

GENERAL NOTES

1. Staging and storage of materials on site is to be coordinated with the Owner.
2. The Contractor is responsible for the protection of the Owner's facilities.
3. All existing conditions shall be field verified. Any variation shall be brought to the attention of the Architect. No deviation from the construction documents shall be made without the written approval of the Owner and Architect.
4. The contractor is responsible for the coordination of all trades.
5. Debris shall be cleaned up and removed at the end of each day.
6. Normal operation of the Owner facilities shall be maintained during construction. All work inside building is to be coordinated with the Owner.
7. Any and all damage to existing conditions, including but not limited to landscaping, paving, and building finishes, shall be repaired or replaced as directed by the Owner.
8. All work shall be installed in accordance with all applicable codes.

PROJECT DESCRIPTION

CONCRETE SLAB FOR INTERIOR REHABILITATION PROJECT.

CODE INFORMATION

APPLICABLE CODES:

2018 INTERNATIONAL BUILDING CODE
2018 INTERNATIONAL FIRE CODE
2018 INTERNATIONAL MECHANICAL CODE
2021 COLORADO PLUMBING CODE
2021 COLORADO FUEL GAS CODE
2018 INTERNATIONAL ENERGY CONSERVATION CODE
2023 NATIONAL ELECTRICAL CODE
ICC/ANSI A117.1 - 2009 (ACCESSIBILITY DESIGN CODE)

OCCUPANCY: A-3

CONSTRUCTION TYPE: TYPE III-B
SPRINKLERED: YES

FLOOR AREA - NO CHANGE TO FLOOR AREA AS A PART OF THIS PROJECT

OCCUPANTS NO CHANGE TO OCCUPANT LOAD

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MECHANICAL

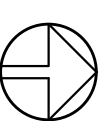
CDM-1 MECHANICAL LEGEND AND NOTES
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E2.0 UNDERGROUND FLOOR PLAN

NOTES

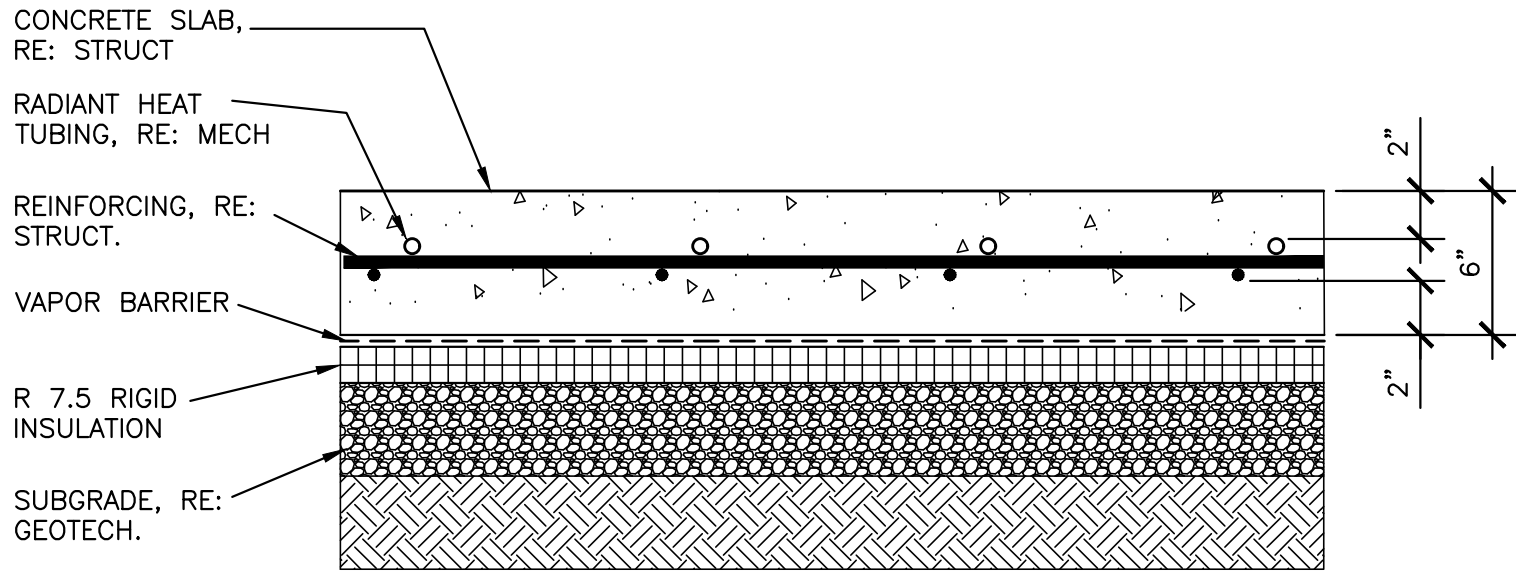
1. BAYS 1-7: REMOVE EXISTING CONCRETE PIT WALLS AS REQUIRED FOR NEW SLAB CONSTRUCTION, +/- 1'-0"
2. NEW SLAB TO ALIGN WITH THRESHOLD AT DOOR ON GRID LINE A = 100'-0", RE: DETAIL 3/S3.2



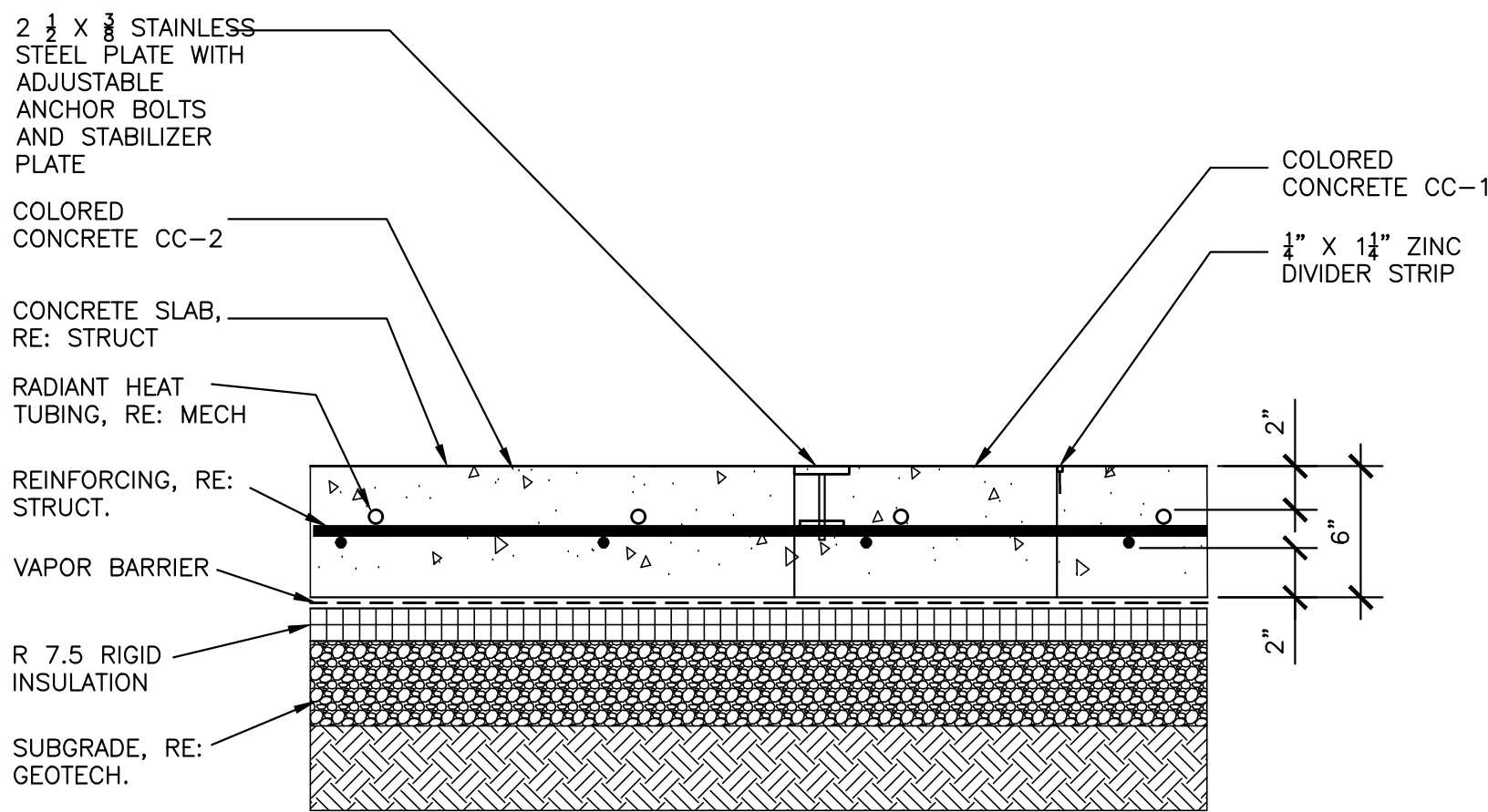
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MAIN FLOOR PLAN

1/8" = 1'-0"



1 TYPICAL SLAB DETAIL
1 1/2" = 1'-0"



2 SLAB DETAIL
1 1/2" = 1'-0"

ML JOB #: 23-0213.S.01
PRINCIPAL ENGINEER
FOR DAVID WITTMAN
PROJECT MANAGER: DAVID WITTMAN

DESIGNER: ORSA KROEGER
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DESIGN CRITERIA
<p>1) CODES AND STANDARDS: 1A) GENERAL DESIGN</p> <ul style="list-style-type: none">INTERNATIONAL BUILDING CODE 2018 <p>2) LATERAL LOADS 2A) SEISMIC LOADS</p> <ul style="list-style-type: none">SEISMIC DESIGN CATEGORY = BRISK CATEGORY = IIEARTHQUAKE IMPORTANCE FACTOR, $I_e = 1.00$MAPPED SPECTRAL RESPONSE ACCELERATION, $S_s = 11.60\%$MAPPED SPECTRAL RESPONSE ACCELERATION, $S_1 = 4.60\%$DESIGN SPECTRAL RESPONSE COEFFICIENT, $SD_s = 0.124$DESIGN SPECTRAL RESPONSE COEFFICIENT, $SD_1 = 0.074$SOIL SITE CLASS = D <p>2B) NEW MEZZANINE CONSTRUCTION SHALL BE Laterally Independent. THEREFORE NO CHANGES TO LOADING OR CONFIGURATION OF THE EXISTING LATERAL FORCE RESISTING SYSTEM ARE PRESENT.</p> <p>3) GRAVITY LOADS 3A) MEZZANINE DEAD LOAD = 16PSF</p> <p>3B) ASSEMBLY LIVE LOAD = 100PSF</p>
PHASED CONSTRUCTION NOTES
<p>1) GENERAL: 1A) THE DRAWINGS IN THIS PACKAGE ARE INCOMPLETE AND REPRESENT A PORTION OF THE TOTAL PROJECT. COORDINATE THE WORK OF THIS PACKAGE WITH FUTURE DRAWINGS ISSUED AND UPDATED DRAWINGS TO ALL TRADES AS REQUIRED.</p> <p>1B) THESE STRUCTURAL DRAWINGS ARE RELEASED FOR SHEETS ISSUED FOR 100% CD IN STRUCTURAL DRAWINGS LIST.</p> <p>1C) DRAWINGS STAMPED OR NOTED AS "NOT FOR CONSTRUCTION" ARE PRELIMINARY AND SUBJECT TO CHANGE.</p> <p>1D) USE THE MOST CURRENT DRAWINGS IN PREPARATION OF SUBMITTALS. ALL SUBMITTALS SHALL LIST DATE OF DRAWINGS USED TO PREPARE THE SUBMITTAL.</p> <p>1E) BECAUSE THIS IS A PHASED CONSTRUCTION PROJECT, THE CONTRACTOR MUST ANTICIPATE ADDITIONAL DRAWING REVISIONS AFTER EARLY BID PACKAGES HAVE BEEN ISSUED. THESE REVISIONS WILL INCREASE THE CONSTRUCTION COST. THE CONTRACTOR SHALL INCLUDE THESE ANTICIPATED COSTS IN ANY BIDS OR PRICE GUARANTEES PROVIDED TO THE OWNER.</p>
GENERAL NOTES
<p>1) GENERAL: 1A) ENGINEER: REFERENCES ON THE STRUCTURAL DRAWINGS TO 'ENGINEER' MEAN THE STRUCTURAL ENGINEER OF RECORD. OTHER ENTITIES ARE SPECIFICALLY NOTED AS "CONTRACTOR'S ENGINEER", "MECHANICAL ENGINEER", ETC.</p> <p>1B) UNDERGROUND UTILITIES: LOCATE EXISTING UTILITIES AND NOTIFY ARCHITECT OF EXISTING UTILITIES OR SUBGRADE CONDITIONS WHICH INTERFERE WITH WORK.</p> <p>1C) STRUCTURAL ELEMENTS ARE CENTERED ON GRID LINES AND GRID LINE INTERSECTIONS UNLESS DIMENSIONED OTHERWISE.</p> <p>2) USE OF DRAWINGS: 2A) DO NOT SCALE DRAWINGS.</p> <p>2B) DETAILS ON DRAWINGS TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.</p> <p>2C) DETAILS NOTED TYPICAL APPLY TO ALL SIMILAR CONDITIONS. WHERE NO SPECIFIC DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ELSEWHERE ON THE PROJECT.</p> <p>2D) WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, AND GENERAL NOTES:</p> <ul style="list-style-type: none">CONTACT THE ARCHITECT PRIOR TO PROCEEDING WITH CONSTRUCTIONTHE MORE STRINGENT REQUIREMENTS SHALL GOVERN FOR BIDDING / PRICING <p>3) EXISTING STRUCTURES: 3A) CONTRACT DOCUMENTS HAVE BEEN PREPARED USING AVAILABLE DRAWINGS AND SITE OBSERVATION AS PERMITTED BY ACCESS RESTRICTIONS DURING DESIGN.</p> <p>3B) DURING CONSTRUCTION, THE CONTRACTOR MAY ENCOUNTER EXISTING CONDITIONS WHICH ARE NOT KNOWN OR ARE AT VARIANCE WITH PROJECT DOCUMENTATION. CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ALL CONDITIONS NOT PER THE CONTRACT DOCUMENTS. EXAMPLES INCLUDE:</p> <ul style="list-style-type: none">SIZES OR DIMENSIONS OTHER THAN THOSE SHOWNDAMAGE OR DETERIORATION TO MATERIALS AND COMPONENTSCONDITIONS OF INSTABILITY OR LACK OF SUPPORTITEMS NOTED AS EXISTING ON THE DRAWINGS BUT NOT FOUND IN THE FIELD <p>3C) PREPARE DIMENSIONAL DRAWINGS OF ALL DISCOVERED ITEMS.</p> <p>3D) CONTRACTOR SHALL FIELD VERIFY ALL EXISTING STRUCTURAL CONDITIONS PRIOR TO SUBMITTING SHOP DRAWINGS.</p> <p>3E) CONTRACTOR SHALL MAKE ALLOWANCE FOR THE RESOLUTION OF SUCH DISCOVERIES IN THE CONSTRUCTION SCHEDULE.</p> <p>3F) SUBMIT A DIMENSIONED DRAWING OF ALL NEW OPENINGS THROUGH EXISTING STRUCTURE AND SECURE APPROVAL PRIOR TO CUTTING. NEW OPENING MAY BE EITHER SHOWN ON THE CONTRACT DOCUMENTS OR PROPOSED BY THE CONTRACTOR. DRAWING SHALL SHOW:</p> <ul style="list-style-type: none">VERTICAL & HORIZONTAL LOCATION AND SIZE OF NEW OPENING(S)ALL EXISTING OPENINGS IN THE VICINITY OF THE NEW OPENING(S)ALL EXISTING STRUCTURE (BEAMS, COLUMNS, SLABS, WALLS, ETC) IN THE VICINITY OF THE NEW OPENING(S)ALL REINFORCING BAR SIZES AND POSITIONS (LAYOUT LOCATION AND DEPTH) CONFLICTING WITH OR IN THE VICINITY OF THE NEW OPENING(S).

GENERAL NOTES
<p>4) COORDINATION: 4A) STRUCTURAL DRAWINGS ARE NOT STAND-ALONE DOCUMENTS AND ARE INTENDED TO BE USED IN CONJUNCTION WITH CIVIL, ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND DRAWINGS FROM OTHER DISCIPLINES. THE CONTRACTOR SHALL COORDINATE ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS INTO SHOP DRAWINGS AND WORK.</p> <p>4B) COORDINATE DIMENSIONS OF ALL OPENINGS, BLOCKOUTS, DEPRESSIONS, ETC., WITH ARCHITECTURAL DRAWINGS, DRAWINGS FROM OTHER DISCIPLINES, AND FIELD CONDITIONS PRIOR TO SHOP DRAWING SUBMITTAL.</p> <p>4C) SEE ARCHITECTURAL PLANS FOR INTERIOR PARTITIONS. PARTITION FRAMING SHALL BE CONNECTED TO THE PRIMARY STRUCTURE IN SUCH A WAY SO AS TO ALLOW FOR VERTICAL LIVE LOAD DEFLECTIONS OF SPAN/360 AT FLOOR FRAMING OR SPAN/240 AT ROOF FRAMING. DO NOT MAKE RIGID VERTICAL AND HORIZONTAL CONNECTIONS TO THE PRIMARY STRUCTURE IN THE PLANE OF THE PARTITION.</p> <p>5) SUBMITTALS AND SUBSTITUTIONS: 5A) SUBMITTALS:</p> <ul style="list-style-type: none">IF THE CONTRACTOR REQUESTS A CHANGE FROM THE STRUCTURAL DRAWINGS, IT SHALL BE APPROVED BY THE ARCHITECT AND DESIGNED BY MARTIN/MARTIN, INC. PRIOR TO SUBMITTING SHOP DRAWINGS. VARIATION SHALL BE INDICATED ON THE SHOP DRAWINGS. CONTRACTOR SHALL COMPENSATE MARTIN/MARTIN, INC. FOR MAKING THE CHANGE.CONSTRUCTION DOCUMENTS SHALL NOT BE REPRODUCED FOR USE IN SUBMITTALSALL SHOP DRAWINGS SHALL REFERENCE THE STRUCTURAL DRAWING NUMBER AND DETAIL USED TO PREPARE THE SUBMITTALSUBMIT A STATEMENT OF RESPONSIBILITY FOR CONSTRUCTION OF THE LATERAL LOAD RESISTING SYSTEM IDENTIFIED IN THE DESIGN CRITERIA IN ACCORDANCE WITH IBC 2006 SECTION 1706. <p>5B) SUBSTITUTIONS: ARCHITECT'S APPROVAL SHALL BE SECURED FOR ALL SUBSTITUTIONS</p> <p>5C) NONCONFORMANCE: NOTIFY ARCHITECT OF CONDITIONS NOT CONSTRUCTED PER THE CONTRACT DOCUMENTS PRIOR TO PROCEEDING WITH CORRECTIVE WORK. SUBMIT PROPOSED REPAIR TO THE ARCHITECT FOR ACCEPTANCE. CONTRACTOR SHALL COMPENSATE MARTIN/MARTIN, INC. FOR DESIGNING THE REPAIR.</p> <p>5D) ALL SHOP DRAWINGS SHALL BE SUBMITTED IN ELECTRONIC FORMAT ONLY.</p> <p>6) TEMPORARY CONDITIONS, CONSTRUCTION ENGINEERING, AND OSHA STANDARDS: 6A) THE STRUCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION AND ONLY FOR LOADS ANTICIPATED DURING THE STRUCTURE'S SERVICE LIFE.</p> <p>6B) THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL TEMPORARY BRACING AND/OR SUPPORT THAT MAY BE REQUIRED AS THE RESULT OF THE CONTRACTOR'S CONSTRUCTION METHODS AND/OR SEQUENCES. REFER TO "LATERAL LOAD RESISTING SYSTEM DESCRIPTION" IN DESIGN CRITERIA FOR ADDITIONAL INFORMATION. CONTRACTOR SHALL PROVIDE ALL REQUIRED ENGINEERING AND OTHER MEASURES TO ACHIEVE THE MEANS, METHODS, AND SEQUENCES OF WORK WHICH MAY INCLUDE, BUT IS NOT LIMITED TO:</p> <ul style="list-style-type: none">LAYOUTDESIGN FOR FORMWORK, SHORING, AND RESHORINGDESIGN OF CONCRETE MIXESERECTION PROCEDURES WHICH ADDRESS STABILITY OF THE FRAME DURING CONSTRUCTIONWELD PROCEDURESDESIGN OF TEMPORARY BRACING OF WALLS FOR WIND, SEISMIC, OR SOIL LOADSSURVEYING TO VERIFY CONSTRUCTION TOLERANCESEVALUATION OF TEMPORARY CONSTRUCTION LOADS ON STRUCTURE DUE TO EQUIPMENT AND MATERIALSSTRUCTURAL ENGINEERING TO RESIST ANY OTHER LOADS NOT IDENTIFIED ON DESIGN DRAWINGS <p>6C) NOTHING SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE CONSTRUED AS ELIMINATING THE NEED FOR THE CONTRACTOR TO COMPLY WITH ALL OSHA REQUIREMENTS. WHERE THE STRUCTURAL DRAWINGS APPEAR TO CONFLICT WITH OSHA REQUIREMENTS, THE STRUCTURAL DRAWINGS REPRESENT FINAL CONDITIONS ONLY.</p> <ul style="list-style-type: none">THE CONTRACTOR SHALL ADD ALL ERECTION FRAMING NECESSARY TO COMPLY WITH OSHA.THE CONTRACTOR SHALL ADD ALL NECESSARY BOLTS, ANCHOR BOLTS, PLATES, STIFFENER PLATES, STABILIZER PLATES, BRIDGING, BRACING, BEARING SEATS, COLUMN SPLICES, ETC., AS WELL AS CLOSURES FOR OPENINGS. IN ADDITION, FIELD WELD ANYTHING THAT MAY BE CONSIDERED A TRIP HAZARD, SUCH AS SHEAR STUDS, AFTER PROTECTIVE DECKING IS INSTALLED.WASHERS OR RINGS MAY BE WELDED TO COLUMNS TO PROVIDE FOR SAFETY CABLES. HOLES IN COLUMNS FOR SAFETY CABLES SHALL BE SHOP INSTALLED AND SHALL BE INDICATED ON SHOP DRAWINGS. ADJUST COLUMN SPLICE LOCATIONS OR ADD COLUMN SPLICES AS NECESSARY TO COMPLY WITH OSHA REQUIREMENTS. SUBMIT PROPOSED LOCATIONS.HOLES IN CONCRETE COLUMNS FOR SAFETY CABLES SHALL BE INDICATED ON THE SHOP DRAWINGS, SHALL BE LIMITED TO 1"Ø MAXIMUM, LOCATED WITHIN THE MIDDLE THIRD OF THE COLUMN AND SHALL BE CREATED USING SLEEVES. DO NOT DRILL OR CORE COLUMNS TO INSTALL SAFETY CABLES.ALL METAL JOISTS REQUIRED BY OSHA TO BE BOLTED SHALL HAVE ERECTION BOLTS INSTALLED REGARDLESS OF FINAL CONNECTION SHOWN ON THE STRUCTURAL DRAWINGS.

CONCRETE NOTES
<p>1) GENERAL: 1A) ALL WORK SHALL CONFORM WITH ACI 301-10, UNLESS NOTED OTHERWISE IN DRAWINGS.</p> <p>1B) DETAIL BARS IN ACCORDANCE WITH THE DRAWINGS AND ACI PUBLICATION SP-66 (2004); "ACI DETAILING MANUAL"</p> <p>2) REINFORCING MATERIALS: 2A) SEE 'REINFORCING MATERIAL TABLE'</p> <p>3) REINFORCING FABRICATION: 3A) SPLICES:</p> <ul style="list-style-type: none">NO SPLICING OF REINFORCEMENT PERMITTED EXCEPT AS NOTED ON DRAWINGS. MAKE BARS CONTINUOUS AROUND CORNERS WHERE DETAIL NOT PROVIDED. WHERE PERMITTED, SPLICES MAY BE MADE BY CONTACT LAPS.SEE 'LAP SPLICE SCHEDULE' FOR LAP LENGTHS.SPLICE CONTINUOUS TOP AND BOTTOM BARS IN WALLS, BEAMS, AND GRADE BEAMS 'LTS' UNLESS NOTED OTHERWISE.SPLICE TOP BARS AT MIDSPAN AND BOTTOM BARS OVER SUPPORT UNLESS NOTED OTHERWISE. <p>3B) MISCELLANEOUS REINFORCING REQUIREMENTS:</p> <ul style="list-style-type: none">PROVIDE ADDITIONAL BARS OR STIRRUPS REQUIRED TO SECURE REINFORCING IN PLACE DURING CONCRETE PLACEMENT.MAKE ALL REINFORCING BAR BENDS IN THE FABRICATOR'S SHOP UNLESS NOTED.NO WELDING OF REINFORCING PERMITTED UNLESS NOTED ON DRAWINGS. WHERE PERMITTED, PERFORM WELDING IN ACCORDANCE WITH AWS D1.4-2011.PROVIDE ADDED REINFORCING TO TRIM ALL OPENINGS, NOTCHES, AND REENTRANT CORNERS AS NOTED IN TYPICAL DETAILS. <p>4) STRUCTURAL CONCRETE MIX REQUIREMENTS: 4A) SEE 'CONCRETE MIX TABLE'</p> <p>5) SLAB-ON-GRADE: 5A) VERIFY ALKALINITY OF CONCRETE SURFACE. SLAB VAPOR TRANSMISSION, AND SLAB FLATNESS/LEVELNESS ARE COMPATIBLE WITH FLOORING SYSTEM AND ADHESIVES PRIOR TO INSTALLING FLOORING.</p> <p>5B) TAKE PRECAUTIONS TO MINIMIZE SLAB CURLING. GRIND SLAB OR USE LEVELING COMPOUND IF FLOOR FLATNESS AND LEVELNESS VALUES ARE NOT ACCEPTABLE TO THE ARCHITECT.</p> <p>6) NON-SHRINK GROUT: 6A) CONFORM TO ASTM C1107</p> <p>6B) ACHIEVE 6000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.</p> <p>7) PLACING REINFORCEMENT: 7A) REINFORCEMENT PROTECTION:</p> <ul style="list-style-type: none">SEE 'REBAR COVER TABLE'SEE ACI 117-10 FOR REINFORCEMENT PLACING TOLERANCES <p>7B) PROVIDE ACCESSORIES NECESSARY TO PROPERLY SUPPORT REINFORCING AND WELDED WIRE REINFORCEMENT AT POSITIONS SHOWN ON PLANS. ALL REINFORCING, DOWELS, BOLTS, AND EMBEDDED PLATES SHALL BE SET AND TIED IN PLACE BEFORE THE CONCRETE IS POURED. "STABBING" INTO PREVIOUSLY PLACED CONCRETE IS NOT PERMITTED.</p> <p>8) CONSTRUCTION/CONTROL JOINTS: 8A) CONSTRUCTION JOINT LOCATION AND CASTING SEQUENCE SHOWN ON THE ARCHITECTURAL DRAWINGS IS SUGGESTED AND HAS BEEN ARRANGED TO MINIMIZE THE EFFECTS OF ELASTIC AND LONG-TERM SHORTENING. SUBMIT DRAWINGS SHOWING PROPOSED CONSTRUCTION JOINT LOCATION AND CASTING SEQUENCE.</p> <p>8B) CONSTRUCTION JOINTS IN SLABS-ON-GRADE SHALL BE LOCATED TO ACCOMMODATE THE MAXIMUM LENGTH AND AREA THE CONTRACTOR CAN REASONABLY POUR, FINISH, AND JOINT IN THE SAME DAY, BUT SHALL NOT EXCEED 150 FEET WITH A MAXIMUM AREA OF 15,000 SQUARE FEET UNLESS APPROVED BY THE ENGINEER.</p> <p>8C) CONCRETE CONSTRUCTION JOINT SURFACE SHALL BE CLEANED AND ALL LAITANCE AND LOOSE MATERIAL REMOVED PRIOR TO SECOND CONCRETE PLACEMENT.</p> <p>9) MODIFICATIONS TO HARDENED OR EXISTING CONCRETE 9A) UNLESS NOTED ON THE STRUCTURAL DOCUMENTS MODIFICATIONS AS LISTED BELOW SHALL NOT BE MADE TO HARDENED OR EXISTING CONCRETE WITHOUT APPROVAL OF THE ARCHITECT:</p> <ul style="list-style-type: none">SAW CUTTINGCORINGCHIPPING <p>9B) DO NOT CUT OR DAMAGE ANY REINFORCING WITHOUT APPROVAL OF THE ENGINEER.</p> <p>10) SLEEVES, OPENINGS, AND EMBEDDED PIPE/CONDUITS: 10A) GENERAL</p> <ul style="list-style-type: none">REFER TO TYPICAL DETAILS FOR REQUIREMENTS FOR CONDUIT AND PIPE EMBEDDED IN WALLS AND SLABSREFER TO TYPICAL DETAILS FOR SPACING AND LAYOUT LIMITATIONS FOR SLEEVES AND OPENINGSFORM OPENINGS AND PROVIDE SLEEVES BEFORE PLACING CONCRETE, CORING OF CONCRETE IS NOT PERMITTEDAT COMPOSITE SLABS DO NOT CUT DECK FOR AT LEAST 7 DAYS AFTER CONCRETE PLACEMENT <p>10B) REINFORCING</p> <ul style="list-style-type: none">REFER TO TYPICAL DETAILS FOR REINFORCEMENT REQUIREMENTS AT SLEEVES, OPENINGS OR CONDUITDO NOT CUT REINFORCING WHICH MAY CONFLICT

FE NOTES

REINFORCING MATERIAL TABLE				
REINF ELEMENT	ASTM	Fy (KSI)	Fu (KSI)	COMMENTS
TYP REINFORCING	A615	60	90	-
WELDED & FIELD BENT REINF	A706	60	80	-
EPOXY COATING OF REINFORCING	A775 OR A934	-	-	-

CONCRETE MIX TABLE							
CONC MIX TYPE	INTENDED USE	28 DAY STRENGTH f'c (KSI)	CONC WEIGHT	MAX W/C RATIO, INCLUDING FLY ASH	MAX AGGREGATE SIZE, IN	TOTAL AIR CONTENT (%), NOTE a	OTHER REQTS, NOTE b
1	INTERIOR CONCRETE SLABS ON GRADE AND FOUNDATION ELEMENTS	4	NWC	-	1	NP	MSS
2	ALL CONC OTHERWISE NOT SPECIFIED	4	NWC	-	1	NP	-

CONCRETE MIX TABLE NOTES:

PROPORTIONS OF MATERIALS IN CONCRETE MIX SHALL BE ESTABLISHED TO:

- PROVIDE THE MINIMUM COMPRESSIVE STRENGTH AS INDICATED IN THE MIX TABLE. DO NOT EXCEED THE MAXIMUM WATER-CEMENT RATIO NOTED.
- PROVIDE WORKABILITY AND CONSISTENCY TO PERMIT CONCRETE TO BE WORKED READILY INTO FORMS AND AROUND REINFORCEMENT UNDER CONDITIONS OF PLACEMENT TO BE EMPLOYED, WITHOUT SEGREGATION OR EXCESSIVE BLEEDING. CONTRACTOR SHALL SELECT APPROPRIATE SLUM...

USE TYPE I / II PORTLAND CEMENT UNLESS NOTED OTHERWISE. FOR CONCRETE MIXES USED ON FLOORS MINIMUM CEMENTITIOUS CONTENT SHALL BE 540 POUNDS PER CUBIC YARD

FOR CONCRETE PLACED BY PUMPING PROVIDE CONCRETE MIX FLOWABILITY TO FACILITATE PUMPING...


a. WHERE AIR CONTENT IS INDICATED IN THE MIX TABLE, PROVIDE AIR ENTRAINING ADMIXTURE. TOTAL AIR CONTENT LIMITS INCLUDE BOTH ENTRAINED AND ENTRAPPED AIR +/- 1 1/2%. "NP" IN COLUMN INDICATES ADDITION OF ENTRAINED AIR IS NOT PERMITTED EXCEPT WHERE CONTRACTOR CAN...

b. ABBREVIATIONS FOR OTHER REQUIREMENTS AS FOLLOWS:

MSS = MAXIMUM SHRINKAGE STRAIN LIMITED

FOUNDATION NOTES			
<p>1) DESIGN CRITERIA:</p> <p>1A) NO PROJECT GEOTECHNICAL REPORT WAS AVAILABLE FOR THIS PROJECT. DESIGN BASED ON ASSUMED VALUES PER IBC 1806.2.</p> <p>1B) THE FOLLOWING IBC MINIMUM VALUES PER TABLE 1806.2 HAVE BEEN USED FOR THIS PROJECT:</p> <ul style="list-style-type: none">- ALLOWABLE VERTICAL BEARING PRESSURE = 1,500 PSF- ALLOWABLE LATERAL BEARING PRESSURE = 150 PCF <p>1C) GEOTECHNICAL REPRESENTATIVE TO INSPECT ONSITE MATERIALS PRIOR TO POURING FOUNDATIONS. REVIEW ADEQUACY OF ONSITE MATERIALS AND PROVIDE RECOMMENDATIONS TO ACHIEVE THE ALLOWABLE VALUES STATED ABOVE.</p>			

STRUCTURAL DRAWING LIST			
SHEET NUMBER	SHEET NAME	ISSUED FOR	ISSUE DATE
S-0.1	GENERAL NOTES	100% CD	12/08/23
S-0.2	GENERAL NOTES	100% CD	12/08/23
S-1.0	FOUNDATION PLAN	100% CD	12/08/23
DDS-1.1	WALL FRAMING PLAN - MAIN FLOOR	50% DD	12/08/23
DDS-1.2	MEZZANINE FLOOR FRAMING PLAN	50% DD	12/08/23
S-3.1	CONCRETE DETAILS	100% CD	12/08/23
S-3.2	CONCRETE DETAILS	100% CD	12/08/23



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HUGO ROUNDHOUSE INTERIORS

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REVISIONS

NO.	ISSUE	DATE
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PROJECT NO:

23.0213.S.01

DATE:

12/08/23

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SHEET TITLE:

GENERAL NOTES

SHEET NUMBER:

S-0.1

ML JOB #: 23-0213.S.01
PRINCIPAL ENGINEER
FOR DAVID WITTMAN
PROJECT MANAGER: DAVID WITTMAN

DESIGNER: ORSA KROEGER
LEAD REVIT TECH: JOEL JONES
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MM JOB #: 23.0213.S.01
PRINCIPAL: JONAH D
EOR: DAVID WITTMAN
PROJECT MANAGER: DAVID WITTMAN

POST-INSTALLED ANCHOR NOTES

1) PERSONNEL REQUIREMENTS:
1A) THE CONTRACTOR SHALL ARRANGE AN ANCHOR MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING FOR ALL OF THEIR ANCHORING PRODUCTS SPECIFIED. SUBMIT DOCUMENTED CONFIRMATION THAT ALL OF THE CONTRACTOR'S PERSONNEL WHO INSTALL ANCHORS HAVE PASSED THE TRAINING COURSE PRIOR TO THE COMMENCEMENT OF INSTALLING ANCHORS.

1B) PERSONNEL WHO WILL INSTALL HORIZONTAL OR UPWARDLY INCLINED ADHESIVE ANCHORS IN CONCRETE THAT SUPPORT SUSTAINED TENSION LOADS SHALL BE CERTIFIED BY THE ACI/CRSI ADHESIVE ANCHOR INSTALLER CERTIFICATION PROGRAM. THESE ANCHORS ARE DESIGNATED WITH A (CERT) AFTER THE ANCHOR CALL OUT. SUBMIT DOCUMENTED CONFIRMATION THAT PERSONNEL HAVE PASSED THE TRAINING COURSE PRIOR TO THE COMMENCEMENT OF INSTALLING ANCHORS.

2) INSTALLATION REQUIREMENTS:
2A) ALL POST-INSTALLED ANCHORS SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS AND PER MANUFACTURER'S ON-SITE TRAINING.

2B) ALL ADHESIVE ANCHORS AND ADHESIVE ANCHORED REINFORCEMENT DESIGNS ARE FOR INSTALLATION IN THE FOLLOWING CONDITIONS, UNLESS NOTED OTHERWISE. WRITTEN APPROVAL MUST BE RECEIVED FROM ENGINEER PRIOR TO INSTALLATION IN ALTERNATE CONDITIONS.

- DRY CONCRETE, UNLESS NOTED OTHERWISE.
- CONCRETE TEMPERATURE AT TIME OF INSTALLATION THROUGH CURE TIME MUST BE WITHIN THE TEMPERATURE RANGE SPECIFIED IN MANUFACTURER'S PRINTED INSTALLATION INSTRUCTION FOR ADHESIVE GEL AND CURE TIMES.
- ANCHOR HOLES TO BE HAMMER DRILLED AND CLEANED.
- CONCRETE MUST BE AT LEAST 21 DAYS OLD BEFORE INSTALLATION OF ANCHORS.
- HOLES TO BE CLEANED AND PREPARED IN STRICT ACCORDANCE WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS AND EVALUATION REPORT PRIOR TO ADHESIVE INJECTION.

2C) THE POSITION OF EXISTING REINFORCING BARS IN THE CONCRETE STRUCTURE SHALL BE LOCATED PRIOR TO INSTALLING POST INSTALLED ANCHORS OR REINFORCEMENT. EXISTING REINFORCEMENT SHALL BE LOCATED USING A SCANNER, GPR, X-RAY, CHIPPING OR OTHER MEANS. DO NOT DAMAGE OR CUT EXISTING REINFORCEMENT.

3) SUBSTITUTION REQUESTS:
3A) SUBSTITUTION REQUESTS FOR ALTERNATE PRODUCTS MUST BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER PRIOR TO USE. CONTRACTOR SHALL PROVIDE CALCULATIONS AND PRODUCT DATA DEMONSTRATING THAT THE SUBSTITUTED PRODUCT IS IN COMPLIANCE WITH THE RELEVANT BUILDING CODES, LOAD RESISTANCE, INSTALLATION CATEGORY, CREEP APPROVAL, IN-SERVICE TEMPERATURE AND INSTALLATION TEMPERATURE OF THE SPECIFIED PRODUCT.

POST-INSTALLED ANCHOR TABLE - SIMPSON				
ANCHOR TYPE	PRODUCT	Fy (KSI)	Fu (KSI)	COMMENT
ADHESIVE (IN CONCRETE)	SET-3G	-	-	SUBMIT CALCULATIONS FOR SUBSTITUTIONS
ADHESIVE ANCHOR RODS	-	36 MIN	58 MIN	THREADED ROD, UNGREASED
EXPANSION ANCHORS (IN CONCRETE)	SIMPSON STRONG BOLT	-	-	SUBMIT CALCULATIONS FOR SUBSTITUTIONS
SCREW ANCHORS	SIMPSON TITEN HD	-	-	SUBMIT CALCULATIONS FOR SUBSTITUTIONS

WOOD NOTES

1) LAMINATED MEMBER SIZES:
1A) LVL SIZES SHOWN ARE NET. OTHER MEMBER SIZES ARE NOMINAL.

2) FRAMING LUMBER:
2A) DRY (19% MAXIMUM MOISTURE CONTENT AT THE TIME OF INSTALLATION), HEM-FIR WITH MINIMUM DESIGN VALUES BASED ON THE 2005 NDS. SEE 'FRAMING LUMBER TABLE' FOR MINIMUM GRADES.

2B) BEAMS AND STRINGERS USED WITH CANTILEVERS OR CONTINUOUS SPANS SHALL BE GRADED TO PROVIDE THE SPECIFIED ALLOWABLE STRESSES OVER THE ENTIRE MEMBER LENGTH.

3) FABRICATED LUMBER:
3A) FABRICATED LUMBER DESIGNATIONS ARE THOSE MANUFACTURED BY ILEVEL, BOISE, IDAHO.

3B) FABRICATED LUMBER IS DESIGNATED ON THE DRAWINGS AS ONE OF THE FOLLOWING: MICROLAM (LVL).

3C) FABRICATED LUMBER SHALL BE DRY.

3D) FABRICATED LUMBER DESIGNATIONS ARE THOSE MANUFACTURED BY WEYERHAUSER.

3E) MINIMUM PROPERTIES FOR LVL SHALL BE:
- E = 2,000,000psi
- Fb = 2,600psi
- Fv = 285psi

3E) FABRICATED RIMBOARD SHALL BE LAMINATED STRAND LUMBER.

4) SHEATHING:
4A) WOOD STRUCTURAL PANELS (WSP)
- WOOD STRUCTURAL PANELS SHALL BE APA RATED SHEATHING CONFORMING TO U.S. DEPARTMENT OF COMMERCE STANDARD PS 2-10.
- ALL WOOD PANELS SHALL BE EXPOSURE 1.

5) BLOCKING AND BRIDGING:
5A) PROVIDE 1" X 4" SIMPSON NC/NCA CROSS-BRIDGING AT 8' OC MAXIMUM SPACING FOR ALL SOLID SAWN WOOD JOISTS AND RAFTERS. PROVIDE FULL HEIGHT SOLID BLOCKING (MINIMUM WIDTH TO MATCH WIDTH OF FRAMING) BETWEEN ALL FRAMING MEMBERS (SOLID SAWN JOISTS AND RAFTERS, FABRICATED JOISTS AND RAFTERS AND TRUSSES) AT SUPPORTS.

6) NAILING:
- UNLESS NOTED OTHERWISE ON THE DRAWINGS, PROVIDE BOX NAILS COMMON NAILS SINKERS WITH SIZES SHOWN IN THE TABLE BELOW. MINIMUM NAILING SHALL BE IN ACCORDANCE WITH THE TYPICAL WOOD CONNECTION SCHEDULE AND IBC 2006 TABLE 2304.9.1

6B) WHERE COMMON NAILS ARE SPECIFIED, BOX NAILS OF EQUAL LENGTH MAY BE SUBSTITUTED PROVIDED ONE BOX NAIL IS ADDED FOR EVERY THREE COMMON NAILS SPECIFIED.

7) METAL CONNECTORS:
7A) FRAMING CONNECTORS SHALL CONFORM TO IBC 2006 SECTION 1715.1 FRAMING CONNECTOR DESIGNATIONS ARE THOSE MANUFACTURED BY SIMPSON STRONG-TIE COMPANY, SAN LEANDRO, CALIFORNIA. OTHER MANUFACTURER'S PRODUCTS MAY BE USED IF APPROVED BY THE ENGINEER. FURNISH NAILS AND/OR BOLTS OF DIAMETER, LENGTH, AND NUMBER SPECIFIED BY THE MANUFACTURER FOR EACH CONNECTOR.

7B) ALL CONNECTOR HOLES SHALL BE FILLED WITH PROPER NAILS/BOLTS INCLUDING OPTIONAL NAIL LOCATIONS FOR UPLIFT. ALL BOLT HOLES SHALL BE DRILLED INTO FRAMING MEMBERS. MAXIMUM HOLE DIAMETER IS 1/16" LARGER THAN THE BOLT DIAMETER.

8) OPENINGS:
8A) OPENING, POCKETS, ETC., SHALL NOT BE PLACED IN BEAMS, JOISTS, RAFTERS, STUDS, POSTS, COLUMNS, TIMBER AND OTHER STRUCTURAL MEMBERS UNLESS DETAILED ON THE STRUCTURAL DRAWINGS.

FRAMING LUMBER TABLE - HEM-FIR (HF)				
TYPE OF USE	GRADE	Fb (PSI)	Fv (PSI)	E (PSI)
LOAD BEARING STUDS (AND COLUMNS ASSEMBLED FROM STUDS)	NO. 2	850	150	1,300,000
NON-LOAD BEARING STUDS	STUD	675	150	1,200,000
FLOOR-JOIST	NO. 2	850	150	1,300,000
BEAMS & STRINGERS	NO. 1	1,050	140	1,300,000
POSTS & TIMBER	NO. 1	975	140	1,300,000
ALL OTHER	NO. 1	975	150	1,500,000

FASTENER TABLE			
FASTENER	DIAMETER	HEAD DIAMETER	LENGTH
8d COMMON NAIL	0.131"	0.281"	2.5"
10d COMMON NAIL	0.148"	0.312"	3"
12d COMMON NAIL	0.148"	0.312"	3.25"
16d COMMON NAIL	0.162"	.344"	3.5"

HUGO ROUNDHOUSE INTERIORS

3RD AVENUE
HUGO, COLORADO 80821

REVISIONS		
NO.	ISSUE	DATE
PROJECT NO: 23.0213.S.01		
DATE: 12/08/23		
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SHEET TITLE: GENERAL NOTES
SHEET NUMBER: S-0.2

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33RD AVENUE
HUGO, COLORADO 80821

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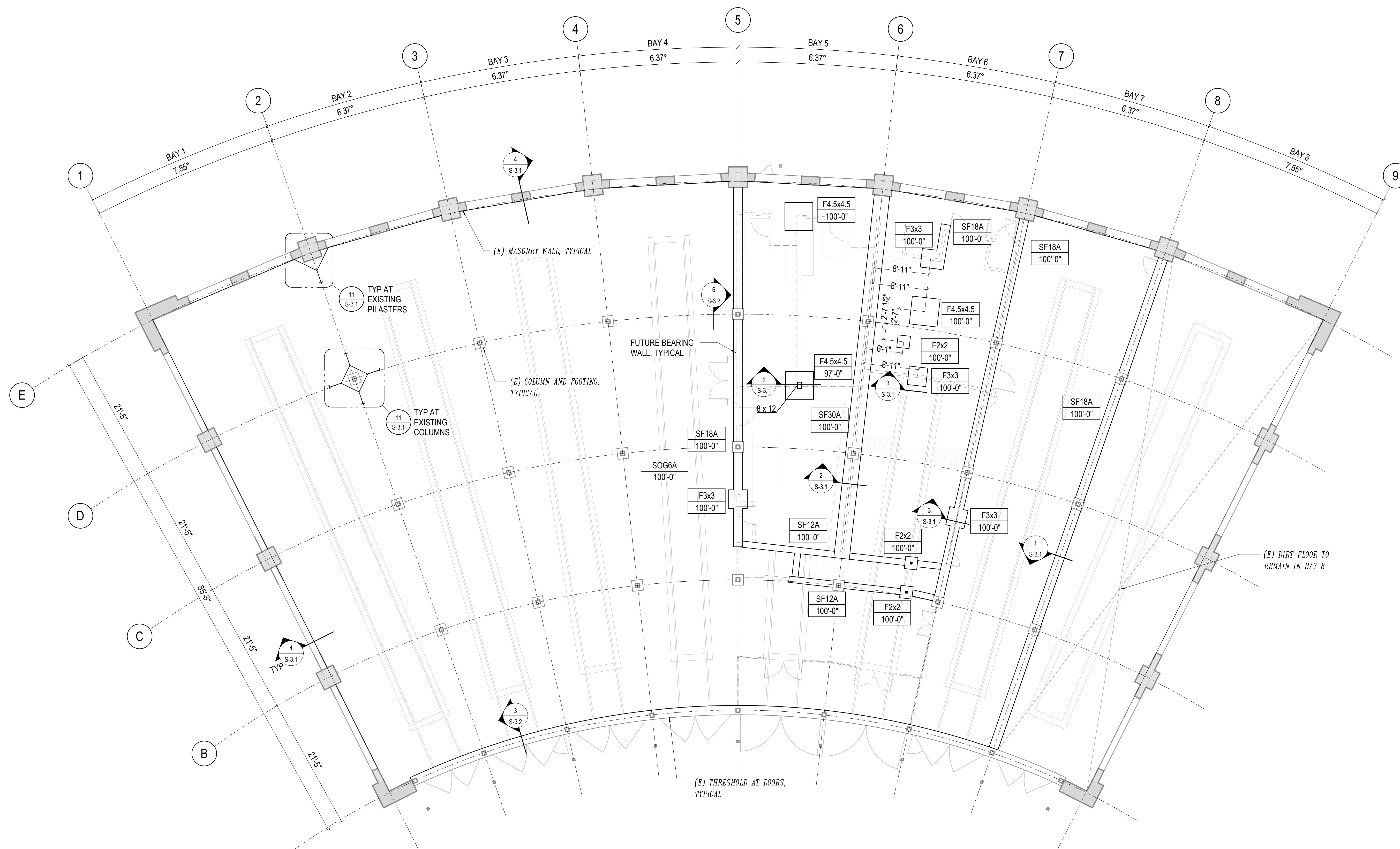
DATE: 12/08/

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SHEET TITLE:
FOUNDATION PLAN

SHEET NUMBER

S-1.0



FOUNDATION PLAN

1/8" = 1'-0"

FOUNDATION NOTES:

1) SLAB-ON-GRADE

1A) SEE S0 SERIES SHEETS FOR GENERAL NOTES

1B) SEE S3 SERIES SHEETS FOR TYPICAL CONCRETE DETAILS.

1C) SEE 6/S-3.1 FOR TYPICAL SLAB-ON-GRADE.

1D)SEE 12/S-3.1 FOR TYPICAL SLAB-ON-GRADE LAYOUT/INFORMATION.

1E) SEE ARCHITECTURAL DRAWINGS FOR SLAB SLOPES, DEPRESSIONS, FILL, PADS, CURBS, AND PENETRATIONS NOT SHOWN ON THE STRUCTURAL DRAWINGS

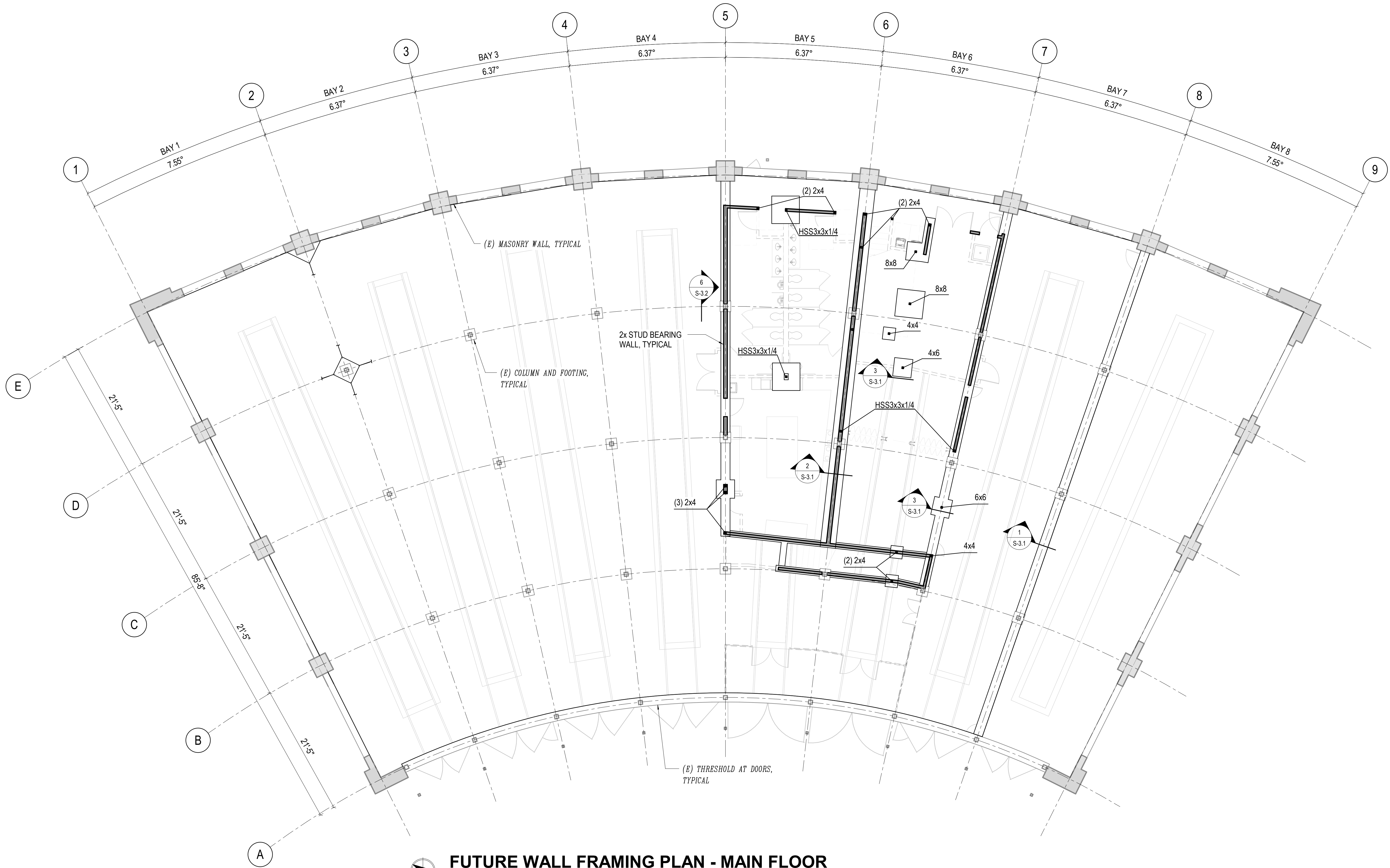
1F) SLAB-ON-GRADE TYPE AND ELEVATION ARE NOTED THUS:

SOGXX
XXX'-XX''

1G) FOOTING TYPE AND ELEVATION ARE NOTED THUS

XXXX
XXXX'-XX'

MM JOB # 23.0213.S.01
PRINCIPAL ENGINEER
FOR DAVID WITTMAN
PROJECT MANAGER DAVID WITTMAN
DESIGNER: RISA KROEGER
LEAD REVIT TECH: JOEL DINKES
DATE PRINTED: 7/26/2024 8:21:15 AM
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FUTURE WALL FRAMING PLAN - MAIN FLOOR

1/8" = 1'-0"

NOTES:

- 1) SEE S0 SERIES SHEETS FOR GENERAL NOTES.
- 2) SEE S1.0 FOR FOUNDATION AND SLAB NOTES.

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PROGRESS PRINTS NOT
FOR CONSTRUCTION

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PROJECT NO: 23.0213.S.01
DATE: 12/08/23

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SHEET TITLE:
WALL FRAMING
PLAN - MAIN
FLOOR
SHEET NUMBER:
DDS-1.1

3RD AVENUE
HUGO, COLORADO 80821

SHEET TITLE:
**MEZZANINE FLOOR
FRAMING PLAN**

SHEET NUMBER:
DDS-1.2


$$1/8" = 1'-0"$$

1) GENERAL:

1A) SEE S0 SERIES SHEETS FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS

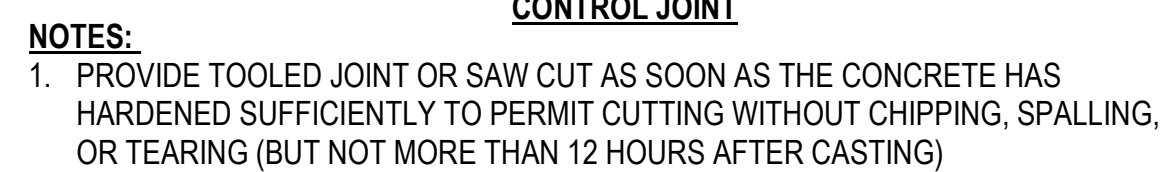
2A) ALL NEW FLOOR SHEATHING SHALL BE 3/4" STURD-I-FLOOR

2B) TOP OF WOOD BEAMS SHALL EQUAL BOTTOM OF WOOD SHEATHING OR PLANKING UNLESS NOTED OTHERWISE ON PLAN.

2C) HEADERS SHOWN ARE IN WALLS BELOW FRAMING.

2D) HEADERS ARE CALLED OUT AS: H(A)2xB-CD WHERE (A) INDICATES THE NUMBER OF MEMBERS, 2xB INDICATES THE SIZE OF MEMBER, C INDICATES THE NUMBER OF TRIMMER STUDS AND D INDICATES THE NUMBER OF KING STUDS.

3A) TOP OF STEEL BEAMS SHALL BE -1 1/2" FROM THE BOTTOM OF WOOD SHEATHING UNLESS NOTED OTHERWISE ON PLAN

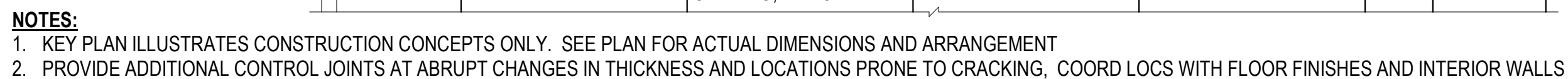


1ST POUR 2ND POUR

LTE LTE

LTS

MATCH SIZE AND NUMBER OF FOOTING BOTTOM BARS IF NO TOP BARS PRESENT



12 3/4" = 1'-0" TYP SOG KEY PLAN



SLAB REINF

BAR SUPPORTS

T

NOTE 1

2' CLR

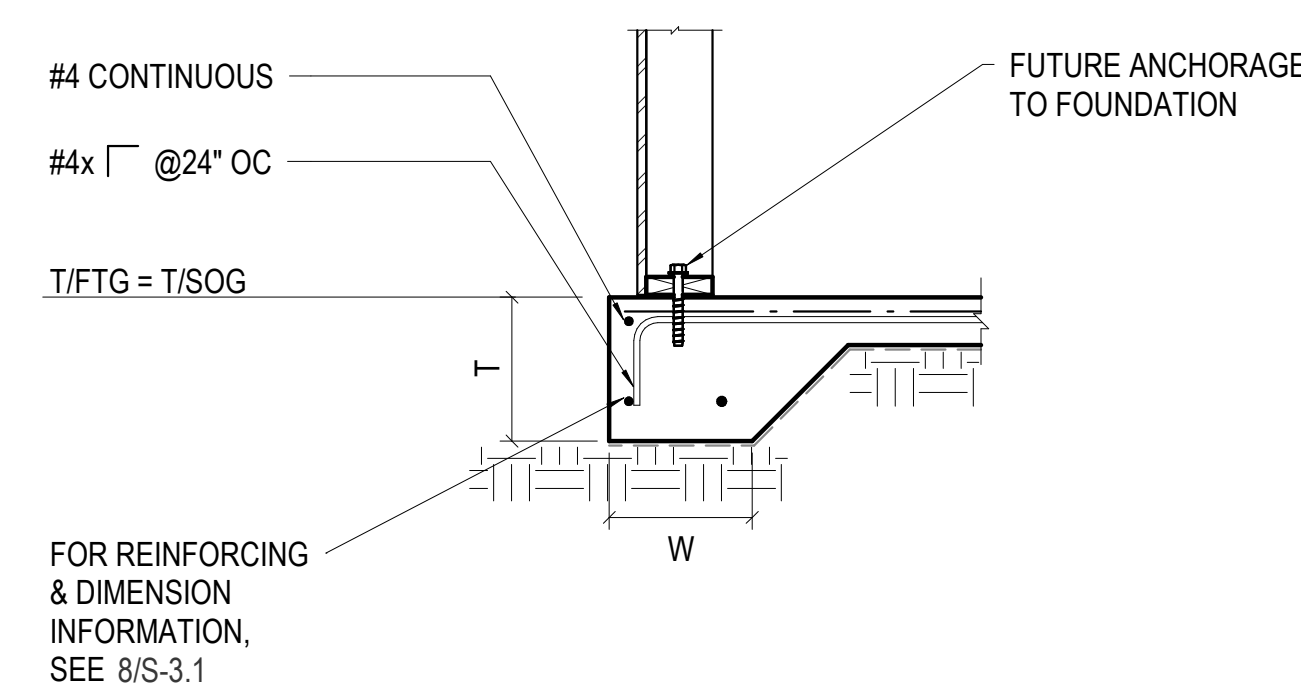
CONT VAPOR BARRIER
SEE ARCH

TYPICAL SLAB-ON-GRADE SECTION

NOTES:

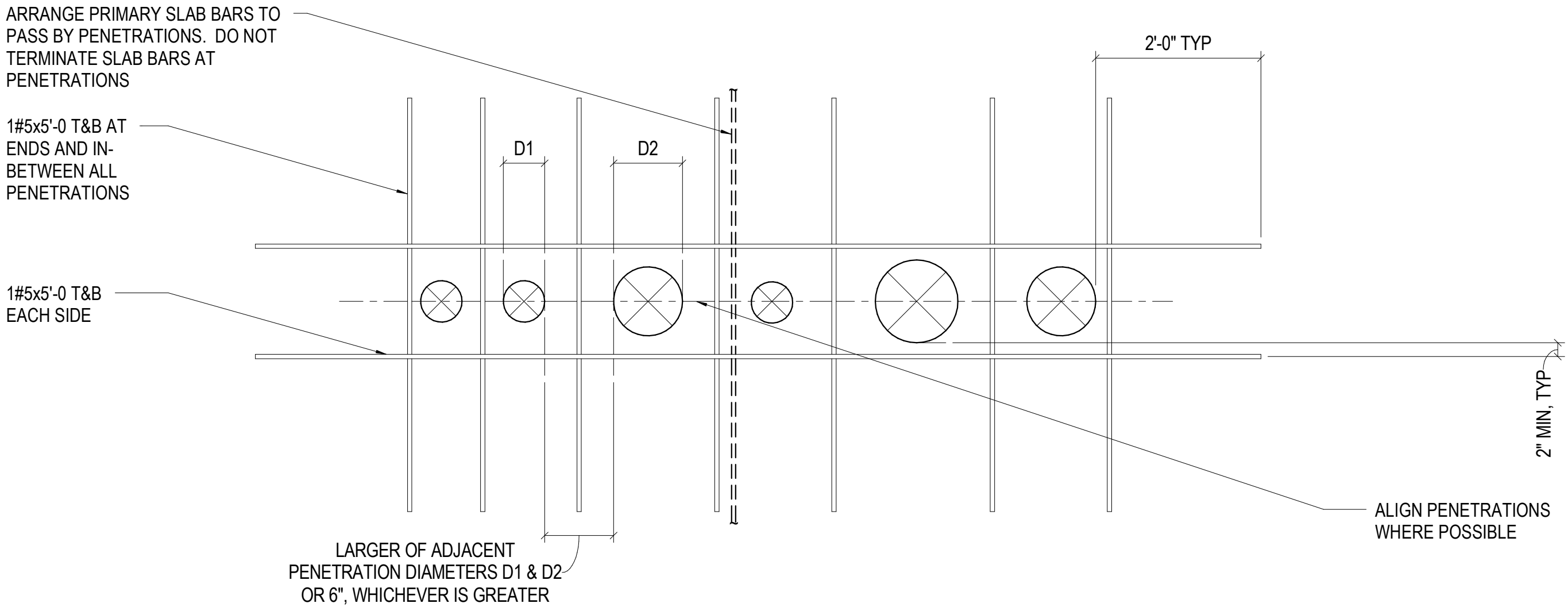
1. CONTRACTOR TO VERIFY EXISTING SUBGRADE CAN BE COMPACTED TO PROVIDE REQUIRED BEARING CAPACITY, OTHERWISE REPLACE W/ 6" MIN COMPACTED GRANULAR FILL.

6 1" = 1'-0" TYP SOG SCHEDULE



3 3/4" = 1'-0" INTERIOR FOOTING SCHEDULE

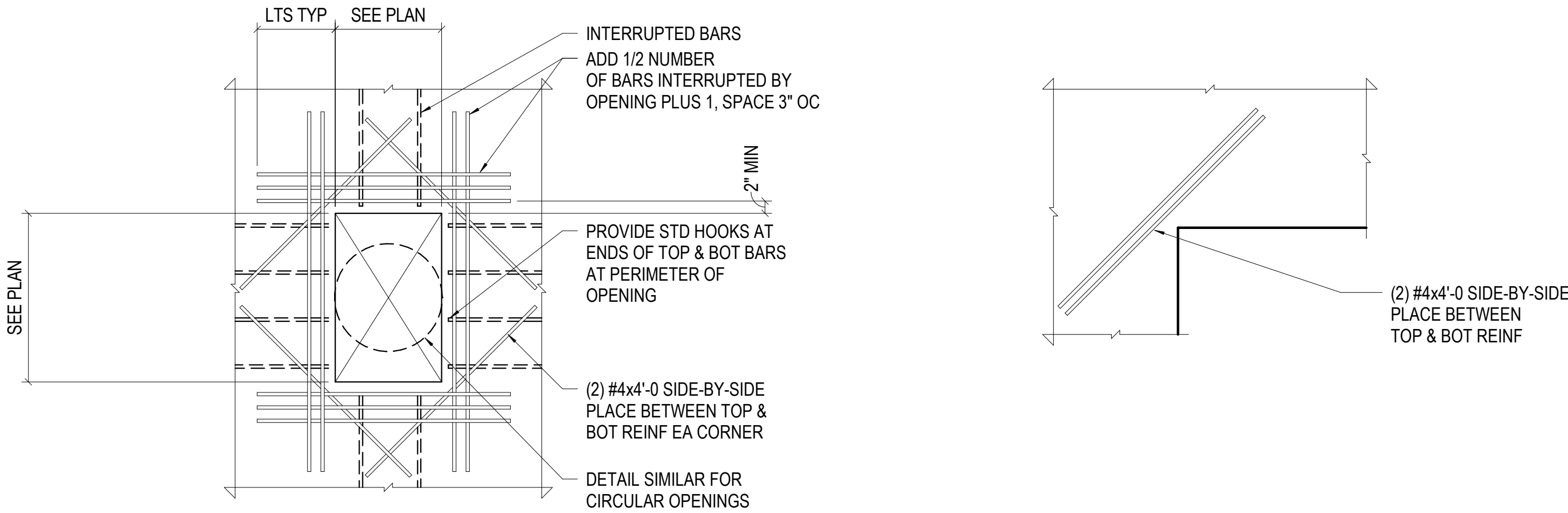
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DESIGNER: RISA KUEGLER
PRINCIPAL: JONAS
LEAD REVIT TECH: JOEL JONES
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EOR: DAVID WITTMAN
PROJECT MANAGER: DAVID WITTMAN



NOTES:

1. DETAIL DOES NOT APPLY FOR PENETRATIONS LARGER THAN 12" IN DIAMETER. SEE TYP SLAB OPENING DETAIL FOR SUCH PENETRATIONS

AT OPENINGS 12" OR LESS



TYPICAL OPENINGS

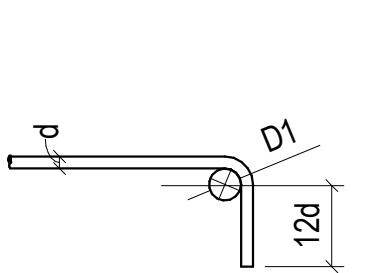
AT REENTRANT CORNERS

REBAR COVER TABLE

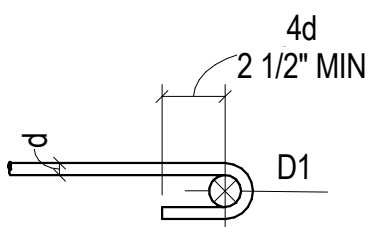
CASE	COVER (IN)
CONCRETE PLACED AGAINST EARTH	3
CONCRETE PLACED IN FORMS, EXPOSED TO WEATHER OR EARTH	2
SLABS OR WALLS NOT EXPOSED TO EARTH OR WEATHER	1

STANDARD BENDS

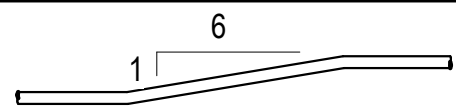
D1
#3 - #8
#9 - #11



90° HOOK



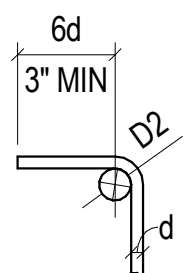
180° HOOK



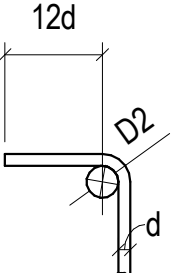
MAX OFFSET BEND

STIRRUP/TIE BENDS

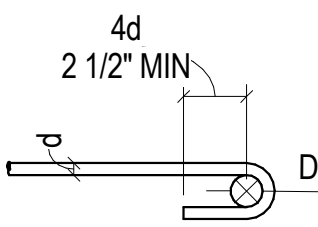
D2
#3 - #5
#6 - #8



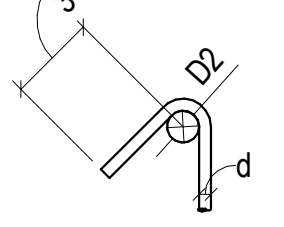
90° HOOK (#3-#5)



90° HOOK (#6-#8)



180° HOOK (#3-#5)



135° HOOK (#3-#5)

NOTES:

1. ALL BENDS SHALL BE MADE COLD

2. #14 & #18 BARS SHALL BE BEND TESTED & LAB APPROVED PRIOR TO BENDING

TYPICAL REINFORCING BENDS

LAP SPLICE & DEVELOPMENT LENGTHS (INCHES)
F_c=3,000 PSI, F_y=60,000 PSI

BAR SIZE	CLEAR COVER			1" 1.5" 2"+		1" 1.5" 2"+		1" 1.5" 2"+	
	LDH	LCE	LCS	LTE	LTS	LTE TOP & LTS	LTS TOP	LTE TOP & LTS	LTS TOP
#3	8	9	12	12	13	13	17	13	17
#4	12	11	15	14	18	18	23	18	23
#5	16	14	19	20	26	22	34	26	34
#6	21	17	23	27	35	26	46	35	46
#7	27	20	27	44	57	43	74	57	74
#8	32	22	30	55	72	54	93	72	93
#9	39	25	34	67	87	66	113	87	113
#10	45	28	38	79	103	79	134	103	134
#11	52	31	42	93	120	93	156	120	156

- GENERAL NOTES:**
- LENGTHS SPECIFICALLY DETAILED ON DRAWINGS SHALL GOVERN IN LIEU OF LAP LENGTHS SCHEDULED
 - ABBREVIATIONS:
 - A. 'LCE' = COMPRESSION EMBEDMENT LENGTH
 - B. 'LCS' = COMPRESSION LAP SPLICE LENGTH
 - C. 'LDH' = HOOK DEVELOPMENT LENGTH
 - D. 'LTE' = TENSION EMBEDMENT LENGTH
 - E. 'LTS' = TENSION LAP SPLICE LENGTH
 - 'TOP' BARS ARE HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12 IN OF FRESH CONCRETE IS CAST BELOW THE BAR
 - CLEAR COVER IS DEFINED FROM THE NEAREST FACE OF CONCRETE TO THE BAR BEING DEVELOPED OR SPLICED
 - UNLESS NOTED OTHERWISE, ALL HOOK BARS SHALL EXTEND TO THE FAR FACE LESS 2" COVER
 - IF A NOTE OR DETAIL CALLS FOR A BAR TO BE EMBEDDED L_d (DEVELOPMENT LENGTH) INTO CONCRETE, THIS SHALL CORRESPOND TO A 'LTE' LENGTH
 - IF A NOTE OR DETAIL REQUIRES A BAR TO HAVE A DEVELOPMENT OR LAP LENGTH BUT INSUFFICIENT DIMENSION IS AVAILABLE FOR THE LENGTH SCHEDULED, EXTEND BAR TO FAR FACE OF CONCRETE LESS 2" COVER AND HOOK

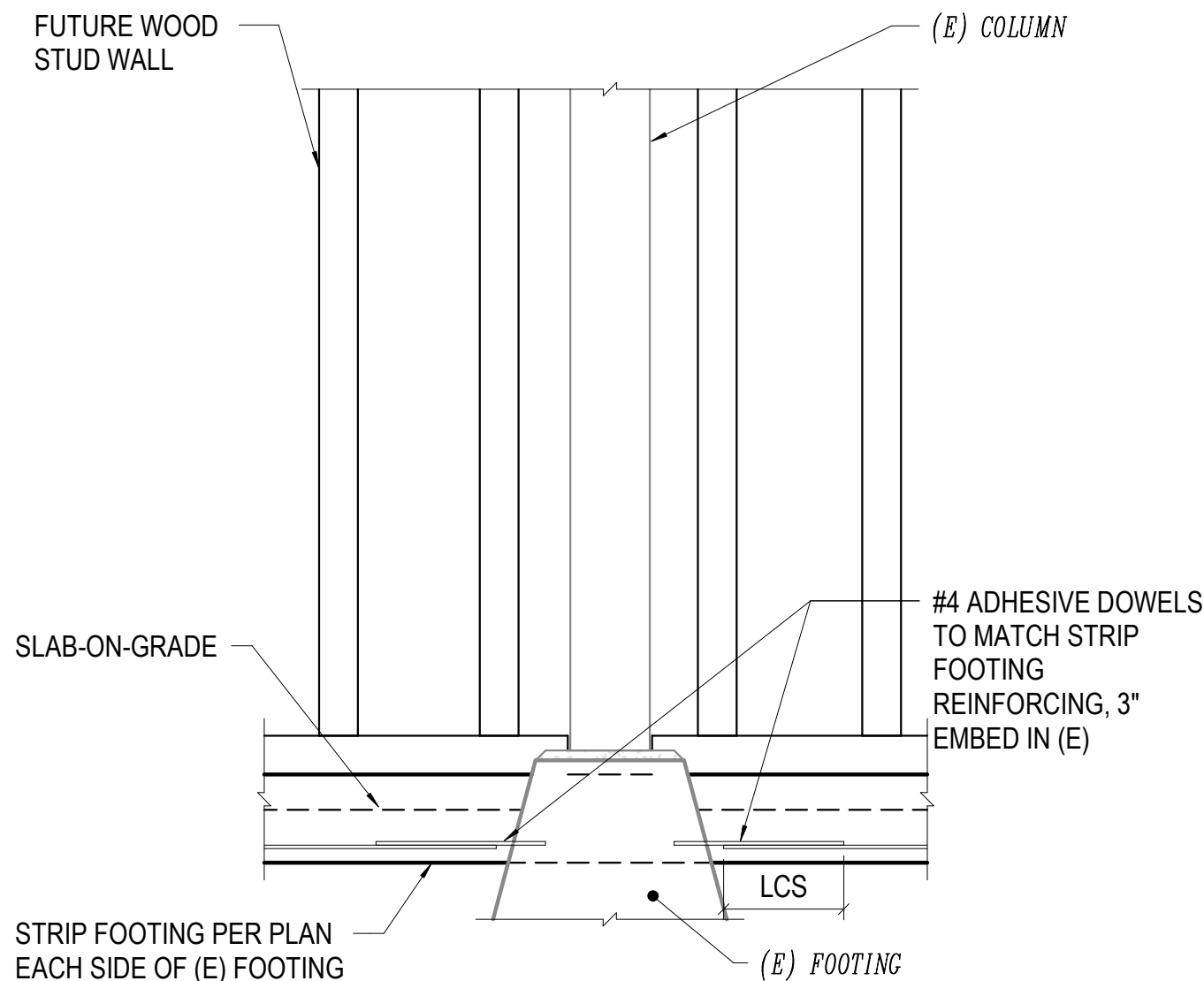
- ADJUSTMENTS TO GIVEN LENGTHS:**
- IF REINFORCING IS SPECIFIED AS EPOXY COATED, INCREASE SCHEDULED LENGTHS BY 50%
 - IF LIGHTWEIGHT AGGREGATE IS SPECIFIED, INCREASE SCHEDULED LAP BY LENGTHS 30%
 - SCHEDULED LENGTHS ASSUME:
 - A. CLEAR COVER IS AS INDICATED IN SCHEDULE
 - B. CLEAR SPACING BETWEEN BARS IS GREATER THAN 2xCLEAR COVER
 - C. IF EITHER CONDITION A OR B IS NOT MET FOR A GIVEN BAR, INCREASE LENGTHS BY 50%
 - LENGTHS NOTED BASED ON F_y = 60,000 PSI.
 - A. FOR OTHER YIELD STRENGTHS, MULTIPLY LENGTHS NOTED BY F_y/60,000

- LAP SPLICE NOTES:**
- ALL SPLICES SHALL BE WIRED IN CONTACT
 - ALL SPLICES ARE 'LTS' UNLESS NOTED OTHERWISE
 - SMALLER BAR LAP LENGTH SHALL BE USED WHEN SPLICING DIFFERENT SIZED BARS
 - A. COMPRESSION LAP LENGTH SHALL NOT BE LESS THAN 'LCE' OF THE LARGER BAR
 - B. TENSION LAP LENGTH SHALL NOT BE LESS THAN 'LTE' OF THE LARGER BAR
 - BUNDLED BAR SPLICES:
 - A. INDIVIDUAL BAR SPLICES WITHIN THE BUNDLE SHALL BE STAGGERED
 - B. INCREASE LAP LENGTH 20% FOR A 3 BAR BUNDLE
 - C. INCREASE LAP LENGTH 33% FOR A 4 BAR BUNDLE
 - TOP AND BOTTOM BEAM SPLICES SHALL BE STACKED VERTICALLY

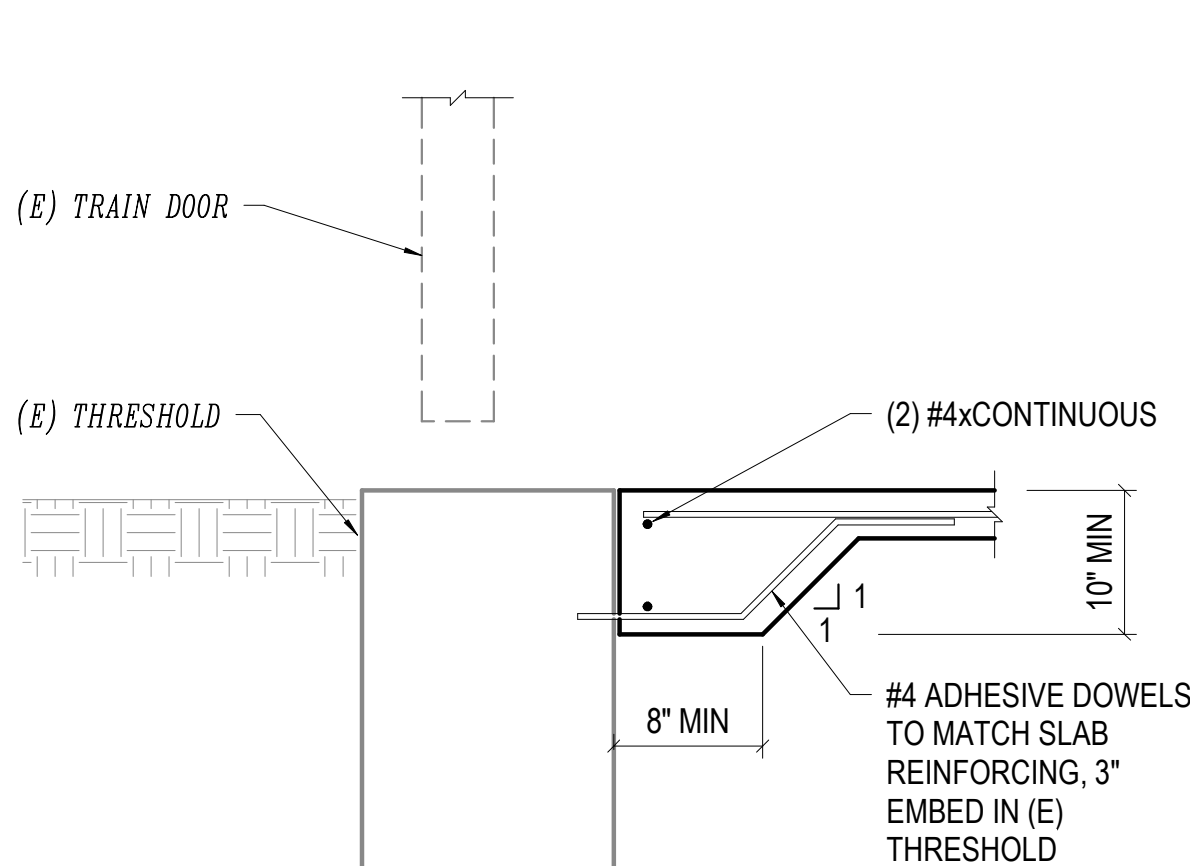
- HOOK EMBEDMENT NOTES:**
- SCHEDULED HOOK EMBEDMENT LENGTHS ASSUME:
 - A. SIDE COVER IS 2 1/2 INCHES OR GREATER
 - B. COVER BEYOND IS 2 INCHES OR GREATER
 - IF REINFORCING IS SPECIFIED AS EPOXY COATED, INCREASE SCHEDULED LENGTHS BY 20%
 - IF LIGHTWEIGHT AGGREGATE IS SPECIFIED, INCREASE SCHEDULED LENGTHS BY 30%
 - IF SIDE COVER IS LESS THAN 2 1/2 INCHES, INCREASE LENGTHS BY 40%

11 3/4" = 1'-0" TYP CIP SLAB OPENING/CORNER REINF

5 NO SCALE REINFORCING DEVELOPMENT, PLACEMENT, AND BEND INFO



6 1/2" = 1'-0" INTERFACE BETWEEN (E) COLUMN FOOTING & NEW STRIP FOOTING



NOTE:

1. SEE 6/S-3.1 FOR SLAB-ON-GRADE INFORMATION.

3 3/4" = 1'-0" SOG AT THRESHOLD

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SHEET TITLE:
**CONCRETE
DETAILS**

SHEET NUMBER:
S-3.2

SHEETMETAL SYMBOLS (NOT ALL SYMBOLS SHOWN ARE USED ON THESE DRAWINGS)			PLUMBING SYMBOLS (NOT ALL SYMBOLS SHOWN ARE USED ON THESE DRAWINGS)		
ABBR.	SYMBOL	DESCRIPTION	ABBR.	SYMBOL	DESCRIPTION
MAV		OUTSIDE AIR INTAKE DUCT	CO		HORIZONTAL CLEANOUT
		POSITIVE PRESSURE DUCT			VERTICAL CLEANOUT
		NEGATIVE PRESSURE DUCT			GAS COCK
		MANUAL VOLUME DAMPER IN DUCT			METER
		FLEXIBLE CONNECTION IN DUCT			SHOCK ABSORBER
		FLEXIBLE DUCT WITH SPIN-IN FITTING AND VOLUME DAMPER (SEE SPECIFICATIONS)			SOLENOID VALVE
		FIRE DAMPER WITH ACCESS PANEL			ELBOW UP
		FIRE/SMOKE DAMPER WITH ACCESS PANEL			ELBOW DOWN
		LINED DUCT (SEE SPECIFICATIONS)			TEE UP
		ELBOW WITH TURNING VANES			TEE DOWN
AP		ACCESS PANEL WITH SIZE	HEV		BALL VALVE
		PARALLEL BLADE DAMPER			CHECK VALVE
		OPPOSED BLADE DAMPER			FLEXIBLE PIPE CONNECTOR
		SUPPLY DIFFUSER			FLOW MEASURING STATION (SEE SPECIFICATIONS)
		RETURN/EXHAUST GRILLE			HOSE END VALVE
			MAV		MANUAL AIR VENT
					PRESSURE RELIEF VALVE
		P/T		PRESSURE/TEMPERATURE TEST POINT STRAINER	
			THERMOMETER AND THERMOWELL		
			UNION		
			INLINE PUMP		
		WH/HB		WALL HYDRANT OR HOSE BIBB	
		RPBP		REDUCED PRESSURE BACKFLOW PREVENTER	
		DCW		DOMESTIC COLD WATER	
		DHW		DOMESTIC HOT WATER	
		DHWC		DOMESTIC HOT WATER CIRCULATING	
				SANITARY SEWER (BURIED)	
				SANITARY SEWER (SUSPENDED)	
				VENT	
				PROPANE GAS	

CONTROL SYMBOLS (NOT ALL SYMBOLS SHOWN ARE USED ON THESE DRAWINGS)			ABBREVIATIONS (NOT ALL ABBREVIATIONS SHOWN ARE USED ON THESE DRAWINGS)	
ABBR.	SYMBOL	DESCRIPTION	ABBR.	DESCRIPTION
		SINGLE PHASE	AD	ACCESS DOOR
		THREE PHASE	AFF	ABOVE FINISHED FLOOR
		CONTROL WIRING	BDD	BACKDRAFT DAMPER
		POWER WIRING	BOD	BOTTOM OF DUCT
		<u>AUTOMATIC CONTROL VALVES:</u>	BOP	BOTTOM OF PIPE
		—2—WAY PNEUMATIC	CI	CAST IRON
		—3—WAY PNEUMATIC	(E)	EXISTING
		—2—WAY ELECTRIC	EA	EXHAUST AIR
		—3—WAY ELECTRIC	EAT	ENTERING AIR TEMPERATURE
		ROOM THERMOMETER	ELEV	ELEVATION
		ZONE SYSTEM	FCO	FLOOR CLEANOUT
		ELECTRIC MOTORIZED CONTROL DAMPER	GCO	GRADE CLEANOUT
		PNEUMATIC MOTORIZED CONTROL DAMPER	(N)	NEW
			NIC	NOT IN CONTRACT
			NO	NORMALLY OPEN
			OA	OUTSIDE AIR
			RA	RETURN AIR
			SA	SUPPLY AIR
			TSP	TOTAL STATIC PRESSURE
			VTR	VENT THROUGH ROOF
			WCO	WALL CLEANOUT

DRAWING SYMBOLS (NOT ALL SYMBOLS SHOWN ARE USED ON THESE DRAWINGS)	
	POINT OF CONNECTION TO EXISTING SYSTEM
	PIPING AND EQUIPMENT TO BE REMOVED
	QUANTITY SIZE TYPE GRILLE, REGISTER, OR DIFFUSER TAG

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED AND ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE LINCOLN COUNTY BUILDING CODE INCLUDING, 2018 INTERNATIONAL MECHANICAL CODE, 2021 INTERNATIONAL PLUMBING CODE, 2021 INTERNATIONAL FUEL GAS CODE AND 2021 INTERNATIONAL ENERGY CONSERVATION CODE.

2. ALL SHEET METAL SHALL BE 26 GAUGE (MINIMUM) AND SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARD (CURRENT VERSION) AND ASHRAE STANDARDS.

3. PROVIDE A TEST AND BALANCE CONTRACTOR TO BALANCE AIR AND WATER FLOWRATES TO FLOWRATES INDICATED AND PROVIDE COPY OF REPORT TO OWNER, ENGINEER AND INSPECTOR AT TIME OF FINAL INSPECTION. PROVIDE BALANCING FOR ALL SUPPLY, RETURN AND EXHAUST GRILLES, OUTSIDE AIR, ALL HYDRONIC COILS, ALL HYDRONIC PUMPS AND ALL SUPPLY, RETURN AND EXHAUST FANS. TESTING SHALL BE COMPLETED AFTER SYSTEM IS CLEAN AND NEW FILTERS ARE INSTALLED.

4. COORDINATE THE INSTALLATION OF ALL MECHANICAL EQUIPMENT WITH THE ELECTRICAL CONTRACTOR.

5. PROVIDE R=5.0 INSULATION ON ALL S/A AND R/A DUCTWORK LOCATED WITHIN PLENUM SPACES AND R=15.0 FOR ALL S/A AND R/A DUCTWORK LOCATED OUTSIDE THE BUILDING ENVELOPE. TOTAL R VALUE SHALL BE A COMBINATION OF ACOUSTICAL LINER (IF REQUIRED) AND EXTERIOR INSULATION.

6. DOMESTIC WATER PIPING SHALL BE COPPER, TYPE L WITH WROUGHT COPPER SOLDERED FITTING. PROVIDE 1" INSULATION ON DOMESTIC WATER PIPING AND VAPOR BARRIER ON COLD PIPING. USE NO LEAD SOLDER.

7. SANITARY AND VENT PIPING SHALL BE CAST IRON AND INSTALLED WITH 1/4" SLOPE IN DIRECTION OF FLOW.

8. DUCT SIZES INDICATED ARE CLEAR INSIDE DIMENSIONS. OUTSIDE DUCT DIMENSIONS SHALL BE INCREASED TO ACCOUNT FOR ACOUSTICAL LINER AS REQUIRED.

9. ALL VENT MATERIAL SHALL BE SCHEDULE 40 PVC FOR CONDENSING APPLIANCES AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCE BETWEEN VENT AND COMBUSTIBLE MATERIALS.

10. BELOW SLAB DOMESTIC WATER PIPING SHALL BE TYPE L SOFT COPPER.

11. CONDENSATE DRAIN PIPING SHALL BE TYPE L COPPER. PROVIDE AIR GAP FITTING BETWEEN CONDENSATE PIPING AND FLOOR DRAIN.

12. PROVIDE BALANCING DAMPER FOR ALL SUPPLY AND RETURN GRILLES.

13. ALL DOMESTIC WATER PIPING INSTALLED WITHIN EXTERIOR WALL SHALL BE ROUTED ON THE WARM SIDE OF THE WALL INSULATION.

14. NO DOMESTIC WATER PIPING SHALL BE ROUTED THROUGH UNHEATED SPACES.

15. ALL GAS PIPING SHALL BE SCHEDULE 40 WITH SCREW FITTINGS. PROVIDE DIRT LEG AND GAS COCK AT ALL APPLIANCES.

16. PROVIDE ALL NECESSARY EQUIPMENT, CONTROLS, VALVES AND APPURTENANCES AS REQUIRED FOR A COMPLETE OPERATING SYSTEM.

17. SEAL ALL EXTERIOR WALL AND ROOF PENETRATIONS WEATHER AND WATERTIGHT.

18. ALL DOMESTIC WATER ISOLATION VALVES SHALL BE TWO PIECE FULL PORT BALL VALVES WITH STAINLESS STEEL BALL AND STEM 600# WOG, NIBCO 585-70-66 OR EQUAL.

19. ALL DOMESTIC WATER CHECK VALVES SHALL BE Y PATTERN BRONZE BODY WITH RENEWABLE SEAT AND DISK, NIBCO TS413 OR EQUAL.

20. ALL SUPPLY DUCTWORK SHALL BE PROVIDED WITH 1" ACOUSTICAL LINER. SUPPLY DUCTWORK FROM EVAPORATIVE COOLING UNITS SHALL NOT BE PROVIDED WITH ACOUSTICAL LINER.

21. ALL DUCT INSULATION SHALL BE FIBERGLASS BLANKET, TYPE II WITH HEAVY DUTY FSK VAPOR BARRIER FACING, 1 1/2" AND 3/4# PER CF WITH A MAXIMUM K VALUE OF 0.28 AT 75° F.

22. ALL MATERIALS AND EQUIPMENT SHALL BE NEW, FREE OF DEFECTS, INSTALLED IN ACCORDANCE WITH MANUFACTURER'S CURRENT PUBLISHED RECOMMENDATIONS IN A NEAT MANNER AND IN ACCORDANCE WITH STANDARD PRACTICE OF THE INDUSTRY.

23. FLEXIBLE DUCT SHALL HAVE A MAXIMUM LENGTH OF 8 FEET AND BE SUPPORTED IN ACCORDANCE WITH THE BUILDING CODE. FLEXIBLE DUCT SHALL BE CONSTRUCTED OF A METALIZED POLYESTER INNER LINER SUPPORTED BY HELICAL WOUND STEEL WIRE, INSULATION AND AN OUTER VAPOR BARRIER, INSULATION SHALL BE 1" WITH R=5.0 (MIN).

24. ALL SPIN IN FITTINGS SHALL BE HERCULES HTO WITH MVD OR EQUAL.

25. CERTAIN MATERIALS AND/OR EQUIPMENT IN THIS SPECIFICATION ARE SPECIFIED BY MANUFACTURER AND CATALOG NUMBERS. THE DESIGN WAS BASED ON THE SPECIFIED EQUIPMENT AND ESTABLISHES A DEGREE OF QUALITY, PERFORMANCE, PHYSICAL CONFIGURATION, ETC. IF THE CONTRACTOR SHOULD ELECT TO USE EQUIPMENT OTHER THAN THE EQUIPMENT USED AS A BASIS FOR DESIGN, HE SHALL BE RESPONSIBLE FOR SPACE REQUIREMENTS, CONFIGURATION, PERFORMANCE AND CHANGES IN, BASES, SUPPORTS, VIBRATION ISOLATORS, STRUCTURAL MEMBERS, OPENINGS IN STRUCTURE AND OTHER APPARATUS THAT MAY BE AFFECTED BY ITS USE.

26. THE APPEARANCE OF THE FINISHED WORK SHALL BE OF EQUAL IMPORTANCE WITH ITS MECHANICAL EFFICIENCY. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ACCEPTABLE COMMERCIAL PRACTICES.FURNISH THE SERVICES OF AN EXPERIENCED SUPERINTENDENT WHO SHALL BE CONSTANTLY IN CHARGE OF THE INSTALLATION OF THE WORK TOGETHER WITH ALL SKILLED WORKMEN, PLUMBERS, FITTERS, METAL WORKERS, WELDERS, HELPERS, AND LABOR REQUIRED TO UNLOAD, TRANSFER, ERECT, CONNECT—UP, ADJUST, START, OPERATE, AND TEST EACH SYSTEM.

27. MECHANICAL EQUIPMENT PROVIDED UNDER THIS CONTRACT SHALL OPERATE UNDER ALL LOAD CONDITIONS WITHOUT SOUND OR VIBRATION WHICH IS OBJECTIONABLE IN THE OPINION OF THE OWNER'S REPRESENTATIVE. IN CASE OF MOVING MACHINERY, SOUND OR VIBRATION NOTICEABLE OUTSIDE OF ROOM IN WHICH IT IS INSTALLED, OR ANNOYINGLY NOTICEABLE INSIDE ITS OWN ROOM, WILL BE CONSIDERED OBJECTIONABLE. SOUND OR VIBRATION CONDITIONS CONSIDERED OBJECTIONABLE BY THE OWNERS SHALL BE CORRECTED IN AN APPROVED MANNER BY THE CONTRACTOR AT HIS EXPENSE. VIBRATION CONTROL SHALL BE BY MEANS OF APPROVED VIBRATION ELIMINATORS IN A MANNER AS RECOMMENDED BY THE MANUFACTURER OF THE ELIMINATORS

28. THE MECHANICAL DRAWINGS ARE DIAGRAMMATIC IN CHARACTER AND DO NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, VALVE, FITTING, ETC.
29. CONTRACTOR AGREES THAT SHOP DRAWINGS AND/OR SUBMITTALS PROCESSED BY THE OWNER'S REPRESENTATIVE ARE NOT CHANGE ORDERS. THE PURPOSE OF SHOP DRAWINGS AND/OR SUBMITTALS IS TO INFORM THE OWNER WHICH EQUIPMENT AND MATERIALS THE CONTRACTOR INTENDS TO PROVIDE. SUBMITTALS AND/OR SHOP DRAWINGS ARE TO BE EDITED TO SHOW ONLY SPECIFIC DATA FOR THE MECHANICAL EQUIPMENT THAT THE CONTRACTOR INTENDS TO PROVIDE. SUBMITTALS AND/OR SHOP DRAWINGS ARE TO BE IDENTIFIED WITH EQUIPMENT TAGS IDENTICAL TO THOSE LISTED IN THE CONTRACT DOCUMENTS. ALL SHOP DRAWINGS FOR SPECIAL SYSTEMS (FIRE PROTECTION, TEMPERATURE CONTROLS, ETC.) THAT WILL BECOME PERMANENT RECORD DOCUMENTS SHALL BE PREPARED ON SHEETS OF 4-MIL MYLAR OF THE SAME SIZE AS THE PROJECT DRAWINGS. PROVIDE SUBMITTALS FOR ALL PRODUCTS THE CONTRACTOR INTENDS TO USE ON THIS PROJECT. PREPARE 4 COPIES OF THE SUBMITTALS FOR THE OWNERS REVIEW BEFORE ORDERING OR INSTALLING ANY EQUIPMENT.

A. ALL MECHANICALL PRODUCT SUBMITTALS SHALL BE PROVIDED IN THE MANNER DETAILED BELOW REGARDLESS OF DESCRIPTION PROVIDED ELSEWHERE IN THE CONTRACT DOCUMENTS.

B. ALL PRODUCT SUBMITTALS SHALL BE PROVIDED TO THE OWNER IN A SINGLE ELECTRONIC PDF FILE.

C. ELECTRONIC FILE SHALL CONTAIN A COVER SHEET WITH THE PROJECT NAME, CONTRACTORS NAME AND SUBMITTAL DATE.

D. ELECTRONIC FILE SHALL CONTAIN DIVIDERS WHICH DIVIDE THE PRODUCT SUBMITTALS INTO SECTIONS MATCHING THE SPECIFIC TYPES OF EQUIPMENT (PLUMBING, HVAC, TEMPERATURE CONTROLS ETC). A TABLE OF CONTENTS IDENTIFYING EACH SECTION SHALL BE INCLUDED IN THE FRONT OF EACH BINDER.

E. THE OWNER WILL PROVIDE TWO (2) REVIEWS OF THE PRODUCT SUBMITTALS. IF AFTER TWO (2) REVIEWS THE SUBMITTALS ARE NOT IN COMPLIANCE WITH THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPENSATING THE OWNER FOR ADDITIONAL SUBMITTAL REVIEWS. COMPENSATION SHALL CONSIST OF SHIPPING AND DELIVERY COSTS, HOURLY WAGES AND OTHER COSTS INCURRED DURING THE ADDITIONAL SERVICES SUBMITTAL REVIEW.

30. THE CONTRACTOR SHALL PREPARE AN OPERATION AND MAINTENANCE MANUAL WHICH SHALL COVER ALL MECHANICAL SYSTEMS AND EQUIPMENT INSTALLED. OPERATION AND MAINTENANCE MANUALS SHALL BE PROVIDED AT THE COMPLETION OF THE CONSTRUCTION. SUBMIT ONE ELECTRONIC FILE IN PDF FORMAT OF THE OPERATION AND MAINTENANCE MANUAL TO THE OWNER FOR REVIEW AT LEAST TWO WEEKS PRIOR TO THE SUBSTANTIAL COMPLETION SITE VISIT. FAILURE TO PROVIDE THE OPERATION AND MAINTENANCE MANUALS TWO WEEKS BEFORE THE SUBSTANTIAL COMPLETION SITE VISIT WILL RESULT IN DELAYING THE SITE VISIT UNTIL THE MANUALS ARE RECEIVED AND REVIEWED.

A. EACH OPERATION AND MAINTENANCE MANUAL SHALL BE INDEXED AND CONTAIN THE FOLLOWING INFORMATION.

B. CONTRACTORS' NAMES, ADDRESSES AND TELEPHONE NUMBERS.

C. ALPHABETICAL LIST OF ALL SYSTEM COMPONENTS WITH THE NAME AND ADDRESS AND 24-HOUR PHONE NUMBER OF THE COMPANY RESPONSIBLE FOR SERVICING EACH ITEM DURING THE FIRST YEAR OF OPERATION.

D. GUARANTEES AND WARRANTIES FOR ALL EQUIPMENT WHENEVER APPLICABLE.

E. ALL MANUFACTURERS' DATA APPLICABLE TO THE INSTALLED EQUIPMENT, INCLUDING: APPROVED SHOP DRAWINGS INSTALLATION INSTRUCTIONS LUBRICATION INSTRUCTIONS WIRING DIAGRAMS A SIMPLIFIED DESCRIPTION OF THE OPERATION OF ALL SYSTEMS INCLUDING THE FUNCTION OF EACH PIECE OF EQUIPMENT WITHIN EACH SYSTEM. THESE DESCRIPTIONS SHALL BE SUPPORTED WITH A SCHEMATIC FLOW DIAGRAM WHEN APPLICABLE. TEMPERATURE CONTROL DIAGRAMS INCLUDING AN EXPLANATION OF THE CONTROL SEQUENCE OF EACH SYSTEM ALONG WITH THE FOLLOWING INSTRUCTIONS, EMERGENCY PROCEDURES FOR FIRE OR FAILURE OF MAJOR EQUIPMENT. NORMAL STARTING, OPERATING AND SHUTDOWN MODES OF OPERATION. SUMMER OR WINTER SHUTDOWN PROCEDURES. APPROVED TESTING, ADJUSTING AND BALANCING REPORT. VALVE TAG LIST WHEN APPLICABLE. AN OUTLINE OF A PREVENTATIVE MAINTENANCE PROGRAM FOR EACH SYSTEM WHICH SHALL INCLUDE A SCHEDULE OF INSPECTION AND MAINTENANCE. IT SHALL SUGGEST THE MAINTENANCE AND INSPECTION OPERATIONS THAT SHOULD BE PERFORMED BY THE OWNER AND THE OPERATIONS THAT SHOULD BE PERFORMED BY CONTRACTORS.

F. EACH OPERATION AND MAINTENANCE MANUAL SHALL BE PROVIDED IN THE MANNER DETAILED ABOVE REGARDLESS OF DESCRIPTION PROVIDED ELSEWHERE IN THE CONTRACT DOCUMENTS. EACH ELECTRONIC FILE SHALL CONTAIN A COVER SHEET WITH THE PROJECT NAME, CONTRACTORS NAME AND SUBMITTAL DATE. EACH ELECTRONIC FILE SHALL CONTAIN DIVIDERS WHICH DIVIDE THE MANUAL INTO SECTIONS MATCHING THE INFORMATION SECTIONS LISTED ABOVE. A TABLE OF CONTENTS IDENTIFYING EACH SECTION SHALL BE INCLUDED IN THE FRONT OF EACH BINDER.
31. ALL DUCTWORK SHALL BE SEALED TO SEAL CLASS A, ALL LONGITUDINAL AND TRANSVERSE SEAMS SEALED TO 10" w.c.

33. COORDINATE THE COLOR OF ALL VISIBLE MECHANICAL EQUIPMENT WITH THE ARCHITECT AND OWNER BEFORE ORDERING ANY EQUIPMENT.

34. THE VISIBLE INTERIOR OF ALL SUPPLY, RETURN AND EXHAUST GRILLES SHALL BE PAINTED FLAT BLACK.

35. PROVIDE LOCKING ACCESS PANEL FOR ALL MECHANICAL EQUIPMENT (VALVES, DAMPERS, CONTROL EQUIPMENT, ETC.) INSTALLED WITHIN WALL CAVITIES. ACCESS PANEL SHALL BE MINIMUM OF 12X12 AND SIZED TO ALLOW MINIMUM 6" CLEARANCE AROUND MECHANICAL EQUIPMENT.

36. PROVIDE R=5.0 INSULATION ON ALL EXHAUST DUCTS FROM THE ENVELOPE PENETRATION TO THE BACKDRAFT DAMPER.

37. ALL RETURN GRILLES SHALL BE PROVIDED WITH A SOUND BOOT. SOUND BOOT SHALL MATCH GRILLE NECK SIZE AND EXTEND 12" PAST EDGE OF GRILLE. PROVIDE 1" ACOUSTICAL LINER IN SOUND BOOT.

38. ALL MECHANICAL WORK SHALL BE COORDINATED WITH OTHER TRADES, INCLUDING SPACE REQUIREMENTS, ROUTING REQUIREMENTS AND ALL OTHER ASPECTS OF THE MECHANICAL INSTALLATION, PRIOR TO BIDDING. FAILURE TO COORDINATE WORK PRIOR TO BIDDING WILL NOT BE A JUSTIFICATION FOR ANY CHANGE ORDER AND NO CHANGE ORDERS WILL BE ENTERTAINED FOR FAILURE TO COORDINATE WORK PRIOR TO BIDDING.



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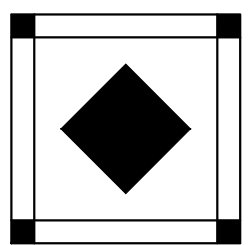
HUGO ROUNDHOUSE
ROUNDHOUSE PRESERVATION, INC
HUGO, COLORADO 80821



JOB NUMBER: 23-001
FILE:
DESIGNED:
DRAWN: LCE
CHECKED: LCE
DATE: 12/3/23
REVISIONS:

SHEET TITLE:
MECHANICAL
LEGEND AND
NOTES

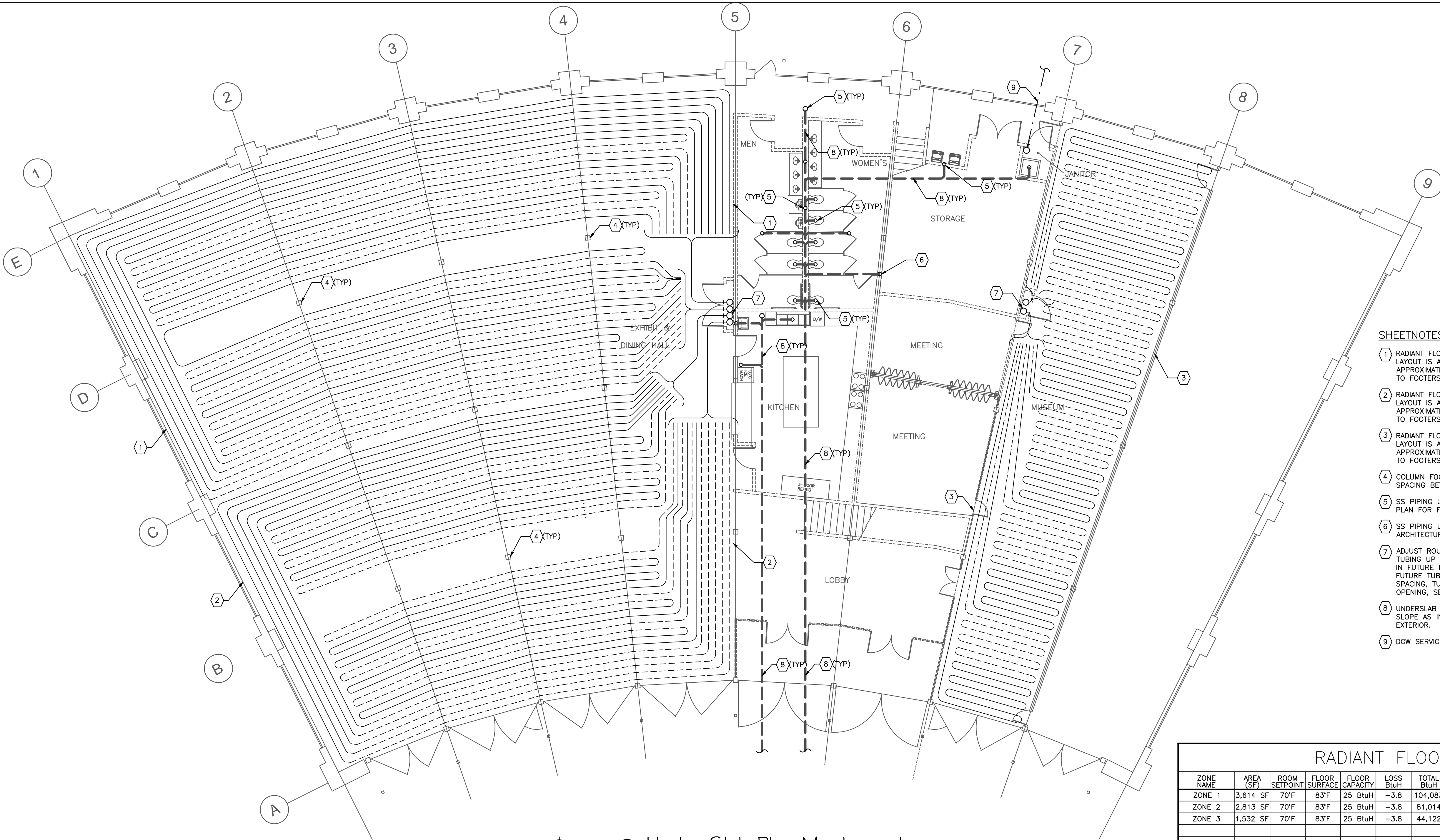
SHEET NUMBER:
CDM-1



JOB NUMBER: 23-001
FILE:
DESIGNED:
DRAWN: LCE
CHECKED: LCE
DATE: 12/3/23
REVISIONS:

SHEET TITLE:
UNDER SLAB
MECHANICAL
PLAN

SHEET NUMBER:
CDM-2



SHEETNOTES

- RADIANT FLOOR ZONE 1. PROVIDE NUMBER OF TUBE LOOPS INDICATED IN SCHEDULE. TUBE LAYOUT IS A REPRESENTATIVE LAYOUT AND CONTRACTOR SHALL ADJUST ROUTING TO MAINTAIN APPROXIMATELY EQUAL LENGTHS OF EACH TUBE RUN. ADJUST ROUTING TO PROVIDE CLEARANCE TO FOOTERS, COLUMN BASES AND ALL UNDERSLAB OBSTRUCTIONS.
- RADIANT FLOOR ZONE 2. PROVIDE NUMBER OF TUBE LOOPS INDICATED IN SCHEDULE. TUBE LAYOUT IS A REPRESENTATIVE LAYOUT AND CONTRACTOR SHALL ADJUST ROUTING TO MAINTAIN APPROXIMATELY EQUAL LENGTHS OF EACH TUBE RUN. ADJUST ROUTING TO PROVIDE CLEARANCE TO FOOTERS, COLUMN BASES AND ALL UNDERSLAB OBSTRUCTIONS.
- RADIANT FLOOR ZONE 3. PROVIDE NUMBER OF TUBE LOOPS INDICATED IN SCHEDULE. TUBE LAYOUT IS A REPRESENTATIVE LAYOUT AND CONTRACTOR SHALL ADJUST ROUTING TO MAINTAIN APPROXIMATELY EQUAL LENGTHS OF EACH TUBE RUN. ADJUST ROUTING TO PROVIDE CLEARANCE TO FOOTERS, COLUMN BASES AND ALL UNDERSLAB OBSTRUCTIONS.
- COLUMN FOOTER, SEE STRUCTURAL PLAN FOR DETAILS. PROVIDE MANUFACTURER REQUIRED SPACING BETWEEN RADIANT TUBE AND BELOW SLAB STRUCTURAL ELEMENTS.
- SS PIPING UP TO FIXTURE ABOVE SLAB, SEE MAIN LEVEL PLAN FOR FIXTURE. SEE ARCHITECTURAL PLAN FOR FIXTURE LOCATION DIMENSIONS.
- SS PIPING UP TO FUTURE RISER, SEE MAIN LEVEL PLAN FOR FUTURE RISER LOCATION. SEE ARCHITECTURAL PLAN FOR FIXTURE RISER DIMENSIONS.
- ADJUST ROUTING OF EACH RADIANT TUBE ZONE AND ROUTE INTO TUBE MANIFOLD CLOSET. EXTEND TUBING UP NEAR WALL TO FUTURE TUBE MANIFOLD LOCATION. TUBE MANIFOLD TO BE INSTALLED IN FUTURE PHASE. RETAIN SUFFICIENT TUBING TO EXTEND EACH TUBE ZONE UP ALONG WALL TO FUTURE TUBE MANIFOLD. SEE DD DOCUMENT SET FOR RADIANT TUBE SCHEDULE INCLUDING TUBE SPACING, TUBE LENGTH AND NUMBER OF TUBE LOOPS PER ZONE. ROUTE TUBES WITHIN DOOR OPENING, SEE RADIANT TUBE DIAGRAMS FOR DETAILS AND INSTALLATION REQUIREMENTS.
- UNDERSLAB SS PIPING, SEE MAIN LEVEL PLAN FOR SS PIPING AND SIZES. MAINTAIN SS PIPE SLOPE AS INDICATED IN GENERAL NOTES AND MEET EXISTING MAIN SS PIPING INVERT AT BUILDING EXTERIOR.
- DCW SERVICE LINE, SEE MAIN LEVEL PLUMBING PLAN FOR DETAILS.

RADIANT FLOOR TUBING SCHEDULE

ZONE NAME	AREA (SF)	ROOM SETPOINT	FLOOR SURFACE	FLOOR CAPACITY	LOSS BTU/H	TOTAL BTU/H	EWT	LWT	FLOW GPM	Δ P FT	TUBING			NOTES
											DIA.	SPACING	LOOPS	
ZONE 1	3,614 SF	70°F	83°F	25 BTU/H	-3.8	104,083	112°F	98°F	14.9	14.3	5/8"	12" o.c.	12	320 FT 1-8
ZONE 2	2,813 SF	70°F	83°F	25 BTU/H	-3.8	81,014	112°F	98°F	11.6	10.7	5/8"	12" o.c.	10	300 FT 1-8
ZONE 3	1,532 SF	70°F	83°F	25 BTU/H	-3.8	44,122	112°F	98°F	6.3	10.4	5/8"	12" o.c.	6	325 FT 1-8

- NOTES: 1. PERFORMANCE BASED UPON HEATING FLUID OF WATER.
2. SEE SPECIFICATION FOR TUBING CONSTRUCTION CRITERIA AND PERFORMANCE.
3. NOMINAL TUBE SPACING INDICATED, ADJUST SPACING TO PROVIDE NUMBER OF LOOPS INDICATED ON PLANS. PROVIDE 1/2 THE TUBE SPACING BETWEEN FIRST TUBE AND WALL AND COLUMN FOOTERS.
4. PROVIDE R=10 RIGID INSULATION (BLUE BOARD OR EQUAL) BELOW ALL AREAS WITH TUBING WITH MINIMUM COMPRESSIVE STRENGTH OF 25 PSI (VERTICAL).
5. 5" NORMAL WEIGHT CONCRETE WITH TUBES IMBEDDED AT CENTERLINE.
6. SUPPLEMENTAL HEATING REQUIRED (AIRSIDE SYSTEM).
7. THERMAL CONDUCTIVITY OF CONCRETE IS 1.4 W/mK.
8. USE AN INSTALLER WITH DEMONSTRATED EXPERIENCE ON PROJECTS OF SIMILAR SIZE AND COMPLEXITY AND POSSESSING DOCUMENTATION PROVING SUCCESSFUL COMPLETION OF PEX RADIANT TUBING INSTALLATION TRAINING BY THE PEX TUBING MANUFACTURER.

TUBE SPACING AND SIZE PER SCHEDULE. SPACING AT EXTERIOR WALLS AND AROUND STRUCTURAL FOOTINGS SHALL BE 1/2 OF TUBE SPACING

CONCRETE SLAB FLOOR SYSTEM, SEE ARCH. PLANS FOR DETAILS.

CONCRETE REINFORCING MESH, SEE STRUC. PLANS FOR DETAILS. ATTACHED TUBING TO WIRE MESH

BELOW AND EDGE OF SLAB INSULATION, SEE ARCHITECTURAL PLANS FOR DETAILS.

TUBING, SEE SCHEDULE FOR DETAILS. INSTALL TUBING IN CONCRETE FLOOR PER MANUFACTURER RECOMMENDATIONS.

SUB SOIL AND INSULTAION

MAXIMUM TUBE ROUTING CORRIDOR WIDTH SHALL BE 4" LESS THAN CLEAR WALL FRAMING DIMENSION AND MAINTAIN 1" SPACING BETWEEN TUBES (MIN).

CONCRETE SLAB FLOOR SYSTEM, SEE ARCH. PLANS FOR DETAILS.

ANCHOR BOLT, SEE ARCHITECTURAL PLANS FOR DETAILS AND SPACING

MAINTAIN 6" (MIN) SPACING BETWEEN TUBE ROUTING CORRIDOR AND ANCHOR BOLTS. CENTER TUBE ROUTING CORRIDOR BETWEEN ANCHOR BOLTS.

SUB SOIL AND INSULTAION

CONCRETE SLAB FLOOR SYSTEM, SEE ARCH. PLANS FOR DETAILS.

CONSTRUCTION JOINT, EXPANSION JOINT OR CONTROL JOINT IN SLAB

OFFSET TUBING BELOW CONSTRUCTION JOINT AND SLAB TO ALLOW INDEPENDENT MOVEMENT OF SLABS.

SUB SOIL AND INSULTAION

2 RADIANT TUBE DIAGRAM
CDM-2 SCALE: NONE

3 RADIANT TUBE DIAGRAM
CDM-2 SCALE: NONE

4 SLAB JOINT TUBE DIAGRAM
CDM-2 SCALE: NONE

SECTION 23 21 00 HYDRONIC PIPING AND PUMPS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section describes the piping and pumps for hydronic systems.

1.2 SUMMARY

- A. This section includes the following materials and methods.
1. Compact in-line circulation Pumps
 2. Low Temperature Water or Glycol Heating Piping (up to 230 Deg F)

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. The General Conditions of the Contract, Supplementary Conditions and General Requirements are a part of the Project Specification and shall be used in conjunction with this Division as a part of the Contract Documents. Consult them for further instructions pertaining to this work. Contractors shall be responsible for and be governed by all requirements thereunder.
- B. Related Sections:
1. Common Work Results for HVAC Systems Section 23 05 00
 2. Valves and Piping Components for HVAC Systems Section 23 05 23
 3. Testing Adjusting and Balancing Section 23 05 93
 4. HVAC Insulation Section 23 07 00
 5. Hydronic Piping and PumpsSection 23 21 00
 6. Heating Boilers Section 23 52 00

1.4 QUALITY ASSURANCE

- A. Qualify the welding processes and welding operators according to the ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
- B. All piping installations shall comply with ASME B31.9, "Building Services Piping," for materials, products, and installation. Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with the ASME Boiler and Pressure Vessel Code, Section VIII, Division 1.
- 1.5 SUBMITTALS
- A. Submit the manufacturer's technical product and performance data for all pipe and fittings.
- B. Submit shop drawings which detail all piping and components associated with the project. The shop drawings shall be submitted and approved prior to start of any work. In addition to the requirements listed in Section 15050, the shop drawings shall be contain the fabrication details for pipe anchors, hangers, special pipe support assemblies, alignment guides, expansion joints and loops, and the attachment to the building structure. Detail location of anchors, alignment guides, and expansion joints and loops.
- C. Submit copies of certificates for welding procedures and personnel.
- D. Submit written reports for all tests specified in Part 3 of this Section. Include the following:
1. Test procedures used.
 2. Test results that comply with requirements.
 3. Failed test results and corrective action taken to achieve requirements.

1.6 COORDINATION

- A. Coordinate layout and installation of hydronic, steam, and condensate piping and suspension system components with other construction, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.
- B. Coordinate pipe sleeve installations for foundation wall penetrations.
- C. Coordinate piping installation with roof curbs, equipment supports, and roof penetrations.
- D. Coordinate pipe fitting pressure classes with products specified in related Sections.
- E. Coordinate installation of pipe sleeves for penetrations through exterior walls and floor assemblies. Coordinate with requirements for firestopping specified in Division 7 Section "Through-Penetration Firestop Systems" for fire and smoke wall and floor assemblies.

1.7 PEX INSTALLER QUALIFICATIONS

- A. Use an installer with demonstrated experience on projects of similar size and complexity and possessing documentation proving successful completion of PEX radiant tubing installation training by the PEX tubing manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Compact In-Line Circulators:
1. Grundfos
 2. Or Pre Approved Equal
- B. Radiant Floor Tubing:
1. Uponor
 2. Or Pre Approved Equal

2.2 GENERAL PUMP REQUIREMENTS

- A. All pumps shall be factory assembled and tested.
- B. All motors shall be provided with built-in, thermal-overload protection and grease-lubricated ball bearings. Select each motor to be nonoverloading over full range of pump performance curve.

2.3 COMPACT IN-LINE CIRCULATORS

- A. Description: Water cooled, horizontal, in-line, compact design, seal-less, centrifugal, and single stage. Include pump and motor assembled on a common shaft in hermetically sealed unit, without stuffing boxes or mechanical seals. Include lubrication of sleeve bearing and cooling of motor by circulating pumped liquid through motor section, and isolation of motor section from motor-stator windings by corrosion-resistant, nonmagnetic, alloy liner. Include design rated for 125-psig minimum working pressure and a continuous water temperature of 225 deg F.
- B. Description: Cartridge type, horizontal, in-line, compact, seal-less, centrifugal, and single stage. Include pump and motor assembled on a common shaft in cartridge-type, hermetically sealed unit, without stuffing boxes or mechanical seals. Include isolation of motor section from motor-stator windings by corrosion-resistant, nonmagnetic, alloy liner. Include design rated for 125-psig minimum working pressure and a continuous water temperature of 225 deg F.
1. Casing: Cast bronze or cast iron, with stainless-steel liner, static O-ring seal to separate motor section from motor stator, and flanged piping connections.
 2. Impeller: Overhung, single suction, closed or open, nonmetallic.
 3. Shaft and Sleeve: Stainless-steel shaft with carbon-steel sleeve.
 4. Motor: Single speed.
 5. Internal check valve

2.4 LOW TEMPERATURE WATER OR GLYCOL HEATING PIPING (UP TO 230 DEG F)

- A. 2" and Smaller, Above Grade: Type L copper tube, ASTM B88 with wrought copper or bronze fittings and unions per ANSI B16.22, brazed, AWS A5.8 Classification Bag-1 (silver), or no-lead solder, ASTM B 32-95-5 tin antimony.
- B. 2-1/2" and Larger, Above Grade: Schedule 40 ERW seamless carbon steel pipe, ASTM A53, Grade B with ASTM A234 steel butt-weld fittings per ANSI 16.9 and A105 steel raised face flanges, ANSI B16.5, Class 150 with self-centering spiral ring 304 stainless steel/styrene butadiene gaskets.

2.5 STEEL PIPE AND FITTINGS

- A. Flexible connectors shall be stainless-steel bellows with woven, flexible, bronze, wire-reinforcing protective jacket; 150-psig minimum working pressure and 250 deg F maximum operating temperature. Connectors shall have flanged or threaded-end connections to match equipment connected and shall be capable of 3/4-inch misalignment.
- B. Welding materials shall comply with Section II, Part C, of the ASME Boiler and Pressure Vessel Code for welding materials appropriate for wall thickness and for chemical analysis of pipe being welded.
- C. Gasket material shall have thickness, material, and type suitable for fluid to be handled; and design temperatures and pressures.

2.6 HYDRONIC RADIANT FLOOR HEATING SYSTEM MATERIALS

- A. Tubing
1. Material: Crosslinked polyethylene (PEX) manufactured by PEX-b method.
 2. Material Standard: Manufactured in accordance with ASTM F1281 and tested for compliance by an independent third-party agency.
 3. Pressure Ratings: Standard Grade hydrostatic design and pressure ratings as issued by the Plastics Pipe Institute (PPI), a division of the Society of the Plastics Industry (SPI).
 4. Minimum Bend Radius.
 - a. 0.50 inch has a minimum radius of 3.2 inches.
 - b. 0.625 inch has a minimum radius of 4.0 inches.
 - c. 0.75 inch has a minimum radius of 5.0 inches.
 - d. 1.00 inch has a minimum radius of 6.0 inches.
 5. Nominal Inside Diameter: Provide tubing with nominal inside diameter in accordance with ASTM F1281 as indicated.
 - a. 0.50 inch
 - b. 0.625 inch
 - c. 0.75 inch
 - d. 1.00 inch
- B. Manifolds
1. For system compatibility, use 2-inch valved copper manifolds manufactured from Type L copper material, offered by the respective PEX tubing manufacturer.
 2. Install valved copper manifolds primarily for wall-hung or boxed applications.
 3. Use manifolds with an isolation valve or a combination isolation/balancing valve on each outlet.
 4. The manifolds support the use of 5/8 inch or 3/4 inch MLC tubing.
 5. Ensure manifold end cap offers tapping for 1/8 inch FNPT and 1/2 inch FNPT for vent and drain.
 6. Install supply and return piping in a reverse-return configuration in a reverse-return configuration to ensure self-balancing.
 7. If the supply and return piping is in direct-return configuration, install and balance flow setters on the return leg of each manifold to the mains.
- C. Fittings
1. For system compatibility, use fittings offered by the PEX tubing manufacturer.
 - a. Compression Fittings
 - 1) Fitting assembly manufactured from UNS C3600 series brass material.
 - 2) The fitting assembly consists of a barbed insert, a compression ring and a compression nut. The barbed insert is manufactured with an o-ring to facilitate air pressure testing.

PART 3 - EXECUTION

3.1 PUMP INSTALLATIONS

- A. Install pumps according to manufacturer's written instructions.
- B. Install pumps to provide access for periodic maintenance, including removing motors, impellers, couplings, and accessories.
- C. Support pumps and piping separately so piping is not supported by pumps.

3.2 CONNECTIONS

- A. Install pressure and temperature test plugs on the suction and discharge of each pump using the integral gauge tapping provided.
- B. Install pressure gauge with piping and shutoffs and other pressure and temperature test plugs in piping around pumps as shown on the Contract Drawings.

3.3 START UP

- A. Perform the following preventative maintenance operations and checks before startup of any pump:
1. Check suction line connections for tightness to avoid drawing air into the pump.
 2. Verify that pumps are installed and connected according to the Contract Documents.
 3. Verify that electrical wiring installation complies with manufacturer's written instructions and the Contract Documents.
 4. Lubricate oil- and/or grease-lubricated bearings.
 5. Check that pump is free to rotate by hand. For pumps handling hot liquids, pump shall be free to rotate with the pump hot and cold. If the pump is bound or even drags slightly, do not operate the pump until the cause of the trouble is determined and corrected.
 6. Check motor for proper rotation. Rotation shall match direction of rotation marked on pump casing.
 7. Check to see that the check valve is operating properly and the discharge balancing valve is open.
 8. Clean suction diffuser and system strainers.
 9. Verify that pump controls are correct for required application.

3.4 HYDRONIC PIPING INSTALLATIONS

- A. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
- B. Install drains, consisting of a tee fitting, 1/2" ball valve, and short 1/2" threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.
- C. Install piping at a uniform grade of 0.2 percent upward in direction of flow.
- D. Reduce pipe sizes using eccentric reducer fitting installed with level side up.
- E. Unless otherwise indicated, install branch connections to mains using tee fittings in main pipe, with the takeoff coming out the bottom of the main pipe. For up-feed risers, install the takeoff coming out the top of the main pipe.
- F. Anchor piping for proper direction of expansion and contraction.
- G. PEX Slab-on-grade Installation
1. Fasten the tubing to the flat slab or reinforcing bar in accordance with the PEX tubing manufacturer's installation recommendations.
 2. Use closer tubing on-center distances along exterior walls. Increase tubing on-center distances as the installation moves away from the exterior wall.
 - a. Do not install tubing within 6 inches of all walls.
 - b. Refer to the submitted radiant floor design layout.
 3. Install tubing at a consistent 2" depth below the surface elevation. Ensure sufficient clearance to avoid control joint cuts.
 4. In areas where tubing must cross expansion joint in the concrete, provide manufacturer recommended "U" bend below the joints.
 5. For tubing that exits the slab in a 90-degree bend, use metal or PVC bend supports.

3.5 FIELD QUALITY CONTROL

- A. Perform the following tests on hydronic piping:
1. Use ambient temperature water as a testing medium unless there is risk of damage due to freezing. Another liquid that is safe for workers and compatible with piping may be used.
 2. While filling system, use vents installed at high points of system to release trapped air. Use drains installed at low points for complete draining of liquid.
 3. Check expansion tanks to determine that they are not air bound and that system is full of water.
 4. Subject piping system to hydrostatic test pressure BEFORE covering tubing with concrete that is not less than 1.5 times the design pressure. Test pressure shall not exceed maximum percent for any vessel, pump, valve, or other component in system under test. Verify that stress due to pressure at bottom of vertical runs does not exceed either 90 percent of specified minimum yield strength or 1.7 times "SE" value in Appendix A of ASME B31.9, "Building Services Piping."
 5. After hydrostatic test pressure has been applied for at least 10 minutes, examine piping, joints, and connections for leakage. Eliminate leaks by tightening, repairing, or replacing components, and repeat hydrostatic test until there are no leaks.
 6. Prepare written report of testing.

3.6 ADJUSTING

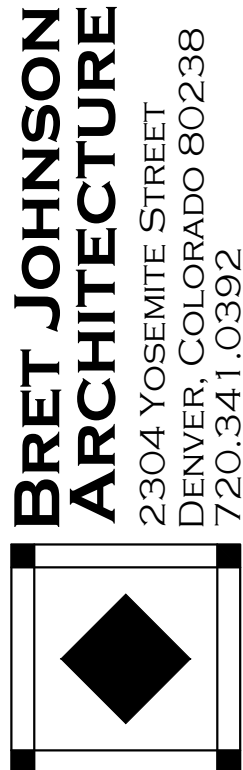
- A. Mark calibrated manometers of pump discharge valves after hydronic balancing has been completed, to permanently indicate final balanced position.
- B. Perform these adjustments before operating the system and before balancing:
1. Set valves to full open position.
 2. Check pump for proper direction of rotation.
 3. Set automatic fill valves for required system pressure.
 4. Check air vents at high points of system and determine if all are installed and operating freely (automatic type), or bleed air completely (manual type).
 5. Set temperature controls so all terminal units are calling for full flow.
 6. Check and set operating temperatures of boilers to design requirements.
 7. Lubricate motors and bearings.

3.7 CLEANING

- A. All water circulating systems for the project shall be thoroughly cleaned before placing in operation to rid the system of dirt, piping compound, mill scale, oil, and any and all other material foreign to the water being circulated.
- B. Extreme care shall be exercised during construction to prevent all dirt and other foreign matter from entering the pipe or other parts of the system. Pipe stored on the project shall have the open ends capped and equipment shall have all openings fully protected. Before installation, each piece of pipe, fitting, or valve shall be visually examined and all dirt removed.
- C. After system (or portion thereof) has been leak tested, it shall be thoroughly flushed with clean water. All valves in main piping shall be full open, flow rate for flush shall be at least 4 ft/sec, and shall replace pipe volume at least five times. Flushing shall continue until water runs clear.
- D. After clear water flushing is complete, a chemical flushing solution, as furnished by the Section 15189 Vendor/Contractor, shall be utilized to remove oil, grease, piping compounds, etc. After the system is filled with cleaning solution, the system shall be brought up to temperature and allowed to circulate for at least eight hours. The system shall then be drained completely and refilled with fresh water. All system strainers shall then be cleaned.
- E. After the system has been completely cleaned as specified herein, it shall be tested by litmus paper or other dependable method and shall be left on the slightly alkaline side (pH = 7.5+). If the system is found to be still on the acid side, the chemical flush shall be repeated as necessary.
- F. The Owner's Representative shall be given notice of this cleaning operation. If the Owner's Representative deems it necessary, the cleaning operation shall be repeated.
- G. The existing piping system may contain a large volume of scale and corrosion which may be dislodged during the cleaning process. The Contractor is responsible for protecting existing devices (boilers, expansion tanks, coils, etc.) from debris accumulating during the cleaning process. The Contractor shall clean these devices, at no expense to the Owner, if He fails to protect these devices during the cleaning process.
- H. "Stop-Leak" compounds shall not be added to the system at any time.

END OF SECTION 23 21 00

I.



HUGO ROUNDHOUSE
ROUNDHOUSE PRESERVATION, INC
HUGO, COLORADO 80821



JOB NUMBER: 23-001

FILE:

DESIGNED:

DRAWN: LCE

CHECKED: LCE

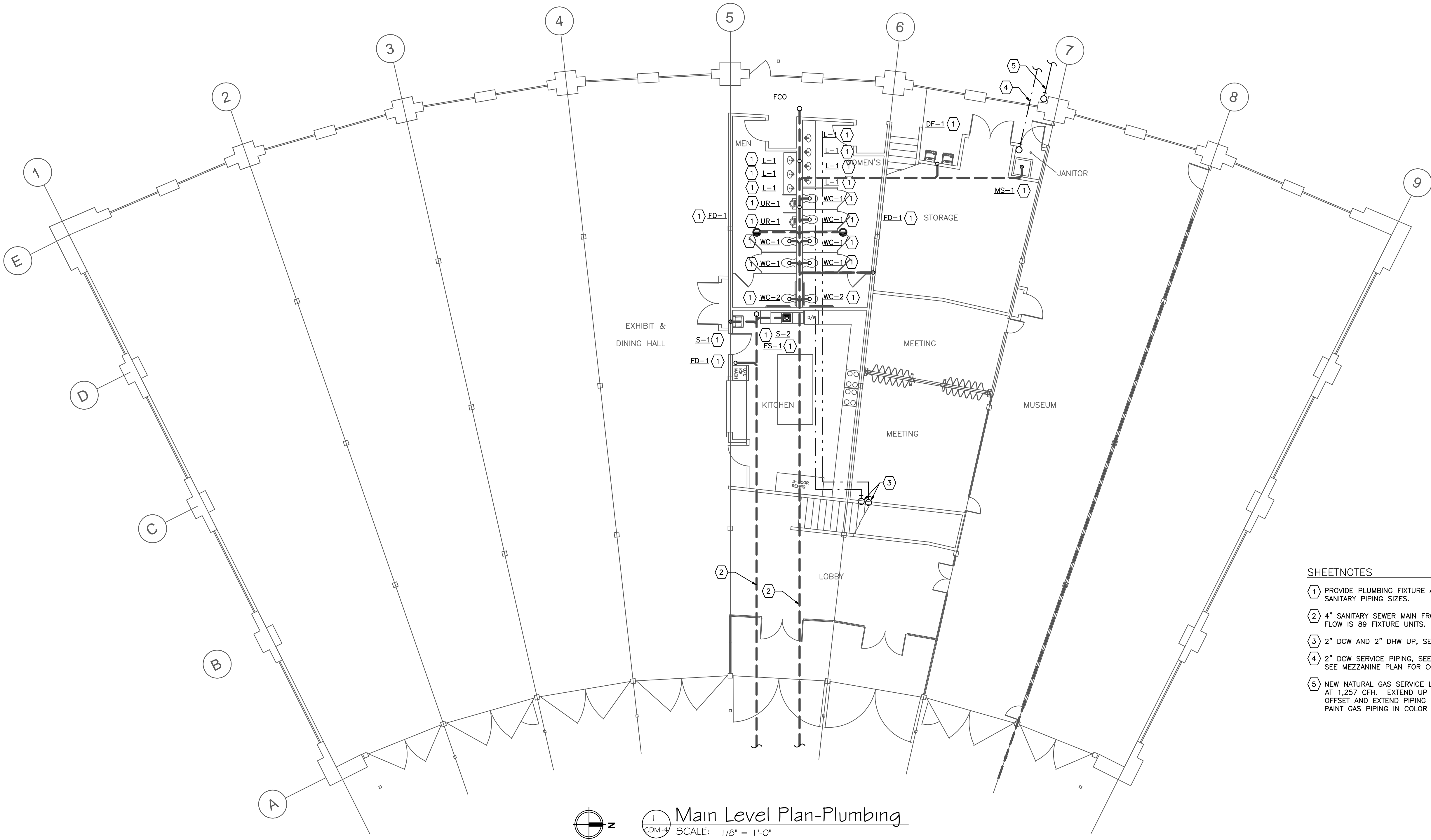
DATE: 12/3/23

REVISIONS:

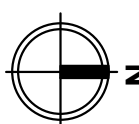
SHEET TITLE:
UNDER SLAB
MECHANICAL
SPECIFICATIONS

SHEET NUMBER:

CDM-3



- SHEETNOTES**
- 1 PROVIDE PLUMBING FIXTURE AS INDICATED. SEE PLUMBING FIXTURE SCHEDULE FOR DOMESTIC AND SANITARY PIPING SIZES.
 - 2 4" SANITARY SEWER MAIN FROM BUILDING, SEE CIVIL PLAN FOR CONTINUATION. TOTAL PROBABLE FLOW IS 89 FIXTURE UNITS. SS PIPING INSTALLED DURING FLOOR SLAB INSTALLATION PROJECT.
 - 3 2" DCW AND 2" DHW UP, SEE MEZZANINE PLAN FOR CONTINUATION.
 - 4 2" DCW SERVICE PIPING, SEE CIVIL PLAN FOR CONTINUATION. EXTEND PIPING UP TO MEZZANINE, SEE MEZZANINE PLAN FOR CONTINUATION. IPC PROBABLE DEMAND IS 35.0 GPM.
 - 5 NEW NATURAL GAS SERVICE LINE SIZED AT 2 1/2", 100 FEET FROM METER TO FARTHEST DEVICE AT 1,257 CFH. EXTEND UP BUILDING EXTERIOR TO MECHANICAL ROOM CEILING ELEVATION. OFFSET AND EXTEND PIPING INTO MECHANICAL ROOM, SEE MEZZANINE PLAN FOR CONTINUATION. PAINT GAS PIPING IN COLOR SELECTED BY ARCHITECT.

 **Main Level Plan-Plumbing**
SCALE: 1/8" = 1'-0"
CDM-4

MECHANICAL REFERENCE DRAWING
THIS SHEET IS PART OF THE DESIGN DEVELOPMENT BUILDING RENOVATION DOCUMENT PACKAGE AND IS INCLUDED WITH THE UNDERSLAB CONSTRUCTION DOCUMENTS FOR REFERENCE.

PRELIMINARY
NOT FOR CONSTRUCTION

JOB NUMBER: 23-001
FILE:
DESIGNED:
DRAWN: LCE
CHECKED: LCE
DATE: 12/3/23
REVISIONS:

SHEET TITLE:
**MAIN LEVEL
PLUMBING
PLAN**
SHEET NUMBER:
CDM-4

HYDRONIC HEATING COIL SCHEDULE															
TAG	CAPACITY GPM	FIN SIZE IN	MAX. FACE VELOCITY FPM	AIR SIDE CRITERIA				FLUID SIDE CRITERIA				ROWS	FPI	MANUFACTURER AND MODEL	NOTES
				CFM	ΔT	ΔT	ΔT	GPM	EW	LWT	WPD				
HC-1	417,460	20.5	732.7 FPM	15,000	60.0° F	90.1° F	0.43" w.c.	43.7	180° F	160° F	8.0 Ft	1	14	CARRIER 28NB	1,2,3
HC-2	417,460	20.5	732.7 FPM	15,000	60.0° F	90.1° F	0.43" w.c.	43.7	180° F	160° F	8.0 Ft	1	14	CARRIER 28NB	1,2,3

NOTES: 1. ALL AIR PERFORMANCE IS BASED UPON THE PROJECT ELEVATION OF 5050 FEET
2. FLUID PERFORMANCE BASED UPON 30% ΔT
3. SCHEDULED CAPACITY AND PERFORMANCE ARE MINIMUM REQUIREMENTS, ACTUAL CAPACITY AND PERFORMANCE SHALL MEET OR EXCEED SPECIFIED PERFORMANCE
4.
5.

GRILLE/REGISTER/DIFFUSER SCHEDULE										
TAG	STYLE	SERVICE	FACE SIZE	PATTERN	MAXIMUM CFM	MAXIMUM WG	MATERIAL	OBD	MANUFACTURER AND MODEL	NOTES
A	CEILING	EXHAUST	SEE NOTES	LOUVERED	250	30	ALUMINUM	YES	TITUS 355FL	1,3,4
B	SIDEWALL	RETURN	SEE NOTES	0° LOUVERED	7,500	30	ALUMINUM	NO	TITUS 350ZRL	1,3

NOTES: 1. ALL AIR PERFORMANCE IS BASED UPON THE PROJECT ELEVATION
2. 24X24 PANEL SIZE, 18X18 LOUVER SIZE, 4 WAY DISCHARGE.
3. SEE PLANS FOR NECK SIZE.
4. 24X24 PANEL SIZE, 18X18 LOUVER SIZE, 3 WAY DISCHARGE.
5. DOUBLE DEFLECTION LOUVERS.
6. 24X24 PANEL SIZE, 18X18 LOUVER SIZE, 3 WAY DISCHARGE.
7. 24X24 PANEL SIZE, 18X18 LOUVER SIZE, 3 WAY DISCHARGE.

FAN SCHEDULE												
TAG	TYPE	SERVICE	CFM	ESP In. w.c.	RPM	EFF. %	FAN DIA. Inches	BHP	MOTOR HP	ELECTRICAL VOLTS/PH	MANUFACTURER AND MODEL	NOTES
EF-1	UPBLAST	RESTROOM	550	0.125	920	--	--	--	1/4	120/1ø	GREENHECK CUBE-099	1,2,3
NOTES: 1. ALL AIR PERFORMANCE IS BASED UPON THE PROJECT ELEVATION OF 5039 FT. 2. INTERLOCK EXHAUST FAN WITH ASSOCIATED AHU OPERATION. 3. PROVIDE BACKDRIFT DAMPER. 4. 5. 6.												

TAG	DESCRIPTION	MANUFACTURER AND MODEL	CONNECTION SIZES					NOTES
			TRAP	DCW	DHW	SS	V	
L-1	LAVATORY, MAVERICK 1, COUNTER MOUNTED, VITREOUS CHINA, 14X12, OVAL BOWL, WHITE, SELF RIMMING, DELTA 590-LGHGMHDF HANDS FREE BATTERY OPERATED SINGLE HOLE WITH DRAIN	MANSFIELD 249	1 1/4"	1/2"	1/2"	1 1/4"	1 1/4"	1,4,5
UR-1	URINAL, SUBURBAN, WALL HUNG, ADA COMPLIANT, VITREOUS CHINA, 3/4" TOP SPUD, 0.5 GPF, ZURN ZER-6003AV-ULF-CMP HANDS FREE BATTERY OPERATED FLUSH VALVE	MANSFIELD 475HE	---	3/4"	---	2"	1 1/2"	4,5
WC-1	WATER CLOSET, ALTO 1.28, FLOOR MOUNTED, VITREOUS CHINA, ELONGATED BOWL, 2 PIECE, 1.28 GPF, ELONGATED OPEN FRONT SEAT	MANSFIELD 135-3173	---	1/2"	---	4"	2"	2,4,5
WC-2	WATER CLOSET, ALTO 1.28, FLOOR MOUNTED, VITREOUS CHINA, ELONGATED BOWL, 2 PIECE, 1.28 GPF, ELONGATED OPEN FRONT SEAT, ADA COMPLIANT	MANSFIELD 137-3173	---	1/2"	---	4"	2"	2,4,5
MS-1	MOP SINK, PRECAST TERRAZZO, 10" HIGH WALLS, SS DRAIN BODY WITH 3" PIPE CONNECTION, DELTA 2819 BODY WITH MOP HANGER, HOSE AND HOSE BRACKET, VACUUM BREAKER, 4.0 GPM	FIAT MSB2424	3"	3/4"	3/4"	3"	1 1/2"	3,5
FD-1	FLOOR DRAIN, CAST IRON, TWO PIECE BODY, DOUBLE DRAINAGE FLANGE, FLASHING COLLAR, WEEP HOLES, BOTTOM OUTLET, 6" ADJUSTABLE ROUND STRAINER, TRAP PRIMER CONNECTION	WADE 1102STD6	2"	---	---	2"	1 1/2"	--
FD-2	FLOOR DRAIN, CAST IRON, TWO PIECE BODY, DOUBLE DRAINAGE FLANGE, FLASHING COLLAR, WEEP HOLES, BOTTOM OUTLET, 6" ADJUSTABLE ROUND STRAINER, TRAP PRIMER CONNECTION	WADE 1104STD6	4"	---	---	4"	2"	--
S-1	HAND SINK, WALL MOUNTED, 20 GAUGE 304 STAINLESS STEEL, 12X10 BOWL, GOOSENECK FAUCET, METAL LEVER HANDLES, 2.2 GPM, DRAIN AND STRAINER	KROWNE HS-9	1 1/4"	1/2"	1/2"	1 1/4"	1 1/4"	1,4
RPBP-1	REDUCED PRESSURE BACKFLOW PREVENTER WITH WATTS 909AG AIR GAP FITTING, 15.0 PSI PRESSURE DROP AT 30.0 GPM, PROVIDE ISOLATION VALVES, STRAINER AND TEST PORTS	WATTS 009M2-QT-SH1 1/4	---	3/4"	---	---	---	--
WH-1	WALL HYDRANT, FREEZE PROOF, CHROME PLATED WITH ANTI-SIPHON VACUUM BREAKER, CONCEALED WALL BOX WITH LOCKING COVER	WOODFORD B65	---	3/4"	---	---	---	5
WHA-1	WATER HAMMER ARRESTER, STAINLESS STEEL, PDI A	SMITH 5005	---	3/4"	3/4"	---	---	--
DF-1	DRINKING FOUNTAIN, TWO STATION, ADA COMPLIANT, 8.0 GPH 50°F WATER, 370 WATTS, 5.0 FLA, 115V	ELKAY EZSTL8LC	1 1/2"	3/4"	---	1 1/2"	1 1/4"	4
S-2	3 COMPARTMENT SINK, FREE STANDING, 20 GAUGE 304 STAINLESS STEEL, 20 GAUGE 304 STAINLESS STEEL DRAINBOARD, FRONT APRON AND BACKSPASH, SWING ARM FAUCET, METAL LEVER HANDLES, 2.2 GPM, DRAIN AND STRAINER	KROWNE 21-43L	1 1/4"	1/2"	1/2"	1 1/4"	1 1/4"	1,4
FS-1	FLOOR SINK, CAST IRON, TWO PIECE BODY, DRAINAGE FLANGE, NO SEEPAGE HOLES, BOTTOM OUTLET, SQUARE STRAINER, HALF GRATE, ALUMINUM DOME, HINGED STRAINER	WADE 9112-15	2"	---	---	2"	1 1/2"	4

NOTES: 1. PROVIDE STRAINER
2. PROVIDE BOWS MODEL 1655C HEAVY DUTY, COMMERCIAL GRADE, PLASTIC OPEN FRONT SEAT.
3. FAUCET PROVIDED WITH INTEGRAL STOPS, PAIL HOOK, INLINE VACUUM BREAKER AND WALL BRACE.
4. COLOR SELECTED BY ARCHITECT
5. PROVIDE ALL NECESSARY ACCESSORIES, STOPS, AND CARRIERS
6. SS AND V SIZES PER BOWL, FOR TWO BOWL SINK COMBINED SS SHALL BE 2" AND V SHALL BE 1 1/2"
7.
8.
9.

COOLING COIL SCHEDULE																		
TAG	SEN. CAP. (BTU/H)	TOT. CAP. (BTU/H)	FINNED SIZE SF	MAX. FACE VELOCITY (FPM)	AIR SIDE CRITERIA					FLUID SIDE CRITERIA					MANUFACTURER AND MODEL	NOTES		
					CFM	EAT(db)	EAT(wb)	LAT(db)	LAT(wb)	APD	GPM	EWT	LWT	WPD			ROWS	FPI
CC-1	336,320	357,390	25.0	600 FPM	15,000	80.0°F	62.0°F	55.3°F	53.2°F	0.57" w.c.	--	--	--	--	4	14	CARRIER 28NE	1,2,3
CC-2	336,320	357,390	25.0	600 FPM	15,000	80.0°F	62.0°F	55.3°F	53.2°F	0.57" w.c.	--	--	--	--	4	14	CARRIER 28NE	1,2,3

NOTES: 1. ALL AIR PERFORMANCE IS BASED UPON THE PROJECT ELEVATION OF 5050 FEET
2. COOLING COIL WITH R410A REFRIGERANT
3. SCHEDULED CAPACITY AND PERFORMANCE ARE MINIMUM REQUIREMENTS, ACTUAL CAPACITY AND PERFORMANCE SHALL MEET OR EXCEED SCHEDULED PERFORMANCE
4.
5.

PUMP SCHEDULE												
TAG	TYPE	SERVICE	FLOW GPM	Δ P Ft. w.c.	EFF. %	RPM	IMP. DIA. Inches	FLUID	MOTOR HP	ELECTRICAL VOLTS/PH	MANUFACTURER AND MODEL	NOTES
P-1	INLINE	BOILER PUMP	32.8	10.0	30.0	1654	5.0	30%PG	0.33	120/1Ø	GRUNDFOS UPS 50-40/4	1,2
P-2	INLINE	BOILER PUMP	32.8	10.0	30.0	1654	5.0	30%PG	0.33	120/1Ø	GRUNDFOS UPS 40-40/4	1,2
P-3	INLINE	BOILER PUMP	32.8	10.0	30.0	1654	5.0	30%PG	0.33	120/1Ø	GRUNDFOS UPS 50-40/4	1,2
P-4	INLINE	BUILDING HEATING	98.4	35.0	30.0	3460	5.25	30%PG	3.0	230/3Ø	GRUNDFOS UPS 80-160/2	1,2
P-5	INLINE	BUILDING HEATING	98.4	35.0	30.0	3460	5.25	30%PG	3.0	230/3Ø	GRUNDFOS UPS 80-160/2	1,2
P-6	INLINE	RADIANT FLOOR	14.9	24.3	45.0	3460	5.0	30% PG	0.50	120/1Ø	GRUNDFOS UPS 32-80/2	1,2
P-7	INLINE	RADIANT FLOOR	11.6	20.7	40.0	3460	5.0	30% PG	0.50	120/1Ø	GRUNDFOS UPS 32-80/2	1,2
P-8	INLINE	RADIANT FLOOR	6.3	20.4	40.0	3460	5.0	30% PG	0.50	120/1Ø	GRUNDFOS UPS 32-80/2	1,2
NOTES: 1. PROVIDE A SUCTION DIFFUSER FOR ALL BASE MOUNTED PUMPS 2. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS 3.												

AIR HANDLER SCHEDULE																							
TAG	TYPE	SERVICE	O/A VOLUME		HEATING COIL	COOLING COIL	SUPPLY FAN								RETURN FAN						OPERATING WEIGHT	MANUFACTURER AND MODEL	NOTES
			MIN.	MAX.			CFM	ESP	RPM	TYPE	HP	QTY	VOLTS/PH	CFM	ESP	RPM	TYPE	HP	QTY	VOLTS/PH			
AHU-1	CENTRAL STATION	WEST SIDE	225	15,000	HC-1	CC-1	15,000	0.5" w.c.	729	AF	15.0	1	208/3Ø	--	--	--	--	--	--	2,100 #	CARRIER 39LF25	1,2,3,4	
AHU-2	CENTRAL STATION	EAST SIDE	225	15,000	HC-2	CC-2	15,000	0.5" w.c.	729	AF	15.0	1	208/3Ø	--	--	--	--	--	--	2,100 #	CARRIER 39LF25	1,2,3,4	

NOTES: 1. ALL AIR PERFORMANCE IS BASED UPON THE PROJECT ELEVATION OF 5050 FEET.
 2. PROVIDE VEE FILTER MOUNTED BOX SECTION AND PREHEAT COIL SECTION.
 3. SCHEDULED CAPACITY AND PERFORMANCE ARE MINIMUM REQUIREMENTS. ACTUAL CAPACITY AND PERFORMANCE SHALL MEET OR EXCEED SCHEDULED PERFORMANCE.
 4. SEE CONTROL DIAGRAM FOR CONTROL COMPONENTS AND OPERATION.

MISC. EQUIPMENT SCHEDULE	
TAG	DESCRIPTION
B-1	HYDRONIC BOILER, TRIANGLE TUBE PRESTIGE SOLO 399, CONDENSING HIGH EFFICIENCY, 399 MBH INPUT, MODULATING (72.5 MBH-399 MBH), 120V/1ø/15 AMPS, 316.3 MBH OUTPUT MIN, 30% PG
B-2	HYDRONIC BOILER, TRIANGLE TUBE PRESTIGE SOLO 399, CONDENSING HIGH EFFICIENCY, 399 MBH INPUT, MODULATING (72.5 MBH-399 MBH), 120V/1ø/15 AMPS, 316.3 MBH OUTPUT MIN, 30% PG
B-3	HYDRONIC BOILER, TRIANGLE TUBE PRESTIGE SOLO 399, CONDENSING HIGH EFFICIENCY, 399 MBH INPUT, MODULATING (72.5 MBH-399 MBH), 120V/1ø/15 AMPS, 316.3 MBH OUTPUT MIN, 30% PG
DWH-1	DOMESTIC WATER HEATER, RHEEM G75-75N, 75 GALLON, 75.1 MBH HEATING INPUT, NATURAL GAS, 91 GPH RECOVERY AT 80°F, PROVIDE T&P RELIEF, DRAIN PAN, ISOLATION VALVES AND EXPANSION TANK
HD-1	RANGE HOOD, BROAN 43000, 200 CFM, 7ø EA DUCT CONNECTION, 120/1PH, 1.8 AMPS, 8 SONES, 2 SPEED FAN SWITCH, INTEGRAL LIGHT, WASHABLE FILTER, STAINLESS STEEL, UL LISTED
ET-1	EXPANSION TANK, TACO CA300, BLADDER TYPE, 79 GALLON TANK, 79 GALLON ACCEPTANCE VOLUME, PRECHARGED TO 15 PSI
AS-1	AIR SCOOP, TACO 436, 3" CONNECTIONS, AUTOMATIC AIR VENT, 67.9 GPM AT 1.5 PSI PRESSURE DROP, PROVIDE 6" LONG ENTERING AND LEAVING PIPING AND TRANSITION TO LISTED PIPE SIZE
EUH-1	ELECTRIC WALL HEATER, RAYWALL FP08-40SW, 4KW, 175 CFM, BUILT IN THERMOSTAT, 208/1ø, 19.2 AMPS, COLOR AS SELECTED BY ARCHITECT
IH-1	INTAKE HOOD, GREENHECK FGI, 60X60 THROAT, 15,000 CFM AT 0.03" w.c., 24" HIGH CURB, COLOR AS SELECTED BY ARCHITECT
TV-1	TEMPERING VALVE, WAITS MMV SERIES THERMOSTATIC TEMPERING VALVE, 0.5 GPM MAXIMUM FLOW PER LAV, 105°F SUPPLY WATER TEMPERATURE
RH-1	RELIEF HOOD, GREENHECK FGR, 30X30 THROAT, 3,600 CFM AT 0.03" w.c., 24" HIGH CURB, COLOR AS SELECTED BY ARCHITECT

CONDENSING UNIT SCHEDULE										
TAG	SEN. CAP. (Btu/h)	TOT. CAP. (Btu/h)	REFRIGERANT	COOLING STAGE	ELECTRICAL DATA			WEIGHT	MANUFACTURER AND MODEL	NOTES
					MCA	MOC	V/PH			
CC-1	364,300	364,300	R410A	2	138.8	175.0	208/3ø	1,300	CARRIER 38APD030	1,2,3
CC-2	364,300	364,300	R410A	2	138.8	175.0	208/3ø	1,300	CARRIER 38APD030	1,2,3
NOTES: 1. ALL PERFORMANCE IS BASED UPON THE PROJECT ELEVATION OF 5050 FEET 2. SCHEDULED CAPACITY AND PERFORMANCE ARE MINIMUM REQUIREMENTS, ACTUAL CAPACITY AND PERFORMANCE SHALL MEET OR EXCEED SCHEDULED PERFORMANCE 3. PROVIDE MANUFACTURER'S REFRIGERANT PIPING KIT, WIRING KIT AND EXPANSION VALVE KIT. 4. CONTRACTOR SHALL VERIFY EQUIPMENT CAPACITY AT PROJECT ELEVATION AND COOLING REQUIREMENTS BEFORE ORDERING EQUIPMENT. 5. MINIMUM 10.8 EER. 6.										

GAS CONSUMPTION TABLE			
DEVICE	INPUT	GAS FLOW	PIPE SIZE
B-1	399.0 MBH	399.0 CFH	1 1/4"
B-2	399.0 MBH	399.0 CFH	1 1/4"
B-3	399.0 MBH	399.0 CFH	1 1/4"
DWH-1	60.0 MBH	60.0 CFH	3/4"
TOTAL	1,257.0 MBH	1,257.0 CFH	

NOTES:

1. PIPE LENGTH FROM METER IS 100 FEET AT 1,257.0 CFH.
2. SIZING TO NEW APPLIANCES BASED UPON 2018 IFGC TABLE 402.4 (2)
3. FUEL IS NATURAL GAS.

MECHANICAL REFERENCE DRAWING

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**BREI JOHNSON
ARCHITECTURE**
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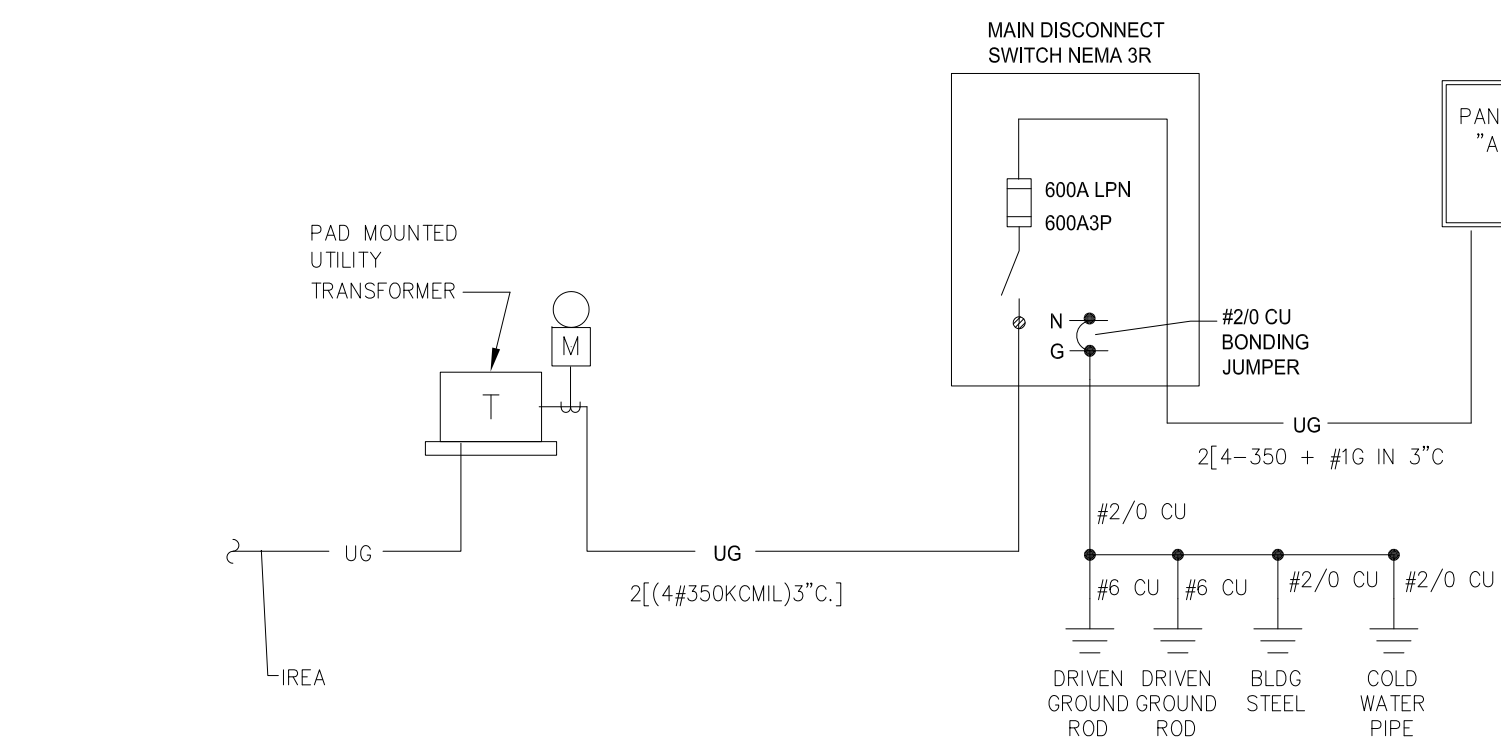
HUGO ROUNDHOUSE
ROUNDHOUSE PRESERVATION, INC
HUGO, COLORADO 80821

CDM-5

LIGHTING		ONE LINE DIAGRAM	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	RECESSED FLUORESCENT LUMINAIRE, LAY-IN GRID CEILING, LOWERCASE SCRIPT INDICATES SUBSCRIPT INDICATES LUMINAIRE TYPE.		DISCONNECT SWITCH
	RECESSED FLUORESCENT LUMINAIRE, FLANGED		DISCONNECT SWITCH, FUSED
	SURFACE MOUNTED LUMINAIRE		CIRCUIT BREAKER: L=LONG TIME PICKUP, S=SHORT TIME PICKUP; I - INSTANTANEOUS TRIP, G=GROUND FAULT
	SURFACE OR PENDANT MOUNTED STRIP		FUSE
	SURFACE MOUNTED WALL LUMINAIRE		GROUND
	PENDANT MOUNTED LINEAR LUMINAIRE		STEP DOWN TRANSFORMER, ## INDICATES KVA
	RECESSED DIRECT/INDIRECT LUMINAIRE		CURRENT TRANSFORMER
	UNDERCABINET LIGHTING		POTENTIAL TRANSFORMER
	SURFACE MOUNTED CEILING LUMINAIRE		SERVICE ENTRANCE TRANSFORMER
	PENDANT MOUNTED LUMINAIRE		METER
	SURFACE MOUNTED WALL LUMINAIRE		EQUIPMENT ENCLOSURE
	RECESS MOUNTED WALL LUMINAIRE		KIRK KEY INTERLOCK, SUBSCRIPT INDICATES INTERLOCKED GROUP
	RECESS MOUNTED CEILING LUMINAIRE		ELECTRICAL INTERLOCK, SUBSCRIPT INDICATES INTERLOCKED GROUP
	RECESS MOUNTED CEILING LUMINAIRE-DIRECTIONAL		MECHANICAL INTERLOCK
	POLE MOUNTED LUMINAIRE		PANELBOARD "A"
	SPOT / FLOOD LIGHT		EM=ENERGY METER, PM=POWER METER, CM=CIRCUIT MONITOR
	BOLLARD		VOLTMETER
	TRACK LIGHTING		AMMETER
	EMERGENCY LIGHTING UNIT		ENGINE GENERATOR
	EXIT LIGHT, ARROWS AS INDICATED, FACES INDICATED BY SHADING		CONTACTOR/RELAY/CAPACITOR (AS NOTED)
	SINGLE POLE SWITCH (SUBSCRIPT DENOTES SWITCHING)		TRANSFER SWITCH - ATS=AUTOMATIC, MTS=MANUAL
	SWITCH: 2 = 2-POLE; 3 = 3-WAY; 4 = 4-WAY		GROUND FAULT INTERRUPTER
	K = KEY OPERATED SWITCH; M = HORSEPOWER		TRANSIENT VOLTAGE SURGE SUPPRESSOR
	RATED DIMMER SWITCH		SHUNT TRIP
	LV = LOW VOLTAGE SWITCH; MC = MOMENTARY CONTACT		DRAW-OUT DEVICE
	THERMAL OVERLOAD SWITCH		PLUG-IN DEVICE
	PHOTOCELL		ELECTRICALLY OPERATED
	TIME CLOCK		SERVICE WEATHERHEAD
	OCCUPANCY SENSOR WALL MOUNTED DUAL TECHNOLOGY; VS = VACANCY SENSOR		
	OCCUPANCY SENSOR CEILING MOUNT DUAL TECHNOLOGY; VS = VACANCY SENSOR		
	SHADING INDICATES CONNECTION TO EMERGENCY SYSTEM; LS INDICATE LIFE SAFETY CIRCUIT.		
POWER		ABBREVIATIONS	
SYMBOL	DESCRIPTION		
	SINGLE RECEPTACLE	A	AMPERES
	DUPLEX RECEPTACLE	AFF	ABOVE FINISHED FLOOR
	DUPLEX RECEPTACLE ABOVE COUNTER	AFG	ABOVE FINISHED GRADE
	DOUBLE DUPLEX RECEPTACLE	ATS	AUTOMATIC TRANSFER SWITCH
	DOUBLE DUPLEX RECEPTACLE ABOVE COUNTER	BFG	BELOW FINISHED GRADE
	DUPLEX RECEPTACLE, HALF SWITCHED	CB	CONDUIT
	DUPLEX RECEPTACLE, CEILING MOUNTED	CATV	CABLE TELEVISION
	DUPLEX RECEPTACLE, FLOOR MOUNTED	CC	CIRCUIT BREAKER
	DOUBLE DUPLEX RECEPTACLE, FLOOR MOUNTED	CCTV	CLOSED CIRCUIT TELEVISION
	SPECIAL RECEPTACLE	EM	EMERGENCY
	SPECIAL RECEPTACLE, FLOOR MOUNTED	EP	EXPLOSION PROOF
	JUNCTION BOX, WALL OR CEILING MOUNTED	EPO	EMERGENCY POWER OFF
	ELECTRICAL PANELBOARD OR OTHER CABINET AS NOTED	EWC	ELECTRIC WATER COOLER
	DISCONNECT SWITCH (NON-FUSED)	FA	FIRE ALARM
	DISCONNECT SWITCH (FUSED)	G	GROUND
	COMBINATION STARTER/DISCONNECT	GFI	GROUND FAULT

[illegible]

- WORK INCLUDED IN THE CONTRACT IS DENOTED IN BOLD. EXISTING CONDITIONS TO REMAIN ARE DENOTED LIGHTLY.
2. ALL ELECTRICAL WORK PERFORMED UNDER THIS CONTRACT SHALL CONFORM WITH LATEST EDITIONS OF THE NATIONAL ELECTRICAL CODE, INTERNATIONAL BUILDING CODE, LOCAL BUILDING AND FIRE DEPARTMENT REQUIREMENTS.
3. ELECTRICAL CONTRACTOR SHALL FULLY COORDINATE WITH OWNER REPRESENTATIVES, PERFORM WORK IN ACCORDANCE WITH REQUIREMENTS OF OWNER REPRESENTATIVES. ELECTRICAL CONTRACTOR SHALL NOTIFY THE ARCHITECT AND ENGINEER OF ANY CHANGES REQUIRED BY THE BUILDING MANAGEMENT AND TENANT REPRESENTATIVES.
4. THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF ELECTRICAL WORK. LOCATIONS ARE APPROXIMATE AND SHALL BE SUBJECT TO MINOR MODIFICATIONS AS DIRECTED BY THE GENERAL CONTRACTOR AND OWNER REPRESENTATIVES. ELECTRICAL CONTRACTOR SHALL REDUCE AS REQUIRED FOR EXACT FIT/TILT OF SUPPORT EQUIPMENT, ETC., IN THE BUILDING AND TENANT SPACE. ALL DIMENSIONS SHALL BE VERIFIED ON THE JOB. ELECTRICAL CONTRACTOR SHALL CUT, CHANNEL, CHASE, AND/OR DRILL FLOORS, WALLS, PARTITIONS, CEILING AND/OR OTHER SURFACES AS REQUIRED FOR EXACT FIT/TILT OF SUPPORT ANCHORAGE, ETC., OF WORK. PROVIDE X-RAY OF FLOOR PRIOR TO CORE DRILLS. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUBSEQUENT PATCHING WORK.
5. A DETAILED WRITTEN METHOD OF PROCEDURE IS REQUIRED WHEN A CONSTRUCTION ACTIVITY OR AN OUTAGE AFFECTS THE SAFETY OF OCCUPANTS. TELEPHONE/DATA/FIRE ALARM EQUIPMENT OR COMPONENTS OF ANY SYSTEM WHICH SUPPORTS THIS EQUIPMENT OR ESSENTIALLY AFFECTS THE BUILDING MANAGEMENT, OPERATIONS OR SECURITY, SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
6. PRIOR TO SUBMITTING BIDS, THE ELECTRICAL CONTRACTOR SHALL VISIT THE SITE TO VERIFY EXISTING ELECTRICAL EQUIPMENT CONDITIONS AND DIFFICULTIES THAT WILL AFFECT EXECUTION OF THE WORK. FIELD VERIFY QUANTITIES OF EXISTING LIGHT FIXTURES, ELECTRICAL DEVICES, COMMUNICATION DEVICES, FIRE ALARM DEVICES, AND ELECTRICAL EQUIPMENT. NOTIFY THE ARCHITECT AND ENGINEER OF ANY EXISTING CONDITIONS, WHICH MAY AFFECT THE SCOPE AS SHOWN ON THE CONSTRUCTION DOCUMENTS. SUBMISSION OF A BID PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND LATER CLAIMS FOR MOBILIZATION, LABOR, MATERIAL, AND/OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WILL NOT BE RECOGNIZED.
7. PROTECT STRUCTURE AND OWNER EQUIPMENT FROM DAMAGE. IMMEDIATELY REPLACE OR REPAIR TO ORIGINAL CONDITION. DAMAGE CAUSED BY THE CONTRACTOR WHETHER EQUIPMENT APPEARS TO BE CURRENTLY IN USE OR NOT. UNLESS WRITTEN AUTHORIZATION FROM THE OWNER INDICATED TO THE CONTRARY, PROVIDE LISTING OF ALL EXISTING DAMAGED ITEMS AND SUBMIT TO OWNER PRIOR TO BEGINNING WORK.
8. EXISTING INFORMATION SHOWN ON THE DRAWINGS HAS BEEN TAKEN FROM OWNER FURNISHED DRAWINGS AND/OR LIMITED FIELD OBSERVATIONS. CMO CONSULTING ENGINEERS, LLC IS NOT RESPONSIBLE FOR THE ACCURACY OF ANY INFORMATION OR THE ADEQUACY, SAFETY AND CONFORMANCE TO CURRENT PREVAILING CODES OF ANY WORK SHOWN AS EXISTING ON THESE DRAWINGS.
9. FIELD LOCATE EXISTING UNDERGROUND PUBLIC AND OWNER UTILITIES OF ALL TRADES AND BUILDING UNDERGROUND LIGHTNING PROTECTION SYSTEMS FOR SYSTEM EXAMINATION. REPLACE OR REPAIR DAMAGED UTILITIES AND GROUNDING/LIGHTNING PROTECTION SYSTEMS TO ORIGINAL CONDITION.
10. INSTALL CONDUIT CONCEALED IN FINISHED AREAS UNLESS OTHERWISE NOTED.
11. DO NOT ROUTE CONDUIT UNDER STRUCTURAL OR TOPPING SLABS OF FLOORS UNLESS SPECIFICALLY NOTED OTHERWISE AND WRITTEN APPROVAL IS OBTAINED FROM THE STRUCTURAL ENGINEER.
12. FIRE SEAL ALL FIRE RATED WALL AND FLOOR PENETRATIONS. VERIFY RATED WALL LOCATIONS ON ELECTRICAL DRAWINGS.
13. PROVIDE SEPARATE INSULATED GROUNDING CONDUIT IN ALL FEEDER, HOMERUN AND BRANCH CIRCUITS.
14. REFER TO ELECTRICAL AND MECHANICAL EQUIPMENT DRAWINGS FOR EXACT LOCATIONS OF ELECTRICAL DEVICES AND LIGHT FIXTURES. DO NOT SCALE FROM THE ELECTRICAL PLANS. ADDITIONAL ELECTRICAL REQUIREMENTS ON ARCHITECTURAL PLANS, KITCHEN EQUIPMENT PLANS, AND MECHANICAL PLANS SHALL BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S BID.
15. DEMOLITION OF ANY ELECTRICAL AND COMMUNICATIONS CONDUIT, WIRING, CABLEING, OR DEVICE MAYES REMOVE IN ITS ENTIRETY. REMOVE UNUSED CONDUITS FROM CEILING SPACES IN AREAS SUCH AS ATTIC TO REQUIRE REMOVAL OF ELECTRICAL CONDUIT AND LIGHT FIXTURES TO BUILDING MANAGEMENT FOR STORAGE AND/OR REMOVE FROM SITE AS DIRECTED BY OWNERS.
16. WHERE REMODELING INTERFERES WITH EXISTING CIRCUITS AND EQUIPMENT WHICH ARE NOT TO BE REMOVED OR ARE OUTSIDE OF THE PROJECT AREA, SUCH CIRCUITS AND EQUIPMENT SHALL BE REWORKED AND RELOCATED AS REQUIRED TO COMPLETE THE PROJECT.
17. MINIMUM WORKING CLEARANCES PER THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE SHALL BE PROVIDED AROUND AND IN FRONT OF ALL ELECTRICAL EQUIPMENT.
18. ELECTRICAL CONTRACTOR SHALL MAINTAIN ON THE JOB AN UP TO DATE SET OF WORKING DRAWINGS, MARKED UP TO SHOW ELECTRICAL SYSTEMS AS INSTALLED. PROVIDE TENANT REPRESENTATIVES WITH ONE SET OF REPRESENTATIONS WITH "AS BUILT" PROJECT RECORD DRAWINGS. CLEARLY INDICATE ALL CHANGES TO THE PROJECT. PROVIDE ONE SET OF DRAWINGS FOR ELEC. FEES, PERMITS, AND SERVICES OF INSPECTIONS/SAFETY REQUIREMENTS REQUIRED BY ELECTRICAL WORK FOR THIS ELECTRICAL CONTRACTOR.
19. PROVIDE TYPED, UPDATED, COMPLETE AND ACCURATE PANELBOARD CIRCUIT DIRECTORIES AT THE COMPLETION OF WORK. CLEAN EXPOSED PANELBOARD SURFACES AND CHECK TIGHTNESS OF ELECTRICAL CONNECTIONS. REPLACE DAMAGED CIRCUIT BREAKERS AS REQUIRED AND PROVIDE FILLER PLATES FOR VACANT SPACES.
20. PROVIDE DETAILED LABELING OF ALL NEW AND RELOCATED ELECTRICAL EQUIPMENT IN SCOPE OF PROJECT. LABELING TO REQUIRE ALL ELECTRICAL EQUIPMENT TO BE CLEARLY IDENTIFIED BY TRANSFORMERS, SWITCHGEAR, SWITCHBOARDS, PANELBOARDS, MOTOR CONTROL CENTERS, AND DISCONNECTS TO INDICATE AMPERE RATING, VOLTAGE RATING, PHASE, CONDUCTOR COLOR CODING WITHIN THE EQUIPMENT AND APPLICABLE AMP RATING.
21. ALL NEW AND MODIFIED ELECTRICAL EQUIPMENT, SUCH AS SWITCHBOARDS, PANELBOARDS, INDUSTRIAL CONTROL PANELS, METER SOKET ENCLOSURES, AND MOTOR CONTROL CENTERS SHALL BE IDENTIFIED BY A FIELD IDENTIFICATION TAG. THE IDENTIFICATION TAGS SHALL BE ENGRAVED SHALL BE FIELD MARKED TO WARN QUALIFIED PERSONS OF POTENTIAL ELECTRIC ARC FLASH HAZARDS. THE MARKING SHALL BE LOCATED SO AS TO BE CLEARLY VISIBLE TO THE EQUIPMENT OPERATOR. THE IDENTIFICATION, ADJUSTMENT, SERVICING, OR MAINTENANCE OF THE EQUIPMENT PER NEC ARTICLE 110.16.



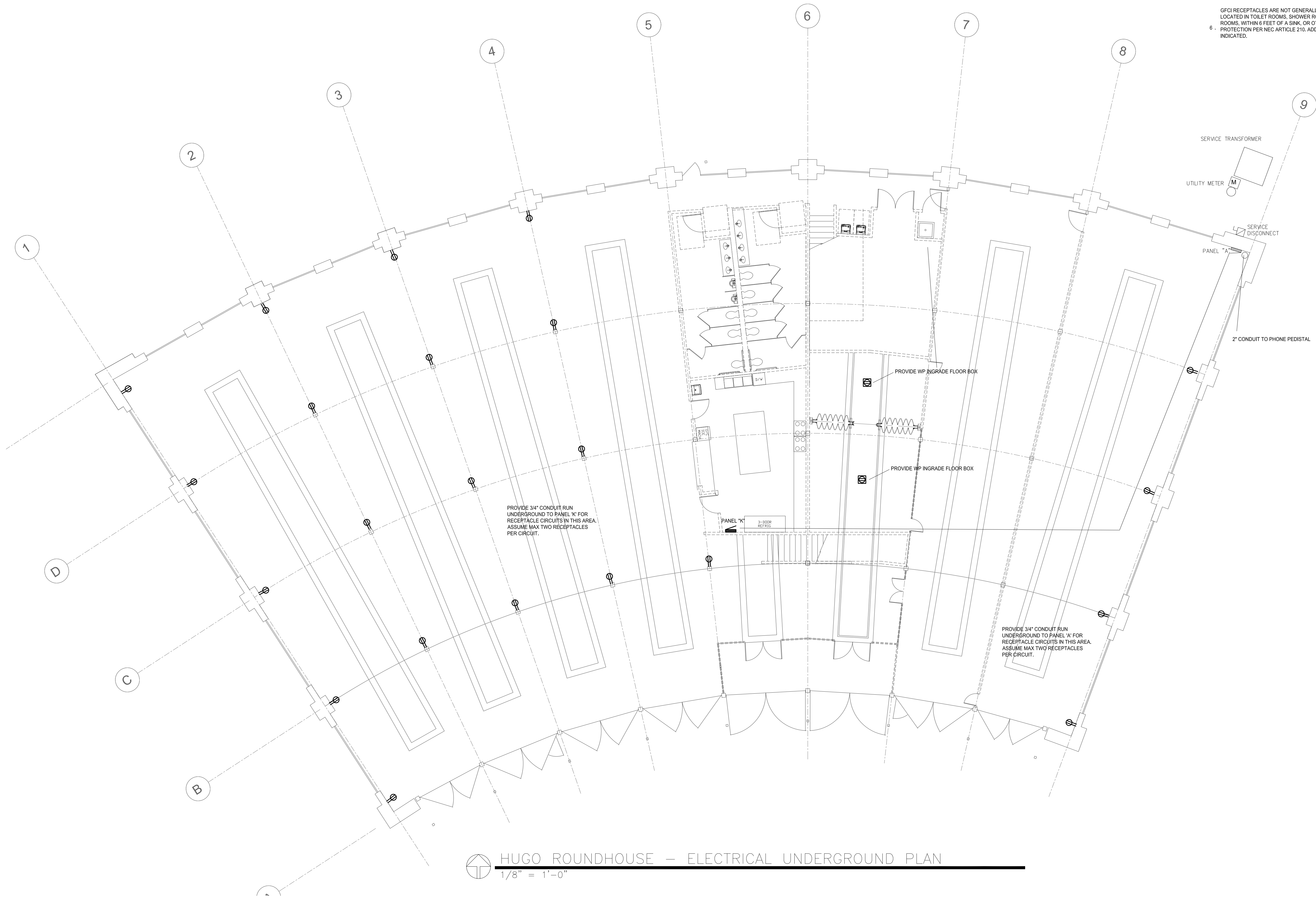
NO SCALE

ALL CONDUCTORS ARE TO BE COPPER

11646 Sun Bear Trail
Golden, Colorado 80403
303.875.4037

HUGO ROADHOUSE
NDHOUSE PRESERVATION, INC
HUGO, COLORADO 80821

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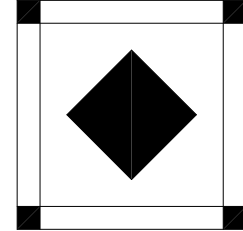


POWER PLAN NOTES:

1. MAKE ALL FINAL ELECTRICAL CONNECTIONS TO EQUIPMENT REQUIRING ELECTRICAL CONNECTION. THIS SHALL INCLUDE BUT NOT BE LIMITED TO ALL MECHANICAL AND OTHER EQUIPMENT INCLUDED IN THIS PROJECT.
 2. PROVIDE FUSES SIZED PER EQUIPMENT MANUFACTURER'S REQUIREMENTS.
 3. DISCONNECT SWITCH LOCATIONS ARE SHOWN DIAGRAMMATICALLY AND SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS TO SUIT EQUIPMENT AND SPACE. DISCONNECT SWITCHES SHALL BE WITHIN SIGHT OF THE EQUIPMENT THEY SERVE AND MOUNTED AT 6'-0", MAXIMUM, TO TOP OF CABINET. MAINTAIN NEC WORK SPACE REQUIREMENTS.
 4. COORDINATE AND VERIFY EXACT MOUNTING LOCATIONS OF WALL AND FLOOR DEVICES WITH ARCHITECTURAL ELEVATIONS, AND ANY FURNITURE OR SPECIALTY EQUIPMENT SUPPLIER DRAWINGS PRIOR TO ROUGH-IN.
 5. COORDINATE EXACT REQUIREMENTS AND LOCATIONS OF MECHANICAL EQUIPMENT WITH MECHANICAL DRAWINGS AND MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.
- PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH 120V AND 277V CIRCUIT.
- GFCI RECEPTACLES ARE NOT GENERALLY SHOWN ON DRAWINGS. ALL RECEPTACLE OUTLETS LOCATED IN TOILET ROOMS, SHOWER ROOMS, ROOFTOPS, OUTDOOR LOCATIONS, MECHANICAL ROOMS, WITHIN 6 FEET OF A SINK, OR OTHER WET LOCATIONS SHALL BE PROVIDED WITH GFCI PROTECTION PER NEC ARTICLE 210. ADDITIONAL GFCI PROTECTION TO BE PROVIDED AS INDICATED.

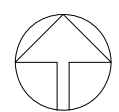
HUGO ROADHOUSE
ROUNDHOUSE PRESERVATION, INC
HUGO, COLORADO 80821

BRET JOHNSON
ARCHITECTURE
2304 YOSEMITE STREET
DENVER, COLORADO 80238
720.341.0392



JOB NUMBER: 20005
FILE:
DESIGNED:
DRAWN: CAD
CHECKED: CAB
DATE: 12/04/23
REVISIONS:

SHEET TITLE:
UNDERGROUND
FLOOR PLAN
SHEET NUMBER:
E2.0



HUGO ROUNDHOUSE – ELECTRICAL UNDERGROUND PLAN
1/8" = 1'-0"

CME
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