

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

SHEET INDEX

ARCHITECTURAL

- A-1 MAIN FLOOR PLAN
- A-2 ENLARGED FLOOR PLANS
- A-3 DETAILS

STRUCTURAL

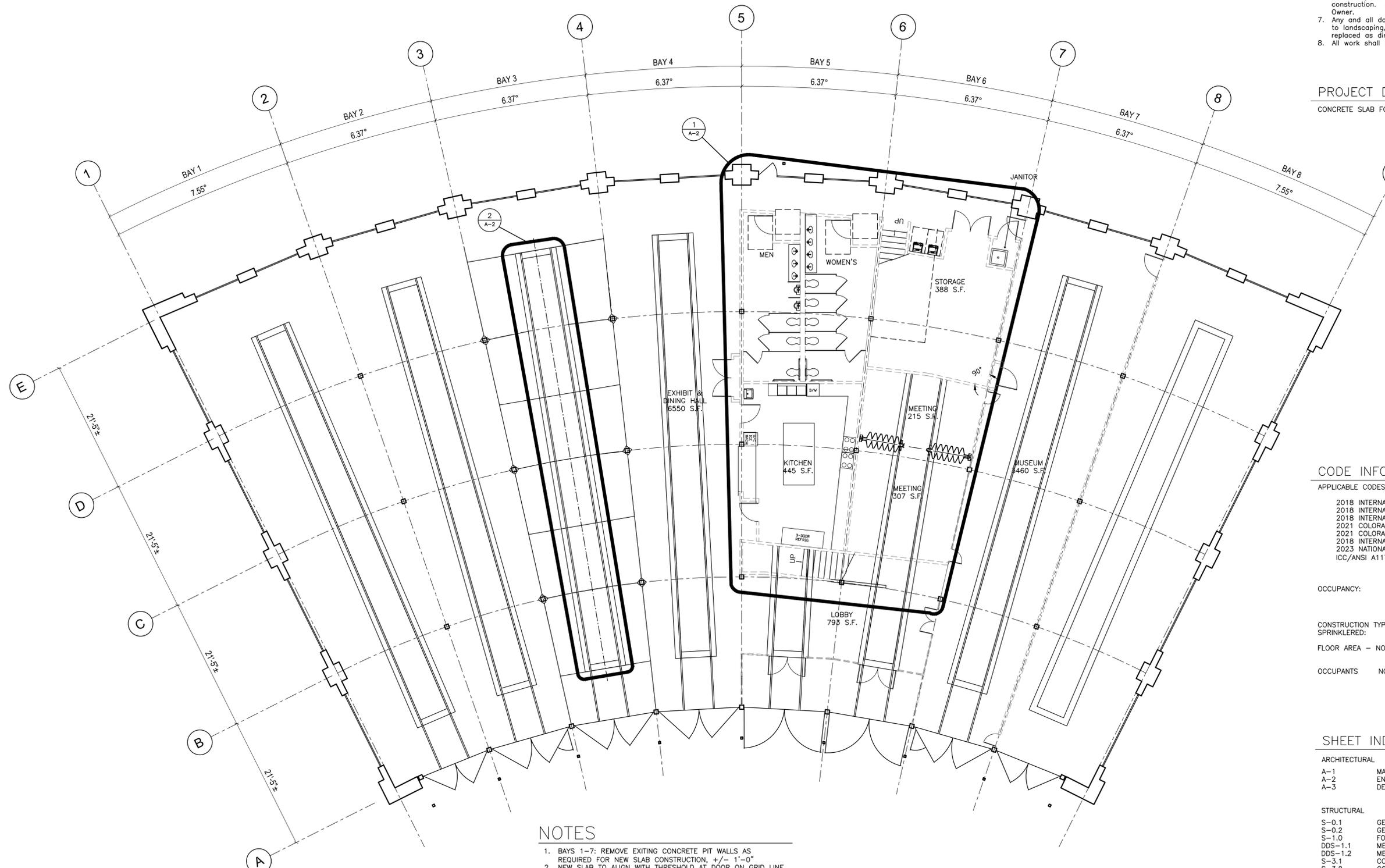
- S-0.1 GENERAL NOTES
- S-0.2 GENERAL NOTES
- S-1.0 FOUNDATION PLAN
- DDS-1.1 MEZZANINE WALL FRAMING PLAN - FOR REFERENCE
- DDS-1.2 MEZZANINE FLOOR FRAMING PLAN - FOR REFERENCE
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MECHANICAL

- CDM-1 MECHANICAL LEGEND AND NOTES
- CDM-2 UNDER SLAB MECHANICAL PLAN
- CDM-3 UNDER SLAB MECHANICAL SPECIFICATIONS
- CDM-4 MAIN LEVEL PLUMBING PLAN
- CDM-5 MECHANICAL SCHEDULES

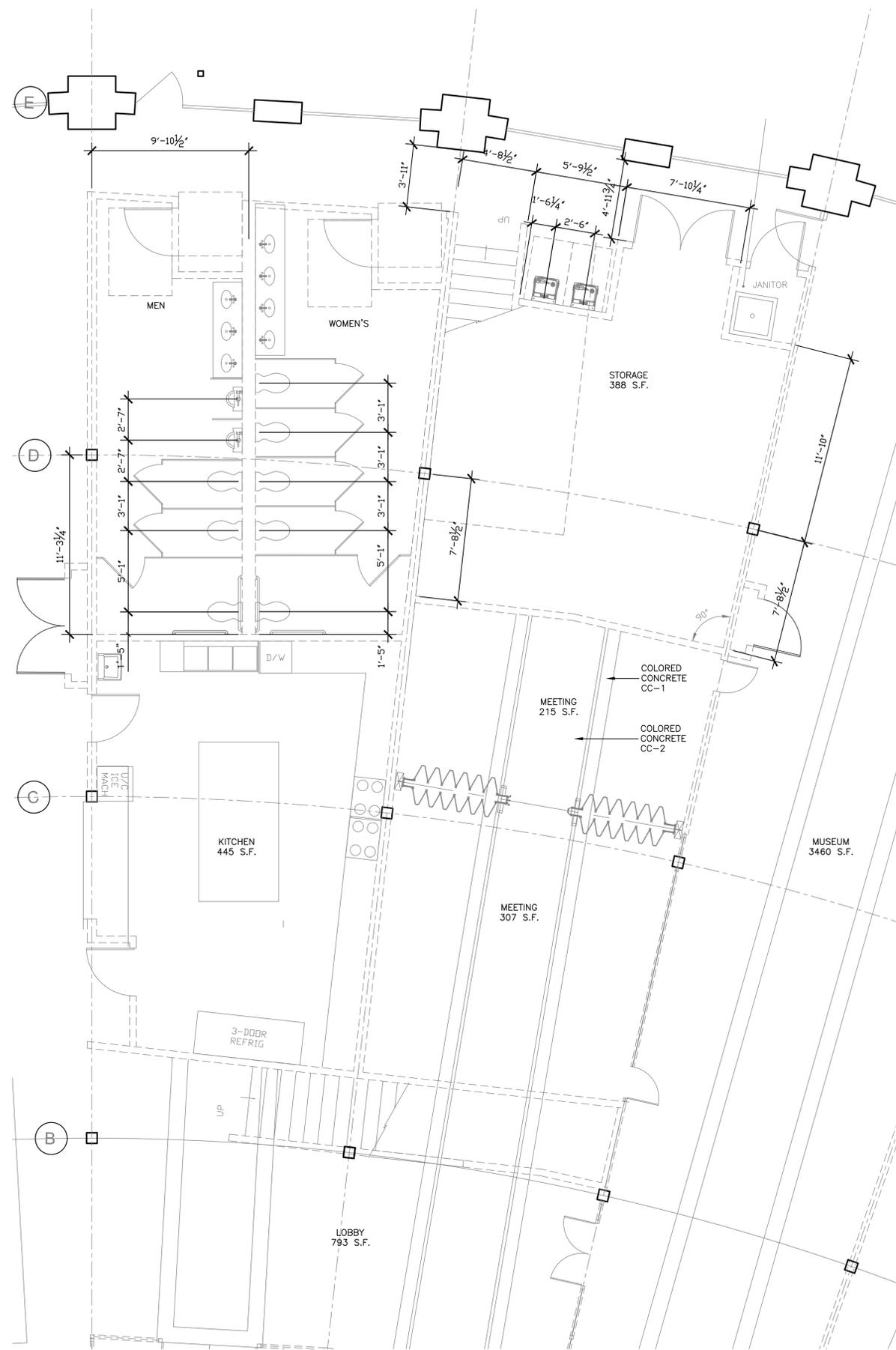
ELECTRICAL

- E1.0 ELECTRICAL LEGEND
- E2.0 UNDERGROUND FLOOR PLAN



NOTES

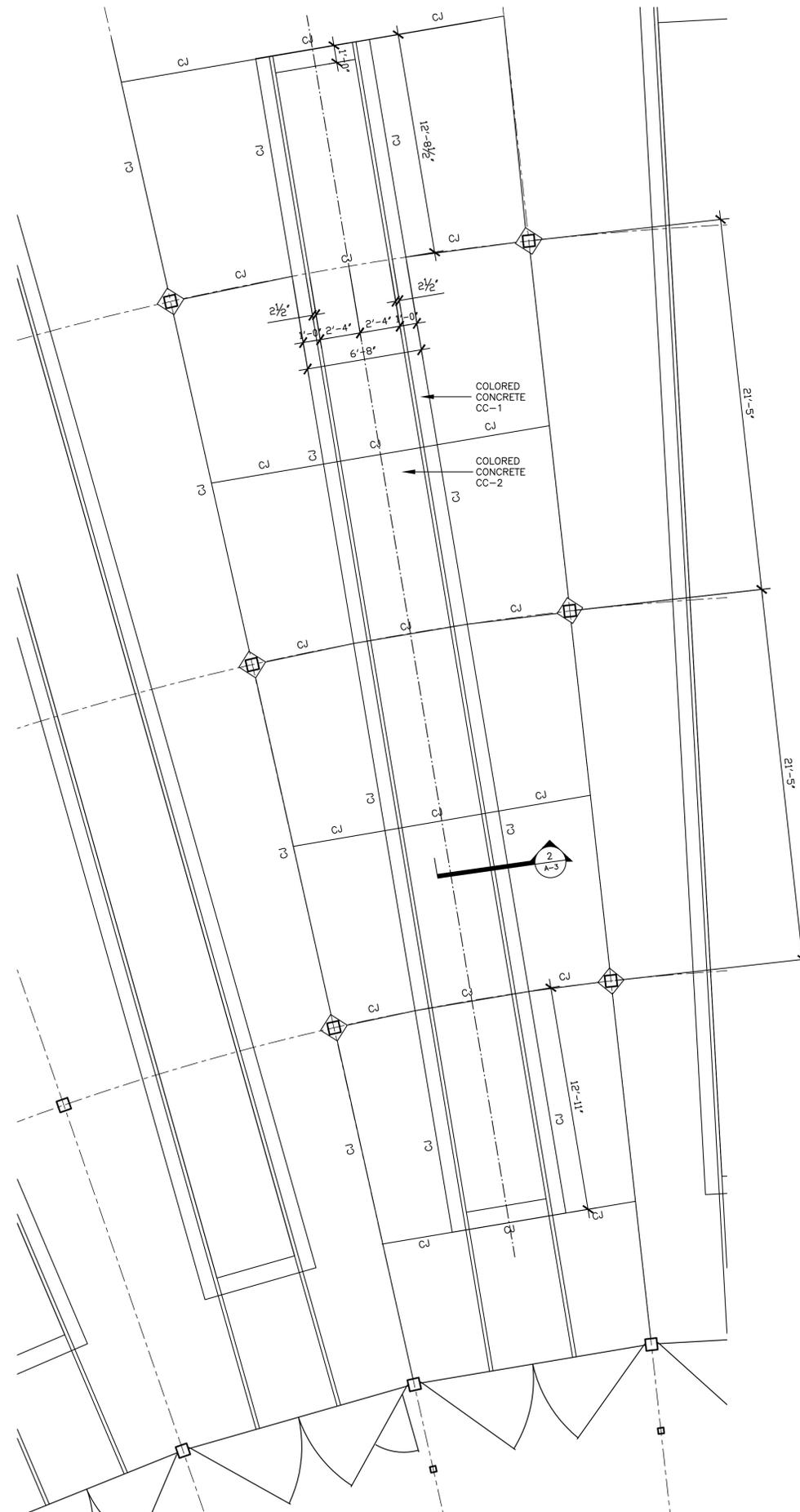
1. BAYS 1-7: REMOVE EXISTING CONCRETE PIT WALLS AS REQUIRED FOR NEW SLAB CONSTRUCTION, +/- 1'-0"
2. NEW SLAB TO ALIGN WITH THRESHOLD AT DOOR ON GRID LINE
A = 100'-0", RE: DETAIL 3/S3.2



1 ENLARGED FLOOR PLAN
1/4" = 1'-0"

LEGEND

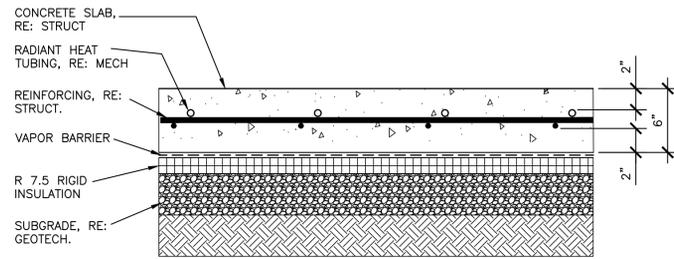
--- FUTURE WALLS



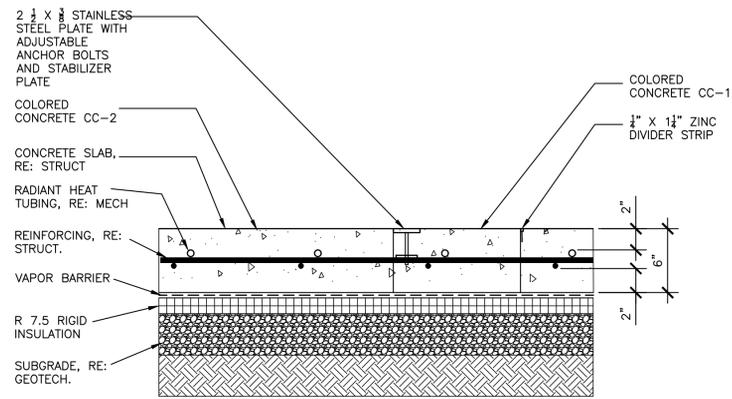
2 ENLARGED PIT PLAN/CONTROL JOINT PLAN - BAYS 1-4, 7
1/4" = 1'-0"

JOB NUMBER: 20-015
FILE:
DESIGNED:
DRAWN: SH
CHECKED:
DATE: 10/24/23
REVISIONS:

SHEET TITLE:
ENLARGED
PLANS
SHEET NUMBER:



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



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

BRET JOHNSON
ARCHITECTURE
2304 YOSEMITE STREET
DENVER, COLORADO 80238
720.341.0392

HUGO ROUNDHOUSE
ROUNDHOUSE PRESERVATION, INC
HUGO, COLORADO 80821

JOB NUMBER: 20-015
FILE:
DESIGNED:
DRAWN: SH
CHECKED:
DATE: 10/24/2023
REVISIONS:

SHEET TITLE:
DETAILS

SHEET NUMBER:
A-3

DESIGN CRITERIA
<p>1) CODES AND STANDARDS: 1A) GENERAL DESIGN - INTERNATIONAL BUILDING CODE 2018</p> <p>2) LATERAL LOADS 2A) SEISMIC LOADS - SEISMIC DESIGN CATEGORY = B - RISK CATEGORY = II - EARTHQUAKE IMPORTANCE FACTOR, I_e = 1.00 - MAPPED SPECTRAL RESPONSE ACCELERATION, S_s = 11.60 %g - MAPPED SPECTRAL RESPONSE ACCELERATION, S₁ = 4.60 %g - DESIGN SPECTRAL RESPONSE COEFFICIENT, S_{Ds} = 0.124 - DESIGN SPECTRAL RESPONSE COEFFICIENT, S_{D1} = 0.074 - SOIL SITE CLASS = D</p> <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 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>
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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: - CONTACT THE ARCHITECT PRIOR TO PROCEEDING WITH CONSTRUCTION - THE MORE STRINGENT REQUIREMENTS SHALL GOVERN FOR BIDDING / PRICING</p> <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: - SIZES OR DIMENSIONS OTHER THAN THOSE SHOWN - DAMAGE OR DETERIORATION TO MATERIALS AND COMPONENTS - CONDITIONS OF INSTABILITY OR LACK OF SUPPORT - ITEMS NOTED AS EXISTING ON THE DRAWINGS BUT NOT FOUND IN THE FIELD</p> <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: - 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).</p>
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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: - 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 SUBMITTALS - ALL SHOP DRAWINGS SHALL REFERENCE THE STRUCTURAL DRAWING NUMBER AND DETAIL USED TO PREPARE THE SUBMITTAL - SUBMIT 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> <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: - LAYOUT - DESIGN FOR FORMWORK, SHORING, AND RESHORING - DESIGN OF CONCRETE MIXES - ERECTION PROCEDURES WHICH ADDRESS STABILITY OF THE FRAME DURING CONSTRUCTION - WELD PROCEDURES - DESIGN OF TEMPORARY BRACING OF WALLS FOR WIND, SEISMIC, OR SOIL LOADS - SURVEYING TO VERIFY CONSTRUCTION TOLERANCES - EVALUATION OF TEMPORARY CONSTRUCTION LOADS ON STRUCTURE DUE TO EQUIPMENT AND MATERIALS - STRUCTURAL ENGINEERING TO RESIST ANY OTHER LOADS NOT IDENTIFIED ON DESIGN DRAWINGS</p> <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. - 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.</p>

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: - 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> <p>3B) MISCELLANEOUS REINFORCING REQUIREMENTS: - 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> <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: - SEE 'REBAR COVER TABLE' - SEE ACI 117-10 FOR REINFORCEMENT PLACING TOLERANCES</p> <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: - SAW CUTTING - CORING - CHIPPING</p> <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 - REFER TO TYPICAL DETAILS FOR REQUIREMENTS FOR CONDUIT AND PIPE EMBEDDED IN WALLS AND SLABS - REFER TO TYPICAL DETAILS FOR SPACING AND LAYOUT LIMITATIONS FOR SLEEVES AND OPENINGS - FORM OPENINGS AND PROVIDE SLEEVES BEFORE PLACING CONCRETE, CORING OF CONCRETE IS NOT PERMITTED - AT COMPOSITE SLABS DO NOT CUT DECK FOR AT LEAST 7 DAYS AFTER CONCRETE PLACEMENT</p> <p>10B) REINFORCING - REFER TO TYPICAL DETAILS FOR REINFORCEMENT REQUIREMENTS AT SLEEVES, OPENINGS OR CONDUIT - DO NOT CUT REINFORCING WHICH MAY CONFLICT</p>

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: 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: - ALLOWABLE VERTICAL BEARING PRESSURE = 1,500 PSF - ALLOWABLE LATERAL BEARING PRESSURE = 150 PCF</p> <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>
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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

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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<p>SHEET TITLE: GENERAL NOTES</p> <p>SHEET NUMBER: S-0.1</p>
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DESIGNERS: RISA KRIEGER
 LEAD REVIT TECH: JOEL JONES
 DATE PRINTED: 7/26/2024 8:21:14 AM
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 PROJECT MANAGER: DAVID WITTMAN
 MR. JOB #: 23.0213.S.01
 PRINCIPAL ENGINEER
 EOR: 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

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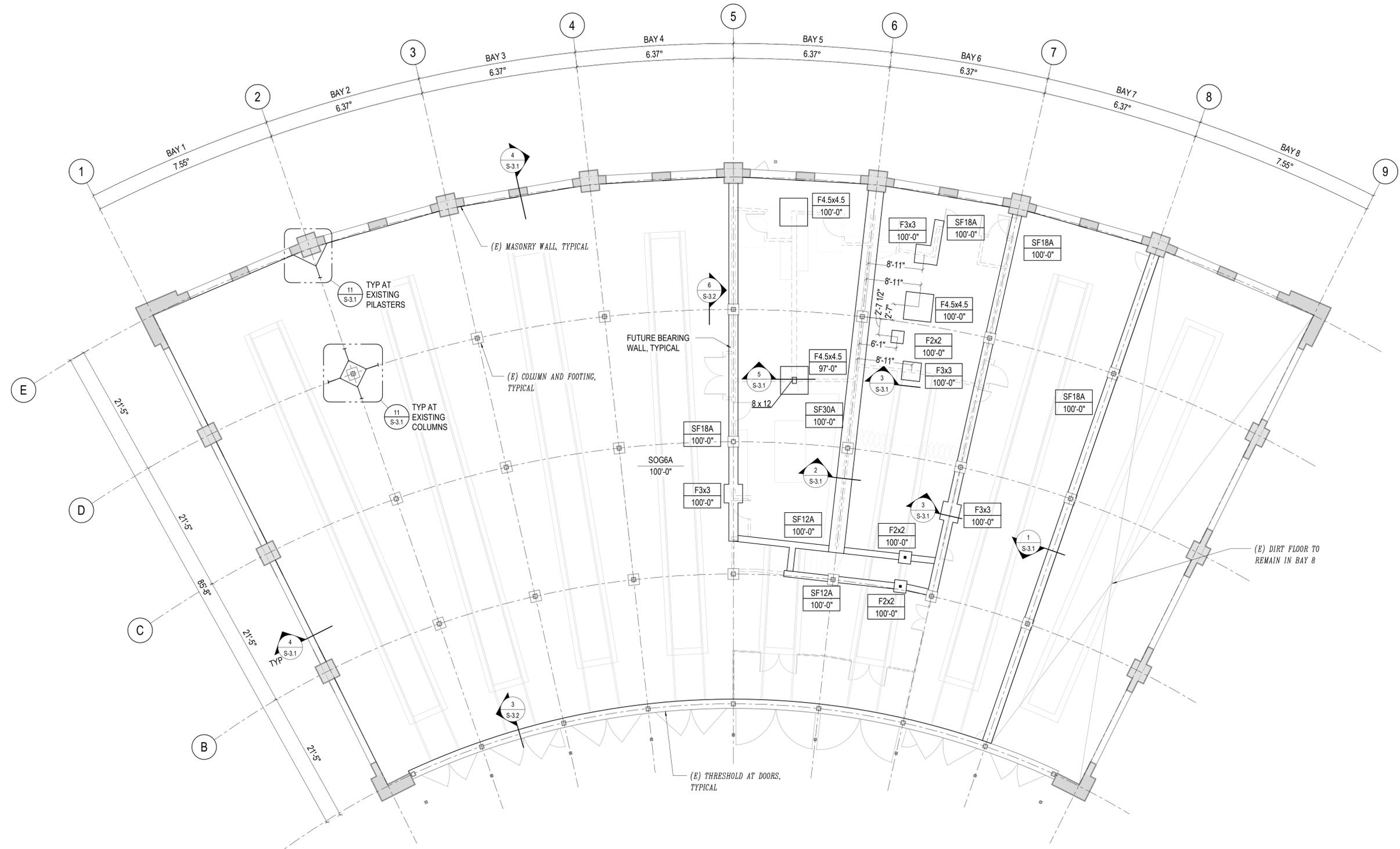
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SHEET TITLE:
GENERAL NOTES

SHEET NUMBER:
S-0.2

HUGO ROUNDHOUSE INTERIORS
3RD AVENUE
HUGO, COLORADO 80821



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"
XXXX	XXX-XX"
- 1G) FOOTING TYPE AND ELEVATION ARE NOTED THUS:

XXXX	XXX-XX"
XXX-XX"	XXX-XX"

MM JOB # 23.0213.S.01
 DESIGNER: DAVID WITTMAN
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 PROJECT MANAGER: DAVID WITTMAN

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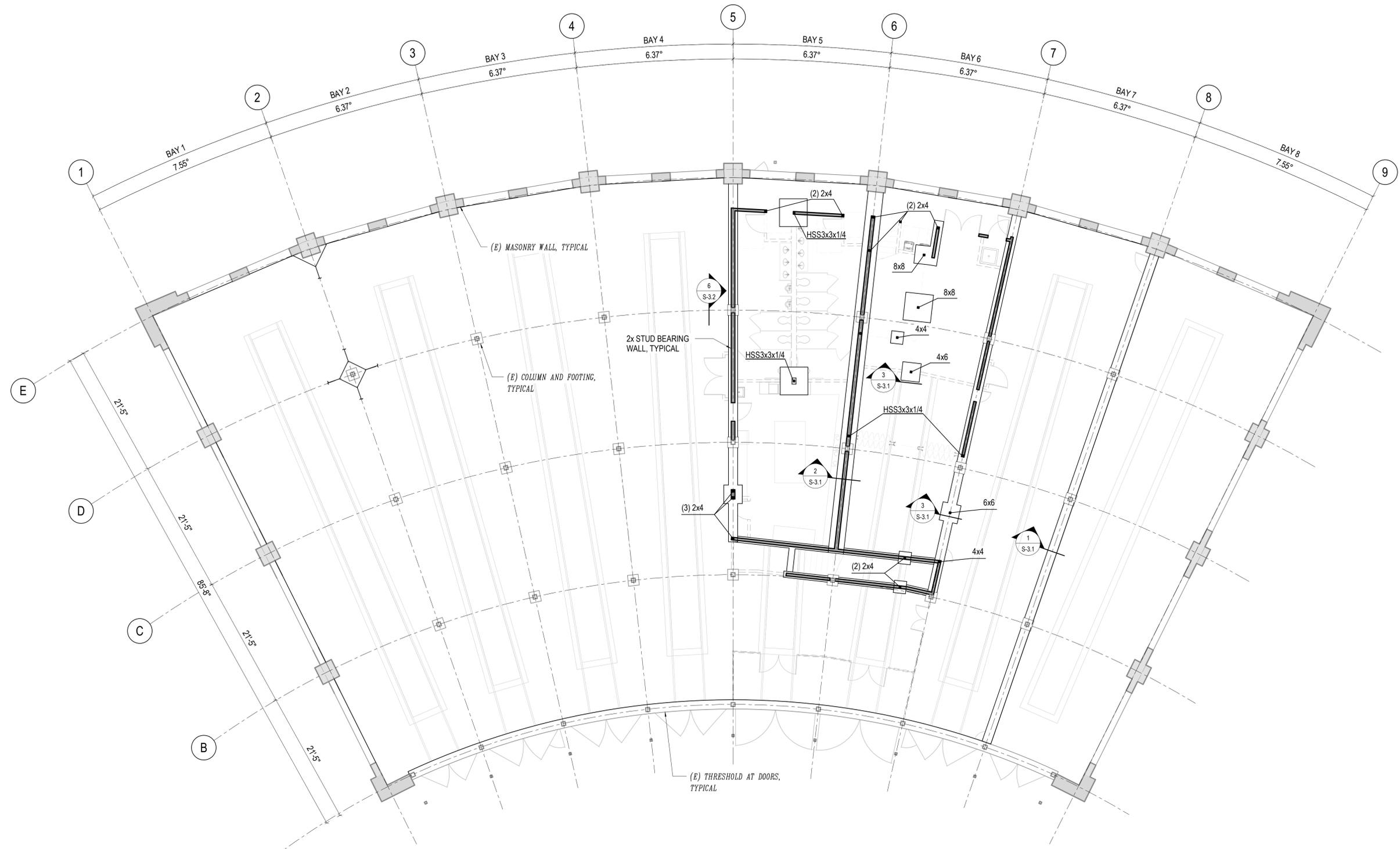
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SHEET TITLE:
FOUNDATION PLAN

SHEET NUMBER:
S-1.0

PROGRESS PRINTS NOT FOR CONSTRUCTION

HUGO ROUNDHOUSE INTERIORS
3RD AVENUE
HUGO, COLORADO 80821



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.

MM JOB # 23.0213.S.01
 PRINCIPAL DESIGNER
 EOR DAVID WITTMAN
 PROJECT MANAGER DAVID WITTMAN
 DESIGNER DICK KRIEGER
 LEAD REVIT TECH JOEL BINES
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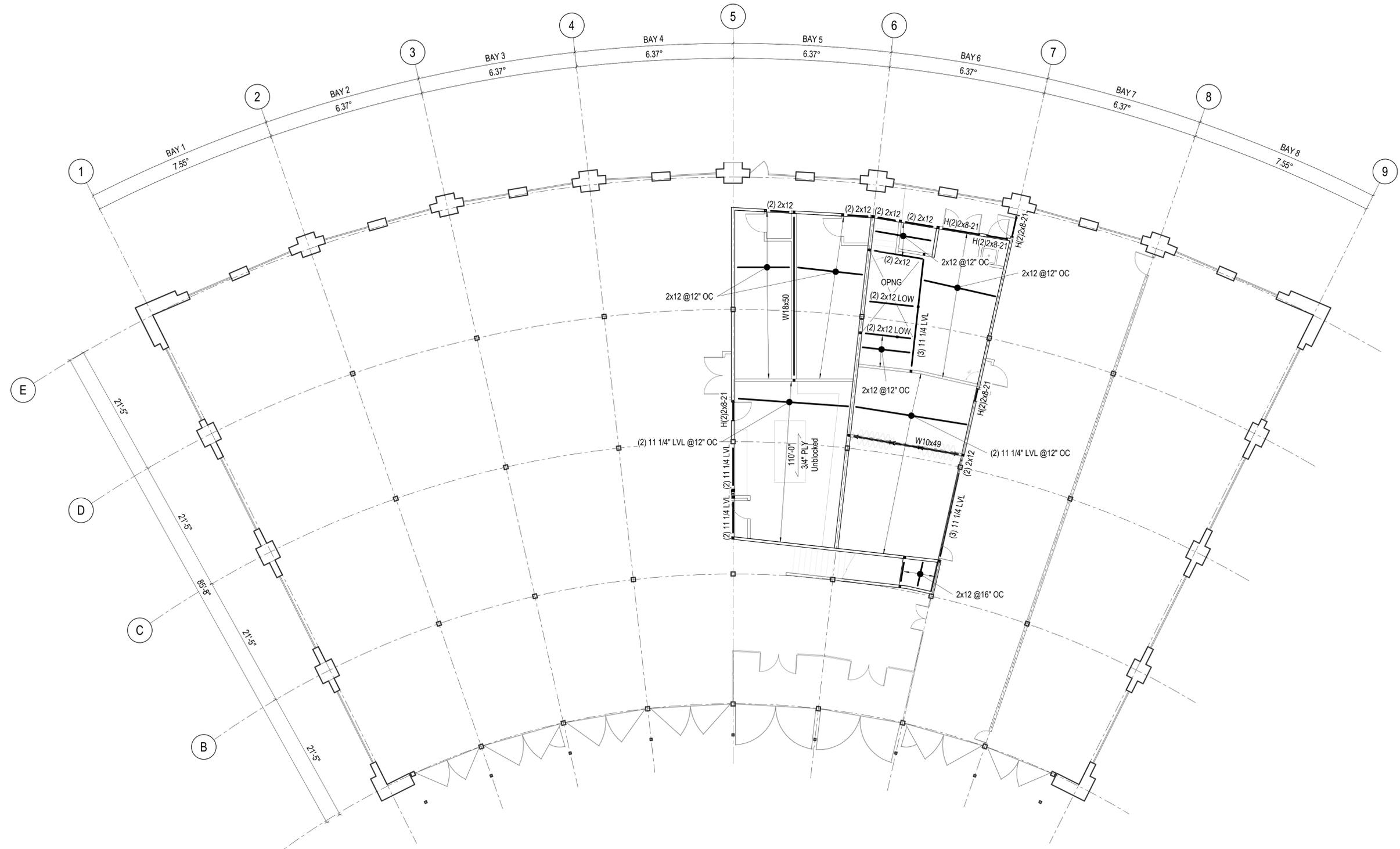
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SHEET TITLE:
WALL FRAMING PLAN - MAIN FLOOR
SHEET NUMBER:
DDS-1.1

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HUGO ROUNDHOUSE INTERIORS

3RD AVENUE
HUGO, COLORADO 80821



FUTURE MEZZANINE FLOOR FRAMING PLAN

1/8" = 1'-0"

MEZZANINE PLAN NOTES

- 1) GENERAL:**
 - 1A) SEE S0 SERIES SHEETS FOR GENERAL NOTES, SYMBOLS AND ABBREVIATIONS.
- 2) WOOD FRAMING:**
 - 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.
- 3) STEEL BEAMS:**
 - 3A) TOP OF STEEL BEAMS SHALL BE -1 1/2" FROM THE BOTTOM OF WOOD SHEATHING UNLESS NOTED OTHERWISE ON PLAN.

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 PROJECT MANAGER DAVID WITTMAN
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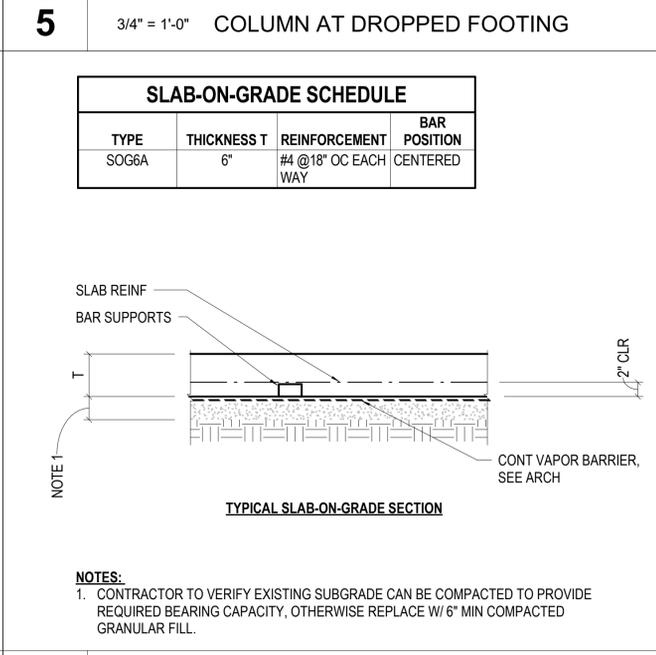
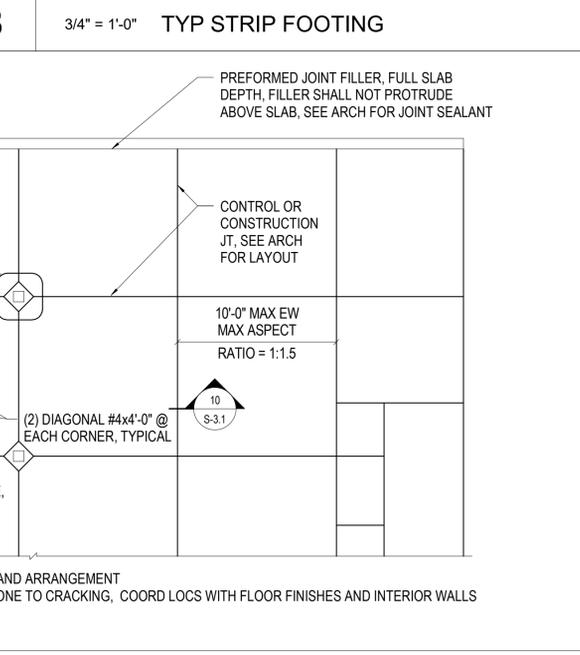
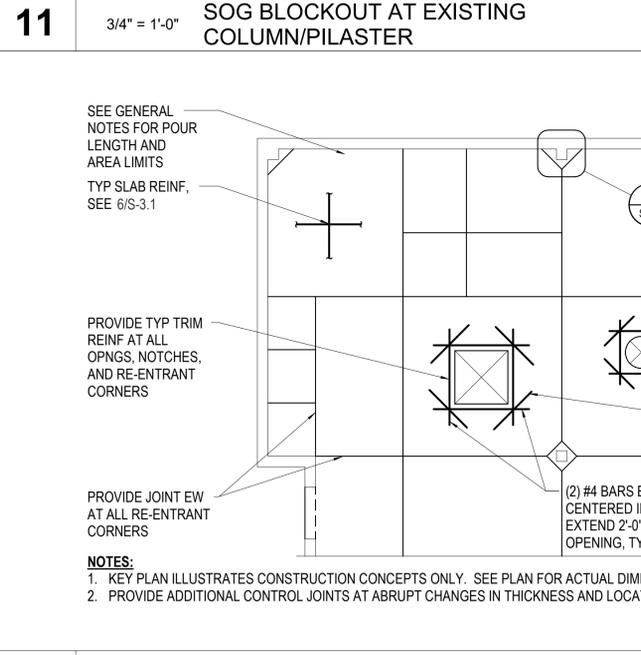
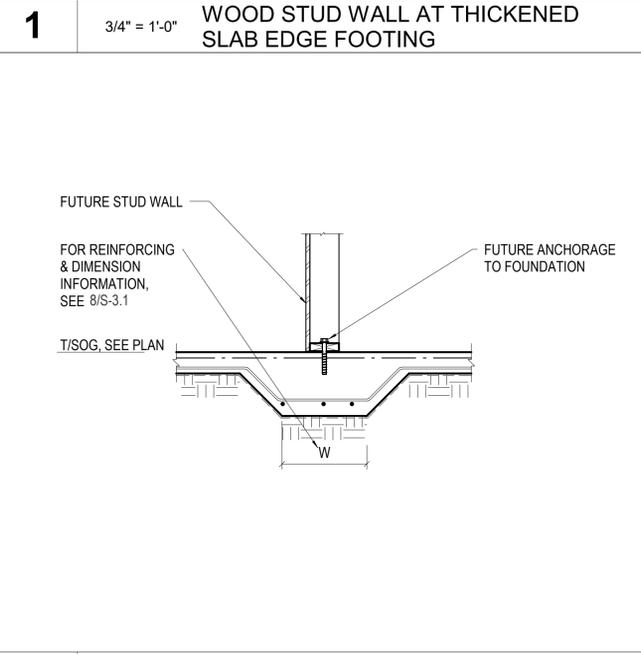
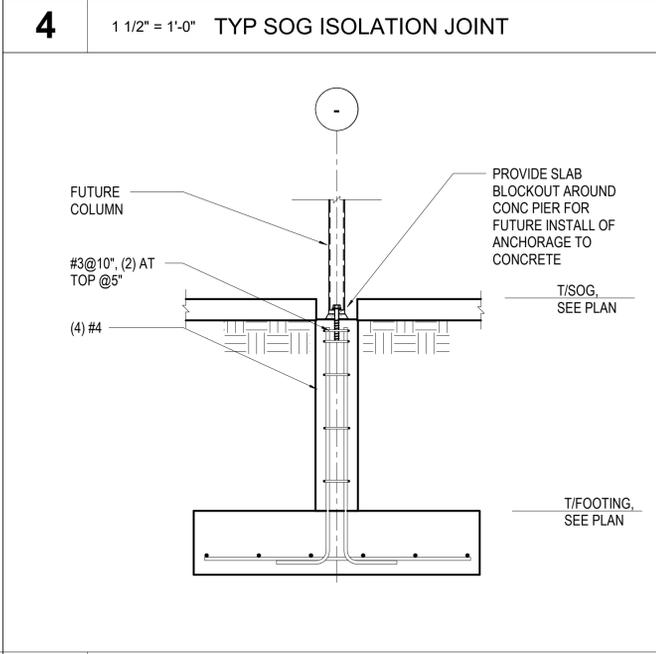
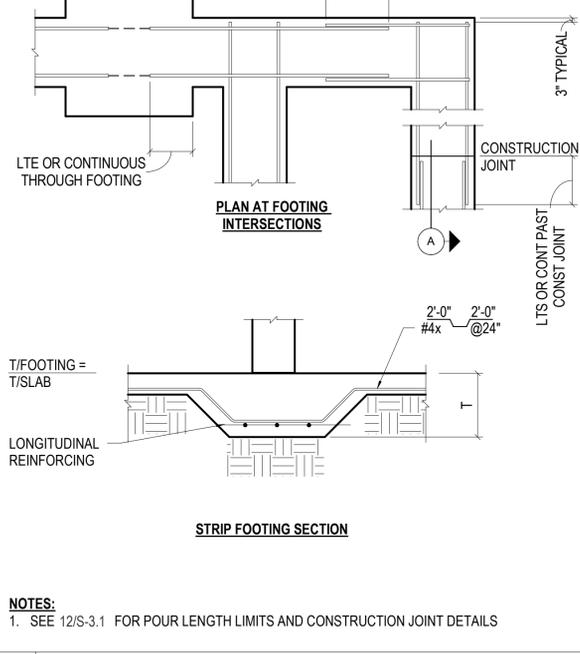
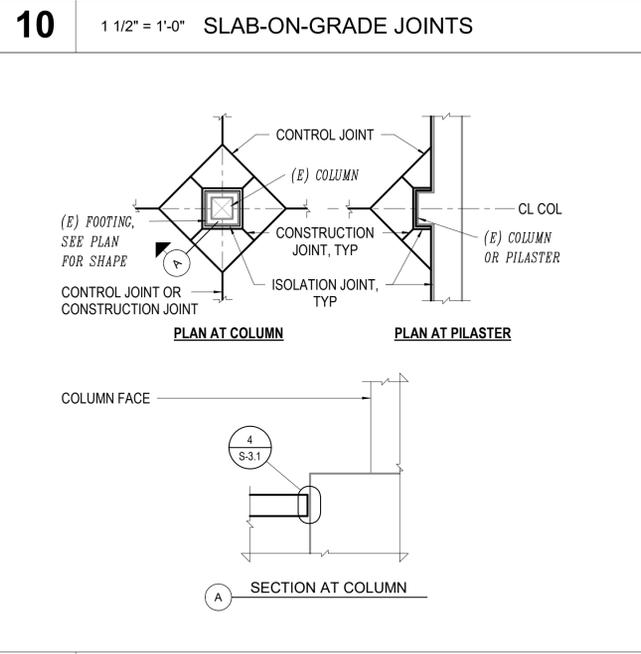
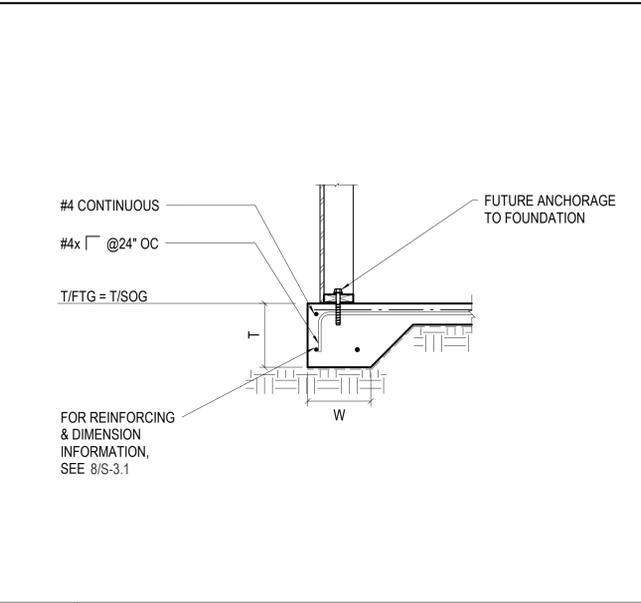
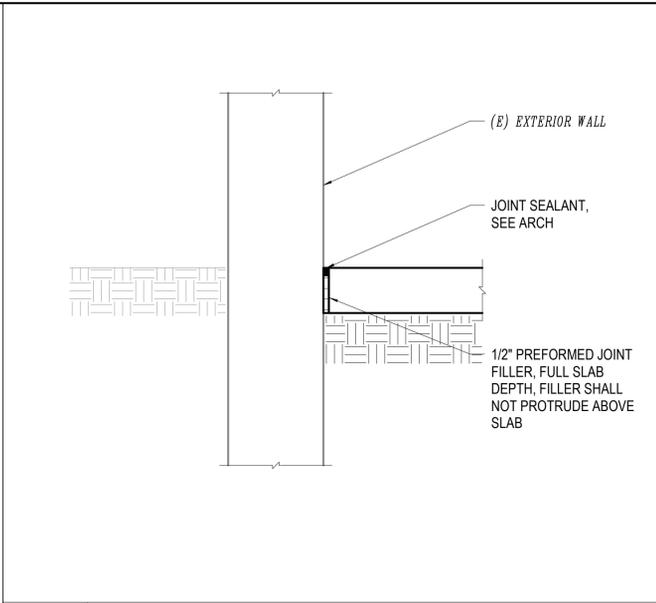
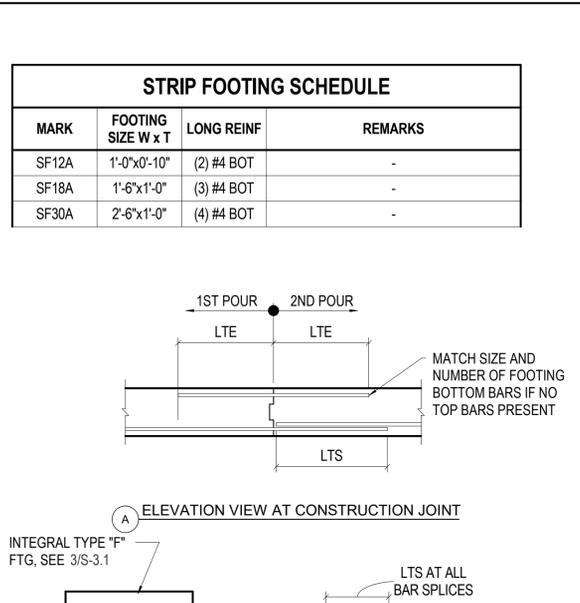
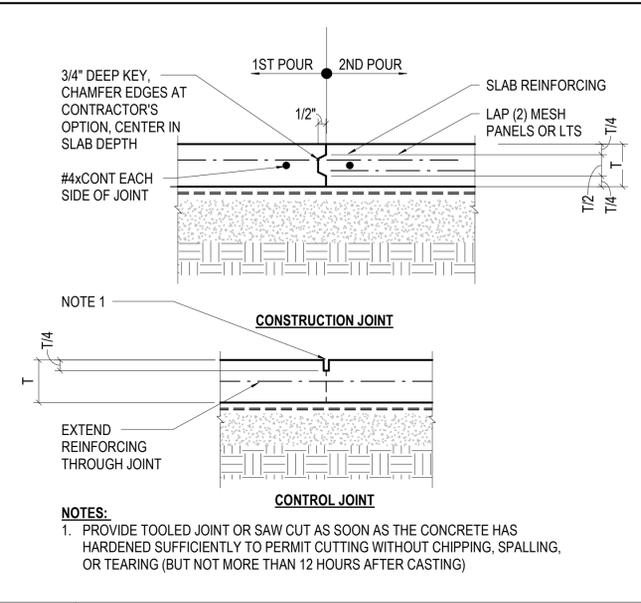
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SHEET TITLE:
MEZZANINE FLOOR FRAMING PLAN

SHEET NUMBER:
DDS-1.2

HUGO ROUNDHOUSE INTERIORS
 3RD AVENUE
 HUGO, COLORADO 80821

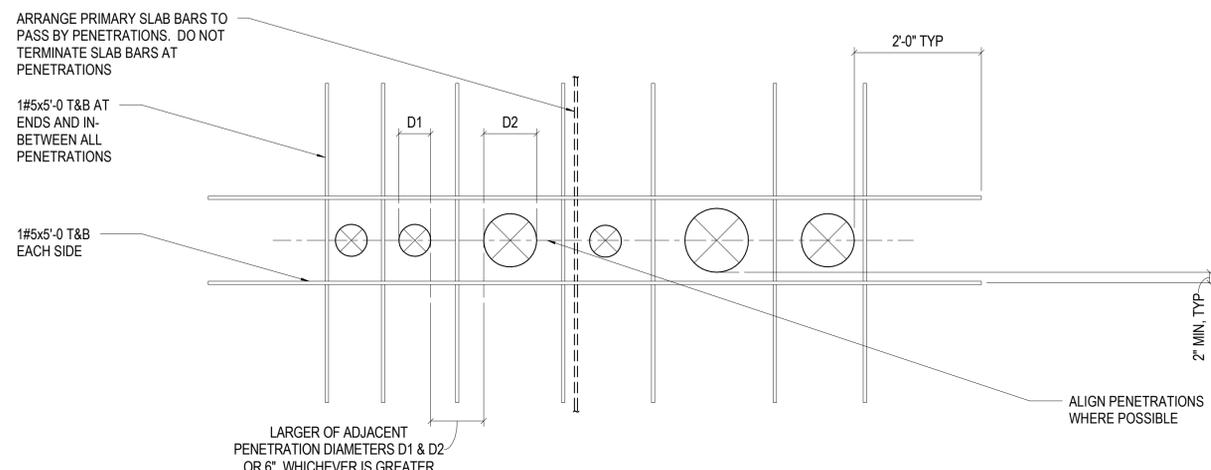


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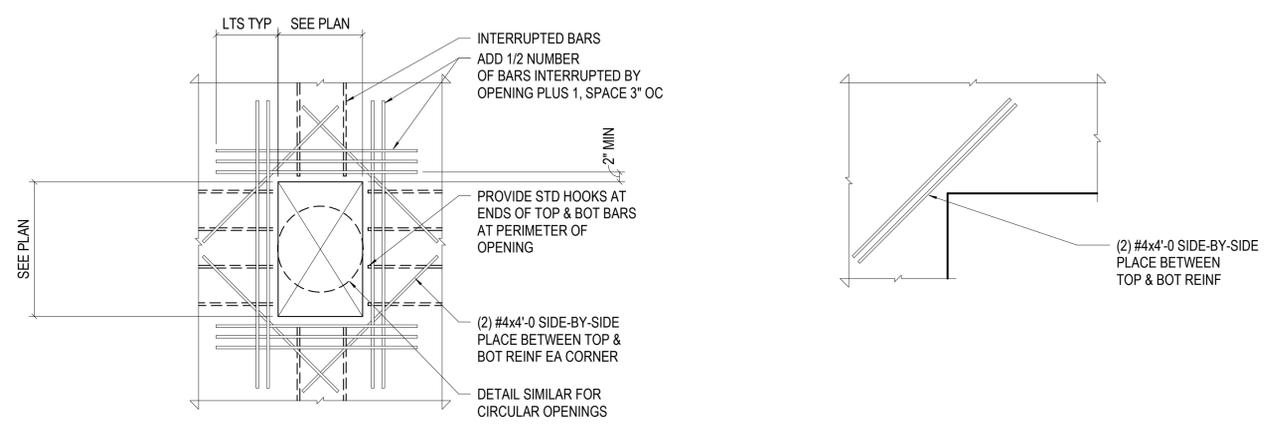
SHEET TITLE:
CONCRETE DETAILS
 SHEET NUMBER:
S-3.1

DESIGNERS: RICK KRIEGER
 LEAD REVIT TECH: JOEL HINES
 EOR: DAVID WITTMAN
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 PLOT: 23.0213.S.01



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

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

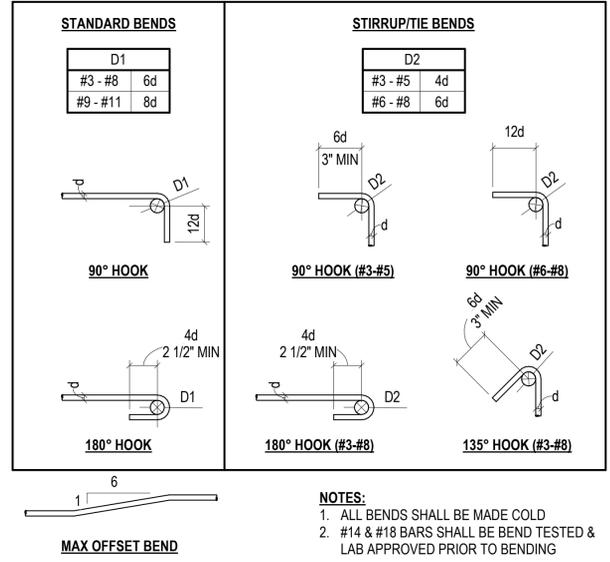
BAR SIZE	CLEAR COVER			1" 1.5" 2"+		1" 1.5" 2"+		1" 1.5" 2"+	
	LDH	LCE	LCS	LTE	LTE TOP & LTS	LTS TOP	LTS TOP	LTS TOP	LTS TOP
#3	8	9	12	12	13	17			
#4	12	11	15	14	18	23			
#5	16	14	19	20	26	34	28		
#6	21	17	23	27	35	46	34		
#7	27	20	27	44	33	57	43	38	74
#8	32	22	30	55	42	33	72	54	43
#9	39	25	34	67	51	41	87	66	53
#10	45	28	38	79	61	49	103	79	64
#11	52	31	42	93	72	58	120	93	76

GENERAL NOTES:
 1. LENGTHS SPECIFICALLY DETAILED ON DRAWINGS SHALL GOVERN IN LIEU OF LAP LENGTHS SCHEDULED
 2. 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
 3. 'TOP' BARS ARE HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12 IN OF FRESH CONCRETE IS CAST BELOW THE BAR
 4. CLEAR COVER IS DEFINED FROM THE NEAREST FACE OF CONCRETE TO THE BAR BEING DEVELOPED OR SPLICED
 5. UNLESS NOTED OTHERWISE, ALL HOOK BARS SHALL EXTEND TO THE FAR FACE LESS 2" COVER
 6. 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
 7. 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:
 1. IF REINFORCING IS SPECIFIED AS EPOXY COATED, INCREASE SCHEDULED LENGTHS BY 50%
 2. IF LIGHTWEIGHT AGGREGATE IS SPECIFIED, INCREASE SCHEDULED LAP BY LENGTHS 30%
 3. 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%
 4. 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:
 1. ALL SPLICES SHALL BE WIRED IN CONTACT
 2. ALL SPLICES ARE 'LTS' UNLESS NOTED OTHERWISE
 3. 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
 4. 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
 5. TOP AND BOTTOM BEAM SPLICES SHALL BE STACKED VERTICALLY

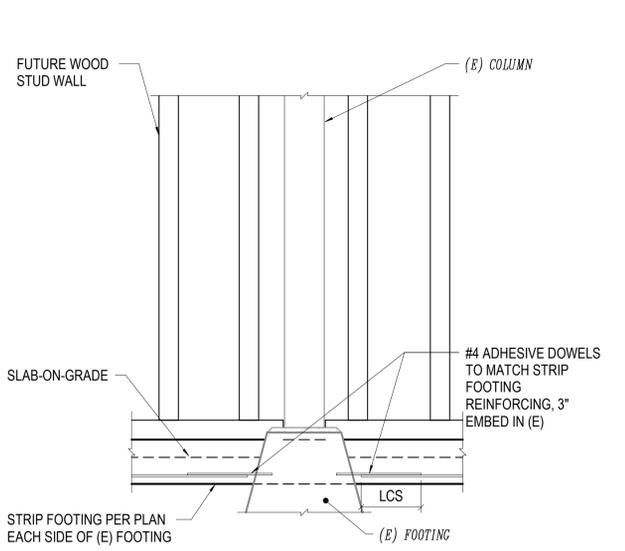
HOOK EMBEDMENT NOTES:
 1. SCHEDULED HOOK EMBEDMENT LENGTHS ASSUME:
 A. SIDE COVER IS 2 1/2 INCHES OR GREATER
 B. COVER BEYOND IS 2 INCHES OR GREATER
 2. IF REINFORCING IS SPECIFIED AS EPOXY COATED, INCREASE SCHEDULED LENGTHS BY 20%
 3. IF LIGHTWEIGHT AGGREGATE IS SPECIFIED, INCREASE SCHEDULED LENGTHS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



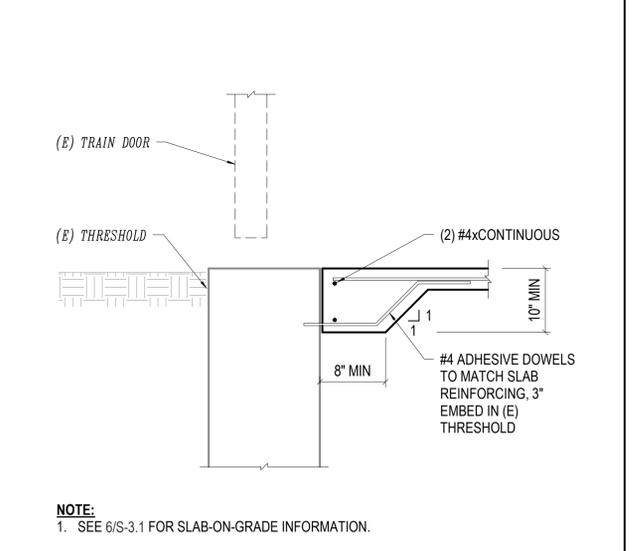
TYPICAL REINFORCING BENDS

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



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

REVISIONS

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SHEET TITLE:
CONCRETE DETAILS
 SHEET NUMBER:
S-3.2

SHEETMETAL SYMBOLS

(NOT ALL SYMBOLS SHOWN ARE USED ON THESE DRAWINGS)

ABBR.	SYMBOL	DESCRIPTION
MAV		OUTSIDE AIR INTAKE DUCT
		POSITIVE PRESSURE DUCT
		NEGATIVE PRESSURE DUCT
		MANUAL VOLUME DAMPER IN DUCT
		FLEXIBLE CONNECTION IN DUCT
		FLEXIBLE DUCT WITH SPIN-IN FITTING AND VOLUME DAMPER (SEE SPECIFICATIONS)
		FIRE DAMPER WITH ACCESS PANEL
		FIRE/SMOKE DAMPER WITH ACCESS PANEL
		LINED DUCT (SEE SPECIFICATIONS)
		ELBOW WITH TURNING VANES
AP		ACCESS PANEL WITH SIZE
		PARALLEL BLADE DAMPER
		OPPOSED BLADE DAMPER
		SUPPLY DIFFUSER
		RETURN/EXHAUST GRILLE

CONTROL SYMBOLS

(NOT ALL SYMBOLS SHOWN ARE USED ON THESE DRAWINGS)

ABBR.	SYMBOL	DESCRIPTION
	1∅	SINGLE PHASE
	3∅	THREE PHASE
		CONTROL WIRING
		POWER WIRING
	AUTOMATIC CONTROL VALVES:	
		-2-WAY PNEUMATIC
		-3-WAY PNEUMATIC
		-2-WAY ELECTRIC
		-3-WAY ELECTRIC
		ROOM THERMOMETER
		ZONE SYSTEM
		ELECTRIC MOTORIZED CONTROL DAMPER
		PNEUMATIC MOTORIZED CONTROL DAMPER

PLUMBING SYMBOLS

(NOT ALL SYMBOLS SHOWN ARE USED ON THESE DRAWINGS)

ABBR.	SYMBOL	DESCRIPTION	
CO		HORIZONTAL CLEANOUT	
		VERTICAL CLEANOUT	
		GAS COCK	
		METER	
		SHOCK ABSORBER	
		SOLENOID VALVE	
		ELBOW UP	
		ELBOW DOWN	
		TEE UP	
		TEE DOWN	
HEV		BALL VALVE	
		CHECK VALVE	
		FLEXIBLE PIPE CONNECTOR	
		FLOW MEASURING STATION (SEE SPECIFICATIONS)	
		HOSE END VALVE	
	MAV		MANUAL AIR VENT
			PRESSURE RELIEF VALVE
	P/T		PRESSURE/TEMPERATURE TEST POINT
			STRAINER
	WH/HB		THERMOMETER AND THERMOWELL
		UNION	
		INLINE PUMP	
RPBP			WALL HYDRANT OR HOSE BIBB
			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	

ABBREVIATIONS

(NOT ALL ABBREVIATIONS SHOWN ARE USED ON THESE DRAWINGS)

ABBR.	DESCRIPTION
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
BDD	BACKDRAFT DAMPER
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
CI	CAST IRON
(E)	EXISTING
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
ELEV	ELEVATION
FCO	FLOOR CLEANOUT
GCO	GRADE CLEANOUT
(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)

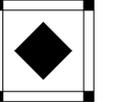
	POINT OF CONNECTION TO EXISTING SYSTEM
	PIPING AND EQUIPMENT TO BE REMOVED
	GRILLE, REGISTER, OR DIFFUSER TAG
	QUANTITY, SIZE, CFM, TYPE

GENERAL NOTES

- 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.
- 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.
- 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.
- COORDINATE THE INSTALLATION OF ALL MECHANICAL EQUIPMENT WITH THE ELECTRICAL CONTRACTOR.
- 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.
- 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.
- SANITARY AND VENT PIPING SHALL BE CAST IRON AND INSTALLED WITH 1/4" SLOPE IN DIRECTION OF FLOW.
- DUCT SIZES INDICATED ARE CLEAR INSIDE DIMENSIONS. OUTSIDE DUCT DIMENSIONS SHALL BE INCREASED TO ACCOUNT FOR ACOUSTICAL LINER AS REQUIRED.
- 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.
- BELOW SLAB DOMESTIC WATER PIPING SHALL BE TYPE L SOFT COPPER.
- CONDENSATE DRAIN PIPING SHALL BE TYPE L COPPER. PROVIDE AIR GAP FITTING BETWEEN CONDENSATE PIPING AND FLOOR DRAIN.
- PROVIDE BALANCING DAMPER FOR ALL SUPPLY AND RETURN GRILLES.
- ALL DOMESTIC WATER PIPING INSTALLED WITHIN EXTERIOR WALL SHALL BE ROUTED ON THE WARM SIDE OF THE WALL INSULATION.
- NO DOMESTIC WATER PIPING SHALL BE ROUTED THROUGH UNHEATED SPACES.
- ALL GAS PIPING SHALL BE SCHEDULE 40 WITH SCREW FITTINGS. PROVIDE DIRT LEG AND GAS COCK AT ALL APPLIANCES.
- PROVIDE ALL NECESSARY EQUIPMENT, CONTROLS, VALVES AND APPURTENANCES AS REQUIRED FOR A COMPLETE OPERATING SYSTEM.
- SEAL ALL EXTERIOR WALL AND ROOF PENETRATIONS WEATHER AND WATERTIGHT.
- 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.
- ALL DOMESTIC WATER CHECK VALVES SHALL BE Y PATTERN BRONZE BODY WITH RENEWABLE SEAT AND DISK, NIBCO TS413 OR EQUAL.
- ALL SUPPLY DUCTWORK SHALL BE PROVIDED WITH 1" ACOUSTICAL LINER. SUPPLY DUCTWORK FROM EVAPORATIVE COOLING UNITS SHALL NOT BE PROVIDED WITH ACOUSTICAL LINER.
- 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.
- 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.
- 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).
- ALL SPIN IN FITTINGS SHALL BE HERCULES HTO WITH MVD OR EQUAL.
- 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.
- 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.
- 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
- THE MECHANICAL DRAWINGS ARE DIAGRAMMATIC IN CHARACTER AND DO NOT NECESSARILY INDICATE EVERY REQUIRED OFFSET, VALVE, FITTING, ETC.
- 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.
 - ALL MECHANICAL PRODUCT SUBMITTALS SHALL BE PROVIDED IN THE MANNER DETAILED BELOW REGARDLESS OF DESCRIPTION PROVIDED ELSEWHERE IN THE CONTRACT DOCUMENTS.
 - ALL PRODUCT SUBMITTALS SHALL BE PROVIDED TO THE OWNER IN A SINGLE ELECTRONIC PDF FILE.
 - ELECTRONIC FILE SHALL CONTAIN A COVER SHEET WITH THE PROJECT NAME, CONTRACTORS NAME AND SUBMITTAL DATE.
 - 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.
 - 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.
- 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.
 - EACH OPERATION AND MAINTENANCE MANUAL SHALL BE INDEXED AND CONTAIN THE FOLLOWING INFORMATION.
 - CONTRACTORS' NAMES, ADDRESSES AND TELEPHONE NUMBERS.
 - 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.
 - GUARANTEES AND WARRANTIES FOR ALL EQUIPMENT WHENEVER APPLICABLE.
 - 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.
 - 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.
- ALL DUCTWORK SHALL BE SEALED TO SEAL CLASS A, ALL LONGITUDINAL AND TRANSVERSE SEAMS SEALED TO 10" w.c.
- COORDINATE THE COLOR OF ALL VISIBLE MECHANICAL EQUIPMENT WITH THE ARCHITECT AND OWNER BEFORE ORDERING ANY EQUIPMENT.
- THE VISIBLE INTERIOR OF ALL SUPPLY, RETURN AND EXHAUST GRILLES SHALL BE PAINTED FLAT BLACK.
- 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.
- PROVIDE R=5.0 INSULATION ON ALL EXHAUST DUCTS FROM THE ENVELOPE PENETRATION TO THE BACKDRAFT DAMPER.
- 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.
- 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.



BRET JOHNSON
ARCHITECTURE
2304 YOSEMITE STREET
DENVER, COLORADO 80238
720.341.0392



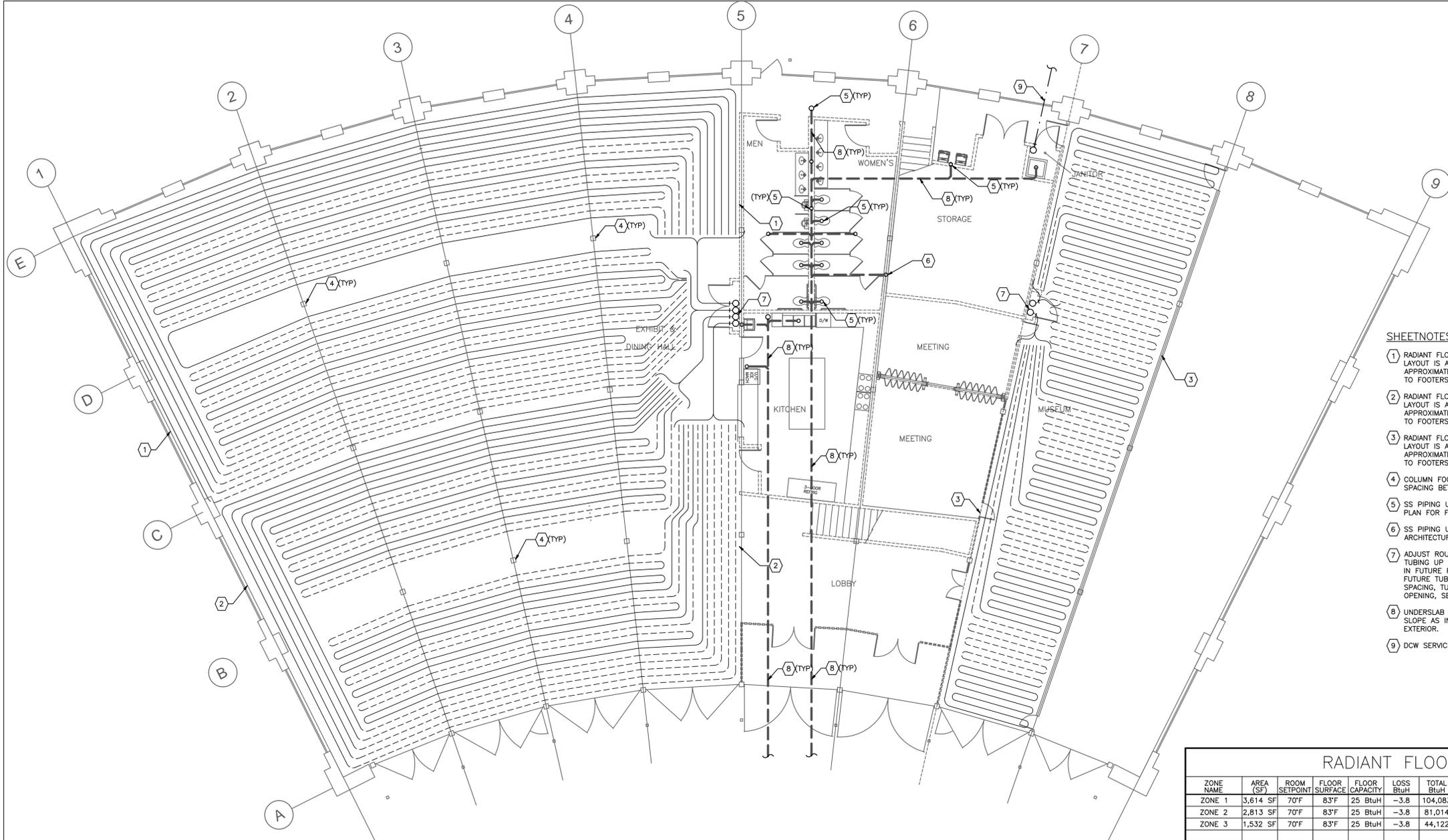
HUGO ROUNDHOUSE
ROUNDHOUSE PRESERVATION, INC
HUGO, COLORADO 80821



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



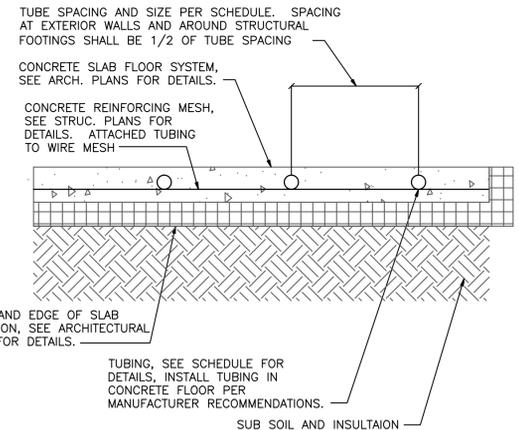
- SHEETNOTES**
- RADIANT FLOOR ZONE 1. PROVIDE NUMBER OF TUBE LOOPS INDICATED IN SCHEDULE. TUBE LAYOUT IS A REPRESENTATIVE LAYOUT AND CONTRACTOR SHALL ADJUST ROUTING TO MAINTAIN APPROXIMATELY EQUAL LENGTHS OF EACH TUBE RUN. ADJUST ROUTING TO PROVIDE CLEARANCE TO FOOTERS, COLUMN BASES AND ALL UNDERSLAB 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

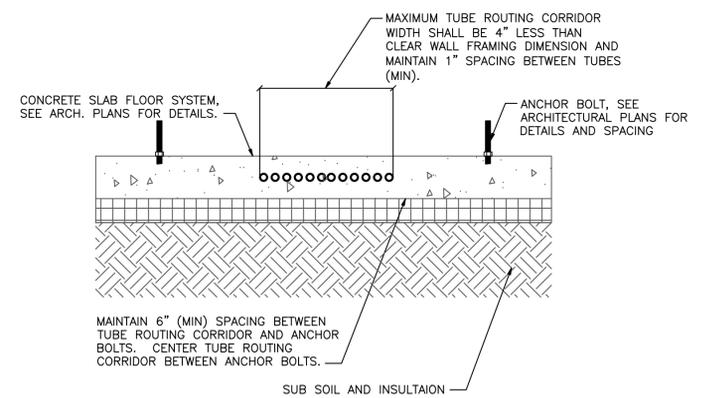
ZONE NAME	AREA (SF)	ROOM SETPOINT	FLOOR SURFACE	FLOOR CAPACITY	LOSS BUH	TOTAL BUH	EWT	LWT	FLOW GPM	Δ P FT	TUBING			NOTES	
											DIA.	SPACING	LOOPS		
ZONE 1	3,614 SF	70°F	83°F	25 BUH	-3.8	104,083	112°F	98°F	14.9	14.3	5/8"	12" o.c.	12	320 FT	1-8
ZONE 2	2,813 SF	70°F	83°F	25 BUH	-3.8	81,014	112°F	98°F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

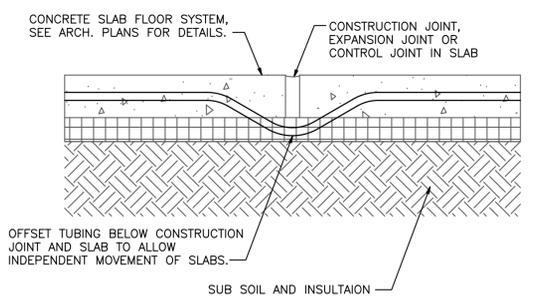
1 Under Slab Plan-Mechanical
SCALE: 1/8" = 1'-0"



2 RADIANT TUBE DIAGRAM
SCALE: NONE



3 RADIANT TUBE DIAGRAM
SCALE: NONE



4 SLAB JOINT TUBE DIAGRAM
SCALE: NONE



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

SECTION 23 21 00 HYDRONIC PIPING AND PUMPS

PART 1 - GENERAL

1. DESCRIPTION

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

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)

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 Pumps Section 23 21 00
6. Heating Boilers Section 23 52 00

4. QUALITY ASSURANCE

A. Qualify all 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.

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.

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.

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.
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.
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.

2.4 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. .50 inch has a minimum radius of 3.2 inches.
b. .625 inch has a minimum radius of 4.0 inches.
c. .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. .50 inch
b. .625 inch
c. .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 to the manifold 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 section 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 section 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-fed 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 nameplates 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

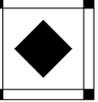
- A. All water circulating systems for the project shall be thoroughly cleaned before placing in operation to rid the system of dirt, piping compound, mill scale, oil, and any and all other material foreign to the water being circulated.
B. Extreme care shall be exercised during construction to prevent 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 water volume at least four 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

1.



BRET JOHNSON ARCHITECTURE 2304 YOSEMITE STREET DENVER, COLORADO 80238 720.341.0392



HUGO ROUNDHOUSE ROUNDHOUSE PRESERVATION, INC HUGO, COLORADO 80821

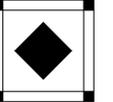


JOB NUMBER: 23-001
FILE:
DESIGNED:
DRAWN: LCE
CHECKED: LCE
DATE: 12/3/23
REVISIONS:

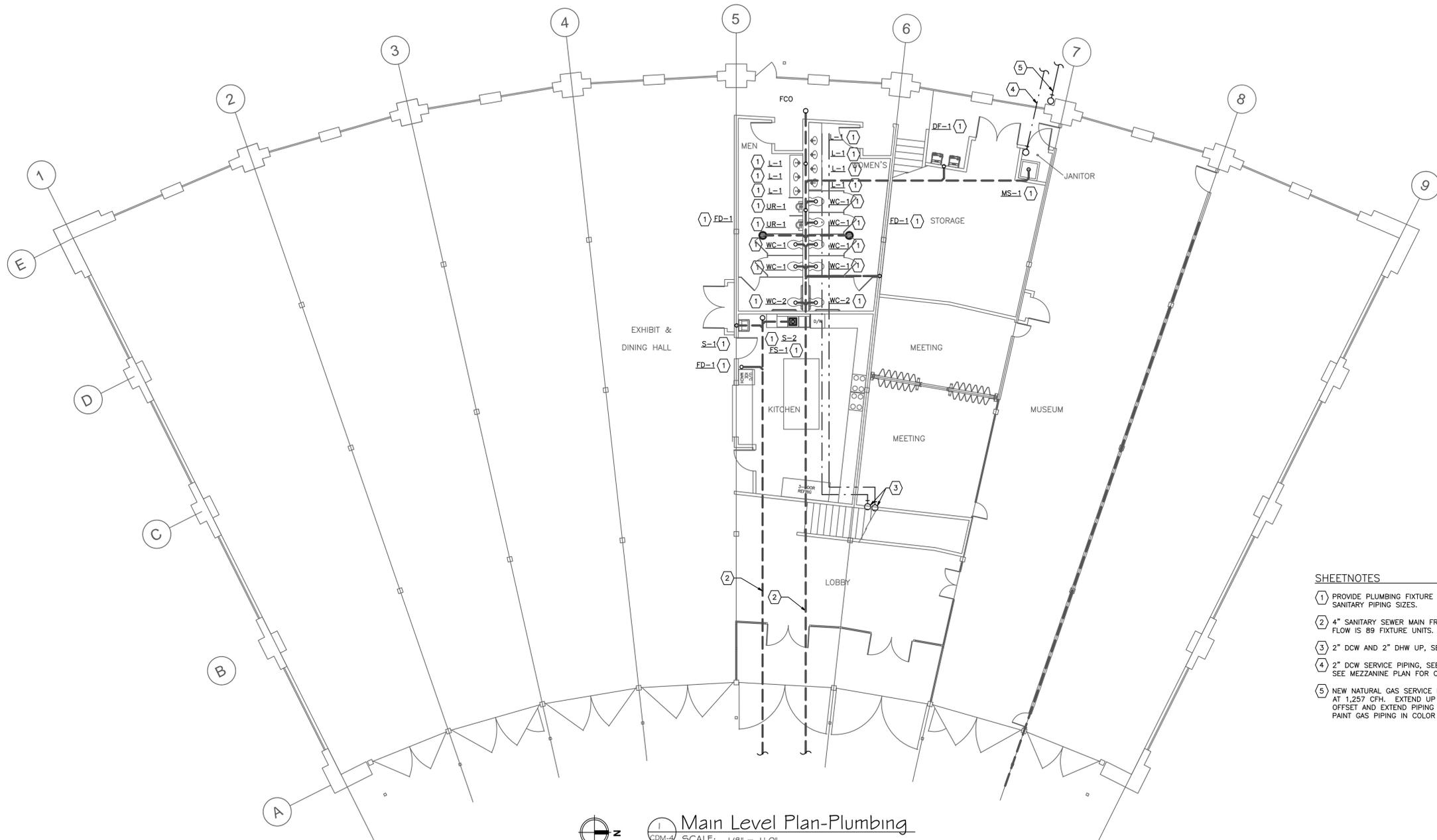
SHEET TITLE: UNDER SLAB MECHANICAL SPECIFICATIONS

SHEET NUMBER:

CDM-3



HUGO ROUNDHOUSE
ROUNDHOUSE PRESERVATION, INC
HUGO, COLORADO 80821



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"

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.

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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 BTUH	FIN SIZE SF	MAX. FACE VELOCITY FPM	AIR SIDE CRITERIA				FLUID SIDE CRITERIA					MANUFACTURER AND MODEL	NOTES	
				CFM	EAT	LAT	APD	GPM	EWT	LWT	WPD	ROWS			FPI
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. SCHEDULED CAPACITY AND PERFORMANCE ARE MINIMUM REQUIREMENTS, ACTUAL CAPACITY AND PERFORMANCE SHALL MEET OR EXCEED SCHEDULED PERFORMANCE.

GRILLE/REGISTER/DIFFUSER SCHEDULE

TAG	STYLE	SERVICE	FACE SIZE	PATTERN	MAXIMUM CFM	MAXIMUM NC	MATERIAL	QBD	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 OF 5050 FEET.
 2. SEE PLANS FOR NECK SIZE.
 3. FACE SIZE IS 1 3/4" LARGER THAN NECK SIZE, SEE PLANS FOR NECK SIZE.
 4. DOUBLE DEFLECTION LOUVER.
 5. 1/8" BARS, 1/4" SPACING.
 6. 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 BACKDRAFT DAMPER.

PLUMBING FIXTURE SCHEDULE

TAG	DESCRIPTION	MANUFACTURER AND MODEL	CONNECTION SIZES					NOTES
			TRAP	DCW	DHW	SS	V	
L-1	LAVATORY, MAVERICK I, COUNTER MOUNTED, VITREOUS CHINA, 14X12, OVAL BOWL, WHITE, SELF RIMMING, DELTA 590-LGHOMDF 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 28T9 FAUCET 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 MODEL 1855C HEAVY DUTY COMMERCIAL GRADE PLASTIC OPEN FRONT SEAT.
 2. PROVIDE BOWL WITH INTEGRAL STOPS, PAIL HOOK, INLINE VACUUM BREAKER AND WALL BRACE.
 3. COLOR SELECTED BY ARCHITECT.
 4. PROVIDE ALL NECESSARY ACCESSORIES, STOPS, AND CARRIERS.
 5. SS AND V SIZES PER BOWL, FOR TWO BOWL SINK COMBINED SS SHALL BE 2" AND V SHALL BE 1 1/2"

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(GB)	LAT(GB)	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. DX COOLING COIL WITH R410A REFRIGERANT.
 3. SCHEDULED CAPACITY AND PERFORMANCE ARE MINIMUM REQUIREMENTS, ACTUAL CAPACITY AND PERFORMANCE SHALL MEET OR EXCEED SCHEDULED PERFORMANCE.

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.

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
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 MIXING 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. PROVIDE MANUFACTURER'S REFRIGERANT PIPING KIT, WIRING KIT AND EXPANSION VALVE KIT.
 5. CONTRACTOR SHALL VERIFY EQUIPMENT CAPACITY AT PROJECT ELEVATION AND COOLING REQUIREMENTS BEFORE ORDERING EQUIPMENT.
 6. MINIMUM 10.8 EER.

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 GPM 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 FPQ8-40SW, 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, WATTS MMV SERIES THERMOSTATIC TEMPERING VALVE, 0.5 GPM MAXIMUM FLOW PER VALV, 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 STAGES	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.

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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BRET JOHNSON
ARCHITECTURE

2304 YOSEMITE STREET
DENVER, COLORADO 80238
720.341.0392

HUGO ROUNDHOUSE
ROUNDHOUSE PRESERVATION, INC
HUGO, COLORADO 80821

JOB NUMBER: 23-001

FILE:

DESIGNED:

DRAWN: LCE

CHECKED: LCE

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REVISIONS:

SHEET TITLE:
MECHANICAL SCHEDULES

SHEET NUMBER:
CDM-5

ELECTRICAL LEGEND

LIGHTING		ONE LINE DIAGRAM	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	RECESSED FLUORESCENT LUMINAIRE, LAY-IN GRID CEILING. LOWERCASE SCRIPT INDICATES SPENSURE 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
	POLE MOUNTED LUMINAIRE		MECHANICAL INTERLOCK
	SPOT / FLOOD LIGHT		PANELBOARD "A"
	BOLLARD		EM=ENERGY METER, PM=POWER METER, CM=CIRCUIT MONITOR
	TRACK LIGHTING		CIRCUIT MONITOR
	EMERGENCY LIGHTING UNIT		VOLTMETER
	EXIT LIGHT, ARROWS AS INDICATED, FACES INDICATED BY SHADING		AMMETER
	SINGLE POLE SWITCH (SUBSCRIPT DENOTES SWITCHING)		ENGINE GENERATOR
	SWITCH: 2 = 2-POLE; 3 = 3-WAY; 4 = 4-WAY		CONTACTOR/RELAY/CAPACITOR (AS NOTED)
	K = KEY OPERATED SWITCH; M = HORSEPOWER RATED DIMMER SWITCH		TRANSFER SWITCH - A=AUTOMATIC, M=MANUAL
	LV = LOW VOLTAGE SWITCH; MC = MOMENTARY CONTACT		GROUND FAULT INTERRUPTER
	THERMAL OVERLOAD SWITCH		TRANSIENT VOLTAGE SURGE SUPPRESSOR
	PHOTOCELL		SHUNT TRIP
	TIME CLOCK		DRAW-OUT DEVICE
	OCCUPANCY SENSOR WALL MOUNTED DUAL TECHNOLOGY; VS = VACANCY SENSOR		PLUG-IN DEVICE
	OCCUPANCY SENSOR CEILING MOUNTED DUAL TECHNOLOGY; VS = VACANCY SENSOR		ELECTRICALLY OPERATED SERVICE WEATHERHEAD
	SHADING INDICATES CONNECTION TO EMERGENCY SYSTEM; LS INDICATE LIFE SAFETY CIRCUIT.		

POWER		ABBREVIATIONS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SINGLE RECEPTACLE	A	AMPERES
	DUPLEX RECEPTACLE	AF	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	C	CONDUIT
	DUPLEX RECEPTACLE, CEILING MOUNTED	CATV	CABLE TELEVISION
	DUPLEX RECEPTACLE, FLOOR MOUNTED	CB	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	EWG	ELECTRIC WATER COOLER
	DISCONNECT SWITCH (NON-FUSED)	FA	FIRE ALARM
	DISCONNECT SWITCH (FUSED)	G	GROUND
	COMBINATION STARTER/DISCONNECT	GFI	GROUND FAULT INTERRUPTING
	MOTOR STARTER	HOA	HAND OFF AUTOMATIC
	PLUG MOLD (MULTI-OUTLET ASSEMBLY)	IG	ISOLATED GROUND
	WIREFORM (SURFACE RACEWAY)	MCB	MAIN CIRCUIT BREAKER
	CONNECTION TO PRE-WIRED EQUIPMENT	MCC	MOTOR CONTROL CENTER
	CONDUIT CONCEALED	MDC	MAIN DISTRIBUTION CENTER
	CONDUIT EXPOSED	MH	MOUNTING HEIGHT
	CONDUIT, UNDERGROUND OR CONCEALED IN FLOOR	MLO	MAIN LUGS ONLY
	CONDUIT TURNING DOWN	MTS	MANUAL TRANSFER SWITCH
	CONDUIT TURNING UP	NC	NORMALLY CLOSED
	CONDUIT CAPPED	NI	NOT IN CONTRACT
	GROUND BAR	NL	NIGHT LIGHT
	MAIN SWITCHBOARD/DISTRIBUTION CENTER	NO	NORMALLY OPEN
	TRANSFORMER	NTS	NOT TO SCALE
	CURRENT TRANSFORMER	OC	ON CENTER
	GENERATOR ANNUNCIATOR PANEL	OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
	MOTOR	OFOI	OWNER FURNISHED, OWNER INSTALLED
	SHADING INDICATES EMERGENCY SYSTEM	PB	PULL BOX
	TEXT INDICATES PANEL AND CIRCUIT DESIGNATION	TP	TAMPER PROOF
		TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
		TYP	TYPICAL
		UF	UNDER FLOOR
		UG	UNDER GROUND
		UON	UNLESS OTHERWISE NOTED
		UPS	UNINTERRUPTABLE POWER SUPPLY
		V	VOLTS
		VFD	VARIABLE FREQUENCY DRIVE
		WP	WEATHER PROOF
		XFMR	TRANSFORMER

ELECTRICAL SPECIFICATIONS

SECTION 1610 - ELECTRICAL - BASIC ELECTRICAL REQUIREMENTS
 A. DESCRIPTION: PROVIDE ALL LABOR, EQUIPMENT, SUPPLIES, MATERIALS, DELIVERY, STORAGE, INSURANCE, PERMITS AND TAXES UNLESS OTHERWISE SPECIFIED, NECESSARY FOR THE INSTALLATION OF COMPLETE ELECTRICAL SYSTEMS AS REQUIRED BY THE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS, SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT
 B. ALL WORK SHALL BE EXECUTED IN ACCORDANCE WITH LOCAL AND STATE CODES, AND LATEST EDITIONS OF THE IBC, IFC, NEC, NFPA AND ADA.
 C. CONTRACTOR SHALL PAY FOR ALL FEES.
 D. CONTRACTOR SHALL PREPARE COMPLETE AS-BUILT DRAWINGS INDICATING ALL ADDENDUMS, CHANGE ORDERS, MAJOR CONDUIT ROUTING, FIELD CHANGES, ETC.

SECTION 1610 - RACEWAYS
 A. GENERAL
 1. RIGID, INTERMEDIATE METAL AND FLEXIBLE METAL CONDUIT SHALL BE GALVANIZED STEEL.
 2. ELECTRICAL METALLIC TUBING SHALL BE GROUND-GALVANIZED STEEL.
 3. LIQUIDTIGHT FLEXIBLE METALLIC TUBING SHALL BE GALVANIZED STEEL WITH POLYVINYL JACKET BONDED ONTO EXTERIOR.
 4. HOME RUN CIRCUITS SHALL BE RUN IN SOLID CONDUIT.
 5. WIREWAYS SHALL BE OF THE HINGED TYPE WITH ALL PARTS FACTORY FABRICATED.
 6. CONDUITS SHALL BE SIZED ACCORDING TO THE NEC BASED ON USE OF COPPER CONDUCTORS.
 7. CONDUITS SHALL BE CONCEALED IN BUILDING CONSTRUCTION EXCEPT WHERE EXPOSED RUNS ARE INDICATED.
 8. ELECTRICAL METALLIC TUBING (EMT) FITTINGS: DIE-CAST SET-SCREW FOR ALL OTHER CONNECTIONS. BUSHINGS SHALL BE THREADED AND HAVE NYLON INSULATED THROAT OR NYLON BUSHING.
 9. LIQUID-TIGHT AND METAL FLEXIBLE CONDUIT FITTINGS: DIE-CAST WITH NYLON INSULATED THROAT ON NYLON BUSHING.
 10. FLEXIBLE CONDUIT IS NOT ALLOWED IN THE HOME-RUN PORTION OF CIRCUITS.
 11. MINIMUM SIZE SHALL BE 1/2-INCH EXCEPT BRANCH CIRCUIT HOME RUNS TO PANELBOARD WHICH SHALL NOT BE LESS THAN 3/4".
 12. MOTOR AND EQUIPMENT CONNECTIONS SHALL USE PVC JACKETED LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT WITH LIQUID TIGHT CONNECTORS.
 13. ALL EMERGENCY CIRCUITS SHALL BE RUN TOTALLY IN METAL CONDUIT AND SHALL BE IN A COMPLETELY SEPARATE RACEWAY SYSTEM FROM NON-EMERGENCY CIRCUITS EXCEPT FOR LIQUIDTIGHT EQUIPMENT CONNECTIONS.
 14. CONDUIT SHALL NOT BE MOUNTED ON OR SUPPORTED FROM DUCTWORK OR OTHER MECHANICAL EQUIPMENT EXCEPT WHERE NECESSARY TO MAKE CONNECTIONS TO ELECTRICAL DEVICES THAT ARE PART OF OR MOUNTED ON SUCH EQUIPMENT. WHERE CONDUIT MUST BE INSTALLED ON EQUIPMENT, DO NOT COVER ACCESS DOORS, CONTROLS, REMOVABLE PANELS, OR OTHERWISE HINDER NORMAL MAINTENANCE AND REPAIR OF THE EQUIPMENT. WHERE IT IS NECESSARY TO MAKE CONDUIT CONNECTIONS TO EQUIPMENT MOUNTED ON VIBRATION MOUNTS, FLEXIBLE CONNECTION SHALL BE USED.
 15. EXTERIOR EXPOSED CONDUIT AND CONDUIT WITH CLASS 1 DIV 2 AREAS SHALL BE GRC.
 16. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC.

SECTION 1610 - WIRES AND CABLE
 A. CONDUCTORS SHALL BE NEW AND UNUSED COPPER, SINGLE CONDUCTOR TYPE. MINIMUM CIRCUIT SIZE SHALL BE 12 AWG COPPER.
 B. NUMBER 10 AWG WIRE AND SMALLER SHALL BE SOLID.
 C. NUMBER 8 AWG WIRE AND LARGER SHALL BE STRANDED.
 D. GROUNDING CONDUCTORS SHALL BE COPPER IN ALL CASES.
 E. BRANCH CIRCUIT AND FEEDER WIRING SHALL BE COLOR CODED IN ACCORDANCE WITH THE NEC.
 F. A GROUNDING CONDUCTOR SHALL BE PROVIDED FOR ALL CIRCUITS.
 G. USE 10 AWG CONDUCTORS FOR 20 AMPERE, 120 VOLT BRANCH CIRCUITS LONGER THAN 80 FEET TO THE FIRST FIXTURE OR DEVICE. USE 10 AWG CONDUCTORS FOR 20 AMPERE, 277 VOLT BRANCH CIRCUITS LONGER THAN 100 FEET TO THE FIRST FIXTURE OR DEVICE.

SECTION 1613 - CABINETS, BOXES, & FITTINGS
 A. CONTRACTOR SHALL PROVIDE CODE GAUGE SHEET METAL PULL & JUNCTION BOXES COMPLETE WITH ACCESSORIES SIZED PER THE NEC.
 B. PULL & JUNCTION BOXES SHALL BE FACTORY PAINTED.
 C. PULL & JUNCTION BOXES AND CABINETS FOR EMERGENCY SYSTEMS SHALL BE PAINTED RED.
 D. OUTLET BOXES SHALL BE ZINC OR CADMIUM-PLATED CODE GAUGE PRESSED STEEL AND OF THE KNOCK-OUT TYPE.
 E. ROUND BOXES WILL NOT BE PERMITTED EXCEPT WHERE SPECIFIED.
 F. OUTLET BOXES SHALL BE INSTALLED SECURELY AND PLUMB WITH BUILDING LINES IN ACCORDANCE WITH THE NEC.
 G. OUTLET BOXES SHALL BE SUPPORTED INDEPENDENTLY OF THE CONDUIT SYSTEM.
 H. BACK TO BACK OUTLETS SHALL NOT BE PERMITTED.
 I. TELEPHONE OUTLETS SHALL BE MOUNTED AT SAME HEIGHT AS ADJACENT RECEPTACLE OUTLETS.
 J. SUPPORT BOXES INDEPENDENTLY OF CONDUIT
 K. INACCESSIBLE CEILING AREAS: PROVIDE ACCESS PANEL AS REQUIRED. INSTALL OUTLET AND JUNCTION BOXES NO MORE THAN 6 INCHES FROM CEILING ACCESS PANEL OR FROM A REMOVABLE RECESSED LUMINAIRE.

SECTION 1614 - ELECTRICAL CONNECTIONS FOR EQUIPMENT
 A. MANUFACTURER: PROVIDE CIRCUIT AND MOTOR DISCONNECTS BY ONE OF THE FOLLOWING: SQUARE D COMPANY, CUTLER-HAMMER INC., GENERAL ELECTRIC CO., SIEMENS ENERGY & AUTOMATION, INC., WESTINGHOUSE ELECTRIC CORP.
 B. FURNISH, SET IN PLACE, AND WIRE (EXCEPT AS MAY BE OTHERWISE INDICATED) ALL HEATING, VENTILATING, AIR CONDITIONING, PLUMBING AND FIRE PROTECTION, ELEVATOR, ETC., MOTORS AND CONTROLS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. CAREFULLY COORDINATE WITH WORK PERFORMED UNDER THE MECHANICAL DIVISION AND WITH OWNER PROVIDED EQUIPMENT.
 C. PROVIDE CIRCUIT AND MOTOR DISCONNECT SWITCHES IN TYPES, SIZES, DUTIES, FEATURES, RATINGS, AND ENCLOSURES AS INDICATED, ALL EQUIPMENT WITH MAXIMUM FUSE SIZE LISTED IN NAMEPLATE SHALL HAVE FUSIBLE DISCONNECT SWITCH PROVIDED.
 D. PROVIDE EQUIPMENT ENCLOSURES THAT ARE RATED FOR THE ENVIRONMENT IN WHICH THEY ARE INSTALLED PER NEC 110.
 E. FUSIBLE SWITCHES: HEAVY DUTY SWITCHES, WITH FUSES OF CLASSES AND CURRENT RATINGS INDICATED. WHERE CURRENT LIMITING FUSES ARE INDICATED, PROVIDE SWITCHES WITH NON-INTERCHANGEABLE FEATURE SUITABLE ONLY FOR CURRENT LIMITING TYPE FUSES. ALL DISCONNECT SWITCHES SHALL BE FUSIBLE UNLESS OTHERWISE NOTED. PROVIDE UL TYPE "HD" 100 PERCENT DUTY RATED SWITCHES.
 F. DISCONNECT SWITCH HANDLES SHALL BE LOCKABLE IN OPEN AND CLOSED POSITION WITHOUT MODIFICATION.
 G. PROVIDE CIRCUIT AND MOTOR DISCONNECT SWITCHES AS INDICATED AND WHERE REQUIRED BY CODE. PROVIDE EACH MOTOR WITH A HORSEPOWER RATED DISCONNECT SWITCH AND EXTERNAL THERMAL OVERLOAD PROTECTION. INSTALL WITHIN SIGHT OF MOTORS OR EQUIPMENT SERVED.
 H. PROVIDE CIRCUIT AND MOTOR DISCONNECT SWITCHES AS INDICATED AND WHERE REQUIRED BY CODE. PROVIDE EACH MOTOR WITH A HORSEPOWER RATED DISCONNECT SWITCH AND EXTERNAL THERMAL OVERLOAD PROTECTION. INSTALL WITHIN SIGHT OF MOTORS OR EQUIPMENT SERVED.

SECTION 1640 - TRANSFORMERS
 A. MANUFACTURERS SHALL BE SIEMENSITE, SQUARED OR GE
 B. ENCLOSURE SHALL BE INDOOR, VENTILATED.
 C. INSULATION CLASS: 220 DEG C
 D. INSULATION TEMPERATURE RISE: 80 DEG C MAX RISE ABOVE 40 DEG C
 E. INSTALL ON VIBRATION MOUNTS
 F. GROUND TRANSFORMER AND TIGHTEN CONNECTION TO COMPLY WITH TIGHTENING TORQUES SPECIFIED IN UL STANDARD 486A.
 G. PROVIDE 4" CONCRETE PAD FOR TRANSFORMER. EXTEND 4" BEYOND EQUIPMENT AND CHAMFER EDGES.
 H. SHALL MEET EFFICIENCY REQUIREMENTS OF 2018 IECC TABLE C405.6.

SECTION 1640 - PANELBOARDS
 A. MANUFACTURERS SHALL BE SIEMENSITE, SQUARED OR GE
 B. EQUIP WITH MOUNTING BRACKETS, BUS CONNECTIONS, AND NECESSARY APPURTENANCES FOR FUTURE INSTALLATION OF DEVICES.
 C. USE SOL-TON BREAKERS.
 D. TIGHTEN ELECTRICAL CONNECTORS AND TERMINALS, INCLUDING GROUNDING CONNECTIONS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES.
 E. PERFORM INSULATION RESISTANCE TESTS OF PANELBOARD BUSES, COMPONENTS, AND CONNECTING SUPPLY AND FEEDER CIRCUITS. PERFORM CONTINUITY TESTS OF CIRCUITS.
 F. PROVIDE TYPED CIRCUIT DIRECTORY.
 G. ALL BUSES TO BE COPPER.

SECTION 1643 - WIRING DEVICES
 A. WIRING DEVICES FOR OWNER FURNISHED EQUIPMENT: MATCH DEVICES TO PLUG CONNECTORS FOR OWNER-FURNISHED EQUIPMENT.
 B. CORD AND PLUG SETS: CONTRACTORS SHALL PROVIDE A LENGTH OF 50 CORD COMPLETE WITH A STRAIGHT BLADE OR TWIST-LOCK RECEPTACLE FOR CONNECTION OF INDICATED EQUIPMENT. CORD AND PLUG RATING SHALL BE SUITABLE FOR THE CONNECTED EQUIPMENT LOAD AND RATING OF THE BRANCH CIRCUIT OVERCURRENT PROTECTIVE DEVICE. PLUG SHALL MATCH RECEPTACLE CONFIGURATION INCLUDED ON THE PLANS AND CORD LENGTH SHALL BE AS REQUIRED.
 C. CONTRACTOR SHALL CONNECT CORD TO EQUIPMENT.
 C. MATERIALS:
 1. MANUFACTURERS: WALL SWITCHES AND RECEPTABLES: PASS & SEYMOUR.
 2. WALL SWITCHES: NEMA WD-1 SPECIFICATION GRADE COMMERCIAL SERIES UL 20 AND FS W-8-896 LISTED, NEMA WD-1 AND WD-6 COMPLIANT, 20 AMP RATED. HANDLE: WHITE.
 C. RECEPTABLES:
 1. MINIMUM SPECIFICATION GRADE, COMMERCIAL SERIES UL 498 AND FS W-C-596 LISTED, NEMA WD-1 AND WD-6 COMPLIANT.
 2. DUPLEX RECEPTACLE: TYPE NEMA 5-20R DUPLEX UNLESS NOTED OTHERWISE.
 3. DEVICE COVER PLATES: SMOOTH NYLON FOR FINISHED AREAS. VERIFY COLOR WITH ARCHITECT.
 4. PROVIDE EXTENSION RINGS TO BRING OUTLET BOXES FLUSH WITH FINISHED SURFACE.
 5. INSTALL SWITCHES WITH OFF POSITION DOWN.
 6. INSTALL RECEPTABLES WITH EITHER GROUND OR NEUTRAL FLU.
 7. PROVIDE GFCI RECEPTABLES THROUGHOUT IN KITCHENS AND AT VENDING MACHINES AND WITHIN 6' OF ANY SINKS.
 8. PROVIDE GFCI TYPE OUTLETS FOR EACH ABOVE COUNTER DUPLEX RECEPTACLE SHOWN WITHIN 6 FEET-0 INCHES OF SINKS/LAVATORIES. FOR ABOVE COUNTER MULTI-OUTLET ASSEMBLIES WHICH DO NOT CONTAIN DUPLEX RECEPTABLES THAT CAN BE REPLACED WITH GFCI DEVICES, PROVIDE GFI CIRCUIT BREAKERS ON THE BRANCH CIRCUITS FEEDING THE ASSEMBLY.
 9. EACH BRANCH CIRCUIT SHALL BE FURNISHED WITH A DEDICATED NEUTRAL CONDUCTOR.

SECTION 1610 - SUPPORTING DEVICES
 A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC REQUIREMENTS.
 B. STRENGTH OF EACH SUPPORT SHALL BE ADEQUATE TO CARRY PRESENT AND FUTURE PROPOSED LOAD MULTIPLIED BY A SAFETY FACTOR OF AT LEAST FOUR.
 C. INSTALL INDIVIDUAL AND MULTIPLE (TRAPEZIE) RACEWAY HANGERS AND RISER CLAMPS AS NECESSARY TO SUPPORT RACEWAYS. PROVIDE U-BOLTS, CLAMPS, ATTACHMENTS AND OTHER HARDWARE NECESSARY FOR HANGER ASSEMBLY AND FOR SECURING HANGER RODS AND CONDUITS.
 D. SUPPORT PARALLEL RUNS OF HORIZONTAL RACEWAYS TOGETHER ON TRAPEZIE-TYPE HANGERS. USE 3/8" DIAMETER OR LARGER THREADED STEEL RODS FOR SUPPORT.
 E. SUPPORT INDIVIDUAL HORIZONTAL RACEWAYS BY SEPARATE PIPE HANGERS. SPRING STEEL FASTENERS MAY BE USED IN LIEU OF HANGERS ONLY FOR 1-1/2 INCH AND SMALLER RACEWAYS SERVING LIGHTING AND RECEPTACLE BRANCH CIRCUITS ABOVE SUSPENDED CEILING ONLY. FOR HANGER RODS WITH SPRING STEEL FASTENERS, USE 1/2" DIAMETER OR LARGER THREADED STEEL. USE SPRING STEEL FASTENERS THAT ARE SPECIFICALLY DESIGNED FOR SUPPORTING SINGLE CONDUITS OR TUBING. FOR HANGER RODS SUPPORTING 1-1/2 INCH OR LARGER CONDUITS PROVIDE 3/8 INCH MINIMUM THREADED STEEL RODS WITH PIPE HANGERS.
 F. SPACE SUPPORTS FOR RACEWAYS IN ACCORDANCE WITH NEC. WHEN THERE ARE 4 OR MORE 'Z' CONDUITS IN A TRAPEZIE, SUPPORTS SHALL BE SPACED 5 FEET O.C.
 G. FASTEN HANGER RODS, CONDUIT CLAMPS AND OUTLET AND JUNCTION BOXES TO BUILDING STRUCTURE USING PRECAST INSERT SYSTEM, EXPANSION ANCHORS, BEAM CLAMPS, OR SPRING STEEL CLIPS.
 H. USE TOGGLE BOLTS OR HOLLOW WALL FASTENERS IN HOLLOW MASONRY, PLASTER OR GYPSUM BOARD PARTITIONS AND WALLS; SELF-DRAWING ANCHORS OR EXPANSION ANCHORS OR PRESET BOLTS IN SOLID MASONRY WALLS; SELF-DRAWING ANCHORS OR EXPANSION ANCHORS ON CONCRETE SURFACES; SHEET METAL SCREWS IN SHEET METAL STUDS; AND WOOD SCREWS IN WOOD CONSTRUCTION.
 I. DO NOT FASTEN SUPPORTS TO PIPING, DUCTWORK, MECHANICAL EQUIPMENT OR CONDUIT.
 J. USE #8 CEILING WIRE TO SUPPORT INDIVIDUAL CONDUITS UP TO 1/2" WITH SPRING STEEL FASTENERS.
 K. CONDUITS SHALL NOT BE SUPPORTED FROM THE SUPPORT WIRES OF SUSPENDED CEILING SYSTEMS.
 L. ELECTRICAL DEVICES OR EQUIPMENT SHALL NOT BE HUNG FROM THE ROOF DECK.
 M. INSTALL SURFACE-MOUNTED CABINETS AND PANELBOARDS WITH MINIMUM OF FOUR ANCHORS. PROVIDE STEEL CHANNEL SUPPORTS TO STAND CABINET ONE INCH OFF WALL.
 N. CUT OFF UNUSED LENGTHS THREADED ROD SUPPORTS.

SECTION 1618 - ELECTRICAL IDENTIFICATION
 A. PRE-PRINTED, FLEXIBLE, SELF-ADHESIVE LABELS WITH LEGEND INDICATING VOLTAGE AND SERVICE (EMERGENCY, LIGHTING, POWER, LIGHT, POWER D.C., AIR CONDITIONING, COMMUNICATIONS, CONTROL, FIRE) SHALL BE PROVIDED FOR ALL RACEWAYS AND METAL CLAD CABLES.
 B. VINYL OR VINYL-CLOTH, SELF-ADHESIVE, WRAPAROUND, CABLE/CONDUCTOR MARKERS SHALL BE PROVIDED FOR WIRE/CABLE DESIGNATION.
 C. ENGRAVING STOCK MELAMINE PLASTIC LAMINATE, WITH ENGRAVED LEGEND IN WHITE LETTERS ON BLACK FACE AND PUNCHED FOR MECHANICAL FASTENERS SHALL BE PROVIDED FOR PANELBOARDS, SWITCHBOARDS, DISCONNECTS, ETC.
 D. PROVIDE NEW TYPED DIRECTORY IN WHERE PANELBOARD SCHEDULES ARE REVISED.

SECTION 1642 - GROUNDING
 A. GROUNDING CONDUCTORS SHALL BE COPPER IN ALL CASES.
 B. GROUND THE SECONDARY ELECTRICAL SYSTEM AND COMMUNICATION SYSTEM IN ACCORDANCE WITH THE NEC.

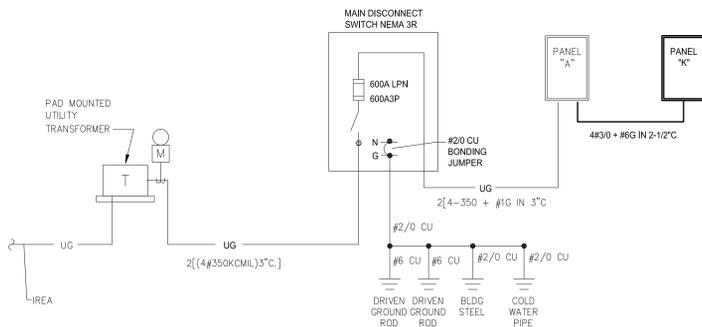
SECTION 1645 - OVERCURRENT PROTECTIVE DEVICES
 A. CIRCUIT BREAKERS SHALL BE OF THE SAME MANUFACTURER AS PANELBOARD, THERMAL MAGNETIC, QUICK-MAKE, QUICK-BREAK, TRIP FREE, TRIP INDICATING, BOLT-IN TYPE AND RATED FOR THE AVAILABLE FAULT CURRENT.
 B. WHERE NOT A PART OF A PRE-FABRICATED PANELBOARD, CIRCUIT BREAKERS SHALL BE INSTALLED IN A NEMA 1 OR NEMA 3R ENCLOSURE AS REQUIRED.
 C. DISCONNECTING SWITCHES SHALL BE NEMA STANDARD TYPE "HD" 100 PERCENT DUTY RATED IN NEMA 1 ENCLOSURES WITH QUICK-MAKE, QUICK-BREAK OPERATING MECHANISMS. PROVIDE FACILITIES FOR PADLOCKING IN "OFF" POSITION.
 D. SWITCHES SHALL BE OF THE SAME OR LARGER AMPERE RATING AS THE CIRCUIT PROTECTIVE DEVICE.

SECTION 1671 - FIRE ALARM
 A. EXTEND OF THE FIRE ALARM SYSTEMS WORK IS INDICATED ON THE POWER AND SYSTEMS PLANS.
 B. PROVIDE ALL SYSTEM COMPONENT DEVICES NECESSARY FOR A COMPLETE SYSTEM.
 C. INSTALLATION SHALL CONFORM TO APPLICABLE SECTIONS OF NFPA-72, INTERNATIONAL CODES, LOCAL CODE REQUIREMENTS AND THE NATIONAL ELECTRICAL CODE.
 D. PROVIDE SUBMITTALS AS REQUIRED BY 2015 IFC AND LOCAL AHJ.
 E. PROVIDE ALL DEVICES, WIRING, COMPONENTS, ACCESSORIES, ETC AS REQUIRED FOR A COMPLETE SYSTEM.
 F. WIRE INSTALLATION SHALL COMPLY WITH NEC ARTICLE 760.

END OF DIVISION 16

GENERAL NOTES:

- WORK INCLUDED IN THE CONTRACT IS DENOTED IN BOLD. EXISTING CONDITIONS TO REMAIN ARE DENOTED LIGHTLY.
- 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.
- 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.
- 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 BE RESPONSIBLE FOR THE EXACT FITTING OF ALL MATERIALS, 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, CEILINGS, OR OTHER SURFACES AS REQUIRED FOR INSTALLATION, UPGRADE, ANCHORAGE, ETC. OF WORK. PROVIDE X-RAY OF FLOOR PRIOR TO CORE DRILLS. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUBSEQUENT PATCHING WORK.
- A DETAILED WRITTEN METHOD OF PROCEDURE IS REQUIRED WHEN A CONSTRUCTION ACTIVITY OR AN OUTAGE AFFECTS THE SAFETY OF OCCUPANTS, TELEPHONE/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.
- 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 MODIFY THE SCOPE OF WORK 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, EQUIPMENT, AND/OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WILL NOT BE RECOGNIZED.
- 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 OTHERWISE. PREPARE LISTING OF ALL EXISTING DAMAGED ITEMS AND SUBMIT TO OWNER PRIOR TO BEGINNING WORK.
- 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.
- FIELD LOCATE EXISTING UNDERGROUND PUBLIC AND OWNER UTILITIES OF ALL TRADES AND BUILDING GROUNDING/LIGHTNING PROTECTION SYSTEMS PRIOR TO ANY EXCAVATION. REPLACE OR REPAIR DAMAGED UTILITIES AND GROUNDING/LIGHTNING PROTECTION SYSTEMS TO ORIGINAL CONDITION.
- INSTALL CONDUIT CONCEALED IN FINISHED AREAS UNLESS OTHERWISE NOTED.
- DO NOT ROUTE CONDUIT WITHIN STRUCTURAL OR TOPPING SLABS OF FLOORS UNLESS SPECIFICALLY NOTED OTHERWISE AND WRITTEN APPROVAL IS OBTAINED FROM THE STRUCTURAL ENGINEER.
- FIRE SEAL ALL FIRE RATED WALL AND FLOOR PENETRATIONS. VERIFY RATED WALL LOCATIONS ON ARCHITECTURAL DRAWINGS.
- PROVIDE SEPARATE INSULATED GROUNDING CONDUCTOR IN ALL FEEDER, HOMERUN AND BRANCH CIRCUITS.
- REFER TO ARCHITECTURAL 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.
- DEMOLITION OF ANY ELECTRICAL AND COMMUNICATIONS CONDUIT, WIRING, CABLEING, OR DEVICE MEANS TO REMOVE IN ITS ENTIRETY. REMOVE UNUSED CONDUITS FROM CEILING SPACES IN AREAS OF WORK. RETURN UNUSED ELECTRICAL EQUIPMENT AND LIGHT FIXTURES TO BUILDING MANAGEMENT FOR STORAGE AND/OR REMOVAL FROM SITE AS DIRECTED BY OWNERS.
- 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.
- MINIMUM WORKING CLEARANCES PER THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE SHALL BE PROVIDED AROUND AND IN FRONT OF ALL ELECTRICAL EQUIPMENT.
- 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 REPRODUCIBLES WITH "AS BUILT" PROJECT RECORD INFORMATION CLEARLY INDICATED. ELECTRICAL CONTRACTOR SHALL OBTAIN AND PAY FOR ALL LOCAL FEES, PERMITS, AND SERVICES OF INSPECTION AUTHORITIES REQUIRED BY ELECTRICAL WORK FOR THIS ELECTRICAL CONSTRUCTION.
- 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.
- PROVIDE UPDATED LABELING OF ALL NEW AND RELOCATED ELECTRICAL EQUIPMENT IN SCOPE OF WORK INCLUDING, BUT NOT LIMITED TO, ENGINE GENERATOR SYSTEMS, TRANSFER SWITCHES, TRANSFORMERS, SWITCHGEAR, SWITCHBOARDS, PANELBOARDS, MOTOR CONTROL CENTERS, AND DISCONNECTS TO INDICATE THE AMPERE RATING, VOLTAGE RATING, PHASE, CONDUCTOR COLOR CODING WITHIN THE EQUIPMENT AND APPLICABLE AIC RATING.
- ALL NEW AND MODIFIED ELECTRICAL EQUIPMENT, SUCH AS SWITCHBOARDS, PANELBOARDS, INDUSTRIAL CONTROL PANELS, METER SOCKET ENCLOSURES, AND MOTOR CONTROL CENTERS, THAT ARE LIKELY TO REQUIRE EXAMINATION, ADJUSTMENT, SERVICING, OR MAINTENANCE WHILE ENERGIZED 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 QUALIFIED PERSONS BEFORE EXAMINATION, ADJUSTMENT, SERVICING, OR MAINTENANCE OF THE EQUIPMENT PER NEC ARTICLE 110.16.



ELECTRICAL ONE-LINE DIAGRAM

NO SCALE
 ALL CONDUCTORS ARE TO BE COPPER

BRET JOHNSON ARCHITECTURE
 2304 YOSEMITE STREET
 DENVER, COLORADO 80238
 720.541.0392

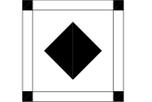
HUGO ROADHOUSE ROUNDHOUSE PRESERVATION, INC
 HUGO, COLORADO 80821

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

SHEET TITLE:
ELECTRICAL LEGEND
 SHEET NUMBER:
E1.0

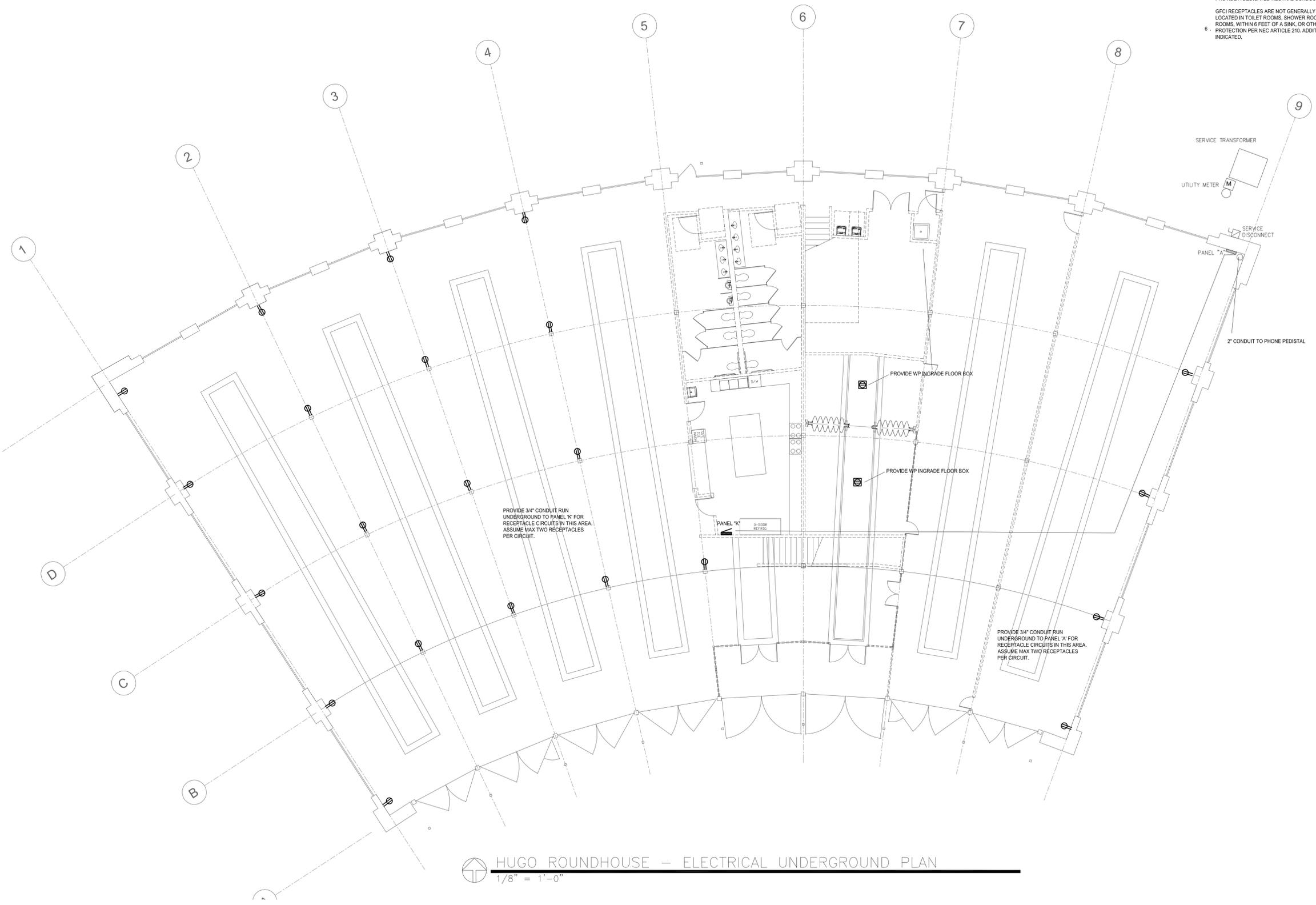
CMO
 Consulting Engineers, LLC

11646 Sun Bear Trail
 Golden, Colorado 80403
 303.875.4037



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

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

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