# MILLER PAVILION - ROOF RECOVER, BID PACKAGE #3 (DOOR REPLACEMENTS, VENTILATION IMPROVEMENTS)

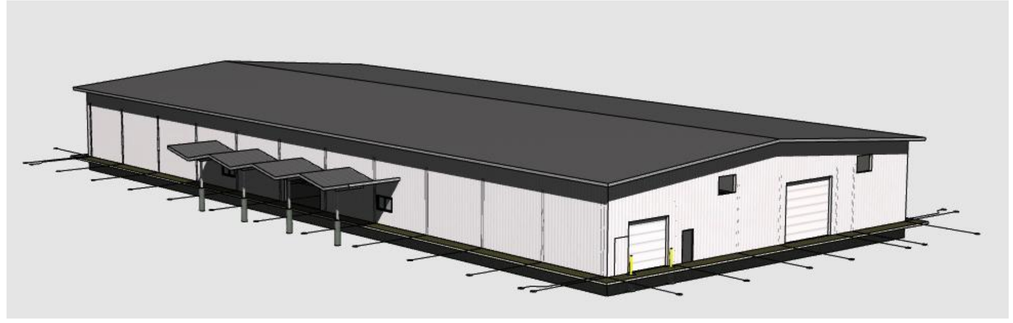
## PPA NO.: 18-2038

## ISSUED FOR PERMIT / BID - 01 FEB 2021


NORTH

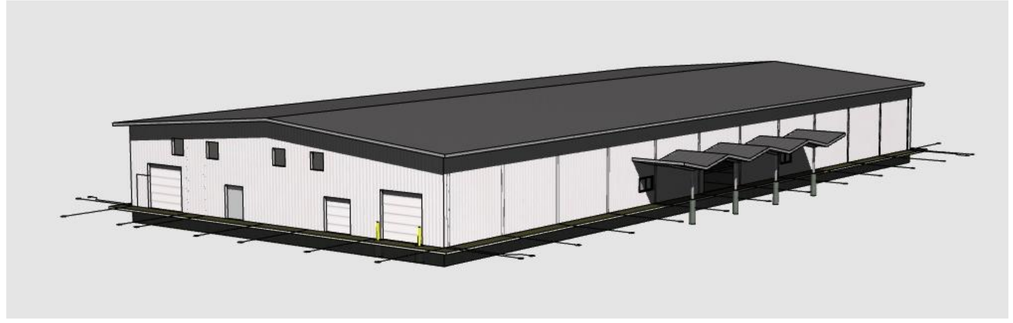
1 **VICINITY MAP**

NOT TO SCALE



2 **VIEW FROM SOUTHEAST - POST CONSTRUCTION**

SCALE: 1:46.56



3 **VIEW FROM SOUTHWEST - POST CONSTRUCTION**

SCALE: 1/4" = 1'-0"

**OWNER / PROJECT LOCATION:**

STATE OF MONTANA
MONTANA STATE UNIVERSITY
BOZEMAN, MONTANA

CONTACT: MICHAEL BOWERS, CPDC
PLEW BUILDING
6TH AVE AND GRANT ST
BOZEMAN, MONTANA
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**DESIGN TEAM:**

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SCOTT STROH
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MECH./ELECT.: CONSULTING DESIGN SOLUTIONS
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**PROJECT DESCRIPTION:**

THE PROJECT WILL REMOVE EXISTING EXTERIOR SLIDING DOORS AND REPLACE THEM WITH SECTIONAL OVERHEAD DOORS. THE PROJECT WILL ALSO INSTALL SOME MECHANICAL VENTILATION SYSTEMS.

**SHEET INDEX:**



**GENERAL SITE / STAGING NOTES:**

A. THE CONTRACTOR SHALL MINIMIZE INTERFERENCE WITH ADJOINING STREETS, SIDEWALKS, PARKING AREAS, AND OTHER ADJACENT OCCUPIED OR USED FACILITIES DURING CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL NOT BLOCK STREETS, SIDEWALKS, OR ACCESS TO DUMPSTER LOCATIONS AT ANY TIME.

B. THE CONTRACTOR SHALL PROTECT EXISTING SITE IMPROVEMENTS AND LANDSCAPING FROM DAMAGE CAUSED BY CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL RESTORE EXISTING SITE IMPROVEMENTS AND LANDSCAPING DAMAGED BY CONSTRUCTION OPERATIONS AS DIRECTED BY THE ARCHITECT PRIOR TO SUBSTANTIAL COMPLETION.

C. THE CONTRACTOR SHALL PROTECT EXISTING CONSTRUCTION FROM DAMAGE, CONTAMINATION, AND SOILING CAUSED BY CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL KEEP BUILDING ENTRANCES, CORRIDORS, ELEVATORS, AND STAIRWELLS CLEAR OF CONSTRUCTION MATERIALS, TOOLS, AND EQUIPMENT AT ALL TIMES. THE CONTRACTOR SHALL RESTORE EXISTING CONSTRUCTION DAMAGED BY CONSTRUCTION OPERATIONS AS DIRECTED BY THE ARCHITECT PRIOR TO SUBSTANTIAL COMPLETION.

D. SHOULD THE CONTRACTOR REQUIRE ON-SITE CONSTRUCTION STAGING, AN AREA FOR THIS PURPOSE WILL BE PROVIDED. THE STAGING AREA IS INTENDED FOR THE STORAGE OF MATERIALS AND EQUIPMENT ONLY. THE CONTRACTOR SHALL RESTORE AREAS USED FOR CONSTRUCTION STAGING THAT ARE DAMAGED DURING THE COURSE OF CONSTRUCTION OPERATIONS AS DIRECTED BY THE ARCHITECT PRIOR TO SUBSTANTIAL COMPLETION.

**BUILDING AREA / OCCUPANCY / CONSTRUCTION TYPE**

- **BUILDING AREA..... 22,000 SF +/-**
- **OCCUPANCY CLASSIFICATION..... BUSINESS GROUP B**
- **CONSTRUCTION TYPE..... TYPE II-B**

**GENERAL PROJECT NOTES:**

A. ALL CONSTRUCTION AND CONSTRUCTION METHODS TO BE IN ACCORDANCE WITH APPLICABLE CODES, GOVERNMENTAL AGENCIES, AND LOCAL DESIGN CRITERIA, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

- **INTERNATIONAL BUILDING CODE, 2018 EDITION**
- **INTERNATIONAL FIRE CODE, 2018 EDITION**
- **INTERNATIONAL MECHANICAL CODE, 2018 EDITION**
- **UNIFORM PLUMBING CODE, 2018 EDITION**
- **INTERNATIONAL FUEL GAS CODE, 2018 EDITION**
- **NATIONAL ELECTRICAL CODE, 2017 EDITION**

B. ANY AMBIGUITIES OR DISCREPANCIES DISCOVERED BY THE USE OF THESE DRAWINGS SHALL BE REPORTED TO THE ARCHITECT IMMEDIATELY.

C. CHANGES OR DEVIATIONS FROM THE CONTRACT DOCUMENTS MADE WITHOUT THE WRITTEN CONSENT OF THE ARCHITECT ARE UNAUTHORIZED. COORDINATE NECESSARY MODIFICATIONS WITH THE ARCHITECT PRIOR TO CONSTRUCTION.

D. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SAFETY AND SHALL TAKE WHATEVER MEASURES ARE NECESSARY TO ENSURE THE HEALTH AND SAFETY OF THEIR EMPLOYEES, SUBCONTRACTORS, BUILDING OCCUPANTS, PEDESTRIANS NEAR THE CONSTRUCTION SITE AND ACCESS ROUTES, AND ALL OTHER PERSONS IN AREAS AFFECTED BY THE CONTRACTOR'S CONSTRUCTION ACTIVITIES. REFER TO THE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

E. THE CONTRACTOR SHALL PAY PARTICULAR ATTENTION TO SAFETY WHILE WORKING NEAR BUILDING ENTRANCES / EXITS. UNLESS DIRECTED OTHERWISE, ALL BUILDING ENTRANCES / EXITS ARE TO REMAIN OPEN AND ACCESSIBLE TO BUILDING OCCUPANTS DURING THE COURSE OF THE PROJECT. SPECIAL PROTECTION MEASURES MAY BE REQUIRED.

F. THE CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION AND SCHEDULING OF ALL REQUIRED INSPECTIONS DURING THE COURSE OF THE CONSTRUCTION PROJECT. PARTIES REQUIRED TO ATTEND SHOULD BE GIVEN A MINIMUM OF TWO WORKING DAYS NOTICE.

G. CONTRACTOR TO COORDINATE ALL MECHANICAL, ELECTRICAL, FIRE SUPPRESSION, FIRE ALARM, COMMUNICATIONS, AND OTHER UTILITY SHUT-DOWNS, AS WELL AS PUBLIC PATHWAY CLOSURES, WITH MSU PROJECT MANAGER AT LEAST 5 CALENDAR DAYS IN ADVANCE, PER MSU REQUIREMENTS.

H. EXISTING BUILDING IS A PRE-ENGINEERED METAL BUILDING FROM BUTLER MANUFACTURING. BUILDING RENOVATION CONTRACTOR SHOULD BE EXPERIENCED WITH RENOVATING PRE-ENGINEERED METAL BUILDING SYSTEMS. PROJECT INTENT IS TO UTILIZE BUTLER BUILDING COMPONENTS AND SIDING PANELS TO THE GREATEST EXTENT POSSIBLE (MATCH EXISTING).

I. NEW SECTIONAL OVERHEAD DOORS AND OPERATORS TO BE AS FOLLOWS:

- RAYNOR THERMASEAL TM200 OR EQUIVALENT
- R VALUE 18.3
- 2 INCH RAYNOR COMMERCIAL GALVANIZED TRACK OR EQUIVALENT
- COLOR WHITE
- NO WINDOWS
- RAYNOR COMMERCIAL DUTY JACKSHAFT OPERATOR OR EQUIVALENT
- NEMA 12 RATED
- CONTROL STATIONS – OPEN, CLOSE, STOP

DOOR OPERATORS TO HAVE WALL-MOUNTED PUSH-BUTTON CONTROL STATIONS (INTERIOR) AND COMBINATION KEYPAD STATIONS (EXTERIOR). DOOR OPERATORS TO BE JACK-SHAFT MOUNTED AND HAVE CHAIN HOIST MANUAL EMERGENCY OPERATION. PROVIDE ELECTRICAL SERVICE TO ALL NEW DOOR OPERATOR LOCATIONS. REFER TO ELECTRICAL.

**GENERAL CONSTRUCTION NOTES:**

A. CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR TO NOTIFY ARCHITECT OF DISCREPANCIES DISCOVERED BETWEEN FIELD CONDITIONS AND THE CONSTRUCTION DOCUMENTS. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION AND DEFINITIONS REGARDING CONSTRUCTION OPERATIONS.

B. CONTRACTOR TO DISPOSE OF ALL REMOVED MATERIALS IN ACCORDANCE WITH ALL LOCAL AND STATE LAWS AND REGULATIONS.

C. CONTRACTOR TO CLEAN, PATCH, AND REPAIR ALL EXISTING SURFACES AND FINISHES TO REMAIN THAT WERE AFFECTED BY CONSTRUCTION OPERATIONS.


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MILLER PAVILION - ROOF RECOVER, BID PACKAGE #3 (DOOR REPLACEMENTS, VENTILATION IMPROVEMENTS)


a|118
architecture one eighteen
115 east oak street bozeman mt 59715


DRAWN BY: SS
REVIEWED BY: SS

| REV. | DESCRIPTION | DATE |
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| | | |

STATE OF MONTANA
BOZEMAN
SCOTT B. STROH
# 1988
JUNE 30, 2021
MONTANA
LICENSED ARCHITECT

PPA # 18-2038

A/E#2019-02-03D

A118 # : 18-043B

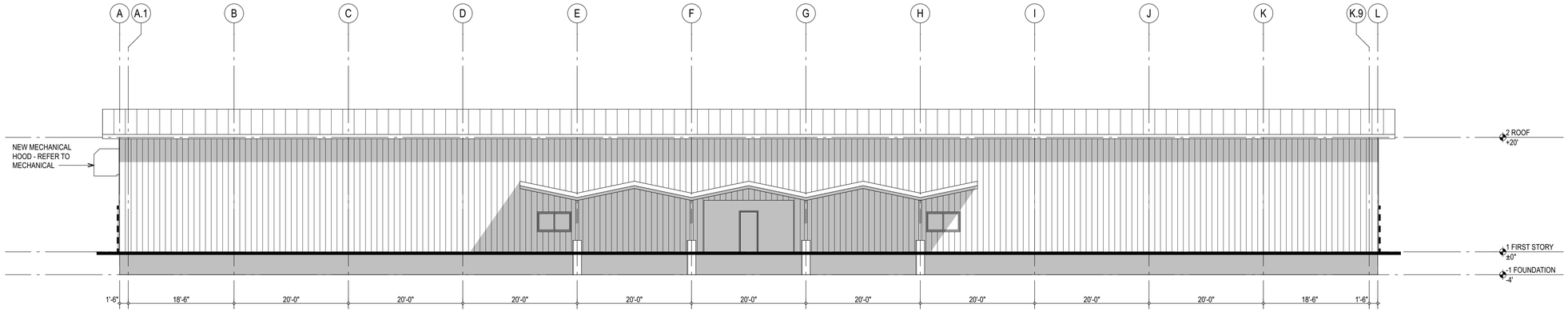
SHEET TITLE
VICINITY MAP
GENERAL NOTES

SHEET
**COVER**

DATE
01 FEB 21

**NOTE:**

NO ARCHITECTURAL DEMOLITION WORK PROPOSED ON THIS ELEVATION.




## 2 SOUTH ELEVATION - DEMOLITION

SCALE: 1" = 10'

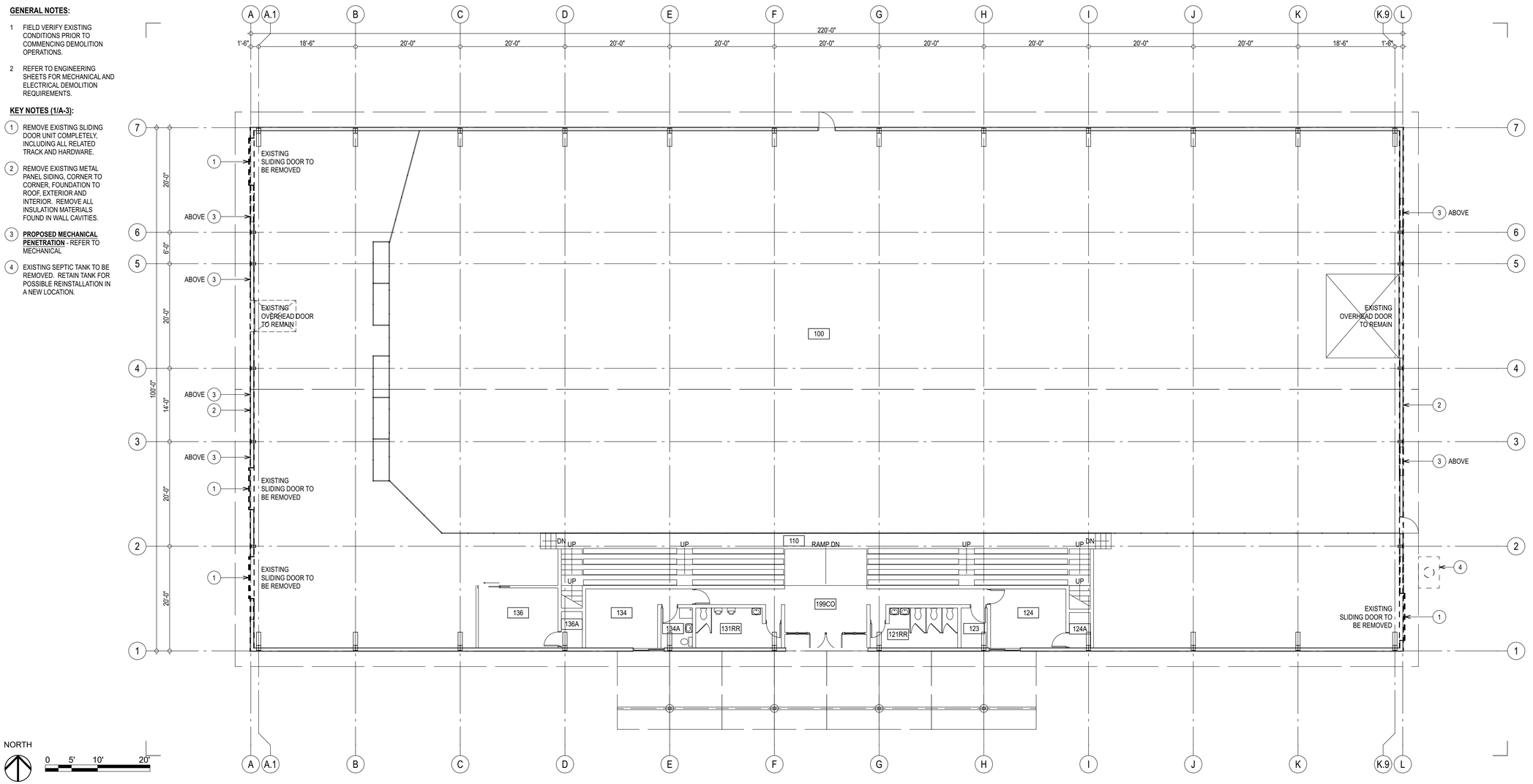
**GENERAL NOTES:**

1 FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING DEMOLITION OPERATIONS.

2 REFER TO ENGINEERING SHEETS FOR MECHANICAL AND ELECTRICAL DEMOLITION REQUIREMENTS.

**KEY NOTES (1/A-3):**

1. REMOVE EXISTING SLIDING DOOR UNIT COMPLETELY, INCLUDING ALL RELATED TRACK AND HARDWARE.
2. REMOVE EXISTING METAL PANEL SIDING, CORNER TO CORNER, FOUNDATION TO ROOF, EXTERIOR AND INTERIOR. REMOVE ALL INSULATION MATERIALS FOUND IN WALL CAVITIES.
3. **PROPOSED MECHANICAL PENETRATION** - REFER TO MECHANICAL
4. EXISTING SEPTIC TANK TO BE REMOVED. RETAIN TANK FOR POSSIBLE REINSTALLATION IN A NEW LOCATION.




## 1 FIRST STORY FLOOR PLAN - DEMOLITION

SCALE: 1" = 10'

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(DOOR REPLACEMENTS, VENTILATION IMPROVEMENTS)


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SHEET TITLE

PLANS, DETAILS

SHEET

**A-3**

DATE

01 FEB 21

## SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous steel framing and supports.
2. Metal bollards.

1.2 ACTION SUBMITTALS

A. Shop Drawings: Show fabrication and installation details.

PART 2 - PRODUCTS

2.1 METALS

A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

B. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.

2.2 MISCELLANEOUS MATERIALS

A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer.

2.3 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible.

B. Cut, drill, and punch metals cleanly and accurately.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously.

2.4 MISCELLANEOUS FRAMING AND SUPPORTS

A. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

2.5 METAL BOLLARDS

A. Fabricate metal bollards from Schedule 40 steel pipe.

B. Where indicated, fabricate bollards with 3/8-inch-thick, steel baseplates for bolting to concrete slab. Drill baseplates at all four corners for concrete anchors specified on Drawings.

C. Prime steel bollards with zinc-rich primer.

2.6 STEEL AND IRON FINISHES

A. Shop prime iron and steel items unless they are to be embedded in concrete.

1. Shop prime with universal shop primer.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.

3.2 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS

A. Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

3.3 INSTALLATION OF METAL BOLLARDS

A. Anchor bollards to existing construction with bolts as specified on Drawings.

B. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 to 6 inches above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.

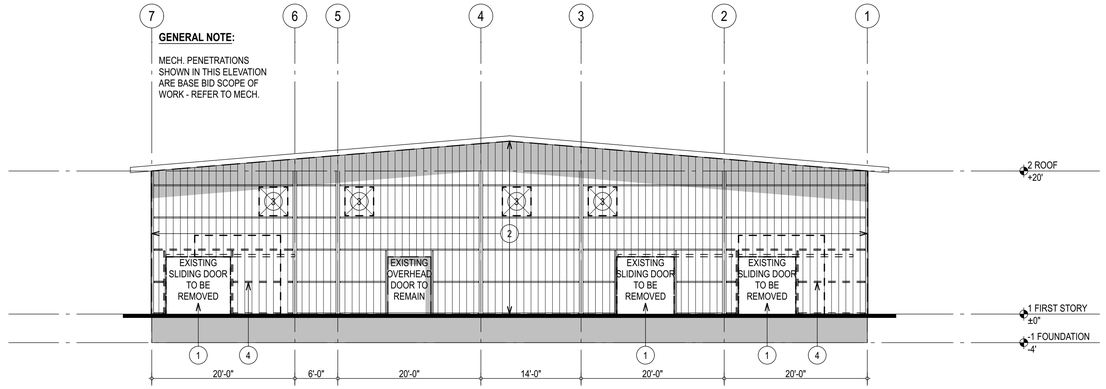
C. Where indicated, anchor bollards to existing concrete slabs with concrete anchors specified on Drawings.

D. Fill bollards solidly with concrete, mounding top surface to shed water.

END OF SECTION 055000

**KEY NOTES (3/A-4):**

1. REMOVE EXISTING SLIDING DOOR UNIT COMPLETELY, INCLUDING ALL RELATED TRACK AND HARDWARE.
2. REMOVE EXISTING METAL PANEL SIDING, CORNER TO CORNER, FOUNDATION TO ROOF, EXTERIOR AND INTERIOR. REMOVE ALL INSULATION MATERIALS FOUND IN WALL CAVITIES.
3. **PROPOSED MECHANICAL PENETRATION** - REFER TO MECHANICAL
4. REMOVE EXISTING STEEL WALL FRAMING AS REQUIRED FOR INSTALLATION OF NEW DOOR ASSEMBLY - TYPICAL WHERE SHOWN THUS.




## 3 WEST ELEVATION - DEMOLITION

SCALE: 1" = 10'




## 4 EAST AND WEST WALL SECTION

SCALE: 1/2" = 1'-0"

**KEY NOTES (2/A-4):**

1. REMOVE EXISTING SLIDING DOOR UNIT COMPLETELY, INCLUDING ALL RELATED TRACK AND HARDWARE.
2. REMOVE EXISTING METAL PANEL SIDING, CORNER TO CORNER, FOUNDATION TO ROOF, EXTERIOR AND INTERIOR. REMOVE ALL INSULATION MATERIALS FOUND IN WALL CAVITIES.
3. **PROPOSED MECHANICAL PENETRATION** - REFER TO MECHANICAL
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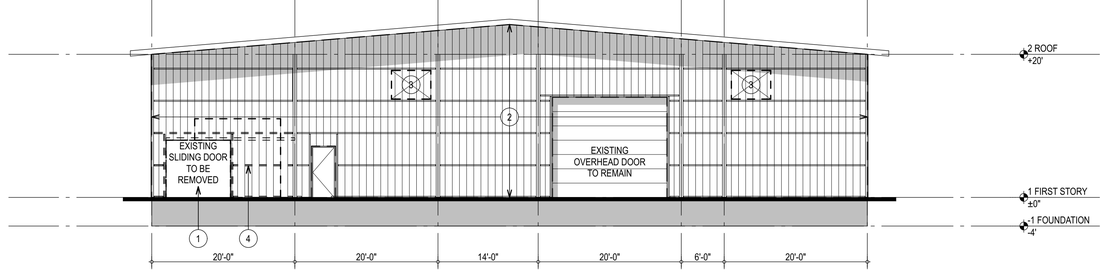
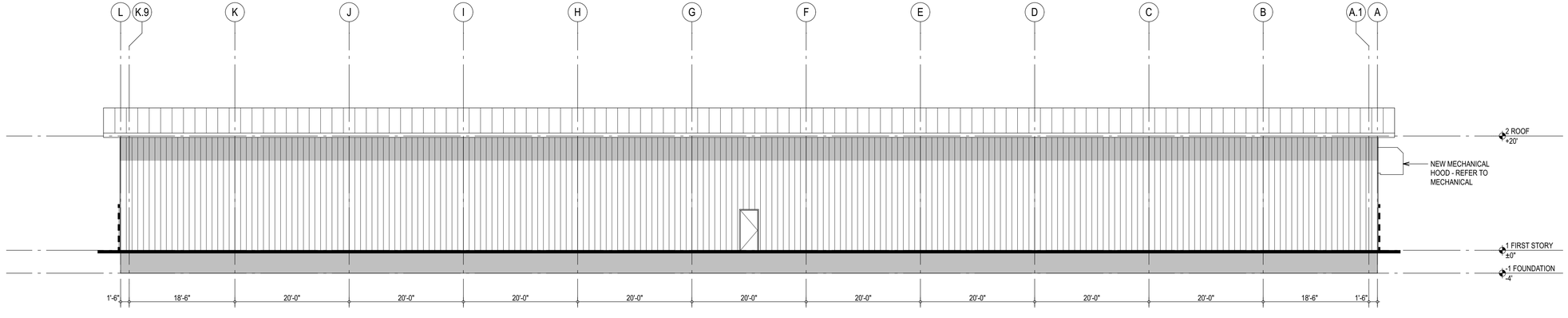



## 2 EAST ELEVATION - DEMOLITION

SCALE: 1" = 10'

**NOTE:**

NO CONSTRUCTION PROPOSED ON THIS ELEVATION.




## 1 NORTH ELEVATION - DEMOLITION

SCALE: 1" = 10'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# MILLER PAVILION - ROOF RECOVER, BID PACKAGE #3

(DOOR REPLACEMENTS, VENTILATION IMPROVEMENTS)


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115 east oak street bozeman mt 59715


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| REVIEWED BY: | SS |

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PPA # 18-2038

A/E#2019-02-03D

A118 # : 18-043B

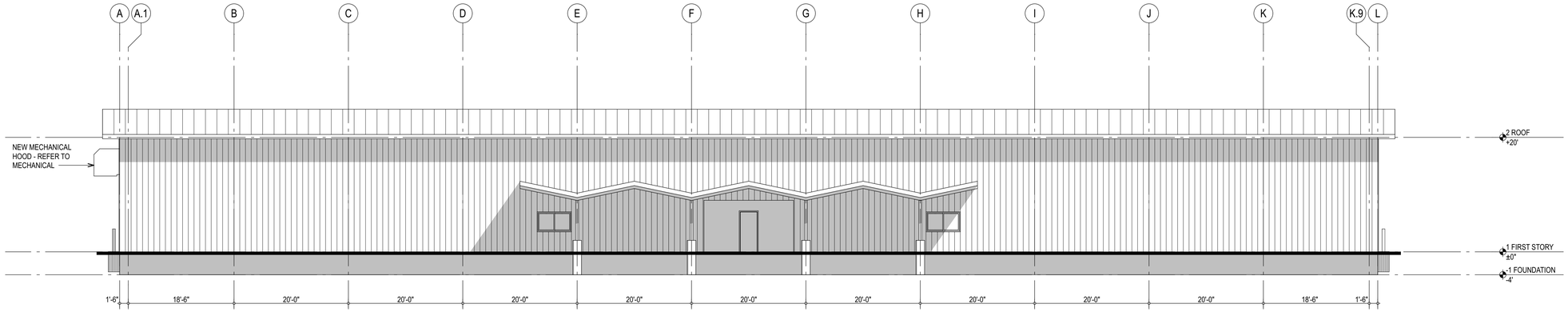
SHEET TITLE
ELEVATIONS

SHEET
**A-4**

DATE
01 FEB 21

**NOTE:**

NO ARCHITECTURAL RENOVATION WORK PROPOSED ON THIS ELEVATION. REFER TO ELECTRICAL FOR ADDITIONAL INFORMATION.




## 2 SOUTH ELEVATION - NEW CONSTRUCTION

SCALE: 1" = 10'

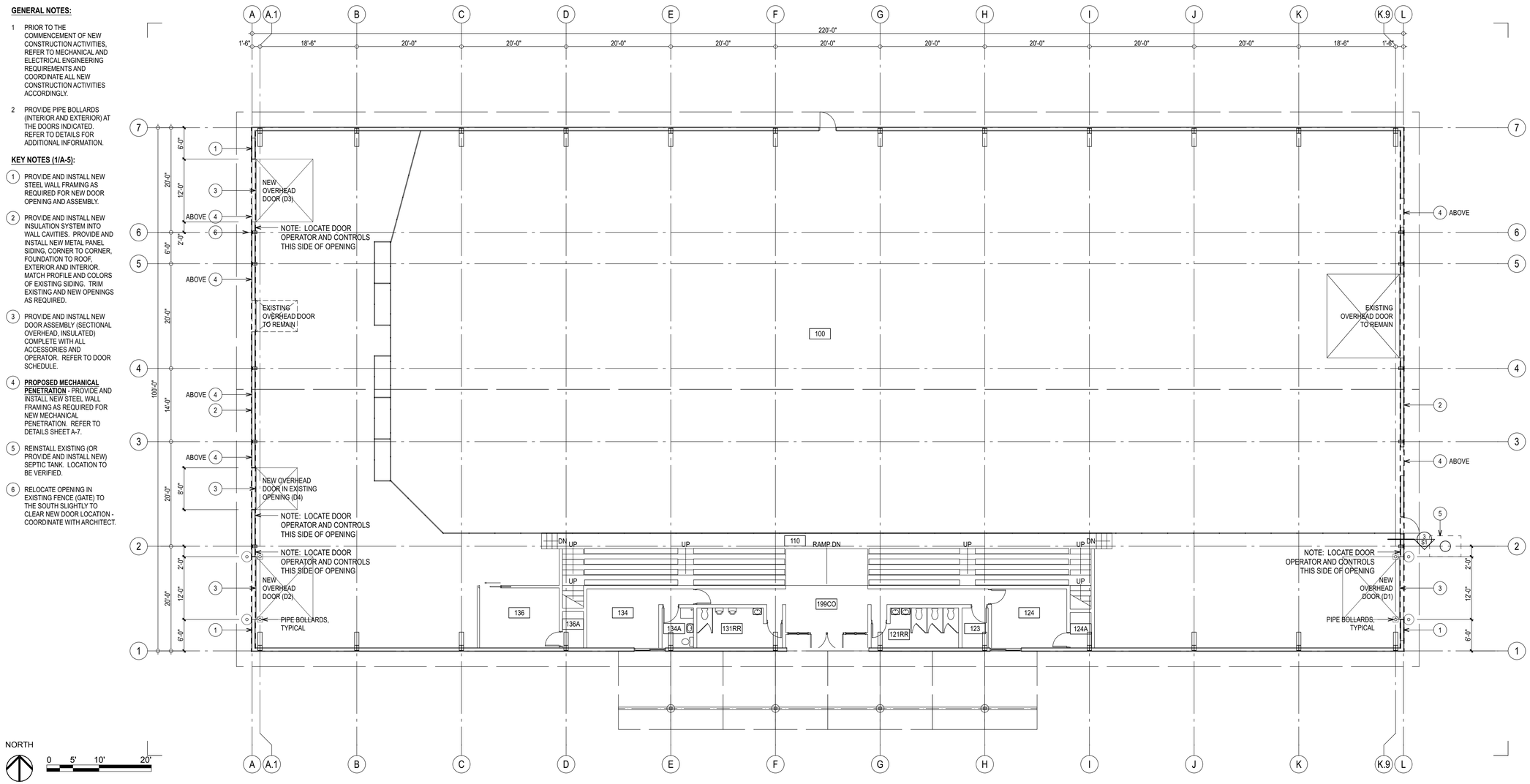
**GENERAL NOTES:**

1 PRIOR TO THE COMMENCEMENT OF NEW CONSTRUCTION ACTIVITIES, REFER TO MECHANICAL AND ELECTRICAL ENGINEERING REQUIREMENTS AND COORDINATE ALL NEW CONSTRUCTION ACTIVITIES ACCORDINGLY.

2 PROVIDE PIPE BOLLARDS (INTERIOR AND EXTERIOR) AT THE DOORS INDICATED. REFER TO DETAILS FOR ADDITIONAL INFORMATION.

**KEY NOTES (1/A-5):**

1. PROVIDE AND INSTALL NEW STEEL WALL FRAMING AS REQUIRED FOR NEW DOOR OPENING AND ASSEMBLY.
2. PROVIDE AND INSTALL NEW INSULATION SYSTEM INTO WALL CAVITIES. PROVIDE AND INSTALL NEW METAL PANEL SIDING, CORNER TO CORNER, FOUNDATION TO ROOF, EXTERIOR AND INTERIOR. MATCH PROFILE AND COLORS OF EXISTING SIDING. TRIM EXISTING AND NEW OPENINGS AS REQUIRED.
3. PROVIDE AND INSTALL NEW DOOR ASSEMBLY (SECTIONAL OVERHEAD, INSULATED) COMPLETE WITH ALL ACCESSORIES AND OPERATOR. REFER TO DOOR SCHEDULE.
4. **PROPOSED MECHANICAL PENETRATION** - PROVIDE AND INSTALL NEW STEEL WALL FRAMING AS REQUIRED FOR NEW MECHANICAL PENETRATION. REFER TO DETAILS SHEET A-7.
5. REINSTALL EXISTING (OR PROVIDE AND INSTALL NEW) SEPTIC TANK. LOCATION TO BE VERIFIED.
6. RELOCATE OPENING IN EXISTING FENCE (GATE) TO THE SOUTH SLIGHTLY TO CLEAR NEW DOOR LOCATION - COORDINATE WITH ARCHITECT.




## 1 FIRST STORY FLOOR PLAN - NEW CONSTRUCTION

SCALE: 1" = 10'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(DOOR REPLACEMENTS, VENTILATION IMPROVEMENTS)


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110 east oak street bozeman mt 59715


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REVIEWED BY: SS

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STATE OF MONTANA · BOZEMAN · SCOTT B. STROH # 1988 · JUNE 30, 2021 · REGISTERED ARCHITECT

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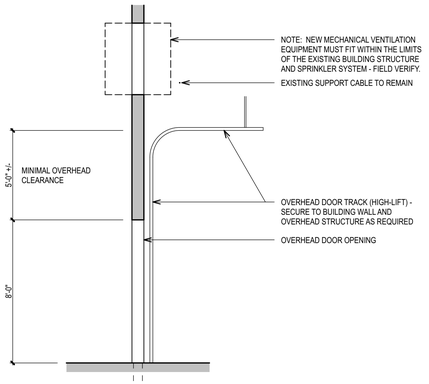
A/E#2019-02-03D

A118 # : 18-043B

SHEET TITLE
PLANS, DETAILS

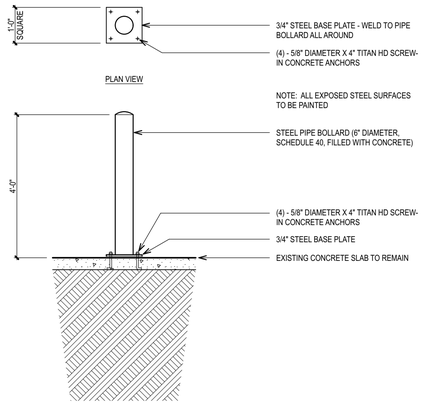
SHEET
**A-5**

DATE
01 FEB 21




## 7 OVERHEAD DOOR TRACK 2

SCALE: 1/4" = 1'-0"

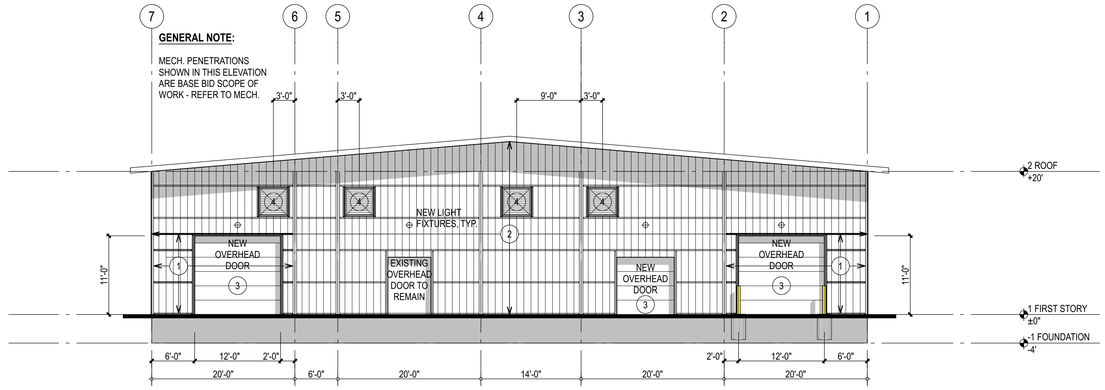



## 5 PIPE BOLLARD - INTERIOR

SCALE: 1/2" = 1'-0"

**KEY NOTES (3/A-6):**

1. PROVIDE AND INSTALL NEW STEEL WALL FRAMING AS REQUIRED FOR NEW DOOR OPENING AND ASSEMBLY.
2. PROVIDE AND INSTALL NEW INSULATION SYSTEM INTO WALL CAVITIES. PROVIDE AND INSTALL NEW METAL PANEL SIDING, CORNER TO CORNER, FOUNDATION TO ROOF, EXTERIOR AND INTERIOR. MATCH PROFILE AND COLORS OF EXISTING SIDING. TRIM EXISTING AND NEW OPENINGS AS REQUIRED.
3. PROVIDE AND INSTALL NEW DOOR ASSEMBLY (SECTIONAL OVERHEAD, INSULATED) COMPLETE WITH ALL ACCESSORIES AND OPERATOR. REFER TO DOOR SCHEDULE.
4. **PROPOSED MECHANICAL PENETRATION** - PROVIDE AND INSTALL NEW STEEL WALL FRAMING AS REQUIRED FOR NEW MECHANICAL PENETRATION. REFER TO DETAILS SHEET A-7.




## 3 WEST ELEVATION - NEW CONSTRUCTION

SCALE: 1" = 10'




## 6 OVERHEAD DOOR TRACK 1

SCALE: 1/4" = 1'-0"




## 4 PIPE BOLLARD - EXTERIOR

SCALE: 1/2" = 1'-0"

**KEY NOTES (2/A-6):**

1. PROVIDE AND INSTALL NEW STEEL WALL FRAMING AS REQUIRED FOR NEW DOOR OPENING AND ASSEMBLY.
2. PROVIDE AND INSTALL NEW INSULATION SYSTEM INTO WALL CAVITIES. PROVIDE AND INSTALL NEW METAL PANEL SIDING, CORNER TO CORNER, FOUNDATION TO ROOF, EXTERIOR AND INTERIOR. MATCH PROFILE AND COLORS OF EXISTING SIDING. TRIM EXISTING AND NEW OPENINGS AS REQUIRED.
3. PROVIDE AND INSTALL NEW DOOR ASSEMBLY (SECTIONAL OVERHEAD, INSULATED) COMPLETE WITH ALL ACCESSORIES AND OPERATOR. REFER TO DOOR SCHEDULE.
4. **PROPOSED MECHANICAL PENETRATION** - PROVIDE AND INSTALL NEW STEEL WALL FRAMING AS REQUIRED FOR NEW MECHANICAL PENETRATION. REFER TO DETAILS SHEET A-7.




## 2 EAST ELEVATION - NEW CONSTRUCTION

SCALE: 1" = 10'

**NOTE:**

NO CONSTRUCTION PROPOSED ON THIS ELEVATION.




## 1 NORTH ELEVATION - NEW CONSTRUCTION

SCALE: 1" = 10'

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SHEET TITLE
ELEVATIONS

SHEET
**A-6**

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01 FEB 21

## DOOR, FRAME, AND HARDWARE SCHEDULE

| DOOR NUMBER | DOOR WIDTH | DOOR HEIGHT | DOOR THICKNESS | DOOR SWING | DOOR MATERIAL | DOOR FINISH | DOOR ELEVATION DETAILS REFER TO 1/A-7 | FRAME MATERIAL | FRAME FINISH | FRAME WALL THICKNESS | FRAME ELEVATION DETAIL REFER TO 1/A-5 | FRAME SECTION DETAILS REFER TO SHEET A-6 | HARDWARE: HINGES, PIVOTS | HARDWARE: MECH. LOCKS, LATCHES | HARDWARE: AUXILIARY LOCKS | HARDWARE: ELECTRONIC HARDWARE | HARDWARE: BOLTS | HARDWARE: EXIT DEVICES | HARDWARE: OPERATING TRIM | HARDWARE: ACCESSORIES FOR PAIRS | HARDWARE: CLOSERS / OPERATORS | HARDWARE: STOPS, HOLDERS | HARDWARE: GASKETING, SEALS | HARDWARE: BOTTOMS, SWEEPS | HARDWARE: THRESHOLDS | HARDWARE: PROTECTIVE TRIM | HARDWARE: AUXILIARY HARDWARE | MISCELLANEOUS: HARDWARE FINISH, UNO | MISCELLANEOUS: HARDWARE FUNCTION | MISCELLANEOUS: ACCESSIBLE DOOR | MISCELLANEOUS: RATING | MISCELLANEOUS: GLAZING | MISCELLANEOUS: SIGNAGE | DETAILS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D1 | 12-0 | 11-0 | 2"x" | OH | STL | FF-P | A1 | - | - | - | - | 6 | - | - | - | - | - | - | - | - | 1 | - | 1 | 1 | - | - | - | - | - | N | - | - | - | 2/A-7 | |
| D2 | 12-0 | 11-0 | 2"x" | OH | STL | FF-P | A1 | - | - | - | - | 6 | - | - | - | - | - | - | - | - | 1 | - | 1 | 1 | - | - | - | - | - | N | - | - | - | 2/A-7 | |
| D3 | 12-0 | 11-0 | 2"x" | OH | STL | FF-P | A1 | - | - | - | - | 6 | - | - | - | - | - | - | - | - | 1 | - | 1 | 1 | - | - | - | - | - | N | - | - | - | 2/A-7 | |
| D4 | 8-0 | 8-0 | 2" | OH | STL | FF-P | A1 | - | - | - | - | 7 | - | - | - | - | - | - | - | - | 1 | - | 1 | 1 | - | - | - | - | - | N | - | - | - | 2/A-7 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

### SCHEDULE ABBREVIATIONS

ALUM = ALUMINUM
ANOD = ANODIZED
BOD = BASIS OF DESIGN
EP = EXTERIOR PAINT
ETR = EXISTING TO REMAIN
FF-P = FACTORY FINISHED PAINT
FF-S = FACTORY FINISHED STAIN
HM = HOLLOW METAL
IP = INTERIOR PAINT
LAM = LAMINATE
LH = LEFT HAND
LHR = LEFT HAND REVERSE
OH = OVERHEAD
PR = PAIR
RH = RIGHT HAND
RHR = RIGHT HAND REVERSE
STL = STEEL
WD = WOOD - SOLID OR SOLID CORE

### HARDWARE FINISH

1 = US10B / 613 OIL RUBBED BRONZE
2 = US15 / 619 SATIN NICKEL
3 = US26D / 626 SATIN CHROME
4 = US32D / 630 SATIN STAINLESS STEEL

### HARDWARE FUNCTION

1 = PASSAGE LATCH, ANSI F75
2 = PRIVACY LOCK, ANSI F76
3 = ENTRANCE / OFFICE LOCK, ANSI F82
4 = ENTRANCE LOCK, ANSI F109
5 = CLASSROOM LOCK, ANSI F84
6 = STORERROOM LOCK, ANSI F86
7 = EXIT LOCK, ANSI F89

### GLAZING

1 =
2 =
3 =

### GENERAL NOTES

1 = REFER TO TECHNICAL SPECIFICATIONS FOR DETAILED INFORMATION REGARDING FRAMES, DOORS, AND HARDWARE.
2 = ALL DOOR INSTALLATIONS SHALL MEET REQUIREMENTS OF APPLICABLE CODES.
3 = ALL GLAZING INSTALLED IN OR ADJACENT TO DOORS SHALL MEET REQUIREMENTS OF APPLICABLE CODES.
4 = AT A MINIMUM, PROVIDE DOOR SILENCERS AT HOLLOW METAL FRAMES. WHERE SCHEDULED OR DETAILED, PROVIDE GASKETING OR SEALS IN LIEU OF SILENCERS.
5 = COORDINATE ALL CYLINDER, CORE, KEYING, AND AUTOMATED ACCESS REQUIREMENTS WITH OWNER.
6 = AT FIRE AND/OR SMOKE RATED DOORS, PROVIDE GASKETING, SEALS, BOTTOMS, SWEEPS, THRESHOLDS, AND ASTRAGALS AS SCHEDULED, AS DETAILED, OR AS REQUIRED BY CODE.
7 = ALL EXTERIOR HOLLOW METAL DOORS TO BE INSULATED. ALL EXTERIOR OVERHEAD DOORS TO BE INSULATED.
8 = MULLION MATERIAL AND FINISH TO MATCH FRAME MATERIAL AND FINISH, UNLESS NOTED OTHERWISE.
9 = CONTRACTOR TO VERIFY ALL WALL THICKNESSES PRIOR TO ORDERING FRAMES.

### HARDWARE DESCRIPTIONS

**HINGES, PIVOTS**
NONE

**MECH. LOCKS, LATCHES**
NONE

**AUXILIARY LOCKS**
NONE

**ELECTRONIC HARDWARE**
NONE

**BOLTS**
NONE

**EXIT DEVICES**
NONE

**OPERATING TRIM**
NONE

**ACCESSORIES FOR PAIRS**
NONE

**CLOSERS / OPERATORS**
1 = JACKSHAFT-MOUNTED OPERATOR

**STOPS, HOLDERS**
NONE

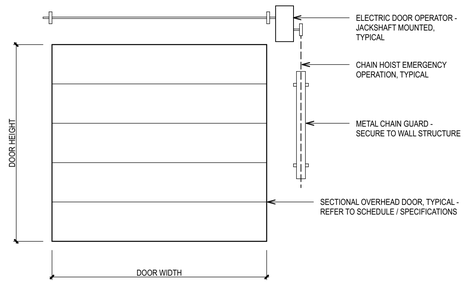
**GASKETING, SEALS**
1 = DOOR MANUFACTURER'S STANDARD

**BOTTOMS, SWEEPS**
1 = BOD PRODUCT: XCLUDER COMMERCIAL DOOR SWEEPS

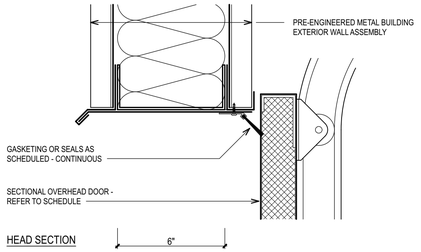
**THRESHOLDS**
NONE

**PROTECTIVE TRIM**
NONE

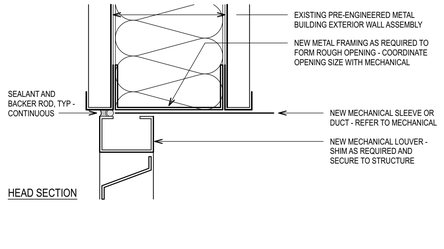
**AUXILIARY HARDWARE**
NONE



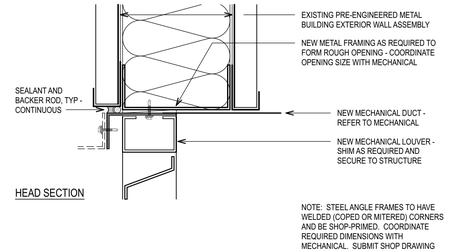

1 **SECTIONAL OVERHEAD DOORS**
SCALE: 1/4" = 1'-0"




2 **SECTIONAL OVERHEAD DOORS**
SCALE: 3" = 1'-0"




3 **MECH. PENETRATION - EAST WALL**
SCALE: 3" = 1'-0"




4 **MECH. PENETRATION - WEST WALL**
SCALE: 3" = 1'-0"

## SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Glass-fiber blanket insulation.
1.2 ACTION SUBMITTALS
A. Product Data.
1.3 INFORMATIONAL SUBMITTALS
A. Installer's Certification: Listing type, manufacturer, and R-value of insulation installed in each element of the building thermal envelope.
PART 2 - PRODUCTS
2.1 GLASS-FIBER BLANKET INSULATION
A. Glass-Fiber Blanket Insulation, Unfaced or with integral Vapor Retarder: ASTM C665, Type I; passing ASTM E136 for combustion characteristics.
1. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
2. Smoke-Developed Index: Not more than 50 when tested in accordance with ASTM E84.
B. Acceptable Insulation System: Simple Saver.
2.2 ACCESSORIES
A. Insulation for Miscellaneous Voids:
1. Glass-Fiber Insulation: ASTM C764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E84.
B. Insulation Anchors, Spindles, and Standoffs: As recommended by manufacturer.
C. Thermal Break Tape: As recommended by manufacturer.
D. Vapor Retarder: As recommended by manufacturer.
PART 3 - EXECUTION
3.1 INSTALLATION, GENERAL
A. Comply with insulation manufacturer's written instructions applicable to products and applications.
B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.
3.2 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION
A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. For metal-framed wall cavities, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal framing.
3. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.
a. Exterior Walls: Set units with facing placed toward interior of construction.
B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft..
END OF SECTION 072100

## SECTION 074213.13 - FORMED METAL WALL PANELS

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Exposed-fastener, lap-seam metal wall panels.
1.2 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Shop Drawings: Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
C. Samples: For each type of metal panel indicated.
1.3 QUALITY ASSURANCE
A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
1.4 WARRANTY
A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.
B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
1. Finish Warranty Period: 20 years from date of Substantial Completion.
PART 2 - PRODUCTS
2.1 EXPOSED-FASTENER, LAP-SEAM METAL WALL PANELS
A. Provide factory-formed metal panels designed to be field assembled by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps. Include accessories required for weathertight installation.
B. Tapered-Rib-Profile, Exposed-Fastener Metal Wall Panels: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs.
1. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A653/A653M, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755/A755M.
a. Nominal Thickness: 0.028 inch.
b. Exterior Finish: Two-coat fluoropolymer.
c. Color: As selected by Architect from manufacturer's full range.
2. Major-Rib Spacing: 12 inches o.c.
3. Panel Coverage: 36 inches.
4. Panel Height: 1.5 inches.
2.2 MISCELLANEOUS MATERIALS
A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing; 1/2 inch wide and 1/8 inch thick.
2. Joint Sealant: ASTM C920; as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.
2.3 FABRICATION
A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
2.4 FINISHES
A. Panels and Accessories:
1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat.
2. Concealed Finish: White or light-colored acrylic or polyester backer finish.
PART 3 - EXECUTION
3.1 PREPARATION
A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.
3.2 INSTALLATION
A. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
5. Flash and seal panels with weather closures at perimeter of all openings.
B. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
C. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.
3.3 CLEANING
A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
END OF SECTION 074213.13

## SECTION 083613 - SECTIONAL DOORS

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Sectional-door assemblies.
1.2 ACTION SUBMITTALS
A. Product Data: For each type and size of sectional door and accessory.
B. Shop Drawings: For each installation and for components not dimensioned or detailed in manufacturer's product data.
C. Samples: For each exposed product and for each color and texture specified.
1.3 INFORMATIONAL SUBMITTALS
A. Sample warranties.
1.4 CLOSEOUT SUBMITTALS
A. Maintenance data.
1.5 QUALITY ASSURANCE
A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.
1.6 WARRANTY
A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of sectional doors that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.
B. Finish Warranty: Manufacturer agrees to repair or replace components that show evidence of deterioration of factory-applied finishes within specified warranty period.
1. Warranty Period: 10 years from date of Substantial Completion.
PART 2 - PRODUCTS
2.1 PERFORMANCE REQUIREMENTS
A. General Performance: Provide sectional doors that comply with performance requirements specified without failure from defective manufacture, fabrication, installation, or other defects in construction.
B. Structural Performance, Exterior Doors: Capable of withstanding the design wind loads.
1. Design Wind Load: Uniform pressure (velocity pressure) of 20 lbf/sq. ft., acting inward and outward.
2.2 SECTIONAL-DOOR ASSEMBLY
A. Steel Sectional Door: As quoted by Door Supplier / Installer, and as follows:
1. Door-Section Thickness: 2 inches.
B. Track: Manufacturer's standard, galvanized-steel, standard-lift or high-lift track system, depending on location. Provide complete system including brackets, bracing, and reinforcement to ensure rigid support of ball-bearing roller guides.
1. Track Reinforcement and Supports: Provide galvanized-steel members to support track without sag, sway, and vibration during opening and closing of doors.
C. Electric Door Operator: Electric door operator assembly of size and capacity recommended by Door Supplier / Installer, and as follows:
1. Operator Type: Jackshaft, side-mounted.
2. Obstruction Detection: None.
3. Emergency Manual Operation: Chain type designed so required force for door operation does not exceed 25 lbf.
D. Metal Finish: As quoted by Door Supplier / Installer.
PART 3 - EXECUTION
3.1 INSTALLATION
A. Install sectional doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; in accordance with manufacturer's written instructions.
B. Tracks:
1. Fasten vertical track assembly to opening jambs and framing with fasteners spaced not more than 24 inches apart.
2. Hang horizontal track assembly from structural overhead framing with angles or channel hangers attached to framing by bolting. Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.
C. Power-Operated Doors: Install automatic garage doors openers in accordance with UL 325.
3.2 DEMONSTRATION
A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain sectional doors.
END OF SECTION 083613

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# MILLER PAVILION - ROOF RECOVER, BID PACKAGE #3
(DOOR REPLACEMENTS, VENTILATION IMPROVEMENTS)


a|118
architecture one eighteen
115 east oak street bozeman mt 59715


DRAWN BY: SS
REVIEWED BY: SS

| REV. | DESCRIPTION | DATE |
|---|---|---|
| | | |

STATE OF MONTANA
BOZEMAN
SCOTT B. STROH
# 1988
JUNE 30, 2021
LICENSED ARCHITECT

PPA # 18-2038
A/E#2019-02-03D
A118 # : 18-043B

SHEET TITLE
SCHEDULES
DETAILS, SPECS.

SHEET
**A-7**

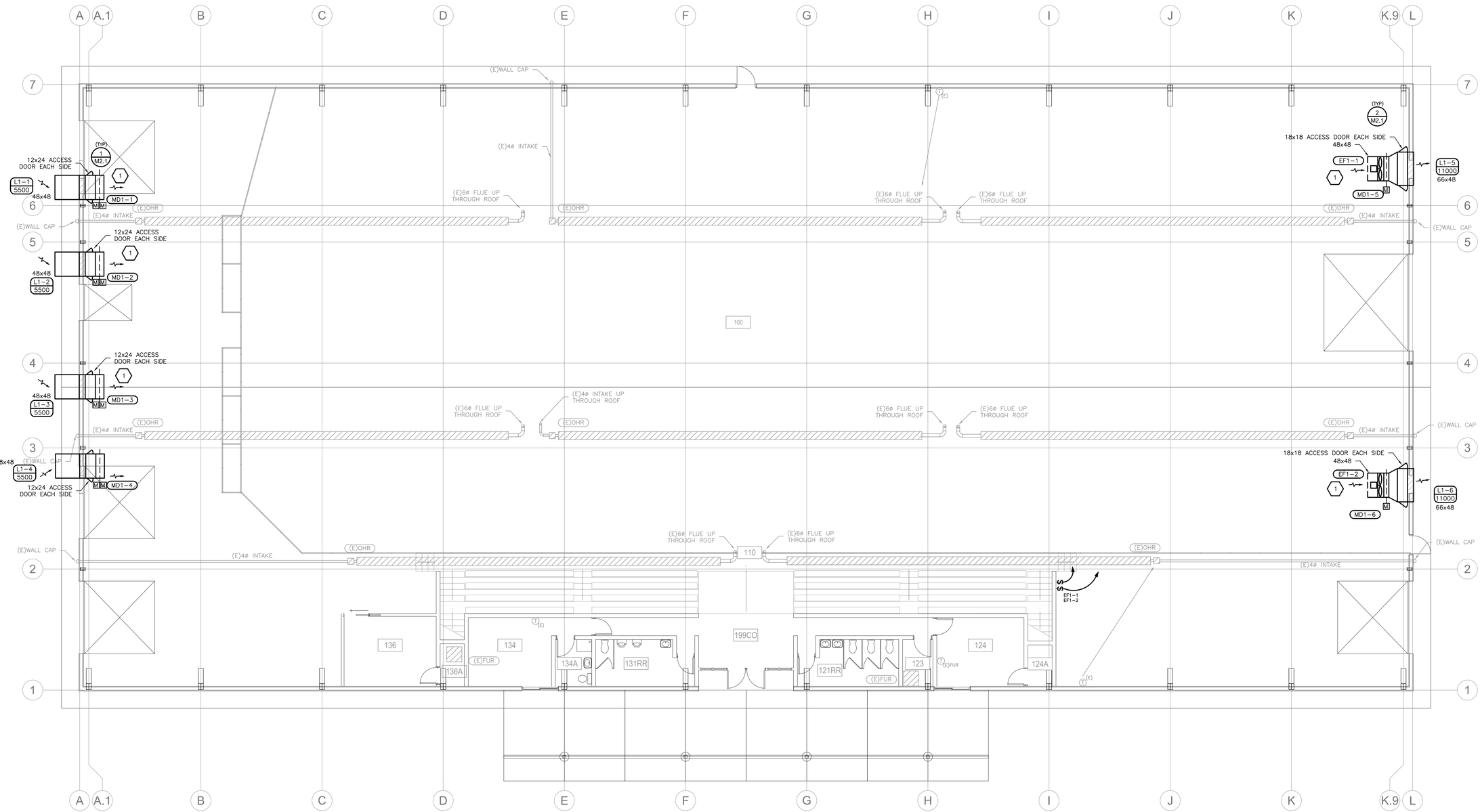
DATE
01 FEB 21

## GENERAL NOTES

1. IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INCLUDING 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.
2. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION: DETAILED EQUIPMENT REQUIREMENTS, INSTALLATION INSTRUCTIONS, PERFORMANCE REQUIREMENTS, CONTROL SEQUENCES AND ALL OTHER PROJECT DETAILS.
3. COORDINATE ALL UTILITY INTERRUPTIONS WITH THE OWNER AND PROVIDE 72 HOURS NOTIFICATION PRIOR TO ANY UTILITY SHUT DOWN.
4. DUCTWORK SHALL BE GALVANIZED SHEET METAL. ALL SIZES ARE NET INTERIOR. INCREASE DUCT SIZES TO ACCOMMODATE INTERNAL DUCT INSULATION.
5. PROVIDE 2" THICK ARMACELL INTERNAL INSULATION FOR ALL SUPPLY AIR, OUTSIDE AIR AND EXHAUST DUCTWORK.

## KEY NOTES

1. AN ARENA WATERING SYSTEM IS INSTALLED IN THE BUILDING. WITH SCH 40 PVC PRESSURE PIPING MATERIALS (MATCH EXISTING PIPING SIZE). IF PIPING INTERFERES WITH NEW INSTALLATION, RELOCATE AS NEEDED. MOVE/RELOCATE PIPING AND RECONNECT.

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FIRST STORY FLOOR PLAN -HVAC BASE BID

SCALE: 1/8" = 1'-0" (24x36 SHEETS)


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# MILLER PAVILION - ROOF RECOVER, BID PACKAGE #3

(DOOR REPLACEMENTS, VENTILATION IMPROVEMENTS)


a|118 architecture one eighteen
110 east oak street bozeman mt 59715

CDS ENGINEERING


| DRAWN BY: HVD | | |
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| REVIEWED BY: CLS | | |
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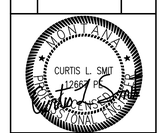



PPA # 18-2038

A/E#2019-02-03D

A118 # : 18-043B

SHEET TITLE
FIRST STORY FLOOR PLAN- HVAC BASE BID

SHEET
**M1.1**

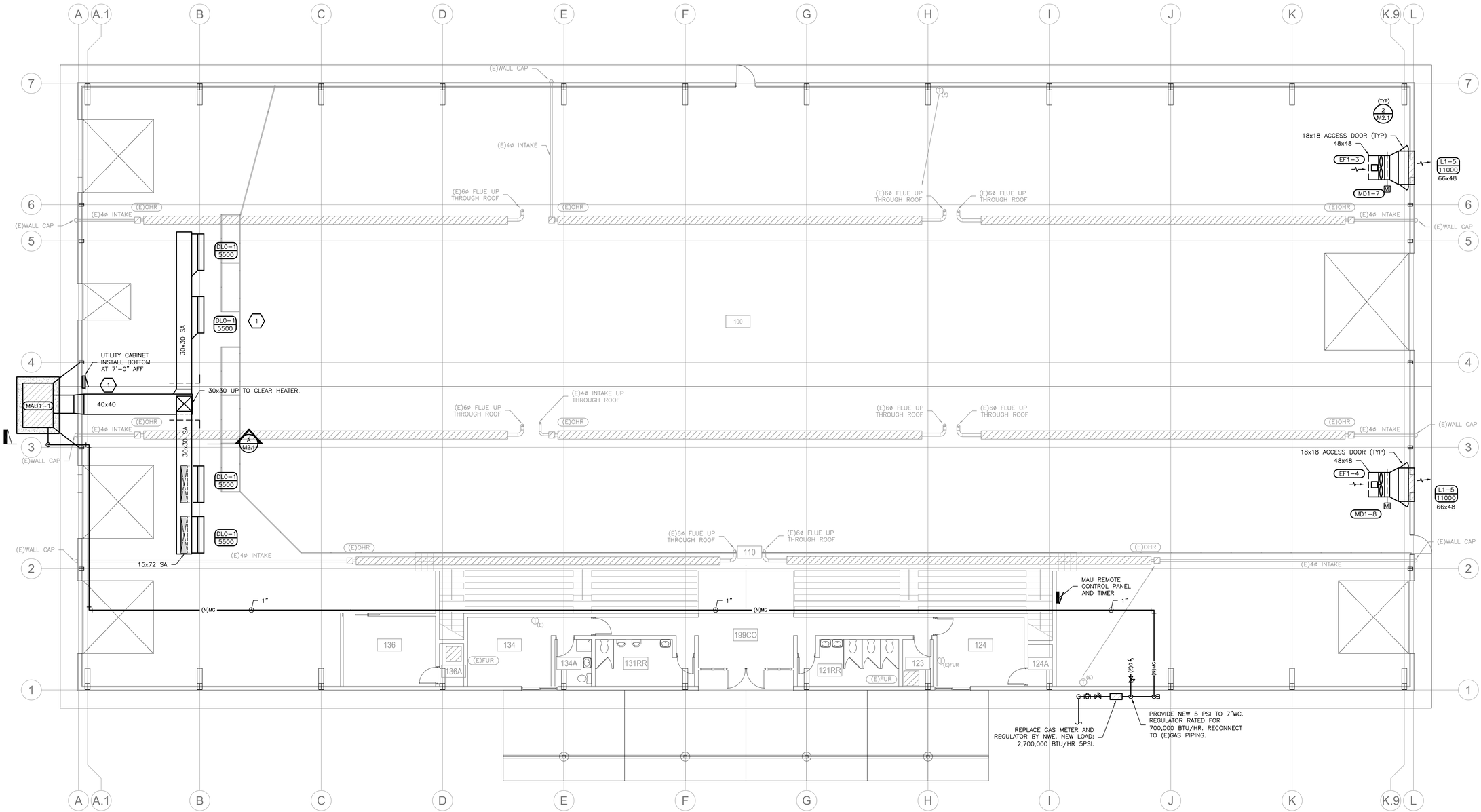
DATE
01 FEB 21

## GENERAL NOTES

1. IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INCLUDING 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.
2. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION: DETAILED EQUIPMENT REQUIREMENTS, INSTALLATION INSTRUCTIONS, PERFORMANCE REQUIREMENTS, CONTROL SEQUENCES AND ALL OTHER PROJECT DETAILS.
3. COORDINATE ALL UTILITY INTERRUPTIONS WITH THE OWNER AND PROVIDE 72 HOURS NOTIFICATION PRIOR TO ANY UTILITY SHUT DOWN.
4. DUCTWORK SHALL BE GALVANIZED SHEET METAL. ALL SIZES ARE NET INTERIOR. INCREASE DUCT SIZES TO ACCOMMODATE INTERNAL DUCT INSULATION.
5. PROVIDE 2" THICK ARMACELL INTERNAL INSULATION FOR ALL SUPPLY AIR, OUTSIDE AIR AND EXHAUST DUCTWORK.

## KEY NOTES

1. AN ARENA WATERING SYSTEM IS INSTALLED IN THE BUILDING. WITH SCH 40 PVC PRESSURE PIPING MATERIALS (MATCH EXISTING PIPING SIZE). IF PIPING INTERFERES WITH NEW INSTALLATION, RELOCATE AS NEEDED. MOVE/RELOCATE PIPING AND RECONNECT.

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# FIRST STORY FLOOR PLAN -HVAC ALT BID

SCALE: 1/8" = 1'-0" (24x36 SHEETS)


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# MILLER PAVILION - ROOF RECOVER, BID PACKAGE #3

(DOOR REPLACEMENTS, VENTILATION IMPROVEMENTS)


a|18 architecture one eighteen
115 east oak street bozeman mt 59715

CDS ENGINEERING


| DRAWN BY: HVD | | |
|---|---|---|
| REVIEWED BY: CLS | | |
| REV. | DESCRIPTION | DATE |
| | | |

CURTIS L. SMIT 12654 PE MONTANA

PPA # 18-2038

A/E#2019-02-03D

A118 # : 18-043B

SHEET TITLE

FIRST STORY FLOOR PLAN- HVAC ALT. BID

SHEET

**M1.1A**

DATE

01 FEB 21

## MECHANICAL LEGEND (NOT ALL SYMBOLS ARE USED ON THIS PROJECT)

- CW — DOMESTIC COLD WATER
- HW — DOMESTIC HOT WATER
- RHW — DOMESTIC HOT RECIRC
- W — WATER SERVICE
- F — FIRE SERVICE
- G — NATURAL GAS (7"W.C.)
- MG — MEDIUM PRESSURE GAS (5 PSI)
- BELOW GRADE SANITARY SEWER
- SS — ABOVE GRADE SANITARY SEWER
- V — SANITARY VENT
- CD — CONDENSATE DRAIN

- A / M3.1 — SECTION TAG DESIGNATION AND SHEET LOCATION
- 1 / M2.1 — DETAIL TAG DESIGNATION AND SHEET LOCATION
- AHU2-12 — EQUIPMENT AND EQUIPMENT TAG
- SG-1 / 200 — DIFFUSER TAG AND OUTLET AIRFLOW (CFM)

- GATE VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- DOUBLE CHECK VALVE
- REDUCED PRESSURE BACKFLOW
- GAS VALVE
- PRESSURE REDUCING VALVE
- THREE-WAY CONTROL VALVE
- TWO-WAY CONTROL VALVE
- STRAINER
- BALANCING VALVE
- TEMP/PRESSURE RELIEF VALVE
- PRESSURE GAUGE
- TEMPERATURE GAUGE
- PETE'S PLUG
- UNION
- PIPE ANCHOR
- PIPE SLEEVE
- EXPANSION JOINT
- PIPE TURN DOWN
- PIPE RISE
- PIPE BOTTOM CONNECTION
- PIPE TOP CONNECTION
- PIPE CONNECTION
- PIPE CAP
- PIPE END CLEANOUT
- FLOOR DRAIN
- ROOF DRAIN
- WC-1 — PLUMBING FIXTURE & LABEL
- POINT OF CONNECTION TO EXISTING PIPING. FIELD VERIFY EXACT SIZE AND LOCATION

- SUPPLY DUCT DROP
- SUPPLY DUCT DOWN TO NEXT FLOOR
- SUPPLY UP TO NEXT FLOOR
- SUPPLY DUCT RISE
- RETURN/EXHAUST DUCT DROP
- RETURN/EXHAUST DUCT DOWN TO NEXT FLOOR
- RETURN/EXHAUST UP TO NEXT FLOOR
- RETURN/EXHAUST DUCT RISE
- 12x10 — DUCT SIZE – FIRST NUMBER INDICATES DUCT WIDTH, NET INTERIOR SIZE INCREASE FOR DUCT LINER
- 12ø — INDICATES ROUND DUCTWORK
- FLEXIBLE DUCT CONNECTION
- D — DUCT OFFSET DROP
- R — DUCT OFFSET RISE
- DUCT TRANSITION
- R — SQUARE TO ROUND TRANSITION
- M — VOLUME DAMPER, MOTORIZED DAMPER
- DIA R — DUCT TURN WITH R EQUAL TO DIA (MINIMUM)
- DUCT TURN WITH SINGLE TURNING VANES. SPACING LESS THAN 3", RADIUS GREATER THAN 4"
- T / AV1-1 — THERMOSTAT AND UNIT SERVED

## ABBREVIATIONS

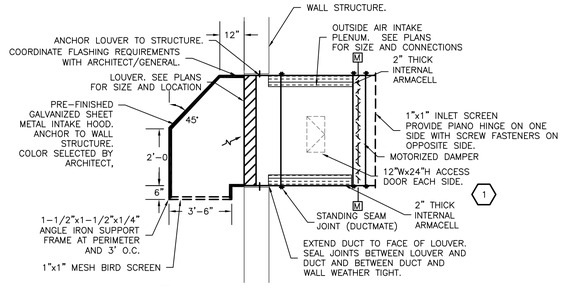
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ADA | AMERICANS W/ DISABILITIES ACT COMPLIANT EQUIPMENT | (E) | EXISTING TO REMAIN | HWR | HEATING WATER (GLYCOL) RETURN | SA | SUPPLY AIR |
| AD | ACCESS DOOR | EA | EXHAUST AIR | L-## | LOUVER | SD | SMOKE DAMPER |
| AFF | ABOVE FINISHED FLOOR | EF | EXHAUST FAN | LAV | LAVATORY | SD/SG | SUPPLY DIFFUSER/GRILLE |
| AHU | AIR HANDLING UNIT | EG-## | EXHAUST GRILLE | MANUF | MANUFACTURER | SF | SUPPLY FAN |
| BDD | BACK DRAFT DAMPER | ELECT | ELECTRICAL | MBH | 1000 BTU/HR | SH | SHOWER |
| BS/BSU | BRANCH SELECTOR UNIT | FCO | FLOOR CLEANOUT | MECH | MECHANICAL | SK | SINK |
| CA | COMBUSTION AIR | FC/FCU | FAN COIL UNIT | MS | MOP SINK | SS | SANITARY SEWER |
| CO | CLEANOUT | FD | FLOOR DRAIN | (N) | NEW | ST | STORM SEWER |
| CONT | CONTINUATION | FD | FIRE DAMPER | OA | OUTSIDE AIR | TC | TEMPERATURE CONTROL |
| CW | DOMESTIC COLD WATER | FD/SD | FIRE/SMOKE DAMPER | OC | ON CENTER | TG | TRANSFER GRILLE |
| CWS | CHILLED WATER (GLYCOL SUPPLY) | FE | FIRE EXTINGUISHER | PRV | PRESS. REDUCING VALVE | TYP | TYPICAL |
| CWR | CHILLED WATER (GLYCOL RETURN) | FS | FLOOR SINK | (R) | REMOVE AND RELOCATE | UR | URINAL |
| DDC | DIRECT DIGITAL CONTROL | HB | HOSE BIB | RA | RETURN AIR | V | SANITARY VENT |
| DF | DRINKING FOUNTAIN | HP/HPU | HEAT PUMP UNIT | RD | ROOF DRAIN | VTR | VENT THROUGH ROOF |
| | | HW | DOMESTIC HOT WATER | RG-## | RETURN GRILLE | WC | WATER CLOSET |
| | | HWS | HEATING WATER (GLYCOL) SUPPLY | | | WCO | WALL CLEANOUT |
| | | | | | | (X) | EXISTING TO BE REMOVED |

## GENERAL NOTES

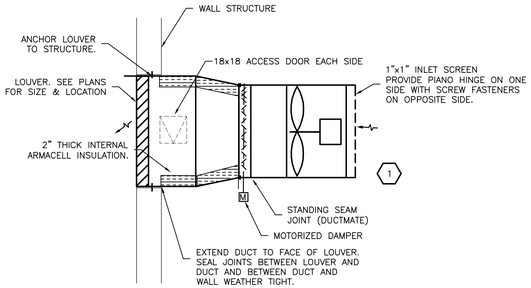
1. IT IS ABSOLUTELY NECESSARY FOR ALL TRADES INCLUDING EQUIPMENT SUPPLIERS TO COORDINATE WITH EACH OTHER AND TO VERIFY THAT THERE ARE NO CONFLICTS IN LOCATIONS OF DUCTS, CONDUITS, SPRINKLER HEADS, SPRINKLER PIPING, DIFFUSERS, ELECTRICAL BOXES AND OTHER ITEMS THROUGHOUT THIS PROJECT BEFORE FINAL PLACEMENT OF MATERIALS.
2. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION: DETAILED EQUIPMENT REQUIREMENTS, INSTALLATION INSTRUCTIONS, PERFORMANCE REQUIREMENTS, CONTROL SEQUENCES AND ALL OTHER PROJECT DETAILS.
3. COORDINATE ALL UTILITY INTERRUPTIONS WITH THE OWNER AND PROVIDE 72 HOURS NOTIFICATION PRIOR TO ANY UTILITY SHUT DOWN.
4. DUCTWORK SHALL BE GALVANIZED SHEET METAL.
5. PROVIDE 2" THICK ARMACELL INTERNAL INSULATION FOR ALL SUPPLY AIR, OUTSIDE AIR AND EXHAUST DUCTWORK.

## KEY NOTES

1. AN ARENA WATERING SYSTEM IS INSTALLED IN THE BUILDING. WITH SCH 40 PVC PRESSURE PIPING MATERIALS (MATCH EXISTING PIPING SIZE). IF PIPING INTERFERES WITH NEW INSTALLATION, RELOCATE AS NEEDED. MOVE/RELOCATE PIPING AND RECONNECT.




1 / M2.1 WALL INTAKE LOUVER DETAIL
NO SCALE




2 / M2.1 WALL EXHAUST FAN AND LOUVER DETAIL
NO SCALE

## FAN SCHEDULE

| TAG | MANUF. | MODEL | SERVES | ARRANGEMENT | ALTITUDE | AIRFLOW (CFM) | SP (IN W.C.) | DRIVE | CONTROL | ELECTRICAL VOLT. | PHASE | HZ | EFFICIENCY | POWER | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EF1-1 | LOREN COOK | AWB-42A6B | ARENA EXHAUST | WALL MOUNTED EXHAUST FAN | 4900' | 11,000 | 0.10 | BELT | TIMER BY TEMP CONTROL | 120 | 1 | 60 | PREMIUM | 3/4 HP | 1,3 |
| EF1-2 | LOREN COOK | AWB-42A6B | ARENA EXHAUST | WALL MOUNTED EXHAUST FAN | 4900' | 11,000 | 0.10 | BELT | TIMER BY TEMP CONTROL | 120 | 1 | 60 | PREMIUM | 3/4 HP | 1,3 |
| EF1-3 | LOREN COOK | AWB-42A6B | ARENA EXHAUST | WALL MOUNTED EXHAUST FAN | 4900' | 11,000 | 0.10 | BELT | TIMER BY TEMP CONTROL | 240 | 1 | 60 | PREMIUM | 3/4 HP | 2,3 |
| EF1-4 | LOREN COOK | AWB-42A6B | ARENA EXHAUST | WALL MOUNTED EXHAUST FAN | 4900' | 11,000 | 0.10 | BELT | TIMER BY TEMP CONTROL | 240 | 1 | 60 | PREMIUM | 3/4 HP | 2,3 |

REMARKS:
1. PROVIDE UNDER BASE BID. PROVIDE WITH PREMIUM EFFICIENCY MOTOR, PRE-WIRED DISCONNECT, WIRE GUARD ON THE MOTOR SIDE. PROVIDE WITH 120V MOTORIZED DAMPER.
2. PROVIDE UNDER ALTERNATE BID. PROVIDE WITH PREMIUM EFFICIENCY MOTOR, PRE-WIRED DISCONNECT, WIRE GUARD ON THE MOTOR SIDE. PROVIDE WITH 240V MOTORIZED DAMPER.
3. SEE CONTROL SEQUENCES AND ELECTRICAL DRAWINGS FOR CONTROLS.

## GRILLE, REGISTER AND DIFFUSER SCHEDULE (ALT BID)

| TAG | MANUF. | MODEL | MOUNTING TYPE | FACE STYLE | MATERIAL | DUCT SIZE | NOMINAL SIZE | DAMPER | MAXIMUM AIRFLOW | APD | FINISH (1) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DLO-1 | PRICE | HCD | SIDEWALL | DRUM LOUVER | STEEL | 72"X15" | 72"X15" | - | 5,500 | 0.1 | CLEAR ANODIZED | 1,2 |

REMARKS:
1. VERIFY ALL COLORS WITH ARCHITECT PRIOR TO ORDERING.
2. PROVIDE 1"X1" WIRE MESH BIRD SCREEN INSIDE DIFFUSER PRIOR TO INSTALLTION OF DRUM LOUVER IN THE DUCTWORK.

## LOUVER SCHEDULE

| TAG | MANUF. | MODEL | SERVES | MOUNTING TYPE | AIRFLOW (CFM) | SIZE | FREE AREA | FINISH | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| L1-1 | RUSKIN | ELF-375X | OUTSIDE AIR | CHANNEL FRAME | 5,500 | 48x48 | 54% | KYNAR | 1,2 |
| L1-2 | RUSKIN | ELF-375X | OUTSIDE AIR | CHANNEL FRAME | 5,500 | 48x48 | 54% | KYNAR | 1,2 |
| L1-3 | RUSKIN | ELF-375X | OUTSIDE AIR | CHANNEL FRAME | 5,500 | 48x48 | 54% | KYNAR | 1,2 |
| L1-4 | RUSKIN | ELF-375X | OUTSIDE AIR | CHANNEL FRAME | 5,500 | 48x48 | 54% | KYNAR | 1,2 |
| L1-5 | RUSKIN | ELF-375X | EXHAUST AIR | CHANNEL FRAME | 11,000 | 66x48 | 54% | KYNAR | 1 |
| L1-6 | RUSKIN | ELF-375X | EXHAUST AIR | CHANNEL FRAME | 11,000 | 66x48 | 54% | KYNAR | 1 |

REMARKS:
1. VERIFY COLOR SELECTED BY ARCHITECT
2. BASE BID ONLY

## MOTORIZED DAMPER SCHEDULE

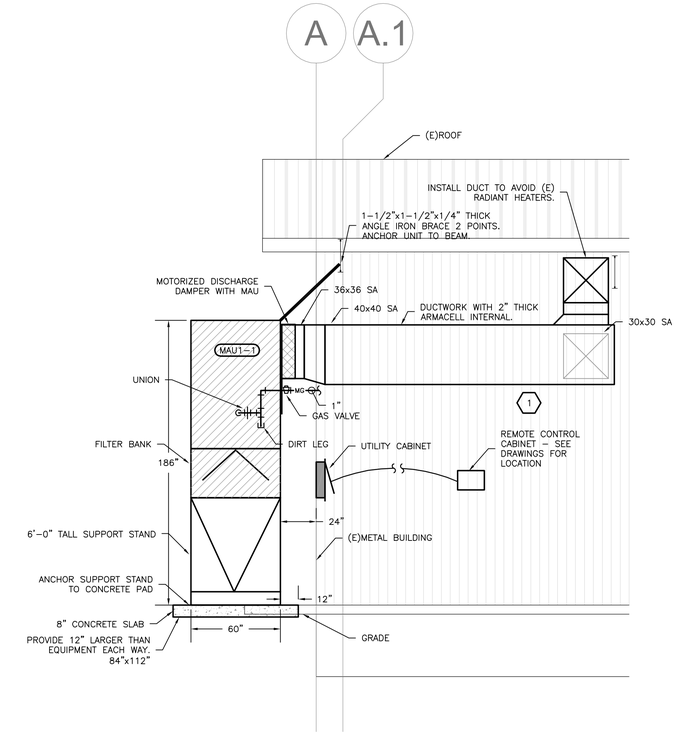
| TAG | DUCT SIZE | SERVES | AIRFLOW (CFM) | CONTROL | ELECTRICAL VOLT | PHASE | HZ | NUMBER OF ACTUATORS | NUMBER OF DAMPERS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| MD1-1 | 48x48 (2)48x24 DAMPERS | OUTSIDE AIR INTAKE | 5,500 | ELECTRICAL | 120 | 1 | 60 | 2 | 2 | 1 |
| MD1-2 | 48x48 (2)48x24 DAMPERS | OUTSIDE AIR INTAKE | 5,500 | ELECTRICAL | 120 | 1 | 60 | 2 | 2 | 1 |
| MD1-3 | 48x48 (2)48x24 DAMPERS | OUTSIDE AIR INTAKE | 5,500 | ELECTRICAL | 120 | 1 | 60 | 2 | 2 | 1 |
| MD1-4 | 48x48 (2)48x24 DAMPERS | OUTSIDE AIR INTAKE | 5,500 | ELECTRICAL | 120 | 1 | 60 | 2 | 2 | 1 |
| MD1-5 | 48x48 | EXHAUST AIR | 11,000 | ELECTRICAL | 120 | 1 | 60 | 1 | 1 | 1,3 |
| MD1-6 | 48x48 | EXHAUST AIR | 11,000 | ELECTRICAL | 120 | 1 | 60 | 1 | 1 | 1,3 |
| MD1-7 | 48x48 | EXHAUST AIR | 11,000 | ELECTRICAL | 240 | 1 | 60 | 1 | 1 | 2,3 |
| MD1-8 | 48x48 | EXHAUST AIR | 11,000 | ELECTRICAL | 240 | 1 | 60 | 1 | 1 | 2,3 |

REMARKS:
1. BASE BID ONLY
2. ALTERNATE BID ONLY
3. DAMPER AND ACTUATOR PROVIDED WITH EXHAUST FAN

## MAKE-UP AIR UNIT SCHEDULE (ALT BID)

| TAG | MANUF. | MODEL | ARRANGEMENT | ALTITUDE | AIRFLOW (CFM) | FAN TYPE | OUTDOOR AIR (CFM) | TSP (IN W.C.) | ESP (IN W.C.) | NATURAL GAS HEAT (5 PSIG) INPUT BTU/HR | OUTPUT (BTU/HR) | EAT (°F) | LAT (°F) | GAS CONTROL | ELECTRICAL VOLT. | PHASE | HZ | EFFICINECY | POWER | EQUIP. WEIGHT | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MAU-1 | CAPTIVE AIRE | CAV-27 | DIRECT FIRED VERTICAL OUTDOOR | 4800' | 22,000 | A27-27H TWIN | 22000 | 1.0 | 0.50 | 2,195,000 | 2,019,000 | -20.0 | 65.0 | MODULATING | 240 | 1 | 60 | PREMIUM | 10 HP | 3600 | 1,2,3,4,5 |

REMARKS:
1. PROVIDE 72" TALL SUPPORT STAND. PROVIDE OUTDOOR CONSTRUCTION. PROVIDE DISCHARGE DAMPER, V-BANK FILTER, DISCONNECT, CONTROL PANEL, VIBRATION FEET, BELT DRIVE MOTOR.
2. PROVIDE WITH FACTORY VFD WITH HARMONIC FILTERS (FAN MOTOR RATED AT 208/3PH, FED FROM VFD'S AT 240V/1PH). PROVIDE DISCONNECT,(STANDARD FUSED). PROVIDE A SECOND BACK UP VFD TO MATCH PRIMARY, SHIPPED LOOSE FOR FUTURE INSTALLATION.
3. PROVIDE WITH FACTORY INSTALLED FREEZE PROTECTION DISCHARGE AIR THERMOSTAT. PROVIDE WITH DUAL EXHAUST FAN STARTERS. PROVIDE CONTROL PANEL HEATER WITH SEPARATE 120V POWER.
4. PROVIDE WITH LOW FIRE START. PROVIDE WITH FREEZE STAT WITH LOW TEMP LIGHT ON THE PANEL. PROVIDE INLET GAS PRESSURE GAUGE, MANIFOLD PRESSURE GAUGE, PROVIDE CONTROL PANEL HEATER WITH SEPARATE 120V POWER.
5. PROVIDE WITH DIGITAL REMOTE CONTROL PANEL WITH SUMMER/WINTER SWITCH, DISCHARGE TEMPERATURE CONTROL, BLOWER/FLAME FAILURE/LOW TEMP/CLOGGED FILTER LIGHTS. SEE ELECTRICAL FOR 0-60 MINUTE TIMER.




A / M2.1 MAU SECTION A (ALTERNATE BID)
NO SCALE

## MECHANICAL SECTION, DETAILS AND SCHEDULES
NO SCALE

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# MILLER PAVILION - ROOF RECOVER, BID PACKAGE #3
(DOOR REPLACEMENTS, VENTILATION IMPROVEMENTS)

a|118
architecture one eighteen
115 road rock street bozeman mt 59715

CDS ENGINEERING

DRAWN BY: HVD
REVIEWED BY: CLS

| REV. | DESCRIPTION | DATE |
|---|---|---|
| | | |

CURTIS L. SMITH 12867 PE REGISTERED PROFESSIONAL ENGINEER STATE OF MONTANA

PPA # 18-2038
A/E#2019-02-03D
A118 # : 18-043B

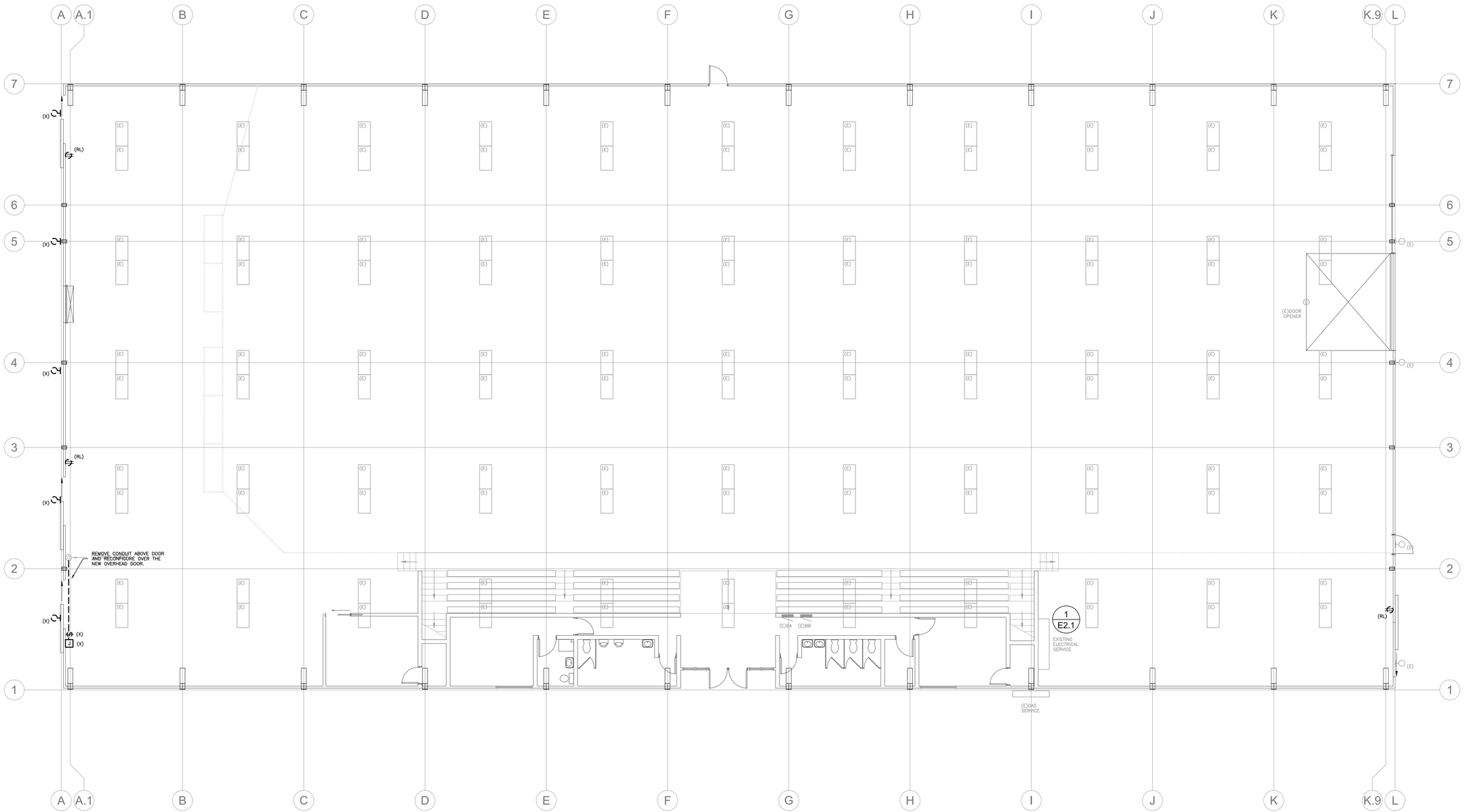
SHEET TITLE
MECHANICAL SECTION, DETAILS AND SCHEDULES

SHEET
**M2.1**

DATE
01 FEB 21

## GENERAL NOTES

1. RE-USE EXISTING CONDUCTORS AS APPLICABLE. CONTRACTOR IS REQUIRED TO MEGGER ALL CONDUCTORS PRIOR TO TURNING ANY EQUIPMENT BACK ON AFTER RE-CONFIGURING CONDUIT AND CONDUCTORS. REFER TO SPECIFICATIONS.
2. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH NEC, STATE AND LOCAL BUILDING CODE.
3. ANY WORK THAT REQUIRES POWER DISRUPTIONS SHALL BE SCHEDULED, MINIMUM OF 7 WORKING DAYS AHEAD OF TIME, AND APPROVED BY THE OWNER. ALL WORK SHALL BE PERFORMED WITH NO DISRUPTION OF THE OWNER'S BUSINESS.
4. NEW CONDUCTORS SHALL BE COPPER AND A MINIMUM OF #12 GAUGE.
5. EXISTING PANEL LOCATIONS ARE SHOWN FOR CONTRACTORS INFORMATION ONLY. THE ONLY WORK ANTICIPATED IS FOR THE SHUT-OFF OF EQUIPMENT AND REMOVAL OF CONDUCTORS FOR THE RECONFIGURATION OF CONDUIT AS REQUIRED TO RAISE EQUIPMENT.




N

FIRST STORY FLOOR PLAN - POWER DEMO

SCALE: 1/8" = 1'-0" (24x36 SHEETS)


MONTANA STATE UNIVERSITY

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# MILLER PAVILION - ROOF RECOVER, BID PACKAGE #3

(DOOR REPLACEMENTS, VENTILATION IMPROVEMENTS)


a|118 architecture one eighteen
115 east oak street bozeman mt 59715

CDS ENGINEERING


| DRAWN BY: STE, CVD | | |
|---|---|---|
| REVIEWED BY: STE | | |
| REV. | DESCRIPTION | DATE |
| | | |

Scott T. Elders No. 29029PE REGISTERED PROFESSIONAL ENGINEER STATE OF MONTANA

PPA # 18-2038

A/E#2019-02-03D

A118 # : 18-043B

SHEET TITLE

FIRST STORY FLOOR PLAN- POWER DEMO

SHEET

**ED1.1**

DATE

01 FEB 21

## LIGHT FIXTURE SCHEDULE

| TYPE (XX) | CATALOG NUMBER: | LAMP: | MOUNTING: | BALLAST/DRIVER: | VOLT: | WATT: | DESCRIPTION: |
|---|---|---|---|---|---|---|---|
| TYPE (A1) | LEOTEK: ES1 24H MV WW W BK 350 OR PRIOR APPROVED EQUAL | 3000K 3000LM | WALL MOUNT | 0-10V DIMMING | 120 | 30 | FULL-CUTOFF EXTERIOR WALL PACK LIGHT FIXTURES MOUNTED AT 13' AFF. PROVIDE WITH A 10 YEAR WARRANTY. |

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2. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION: DETAILED EQUIPMENT REQUIREMENTS, INSTALLATION INSTRUCTIONS, PERFORMANCE REQUIREMENTS, CONTROL SEQUENCES AND ALL OTHER PROJECT DETAILS.
3. INSTALL ALL NEW WORK TO MEET CURRENT CODES AND INSTALLATION STANDARDS.
4. RE-USE EXISTING CONDUCTORS AS APPLICABLE. CONTRACTOR IS REQUIRED TO MEGGER ALL CONDUCTORS PRIOR TO TURNING ANY EQUIPMENT BACK ON AFTER RE-CONFIGURING CONDUIT AND CONDUCTORS. REFER TO SPECIFICATIONS.
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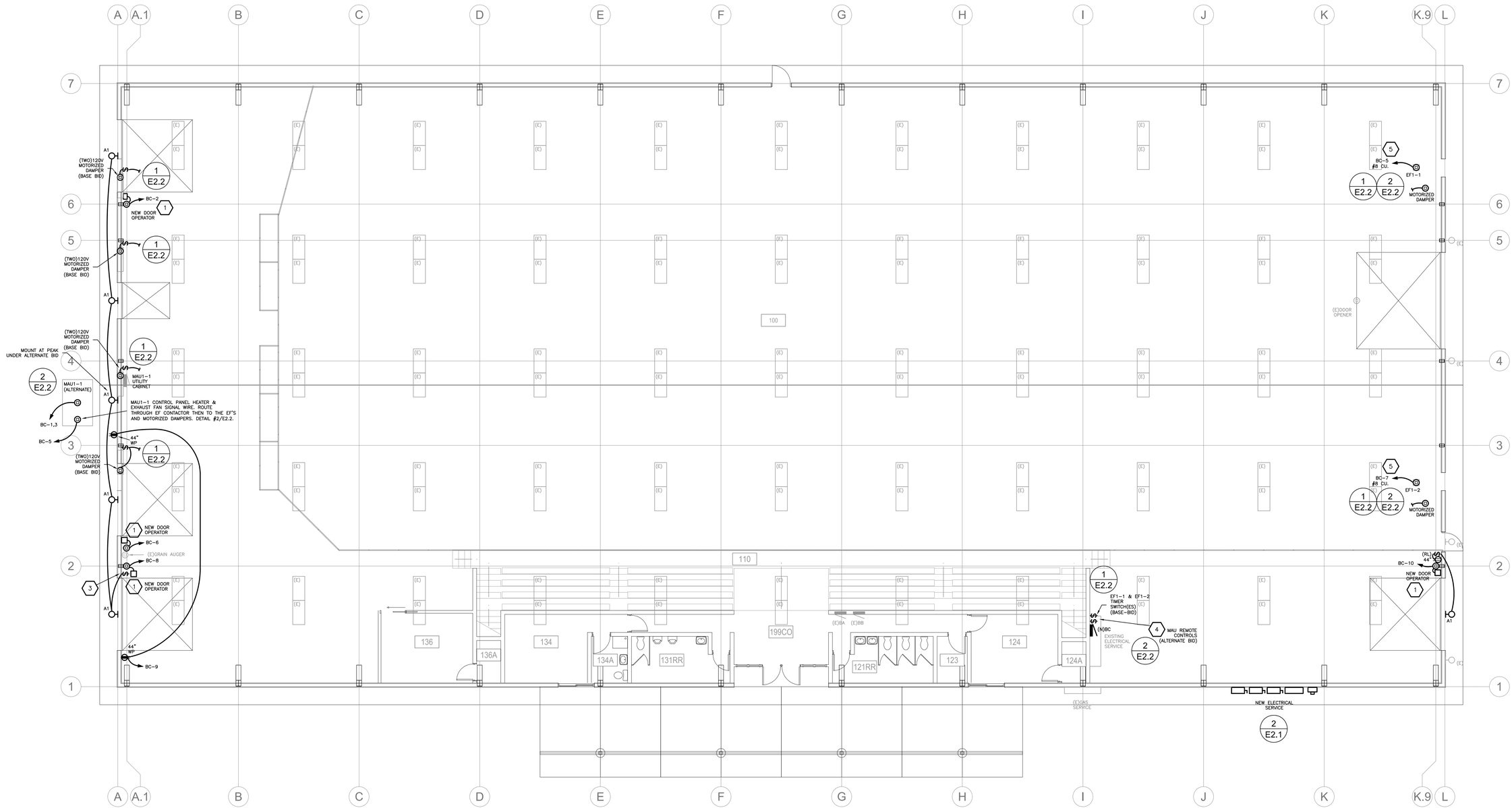
## CONSTRUCTION NOTES

1. PROVIDE 1/2" CONDUIT FROM DOOR OPERATOR TO THE PUSH BUTTON LOCATIONS.
2. RECONFIGURE CONDUIT FEEDING EXISTING GRAIN AUGER.
3. UTILIZE EXISTING LIGHTING CIRCUIT FOR THE NEW SWITCH AND LIGHT FIXTURES.
4. ALTERNATE BID: PROVIDE MAU REMOTE CONTROL PANEL AND TIMER SWITCH AT THE SAME LOCATION AS THE BASE BID TIMER SWITCH(ES) THEY WILL REPLACE. PROVIDE CAT5E CATEGORY CABLE FROM THE MAU CONTROL PANEL TO THE REMOTE CONTROL PANEL. 120V LINE VOLTAGE CONDUCTORS IN CONDUIT WILL NEED TO BE RUN FOR THE TIMER SWITCH.
5. REFER TO PANEL SCHEDULE FOR CIRCUIT NUMBERS UNDER THE ALTERNATE BID.

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FIRST STORY FLOOR PLAN - POWER

SCALE: 1/8" = 1'-0" (24x36 SHEETS)


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# MILLER PAVILION - ROOF RECOVER, BID PACKAGE #3

(DOOR REPLACEMENTS, VENTILATION IMPROVEMENTS)

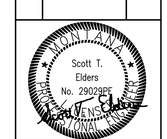

a|118 architecture one eighteen
110 east oak street bozeman mt 59715

CDS ENGINEERING


DRAWN BY: STE, CVD

REVIEWED BY: STE

| REV. | DESCRIPTION | DATE |
|---|---|---|
| | | |




PPA # 18-2038

A/E#2019-02-03D

A118 # : 18-043B

SHEET TITLE

FIRST STORY FLOOR PLAN- POWER

SHEET

**E1.1**

DATE

01 FEB 21

## (E)PANEL BA

600 AMPS MLO 240/120V VOLT 1 PHASE 3 WIRE SURFACE MOUNTING

| BREAKER AMPS | BREAKER POLES | DESCRIPTION | Category | CIRCUIT VA | CIRCUIT # | PHASE LOADS A | PHASE LOADS B | CIRCUIT # | CIRCUIT VA | Category | DESCRIPTION | BREAKER AMPS | BREAKER POLES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 1 | (E) ARENA LIGHTS ROW 1 | | | 1 | 0 | | 2 | | | (E) SOUTHWEST LIGHTS | 20 | 1 |
| 20 | 1 | (E) ROW 2 | | | 3 | | 0 | 4 | | | (E) BLEACHER LIGHTS | 20 | 1 |
| 20 | 1 | (E) ROW 3 | | | 5 | 0 | | 6 | | | (E) SOUTHEAST LIGHTS | 20 | 1 |
| 20 | 1 | (E) ROW 4 | | | 7 | | 0 | 8 | | | (E) BOTTLE FILL STATION | 20 | 1 |
| 20 | 1 | (E) ROW 5 | | | 9 | 0 | | 10 | | | (E) ENTRY RECEPTACLE | 20 | 1 |
| 20 | 1 | (E) ROW 6 | | | 11 | | 0 | 12 | | | (E) SPARE | 20 | 1 |
| 20 | 1 | (E) ROW 7 | | | 13 | 0 | | 14 | | | (E) SPARE | 20 | 1 |
| 20 | 1 | (E) ROW 8 | | | 15 | | 0 | 16 | | | (E) MENS/APARTMENT LIGHTS | 20 | 1 |
| 20 | 1 | (E) ROW 9 | | | 17 | 0 | | 18 | | | (E) SPARE | 20 | 1 |
| 20 | 1 | (E) ROW 10 | | | 19 | | 0 | 20 | | | (E) WOMENS/HALL LIGHTS | 20 | 1 |
| 20 | 1 | (E) ROW 11 | | | 21 | 0 | | 22 | | | (E) SPARE | 20 | 1 |
| 20 | 1 | (E) NORTH WALL RECEPTACLE | | | 23 | | 0 | 24 | | | (E) SPARE | 20 | 1 |
| 20 | 1 | (E) LIGHTING CONTROL | | | 25 | 0 | | 26 | | | (E) WEST OUTSIDE LIGHTS | 20 | 1 |
| 20 | 1 | (E) NORTH OUTSIDE LIGHTS | | | 27 | | 0 | 28 | | | (E) OFFICE | 20 | 1 |
| 20 | 1 | (E) LOFT RECEPTACLE | | | 29 | 0 | | 30 | | | (E) SPARE | 20 | 1 |
| | | | | | | 0 | 0 | | | | | | |

TOTAL LOADS: 0 VA

DEMAND

0 AMPS

## (E)PANEL BB

600 AMPS MLO 240/120V VOLT 1 PHASE 3 WIRE SURFACE MOUNTING

| BREAKER AMPS | BREAKER POLES | DESCRIPTION | Category | CIRCUIT VA | CIRCUIT # | PHASE LOADS A | PHASE LOADS B | CIRCUIT # | CIRCUIT VA | Category | DESCRIPTION | BREAKER AMPS | BREAKER POLES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 1 | (E) APARTMENT N. RECEPTACLE | | | 1 | 0 | | 2 | | | (E) EAST HALL RECEPTACLES | 20 | 1 |
| 20 | 1 | (E) APARTMENT S. RECEPTACLE | | | 3 | | 0 | 4 | | | (E) FURNACE | 20 | 1 |
| | | (E) SPARE | | | 5 | 0 | | 6 | | | (E) GRA-INSN AUGER | 20 | 1 |
| 20 | 1 | (E) APARTMENT COUNTER | | | 7 | | 0 | 8 | | | (E) SW WALL RECEPTACLES | 20 | 1 |
| 20 | 1 | (E) SE WALL RECEPTACLES | | | 9 | 0 | | 10 | | | (E) OVERHEAD DOOR OPERATOR | 20 | 1 |
| 20 | 1 | (E) SE WALL RECEPTACLES | | | 11 | | 0 | 12 | | | (E) SPARE | | |
| | | (E) PROVISION | | | 13 | 0 | | 14 | | | (E) WATER HEATER | 30 | 2 |
| 20 | 1 | (E) ARENA HEATERS | | | 15 | | 0 | 16 | | | ---- | -- | -- |
| -- | -- | ---- | | | 17 | 0 | | 18 | | | (E) PROVISION | | |
| 50 | 2 | (E) OVEN | | | 19 | | 0 | 20 | | | (E) SPRINKLER SYSTEM | 30 | 2 |
| -- | -- | ---- | | | 21 | 0 | | 22 | | | ---- | -- | -- |
| | | (E) PROVISION | | | 23 | | 0 | 24 | | | (E) SPARE | 20 | 2 |
| 20 | 2 | (E) SPARE | | | 25 | 0 | | 26 | | | (E) PROVISION | | |
| | | (E) PROVISION | | | 27 | | 0 | 28 | | | (E) SPARE | 20 | 2 |
| 70 | 2 | (E) SPARE | | | 29 | 0 | | 30 | | | (E) PROVISION | | |
| | | | | | | 0 | 0 | | | | | | |

TOTAL LOADS: 0 VA

DEMAND

0 AMPS

## (N)PANEL BC

225 AMPS MLO 240/120V VOLT 1 PHASE 3 WIRE SURFACE MOUNTING

| BREAKER AMPS | BREAKER POLES | DESCRIPTION | Category | CIRCUIT VA | CIRCUIT # | PHASE LOADS A | PHASE LOADS B | CIRCUIT # | CIRCUIT VA | Category | DESCRIPTION | BREAKER AMPS | BREAKER POLES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60 | 2 | MAU1-1 ( ALTERNATE BID) | V | 5800 | 1 | 6976 | | 2 | 1176 | E | N.W. DOOR OPENER (1/2 HP) | 20 | 1 |
| - | - | ---- | V | 5800 | 3 | | 5800 | 4 | | E | SPARE | 20 | 1 |
| 20 | 1 | MAU1-1 CTRL, PNL HEATER & EF SIGNAL CIRC. | H | 300 | 5 | 1476 | | 6 | 1176 | E | CENTRAL LARGE DOOR OPENER (1/2 HP) | 20 | 1 |
| 25 | 1 | EF1-1 (BASE BID) | V | 1656 | 7 | | 2832 | 8 | 1176 | E | S.W. DOOR OPENER (1/2 HP) | 20 | 1 |
| 25 | 1 | EF1-2 (BASE BID) | V | 1656 | 9 | 2832 | | 10 | 1176 | E | S.E. DOOR OPENER ( 1/2 HP) | 20 | 1 |
| 20 | 1 | RCPT. FERRIER & EXTERIOR W. WALL | R | 1200 | 11 | | 1200 | 12 | | | SPARE | 20 | 1 |
| 20 | 2 | EF1-3 (ALTERNATE BID) | V | 828 | 13 | 828 | | 14 | | | SPARE | 20 | 1 |
| - | - | ---- | V | 828 | 15 | | 828 | 16 | | | SPARE | 20 | 1 |
| 20 | 2 | EF1-4 (ALTERNATE BID) | V | 828 | 17 | 828 | | 18 | | | SPARE | 20 | 1 |
| - | - | ---- | V | 828 | 19 | | 828 | 20 | | | SPARE | 20 | 1 |
| 20 | 1 | SPARE | | | 21 | 0 | | 22 | | | SPARE | 20 | 1 |
| 20 | 1 | SPARE | | | 23 | | 0 | 24 | | | SPARE | 20 | 1 |
| 20 | 1 | SPARE | | | 25 | 0 | | 26 | | | SPARE | 20 | 1 |
| 20 | 1 | SPARE | | | 27 | | 0 | 28 | | | SPARE | 20 | 1 |
| 20 | 1 | SPARE | | | 29 | 0 | | 30 | | | SPARE | 20 | 1 |
| 20 | 1 | SPARE | | | 31 | | 0 | 32 | | | SPARE | 20 | 1 |
| 20 | 1 | SPARE | | | 33 | 0 | | 34 | | | SPARE | 20 | 1 |
| 20 | 1 | SPARE | | | 35 | | 0 | 36 | | | SPARE | 20 | 1 |
| 20 | 1 | SPARE | | | 37 | 0 | | 38 | | | SPARE | 20 | 1 |
| 20 | 1 | SPARE | | | 39 | | 0 | 40 | | | SPARE | 20 | 1 |
| 20 | 1 | SPARE | | | 41 | 0 | | 42 | | | SPARE | 20 | 1 |
| | | | | | | 12940 | 11488 | | | | | | |

TOTAL LOADS: 24428 VA

DEMAND

102 AMPS

BRANCH CIRCUIT HOMERUN WIRE SIZES, AS SHOWN ON DRAWINGS OR PANEL SCHEDULES, ARE MINIMUM SIZES FOR CURRENT DRAW. CONTRACTOR SHALL INCREASE WIRE AND CONDUIT SIZES AS REQUIRED TO LIMIT BRANCH CIRCUIT VOLTAGE DROP TO 3%, BASED ON ACTUAL HOMERUN LENGTHS REQUIRED IN FIELD. BRANCH CIRCUIT VOLTAGE DROP CALCULATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THESE CRITERIA:

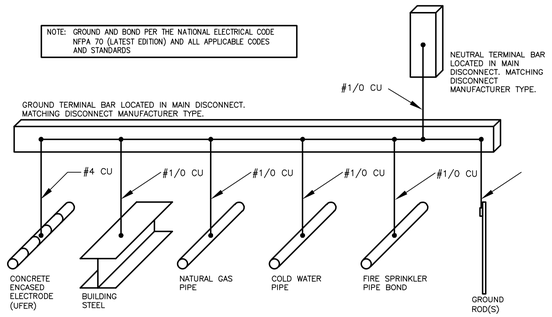
| TYPE OF LOAD | LOAD CURRENT | DISTANCE |
|---|---|---|
| DUPLEX RECEPTACLE | 16A | TO FARTHEST RECEPTACLE |
| OTHER RECEPTACLES | 80% OF RATED CURRENT | TO FARTHEST RECEPTACLE |
| LIGHT FIXTURES | TOTAL VA OF ALL FIXTURES ON CKT | TO FIRST FIXTURE VIA SWITCH(ES) INCLUDING LENGTH OF TRAVELERS |
| MOTORS | 125% OF NAMEPLATE FLA | TO MOTOR/EQUIPMENT |
| HEATERS | BASED ON TOTAL VA | TO DEVICE/EQUIPMENT |
| MISCELLANEOUS | | |

IN GENERAL, BASED ON COPPER WIRES, MINIMUM WIRE SIZES FOR 120V, 20A BRANCH CIRCUITS SHALL BE AS SHOWN IN TABLES BELOW:

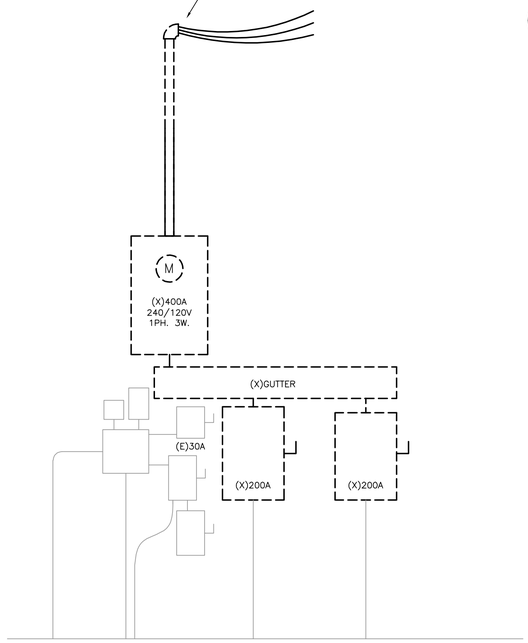
| 20A RECEPT/ EQUIP BRANCH CIRCUITS | |
|---|---|
| LENGTH (FEET) | WIRE SIZE (AWG) |
| UP TO 60 | #12 |
| UP TO 95 | #10 |
| UP TO 150 | #8 |
| UP TO 240 | #6 |

ALL DUPLEX AND GFI RECEPTACLES SHALL BE RATED FOR 20A.

MC CABLE MAY BE USED, BUT ONLY WHERE IT IS FISHED INSIDE EXISTING WALLS OR CEILINGS. UNDER NO CIRCUMSTANCES SHALL MC CABLE BE INSTALLED WHERE IT IS EXPOSED. WHEREVER MC CABLE IS INSTALLED, IT SHALL HAVE ONE SPARE CURRENT CARRYING CONDUCTOR FOR FUTURE USE.



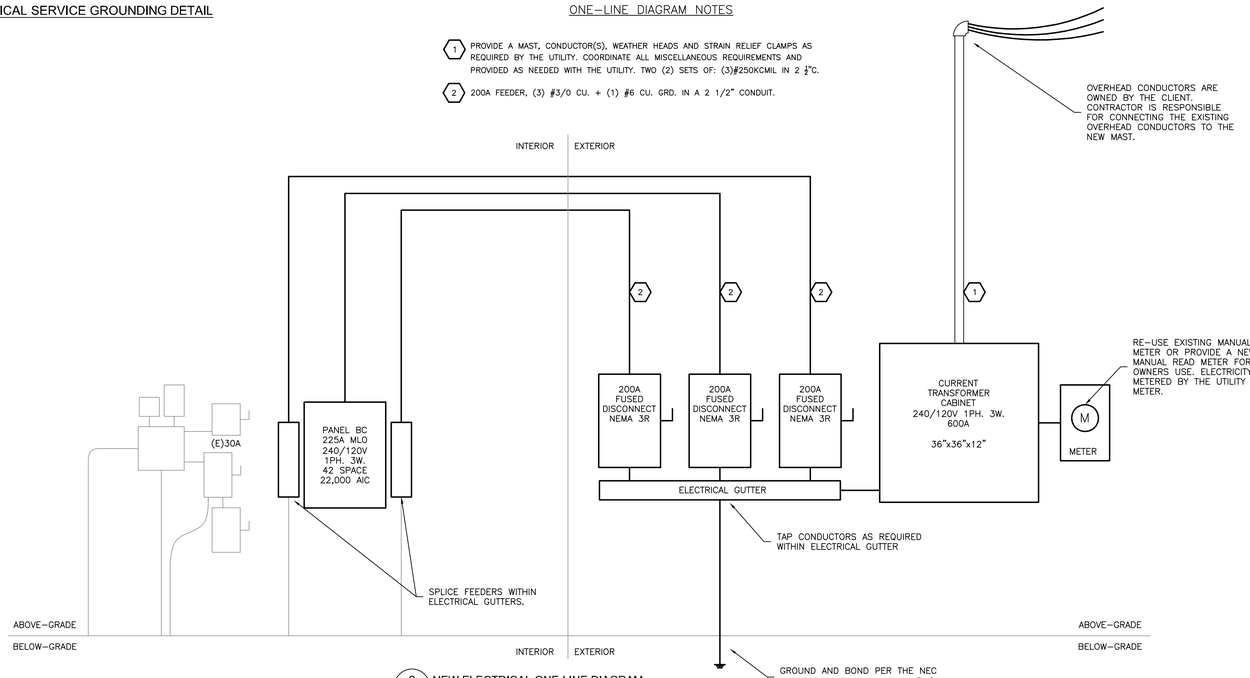

3 E2.1 ELECTRICAL SERVICE GROUNDING DETAIL
NO SCALE




1 E2.1 EXISTING ELECTRICAL ONE-LINE DIAGRAM
NO SCALE

ONE-LINE DIAGRAM NOTES

1. PROVIDE A MAST, CONDUCTOR(S), WEATHER HEADS AND STRAIN RELIEF CLAMPS AS REQUIRED BY THE UTILITY. COORDINATE ALL MISCELLANEOUS REQUIREMENTS AND PROVIDED AS NEEDED WITH THE UTILITY. TWO (2) SETS OF: (3)#250KCMIL IN 2 ½"C.
2. 200A FEEDER, (3) #3/0 CU. + (1) #6 CU. GRD. IN A 2 1/2" CONDUIT.




2 E2.1 NEW ELECTRICAL ONE-LINE DIAGRAM
NO SCALE

MONTANA STATE UNIVERSITY

MSU-CPDC
MONTANA STATE UNIVERSITY
BOZEMAN, MONTANA
PHONE: 406.994.5413
FAX: 406.994.5665

# MILLER PAVILION - ROOF RECOVER, BID PACKAGE #3
(DOOR REPLACEMENTS, VENTILATION IMPROVEMENTS)


a118 architecture one eighteen
115 east oak street bozeman mt 59715
CDS ENGINEERING


DRAWN BY: STE, CVD

REVIEWED BY: STE

| REV. | DESCRIPTION | DATE |
|---|---|---|
| | | |

Scott T. Elders No. 29029PE REGISTERED PROFESSIONAL ENGINEER STATE OF MONTANA

PPA # 18-2038

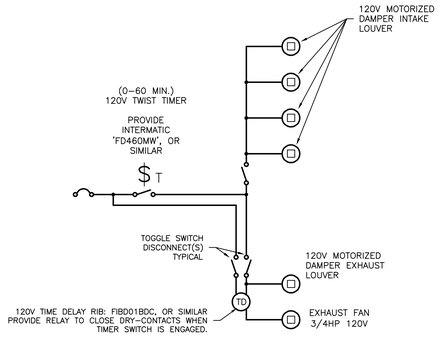
A/E#2019-02-03D

A118 # : 18-043B

SHEET TITLE
ELEC. EXISTING ONE-LINE DIAGRAM

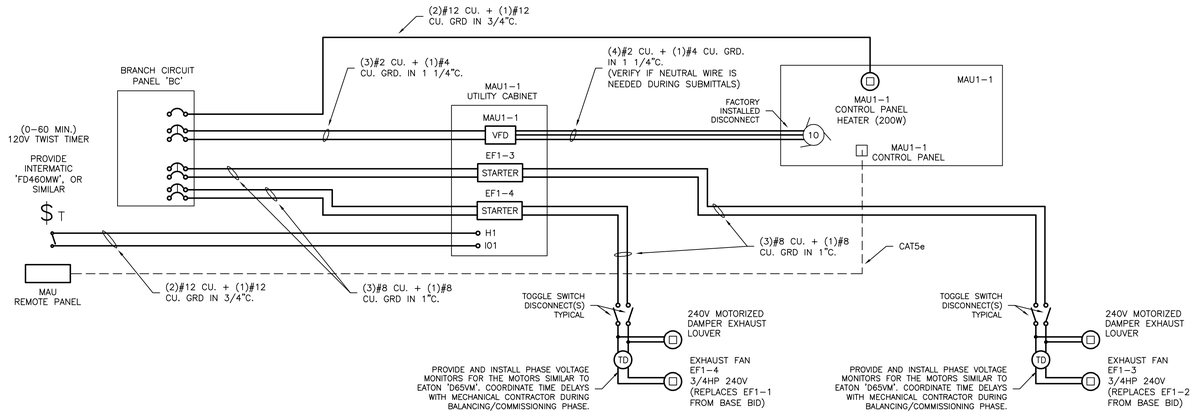
SHEET
E2.1

DATE
01 FEB 21




NOTE: WALL TIMER SWITCH SHALL ENERGIZE THE FOUR (4) INTAKE MOTORIZED DAMPERS, AND THE ONE (1) EXHAUST MOTORIZED DAMPER. PROVIDE AN ADJUSTABLE TIME DELAY BEFORE THE EXHAUST FAN. COORDINATE WITH MECHANICAL CONTRACTOR TO SET THE TIME DELAY ONCE THE LOUVERS ARE OPEN. TWO (2) SETS OF THIS DETAILS ARE REQUIRED, ONE FOR EACH EXHAUST FAN.

1 / E2.2 EXHAUST & LOUVER WIRING DIAGRAM (BASE-BID)
NO SCALE




2 / E2.2 EXHAUST & MAKE-UP AIR UNIT WIRING DIAGRAM (ALTERNATE-BID)
NO SCALE

## MECHANICAL AND PLUMBING EQUIPMENT CONNECTION SCHEDULE

| TAG | DESCRIPTION | LOCATION | ELECTRICAL | | | | | | CONNECTION TYPE | DISCONNECT DESCRIPTION | DISCONNECT PROVIDED BY | SPECIAL REQUIREMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | VOLT. | PHASE | HZ | AMP | VA | HORSEPOWER | | | | |
| MAU1-1 | MAKEUP AIR UNIT (ALTERNATE BID) | WEST WALL | 240 | 1 | 60 | 48.4 FLA | 11,600 VA | 10 HP @ 3Ph. | DIRECT CONNECTION | FACTORY INSTALLED VFD STARTER AND DISCONNECT | MECHANICAL CONTRACTOR | NEED ADDITIONAL 120V CIRCUIT FOR CONTROL PANEL HEATER |
| | | | | | | | | | | | | |
| EF1-1 | EXHAUST FAN BASE BID ONLY | EAST WALL | 120 | 1 | 60 | 13.8 FLA | 1656 VA | 3/4 HP | DIRECT CONNECTION | FACTORY INSTALLED | MECHANICAL CONTRACTOR | WALL TIMER BY ELECTRICAL. (3) |
| EF1-2 | EXHAUST FAN BASE BID ONLY | EAST WALL | 120 | 1 | 60 | 13.8 FLA | 1656 VA | 3/4 HP | DIRECT CONNECTION | FACTORY INSTALLED | MECHANICAL CONTRACTOR | WALL TIMER BY ELECTRICAL. (3) |
| EF1-3 | EXHAUST FAN ALTERNATE BID ONLY | EAST WALL | 240 | 1 | 60 | 6.9 FLA | 1656 VA | 3/4 HP | DIRECT CONNECTION | FACTORY INSTALLED | MECHANICAL CONTRACTOR | WALL TIMER BY ELECTRICAL. (3) |
| EF1-4 | EXHAUST FAN ALTERNATE BID ONLY | EAST WALL | 240 | 1 | 60 | 6.9 FLA | 1656 VA | 3/4 HP | DIRECT CONNECTION | FACTORY INSTALLED | MECHANICAL CONTRACTOR | WALL TIMER BY ELECTRICAL. (3) |
| | | | | | | | | | | | | |
| MD1-1 | MOTORIZED DAMPER BASE BID ONLY | EAST WALL | 120 | 1 | 60 | (4) FRACTIONAL | 50 VA/MD | - | DIRECT CONNECTION | 20A TOGGLE-SWITCH | ELECTRICAL CONTRACTOR | WALL TIMER BY ELECTRICAL. (3) |
| MD1-2 | MOTORIZED DAMPER BASE BID ONLY | EAST WALL | 120 | 1 | 60 | (4) FRACTIONAL | 50 VA/MD | - | DIRECT CONNECTION | 20A TOGGLE-SWITCH | ELECTRICAL CONTRACTOR | WALL TIMER BY ELECTRICAL. (3) |
| MD1-3 | MOTORIZED DAMPER BASE BID ONLY | EAST WALL | 120 | 1 | 60 | FRACTIONAL | 50 VA/MD | - | DIRECT CONNECTION | 20A TOGGLE-SWITCH | ELECTRICAL CONTRACTOR | WALL TIMER BY ELECTRICAL. (3) |
| MD1-4 | MOTORIZED DAMPER BASE BID ONLY | EAST WALL | 120 | 1 | 60 | FRACTIONAL | 50 VA/MD | - | DIRECT CONNECTION | 20A TOGGLE-SWITCH | ELECTRICAL CONTRACTOR | WALL TIMER BY ELECTRICAL. (3) |
| MD1-5 | MOTORIZED DAMPER BASE BID ONLY | WEST WALL | 120 | 1 | 60 | FRACTIONAL | 50 VA/MD | - | DIRECT CONNECTION | 20A TOGGLE-SWITCH | ELECTRICAL CONTRACTOR | WALL TIMER BY ELECTRICAL. (3) |
| MD1-6 | MOTORIZED DAMPER BASE BID ONLY | WEST WALL | 120 | 1 | 60 | FRACTIONAL | 50 VA/MD | - | DIRECT CONNECTION | 20A TOGGLE-SWITCH | ELECTRICAL CONTRACTOR | WALL TIMER BY ELECTRICAL. (3) |
| MD1-7 | MOTORIZED DAMPER ALTERNATE BID ONLY | WEST WALL | 240 | 1 | 60 | FRACTIONAL | 50 VA/MD | - | DIRECT CONNECTION | 20A TOGGLE-SWITCH | ELECTRICAL CONTRACTOR | WALL TIMER BY ELECTRICAL. (3) |
| MD1-8 | MOTORIZED DAMPER ALTERNATE BID ONLY | WEST WALL | 240 | 1 | 60 | FRACTIONAL | 50 VA/MD | - | DIRECT CONNECTION | 20A TOGGLE-SWITCH | ELECTRICAL CONTRACTOR | WALL TIMER BY ELECTRICAL. (3) |
| | | | | | | | | | | | | |

REMARKS:
1. CONTRACTOR SHALL REVIEW AND COORDINATE ALL ELECTRICAL REQUIREMENTS WITH THE MECHANCIAL AND PLUMBING DRAWINGS PRIOR TO ROUGH-IN.
2. CONTRACTOR SHALL REVIEW ALL MECHANICAL AND PLUMBING SUBMITTALS PRIOR TO ROUGH-IN AND CONNECT AS REQUIRED.
3. WIRE MOTORIZED DAMPERS TO OPEN, AND FAN TO OPERATE UPON ACTIVATION OF WALL TIMER. PROVIDE WIRING TO ALLOW FOR ELECTRICAL VOLTAGE DROP. REFER TO DETAILS #1/E2.2 & #2/E2.2.

MONTANA STATE UNIVERSITY

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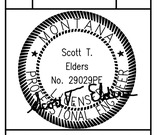
# MILLER PAVILION - ROOF RECOVER, BID PACKAGE #3
## (DOOR REPLACEMENTS, VENTILATION IMPROVEMENTS)

a118 architecture one eighteen
115 east oak street bozeman mt 59715
CDS ENGINEERING

| DRAWN BY: STE, CVD | | |
|---|---|---|
| REVIEWED BY: STE | | |
| REV. | DESCRIPTION | DATE |
| | | |




PPA # 18-2038

A/E#2019-02-03D

A118 # : 18-043B

SHEET TITLE
ELEC. SCHEDULES AND DETAILS

SHEET
**E2.2**

DATE
01 FEB 21