiring to light fixtures in appliances.  The term fixture includes all items listed including existing, re-used and vendor furnished items.

B.  All ventilation work and ducts above finished ceiling including the welded transition
between duct and ventilator. All exhaust fans and make-up air units.

C. All concrete work, including curbs, gutters, raised bases, floor depressions, cement finishings and tile overlay, including cold storage room floors and coved bases.

D. Finish floor sealing or covering.

E. Color and pattern selection of paints, stains, and plastic laminate materials.

1.04 BASE BID AND SUBSTITUTIONS

A. Base bid shall be for furnishing all equipment and material as specified. Prior approval of substitutions covered in Section 11 40 00.

B. Acceptance of proposed substitution is entirely at discretion of Owner or his Representative, and subject to the following qualifications:

1. Equal in quality of materials used, in structural strength, and in details of construction.
2. Equal in performance and capacity.
3. Mechanical and electrical requirements must be comparable.
4. Equal in finish or in characteristics permitting specified finish to be applied.
5. Availability of replacement parts and maintenance service.

1.05 MODIFICATION/RESET OF EXISTING EQUIPMENT

A. All equipment noted in the specifications as “Existing/Relocate” shall be removed and relocated as specified and shown on the drawings. All utility connections must be disconnected by the Contractor prior to removal of equipment.

B. Bidders shall carefully examine the specifications and the project site including location and condition of existing equipment to determine cost of each “Existing/Relocate” and “Existing/Modify” item to cover removal, cleaning, inspection for damage, repair, resetting and relocating.

C. Each “Existing/Relocate” item shall be clean, in good repair, and operable condition when relocated and reset.

1.06 DRAWINGS

A. Drawings furnished represent the design intent and must be used in conjunction with these specifications. They show locations of equipment and the general arrangement of mechanical and electrical services. Necessary deviation from the illustrated arrangement to meet structural conditions shall be considered a part of the work of this section.

B. The drawings are for the assistance and guidance of the Contractor. Exact locations shall be governed by the building configuration.

1.07 REGULATORY AGENCIES

A. All work shall be in accordance with the governing health, building, safety and fire protection codes and regulations.

B. Standards of the National Sanitation Foundation (NSF) shall serve as guidelines or the work of this section. All fabrication and equipment furnished shall be currently listed by NSF.

C. All electric equipment and accessories shall conform to the standards of the National Electric Manufacturers Association (NEMA), Underwriters Laboratories, Inc. (UL) or the local Electrical Testing Laboratories. For fire extinguishing systems comply with UL300.

D. All gas-fired equipment and accessories shall conform to the standards of the American Gas Association (AGA), equipped to operate on the type of gas available at the job site.
and shall contain automatic safety shut-off device.

E. All steam-generating equipment and accessories shall conform to the standards of the American Society of Mechanical Engineers (ASME).

F. Rulings and interpretations of state and local enforcing agencies shall be considered a part of the regulations.

1.08 SUBMITTALS
A. Upon award of Contract, furnish the Architect with one electronic copy (PDF) of the following drawings in accordance with the approved project schedule. Reproduced copies of bid documents will not be accepted for this purpose in any fashion.

1. Equipment specified for fabrication shall be detailed and fully dimensioned to a minimum scale of 3/4" = 1'-0" (1:20) for plan and elevation views and 1-1/2" = 1'-0" (1:10) for sections. Show all materials, gauges, and methods of construction.

2. Prepare separate electrical and mechanical dimensioned rough-in drawings at 1/4" = 1'-0" (1:50) showing exact point of penetration of floors, walls and ceilings for all services required to operate the equipment that the Contractor shall furnish, including the requirements for Contractor supplied and installed refrigerant and beverage piping line runs. These drawings shall also show exact locations of final connections to equipment. Indicate floor drains, floor sinks, receptacles, lights and other special conditions related to the equipment known to the Contractor but provided under other Sections.

3. Dimensioned drawings shall be submitted showing the location and size of all bases, depressions, grease interceptors, special height walls, openings in walls for equipment or operations, and critical dimensions, etc. Drawings shall be drawn to a scale of not less than 1/4" = 1'-0" (1:50).

B. MANUFACTURERS’ LITERATURE - Upon award of contract, submit four bound sets of manufacturers’ specifications and data sheets or one electronic copy (PDF) describing articles and equipment, as specified, for approval. Cut sheets shall be printed originals.

1. Each submittal must contain a page for every item indicating units to be furnished, manufacturer’s number and list optional finish and accessories to be supplied. In addition, show electrical characteristics and BTU rating and indicate if electrical cord and plug will be furnished.

2. Submittals shall be complete, accounting for each specified “buy out” (standard equipment) item. Loose sheets or “piecemeal” submittals shall not be acceptable. If a manufacturer’s catalog sheet is not obtainable, for a specific item, inset a typewritten sheet describing the item giving all of the required information.

C. FULL SCALE MOCK UP – Upon Foodservice Consultant’s approval of custom counter shop drawings and prior to fabrication, Contractor shall create a full scale mockup of a typical counter, complete with applicable drop-in unit, food guard post and shield and base. Contractor shall ship mock up to job site for Owner, Foodservice Consultant and Architect review and approval. Review and approval required prior to fabrication of units as specified in Part IV.

D. MAINTENANCE DATA AND OPERATING INSTRUCTIONS - Submit for approval, for Owner’s use, three bound sets or one electronic copy (PDF) of operating and maintenance instructions containing complete description, wiring diagrams, operating data and other information pertaining to the proper operation and upkeep of the various items of mechanical equipment having motors or other moving parts. Include names, addresses and telephone numbers of authorized service agencies for all items with mechanical/electrical components.

1.09 GUARANTIES AND WARRANTIES
A. New equipment furnished for this food service facility shall be guaranteed for a period of one year, covering parts and labor, beginning on the date of final acceptance of the work of this section. Warranty shall protect against defective material, design and workmanship.

B. In addition to the above, all self-contained and remote refrigeration systems shall include in their warranty, installation, start-up and an additional, minimum four-year extended warranty on sealed compressor/motor assemblies. The extended warranty shall include parts only.

C. Upon receipt of notice of failure of any part, during the guarantee period, the affected part or parts shall be replaced promptly at no cost to the Owner.

D. In the event the replacement of an entire item is required, the Owner shall have the option of full use of the defective equipment until a replacement has been delivered and completely installed.

E. All repairs and replacement shall be made at a time and during hours satisfactory to the Owner.

PART II PRODUCTS

2.01 MATERIALS

A. Metal

1. Stainless Steel: All new, first grade, material; U.S. Standard Gauges as specified or shown; 18-8, Type 304, No. 4 finish, ASTM A 167.

2. Galvanized Steel: All new, commercial quality, zinc-coated carbon steel; U.S. Standard Gauges as specified or shown, ASTM A 526.

3. Steel Pipe: All new, commercial quality galvanized; rust resistant coating on threads.

B. Wood

1. Plywood: All new material; thickness as specified; waterproof glued, marine grade. (Particle board is not acceptable.)

2. Hardwood: Birch, kiln dried, clear stock sizes.

3. Construction Lumber: Douglas fir, commercial construction grade, select “Wolmanize” where in contact with concrete or masonry.

C. Hardware

1. Locks

   a) All metal cabinet doors and drawers shall be furnished with Standard-Keil cylinder locks No. 1230-1216-3000, or equal, all keyed alike unless specified otherwise.

   b) All wood cabinet doors and drawers shall be furnished with Standard-Keil cylinder locks No. 1210-421–3000, or equal, all keyed alike unless specified otherwise.

   c) All refrigerated and heated cabinets of the reach-in type shall be furnished with heavy-duty cylinder locks, on all doors, all keyed alike unless specified otherwise.

2. Catches

   a) All cabinet doors shall be Magna Tite No. 592, self-aligning Magnetic, or equal, unless specified otherwise.

3. Door and Drawer Pulls
a) For metal sliding doors, shall be stainless steel recessed type Standard-Keil No. 1262-1014-1283, or equal, unless shown or specified otherwise.

b) For metal sliding doors, shall be stainless steel recessed typed Standard-Keil No. 1262-1014-1283, or equal, unless shown or specified otherwise.

c) For wood cabinet doors and drawers provide an allowance for pulls to be selected by Interior Design, unless specified otherwise.

4. Hinges
a) For metal cabinet doors, shall be heavy-duty concealed pivot hinge of stainless steel or cadmium plated, unless shown or specified otherwise.

b) For wood cabinet doors, shall be heavy-duty concealed pivot hinge finished to harmonize with cabinet finish unless shown or specified otherwise.

5. Casters
a) Shall be heavy-duty, bright zinc or chrome plated, ball-bearing type with greaseproof rubber, neoprene or polyurethane tires. Wheels shall be 5" diameter with minimum width treads of 1-1/8" and minimum capacity of 250 lbs. per caster. Furnish with rubber donut bumpers and wheel brakes.

D. Plumbing Fixtures
1. Faucets
a) Deck mounted mixing faucet assemblies shall be T&S B-0222 with 6" swing nozzle and non-splash aerator, or equal, unless specified otherwise.

b) Splash mounted mixing faucet assemblies for pot sinks shall be T&S B-0290 with 12" nozzle and non-splash aerator, or equal, unless specified otherwise.

c) Splash mounted mixing faucets for preparation and utility sinks shall be T&S B-230 with 12" nozzle and non-splash aerator, or equal, unless specified otherwise.

d) All faucet assemblies shall be polished chromium plated.

2. Rotary Wastes
a) Shall be Component Hardware No. D50-7200 (for pot sinks) and D50-7215 (for utility sinks) with stainless steel basket strainer, or equal, unless specified otherwise.

3. Pre-Rise Assemblies
a) Splash mounted pre-rinse assemblies shall be T&S B-0133 with B-0109-01 wall bracket, or equal, unless specified otherwise.

b) Deck mounted pre-rinse assemblies shall be T&S B-0123 with B-0109-01 wall bracket and remote control mixing valve, or equal, unless specified otherwise.

c) All pre-rinse assemblies shall be polished chromium plated.

4. Scrapping Troughs
a) Furnish water inlet fitting and control valve as part of all scrapping troughs ready for final connection. Furnish Component Hardware NO. K 36-6000 (or equal) Water Inlet Fitting with chrome plated control valve indexed “cold.”
5. All plumbing fixtures shall be identifiable for manufacturer.
6. Furnish all built-in mechanically cooled and ice cooled water chillers with interconnecting insulated pipe between units and faucets installed and ready for final connection.

E. Heating Equipment
1. Furnish all built-in gas and electric heating equipment as complete systems, in size and rating specified, ready for final connection.
   a) All controls shall be readily accessible.
   b) All equipment shall be readily cleanable or easily removable for cleaning.
2. Furnish thermostatic controls and low water protection on all gas and electric heated warewasher and utensil washer tanks.
3. Furnish thermostatic controls on all gas heated appliances other than open burner units, hot plates, hot tops, and broilers, unless specified otherwise.
4. Furnish all built-in steam heating equipment as complete systems, including valves, strainers, steam traps, gauges and pressure regulators in size or rating specified ready for final connection.
   a) All control valves, gauges, and safety valves shall be readily accessible.
   b) All steam traps and check valves shall be accessible.
5. Furnish all buy-out steam operated equipment with necessary pressure regulators, traps and valves, etc., for final connection.

F. Electrical
1. Furnish a control switch and starter with overload protection for each motor driven appliance and electrical heating unit, unless specified otherwise.
2. Furnish and install all electrical devices, including hood lights unless specified otherwise, and do all internal wiring of electrical apparatus built into or forming an integral part of fabricated equipment, complete to a J-box or breaker panel, as shown on plans, ready for final connection.
3. Furnish cord and plug for all mobile and portable equipment operating on 120 volts or 208 volts single phase power supply, unless specified, or indicated otherwise.
   a) Cord to be rubber-covered, three-wire or proper current capacity; furnish appropriate length.
   b) Plug to be three-prong, ground type of proper NEMA configuration. (Verify for matching receptacle.)
4. Furnish and install all fluorescent and incandescent fixtures, with lamps, when specified or shown on the drawings. Light switches (unless a part of a fixture) shall be furnished and installed by the Electrical Contractor.

G. Mechanical
1. All ventilators shall be constructed with a totally all welded shell in strict accordance with current NFPA 96 and must meet this criteria even though the ventilators may carry a "U.L. Listed" or "U.L. Classified" designation (UL710). Ventilator and installation shall meet all requirements of the current I.M.C. and all local codes as required by the authority having jurisdiction.
2. All penetrations for lights or fire suppression must be minimal and sealed with a heat resistant sealant or gasket material.
3. Recessed light fixtures are not approved if they require cutting the all welded shell.

4. Special ventilator designs necessary to meet exceptional field conditions must be submitted to the local agency in charge for approval prior to installation.

5. Furnish and install all welded stainless steel ducts, stacks and vents to finished ceiling connections from hoods, ventilators, ovens and other appliances furnished by this section. Mechanical Contractor to make final connections. Refer to Section 3.03 - B.

6. The flue risers of broilers, griddles, fryers and their equipment furnished by this section shall be verified for proper venting.

7. All equipment heights shall be verified for clearance under ceilings, beams, pipes, and all exhaust devices including hoods and ventilators.

8. Any variation or modification of ventilators shall be the sole responsibility of the Contractor.

9. Provide emergency gas shut-off valve as part of the Fire Extinguishing System.

10. If water hardness is over 6.0 GPG, provide water softener and soft water lines to all equipment requiring a water connection. If below 2 GPG, advise as some equipment functions can be adversely affected.

   a) A comprehensive water quality test shall be generated for the project. Provide water quality test results for review. Minimum water quality standards shall be:

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Inlet Water Requirements (untreated water)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Chlorine</td>
<td>Less than 0.1 ppm (mg/L)</td>
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<tr>
<td>Hardness</td>
<td>Less than 3 gpg (52ppm)</td>
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<tr>
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<td>Less than 30 ppm (mg/L)</td>
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<tr>
<td>PH</td>
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<td>Alkalinity</td>
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<tr>
<td>Silica</td>
<td>Less than 12 ppm (mg/L)</td>
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<tr>
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<td>Less than 60 ppm</td>
</tr>
<tr>
<td>Solids</td>
<td></td>
</tr>
</tbody>
</table>

2.02 METAL FABRICATION

A. General

1. Custom fabricated items shall be fabricated by one manufacturer in an approved manner acceptable to the Owner.

2. Weld all top, splash, sink and panel construction, of 18 gauge or heavier, into uninterrupted integral units.

   a) All seams and joints shall be shop welded where possible.

   b) All exposed stainless steel to have No. 4 finish.

3. Grind and polish all welds on stainless steel, with finish abrasion marks running longitudinally to a No. 4 finish.

4. Grind smooth welds on galvanized steel and restore coating with Allstate No. 321 Galvanizing Powder or equal.

5. Conceal fasteners where possible; cap exposed bolts, nuts, and pipe ends.

   a) Use non-corrosive materials.

6. Use 1-5/8", 16 gauge stainless steel tubing for all legs, tubular supports and cross rails unless shown or specified otherwise.
a) Furnish stainless steel foot insert and leg socket for mounting each leg.
   i) Standard-Keil No. 1010-0802-1144 foot insert, or equal.
   ii) Standard-Keil No. 1020-0206-1283 leg socket, or equal.

b) Furnish 6" high cabinet base legs, including foot.
   i) Standard-Keil No. 1064-0642-1680 cabinet base leg, or equal.

7. For metal top tables, weld gussets to 14 gauge stainless steel hat sections, or open channels.
8. Fully weld all cross rails to legs 10 inches above floor, grind smooth and polish.
9. Legs without shelves or cross rails shall have ½" O.D. stainless steel pin for anchoring to floor.
10. Undercoat sink tops (drainboards), dishtable and work tables with Component Hardware latex sound deadening material, light tan color.

B. Tops
1. Table tops, drainboards, counter tops, splashes and extensions shall be constructed of 14 gauge stainless steel, unless shown otherwise.
2. All tops with turned up rolled edge shall be reinforced with 14 gauge stainless steel closed hat sections, or open channels, spaced 30 inches O.C. or less, fastened to threaded studs, welded to underside of top, with acorn nuts.
3. All tops with turned down rolled edge shall be reinforced with 14 gauge stainless steel closed hat sections or open channels, spaced 30 inches O.C. or less, fastened to threaded studs, welded to underside of top, with acorn nuts.
4. All hat sections shall be sealed to underside of tops with pad of 3M-1000 sealant.
5. Raised rolled edges shall have a roll diameter of 1-1/2 inches. Corners shall be bull nosed.
6. Inside radius bends, wherever horizontal and vertical surfaces intersect, shall be 9/16 inches.
7. All drainboard surfaces shall pitch toward drainers, scrapping trough, dishwashers, and sinks.
8. Tops shall be turned down no less than 1 inch into openings for ice bins; and 1/4 inch minimum raised embossment shall be provided on horizontal surface of top around entire perimeter of opening.
9. All openings for exposed foods shall be provided with 1/4 inch minimum raised embossment on horizontal surface of top around entire perimeter of opening.

C. Sinks
1. Sinks that are integral with drainboards shall be fabricated and constructed of same gauge and material as drainboard and splash.
2. Sinks that are integral with table or counter tops may be fabricated or die formed.
   a) Fabricated sinks shall be of same gauge and materials as top.
   b) Die formed sinks shall be not less than 18 gauge stainless steel.
3. All interior vertical and horizontal corners shall be coved.
4. Partitions between adjacent sink compartments shall be 1" apart joined with continuously welded radius top closure.
5. Exterior front of multiple compartment sinks shall be continuous.
6. Bottom of all sink compartments shall be pitched to insure complete drainage to waste opening.

D. Cabinets
1. Fabricate all visible parts of counter cabinet of 18 gauge stainless steel, unless shown otherwise, reinforced with formed steel sections, welded throughout to form a one-piece box-like structure, including front rails and mullions.

E. Drawers
1. Furnish all-welded double pan drawer front with 16 gauge stainless steel exterior pan, 18 gauge stainless steel interior pan and interlocking channel supports, with Standard-Keil drawer track Series 1452; shall be easily removable; recessed stainless steel drawer pulls; 128 gauge stainless steel die-formed, easily removable, drawer bowl.
   a) Drawers mounted on underside of open tables; furnish 18 gauge stainless steel enclosures on sides and rear. Furnish with keyed cylinder lock.
   b) Drawers in refrigerated units; furnish large ball bearing wheels and large flat track bearing surfaces; wheels and bearings of corrosion resistant, long wearing material, grease packed before assembly. Drawers shall be self-closing with easily removable drawer pans, perforated on all sides.

F. Doors
1. Furnish double cased steel doors, unless specified otherwise; 16 gauge stainless steel outer pan with corners welded, ground smooth and polished; 18 gauge stainless steel inner pan fitted tightly into outer pan with sound deadening material, such as Celtex, used as a core; tack weld pans together and fill seams with solder; finished door shall be approximately 3/4" thick and furnished with recessed pull.
   a) Reinforce and stiffen with closed hat sections, single pan type doors, when specified.
2. Flush mount sliding doors; suspend with large ball-bearing quiet rollers in 14 gauge stainless steel overhead tracks; made easily removable.
3. Flush mount hinged doors.

G. Shelves
1. All wall mounted shelves, elevated shelves and undershelves with open leg bases shall be constructed of 16 gauge stainless steel, unless shown otherwise.
2. Unless shown otherwise, wall mounted shelves shall be die-rolled down 2 inches at fronts and ends, and turned up 2 inches at back and flared. Shelf shall be mounted on 14 gauge stainless steel brackets and anchored securely to wall.
3. Elevated and undershelves shall be as detailed. Where rolled edges are indicated, they shall be die-rolled down 2 inches. Elevated shelf supports shall extend below table or counter tops and be securely attached to structural frame.
4. Shelf and flange of undershelf with open leg base shall be notched a full 90 degrees, with radius to match leg. Flange shall be welded to leg from back side, 10 inches above floor.
5. Shelves in cabinet bases shall be constructed of 16 gauge stainless steel, unless shown otherwise.
6. Unless shown otherwise, shelves in cabinet bases shall be formed with minimum
2 inches turn-up at back and sides and feathered to insure a tight fit to enclosure panels and shall be turned down at front.

a) Bottom shelves shall be removable unless shown otherwise.

H. Ducts
1. Verify size and position of all exhaust duct connections required for hoods, ventilators, washers and appliances; furnish and install 16 gauge stainless steel all welded ducts to ceiling connection locations. Welds on seams shall be continuous. Grind and polish welds to a No. 4 finish. Include stainless steel duct collar at exposed connection.

I. Undercounter Refrigerators
1. Outer casing shall be constructed of 18 gauge stainless steel; inner liner shall be of 20 gauge stainless steel with #2B finish unless shown otherwise.

2. Refrigerator shall be fully insulated with 2” minimum thickness of urethane between outer casing and inner liner at top, bottom and sides including doors.

3. Entire perimeter of door opening shall be faced with a 1/8” black Bakelite thermal breaker strip approximately the width of mullion. Breaker strip at door sill shall be faced with 16 gauge stainless steel.

4. Door shall be constructed with 18 gauge stainless steel outer casing and 20 gauge stainless steel, #2B finish, inner lining, unless shown otherwise, molded gray vinyl latex door gasket shall be attached to perimeter of doors with concealed fasteners.

5. Drawer fronts shall be of same materials as specified for doors. Insulation shall be of same material as used in refrigerator walls and shall be a minimum of 1 inch in thickness. Unless shown otherwise, drawers shall be provided with Standard-Keil No. 1260-1410-1283, or equal, flush style pulls.

6. All refrigerators shall be furnished with one 40 watt incandescent appliance light bulb and socket for each mullion connected in parallel with automatic door switch mounted in each door opening; full set of Kason No. 65 with No. 66 shelf clip bracket, or equal, stainless steel, removable adjustable pilaster standards for shelves for each refrigerator opening; two heavy-duty epoxy coated wire shelves per compartment; one exterior reading, flush mounted dial type thermometer with -40 to +60 degree F. range.

7. All electrical wiring, including service for built-in evaporator coil fan shall be run in flexible conduit within refrigerator walls and shall terminate in external J-box mounted on end or rear of refrigerator cabinet in an accessible location for final connection.

8. Hardware for doors shall be Kason No. 218 self-closing edge mount hinge and Kason No. 171C, cylinder-locking, edge mount, magnetic latch or equal (all locks keyed alike).

9. All undercounter refrigerators shall be furnished with 20 gauge stainless steel box to house expansion valve located in base of fixture housing refrigerator or other concealed but accessible location.

10. Where cut-outs in refrigerator tops are specified or shown on detail drawings, raw edges of cut metal and insulation shall be covered with stainless steel sleeve. Counter top shall be turned down into opening to overlap sleeve with thermal barrier installed between. A stainless steel expanded metal guard shall be furnished for the full length and width of opening with sides attached to underside of refrigerator interior with closed bottom of guard located 6-1/2” below counter top.
J. Ice Bins and Cold Pans
   1. Inner lining shall be constructed of 18 gauge stainless steel and outer casing shall be of 18 gauge galvanized iron, unless shown otherwise.
   2. All ice bins and cold pans shall be fully insulated with 2" minimum thickness of urethane or Styrofoam between outer casing and inner liner.
   3. Ice bins and cold pans shall be isolated from tops of support fixtures by means of thermal barrier.
   4. Furnish 16 gauge stainless steel perforated false bottom raise 1" above bin or pan bottom.
   5. Furnish 1" drain and extend to floor skin.

K. Wall Flashing
   1. Wall flashing shall be of 18 gauge stainless steel affixed to wall with heavy-duty, heat-resistant adhesive.
   2. Flashing shall be fabricated from maximum width sheets for minimum amount of vertical joints and shall be sealed with silicone and capped with 1" wide "T" molding, without exposed screws or fasteners.
   3. When wall flashing includes capping of wall ends, capping shall be fabricated from 16 gauge stainless steel.

2.03 WOOD AND LAMINATED CONSTRUCTION

A. General
   1. Wood fixtures included under this section shall comply with the requirements of the drawings, and the following listed standard specifications.
   2. Selection of all colors, patterns, laminates, paint, stain and varnish shall be made by the Architect.

B. Interior Finishes
   1. Finish all interior surfaces of cabinets, including shelves and drawers as follows (except when specified otherwise):
      a) Cabinets: Non-exposed interiors shall be stained to match exterior finish of cabinets; finish with one coat of clear plastic varnish painted with a light colored enamel.
      b) Shelves: Wrap in shelf-grade laminate, light in color.
      c) Drawers: Wrap in shelf-grade laminate, light in color.
      d) Doors and Panels: When exterior and edges are of plastic laminate, apply plastic laminate backing sheet to match color.

2.04 REFRIGERATION REQUIREMENTS FOR REMOTE SYSTEMS

A. Vibration absorbing mountings for condensing units and suction lines.

B. Disconnect switches, automatic starting switches, motor protectors and pressure limit switches all enclosed and with interconnecting wiring, factory installed ready for line connections.
C. Automatic pressure operated water valve; liquid line sight glass; and liquid line dehydrator filter of ample capacity.

D. Refrigerant lines shall be type "L" hard copper with "Silfos" brazed joints.

E. A heat exchanger for each evaporator.

F. A thermostatic expansion valve for each evaporator.

G. A full charge of refrigerant and oil for each system.

H. Start up, adjustment and one-year free warranty service. Five-year warranty on motor compressor units.

I. Where refrigerant suction lines are trapped, use next size smaller pipe in vertical portion of the trap than that indicated so as to acquire sufficient gas velocity for proper air return.

J. Suction lines shall be insulated their full length with anti-sweat pipe covering of ½" ARMAFLEX or equal.

K. 1" copper drain tubing from cooling units to floor drains outside refrigerator properly insulated and heated where required.

L. The systems shall be completely sealed and fully automatic in operation. All condensers and compressors shall be identified to correspond with the unit they are chilling.

M. Systems used for freezing temperatures shall have automatic defrosting devices.

N. The foamed-in-place urethane panels shall be in compliance with 1998 CFC reduction level requirements and shall be in compliance with the 1989 Montreal Protocol Agreement on chlorofluorocarbon emissions. Only those panel manufacturers that meet these requirements will be acceptable on this project.

O. Use non-CFC refrigerant (R-404A or equal). The use of R-12 or R-22 is not acceptable.

PART III EXECUTION

3.01 UTILITIES, STORAGE AND SPECIAL HANDLING

A. It shall be the Contractor’s responsibility to determine who will furnish and provide temporary power and light, openings and storage space to permit scheduled delivery of equipment.

B. The Contractor shall verify door openings, passages and conditions at the buildings. All special handling equipment charges shall be paid by the Contractor.

3.02 CONDITIONS AND PREPARATION

A. Verify all pertinent dimensions of the building and examine conditions affecting proper execution of this section. Evaluate access to various areas for moving in or equipment, and coordinate with General Contractor.

B. Verify water pressures and furnish necessary reducing valves.

C. Inspect flooring and raised concrete bases, wall finishes; verify existence of required mechanical and electrical rough-ins; check painting, ceiling installation and all related work for readiness to receive installation of kitchen equipment.

D. Coordinate with the project superintendent as to the proper sequence for installation of equipment and wall finish.

E. Sweep clean all floor areas and tops of raised concrete bases before setting equipment in place; remove any spillage of foreign matter.

3.03 EQUIPMENT CONNECTIONS

A. Equipment shall be complete with connection terminals as standardized by equipment
manufacturers, except where specified otherwise, for others to make plumbing, electrical, ventilation, and refrigeration connections.

B. Indirect waste lines shall be hard copper tubing, wrapped with insulating tape when extended from ice storage bins, ice bins or other equipment where “sweating” may occur.

C. All exposed utility lines, valves, gauges, tubing, and conduit including mounting brackets, shall be chrome plated stainless steel or sheathed in stainless steel.

3.04 TRIMMING AND SEALING EQUIPMENT

A. All gaps, joints, and seams between fixtures and walls, ceilings, and floor shall be completely closed and sealed with stainless steel trim strips, welding, silicone (Dow Corning No. #784 or equal), or epoxy sealant.

1. Sealant is not permissible in joints or seams which exceed 3/16 inch width.

2. Wood fixtures shall be scribed to exactly fit floor and wall surfaces and shall not be shimmed. Tops are to be installed level and securely fastened to bases.

B. All hollow sections shall be sealed.

C. All exposed ends of back splashes shall be capped with stainless steel, welded, ground smooth, and polished.

D. Fixtures resting on concrete bases shall be set into a mastic bed to eliminate crevices between fixture and base, and caulked after installation has been completed.

E. Where applicable, ends of all fixtures, splash backs, and shelves, shall be finished flush to walls or adjoining fixtures.

3.05 CLEANING

A. All debris, crates, and packages resulting from this work shall be removed from the premises or to area designated by the project superintendent.

B. All food service equipment shall be cleaned and ready for use when the structure is turned over to the Owner.

1. Protection of completed and cleaned work shall be the responsibility of the Contractor.

2. Include all existing/reset equipment, if any, as listed in the specifications.

3.06 ADJUSTMENT OF EQUIPMENT AND DEMONSTRATION

A. Turn on all mechanical equipment, test for leaks, poor connections, inadequate or faulty performance and correct if necessary; adjust for proper operation.

1. All thermostatically controlled equipment and equipment with automatic features shall be operated for a sufficient length of time to prove controls are functioning as intended.

B. At a time and date, selected by the Owner, the Contractor shall arrange for a demonstration of all mechanical equipment for the Owner and his appointed representatives, to be conducted by representatives of the various equipment manufacturers, with the Contractor in attendance.

3.07 STATEMENT OF CLARIFICATION OF WORK RESPONSIBILITY PERTAINING TO THE INSTALLATION OF FOOD SERVICE EQUIPMENT

A. Clarifications regarding areas of work performance and responsibility by the various trades.

B. General Contractor

1. The General Contractor is responsible for creating depressions, adding insulation under the floor, adding redwood screens within the floor for the purpose of
installing Walk-In Coolers and Freezers.

2. The General Contractor is responsible for adding concrete or masonry bases where required.

3. The General Contractor is responsible for any or all wall penetrations for refrigeration lines, soda lines, beer lines, etc., that may be required.

4. The General Contractor is responsible for the roof penetrations or wall penetrations for exhaust ducts or make-up air ducts for the exhaust ventilators.

5. The General Contractor is responsible for creating fire retention chambers around exhaust ducts, hoods or ventilators that require closures by code.

6. The General Contractor shall install all internal wall supports for shelves, cantilever brackets, cabinets, utensil racks, etc., as shown on plans.

C. Contractor

1. The Contractor shall deliver, uncrate and set-in-place all equipment.

2. The Contractor shall install all custom stainless steel items including tables, dishtable, sinks, hoods and ventilators, utility distribution systems, shelving, and all walk-in coolers and freezers.

3. The Contractor shall deliver to the General Contractor items such as hand sinks, floor troughs, janitor sinks, faucets, drains, lever wastes, hose reels, hose reel piping assemblies, ventilator piping assemblies, filters or any other miscellaneous items that are part of the Kitchen Equipment Specifications but are to be installed by other trades.

4. The Contractor shall install the exhaust ventilators including hanger rods, and channel supports and leave ready for the final duct connections by other trades. (When a ventilator has internal piping such as a water wash system, the internal piping connections between units, the piping between the control panel and ventilator and the drain extension to the floor sink is the responsibility of the Plumbing Contractor).

5. The Contractor shall set the dish machine in place and provide stainless steel exhaust ducts that extend from the vent cowls of the dish machine to approximately 2" to 4" above the finished ceiling line. The HVAC Contractor shall then bring the exhaust duct system to this point and make the final connections. In cases where the exhaust duct system is in place before the hood is installed, the Contractor shall field measure and build the exhaust risers to meet existing conditions. The HVAC Contractor shall be responsible for making the all welded transition.

6. The Contractor shall erect the Walk-in Coolers and Freezers, install the cooling coils and the complete refrigeration system. The Contractor’s Refrigeration Contractor shall be responsible for running hard copper drain lines from the cooler and freezer coil drainer pan to a floor sink or floor drain. Drain lines in the freezer shall be wrapped with heating tape and wired to prevent freezing.

7. The Contractor supplies all lighting fixtures for walk-ins including a light bulb for each fixture. The Electrical trade shall complete the conduit and wiring.

8. The Contractor or his Subcontractor shall install the Fire Extinguishing Systems for all exhaust hoods requiring same. This includes piping, fittings, remote pulls and tanks. Contractor shall also furnish emergency gas shut-off valve as part of the Fire Extinguishing System.

9. The Contractor shall install all sink strainers and lever wastes assemblies.

D. Plumbing Contractor
1. The Plumbing Contractor shall install all drains, traps and fittings from hand sinks, prep sinks, pot sinks, ice machines, steamers, ventilators, dishtable, dish machines, booster heaters, drainers in tables and in all appliances requiring drains except those specifically called out in the specifications to be pre-plumbed and per section 3.07, C, 6 and per section 3.07, C, 9.

2. The Plumbing Contractor shall provide incoming water lines as required on all appliances in hard copper without reduction in size to the faucets. All water lines are to be provided with stops upstream from the appliance.

3. The Plumbing Contractor shall install water filters or special valves, strainers, dampers, vacuum breakers, etc., that may be supplied as part of the appliance or by the Contractor separately.

4. The Plumbing Contractor shall install all faucets supplied with the appliance or furnished separately by the Contractor.

5. The Plumbing Contractor shall extend the water supply line through the disposer solenoid to trough inlets or cone hopper inlets complete with a control valve.

6. The Plumbing Contractor shall pipe between the booster heater and the dish machine including the temperature gauge, pressure gauge, line strainer or check valves that may be supplied by others.

E. Electrical Contractor

1. The Electrical Contractor shall make all the final connections to all kitchen appliances in the project unless specified to the contrary.

2. The Electrical Contractor shall supply all disconnects, shunt trips, and control switches required for individual appliances including conduit, flex and fittings as necessary.

3. The Electrical Contractor shall complete the wiring from source through the control panel and solenoid valve to disposers.

4. The Electrical Contractor shall install all loose light fixtures supplied for the Walk-ins and connect the cooling coils to the remote condensers complete with disconnects.

5. The Electrical Contractor shall furnish all special receptacles that may be required that are not furnished with the appliances.

6. The Electrical Contractor shall furnish all Ground Fault receptacles that may be required by code.

7. The Electrical Contractor shall supply all switch and receptacle plates in stainless steel and moisture resistant covers where necessary or as specified.

8. The Electrical Contractor shall, if necessary, rework or shorten and install all loose electrical cords supplied with the appliances.

9. The Electrical Contractor shall, when pulling wire, leave an additional four to six feet beyond the junction box in order to make a continuous connection to an appliance, particularly those requiring heaving loads.

PART IV ITEMIZED PRODUCT SPECIFICATIONS

ITEM 1.001 WALK-IN REFRIGERATOR/ FREEZER COMPLEX
AMERICAN PANEL CORPORATION CUSTOM/NSF
WALK-IN REFRIGERATOR/ FREEZER COMPLEX

Unit shall be modular panel NSF No 7 construction

Two (2) compartment unit, sized & shaped as shown on plan and described in American Panel Quote 164139a.

Unit shall be provided with integral built-in internal panelized insulated structural floor system with internal ramp to sit on top of architectural slab. KEC to verify slab finish conditions and coordinate appropriately.

Exterior Finishes:
Exposed Exterior (except ceiling): 22 ga. embossed stainless steel
Ceiling & Unexposed Exterior: 26 ga. embossed Galvalume

Interior Finishes:
.032 gauge embossed aluminum pre-painted white ceiling
26 ga. embossed Galvalume pre-painted white interior walls

Two (2) 36" X 78" door, hinged as shown on plan with 26 ga embossed galvanized pre-painted white frame and plug. Door to be provided with third hinge, automatic door closure with 1248 Kason spring hinges and 14" X 24" viewport with heated frame and glass.

Provide CCI Industries SS3678-AQ Clear Vu flexible swinging air curtain door, for 36" exterior entry door, 36" wide X 78" high, clear .08 PVC, with gravity hinge, easy in and out access, auto-close feature, for everyday traffic.

Nine (9) ceiling mounted 48" LED light fixtures.

Walk-in provided under this portion of the specifications shall be prefabricated of modular design and construction. They shall be designed to allow convenience and accurate field assembly and future enlargement by the addition of panels.

Standard 4" thick wall & ceiling panels shall be 11½", 23", 34½" and 46" in width and shall be interchangeable with like panels. Corner panels shall be 90° angles with actual 12" exterior horizontal measurements. Custom width panels shall be incorporated when required to meet floor plan requirements as indicated in contract foodservice drawings.

Panels shall consist of foamed-in-place urethane insulation, sandwiched between interior and exterior metal surfaces, which have been die-formed and gauged for uniformity in size.

Edges of panels shall be foamed-in-place “tongue and groove” with Posi-Loc locking assemblies foamed-in-place at time of fabrication.

Insulation shall have a 97% closed cell structure, average in-place density of 2.2 lbs. per cubic foot. Overall thickness shall be four inches. Fire hazard classification according to ASTME-84 (UL 723) and is certified with UL label.

Assembly of walk-ins shall be accomplished by “Posi-Loc” locking assemblies, which shall be foamed-in-place and activated by a hex wrench provided by the manufacturer. Access ports shall be on interior to allow assembly of walk-in from the inside and shall be covered by snap caps.

Flexible vinyl gaskets shall be foamed-in-place on the interior and exterior edge of the “tongue” rail. Gaskets shall be impervious to stains, greases, oils and mildew.
Provide, where shown, 36” X 78” clear opening entrance door(s). All doors shall have three hinges. The door shall be flush type, finished in and out, to match the wall in which it is located. Door and door section shall be listed by Underwriters Laboratories and equipped with the following:

Magnetic gasket, Posi-Seal door closure, brushed chrome latch and strap-type, cam-lift hinges. Hardware shall have provisions for locking and a safety release to prevent entrapment of personnel within the box.

Door jamb and door perimeter shall be made of Fiberglass Reinforced Plastic.

Each entrance door section shall be provided with an LED vapor-proof light, pilot light switch and conduit between switch box and outlet box. Concealed wiring shall be standard on each entrance door section.

A digital thermometer shall be included with each door section to indicate inside temperature.

All walk-ins shall be fabricated to comply with National Sanitation Foundation Standard No. 7. The NSF label shall be affixed to the interior door pan. Interior corners and floor shall be coved to meet NSF specifications.

A complete set of installation instructions shall be included with the walk-in. These instructions shall cover the erection and assembly of the walk-in and the installation of refrigeration systems. A floor print shall be included.

Walk-In doors shall be provided with deadbolt lock. Lock mechanism shall be located on interior of door with key access on exterior. Inside safety release shall be provided.

Provide, as required, spring hinge to assist in closing the door. It shall be of a torsion-compression design.

Provide .080” aluminum diamond treadplate kickplate on interior & exterior of all doors. Kickplate to be 36” high by the width of the door. Provide vinyl bumper rails at 24” and 48” above finished floor on all exposed exterior walls.

Provide 4” pressure relief vent for freezer compartment.

Furnish removable closure panels to enclose the area between the building and the walk-in ceilings. Panels to be fabricated of same material as walk-in exposed exterior.

Furnish trim strips between walk-in and building walls where applicable. Constructed and finished of same material as exposed exterior of walk-in.

Furnish two (2) Modularm 75LC temperature alarms (or equal) with light manager, completely solid state, digital readout of monitored temperature in degrees F., field adjustable built-in test circuitry, built-in battery and charger circuitry for power failure notification, safe and alarm lights provide constant visual states of monitored area. Built-in A/O + N/C dry contacts for remote notification, fail save circuitry design prevents accidental disabling, automatic multi-point scanning of our temperature probe locations.

Walk-In shall be fabricated to hold a temperature of +35˚F in refrigerated sections, and -10˚F in the freezer section.

KEC to verify all dimensions in field to accommodate installation of unit prior to fabrication.

KEC to install condensate drain, GC/EC to install heat tape, GC/PC to insulate drain

**ITEM 1.002 EVAPORATOR COIL, -10F**
RDT LET-140

EVAPORATOR COIL, -10F

Evaporator coil shall be a pre-engineered and factory assembled unit. Furnish & install unit as shown on plans & per RDT Quote 19466.

Coil shall be hung flush against the underside of walk-in ceiling and seal perimeter as required by code.

KEC shall verify location of water cooled Remote Condensing Unit specified under Item 1.005 & interconnect with evaporator coil as required

Line run shall be verified by KEC

KEC shall coordinate with RDT to ensure that system is installed complete with all necessary components and accessories, allowing system to operate at -10°F.

Wrap drain line with heater cable and insulate.

Drain line and heating cable shall be installed for continuous operation

ITEM 1.003 EVAPORATOR COIL, +35F

RDT ADT-130

EVAPORATOR COIL, +35F

Evaporator coil shall be a pre-engineered and factory assembled unit. Furnish & install unit as shown on plans & per RDT Quote 19466.

Coil shall be hung flush against the underside of walk-in ceiling and seal perimeter as required by code.

KEC shall verify location of water cooled Remote Condensing Unit specified under Item 1.005 & interconnect with evaporator coil as required

Line run shall be verified by KEC

KEC shall coordinate with Manufacturer to ensure that system is installed complete with all necessary components and accessories, allowing system to operate at +35°F

ITEM 1.004 OPEN NUMBER

ITEM 1.005 REMOTE PACKAGE REFRIGERATION SYSTEM, WATER COOLED

RDT IRW2-7

IRW SERIES REMOTE PACKAGE REFRIGERATION SYSTEM, INDOOR WATER COOLED

Indoor rack system sized & shaped as shown on plan and described in RDT Quote / Drawing #19466

Multi compressor, Indoor water-cooled. the refrigeration package shall be a pre-engineered and factory assembled unit, trade name "IRW", as manufactured by Refrigeration Design Technologies

1. Water-Cooled Refrigeration System
A. The RDT UL-Listed "water-cooled" refrigeration system shall be housed in a single, compact structural steel frame. The unit shall include a water-cooled condenser sized to operate at 20 degree TD. Entire frame shall be pre-assembled welded, cleaned and painted with two coats of polyurethane.

B. Compressor units shall be mounted individually on one common structural steel frame. Each unit shall be scroll and hermetic type designed for rack installations. The units shall be factory assembled and designed to operate with the coolant specified. Medium and low temperature units shall use R-refrigerant.

C. The water circuits of the condensers shall be valved separately and pre-piped to a common supply and return header. The header shall employ a bronze ball valve for connection to building condenser or chilled water supply.

D. Compressor units shall include a control panel oversized shell and tube water-cooled condenser and receiver. The control panel shall contain all the necessary controls for food service fixtures and evaporators and shall be factory-wired to the motor compressors.

E. Each compressor shall feature adjustable water regulators, suction filter, sight glass, drier, liquid line inlet and outlet valves and braided, armored super-hose connections.

F. Compressors shall feature a separate power relay for defrost circuits, interlocked with the compressor relay, to insure full pump down prior to the defrost cycle and prevent simultaneous operation of compressor and heater.

2. Evaporator Coils

A. Evaporator coils shall be direct expansion type fabricated of copper tubes with aluminum fins.

B. All evaporator coils shall be provided with solenoid valve, thermostatic expansion valve suction "p" trap and thermostat.

3. Electrolysis Prevention

A. Each unit shall be equipped with a dielectric union or flexible rubber connection at the water entry point to prevent electric conduction and extend equipment life. Dielectric unions shall be used to connect the water entry point to

ITEM 1.006 MOBILE SHELVING UNIT
NIKEC, BY OWNER

ITEM 1.007 MOBILE RACK
NIKEC, BY OWNER

ITEM 1.008 OPEN NUMBER

ITEM 1.009 DUNNAGE RACK
NIKEC, BY OWNER
ITEM 1.010  OPEN NUMBER

ITEM 1.011  HIGH DENSITY SHELVING
METRO TTS9NA

Super Erecta®, MetroMax Q™ Top-Track Track Set, ft., includes: necessary sections of track for assembling track runs (only (1) track set is required between stationary units), NSF

MQTTE18 MetroMax Q™ Top-Track Stationary End Unit Kit, 18"W, includes: hardware necessary for connecting stationary end units to track (shelves sold separately), includes: (8) epoxy coated steel posts
TTS9NA Super Erecta®, MetroMax Q™ Top-Track Track Set, 9' L, includes: necessary sections of track for assembling track runs (only (1) track set is required between stationary units)
FPS9N High-Density Top-Track Floor Pad Protectors, 9 foot length, use for both MetroMax Q™ Top-Track & Super Erecta® Top-Track Systems
MQTTM18S MetroMax Q™ Top-Track Mobile Unit Kit, 18"W, includes: corrosion proof rigid casters, caster channels, bumpers & roller assemblies (shelves sold separately), includes: (4)
MQ74UPE epoxy coated steel posts
MQ1848G MetroMax Q™ Shelf, 48"W x 18"D, open grid polymer with Microban® antimicrobial product protection, epoxy coat steel frame, (4) wedge connectors, NSF
MQ2448G MetroMax Q™ Shelf, 48"W x 24"D, open grid polymer with Microban® antimicrobial product protection, epoxy coat steel frame, (4) wedge connectors, NSF

ITEM 1.012  OPEN NUMBER

ITEM 1.013  WALL MOUNTED SHELVING
ADVANCE TABCO WS-12-36-16

Shelf, wall-mounted, 36"W x 12"D, 1-5/8" bullnose front edge, 1-1/2" rear up-turn, 16/304 satin finish stainless steel, NSF

KEC to verify mounting height with Owner

ITEM 1.014  WALL MOUNTED POT SHELVING
ADVANCE TABCO MODEL PS-12-36

Shelf with Pot Rack, wall-mounted, 36"W x 12"D, 18/430 stainless steel shelf, 2" x 1/4" stainless steel pot rack, includes: (6) plated double pot hooks

KEC to verify mounting height with Owner

ITEM 1.015  OPEN NUMBER

ITEM 1.016  TWO COMPARTMENT SINK
ADVANCE TABCO MODEL 94-62-36-36RL
Regaline Sink, 2-compartment, with left & right-hand drainboards, 24" front-to-back x 18"W sink compartment, 14" deep, with 11"H backsplash, stainless steel legs with welded front-to-rear & adjustable left-to-right cross rails, 36" drainboards, 1" adjustable feet, 14 gauge 304 series stainless steel, NSF

Welded set-up & shell crated
Turn down backsplash
Wall Bracket
Paint-on sound deadening under top
300 Series Legs, stainless steel, welded, assembly with S/S bullet feet
(2 ea) Sink Cover, 18" x 24", Poly-Vance™
Poly board holder, leg mounted
(2 ea) Support Bracket, for lever waste drain handle, (1) support required for each lever drain
T&S Brass B-0231-CR Faucet, 12" swing nozzle, 8" wall mount base, 1/2" NPT female Inlets, Ceramas cartridges
T&S Brass B-3970-01 (2 ea) Waste Valve, lever handle, 3-1/2" sink opening, 2" drain outlet with 1-1/2" adapter and overflow assembly (replaces B-3926-01)

ITEM 1.017  HAND SINK W/ FOOT PEDAL & SOAP/TOWEL
ADVANCE TABCO MODEL 7-PS-95

KEC PROVIDED, PLUMBER INSTALLED

Hand Sink, pedestal mounted base, 14" wide x 10" front-to-back x 5" deep bowl, 20 gauge 304 series stainless steel, splash mounted faucet, soap & paper towel dispenser, pedal valves with easy access design, basket drain, wall bracket, NSF, cCSAus

K-08 Low-flow aerator 0.5gpm, fits 55/64-27 male or 15/16-27 female thread on spout, conforms to California AB 1953

ITEM 1.018  WORK TABLE
ADVANCE TABCO MODEL KSS-3010

KEC PROVIDED, OWNER INSTALLED

Work Table, 120"W x 30"D, 14 gauge 304 series stainless steel top with 5"H backsplash, 18 gauge stainless steel adjustable undershell, stainless steel legs with stainless steel bullet feet, NSF
Model SHD-2015 Drawer, 20"W x 15"D x 5" deep drawer pan insert, heavy duty, self-closing, stainless steel, NSF

Upgrade table understructure to stainless steel
Wall Clips
Welded Set Up Table/Shell Crating
Reinforced understructure for undershelves
16 gauge 304 series stainless steel undershell upgrade
16 gauge 304 series stainless steel leg & bullet foot upgrade

ITEM 1.019  BUFFALO CHOPPER
HOBART 84145-1

NIKEC, EXISTING ITEM #TBD HARRISON RELOCATED
ITEM 1.020   OPEN NUMBER

ITEM 1.021   WALL MOUNTED POT SHELVING
ADVANCE TABCO PS-12-48

Shelf with Pot Rack, wall-mounted, 48"W x 12"D, 18/430 stainless steel shelf, 2" x 1/4" stainless steel pot rack, includes: (6) plated double pot hooks

KEC to verify mounting height with Owner

ITEM 1.022   WALL MOUNTED SHELVING
ADVANCE TABCO WS-12-48-16

Shelf, wall-mounted, 48"W x 12"D, 1-5/8" bullnose front edge, 1-1/2" rear up-turn, 16/304 satin finish stainless steel, NSF

KEC to verify mounting height with Owner

ITEM 1.023   20 QT MIXER
HOBART HL200-10STD

NIKEC, EXISTING ITEM #14 HARRISON RELOCATED

ITEM 1.024   EQUIPMENT STAND
ADVANCE TABCO AG-MP-30

KEC PROVIDED, OWNER INSTALLED

Mobile Equipment Stand, 30"W x 24"D x 28"H, counter top edge, corner bumper guards, push handle, (2) casters, stainless steel top, galvanized base, NSF

Welded Set Up Table/Shell Crating
16 gauge 304 series stainless steel undershelf upgrade
16 gauge 304 series stainless steel leg & bullet foot upgrade

ITEM 1.025   GREASE INTERCEPTOR
NIKEC, BY GC

ITEM 1.026   WORK TABLE
ADVANCE TABCO SS-369

KEC PROVIDED, OWNER INSTALLED

Work Table, 108"W x 36"D, 14 gauge 304 series stainless steel top, 18 gauge adjustable stainless steel undershelf, stainless steel legs & adjustable bullet feet, NSF

Welded Set Up Table/Shell Crating
16 gauge 304 series stainless steel undershelf upgrade
Reinforced understructure for undershelves
ITEM 1.027 FOOD PROCESSOR
NIKEC
NIKEC, EXISTING ITEM #20 HANNON RELOCATED

ITEM 1.028 POT RACK, CEILING MOUNT
ADVANCE TABCO SC-84
Pot Rack, ceiling hung, triple bar design, 84"W x 22"D, constructed of 1/4" x 2" stainless steel, includes: (18) plated double pot hooks & 24" plated hanging chains
KEC to verify mounting height with Owner

ITEM 1.029 WORK TABLE
ADVANCE TABCO KSS-308
KEC PROVIDED, OWNER INSTALLED
Work Table, 96"W x 30"D, 14 gauge 304 series stainless steel top with 5"H backsplash, 18 gauge stainless steel adjustable undershelf, stainless steel legs with stainless steel bullet feet, NSF
SHD-2015 Drawer, 20"W x 15"D x 5" deep drawer pan insert, heavy duty, self-closing, stainless steel, NSF
Upgrade table understructure to stainless steel
Wall Clips
Welded Set Up Table/Shell Crating
Reinforced understructure for undershelves
16 gauge 304 series stainless steel undershelf upgrade
16 gauge 304 series stainless steel leg & bullet foot upgrade

ITEM 1.030 OPEN NUMBER

ITEM 1.031 WORK TABLE W/ 20 X 20 PREP SINK
ADVANCE TABCO TKSS-306
Work Table, 30" wide top, with splash at rear only, 72" long, with stainless steel legs, side & rear stainless steel crossrails, 14 gauge 304 series stainless steel top, 5" backsplash, stainless steel bullet feet
16 gauge 304 series stainless steel leg & bullet foot upgrade
Upgrade table understructure to stainless steel
Welded Set Up Table/Shell Crating
Wall Clips
20" x 20 " Sink as indicated in drawing, welded Into table top, 12" deep bowl
Delete standard faucet
Support bracket, for lever waste drain handle
Sink cover, 20" x 20", stainless steel
Leg mounted storage bracket for 20" x 20" stainless steel sink cover
ITEM 1.032  WALL MOUNTED SHELVING
ADVANCE TABCO WS-12-36-16

Shelf, wall-mounted, 36"W x 12"D, 1-5/8" bullnose front edge, 1-1/2" rear up-turn, 16/304 satin finish stainless steel, NSF

KEC to verify mounting height with Owner

ITEM 1.033  WALL MOUNTED POT SHELVING
ADVANCE TABCO PS-12-36

Shelf with Pot Rack, wall-mounted, 36"W x 12"D, 18/430 stainless steel shelf, 2" x 1/4" stainless steel pot rack, includes: (6) plated double pot hooks

KEC to verify mounting height with Owner

ITEM 1.034  INGREDIENT BIN
CAMBRO IBS20148

OWNER PROVIDED, CONTRACTOR INSTALLED

Ingredient Bin, mobile, 21 gallon capacity, 3" casters, molded polyethylene with sliding cover, S-hook on front (scoop NOT included), (4) 3" heavy duty casters (2 front swivel, 2 fixed), with bin securely attached to base plate, white, NSF

ITEM 1.035  OPEN NUMBER

ITEM 1.036  60 QUART MIXER
HOBART S-601

KEC INSTALL, EXISTING ITEM #XX HARRISON RELOCATED

ITEM 1.037  ROLL-IN BLAST CHILLER/FREEZER
AMERICAN PANEL CORPORATION AP20BCF200-3

HurriChill™ Blast Chiller/Shock Freezer, Roll-in, self-contained, accepts (1) mobile rack that holds (20) 12" x 20" x 2.5" or (10) 18" x 26" pan capacity, 200 lbs. from 160° F to 38° F blast chill capacity/90 minutes, 120 lbs. 160° F to 0° F freeze capacity/240 minutes, solid-state electronic control panel with VFD display & alarms, (1) heated food probe, 208v/60/3, 19.5 amps, 2-1/2 HP, field wired, 30 amp circuit required, stainless steel interior & exterior, cUL (PAST MODELS: AP20BCF175-3)
UV lights option to be included.

**ITEM 1.038 WORK TABLE W/ 24 X 24 PREP SINK ADVANCE TABCO TSS-368**

Work Table, 36" wide top, without backsplash, 96" long, with stainless steel legs, side & rear stainless steel crossrails, 14 gauge 304 series stainless steel top, stainless steel bullet feet

16 gauge 304 series stainless steel leg & bullet foot upgrade
Upgrade table understructure to stainless steel
Welded Set Up Table/Shell Crating
24" x 24 " Sink as indicated in drawing, welded Into table top, 12" deep bowl
Sink cover, 24" x 24", stainless steel
Leg mounted storage bracket for 24" x 24" stainless steel sink cover
T&S Brass B-0221 Mixing Faucet, deck mount, 12" swing nozzle, 8" centers on deck faucet with 1/2" IPS eccentric flanged female inlets, lever handles
T&S Brass B-WH4 Wrist Action Handle
T&S Brass B-0425 Supply Nipple Unit, 1/2 x 2
T&S Brass B-3970-01 Waste Valve, lever handle, 3-1/2" sink opening, 2" drain outlet with 1-1/2" adapter and overflow assembly (replaces B-3926-01)

**ITEM 1.039 WORK TABLE ADVANCE TABCO SS-366**

KEC PROVIDED, OWNER INSTALLED

Work Table, 72"W x 36"D, 14 gauge 304 series stainless steel top, 18 gauge adjustable stainless steel undershelf, stainless steel legs & adjustable bullet feet, NSF

16 gauge 304 series stainless steel leg & bullet foot upgrade
Upgrade table understructure to stainless steel
Welded Set Up Table/Shell Crating
SHD-2015 (2 ea.)Drawer, 20"W x 15"D x 5" deep drawer pan insert, heavy duty, self-closing, stainless steel, NSF

**ITEM 1.040 OPEN NUMBER**

**ITEM 1.041 WORK TABLE W/ 24 X 24 PREP SINK ADVANCE TABCO TSS-369**

Work Table, 36" wide top, without backsplash, 108" long, with stainless steel legs, side & rear stainless steel crossrails, 14 gauge 304 series stainless steel top, stainless steel bullet feet

16 gauge 304 series stainless steel leg & bullet foot upgrade
Upgrade table understructure to stainless steel
Welded Set Up Table/Shell Crating
24" x 24 " Sink as indicated in drawing, welded Into table top, 12" deep bowl
Sink cover, 24" x 24", stainless steel
Leg mounted storage bracket for 24" x 24" stainless steel sink cover
T&S Brass B-0221 Mixing Faucet, deck mount, 12" swing nozzle, 8" centers on deck faucet with 1/2" IPS eccentric flanged female inlets, lever handles

MSU - New Dining Hall 100% CD Set
PPA #15-0103
11 40 00 - 25
FOODSERVICE EQUIPMENT
T&S Brass B-WH4 Wrist Action Handle
T&S Brass B-0425 Supply Nipple Unit, 1/2 x 2
T&S Brass B-3970-01 Waste Valve, lever handle, 3-1/2" sink opening, 2" drain outlet with 1-1/2" adapter and overflow assembly (replaces B-3926-01)

ITEM 1.042 WASTE CONTAINER
NIKEC, BY OWNER

ITEM 1.043 AUTOMATIC SLICER
NIKEC
NIKEC, EXISTING ITEM #20 HARRISON RELOCATED

ITEM 1.044 WORK TABLE
ADVANCE TABCO KSS-368
NIKEC, EXISTING ITEM #20 HARRISON

Work Table, 96"W x 36"D, 14 gauge 304 series stainless steel top with 5"H backsplash, 18 gauge stainless steel adjustable undershelf, stainless steel legs with stainless steel bullet feet, NSF

SHD-2015 Drawer, 20"W x 15"D x 5" deep drawer pan insert, heavy duty, self-closing, stainless steel, NSF
Upgrade table understructure to stainless steel
Wall Clips
Welded Set Up Table/Shell Crating
Reinforced understructure for undershelves
16 gauge 304 series stainless steel undershelf upgrade
16 gauge 304 series stainless steel leg & bullet foot upgrade

ITEM 1.045 OPEN NUMBER

ITEM 1.046 WALL MOUNTED SHELVING
ADVANCE TABCO WS-12-36-16

Shelf, wall-mounted, 36"W x 12"D, 1-5/8" bullnose front edge, 1-1/2” rear up-turn, 16/304 satin finish stainless steel, NSF

KEC to verify mounting height with Owner

ITEM 1.047 WALL MOUNTED POT SHELVING
ADVANCE TABCO PS-12-36

Shelf with Pot Rack, wall-mounted, 36"W x 12"D, 18/430 stainless steel shelf, 2" x 1/4" stainless steel pot rack, includes: (6) plated double pot hooks
KEC to verify mounting height with Owner

**ITEM 1.048** ROLL-IN REFRIGERATOR  
TRUE FOOD SERVICE EQUIPMENT STR1RR1-1S

SPEC SERIES® Roll-in Refrigerator, one-section, stainless steel front & sides, (1) stainless steel door with lock, cam-lift hinges, digital temperature control, stainless steel interior, incandescent interior lighting, stainless steel ramp, 1/3 HP, 9' cord, [accommodates 27"Wx29"Dx66"H cart, NOT included], cULus, NSF, MADE IN USA

Door hinged right standard

**ITEM 1.049** OPEN NUMBER

**ITEM 1.050** OPEN NUMBER

**ITEM 1.051** REACH-IN REFRIGERATOR MOBIL REACH-IN REFRIGERATOR  
TRUE FOOD SERVICE EQUIPMENT STA1R-2HS

SPEC SERIES® Refrigerator, Reach-in, one-section, stainless steel front & sides, (2) stainless steel half doors with locks, cam-lift hinges, digital temperature control, aluminum interior, (3) chrome shelves, LED interior lights, 5" castors, 1/3 HP, 9' cord, , cULus, UL EPH Classified, MADE IN USA

Door hinged right standard  
(3) chrome shelves and shelf supports standard per section  
5" castors, set of 4, standard

**ITEM 1.052** EXHAUST VENTILATOR- HOT PREP  
NIKEC

NIKEC, GC/MC PROVIDED, INSTALLED

**ITEM 1.053** FIRE EXTINGUISHING SYSTEM  
NIKEC

NIKEC, GC/MC PROVIDED, INSTALLED

**ITEM 1.054** S/S LOW WALL CAP  
NIKEC

NIKEC, GC PROVIDED, INSTALLED

**ITEM 1.055** OPEN NUMBER
ITEM 1.056  MOBILE DOUBLE CONVECTION OVEN  
VULCAN VC44GD

Convection Oven, gas, double-deck, standard depth, solid state controls, electronic spark ignition, 60 minute timer, 150° to 500°F temperature range, (5) oven racks per section, independently operated doors with windows, porcelain interior, stainless steel doors, front, top, sides & 8" legs

Gas manifold piping included with stacking kit to provide single point gas connection
Dormont 1675KITS48 Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 SnapFast® QD, 1 Swivel MAX®, 1 full port valve, 1 elbow, coiled restraining cable with hardware, 167,000 BTU/hr minimum flow capacity, limited lifetime warranty

ITEM 1.057  DOUBLE MOBILE COMBI OVEN/STEAMER, STACKED  
RATIONAL B628106.43

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

(SCC 62 E 480V) SelfCooking Center® Combi Oven/Steamer, electric, (6) 18" x 26" full size sheet or (12) 12" x 20" full size hotel pan capacity, iCookingControl with 7 modes, HiDensityControl®, iLevelControl, Efficient CareControl, Combi-Steamer with 3 modes, core temp probe with 6 point measurement, hand shower with automatic retracting system, (3) grid shelves, ethernet interface, 480v/60/3-ph, 31.5 amps, 22.1 kW (dual voltage: retrofitable to 440v/60/3-ph, 29.0 amps, 22.1 kW) ENERGY STAR®

(SCC 62 E 480V) SelfCooking Center® Combi Oven/Steamer, electric, (6) 18" x 26" full size sheet or (12) 12" x 20" full size hotel pan capacity, iCookingControl with 7 modes, HiDensityControl®, iLevelControl, Efficient CareControl, Combi-Steamer with 3 modes, core temp probe with 6 point measurement, hand shower with automatic retracting system, (3) grid shelves, ethernet interface, 480v/60/3-ph, 31.5 amps, 22.1 kW (dual voltage: retrofitable to 440v/60/3-ph, 29.0 amps, 22.1 kW) ENERGY STAR®

60.71.933 Combi-Duo Stacking Kit, Mobile, casters, for electric or gas SCC WE 62 or CM P 62 stacked on electric SCC WE 62, SCC WE 102, CM P 62, or CM P 102

Doors hinged on right std.

Dormont W50B2Q48 (4 ea.) Dormont Hi-PSI® Water Connector Hose, 1/2" dia., 48" long, covered with stainless steel braid, brass two-way Quick Disconnect coupling.

ITEM 1.058  SINGLE MOBILE COMBI OVEN/STEAMER  
RATIONAL SCC WE 102 E 480V

NIKEC, EXISTING ITEM #TBD HANNON RELOCATED

(SCC WE 102 E 480V) SelfCooking Center® 5 Senses Combi Oven/Steamer - RELOCATED Dormont Model W50B2Q48 (2 ea.) NEW Dormont Hi-PSI® Water Connector Hose, 1/2" dia., 48" long, covered with stainless steel braid, brass two-way Quick Disconnect coupling, limited lifetime warranty

ITEM 1.059  OPEN NUMBER

ITEM 1.060  OPEN NUMBER
ITEM 1.061 FILTER SYSTEM, COMBI STEAMER
EVERPURE EV979722

KleenSteam® II Twin System, total system for boiler base steamers, 5.0 gpm flow rate, deliming (2) 7CB5 carbon filter, SS-10 scale inhibitor Cartridge, dip tube, pressure gauge, water shut-off valve & wall bracket

ITEM 1.062 72" COUNTER GRIDDLE
KEATING 72X30FT-G

Miraclean® Griddle, gas, 72" W x 24" D cooking surface, 3/4" thick chrome finished griddle plate, front grease trough, (3) zoned millivolt thermostatic heat controls, stainless steel front sides & back, 180,000 BTU, cETLus, ETL-Sanitation, NSF®

Dormont 1675KITS48 Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 SnapFast® QD, 1 Swivel MAX®, 1 full port valve, 1 elbow, coiled restraining cable with hardware, 167,000 BTU/hr minimum flow capacity, limited lifetime warranty

ITEM 1.063 MOBILE REFRIGERATED BASE
TRUE FOOD SERVICE EQUIPMENT TRCB-72

Refrigerated Chef Base, 72-3/8"L base, one-piece 300 series 18 gauge stainless steel top with V edge, stainless steel front/sides, aluminum back, aluminum interior with stainless steel floor, (4) drawers [accommodates (2) 12"x20"x4" pans, NOT included], 4" castors, 1/3 HP, 7’ cord, cULus, NSF, CE, MADE IN USA

ITEM 1.064 - MOBILE WORK TABLE
ADVANCE TABCO KSS-363

KEC PROVIDED, OWNER INSTALLED

Work Table, 36"W x 36"D, 14 gauge 304 series stainless steel top with 5"H backsplash, 18 gauge stainless steel adjustable undershelf, stainless steel legs with stainless steel bullet feet, NSF

TA-25S-6 Casters, 5" diameter, set of 6 (2 with brakes) with stainless steel legs for standard working height of 35-1/2"

TA-25B Brakes, on all casters
Welded Set Up Table/Shell Crating
Reinforced understructure for undershelves
16 gauge 304 series stainless steel undershelf upgrade
16 gauge 304 series stainless steel leg & bullet foot upgrade

ITEM 1.065 OPEN NUMBER

ITEM 1.066 EXHAUST VENTILATOR- HOT PREP
NIKEC

NIKEC, GC/MC PROVIDED, INSTALLED
ITEM 1.067  FIRE EXTINGUISHING SYSTEM
NIKEC

NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 1.068  (6) BURNER RANGE
VULCAN MODEL V6B36C

V Series Heavy Duty Range, gas, 36", (6) 33,000 BTU open burners, cast iron grates, convection oven, stainless steel front, front top ledge, sides, base, burner box & stub back, 6" adjustable legs, 230,000 BTU, CSA, NSF
1-1/4" rear gas connection, with accessory pressure regulator
Rear gas connection: cap and cover, both ends
V36SFL Single-deck flow-thru hi-shelf, non-overlapping, 36"
CASTERS RR4 Casters (set of 4)

ITEM 1.069  OPEN NUMBER

ITEM 1.070  OPEN NUMBER

ITEM 1.071  20 QT. TILT COUNTER KETTLE
GROEN TDH-20

Kettle, gas, table top, 20-quart capacity, 2/3 jacket, 304 stainless steel liner, hand tilt, support console on right, stainless steel construction, 50 PSI, 0 - 2000' elevation, 31,000 BTU, NSF, ASME, CSA
139805 Cover and Holder, for 20, 24, 40 & 48 quart table top kettle

ITEM 1.071B  EQUIPMENT STAND FOR DRAIN CART
GROEN TS/9S-2

Support Stand, for TD/FPC

ITEM 1.071C  DRAIN CART
GROEN 174311

Drain Cart, for all table top kettles stands

ITEM 1.072  40 GAL TILTING KETTLE
GROEN DH-40

Tilting Kettle, gas, 40-gallon capacity, crank tilt, 2/3 jacket, 316 stainless steel liner, floor mounted control console supports, stainless steel construction, bullet feet, electronic ignition, 50 PSI, 0 - 2000' elevation, 100,000 BTU
2” Tangent draw-off (TDO)
104278 Brush Set, 2”, includes drain valve brush & paddle, for 2” TDO
159143 Hinged Cover Kit (no. 41), for 40 gallon tilting kettle, factory installed
N60346 Faucet, double pantry, with spray hose, 60”, for table top & floor model kettles

ITEM 1.072B  40 GAL TILTING KETTLE
GROEN DH-40

Tilting Kettle, gas, 40-gallon capacity, crank tilt, 2/3 jacket, 316 stainless steel liner, floor mounted control console supports, stainless steel construction, bullet feet, electronic ignition, 50 PSI, 0 - 2000’ elevation, 100,000 BTU

159143 Hinged Cover Kit (no. 41), for 40 gallon tilting kettle, factory installed

ITEM 1.072C  40 GAL TILTING KETTLE
GROEN DH-40

Tilting Kettle, gas, 40-gallon capacity, crank tilt, 2/3 jacket, 316 stainless steel liner, floor mounted control console supports, stainless steel construction, bullet feet, electronic ignition, 50 PSI, 0 - 2000’ elevation, 100,000 BTU

159143 Hinged Cover Kit (no. 41), for 40 gallon tilting kettle, factory installed

N60346 Faucet, double pantry, with spray hose, 60”, for table top & floor model kettles

ITEM 1.073  FLOOR TROUGH
ADVANCE TABCO FFTG-1824
NIKEC

PLUMBER PROVIDED, PLUMBER INSTALLED

Floor Trough, 18"W, 24"L, 4"D, with fiberglass grating, stainless steel removable strainer basket, 4" O.D. waste pipe 3"L, pitched towards waste
Model FT-1 Anti-Splash Guard, factory installed.

ITEM 1.074  WORK TABLE W/ 24 X 24 PREP SINK
ADVANCE TABCO TSS-368

Work Table, 36" wide top, without backsplash, 96" long, with stainless steel legs, side & rear stainless steel crossrails, 14 gauge 304 series stainless steel top, stainless steel bullet feet

16 gauge 304 series stainless steel leg & bullet foot upgrade
Upgrade table understructure to stainless steel
Welded Set Up Table/Shell Crating
24" x 24 " Sink as indicated in drawing, welded Into table top, 12" deep bowl
Sink cover, 24" x 24", stainless steel
Leg mounted storage bracket for 24" x 24" stainless steel sink cover
T&S Brass B-0221 Mixing Faucet, deck mount, 12" swing nozzle, 8" centers on deck faucet with 1/2" IPS eccentric flanged female inlets, lever handles
T&S Brass B-WH4 Wrist Action Handle
T&S Brass B-0425 Supply Nipple Unit, 1/2 x 2
T&S Brass B-3970-01 Waste Valve, lever handle, 3-1/2" sink opening, 2" drain outlet with 1-1/2" adapter and overflow assembly (replaces B-3926-01)

ITEM 1.075  OPEN NUMBER

ITEM 1.076  WORK TABLE
ADVANCE TABCO MODEL SS-368

KEC PROVIDED, OWNER INSTALLED

Work Table, 196"W x 36"D, 14 gauge 304 series stainless steel top, 18 gauge adjustable stainless steel undershelf, stainless steel legs & adjustable bullet feet, NSF

Welded Set Up Table/Shell Crating
16 gauge 304 series stainless steel undershelf upgrade
Reinforced understructure for undershelves
16 gauge 304 series stainless steel leg & bullet foot upgrade

ITEM 1.077  POT RACK, CEILING MOUNT
ADVANCE TABCO SC-72

Pot Rack, ceiling hung, triple bar design, 72"W x 22"D, constructed of 1/4" x 2" stainless steel, includes:
(18) plated double pot hooks & 24" plated hanging chains

KEC to verify mounting height with Owner

ITEM 1.078  OPEN NUMBER

ITEM 1.079  OPEN NUMBER

ITEM 1.080  OPEN NUMBER

ITEM 1.081  OPEN NUMBER

ITEM 1.082  OPEN NUMBER

ITEM 1.083  MOBILE WARMING & HOLDING CABINET
ALTO-SHAAM 1200-UP

KEC PROVIDED, OWNER INSTALLED

Halo Heat® Holding Cabinet, double compartment, on/off simple control with adjustable thermostats, indicator light, (2) sets of chrome plated universal side rails, (4) sets of pan slides, (16) 20" x 12" x 2-1/2" full size pan capacity, heavy duty 20 gauge stainless steel exterior, 5" casters; 2 rigid, 2 swivel with brakes, EcoSmart®, cULus, UL EPH ANSI/NSF 4, CE, IP X4, TUV NORD, EAC
Solid door, hinged on right, standard 5012932 Bumper, full perimeter.

**ITEM 1.084**  MOBILE WARMING & HOLDING CABINET
NIKEC
NIKEC, EXISTING ITEM #48 HARRISON RELOCATED

**ITEM 1.085**  OPEN NUMBER

**ITEM 1.086**  DRY STORAGE SHELVING
NIKEC, BY OWNER

**ITEM 1.087**  CAN RACK, FIRST IN-FIRST OUT
CHANNEL MANUFACTURING CSR-156
KEC PROVIDED, OWNER INSTALLED
First In, First Out Can Rack, 82"H, stationary, inclined angle can slides, front loading, holds (156) #10 cans, front edge turned up, welded aluminum construction, NSF

**ITEM 1.088**  OPEN NUMBER

**ITEM 1.089**  OPEN NUMBER

**ITEM 1.090**  OPEN NUMBER

**ITEM 1.091**  DUNNAGE RACK
METRO HP2236PD
NIKEC, EXISTING ITEM #10 HARRISON RELOCATED
Dunnage Rack

**ITEM 1.092**  HIGH DENSITY SHELVING
METRO MAX Q SERIES
Complete high density storage shelving system length and width as indicated in plan with (4) shelves per section, comprised of the following components:
MQTTE18 MetroMax Q™ Top-Track Stationary End Unit Kit, 18"W, includes: hardware necessary for
connecting stationary end units to track (shelves sold separately), includes: (8) epoxy coated steel posts
TTS15NA Super Erecta®, MetroMax Q™ Top-Track Track Set, 15’ L, includes: necessary sections of
track for assembling track runs (only (1) track set is required between stationary units)
FPS15N High-Density Top-Track Floor Pad Protectors, 15 foot length, use for both MetroMax Q™
Top-Track & Super Erecta® Top-Track Systems
MQTTM18S MetroMax Q™ Top-Track Mobile Unit Kit, 18"W, includes: corrosion proof rigid casters,
caster channels, bumpers & roller assemblies (shelves sold separately), includes: (4) MQ74UPE epoxy
coated steel posts
MQ1848G MetroMax Q™ Shelf, 48"W x 18"D, open grid polymer with Microban® antimicrobial product
protection, epoxy coat steel frame, (4) wedge connectors, NSF

ITEM 1.093 FLOOR TROUGH
ADVANCE TABCO FTG-1272
NIKEC

PLUMBER PROVIDED, PLUMBER INSTALLED

Floor Trough, 12"W, 72"L, 4"D, 14 gauge 304 series stainless steel, includes stainless steel subway
grating constructed from 3/16" x 1" bars, removable stainless steel strainer basket, 4" O.D. waste pipe
3"L, pitched towards waste

ITEM 1.094 ICE TRANSPORT SYSTEM BIN WITH CARTS
FOLLETT CORPORATION DEV2250SG-72-75

Ice-Device™ with SmartCART™ 75, double chuted, elevated bin, 2250 lb. total bin storage, cube or
Chewblet ice only, includes (2) carts, (6) ice Totes, Tote capacity 25 lb. each, paddle, rake, poly liner,
SmartGATE™, poly lift door with PowerHinge, stainless steel exterior base, custom cut top

Model ICS125L Additional Cambro Ice Cart, 125 lb capacity, mobile, insulated, polyethylene, slide back
lid, NSF
Model 00146365 Saf-T-Ice® Guardian Scoop System, 64 oz.

ITEM 1.095 WALK-IN REFRIGERATOR/ FREEZER COMPLEX
AMERICAN PANEL CORPORATION CUSTOM/NSF

WALK-IN REFRIGERATOR/ FREEZER COMPLEX

Unit shall be modular panel NSF No 7 construction

Two (2) compartment unit, sized & shaped as shown on plan and described in American Panel Quote
164139b

Unit shall be provided with integral built-in internal panelized insulated structural floor system with internal
ramp to sit on top of architectural slab. KEC to verify slab finish conditions and coordinate appropriately.

Exterior Finishes:
Exposed Exterior (except ceiling): 22 ga. embossed stainless steel
Ceiling & Unexposed Exterior: 26 ga. embossed Galvalume

Interior Finishes:
.032 gauge embossed aluminum pre-painted white ceiling
26 ga. embossed Galvalume pre-painted white interior walls

Two (2) 36" X 78" door, hinged as shown on plan with 26 ga embossed galvanized pre-painted white frame and plug. Door to be provided with third hinge, automatic door closure with 1248 Kason spring hinges and 14" X 24" viewport with heated frame and glass.

Provide CCI Industries SS3678-AQ Clear Vu flexible swinging air curtain door, for 36" exterior entry door, 36" wide X 78" high, clear .08 PVC, with gravity hinge, easy in and out access, auto-close feature, for everyday traffic.

Three (3) ceiling mounted 48" LED light fixtures.

Walk-in provided under this portion of the specifications shall be prefabricated of modular design and construction. They shall be designed to allow convenience and accurate field assembly and future enlargement by the addition of panels.

Standard 4" thick wall & ceiling panels shall be 11½", 23", 34½" and 46" in width and shall be interchangeable with like panels. Corner panels shall be 90° angles with actual 12" exterior horizontal measurements. Custom width panels shall be incorporated when required to meet floor plan requirements as indicated in contract foodservice drawings.

Panels shall consist of foamed-in-place urethane insulation, sandwiched between interior and exterior metal surfaces, which have been die-formed and gauged for uniformity in size.

Edges of panels shall be foamed-in-place “tongue and groove” with Posi-Loc locking assemblies foamed-in-place at time of fabrication.

Insulation shall have a 97% closed cell structure, average in-place density of 2.2 lbs. per cubic foot. Overall thickness shall be four inches. Fire hazard classification according to ASTME-84 (UL 723) and is certified with UL label.

Assembly of walk-ins shall be accomplished by “Posi-Loc” locking assemblies, which shall be foamed-in-place and activated by a hex wrench provided by the manufacturer. Access ports shall be on interior to allow assembly of walk-in from the inside and shall be covered by snap caps.

Flexible vinyl gaskets shall be foamed-in-place on the interior and exterior edge of the “tongue” rail. Gaskets shall be impervious to stains, greases, oils and mildew.

Provide, where shown, 36" X 78" clear opening entrance door(s). All doors shall have three hinges. The door shall be flush type, finished in and out, to match the wall in which it is located. Door and door section shall be listed by Underwriters Laboratories and equipped with the following:

Magnetic gasket, Posi-Seal door closure, brushed chrome latch and strap-type, cam-lift hinges. Hardware shall have provisions for locking and a safety release to prevent entrapment of personnel within the box.

Door jamb and door perimeter shall be made of Fiberglass Reinforced Plastic.

Each entrance door section shall be provided with an LED vapor-proof light, pilot light switch and conduit between switch box and outlet box. Concealed wiring shall be standard on each entrance door section.

A digital thermometer shall be included with each door section to indicate inside temperature.
All walk-ins shall be fabricated to comply with National Sanitation Foundation Standard No. 7. The NSF label shall be affixed to the interior door pan. Interior corners and floor shall be coved to meet NSF specifications.

A complete set of installation instructions shall be included with the walk-in. These instructions shall cover the erection and assembly of the walk-in and the installation of refrigeration systems. A floor print shall be included.

Walk-In doors shall be provided with deadbolt lock. Lock mechanism shall be located on interior of door with key access on exterior. Inside safety release shall be provided.

Provide, as required, spring hinge to assist in closing the door. It shall be of a torsion-compression design.

Provide .080” aluminum diamond treadplate kickplate on interior & exterior of all doors. Kickplate to be 36” high by the width of the door. Provide vinyl bumper rails at 24” and 48” above finished floor on all exposed exterior walls.

Provide 4” pressure relief vent for freezer compartment.

Furnish removable closure panels to enclose the area between the building and the walk-in ceilings. Panels to be fabricated of same material as walk-in exposed exterior.

Furnish trim strips between walk-in and building walls where applicable. Constructed and finished of same material as exposed exterior of walk-in.

Furnish two (2) Modularm 75LC temperature alarms (or equal) with light manager, completely solid state, digital readout of monitored temperature in degrees F., field adjustable built-in test circuitry, built-in battery and charger circuitry for power failure notification, safe and alarm lights provide constant visual states of monitored area. Built-in A/O + N/C dry contacts for remote notification, fail save circuitry design prevents accidental disabling, automatic multi-point scanning of our temperature probe locations.

Walk-In shall be fabricated to hold a temperature of +35˚F in refrigerated sections, and -10˚F in the freezer section.

KEC to verify all dimensions in field to accommodate installation of unit prior to fabrication.

ITEM 1.096  ICE MAKER, WATER COOLED
MANITOWOC ID-1203W

Indigo™ Series Ice Maker, cube-style, water-cooled, self-contained condenser, 30"W x 24-1/2"D x 29-1/2"H, up to 1165-lb approximately/24 hours, DuraTech™ exterior (stainless finish with innovative clear-coat resists fingerprints & dirt), dice size cubes

Connect condenser inlet/out to buildings chilled water loop

ITEM 1.097  FILTER SYSTEM, ICE MAKER
EVERPURE EV932504

INSURICE Quad i40002 System, 48,000 gallon capacity, 6.7 gpm flow rate, 0.5-micron precoat filtration (4) i40002 Cartridges, with self-contained scale inhibitor feed, pressure gauge, flushing valve
ITEM 1.098  EVAPORATOR COIL, +35F
RDT ADT-065

EVAPORATOR COIL, +35F

Evaporator coil shall be a pre-engineered and factory assembled unit. Furnish & install unit as shown on plans & per RDT Quote 19466.

Coil shall be hung flush against the underside of walk-in ceiling and seal perimeter as required by code.

KEC shall verify location of water cooled Remote Condensing Unit specified under Item 1.005 & interconnect with evaporator coil as required

Line run shall be verified by KEC

KEC shall coordinate with Manufacturer to ensure that system is installed complete with all necessary components and accessories, allowing system to operate at +35°F

ITEM 1.099  EVAPORATOR COIL, -10F
RDT LET-0650

EVAPORATOR COIL, -10F

Evaporator coil shall be a pre-engineered and factory assembled unit. Furnish & install unit as shown on plans & per RDT Quote 19466.

Coil shall be hung flush against the underside of walk-in ceiling and seal perimeter as required by code

KEC shall verify location of water cooled Remote Condensing Unit specified under Item 1.005 & interconnect with evaporator coil as required

Line run shall be verified by KEC

KEC shall coordinate with RDT to ensure that system is installed complete with all necessary components and accessories, allowing system to operate at -10°F.

Wrap drain line with heater cable and insulate.

Drain line and heating cable shall be installed for continuous operation

ITEM 1.100  OPEN NUMBER

ITEM 1.101  HAND SINK W/ FOOT PEDAL & SOAP/TOWEL
ADVANCE TABCO 7-PS-95

KEC PROVIDED, PLUMBER INSTALLED

Hand Sink, pedestal mounted base, 14" wide x 10" front-to-back x 5" deep bowl, 20 gauge 304 series stainless steel, splash mounted faucet, soap & paper towel dispenser, pedal valves with easy access design, basket drain, wall bracket, NSF, cCSAus
K-08 Low-flow aerator 0.5gpm, fits 55/64-27 male or 15/16-27 female thread on spout, conforms to California AB 1953

**ITEM 1.102  PRE RINSE SPRAY STATION**
**T&S BRASS B-0133-B**

KEC PROVIDED, PLUMBER INSTALLED

EasyInstall Pre-Rinse Unit, wall mount. base faucet with spring check cart. & lever handles, 2" diameter flanges with 1/2" NPT female eccentric flanged inlets, 35-1/2"H, 15" overhang, 8-1/4" clearance, 18" riser, B-0107 spray valve, B-0044-H flex stainless steel hose, 6" wall bracket

**ITEM 1.103  DISPOSER**
**SALVAJOR 300-CA-ARSS**

KEC PROVIDED, PLUMBER INSTALLED

Disposer, with cone assembly , 3-HP motor, single support leg, auto reversing magnetic, with start/stop push button, drain/flush/time delay, energy/water saving switch, rubber scrap ring, vacuum breaker, solenoid with flow control & fixed nozzle, 6-1/2" inlet diameter, heat treated aluminum alloy housing, single support leg, UL, CSA, CE

15" Cone with nozzle
DP Stainless steel dejamming prong

**ITEM 1.104  POT SINK**
**ADVANCE TABCO 94-83-60-36RL**

Custom Ell shaped Regaline Sink, 3-compartment, with custom length left drainboard & right-hand custom length dish table drainboard, (2) 28" front-to-back x 24"W sink compartments, (1) 28" front-to-back x 30"W sink compartment, 14" deep, with 11"H backsplash, stainless steel legs with welded front-to-rear & adjustable left-to-right cross rails, custom length drainboards, 1" adjustable bullet feet, 14 gauge 304 series stainless steel, overall

Ell shaped pot sink/dish table with integral (3) compartment sink, shared clean drain board with 48" tubular dishrack undershelf and soiled drain board with disposer and cone. 10-1/2"H backsplash, stainless steel legs with crossrails front to back, 14/304 series stainless steel

Size and shape as shown per plan.

2 service faucets (specified below) located at sinks as shown. Pot wash bowls to be provided with overflow waste valves (specified below) and lever waste handle support brackets. Soiled dish table approximately 6'-1" long with provision for splash mounted pre-rinse faucet (specified separately), item 1.103 disposer and cone assembly with cone weldment, vacuum breaker holes and control panel mounting bracket.

Welded set-up & shell crated
Turn down backsplash
Wall Bracket
Paint-on sound deadening under top
300 Series Legs, stainless steel, welded, assembly with S/S bullet feet
Support Bracket, for lever waste drain handle, (1) support required for each lever drain

T&S Brass B-0231-CR (2 ea) Faucet, 12" swing nozzle, 8" wall mount base, 1/2" NPT female Inlets, Ceramas cartridges
T&S Brass B-WH4 (4 ea) Wrist Action Handle
T&S Brass B-1100-K (2ea) Installation Kit, for workboard wall mount faucets, (2) short EL's
T&S Brass B-3970-01 (3 ea) Waste Valve, lever handle, 3-1/2" sink opening, 2" drain outlet with 1-1/2" adapter and overflow assembly

ITEM 1.105  OPEN NUMBER

ITEM 1.106 -  WALL MOUNTED SHELVING
ADVANCE TABCO WS-12-48-16

Shelf, wall-mounted, 48"W x 12"D, 1-5/8" bullnose front edge, 1-1/2" rear up-turn, 16/304 satin finish stainless steel, NSF

KEC to verify mounting height with Owner

ITEM 1.107  OPEN NUMBER

ITEM 1.108  CLEAN DISH TABLE
FABRICATED CUSTOM/NSF

CLEAN DISH TABLE

Included as a component of Pot Sink, Item 1.104

ITEM 1.109  EXHAUST VENTILATOR- POT WASH- TYPE II
NIKEC

NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 1.110  OPEN NUMBER

ITEM 1.111  OPEN NUMBER

ITEM 1.112  POT WASHER W/ BOOSTER HTR.
CHAMPION PP-28

Pot & Pan Washer, rack type, 25 rack/hour capacity, auto-fill, door safety switch, upper/lower rotating spray arms, front & side panels, stainless steel construction, 6" vent connection, UL, CSA, NSF

Factory authorized performance test included.
Straight-through operation
Electric tank heat with thermostat & low water cut-off, standard
70 degree rise electric booster heater (externally mounted with cover on corner models)
Water pressure regulating valve
Drain water tempering kit, factory mounted.

**ITEM 1.113  DISPOSER**
**SALVAJOR 300-CA-ARSS**

KEC PROVIDED, PLUMBER INSTALLED

Disposer, with cone assembly, 3-HP motor, single support leg, auto reversing magnetic, with start/stop push button, drain/flush/time delay, energy/water saving switch, rubber scrap ring, vacuum breaker, solenoid with flow control & fixed nozzle, 6-1/2" inlet diameter, heat treated aluminum alloy housing, single support leg, UL, CSA, CE

15" Cone with nozzle

**ITEM 1.114  PRE RINSE SPRAY STATION**
**T&S BRASS B-0133-B**

KEC PROVIDED, PLUMBER INSTALLED

EasyInstall Pre-Rinse Unit, wall mount. base faucet with spring check cart. & lever handles, 2" diameter flanges with 1/2" NPT female eccentric flanged inlets, 35-1/2"H, 15" overhang, 8-1/4" clearance, 18" riser, B-0107 spray valve, B-0044-H flex stainless steel hose, 6" wall bracket

**ITEM 1.115  SOILED DISH TABLE W/ SOAK SINK**
**FABRICATED CUSTOM**

SOILED DISH TABLE W/ SOAK SINK

DT(X) SERIES corner soiled dish table 10-1/2"H backsplash, stainless steel legs with crossrails front to back, 14/304 series stainless steel

Size and shape as shown per plan.

Corner dish table consisting of the following components from left to right entering pot washer:

**LONG PORTION OF L:**
Soiled dish table with open drain board followed by disposer w/ cone weldment and pre-rinse faucet, (specified separately). Corner located integral welded pre-soak sink 14" deep, 24" wide, 30" long with overflow lever waste (specified below) and fill faucet (specified below).

**SHORT PORTION OF L:**
Pot machine entry table with scrap trough as shown and 30" tubular under shelf for pot washer racks.

T&S Brass B-0231-CR Faucet, 12" swing nozzle, 8" wall mount base, 1/2" NPT female Inlets
Ceramas cartridges
T&S Brass B-WH4 (2 ea) Wrist Action Handle
T&S Brass B-1100-K Installation Kit, for workboard wall mount faucets, (2) short EL's
T&S Brass Model B-3970-01 Waste Valve, lever handle, 3-1/2" sink opening, 2" drain outlet with 1-1/2" adapter and overflow assembly
ITEM 1.116  OPEN NUMBER

ITEM 1.117  OPEN NUMBER

ITEM 1.118  OPEN NUMBER

ITEM 1.119  MOBILE SHELVING UNIT
NIKEC, BY OWNER

ITEM 1.120  OPEN NUMBER

ITEM 1.201  TRAY CONVEYOR
CADDY CUSTOM FABRICATION

TRAY ACCUMULATOR/ CONVEYOR

Size and shape per plan. Specification supplemented by and based on Caddy drawing / quote DQ-1-20133 Revision A

STA-R-40 accumulator , 19'-5 15/16" LONG X 5'-3" wide with inserts for trayless operation, window buck and sill: sight and sound baffle and pan under at tray drop.

BV-10 bussing conveyor, 31'-4" Long with one turn.

Soiled dish table, 14'-5 1/8"long with scrapping trough and (2) pre rinse stations.

T-101 Silver soak sinks (2 ea.)

ITEM 1.202  PASS THROUGH WINDOW LEDGE
CADDY CUSTOM FABRICATION

PASS THROUGH WINDOW LEDGE

Included 1.201

ITEM 1.203  SIGHT AND SOUND BAFFLE
CADDY CUSTOM FABRICATION

SIGHT AND SOUND BAFFLE

Included 1.201
ITEM 1.204  PRE RINSE
            CADDY CUSTOM FABRICATION

PRE RINSE
Included 1.201

ITEM 1.205  FLOOR TROUGH
            ADVANCE TABCO  FFTG-1236

PLUMBER PROVIDED, PLUMBER INSTALLED

Floor Trough, 12"W, 36"L, 4"D, with fiberglass grating, stainless steel removable strainer basket, 4" O.D. waste pipe 3"L, pitched towards waste

ITEM 1.206  SILVER SOAK SINK
            CADDY CUSTOM FABRICATION

Silver Soak Sink
Included 1.201

ITEM 1.207  DISPOSER
            SALVAJOR 500-SA-6-ARSS

KEC PROVIDED, PLUMBER INSTALLED

Disposer, Sink Assembly, 6-1/2" sink collar, 5 Hp motor, start/stop push button, drain/flush/time delay, automatic reversing & water saving ARSS control, includes fixed nozzle, vacuum breaker, solenoid valve, sink stopper & flow control, heat treated aluminum alloy housing, single support leg, UL, CSA, CE

ITEM 1.208  GARBAGE CAN, 32 GAL
            NIKEC, BY OWNER

ITEM 1.209  OPEN NUMBER

ITEM 1.210  OPEN NUMBER

ITEM 1.211  FLIGHT TYPE BELT CONVEYOR WAREWASHER
            MEIKO M-IQ B-S74 N02 P8 ELECTRIC

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

REFERENCE MEIKO DRAWING #M01-G98315 A

Flight Type Rackless Conveyor Dishwasher, high temperature sanitizing with built-in booster, multiple tank configuration. 2-tank without prewash, water consumption 56.8 gallons/hour, 7,496
dishes/hour, 29-1/2" wide conveyor belt, wash, power rinse, pumped final rinse, blower dryer, contact-plus zone between wash and power rinse tanks to minimize soil carryover, steam coil or electric tank and booster heat, fully automatic operation, double-wall insulated stainless steel construction, connection for external vent fan control, level conveyor belt throughout full length of machine. M-Filter active tank water filtration with active tank level management, 3-stage variable output built-in booster heater, Waste Air Heat Recovery System. Single point vent at cool end of machine, intuitive cleaning features, glass touch-screen controls with selectable languages, configurable based on requirements, includes installation supervision, commissioning & training by MEIKO field engineer, NSF, cETLus, ENERGY STAR®

LEFT-TO-RIGHT
LOAD SECTION: 1200mm
UN-LOAD SECTION: 200mm
OVERALL LENGTH - 5800mm 19’ 3/8"

1 ea Startup + Performance & Installation inspection which activates 1 year standard warranty.

ITEM 1.212  EXHAUST VENTILATOR- FLIGHT- TYPE II
NIKEC

NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 1.213  FLOOR TROUGH
ADVANCE TABCO FFTG-1260

PLUMBER PROVIDED, PLUMBER INSTALLED

Floor Trough, 12"W, 60"L, 4"D, with fiberglass grating, stainless steel removable strainer basket, 4" O.D. waste pipe 3"L, pitched towards waste

ITEM 1.214  RACK DOLLY
NIKEC, BY OWNER

ITEM 1.215  OPEN NUMBER

ITEM 1.216  DISH DOLLY
NIKEC, BY OWNER

ITEM 1.217  OPEN NUMBER

ITEM 1.218  MOBILE UTILITY CART
NIKEC, BY OWNER

MSU - New Dining Hall 100% CD Set
PPA #15-0103
FOODSERVICE EQUIPMENT
ITEM 1.219  OPEN NUMBER

ITEM 1.220  OPEN NUMBER

ITEM 1.221  HOSE REEL
  COMPONENT HARDWARE KHR-1439-01
  KEC PROVIDED, PLUMBER INSTALLED
  Encore® Hose Reel, 50 ft. hose, open stainless steel reel assembly, continuous pressure vacuum breaker with integral check valve, 8” OC (203mm) wall mounted faucet with lever handles, control valve in riser, 3/8” NPT X 36” flexible water connector to hose reel

ITEM 1.222  MOBILE SHELVING UNIT
  NIKEC, BY OWNER

ITEM 1.223  HAND SINK W/ FOOT PEDAL & SOAP/TOWEL
  ADVANCE TABCO 7-PS-95
  KEC PROVIDED, PLUMBER INSTALLED
  Hand Sink, pedestal mounted base, 14” wide x 10” front-to-back x 5” deep bowl, 20 gauge 304 series stainless steel, splash mounted faucet, soap & paper towel dispenser, pedal valves with easy access design, basket drain, wall bracket, NSF, cCSAus
  K-08 Low-flow aerator 0.5gpm, fits 55/64-27 male or 15/16-27 female thread on spout, conforms to California AB 1953

ITEM 1.224  EYE WASH STATION
  T&S BRASS EW-7360B
  KEC PROVIDED, PLUMBER INSTALLED
  Eyewash Unit, wall mount

ITEM 2.101  WOK / STIR-FRY COUNTER
  NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.102  DROP-IN UTILITY SINK
  ADVANCE TABCO DI-1-208
  KEC PROVIDED, PLUMBER INSTALLED
Drop-In Sink, 1-compartment, 20” wide x 16” front-to-back x 8” deep bowl, 18 gauge 304 series stainless steel, with deck mounted 8” swing spout faucet, basket drain, NSF

K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink faucet (1 pair hot & cold 4” long Blades

**ITEM 2.103 MOBILE UNDERCOUNTER REFRIGERATOR**
TRUE FOOD SERVICE EQUIPMENT TUC-48-LP-HC

Low Profile Undercounter Refrigerator, 33-38° F, (4) shelves, stainless steel top & sides, clear coated aluminum interior with stainless steel floor, (2) stainless steel doors, 1-1/2” diameter dual wheel castors, 31-7/8” counter height, front breathing, R290 Hydrocarbon refrigerant, 1/5 HP, 7’ cord, , cULus, NSF, CE, MADE IN USA

Doors hinged per plan
1-1/2” diameter dual wheel castors, standard

**ITEM 2.104 DROP-IN HAND SINK**
ADVANCE TABCO DI-1-10SP

KEC PROVIDED, PLUMBER INSTALLED

Drop-In Sink, 1-compartment, 10” wide x 14” front-to-back x 10” deep bowl, 6” tapered rear & side splashes, 20 gauge 304 series stainless steel, with deck mounted gooseneck faucet, basket drain, NSF

K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink faucet (1 pair hot & cold 4” long blades), fits faucets supplied after November 2015 with hot & cold color rings that do not have exposed screw head
K-08 Low-flow aerator 0.5gpm, fits 55/64-27 male or 15/16-27 female thread on spout, conforms to California AB 1953
7-PS-35 Paper Towel Dispenser-Wall Mounted
7-PS-12 Soap Dispenser, wall mounted

**ITEM 2.105 MOBILE UNDERCOUNTER HEATED CABINET**
ALTO-SHAAM 750-S

Halo Heat® Low Temp Holding Cabinet, on/off simple control with adjustable thermostat, indicator light, capacity (10) 12” x 20” pans, (2) chrome plated side racks, (3) wire shelves, stainless steel exterior, 3-1/2” casters; 2 rigid, 2 swivel with brakes, EcoSmart®, cULus, UL EPH ANSI/NSF 4, CE, IP X3, TUV-NORD, EAC
Solid Door, hinged on left.

**ITEM 2.106 FOOD GUARD W/ LIGHT & HEAT**
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY
Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3'8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. GRN4L-XX heat/light combination unit with stainless steel housing & remote infinite control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified.

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for combination heat/ light fixture at an accessible location on counter face and interwire as necessary through Food Guard post.

KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

**ITEM 2.107  HEATED STONE SHELF**
**HATCO GRSS-3618**

KEC PROVIDED, OWNER INSTALLED

Glo-Ray® Heated Stone Shelf, portable, 36" x 18" x 2-1/2", 100-200°F temperature range, cord and plug located in center of side with switch, cULus, UL EPH Classified, ANSI/NSF 4, Made in USA

Model SS-NSKY Night sky stone. Verify stone color with architect prior to ordering

KEC to present color options to architect for final selection of stone color prior to ordering.

**ITEM 2.108  FOOD GUARD W/ LIGHT & HEAT**
**ENGLISH MANUFACTURING AMA-101A**

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3'8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. GRN4L-XX heat/light combination unit with stainless steel housing & remote infinite control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified.

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for combination heat/ light fixture at an accessible location on counter face and interwire as necessary through Food Guard post.

KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

**ITEM 2.109  S/S LOW WALL CAP**
**NIKEC**

NIKEC, GC PROVIDED, INSTALLED

**ITEM 2.110  DROP-IN WOK INDUCTION WARMER**
**COOKTEK 605301**

MSU - New Dining Hall 100% CD Set
PPA #15-0103
11 40 00 - 46
FOODSERVICE EQUIPMENT
Heritage Induction Wok Range (MWDG1800), drop-in, single hob, recessed glass-ceramic wok bowl designed, control knob, microprocessor with (20) power cook settings & auto shut-off, self-diagnostics, auto pan detection, LED display, integral cooling fan, stainless steel top, aluminum housing, 6 ft. cord, cETLus, NSF, CE

Model CT-103871 Six (6) ea. Model #4WOKSS Wok, 14", rubber handle, round bottom

**ITEM 2.111** FOOD GUARD W/ LIGHT & HEAT
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3'8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. GRN4L-XX heat/light combination unit with stainless steel housing & remote infinite control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for combination heat/light fixture at an accessible location on counter face and interwire as necessary through Food Guard post.

KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

**ITEM 2.112** DROP-IN HOT FOOD WELL
ATLAS METAL WH-2

Hot Food Drop-In Well Unit, electric, 2-well, individual pan design, wet or dry type, holds (2) 12" x 20" pans, control panel with individual thermostatic controls, stainless steel top & wells, galvanized outer liner, with fiberglass insulation

Model RTL-2 Remote Thermostat, for counter mounting with 50"L lead, 4-1/2" x 12-1/4" cutout required
Model DM-2 Individual Drain, for each well with manifold to single valve, for drop-in units
Model RDVE Rear Extension, for DM or DMV drain options
Model AF Automatic Water Fill
Model MS Master On/Off Switch

**ITEM 2.113, 2.113A** RICE COOKER/WARMER
UNKNOWN MFG./MODEL

EXISTING RELOCATED FROM OTHER UNDEFINED LOCATION

**ITEM 2.114** UNDERCOUNTER WARE WASHER/BOOSTER HEATER
HOBART LXEH-3

LXe Dishwasher, undercounter, 23-15/16"W x 25-9/16"D x 32-1/2"H, high temperature sanitizing, (32) racks/hr, fresh water rinse, .74 gal/rack, delime notification, auto chemical priming, service diagnostics, detergent & rinse aid pump, 120/208-240/60/1-ph, cULus, NSF, ENERGY STAR®
ITEM 2.115  EXHAUST VENTILATOR- WOKS
NIKEC
NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 2.116  FIRE EXTINGUISHING SYSTEM
NIKEC
NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 2.117  2 HOLE WOK RANGE
TOWN EQUIPMENT Y-2-SS
York® Wok Range, Gas, (2) chambers, fiber ceramic insulation, water cooled top, Chinese swing faucets, knee "L" lever gas handle, stainless steel sides, ETL, NSF
226198 Safety Pilot System for propane gas, two chambers
1st Chamber: 18" Chamber size
226600 Jet Burner, 23 tip, with pilot, Gas, for use with 16" or 18" chamber, SR-24G, SR-24M, or SR-24C, wide heat area, clogs from food spillage, natural 90,000 BTU, propane 92,000 BTU (no charge)
2nd Chamber: 13" Chamber size
226911 Shield Tip Burner, vertical, 18 tip, Gas, for use with 13" or 16" chamber, SR-24G, SR-24M, or SR-24C, wide heat area, some spillage tolerance, natural 97,000 BTU, 62,000 BTU (no charge)
228362 Range Deck, (2) chamber deck, stainless steel laminated to steel subdeck, 60" overall length
228462 Front Gutter/Waterfall Backsplash, (2) chambers, spray bar on top of backsplash, to keep range cool and clean, 60" overall length
Small sink w/basket is standard
Sink located at lower left
229202 Spice Shelf, wraps around on range, stainless steel construction
29004/12 Manual Faucet, 12" spout, 2-5/8" shank, overall length 14-5/8", wrist handle

ITEM 2.118  MOBILE REFRIGERATED PREP TABLE
TRUE FOOD SERVICE EQUIPMENT TSSU-27-12M-C
Mega Top Sandwich/Salad Unit, (12) 1/6 size (4"D) poly pans, stainless steel insulated cover, 8-7/8"D cutting board, series stainless steel top/front/sides, aluminum back, (1) door, (2) shelves, aluminum interior with stainless steel floor, 5" castors, 1/5 HP, 7' cord, , cULus, NSF, CE, MADE IN USA
Model 920233FI Flat Lid, per each, for TSSU Mega top models.

ITEM 2.119  FOOD GUARD W/ LIGHT & HEAT
ENGLISH MANUFACTURING AMA-101A
NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY
Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3/8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. GRN4L-XX heat/light combination unit with stainless steel housing & remote infinite control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for combination heat/ light fixture at an accessible location on counter face and interwire as necessary through Food Guard post.

KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

**ITEM 2.120  1 HOLE WOK RANGE**
**TOWN EQUIPMENT Y-1-SS**

York® Wok Range, Gas, (1) chamber, fiber ceramic insulation, water cooled top, Chinese swing faucet, knee "L" lever gas handle, stainless steel sides, ETL, NSF

Natural gas

18" Chamber size
226131 Ring Burner, 3 ring burner/nipple, Gas, simmer to sauté heat, low maintenance, for ranges with 16" chamber or larger, natural 137,000 BTU, propane 120,000 BTU
228361 Range Deck, (1) chamber deck, stainless steel laminated to steel subdeck, up to 36" overall length
228461 Front Gutter/Waterfall Backsplash, (1) chamber, spray bar on top of backsplash, to keep range cool and clean, up to 36" overall length
229920 Chamber Sink & Basket, single, front access
229202 Spice Shelf, wraps around on range, stainless steel construction
229004/12 Manual Faucet, 12" spout, 2-5/8" shank, overall length 14-5/8", wrist handle

**ITEM 2.121  WORK TABLE**
**ADVANCE TABCO VKS-302**

KEC PROVIDED, OWNER INSTALLED

Work Table, 24"W x 30"D, with splash at rear only, with adjustable undershelf, stainless steel frame & shelf, 14 gauge 304 series stainless steel top, 10" backsplash, with countertop non drip edge, 16 gauge 304 series stainless steel legs, stainless steel bullet feet

**ITEM 2.122  MOBILE FRYER BATTERY W/ HEATED DUMP**
**FRYMASTER FPPH255**

Fryer Battery, gas, hi-efficiency, (2) 50 lb. capacity each, built-in filtration, open frypot design, automatic melt cycle, boil-out temp control, electronic ignition, center mounted RTD, 1° compensating temperature
probe, includes: rack-type basket support, basket hanger & twin baskets, stainless steel frypots, doors & cabinet, 160,000 BTU, NSF, CSA, cCSAus, ENERGY STAR®, Enerlogic®

Spread cabinet, stainless steel door and cabinet
Spread located at left end of fryer battery, Solid Flat Top, standard
FWH-1 Food Warmer & Holding Station, includes; heat lamp, cord & plug, 12 x 20 x 2-1/2" stainless steel cafeteria-style pan & screen, NSF, cULus, CE
6" casters (set of 4), standard
Dormont 16100KITS48PS Dormont Blue Hose™ Moveable Gas Connector Kit, 1" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 Snap Fast™ QD, 1 Swivel MAX®, 1 full port valve, 1 elbow, 1 pair Safety Set® with adhesive foam tape and hardware mounting options, limited lifetime warranty

ITEM 2.123 MOBILE REACH-IN FREEZER
TRUE FOOD SERVICE EQUIPMENT STA1F-2HS

SPEC SERIES® Freezer, Reach-in, -10°F, one-section, stainless steel front & sides, (2) stainless steel half doors with locks, cam-lift hinges, digital temperature control, aluminum interior, (3) chrome shelves, LED interior lights, 5" castors, 1/2 HP, 9' cord, , MADE IN USA

Door hinged right standard
Stainless steel back.
(3) chrome shelves and shelf supports standard per section
1 Additional Chrome plated shelf w/ shelf clip supports
5" castors, set of 4, standard

ITEM 2.124 BACK COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.201 PIZZA / PASTA COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.202 FOOD GUARD
ENGLISH MANUFACTURING AMA-100-2

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3/8" tempered glass front panel with 1" radius corners. Two (2) end posts an (2) double sided intermediate posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. Brushed #4 stainless steel finish KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for LED light fixture at an accessible location on counter face and interwire as necessary through Food Guard post.
KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

ITEM 2.203 DROP-IN GLASS HEATED SHELF
BSI HTD-INF-60

Solera Heated Merchandiser, 60" Glass Ceramic Heated Drop-In Display, matte black ceramic top, black enclosure, 3' flex conduit, UL Listed

Extendend flexible conduit leads (6')
Frame: Brushed stainless

ITEM 2.204 HANGING HEAT LAMP
HATCO DL-700-SL

Decorative Lamp, (1) bulb type, 8-1/2" H x 6-1/2" Dia. shade, rigid stem mount to canopy (14" - 71" overall length), lower switch location, No bulb included, CE, cULus, UL EPH Classified, ANSI/NSF 4, Made in USA
KEC to coordinate shade style and color selection with architect prior to ordering.

KEC to Confirm w/ Architect, bottom of heat lamp shade to be fixed at 16" above finished counter top.

ITEM 2.205 OPEN NUMBER

ITEM 2.206 OPEN NUMBER

ITEM 2.207 OPEN NUMBER

ITEM 2.208 OPEN NUMBER

ITEM 2.209 OPEN NUMBER

ITEM 2.210 STONE HEARTH OVEN
WOOD STONE FD-9660-RFGLR-IR

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Fire Deck Stone Hearth Oven, radiant gas flame on left and right sides with infrared under floor burner, 72" w x 46" d hearth, (40) 8", (24) 10", (15) 12", (8) 16" or (6) 18" pizza capacity, monolithic cast-ceramic floor & dome create "deep heat sink", galvanized steel upper body, heavy duty steel frame base painted black, 12" OD flue collar, ETL-Sanitation, 350,000 BTU

FD-DECFLAME Decorative Flame, 20 1/8 "W x 3.75"D, turns on automatically with oven controller, 15,000
9960-FFFULR Factory prepared for field facade UPPER: Front, left & right side upper: facade ready finish, back galvanized steel
000-109660-G-SQ Black Granite Mantle, with stainless steel bracket for Fire Deck 9660 or 11260
5130-1216-SS Mantle Bracket, stainless steel, for SQ granite - FD 9660 or FD 11260
WS-TL-SET-M-GAS Medium Tool Set, for gas ovens, includes (1) loading peel (12” pies and smaller), (1) loading peel (16” pies and smaller), (1) utility peel, (1) medium brush set and (1) bubble hook

ITEM 2.211  VENT DUCT
NIKEC
NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 2.212  MOBILE PIZZA CUTTING TABLE
ADVANCE TABCO PZ12
KEC PROVIDED, OWNER INSTALLED
Pizza Pan Rack, mobile, (12) pan capacity, 22"W x 20"D x 33-3/4"H, 2" shelf spacing, 4" wide slides, solid aluminum top, holds both round & square pans, fully welded aluminum construction, 5" poly stem bolted casters, NSF

ITEM 2.213  OPEN NUMBER

ITEM 2.214  OPEN NUMBER

ITEM 2.215  OPEN NUMBER

ITEM 2.216  OPEN NUMBER

ITEM 2.217  OPEN NUMBER

ITEM 2.218  DROP-IN PREP SINK
ADVANCE TABCO DI-1-2012
KEC PROVIDED, OWNER INSTALLED
Drop-In Sink, 1-compartment, 20" wide x 16" front-to-back x 12" deep bowl, 18 gauge 304 series stainless steel, with deck mounted 8" swing spout faucet, basket drain, NSF
K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink

ITEM 2.219  OPEN NUMBER

ITEM 2.220  OPEN NUMBER
ITEM 2.221  OPEN NUMBER

ITEM 2.222  WASTE RECEPTACLE
NIKEC, BY OWNER

ITEM 2.223  ROLL-IN REFRIGERATOR
TRUE FOOD SERVICE EQUIPMENT STR1RR1-1S

SPEC SERIES® Roll-in Refrigerator, one-section, stainless steel front & sides, (1) stainless steel door with lock, cam-lift hinges, digital temperature control, stainless steel interior, incandescent interior lighting, stainless steel ramp, 1/3 HP, 9' cord, [accommodates 27"Wx29"Dx66"H cart, NOT included], cULus, NSF, MADE IN USA
Door hinged right standard

ITEM 2.224  MOBILE RACK
NIKEC, BY OWNER

ITEM 2.225  OPEN NUMBER

ITEM 2.226  MOBILE WORK TABLE
NIKEC, BY OWNER

ITEM 2.227  COLD FOOD WELL
ATLAS META RM-3

Cold Food Drop-In Unit, 3-pan size, 18/304 stainless steel top & liner with 3" recess, holds (3) 12" x 20" pans, self-contained refrigeration, insulated pan with 22 gauge galvanized outer case, 3/4" drain with strainer, 44"W x 24-1/2"D cutout required, NSF 7, UL

Model RS Remote On/Off Switch, for counter mounting

ITEM 2.228  MOBILE REFRIGERATED PIZZA PREP TABLE
MARRA FORNI GPZ166A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Refrigerated Pizza Prep Table, two-section, 12.0 cu. ft. capacity, (7) 1/3 pan rail capacity, self contained refrigeration, digital controller, (2) self-closing doors, (4) plastic dough trays per door, granite work surface, 304 stainless steel interior & exterior, 6" casters, 1/5 HP, , cETLus, ETL-Sanitation, UL, NSF

ITEM 2.229  FOOD GUARD W/ LIGHT
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY
Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3'8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. Full length ECO5 LED lighting with stainless steel housing & remote on/off control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for light fixture at an accessible location on counter face and interwire as necessary through Food Guard post. KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

ITEM 2.230 OPEN NUMBER

ITEM 2.231 DROP-IN ROUND SAUCE WELL
WELLS SS-8TDU

Food Warmer, top-mount, built-in, electric, for 7-quart round inserts, drain, wet/dry operation, thermostatic control, non-insulated, stainless steel interior, Wellslok, UL, cULus, NSF

20385 Drain Valve Extension Kit, extension from drain to counter front with remote handle (for use with "D" models only) excluding DM models
22592 Wellslok Extension Kit, for UL listed circular warmers only to adapt to wood countertops up to 1-1/2" thick
72" Wiring (thermostatically controlled warmers) per well

ITEM 2.232 MOBILE UNDERCOUNTER HEATED CABINET
ALTO-SHAAM 750-S

Halo Heat® Low Temp Holding Cabinet, on/off simple control with adjustable thermostat, indicator light, capacity (10) 12" x 20" pans, (2) chrome plated side racks, (3) wire shelves, stainless steel exterior, 2-1/2" casters; 2 rigid, 2 swivel with brakes, EcoSmart®, cULus, UL EPH ANSI/NSF 4, CE, IP X3, TUV-NORD, EAC, N11942

Solid Door, hinged on left

ITEM 2.233 FOOD GUARD W/ LIGHT & HEAT
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3'8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. Right and center sections to receive GRN4L-XX heat/light combination unit with stainless steel housing & remote infinite control. Left section to receive full length ECO5 LED lighting with stainless steel housing & remote on/off control. Brushed #4 stainless steel finish
(KEC to verify with Architect). Length and configuration shown in plan by 22” high.. NSF and UL certified.

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for lights and combination heat/ light fixtures at an accessible location on counter face and interwire as necessary through Food Guard post.

KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

<table>
<thead>
<tr>
<th>ITEM 2.234</th>
<th>COLD FOOD WELL</th>
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<td>ATLAS METAL RM-2</td>
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Cold Food Drop-In Unit, 2-pan size, 18/304 stainless steel top & liner with 3" recess, holds (2) 12" x 20" pans, self-contained refrigeration, insulated pan with 22 gauge galvanized outer case, 3/4" drain with strainer, 30-1/4"W x 24-1/2"D cutout required, NSF 7, UL Model RS Remote On/Off Switch, for counter mounting

<table>
<thead>
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<th>ITEM 2.235</th>
<th>EXHAUST VENTILATOR- F. PASTA</th>
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NIKEC, GC/MC PROVIDED, INSTALLED

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NIKEC, GC/MC PROVIDED, INSTALLED

<table>
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<th>ITEM 2.237</th>
<th>STEP-UP COUNTER RANGE</th>
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<td>GARLAND/US RANGE GTOG36-SU6</td>
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Step-Up Hotplate, gas, 36", countertop. (3) 30,000 BTU open burners, (3) 30,000 BTU step-up open burners, manual controls, pilot lights, stainless steel front, sides and back, 3-1/2" front rail, 4" high adjustable legs, 180,000 BTU, CSA, NSF (Garland)

Removable stainless steel condiment front rail attachment for 1/9 or 1/3 pan cut outs
Stainless steel skirt
Dormont 1675KITS48 Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 SnapFast® QD, 1 Swivel MAX®, 1 full port valve, 1 elbow, coiled restraining cable with hardware, 167,000 BTU/hr minimum flow capacity, limited lifetime warranty

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<th>ITEM 2.238</th>
<th>MOBILE REFRIGERATED EQUIPMENT STAND</th>
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<td>TRUE FOOD SERVICE EQUIPMENT TRCB-36</td>
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Refrigerated Chef Base, 36-3/8"L, one-piece 300 series 18 gauge stainless steel top with V edge, stainless steel front/sides, aluminum back, aluminum interior with stainless steel floor, (2) drawers [accommodates (1) 12"x20"x4" pans & (3) 1/6 size pans, NOT included], 4" castors, 1/5 HP, 7’ cord, , cULus, NSF, CE, MADE IN USA

MSU - New Dining Hall 100% CD Set
PPA #15-0103

FOODSERVICE EQUIPMENT
ITEM 2.239  OPEN NUMBER

ITEM 2.240  FOOD GUARD W/ LIGHT
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application. 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3'8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. Full length ECO5 LED lighting with stainless steel housing & remote on/off control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for light fixture at an accessible location on counter face and interwire as necessary through Food Guard post. KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

ITEM 2.241  FOOD GUARD PARTITION
ENGLISH MANUFACTURING M-100-2

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Sneeze guard, Partition, length and shape per plan. 18" high posts 1" OD with brushed stainless steel finish (2) end posts (1) 3/8" clear tempered glass panels with polished edges

ITEM 2.242  DROP-IN HOT FOOD WELL
ATLAS METAL WIH-4

Hot Food Drop-In Well Unit, electric, 4-well, individual pan design, wet or dry type, holds (4) 12" x 20" pans, control panel with individual thermostatic controls, stainless steel top & wells, galvanized outer liner, with fiberglass insulation

DM-4 Individual Drain, for each well with manifold to single valve, for drop-in units
RDVE Rear Extension, for DM or DMV drain options
AF Automatic Water Fill
MS Master On/Off Switch
RTL-2 Remote Thermostat, for counter mounting with 50"L lead, 4-1/2" x 12-1/4" cutout required

ITEM 2.243  MOBILE REACH-IN REFRIGERATOR
TRUE FOOD SERVICE EQUIPMENT STA1R-2HS

SPEC SERIES® Refrigerator, Reach-in, one-section, stainless steel front & sides, (2) stainless steel half doors with locks, cam-lift hinges, digital temperature control, aluminum interior, (3) chrome shelves, LED interior lights, 5" castors, 1/3 HP, 9' cord, cULus, NSF, MADE IN USA

Door hinged right standard
(3) chrome shelves and shelf supports standard per section
Spec Kit #2 - (1) set of #2 type tray slides for top section
5" castors, set of 4, standard

ITEM 2.244 OPEN NUMBER

ITEM 2.245 OPEN NUMBER

ITEM 2.246 PASTA COOKER
ELECTROLUX PROFESSIONAL 391202

(E9PCGH2MF2) Pasta Cooker, gas, (2) 10.5 gallon tanks, 66 lbs/hour capacity each, automatic starch removal, automatic low water level controls, 9 position energy controls, 316 stainless steel tanks, stainless steel cabinet & legs, 95,452 BTU

927211 (9AC39) Baskets (2) (11" x 9") for 10.5 gallon pasta cooker
927213 (9AC41) Single-portion baskets (6), round - requires support rack for pasta cookers (PNC 927219)
206190 (9AC100) Lid and lid holder for pasta cookers
927219 (9AC44) Support rack for single portion pasta baskets
206135 (4WHEELCOMP) Wheel Kit (4), (2) swiveling with brake (to be used with Base Support Assembly)
206366 (BSUPPFW4) Base Support Assembly, 16" (400mm), for feet/wheels (to be used with PNC 206135)
Dormont 1675KITS48 Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 SnapFast® QD, 1 Swivel MAX®, 1 full port valve, 1 elbow, coiled restraining cable with hardware, 167,000 BTU/hr minimum flow capacity, limited lifetime warranty
Dormont W50BP2Q48 (2 ea.) Dormont Hi-PSI® Water Connector Hose, 1/2" dia., 48" long, covered with stainless steel braid, coated with gray antimicrobial PVC, brass two-way Quick Disconnect coupling, limited lifetime warranty

ITEM 2.247 BACK COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.248 UNDERCOUNTER WARE WASHER/BOOSTER HEATER
HOBART LXEH-3

LXe Dishwasher, undercounter, 23-15/16"W x 25-9/16"D x 32-1/2"H, high temperature sanitizing, (32) racks/hr, fresh water rinse, .74 gal/rack, delime notification, auto chemical priming, service diagnostics, detergent & rinse aid pump, 120/208-240/60/1-ph, cULus, NSF, ENERGY STAR®

Model COVER-TRIM-LXE Trim Cover

ITEM 2.249 DROP-IN HAND SINK
ADVANCE TABCO DI-1-10SP

KEC PROVIDED, PLUMBER INSTALLED

MSU - New Dining Hall 100% CD Set
PPA #15-0103
11 40 00 - 57
FOODSERVICE EQUIPMENT
Drop-In Sink, 1-compartment, 10" wide x 14" front-to-back x 10" deep bowl, 6" tapered rear & side splashes, 20 gauge 304 series stainless steel, with deck mounted gooseneck faucet, basket drain, NSF

K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink faucet (1 pair hot & cold 4" long blades), fits faucets supplied after November 2015 with hot & cold color rings that do not have exposed screw head

K-08 Low-flow aerator 0.5gpm, fits 55/64-27 male or 15/16-27 female thread on spout, conforms to California AB 1953

7-PS-35 Paper Towel Dispenser-Wall Mounted
7-PS-12 Soap Dispenser, wall mounted

ITEM 2.301 CARVERY/COMFORT FOODS COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.302 DROP-IN ROUND SAUCE WELL
WELLS SS-8TDU

Food Warmer, top-mount, built-in, electric, for 7-quart round inserts, drain, wet/dry operation, thermostatic control, non-insulated, stainless steel interior, Wellslok, UL, cULus, NSF

20385 Drain Valve Extension Kit, extension from drain to counter front with remote handle (for use with "D" models only) excluding DM models
22592 Wellslok Extension Kit, for UL listed circular warmers only to adapt to wood countertops up to 1-1/2" thick
72" Wiring (thermostatically controlled warmers) per well

ITEM 2.303 CARVING BOARD
JOHN BOOS AUJUS

KEC PROVIDED, OWNER INSTALLED

Professional Cutting Board, 18" x 24", 1-1/2" Hard Rock maple with Boos Block Cream Finish with Beeswax, grooved, edge grain, reversible, NSF

ITEM 2.304 MOBILE UNDERCOUNTER HEATED CABINET
ALTO-SHAAM 750-S

Halo Heat® Low Temp Holding Cabinet, on/off simple control with adjustable thermostat, indicator light, capacity (10) 12" x 20" pans, (2) chrome plated side racks, (3) wire shelves, stainless steel exterior, 3-1/2" casters; 2 rigid, 2 swivel with brakes, EcoSmart®, cULus, UL EPH ANSI/NSF 4, CE, IP X3, TUV-NORD, EAC

Solid Door, hinged on left

ITEM 2.305 FOOD GUARD
ENGLISH MANUFACTURING AMA-100-2

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY
Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3/8" tempered glass front panel with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. Full length per section. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for LED light fixture at an accessible location on counter face and interwire as necessary through Food Guard post.

KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

**ITEM 2.306 HEATED STONE SHELF**
**HATCO GRSS-4818**

KEC PROVIDED, OWNER INSTALLED

Glo-Ray® Heated Stone Shelf, portable, 48" x 18" x 2-1/2", 100-200°F temperature range, cord and plug located in center of side with switch, cULus, UL EPH Classified, ANSI/NSF 4, Made in USA

SS-NSKY Night sky stone. Verify stone color with architect prior to ordering

KEC to present color options to architect for final selection of stone color prior to ordering.

**ITEM 2.307 HANGING HEAT LAMP**
**HATCO DL-700-SL**

Decorative Lamp, (1) bulb type, 8-1/2" H x 6-1/2" Dia. shade, rigid stem mount to canopy (14" - 71" overall length), lower switch location, No bulb included (specify finish), CE, cULus, UL EPH Classified, ANSI/NSF 4, Made in USA

KEC to coordinate shade style and color selection with architect prior to ordering.

KEC to Confirm w/ Architect, bottom of heat lamp shade to be fixed at 16" above finished counter top

**ITEM 2.308 COUNTER HEAT LAMP W/ BASE**
**HATCO DCS400-1**

Decorative Carving Station Heat Lamp with Black Base, single bulb (clear bulb included), telescoping clearance (bottom of shade to counter top) 16" - 28", specify finish, cULus, UL EPH Classified, ANSI/NSF 4, Made in USA

BNICKEL Bright Nickel
NSKY Night Sky Swanstone® base trim ring
RED-CTD-120 Lamp Bulb, red, coated, each

**ITEM 2.309 FOOD GUARD W/ LIGHT & HEAT**
**ENGLISH MANUFACTURING AMA-101A**
NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3'8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. GRN4L-XX heat/light combination unit with stainless steel housing & remote infinite control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified.

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for combination heat/ light fixture at an accessible location on counter face and interwire as necessary through Food Guard post.

KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

ITEM 2.310 OPEN NUMBER

ITEM 2.311 SMASH BURGER COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.312 OPEN NUMBER

ITEM 2.313 OPEN NUMBER

ITEM 2.314 OPEN NUMBER

ITEM 2.315 72" COUNTER GRIDDLE
KEATING 72X30FT-G

Miraclean® Griddle, gas, 72" W x 24" D cooking surface, 3/4" thick chrome finished griddle plate, front grease trough, (3) zoned millivolt thermostatic heat controls, stainless steel front sides & back, 180,000 BTU, cETLus, ETL-Sanitation, NSF®

Dormont 1675KITS48 Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 SnapFast® QD, 1 Swivel MAX®, 1 full port valve, 1 elbow, coiled restraining cable with hardware, 167,000 BTU/hr minimum flow capacity, limited lifetime warranty

ITEM 2.316 MOBILE REFRIGERATED BASE
TRUE FOOD SERVICE EQUIPMENT TRCB-72

Refrigerated Chef Base, 72-3/8"L base, one-piece 300 series 18 gauge stainless steel top with V edge, stainless steel front/sides, aluminum back, aluminum interior with stainless steel floor, (4) drawers [accommodates (2) 12"x20"x4" pans, NOT included], 4" castors, 1/3 HP, 7' cord, , cULus, NSF, CE, MADE IN USA
ITEM 2.317  WASTE CONTAINER  
NIKEC, BY OWNER

ITEM 2.318  EXHAUST VENTILATOR - ROTISSERIE  
NIKEC
NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 2.319  FIRE EXTINGUISHING SYSTEM  
NIKEC
NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 2.320  OPEN NUMBER

ITEM 2.321  DROP-IN PREP SINK  
ADVANCE TABCO DI-1-2012
KEC PROVIDED, PLUMBER INSTALLED

Drop-In Sink, 1-compartment, 20" wide x 16" front-to-back x 12" deep bowl, 18 gauge 304 series stainless steel, with deck mounted 8" swing spout faucet, basket drain, NSF
K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink faucet (1 pair hot & cold 4" long blades

ITEM 2.322  BACK COUNTER  
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.323  MOBILE UNDERCOUNTER REFRIGERATOR  
TRUE FOOD SERVICE EQUIPMENT TUC-48-ADA-HC

ADA Compliant Undercounter Refrigerator, 33-38° F, stainless steel top & sides, (2) stainless steel doors, (4) shelves, clear coated aluminum interior with stainless steel floor, 3" castors, front breathing, R290 Hydrocarbon refrigerant, 1/5 HP, 7' cord, , 34" working height, cULus, UL EPH Classified, CE, MADE IN USA
3" castors, standard
Both doors hinged right per plan.

ITEM 2.324  EXHAUST VENTILATOR- SMOKER- SOLID FUEL  
NIKEC
NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 2.325  FIRE EXTINGUISHING SYSTEM  
NIKEC
ITEM 2.326  SMOKER  
SOUTHERN PRIDE SRG-400 (230)  

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Stainless steel construction; exterior and interior. Mineral wool insulated cabinet. 6” (152mm) locking casters. Convection fan with 10” (254 mm) blower wheel. Control with a digital cook and hold thermostat ((140° to 325°F)(60° to 163°C), allows for selection of cook temperature, cook time, hold temperature, and programming of 30 preset menus). 6” (152mm) grease drain pan. (7) 18” x 26” (457 x 660mm) nickel chrome plated product racks). Smoker can hold a maximum of 27 product racks. Maximum capacities above are based on (7) racks for pork butts, (14) racks for ribs, and (9) racks for whole chickens and brisket.

Dormont 1650KITS48 Dormont Blue Hose™ Moveable Gas Connector Kit, 1/2” inside dia., 48” long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 SnapFast® QD, 1 Swivel MAX®, 1 full port valve, 1 elbow, coiled restraining cable with hardware.

ITEM 2.327  DROP-IN HAND SINK  
ADVANCE TABCO DI-1-10SP  

KEC PROVIDED, PLUMBER INSTALLED

Drop-In Sink, 1-compartment, 10” wide x 14” front-to-back x 10” deep bowl, 6” tapered rear & side splashes, 20 gauge 304 series stainless steel, with deck mounted gooseneck faucet, basket drain, NSF Model K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink faucet (1 pair hot & cold 4” long blades), fits faucets supplied after November 2015 with hot & cold color rings that do not have exposed screw head.

K-08 Low-flow aerator 0.5gpm, fits 55/64-27 male or 15/16-27 female thread on spout, conforms to California AB 1953
7-PS-35 Paper Towel Dispenser-Wall Mounted
7-PS-12 Soap Dispenser, wall mounted

ITEM 2.328  OPEN NUMBER

ITEM 2.329  FERRIS WHEEL ROTISSERIE  
WOOD STONE WS-GFR-6  

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Cascade Rotisserie, Gas, 36 - 42 chicken capacity, (6) 44” long stainless steel angle spits, radiant flame at front provides showy adjustable flame wall with overhead infrared burner, variable speed, 1/4 HP DC motor with soft start/stop, bump bar shut-off, cascade water bath drip tray, stainless steel construction, 175,000 BTU

Left side drive
Includes (6) S/S Angle Spits, standard
Dormont 16100KITS48PS Dormont Blue Hose™ Moveable Gas Connector Kit, 1” inside dia., 48” long,
covered with stainless steel braid, coated with blue antimicrobial PVC, 1 Snap Fast™ QD, 1 Swivel MAX®, 1 full port valve, 1 elbow, 1 pair Safety Set® with adhesive foam tape and hardware mounting options, limited lifetime warranty

**ITEM 2.330  PASS-THRU STACKED HOT HOLDING/ DISPLAY CABINET**

ALTO-SHAAM AR-7H-DBLPANE

Halo Heat® Holding Cabinet, solid back, single compartment, (1) ON/OFF adjustable thermometer, individual light & temperature gauge, includes four (4) stainless steel wire shelves, pan capacity (8) 18” x 26” x 1”, (16) 18” x 13” x 1”, double pane curved glass door, 5" casters - 2 rigid; 2 swivel with brakes, stainless steel exterior, EcoSmart®, cULus UL EPH ANSI/NSF 4, CE, TUV NORD

AR-7H-DBLPANE Halo Heat® Holding Cabinet, solid back, single compartment, (1) ON/OFF adjustable thermometer, individual light & temperature gauge, includes four (4) stainless steel wire shelves, pan capacity (8) 18” x 26” x 1”, (16) 18” x 13” x 1”, double pane curved glass door, 5” casters - 2 rigid; 2 swivel with brakes, stainless steel exterior, EcoSmart®, cULus UL EPH ANSI/NSF 4, CE, TUV NORD

Pass-thru, double pane, curved glass door
Black powder coated finish (VERIFY w/ ARCHITECT)
Doors hinged per plan
5009711 Stacking Hardware, AR-7H over AR-7H
5001414 Legs, 6” (152mm) Assembly
KEC to verify finish with Architect prior to ordering

**ITEM 2.331  OPEN NUMBER**

**ITEM 2.332  WALL MOUNTED SHELVING**

ADVANCE TABCO WS-12-60-16

Shelf, wall-mounted, 60"W x 12"D, 1-5/8" bullnose front edge, 1-1/2" rear up-turn, 16/304 satin finish stainless steel, NSF
KEC to verify mounting height with Owner

**ITEM 2.333  BACK COUNTER**

NIKEC, BY GC MILLWORK CONTRACTOR

**ITEM 2.334  DROP-IN PREP SINK**

ADVANCE TABCO DI-1-2012

KEC PROVIDED, PLUMBER INSTALLED

Drop-In Sink, 1-compartment, 20” wide x 16” front-to-back x 12” deep bowl, 18 gauge 304 series stainless steel, with deck mounted 8” swing spout faucet, basket drain, NSF

K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink faucet (1 pair hot & cold 4” long blades), fits faucets supplied after November 2015 with hot & cold color rings that do not have exposed screw head

**ITEM 2.335  MOBILE REACH-IN REFRIGERATOR**
TRUE FOOD SERVICE EQUIPMENT STA2R-4HS

SPEC SERIES® Refrigerator, Reach-in, two-section, stainless steel front & sides, (4) stainless steel half doors with locks, cam-lift hinges, digital temperature control, aluminum interior, (6) chrome shelves, LED interior lights, 5” castors, 1/2 HP, 9’ cord, , cULus, NSF, MADE IN USA

Dual right door hinging
(3) chrome shelves and shelf supports standard per section
Spec Kit #3 - (6) sets of universal type tray slides for left section.
5” castors, set of 4, standard

ITEM 2.336 EXHAUST VENTILATOR - B. BURGER
NIKEC
NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 2.337 FIRE EXTINGUISHING SYSTEM
NIKEC
NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 2.338 GRIDDLE W/ STAND
KEC RELOCATE/ INSTALL
KEC INSTALL, EXISTING ITEM 127 HARRISON RELOCATED
Miraclean® Griddle, Electric, 69” W x 24” D cooking surface
Dormont 1675KITS48 Provide and install new gas connector hose and restraining device as a component of relocation and reuse. Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4” inside dia., 48” long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 SnapFast® QD, 1 Swivel MAX®, 1 full port valve, 1 elbow, coiled restraining cable with hardware, 167,000 BTU/hr minimum flow capacity, limited lifetime warranty

ITEM 2.339 OPEN NUMBER

ITEM 2.340 OPEN NUMBER

ITEM 2.341 MOBILE FRYER BATTERY W/ HEATED DUMP
FRYMASTER MODEL FPPH355
Fryer Battery, gas, hi-efficiency, (3) 50 lb. capacity each, built-in filtration, open pot design, automatic melt cycle, boil-out temp control, electronic ignition, center mounted RTD, 1° compensating temperature probe, includes: rack-type basket support, basket hanger & twin baskets, stainless steel frypots, doors & cabinet, 240,000 BTU, NSF, CSA, cCSAus, ENERGY STAR®, Enerlogic®
DIGITAL Controller, standard
Spread cabinet, stainless steel door and cabinet.
Solid Flat Top Spreader located at left end of fryer battery
FWH-1 Food Warmer & Holding Station, includes; heat lamp, cord & plug, 12 x 20 x 2-1/2" stainless steel cafeteria-style pan & screen, NSF, cULus, CE
6" casters (set of 4), standard
Dormont 16100KITS48PS Dormont Blue Hose™ Moveable Gas Connector Kit, 1" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 Snap Fast™ QD, 1 Swivel MAX®, 1 full port valve, 1 elbow, 1 pair Safety Set® with adhesive foam tape and hardware mounting options, limited lifetime warranty

ITEM 2.342 MOBILE REACH-IN FREEZER
TRUE FOOD SERVICE EQUIPMENT STA1F-2HS

SPEC SERIES® Freezer, Reach-in, -10°F, one-section, stainless steel front & sides, (2) stainless steel half doors with locks, cam-lift hinges, digital temperature control, aluminum interior, (3) chrome shelves, LED interior lights, 5" castors, 1/2 HP, 9' cord, MADE IN USA

Left door hinging
(3) chrome shelves and shelf supports standard per section
Spec Kit #2 - (1) set of #2 type tray slides for top section (equips 1/2 section only)
5" castors, set of 4, standard
Spec Kit #2 - (1) set of #2 type tray slides for top section

ITEM 2.343 OPEN NUMBER

ITEM 2.344 OPEN NUMBER

ITEM 2.345 FOOD GUARD W/ LIGHT
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3/8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height 1/4" tempered glass end panels. Full length ECO5 LED lighting with stainless steel housing & remote on/off control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for light fixture at an accessible location on counter face and interwire as necessary through Food Guard post. KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

ITEM 2.346 COLD FOOD WELL
ATLAS METAL RM-3

Cold Food Drop-In Unit, 3-pan size, 18/304 stainless steel top & liner with 3" recess, holds (3) 12" x 20" pans, self-contained refrigeration, insulated pan with 22 gauge galvanized outer case, 3/4" drain with strainer, 44"W x 24-1/2"D cutout required, NSF 7, UL
ITEM 2.347  EXHAUST VENTILATOR- F. BURGER
NIKEC

NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 2.348  FIRE EXTINGUISHING SYSTEM
NIKEC

NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 2.349  OPEN NUMBER

ITEM 2.350  FOOD GUARD W/ LIGHT & HEAT
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3"8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. Right and center sections to receive GRN4L-XX heat/light combination unit with stainless steel housing & remote infinite control. Left section to receive full length ECO5 LED lighting with stainless steel housing & remote on/off control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high.. NSF and UL certified.

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for lights and combination heat/ light fixtures at an accessible location on counter face and interwire as necessary through Food Guard post.

KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

ITEM 2.351  HEATED STONE SHELF
HATCO GRSS-3618

KEC PROVIDED, OWNER INSTALLED

Glo-Ray® Heated Stone Shelf, portable, 36" x 18" x 2-1/2", 100-200°F temperature range, cord and plug located in center of side with switch, cULus, UL EPH Classified, ANSI/NSF 4, Made in USA Model SS-NSKY Night sky stone. Verify stone color with architect prior to ordering
KEC to present color options to architect for final selection of stone color prior to ordering.

ITEM 2.352  BACK COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

MSU - New Dining Hall 100% CD Set
PPA #15-0103

FOODSERVICE EQUIPMENT
ITEM 2.353  DROP-IN HAND SINK
ADVANCE TABCO DI-1-10SP

KEC PROVIDED, PLUMBER INSTALLED

Drop-In Sink, 1-compartment, 10" wide x 14" front-to-back x 10" deep bowl, 6" tapered rear & side splashes, 20 gauge 304 series stainless steel, with deck mounted gooseneck faucet, basket drain, NSF

K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink faucet (1 pair hot & cold 4" long blades)
K-08 Low-flow aerator 0.5gpm, fits 55/64-27 male or 15/16-27 female thread on spout, conforms to California AB 1953
7-PS-35 Paper Towel Dispenser-Wall Mounted
7-PS-12 Soap Dispenser, wall mounted

ITEM 2.354  OPEN NUMBER

ITEM 2.355  OPEN NUMBER

ITEM 2.401  FRONT SERVICE COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.402  CUTTING BOARD BREAD DISPLAY
JOHN BOOS R02

OWNER PROVIDED, CONTRACTOR INSTALLED

Cutting Board, 18" x 24", 1-1/2" thick, edge grain construction, Hard Rock maple, with Boos Block Cream Finish with Beeswax, reversible

ITEM 2.403  FOOD GUARD W/ LIGHT
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3/8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height 1/4" tempered glass end panels. Full length ECO5 LED lighting with stainless steel housing & remote on/off control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for light fixture at an
ITEM 2.404  DROP-IN ANGLED COLD UNIT
ATLAS METAL RM-4

Cold Food Drop-In Unit, 4-pan size, 18/304 stainless steel top & liner with 3" recess, holds (4) 12" x 20" pans, self-contained refrigeration, insulated pan with 22 gauge galvanized outer case, 3/4" drain with strainer, 57-3/4"W x 24-1/2"D cutout required, NSF 7, UL

Model RS Remote On/Off Switch, for counter mounting
Model SA-4 Sloped Adapter, 60"L (25-3/4" x 59" counter cut-out required), stainless steel, for RM units
Model RS Remote On/Off Switch, for counter mounting

ITEM 2.405  OPEN NUMBER

ITEM 2.406  REFRIGERATED SELF-SERVICE CASE
STRUCTURAL CONCEPTS HV48RSSRD

Encore® Self-Service Refrigerated Open Air Screen Case, 50"W, 51-1/4"H, Breeze™ with EnergyWise self-contained refrigeration system with evaporator pan, (3) lighted glass shelves (14",18",22"D), sheet metal deck, clear glass rear sliding doors with inner acrylic plenum, black interior, black trim, (2) full end panels with mirror, cETLus, ETL-Sanitation

6 ft straight blade power cord, standard
Base Support: Units are supplied with levelers extended 1-1/4" & MUST be adjusted during installation to ensure unit is level for operation
LED 3500K lights UPGRADE
Exterior: Wilsonart or Formica NON-PREMIUM laminate VERIFY FINISH OPTIONS WITH ARCHITEDT
Rear Exterior: Black
Trim: Black, standard
Upper Rear: Clear glass rear sliding doors, standard
Night curtain, retractable, non-locking

KEC to verify finish with Architect prior to ordering

ITEM 2.407  MEXICAN SERVICE COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.408  VEGAN/ SMOOTHIE SERVICE COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.409  VEGAN/ SMOOTHIE END SERVICE COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.410  OPEN NUMBER
ITEM 2.411 OPEN NUMBER

ITEM 2.412 FOOD GUARD W/ LIGHT
ENGLISH MANUFACTURINGAMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3'8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. Full length ECO5 LED lighting with stainless steel housing & remote on/off control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for light fixture at an accessible location on counter face and interwire as necessary through Food Guard post.

KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

ITEM 2.413 FOOD GUARD W/ LIGHT & HEAT
ENGLISH MANUFACTURINGAMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3'8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. GRN4L-XX heat/light combination unit with stainless steel housing & remote infinite control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified.

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for combination heat/ light fixture at an accessible location on counter face and interwire as necessary through Food Guard post.

KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

ITEM 2.414 DROP-IN HOT FOOD WELL
ATLAS METAWIH-4

Hot Food Drop-In Well Unit, electric, 4-well, individual pan design, wet or dry type, holds (4) 12" x 20" pans, control panel with individual thermostatic controls, stainless steel top & wells, galvanized outer liner, with fiberglass insulation

DM-4 Individual Drain, for each well with manifold to single valve, for drop-in units
RDVE Rear Extension, for DM or DMV drain options
AF Automatic Water Fill
MSU Master On/Off Switch
RTL-2 Remote Thermostat, for counter mounting with 50"L lead, 4-1/2" x 12-1/4" cutout required

ITEM 2.415 BACK COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.416 DROP-IN PREP SINK
ADVANCE TABCO DI-1-2012

KEC PROVIDED, PLUMBER INSTALLED

Drop-In Sink, 1-compartment, 20" wide x 16" front-to-back x 12" deep bowl, 18 gauge 304 series stainless steel, with deck mounted 8" swing spout faucet, basket drain, NSF

K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink faucet (1 pair hot & cold 4" long blades), fits faucets supplied after November 2015 with hot & cold color rings that do not have exposed screw head

ITEM 2.417 DROP-IN HAND SINK
ADVANCE TABCO DI-1-10SP

KEC PROVIDED, PLUMBER INSTALLED

Drop-In Sink, 1-compartment, 10" wide x 14" front-to-back x 10" deep bowl, 6" tapered rear & side splashes, 20 gauge 304 series stainless steel, with deck mounted gooseneck faucet, basket drain, NSF

K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink faucet (1 pair hot & cold 4" long blades), fits faucets supplied after November 2015 with hot & cold color rings that do not have exposed screw head
K-08 Low-flow aerator 0.5gpm, fits 55/64-27 male or 15/16-27 female thread on spout, conforms to California AB 1953
7-PS-35 Paper Towel Dispenser-Wall Mounted
7-PS-12 Soap Dispenser, wall mounted

ITEM 2.418 MOBILE UNDERCOUNTER REFRIGERATOR
TRUE FOOD SERVICE EQUIPMENT TUC-48-LP-HC

Low Profile Undercounter Refrigerator, 33-38° F, (4) shelves, stainless steel top & sides, clear coated aluminum interior with stainless steel floor, (2) stainless steel doors, 1-1/2" diameter dual wheel castors, 31-7/8" counter height, front breathing, R290 Hydrocarbon refrigerant, 1/5 HP, 7" cord, cULus, NSF, CE, MADE IN USA

All doors hinged left

ITEM 2.419 FOOD GUARD W/ LIGHT
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY
Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3'8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. Full length ECO5 LED lighting with stainless steel housing & remote on/off control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for light fixture at an accessible location on counter face and interwire as necessary through Food Guard post. KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

**ITEM 2.420  FROST TOP**
**ATLAS METAL WF-2**

Frost Top Drop-In Unit, self-contained refrigeration, 19-1/2" x 25-1/4" 14/304 stainless steel frost top, 14 gauge galvanized steel outer liner, with on/off switch & pilot light, 1"IPS drain, 22-1/4" x 28" cutout required, 1/5 HP, NSF, UL

Model RS Remote On/Off Switch, for counter mounting

**ITEM 2.421  OPEN NUMBER**

**ITEM 2.422  SOUP KETTLE**
**TOMLINSON INDUSTRIES 1006856**

KEC PROVIDED, OWNER INSTALLED

Deluxe Frontier Soup Kettle, 12 quart, adjustable temperature control, cast aluminum construction, stainless steel insert, hinged lid, black, (22) product name cards, 120v, NSF, cULus, CB, CE, (must be purchased in case quantities)

Black

**ITEM 2.423  MOBILE UNDERCOUNTER HEATED CABINET**
**ALTO-SHAAM 750-S**

Halo Heat® Low Temp Holding Cabinet, on/off simple control with adjustable thermostat, indicator light, capacity (10) 12" x 20" pans, (2) chrome plated side racks, (3) wire shelves, stainless steel exterior, 3-1/2" casters; 2 rigid, 2 swivel with brakes, EcoSmart®, cULus, UL EPH ANSI/NSF 4, CE, IP X3, TUV-NORD, EAC

Solid door, hinged on right, 1 of 3 units
Solid door, hinged on left, 2 of 3 units

**ITEM 2.424  FOOD GUARD PARTITION**
**ENGLISH MANUFACTURING M-100-2**
NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Sneeze guard, Partition, length and shape per plan. 18" high posts 1" OD with brushed stainless steel finish (2) end posts (1) 3/8" clear tempered glass panels with polished edges

ITEM 2.425  UNDERCOUNTER WAREWASHER/BOOSTER HEATER
HOBART LXEH-3

LXe Dishwasher, undercounter, 23-15/16"W x 25-9/16"D x 32-1/2"H, high temperature sanitizing, (32) racks/hr, fresh water rinse, .74 gal/rack, delime notification, auto chemical priming, service diagnostics, detergent & rinse aid pump, 120/208-240/60/1-ph, cULus, NSF, ENERGY STAR®

COVER-TRIM-LXE Trim Cover

ITEM 2.426  MOBILE REACH-IN REFRIGERATOR
TRUE FOOD SERVICE EQUIPMENT STA1R-2HS

SPEC SERIES® Refrigerator, Reach-in, one-section, stainless steel front & sides, (2) stainless steel half doors with locks, cam-lift hinges, digital temperature control, aluminum interior, (3) chrome shelves, LED interior lights, 5" castors, 1/3 HP, 9' cord, , cULus, NSF, MADE IN USA

Door hinged right standard
(3) chrome shelves and shelf supports standard per section
Spec Kit #2 - (1) set of #2 type tray slides (equips 1/2 section only) for top section
5" castors, set of 4, standard

ITEM 2.427  EXHAUST VENTILATOR- S.W. FRYER
NIKEC

NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 2.428  FIRE EXTINGUISHING SYSTEM
NIKEC

NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 2.429  MOBILE REFRIGERATED BASE
TRUE FOOD SERVICE EQUIPMENT TRCB-52-60

Refrigerated Chef Base, 51-7/8"L base, 60"L one-piece 300 series 18 gauge stainless steel top with V edge, stainless steel front/sides, aluminum back, aluminum interior with stainless steel floor, (2) drawers [accommodates (3) 12"x20"x4" pans, NOT included], 4" castors, 1/3 HP, 7' cord, , cULus, NSF, CE, MADE IN USA

ITEM 2.430  36" COUNTER GRIDDLE
KEATING M36X30FT-G

Miraclean® Griddle, gas, 36" W x 24" D cooking surface, 3/4" thick chrome finished griddle plate, front
grease trough, (2) zoned millivolt thermostatic heat controls, stainless steel front sides & back, 90,000 BTU, cETLus, ETL-Sanitation, NSF®

Dormont 1675KITS48 Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 SnapFast® QD, 1 Swivel MAX®, 1 full port valve, 1 elbow, coiled restraining cable with hardware, 167,000 BTU/hr minimum flow capacity, limited lifetime warranty

ITEM 2.431  MOBILE FRYER BATTERY W/ HEATED DUMP
FRYMASTER FPPH255

Fryer Battery, gas, hi-efficiency, (2) 50 lb. capacity each, built-in filtration, open frypot design, automatic melt cycle, boil-out temp control, electronic ignition, center mounted RTD, 1° compensating temperature probe, includes: rack-type basket support, basket hanger & twin baskets, stainless steel frypots, doors & cabinet, 160,000 BTU, NSF, CSA, cCSAus, ENERGY STAR®, Enerlogic®

Spreader cabinet, stainless steel door and cabinet
Spreader located at left end of fryer battery
Solid Flat Top, standard
FWH-1 Food Warmer & Holding Station, includes; heat lamp, cord & plug, 12 x 20 x 2-1/2" stainless steel cafeteria-style pan & screen, NSF, cULus, CE
6" casters (set of 4), standard
Dormont 16100KITS48PS Dormont Blue Hose™ Moveable Gas Connector Kit, 1" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, 1 Snap Fast™ QD, 1 Swivel MAX®, 1 full port valve, 1 elbow, 1 pair Safety Set® with adhesive foam tape and hardware mounting options, limited lifetime warranty

ITEM 2.432  OPEN NUMBER

ITEM 2.433  OPEN NUMBER

ITEM 2.434  BACK COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.435  MOBILE UNDERCOUNTER FREEZER
TRUE FOOD SERVICE EQUIPMENT TUC-48F-LP-HC

Low Profile Undercounter Freezer, -10° F, (4) shelves, stainless steel top & sides, clear coated aluminum interior with stainless steel floor, (2) stainless steel door, 1-1/2" diameter dual wheel castors, 31-7/8" counter height, front breathing, R290 Hydrocarbon refrigerant, 1/2 HP, , 7' cord, MADE IN USA
Self-contained refrigeration standard

Warranty - 5 year compressor (self-contained only), please visit www.Truemfg.com for specifics
Warranty - 3 year parts and labor, please visit www.Truemfg.com for specifics
Alternative hinging available, please contact factory
1-1/2" diameter dual wheel castors, standard
ITEM 2.436  WASTE CONTAINER
NIKEC, BY OWNER

ITEM 2.437  OPEN NUMBER

ITEM 2.438  OPEN NUMBER

ITEM 2.439  OPEN NUMBER

ITEM 2.440  DROP-IN ROUND SAUCE WELL
WELLS SS-8TDU
Food Warmer, top-mount, built-in, electric, for 7-quart round inserts, drain, wet/dry operation, thermostat control, non-insulated, stainless steel interior, Wellslok, UL, cULus, NSF
20385 Drain Valve Extension Kit, extension from drain to counter front with remote handle (for use with "D" models only) excluding DM models
22592 Wellslok Extension Kit, for UL listed circular warmers only to adapt to wood countertops up to 1-1/2" thick
72" Wiring (thermostatically controlled warmers) per well

ITEM 2.441  OPEN NUMBER

ITEM 2.442  MOBILE SLIDE DOOR U/C REFRIGERATOR
CONTINENTAL REFRIGERATOR UC48-SGD
Undercounter Display Refrigerator, 48" wide, two-section, (2) sliding glass doors, LED lighting, stainless steel front, aluminum subtop, sides, back & interior, 3-5/8" casters, front breathing, rear-mounted self-contained refrigeration, 1/4 hp
20177 Cylinder lock, per drawer or door (not available on 3 tier drawers)

ITEM 2.443  FOOD GUARD W/ LIGHT & HEAT
ENGLISH MANUFACTURING AMA-101A
NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY
Viper series sneeze guard, counter mounted, for full serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3/8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¾" tempered glass end panels. GRN4L-XX heat/light combination unit with stainless steel housing & remote infinite control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified.
Counter mount narrow flange.
Millwork fabricator to mount English Manufacturing provided remote controls for combination heat/light fixture at an accessible location on counter face and interwire as necessary through Food Guard post.

KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

**ITEM 2.444  FOOD GUARD W/ LIGHT & HEAT**  
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3'8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. GRN4L-XX heat/light combination unit with stainless steel housing & remote infinite control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified.

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for combination heat/light fixture at an accessible location on counter face and interwire as necessary through Food Guard post.

KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

**ITEM 2.445  HEATED SHELF FOOD WARMER**  
HATCO GRSS-6018

KEC PROVIDED, OWNER INSTALLED

Glo-Ray® Heated Stone Shelf, portable, 60" x 18" x 2-1/2", 100-200°F temperature range, cord and plug located in center of side with switch, cULus, UL EPH Classified, ANSI/NSF 4, Made in USA

Model SS-NSKY Night sky stone. Verify stone color with architect prior to ordering

KEC to present color options to architect for final selection of stone color prior to ordering.

**ITEM 2.446  EXHAUST VENTILATOR- S.W. TORTILLA**  
NIKEC

NIKEC, GC/MC PROVIDED, INSTALLED

**ITEM 2.447  FIRE EXTINGUISHING SYSTEM**  
NIKEC

NIKEC, GC/MC PROVIDED, INSTALLED

**ITEM 2.448  ROTATING TORTILLA GRILL**  
JADE RANGE JTRG-48-FF

MSU - New Dining Hall 100% CD Set
PPA #15-0103  
FOODSERVICE EQUIPMENT
Titan™ Rotating Tortilla Griddle, gas, 67" diameter, with gutter, 5/8" thick steel plate, adjustable variable speeds, motor controls, stainless steel outer shroud & base cabinet, adjustable feet, 100,000 BTU, CSAus, NSF

Flame Failure Valve

ITEM 2.449 DROP-IN ROTATING COLD PAN
BSI CP-500N

Configured for salsa pan display

ITEM 2.450 FOOD GUARD PARTITION
ENGLISH MANUFACTURING M-100-2

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Sneeze guard, Partition, length and shape per plan. 18" high posts 1" OD with brushed stainless steel finish (2) end posts (1) 3/8" clear tempered glass panels with polished edges

ITEM 2.451 MOBILE REFRIGERATED SANDWICH UNIT
TRUE FOOD SERVICE EQUIPMENT TSSU-60-24M-B-ST

Mega Top Sandwich/Salad Unit, (24) 1/6 size (4"D) poly pans, (2) stainless steel insulated covers, 8-7/8"D cutting board, stainless steel top/front/sides, aluminum back, (2) full doors, (4) shelves, aluminum interior with stainless steel floor, 5" castors, 1/3 HP, 7' cord, cULus, NSF, CE, MADE IN USA

Model 915166 Composite Cutting Board, pre-drilled, 60" x 8-7/8" x 1/2" thick for TSSU-60 Mega Top unit Model 955549FI Flat Lid, quantity of (2), for TSSU-60-24M-B-ST Mega top models

5" Castors, standard

ITEM 2.452 TORTILLA PRESS, HEATED
SOMERSET SDP-747

SomerSET® Pizza/Bread Dough Press, compact/table top design, manual operation, heated upper platen, adjustable heat controls with a range of 0° - 350°F, LED temp display, up to 18" diameter crusts, heavy duty stainless steel construction, cETLus, NSF, CE

ITEM 2.453 UC ICE MAKER W/ BIN
HOSHIZAKI IM-200BAA

Undercounter Ice Maker, Cube-Style, air-cooled, self-contained condenser, approximately 200 lb. production/24 hours, 50 lb. built-in storage capacity, stainless steel finish, individual square cube style, Evercheck™ digital control with LED display, alert system, removable filter, 6" legs, R134 refrigerant, NSF, cETLus, UL, ENERGY STAR®

Everpure EV9100-71 IN-10 CC In-Line Filter, without fittings, 10" calcite/carbon for taste & odor with mineral feed, 2,000 gallon capacity

ITEM 2.454 BLENDER W/ COVER
VITAMIX MODEL UNKNOWN
NIKEC, EXISTING ITEM #TBD HARRISON RELOCATED

ITEM 2.455  FOOD GUARD W/ LIGHT
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3'8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. Full length ECO5 LED lighting with stainless steel housing & remote on/off control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for light fixture at an accessible location on counter face and interwire as necessary through Food Guard post. KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

ITEM 2.456  FOOD GUARD W/ LIGHT & HEAT
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3'8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. GRN4L-XX heat/light combination unit with stainless steel housing & remote infinite control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for combination heat/ light fixture at an accessible location on counter face and interwire as necessary through Food Guard post. KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

ITEM 2.457  DROP-IN HOT FOOD WELL
ATLAS METAL WH-2

Hot Food Drop-In Well Unit, electric, 2-well, individual pan design, wet or dry type, holds (2) 12" x 20" pans, control panel with individual thermostatic controls, stainless steel top & wells, galvanized outer liner, with fiberglass insulation

DM-4 Individual Drain, for each well with manifold to single valve, for drop-in units
RDVE Rear Extension, for DM or DMV drain options
AF Automatic Water Fill
MS Master On/Off Switch
RTL-2 Remote Thermostat, for counter mounting with 50"L lead, 4-1/2" x 12-1/4" cutout required

**ITEM 2.458** BACK ISLAND COUNTER  
NIKEC, BY GC MILLWORK CONTRACTOR

**ITEM 2.459** CHEESEMELTER  
ANTUNES MS-355-9100480

Miracle Steamer, self-contained water tank, 14" capacity drawer style, 0-99 minute 59 second timer, 6 ft. grounded power cord, stainless steel construction, , 208V/50-60/1, cETLus, ETL-Sanitation

**ITEM 2.460** WALK-IN REFRIGERATOR COMPLEX  
AMERICAN PANEL CORPORATION CUSTOM/NSF

Unit shall be modular panel NSF No 7 construction

One(1) compartment unit, sized & shaped as shown on plan and described in American Panel Quote 164139c

Unit shall be provided with integral built-in internal panelized insulated structural floor system with internal ramp to sit on top of architectural slab. KEC to verify slab finish conditions and coordinate appropriately.

Exterior Finishes:
Exposed Exterior (except ceiling): 22 ga. embossed stainless steel  
Ceiling & Unexposed Exterior: 26 ga. embossed Galvalume

Interior Finishes:
.032 gauge embossed aluminum pre-painted white ceiling  
26 ga. embossed Galvalume pre-painted white interior walls

One(1) 36" X 78" door, hinged as shown on plan with 26 ga embossed galvanized pre-painted white frame and plug. Door to be provided with third hinge, automatic door closure with 1248 Kason spring hinges and 14" X 24" viewport with heated frame and glass.

Provide CCI Industries SS3678-AQ Clear Vu flexible swinging air curtain door, for 36" exterior entry door, 36" wide X 78" high, clear .08 PVC, with gravity hinge, easy in and out access, auto-close feature, for everyday traffic.

Nine (3) ceiling mounted 48" LED light fixtures.

Walk-in provided under this portion of the specifications shall be prefabricated of modular design and construction. They shall be designed to allow convenience and accurate field assembly and future enlargement by the addition of panels.

Standard 4" thick wall & ceiling panels shall be 11½", 23", 34½" and 46" in width and shall be interchangeable with like panels. Corner panels shall be 90° angles with actual 12" exterior horizontal measurements. Custom width panels shall be incorporated when required to meet floor plan requirements as indicated in contract foodservice drawings.

Panels shall consist of foamed-in-place urethane insulation, sandwiched between interior and exterior metal surfaces, which have been die-formed and gauged for uniformity in size.
Edges of panels shall be foamed-in-place “tongue and groove” with Posi-Loc locking assemblies foamed-in-place at time of fabrication.

Insulation shall have a 97% closed cell structure, average in-place density of 2.2 lbs. per cubic foot. Overall thickness shall be four inches. Fire hazard classification according to ASTME-84 (UL 723) and is certified with UL label.

Assembly of walk-ins shall be accomplished by “Posi-Loc” locking assemblies, which shall be foamed-in-place and activated by a hex wrench provided by the manufacturer. Access ports shall be on interior to allow assembly of walk-in from the inside and shall be covered by snap caps.

Flexible vinyl gaskets shall be foamed-in-place on the interior and exterior edge of the “tongue” rail. Gaskets shall be impervious to stains, greases, oils and mildew.

Provide, where shown, 36" X 78" clear opening entrance door(s). All doors shall have three hinges. The door shall be flush type, finished in and out, to match the wall in which it is located. Door and door section shall be listed by Underwriters Laboratories and equipped with the following:

Magnetic gasket, Posi-Seal door closure, brushed chrome latch and strap-type, cam-lift hinges. Hardware shall have provisions for locking and a safety release to prevent entrapment of personnel within the box.

Door jamb and door perimeter shall be made of Fiberglass Reinforced Plastic.

Each entrance door section shall be provided with an LED vapor-proof light, pilot light switch and conduit between switch box and outlet box. Concealed wiring shall be standard on each entrance door section.

A digital thermometer shall be included with each door section to indicate inside temperature.

All walk-ins shall be fabricated to comply with National Sanitation Foundation Standard No. 7. The NSF label shall be affixed to the interior door pan. Interior corners and floor shall be coved to meet NSF specifications.

A complete set of installation instructions shall be included with the walk-in. These instructions shall cover the erection and assembly of the walk-in and the installation of refrigeration systems. A floor print shall be included.

Walk-In doors shall be provided with deadbolt lock. Lock mechanism shall be located on interior of door with key access on exterior. Inside safety release shall be provided.

Provide, as required, spring hinge to assist in closing the door. It shall be of a torsion-compression design.

Provide .080" aluminum diamond treadplate kickplate on interior & exterior of all doors. Kickplate to be 36" high by the width of the door. Provide vinyl bumper rails at 24" and 48" above finished floor on all exposed exterior walls.

Furnish (1) set of (2) 24" x 33" glass cooler doors with frame and mullion heaters.

Furnish removable closure panels to enclose the area between the building and the walk-in ceilings. Panels to be fabricated of same material as walk-in exposed exterior.

Furnish trim strips between walk-in and building walls where applicable. Constructed and finished of same material as exposed exterior of walk-in.

Furnish one(1) Modularm 75LC temperature alarms (or equal) with light manager, completely solid state,
digital readout of monitored temperature in degrees F., field adjustable built-in test circuitry, built-in battery and charger circuitry for power failure notification, safe and alarm lights provide constant visual states of monitored area. Built-in A/O + N/C dry contacts for remote notification, fail save circuitry design prevents accidental disabling, automatic multi-point scanning of our temperature probe locations.

Walk-In shall be fabricated to hold a temperature of +35°F in refrigerated section.

KEC to verify all dimensions in field to accommodate installation of unit prior to fabrication.

ITEM 2.461  EVAPORATOR COIL, +35F
RDT ADT-120

EVAPORATOR COIL, +35F

Evaporator coil shall be a pre-engineered and factory assembled unit. Furnish & install unit as shown on plans & per RDT Quote 19466.

Coil shall be hung flush against the underside of walk-in ceiling and seal perimeter as required by code.

KEC shall verify location of water cooled Remote Condensing Unit specified under Item 1.005 & interconnect with evaporator coil as required

Line run shall be verified by KEC

KEC shall coordinate with Manufacturer to ensure that system is installed complete with all necessary components and accessories, allowing system to operate at +35°F

ITEM 2.462  MOBILE SHELVING UNIT
NIKEC, BY OWNER

ITEM 2.463  MOBILE COMBI OVEN/STEAMER
RATIONAL SCC WE 102 E 480V

NIKEC, EXISTING ITEM #XX HARRISON RELOCATED

(SCC WE 102 E 480V) SelfCooking Center® 5 Senses Combi Oven/Steamer, Mobile Oven Stand.

ITEM 2.464  FILTER SYSTEM, STEAMER
EVERPURE EV979750

KleenSteam® CT System, total system for boilerless steamers, 1.0 gpm flow rate, deliming, 4CB5 carbon filter, SS-10 scale inhibitor Cartridge, dip tube (2) 7 oz. bags ScaleKleen, pressure gauge, water shut-off valve & wall bracket

ITEM 2.465  OPEN NUMBER

ITEM 2.466  DROP-IN ANGLED COLD UNIT
ATLAS METAL RM-2
Cold Food Drop-In Unit, 2-pan size, 18/304 stainless steel top & liner with 3" recess, holds (2) 12" x 20" pans, self-contained refrigeration, insulated pan with 22 gauge galvanized outer case, 3/4" drain with strainer, 30-1/4"W x 24-1/2"D cutout required, NSF 7, UL

RS Remote On/Off Switch, for counter mounting
SA-2 Sloped Adapter, 32-1/2"L (25-3/4" x 31-1/2" counter cut-out required), stainless steel, for RM units

**ITEM 2.467 FOOD GUARD W/ LIGHT**  
**ENGLISH MANUFACTURING AMA-101A**

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3/8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. Full length ECO5 LED lighting with stainless steel housing & remote on/off control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for light fixture at an accessible location on counter face and interwire as necessary through Food Guard post.  
KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

**ITEM 2.468 DROP-IN UTILITY SINK**  
**ADVANCE TABCO DI-1-10**

KEC PROVIDED, PLUMBER INSTALLED

Drop-In Sink, 1-compartment, 10" wide x 14" front-to-back x 10" deep bowl, 20 gauge 304 series stainless steel, with deck mounted gooseneck faucet, basket drain, NSF  
K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink faucet (1 pair hot & cold 4" long blades), fits faucets supplied after November 2015 with hot & cold color rings that do not have exposed screw head

**ITEM 2.469 EXHAUST VENTILATOR- S.W. COMBI**  
**NIKEC**

NIKEC, GC/MC PROVIDED, INSTALLED

**ITEM 2.470 OPEN NUMBER**

**ITEM 2.501 BEVERAGE COUNTER**  
**NIKEC, BY GC MILLWORK CONTRACTOR**

**ITEM 2.502 SODA & ICE DISPENSER**

**MSU - New Dining Hall 100% CD Set**  
**PPA #15-0103**  
**FOODSERVICE EQUIPMENT**
NIKEC, BY VENDOR

ITEM 2.503  OPEN NUMBER

ITEM 2.054  DROP-IN GLASS FILLER WATER STATION
T&S B-1230

KEC PROVIDED, PLUMBER INSTALLED

Water Station, drop-in, 10-1/2" 18 ga. stainless steel drip pan, B-1210 push back glass filler with 8" clearance

ITEM 2.505  ICED TEA BREWER/DISPENSER
NIKEC, BY VENDOR

Iced Tea Brewer, 3 or 5 gallon capacity single brewer

ITEM 2.506  JUICE DISPENSER
NIKEC, BY VENDOR

ITEM 2.507  COFFEE BREWER
FETCO CBS-2162XTS

XTS™ Series Coffee Brewer, twin, 3 gallon capacity, touchscreen operation, customizable screen, adjustable brew time & volume, streamlined programming & diagnostics, manual hot water service, Extractor® Brewing System, stainless steel, 3/8" male flare fitting, 2 GPM, 20-75 psi, UL, cUL, NSF

D012 TPD-30 LUXUS® Thermal Dispenser (4 ea.), 3 gallon, stainless steel construction, twist & remove lid, thermally insulated, faucet & gauge guards, side handles
A137 Drip Tray, freestanding, square (4 ea)
Everpure EV9100-71 IN-10 CC In-Line Filter (2 ea.), without fittings, 10" calcite/carbon for taste & odor with mineral feed, 2,000 gallon capacity
Dormont W25B2Q36 Dormont Hi-PSI® Water Connector (2 ea.), 1/4" dia., 36" long, covered with stainless steel braid, brass two-way Quick Disconnect coupling, limited lifetime warranty

ITEM 2.508  TRIPLE CEREAL DISPENSER
NIKEC, BY OWNER

ITEM 2.509  MOBILE UNDERCOUNTER DISPLAY REFRIGERATOR
CONTINENTAL REFRIGERATOR UC32-GD

Undercounter Display Refrigerator, 32" wide, one-section, (1) field rehingable glass door, LED interior lighting, stainless steel front, aluminum subtop, sides, back & interior, 3-5/8" casters, rear-mounted self-contained refrigeration, 1/5 hp

ITEM 2.510  OPEN NUMBER
ITEM 2.511  DOUBLE MILK DISPENSER
LANCER CED-SS

Double milk dispenser, front loading product, high capacity ice bank. Automatic ratio control, no refractometer required. Key lock switch.

ITEM 2.512  BEVERAGE COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.601  SHAKES COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.602  DROP-IN SINK
ADVANCE TABCO DI-1-10SP

KEC PROVIDED, PLUMBER INSTALLED

Drop-In Sink, 1-compartment, 10" wide x 14" front-to-back x 10" deep bowl, 6" tapered rear & side splashes, 20 gauge 304 series stainless steel, with deck mounted gooseneck faucet, basket drain, NSF

K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink faucet (1 pair hot & cold 4" long blades), fits faucets supplied after November 2015 with hot & cold color rings that do not have exposed screw head

ITEM 2.603  MILK SHAKE MACHINE
TAYLOR COMPANY MODEL C709

Crown® Series Soft Serve Freezer, counter model, self-contained, single flavor, heat treatment, 20qt. hopper, 3.4qt. freezing cylinder, indicator lights, touch screen controls, standby, stainless steel finish, R1-1/2 HP motor, NSF, cULus listed

ITEM 2.604  ICE CREAM CONE DISPENSER
CAL-MIL 386

Cone Cabinet, 9 hole, 12"W x 12"D x 15"H, 2" dia. hole size, clear, BPA Free

ITEM 2.605  FOOD GUARD W/ LIGHT
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3/8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. Full length ECO5 LED lighting with stainless steel housing & remote on/off control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.
Millwork fabricator to mount English Manufacturing provided remote controls for light fixture at an accessible location on counter face and interwire as necessary through Food Guard post. KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

**ITEM 2.606 FOOD GUARD W/ LIGHT**
**ENGLISH MANUFACTURING AMA-101A**

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1" round brushed stainless steel posts. Vertically & angularly adjustable. 3'8" tempered glass front panel & 3/8" tempered glass fixed top shelf with 1" radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼" tempered glass end panels. Full length ECO5 LED lighting with stainless steel housing & remote on/off control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22" high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for light fixture at an accessible location on counter face and interwire as necessary through Food Guard post. KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

**ITEM 2.607 DROP-IN REFRIGERATED COLD PAN**
**ATLAS METAL RML-2**

Slim-Line Cold Food Drop-In Unit, refrigerated, 3" recessed top, 2-pan size, self-contained refrigeration, insulated pan, stainless steel inner liner & top, galvanized steel outer liner, 1/4HP, with on/off thermostat switch & pilot light, NSF

A 3/4" diameter drain & valve, separator channels are provided

**ITEM 2.608 DIPPERWELL**
**SERVER PRODUCTS 87760**

KEC PROVIDED, PLUMBER INSTALLED

CONSERVEWELL™-DROP-IN SERVICE UTENSIL HOLDER WITHOUT COUNTDOWN TIMER, hold utensils above 140°F, fits into most existing counter cut-outs for perpetual flow dipper wells, includes (1) stainless steel inset, 120v, NSF, cULus

**ITEM 2.609 ICE CREAM DIPPING CABINET**
**NIKEC, BY VENDOR**

Ice Cream Dipping Cabinet, dip (18) 3 gallon, store (15) 3 gallon

**ITEM 2.610 COLD FOOD WELL**
**ATLAS METAL RM-1**

Cold Food Drop-In Unit, 1-pan size, 18/304 stainless steel top & liner with 3" recess, holds (1) 12" x 20" pan, self-contained refrigeration, insulated pan with 22 gauge galvanized outer case, 3/4" drain with strainer, 16-1/2"W x 24-1/2"D cutout required, NSF 7, UL
ITEM 2.611  NOVELTY ICE CREAM MERCHANDISER
NIKEC, BY VENDOR

ITEM 2.612  PEANUT BUTTER MACHINE
NIKEC
NIKEC, EXISTING ITEM BY OWNER RELOCATED

ITEM 2.613  SYRUP WARMER/DISPENSER
SERVER PRODUCTS 85480
KEC PROVIDED, OWNER INSTALLED
SY 1.5 SYRUP SERVER, stainless steel syrup warmer/server with 1-1/2 gallon (5.7 L) capacity, features precalibrated thermostat for accurate heat control and thermostat lock to prevent accidental changes, dispenses from traditional spigot-style faucet, NSF & cULus LISTED

ITEM 2.614  WAFFLE BAKER
NIKEC, BY VENDOR

ITEM 2.615  MOBILE UNDERCOUNTER DISPLAY REFRIGERATOR
CONTINENTAL REFRIGERATOR UC32-GD
Undercounter Display Refrigerator, 32" wide, one-section, (1) field rehingable glass door, LED interior lighting, stainless steel front, aluminum subtop, sides, back & interior, 3-5/8" casters, rear-mounted self-contained refrigeration, 1/5 hp

ITEM 2.616  BATTER DISPENSER
NIKEC, BY VENDOR

ITEM 2.617  CONVEYOR TOASTER
HATCO TQ-10
KEC PROVIDED, OWNER INSTALLED
Toast-Qwik® Conveyor Toaster, horizontal conveyor, countertop design, all bread types toaster, approximately 5 slices/min capacity, 2" opening height, 4" legs, cULus, UL EPH Classified, ANSI/NSF 4, Made in USA

ITEM 2.618  PASTRY/BREAD DISPLAY CASE
CAL-MIL 288
KEC PROVIDED, OWNER INSTALLED
Classic Bakery Display Case, 27"W x 23"D x 28"H, non-refrigerated, countertop, see-thru design, double front doors, includes: (6) 13" x 18" trays and pricing strips, clear acrylic,

ITEM 2.701   COFFEE BREWER  
FETCO CBS-2162XTS

XTS™ Series Coffee Brewer, twin, 3 gallon capacity, touchscreen operation, customizable screen, adjustable brew time & volume, streamlined programming & diagnostics, manual hot water service, Extractor® Brewing System, stainless steel, 3/8" male flare fitting, 2 GPM, 20-75 psi, UL, cUL, NSF

D009 TPD-15 LUXUS® Thermal Dispenser (6 ea.), 1-1/2 gallon, stainless steel construction, twist & remove lid, thermally insulated, faucet & gauge guards, side
A069 ID Plates, recipe/flavor, acrylic (6 ea)
Everpure EV9100-71 IN-10 CC In-Line Filter (3 ea.), without fittings, 10" calcite/carbon for taste & odor with mineral feed, 2,000 gallon capacity
Dormont W25B2Q36 Dormont Hi-PSI® Water Connector (3 ea.), 1/4" dia., 36" long, covered with stainless steel braid, brass two-way Quick Disconnect coupling, limited lifetime warranty

ITEM 2.702   COFFEE COUNTER  
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.703   COFFEE SERVER  
NIKEC, BY OWNER

ITEM 2.704   FRONT SERVICE COUNTER - BAKERY  
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.705   OPEN NUMBER

ITEM 2.706   COLD FOOD WELL  
ATLAS METAL RML-2

Slim-Line Cold Food Drop-In Unit, refrigerated, 3" recessed top, 2-pan size, self-contained refrigeration, insulated pan, stainless steel inner liner & top, galvanized steel outer liner, 1/4HP, with on/off thermostat switch & pilot light, NSF 7

RS Remote On/Off Switch, for counter mounting

ITEM 2.707   FOOD GUARD W/ LIGHT  
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

MSU - New Dining Hall 100% CD Set 11 40 00 - 86  
PPA #15-0103 FOODSERVICE EQUIPMENT
Viper series sneeze guard, counter mounted, for full serve application, 1” round brushed stainless steel posts. Vertically & angularly adjustable. 3’8” tempered glass front panel & 3/8” tempered glass fixed top shelf with 1” radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼” tempered glass end panels. Full length ECO5 LED lighting with stainless steel housing & remote on/off control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22” high. NSF and UL certified

Counter mount narrow flange.

Millwork fabricator to mount English Manufacturing provided remote controls for light fixture at an accessible location on counter face and interwire as necessary through Food Guard post. KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

**ITEM 2.708** CREPE MAKER
NIKEC

NIKEC, EXISTING ITEM #TBD HARRISON

**ITEM 2.709** OPEN NUMBER

**ITEM 2.710** OPEN NUMBER

**ITEM 2.711** OPEN NUMBER

**ITEM 2.712** OPEN NUMBER

**ITEM 2.713** WASTE RECEPTACLE
NIKEC, BY OWNER

**ITEM 2.714** FOOD GUARD W/ LIGHT
ENGLISH MANUFACTURING AMA-101A

NO SUBSTITUTION ALLOWED, AS SPECIFIED ONLY

Viper series sneeze guard, counter mounted, for self serve application, 1” round brushed stainless steel posts. Vertically & angularly adjustable. 3’8” tempered glass front panel & 3/8” tempered glass fixed top shelf with 1” radius corners. Two (2) end posts with narrow flange for counter top surface mount. Full height ¼” tempered glass end panels. Full length ECO5 LED lighting with stainless steel housing & remote on/off control. Brushed #4 stainless steel finish (KEC to verify with Architect). Length and configuration shown in plan by 22” high. NSF and UL certified

Counter mount narrow flange.
Millwork fabricator to mount English Manufacturing provided remote controls for light fixture at an accessible location on counter face and interwire as necessary through Food Guard post. KEC to verify dimensions, post locations, spacing & mounting style in field prior to fabrication.

ITEM 2.715  OPEN NUMBER

ITEM 2.716  COMBO AMBIENT/REFRIGERATED DISPLAY CASE
STRUCTURAL CONCEPTS C3Z4867

Oasis® Service/Self-Service Ambient/Refrigerated Merchandiser, 48-1/2"W, upper: service, fixed flat front glass, non-refrigerated, (2) display levels, sliding rear doors, middle service: fixed flat front glass, convertible refrigeration from non-refrigerated to refrigerated, (1) display level, sliding rear doors lower: self-service open front, (1) lighted glass shelf, top light, Breeze™ with EnergyWise self-contained refrigeration system, shelf, rear wrap board, black interior, laminated exterior, full end panels with mirror, cETLus, ETL-Sanitation

Exterior: Wilsonart or Formica NON-PREMIUM laminate
Clear glass upper & middle rear sliding glass doors, standard
Night curtain, retractable, non-locking
Add Lights (LED 3500K) to standard shelves

KEC to verify finish with Architect prior to ordering

ITEM 2.717  POS TERMINAL
NIKEC BY OWNER

ITEM 2.718  SYRUP ORGANIZER
CAL-MIL 677
KEC PROVIDED, OWNER INSTALLED

Bottle Organizer, 9-1/2"W x 12-3/4"D x 6-1/2"H, 3-tier step design, holds 6 bottles, acrylic, black

ITEM 2.719  BOTTLE SYRUP RAIL
GLASTENDER SSR-18

Single Speed Rail, 18"W, open step-and-rail design, ABS sound-deadening covers, clear snap-on liquor identification label cover, field installed, stainless steel construction, ETL

ITEM 2.720  OPEN NUMBER

ITEM 2.721  FRONT SERVICE COUNTER - ESPRESSO
NIKEC, BY GC MILLWORK CONTRACTOR
ITEM 2.722  COFFEE GRINDER  
NIKEC, BY OWNER

ITEM 2.723  MOBILE UNDERCOUNTER REFRIGERATOR  
TRUE FOOD SERVICE EQUIPMENT TUC-27-LP-HC

Low Profile Undercounter Refrigerator, 33-38° F, (2) shelves, stainless steel top & sides, clear coated aluminum interior with stainless steel floor, (1) stainless steel door, 1-1/2” diameter dual wheel castors, 31-7/8” counter height, front breathing, R290 Hydrocarbon refrigerant, 1/6 HP, 7’ cord, , cULus, NSF, CE, MADE IN USA

Alternative hinging available, Hinge (1) unit left, (1) unit right as indicated in plan

ITEM 2.724  ESPRESSO/CAPPUCCINO MACHINE  
NUOVA SIMONELLI VA358 WHITE EAGLE 2GR T3

MVA358AVT302ND0001 VA358 White Eagle Espresso Coffee Machine, 2 group, full automatic, volumetric, 12.1 liter (total capacity), independently digitally-controlled PID broilers, (1) steam & (4) brewing, multi-function display, (2) steam wands (cool touch), (1) hot water nozzle with economizer, 208-240/50-60/1-ph, , UL, CSA, NSF

KD8 Water Softener, 8 liter, manual, rechargeable, capacity 4500 grains, 1 gallon per minute flow rate, 2 x 21mm compression valves, built-in flushing valves, for use on all Nuova Simonelli units

ITEM 2.725  OPEN NUMBER

ITEM 2.726  OPEN NUMBER

ITEM 2.727  KNOCK BOX  
VOLLRATH E06064-KB

KEC PROVIDED, OWNER INSTALLED

Knock Box, 1/6 size, 1-7/8 quart, 6-7/8” x 6-3/8” x 4” deep, rubber coated knock bar, includes: attachable rubber feet, 22 gauge, 300 series stainless steel, Made in USA

ITEM 2.728  REFRIGERATED BAKERY CASE  
STRUCTURAL CONCEPTS HV48R

Encore® Service Refrigerated Bakery Merchandiser, 50"W, Breeze™ with EnergyWise self-contained refrigeration system with evaporator pan, curved lift-up front glass, (3) lighted glass shelves, sheet metal deck, sliding glass rear doors, black interior, black trim, (2) full end panels with mirror, cETLus, ETL-Sanitation

6 ft straight blade power cord, standard  
LED 3500K lights  
Exterior: Wilsonart or Formica NON-PREMIUM laminate  
Rear Exterior: Black

MSU - New Dining Hall 100% CD Set  
PPA #15-0103  
11 40 00 - 89  
FOODSERVICE EQUIPMENT
Trim: Black, standard
Upper Rear: Clear glass rear sliding doors, standard

KEC to verify finish with Architect prior to ordering

ITEM 2.729 BACK ISLAND COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.730 OPEN NUMBER

ITEM 2.731 MOBILE SANDWICH PREP TABLE
TRUE FOOD SERVICE EQUIPMENT TSSU-48-18M-B-HC
Mega Top Sandwich/Salad Unit, (18) 1/6 size (4"D) poly pans, stainless steel insulated cover, 8-7/8"D cutting board, stainless steel top, front, sides, aluminum back, (2) full doors, (4) PVC coated wire shelves, aluminum interior with stainless steel floor, 5" castors, R290 Hydrocarbon refrigerant, 1/3 HP, 11’ cord, , cULus, UL EPH Classified, CE, MADE IN USA
Model 915156 Composite Cutting Board, pre-drilled, 48" x 8-7/8" x 1/2" thick for TSSU-48 Mega Top unit

ITEM 2.732 DROP-IN PREP SINK
ADVANCE TABCO DI-1-2012
KEC PROVIDED, PLUMBER INSTALLED
Drop-In Sink, 1-compartment, 20" wide x 16" front-to-back x 12" deep bowl, 18 gauge 304 series stainless steel, with deck mounted 8" swing spout faucet, basket drain, NSF
K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink faucet (1 pair hot & cold 4" long blades), fits faucets supplied after November 2015 with hot & cold color rings that do not have exposed screw head

ITEM 2.733 MOBILE REACH-IN REFRIGERATOR
TRUE FOOD SERVICE EQUIPMENT TUC-48-ADA-HC
ADA Compliant Undercounter Refrigerator, 33-38° F, stainless steel top & sides, (2) stainless steel doors, (4) shelves, clear coated aluminum interior with stainless steel floor, 3" castors, front breathing, R290 Hydrocarbon refrigerant, 1/5 HP, 7" cord, , 34" working height, cULus, UL EPH Classified, CE

ITEM 2.734 MOBILE RACK
NIKEC, BY OWNER

ITEM 2.735 RAPID BAKE OVEN
MERRYCHEF USA E2
Convection, Planar Plume and Microwave Rapid Cook Oven, ventless cooking capability, quiet operation, EasyToUCH™ controls, USB memory, built-in diagnostic testing, bottom-hinged door, stainless steel construction, , 208/UL EPH, NSF, cULus
300P Oven Paddle, 12” x 8.5” x 1.5” to handle base, aluminum alloy
P80041 Teflon Basket, 8.5” x 11.5” x .5”, weave mesh

ITEM 2.736  RETAIL SERVICE COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.737  OPEN NUMBER

ITEM 2.738  OPEN NUMBER

ITEM 2.739  WORK TABLE W/ DROP-IN PREP SINK
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.740  OPEN NUMBER

ITEM 2.741  OPEN NUMBER

ITEM 2.742  WASTE RECEPTACLE
NIKEC, BY OWNER

ITEM 2.743  HAND SINK W/ FOOT PEDAL & SOAP/TOWEL
ADVANCE TABCO 7-PS-95
KEC PROVIDED, PLUMBER INSTALLED

Hand Sink, pedestal mounted base, 14" wide x 10" front-to-back x 5" deep bowl, 20 gauge 304 series stainless steel, splash mounted faucet, soap & paper towel dispenser, pedal valves with easy access design, basket drain, wall bracket, NSF, cCSAus

K-08 Low-flow aerator 0.5gpm, fits 55/64-27 male or 15/16-27 female thread on spout, conforms to California AB 1953

ITEM 2.744  20 QT MIXER
HOBART HL200-10STD
Floor type mixer; with bowl, beater, & whip; US/EXP configuration
Legacy Planetary (Floor) Mixer, 20-quart, (3) fixed speeds plus stir speed, gear-driven transmission, 15-minute SmartTimer™, #12 taper hub, manual bowl lift, stainless steel bowl, aluminum "B" beater, stainless steel "D" wire whip, stainless steel bowl guard, 1/2 hp, cord with plug

BOWL-HL12 12 qt., Bowl, stainless steel
BBEATER-HL12 12 qt B flat beater, aluminum
DWHIP-HL12 12 qt., "D" Wire Whip, stainless steel
ITEM 2.745  OPEN NUMBER

ITEM 2.746  OPEN NUMBER

ITEM 2.747  OPEN NUMBER

ITEM 2.748  WORK TABLE
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.749  SPIRAL MIXER, 180 LB
HOBART HSL180-1

Hobart Spiral Mixer, 8.5 HP spiral motor & a 1.5 HP bowl motor, 180-pound capacity, two fixed speeds with dual 20 minute timers plus a reverse speed & Jog Control feature. Has an extra pulley & strong SS spiral dough hook

ITEM 2.750  OPEN NUMBER

ITEM 2.751  OPEN NUMBER

ITEM 2.752 - ROLL-IN REFRIGERATOR
TRUE FOOD SERVICE EQUIPMENT STR2RRI-2S

SPEC SERIES® Roll-in Refrigerator, stainless steel front & sides, (2) stainless steel doors with locks, cam-lift hinges, digital temperature control, stainless steel interior, incandescent interior lighting, stainless steel ramps, 1/2 HP, 9' cord, [accommodates 27"Wx29"Dx66"H carts, NOT included], cULus, NSF

ITEM 2.753  OPEN NUMBER

ITEM 2.754  OPEN NUMBER

ITEM 2.755 - OPEN NUMBER

ITEM 2.756 - MOBILE TRIPLE DECK OVEN
DOYON BAKING EQUIPMENT 2T-3

Artisan Stone Triple Deck Oven, Electric, energy miser/governor, stone hearth bake deck, (2) pans capacity each, end load, 8" deck height std., individual digital electronic temp control (3 zone) per deck, self-contained steam injection per deck, includes stand & oven cover, ELT, cETLus, CE, ISO

Built as (1) one piece, standard

Super High: 10" high interior, for bottom deck
High: 8" high interior, for middle deck
High: 8” high interior, for top deck
Model 50-1531 Water Filter Assembly
MPA085 Cleaning Brush, for artisan stone deck

ITEM 2.757  EXHAUST VENTILATOR- RETAIL/ BAKERY
NIKEC
NIKEC, GC/MC PROVIDED, INSTALLED

ITEM 2.758  OPEN NUMBER

ITEM 2.759  ROLL-IN PROOFER
DOYON BAKING EQUIPMENT DRIP1

Proofer Cabinet, roll-in, one-section, capacity one single rack or (36) 18” x 26” sheet pans on 2-1/2” centers, solid state heat/humidity controls, auto. water entry, full view glass door, stainless steel interior and exterior, aluminum floor, NSF, cETLus, ETL

Full view glass door
Door hinged on right
Model DB Door Bumpers

ITEM 2.760  OPEN NUMBER

ITEM 2.761  OPEN NUMBER

ITEM 2.762  BAKERS TABLE W/ WOOD TOP
JOHN BOOS SBO-S19-MOD

Work Table Frame, fits 114"W x 48"D top, stainless steel legs & bullet feet, without bin stops, centered bracing, welded set-up, NSF Work Table Top, wood, 120"W x 48"D, 2-1/4" butt jointed laminated Hard Rock maple flat top with penetrating oil finish, commercial grade, NSF

ITEM 2.763  MOBILE WASTE CONTAINER
NIKEC, BY OWNER

ITEM 2.764  INGREDIENT BIN
CAMBRO IBS27148

KEC PROVIDED, OWNER INSTALLED
Ingredient Bin, mobile, 27 gallon capacity, 1-pc seamless polyethylene bin, 2-pc sliding polycarbonate lid, S-hook on front (scoop NOT included), (4) 3” heavy duty casters (2 front swivel, 2 fixed), white with clear cover, NSF

ITEM 2.765 OPEN NUMBER

ITEM 2.766 ROUNDER DIVIDER
DOYON BAKING EQUIPMENT DSA315

KEC PROVIDED, OWNER INSTALLED

Dough Divider/Rounder, semi-automatic, 15 piece, 2.3 oz. - 7 oz., includes (3) sanitary plastic rounding plates, stainless steel cutting knives, wheel mounted, interchangeable dough head, ETL

KEC to verify with operator prior to order how many and what size interchangeable dough heads are desired.

ITEM 2.767 DOUGH SHEETER
SOMERSET CDR-2000M

KEC PROVIDED, OWNER INSTALLED

Somerset® Dough Roller, 20" metallic rollers, sheets 500-600 pieces per hour up to 20" diameter, front operation, manual roller adjustable, fixed speed, safety sensors, removable spring loaded scrapers, large hopper, 4” adjustable stainless steel legs, all stainless steel welded construction, 3/4 HP, cETLus, NSF, CE, USDA

Model 2000-426 One-Way Adjusting Stop, install 2 per handle, creates 2 stops per handle

ITEM 2.768 BACK COUNTER
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 2.769 MOBILE UNDERCOUNTER REFRIGERATOR
TRUE FOOD SERVICE EQUIPMENT TUC-48-ADA-HC

ADA Compliant Undercounter Refrigerator, 33-38° F, stainless steel top & sides, (2) stainless steel doors, (4) shelves, clear coated aluminum interior with stainless steel floor, 3” castors, front breathing, R290 Hydrocarbon refrigerant, 1/5 HP, 7’ cord, , 34” working height, cULus, UL EPH Classified, CE, MADE IN USA

Both Doors hinged left
3” castors, standard

ITEM 2.770 OPEN NUMBER
ITEM 2.771 OPEN NUMBER

ITEM 2.772 DROP-IN UTILITY SINK
ADVANCE TABCO DI-1-168
KEC PROVIDED, PLUMBER INSTALLED

Drop-In Sink, 1-compartment, 16" wide x 14" front-to-back, 8" deep bowl, 18 gauge 304 series stainless steel, with deck mounted gooseneck faucet, basket drain, NSF

K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink faucet (1 pair hot & cold 4" long blades), fits faucets supplied after November 2015 with hot & cold color rings that do not have exposed screw head

ITEM 3.001 WALK-IN REFRIGERATOR/ FREEZER COMPLEX
AMERICAN PANEL CORPORATION CUSTOM/NSF

Unit shall be modular panel NSF No 7 construction

Two (2) compartment unit, sized & shaped as shown on plan and described in American Panel Quote 164139d

Unit shall be provided with integral built-in internal panelized insulated structural floor system with internal ramp to sit on top of architectural slab. KEC to verify slab finish conditions and coordinate appropriately.

Exterior Finishes:
Exposed Exterior (except ceiling): 22 ga. embossed stainless steel
Ceiling & Unexposed Exterior: 26 ga. embossed Galvalume

Interior Finishes:
.032 gauge embossed aluminum pre-painted white ceiling
26 ga. embossed Galvalume pre-painted white interior walls

Two (2) 36" X 78" door, hinged as shown on plan with 26 ga embossed galvanized pre-painted white frame and plug. Door to be provided with third hinge, automatic door closure with 1248 Kason spring hinges and 14" X 24" viewport with heated frame and glass.

Provide CCI Industries SS3678-AQ Clear Vu flexible swinging air curtain door, for 36" exterior entry door, 36" wide X 78" high, clear .08 PVC, with gravity hinge, easy in and out access, auto-close feature, for everyday traffic.

Nine (9) ceiling mounted 48" LED light fixtures.

Walk-in provided under this portion of the specifications shall be prefabricated of modular design and construction. They shall be designed to allow convenience and accurate field assembly and future enlargement by the addition of panels.

Standard 4" thick wall & ceiling panels shall be 11½", 23", 34½" and 46" in width and shall be interchangeable with like panels. Corner panels shall be 90° angles with actual 12" exterior horizontal measurements. Custom width panels shall be incorporated when required to meet floor plan requirements as indicated in contract foodservice drawings.

Panels shall consist of foamed-in-place urethane insulation, sandwiched between interior and exterior metal surfaces, which have been die-formed and gauged for uniformity in size.

Edges of panels shall be foamed-in-place "tongue and groove" with Posi-Loc locking assemblies foamed-in-place at time of fabrication.

Insulation shall have a 97% closed cell structure, average in-place density of 2.2 lbs. per cubic foot.
Overall thickness shall be four inches. Fire hazard classification according to ASTME-84 (UL 723) and is certified with UL label.

Assembly of walk-ins shall be accomplished by "Posi-Loc" locking assemblies, which shall be foamed-in-place and activated by a hex wrench provided by the manufacturer. Access ports shall be on interior to allow assembly of walk-in from the inside and shall be covered by snap caps.

Flexible vinyl gaskets shall be foamed-in-place on the interior and exterior edge of the "tongue" rail. Gaskets shall be impervious to stains, greases, oils and mildew.

Provide, where shown, 36" X 78" clear opening entrance door(s). All doors shall have three hinges. The door shall be flush type, finished in and out, to match the wall in which it is located. Door and door section shall be listed by Underwriters Laboratories and equipped with the following:

Magnetic gasket, Posi-Seal door closure, brushed chrome latch and strap-type, cam-lift hinges. Hardware shall have provisions for locking and a safety release to prevent entrapment of personnel within the box.

Door jamb and door perimeter shall be made of Fiberglass Reinforced Plastic.

Each entrance door section shall be provided with an LED vapor-proof light, pilot light switch and conduit between switch box and outlet box. Concealed wiring shall be standard on each entrance door section.

A digital thermometer shall be included with each door section to indicate inside temperature.

All walk-ins shall be fabricated to comply with National Sanitation Foundation Standard No. 7. The NSF label shall be affixed to the interior door pan. Interior corners and floor shall be coved to meet NSF specifications.

A complete set of installation instructions shall be included with the walk-in. These instructions shall cover the erection and assembly of the walk-in and the installation of refrigeration systems. A floor print shall be included.

Walk-In doors shall be provided with deadbolt lock. Lock mechanism shall be located on interior of door with key access on exterior. Inside safety release shall be provided.

Provide, as required, spring hinge to assist in closing the door. It shall be of a torsion-compression design.

Provide .080" aluminum diamond treadplate kickplate on interior & exterior of all doors. Kickplate to be 36" high by the width of the door. Provide vinyl bumper rails at 24" and 48" above finished floor on all exposed exterior walls.

Provide 4" pressure relief vent for freezer compartment.

Furnish removable closure panels to enclose the area between the building and the walk-in ceilings. Panels to be fabricated of same material as walk-in exposed exterior.

Furnish trim strips between walk-in and building walls where applicable. Constructed and finished of same material as exposed exterior of walk-in.

Furnish two (2) Modularm 75LC temperature alarms (or equal) with light manager, completely solid state, digital readout of monitored temperature in degrees F., field adjustable built-in test circuitry, built-in battery and charger circuitry for power failure notification, safe and alarm lights provide constant visual states of monitored area. Built-in A/O + N/C dry contacts for remote notification, fail save circuitry design prevents accidental disabling, automatic multi-point scanning of our temperature probe locations.
Walk-In shall be fabricated to hold a temperature of +35°F in refrigerated sections, and -10°F in the freezer section.

KEC to verify all dimensions in field to accommodate installation of unit prior to fabrication.

**ITEM 3.002  EVAPORATOR COIL, -10F**  
**RDT LET-120**

EVAPORATOR COIL, -10F

Evaporator coil shall be a pre-engineered and factory assembled unit. Furnish & install unit as shown on plans & per RDT Quote 19466.

Coil shall be hung flush against the underside of walk-in ceiling and seal perimeter as required by code.

KEC shall verify location of water cooled Remote Condensing Unit specified under Item 1.005 & interconnect with evaporator coil as required.

Line run shall be verified by KEC.

KEC shall coordinate with RDT to ensure that system is installed complete with all necessary components and accessories, allowing system to operate at -10°F.

Wrap drain line with heater cable and insulate.

Drain line and heating cable shall be installed for continuous operation.

**ITEM 3.003  EVAPORATOR COIL, +35F**  
**RDT ADT-140**

EVAPORATOR COIL, +35F

Evaporator coil shall be a pre-engineered and factory assembled unit. Furnish & install unit as shown on plans & per RDT Quote 19466.

Coil shall be hung flush against the underside of walk-in ceiling and seal perimeter as required by code.

KEC shall verify location of water cooled Remote Condensing Unit specified under Item 1.005 & interconnect with evaporator coil as required.

Line run shall be verified by KEC.

KEC shall coordinate with Manufacturer to ensure that system is installed complete with all necessary components and accessories, allowing system to operate at +35°F.

**ITEM 3.004  MOBILE SHELVING UNIT**  
**NIKEC, BY OWNER**
ITEM 3.005  DUNNAGE RACK  
NIKEC, BY OWNER

ITEM 3.006  HIGH DENSITY SHELVING  
METRO TTS9NA

Super Erecta®, MetroMax Q™ Top-Track Track Set, ft., includes: necessary sections of track for assembling track runs (only (1) track set is required between stationary units), NSF
MQTTE18 MetroMax Q™ Top-Track Stationary End Unit Kit, 18"W, includes: hardware necessary for connecting stationary end units to track (shelves sold separately), includes: (8) epoxy coated steel posts
TTS9NA Super Erecta®, MetroMax Q™ Top-Track Track Set, 9' L, includes: necessary sections of track for assembling track runs (only (1) track set is required between stationary units)
FPS9N High-Density Top-Track Floor Pad Protectors, 9 foot length, use for both MetroMax Q™ Top-Track & Super Erecta® Top-Track Systems
MQTTM18S MetroMax Q™ Top-Track Mobile Unit Kit, 18"W, includes: corrosion proof rigid casters, caster channels, bumpers & roller assemblies (shelves sold separately), includes: (4) MQ74UPE epoxy coated steel posts
MQ1848G MetroMax Q™ Shelf, 48"W x 18"D, open grid polymer with Microban® antimicrobial product protection, epoxy coat steel frame, (4) wedge connectors, NSF
MQ2448G MetroMax Q™ Shelf, 48"W x 24"D, open grid polymer with Microban® antimicrobial product protection, epoxy coat steel frame, (4) wedge connectors, NSF

ITEM 3.101  CO2 SUPPLY  
NIKEC/ BY VENDOR

ITEM 3.102  WATER FILTER ASSEMBLY  
EVERPURE EV943710

High Flow CSR Quad-MC2 System, 36,000 gallon capacity, 6.70 gpm flow rate, hi-combination 4 coffee brewers, 4 carbonators & ice maker @ 1,200 lb/day (1) EC210 prefilter (4) MC 0.5 micron precoat Cartridges (1) SRX scale reduction feeder, water shut-off, pressure gauges, flushing valve

ITEM 3.103  SODA SYSTEM - BIB  
NIKEC, BY VENDOR

ITEM 3.104  STATIONARY SHELVING UNIT  
NIKEC/ BY OWNER

ITEM 4.001  BEVERAGE COUNTER  
NIKEC, BY GC MILLWORK CONTRACTOR

ITEM 4.002  SODA & ICE DISPENSER  
NIKEC, BY VENDOR

ITEM 4.003  DROP-IN GLASS FILLER WATER STATION

MSU - New Dining Hall 100% CD Set  
PPA #15-0103  
FOODSERVICE EQUIPMENT
T&S B-1230
KEC PROVIDED, PLUMBER INSTALLED

Water Station, drop-in, 10-1/2” 18 ga. stainless steel drip pan, B-1210 push back glass filler with 8” clearance

ITEM 4.004 ICED TEA BREWER/DISPENSER
NIKEC, BY VENDOR

ITEM 4.005 JUICE DISPENSER
NIKEC, BY VENDOR

ITEM 4.006 COFFEE BREWER
FETCO CBS-2162XTS

XTS™ Series Coffee Brewer, twin, 3 gallon capacity, touchscreen operation, customizable screen, adjustable brew time & volume, streamlined programming & diagnostics, manual hot water service, Extractor® Brewing System, stainless steel, 3/8” male flare fitting, 2 GPM, 20-75 psi, UL, cUL, NSF

D012 TPD-30 LUXUS® Thermal Dispenser (4 ea.), 3 gallon, stainless steel construction, twist & remove lid, thermally insulated, faucet & gauge guards, side handles
A137 Drip Tray, freestanding, square (4 ea)
Everpure EV9100-71 IN-10 CC In-Line Filter (2 ea.), without fittings, 10” calcite/carbon for taste & odor with mineral feed, 2,000 gallon capacity
Dormont W25B2Q36 Dormont Hi-PSI® Water Connector (2 ea.), 1/4” dia., 36” long, covered with stainless steel braid, brass two-way Quick Disconnect coupling, limited lifetime warranty

ITEM 4.007 DROP-IN HAND SINK
ADVANCE TABCO DI-1-10SP
KEC PROVIDED, PLUMBER INSTALLED

Drop-In Sink, 1-compartment, 10” wide x 14” front-to-back x 10” deep bowl, 6” tapered rear & side splashes, 20 gauge 304 series stainless steel, with deck mounted gooseneck faucet, basket drain, NSF

K-316-LUHA Wrist Handles Only, for splash or deck mount hand sink faucet (1 pair hot & cold 4” long blades), fits faucets supplied after November 2015 with hot & cold color rings that do not have exposed screw head
K-08 Low-flow aerator 0.5gpm, fits 55/64-27 male or 15/16-27 female thread on spout, conforms to California AB 1953
7-PS-35 Paper Towel Dispenser-Wall Mounted
7-PS-12 Soap Dispenser, wall mounted

END OF SECTION 11 40 00
SECTION 12 2400
WINDOW SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Window shades and accessories.
B. Electric motor operators.

1.02 RELATED REQUIREMENTS
A. Section 06 1000 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.
B. Section 09 2116 - Gypsum Board Assemblies: Substrate for window shade systems.
C. Section 09 5100 - Suspended Acoustical Ceilings: Shade Pockets, pocket closures and accessories.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets including materials, fabrication details, dimensions, profiles, mounting requirements, and accessories.
   1. Motorized Shades: Include power requirements and standard wiring diagrams.
C. Shop Drawings: Include shade schedule indicating size, location and keys to details.
D. LEED Submittal:
   1. Product Data for Credit MR4.1 and Credit MR4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.
   2. Product Data indicating VOC compliance.
E. Shop Drawings - Motorized Shades: Provide schematic system riser diagram indicating component interconnections. Include requirements for interface with other systems.
F. Source Quality Control Submittals: Provide test reports indicating compliance with specified fabric properties.
G. Verification Samples: Minimum size 6 inches square, representing actual materials, color and pattern.
H. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.
I. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.
J. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in MSU Facilities's name and registered with manufacturer.

1.05 QUALITY ASSURANCE
A. Manufacturer's Qualifications: Obtain roller shade through one source from a single manufacturer with a minimum of 20 years experience in manufacturing products comparable to those specified in this section.
B. Installer Qualifications: Company specializing in performing work of this type with minimum ten years of experience.

C. Fire-Test-Response Characteristics: Passes NFPA 701-99 small and large scale vertical burn. Materials tested shall be identical to products proposed for use.

D. Anti-Microbial Characteristics: "No Growth" per ASTM G 21 results for fungi ATCC 9642, ATCC 9644, ATCC 9645.

E. Environmental Certification: Submit written certification from the manufacturer, including third party evaluation, recycling characteristics, and perpetual use certification as specified below. Initial submittals, which do not include the Environmental Certification, below will be rejected. Materials that are simply "PVC Free" without identifying their inputs shall not qualify as meeting the intent of this specification and shall be rejected.

1.06 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
   1. Lifetime Limited Warranty.
   2. Fabric: 5 years.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Roller Shades:
   1. Hunter Douglas: www.hunterdouglas.com
   3. Substitutions: See Section 01 6000 - Product Requirements.
B. E Screen 7503 - 3% Openness
   1. Max. Fabric Width: 122"
   2. Roll length: 30 yards
   3. Fabric Weight: 11.6 oz/yd
   4. Fabric thickness: 0.017"
   5. Openness Factor: 3%
   6. Composition: 64% Vinyl, 36% Fiberglass
   7. Color: 30:30 Charcoal/Charcoal
   8. UV Blockage: 97%.
   9. Fire Classification: NFPA 701

2.02 MOTORIZED ROLLER SHADES - RB 500 MOTORIZED ROLLER SHADES
A. Product Hunter Douglas Contract "RB 500 Motorized Roller Shade"
   1. Fabrics: Finish selected by Architect from manufacturer's available contract colors.
   2. Roller Shade Motors: Design of shade motors is based on the HDC Whisper Q Control System manufactured by Hunter Douglas Contract Window Coverings.
      a. Motors:
         1) Tubular, asynchronous (non-synchronous) motors with a 3 conductor keyed AC power plug at the motor head that can be detached at the motor head assembly directly. Concealed inside roller shade tube. Quiet operation of up to 44dBA within 3'-0".
         b. Intelligent AC Motor 115 VAC, 50-60 Hz, theromally protected, lifetime lubricated, equipped with an internal thermal overload protector. Maximum current draw not to exceed 0.9 amps when operating up to an overall width of 156", or a maximum current of 1.8 amps when operating 156+ overall width.
         c. Provide the ability to set limit stop positioning (maximum up/down limits) through 3 clear buttons with internal LED's.
d. Total hanging weight of shade band shall not exceed 80 percent of the rated lifting capacity of 6Nm when operating up to 156” overall width, and 12 Nm when operating 156+ overall width.

e. Motors must include an embedded Motor Control System without requiring any external motor logic control system outside of the motor assembly itself.
   1) This allows the motor to provide individual and group control.
   2) Provide up to 6 sub group layers of control.
   3) Allow a keypad switch control for up to 24 buttons connected directly to the Whisper Q Motor assembly to allocate for individual and group control, with up to four intermediate stop positions. When utilizing intermediate stop positions, all shades in the same room must be able to perfectly align with each other along those programmed intermediate stops.
   4) Intermediate Stop are available at up to 98 positions when communicating to the motors via RS232 (automation, BMS, computer, etc).
   5) Connect local wall switches/keypads directly to the motor assembly itself via a low voltage 6p6c (6 pin, 6 conductor DC) cable with RJ25 Plug sets. A low voltage (DC) splitter (SP1E3Q) is used to connect the keypad to the motor, and to allow for communication/direct connection to adjacent motors in the same network.

e. Control System:
   1) Motor Control System must provide bidirectional feedback, allowing for two way communication between the motor with embedded internal motor control system and its point of communication.
   2) Motors can be operated via a three position low voltage wall switch, a low voltage keypad, through dry contact, through RS232, through BMS systems, as chosen by the Architect.
   3) Motor control system allows for backward compatibility to allow for the add on of building automation system integration, audio-visual systems, third party light control systems, light sensors, radio frequency and infrared remote operation, all through means of plugging into a splitter via a low voltage 6 pin 6 conductor (6p6c DC) cable with RJ25 plug sets.
   4) Allow for up to 100 whisper Q motors to be networked together to allow for master group controlling or integration with third party light control and building automation systems. Another 100 motors can be plugged into the busline through the use of a pair of RQ Extenders, which can again be added to network up to 300 or more motors, all capable of operating from a single input.
   5) Allow for operation of all motors via a computer on the GUI PRO system.
   6) Reconfiguration of switch shall not require rewiring of the hardwired line voltage motor supply wiring, or the low voltage control wiring. Reconfiguration of switch groups shall be accomplished within the motor control device (Whisper Q embedded internal motor control system).

2.03 ACCESSORIES

A. Roller Tube: Circular shaped aluminum tube extruded from alloy and temper outside diameter to have a .079 wall thickness. Heavily reinforced with minimum six internal ribs providing additional tensile strength and allows for secure placement of clutch and end plug.

B. Heavy Duty Tube Bearing Plug: Die cast metal and reinforced idler assembly containing spring loaded end plug and positive locking wheel allows up to 7/8 inch adjustment and provides for a secure installation and removal of shade. Locking tube bearing plug contains minimum 6 ribs and inserted a minimum of 2-3/8” into roller tube.

C. Bottom Bar: Extruded aluminum weight in a sealed pocket hem bar provides tracking adjustments and uniform look.

D. Mounting Hardware: Manufacturer's standard heavy duty bracket constructed of hardened 1/8 inch thick steel to support full weight of shade with bracket and screw hole covers to provide
uniform look. Integrated leveling device for enhanced level adjustment of overall shade. Locking mechanism on bracket adaptor provides for a secure installation and removal of the shade.

E. Facia: L shape removable aluminum extrusion valance that attaches to brackets and conceals roller shade. Facia must have a 2" return on 3" tall profile facia boxes, and a 3” return on a 4” tall profile facia box. Maximum exposure is only 1” for the fabric to drop down from its enclosure.

2.04 FABRICATION
A. Shade measurement shall be accurate to within +/- 1/8” or as recommended by manufacturer.

2.05 FABRICS
A. 30.30 Charcoal/Charcoal.

2.06 COLOR
A. Facia and Bracket: Color to be chosen from manufacturer's full range of colors.

PART 3 EXECUTION

3.01 EXAMINATION
A. Examine finished openings for deficiencies that may preclude satisfactory installation.
B. If substrate preparation is the responsibility of another installer, notify Mosaic Architecture of unsatisfactory preparation before proceeding.
C. Start of installation shall be considered acceptance of substrates.

3.02 INSTALLATION
A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.
B. Installation Tolerances:
   1. Maximum Offset From Level: 1/16 inch.
C. Adjust level, projection and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.03 CLOSEOUT ACTIVITIES
A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
B. See Section 01 7900 - Demonstration and Training, for additional requirements.
C. Training: Train MSU Facilities's personnel on operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.

3.04 PROTECTION
A. Protect installed products from subsequent construction operations.
B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION
SECTION 12 9300
SITE FURNISHINGS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Tables and Chairs.
B. Skate deterrents.

1.02 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer’s specifications and descriptive literature, installation
instructions, and maintenance information.
C. Shop Drawings: Indicate plans for each unit or groups of units, elevations with model number,
on overall dimensions; construction, and anchorage details.

1.03 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Provide manufacturer’s warranty against defects in materials or workmanship for ductile iron
castings for a period of 10 years from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Tables and Chairs:
   2. Substitutions: See Section 01 6000 - Product Requirements.
B. Skate Deterrents:
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 TABLES
A. Manufacturer: Landscape Forms, 431 Lawndale Ave., Kalamazoo, MI 49048, 800-521-2546,
   www.landscapeforms.com
B. Product Representative: Vivian Kovacs, 800-430-6206 x1323
   1. Crena Table.
   2. Size:
      a. Height: 29"
      b. Diameter: 42".
        1) No umbrella hole.
   3. Table Top: Catena 16 gauge with rolled edge, reinforced steel channels beneath top
   4. Table Supports: 2.5" outer diameter x 0.120" wall steel tubing welded to 18" diameter cast
      iron base
   5. Mounting: Catena Free standing
   6. Finish: Powder Coat: Color to be determined
   7. Quantity: Per Drawings

2.03 CHAIRS
A. Manufacturer: Landscape Forms, 431 Lawndale Ave., Kalamazoo, MI 49048, 800-521-2546,
   www.landscapeforms.com
B. Product Representative: Vivian Kovacs, 800-430-6206 x1323.
   1. Parc Vue Bench – custom size as Chair
   2. Size:
      a. Backed and arms.
      b. Depth: 25".
c. Overall Height: 35-1/2"
d. Arm Height: 27-1/4"
e. Width: 21”.
3. Finish: Powder coated; Color to be determined
4. Mounting: Free standing with nylon 6-6-400 glides
5. Quantity: Per Drawings

2.04 SKATE DETERRENTS

A. Wall Skate Deterrents:
      a. Penn 135, install per manufacturer’s recommendations.
      c. Outside Dimensions: Approximately 6” long x 1” wide x 1” tall.
      d. Mounting: (2) blind SMART PIN PLUS anchors, with two part epoxy.
      e. Finish: Brushed Finish
      f. Quantity: Per Drawings

B. Handrail Skate Stops:
      a. HR Series PN #HR1.5, install per manufacturer’s recommendations
      b. Materials: Cast Aluminum
      c. Outside Dimensions: Approximately 2” long
      d. Mounting: (2) Stainless Steel tamper resistant screws, and two part epoxy
      e. Finish: Clear Anodize coating
      f. Quantity: Spaced 4’ o.c. maximum

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Bicycle racks.

1.02 RELATED REQUIREMENTS
   A. Section 03 3000 - Cast-in-Place Concrete: Mounting surface for bicycle racks.

1.03 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Manufacturer's data sheets on each product to be used, including:
      1. Preparation instructions and recommendations.
      2. Storage and handling requirements and recommendations.
      3. Installation methods.
   C. Shop Drawings: Indicate size, shape, and dimensions, including clearances from adjacent walls, doors, and obstructions.
   D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
   E. LEED Submittal:
      1. Product Data for Credit MR4.1 and Credit MR4.2: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

1.04 DELIVERY, STORAGE, AND HANDLING
   A. Store products in manufacturer's unopened packaging until ready for installation.
   B. Handle racks with sufficient care to prevent scratches and other damage to the finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Outdoor Bicycle Racks:
      1. Peak Bike Racks; www.peakracks.com
      2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 BICYCLE RACKS
   A. Single Sided:
      1. 5 bike capacity
      2. 6 bike capacity
      3. 7 bike capacity
      4. 8 bike capacity
   B. Double Sided:
      1. 6 bike capacity
      2. 8 bike capacity
   C. Mounting: Surface mount per manufacturer's recommendations.
   D. Finish: Hot Dipped Galvanized.
   E. Quantity: Per Drawings.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Examine surfaces to receive bicycle racks.
B. If substrate preparation is the responsibility of another installer, notify Mosaic Architecture of unsatisfactory preparation before proceeding.

C. Do not begin installation until unsatisfactory substrates have been properly repaired.

3.02 PREPARATION
A. Ensure surfaces to receive bicycle racks are clean, flat, and level.

3.03 INSTALLATION
A. Install in accordance with manufacturer's instructions.

B. Install bicycle racks level, plumb, square, and correctly located as indicated on the drawings.

C. In-Ground Anchor Installation:
   1. Prepare holes in size according to manufacturer's instructions.
   2. Place anchoring bolts through the holes in the pipe.
   3. Lower rack into holes, ensuring the bottom of lower bends are at least 1-1/2 inch from the ground.
   4. Pour concrete and level rack.
   5. Support until dry.

3.04 CLEANING
A. Clean installed work to like-new condition. Do not use cleaning materials or methods that could damage finish.

3.05 PROTECTION
A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION
SECTION 14 2010
PASSENGER ELEVATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Section Includes: Hydraulic Elevator.
B. Products Supplied But not Installed Under This Section:
   1. Hoist Beam
   2. Pit Ladder
   3. Inserts mounted in walls for rail attachment
C. Work Supplied Under Other Sections:
   1. Temporary lighting, including temporary lighting in hoistway for machine space with switch located in hoistway on the strike jamb side of top landing door.
   2. Hoistway ventilation shall be in accordance with local and national building code requirements.
   3. Guide Rail Support shall be structurally adequate to extend from pit floor to top of hoistway, with spans in accordance with requirements of authority having jurisdiction and final layout.
   4. Removable barricades at all hoistway openings, in compliance with OSHA 29 CFR 1926.502 in addition to any local code requirements.
   5. Lifeline attachments capable of withstanding 5000 pounds load in accordance with OSHA 29 CFR 1926.502. Provide a minimum of 2 at the top, front of each hoistway.
   6. Pit lighting: Fixture with switch and guards. Provide illumination level equal to or greater than that required by ASTM A17.1/CSA B44 2000, or applicable version.
   7. Control space lighting with switch. Coordinate switch with lighting for machine space allowable by code.
   8. Access Doors: As required for access to governor. Access door shall be self-closing, self locking if necessary and operable from inside without a key.

1.02 DESCRIPTION OF ELEVATOR

A. Elevator # 1:
   1. Elevator Equipment: Vertical Express Hydraulic Holeless Elevator
   2. Quantity of Elevators: 1
   3. Landings: 3
   4. Openings: 3 Front Openings.
   5. Travel Distance: See Drawings.
   7. Rated Speed: 150 fpm.
   9. Cab Height: See Drawings.
   10. Clear Height Under Suspended Ceiling: 7'-7".
   11. Entrance Width and Type: 3'-0" and Center Opening.
   12. Entrance Height: 7'-0".
   14. Machine Location: Remote
   15. TwinPost Telescopic (2 Stage) Hydraulic Jack
   16. Elevator Equipment shall conform to the requirements of seismic zone: See drawings.
   17. Maintenance Service Period: 12 months.
B. Elevator # 2:
   1. Elevator Equipment: Vertical Express Hydraulic Holeless Elevator
   2. Quantity of Elevators: 1
   3. Landings: 2
   4. Openings: 2 Front Openings
5. Travel Distance: See Drawings
6. Rated Capacity: 4000 lbs.
7. Rated Speed: 150 fpm.
9. Cab Height: See Drawings.
10. Clear Height Under Suspended Ceiling: 7'-7".
11. Entrance Width and Type: 3'-6" and Left Opening.
12. Entrance Height: 7'-0".
14. Machine Location: Remote
15. TwinPost Telescopic (2 Stage) Hydraulic Jack
16. Elevator Equipment shall conform to the requirements of seismic zone: See drawings.
17. Maintenance Service Period: 12 months.

C. Elevator # 3: Alternate Bid
1. Elevator Equipment: Vertical Express Hydraulic Holeless Elevator
2. Quantity of Elevators: 1
3. Landings: 2
4. Openings: 1 Front Openings and 1 Rear Opening.
5. Travel Distance: See Drawings
7. Rated Speed: 150 fpm.
9. Cab Height: See Drawings.
10. Clear Height Under Suspended Ceiling: 7'-7".
11. Entrance Width and Type: 3'-0" and Right Opening.
12. Entrance Height: 7'-0".
14. Machine Location: Remote
15. TwinPost Telescopic (2 Stage) Hydraulic Jack
16. Elevator Equipment shall conform to the requirements of seismic zone: See drawings.
17. Maintenance Service Period: 12 months.

1.03 PERFORMANCE REQUIREMENT
A. Car Performance:
1. Car Speed +/- 5% of contract speed under loading condition or direction of travel.
2. Car Capacity: Safely lower, stop and hold (per code) up to 125% of rated load.

B. System Performance:
3. Jerk Rate (maximum): 3.3 ft/sec³.
4. Acceleration (maximum): 1.3 ft/sec².
6. Leveling Accuracy: +/-0.2 inches.
7. Starts per hour (maximum): 120.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit manufacturer's product literature for each proposed system:
1. Cab design, dimensions and layout.
2. Layout, finishes, and accessories and available options.
3. Controls, signals and operating system.
C. Shop Drawings:
1. Clearances and travel car.
2. Clear inside hoistway and pit dimensions.
3. Location and layout of equipment and signals.
4. Car, guide rails, buffers and other components in hoistway.
5. Maximum loads imposed on building structure.
6. Hoist beam requirements.
7. Location and sizes of access doors.
8. Location and details of hoistway door and frames.
9. Electrical characteristics and connection requirements.

D. Operation and Maintenance Data:
   1. Provide manufacturer’s standard maintenance and operation manual.

E. Diagnostic Tools:
   1. Prior to seeking final acceptance for the completed project as specified by the Contract Documents, the Elevator Contractor shall deliver to the Owner any specialized tools that may be required to perform diagnostic evaluations, adjustments and/or parametric software changes and/or test and inspections of any piece of control or monitoring equipment installed. This shall include any specialized tools required for monitoring, inspection and/or maintenance where the means of suspension other than conventional wire ropes are furnished and installed by the Elevator Contractor. Any and all such tools shall become property of the Owner. Any diagnostic tool provided to the Owner by the elevator contractor shall be configured to perform all levels of diagnostics, systems adjustment and parametric software changes which are available to the elevator contractor. In those cases where diagnostic tools provided to the Owner for a period equal to the term of the maintenance agreement from the date of final acceptance of the completed project. During those intervals in which the Owner might find necessary to surrender a diagnostic tool for re-calibration, re-installation, or repair, the elevator contractor shall provide a temporary replacement for the tool at no additional cost to the Owner. The elevator contractor shall deliver to the Owner, printed instructions for the proper use of the tool that may be necessary to perform diagnostic evaluations, system adjustment, and/or parametric software changes on any unit of microprocessor-based elevator control equipment and means of suspension other than standard elevator steel cables furnished and install by the elevator contractor. Accompanying the printed instructions shall be any and all access codes, password, or other proprietary information that is necessary to interface with the microprocessor-control equipment.

1.05 QUALITY ASSURANCE
   A. Manufacturer: Minimum of fifteen years experience in the fabrication, installation and service of elevators of the type and performance of the specified. The manufacturer shall have a documented quality assurance program.
   B. Installer: The equipment manufacturer shall install the elevator.
   C. Inspection and Testing: In accordance with requirements of local jurisdiction, obtain required permits, inspections and tests.

1.06 DELIVERY, STORAGE AND HANDLING
   A. If the construction site is not prepared to receive the elevator equipment at the agreed ship date, the general Contractor shall be responsible to provide a safe, dry and easily accessible storage area on or off the premises. Additional labor costs for double handling will be responsibility of the general contractor.
   B. Delivered elevator materials shall be stored in a protected environment in accordance with manufacturer recommendations. A minimum storage area of 10 feet by 20 feet is required adjacent to the hoistway.

1.07 WARRANTY
   A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Provide manufacturer warranty for a period of one year. The warranty period is to begin upon substantial completion of the contract. Warranty covers defects in materials and workmanship. Damage due to ordinary use, vandalism, improper or insufficient maintenance, misuse, or neglect do not constitute defective material or workmanship.

1.08 MAINTENANCE SERVICE
A. The elevator manufacturer shall provide maintenance service consisting of regular examinations and adjustments of the elevator equipment for a period of 12 months after date of substantial completion. Replacement parts shall be produced by the original equipment manufacturer.
B. Maintenance service be performed during regular working days and shall include regular time call back service.
C. Maintenance service shall not include adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents.

1.09 IMPORTANT REQUIREMENT
A. The conveying equipment contractor shall be aware that the space beneath the access floor will be used as an air delivery plenum and as such will take the necessary precautions when installing their work so as not to impact the integrity of the plenum space specific to air leakage and cleanliness. Any penetrations or holes in the underfloor plenum created for or resulting from the work performed by the Division 14 contractors are required to be properly sealed to prevent air leakage.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Basis of Design: Vertical Express (The Office).
B. Other Acceptable Manufacturers:
   3. Kone Elevators; www.kone.com
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 EQUIPMENT: CONTROL COMPONENTS AND CONTROL SPACE
A. Controller: provide microcomputer based control system to perform all of the functions.
   1. All high voltage (110V or above) contact points inside the controller cabinet shall be protected from accidental contact in a situation where the controller doors are open.
   2. Controller shall be separated into two distinct halves; motor drive side and control side. High voltage motor power conductors shall be routed and physically segregated from the rest of the controller.
   3. Provide a serial cardrack and main CPU board containing a non-erasable EPROM and operating system firmware.
   4. Variable field perimeters and adjustments shall be contained in a non-volatile memory module.
B. Drive: Provide Variable Voltage Variable Frequency AC Drive System to develop high starting torque with low starting current.
C. Controller Location: Locate controller in an integral cabinet adjacent to the entrance frame at the top landing of the elevator.

2.03 EQUIPMENT: HOISTWAY COMPONENTS
A. Machine: AC gearless machine, with permanent magnet synchronous motor, direct current electro-mechanical disc brakes and integral traction sleeve, mounted to the car guide rail at the top of the hoistway.
B. Governor: Friction type over-speed governor rated for the duty of the elevator specified.
C. Buffers: Car and counterweight: polyurethane buffer.
D. Hoistway Operating Devices:
   1. Emergency stop switch in the pit.
   2. Terminal stopping switch.
   3. Emergency stop switch on the machine.
E. Positioning System: System consisting of magnets and proximity switches.
F. Guard Rails and Attachments: Steel rail with brackets and fasteners.

2.04 EQUIPMENT: HOISTWAY ENTRANCES
A. Hoistway Entrances:
   2. Doors: Hollow metal construction with vertical internal channel reinforcements.
   3. Fire Rating: Entrance and doors shall be UL Fire-Rated for 1-1/2 hours.
   5. Entrance Marking Jamb Plates: Provide standard entrance jamb tactile markings on both jambs, at all floors. Plate Mounting: Refer to manufacturer drawings.

2.05 EQUIPMENT: CAR COMPONENTS ELEVATOR # 1
A. Car Frame: Provide car frame with adequate bracing to support the platform and car enclosure.
B. Platform: Platform shall be per manufacturers standard.
C. Car Guides: Provide guide-shoes mounted to top and bottom of both car and counterweight frame. Each guide shoe assembly shall be arranged to maintain constant contact on the rail surfaces. Provide retainers in areas with seismic design requirements.
D. Load weighing device shall be strain gauge type mounted to dead-end hitch attached atop the hoistway guide rail.
E. Steel Cab: Glass Series
   4. Ceiling:
      a. LF-97, Satin Stainless Steel.
   5. Handrail:
      a. Custom Flat: Satin stainless steel - 4 inch wide. Rails to be located on back wall and side walls of car enclosure.
   6. Flooring By Others: (Not to exceed 2 sq.ft. and 1/2" finished depth).
   7. Threshold: Aluminum.
   8. Protective pad hooks and quilted fire retardant protective pads. Pad to be hung from suspended ceiling.
F. Emergency Car Signals:
   1. Emergency Siren: Siren mounted on top of cab that is activated when the alarm button in the car operating panel is engaged. Siren shall have rated sound pressure level of 80 dB(A) at a distance of three feet from device. Siren shall respond with a delay of not more than one second after activation of alarm button.
   2. Emergency Car Lighting: Provide emergency power unit employing a 12-volt sealed rechargeable battery and totally static circuits shall illuminate the elevator car and provide current to the alarm bell in the event of a building power failure.
   3. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.
   4. Ventilation: Fan

2.06 EQUIPMENT: CAR COMPONENTS ELEVATOR # 2
A. Car Frame: Provide car frame with adequate bracing to support the platform and car enclosure.
B. Platform: Platform shall be per manufacturers standard.

C. Car Guides: Provide guide-shoes mounted to top and bottom of both car and counterweight frame. Each guide shoe assembly shall be arranged to maintain constant contact on the rail surfaces. Provide retainers in areas with seismic design requirements.

D. Load weighing device shall be strain gauge type mounted to dead-end hitch attached atop the hoistway guide rail.

E. Steel Cab: PLAM Series.
   1. Panels: Non-removable vertical panels, plam with polished aluminum frame selected from manufacturer's catalog of choices.
   4. Ceiling:
      a. LF-97, Satin stainless steel.
   5. Handrail:
      a. Round 1-1/2" Straight End Satin. Rails to be located on back wall and side walls of car enclosure.
   6. Flooring by Others.
   7. Threshold: Aluminum.
   8. Protective pad hooks and quilted fire retardant protective pads. Pad to be hung from suspended ceiling.

F. Emergency Car Signals:
   1. Emergency Siren: Siren mounted on top of cab that is activated when the alarm button in the car operating panel is engaged. Siren shall have rated sound pressure level of 80 dB(A) at a distance of three feet from device. Siren shall respond with a delay of not more than one second after activation of alarm button.
   2. Emergency Car Lighting: Provide emergency power unit employing a 12-volt sealed rechargeable battery and totally static circuits shall illuminate the elevator car and provide current to the alarm bell in the event of a building power failure.
   3. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.
   4. Ventilation: Fan

2.07 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

A. Car Operating Panel: Provide car operating panel with all push buttons, key switches, and message indicators for elevator operation.
   1. Flush car operating panel shall contain a bank of round, mechanical, illuminated buttons marked to correspond to landings served, emergency call button, door open button, door close button, and key switches for lights, inspection, and exhaust fan. Buttons have blue illumination (halo). All buttons to have raised test and braille marking on left hand side. The car operating display panel shall be blue scrolling DOT-matrix. All texts, when illuminated, shall be blue. The car operating panel shall have a brushed stainless steel finish.
   2. Additional features of car operating panel shall include:
      a. Car Position Indicator within operating panel (blue).
      b. Elevator Data Plate marked with elevator capacity and car number on car top.
      c. Help buttons with raised markings.
      d. In car stop switch per local code.
      e. Firefighter's hat.
      f. Firefighter's Phase II key-switch.
      g. Call cancel button.
      h. Pre-programmed integrated ADA phone (complete description of krms features included as standard)
      i. Help Button/Communication: Activation of help button will initiate two-way communication between car and a location inside the building, switching over to a
alternate location if call is unanswered, where personnel are available to take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.

j. Firefighter's Phase II emergency in-car operating instructions.

B. Hall fixture: Wall mounted hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Wall mounted hall fixtures shall have a brushed stainless steel finish.
   1. Hall fixtures shall feature round, mechanical, buttons in applied mount face frame. Hall fixtures shall correspond to options available from that landing. Buttons shall be in a vertically mounted fixture. Hall fixtures shall not be jamb-mounted. Hall lanterns shall feature blue illumination.

C. Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound. The chime will sound once for up and twice for down.

D. Combination Scrolling DOT-Matrix Hall Position Indicator and Hall Altern located at Lobby and first floor. Hall lanterns and hall indicators shall feature blue illumination, all numbers will be in blue display.

2.08 EQUIPMENT: ELEVATOR OPERATION AND CONTROLLER

A. Elevator Operation:
   1. Simplex Collective Operation: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.
   2. Zoned Car Parking.

B. Standard Operating Features to include:
   1. Full Collective Operation.
   2. Fan and Light Control.
   3. Load Weighing Bypass.
   5. Top of Car Inspection Station.

C. Additional Operating Features to include:
   1. Provision for Card Reader Outside Car: (Card Reader provided and installed by others).

D. Elevator Control System for Inspections and Emergency:
   1. Provide devices within controller to run the elevator in inspection operation.
   2. Provide devices on car top to run the elevator in inspection operation.
   3. Provide within controller an emergency stop switch to disconnect power from the brake and prevents motor from running.
   4. Provide the means from the controller to mechanically lift and control the elevator brake to safely bring car to nearest available landing when power is interrupted.
   5. Provide the means from the controller to reset the governor over speed speed switch and also trip the governor.
   6. Provide the means from the controller to reset the emergency brake when set because of an unintended car movement or ascending car over speed.
   7. Provide the means for the control to reset elevator earthquake operation.

2.09 EQUIPMENT: DOOR OPERATOR AND CONTROL

A. Door Operator: A closed loop permanent magnet VVVF high-performance door operator shall be provided to open and close the car and hoistway doors simultaneously. Door movement shall be cushioned at both limits of travel. Electro-mechanical interlock shall be provided at each hoistway entrance to prevent operation of the elevator unless all doors are closed and
locked. An electric contact shall be provided on the car at each car entrance to prevent the operation of the elevator unless the car door is close.

B. The door operator shall be arranged so that, in case of interruption or failure of electric power, the doors can be readily opened by hand from within the car, in accordance with applicable code. Emergency devices and keys for opening doors from the landing shall be provided as required by local code.

C. Doors shall open automatically when the car has arrived at or is leveling at the respective landings. Doors shall close after a predetermined time interval or immediately upon pressing of a car button. A door open button shall be provided in the car. Momentary pressing of this button shall reopen the doors and reset the time interval.

D. Door hangers and tracks shall be provided for each car and hoistway door. Tracks shall be contoured to match the hanger sheaves. The hangers shall be designed for power operation with provisions for vertical and lateral adjustment. Hanger sheaves shall have polyurethane tires and pre-lubricated sealed for life bearings.

E. Electronic Door Safety Device: the elevator car shall be equipped with an electronic protective device extending the full height of the car. When activated, this sensor shall prevent the doors from closing or cause then to stop and reopen if they are in the process of closing. The doors shall remain open as long as the flow of traffic continues and shall close shortly after the last person passes through the door openings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Field measure and examine substrates, supports, and other conditions under which elevator work is to be performed.

B. Do not proceed with work until unsatisfactory conditions are corrected.

C. Prior to start of work, verify hoistway is in accordance with shop drawings. Dimensional tolerance of hoistway from shop drawings; -0 inches + 2 inches. Do not begin work of this section until dimensions are within tolerances.

D. Prior to start of work, verify projections greater than 2 inches (4 inches if ASTM A17.1/CSA B44 2000 applies) must be beveled not less than 75 degrees from horizontal.

E. Prior to start of work, verify landings have been prepared for entrance sill installation. Traditional sill angle or concrete sill support shall not be required.

F. Prior to start of work, verify elevator pit has been constructed in accordance with requirements, is dry and reinforced to sustain vertical forces, as indicated in approved submittal. Verify that sumps or sump pumps located within the pit will not interfere with installed elevator equipment.

G. Prior to start of work, verify control space has been constructed in accordance with requirements, is dry and reinforced to sustain vertical forces, as indicated in approval submittal. Verify that sumps or sump pumps located within pit will not interfere with installed elevator equipment.

H. Prior to start of work, verify control space has been constructed in accordance with requirements, with access coordinated with elevator shop drawings, including sleeves and penetrations.

I. Verify installation of GFCI protected 20-amp in pit and adjacent to each signal control cabinet in control space.

3.02 PREPARATION

A. Coordinate installation of anchors, bearing plates, brackets and other related accessories.

3.03 INSTALLATION

A. Interface with Other Work:

1. Guide rail brackets attached to steel shall be installed prior to application of fireproofing.
2. Coordinate construction of entrance walls with installation of door frames and sills. Maintain front wall opening until elevator equipment has been installed.
   a. Ensure adequate support for entrance attachment points at all landings.
   b. Coordinate wall openings for hall push buttons, signal fixtures and sleeves. Each elevator requires sleeves within the hoistway wall.
   c. Coordinate emergency power transfer switch and power change pending signals as required for termination at the primary elevator signal control cabinet in each group.
   d. Coordinate interface of elevators and fire alarm systems.
   e. Coordinate interface of dedicated telephone line.

3.04 TESTING AND INSPECTIONS
   A. Perform recommended and required testing in accordance with authority having jurisdiction.
   B. Obtain required permits and provide originals to Owner’s representative.

3.05 DEMONSTRATION
   A. Prior to substantial completion, instruct Owner on the proper function and required daily maintenance of elevators. Instruct personnel on emergency procedures.

   END OF SECTION
SECTION 31 1000
SITE CLEARING

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Clearing and protection of vegetation.
   B. Removal of existing debris.

1.02 RELATED REQUIREMENTS
   A. Section 01 5713 - Temporary Erosion and Sediment Control.
   B. Section 01 7419 - Waste Management for requirements on recycling existing asphalt and concrete.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION
3.01 SITE CLEARING
   A. Comply with other requirements specified in Section 01 7000.
   B. All existing site asphalt and concrete must be recycled.

3.02 EXISTING UTILITIES AND BUILT ELEMENTS
   A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
   B. Protect existing utilities to remain from damage.
   C. Do not disrupt public utilities without permit from authority having jurisdiction.
   D. Protect existing structures and other elements that are not to be removed.

3.03 VEGETATION
   A. Scope: Remove trees, shrubs, brush, and stumps in areas to be covered by building structure, paving, playing fields, lawns, and planting beds.
   B. Do not remove or damage vegetation beyond the limits indicated on drawings.
      1. 40 feet outside the building perimeter.
      2. 10 feet each side of surface walkways, patios, surface parking, and utility lines less than 12 inches in diameter.
      3. 15 feet each side of roadway curbs and main utility trenches.
      4. 25 feet outside perimeter of pervious paving areas that must not be compacted by construction traffic.
   C. Install substantial, highly visible fences at least 3 feet high to prevent inadvertent damage to vegetation to remain:
      1. At vegetation removal limits.
   D. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum disturbance of the subsoil.
   E. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated.
      1. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.
      2. Trees: Sell if marketable; if not, treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
   F. Restoration: If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to MSU Facilities.

3.04 DEBRIS
   A. Remove debris, junk, and trash from site.
B. Leave site in clean condition, ready for subsequent work.
C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION
SECTION 31 2200
EARTH MOVING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Preparing subgrades for slabs-on-grade and planting areas.
B. Excavating and backfilling for buildings and structure.
C. Drainage course for concrete slab-on-grades.

1.02 RELATED REQUIREMENTS
A. Section 31 2310 - Pipe Trench Excavation and Backfill.
B. Section 31 2320 - Street Excavation and Backfill.
C. Standard Specifications - Earth Moving for Site Work:
   1. Earth moving for site work consists of all earth moving except that directly associated with excavation and structural backfill around buildings, walls and other structures. For all site work, the Standard Specifications consist of the Montana Public Works Standard Specifications, sixth edition (MPWSS), as amended by City of Bozeman Modifications to MPWSS, latest edition.
   2. Except as specifically noted otherwise in the contract documents, all site work shall be performed in accordance with the Standard Specifications.
   3. The information in these project specifications shall take precedence in the event of any discrepancies. Any discrepancies discovered by the Contractor shall be brought to the attention of the Engineer before performing the associated work.

1.03 DEFINITIONS
A. Backfill: Soil material used to fill an excavation.
B. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
C. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated:
   1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and and replacement material will be paid for according to Contract provisions for changes in work.
   2. Unauthorized Excavations: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
D. Fill: Soil materials used to raise existing grades.
E. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
F. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage fill, drainage course, or topsoil material.

1.04 QUALITY ASSURANCE
A. Pre-Excavation Conference: Conduct conference at project site.

1.05 PROJECT CONDITIONS
A. Do not commence earth moving operations until plant-protection measures specified in Division 01 Section "Temporary Tree and Plant Protection" are in place.
B. Do not commence earth moving operations until plant-protection measures specified in Section 015639 "Temporary Tree and Plant Protection" are in place.
PART 2 PRODUCTS

2.01 SOIL MATERIAL

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil clarification Group GW, GP, GM, SW, SP and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, or other deleterious matter.

C. Unsatisfactory Materials: Soil Clarification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Structural Fill: Material and gradation as indicated in the Drawings.

E. Drainage Gravel: Material and gradation as indicated in the Drawings.

PART 3 EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavement, and other facilities from damage caused by settlement lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soil from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.02 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.03 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within the tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Trim bottoms to required lines and grades to leave solid base to receive other work.

B. Excavations at edges of Tree and Plant Protection Zones:

1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears or pulls roots.

2. Cut and protect roots according to requirements in Division 01 Section "Temporary Tree and Plant Protection."

C. Proof-roll subgrade below the building slabs with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.04 SUBGRADE INSPECTION

A. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

**3.05 EXCAVATION FOR UTILITY TRENCHES**

A. Excavate trenches to indicated gradients, lines, depths, and elevations.
   1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe and conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.
   1. Clearance: 12 inches each side of pipe or conduit.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipe and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones for sharp objects along trench subgrade.
   1. For pipes and conduit less than 6 inches in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
   2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe and conduit circumference. Fill depressions with tamped sand backfill.
   3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
   4. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.
   1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

E. Trenches in Tree-and-Plant Protection Zones:
   1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spreading forks or comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pull roots.
   2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
   3. Cut and protect roots according to requirements in Division 01 Section "Temporary Tree and Plant Protection".

**3.06 UNAUTHORIZED EXCAVATION**

A. Fill unauthorized excavation under footings or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28 day compressive strength of 2500 psi, may be used when approved by the Architect.
   1. Fill unauthorized excavations under other construction pipe, or conduit as directed by Architect.

**3.07 STORAGE OF SOIL MATERIAL**

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

B. Place and compact fill material in layers to required elevations as follows:
   1. Under building slabs, use engineered fill.
3.08 **SOIL FILL**
A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
B. Place and compact fill material in layers to required elevations as follows:
   1. Under grass and planted areas, use unsatisfactory soil material and topsoil
   2. Under walks and pavements, use satisfactory soil material
   3. Under steps and ramps, use engineered fill
   4. Under building slabs, use engineered fill.
   5. Under footings and foundations, use engineered fill

3.09 **SOIL MOISTURE CONTROL**
A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
   1. Do not backfill or fill soil material on surfaces that are muddy, frozen, or contain ice or frost.
   2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimal moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.10 **COMPACTION OF SOIL BACKFILLS AND FILLS**
A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698.
   1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 98 percent.
   2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
   3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.

3.11 **GRADING**
A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
B. Site Rough Grading: Slope grades to direct water away from buildings and prevent ponding.
   1. Turf or Unpaved Area: Elevation of prepared subgrade shall allow for 6 inch depth of imported topsoil before compaction to achieve finish grade.
C. Grading Inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.12 **DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE**
A. Place drainage course on subgrades free of mud, frost, snow, or ice.
B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
   1. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
   2. Compact each layer of drainage course to required cross sections and thickness to not less than 98 percent of maximum dry unit weight according to ASTM D 698.
3.13 FIELD QUALITY CONTROL
   A. Testing Agency: Contractor will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
   B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
   C. When testing agency reports that subgrades, fills, or backfill have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil material to depth required; recompact and retest until specified compaction is obtained.

3.14 PROTECTION
   A. Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
   B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
   C. Where settling occurs before project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct possible.
      1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.15 DISPOSAL OF SURPLUS AND WASTE MATERIALS
   A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off owner's property.

END OF SECTION
SECTION 31 2316
EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Excavating for building volume below grade, footings, slabs-on-grade, paving, and utilities within the building.
   B. Trenching for utilities outside the building to utility main connections.

1.02 RELATED REQUIREMENTS
   A. See Geotechnical report; bore hole locations and findings of subsurface materials.
   B. Section 01 7000 - Execution and Closeout Requirements: General requirements for dewatering of excavations and water control.
   C. Section 31 2323 - Fill: Fill materials, filling, and compacting.

1.03 UNIT PRICES
   A. See Section 01 2200 - Unit Prices, for general requirements applicable to unit prices for excavation.
   B. Unit Price UP-1: Excavating Soil Materials:
      1. Measurement method: By the cubic foot.
      2. Includes: Excavating to required elevations, loading and placing materials in stockpile.
      3. Does Not Include Over-Excavation: Payment will not be made for over-excavated work nor for replacement materials.

1.04 PROJECT CONDITIONS
   A. Verify that survey bench mark and intended elevations for the Work are as indicated.
   B. Protect bench marks, survey control points, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PREPARATION
   A. Identify required lines, levels, contours, and datum locations.
   B. Locate, identify, and protect utilities that remain and protect from damage.

3.02 EXCAVATING
   A. Excavate to accommodate new structures and construction operations.
   B. Notify Mosaic Architecture of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
   C. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.
   D. Do not interfere with 45 degree bearing splay of foundations.
   E. Cut utility trenches wide enough to allow inspection of installed utilities.
   F. Hand trim excavations. Remove loose matter.
   G. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 31 2323.
   H. Grade top perimeter of excavation to prevent surface water from draining into excavation.
   I. Remove excavated material that is unsuitable for re-use from site.
   J. Remove excess excavated material from site.
3.03 FIELD QUALITY CONTROL
   A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.
   B. Provide for visual inspection of load-bearing excavated surfaces before placement of foundations.

3.04 PROTECTION
   A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.
   B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

END OF SECTION
SECTION 31 2323
FILL

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Filling, backfilling, and compacting for building volume below grade.

1.02 RELATED REQUIREMENTS
A. See Geotechnical report; bore hole locations and findings of subsurface materials in specifications.
B. Section 31 2316 - Excavation: Removal and handling of soil to be re-used.
C. Section 03 3000 - Cast-in-Place Concrete.

1.03 UNIT PRICING
A. Structural Fill: Applies to Unit Price UP-1.
   1. Measurement Method: By the cubic yard.
   2. Includes: Supplying fill, placing additional (or reduced) structural fill where required, and compacting.

1.04 REFERENCE STANDARDS
B. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2012.
D. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN m/m³)); 2012.
F. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 2005.

1.05 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Samples: 10 lb sample of each type of fill; submit in air-tight containers to testing laboratory.
C. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
D. Compaction Density Test Reports.

PART 2 PRODUCTS

2.01 FILL MATERIALS
A. General Fill: Subsoil excavated on-site or imported borrow per Geo-Technical Report.
   1. Graded.
   2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and fat clays debris.
B. Structural Fill: Imported borrow.
   1. Graded as indicated on drawings or as specified in the attached Geotechnical Report.
C. Concrete for Fill: As specified in Section 03 3000; compressive strength of 2500 psi.
D. Drainage Fill: Natural stone, washed, free of clay, shale and organic matter, for free drainage layer under slabs on grade.
2.02 ACCESSORIES
   A. Vapor Retarder: 10 mil thick, polyethylene.
   B. Geo Textile Sederator: Approved by Geo-Tech Engineer.

2.03 SOURCE QUALITY CONTROL
   A. See Section 01 4000 - Quality Requirements, for general requirements for testing and analysis of soil material.
   B. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.
   C. If tests indicate materials do not meet specified requirements, change material and retest.
   D. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Identify required lines, levels, contours, and datum locations.
   B. See Section 31 2200 for additional requirements.
   C. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.
   D. Verify structural ability of unsupported walls to support imposed loads by the fill.

3.02 PREPARATION
   A. Scarify and proof roll subgrade surface to a depth of 6 inches to identify soft spots.
   B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.
   C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
   D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING
   A. Fill to contours and elevations indicated using unfrozen materials.
   B. Fill up to subgrade elevations unless otherwise indicated.
   C. Employ a placement method that does not disturb or damage other work.
   D. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
   E. Maintain optimum moisture content of fill materials to attain required compaction density.
   F. Drainage Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.
   G. General Fill: Place and compact material in equal continuous layers not exceeding 12 inches compacted depth.
   H. Slope grade away from building minimum 2 inches in 10 ft, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.
   I. Correct areas that are over-excavated.
      1. Load-bearing foundation surfaces: Use structural fill, flush to required elevation, compacted to 100 percent of maximum dry density.
      2. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.
   J. Compaction Density Unless Otherwise Specified or Indicated:
      1. Under paving, slabs-on-grade, and similar construction: 98 percent of maximum dry density.
   K. Reshape and re-compact fills subjected to vehicular traffic.
3.04 FILL AT SPECIFIC LOCATIONS

A. Use general fill unless otherwise specified or indicated.

B. Use Structural Fill under footings and mat foundations: As indicated on the drawings.
   1. Fill to elevations shown on drawings.
   2. Maximum depth per lift: 8 inches, loose thickness.
   3. Compact to minimum 98 percent of maximum dry density.

C. Under Interior Slabs-On-Grade:
   1. Use granular fill and structural fill as indicated on the drawings.
   2. Compact to 98 percent of maximum dry density.

D. Backfill for Exterior Face of Foundation Walls and Footings:
   1. Use granular fill.
   2. Fill up to finish grade elevation.
   3. Compact each lift to 95 percent of maximum dry density.
   4. Do not backfill against unsupported foundation walls.
   5. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.

E. Over Buried Utility Piping, Conduits, and Duct Bank in trenches:
   2. Cover with general fill.
   3. Compact in maximum 8 inch lifts to 95 percent of maximum dry density.

3.05 TOLERANCES

A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.

B. Top Surface of Filling Under Paved Areas: Plus or minus 1 inch from required elevations.

3.06 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.

B. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, ASTM D3017, or ASTM D6938.

C. Results will be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D698 ("standard Proctor"), ASTM D1557 ("modified Proctor"), or AASHTO T 180.

D. If tests indicate work does not meet specified requirements, remove work, replace and retest.

E. Frequency of Tests: Minimum of 2 tests per lift of each type of material.

F. Proof roll compacted fill at surfaces that will be under slabs-on-grade.

END OF SECTION