

BRICK BREEDEN FIELDHOUSE WEST ENTRANCE ROOF RETROFIT PPA#19-0172 MONTANA STATE UNIVERSITY, BOZEMAN, MONTANA

MONTANA STATE UNIVERSITY

CAMPUS PLANNING DESIGN & CONSTRUCTION DIVISION PO BOX 172760 BOZEMAN, MONTANA 59717.2760 PHONE: 406-994-5413

DCI ENGINEERS **1060 FOWLER AVE SUITE 202 BOZEMAN, MONTANA 59715** WWW.DCI-ENGINEERS.COM PHONE: 406-556-8600 CONTACT PERSON: JAMI LORENZ, PE

STRUCTURAL

ARCHITECTURAL

CUSHING TERRELL 411 EAST MAIN STREET #101 **BOZEMAN, MONTANA 59715** WWW.CUSHINGTERRELL.COM PHONE: 406-556-7100 CONTACT PERSON: CHELSEA HOLLING, HISTORIC PRESERVATION DESIGN PROFESSIONAL

CONSULTING DESIGN SOLUTIONS, INC 7540 CHURCHILL RD MANHATTAN, MONTANA 59741 WWW.CDSIENGINEERING.COM PHONE: 406-282-7082 CONTACT PERSON: CURTIS L. SMIT, PE

| S0.1 | STRUCTURAL - GENERAL NOTES |
|------|---|
| S0.2 | STRUCTURAL - GENERAL NOTES & SLIDING |
| | SNOW LOAD PLAN |
| S1.1 | STRUCTURAL - (E) & (N) FOUNDATION PLANS |
| S2.1 | STRUCTURAL - (E) & (N) ROOF FRAMING PLANS |
| S5.1 | STRUCTURAL - FRAMING DETAILS |
| S5.2 | STRUCTURAL - FRAMING DETAILS |
| | |

| A1.0 | ARCHITECTURAL FLOOR PLAN |
|------|--------------------------------------|
| A1.1 | ARCHITECTURAL ROOF PLAN |
| A1.2 | ARCHITECTURAL ROOF DETAILS |
| A5.1 | ARCHITECTURAL FINISH PLAN |
| A9.1 | ARCHITECTURAL REFLECTED CEILING PLAN |
| | |

| M1.1 | ARENA LEVEL PLAN WEST - PIPINO |
|------|--------------------------------|
| | |

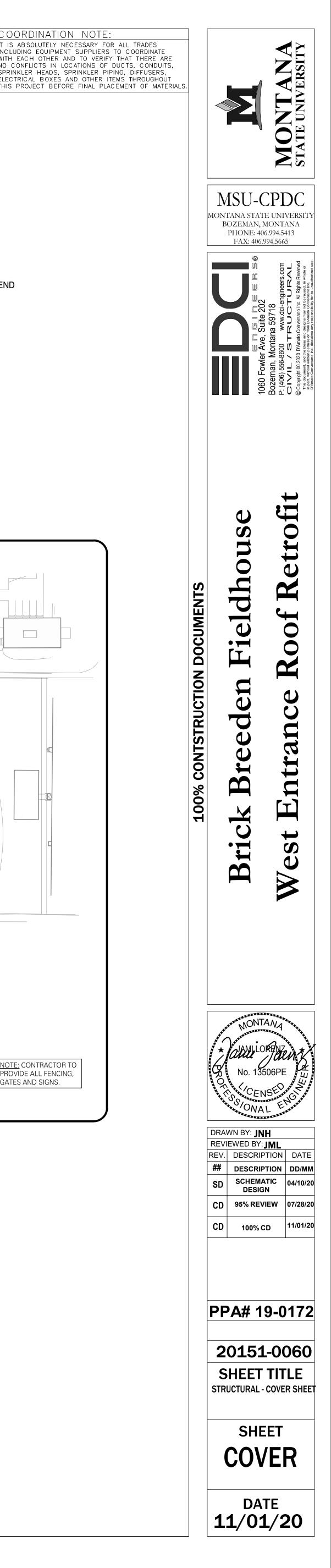
STAGING AREA



MECHANICAL

ELECTRICAL

CONSULTING DESIGN SOLUTIONS, INC 7540 CHURCHILL RD MANHATTAN, MONTANA 59741 WWW.CDSIENGINEERING.COM PHONE: 406-282-7082 CONTACT PERSON: SCOTT ELDERS, PE



STRUCTURAL - GENERAL NOTES

GENERAL REQUIREMENTS

<u>GOVERNING CODE</u>: The design and construction of this project is governed by the "International Existing Building Code (IEBC)", 2018 Edition, here after referred to as the IEBC, as adopted and modified by the State of Montana understood to be the Authority Having Jurisdiction (AHJ).

REFERENCE STANDARDS: Refer to Chapter 16 of 2018 IEBC. Where other Standards are noted in the drawings, use the latest edition of the standard unless a specific date is indicated. Reference to a specific section in a code does not relieve the contractor from compliance with the entire standard.

<u>DEFINITIONS</u>: The following definitions cover the meanings of certain terms used in these notes:

"Architect/Engineer" - The Architect of Record and the Structural Engineer of Record.

- "Structural Engineer of Record" (SER) The structural engineer who is licensed to stamp & sign the structural documents for the project. The SER is responsible for the design of the Primary Structural System. "Submit for review" - Submit to the Architect/SER for review prior to fabrication or construction.
- "Per Plan" Indicates references to the structural plans, elevations and structural general notes.
- "Specialty Structural Engineer" (SSE) A professional engineer (PE or SE), licensed in the State where the project is located, (typically not the SER), who performs specialty structural engineering services for selected specialty-engineered elements identified in the Contract Documents, and who has experience and training in the Specialty. Documents stamped and signed by the SSE shall be completed by or under the direct supervision of
- "Bidder-designed" Components of the structure that require the general contractor, subcontractor, or supplier who is responsible for the design, fabrication and installation of specialty-engineered elements identified in the Contract Documents to retain the services of an SSE. Submittals of "Bidder-designed" elements shall be stamped and signed by the SSE.

<u>OTHER DRAWINGS</u>: Refer to the architectural, mechanical, electrical, civil and plumbing drawings for additional information including but not limited to: dimensions, elevations, slopes, door and window openings, non-bearing walls, stairs, finishes, drains, waterproofing, railings, mechanical unit locations, and other nonstructural items.

STRUCTURAL DETAILS: The structural drawings are intended to show the general character and extent of the project and are not intended to show all details of the work. Use entire detail sheets and specific details referenced in the plans as "typical" wherever they apply. Similarly, use details on entire sheets with "typical" in the name wherever they apply. STRUCTURAL RESPONSIBILITIES: The structural engineer (SER) is responsible for the strength and stability of the primary structure in its completed form.

COORDINATION: The Contractor is responsible for coordinating details and accuracy of the work; for confirming and correlating all quantities and dimensions; for selecting fabrication processes; for techniques of assembly; and for performing work in a safe and secure manner.

EXISTING CONDITIONS: Information shown on the drawings related to existing conditions represent the present knowledge, but without guarantee of accuracy. Report conditions that conflict with contract documents to the architect or SEOR. Do not deviate from the contract documents without written direction from the architect and/or SEOR. All existing dimensions and information shall be field verified prior to fabrication as required to coordinate with new construction.

NEW CONSTRUCTION: The contractor shall remove all interfering items for new construction and shall repair or replace all removed items to match the existing conditions in accordance with the architectural drawings. New construction elements shall be designed and installed per current International Building Code 2018, hereafter referred to as IBC as allowed by IEBC.

PRE-CONSTRUCTION MEETINGS: The Contractor is responsible for coordinating pre-construction meetings prior to commencing work. Pre-con meetings, scheduled approximately two weeks prior to the start of the relevant work, are required for the following phases of construction: Structural Steel, Concrete, Demolition. Attendees for preconstruction meeting are to include contractor, relevant subcontractors, fabricators, inspectors, architect/SER, and representative of the Authority Having Jurisdiction where required. Meeting agendas are to include review of the work scope, project schedule relevant to the work, contact information of responsible parties, inspection points, review of materials and any special cases or issues, procedures for clarifications if required, testing and acceptance, etc.

MEANS, METHODS and SAFETY REQUIREMENTS: The contractor is responsible for the means and methods of construction and all job related safety standards such as OSHA and DOSH (Department of Occupational Safety and Health). Contractor is responsible to adhere to OSHA regulations regarding steel erection items specifically addressed in the latest OSHA regulations. Bolting and field welding at all member connections is to be completed prior to the release of the member from the hoisting mechanism unless reviewed and approved by the General Contractor's temporary bracing and shoring design engineer. The construction documents represent the completed structure. The contractor is refor means and methods of construction related to the intermediate structural conditions (i.e. movement of the structure due to moisture and thermal effects; construction sequence; temporary bracing, etc).

BRACING/SHORING DESIGN ENGINEER: The contractor shall at his discretion employ an SSE, a registered professional engineer for the design of any temporary bracing and shoring.

TEMPORARY SHORING, BRACING: The contractor is responsible for the strength and stability of the structure during construction and shall provide temporary shoring, bracing and other elements required to maintain stability until the structure is complete. It is the contractor's responsibility to be familiar with the work required in the construction documents and the requirements for executing it properly.

CONSTRUCTION LOADS: Loads on the structure during construction shall not exceed the design loads as noted in DE-GIGN CRITERIA & LOADS below or the capacity of partially completed construction as determined by the Contractor's SSE for Bracing/Shoring.

CHANGES IN LOADING: The contractor has the responsibility to notify the SER of any architectural, mechanical, electrical, or plumbing load imposed onto the structure that differs from, or that is not documented on the original Contract Documents (architectural / structural / mechanical / electrical or plumbing drawings). Provide documentation of location, load, size and anchorage of all undocumented loads in excess of 400 pounds. Provide marked-up structural plan indicating locations of any new equipment or loads. Submit plans to the Architect/Engineer for review prior to installation.

NOTE PRIORITIES: Plan and detail notes and specific loading data provided on individual plans and detail drawings supplements information in the Structural General Notes.

DISCREPANCIES: In case of discrepancies between the General Notes, Specifications, Plans/Details or Reference Standards, the Architect/Engineer shall determine which shall govern. Discrepancies shall be brought to the attention of the Architect/Engineer before proceeding with the work. Should any discrepancy be found in the Contract Documents, the Contractor will be deemed to have included in the price the most expensive way of completing the work, unless prior to the submission of the price, the Contractor asks for a decision from the Architect as to which shall govern. Accordingly, any conflict in or between the Contract Documents shall not be a basis for adjustment in the Contract Price.

SITE VERIFICATION: The contractor shall verify all dimensions and conditions at the site. Conflicts between the drawings and actual site conditions shall be brought to the attention of the Architect/Engineer before proceeding with the

ADJACENT UTILITIES: The contractor shall determine the location of all adjacent underground utilities prior to earthwork, foundations, shoring, and excavation. Any utility information shown on the drawings and details is approximate and not necessarily complete.

ALTERNATES: Alternate products of similar strength, nature and form for specified items may be submitted with adeguate technical documentation (proper test report, etc.) to the Architect/Engineer for review. Alternate materials that are submitted without adequate technical documentation or that significantly deviate from the design intent of materials specified may be returned without review. Alternates that require substantial effort to review will not be reviewed unless authorized by the Owner.

NARRATIVE: The following items will be repaired, modified, or added for this project: 1.) Brick Breeden Fieldhouse West Entrance Roof Retrofit Schematic Design Submittal

ADDITIONS/ALTERATIONS/REPAIRS: Additions, alterations, and/or repairs to the existing structure has been analyzed for additional loading and/or modification due to the addition, the alteration or the repair. All affected existing member have been analyzed or reinforced as required per IEBC.

All Demolition or removal of architectural, mechanical or structural elements shall not damage structural items to remain.

DESIGN CRITERIA AND LOADS

OCCUPANCY: Risk Category of Building per 2018 IBC Table 1604.5 =

WIND DESIGN: COMPONENTS & CLADDING PRESSURES FOR DESIGN (PSF, ULTIMATE)

| | EFFECTIVE WIND AREA (SQ. FT) | | | | | | | | |
|-----------|------------------------------|-------------|-------------|-------------|-------------|--|--|--|--|
| a = 4'-3" | 10 | 500 | | | | | | | |
| ZONE 1 | -42.2 / +16 | -39.5 / +16 | -35.8 / +16 | -33 / +16 | -26.5 / +16 | | | | |
| ZONE 1' | -24.3 / +16 | -24.3 / +16 | -24.3 / +16 | -24.3 / +16 | -16.4 / +16 | | | | |
| ZONE 2 | -55.7 / +16 | -52.1 / +16 | -47.4 / +16 | -43.8 / +16 | -35.5 / +16 | | | | |
| ZONE 3 | -75.9 / +16 | -68.8 / +16 | -59.3 / +16 | -52.1 / +16 | -35.5 / +16 | | | | |

1) Components and Cladding Wind Pressures are based on ASCE 7-16 Chapter 30 Part 1: Buildings with $h \le 60$ ft. 2) Components and Cladding zone locations are based on ASCE 7-16 Tables 30.3-1, 30.3-2, and 30.3-3 Buildings

with $h \le 60$ ft. 3) For parapets around the perimeter of the roof equal to or higher than 3 ft, Zone 3 shall be treated as Zone 2. 4) All Parapet Components and Cladding Wind Pressures shall be determined through ASCE 7-16 Figure 30.6-2.

(1) Flat Deaf Onew Load (DOF)

| ow load : ⁽¹⁾ | Flat Roof Snow Load, (PSF) | р _f = | 30 ⁽²⁾ |
|---------------------------------|---|------------------|--------------------------|
| | Snow Drift Loading required by Authority Having Jurisdiction? | | Yes |
| | Snow Load Importance Factor | I _s = | 1.0 ⁽³⁾ |
| | Ground Snow Load, (PSF) | p _g = | 42 |
| | Snow Exposure Factor | C _e = | 1.1 |
| | Thermal Factor | C , = | 1.0 |
| | See Roof Framing Plan for Drift and Sliding Snow Loading | | |

1) Snow Load is <u>un-reducible</u> and includes 5 psf rain-on-snow surcharge where ground snow load is greater than

zero and 20 psf or less per ASCE 7-16 Section 7.10. Snow Load based on Montana Ground Snow Load Finder

3) Snow Load Importance Factor per ASCE 7-16 Table 1.5-2.

| DESIGN LIVE LOADS | AREA | LIVE LOADS (PSF) UNO | REMARKS & FOOT- NOTES (2) |
|----------------------|---|-------------------------|---|
| | Roofs | 20 PSF or 300 LB | Area load is reducible. Point load per note (1), See above for Snow Load |
| | Roof – Point Loads to Joist and Girder Mem- bers open to floor below in Occupancy Classes A, B, E, I, M, R and U | 500 lbs | At any Panel Point of Truss-type members or at Any Point along primary structural members |

(1) Place 300 lb concentrated load over 2"x2" area at any point to produce maximum stress. Area load and concentrated load are to be considered separately with worst case used for design. (2) Unless otherwise noted, point loads to be distributed over a 2.5ft x 2.5ft area and located to produce maximum load effects on structural members.

SUBMITTALS

SUBMIT FOR REVIEW: SUBMITTALS of shop drawings and product data are required for items noted in the individual materials sections and for bidder designed elements.

SUBMITTAL REVIEW PERIOD: Submittals shall be made in time to provide a minimum of TWO WEEKS or 10 WORK-ING DAYS for review by the Architect/Engineer prior to the onset of fabrication.

GENERAL CONTRACTOR'S PRIOR REVIEW: Prior to submission to the Architect/Engineer, the Contractor shall review the submittal for completeness. Dimensions and quantities are not reviewed by the SER, and therefore, must be verified by the General Contractor. Contractor shall provide any necessary dimensional details requested by the Detailer and provide the Contractor's review stamp and signature before forwarding to the Architect/Engineer.

SHOP DRAWING REVIEW: Once the contractor has completed his review, the SER will review the submittal for general conformance with the design concept and the contract documents of the building and will stamp the submittal accordingly. Markings or comments shall not be construed as relieving the contractor from compliance with the project plans and specifications, nor departures there from. The SER will return submittals in the form they are submitted in (either hard copy or electronic). For hard copy submittals, the contractor is responsible for submitting the required number of copies to the SER for review.

SHOP DRAWING DEVIATIONS: When shop drawings (component design drawings) differ from or add to the requirements of the structural drawings they shall be designed and stamped by the responsible SSE.

DEFERRED SUBMITTALS

BIDDER-DESIGNED ELEMENTS Submit "Bidder-Designed" deferred submittals to the Architect and SER for review. The deferred submittals shall also be submitted to the city for approval, if required by the city.

Design of prefabricated, "bidder designed", manufactured, pre-engineered, or other fabricated products shall comply with the following requirements:) Design considers tributary dead, live, wind and earthquake loads in combinations required by IBC.

) Design within the Deflection Limits noted herein and as specified or referenced in the IBC. 3) Design shall conform to the specifications and reference standards of the governing code. 4) Submittal shall include:

a. Calculations prepared, stamped and signed by the SSE demonstrating code conformance. b. Engineered component design drawings are prepared, stamped and signed by the SSE.

c. Product data, technical information and manufacturer's written requirements and Agency approvals as applicable

d. SSE may submit to the Architect/Engineer, a request to utilize relevant alternate design criteria of similar nature and generally equivalency which is recognized by the Code and acceptable to the Authority Having Jurisdiction. Submit adequate documentation of design.

| DEFLECTION | VERTICAL | LIMIT | | |
|------------|--|--|--|--|
| | Roof Members, Dead + Live or Snow or Wind, Total Load (TL) Deflection | L / 240, where (L is span length, inches) | | |
| DESIGNED | Roof, Live or Snow or Wind Load (RLL) | L / 360 | | |
| ELEMENTS: | Floor Members, Total Load (TL) uno | L / 240 | | |
| | Floor Live Load (LL) uno | L / 360 | | |

(1) Wind Load is reducible to 0.42 times the Component and Cladding Loads per Table 1604.3 footnote f.

GENERAL CONTRACTOR'S PRIOR REVIEW: Once the contractor has completed his review of the SSE component drawings, the SER will review the submittal for general conformance with the design of the building and will stamp the submittal accordingly. Review of the Specialty Structural Engineer's (SSE) shop drawings (component design drawings) is for compliance with design criteria and compatibility with the design of the primary structure and does not relieve the SSE of responsibility for that design. All necessary bracing, ties, anchorage, proprietary products shall be furnished and installed per manufacturer's instructions or the SSE's design drawings and calculations. These elements include but are not limited to:

 Metal Deck Edge Forms Mechanical, Electrical, Plumbing & Sprinkler Hanger Plans

Temporary Shoring Systems

INSPECTIONS, QUALITY ASSURANCE VERIFICATIONS AND TEST REQUIREMENTS

INSPECTIONS: Foundations, footings, under slab systems and framing are subject to inspection by the Building Official in accordance with IBC 110.3. Contractor shall coordinate all required inspections with the Building Official.

SPECIAL INSPECTIONS, VERIFICATIONS and TESTS: Special Inspections, Verifications and Testing shall be done in accordance with IBC Chapter 17, the STATEMENT AND SCHEDULES OF SPECIAL INSPECTIONS listed in these drawings, and the AHJ STATEMENT OF SPECIAL INSPECTION.

STRUCTURAL OBSERVATION: per IBC Section 1704.6

[Structural Observation for this project is not required per IBC Section 1704.6.]

Structural Observation is the visual observation of the structural system by a registered design professional for general conformance to the approved construction documents. It is not always required on a project, does not include or waive the responsibility for the special inspections and tests required by a Special Inspector per IBC Chapter 17, is not continuous, and does not certify conformance with the approved construction documents.

Structural Observation for this project is required per IBC Section 1704.6. Contractor shall notify the SER in a timely manner to allow required Structural Observations to occur. Reports will be distributed to the Architect, the Contractor, Special Inspector and the Authority Having Jurisdiction.

The frequency and extent of observations is at the discretion of the structural observer. Only significant stages of construction identified by the Structural Observer require observation. For repetitive or similar structural elements identified as significant, only the first element of a stage requires observation unless noted otherwise. The following significant stages of construction require observation: prior to foundation concrete placement, during roof framing, and after roof diaphragm is complete prior to roofing.

CONTRACTOR RESPONSIBILITY: Prior to issuance of the building permit, the Contractor is required to provide the Authority Having Jurisdiction a signed, written acknowledgement of the Contractor's responsibilities associated with the above Statement of Special Inspections addressing the requirements listed in IBC Section 1704.4. Contractor is referred to IBC Sections 1705.12.5 and 1705.12.6 for architectural and MEP building systems that may be subject to additional inspections (based on the building's designated Seismic Design Category listed in the CRITERIA), including anchorage of HVAC ductwork containing hazardous materials, piping systems and mechanical units containing flammable, combustible or highly toxic materials, electrical equipment used for emergency or standby power, exterior wall panels and suspended ceiling systems.

SOILS AND FOUNDATIONS

REFERENCE STANDARDS: Conform to IBC Chapter 18 "Soils and Foundations."

<u>GEOTECHNICAL REPORT</u>: Recommendations contained in "Geotechnical Engineering Report Brick Breeden Fieldhouse Renovation, MSU-Bozeman, Montana" by Terracon dated January 30, 1997 were used for design.

CONTRACTOR'S RESPONSIBILITIES: Contractor shall be responsible to review the Geotechnical Report and shall follow the recommendations specified therein including, but not limited to, subgrade preparations, pile installation procedures, ground water management and steep slope Best Management Practices."

GEOTECHNICAL SUBGRADE INSPECTION: The Geotechnical Engineer shall inspect all sub-grades and prepared soil bearing surfaces, prior to placement of foundation reinforcing steel and concrete. Geotechnical Engineers shall provide a letter to the owner stating that soils are adequate to support the "Allowable Foundation Bearing Pressure(s)" shown below. Assumed values shall be field verified by the Building Official or the Geotechnical Engineer prior to placing concrete.

1.5

DESIGN SOIL VALUES: Safety Factor per Soils Report.

Allowable Foundation Bearing Pressure... 3000 PSF – Native

FOUNDATIONS and FOOTINGS: Foundations shall bear on either competent native soil or compacted structural fill as per the geotechnical report. Exterior perimeter footings shall bear not less than 36 inches below finish grade, unless otherwise specified by the geotechnical engineer and/or the building official.

FOOTING DEPTH: Tops of footings shall be as shown on plans with vertical changes as indicated with steps in the footings; locations of steps shown as approximate and shall be coordinated with the civil grading plans.

SLABS-ON-GRADE: All slabs-on-grade shall bear on compacted structural fill or competent native soil per the geotechnical report. All moisture sensitive slabs-on-grade or those subject to receive moisture sensitive coatings/covering shall be provided with an appropriate capillary break and vapor barrier/retardant over the subgrade prepared and installed as nical report, barrier manufacturer's written recommendations and coordinated with the finishes spec ified by the Architect.

CAST-IN-PLACE CONCRETE

REFERENCE STANDARDS: Conform to: (1) ACI 301-16 "Specifications for Structural Concrete"

(2) IBC Chapter 19 "Concrete" (3) ACI 318-14 "Building Code Requirements for Structural Concrete"

(4) ACI 117-10 "Specifications for Tolerances for Concrete Construction and Materials" FIELD REFERENCE: The contractor shall keep a copy of ACI Field Reference manual, SP-15, "Standard Specifications for Structural Concrete (ACI 301) with Selected ACI and ASTM References."

CONCRETE MIXTURES: Conform to ACI 301 Section 4 "Concrete Mixtures" and IBC Section 1904.1.

MATERIALS: Conform to ACI 301 Section 4.2.1 "Materials" for requirements for cementitious materials, aggregates, mixing water and admixtures.

SUBMITTALS: Provide all submittals required by ACI 301 Section 4.1.2. Submit mix designs for each mix in the table below. Substantiating strength results from past tests shall not be older than 24 months per ACI 318 Section 26.4.3.1

TABLE OF MIX DESIGN REQUIREMENTS

| Member Type/Location | Strength f'c (psi) | Test Age (days) | Nominal Maximum Aggregate | Exposure Class | Max W/C Ratio | Air Con- tent | Notes (1 to 9 Typical UNO) |
|-------------------------|-----------------------|--------------------|---------------------------------|-------------------|---------------------|------------------|----------------------------------|
| Footings | 4000 | 28 | 1" | - | - | - | - |
| Interior Slabs on Grade | 3000 | 28 | 1" | - | 0.50 | - | - |

Table of Mix Design Requirements Notes:

(1) W/C Ratio: Water-cementitious material ratios shall be based on the total weight of cementitious materials. Maximum ratios are controlled by strength noted in the Table of Mix Design Requirements and durability requirements given in ACI 318 Section 19.3.

(2) Cementitious Materials:

- proved otherwise by SER.
- review and acceptance.
- c. Cementitious materials shall conform to the relevant ASTM standards listed in ACI 318 Section 26.4.1.1.1(a).
- If freezing and thawing class is not noted, air content given is that required by the SER. Tolerance is ±1-½%. Air content shall be measured at point of placement.
- Aggregates shall conform to ASTM C33.
- (5) Slump: Conform to ACI 301 Section 4.2.2.2. Slump shall be determined at point of placement.
- (6) Chloride Content: Conform to ACI 318 Table 19.3.2.1.
- atures below 50°F at the contractor's option.
- (8) ACI 318, Section 19.3.1.1 exposure classes shall be assumed to be F0, S0, W0, and C0 unless different exposure classes are listed in the Table of Mix Design Requirements that modify these base requirements.

(9) Modulus of Elasticity shall be a minimum of 57,000 x \sqrt{f} c for all mix designs. FORMWORK & RESHORING: Conform to ACI 301 Section 2 "Formwork and Form Accessories." Removal of Forms shall conform to Section 2.3.2 except strength indicated in Section 2.3.2.5 shall be 0.75 f' c. MEASURING, MIXING, AND DELIVERY: Conform to ACI 301 Section 4.3. HANDLING, PLACING, CONSTRUCTING AND CURING: Conform to ACI 301 Section 5. In addition, hot weather concreting shall conform to ACI 305R-10 and cold weather concreting shall conform to ACI 306R-10.

CONSTRUCTION JOINTS: Conform to ACI 301 Sections. 2.2.2.5 and 5.3.2.6. Construction joints shall be located and detailed as on the construction drawings. Submit alternate locations per ACI 301 Section 5.1.2.4(a) for review and approval by the SER two weeks minimum prior to forming. Use of an acceptable adhesive, surface retardant, portland cement grout or roughening the surface is not required unless specifically noted on the drawings.

EMBEDDED ITEMS: Position and secure in place expansion joint material, anchors and other structural and nonstructural embedded items before placing concrete. Contractor shall refer to mechanical, electrical, plumbing and architectural drawings and coordinate other embedded items.

<u>GROUT</u>: Consult BASF Building Systems Product Catalog for description of grouts listed below. 1) Bearing Plates and Equipment. Use BASF MASTERFLOW 555 Grout. (2) Special Equipment Base Plates. Where noted on the plans, use BASF EMBECO 885 GROUT, or BASF MASTER-FLOW 648 CP Plus epoxy grout.

GROUTED REBAR: See Post-Installed Anchors to Concrete.

POST-INSTALLED ANCHORS to CONCRETE: Anchor location, type, diameter and embedment shall be as indicated on drawings. Reference the POST INSTALLED ANCHORS section for applicable Post-Installed Anchor Adhesives. Anchors shall be installed and inspected in strict accordance with the applicable ICC-Evaluation Service Report (ESR). Special inspection shall be per the TESTS and INSPECTIONS section.

SHRINKAGE: Conventional and post-tensioned concrete slabs will continue to shrink after initial placement and stressing of concrete. Contractor and subcontractor shall coordinate jointing and interior material finishes to provide adequate t erance for expected structural frame shrinkage and shall include, but not be limited to: curtain wall, dryvit, storefront, skylight, floor finish, and ceiling suppliers. Contact Engineer for expected range of shrinkage.

MODULUS OF ELASTICITY TESTING AND ACCEPTANCE:

Obtain samples and conduct tests of mix designed specified in accordance with ACI 318 Section 19.2.2, ACI 318 R19.2.2, ACI 301 Section 1.6.3.2, ASTM C42 and ASTM C469. Tests data shall be performed at the 28 day compressive test age. Provide a minimum of (2) tests for each mix design used in the following elements: Slabs. Provide a minimum of (1) test for all other elements. The average of the tests shall equal or exceed the specified Modulus of Elasticity. If (2) or more tests are performed, no individual test shall fall below the specified Modulus of Elasticity by more than 20 percent. A "test" for acceptance is the average strength of two 6 by 12 in. cylinders or three 4 by 8 in. cylinders tested at the specified test age.

STRENGTH TESTING AND ACCEPTANCE:

Testing: Obtain samples and conduct tests in accordance with ACI 301 Section 1.6.3.2. Additional samples may be required to obtain concrete strengths at alternate intervals than shown below.

- Cure 4 cylinders for 28-day test age. Test 1 cylinder at 7 days, test 2 cylinders at 28 days, and hold 1 cylinder reserve cylinder may be discarded without being tested for specimens meeting 28-day strength requirements.
- Acceptance. Strength is satisfactory when:
- The averages of all sets of 3 consecutive tests equal or exceed the specified strength. (2) No individual test falls below the specified strength by more than 500 psi. A "test" for acceptance is the average strength of two 6 by 12 in. cylinders or three 4 by 8 in. cylinders tested at
- the specified test age. CONCRETE PLACEMENT TOLERANCE: Conform to ACI 117-10 for concrete placement tolerance.

CONCRETE REINFORCEMENT

REFERENCE STANDARDS: Conform to:

- (1) ACI 301-16 "Standard Specifications for Structural Concrete", Section 3 "Reinforcement and Reinforcement Sup-
- (2) ACI SP-66(04) "ACI Detailing Manual" (3) CRSI MSP-09, 28th Edition, "Manual of Standard Practice."
- (4) ANSI/AWS D1.4: 2005, "Structural Welding Code Reinforcing Steel."
- (5) IBC Chapter 19-Concrete. (6) ACI 318-14 "Building Code Requirements for Structural Concrete."

SUBMITTALS: Conform to ACI 301 Section 3.1.2 "Submittals." Submit placing drawings showing fabrication dimensions and placement locations of reinforcement and reinforcement supports.

MATERIALS:

| Reinforcing Bars | ASTM A615, Grade 60, deformed bar |
|-----------------------------|-------------------------------------|
| Ũ | ASTM A706, Grade 60, deformed bar |
| Smooth Welded Wire Fabric | ASTM A1064 |
| Deformed Welded Wire Fabric | ASTM A1064 |
| Bar Supports | CRSI MSP-09, Chapter 3 "Bar Suppo |
| Tie Wire | 16 gage or heavier, black annealed. |
| Stud Rails | ASTM A1044 |
| Headed Deformed Bars | ASTM 4970 |

Headed Deformed Bars ASTM A970 FABRICATION: Conform to ACI 301, Section 3.2.2. "Fabrication", and ACI SP-66 "ACI Detailing Manual." WELDING: Bars shall not be welded unless authorized. When authorized, conform to ACI 301, Section 3.2.2.2.

"Welding", AWS D1.4, and provide ASTM A706, grade 60 reinforcement. PLACING: Conform to ACI 301, Section 3.3.2 "Placing." Placing tolerances shall conform to ACI 117. nents unless noted otherwise in the drawings.

| CONCRETE COVER: Conform to the following cover | r requirem |
|--|------------|
| Concrete cast against earth | 3" |
| Concrete exposed to earth or weather | 2" |
| Ties in columns and beams | 1-1⁄2" |
| Bars in slabs | 3/4" |
| Bars in walls | 3/4" |
| Exterior bars in Tilt-up Panels | 1" |
| | |

SPLICES: Conform to ACI 301, Section 3.3.2.7, "Splices". Refer to "Typical Lap Splice and Development Length Schedule" for typical reinforcement splices. Splices indicated on individual sheets shall control over the schedule. Mechanical connections may be used when approved by the SER.

FIELD BENDING: Conform to ACI 301 Section 3.3.2.8. "Field Bending or Straightening." Bar sizes #3 through #5 may be field bent cold the first time. Subsequent bends and other bar sizes require preheating. Do not twist bars. Bars shall not be bent past 45 degrees.

| INCLUDING EQU WITH EACH OTI NO CONFLICTS SPRINKLER HEA ELECTRICAL BO | INDICATES W INDICATES W INDICATES W INDICATES W INDICATES W INDICATES W INDICATES W INDICATES H SECTION (HS STEEL PIPE C INDICATES W INDICATES W INDICATES W INDICATES W | OLLOW STRUCTURAL S) COLUMN OR OLUMN /OOD POST UNDLED STUDS ONCRETE COLUMN RECAST | S, T RIALS. | PHONE: 4 FAX: 406 | ana 59718 LE RUZANA WWW.dci-engineers.com WWW.dci-engineers.com TRUCTURAL and conversano lnc. All Rights Reserved and designs may note or and and and and and and and and and and |
|---|---|--|------------------------------|--|---|
| Image: Constraint of the section of | CONNECTION INDICATES C. CONNECTION INDICATES D INDICATES W BEARING WA PER KEY ON INDICATES W SHEAR WALL PER KEY ON INDICATES W INDICATES W INDICATES C CONCRETE W INDICATES E INDICATES E INDICATES E POST-TENSIC POST-TENSIC (IN INCHES) INTERMEDIA PSF PSI PSI PSI PSI PSI PSI PSI PSI PSI PSI | IOMENT FRAME ANTILEVER ANTILEVER RAG CONNECTION /OOD OR STEEL STUD (UOD OR STEEL STUD LLINE SHEET /OOD OR STEEL STUD LINE AND HOLD-DOWN SHEET /ASONRY/CMU WALL ONCRETE/TILT-UP VALL EARING WALL BELOW (XISTING WALL EARING WALL BELOW (XISTING WALL ON DEAD END (PLAN) ON STRESSING END (PLA ON PROFILE (PLAN) TE STRESSING (PLAN) TE STRESSING (PLAN) TE STRESSING (PLAN) Partial Joint Penetration Prefabricated Pounds per Square Foor Pounds Per Square Inch Parallel Strand Lumber Post-Tensioned Pressure Treated Radius Roof Drain Refer/Reference Refer/Reference Reinforcing Required Retaining Site-Built Special Concentric Braced Firame Schedule Structural Engineer of Record Seismic Force- Resisting System Sheathing Similar Short Leg Back-to-Back Special Moment Frame | 100% CONTSTRUCTION DOCUMENTS | Brick Breeden Fieldhouse | West Bnttance Roof Retrofit (406)556-860 CUL / S- Copieto 2020 Dam Recommended Retrofit (200,02020 Dam Recommended Retrofie |
| Face Pr Square Foot Foot ad eg Back-to-Back eg Horizontal eg Vertical bint udinal ted Strand Lumber ted Veneer Lumber ry um nical nine acturer um aneous Contract minated Timber Scale nter ry Concentric Brace e Diameter e Face g te Veb Steel Joist Veb Steel Joist Veb Wood Joist r Actuated Fastene t dicular | r SWWJ SYM T T/ T&B TC AX LD TCX TDS T&G THKND THRD THRD THRU THRU UNO URM VERT W W/ W/O | Slab on Grade Southern Pine Specification Square Studrail Square Foot Stainless Steel Stagger/Staggered Standard Stiffener Steel Structural Solid Web Wood Joist Symmetrical Top Top Of Top & Bottom Top Chord Axial Load Top Chord Extension Tie Down System Tongue & Groove Thickened Threaded Through Transverse Typical Unless Noted Otherwis Unreinforced Masonry Unit Vertical Wide With Without Welded Headed Stud Working Point Welded Wire Fabric Plus or Minus | e | DRAWN BY: JM REVIEWED BY REV. DESCRI ## DESCRI ## DESCRI CD 95% RE CD 100% | IMLPTIONDATEPTIONDD/MMATIC GN04/10/20VIEW07/28/20 |
| | | | | 2015 SHEET STRUCTURAL NOTES SHI SO | - GENERAL EET 1.1 TE |

a. The use of fly ash, other pozzolans, silica fume, or slag shall conform to ACI 318 Sections 19.3.2 and 26.4.2.2. Maximum amount of fly ash shall be 25% of total cementitious content unless reviewed and apb. For concrete used in elevated floors, minimum cementitious-materials content shall conform to ACI 301 Table 4.1.2.9. Acceptance of lower cement content is contingent on providing supporting data to the SER for (3) Air Content: Conform to ACI 318 Section 19.3.3.1. Minimum standards for exposure class are noted in the table.

(7) Non- chloride accelerator: Non-chloride accelerating admixture may be used in concrete placed at ambient temper-

in reserve for use as the Engineer directs. After 56 days, unless notified by the Engineer to the contrary, the • The number of cylinders indicated above reference 6 by 12 in cylinders. If 4 by 8 in cylinders are to be used, additional cylinders must be cured for testing of 3 cylinders at test age per the table of mix design require-

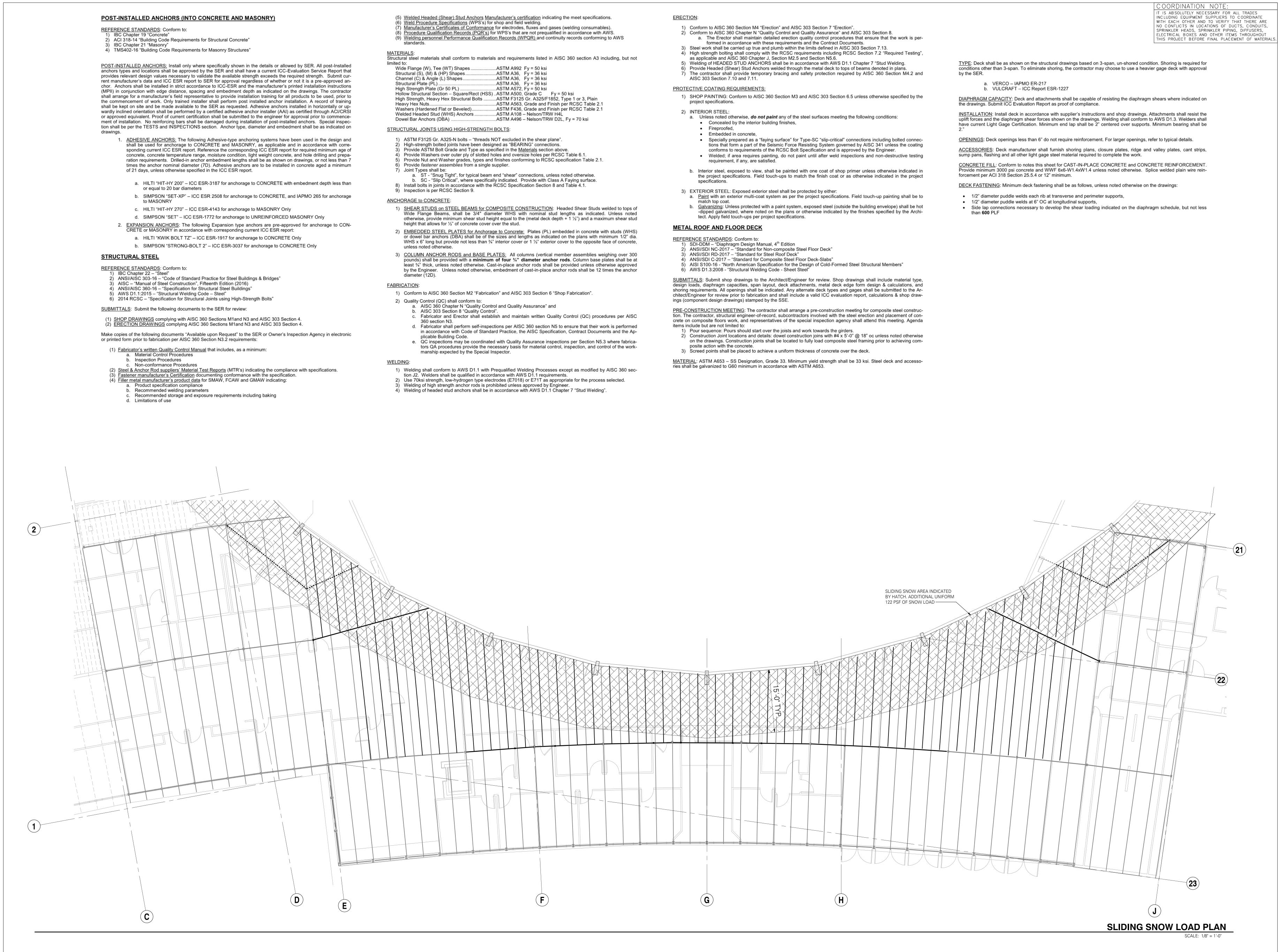
(7) ACI 117-10 "Specifications for Tolerances for Concrete Construction and Materials"

, deformed bars.), deformed bars.

oter 3 "Bar Supports.

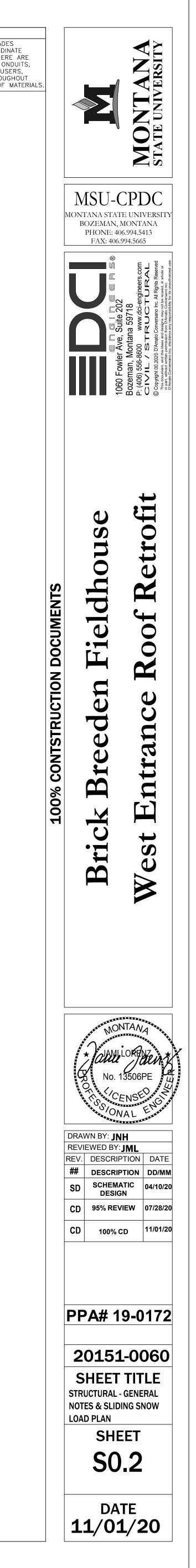
| | | | | INCLUDING EQU WITH EACH OTH NO CONFLICTS SPRINKLER HEA ELECTRICAL BC | ELY NECESSAR JIPMENT SUPPI HER AND TO N IN LOCATIONS ADS, SPRINKLE DXES AND OTH |)TE: Y FOR ALL TRADES IERS TO COORDINATE (ERIFY THAT THERE ARE G OF DUCTS, CONDUITS, R PIPING, DIFFUSERS, ER ITEMS THROUGHOUT PLACEMENT OF MATERI, | ALS. | | ANA VERSITY |
|--|---|---|---|---|---|--|---------------|---------------------------------------|---|
| | | DRAV | VING | |) | | ן ו ר | | |
| MARK | DESCR | | | MARK | | DESCRIPTION | | | |
| F2.0 | FOOTING SYMBOL (I FOOTING SCHEDULE | | READ | | INDICATES D | RECTION OF DECK SPAN | | | |
| (1P) | PILE CAP SYMBOL (F PILE CAP SCHEDULE | | | I | INDICATES W | IDE FLANGE COLUMN | | MSU-0 | CPDC |
| 1 | TILT-UP/PRECAST CC CONNECTION SYMB CONNECTION DETAI | OL (REFER TO | | | | DLLOW STRUCTURAL 5) COLUMN OR TS) COLUMN | М | ONTANA STA BOZEMAN, PHONE: 4 | |
| 2W4 | SHEAR WALL SYMB SHEAR WALL SCHEE | | C | 0 | | DLLOW STRUCTURAL 5) COLUMN OR DLUMN | | FAX: 406 | _ , , , , , , , , , , , , , , , , , , , |
| \bigtriangleup | REVISION TRIANGLE | | | ⊠ | INDICATES W | OOD POST | | | ngjineers.com DRghtsRAL All Rights Reserver ereased.in whole or ereased ins. |
| | TILT-UP/PRECAST CC PANEL NUMBER (RE PRECAST CONCRETE | FER TO TILT- | UP/ | • | INDICATES BI | JNDLED STUDS | | | 718 dci-en c T no Inc. A av not brc. A at a conver |
| | CMU WALL REINFOF (REFER TO CMU WA SCHEDULE) | | | | INDICATES CO | DNCRETE COLUMN | | | |
| 8" | CONTINUITY PLATE (REFER TO TYPICAL | DETAIL) | | | INDICATES PR CONCRETE C | | | | owiel Av an, Mont 556-8600 L / S ⁻¹ 00.2020 D'Am ent, and the ideas out writen permis |
| | INDICATES DOUBLE CONNECTION (REFE SHEAR PLATE CONN | R TO THE DO | | - | INDICATES M CONNECTION | OMENT FRAME | | | Bozeman, Bozeman, P: (406) 556- CIVIL, COVIDIO 2020: This document, and This document, and in part, without without Damato Conversari |
| ООТВ | INDICATES REINFOR (REFER TO THE REIN SCHEDULE) | IFORCING | | | INDICATES CAR | | | | |
| (SR_) | INDICATES NUMBER REQUIRED AT COLU STUD RAIL DETAILS) | MN (REFER T | 0 | •— | | RAG CONNECTION | | | |
| | ROOF/FLOOR DIAPH SYMBOL (REFER TO NAILING SCHEDULE) | DIAPHRAGM) | | ÷••••• | BEARING WA | SHEET | | | |
| C1 XX"xXX" | STEEL/CONCRETE CO SYMBOL (REFER TO COLUMN SCHEDULE |) STEEL E) | | ┿ ══ ┋ ╸ ╝┆ | | OOD OR STEEL STUD LINE AND HOLD-DOWNS SHEET | | | ÷ |
| T/FTG = X'-X | ELEVATION REFEREN | AT THE NCES) | | \$277777 | INDICATES M | ASONRY/CMU WALL | | Ö |)fi |
| 3 | STUD BUBBLE (INDIG OF STUDS REQUIRED NUMBER SPECIFIED | D IF EXCEEDS | S | | INDICATES CO CONCRETE V | DNCRETE/TILT-UP /ALL | | Sn | etro |
| | INDICATES STEP IN F (REFER TO TYPICAL S FOOTING DETAIL) | | | \$\$ \$\$ | INDICATES BI | EARING WALL BELOW | | JO | G |
| X SX.X | DETAILS OR SECTION (DETAIL NUMBER/SH | | R) | ¥ | INDICATES EX | KISTING WALL | NTS | df | |
| | DETAILS OR SECTION | BER/SHEET NU | UMBER) | þ | POST-TENSIO | N DEAD END (PLAN) | OCUMENTS | el | of |
| XX/SXX.XX | INDICATES LOCATIO WALLS, SHEAR WAL FRAME ELEVATIONS | LS OR BRAC | | } | POST-TENSIC | N STRESSING END (PLAN) | DOC | | Ŏ |
| | STRUCTURAL EXTEN SINGLE ARROW - EN DOUBLE ARROW - C | ID OF EXTENT | | , → ³ | POST-TENSIO (IN INCHES) | N PROFILE (PLAN) | | | |
| | EXTENT ALONG THE | | | <u>⊢</u> | INTERMEDIA | E STRESSING (PLAN) | | G | CC |
| L A | ngle | | BREV | IATIONS | PJP | Partial Joint Penetration | CONTSTRUCTION | ed | r u |
| ARCHAB or BOTBB/BBLDGBBLKGBBMUBBPBBRFBBRGBBTVVNBCCCBCCL or QCCL or QCCJCCJCCUPCCLRCCONCCCONSTCCONSTCCONSTCCONSTCDIADDBDBDBDDFDDIAGDDVGDDVGDEQEELECEEQEEQEEQEEQEEWEEXPE | Iternate rchitectural ottom ottom Of uilding locking rick Masonry Unit aseplate uckling Restrained raced Frame earing etween amber astellated Beam ounterbore enterline ross-Laminated Timber ast in Place onstruction or ontrol Joint omplete Joint enetration lear eiling oncrete Masonry Unit olumn oncrete onnection onstruction ontinuous ountersink entered iameter rop Beam eformed Bar Anchor ouble emolish evelopment ouglas Fir iagonal istributed ead Load own itto epth/Deep ravving xisting ach ach Face levator mbedment qual quipment ach Way xpansion Joint | FLR FRP FRT FTG F/ GA GALV GEOTECH GL GVVB HDR HF HGR HD HORIZ HP HSS = TS IBC ID IE IF INT k KSF LF LL LLBB LLH LLV LP LONGIT LSL LVL MAS MAX MECH MEZZ MFR MIN MISC NIC NLT NTS OC OCBF OD OF OPNG OPP OVVSJ OVVVJ PL PAF PC PERP | Fire Reta Footing Face of Gage Galvanize Geotechr Glue Larr Gypsum Header Hem-Fir Hanger Hold-dow Horizonta High Poir (Hollow S Internatic Inside Dia Invert Ele Inside Fa Interior Kips Kips Per Live Loac Long Leg Long Leg Cong Cong Leg Cong Cong Leg Cong | nical ninated Timber Wall Board vn al nt Structural Section onal Building Code ameter evation ce Square Foot ot g Back-to-Back g Horizontal g Vertical nt inal ed Strand Lumber of Veneer Lumber of Veneer Lumber n cal ne turer n heous pontract inated Timber cale er Concentric Brace Diameter Face | R RD REF REINF REQD RET SB SCBF SCHED SER SFRS SFRS SMF SOG SP SPEC SQ SR SF SST STAGG STD STIFF STL STRUCT SWWJ STIFF STL STRUCT SWWJ SYM T T/ T&B TC AX LD TCX TDS T&G THKND THRD THRD THRD THRU TRANSV TYP UNO URM VERT W W/ W/O | Parallel Strand Lumber Post-Tensioned Pressure Treated Radius Roof Drain Refer/Reference Reinforcing Required Retaining Site-Built Special Concentric Braced Frame Schedule Structural Engineer of Record Seismic Force- Resisting System Sheathing Similar Short Leg Back-to-Back Special Moment Frame Slab on Grade Southern Pine Specification Square Studrail Square Foot Stainless Steel Stagger/Staggered Standard Stiffener Steel Structural Solid Web Wood Joist Symmetrical Top Top Of Top & Bottom Top Chord Axial Load Top Chord Axial Load Top Chord Extension Tie Down System Tongue & Groove Thickened Threaded Through Transverse Typical Unless Noted Otherwise Unreinforced Masonry Unit Vertical Wide With Without Welded Headed Stud Working Point Welded Wire Fabric Plus or Minus | | A A A A A A A A A A A A A A A A A A A | NSED NH JML PTION DATE PTION DD/MM ATIC O4/10/20 CD 11/01/20 9-0172 L-0060 TITLE |
| | | | | | | | | sні SO |).1 |

| | | | INCLUDING EQU WITH EACH OTH NO CONFLICTS SPRINKLER HEA ELECTRICAL BO | LY NECESSAR IPMENT SUPPL IER AND TO V IN LOCATIONS DS, SPRINKLEI XES AND OTHI | TE: FOR ALL TRADES IERS TO COORDINATE ERIFY THAT THERE ARE OF DUCTS, CONDUITS, PIPING, DIFFUSERS, ER ITEMS THROUGHOUT PLACEMENT OF MATERIAL | .S. | | TANA |
|---|--|---|--|---|---|---------------|---|---|
| | DF | RAWING | LEGEND | | | | | |
| MARK | DESCRIPTION | | MARK | ſ | DESCRIPTION | | | |
| F2.0 | FOOTING SYMBOL (REFER T FOOTING SCHEDULE) | FO SPREAD | | INDICATES DI | RECTION OF DECK SPAN | | | |
| $\langle 1P \rangle$ | PILE CAP SYMBOL (REFER T PILE CAP SCHEDULE) | 0 | I | INDICATES WI | DE FLANGE COLUMN | | MSU-(| CPDC |
| 1) | TILT-UP/PRECAST CONCRET CONNECTION SYMBOL (REF | | | SECTION (HSS | DLLOW STRUCTURAL) COLUMN OR | MC | BOZEMAN, N | |
| 2W4 | CONNECTION DETAIL) SHEAR WALL SYMBOL (REF SHEAR WALL SCHEDULE) | ER TO | 0 | SECTION (HSS |) COLUMN OR | | PHONE: 40 FAX: 406.9 | |
| | REVISION TRIANGLE | | | STEEL PIPE CO | | | e N I I I | iglineers.com URAL All Rights Reserved reaced, in whole or rearo.Inc. |
| $\langle 1 \rangle$ | TILT-UP/PRECAST CONCRET PANEL NUMBER (REFER TO | TILT-UP/ | | INDICATES BU | NDLED STUDS | | | 8 alengineers.com 2TURAL Inc. All Rights Reserved Inc. All Rights Reserved Inc. All Rights Reserved In whole or conversant for conversant for |
| $\langle 1 \rangle$ | PRECAST CONCRETE WALL CMU WALL REINFORCING S (REFER TO CMU WALL REIN | SYMBOL | | INDICATES CC | NCRETE COLUMN | | Suite | www.c www.c Conversal designs from D'Ama |
| 8" | SCHEDULE) CONTINUITY PLATE LENGTH | | | INDICATES PR CONCRETE CO | | | | Mont 3600 20 D'An 20 D'An 20 D'An 20 D'An 20 D'An 20 dis |
| | (REFER TO TYPICAL DETAIL) INDICATES DOUBLE SHEAR CONNECTION (REFER TO TH | | | INDICATES M | DMENT FRAME | | 1060 Fowl | Bozeman, P: (406) 556-4 CIVIL © Copyright 00.203 This document, and D Amato Conversan |
| OOTB | SHEAR PLATE CONNECTION INDICATES REINFORCING T (REFER TO THE REINFORCIN | YPE | | CONNECTION | NTILEVER | | 0 | |
| (SR_) | SCHEDULE) INDICATES NUMBER OF STU REQUIRED AT COLUMN (RE | JD RAIL | • | CONNECTION | AG CONNECTION | | | |
| | STUD RAIL DETAILS) ROOF/FLOOR DIAPHRAGM SYMBOL (REFER TO DIAPHF | NAILING | - | | DOD OR STEEL STUD | | | |
| | NAILING SCHEDULE) STEEL/CONCRETE COLUMN | | | PER KEY ON S | HEET DOD OR STEEL STUD | | | |
| XX"xXX" | SYMBOL (REFER TO STEEL COLUMN SCHEDULE) ELEVATION SYMBOL (T/ REF | ERS | * * * * * * * | PER KEY ON S | | | | |
| $\frac{1}{\sqrt{3}}$ | TO COMPONENT THAT THE ELEVATION REFERENCES) STUD BUBBLE (INDICATES N | NUMBER | \$ <u>/////</u> \$ | | ASONRY/CMU WALL | | Se | of |
| | OF STUDS REQUIRED IF EXO NUMBER SPECIFIED IN PLA INDICATES STEP IN FOOTIN | N NOTE) G | <u>+</u> | CONCRETE W | ALL | | n | etro |
| | (REFER TO TYPICAL STEP IN FOOTING DETAIL) DETAILS OR SECTION CUT | | È = = = = = ⇒ È = = = = ⇒ | | | <u>v</u> | hc | G |
| SX.X | DETAILS OR SECTION COT (DETAIL NUMBER/SHEET NU DETAILS OR SECTION CUT I | | \$\$ • | | | ENT | | ſ |
| S0.0 | VIEW (DETAIL NUMBER/SHE | EET NUMBER) | P ; | | | DOCUMENTS | iel | |
| XX/SXX.XX | WALLS, SHEAR WALLS OR I FRAME ELEVATIONS STRUCTURAL EXTENT SYME | | 3 | | N STRESSING END (PLAN) | DO | Ĩ, | |
| | SINGLE ARROW - END OF E DOUBLE ARROW - CONTINU EXTENT ALONG THE ELEME | XTENT JOUS | | (IN INCHES) | | lion | Ţ | |
| | UNTIL THE ELEMENT IS INTE | | | | E STRESSING (PLAN) | CONTSTRUCTION | de | C |
| L Ang AB Ang | | Exterior Factory- | IATIONS | PJP PREFAB | Partial Joint Penetration Prefabricated | TST | Ğ | an |
| B or BOT Bot B/ Bot BLDG Bui BLKG Blo BMU Brid BP Bas BRBF Bud BRG Bea BTWN Bet C Car CB Cas C'BORE Cou CL or & Cer CLT CrO CIP Cas C'BORE Cou CL or & Cer CLT CrO CIP Cas CJ Cor CJP Cor CJP Cor CJP Cor CJP Cor CJP Cor CONC Cor CONC COR CONC COR CONC COR CONC COR CONC COR CONST COR CON CONST COR CON CON CON CON CON CON CON CON CON CON | lingkIncrete Masonry UnitKSFumnLFIncreteLLInnectionLLBBInstructionLLVuntersinkLPInteredLONGIImeterLSLup BeamLVLformed Bar AnchorMASubleMAXmolishMECHvelopmentMFRgonalMINtributedMISCad LoadNIC | Fire Reta Footing Face of Gage Galvaniz CH Geotech Glue Lar Gypsum Header Hem-Fir Hanger Hold-dow Horizont High Poi TS (Hollow Internati Inside D Invert El Inside Fa Interior Kips Kips Per Lineal Fo Live Loa Long Le Long Le Long Le Low Poi T Longitud Laminati Masonry Maximu Mechan Mezzani Manufad Not In C | nical ninated Timber Wall Board Wn al nt Structural Section) onal Building Code iameter evation ace Square Foot oot d g Back-to-Back g Horizontal g Vertical nt linal ed Strand Lumber of Veneer Lumber m ical ne cturer n neous | R RD REF REINF REQD RET SB SCBF SCHED SER SFRS SFRS SHTHG SIM SLBB SMF SOG SP SPEC SQ SR SF SST STAGG STD STIFF STL STRUCT | Post-Tensioned Pressure Treated Radius Roof Drain Refer/Reference Reinforcing Required Retaining Site-Built Special Concentric Braced Frame Schedule Structural Engineer of Record Seismic Force- Resisting System Sheathing Similar Short Leg Back-to-Back Special Moment Frame Slab on Grade Southern Pine Specification Square Studrail Square Foot Stainless Steel Stagger/Staggered Standard Stiffener Steel Structural Solid Web Wood Joist Symmetrical Top Top Of Top & Bottom Top Chord Axial Load Top Chord Extension Tie Down System Tongue & Groove Thickened | 100% | BUCK No. 135 | DOGPE |
| DWG Dra | wing OC | | | | Threaded Through Transverse | | RAWN BY: JN EVIEWED BY: V. DESCRIF | JML |
| EA Eac EF Eac EL Ele ELEC Ele ELEV Ele | sting h OD h Face OF vation OPNG ctrical OPP vator OWSJ bedment OWW | Outside Opening Opposite Open W | | TYP UNO URM VERT W W/ | Typical Unless Noted Otherwise Unreinforced Masonry Unit Vertical Wide With | | # DESCRIP D SCHEMA DESIG D 95% REV | ATIC 04/10/20 |
| EQ Equ EQUIP Equ EW Eac | ial PL uipment PAF h Way PC | Plate Powder Precast | Actuated Fastener | W/O WHS WP | Without Welded Headed Stud Working Point | C | D 100% C | D 11/01/20 |
| | ansion PERP ansion Joint PLWD | Perpend Plywood | | WWF ± | Welded Wire Fabric Plus or Minus | | | |
| | | | | | | S | | GENERAL |
| | | | | | | | DA ⁻ 11/01 | |

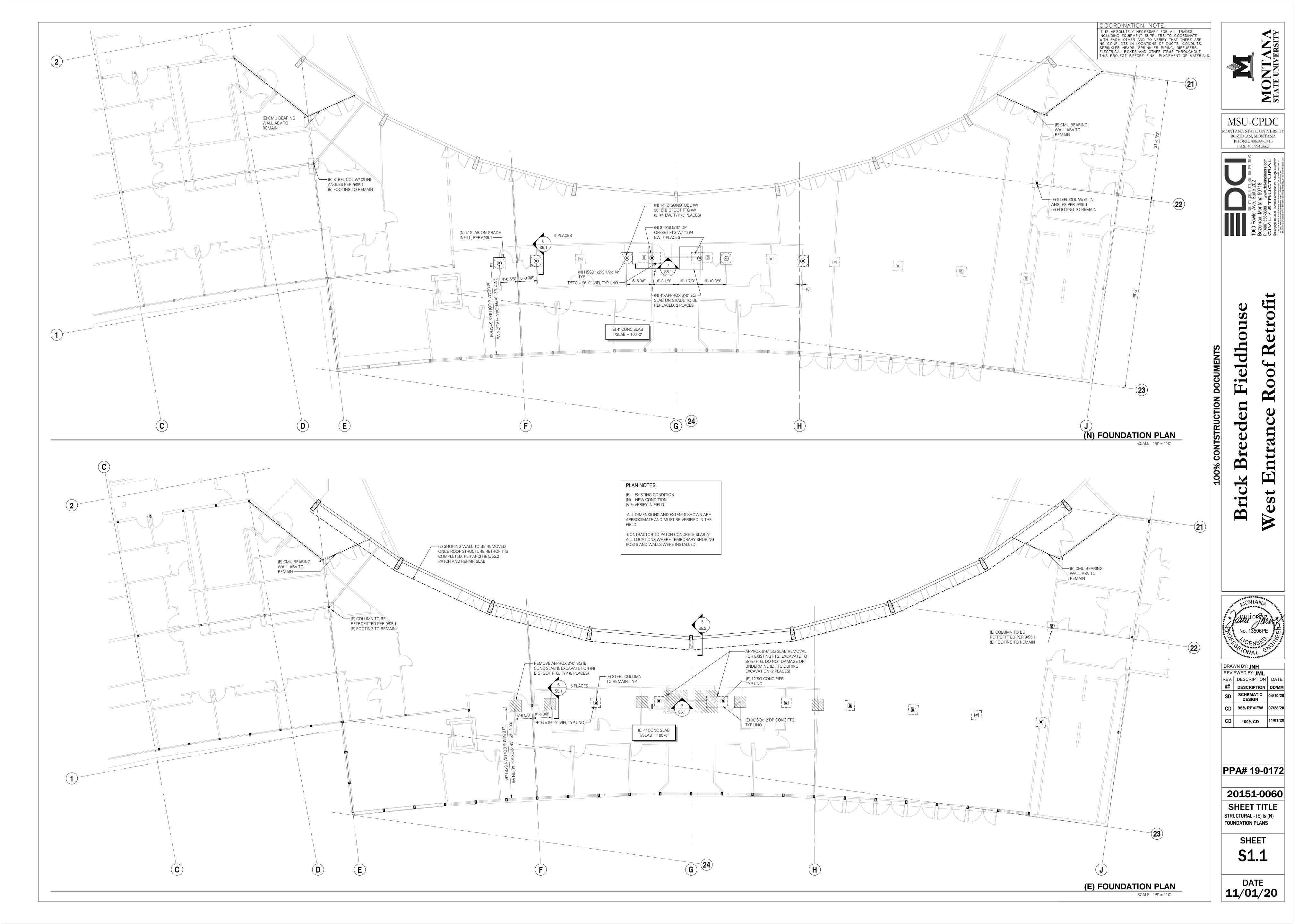


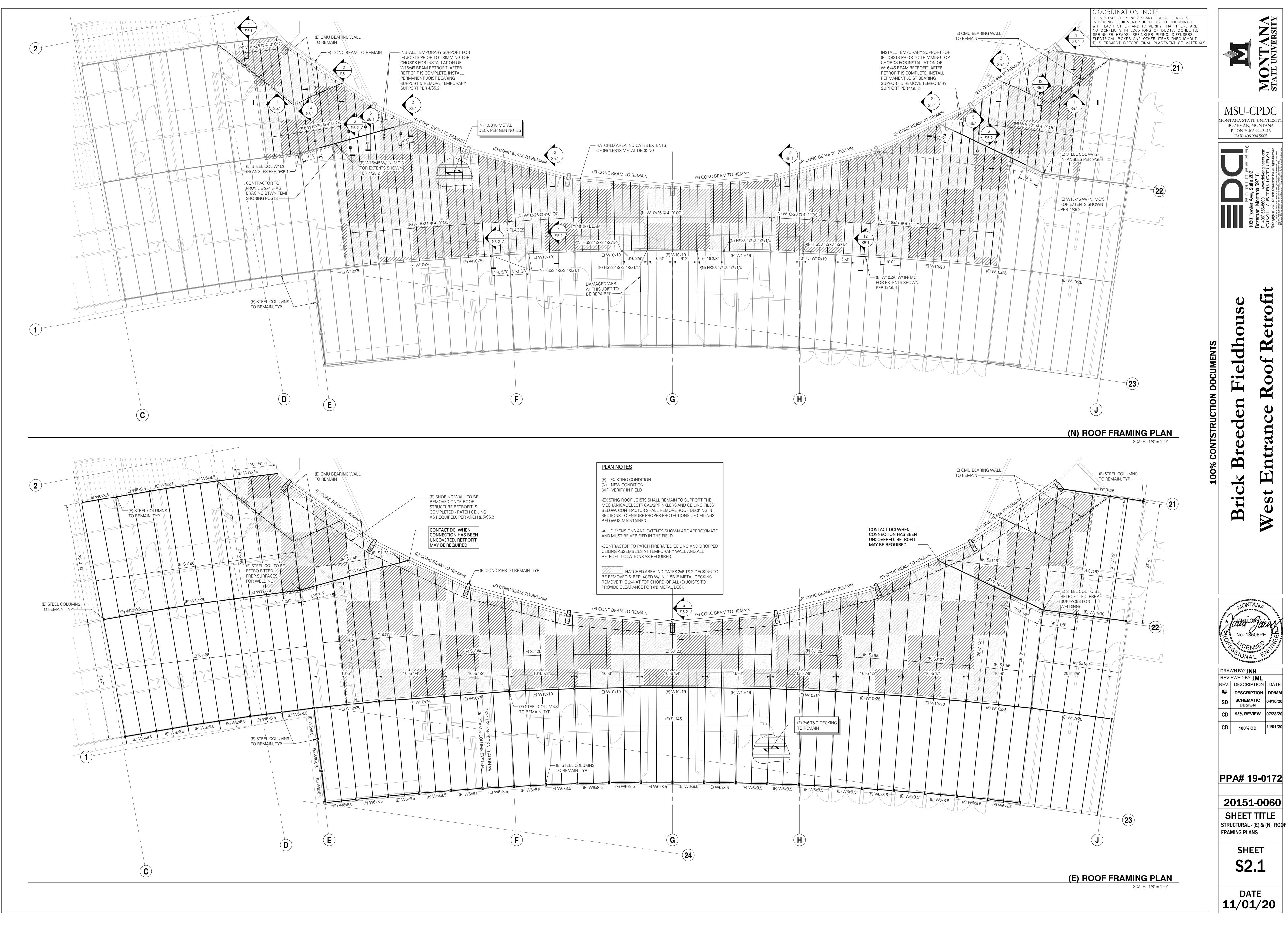
| Structural (S), (M) & (HP) Shapes | .AS |
|--|-----|
| Channel (C) & Angle (L) Shapes | |
| Structural Plate (PL) | .AS |
| High Strength Plate (Gr 50 PL) | .AS |
| Hollow Structural Section - Square/Rect (HSS). | .AS |
| High Strength, Heavy Hex Structural Bolts | .AS |
| Heavy Hex Nuts | .AS |
| Washers (Hardened Flat or Beveled) | .AS |
| | |

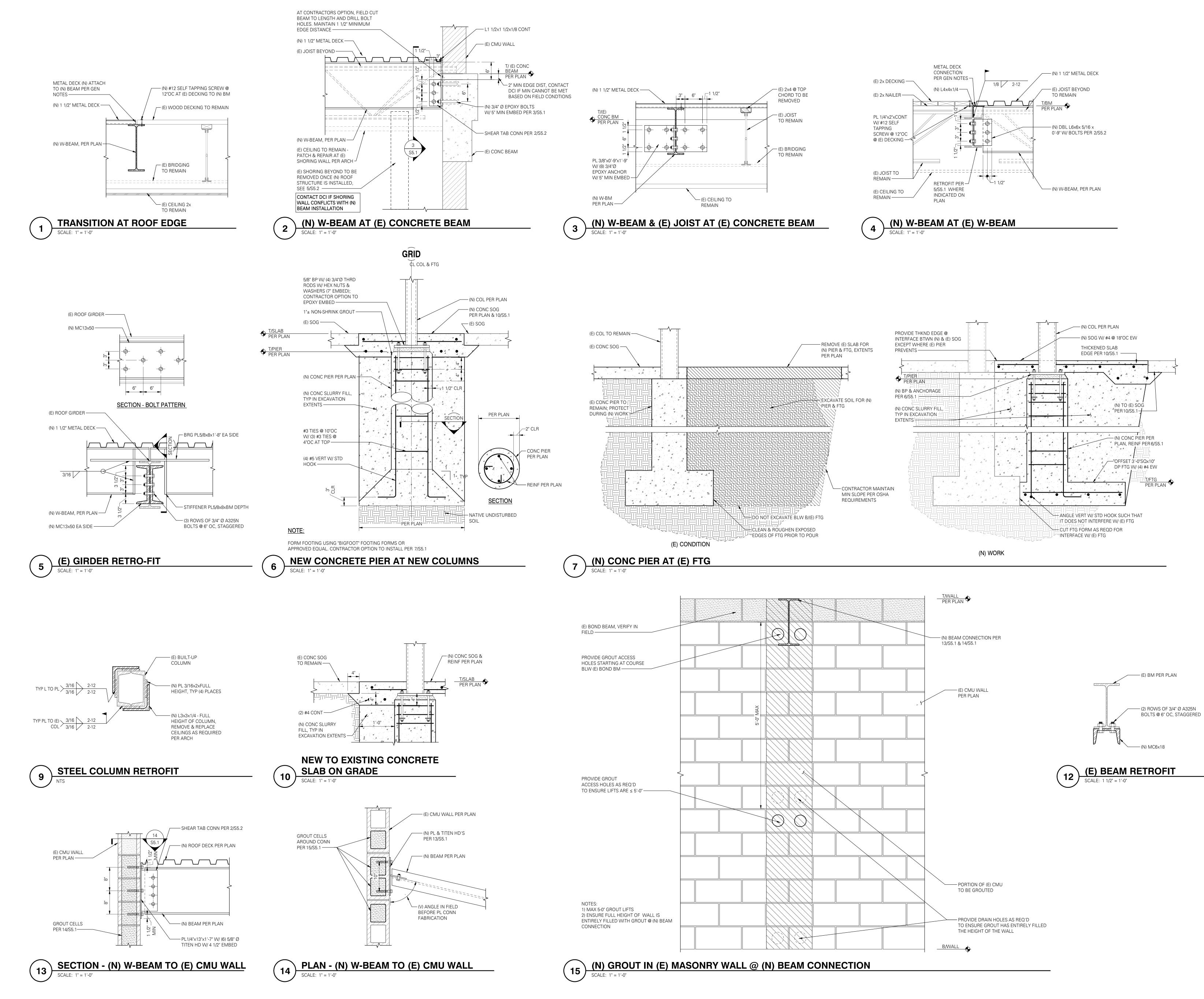
| STM A36, Fy = 36 ksi | |
|--------------------------------|----|
| STM A36, Fy = 36 ksi | |
| STM A36, Fy = 36 ksi | |
| STM A572, Fy = 50 ksi | |
| STM A500, Grade C Fy = 50 | k٩ |
| STM F3125 Gr. A325/F1852, Typ | e |
| STM A563, Grade and Finish per | F |
| STM F436, Grade and Finish per | R |
| STM A108 – Nelson/TRW H4L | |
| STM A496 – Nelson/TRW D2L, F | y |
| | _ |

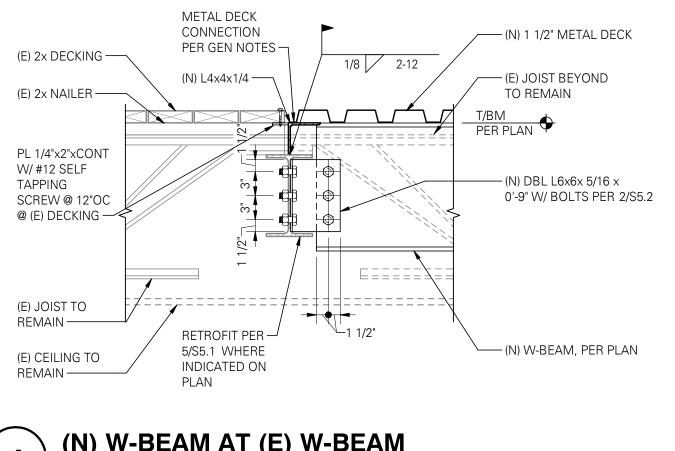


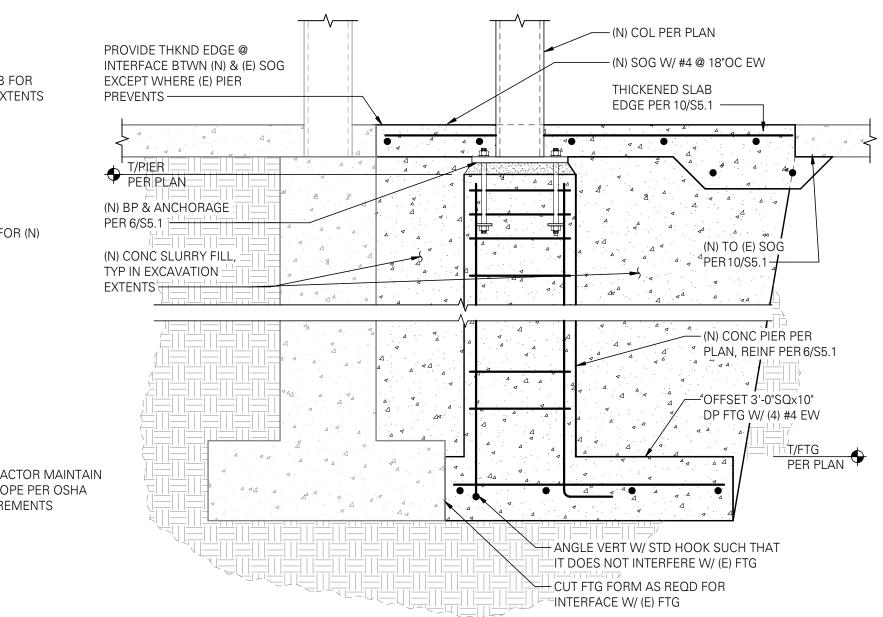
(21

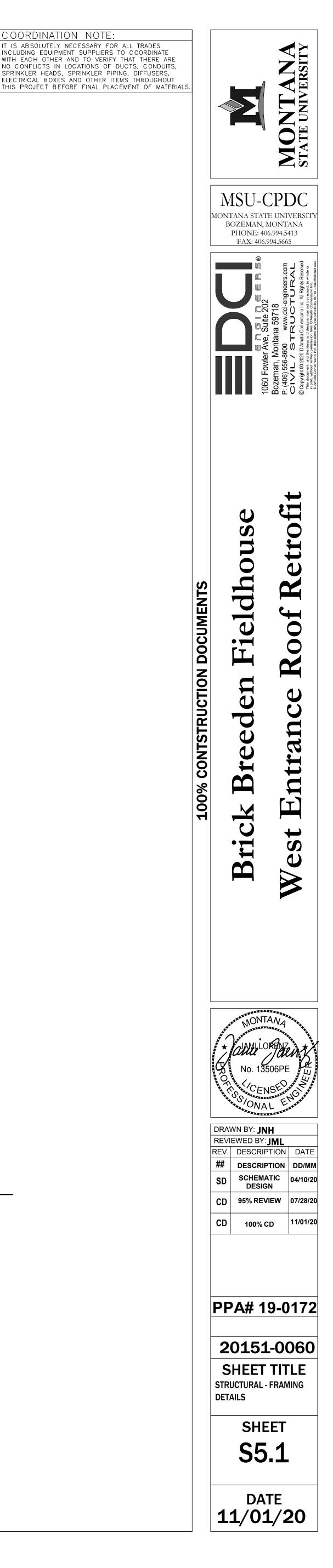


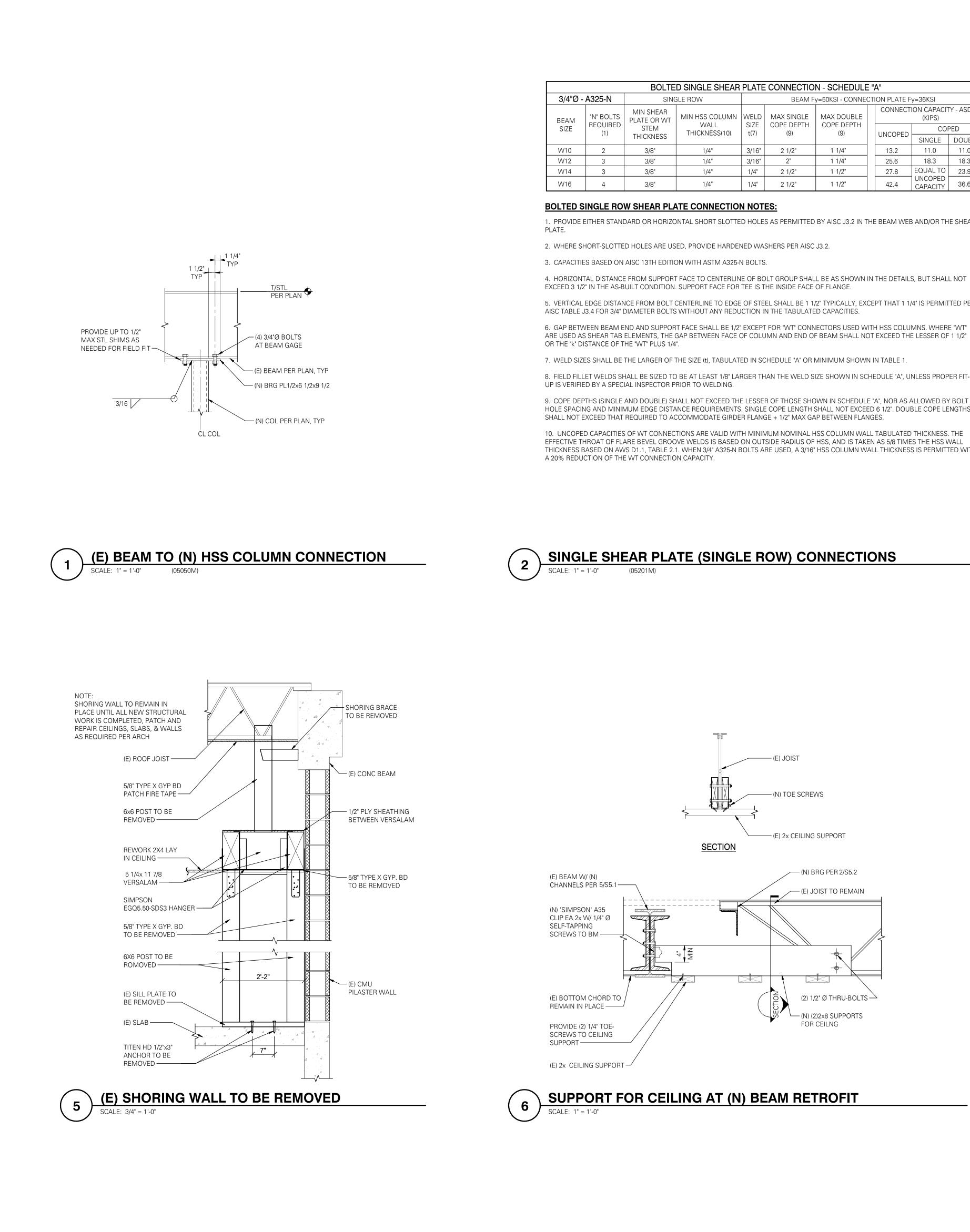












| BOLTED SINGLE SHEAR PLATE CONNECTION - SCHEDULE "A" | | | | | | | | | | | | |
|---|-------------------------------------|--------------------------|-----------------------|--------------|---|-------------------|---------|------------------------|--------------|--|--|--|
| 3/4"Ø - A325-N | | SINGLE ROW | | | BEAM Fy=50KSI - CONNECTION PLATE Fy=36KSI | | | | | | | |
| BEAM | "N" BOLTS | MIN SHEAR PLATE OR WT | MIN HSS COLUMN | WELD | MAX SINGLE | MAX DOUBLE | CONNEC | TION CAPACIT (KIPS) | ry - ASD (3) | | | |
| SIZE | (1) REQUIRED (1) THICKNESS | • • = • • • | WALL THICKNESS(10) | SIZE t(7) | COPE DEPTH (9) | COPE DEPTH (9) | UNCOPED | | COPED | | | |
| | | THICKNESS | | | | | | SINGLE | DOUBLE | | | |
| W10 | 2 | 3/8" | 1/4" | 3/16" | 2 1/2" | 1 1/4" | 13.2 | 11.0 | 11.0 | | | |
| W12 | 3 | 3/8" | 1/4" | 3/16" | 2" | 1 1/4" | 25.6 | 18.3 | 18.3 | | | |
| W14 | 3 | 3/8" | 1/4" | 1/4" | 2 1/2" | 1 1/2" | 27.8 | EQUAL TO | 23.9 | | | |
| W16 | 4 | 3/8" | 1/4" | 1/4" | 2 1/2" | 1 1/2" | 42.4 | UNCOPED CAPACITY | 36.6 | | | |

1. PROVIDE EITHER STANDARD OR HORIZONTAL SHORT SLOTTED HOLES AS PERMITTED BY AISC J3.2 IN THE BEAM WEB AND/OR THE SHEAR

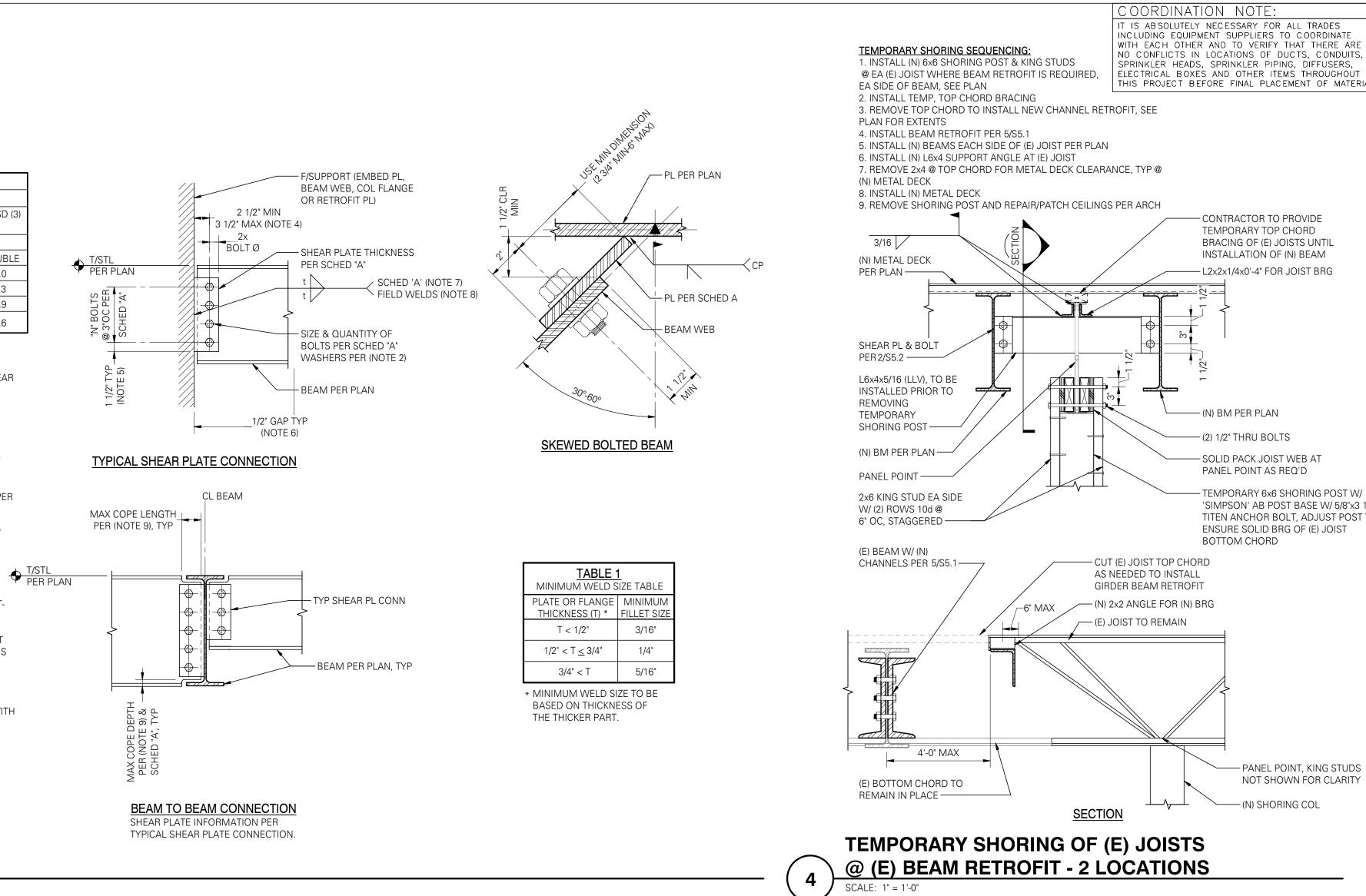
5. VERTICAL EDGE DISTANCE FROM BOLT CENTERLINE TO EDGE OF STEEL SHALL BE 1 1/2" TYPICALLY, EXCEPT THAT 1 1/4" IS PERMITTED PER

6. GAP BETWEEN BEAM END AND SUPPORT FACE SHALL BE 1/2" EXCEPT FOR "WT" CONNECTORS USED WITH HSS COLUMNS. WHERE "WT" ARE USED AS SHEAR TAB ELEMENTS, THE GAP BETWEEN FACE OF COLUMN AND END OF BEAM SHALL NOT EXCEED THE LESSER OF 1 1/2"

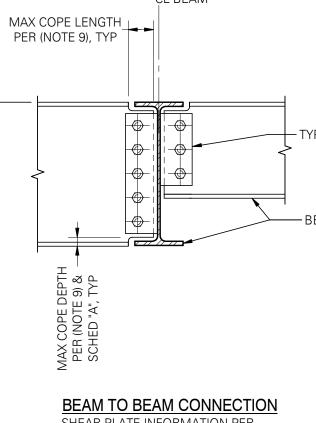
8. FIELD FILLET WELDS SHALL BE SIZED TO BE AT LEAST 1/8" LARGER THAN THE WELD SIZE SHOWN IN SCHEDULE "A", UNLESS PROPER FIT-

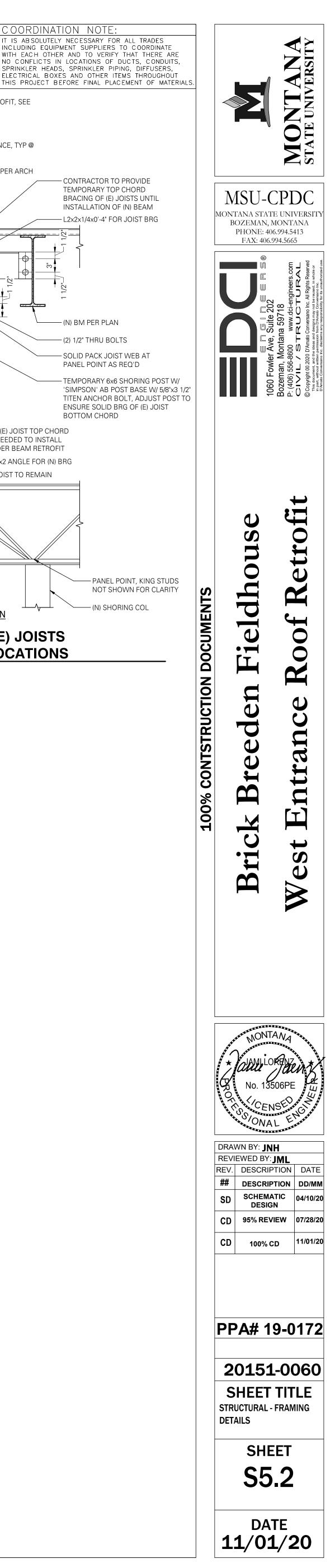
9. COPE DEPTHS (SINGLE AND DOUBLE) SHALL NOT EXCEED THE LESSER OF THOSE SHOWN IN SCHEDULE "A", NOR AS ALLOWED BY BOLT HOLE SPACING AND MINIMUM EDGE DISTANCE REQUIREMENTS. SINGLE COPE LENGTH SHALL NOT EXCEED 6 1/2". DOUBLE COPE LENGTHS

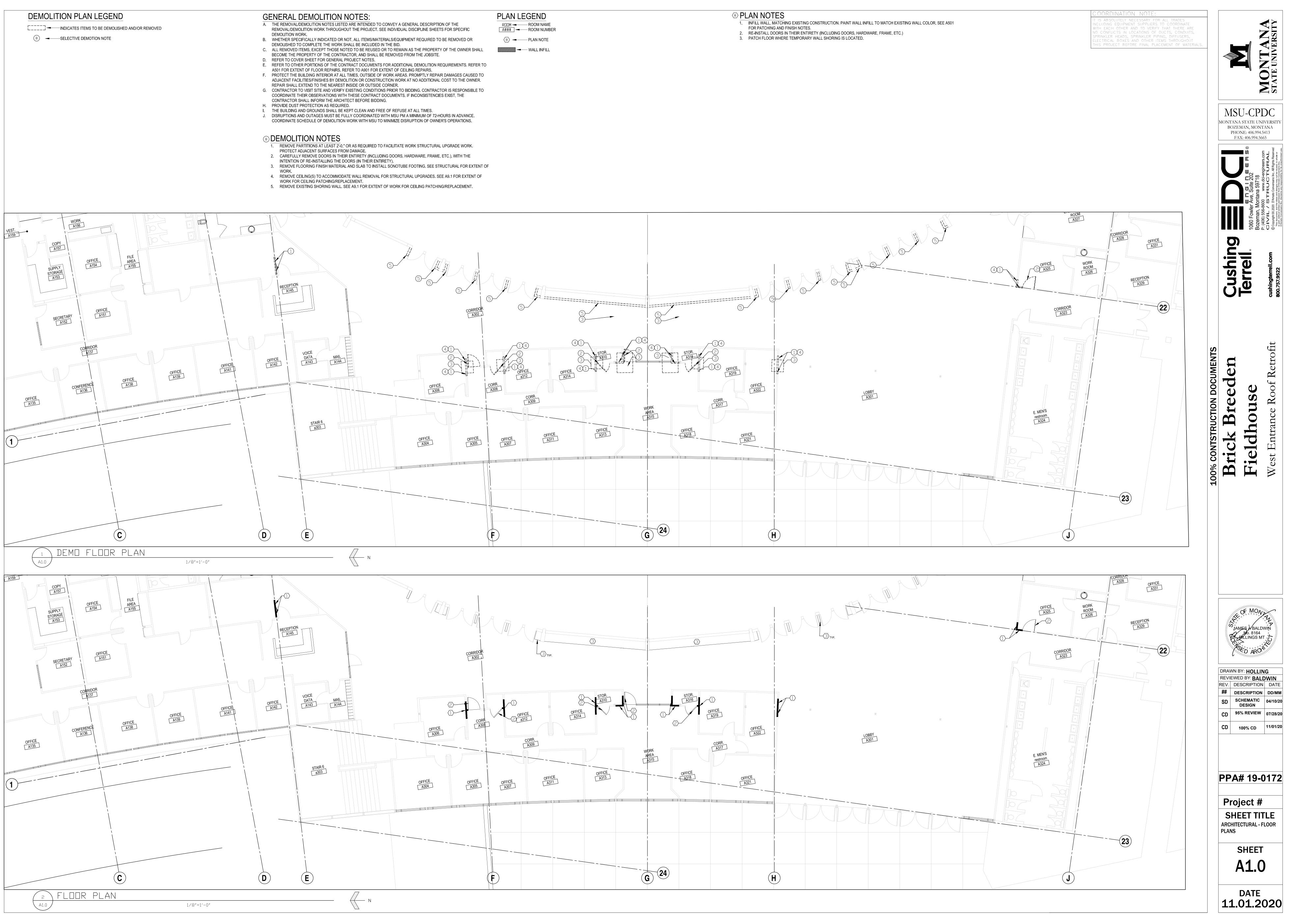
10. UNCOPED CAPACITIES OF WT CONNECTIONS ARE VALID WITH MINIMUM NOMINAL HSS COLUMN WALL TABULATED THICKNESS. THE EFFECTIVE THROAT OF FLARE BEVEL GROOVE WELDS IS BASED ON OUTSIDE RADIUS OF HSS, AND IS TAKEN AS 5/8 TIMES THE HSS WALL THICKNESS BASED ON AWS D1.1, TABLE 2.1. WHEN 3/4" A325-N BOLTS ARE USED, A 3/16" HSS COLUMN WALL THICKNESS IS PERMITTED WITH



4

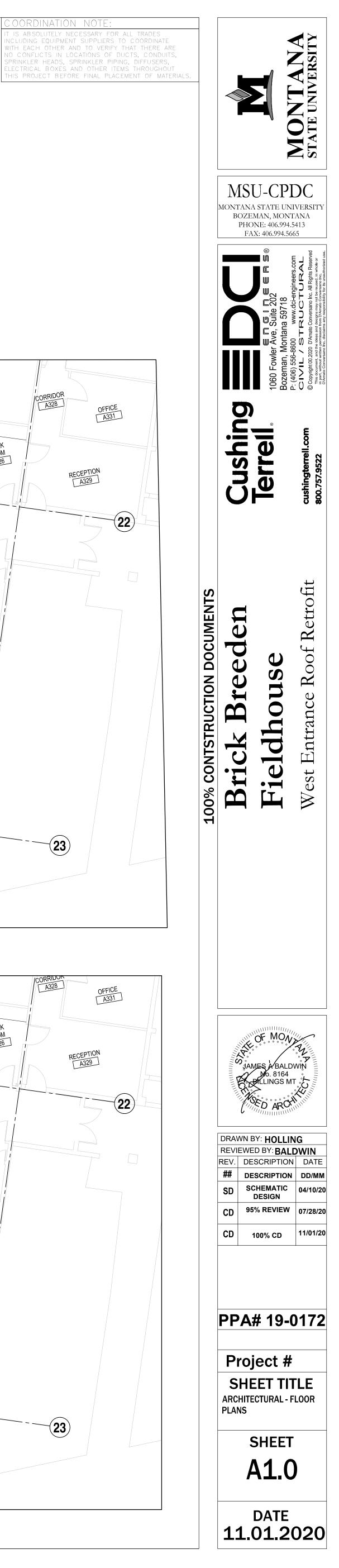


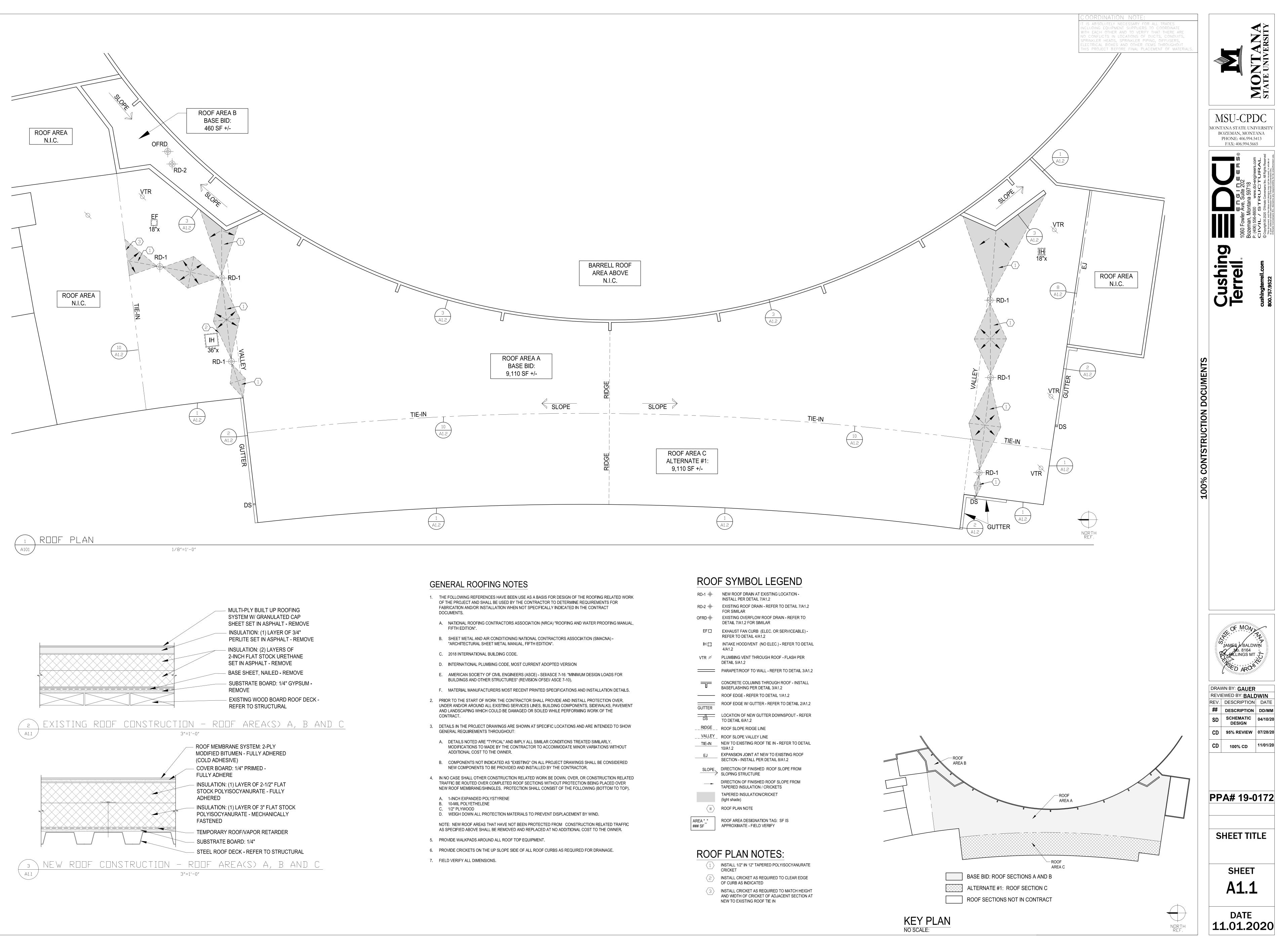






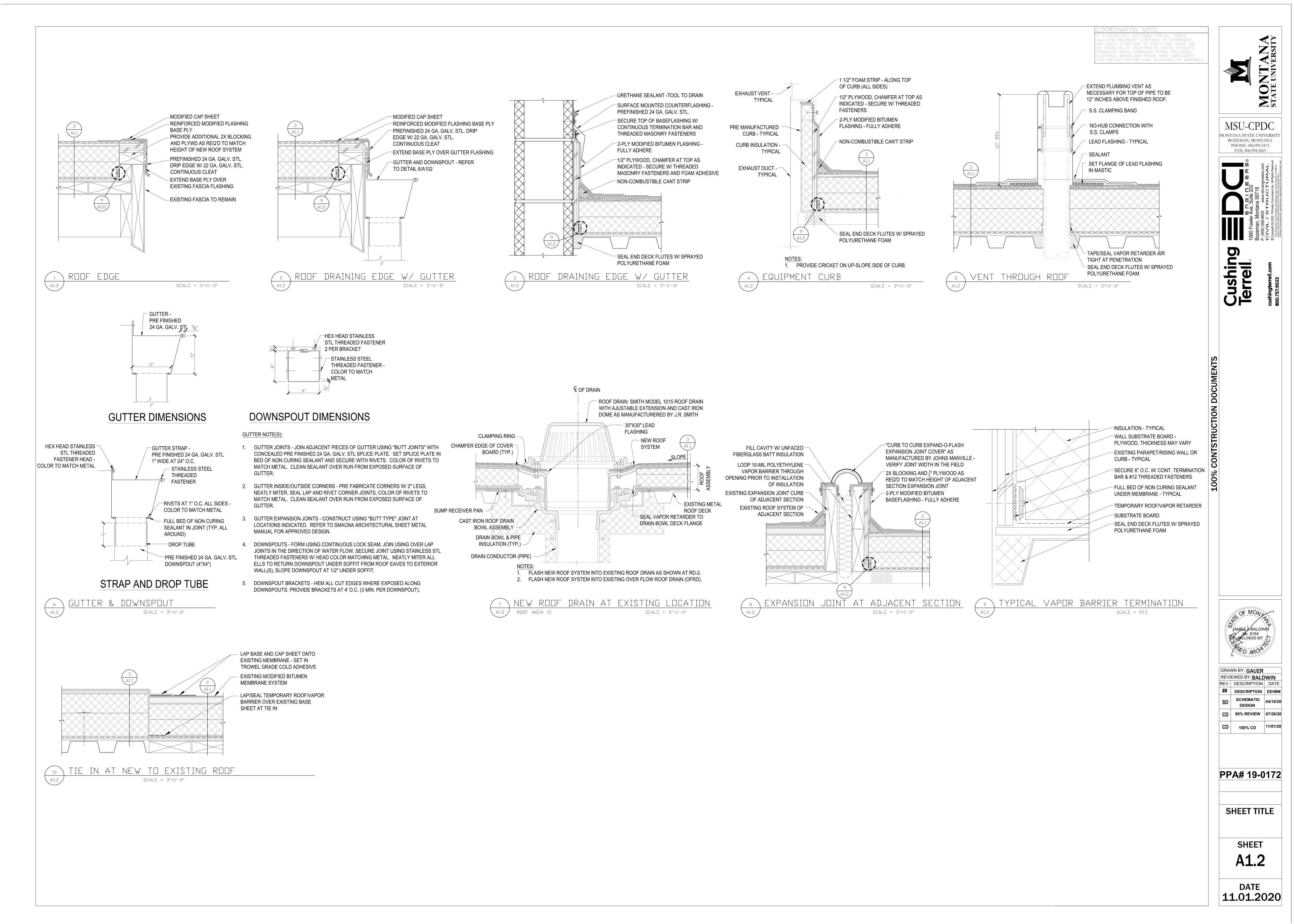


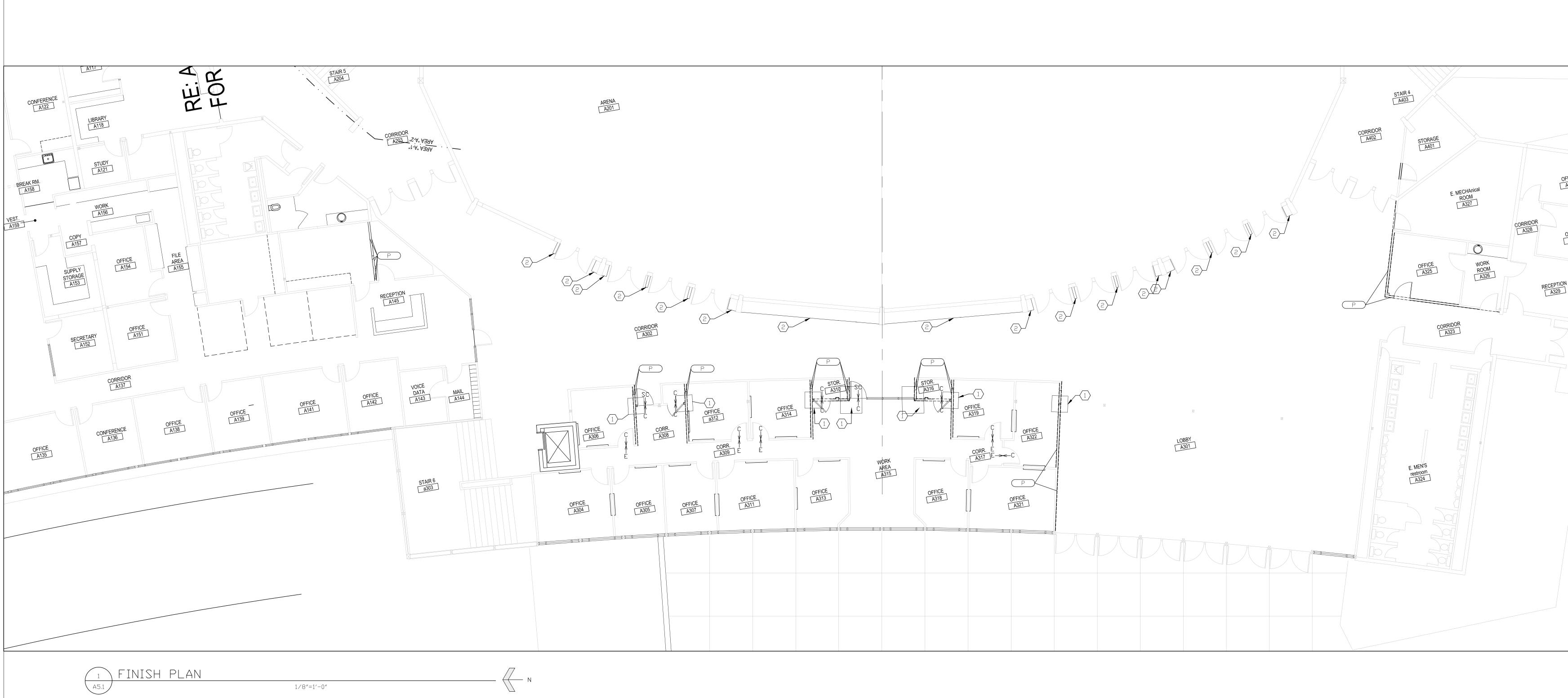




| RD-2 🔶 | EXISTING FOR SIMIL |
|----------------------|------------------------|
| OFRD 🔶 | EXISTING DETAIL 7/, |
| EF 🖸 | EXHAUST REFER TC |
| IH 🗖 | INTAKE H 4/A1.2 |
| VTR Ø | PLUMBING DETAIL 5/A |
| | PARAPET/ |
| | CONCRET BASEFLAS |
| | ROOF EDC |
| GUTTER | ROOF EDC |
| DS | LOCATION |
| RIDGE | ROOF SLO |
| VALLEY_ | ROOF SLO |
| TIE-IN | NEW TO E 10/A1.2 |
| EJ | EXPANSIO SECTION - |
| | DIRECTION SLOPING S |
| | DIRECTION TAPERED |
| | TAPERED (light shade |
| $\langle \# \rangle$ | ROOF PLA |
| AREA "_" ### SF | ROOF ARE APPROXIN |

| <u> </u> | - | |
|------------------------|---|---------------|
| \rangle | | ALL 1 KET |
| $\left \right\rangle$ | | ALL C |
| $\left \right\rangle$ | | ALL C WIDT |





LEGEND

FINISH TAG ←### FLOOR FINISH TAG

FLOOR FINISHES CARPET TILES E EXISTING

BASE FINISHES E EXISTING CS CONCRETE SLAB ON GRADE

WALL FINISHES MISC FINISHES RT RUBBER FLOOR TRANSITION

FINISH NOTES

CORNER GUARD - SEE SPECIFICATIONS

---- PAINTED WALLS

ROOM FINISHES

SC SEALED CONCRETE

GENERAL FINISH NOTES

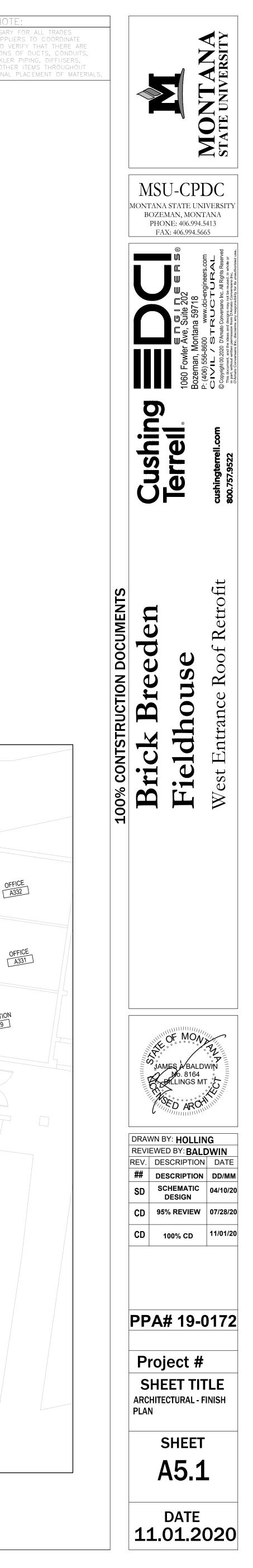
A. PROVIDE RUBBER TRANSITION STRIPS AT ALL CONCRETE AND CARPET TRANSITIONS. TRANSITION TO MATCH EXISTING. B. ALL TRANSITIONS TO OCCUR DIRECTLY BENEATH DOORS UNLESS OTHERWISE NOTED.

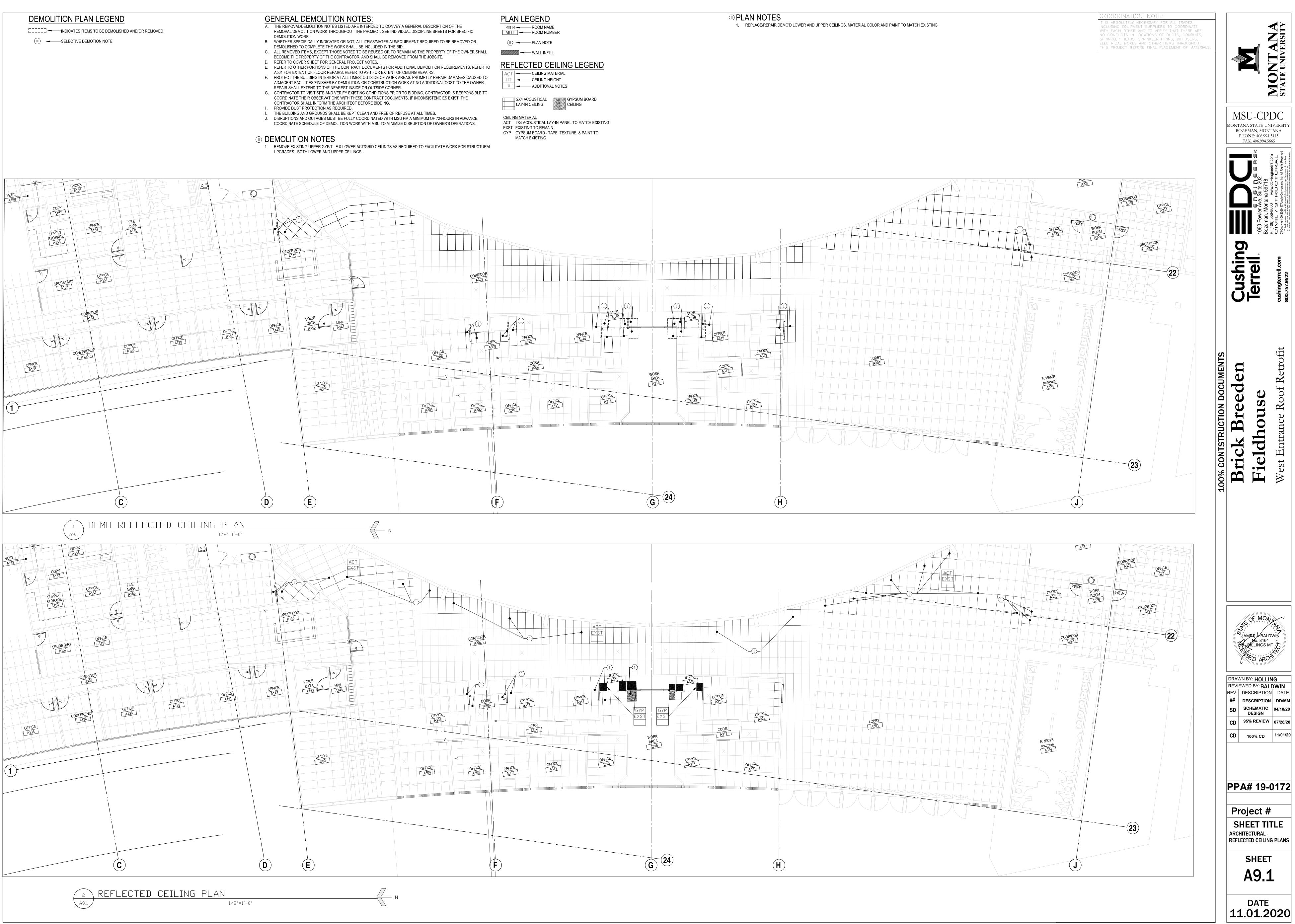
C. ALL PRODUCTS TO BE INSTALLED PER MANUFACTURERS INSTRUCTION USING MANUFACTURERS ADHESIVES, ETC. D. PATCH ALL AREAS OF REMOVED FINISH. E. MATCH EXISTING ADJACENT WALL FINISHES AT NEW AND REMODELED WALLS.

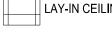
F. REPAINT HOLLOW METAL DOORS AND FRAMES TO MATCH EXISTING.

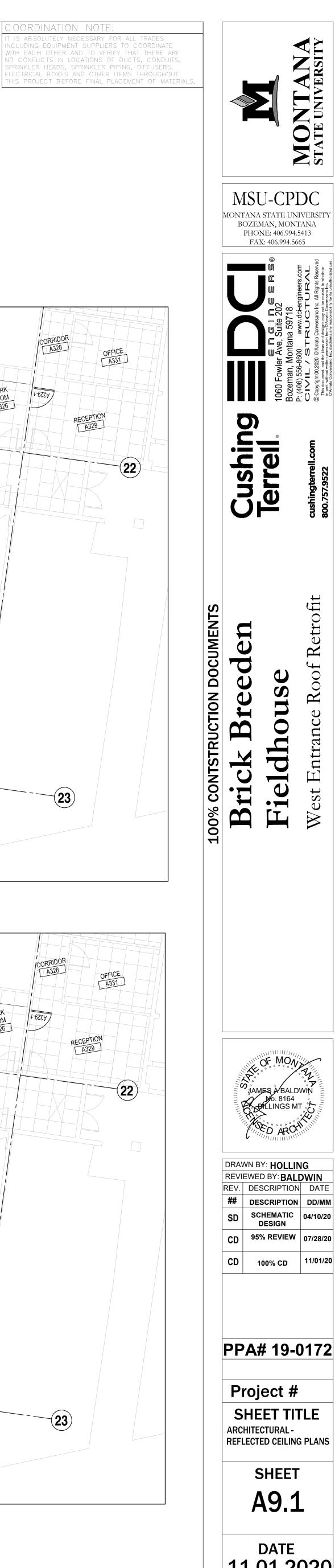
1. AREA OF EXTENT OF FLOOR WORK, MATCH REPLACED FLOORING WITH EXISTING. SEE STRUCTURAL FOR SIZE EXTENT. 2. PATCH FLOOR AND TOUCH-UP WALL ONCE SHORING IS REMOVED.

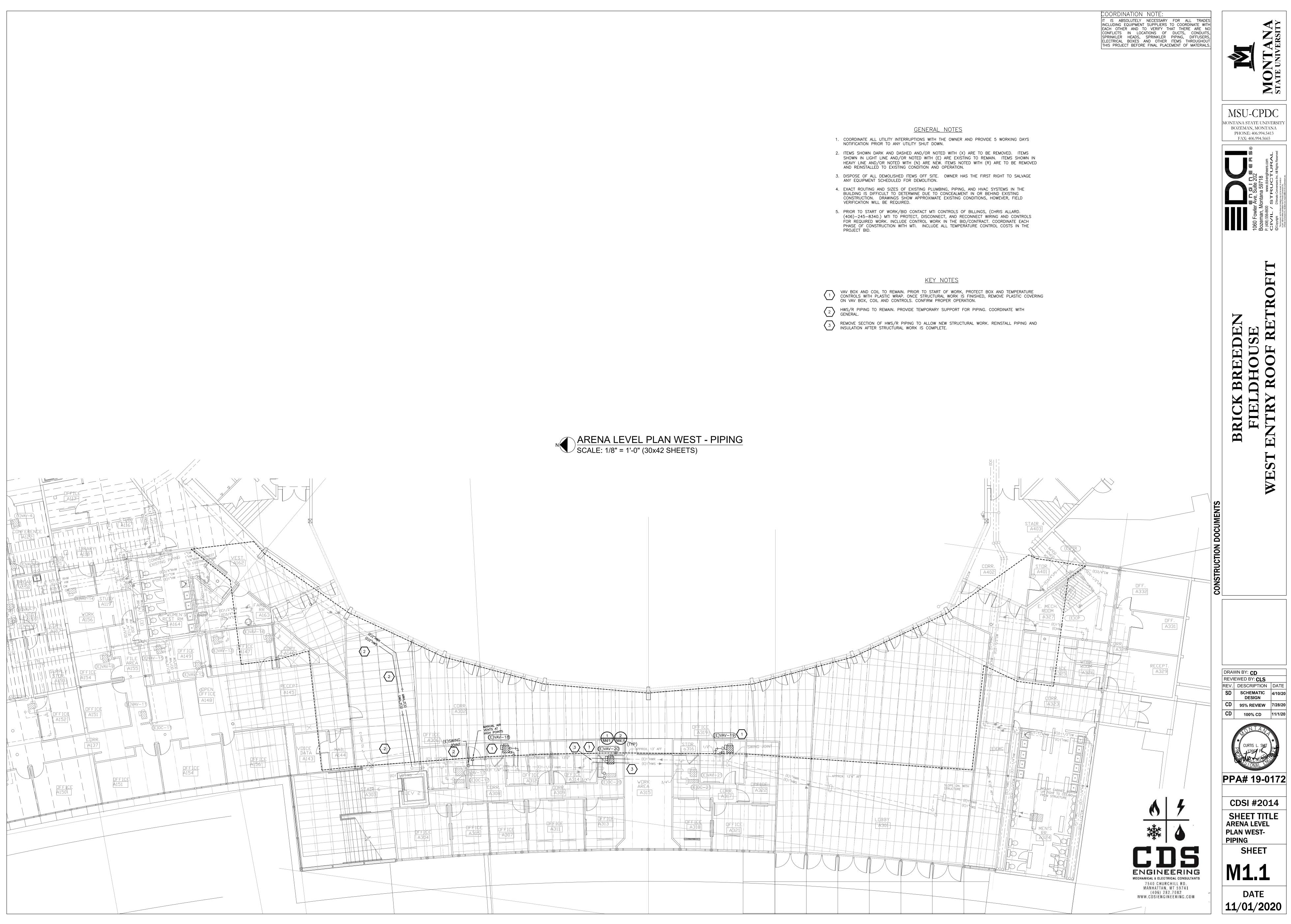
OORDINATION NOT IS ABSOLUTELY NECESSARY FOR ALL TRADES NCLUDING EQUIPMENT SUPPLIERS TO COORDINATE WITH EACH OTHER AND TO VERIFY THAT THERE ARE NO CONFLICTS IN LOCATIONS OF DUCTS, CONDUITS, SPRINKLER HEADS, SPRINKLER PIPING, DIFFUSERS, ELECTRICAL BOXES AND OTHER ITEMS THROUGHOUT THIS PROJECT BEFORE FINAL PLACEMENT OF MATERIALS.

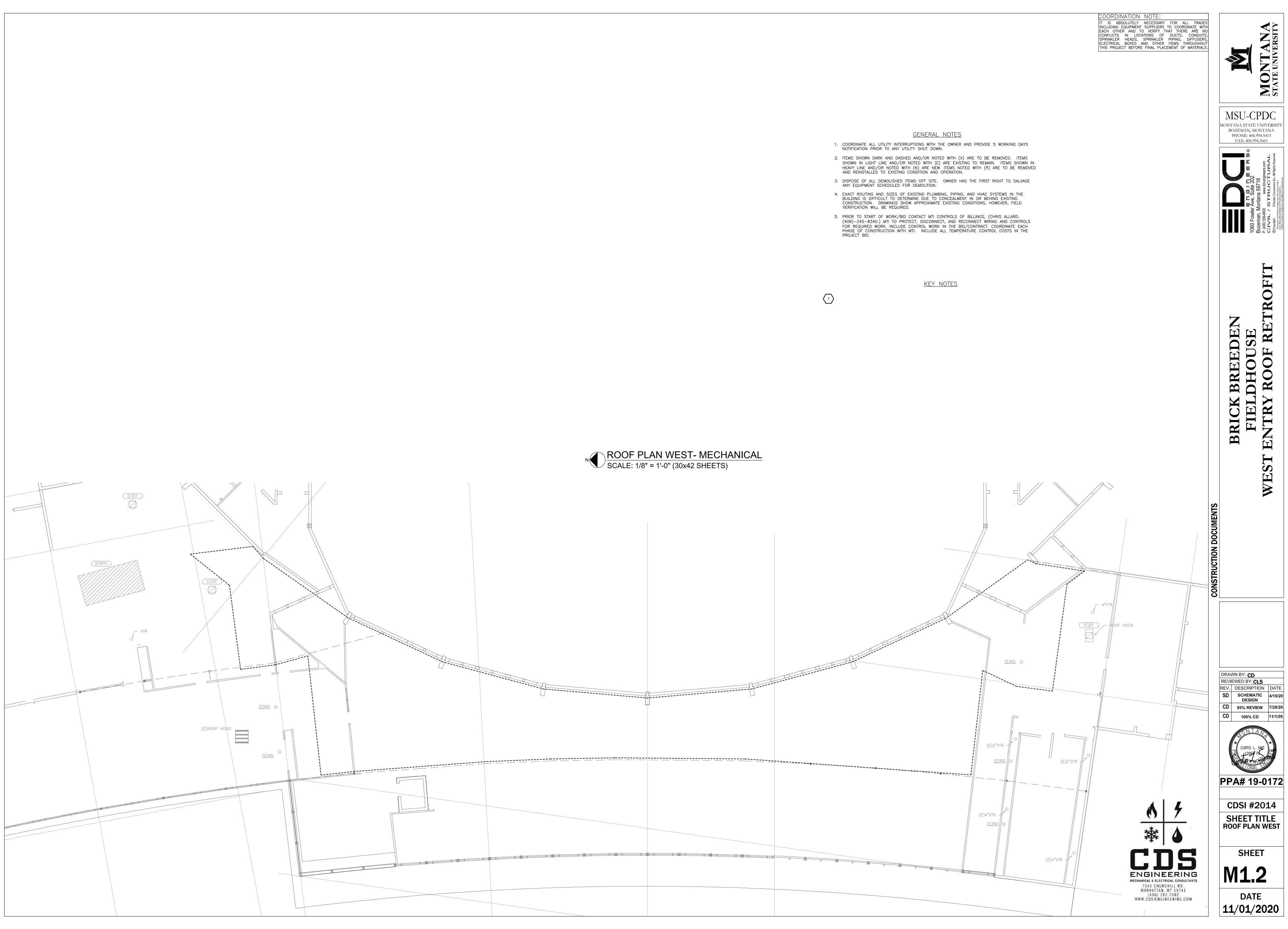


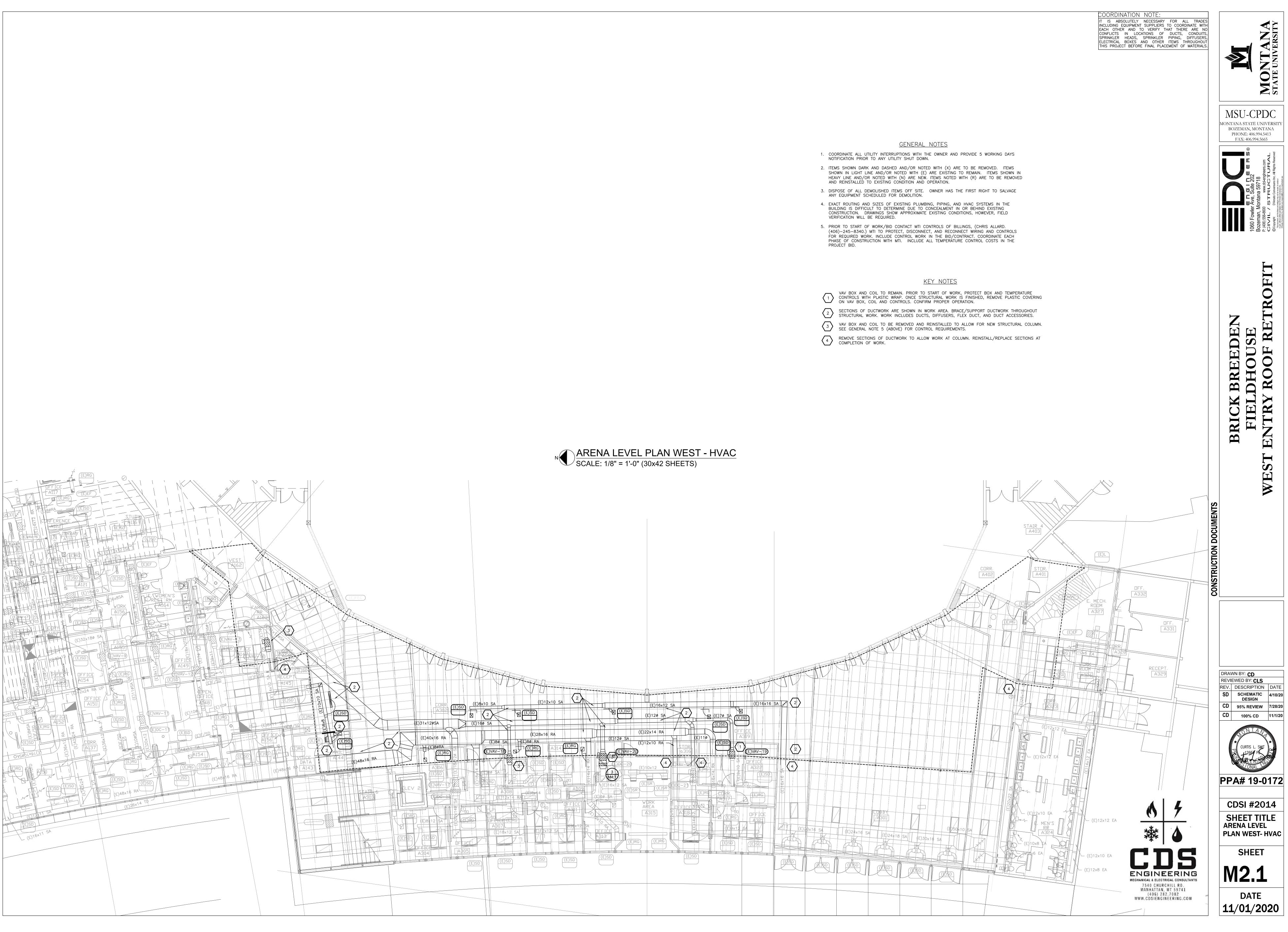


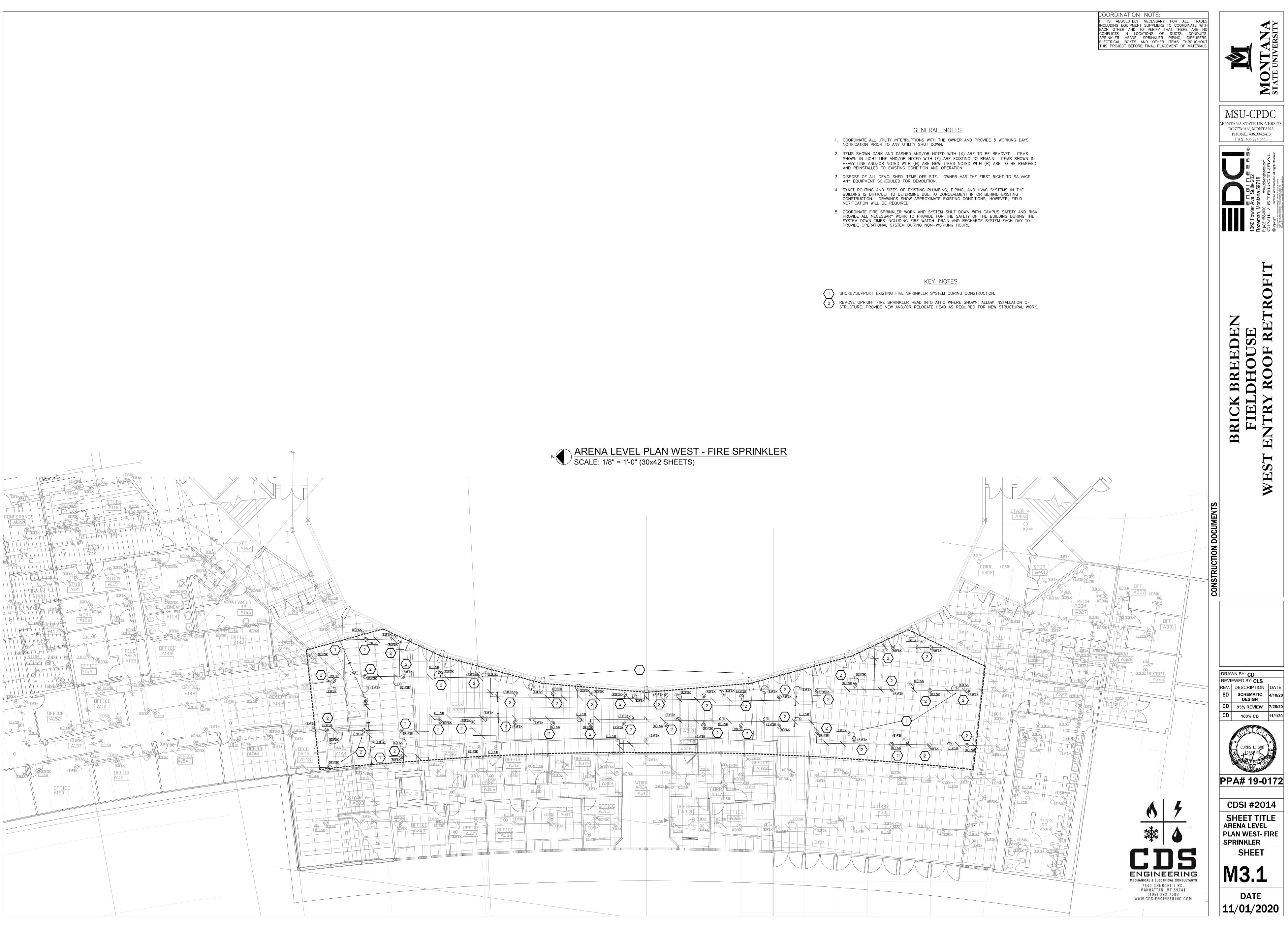


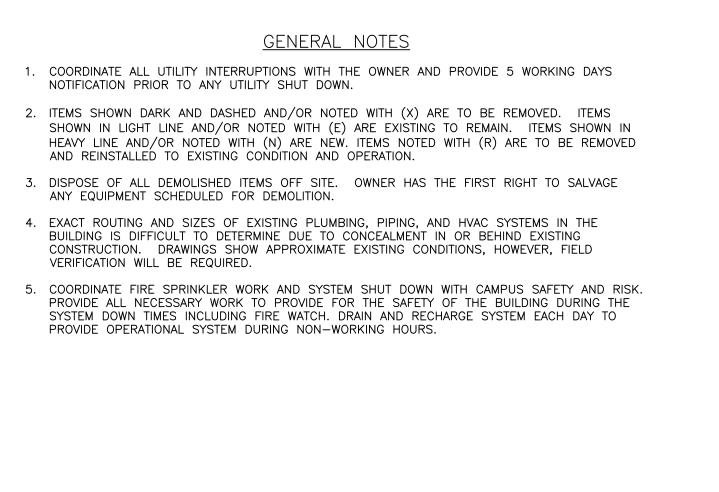










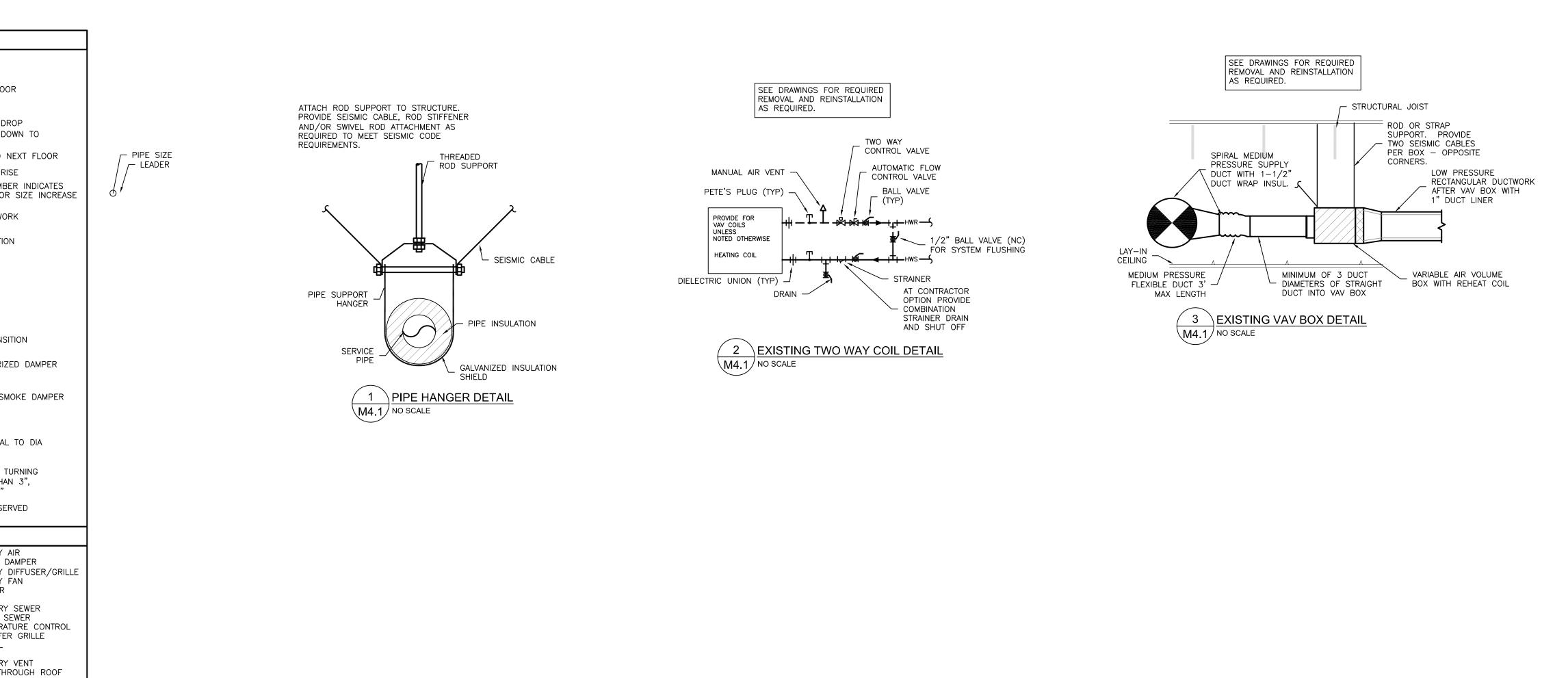




| | | | | | | | | A 1545 | |
|---|---------------------------|----------------|-----------------|---------------------------------|-----------------|------------------------|-----------------|-----------------------------|--------------------|
| | | | | NOT ALL SYME | BOLS ARE | | | | |
| сw нw | DOMESTIC COL | | | - GATE VALVE | | (\mathfrak{L}) | | PPLY DUCT I | |
| —— RHW — | | | - | - BALL VALVE | | \bigotimes | | PPLY DUCT I KT FLOOR | DOWN TO |
| | | ILCIII.C | | - BUTTERFLY VAL | VE | Ā | | PPLY UP TO | |
| | | | | - CHECK VALVE - DOUBLE CHECK | | $\mathbf{\Theta}$ | | | |
| G | | | | - REDUCED PRES | | (FLOW 🚫 | SUF | PPLY DUCT I | RISE |
| | BELOW GRADE SANITARY | SEWER | Y | | BRIE BRIER | | RET | URN/EXHAU | ST DUCT DF |
| | | SEWER | • | - GAS VALVE | | Ă | RET | TURN/EXHAU KT FLOOR | ST DUCT DO |
| | – — SANITARY VENT | | | PRESSURE RED THREE—WAY CO | | | | | |
| | BELOW GRADE STORM | | Ţ | | | | RET | TURN/EXHAU | ST UP TO N |
| | | | | - TWO-WAY CONT | ROL VALVE | \bigcirc | RET | URN/EXHAU | ST DUCT RI |
| | CONDENSATE DRAIN | | · · | - STRAINER | | Ĕ | | , CT SIZE — F | |
| | - AUXILIARY CONDENSATE D | ORAIN | ¥ ∕\$ | - BALANCING VAL | | | | CT WIDTH, N | ET INTERIOR |
| | | | <u> </u> | - TEMP/PRESSUR | E RELIEF V | Δ | <u> </u> | R DUCT LINE | |
| | | | <u> </u> | - PRESSURE GAU | GE | y 1 | 2ø y IND | ICATES ROUI | ND DUCTWO |
| | - HEATING WATER RETORN | | Q | – TEMPERATURE (| | | | | |
| | SECTION TAG DESIG | ΝΑΤΙΩΝ | <u> </u> | PETE'S PLUG | BAUGE | Ł | | XIBLE DUCT | CONNECTIO |
| M3.1 | AND SHEET LOCATIO | | | - UNION | | | | | |
| | | | | 9 PIPE TURN DOW | VNI | <u>{</u>] | | CT OFFSET D | DROP |
| $\left \begin{array}{c} 1 \end{array} \right $ | DETAIL TAG DESIGNA | | | O PIPE RISE | VIN | | | | |
| M2.1 | AND SHEET LOCATIC | ON | | - PIPE BOTTOM C | ONNECTION | <u>{</u>] | | CT OFFSET F | RISE |
| | EQUIPMENT AND | | | - PIPE TOP CONN | | | | | |
| AHU2- | 12 EQUIPMENT TAG | | ' | - PIPE CONNECTION | NC | ł | | CT TRANSITIC |)N |
| | | | | PIPE CAP | | | | | |
| SG- | 1 DIFFUSER TAG AND | | | PIPE END CLEA | NOUT | ł | | JARE TO RO | UND TRANSI |
| 200 | OUTLET AIRFLOW (CFM) | | | FLOOR DRAIN | | | | | |
| | | | \bigcirc | ROOF DRAIN | | <u>{</u> | | LUME DAMPE | R, MOTORIZ |
| | | | $\Box \bigcirc$ | | | с. | <u>м</u> | | |
| | | | | PLUMBING FIXTU | JRE | Ľ. | | E, SMOKE A | |
| | | | <u>WC-1</u> | & LABEL | | 1 <u> </u> | | L, SMORL A | |
| | | | | POINT OF CONN | | | SD F/SD | | |
| | | | \bullet | EXISTING PIPING | | | $\overline{3}$ | | |
| | | | | EXACT SIZE AND | | (| | CT TURN WIT | H R EQUAL |
| | | | | FIRE SPRINKLER | <u>R HEAD</u> | | | NIMUM) | |
| | | | | SIDEWALL HEAD | | | - | ייאסע אריי | |
| | | | Ø | UPRIGHT HEAD | | | | CT TURN WIT NES. SPACINO | |
| | | | Õ | PENDENT HEAD | | | | DIUS GREATE | |
| | | | J | | | | | | |
| | | | | | | | WAV1-1 THE | ERMOSTAT AN | NU UNII SEI |
| | | | | | | | | | |
| | | | | ABBREVI | ATIONS | | | | |
| ADA | AMERICANS W/ DISABILITIES | (E) | EXISTING . | TO REMAIN | HWR | HEATING WA | ATER | SA | SUPPLY / |
| | ACT COMPLIANT EQUIPMENT | ÉÁ | EXHAUST | AIR | | (GLYCOL) F | | SD | SMOKE D |
| AD AFF | | EF | EXHAUST | | L-## | LOUVER | | SD/SG SF | SUPPLY SUPPLY |
| AFF | | EG-## ELECT | ELECTRICA | NUST GRILLE | LAV | | DED | SF | SUPPLI |
| BDD | BACK DRAFT DAMPER | FCO | FLOOR CL | | MANUF MBH | MANUFACTU 1000 BTU/ | | SK | SINK |
| BS/BSU | | FC/FCU | FAN COIL | UNIT | MECH | MECHANICAL | | SS | SANITARY |
| CA CO | | FD FD | FLOOR DR | | MS | MOP SINK | | ST TC | STORM S TEMPERA |
| CONT | | FD FD/SD | FIRE DAME | KE DAMPER | (N) | | D | TG | TRANSFE |
| CW | DOMESTIC COLD WATER | FE | FIRE EXTIN | | OA OC | OUTSIDE AI | | TYP | TYPICAL |
| CWS | CHILLED WATER | FS | FLOOR SIN | | PRV | | DUCING VALVE | UR V | URINAL SANITARY |
| CWR | | НВ НВ /НВЦ | HOSE BIB | | (R) | REMOVE AN | ID RELOCATE | VTR | VENT THE |
| | | HP/HPU HW | HEAT PUM | HOT WATER | RÁ | RETURN AIF | | WC | WATER CI |
| DDC | DIRECT DIGITAL CONTROL | HWS | HEATING V | VATER | RD RG-## | ROOF DRAII | | WCO | WALL CLE |
| DF | DRINKING FOUNTAIN | | (GLYCOL) | | ···· <i>"</i> # | | | (X) | EXISTING |

<u>GENERAL NOTES</u>

- 1. COORDINATE ALL UTILITY INTERRUPTIONS WITH THE OWNER AND PROVIDE 5 WORKING DAYS NOTIFICATION PRIOR TO ANY UTILITY SHUT DOWN.
- 2. ITEMS SHOWN DARK AND DASHED AND/OR NOTED WITH (X) ARE TO BE REMOVED. ITEMS SHOWN IN LIGHT LINE AND/OR NOTED WITH (E) ARE EXISTING TO REMAIN. ITEMS SHOWN IN HEAVY LINE AND/OR NOTED WITH (N) ARE NEW. ITEMS NOTED WITH (R) ARE TO BE REMOVED AND REINSTALLED TO EXISTING CONDÍTION AND OPERATION.
- 3. DISPOSE OF ALL DEMOLISHED ITEMS OFF SITE. OWNER HAS THE FIRST RIGHT TO SALVAGE ANY EQUIPMENT SCHEDULED FOR DEMOLITION.
- 4. EXACT ROUTING AND SIZES OF EXISTING PLUMBING, PIPING, AND HVAC SYSTEMS IN THE BUILDING IS DIFFICULT TO DETERMINE DUE TO CONCEALMENT IN OR BEHIND EXISTING CONSTRUCTION. DRAWINGS SHOW APPROXIMATE EXISTING CONDITIONS, HOWEVER, FIELD VERIFICATION WILL BE REQUIRED.
- 5. PRIOR TO START OF WORK/BID CONTACT MTI CONTROLS OF BILLINGS, (CHRIS ALLARD. (406)-245-8340.) MTI TO PROTECT, DISCONNECT, AND RECONNECT WIRING AND CONTROLS FOR REQUIRED WORK. INCLUDE CONTROL WORK IN THE BID/CONTRACT. COORDINATE EACH PHASE OF CONSTRUCTION WITH MTI. INCLUDE ALL TEMPERATURE CONTROL COSTS IN THE PROJECT BID.

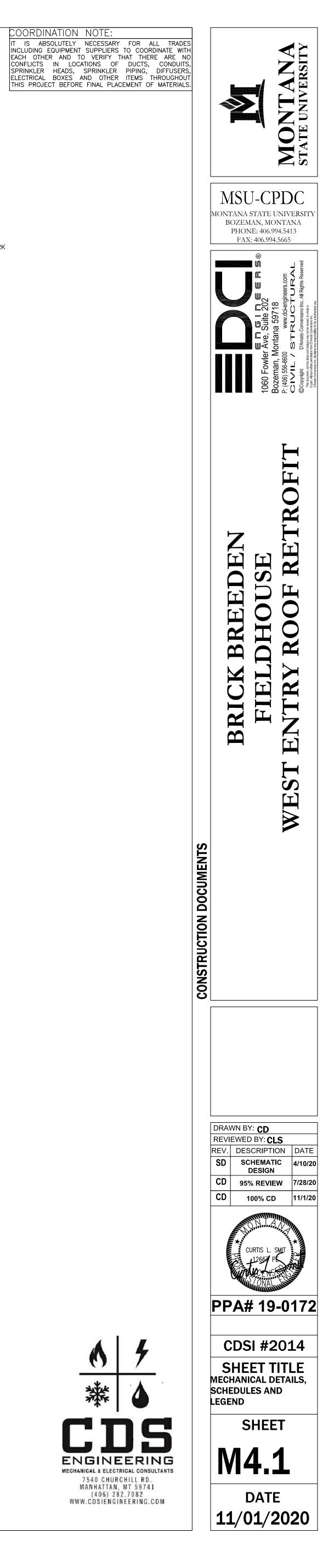


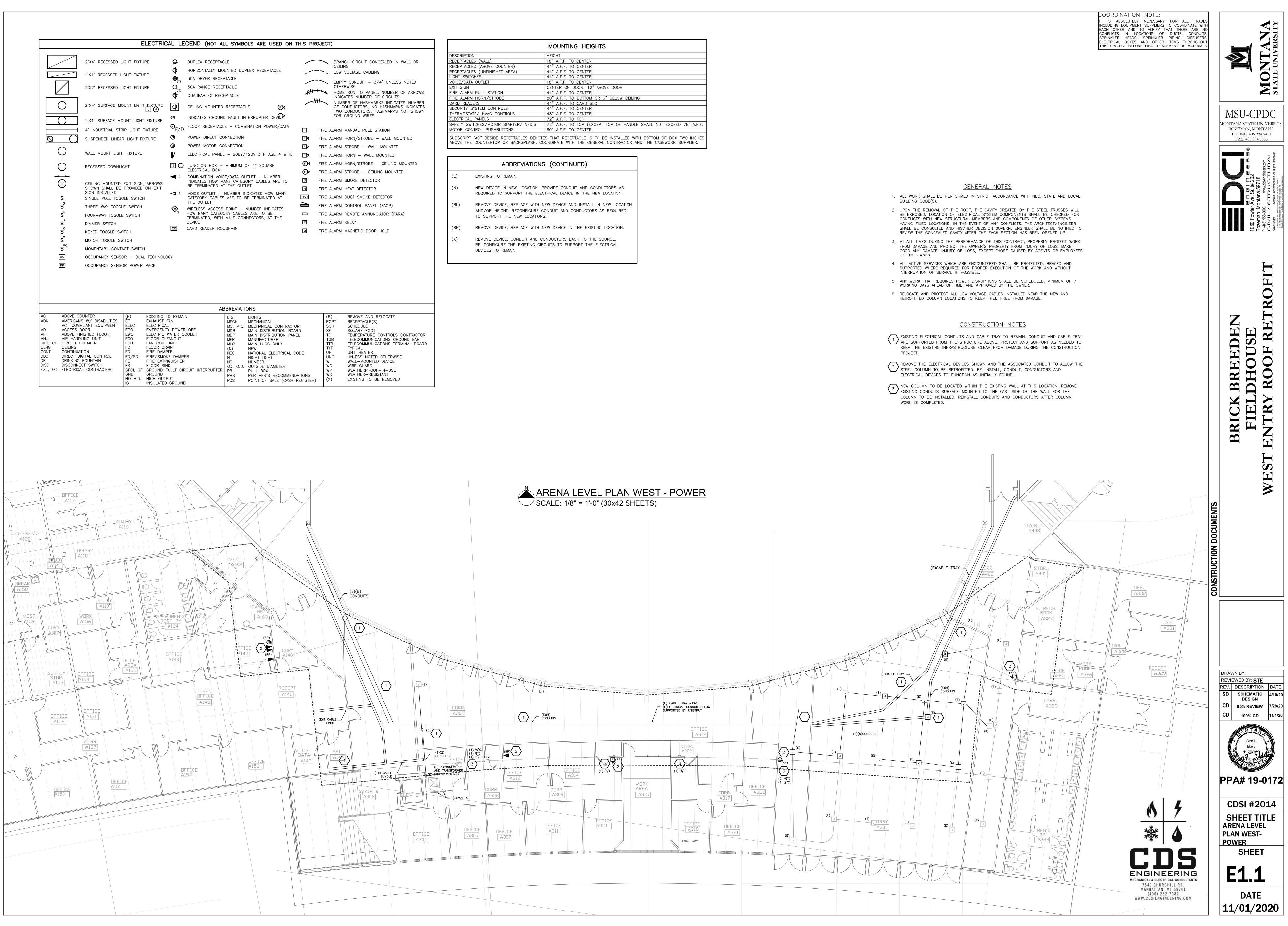
LOSET EANOUT G TO BE REMOVED

MECHANICAL DETAILS, SCHEDULES AND LEGEND NOT TO SCALE (30x42 SHEETS)



COORDINATION NOTE





| | MOUNTING HEIGHTS |
|--------------------------------------|---|
| DESCRIPTION | HEIGHT |
| RECEPTACLES (WALL) | 18" A.F.F. TO CENTER |
| RECEPTACLES (ABOVE COUNTER) | 44" A.F.F. TO CENTER |
| RECEPTACLES (UNFINISHED AREA) | 44" A.F.F. TO CENTER |
| LIGHT SWITCHES | 44" A.F.F. TO CENTER |
| VOICE/DATA OUTLET | 18" A.F.F. TO CENTER |
| EXIT SIGN | CENTER ON DOOR, 12" ABOVE DOOR |
| FIRE ALARM PULL STATION | 44" A.F.F. TO CENTER |
| FIRE ALARM HORN/STROBE | 80" A.F.F. TO BOTTOM OR 6" BELOW CEILING |
| CARD READERS | 44" A.F.F. TO CARD SLOT |
| SECURITY SYSTEM CONTROLS | 44" A.F.F. TO CENTER |
| THERMOSTATS/ HVAC CONTROLS | 48" A.F.F. TO CENTER |
| ELECTRICAL PANELS | 72" A.F.F. TO TOP |
| SAFETY SWITCHES/MOTOR STARTER/ VFD'S | 72" A.F.F. TO TOP (EXCEPT TOP OF HANDLE SHALL NOT EXCEED 78" A.F.F. |
| MOTOR CONTROL PUSHBUTTONS | 60" A.F.F. TO CENTER |
| | ES THAT RECEPTACLE IS TO BE INSTALLED WITH BOTTOM OF BOX TWO INCHES |

| | ABBREVIATIONS (CONTINUED) |
|----|--|
|) | EXISTING TO REMAIN. |
| 1) | NEW DEVICE IN NEW LOCATION. PROVIDE CONDUIT AND CONDUCTORS AS REQUIRED TO SUPPORT THE ELECTRICAL DEVICE IN THE NEW LOCATION. |
| L) | REMOVE DEVICE, REPLACE WITH NEW DEVICE AND INSTALL IN NEW LOCATION AND/OR HEIGHT. RECONFIGURE CONDUIT AND CONDUCTORS AS REQUIRED TO SUPPORT THE NEW LOCATIONS. |
| P) | REMOVE DEVICE, REPLACE WITH NEW DEVICE IN THE EXISTING LOCATION. |
|) | REMOVE DEVICE, CONDUIT AND CONDUCTORS BACK TO THE SOURCE. RE-CONFIGURE THE EXISTING CIRCUITS TO SUPPORT THE ELECTRICAL DEVICES TO REMAIN. |

