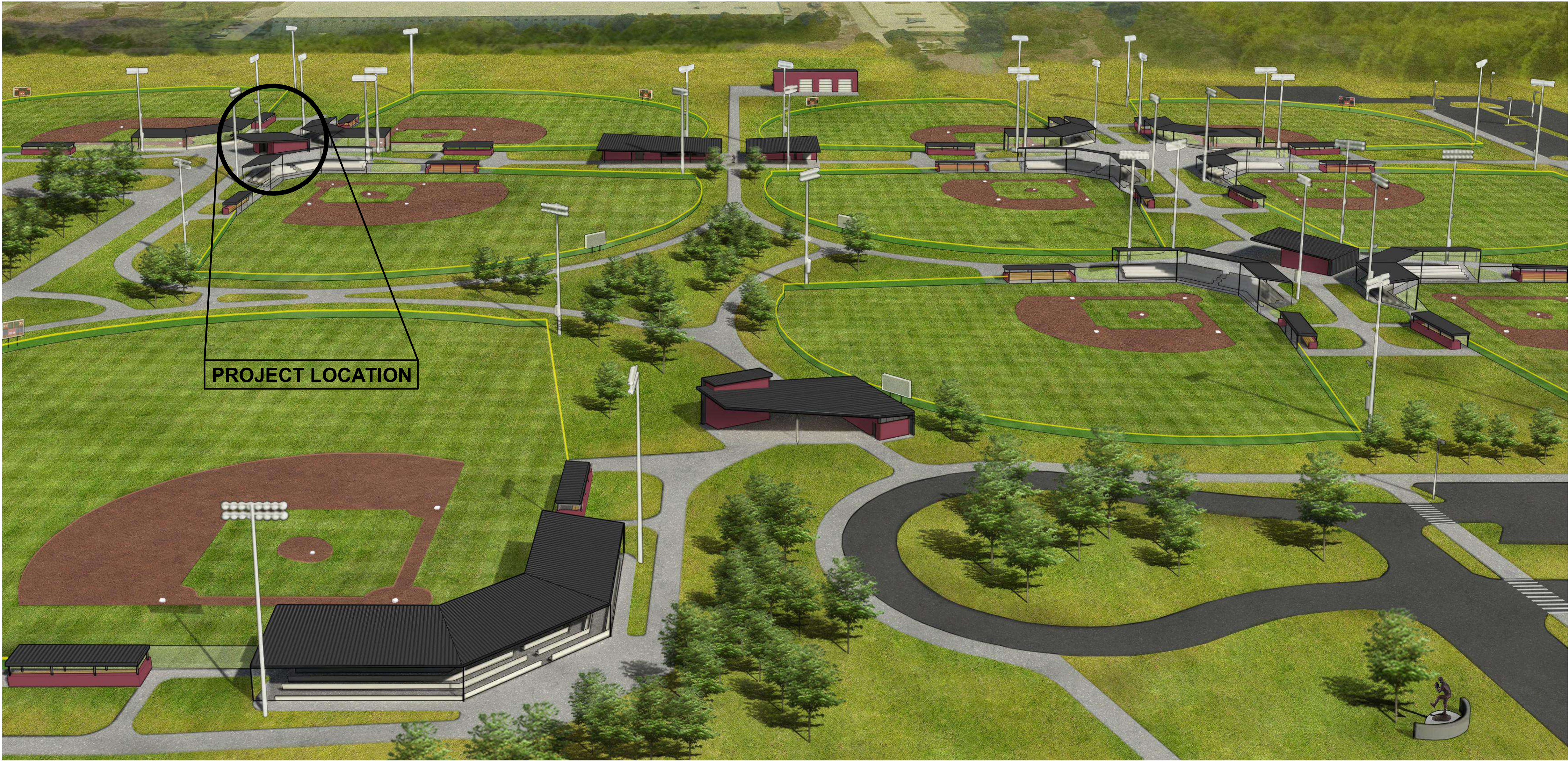




PHILLIPS PARK NORTH RESTROOM

CONSTRUCTION DOCUMENTS



ARCHITECT'S

"I HEREBY CERTIFY THAT THESE PLANS AND SPECIFICATIONS HAVE BEEN PREPARED BY ME, OR UNDER MY SUPERVISION. I FURTHER CERTIFY THAT TO THE BEST OF MY KNOWLEDGE THESE PLANS AND SPECIFICATIONS ARE AS REQUIRED BY LAW AND IN COMPLIANCE WITH THE ARKANSAS FIRE PREVENTION CODE FOR THE STATE OF ARKANSAS."

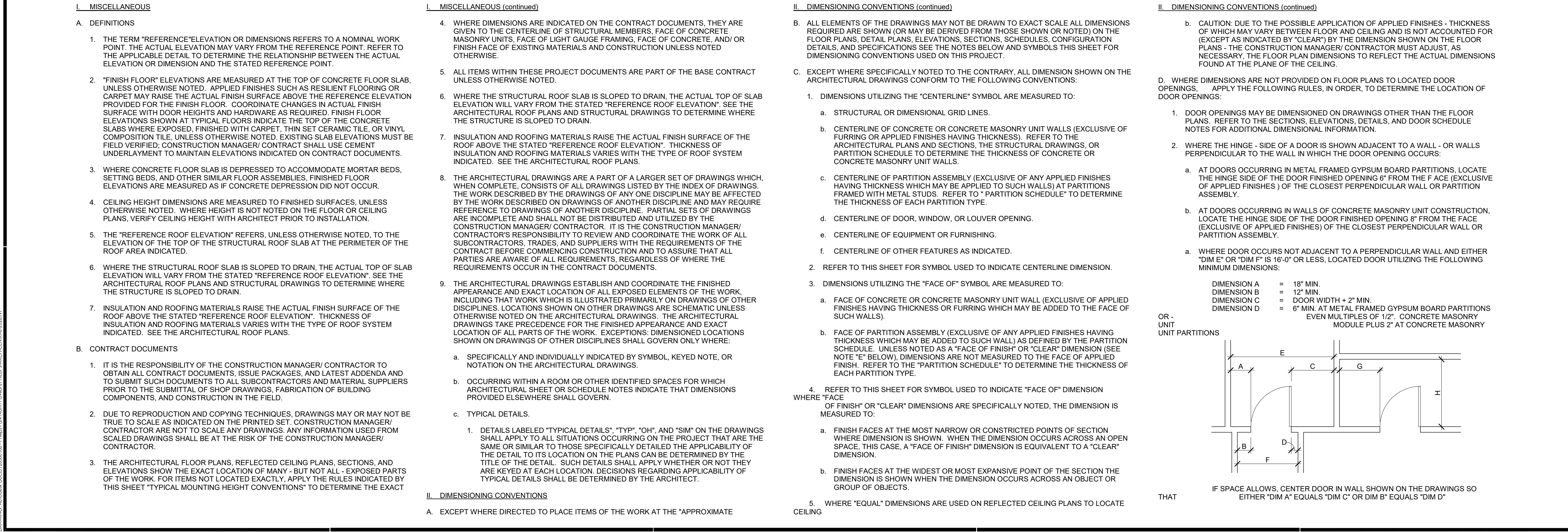
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GENERAL NOTES:

XX. DIVISION 9 (continued)

- H. PENETRATIONS THROUGH RATED PARTITIONS SHALL COMPLY WITH UL DESIGNED ASSEMBLIES AND MAINTAIN DESIGNED PARTITION RATING. BLOCKING SHALL BE PROVIDED FOR CASEWORK, HANDRAILS, SIGNAGE, ACCESSORIES, FIXTURES, EQUIPMENT, ETC. AND SHALL BE FIRE RESISTIVE.
- I. WHERE PLANS INDICATE ACOUSTICAL PARTITIONS, PROVIDE PARTITIONS PER PARTITION TYPE. PENETRATIONS THROUGH PARTITION SHALL RECEIVE ACOUSTICAL SEALANT AS DEFINED IN JOINT SEALANTS - 079200.
- J. FIRECODE/TYPE "X" GYPSUM WALL BOARD IS TEH TYPICAL. MINIMUM SHEATHING MATERIAL. APPLY ALTERNATE MATERIALS AS SPECIFIED IN GYPSUM BOARD ASSEMBLIES - 092900 AND OR AS INDICATED ON THE DRAWINGS.
- K. GYPSUM WALL BOARD PARTITIONS NOT EXPOSED TO VIEW SHALL RECEIVE TAPE EMBEDDING AND FIRST COAT UNLESS REQUIRED OTHERWISE TO MAINTAIN A DESIGN FIRE RATING. RE: GYPSUM BOARD ASSEMBLIES - 092900.
- L. GYPSUM WALLBOARD PARTITIONS EXPOSED TO PUBLIC VIEW SHALL RECEIVE A SECOND COAT (FIN COAT) UNLESS REQUIRED OTHERWISE TO MAINTAIN A DESIGN FIRE RATING. RE: GYPSUM BOARD ASSEMBLIES - 092900.
- M. GYPSUM WALLBOARD PARTITIONS SHALL RECEIVE A THIRD COAT (FINISH COAT) UNLESS OTHER OTHERWISE NOTED OR REQUIRED. RE: GYPSUM BOARD ASSEMBLIES - 092900.

XXI.DIVISION I

- A. PROVIDE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2A AS SHOWN ON DRAWINGS WITHIN 75 FOOT TRAVEL DISTANCE TO ALL PORTIONS OF THE BUILDING. PROVIDE PORTABLE FIRE EXTINGUISHER WITH A RATING OF NOT LESS THAN 10BC FOR MECHANICAL AND ELECTRICAL EQUIPMENT ROOMS. PROVIDE PORTABLE FIRE EXTINGUISHERS AS THE BUILDING IS CONSTRUCTED, WHERE NOT SHOWN ON THE PLANS.

XXII. DIVISION 13

- A. LIGHTNING PROTECTION
1. GROUNDING FOR THE LIGHTNING PROTECTION SYSTEM SHALL BE LOCATED IN SUCH A MANNER THAT IT IS CONCEALED. COORDINATE WITH ARCHITECT PRIOR TO INSTALLATION.
- B. AUTOMATIC SPRINKLER SYSTEM
1. THE SIZE, COLOR, AND FINISH OF TRIM KITS SHALL BE COORDINATED WITH THE ARCHITECT/ ENGINEER AND SHALL MATCH SURROUNDING SURFACES.
 2. FIXTURES INSTALLED IN ACOUSTICAL TILE CEILINGS SHALL INSTALLED AT THE CENTER OF TILES UNLESS OTHERWISE.

XXII. DIVISION 15

- A. DEVICES
1. THE SIZE, COLOR, AND FINISH OF TRIM KITS SHALL MATCH SURROUNDING FINISHES UNLESS NOTED OTHERWISE. COORDINATE FINAL COLOR, FINISH SIZE, AND ORIENTATION OF TRIM KITS WITH ARCHITECT/ENGINEER.
 2. FIXTURES INSTALLED IN ACOUSTICAL TILE CEILING SHALL BE INSTALLED "CENTER OF TILE" UNLESS OTHERWISE NOTED.
- B. ACCESS PANELS
1. ACCESS PANELS, WHERE REQUIRED BY BUILDING CODE OR FOR THE PROPER OPERATION OR MAINTENANCE OF MECHANICAL OR ELECTRICAL EQUIPMENT, SHALL BE PROVIDED AND INSTALLED AS SHOWN ON THE REFLECTED CEILING PLANS. THE CONSTRUCTION MANAGER/CONTACTOR SHALL COORDINATE SIZE, LOCATION AND TYPE OF ACCESS PANEL WITH OTHER CONTRACTORS WORK AND RECEIVE APPROVAL OF THE ARCHITECT ACCESS PANEL SHALL BE AS SPECIFIED.
- C. HOUSEKEEPING PAD AND BASES.
1. SIZES OF HOUSEKEEPING PADS AND BASES FOR MECHANICAL EQUIPMENT ARE APPROXIMATE. CONSTRUCTION MANAGER/CONTACTOR SHALL VERIFY EXACT LOCATION AND REQUIRED SIZE OF ALL CONCRETE PADS AND BASES WITH EQUIPMENT MANUFACTURER'S BEFORE POURING.

XXIV. DIVISION 16

- A. GENERAL AND EMERGENCY LIGHT LEVELS ARE DESIGN AROUND THE SPECIFIC FIXTURES, LOCATIONS, AND QUANTITIES SPECIFIED IN THESE DOCUMENTS. ANY CHANGES BY THE CONSTRUCTION MANAGER/ CONTRACTOR SHALL BE VERIFIED TO ENSURE THAT EQUIVALENT LIGHT LEVELS ARE PROVIDED.
- B. FIXTURES INSTALLED IN ACOUSTICAL TILE CEILINGS SHALL BE INSTALLED CENTER OF TILE UNLESS OTHERWISE NOTED.

XXIVII AMERICANS WITH DISABILITIES ACCESSIBILITY GUIDELINES (ADA AG)

- A. THE INFORMATION PRESENTED ON THIS SHEET IS A GUIDE TO MEETING THE REQUIREMENTS OF THE ADA AG. THEY APPLY TO THIS PROJECT. THIS INFORMATION IS INTENDED TO BE NO LESS RESTRICTIVE THAN THE REQUIREMENTS PRESENTED IN THE ADA ACCESSIBILITY GUIDELINE. IN SOME CASES WHERE THEY ARE MORE RESTRICTIVE, THE CRITERIA PRESENTED HERE SHALL BE FOLLOWED. SOME OF THE TOILET ACCESSORIES ILLUSTRATED HERE ARE BASED ON PRODUCTS OF SPECIFIC MANUFACTURERS, BUT THIS IN NO WAY IS MEANT TO RESTRICT THE USE OF PRODUCTS OF OTHER MANUFACTURERS AS MAY BE PERMITTED BY THE PROJECT MANUAL AND SPECIFICATIONS. CONTRACTORS AND SUPPLIERS SHALL NOTIFY THE ARCHITECT IF THEY BELIEVE A PRODUCT SPECIFIED OR AN INSTALLATION DETAIL TO BE CONTRARY TO THE MINIMUM REQUIREMENTS OF THE ADA AG.
- B. THE SERVICE OR OPERATING POINT FOR ALL INSTALLED TOILET ROOM EQUIPMENT OR ACCESSORIES SHALL BE MOUNTED NOT MORE THAN 48" ABOVE FINISHED FLOOR.
- C. NO CONSTRUCTION OR EQUIPMENT SHALL BE INSTALLED WHICH DIMINISHES AN ACCESSIBLE ROUTE TO LESS THAN 36" WIDE BY 80" HIGH.
- D. NO OBJECT SHALL BE INSTALLED WHICH PROTRUDES MORE THAN 4" FROM THE WALL IF THE BOTTOM OF THE LEADING EDGE IS BETWEEN 27" AND 80" ABOVE THE FLOOR.
- E. UNLESS SPECIFICALLY DETAILED OR SPECIFIED OTHERWISE, ALL DOORWAYS SHALL HAVE A MINIMUM CLEAR OPENING OF 32" AND HAVE A CLEAR SPACE FROM THE LATCH JAMB TO ANY OBSTRUCTION OF NOT LESS THAN 12" ON THE "PUSH SIDE" AND 18" ON THE "PULL SIDE".
- F. ALL CONCESSION STANDS, TICKET WINDOWS, AND OTHER FACILITIES PROVIDING SERVICE AT A COUNTER SHALL HAVE AN ACCESSIBLE PORTION OF THE COUNTER THAT IS AT LEAST 36" LONG AND NOT MORE THAN 36" ABOVE FINISHED FLOOR.
- G. ALL GRAB BARS SHALL PROJECT NOT MORE THAN 3" FROM THE WALL AND HAVE A 1 1/2" CLEAR FINGER SPACE BETWEEN THE WALL AND THE GRAB BAR.
- H. ALL CARPET SHALL BE SECURELY FASTENED TO THE FLOOR AND HAVE A PILE THICKNESS NOT MORE THAN 1/2".
- I. ALL GRATINGS LOCATED IN WALKING SURFACES SHALL HAVE SPACED NO GREATER THAN 1/2" WIDE IN ONE DIRECTION AND WHERE ELONGATED OPENINGS ARE PROVIDED THEY SHALL BE PLACED SO THAT THE LONG DIRECTION IS PERPENDICULAR TO THE DOMINATE DIRECTION OF TRAVEL.
- J. NO RAMP SHALL BE CONSTRUCTED WITH A SLOPE GREATER THAN 1:12 IN THE DIRECTION OF TRAVEL AND A CROSS SLOPE GREATER THAN 1:50.



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PHILLIPS PARK

3108 SE J Street
Bentonville, AR

Key Plan

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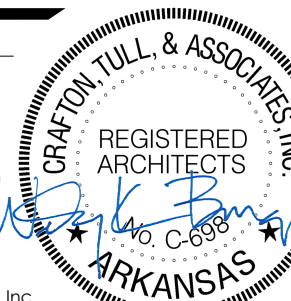
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CONSTRUCTION
DOCUMENTS

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GENERAL NOTE:



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GENERAL NOTES

G-004

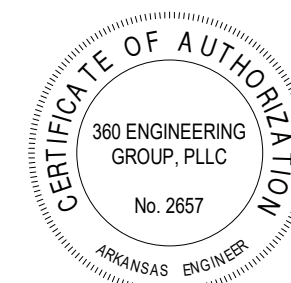
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CONCRETE MIX DESIGN REQUIREMENTS ¹							
ELEMENT	f _c (psi)	CEMENT TYPE	MAX W/C	MAX AGG	AIR CONTENT (NOTE 1)	SLUMP (NOTE 2)	OTHER (NOTE 3)
FOOTINGS	3500, NW	I/II	0.55	1 1/2"	4.5%	4"	NOTE 4
INTERIOR SLAB ON GRADE	3500, NW	I/II	0.55	1"	1.5%	3"	NOTE 5,6,7
EXTERIOR STRUCTURAL CONCRETE	4500, NW	I/II	0.45	1"	4.5%	3"	NOTE 4
FOOTNOTES:							
1. TOLERANCE ON AIR CONTENT AS DELIVERED SHALL BE AS FOLLOWS:							
FOR f _c LESS THAN OR EQUAL TO 5000PSI = +/- 1.5%							
FOR f _c GREATER THAN 5000PSI = +/- 1.0%							
2. SLUMP TOLERANCES AS FOLLOWS (ACI 117):							
SPECIFIED SLUMP LESS THAN OR EQUAL TO 4" = +/- 1"							
SPECIFIED SLUMP GREATER THAN 4" = +/- 1 1/2"							
SPECIFIED SLUMP OF CONCRETE IS BEFORE ADDITION OF PLASTICIZERS OR HIGH-RANGE WATER REDUCING ADMIXTURES.							
3. MAXIMUM WATER-SOLUBLE CHLORIDE ION (CL-) CONTENT IN CONCRETE BY % WEIGHT OF CEMENT IS 1.0 UNO.							
4. MAXIMUM WATER-SOLUBLE CHLORIDE ION (CL-) CONTENT IN CONCRETE BY % WEIGHT OF CEMENT IS 0.3.							
5. CONCRETE FOR SLABS SHALL HAVE MINIMUM CEMENTITIOUS MATERIALS CONTENT AS FOLLOWS:							
MAX AGGREGATE SIZE LESS THAN 1" = 610 LB/ CU YD							
MAX AGGREGATE SIZE GREATER THAN OR EQUAL TO 1" = 540 LB/ CU YD							
6. NW CONCRETE FOR SLABS TO RECEIVE A HARD-TROWELED FINISH SHALL NOT CONTAIN AIR-ENTRAINING ADMIXTURE OR HAVE A TOTAL AIR CONTENT GREATER THAN 3%.							
7. WHEN FLY ASH IS USED IN SLABS, IT SHOULD BE 25% MAX BY WEIGHT OF TOTAL CEMENTITIOUS MATERIALS.							
8. ADMIXTURES CONTAINING CHLORIDE SALTS SHALL NOT BE USED ON METAL DECKS.							
9. MAXIMUM WATER-SOLUBLE CHLORIDE ION (CL-) CONTENT IN CONCRETE BY % WEIGHT OF CEMENT IS 0.15.							
10. LIMITS ON SUPPLEMENTARY CEMENTITIOUS MATERIALS TO CONFORM TO ACI TABLE 26.4.2.2(b).							
11. USE AGGREGATE SIZE FOR CONCRETE CORE THICKNESS AS FOLLOWS:							
FOR CORE THICKNESS LESS THAN OR EQUAL TO 4" = 3/8" MAX							
FOR CORE THICKNESS LESS THAN OR EQUAL TO 6" = 1/2" MAX							
FOR CORE THICKNESS LESS THAN OR EQUAL TO 8" = 1" MAX							
GENERAL CONCRETE MIX NOTES:							
1. MIX DESIGNS SHALL BE IN ACCORDANCE WITH ACI 301.							
2. STRENGTH (f _c) IS THE 28 DAY COMPRESSIVE STRENGTH UNO OR COMPRESSIVE STRENGTH AT THE SPECIFIED AGE.							
3. CONCRETE IS NORMAL WEIGHT (NW) CONCRETE UNO. NORMAL WEIGHT CONCRETE (NW) SHALL HAVE A DRY DENSITY OF 150 PCF MAX UNO.							
4. LIGHT WEIGHT CONCRETE (LW) SHALL HAVE A DRY DENSITY OF 110 PCF MAX.							
5. MIX DESIGNS NOT FURNISHED, SUCH AS THOSE REQUIRING SULFATE RESISTANCE OR EXPOSED TO DE-ICING CHEMICALS, SHALL BE FOUND IN THE SPECIFICATIONS.							
DIVISION 4 - MASONRY							
1. CONCRETE MASONRY UNITS SHALL MEET ASTM SPECIFICATION C90, GRADE N TYPE 1 BLOCK WITH A MINIMUM UNIT COMPRESSIVE STRENGTH OF 1900 PSI. THE SPECIFIED DESIGN COMPRESSIVE STRENGTH OF THE CONCRETE MASONRY ASSEMBLY SHALL BE 1,900 PSI.							
2. MORTAR SHALL MEET ASTM SPECIFICATION C270 FOR TYPE "S" MORTAR.							
3. GROUT SHALL MEET ASTM SPECIFICATION C476 AND HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2,000 PSI.							
4. GROUT PLACED BY THE LOW LIFT GROUTING METHOD SHALL BE MECHANICALLY CONSOLIDATED USING A VIBRATOR WITH A MAXIMUM 3/4 INCH DIAMETER HEAD.							
5. HORIZONTAL JOINT REINFORCEMENT SHALL BE LADDER TYPE (REFERENCE SPECIFICATION). JOINT REINFORCEMENT SHALL BE SPACED AT 8 INCHES ON CENTER BELOW FINISHED FLOOR AND IN PARAPETS, AND 16 INCHES ON CENTER ABOVE FINISHED FLOOR.							
6. CONCRETE MASONRY SHALL BE LAID IN RUNNING BOND.							
7. CONCRETE MASONRY BELOW FINISHED FLOOR SHALL BE NORMAL WEIGHT UNITS AND SHALL HAVE ALL THE CELLS FULLY GROUTED. CONCRETE MASONRY ABOVE FINISHED FLOOR SHALL BE MEDIUM WEIGHT OR LIGHT WEIGHT AND IS TO BE GROUTED AT REINFORCED CELLS AND BOND BEAMS. ALL CELLS WITH REINFORCING SHALL BE GROUTED SOLID.							
8. SEE WALL SECTIONS AND DETAILS FOR MISCELLANEOUS BOND BEAM LOCATIONS AND EMBEDDED ITEMS. USE OPEN KNOCK OUT BOND BEAM BLOCK. DO NOT USE THROUGH TYPE BLOCKS FOR BOND BEAMS. DO NOT CONTINUE BOND BEAM REINFORCING THROUGH CONTROL JOINTS.							
9. REINFORCING STEEL SHALL MEET ASTM SPECIFICATION A615, GRADE 60.							
10. ANCHORS INSTALLED IN GROUT FILLED CONCRETE MASONRY UNITS SHALL BE USED WHERE SPECIFIED ON THE DRAWINGS. ANCHORS MUST BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS. USE HILTI HY-270 ADHESIVE ANCHORING SYSTEM OR HILTI KWIK BOLT3 EXPANSION ANCHOR. REFERENCE DETAILS FOR ANCHOR SIZE AND EMBEDMENT. SUBSTITUTIONS TO THE SPECIFIED ANCHORS MUST BE APPROVED BY THE ENGINEER OF RECORD.							
11. CONSTRUCTION BRACING FOR MASONRY WALLS SHALL BE DESIGNED AND DETAILED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED.							
MASONRY VENEER LINTEL SCHEDULE							
CLEAR SPANS (S)	ANGLE SIZE (GALVANIZED)	BEARING (EACH END)					
S ≤ 7'-0"	L3 1/2x3 1/2x1/4	4"					
7'-0" < S ≤ 9'-0"	L5x3 1/2x1/4 (LLV)	6"					
9'-0" < S ≤ 10'-8"	L5x3 1/2x5/16 (LLV)	6"					
10'-8" < S ≤ 12'-0"	BENT PLATE 5/16x3 1/2x7 (LLV)	6"					

DIVISION 5 - STEEL			
1. STRUCTURAL STEEL SHALL MEET THE FOLLOWING MINIMUM YIELD STRENGTHS (F _y):			
		YIELD	ASTM SPECIFICATION
A.	WIDE FLANGE SHAPES:	50 KSI	A992
B.	OTHER SHAPES, BARS, PLATES AND RODS	36 KSI	A36
C.	SQUARE AND RECTANGULAR HSS	46 KSI	A500, GRADE B
		50 KSI	A500, GRADE C
D.	ROUND HSS	42 KSI	A500, GRADE B
		46 KSI	A500, GRADE C
E.	STRUCTURAL STEEL PIPE	35 KSI	A53, TYPE E, GRADE B
F.	ANCHOR RODS	36 KSI	F1554
G.	ALL-THREAD RODS	36 KSI	A36
H.	HEADED STUD ANCHORS	65 KSI (TENSILE)	A106 (GRADE DESIGNATIONS 1010-1020 INCLUSIVE)
2. BOLTS FOR STEEL BEAM AND COLUMN CONNECTIONS SHALL BE 3/4" DIAMETER ASTM A325 HIGH-STRENGTH BOLTS INSTALLED SNUG TIGHT, UNO.			
3. WHERE FIELD AND SHOP WELDS ARE INDICATED ON THE DRAWINGS, THEY SHALL BE THE SIZE AND TYPE NOTED. ALL WELDING OF STRUCTURAL STEEL SHALL BE DONE IN ACCORDANCE WITH LATEST EDITION OF AWS D1.1 CORRESPONDING TO THE AISC SPECIFICATION USED, AND ALL WELDS INCLUDING FIELD WELDS SHALL BE MADE BY CERTIFIED WELDERS USING E70XX ELECTRODES.			
4. WHERE FIELD WELD SIZES ARE NOT INDICATED ON WELD SYMBOLS, FILLET SIZE SHALL BE 1/16TH INCH SMALLER THAN THICKNESS OF THINNER MATERIALS BEING JOINED.			
5. COMPLETE PENETRATION WELDS ARE INDICATED BY NOTATION "CP" ON WELD SYMBOLS, PARTIAL PENETRATION BY "PP".			
6. PROVIDE DOUBLE NUTS AND DOUBLE WASHERS FOR STEEL COLUMN ANCHOR BOLTS TO ALLOW FOR ADJUSTMENT IN BASE PLATE...			
7. EXPOSED STEEL LABELED AS ARCHITECTURALLY EXPOSED STEEL REQUIRES HIGHER TOLERANCES FOR CONSTRUCTION. REFER TO SPECIFICATIONS SECTION 051200 FOR REQUIREMENTS. FLARE BEVEL WELDS FOR ARCHITECTURALLY EXPOSED TUBE SHAPED SECTIONS SHALL BE BEVELED 45 DEGREES, WELDED AND GRINDED SMOOTH.			
8. ALL STEEL MEMBERS NOTED OR INDICATED ON PLANS, ELEVATIONS, SECTIONS OR DETAILS SHALL BE SHOP ROLLED BY THE STEEL FABRICATOR. SHOP DRAWINGS SHALL INDICATE CURVATURE DATA AND FULL PENETRATION SPLICE LOCATIONS.			
9. SEE SPECIFICATIONS FOR MISC. STEEL REQUIREMENTS NOT SHOWN ON STRUCTURAL PLANS.			
10. TOUCH UP ALL FIELD WELDS ON GALVANIZED SURFACES WITH GALVANIZING REPAIR PAINT.			
15. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCLUDING THE COSTS FOR ALL MISCELLANEOUS STEEL IN THEIR BID, REGARDLESS OF WHETHER THOSE ITEMS ARE INDICATED ON THE STRUCTURAL DRAWINGS. THESE COSTS SHALL INCLUDE, BUT NOT LIMITED TO, MISCELLANEOUS STEEL ITEMS SHOWN ON ARCHITECTURAL, CIVIL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS.			
11. UNLESS DETAILED OTHERWISE OR REACTIONS ARE INDICATED, BEAM CONNECTIONS SHALL BE SELECTED TO SUPPORT ONE-HALF THE TOTAL UNIFORM LOAD CAPACITY SHOWN IN THE "MAXIMUM TOTAL UNIFORM LOAD TABLES" IN PART 3 OF THE AISC STEEL CONSTRUCTION MANUAL, 15TH EDITION, FOR THE GIVEN BEAM SIZE, SPAN AND STEEL SPECIFICATION OR FOR THE BEAM REACTION SHOWN ON THE DRAWINGS, WHICHEVER IS GREATER. THE MINIMUM BEAM CONNECTION SHALL NOT BE SMALLER THAN THOSE LISTED IN TABLES 10-1 AND 10-2 OF THE AISC STEEL CONSTRUCTION MANUAL, 15TH EDITION, FOR THE GIVEN BEAM DEPTH, BOLT DIAMETER AND WELD SPECIFICATION.			
12. THE FABRICATOR SHALL BE RESPONSIBLE FOR THE DESIGN AND ADEQUACY OF ALL CONNECTIONS THAT ARE NOT DESIGNED OR FULLY DETAILED ON THE CONTRACT DOCUMENTS. SHOP DRAWINGS, DEPICTING THE CONFIGURATIONS AND FABRICATION DETAILS, ALONG WITH CALCULATIONS, SEALED BY A REGISTERED PROFESSIONAL ENGINEER, LICENSED TO PRACTICE IN THE STATE IN WHICH THE PROJECT IS LOCATED, SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER OF RECORD FOR REVIEW.			
13. UNLESS OTHERWISE INDICATED, BEAM REACTIONS SHOWN ON THE PLANS ARE DESIGN SERVICE LEVEL (ASD) GRAVITY (DEAD LOAD PLUS LIVE LOAD) SHEAR LOADS. ANY AXIAL OR OTHER LOADS REQUIRED MUST BE CONSIDERED IN ADDITION TO THE VERTICAL REACTIONS SHOWN.			
14. THE MINIMUM DESIGN LOAD FOR ANY CONNECTION SHALL BE 6 KIPS (ASD) OR 10 KIPS (LRFD), REGARDLESS OF THE BEAM REACTION(S) SHOWN ON THE PLANS.			
15. STEEL FRAMES ARE NON SELF-SUPPORTING AND COLUMN ANCHOR RODS ARE DESIGNED FOR A COMPLETED CONDITION ONLY. METAL ROOF DECK, BEAM-TO-COLUMN MOMENT CONNECTIONS, PORTAL FRAMES, AND DIAGONAL BRACES ARE REQUIRED TO PROVIDE LATERAL STABILITY FOR THE FRAME AND BUILDING. THIS INCLUDES RESISTANCE TO WIND AND SEISMIC FORCES DURING AND AFTER CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY BRACING REQUIRED TO MAINTAIN STABILITY UNTIL THE LATERAL FORCE RESISTING SYSTEM FOR THE BUILDING IS COMPLETE.			
16. FIELD CUTTING, DRILLING OR OTHER MODIFICATION OF STRUCTURAL STEEL COMPONENTS IS NOT PERMITTED WITHOUT WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER OF RECORD. WHERE BEAM PENETRATIONS CANNOT BE AVOIDED OR WHERE CUTTING IS REQUIRED, THE CONTRACTOR SHALL SUBMIT TO THE STRUCTURAL ENGINEER OF RECORD ALL PERTINENT INFORMATION INCLUDING PENETRATION SHAPE, SIZE, LOCATION AND METHOD OF CUTTING OPENINGS.			
17. ALL STEEL MEMBERS EXPOSED TO WEATHER SHALL BE GALVANIZED OR PAINTED WITH TNEPEC EPOXY SYSTEM OR SIMILAR SYSTEM MEETING THE REQUIREMENT FOR PAINTING STRUCTURAL STEEL IN THE PROJECT SPECIFICATIONS. ALL OTHER STEEL MEMBERS SHALL BE FURNISHED WITH A SHOP COAT OF TNEPEC RED OR GRAY OXIDE PRIMER OR SIMILAR SYSTEM MEETING THE REQUIREMENT FOR PAINTING STRUCTURAL STEEL IN THE PROJECT SPECIFICATIONS. ALL PRIMERS SHALL BE COMPATIBLE WITH TOP COATINGS SPECIFIED.			
DIVISION 5 - COLD-FORMED STEEL FRAMING			
1. ALL METAL STUDS, JOISTS AND TRACK SHALL MEET THE FOLLOWING MINIMUM GROSS STRUCTURAL PROPERTIES BASED ON SSMA (ER #943P) SECTIONS. YIELD STRENGTH SHALL BE AS FOLLOWS: 33 KSI FOR 18 GAGE AND LIGHTER, 50 KSI FOR 16 GAGE AND HEAVIER.			
2. DO NOT WELD 20 GAGE AND LIGHTER FRAMING, UNLESS SPECIFICALLY CALLED FOR IN PLANS AND DETAILS.			
3. MINIMUM WIDTH OF THE STUDS SHALL BE 1 5/8", AND THE LIP OF THE "C" PORTION SHALL BE A MINIMUM OF 1/2".			
4. STUD TRACK SHALL BE 18 GA. MINIMUM FOR WALL STUDS 18 GA. OR LIGHTER. STUD TRACK SHALL MATCH WALL STUD GAGE FOR WALL STUDS 16 GA. AND HEAVIER. TRACKS SHALL BE ANCHORED AS FOLLOWS UNO:			
• TO STEEL - HILTI X-S16 P8TH, 0.145" DIA. PAF AT 16" OC.			
• TO CONCRETE - HILTI X-U, 0.157" DIA PAF AT 16" OC WITH 1 1/4" EMBEDMENT			
5. STEEL STUDS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. HORIZONTAL BRIDGING SHALL BE PLACED AT 4'-0" OC, OR AS PER MANUFACTURER'S RECOMMENDATION IF LESS THAN 4'-0" OC.			
6. ALL AXIALLY LOADED STUDS SHALL HAVE FULL FLANGE BEARING AGAINST UPPER AND LOWER TRACK WEB PRIOR TO ATTACHMENT TO TRACK. SPLICES IN AXIALLY LOADED STUDS ARE NOT PERMITTED.			
7. PROVIDE FULL DEPTH BLOCKING BETWEEN JOISTS AT SUPPORTS WHERE JOISTS ARE NOT OTHERWISE RESTRAINED FROM ROTATION, AND AS INDICATED IN THE SECTIONS.			
8. JOISTS SHALL BE PLACED DIRECTLY OVER BEARING STUDS AND JOIST WEB STIFFENERS SHALL BE PROVIDED AT ALL REACTION POINTS AND AS OTHERWISE SHOWN ON THE DRAWINGS.			
9. JOIST BRIDGING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. JOIST BRIDGING SHALL BE INSTALLED AT 8'-0" OC MAXIMUM. APPLIED FINISH MATERIALS SHALL NOT BE CONSIDERED BRIDGING OR FLANGE BRACING, UNLESS NOTED OTHERWISE.			
10. CONNECTIONS OF COLD-FORMED METAL FRAMING SHALL CONFORM TO THE FOLLOWING:			
A. ALL WELDED CONNECTIONS TO BE PERFORMED IN ACCORDANCE WITH THE LATEST VERSION OF AWS D1.3 "SPECIFICATIONS FOR WELDING SHEET STEEL STRUCTURES". CONSULT AWS D19.0 "WELDING ZINC COATED STEEL" & ANSI STANDARD Z49.1 FOR INFORMATION REGARDING SAFE WELDING PROCEDURES. WELDERS SHALL BE CERTIFIED FOR SHEET STEEL IN ALL POSITIONS REQUIRED PER AWS D1.3.			
B. ALL WELDS ARE TO BE TOUCHED-UP WITH A RUST INHIBITIVE GALVANIZING PAINT.			
C. SUGGESTED WELD METAL AND PROCESS FOR SHOP WELDING ARE: 60 KSI WELD METAL STRENGTH (MINIMUM) - MIG. SUGGESTED METHODS FOR FIELD WELDING: 1/8 INCH E60XX (MINIMUM) ELECTRODE - SMAW; OR "GASLESS" MIG. MINIMUM WELD THROAT THICKNESS (T) MUST MATCH OR EXCEED THE BASE STEEL THICKNESS OF THE THINNEST CONNECTED PART (UNO).			
D. ALL SCREWS SHALL BE OF THE DIAMETER AND SIZE INDICATED ON THE DRAWINGS AND SHALL BE THOSE MANUFACTURED AND TESTED BY GRABBER, ITW BUILDEX, OR APPROVED EQUIVALENT. A MINIMUM OF (1.5 x) SCREW DIAMETER EDGE DISTANCE AND (3 x) SCREW DIAMETER SPACING IS REQUIRED (UNO)			
E. SELECT SCREW WITH AN ADEQUATE CUTTING TIP TO ACCOMMODATE THE TOTAL THICKNESS TO BE DRILLED. DRILLING MUST BE COMPLETED BEFORE THE THREADS ENGAGE THE MATERIAL.			
F. CONNECTIONS NOT FULLY DETAILED ON THE CONTRACT DOCUMENTS SHALL BE DESIGNED BY THE CONTRACTOR PER THE SPECIFICATION.			
11. TORCH CUTTING OF COLD-FORMED METAL FRAMING MEMBERS IS NOT PERMITTED.			
12. ROOF AND FLOOR JOISTS MUST ALIGN DIRECTLY OVER STUDS (UNO).			
13. PER AISI S200, THE MAXIMUM ALLOWABLE GAP (MEASURED BETWEEN THE WEB OF THE STUD AND THE WEB OF THE TRACK) FOR A STUD SEATED IN A TRACK IS 1/4" FOR NON-AXIAL LOAD BEARING CONDITIONS AND 1/8" FOR AXIALLY LOAD BEARING CONDITIONS (UNO). PRESSURE SHALL BE APPLIED TO NEST STUDS INTO THE TRACKS UNTIL THESE TOLERANCES ARE ACHIEVED.			
14. PRODUCT IDENTIFICATION:			
A. THE AMERICAN IRON AND STEEL INSTITUTE STANDARDS ARE USED IN THESE DOCUMENTS. ANY MANUFACTURER WHOSE PRODUCT GEOMETRIES MEET OR EXCEED AISI STANDARDS ARE ACCEPTABLE.			
B. IDENTIFICATION:			

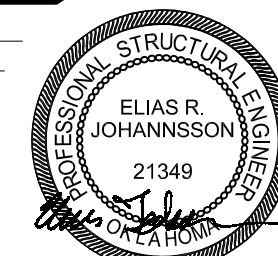
CFS THICKNESS ¹				
GAUGE	DESIGN	MINIMUM	AISI	COLOR
20	0.0346"	0.0329"	33 MILS	WHITE
18	0.0451"	0.0428"	43 MILS	YELLOW
16	0.0566"	0.0538"	54 MILS	GREEN
14	0.0713"	0.0677"	68 MILS	ORANGE
12	0.1017"	0.0966"	97 MILS	RED
LEG 2 LENGTH: IN 1/100 INCHES CLIP IDENTIFIER LEG 1 LENGTH: IN 1/100 INCHES MATERIAL THICKNESS: IN MILS CLIP LENGTH 200 L 200 - 43 - 4" CLIP IDENTIFICATION MEMBER DEPTH: IN 1/100 INCHES TYPE: S = STUD OR JOIST SECTIONS T = TRACK SECTIONS U = CHANNEL SECTIONS F = FURRING CHANNEL SECTIONS MATERIAL THICKNESS: IN 1/1000 INCHES FLANGE WIDTH: IN 1/100 INCHES 800 S 162 - 43 MEMBER IDENTIFICATION				
DIVISION 6 - WOOD FRAMING				
1. ALL WOOD PLATES BEARING ON CONCRETE OR MASONRY SHALL BE PRESSURE TREATED LUMBER.				
2. ALL METAL CONNECTORS SHALL MEET THE FOLLOWING:				
A. CLIPS AND FASTENERS SHALL BE CORROSION RESISTANT.				
B. RATED TO PROVIDE LOAD RESISTANCE EQUAL TO CLIP SHOWN ON THE PLANS.				
C. APPROVED BY ICC AND OTHER REQUIRED LOCAL CODE AGENCIES.				
D. INSTALLED AS RECOMMENDED BY THEIR MANUFACTURER.				
3. ALL WOOD TRUSSES, JOISTS, AND RAFTERS SHALL BE FASTENED TO TOP PLATE WITH ONE (1) SIMPSON H3 AND ONE (1) SIMPSON A34 METAL CLIP OR APPROVED EQUAL, UNO.				
4. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR FASTENING OF HANGERS IN ORDER TO ACHIEVE THE REQUIRED ALLOWABLE LOADS SHOWN ON THE PLANS. WHERE REQUIRED ALLOWABLE LOADS ARE NOT SHOWN, USE THE MAXIMUM RATED STRENGTH OF THE HANGER.				
5. WHEN CONNECTORS ARE NOT SHOWN, TABLE 2304.10.1 FASTENING SCHEDULE OF THE INTERNATIONAL BUILDING CODE SHALL APPLY.				
6. WHEN HEADERS ARE NOT SHOWN, TABLE 2308.4.1 HEADER DESIGN CHART OF THE INTERNATIONAL BUILDING CODE SHALL APPLY.				
7. PROVIDE SUPPLEMENTAL STRUCTURAL FRAMING AND BLOCKING AS REQUIRED TO ACHIEVE SOLID AND SOUND STRUCTURAL AND NON-STRUCTURAL ELEMENTS USING ACCEPTED FRAMING PRACTICES.				
8. MINIMUM WOOD FRAMING MATERIAL SPECIFICATIONS ARE AS FOLLOWS:				
A. FRAMING 2-4 INCHES THICK, 2 INCHES AND WIDER, DOUGLAS FIR SOUTH No. 2				
1. F _b = 850 PSI (SINGLE MEMBER USE)				
2. F _t = 525 PSI				
3. F _c = 1,350 PSI (PARALLEL TO GRAIN)				
4. F _c = 520 PSI (PERPENDICULAR TO GRAIN)				
5. F _v = 180 PSI				



Key Plan

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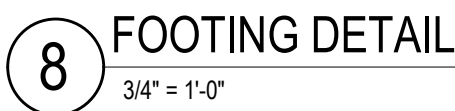


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FOUNDATION DETAILS

01/29/2026

FOUNDATION DETAILS



NOTES:

- NOTES:

- 6 ANCHOR ROD
NO SCALE



- ## NOTES

- 2 SLAB JOINTS
NO SCALE



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CMU DETAIL:

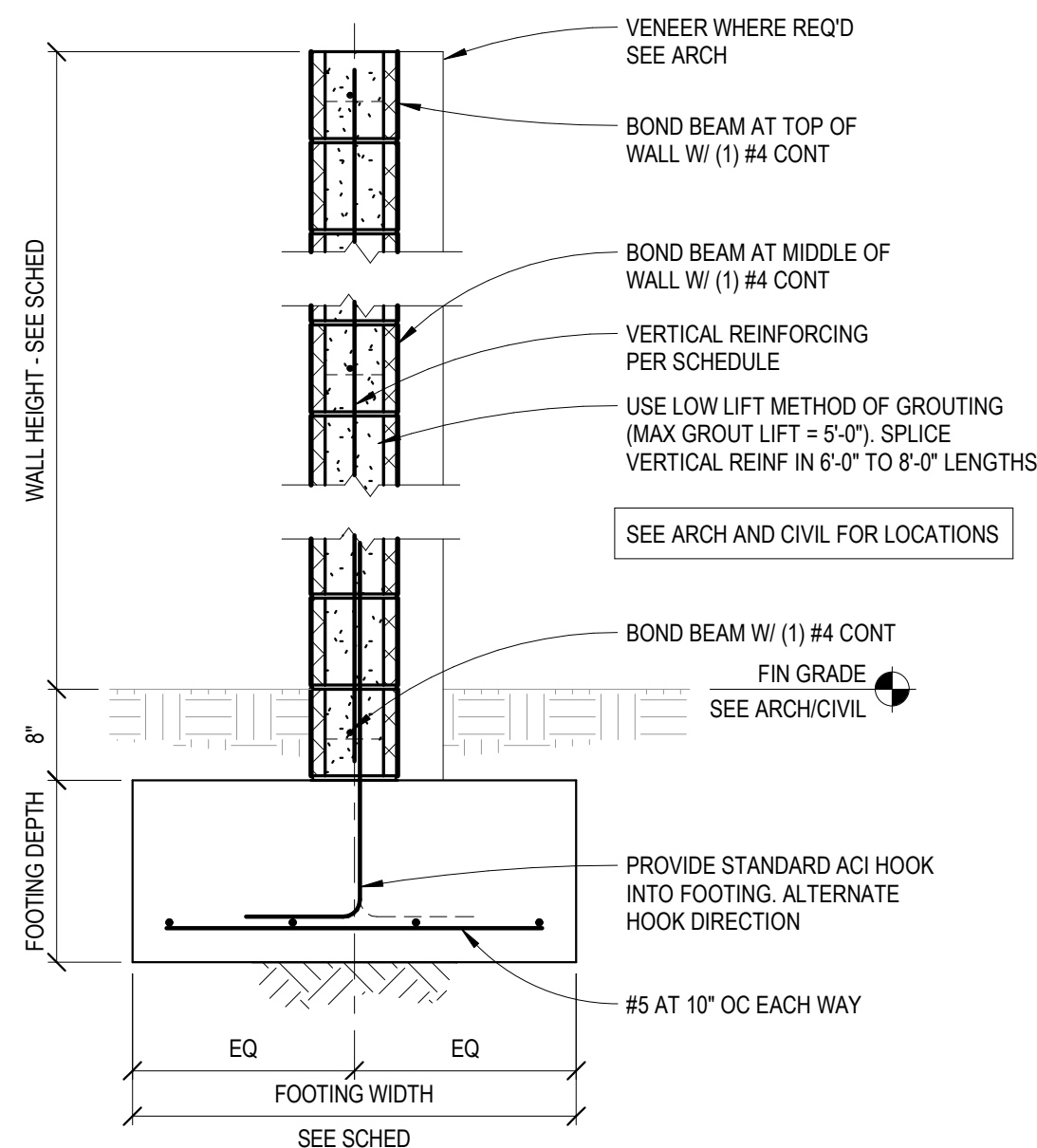
ELIAS R. JOHANSSON
21349
OKLAHOMA

S-601

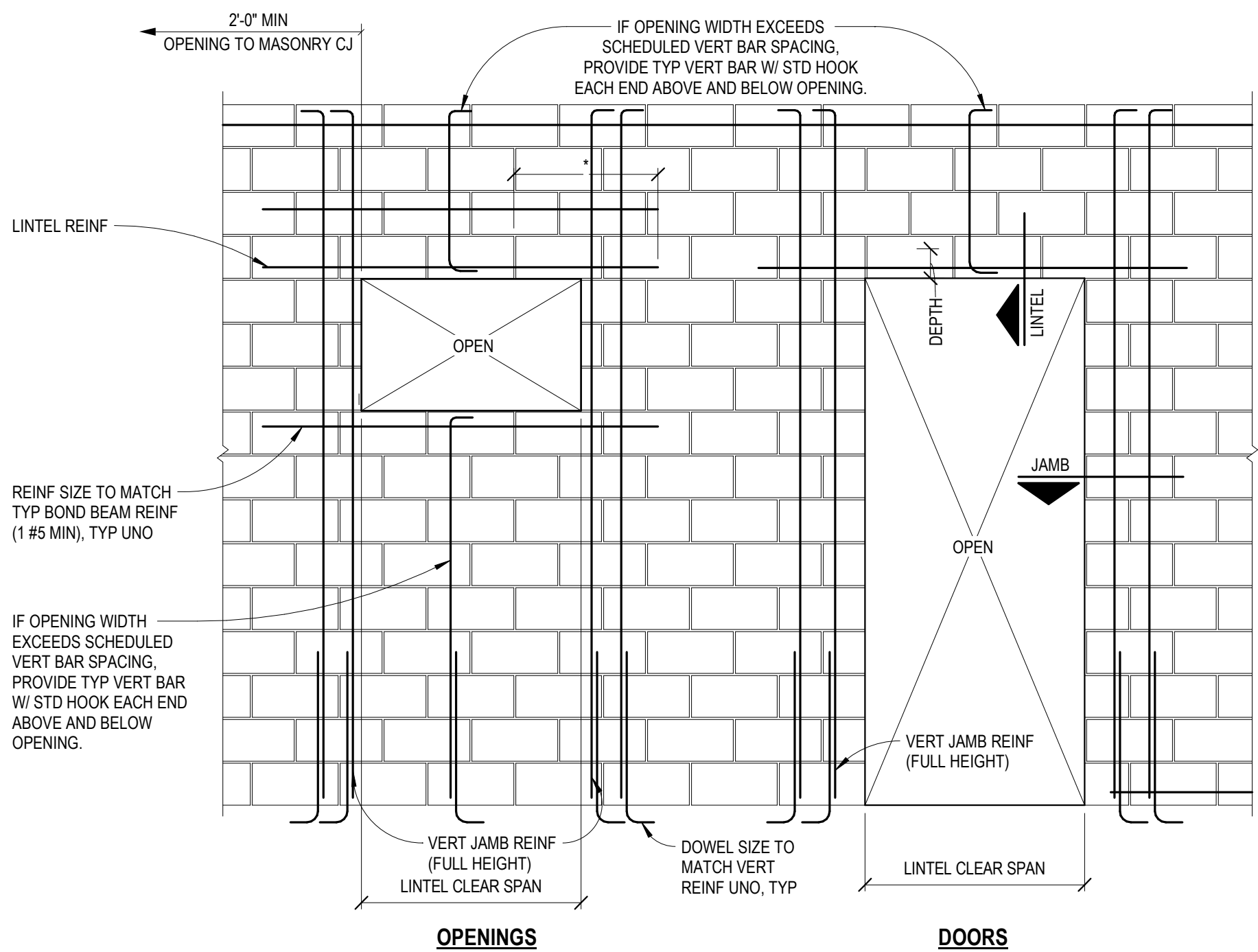
CMU LINTEL SCHEDULE								
WIDTH "W"	DEPTH "D"	CLEAR SPAN	BOTTOM REIN'	TOP REIN'	JAMB REIN' (EACH CELL)	JAMB WIDTH	VERT REIN'	STIRRUPS
8"	8"	UP TO 4'-0"	(1) #5	--	(1) #5	16"	(1) #5	--
8"	16"	UP TO 8'-0"	(2) #5	(2) #5	(2) #5	16"	(1) #5	--
8"	24"	UP TO 11'-4"	(2) #5	(2) #5	(2) #5	24"	(1) #5	--

* ALL BARS AROUND PERIMETER OF OPENINGS SHALL
EXTEND 40 BAR DIAMETERS (24" MIN) PAST OPENING OR
TERMINATE WITH 90 DEGREE STD ACI HOOK. BAR EXTENSION
WITH HOOK SEE NOTE #2 AT LINTEL SCHEDULE.

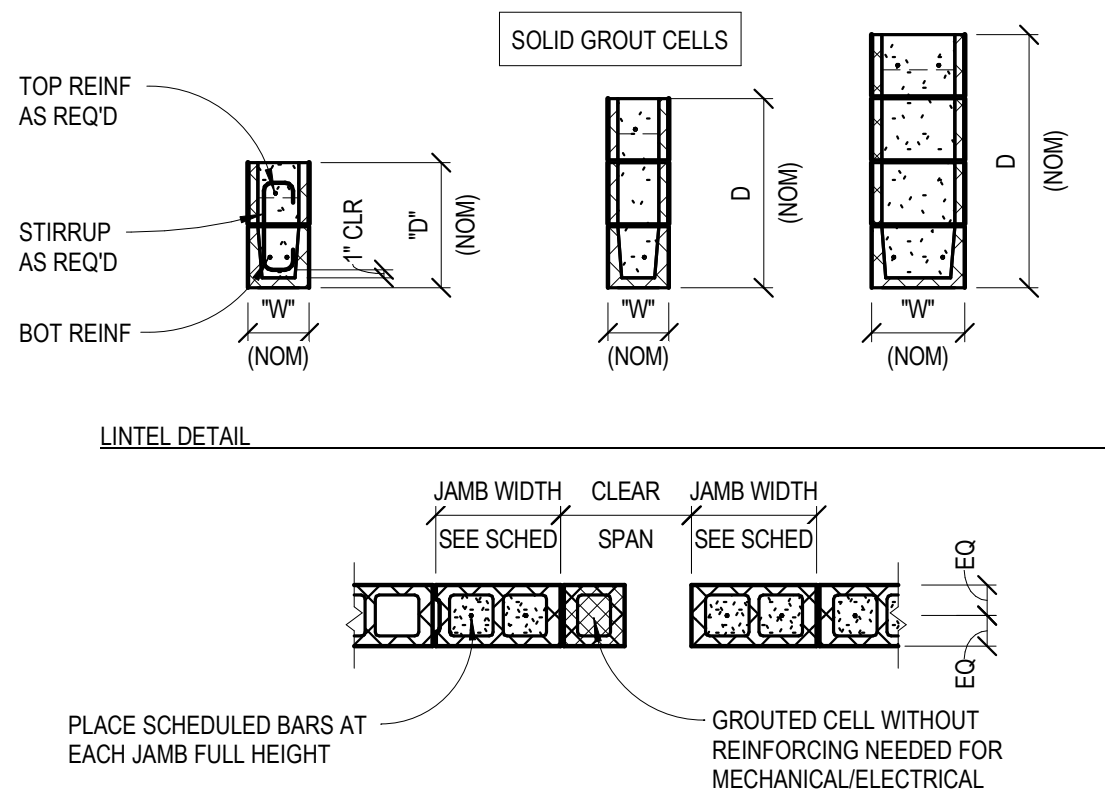
CMU SCREEN WALL AND FOUNDATION				
WALL HEIGHT	WALL THICK	VERT REINF	FOOTING WIDTH	FOOTING DEPTH
UP TO 12'-0"	8"	(2)- #5 AT 16"	4'-0"	1'-4"



5 TYP SCREEN WALL
3/4" = 1'-0"

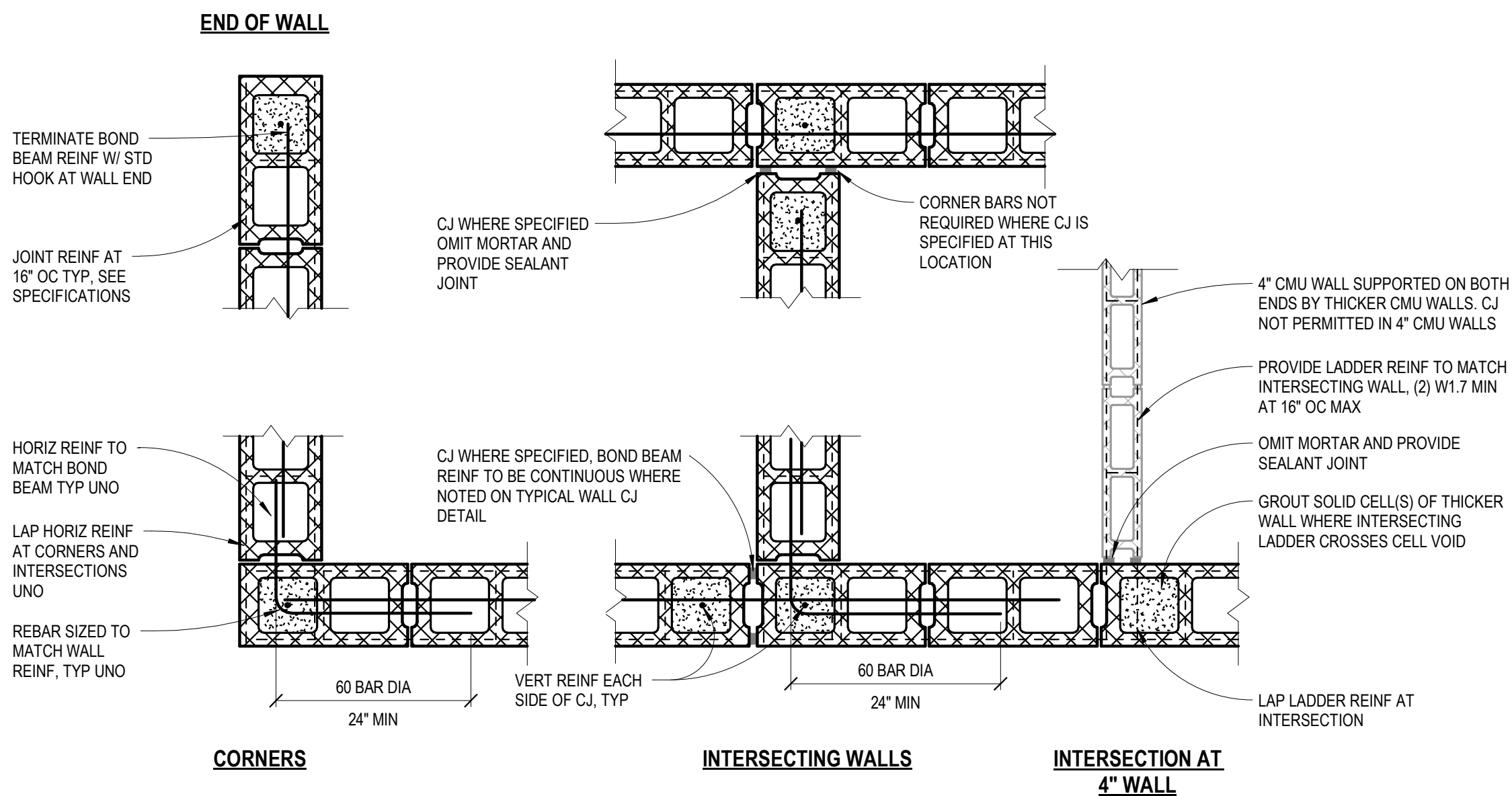


4 TYPICAL LOAD-BEARING MASONRY LINTEL



JAMB DETAIL

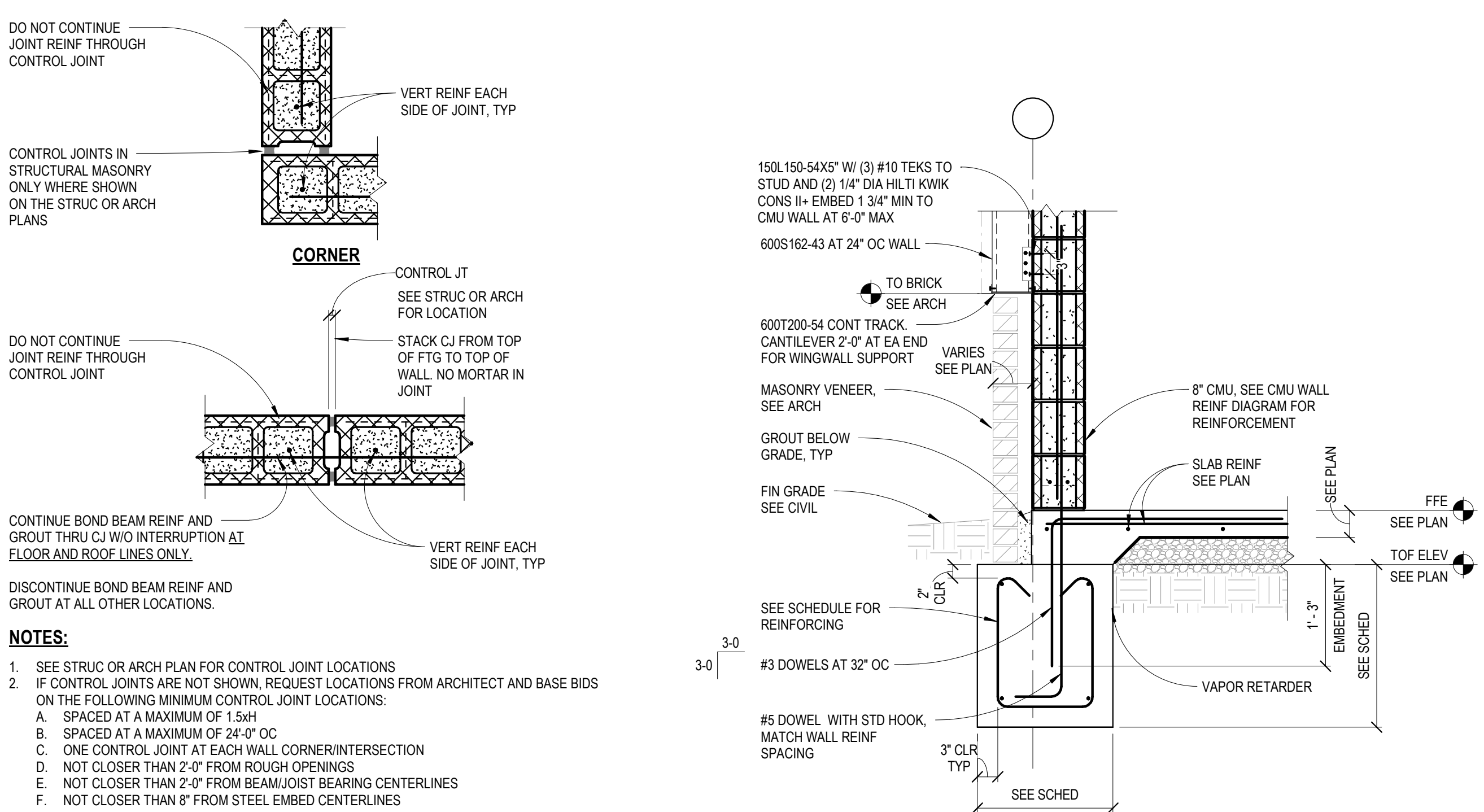
1. CONSTRUCT BOTTOM COURSE OF SOLID-BOTTOM, THOUGH-STYLE BLOCK, UNO.
2. A CMU LINTEL IS REQUIRED FOR OPENINGS GREATER THAN 16" IN WIDTH.
3. LINTEL REINFORCEMENT MAY NOT BE LAP SPICED ABOVE AN OPENING.
4. CONTROL JOINTS ARE NOT PERMITTED TO OCCUR WITHIN LINTEL REINFORCEMENT.
5. SEE CMU WALL REINFORCING DETAIL FOR VERTICAL REINFORCEMENT PLACEMENT AT JAMBS.
6. EXTEND HORIZONTAL REINFORCEMENT 24" OR 40 BAR DIAMETERS BEYOND THE FACE IF OPENING. PROVIDE STD HOOK AT END OF BAR IF HORIZONTAL EXTENSION IS NOT POSSIBLE.
7. PROVIDE CONCRETE LINTELS OF THE SAME SIZE AND LENGTH MAY BE SUBSTITUTED EXCEPT THAT TOP BARS SHALL BE PROVIDED EQUAL TO SCHEDULE BOTTOM BARS.
8. MASONRY LINTELS SHALL SPAN CONTINUOUSLY BETWEEN BEARINGS EACH SIDE. EXTEND TOP AND BOTTOM REIN 40 BAR DIAMETERS BEYOND EDGE OF OPENING OR EXTENDED (JAMB WIDTH + 1, 8" MIN) BEYOND EDGE OF OPENING AND TERMINATE WITH 90 DEGREE STD HOOK.



- NOTES:**

1. REINFORCEMENT SHOWN IS IN ADDITION TO MINIMUM WALL REINFORCEMENT SHOWN IN CONC MASONRY WALL REINF SCHEDULE.
2. REINFORCING TO BE CONTINUOUS FROM FOOTING TO TOP OF WALL. FILL CORES SOLID WITH GROUT AS NOTED IN THE SPECIFICATIONS OR GENERAL NOTES. SEE CONCRETE MASONRY NOTES FOR REINF LAPPING LENGTH.
3. USE PREFABRICATED JOINT REINFORCEMENT "T" AND "L" SECTIONS ACROSS ALL INTERSECTIONS AT STRUC TO STRUC WALLS.

3 TYPICAL STRUC MASONRY WALL INTERSECTIONS



- NOTES:**

1. SEE STRUCTURAL ARCHITECTURAL PLAN FOR CONTROL JOINT LOCATIONS.
2. IF CONTROL JOINTS ARE NOT SHOWN, REQUEST LOCATIONS FROM ARCHITECT AND BASE BIDS ON THE FOLLOWING MINIMUM CONTROL JOINT LOCATIONS:
 - A. SPACED AT A MAXIMUM OF 1.5M
 - B. SPACED AT A MAXIMUM OF 24'-0" OC
 - C. ONE CONTROL JOINT AT EACH WALL CORNER/INTERSECTION
 - D. NOT CLOSER THAN 2'-0" FROM ROUGH OPENINGS
 - E. NOT CLOSER THAN 2'-0" FROM BEAM/JOIST BEARING CENTERLINES
 - F. NOT CLOSER THAN 8" FROM STEEL EMBED CENTERLINES

2 TYPICAL BOND BEAM STEP

1 TYP EXTERIOR FOOTING
3/4" = 1'-0"

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CMU DETAIL:



nc. 01/29/2026

CMU DETAIL:



- 3 TYP BOND BEAM STEP
3/4" = 1'-0"



- 2 CMU WALL REINF
3/4" = 1'-0"



NOTES:

- ## 1 CMU JOINT REINF AT WALL INTERSECTIONS



Key Plan

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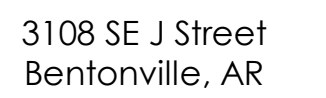
ARCHITECTURAL SITE PLAN

A-100



TOILET ACCESSORIES & PARTITIONS	
TA-1	WALL-MOUNTED DOUBLE JUMBO ROLL TOILET TISSUE DISPENSOR
TA-2	GRAB BARS - 36" BACK, 42" SIDE, AND 18" VERTICAL - STAINLESS STEEL W/ PEENED FINISH
TA-2.2	GRAB BARS - 42" SIDE, AND 18" VERTICAL - STAINLESS STEEL W/ PEENED FINISH
TA-3	FRAMELESS MIRROR (30" x 18" W)
TA-4	ELECTRIC HAND DRYER
TA-5	BABY CHANGING STATION
TA-7	34" PARTITION DOOR
TA-8	24" PARTITION DOOR

GENERAL PLAN NOTES	
1	ALL DIMENSIONS ARE TO FACE OF MASONRY OR TO FACE OF STUD UNLESS OTHERWISE NOTED.
2	REFER TO PARTITION TYPES SCHEDULE FOR INTERIOR WALL COMPOSITION AND REQUIREMENTS.
3	ALL DOOR FRAMES ARE TO BE LOCATED 8" FROM MASONRY CORNERS/ 6" FROM GYP. BD. CORNERS UNLESS OTHERWISE NOTED.
4	PROVIDE 1/4" CONTROL JOINTS IN ALL GYPSUM BOARD ASSEMBLIES AT A SPACING NOT TO EXCEED 20'-0" O.C. MAX. ALIGN WITH DOORFRAMES UNLESS OTHERWISE NOTED.
5	RAKE AND CAULK THE 1ST MASONRY JOINT AT ALL EXTERIOR WALLS WHERE SIDEWALKS OR PAVING ABUT STRUCTURE
6	SEE SHEET A-501 FOR PARTITION TYPES.
7	SEE SHEET A-103 FOR DOOR INFORMATION, SHEET A-201 FOR DOOR DETAILS.
8	SEE SHEET A-501 FOR GLASS BLOCK DETAILS.
9	ALL APPLIANCES AND CONCESSION EQUIPMENT TO BE OWNER PROVIDED, OWNER INSTALLED.

[illegible]

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The image displays three architectural cross-sections of a building facade, labeled E1, RB, and A-501. Each section shows a vertical wall assembly with various materials and components, including insulation, structural elements, and a roofline. The sections are detailed with callouts for specific parts and materials.

Section E1: This section shows a wall assembly with a roofline at the top. The roof is labeled 07 41 13.A1 and 07 21 00.B7. The wall assembly includes a vertical structural element labeled 06 15 16.A1. The wall is composed of several layers, including insulation (05 12 00.C8, 04 23 00.A1, 05 12 00.A105) and structural elements (04 22 00.C3 (UPSIDE DOWN), 04 20 00.A6, 04 22 00.A19, 04 20 00.A8, 07 19 20.A1, 07 21 19.A1). A 5" gap is indicated between the wall and the foundation. The foundation is labeled 03 30 00.A1. A level marker indicates LEVEL 1 at 0'-0".

Section RB: This section shows a wall assembly with a roofline at the top. The roof is labeled 07 21 00.B7. The wall assembly includes a vertical structural element labeled 06 15 16.A1. The wall is composed of several layers, including insulation (05 12 00.C8, 04 23 00.A1, 05 12 00.A105) and structural elements (04 22 00.C3 (UPSIDE DOWN), 04 20 00.A6, 04 22 00.A19, 04 20 00.A8, 07 19 20.A1, 07 21 19.A1). A 5" gap is indicated between the wall and the foundation. The foundation is labeled 03 30 00.A1. A level marker indicates LEVEL 1 at 0'-0".

Section A-501: This section shows a wall assembly with a roofline at the top. The roof is labeled 07 21 00.B7. The wall assembly includes a vertical structural element labeled 06 15 16.A1. The wall is composed of several layers, including insulation (05 12 00.C8, 04 23 00.A1, 05 12 00.A105) and structural elements (04 22 00.C3 (UPSIDE DOWN), 04 20 00.A6, 04 22 00.A19, 04 20 00.A8, 07 19 20.A1, 07 21 19.A1). A 5" gap is indicated between the wall and the foundation. The foundation is labeled 03 30 00.A1. A level marker indicates LEVEL 1 at 0'-0".

2 WALL SECTION
3/4" = 1'-0"



3108 SE J Street
Bentonville, AR

Key Plan

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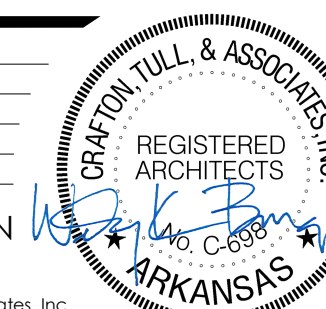
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WALL SECTIONS

WALL SECTION



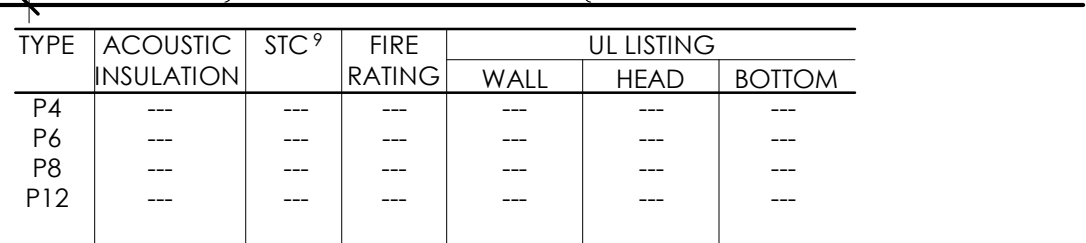
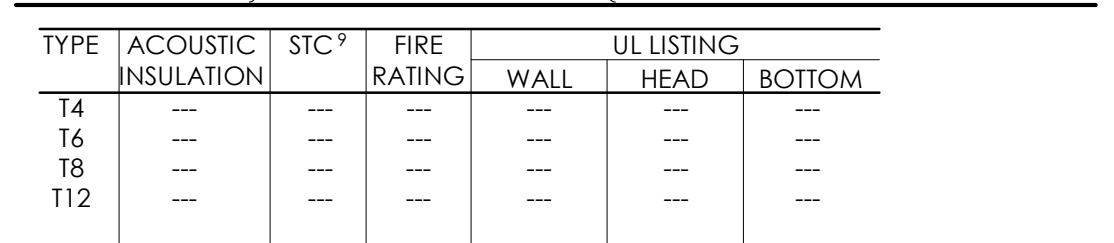
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REVISION NUMBER - SHOWN ON PLANS

POINT WHERE NEW CONNECTS TO EXISTING

NUMBER OF DETAIL ON SHEET

NUMBER OF SHEET WHERE DETAIL APPEARS

KEYNOTE

CONTINUATION SYMBOL

Room

5

ROOM NAME AND NUMBER

ITEM TO BE DEMOLISHED

AREA NOT IN CONTRACT

2"

PIPE SIZE TAG (DIAMETER)

ABOVE GROUND PIPING

1/8" / 12" SLOPE

PIPE SLOPE TAG

BELOW GROUND PIPING

INVERT: -105' - 1"

PIPE INVERT ELEVATION TAG

(E)

EXISTING PIPE TAG

PIPING BEING DEMOLISHED

ABBREVIATIONS

Ø	ROUND	LVR	LOUVER
ABV	ABOVE	LWT	LEAVING WATER TEMPERATURE
AC	AIR CONDITIONING	M/A	MIXED AIR
AD	AREA DRAIN	MAX	MAXIMUM
ADD	ADDENDUM	MBH	ONE THOUSAND BTU PER HOUR
AFF	ABOVE FINISHED FLOOR	MCF	ONE THOUSAND CUBIC FEET
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	MD	MOTORIZED DAMPER
ALT	ALTERNATE	MECH	MECHANICAL
AP	ACCESS PANEL	MFR	MANUFACTURER
ARCH	ARCHITECT/ARCHITECTURAL	MIN	MINIMUM
BFF	BELOW FINISHED FLOOR	MISC	MISCELLANEOUS
BLW	BELOW	MTOR	MOTOR
BTU	BRITISH THERMAL UNITS	MUIA	MAKE-UP/AIR
BTUH	BRITISH THERMAL UNITS PER HOUR	NC	NOISE CRITERIA
CAP	CAPACITY	NC	NORMALLY CLOSED
CB	CATCH BASIN	NIC	NOT IN CONTRACT
CFM	CUBIC FEET PER MINUTE	NO	NUMBER
CLG	CEILING	NO	NORMALLY OPEN
CO	CLEAN OUT	NTS	NOT TO SCALE
CW	COLD WATER	O	OXYGEN
D	DEGREE	O/A	OUTSIDE AIR
DB	DRY BULB	ORD	OVERFLOW ROOF DRAIN
DIA	DIAMETER	PD	PRESSURE DROP
DN	DOWN	PIV	POST INDICATOR VALVE
DW	DISTILLED WATER	PLBG	PLUMBING
EA	EACH	PRESS	PRESSURE
EAT	ENTERING AIR TEMPERATURE	PRV	PRESSURE REDUCING VALVE
ELEC	ELECTRICAL	PSI	POUNDS PER SQUARE INCH
EQUIP	EQUIPMENT	PSIG	POUNDS PER SQUARE INCH GAUGE
EW	ELECTRIC WATER COOLER	PWR	POWER
EWT	ENTERING WATER TEMPERATURE	R	DUCT RISER
EA	EXHAUST AIR	R/A	RETURN AIR
EXIST	EXISTING	RCP	RADIANT CEILING PANEL
F	DEGREES FAHRENHEIT	RD	ROOF DRAIN
FCO	FLOOR CLEAN OUT	REC	RECESSED
FD	FLOOR DRAIN	RED	REDUCER
FDC	FIRE DEPARTMENT CONNECTION	RH	RELATIVE HUMIDITY
FL	FLOOR	RJA	RELIEF AIR
FO	FUEL OIL	RM	ROOM
FOV	FUEL OIL VENT	RPM	REVOLUTIONS PER MINUTE
FOR	FUEL OIL RETURN	RW	RAIN WATER
FOS	FUEL OIL SUPPLY	SF	SQUARE FOOT
FS	FLOOR SINK	S/A	SUPPLY AIR
FT	FOOT/FEET	SAN	SANITARY
FTR	FIN TUBE RADIATION	SF	SQUARE FOOT
GAL	GALLON	SD	SMOKE DAMPER
GF	GAS-FIRED	SM	SURFACE MOUNT
GC	GENERAL CONTRACTOR	SP	STANDPIPE
GPM	GALLONS PER MINUTE	SP	STATIC PRESSURE
GW	GREASE WASTE	STM	STEAM
HB	HOSE BIB	T	THERMOSTAT
HP	HORSE POWER	TD	TEMPERATURE DROP
HTG	HEATING	TDR	TRENCH DRAIN
HTR	HEATER	TEMP	TEMPERATURE
HW	HOT WATER	TEMP	TEMPERATURE
HYD	HYDRANT	TEMP	TEMPERATURE
ID	INDIRECT	TEMP	TEMPERATURE
IN	INCH	TEMP	TEMPERATURE
INV	INVERT	TEMP	TEMPERATURE
LB	POUND	TEMP	TEMPERATURE
LB/HR	POUNDS PER HOUR	TEMP	TEMPERATURE
LAT	LEAVING AIR TEMPERATURE	TEMP	TEMPERATURE
LP	LOW PRESSURE	TEMP	TEMPERATURE
LPG	LIQUEFIED PETROLEUM GAS	TEMP	TEMPERATURE

EQUIPMENT ABBREVIATIONS

AC	AIR CONDITIONING UNIT	ET	EXPANSION TANK
ACCU	AIR COOLING CONDENSING UNIT	EW	ELECTRIC WATER HEATER
AHU	AIR HANDLING UNIT	FCU	FAN COIL UNIT
AS	AIR SEPARATOR	FP	FIRE PUMP
B	BOILER	GI	GREASE INTERCEPTOR
CH	CHILLER	GRV	GRAVITY ROOF VENTILATOR
CT	COOLING TOWER	HWP	HEATING WATER PUMP
CUH	CABINET UNIT HEATER	HRU	HEAT RECOVERY UNIT
CHWP	CHILLED WATER PUMP	PRV	POWER ROOF VENTILATOR
DBP	DOMESTIC WATER BOOSTER PUMP	RE	RETURN/EXHAUST FAN
DC	DUCT MOUNTED COIL	RTU	ROOFTOP UNIT
DCP	DOMESTIC WATER CIRCULATING PUMP	SP	SUMP PUMP
EF	EXHAUST FAN	UH	UNIT HEATER
EDC	ELECTRIC DUCT COIL	WH	WATER HEATER

CHWR

CHILLED WATER RETURN

CHWS

CHILLED WATER SUPPLY

CD

CONDENSATE DRAINAGE

CWR

CONDENSER WATER RETURN

CWS

CONDENSER WATER SUPPLY

GWR

GEOTHERMAL WATER RETURN

GWS

GEOTHERMAL WATER SUPPLY

HWR

HEATING WATER RETURN

HWS

HEATING WATER SUPPLY

G

NATURAL GAS

PG

PROPANE GAS

REF-L

REFRIGERANT-LIQUID

REF-S

REFRIGERANT-SUCTION

REF-HG

REFRIGERANT-HOT GAS

STM

STEAM

CDR

CONDENSATE RETURN

CWV

COMBINATION WASTE & VENT

CA

COMPRESSED AIR

CW

DOMESTIC COLD WATER

H-CW

HARD COLD WATER

S-CW

SOFT COLD WATER

F-CW

FILTERED COLD WATER

RO

REVERSE OSMOSIS WATER

HW

HOT WATER

HW-140°

HOT WATER 140°

HW-R

HOT WATER RECIRCULATION

HW-R-140°

HOT WATER RECIRCULATION 140°

GV

GREASE VENT

GW

GREASE WASTE

IW

INDIRECT WASTE

OV

OIL VENT

OW

OIL WASTE

PD

PUMP DISCHARGE

V

SANITARY VENT

SS

SANITARY SEWER

SHWR

SOLAR HOT WATER RETURN

SHWS

SOLAR HOT WATER SUPPLY

SD

STORM DRAINAGE

OSD

OVERFLOW STORM DRAINAGE

PIPE ACCESSORY TAGS

2" DOM. WM

DOMESTIC WATER METER

2" BALANCING

BALANCING VALVE

2" SHUTOFF

1/4 TURN BALL VALVE

2" CHECK

CHECK VALVE

2" TMV

3-WAY MIXING VALVE

GATE VALVE

3-WAY AIRMOTOR CONTROLLER

ANGLE GLOBE VALVE

GATE VALVE

DIAPHRAGM VALVE

GLOBE VALVE

HOSE GLOBE VALVE

2" M-CNTRL

MOTORIZED CONTROL VALVE

2" 3-WAY CNTRL

3 WAY MOTORIZED CONTROL VALVE

2" PRV

PRESSURE REDUCING VALVE

3/8" SOLENOID

REFRIGERANT SOLENOID VALVE

2" BUTTERFLY

BUTTERFLY VALVE

LOCK SHIELD VALVE

NEEDLE VALVE

GATE VALVE

QUICK OPENING VALVE

SPRING CHECK VALVE

SWING GATE CHECK VALVE

TEMP PRESSURE RELIEF VALVE

PIPE TAGS

PIPE SIZE TAG (DIAMETER)

ABOVE GROUND PIPING

PIPE SLOPE TAG

BELOW GROUND PIPING

PIPE INVERT ELEVATION TAG

EXISTING PIPE TAG

PIPING BEING DEMOLISHED

ABBREVIATIONS

Ø	ROUND	LVR	LOUVER
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DN	DOWN	PIV	POST INDICATOR VALVE
DW	DISTILLED WATER	PLBG	PLUMBING
EA	EACH	PRESS	PRESSURE
EAT	ENTERING AIR TEMPERATURE	PRV	PRESSURE REDUCING VALVE
ELEC	ELECTRICAL	PSI	POUNDS PER SQUARE INCH
EQUIP	EQUIPMENT	PSIG	POUNDS PER SQUARE INCH GAUGE
EW	ELECTRIC WATER COOLER	PWR	POWER
EWT	ENTERING WATER TEMPERATURE	R	DUCT RISER
EA	EXHAUST AIR	R/A	RETURN AIR
EXIST	EXISTING	RCP	RADIANT CEILING PANEL
F	DEGREES FAHRENHEIT	RD	ROOF DRAIN
FCO	FLOOR CLEAN OUT	REC	RECESSED
FD	FLOOR DRAIN	RED	REDUCER
FDC	FIRE DEPARTMENT CONNECTION	RH	RELATIVE HUMIDITY
FL	FLOOR	RJA	RELIEF AIR
FO	FUEL OIL	RM	ROOM
FOV	FUEL OIL VENT	RPM	REVOLUTIONS PER MINUTE
FOR	FUEL OIL RETURN	RW	RAIN WATER
FOS	FUEL OIL SUPPLY	SF	SQUARE FOOT
FS	FLOOR SINK	S/A	SUPPLY AIR
FT	FOOT/FEET	SAN	SANITARY
FTR	FIN TUBE RADIATION	SF	SQUARE FOOT
GAL	GALLON	SD	SMOKE DAMPER
GF	GAS-FIRED	SM	SURFACE MOUNT
GC	GENERAL CONTRACTOR	SP	STANDPIPE
GPM	GALLONS PER MINUTE	SP	STATIC PRESSURE
GW	GREASE WASTE	STM	STEAM
HB	HOSE BIB	T	THERMOSTAT
HP	HORSE POWER	TD	TEMPERATURE DROP
HTG	HEATING	TDR	TRENCH DRAIN
HTR	HEATER	TEMP	TEMPERATURE
HW	HOT WATER	TEMP	TEMPERATURE
HYD	HYDRANT	TEMP	TEMPERATURE
ID	INDIRECT	TEMP	TEMPERATURE
IN	INCH	TEMP	TEMPERATURE
INV	INVERT	TEMP	TEMPERATURE
LB	POUND	TEMP	TEMPERATURE
LB/HR	POUNDS PER HOUR	TEMP	TEMPERATURE
LAT	LEAVING AIR TEMPERATURE	TEMP	TEMPERATURE
LP	LOW PRESSURE	TEMP	TEMPERATURE
LPG	LIQUEFIED PETROLEUM GAS	TEMP	TEMPERATURE

EQUIPMENT ABBREVIATIONS

AC	AIR CONDITIONING UNIT	ET	EXPANSION TANK
ACCU	AIR COOLING CONDENSING UNIT	EW	ELECTRIC WATER HEATER
AHU	AIR HANDLING UNIT	FCU	FAN COIL UNIT
AS	AIR SEPARATOR	FP	FIRE PUMP
B	BOILER	GI	GREASE INTERCEPTOR
CH	CHILLER	GRV	GRAVITY ROOF VENTILATOR
CT	COOLING TOWER	HWP	HEATING WATER PUMP
CUH	CABINET UNIT HEATER	HRU	HEAT RECOVERY UNIT
CHWP	CHILLED WATER PUMP	PRV	POWER ROOF VENTILATOR
DBP	DOMESTIC WATER BOOSTER PUMP	RE	RETURN/EXHAUST FAN
DC	DUCT MOUNTED COIL	RTU	ROOFTOP UNIT
DCP	DOMESTIC WATER CIRCULATING PUMP	SP	SUMP PUMP
EF	EXHAUST FAN	UH	UNIT HEATER
EDC	ELECTRIC DUCT COIL	WH	WATER HEATER

PIPE ACCESSORY TAGS

2" DOM. WM

DOMESTIC WATER METER

2" BALANCING

BALANCING VALVE

2" SHUTOFF

1/4 TURN BALL VALVE

2" CHECK

CHECK VALVE

2" TMV

3-WAY MIXING VALVE

GATE VALVE

3-WAY AIRMOTOR CONTROLLER

ANGLE GLOBE VALVE

GATE VALVE

DIAPHRAGM VALVE

GLOBE VALVE

HOSE GLOBE VALVE

2" M-CNTRL

MOTORIZED CONTROL VALVE

2" 3-WAY CNTRL

3 WAY MOTORIZED CONTROL VALVE

2" PRV

PRESSURE REDUCING VALVE

3/8" SOLENOID

REFRIGERANT SOLENOID VALVE

2" BUTTERFLY

BUTTERFLY VALVE

LOCK SHIELD VALVE

NEEDLE VALVE

GATE VALVE

QUICK OPENING VALVE

SPRING CHECK VALVE

SWING GATE CHECK VALVE

TEMP PRESSURE RELIEF VALVE

PIPE TAGS

PIPE SIZE TAG (DIAMETER)

ABOVE GROUND PIPING

PIPE SLOPE TAG

BELOW GROUND PIPING

PIPE INVERT ELEVATION TAG

EXISTING PIPE TAG

PIPING BEING DEMOLISHED

ABBREVIATIONS

Ø	ROUND	LVR	LOUVER
ABV	ABOVE	LWT	LEAVING WATER TEMPERATURE
AC	AIR CONDITIONING	M/A	MIXED AIR
AD	AREA DRAIN	MAX	MAXIMUM
ADD	ADDENDUM	MBH	ONE THOUSAND BTU PER HOUR
AFF	ABOVE FINISHED FLOOR	MCF	ONE THOUSAND CUBIC FEET
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	MD	MOTORIZED DAMPER
ALT	ALTERNATE	MECH	MECHANICAL
AP	ACCESS PANEL	MFR	MANUFACTURER
ARCH	ARCHITECT/ARCHITECTURAL	MIN	MINIMUM
BFF	BELOW FINISHED FLOOR	MISC	MISCELLANEOUS
BLW	BELOW	MTOR	MOTOR
BTU	BRITISH THERMAL UNITS	MUIA	MAKE-UP/AIR
BTUH	BRITISH THERMAL UNITS PER HOUR	NC	NOISE CRITERIA
CAP	CAPACITY	NC	NORMALLY CLOSED
CB	CATCH BASIN	NIC	NOT IN CONTRACT
CFM	CUBIC FEET PER MINUTE	NO	NUMBER
CLG	CEILING	NO	NORMALLY OPEN
CO	CLEAN OUT	NTS	NOT TO SCALE
CW	COLD WATER	O	OXYGEN
D	DEGREE	O/A	OUTSIDE AIR
DB	DRY BULB	ORD	OVERFLOW ROOF DRAIN
DIA	DIAMETER	PD	PRESSURE DROP
DN	DOWN	PIV	POST INDICATOR VALVE
DW	DISTILLED WATER	PLBG	PLUMBING
EA	EACH	PRESS	PRESSURE
EAT	ENTERING AIR TEMPERATURE	PRV	PRESSURE REDUCING VALVE
ELEC	ELECTRICAL	PSI	POUNDS PER SQUARE INCH
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ID	INDIRECT	TEMP	TEMPERATURE
IN	INCH	TEMP	TEMPERATURE
INV	INVERT	TEMP	TEMPERATURE
LB	POUND	TEMP	TEMPERATURE
LB/HR	POUNDS PER HOUR	TEMP	TEMPERATURE
LAT	LEAVING AIR TEMPERATURE	TEMP	TEMPERATURE
LP	LOW PRESSURE	TEMP	TEMPERATURE
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DBP	DOMESTIC WATER BOOSTER PUMP	RE	RETURN/EXHAUST FAN
DC	DUCT MOUNTED COIL	RTU	ROOFTOP UNIT
DCP	DOMESTIC WATER CIRCULATING PUMP	SP	SUMP PUMP
EF	EXHAUST FAN	UH	UNIT HEATER
EDC	ELECTRIC DUCT COIL	WH	WATER HEATER

GENERAL PLUMBING NOTES

THE ENTIRE PLUMBING SYSTEM SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE INTERNATIONAL/ARKANSAS PLUMBING CODE REGULATIONS AND LOCAL PLUMBING INSPECTOR.

IT IS THE PLUMBING CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE SITE CONTRACTOR TO CONFIRM THAT THE INVERT AND LOCATION OF THE SANITARY SERVICE IS COMPATIBLE WITH THE SITE UTILITIES PRIOR TO BEGINNING WORK.

THE PIPING INDICATED ON THESE PLANS ARE DIAGRAMMATICAL. ALL WORK SHALL BE COORDINATED WITH ALL OTHER TRADES PRIOR TO INSTALLATION. CONTRACTOR SHALL COORDINATE ROUTING OF ALL PIPING WITH EXISTING CONDITIONS AND SHALL PROVIDE ANY NECESSARY OFFSETS, REROUTING, TEES, ELBOWS, ETC. REQUIRED FOR A COMPLETE AND COORDINATED INSTALLATION.

THE CONTRACTOR SHALL OBTAIN AND PAY ALL FEES RELATED TO PERMITTING, INSPECTIONS, TAP-ON FEES, ETC.

THE CONTRACTOR SHALL COORDINATE ANY PLUMBING OR PIPING SYSTEM SHUTDOWN WITH THE OWNER 48 HOURS IN ADVANCE.

CONTRACTOR SHALL COORDINATE AND PROVIDE ALL NECESSARY PIPING & PLUMBING FITTINGS, PIPING, MISCELLANEOUS ITEMS REQUIRED FOR A COMPLETE INSTALLATION OF ALL PLUMBING RELATED ITEMS.

DOMESTIC WATER AND SEWER LOCATED OUTSIDE OF FOOTING SHALL MAINTAIN A MINIMUM OF 10' SEPARATION UNLESS WRITTEN PERMISSION IS OBTAINED FROM LOCAL AUTHORITIES AND/OR PROPER CONTAMINATION PROVISIONS PER LOCAL CODE HAVE BEEN MET.

ALL DOMESTIC WATER, NATURAL GAS, DEIONIZED WATER, CARBON DIOXIDE, COMPRESSED AIR, AND NITROGEN PIPING SHOWN IS ABOVE CEILING, EXPOSED OVERHEAD, AND WITHIN WALLS UNLESS OTHERWISE NOTED. WATER HAMMER ARRESTORS SHALL BE INSTALLED AT DISHWASHERS, WASHING MACHINES, SUPPLY BOXES, AND QUICK CLOSING VALVES NOT LISTED. INSTALL WHA-1 AS CLOSE TO QUICK CLOSING VALVE AS POSSIBLE PER MANUFACTURER'S RECOMMENDATIONS. ISOLATION VALVES SHALL BE INSTALLED ON ALL SUPPLY FIXTURE GROUPS AND HOT WATER BALANCING VALVES.

ALL SANITARY, GREASE, LAB, AND ACID WASTE PIPING SHOWN IS BELOW SLAB, BELOW FLOOR, OR WITHIN WALLS UNLESS OTHERWISE NOTED. ALL SANITARY VENT PIPING SHOWN IS ABOVE CEILING, EXPOSED OVERHEAD, OR WITHIN WALLS UNLESS OTHERWISE NOTED.

FROST PROOF HOSE BIBBS AND SUPPLY PIPING SHALL BE INSTALLED ON THE INSIDE OF THE INSULATION. SEAL SHEATHING PENETRATION TO PREVENT AIR FROM REACHING THE VALVE.

FLOOR DRAIN CONNECTION SIZE TO BE THE SAME SIZE AS THE DRAIN LINE IT CONNECTS UNLESS NOTED OTHERWISE. IF SIZE IS NOT INDICATED ON DRAWINGS REFER TO PLUMBING ROUGH-IN SCHEDULE FOR PROPER SIZE.

FLUSH CONTROLS FOR HANDICAPPED WATER CLOSETS ARE TO BE MOUNTED TO THE OPEN SIDE OF THE TOILET AREAS.

THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL UNDER SLAB PIPING WITH EXISTING STRUCTURAL FOUNDATIONS. UNDERGROUND UTILITY LOCATIONS SHALL BE VERIFIED PRIOR TO ANY WORK BEING PERFORMED. CONTRACTOR SHALL REPAIR OR REPLACE ALL PIPING NOT IN PROPER WORKING ORDER OR DAMAGED DURING INSTALLATION OF THE NEW UNDERGROUND PIPING.

ALL PIPING PENETRATIONS THROUGH NEW, EXISTING WALL, OR FLOOR SHALL BE SEALED TO EQUAL THE RATING OF THE NEW, EXISTING WALL OR FLOOR.

THE PLUMBING SYSTEM SHALL BE TESTED AS REQUIRED BY LOCAL CODE OR BY THE REQUIREMENTS OF THE LOCAL PLUMBING INSPECTOR.

THE ENTIRE DOMESTIC WATER SYSTEM (EXISTING/NEW) SHALL BE DISINFECTED IN ACCORDANCE TO THE LOCAL CODE & HEALTH DEPARTMENT REQUIREMENTS.

FINISHED FLOOR ELEVATION (F.F.E.) SHALL BE 0.00' FOR CALCULATION PURPOSES ONLY, UNLESS NOTED OTHERWISE.

THE BACKFLOW PREVENTION DEVICE SHALL BE INSTALLED PER LOCAL CODE & PER AUTHORITY HAVING JURISDICTION REQUIREMENTS. NON-LEAD TYPE ONLY.

ALL PIPING ON ROOF SHALL BE ANCHORED TO STEEL RIB FASTENERS APPROVED BY THE ROOF MANUFACTURER. INSTALL ANCHORS PER MANUFACTURERS RECOMMENDATION.

ALL PLUMBING & PIPING SYSTEMS SHALL BE SUPPORTED AS REQUIRED BY THE LOCAL CODE REQUIREMENTS AND PER MANUFACTURER'S RECOMMENDATIONS.

ALL VENT THRU ROOF (VTR'S) PENETRATIONS INDICATED ON PLANS ARE PRELIMINARY. FINAL LOCATIONS SHALL BE COORDINATED WITH ALL TRADES. ALL VTR'S SHALL BE A MINIMUM OF 10'-0" FROM ALL FRESH AIR INTAKE OPENINGS.

ANY PVC PIPE PENETRATING A FIRE RATED ASSEMBLY SHALL BE EXTERNALLY SLEEVED WITH STEEL, FERROUS, OR COPPER MATERIALS. SECURELY FASTENED TO THE FIRE RATED ASSEMBLY. ANY SPACE BETWEEN THE SLEEVE AND THE FIRE RATED ASSEMBLY

22A PLUMBING rev - 20150529

22A 1 GENERAL INSTRUCTIONS

22A 1-1 GENERAL REQUIREMENTS

Requirements under Division 1 and the general and supplementary conditions of these specifications apply to this section and division. Where the requirements of this section and division exceed those of Division 1, this section and division take precedence. Become thoroughly familiar with all their contents as to requirements that affect this division, section or both. The work required under this section includes material, equipment, appliances, transportation, services, and labor required to complete the entire system as required by the drawings and specifications, or reasonably inferred to be necessary to facilitate each system's functioning as implied by the design and the equipment specified.

The specifications and drawings for the project are complementary, and portions of the work described in one, shall be provided as if described in both. In the event of discrepancies, notify the engineer and request clarification prior to proceeding with the work involved.

Drawings are graphic representations of the work upon which the contract is based. They show the materials and their relationship to one another, including sizes, shapes, locations, and connections. They also convey the scope of work, identifying the intended general arrangement of the equipment and other materials without showing all of the exact details as to elevations, offsets, control lines, and other installation requirements. Use the drawings as a guide when laying out the work and to verify that materials and equipment will fit into the designated spaces, and when, when installed per manufacturers' requirements, will ensure a complete, coordinated, satisfactory and properly operating system. Determine exact locations by job measurements, by checking the requirements of other trades, and by reviewing all contract documents. Correct errors that could have been avoided by proper checking and inspection, at no additional cost to the owner.

Specifications define the qualitative requirements for products, materials, and workmanship upon which the contract is based.

22A 1-2 DEFINITIONS

Whenever used in these specifications or drawings, the following terms shall have the indicated meanings:

Furnish: "to supply and deliver to the project site, ready for unloading, unpacking, assembling, installing, and similar operations."

Install: "to perform all operations at the project site, including, but not limited to, and as required: unloading, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, testing, commissioning, starting up and similar operations, complete, and ready for the intended use."

Provide: "to furnish and install complete, and ready for the intended use."

Furnished by owner (or owner-furnished) or furnished by others: "an item furnished by the owner or under other divisions or contracts, and installed under the requirements of this division, complete, and ready for the intended use, including all items and services incidental to the work necessary for proper installation and operation. Include the installation under the warranty required by this division.

Engineer: where referenced in this division, "engineer" is the engineer of record and the design professional for the work under this division, and is a consultant to, and an authorized representative of, the architect, as defined in the general and/or supplementary conditions. When used in this division, it means increased involvement by, and obligations to, the engineer, in addition to involvement by, and obligations to, the "architect".

AJH: the local code and/or inspection agency (authority) having jurisdiction over the work.

NRTL: nationally recognized testing laboratory, as defined and listed by OSHA in 29 CFR 1910.7 (e.g., UL, ETL, CSA), and acceptable to the AHJ over this project.

The terms "equivalent", "equivalent", or "equal" are used synonymously and shall mean "accepted by or acceptable to the engineer as equivalent to the material or manufacturer specified". The term "approved" shall mean labeled, listed, certified, or all three, by an NRTL, and acceptable to the AHJ over this project.

22A 1-3 PRE-BID SITE VISIT

Prior to submitting bid, visit the site of the proposed work and become fully informed as to the conditions under which the work is to be done. Failure to do so will not be considered sufficient justification to request or obtain extra compensation over and above the contract price.

22A 1-4 MATERIAL AND WORKMANSHIP

Provide all material and equipment new and in first class condition. Provide markings or a nameplate for all material and equipment identifying the manufacturer and providing sufficient reference to establish quality, size and capacity. In general, provide the following quality grade(s) for all materials and equipment:

Commercial Specification Grade

Pipe, pipe fittings, pipe specialties and valves shall be manufactured in plants located in the United States.

Work performed under this contract shall provide a neat and "workmanlike" appearance when completed, to the satisfaction of the architect and engineer. Workmanship shall be the finest possible by experienced mechanics of the proper trade.

The complete installation shall function as designed and intended with respect to efficiency, capacity, noise level, etc. Abnormal or excessive noise from equipment, devices or other system components will not be acceptable.

Remove from the premises waste material present as a result of work. Clean equipment installed under this contract to present a neat and clean installation at the termination of the work.

Repair or replace public and private property damaged as a result of work performed under this contract to the satisfaction of authorities and regulations having jurisdiction.

22A 1-5 MANUFACTURERS

In other articles where lists of manufacturers are introduced, subject to compliance with requirements, provide products by one of the manufacturers specified.

Where a list is provided, manufacturers listed are not in accordance with any ranking or preference.

Where manufacturers are not listed, provide products subject to compliance with requirements from manufacturers that have been actively involved in manufacturing the specified product for no less than 5 years.

22A 1-6 COORDINATION

Coordinate all work with other divisions and trades so that the various components of the systems will be installed at the proper time, fit the available space, and will allow proper service drawings to those items requiring maintenance. Refer to all other division's drawings, and to relevant equipment submittals and shop drawings to determine the extent of clear spaces. Components which are installed without regard to the above shall be relocated at no additional cost to the owner.

Unless otherwise indicated, the general contractor will provide chases and openings in building construction required for installation of the systems specified herein. Contractor shall furnish the general contractor with information where chases and openings are required. Make all offsites required to clear equipment, beams and other structural members, and to facilitate concealing system components in the manner anticipated in the design. Keep informed as to the work of other trades engaged in the construction of the project, and execute work in a manner as to not interfere with or delay the work of other trades.

Figured dimensions shall be taken in preference to scale dimensions. Contractor shall take his own measurements at the building, as variations may occur. Contractor will be held responsible for errors that could have been avoided by proper checking and inspection

Provide materials with trim that will properly fit the types of ceiling, wall, or floor finishes actually installed. Model numbers listed in the construction documents are not necessarily intended to designate the required trim.

22A 1-7 ORDINANCES, CODES, AND STANDARDS

Work performed under this contract shall, at a minimum, be in conformance with applicable national, state and local codes having jurisdiction. Equipment furnished and associated installation work performed under this contract shall be in strict compliance with current applicable codes adopted by the local AHJ including any amendments and standards as set forth by the National Fire Protection Association (NFPA), Underwriters Laboratories (UL), Occupational Safety and Health Administration (OSHA), American Society of Mechanical Engineers (ASME), American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), American National Standards Institute (ANSI), American Society of Testing Materials (ASTM) and other national standards and codes where applicable. Additionally, comply with rules and regulations of public utilities and municipal departments affected by connection of services.

Where the contract documents exceed the requirements of the referenced codes, standards, etc., the contract documents shall take precedence.

Promptly bring all conflicts observed between codes, ordinances, rules, regulations, referenced standards, and these documents to the engineer's attention for final resolution. Contractor will be held responsible for any violation of the law.

Procure and pay for permits and licenses required for the accomplishment of the work herein described. Where required, obtain, pay for and furnish certificates of inspection to owner. Contractor will be held responsible for violations of the law.

22A 1-8 PROTECTION OF EQUIPMENT AND MATERIAL

Store and protect from damage equipment and materials delivered to job site, in accordance with manufacturers' recommendations. For materials and equipment susceptible to changing weather conditions, dampness, or temperature variations, store inside in conditioned spaces. For materials and equipment not susceptible to these conditions, cover with waterproof, tear-resistant, heavy tarp or polyethylene plastic as required to protect from weather, dirt, paint, water, or physical damage. Equipment and material that has been damaged by construction activities will be rejected, and contractor shall furnish new equipment and material as required at no additional cost to the owner.

Keep premises broom clean from foreign material created during work performed under this contract. Piping, equipment, etc. shall have a neat and clean appearance at the termination of the work.

Plug or cap open ends of piping systems while stored and installed during construction when not in use to prevent the entrance of debris into the systems. Keep the manufacturer-provided protective coverings on floor drains, floor sinks and trench drains during construction. Remove coverings at the termination of the work and polish exposed surfaces

22A 1-9 SUBSTITUTIONS

Include in the base bid the products specifically named in these specifications or on the drawings. Submit, in the form of alternates, with bid, products of any other manufacturers for similar use, provided the differences in cost, if any, are included for each proposed alternate.

No substitutions will be considered with receipt of Bids, unless the Architect and Engineer have received from the Bidder a written request for approval to bid a substitution at least ten calendar days prior to the date for receipt of Bids, and have approved the substitution request. Include, with each such request, the name of the material or equipment for which substitution is being requested, and a complete description of the proposed substitution including drawings, cut sheets, performance and test data, and all other information necessary for an evaluation. Include also a statement setting forth changes in other materials, equipment or other work that would be required to incorporate the substitution. The burden of proof of the merit of the proposed substitution is upon the proposer. The proposer of any substitutions shall compensate the Engineer at a rate of \$150.00 per hour for time spent evaluating proposed substitutions and/or the subsequent revisions to the design required to utilize the substitution.

The Architect's or Engineer's decision to approve or disapprove a substitution in a Bid is final.

If the proposed substitution is approved prior to receipt of Bids, such approval will be stated in an Addendum. Bidders shall not rely upon approvals made in any other manner, including verbal.

No substitutions will be considered after receipt of Bids and before award of the Contract.

No substitutions will be considered after the Contract is awarded unless specifically provided in the Contract Documents.

22A 1-10 SUBMITTALS

Assemble and submit to the architect, for engineer's review, manufacturers' product literature for material and equipment to be furnished, installed, or both, under this division, including shop drawings, manufacturers' product data and performance sheets, samples, and other submittals required by this division. Highlight, mark, list or indicate the materials, performance criteria and accessories that are being proposed. Provide the number of submittals required by division 1, however, at a minimum, submit two (2) sets. Before submitting, verify that all materials and equipment submittals are mutually compatible and suitable for the intended use, fit the available spaces, and allow ample and code-required room for access and maintenance. Submittals shall contain the following information. Submittals not so identified will be returned to the contractor without action:

The project name.
The applicable specification section and paragraph.
The submittal date.
The contractor's stamp, which shall certify that the stamped drawings have been checked by the contractor, comply with the drawings and specifications, and have been coordinated with other trades.

Submittals and shop drawings shall not contain HP Engineering's firm name or logo, nor shall it contain the HP Engineering's engineers' seal and signature. They shall not be copies of HP Engineering's work product.

Transmit submittals as early as required to support the project schedule. Allow for two weeks engineer review time, plus mailing time, plus a duplication of this time for re-submittals, if required. The engineer's submittal reviews will not relieve the contractor from responsibility for errors in dimensions, details, size of members, or quantities; or for omitting components or fittings; or for not coordinating items with actual building conditions.

Refer to division 1 for acceptance of electronic submittals for this project. For electronic submittals, contractor shall submit the documents in accordance with the procedures specified in division 1. Contractor shall notify the architect and engineer that the shop drawings have been posted. If electronic submittal procedures are not defined in division 1, contractor shall include the website, user name and password information needed to access the submittals. For submittals sent by e-mail, contractor shall copy the architect and engineer's designated representatives. Contractor shall allow the engineer review time as specified above in the construction schedule. Contractor shall submit only the documents required to purchase the materials and/or equipment in the electronic submittal and shall clearly indicate the materials, performance criteria and accessories being proposed. General product catalog data not specifically noted to be part of the specified product will be rejected and returned without review.

22A 1-11 ELECTRONIC DRAWINGS

In preparation of shop drawings or record drawings, contractor may, as an option, obtain electronic drawing files in Revit, AutoCAD, or DXF format from the engineer for a fee of \$200 for the first sheet and \$100 per sheet for each additional sheet. Contact the architect for written authorization; and, contact the engineer to obtain the necessary release agreement form and to indicate the desired shipping method and drawing format. In addition to payment, architect's written authorization and engineer's release agreement form must be received before electronic drawing files will be sent.

22A 1-12 OPERATION AND MAINTENANCE INSTRUCTIONS

Submit to the architect, for engineer's review, copies each of operations and maintenance instruction manuals, appropriately bound into manual form including approved copies of the following, revised if necessary to show system and equipment as actually installed. Paper clips, staples, rubber bands, and mailing envelopes are not considered approved binders. Provide the number of submittals required by Division 1, however, at a minimum, submit two (2) sets, and include, at a minimum, the following information:

Cover sheet that lists the project name, date, owner, architect, consulting engineer, general contractor, sub-contractor, and an index of contents.
Manufacturers' catalogs and product data sheets
Wiring diagrams
Operation and Maintenance instructions
Parts lists
Approved shop drawings
Test reports as defined for the systems and equipment provided or furnished or installed under this contract.
Names, addresses, telephone numbers, and e-mail addresses of local contacts for warranty services and spare parts.

Submit manuals prior to requesting the final punch list and before any requests for substantial completion. Final approval of this division's systems installed under this contract will be withheld until this equipment brochure is received and deemed complete by the architect and engineer.

Provide "as-built" drawings (see Division 1 and general conditions).

22A 1-13 TRAINING

At a time mutually agreed upon between the owner and contractor, provide the services of a factory trained and authorized representative to train owner's designated personnel on the operation and maintenance of the equipment provided for this project.

Provide training to include but not be limited to an overview of the system and/or equipment as it relates to the facility as a whole; operation and maintenance procedures and schedules related to startup and shutdown, troubleshooting, servicing, preventive maintenance and appropriate operator intervention; and review of data included in the operation and maintenance manuals.

Submit a certification letter to the architect stating that the owner's designated representative has been trained as specified herein. Letter shall include date, time, attendees and subject of training. The contractor and the owner's representative shall sign the certification letter indicating agreement that the training has been provided.

Schedule owner training with at least 7 days' advance notice.

22A 1-14 WARRANTIES

Warrant each system and each element thereof against all defects due to faulty workmanship, design or material for a period of 12 months from date of substantial completion, unless specific items are noted to carry a longer warranty in the construction documents or manufacturer's standard warranty exceeds this duration. Warranties shall include labor and material. Remedy all defects, occurring within the warranty period(s), as stated in the general conditions and Division 1 without any additional costs to the owner.

Perform any required remedial work promptly, upon written notice from the engineer or owner.

At the time of substantial completion, deliver to the owner all warranties, in writing and properly executed, including term limits for warranties extending beyond the required period, each warranty instrument being addressed to the owner and stating the commencement date and term.

SECTION 1-15 EXCAVATION AND BACKFILLING

Perform excavation and backfill required for installation of underground work under this contract. Trenches shall be of sufficient width. Crib or brace trenches to prevent cave-in or settlement. Do not excavate trenches close to columns and walls of building without prior consultation with the architect. Use pumping equipment if required to keep trenches free of water. Backfill trenches in maximum 6" layers of well-tamped dry earth in a manner to prevent future settlement.

Excavation as herein specified shall be classified as common excavation. Common excavation comprises the satisfactory removal and disposition of material of whatever substances and of every description encountered, including rock, if any, within the limits of the work as specified and shown on the drawings. Excavals shall be excavated to the lines and grades indicated on the drawings. Excavated materials which are considered unsuitable for backfill, and surplus of excavated material which is not required for backfill, shall be disposed of by the contractor at his own expense and responsibility, and to the satisfaction of the architect.

SECTION 1-16 COINCIDENTAL DAMAGE

Repair all streets, sidewalks, drives, paving, walls, finishes, and other facilities damaged in the course of this work. Repair materials shall match existing conditions. All backfilling and repairing shall meet all requirements of the owner, city and others having jurisdiction. Materials work shall be thoroughly first class. Conform to all requirements of Division 2 of these specifications.

SECTION 1-17 CUTTING AND PATCHING

Following the requirements in Division 1, cut walls, floors, ceilings, and other portions of the facility as required to perform work under this division. Obtain permission of the architect, owner, or both, before doing any cutting. Cut all holes as small as possible. Patch walls, floors, and other portions of the facility as required by work under this division. All patching shall be thoroughly first class and shall match the original material and construction, including fire ratings if applicable in a manner satisfactory to the architect.

SECTION 1-18 ROUGH-IN

Coordinate without delay all rough-in with other divisions. Conceal all piping and rough-in except in unfinished areas and where otherwise indicated in the construction documents.

SECTION 1-19 CONCRETE BASES

Provide concrete bases for equipment where indicated on the drawings. Concrete bases shall have chamfered edges. Size of pad shall be a minimum of 4" greater than the footprint of the equipment that it is supporting.

Construct equipment bases and housekeeping pads of a minimum 28 day, 4000 psi concrete conforming to American Concrete Institute standard building code for reinforced concrete (ACI 318-99) and the latest applicable recommendations of the ACI standard practice manual. Concrete shall be composed of cement conforming to ASTM C 150 Type I, aggregate conforming to ASTM C33, and potable water. Exposed exterior concrete shall contain 5 to 7 percent air entrainment.

Unless otherwise specified or shown on the structural drawings, reinforce equipment bases and housekeeping pads with No. 4 reinforcing bars not conforming to ASTM A 615 or 6x6 - W2 x W2.3 welded wire mesh conforming to ASTM A185. Place reinforcing bars 24" on center with a minimum of two bars each direction.

Provide galvanized anchor bolts for equipment placed on concrete equipment bases and housekeeping pads or on concrete slabs. Anchor bolts size, number and placement shall be as recommended by the manufacturer of the equipment.

Concrete equipment bases shall have minimum heights in accordance with the following: for water heaters, water softeners and other equipment not listed, minimum height is 4". For water heaters over 200 gallons capacity and domestic water booster pumps, minimum height is 6". Height of equipment bases applies to equipment installed on slab-on-grade. For equipment installed on floors above grade and on the roof, refer to the drawings.

SECTION 1-20 STRUCTURAL STEEL

Structural steel used for pipe supports, equipment supports, etc., shall be new and clean, and shall conform to ASTM designation A-36. Support plumbing equipment and piping from the building structure. Do not support plumbing equipment and piping from ceilings, other mechanical or electrical components, and other non-structural elements.

SECTION 1-21 ACCESS DOORS

Provide access doors in ceilings and walls where indicated or required for access to concealed valves and equipment installed under this section. Provide concealed hinges, screwdriver-type lock, anchor straps; manufactured by Milcor, Zurn, Tipton, or equal. Obtain architect's approval of type, size, location, and color before ordering.

SECTION 1-22 PENETRATIONS

Provide sleeves for pipes passing through above grade concrete or masonry walls, concrete floor or roof slabs. Sleeves are not required for core drilled holes in existing masonry walls, concrete floors or roofs. Provide 10 gauge galvanized steel sleeves for sleeves 6" and smaller. Provide galvanized sheet metal sleeves for larger than 6". Schedule 40 PVC sleeves are acceptable for installation in areas without return air plenums.

Seal elevated floor, exterior wall and roof penetrations watertight and weathertight with non-shrink, non-hardening commercial sealant. Pack with mineral wool and seal both ends with minimum of 1/2" of sealant.

Seal around penetrations of fire rated assemblies. Coordinate fire ratings and locations with the architectural drawings. Refer to architectural specifications for fire stoppings. Provide a product schedule for UL listing, location, wall or floor rating and installation drawing for each penetration fire stop system.

Extend pipe insulation for insulated pipe through floor and roof penetrations, including fire rated walls and floors. The vapor barrier shall be maintained. Size sleeve for a minimum of 1" annular clear space between inside of sleeve and outside of insulation.

Seal concrete or masonry exterior wall penetrations below slabs with "wall pipes" and mechanical sleeve seals. Provide cast iron "wall pipes" with integral waterstop ring manufactured by Josam, Jay R. Smith, Wade, Watts or Zurn. Provide modular mechanical sleeve seals, manufactured by Thunderbolt / Link Seal, Calpicco, Inc., and Metraflex.

Seal elevated concrete slab with water proof membrane penetrations with "wall pipes" and water proof sealant. Secure waterproof membrane flashing between "wall pipe" and concrete slab with watertight clamping ring. Provide cast iron "wall pipes" with integral waterstop ring manufactured by Josam, Jay R. Smith, Wade, Watts or Zurn.

Provide sleeves for horizontal pipe passing through or under foundation. Sleeves shall be cast iron soil pipe two nominal pipe sizes larger than the pipe served.

Provide Schedule 40 PVC pipe sleeves for vertical pressure pipe passing through concrete slab on grade. Sleeves shall be one nominal pipe size larger than the pipe served and two pipe sizes larger than pipe served for ductile iron pipes with restraining rods. Seal water-tight with silicone caulk.

Provide 1/2" thick cellular foam insulation around perimeter of non-pressure pipe passing thru concrete slab on grade. Insulation shall extend to 22" above and below the concrete slab.

SECTION 1-24 ELECTRICAL WIRING

Line Voltage control and interlock wiring shall be provided by the Division 26 contractor. Low Voltage control wiring shall be provided by the Division 23 contractor. Required conduit and rough-ins for low voltage control wiring shall be provided by the Division 26 contractor. Furnish wiring diagrams to the Division 26 contractor as required for proper equipment hookup. Coordinate with the Division 26 contractor the actual wire sizing amps for the equipment (from the equipment nameplate) to ensure proper installation.

SECTION 1-25 EQUIPMENT FURNISHED BY OTHERS

Furnish and install rough-in-wastes, vents and water services. Provide final connection to kitchen equipment, furnished by others, in locations as indicated on the drawings. Provide accessory items that are required but not furnished with the equipment, including traps, stop valves, P-TRVs, the indirect drain from equipment to floor drains, and accessory items indicated or required for the proper operation of the complete system and termination of the work.

Contractor shall be responsible for correct rough-in dimensions, and shall verify same with architect and/or equipment supplier prior to service installations.

SECTION 1-26 ALTERNATES

Refer to the architectural portion of the specification for list of alternates. Applicable sections of the base specifications shall apply to all work required by the alternate unless otherwise specified. Determine whether or not and how each alternate affects work. Include labor, materials, equipment and transportation services necessary for and incidental to the completion of work under each particular alternate. Furnish separate bid for each alternate applicable to work, stating the amount to be added or deducted from the base bid.

SECTION 1-27 EXTERIOR UTILITY CONNECTIONS

Terminate domestic water, storm, and sewer lines at a point approximately five feet from the building wall, or as shown on the drawings. Make connection to the various services provided by others and coordinate connection requirements with civil engineer. Verify that installation will tie into the various services provided by others at the indicated invert elevation point prior to installation. If the installation will not tie into the indicated invert elevation point while maintaining proper fall, notify architect and civil engineer so that an alternative may be determined.

Provide service piping and accessories required to complete utility connections that are not furnished by the serving utility.

comply with the schedule of operations as outlined in the architectural portions of this specification. Building shall be in continuous operation. accomplish work that requires interruption of building operation at a time when the building is not in operation, and only with written approval of building owner and/or tenant. Coordinate interruption of building operation with the owner and/or tenant a minimum of 7 days in advance of work.

2A 1-30 SYSTEM TESTING AND ADJUSTING

Upon completion of each phase of the installation, test each system in conformance with local code requirements and as noted below. Furnish labor and equipment required to test plumbing work installed under this contract, and assume costs involved in making the tests, and repairing and/or replacing damage resulting therefrom.

Notify the architect and the authority having jurisdiction, three (3) working days prior to making plumbing system tests. Leave concealed work uncovered until the required tests have been completed, but, if necessary due to construction procedure, tests on portions of the work may be made, and, when satisfactory, the work may be concealed. Test defects before insulation is installed, and before backfill. Pipes, joints, flanges, valves, steam stems, etc., shall be leak tight. Repair or replace system defects with new materials. Caulking of defective joints, cracks or holes will not be permitted. Repeat tests after defects have been eliminated. Make tests in the presence of the administrative authority and/or the owner's authorized representative.

Upon completion of the systems installation, and prior to acceptance by the architect and engineer, make general operating tests to demonstrate that equipment and systems are in proper working order, and are functioning in conformance with the intent of the drawings and specifications. As a part of these tests, open every water outlet to ensure complete system flushing, remove and clean faucet aerators, clean faucets, pilot light jets, and operate every piece of equipment furnished under this contract to demonstrate proper functioning.

Test the drainage and vent system by plugging openings with test plugs, except those at the top of the stacks. Fill the system with water; test the results will be satisfactory if the water level remains stationary for not less than one (1) hour. Subject the drainage and vent system to a test pressure of at least ten (10) feet of water. If leaks develop, repair them and repeat the test.

Test the domestic water system by filling it with water and then isolating the system from its source. Keep the system closed for a period of twenty-four hours, with no fixture being used. The pressure differential for this test period shall not exceed 10 psig. Test water piping to a 125 psi hydrostatic pressure.

For low pressure natural gas systems, subject the pipe to 10 psig air pressure for a period of one hour. The resultant pressure differential for this period shall be 0 psig. Test per gas company requirements where required.

2A 2 PLUMBING PIPING

2A 2-1 PIPING MATERIALS

Materials specified or noted on the drawings are subject to the approval of local code authorities. Verify approval before installing any material for plumbing work.

Domestic Water (cold, hot and hot water recirculation). Domestic water piping installed above the floor slab inside the building shall be type "L" standard copper pipe with wrought copper fittings and soldered connections made up with 95/5 solder. Brazed mechanically formed tee joints using PVC meeting ASTM B174, "solid wall" cell Class 12454-B with ASTM 2665 socket fittings with solvent weld joints is also permitted where approved by code. Connection shall be made with brazed silver solder (Silfos) joints in conformance with manufacturer's instructions.

Underground domestic water piping 2" and smaller shall be type "K" soft temper copper tubing with flared copper alloy fittings and connections. Type "K" hard temper copper tubing with conventional wrought copper fittings and silver solder (Silfos) joints. Install as few underground copper piping joints as possible. At building service entrance, no joints shall be installed under or within 5 feet of the building. Install domestic water piping below grade outside building at adequate depth to prevent freezing.

Underground domestic water piping 3" and larger shall be Class 52 ductile iron meeting the requirements of ANSI / AWWA Standard C100/A21.1. Piping shall be double cement lined in accordance with ANSI / AWWA Standard C104/A21.4. Fittings shall have mechanical joints. At contractor's option, pipe joints in straight runs (not at fittings) and not installed under or within 5 feet of the building slab may be push-on joints. Joints shall conform to the requirements of ANSI 21.1.

Interior Waste and Vent Below Slab: Waste and vent pipe below slab inside building shall be service weight cast iron soil pipe with hub and flange, meeting ASTM A888 and C151, manufactured by AB & I Foundry, Charlotte or Tyler Pipe and bearing the trademark of the CISPI and NSF. Hubless waste and vent pipe is not permitted below base slab. PVC Schedule 40 DWV ASTM D2665 pipe with solvent weld joints is also permitted where approved by code.

Interior Waste and Vent Above Slab: Waste and vent pipe above slab inside building shall be hubless cast iron soil pipe and fittings, meeting ASTM A888 and CISPI 301, manufactured by AB & I Foundry, Charlotte or Tyler Pipe and bearing the trademark of the CISPI and NSF. PVC Schedule 40 DWV ASTM D2665 pipe with PVC meeting ASTM B174, "solid wall" cell class 12454-B with ASTM 2665 socket fittings with solvent weld joints is also permitted where approved by code.

Note: PVC piping is not allowed in ceiling return air plenums)

Interior Storm: Inside building shall be same as specified for interior waste and vent pipe.

Natural Gas: Gas piping above ground shall be Schedule 40 black steel with malleable iron screwed fittings, or standard welded fittings, as directed on the drawings, gas piping above slab shall be 1/2" rigid corrugated stainless steel tubing (CSST) by Omegaflex, Inc., or Tracpipe or Inflex Corp., "GasTite", Type 304 stainless tubing meeting ASTM A240, with UV resistant polyethylene jacket meeting ASTM E-84 flame retardant and smoke rating, and yellow brass auto-flare ends with stainless steel inserts. Gas piping below slab shall be semi-rigid corrugated stainless steel tubing (CSST) by Omegaflex, Inc., Tracpipe or Inflex Corp., "GasTite", Type 304 stainless tubing meeting ASTM A240, with UV resistant polyethylene jacket meeting ASTM E-84 flame and smoke rating, encased in a polyethylene variable sleeve and yellow brass auto-flare ends with stainless steel inserts. Underground gas piping shall be welded, coated, and wrapped with coal tar enamel and 15 pound mastic. Install underground steel gas piping at least 30" below grade, and provide with cathodic protection per gas company details. Underground gas piping shall be high density or ultrahigh density polyethylene pipe as required by the gas utility company. Polyethylene pipe shall conform to specification, or equivalent. Installation shall be in conformance with utility company rules. Provide polyethylene to steel pipe transition fittings by the pipe design, with steel half of Schedule 40 steel pipe with beveled edge for welding and polyethylene half shall be of ample length for making welds. Steel pipe shall have epoxy protective coating.

Drinking Petroleum Gas: Same as specified for natural gas pipe.

Deionized Water: Schedule 80 PP Kynar PVDF by Orion in return air plenums pipe and fittings, mechanical couplings above grade and thermal break connections welded below grade, installed per manufacturer's recommendations. Pipe shall be carefully cut and assembled to avoid creating pits and burrs where contamination may accumulate. Slope piping at a 1% grade to allow for drainage. Coordinate requirements for PP pipe with the ASTM type I quality deionized water.

Connections To Plumbing Fixtures And Equipment: 1-1/4" and larger waste connections from fixture traps to cast iron pipe shall be "DWV" copper pipe with wrought copper drainage pattern fittings with copper sweat or compression joints at fixture trap connections and threaded joints at connections to cast iron pipe.

Indirect and Condensate Drain Inside Building: Indirect and condensate drain pipe installed inside the building shall be Type "M" hard copper pipe with wrought copper fittings for 1" and smaller and "DWV" copper with wrought copper drainage pattern fittings for 1-1/4" and larger. Install as few joints as possible.

Indirect and Condensate Drain Outside Building: Indirect and condensate drain pipe installed outside the building above ground shall be Type "M" and 1" and smaller and "DWV" for 1-1/4" and larger. Terminate at nearest roof drain, gutter or other location as shown drawings. Install elbows at elbows greater than 45 degrees.

[illegible]

22A 2-2 PIPING AND EQUIPMENT INSULATION

Domestic cold water, hot water, indirect and condensate drain pipe (within building)

Interior horizontal storm drain piping above ceiling and exposed

Refer to pipe insulation schedule on drawings for insulation details. Provide with self-sealing lap to provide a continuous vapor barrier by Certainteed, Owens-Corning or Armstrong. For hot piping, provide pipe hangers and riser clamps sized for the outside diameter of piping. Butt insulation to hanger or riser clamp for vertical pipe. Seal exposed insulation with insulation sealer. Exception for vertical piping: provide clamps sized for the outside diameter of the vertical pipe and extend clamp through insulation. Seal penetrations of insulation and vapor barrier with wet coat of vapor barrier lap cement. For cold piping at hangers provide 8" long sections of high density, high temperature calcium silicate by Johns-Manville, fiberglass by Knauf, or 8" long styrofoam billets by Dow or flexible unicellular piping insulation meeting ASTM C 534-01, Type I with integral high density pipe supports and encased in steel insulation shield in Cooper B-Line / Armacel or equivalent. Insulation shall be continuous along the pipe surface, except at valves, unions, and where piping is exposed at fixtures. Provide insulation on vent piping within six feet of vent through the roof. Provide insulation on domestic cold and hot water pipes installed in walls and chases.

Roof drain bodies: 2" one-piece fiberglass covering with fire-resistant jacket with self-sealing lap to provide a continuous vapor barrier, by Certainteed, Owens-Corning or Armstrong.

Provide insulation protection shield at each hanger for insulated piping.

Cover fittings with Zeston, Knauf, or equal one-piece PVC pre-molded insulating covers. Fitting covers, jackets and adhesives shall not exceed flame spread rating of 25 and smoke development rating of 50 per ASTM E84. At all elbows and tees, fill voids between covers and piping with fiberglass insulation and tape joints. Install pipe insulation in compliance with manufacturer's recommendations. Where pre-molded insulating fittings are not approved by local authorities, miter insulation at fittings.

Provide 2" fiberglass thick insulation for water, sanitary, waste or grease waste piping in unheated spaces where indicated on the drawings.

22A 2-3 PIPING JOINTS

Copper Tubing: Joints in hard temper tubing shall be soldered joints using lead-free 95/5 solder except where tubing is installed below grade or below the base slab, in which case joints shall be soldered with silver solder (Silfos). Joints in soft temper copper tubing shall be of the flared type installed in compliance with the fitting manufacturer's recommendations.

Threaded Steel Pipe: Threaded joints shall be full and clean, cut with not more than three (3) threads exposed beyond the fittings. Make joints tight with graphite base pipe joint compound and paint exposed threads of ferrous pipe with acid-resisting paint after piping has been tested and proven tight. No caulking, lamp-wick or other material will be permitted for correction of defective joints.

Welded Steel Pipe: Welded joints shall be of the butt welded single "v"ee" type. Bevel pipe at a 45 degree angle to within 1/16" of the inside wall, and build up the weld to one fourth greater depth than the pipe wall thickness. Welding shall be either electric or oxy-acetylene, performed in conformance with the ASME code for pressure pipe welding, and only by experienced certified welders.

Cast Iron Pipe Below Grade: Joints in bell and spigot cast iron waste and vent pipe shall be neoprene compression gaskets, Tyseal or equal.

Cast Iron Pipe Above Grade: Joints in hubless pipe shall be standard CISPI 310 domestically manufactured by Anaco, AB & I Foundry, Charlotte, Hasky, Ideal, Tyler, Mission or Fernco.

PVC Pipe: Clean joints free from debris and moisture. Apply PVC primer meeting ASTM F656 to each joint. Apply solvent cement meeting ASTM D2564 and make joint while wet and in accordance with ASTM D2855.

Pipe Adapters: Make connection of new waste pipe to new or existing dissimilar waste pipe using adapter couplings. Provide Fernco, Proflex 3000 series or Mission Flexseal MR50 series with neoprene adapter gasket with stainless steel shield and hose clamps for connecting dissimilar pipes above grade. Provide Fernco, 1050 series or Mission sewer couplings with neoprene adapter gasket and hose clamps for connecting dissimilar pipes below grade and cast stainless steel bands with mastic

22A 2-4 PIPING INSTALLATION

General: Clean pipe thoroughly prior to installation. Ream ends of pipe to remove burrs. Cut pipe accurately to measurements taken on the job. Install with adequate clearance for installation of coverings where required. Pipe shall not be sprung or bent. Neatly align pipe, connect it securely, and support it from the building structure with hangers as specified below. Provide chrome-plated escutcheons on pipes passing through ceilings, floors or walls of finished spaces. Run pipes freely through floor and wall penetrations using pipe sleeves. Do not grind in place unless required for structural fire integrity. Install pipe concealed in finished spaces wherever possible. Use a dielectric union where ferrous and copper pipe connect. Dielectric union shall have a zinc-plated steel body, a threaded nylon insert, and insulating pressure gasket. No ferrous metal-to-copper connection made without insulating unions will be allowed.

Hanger & Supports: Pipe hangers shall be as described in the specifications by B-Line or equal by Anvil, Michigan, Truscon, or Unistrut. Connect hangers to the structure with side beam connectors and all thread hanger rods. Provide engineered support struts between joists and other structural members as required to provide a rigid hanging installation. Do not hang pipes from other pipes, conduit or ductwork. Provide hanger rods and space hangers at intervals as specified in "hanger spacing". Provide support within 1' of each elbow and tee. Provide supports within 1' of each equipment connection. Provide two nuts on threaded supports to securely fasten the support. Install hanger types or supports for various piping as follows:

Copper Tube: Adjustable band hangers for bare copper tube 3" and smaller shall be B-Line #B3170 CT copper plated adjustable band swivel ring type. Adjustable band hangers for insulated copper tube and 3" smaller shall be B-Line #B3170 NF adjustable band swivel ring type. Clevis hangers for insulated copper tube 4" and larger shall be B-Line #B3100 galvanized steel clevis type. Support exposed copper tube 2" and smaller to walls or in chases with B-Line #B3198 RCT copper coated extension split ring pipe clamps, 3/8" threaded rod and B-Line #B3199 CT ceiling flanges. Support copper tube in chases and walls at plumbing fixtures with plastic or copper brackets secured to structure and u-bolts sized to bare on the pipe. Riser clamps to support vertical copper tube shall be B-Line #B3373 CT copper coated steel, cut insulation, seal vapor barrier, and attach to bare tube.

Steel Pipe: Adjustable band hangers for 2" and smaller shall be B-Line #B3170 NF adjustable band swivel ring type. Clevis hangers for 2-1/2" and larger shall be B-Line #B3100 galvanized steel clevis type. Riser clamps to support vertical pipe shall be B-Line #B3373 galvanized steel.

Cast Iron Pipe: Adjustable band hangers for 2" and smaller shall be B-Line #B3170 NF adjustable band swivel ring type. Clevis hangers for 3" and larger shall be B-Line #B3100 galvanized steel clevis type. Riser clamps to support vertical pipe shall be B-Line #B3373 galvanized steel.

PVC Pipe: Adjustable band hangers for 3" and smaller shall be B-Line #B3170 NF adjustable band swivel ring type. Clevis hangers for 4" and larger shall be B-Line #B3100 galvanized steel clevis type. Riser clamps to support vertical pipe shall be B-Line #B3373 galvanized steel.

Insulation Protection Shields: B-Line #B3151 of 18 gauge galvanized sheet metal. Shield shall cover half of the circumference of the pipe and shall be of length indicated by manufacturer for pipe size and thickness of insulation.

Hanger Spacing, Rod Sizes & Connectors: Connect rods to steel beams or joists with B-Line #B3031 or #B3033 beam clamps as required. Connect rods to concrete with B-Line #B3014 malleable iron single type inserts with malleable iron nut. Connect rods in wood construction with B-Line #B3035 side beam connectors. Hang and support piping with spacing and rod sizes as follows:

Copper Tube: 1-1/2" and smaller - every 6' with 3/8" hanger rods; 2" every 10' with 3/8" hanger rods; 2-1/2" every 10' with 3/8" hanger rods; 3" every 10' with 1/2" rods; 4" every 10' with 5/8" hanger rods. Support vertical copper tube every 10'.

Steel Pipe: 1" and smaller - every 8' with 3/8" hanger rods; 1-1/4" to 2" every 10' with 3/8" hanger rods; 2-1/2" and 3" every 10' with 1/2" hanger rods; 4" every 10' with 5/8" hanger rods. Support vertical steel pipe every 10'.

Cast Iron Pipe: Every 10' and within 1' of each joint. 2" and smaller with 3/8" hanger rods; 3" with 1/2" hanger rods; 4" with 5/8" hanger rods; 6" with 3/4" hanger rods; 8" and larger with 7/8" hanger rods. Support vertical cast iron pipe every 15'.

PVC Pipe: Support all pipes sizes every 4'. 1-1/2" and smaller with 3/8" hanger rods; 2" with 1/2" hanger rods; 2-1/2" and 3" with 1/2" hanger rods; 4" and larger with 5/8" hanger rods. Support vertical PVC pipe every 4'.

Supports on roof: Support piping on roof with 4" x 4" x 12" long CCA rot-proof wood blocks. Set wood blocks on 18" x 18" x 3/16" thick roof walkway material. Connect pipe to wood blocks with galvanized steel pipe clamp and 1/4" x 1-1/2" long cadmium plated lag screws. Slack blocks and nail them together as required and support pipe as required to change pipe elevation. Support pipe with spacing as described above at a minimum 7' above the roof. Set blocks on 18" x 18" x 3/16" thick roof walkway material compatible with actual roof covering material.

Supports On Floor: Support piping from the floor where required for ferrous pipe or insulated copper tube, shall be B-Line #B3093 galvanized steel with pipe saddle, threaded shank for height adjustment and floor stand secured to the floor.

Below Ground Installation For Soil, Waste And Storm: Install soil and waste piping to a uniform slope of not less than 1/8" per foot for piping 3" or larger, and not less than 1/4" per foot for piping 2-1/2" or smaller.

Slope storm piping at 1/4" per foot. Lay pipe at uniform slope, free from sags, with hub end upstream. Make changes in direction from horizontal to vertical, at fixture branches and other branch connections with sanitary "tees" or short sweep "ells". Make changes in direction from vertical to horizontal or horizontal to horizontal with long radius fittings, long sweeping "ells", combination "y" and 1/8 bend" fittings, or 45 degree "ells" (1/8 bend fittings), 1/6 bend or 1/16 bend and "y" fittings. Install pipe with the barrel of the pipe on firm, solid earth for its entire length, and excavate holes for the pipe bells. Lay pipe in a straight line and install with uniform grade to line with batten boards set not more than 24" apart. Close open ends of pipe with a stopper when pipe laying is not in progress. Center spigots accurately in bells for uniform caulking. Provide a smooth and uniform invert in the system. Drilling or tapping of soil and waste lines, and saddle hubs and bands are not permitted. Locate and install soil and waste lines as indicated on the drawings. Determine exact locations in such a manner as to maintain proper clearance. Prior to installation of any building drain pipe, verify elevation of connection point of existing sewer, service line or existing tenant connections indicated on the drawings. If the installation will not tie into the indicated invert elevation point while maintaining proper fall, notify architect so that an alternative may be determined.

Above Ground Installation For Soil, Waste And Storm: Install piping to a uniform slope of not less than 1/8" per foot for piping 3" or larger, and not less than 1/4" per foot for piping 2-1/2" or smaller. Lay pipe at uniform slope free from sags. Support pipe within 12" of each joint. Make changes in direction from horizontal to vertical, at fixture branches and other branch connections with sanitary "tees" or short sweep "ells". Make changes in direction from vertical to horizontal or horizontal to horizontal with long radius fittings, long sweeping "ells", combination "y" and 1/8 bend" fittings, or 45 degree "ells" (1/8 bend fittings), 1/6 bend or 1/16 bend and "y" fittings. Provide a smooth and uniform invert in the system. Drilling or tapping of soil and waste lines, and saddle hubs and bands are not permitted. Locate and install soil and waste lines as indicated on the drawings. Determine exact locations in such a manner as to maintain proper clearance.

PLUMBING VENT: Connect plumbing vent pipes to fixture drain pipes as indicated on the drawings or as required by the installation practices adopted and enforced by local codes official, and extend vent pipes full size through the roof line. Grade pipe to a uniform slope so as to drain back by gravity to the drainage piping system. Vents passing through the roof shall be minimum 3" size except in tropical climates, per local codes. Turn flashing down into stacks at least 2", and extend flashing 24" in all directions from the pipe at the roof line. Apply white lead pipe dope on male steel pipe threads. Vent lines shall be air and water tight. Vent floor drains individually or connect them to a horizontally vented line as shown on the drawings.

DOMESTIC WATER: Arrange cold, hot, and hot water recirculation piping to drain at the lowest point in each system. Install at least one pipe union adjacent to all shut-off valves, at connection points of each piece of equipment, and elsewhere in the system where required to allow proper maintenance. Provide accessible shut off valves for expansion and contraction where required by the installation. Make allowance for expansion in exterior walls, hold pipe as close as possible to the interior face of wall and install insulation batt or other insulation (minimum R-8) between piping and the exterior wall face.

NATURAL GAS: Pitch natural gas piping, and provide accessible dirt legs at the low points. Take branch pipes off the top or sides of main pipes, to prevent accumulation of water in the branches. Install gas piping valves and unions only in accessible locations. Do not install gas pipe below the base slab.

22A 2-5 PIPING SANITIZATION

Sanitize the entire domestic water piping system (cold, hot, and hot water return) with a solution containing not less than 50 ppm available chlorine. Keep solution in the system for a minimum of 24 hours, with each valve being operated several times during the period. After completion, flush system with city water until chlorine residual is lowered to incoming city water level.

22A 2-6 PIPE AND VALVE MARKERS

Provide manufacturer's standard pre-printed, semi-rigid snap-on or permanent adhesive, pressure-sensitive vinyl pipe markers. Pipe markers shall be color-coded complying with ANSI A13.1.

Install pipe markers on each plumbing piping system and include arrows to show normal direction of flow.

Locate pipe markers and color bands wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior non-enclosed locations.

Provide plastic laminate or brass valve tag on every valve, cock and control device in each plumbing piping system; exclude check valves, valves within factory-fabricated equipment units, plumbing fixture faucets, convenience and lawn-watering hose bibbs, and shut-off valves at plumbing fixtures and similar rough-in connections of end-use fixtures and units.

22A 2-9 AIR ADMITTANCE VALVES

Provide air admittance valves where indicated on drawings. Air admittance valves shall meet ASSE 1050 or 1051 where applicable by Studor or equal, by Oatey, Proseal, or Rectoseal. Install per code and manufacturer requirements.

22A 3 PLUMBING SPECIALTIES

22A 3-1 WATER HAMMER ARRESTORS, AND TRAPS Provide water hammer arrestors at valves or batteries of fixtures as indicated on the drawings to prevent water hammer. Arrestors shall be Josam, Jay R. Smith, Precision Plumbing Products, Proflo, Sioux Chief, Wade, Watts, or Zum, stainless steel bellows type, or o-ring sealed and lubricated acetal piston. Install water hammer arrestors per the Plumbing and Drainage Institute PDI WH-201 installation instructions. Installation of arrestors at batteries of fixtures precludes the requirement for individual air chambers at each battery fixture. Air chambers are not acceptable as a substitute for water hammer arrestors.

Provide water-seal traps on floor drains, fixtures and equipment with drain connections, including traps not furnished in combination with fixtures and equipment. Place trap on close to the fixture or drain as possible. Exposed traps in finished spaces shall be chrome-plated brass.

Provide conventional "p" type trap, water-sealed self-cleaning design. Full "s" traps or trap standards shall be used only where specifically called for on the drawings or elsewhere in this specification. Trap water seals shall not be less than 2", and deep seal traps shall be provided where specified or indicated. Each trap not integral with the fixture or floor drain or installed below the base slab shall be provided with an accessible cleanout of adequate size. Provide trap primers where required by code and where indicated on the drawings.

22A 3-2 CLEANOUTS, FLOOR DRAINS AND ROOF DRAINS

Cleanouts, floor drains and roof drains shall be by one manufacturer if possible. Acceptable manufacturers are Josam, Jay R. Smith, Wade, Watts, Mifab, and Zum.

Provide long sweep fittings for cleanout extensions; short sweeps at start of runs or change in direction and combination wye and eighth bend fittings in horizontal runs. Install cleanouts with a minimum of 18" clear all around, consult local codes for other requirements, for easy system maintenance. Install plug with teflon joint compound.

FLOOR DRAINS: Shall be as scheduled on the drawings, manufactured by Zum or equivalent by ABT, Inc., Polydrain, Quazite, Mifab, Jay R. Smith - ACO or NDS.

TRENCH DRAINS: Shall be as scheduled on the drawings, manufactured by Zum or equivalent by ABT, Inc., Polydrain, Quazite, Mifab, Jay R. Smith - ACO or NDS.

FLOOR CLEANOUTS: Shall be as scheduled on the drawings. Install cleanouts at points as noted on the drawings, at the building exit; at a minimum of every 50 feet in horizontal soil and waste lines; and at turns of pipe greater than 45 degrees cleanouts shall be full size of the pipe up to 4", and 4" size for pipes larger than 4". Determine the type of floor covering to be used at each floor cleanout location and provide top with variations suitable for floor covering (carpet markers, recessed for tile and scotiated for unfinished floor). Rough-in and install each floor cleanout flush with the finished floor construction.

EXTERIOR CLEANOUTS: Shall be as scheduled on the drawings. Install cleanouts at points as noted on the drawings, at the building exit; at a minimum of every 100 feet in horizontal soil, waste and service lines. Embed each exterior cleanout in a block of concrete, flush with finished grade. Coordinate size of block with construction documents.

WALL CLEANOUTS: Shall be as scheduled on the drawings. Install wall cleanouts at points as noted on the drawings; at the foot of each soil, waste or interior downspout stack; at horizontal soil and waste branches longer than five feet not served by a floor cleanout; consult local codes for installation at specific fixture types. Install wall cleanouts above the flood rim of the fixture served within four feet of the floor and install extensions from the cleanout tee to the wall to locate the plug within 2" of the wall where required. Install cleanouts on urinals and sinks where required by code.

ROOF DRAINS: Shall be as scheduled on the drawings. Provide with roof sump receiver, extension, secondary flashing clamps and underdeck clamp as required; provide expansion joints where required. Provide overflow roof drains where indicated on the drawings with inlet flow line 2" above the primary roof drain inlet.

BACKWATER VALVES - removable flapper type: Shall be as scheduled on the drawings by Cleancheck or equal, by Mainline Backflow Products or Spears.

22A 3-3 VALVES, STRAINERS, HOSE BIBBS, AND UNIONS

Plumbing system valves shall be Crane Company or Nibco of models herein specified, or equivalent by Hammond, Milwaukee, Stockham or Mueller Valves. Valves shall be of the best quality, designed for 125 psi steam working pressure. Install valves on the hot and cold water lines at the water heater connections and other items of equipment, at branches from mains serving groups of fixtures, and at other places indicated or required by the installation to allow ease of future maintenance

GATE VALVES: Class 125, size 2" and smaller shall be Nibco #S-113-LF non-rising stem, soldered lead free bronze body and parts, with wedge disc. Gate valves 2-1/2" and larger shall be Crane #465-1/2 or Nibco #517-0, OS&Y, iron body flanged wedge gate with brass seats and stem.

BALL VALVES (may be used in lieu of gate valves up to 2"): 2" and smaller, Nibco #S-685-90-LF; two piece lead free bronze body, with soldered ends, chrome plated bronze ball with conventional port, 600 psi, blow-out proof stem.

GLOBE VALVES: Globe valves shall be Class 125. Globe valves 2" and smaller shall be Milwaukee #UP1502, screwed lead free bronze body and brass disc. Globe valves 2-1/2" and larger shall be Crane #351 iron body flanged valve with brass trim.

CHECK VALVES: Check valves shall be Class 125. Check valves for installation in horizontal pipe runs shall be of the "swing disc" design. Horizontal check valves 2" and smaller shall be Milwaukee #UP1509 or Nibco #S-413-Y-LF with soldered lead free bronze body and bronze disc. Horizontal check valves 2-1/2" and larger shall be Crane #473 or Nibco #-918 iron body flanged valve with brass trim. Check valves for installation in vertical pipe runs shall be of the "vertical lift" spring loaded design. Vertical check valves 2" and smaller shall be Milwaukee #UP1548T or Nibco #S-480-Y-LF with soldered lead free bronze body and bronze disc. Vertical check valves 3" and larger shall be center guided.

GAS COCKS: Gas cocks 2" and smaller shall be Homestead #511, screwed iron body with brass trim and flat head. Gas cocks 2-1/2" and larger shall be Homestead #612 flanged semi-steel body with iron trim and square head. Equivalent are Flowserve-Nordstrom or RM Energy Systems "Hercules"

THERMOSTATIC MIXING VALVES: Thermostatic mixing valves shall be Powers as described on the drawings or equal Armstrong, Bradley, Leonard, Lawler, Symmons or Watts meeting ASSE 1070 with brass body, non-corrosive internal parts, lamp resistor temperature adjustment union inlets and check stops with strainers. Set temperature at 110 deg. F for hand washing.

EMERGENCY MIXING VALVES: Emergency mixing valves shall be Powers as described on the drawings or equal by Armstrong, Bradley, Leonard, Lawler, Symmons or Haws meeting ASSE 1071 complete with chrome plated bronze body construction, full flow cold water by-pass, non-corrosive internal parts, lamp resistor temperature adjustment, dial thermometer, union inlets with strainers, checks, and stops. Refer to construction documents for required temperature setting.

GAS LINE PRESSURE REGULATORS: Gas line pressure regulators shall be by American Meter Company, Fisher, Itron, Maxitrol or Sensus with capacities as scheduled on the drawings. Regulators shall be single stage, steel jacketed, corrosion-resistant type with interstitial relief valve with atmospheric vent, elevation compensator; with threaded ends, for inlet and outlet.

BALL VALVES FOR DEIONIZED WATER: Ball valves shall be by Chemtrol, or R&G Sloane. Valves shall be Schedule 80 PP PVDF true union full port ball type with mechanical couplings. Coordinate requirement for // PP / / PVDF // pipe with ASTM Type I quality deionized water.

STRAINERS: Strainers 2" and smaller shall be Watts #S777SI or Watts #LFS777SI with soldered lead free bronze, brass cap and Monel 40 mesh screen. Strainers 2-1/2" and larger shall be Watts #77F-DH-FA-125 with flanged iron body with fused FDA epoxy coating, bolted iron cap and stainless steel screen with 116" perforations. Strainers size 2-1/2" and larger shall have a 1" blow-off line with a 1" gate valve connected to the blow-off connection and shall be extended to the nearest floor drain.

DRAIN VALVES IN INTERIOR HOSE BIBBS: Woodford #24P, equivalent by Watts, Zum, or J.R. Smith with rough brass body, 1/2" screwed inlet, with 3/4" hose thread outlet, integral vacuum breaker, wheel handle and composition disc.

EXPOSED INTERIOR HOSE BIBBS: Chicago #952, equivalent by Watts, Zum, or J.R. Smith with chrome plated brass body, 3/4" screwed inlet, 3/4" hose thread outlet, integral vacuum breaker, wheel handle and composition disc.

HOT & COLD WATER MIXING HOSE BIBBS: Chicago #897-CP-HC, equivalent by Watts, Zum, or J.R. Smith with vacuum breaker, stops in tanks with integral checks, and 3/4" hose thread outlet.

WALL HYDRANTS: Jay R. Smith #5609-QT "non-freeze" surface type with cast bronze satin nickel plated face, with integral vacuum breaker, 3/4" hose connection, adjustable wall clamp, removable key handle operator; or equal by Woodford, Josam, Prier, Wade, Watts or Zum. Provide accessible shut off valve and water hammer arrestor inside building.

MILD CLIMATE WALL HYDRANTS: Mifab #MY-25 surface type with top or bottom feed close coupled connection for installation in a 4" nominal wall, cast bronze satin nickel plated face, with integral vacuum breaker, 3/4" hose connection, adjustable wall clamp, removable key handle operator; or equal by Woodford, Josam, or Zum. Provide accessible stop valve and water hammer arrestor inside building.

SANITARY POST HYDRANTS: Hoepfner "freeze-flow executive" or equal by Woodford, Watts, Zum, or J.R. Smith meeting ASSE #1057.

SANITARY ROOF HYDRANTS: As scheduled on the drawings, by Mapa, Woodford, Watts, Zum, or J.R. Smith.

UNIONS: Ferrous unions shall be Crane or equal, combination iron and brass, ground joint with screwed ends. Copper unions shall be Steamline or equal, cast bronze sweet type with ground joint. Ferrous to copper unions shall be Universal Controls or equal, dielectric type with threaded nylon insert.

FLOW CONTROL VALVES: For installation in hot water recirculation lines, shall be Bell & Gossett #RF-1/2S "circuit setter" or equal by Armstrong or Nibco with bronze body, brass ball, TFE seat rings, calibrated orifice, memory stop, readout valves with internal check valves, drain port and sweat connections. Provide ball valve, strainer and check valve upstream and union and ball valve downstream of each flow control valve. Set the flow control valves to the flows as indicated on the drawings.

PRESSURE REDUCING VALVES: Self-contained type shall be of the type as scheduled and indicated on the drawings by Watts or equal by Cash-Acme or Wilkins.

PRESSURE REDUCING VALVES: Pilot operated type shall be as scheduled on the drawings by Watts or equal by Clay-Val, OCV or Wilkins.

BACKFLOW PREVENTERS: Shall be of the type as scheduled and indicated on the drawings by Watts, Conbraco, Febco or Wilkins.

22A 3-5 WATER SERVICE ENTRANCE: PRESSURE REDUCING VALVE AND BACKFLOW PREVENTER

Provide a backflow preventer (BFP) of type required by local code, and a pressure reducing valve (PRV) if required by water pressure greater than 80 ps, on the domestic water service immediately downstream of the BFP at the water service entry. Set the PRV as indicated on the drawings. Provide a pressure gauge and hose bibb with isolation valve downstream of the BFP and/or PRV for system drain down. For water services 2" and smaller provide a Type "K" soft copper tube that runs continuously from five feet outside the building with sweeping bend to 12" above the floor slab. Provide a shut-off valve at 12" above the floor. There shall be no fittings under the floor slab. Provide a PVC sleeve two pipe sizes larger than the water pipe served and seal with caulk. For water services 3" and larger provide ductile iron pipe and fittings from five feet outside the building to 12" above the floor. Provide a shut-off valve at 12" above the floor. Provide a PVC sleeve two pipe sizes larger than the water pipe served and seal with caulk.

22A 3-6 SYSTEM ACCESSORIES

Thermometers shall be American 3" bi-metal dial type with separable socket, and shall be installed where indicated or required.

Pressure gauges shall be Ashcroft 3" dial type with shut-off cock, and shall be installed where indicated or required. Ice maker connection boxes shall be as specified on the drawings, Guy Gray #BIM875 or equivalent, with 20 gauge steel body, wall flange and water connection.

Trap guards shall be by Proset Systems of molded PVC enclosure that allows the flow of waste water and closes upon termination of flow. Install per manufacturer's installation instructions. Do not touch elastomeric plug or allow contact with primer or solvent cement.

22A 4 PLUMBING FIXTURES AND EQUIPMENT

22A 4-1 PLUMBING FIXTURES

Provide china fixtures as scheduled by American-Standard or equivalent by Crane, Eljer, Gerber, Kohler, Toto-kiki or Zum. Provide stainless steel sinks as scheduled by Elkay or equal by Just. Provide electric water coolers as scheduled by Elkay or equivalent by Acom / Aqua, Halsey Taylor or Haws. Provide mop sinks as scheduled by Stern-Williams or equal by Acom Engineering Co., Fiat or Florestone. Provide fixtures of same manufacturer where possible.

Fixtures shown on the drawings or specified herein shall be furnished and installed, set firm and true, connected to required piping services, thoroughly cleaned, left clean and ready for use. Exposed fittings and piping at the fixtures shall be chrome-plated, and water supply piping shall be valved at each fixture.

Vitreous china fixtures shall be of the best grade vitreous ware, without pit holes or blemishes, and the outlines shall be generally true. The engineer reserves the right to reject any pieces which, in his opinion, are faulty. Fixtures set against walls shall have ground backs and shall be caulked with silicone sealant of a matching color.

22A 4-2 PLUMBING FIXTURE TRIM
Faucets and trim in contact with drinking water shall meet or exceed the safe water drinking act (SWDA) lead-free standards of ANSINFS Standard 61, Section 9.

Provide faucets as scheduled on drawings.

Provide single lever handle faucets as scheduled on drawings.

Fixture p-traps shall be 17 gauge brass body with cleanout, 17 gauge seamless tubular wall bend with cast brass slip nut, shallow steel flange, all chrome plated.

Lavatory, sink and water closet supplies shall be solid brass angle or straight type with full turn brass stem, wheel handle or loose key types as noted on drawings, shallow steel flange, 3/8" copper riser flange, all chrome plated, final connection as required.

Lavatory drains shall be grid type chrome plated 17 gauge brass open grid with 1-1/4" x 6" long seamless brass tailpiece and brass locknut with heavy rubber basin washer and fiber friction washer.

Provide shower valves as scheduled on drawings.

Sink drains shall be basket type with chrome plated forged brass basket strainer and strainer body with 1-1/2" x 4" long seamless brass tailpiece and cast brass lock and coupling nuts.

Provide handicap insulation kits for lavatories and sinks on exposed water and waste pipes and fittings, including offset drain and continuous waste covers where required.

Provide flush valves as specified on drawings: Sloan or equivalent with chrome plated brass body, chloramine resistant diaphragm with protected orifice, screw driver angle stop, non-hold open feature and sweat adapter kit. Provide ADA handles on ADA compliant fixtures. Provide solid pipe ring supports for pipe hangers and hose bibbs anchored securely to wall where indicated on the drawings. Provide low consumption type valves with 1.28 gallons per flush for water closets and 0.125 gallons per flush for urinals.

Provide carriers for mounting wall mounted water closets and lavatories as described on the drawings. Securely fasten carriers to floor and test per manufacturer's recommendations prior to installation of partitions.

Secure wall-mounted water closet carriers to floor with 3/8" anchor bolts, including the anchor foot. Secure lavatory chair carriers to floor with 1/2" anchor bolts.

Furnish to the owner, with receipt, the spare parts to include faucet washers and o-rings, flushometer repair kits and water closet tank repair kits for the fixtures furnished under the construction documents for this project.

22A 4-3 WATER HEATER

Water heater shall be by A.O. Smith, Bradford-White, Lochinvar, State, Rheem, Ruud, or equivalent with capacity as scheduled on the drawings. Unit shall be electric gasless tank type complete with steel jacket, fiberglass insulation, magnesium anode, integral thermostats and controls, and temperature & pressure relief valve. Water heater shall be UL listed and meet ASHRAE 90.1B standards for thermal efficiency and standby heat loss.

Water heater shall be by A.O. Smith, Bradford-White, Lochinvar, State, Rheem, Ruud, or equivalent with capacity as scheduled on the drawings. Unit shall be gas-fired vertical tube tank type complete with glass lined cast iron or bronze header, steel jacket, fiberglass insulation, and factory mounted all bronze circulation pump. Provide heater with sealed combustion chamber, fan assisted combustion, factory vertical combustion air cap and exhaust electrical flue cap, 85% thermal efficiency, redundant gas valves, stainless steel burners, low switch and integral control panel. Control panel shall feature staged burner control, high limit shut-out, hot surface ignition system with flame monitoring system. Provide with tank drain and/or low water cutoff as required by local boiler code. Water heater shall be AGA approved and meet ASHRAE 90.1B standards for thermal efficiency and standby heat loss.

Relief valve: Water heater relief valve shall be of the test lever type, with automatic reset, combination temperature and pressure relief, and shall be ASME and AGA stamped and approved. It shall be installed directly on the heater tank, or in the hot water outlet, not more than 3" from the tank. The temperature shall be normally set to relieve at 210 deg. F and the pressure relief shall be at 125 psi. The relief valve discharge line shall be piped down and terminate 6" above a floor drain.

Vacuum relief valve: Watts #N36 or Wilkins #VR-10 with bronze body and silicon disc. Valve shall open at 0.5" Hg vacuum and be rated for 200 psig working pressure and 250 deg. F temperature. Install in cold water supply to each water heater downstream of the shutoff and check valves.

Recirculation pump: Shall be by Taco as scheduled on the drawings, or equal by Armstrong, Grundfos, or Bell & Gossett, of all bronze construction with aquastat and/or timer.

Expansion tank: Expansion tank shall be Amtrol "Therm-X-Trol" as scheduled on the drawings or equal by Armstrong, Bell & Gossett, Proflo, Taco, or Watts. Unit shall be constructed of welded carbon steel listed for 125 psig working pressure, with a FDA approved butyl rubber diaphragm, taps for pressure gage, air charging fitting, and drain fitting. Support as detailed on the drawings. Charge tank with air pressure equal to the static water pressure.

Storage tank: Hot water storage tank shall be as scheduled; by Lochinvar or equivalent welded carbon steel, vertical glass-lined type as noted on the drawings, listed for ASME labeled for 125 psig working pressure, magnesium anodes, threaded leg sockets on one head for vertical mounting, and pressure and temperature relief valve. Provide external insulation for tank if not factory insulated.

END OF SECTION 22A

1450 E. Zion Road, Suite 9
Fayetteville, Arkansas 72703



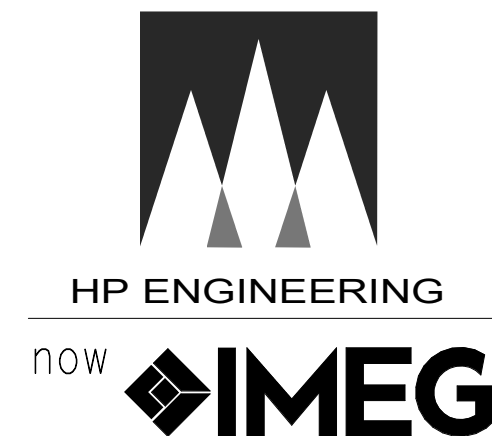
architecture | engineering |

1 OVERALL PLUMBING SITE PLAN
P-100 1" = 80'-0"

IMEG 5504 W. PINNACLE POINTE DRIVE
SUITE 200
ROGERS, AR 72758
P. 479.899.6370
www.imegcorp.com

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REF. SCALE IN INCHES PROJECT #6221019R



PHILLIPS PARK

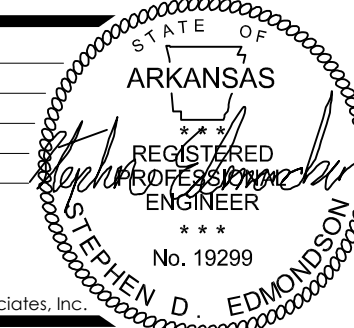
3108 SE J Street
Bentonville, AR

Key Plan

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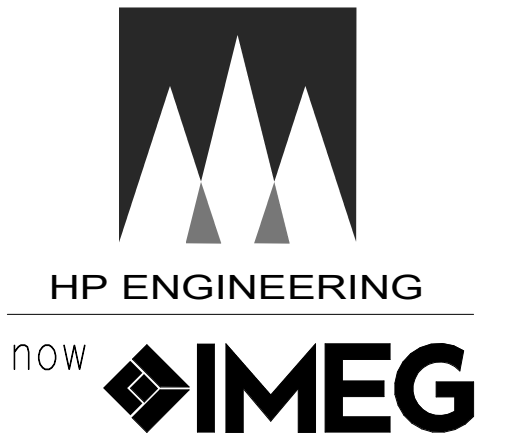
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ISSUE DATE: 01/30/26
CONTACT: W. BURGESS
QC BY:
QC DATE:



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OVERALL PLUMBING SITE PLAN

P-100



PHILLIPS PARK

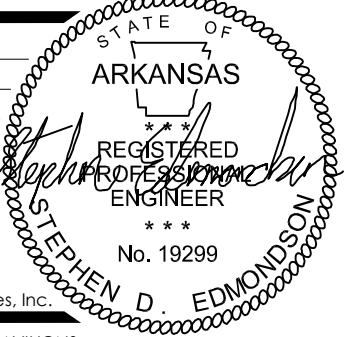
3108 SE J Street
Bentonville, AR

Key Plan

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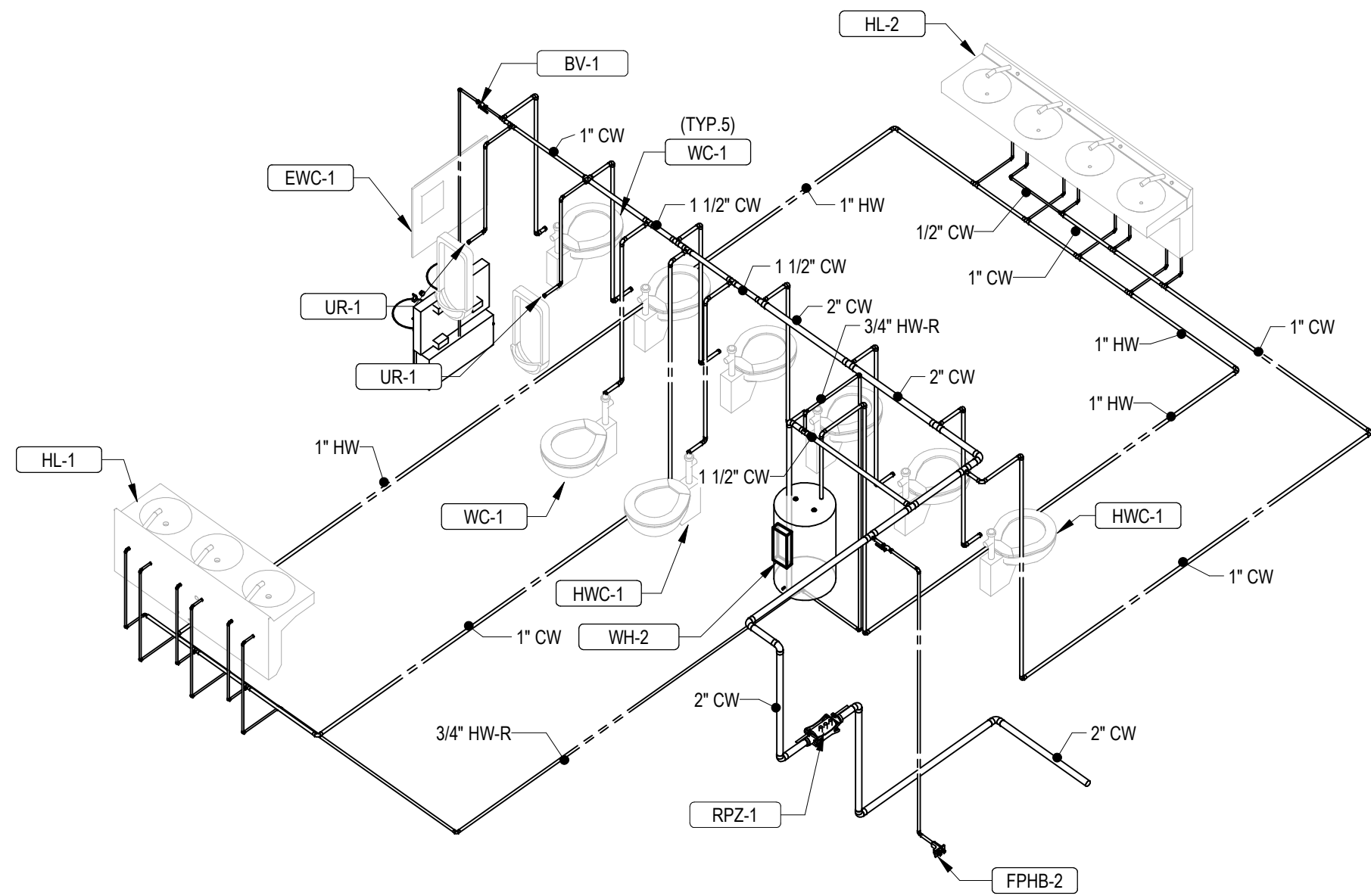
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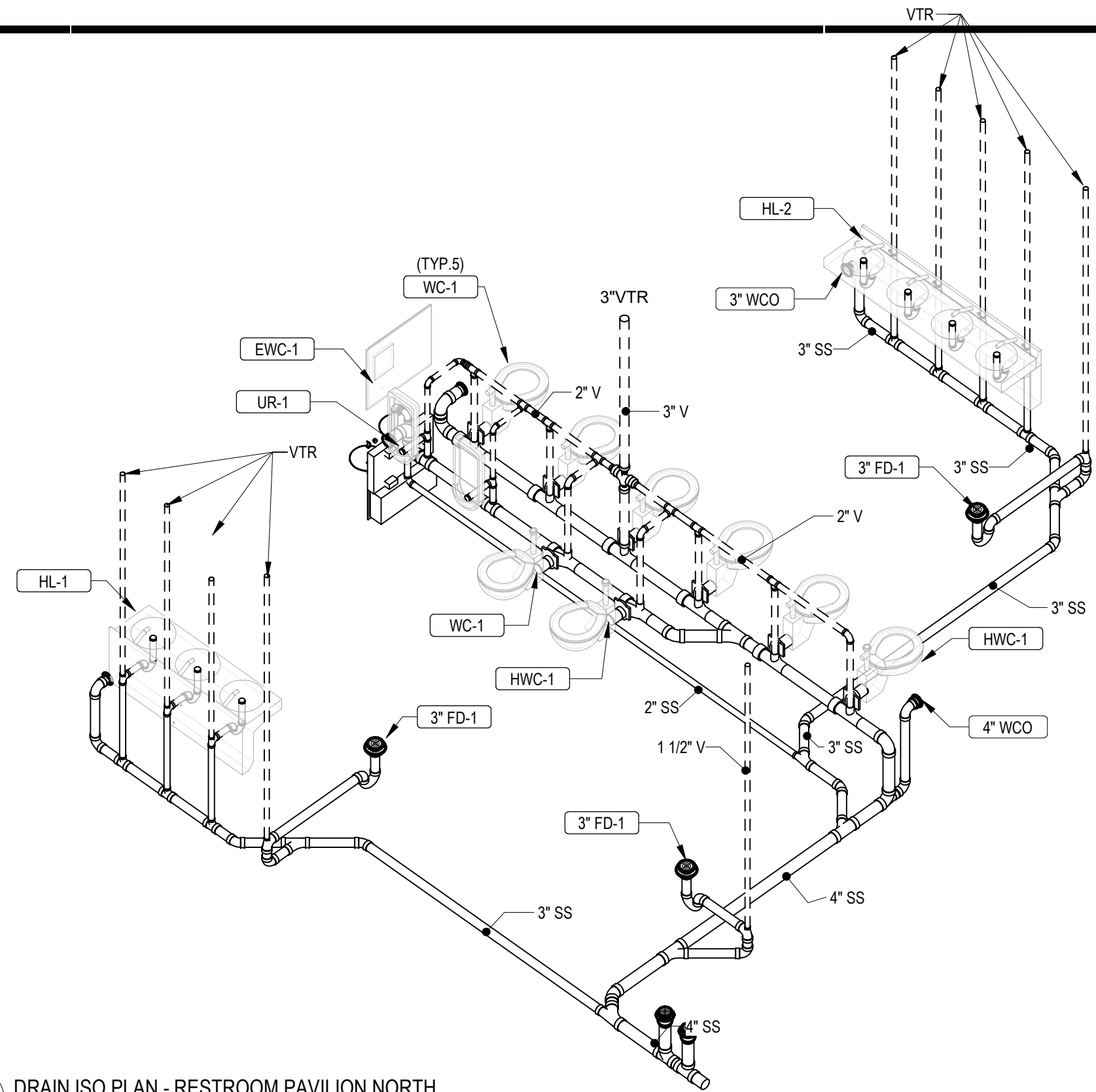


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PLUMBING PLAN - RESTROOM PAVILIONS

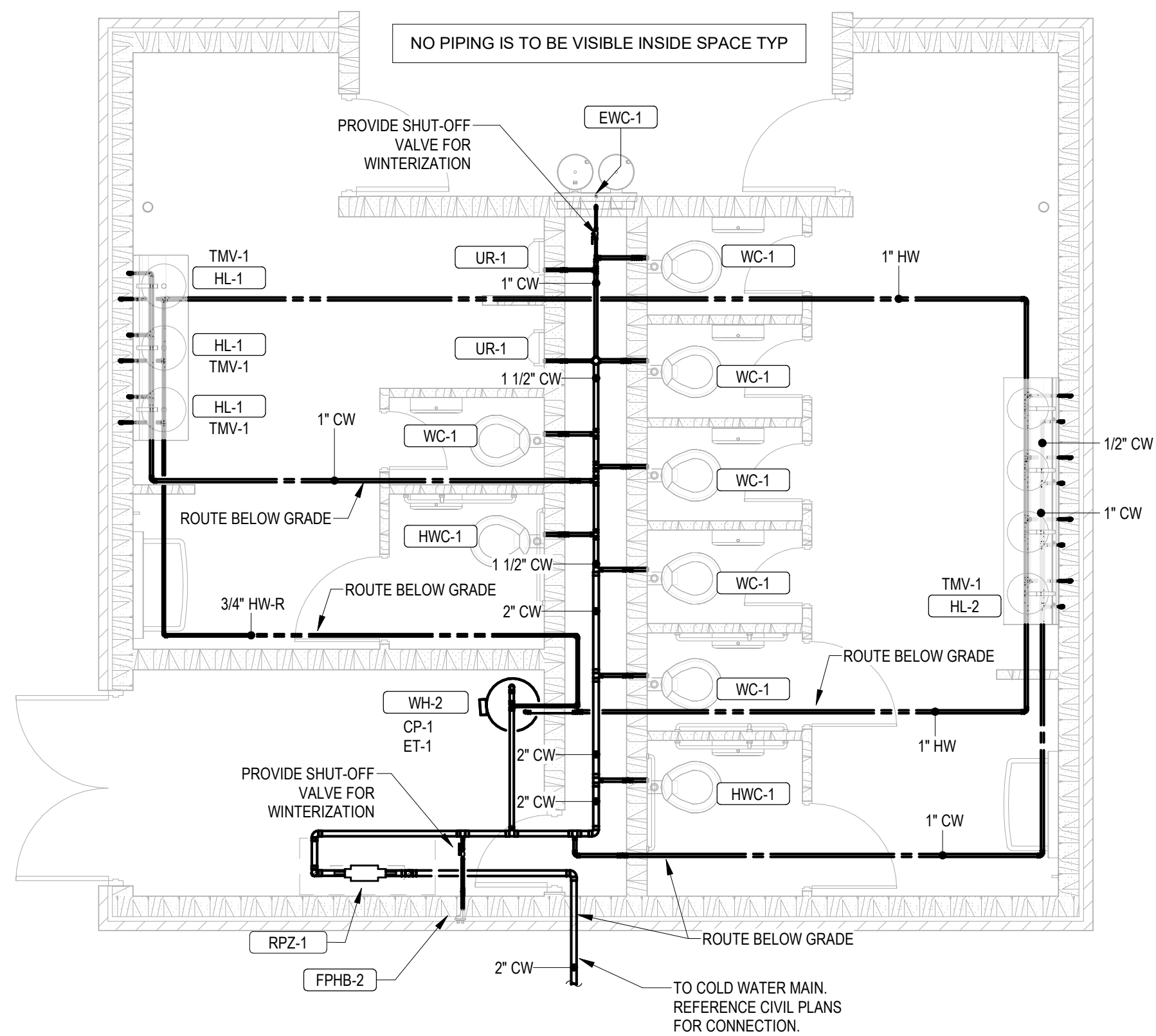
P-104



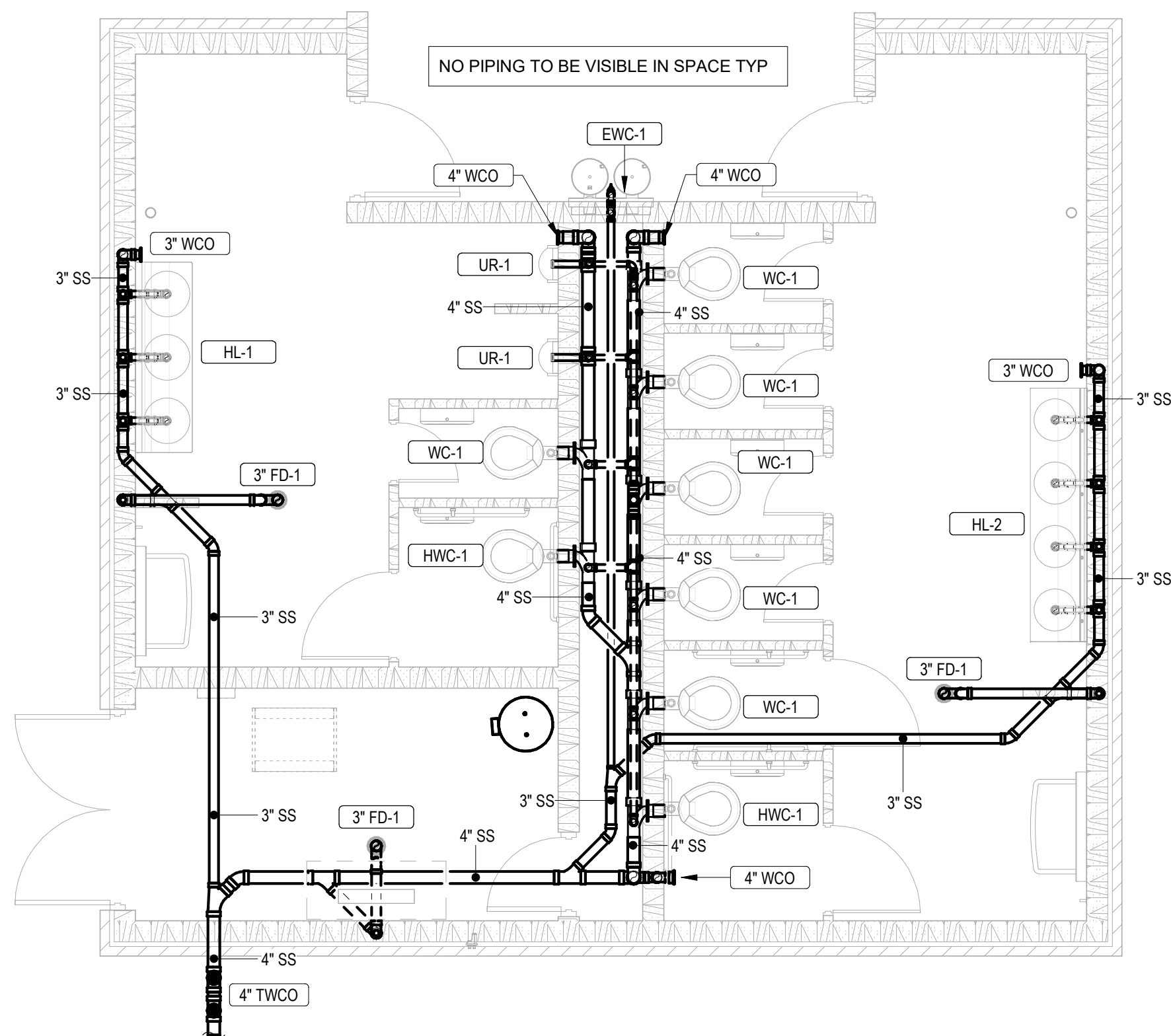
2.2 SUPPLY ISO PLAN - RESTROOM PAVILION NORTH
P-104



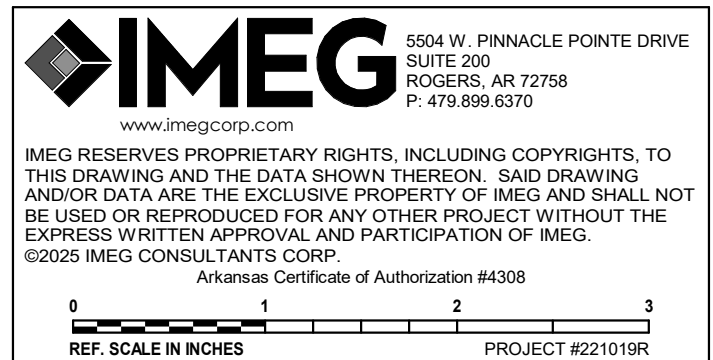
1.1 DRAIN ISO PLAN - RESTROOM PAVILION NORTH
P-104



2 SUPPLY PLAN - RESTROOM PAVILION NORTH
P-104 1/4" = 1'-0"



1 DRAIN PLAN - RESTROOM PAVILION NORTH
P-104 1/4" = 1'-0"



ROUGH-IN AND MOUNTING HEIGHT SCHEDULE

NOTES:

1. ALL VENT LINE SIZES SHOWN ARE MINIMUM UNLESS SHOWN LARGER ON RISER DIAGRAMS.
2. SIZES SHOWN FOR WASTE ARE FOR RISERS ONLY.
3. ALL DRAIN AND VENT LINES BELOW SLAB SHALL BE 2" OR LARGER.
4. VENT LINES SHALL RISE 6" ABOVE FLOOD LEVEL RIM BEFORE OFFSETTING HORIZONTALLY, EXCEPT FOR INTERCEPTORS LOCATED OUTDOORS.
5. SIZES SHOWN APPLY UNLESS NOTED DIFFERENTLY ON PLANS.

FIXTURE	WASTE	VENT	COLD WATER	HOT WATER	HEIGHT OF INSTALLATION
DRINKING FOUNTAIN	1-1/2"	1-1/2"	1/2"		NON-ADA 40" TO TOP OF ORIFICE ADA 36" TO TOP OF ORIFICE
FLOOR DRAINS/SINKS	2"	1-1/2"			
JANITOR'S SINK	3"	1-1/2"	1/2"	1/2"	
LAVATORIES AND SINKS, WALL MOUNTED	1-1/2"	1-1/4"	1/2"	1/2"	NON-ADA 31" TO TOP OF RIM ADA 34" TO TOP OF RIM
URINAL FLUSH VALVE WALL MOUNTED	2"	1-1/4"	1"		NON-ADA 24" TO TOP OF FLOOD LEVEL ADA 17" TO TOP OF FLOOD LEVEL
WATER CLOSET FLUSH VALVE WALL MOUNTED	3"	1-1/2"	1-1/4"		NON-ADA 15" TO TOP OF BOWL ADA 17" TO TOP OF BOWL

FIXTURE SCHEDULE

FIXTURE					FAUCET/VALVE			DESCRIPTION	SCHEDULE NOTES
FIXTURE TAG	TYPE	MANUFACTURER	MODEL	MATERIAL DESCRIPTION	MANUFACTURER	MODEL	TYPE		
EWC-1	WATER COOLER - DUAL HEIGHT - ADA	MOST DEPENDABLE BRAND	10495 WMSS					ADA APPROVED, W/ TOUCH PADS ON FRONT. FLEXIBLE SAFETY BUBBLER, P-TRAP, WATER VALVE, MLP200 CARRIER. MOUNT UNIT AT ADA COMPLIANT HEIGHT. BLACK FINISH	115V, 1PH, 370W
HL-1	LAVATORY - WALL HUNG - ADA	ACORN	3713				MANUAL	TMV-1, ZURN Z8743-PC GRID STRAINER, ZURN Z8700 SERIES P-TRAP, ZURN Z8800 SERIES STOP WITH FLEXIBLE SUPPLIES AND TURN KEY, ZURN Z8946-1-NT ADA TRAP, STOP AND SUPPLY PROTECTOR PVC TYPE INSULATION AROUND 1" TRAP & IPS CONNECTIONS, CONCEALED ARM CARRIER SYSTEM, THREE HOLES ON DECK 4" CENTERS	
HL-2	LAVATORY - WALL HUNG - ADA	ACORN	3714				MANUAL	TMV-1, ZURN Z8743-PC GRID STRAINER, ZURN Z8700 SERIES P-TRAP, ZURN Z8800 SERIES STOP WITH FLEXIBLE SUPPLIES AND TURN KEY, ZURN Z8946-1-NT ADA TRAP, STOP AND SUPPLY PROTECTOR PVC TYPE INSULATION AROUND 1" TRAP & IPS CONNECTIONS, CONCEALED ARM CARRIER SYSTEM, THREE HOLES ON DECK 4" CENTERS	
HWC-1	WATER CLOSET - WALL HUNG - ADA	ACORN	1685	STAINLESS STEEL	SLOAN	152 ESS	MANUAL	1.28 GPF SIPHON JET BOWL, EZ-FLO 65913 OPEN FRONT SEAT, J.R. SMITH 0210-M54-XK 1000# CARRIER, ANTIMICROBIAL CERAMIC GLAZE. INSTALL AT ADA COMPLIANT HEIGHT.	
UR-1	URINAL	ACORN	1702	STAINLESS STEEL	SLOAN	190 ESS	MANUAL	INTEGRAL ELONGATED FLUSHING RIM, INTEGRAL TRAP, 2" FEMALE FLANGED OUTLET CONNECTION, J.R. SMITH 0615 URINAL SUPPORT.	
WC-1	WATER CLOSET - WALL HUNG	ACORN	1685	STAINLESS STEEL	SLOAN	152 ESS	MANUAL	1.28 GPF SIPHON JET BOWL, EZ-FLO 65913 OPEN FRONT SEAT, J.R. SMITH 0210-M54-XK 1000# CARRIER, ANTIMICROBIAL CERAMIC GLAZE. INSTALL AT ADA COMPLIANT HEIGHT.	

PLUMBING ACCESSORIES SCHEDULE

FIXTURE TAG	DESCRIPTION	MANUFACTURER	TRIM	ELECTRICAL REQUIREMENTS
BV-1	BALL VALVE	APOLLO INTERNATIONAL 94ALF-A	LEAD FREE BALL VALVE, FULL PORT, BLOWOUT-PROOF, PRESSURE RETAINING, ADJUSTABLE STEM PACKING NUT	
COTG-1	CLEANOUT TO GRADE, SPEEDI-SET OUTLET	J. R. SMITH 4237	UNFINISHED FLOOR CLEANOUT WITH ADJUSTABLE ROUND CAST IRON TRACTOR COVER TOP. DUCO CAST IRON CLEANOUT WITH ROUND ADJUSTABLE SCORIATED SECURED CAST IRON TOP. TAPERED THREAD BRONZE PLUG, REFER TO PLANS FOR SIZES	
CP-1	CIRCULATING PUMP	ARMSTRONG ASTRO 230 SS	THREE SPEED, BRONZE BODY WITH BRASS IMPELLER, WITH AQUASTAT AND AUTOMATIC TIMER KIT, 6 GPM @ 10 HEAD-FEET	115V, 1PH, 97 WATTS
ET-1	EXPANSION TANK	WATTS PLT-5	STAINLESS STEEL CONNECTION, WELDED STEEL CONSTRUCTION, POLYPROPYLENE LINER, BUTYL DIAPHRAGM, GROOVED DIAPHRAGM HOOP RING, WELDED AIR CHARGE FITTING	
RPZ-1	REDUCE PRESSURE PRINCIPLE BACKFLOW PREVENTER, FOR DOMESTIC WATER	WATTS LFO09M2 QT	PROVIDE SAME SIZE AS WATER LINE FROM METER, WATTS BALL VALVES AND "Y" STRAINER, SHALL MEET APPROVAL BY FOUNDATION FOR CROSS CONNECTION CONTROL AND HYDRAULIC RESEARCH AT THE UNIVERSITY OF SOUTHERN CALIFORNIA	
TMV-1	THERMOSTATIC MIXING VALVE - POINT OF USE	LEONARD 270-LF	LEAD FREE, INTEGRAL CHECK VALVE AND STRAINER, PROVIDE, TEMPERATURE CONTROL SET AT 110°	
WCO-1	WALL CLEANOUT	J. R. SMITH 4510	DUCO CAST IRON CLEANOUT TEE, BRONZE PLUG, REMOVABLE STAINLESS STEEL COVER. REFER TO PLANS FOR SIZE, PROVIDE ROUND OR SQUARE FRAME AND COVER AS REQUIRED, REFER TO ARCHITECT	
WHA-1	WATER HAMMER ARRESTOR	SIOUX CHIEF 650&660 HYDRARESTER	VACURESTER VACUUM BREAKER ARRESTER, TYPE L COPPER CONSTRUCTION, IF AN ACCESS DOOR IS NEEDED CONTACT THE ARCHITECT	

ELECTRIC WATER HEATER SCHEDULE

ID	MANUFACTURER	MODEL NO.	TYPE	VOL	POWER	VOLT	PH	UNIT WEIGHT	REMARKS
WH-2	AO SMITH	DEN-30	STORAGE	30.0 gal	6.0 kW	208 V	3	349 lb	PROVIDE ASSE 1017 COMPLIANT MIXING VALVE; POWERS SERIES LF5H OR EQUAL. (2) 3KW HEATING ELEMENTS WIRED TO OPERATE SIMULTANEOUSLY

FLOOR DRAIN SCHEDULE

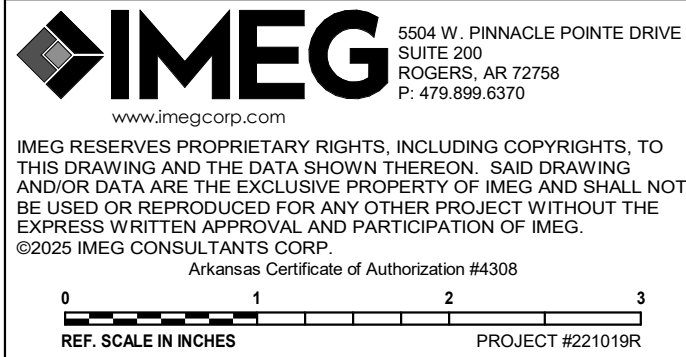
ID	DESCRIPTION	MANUFACTURER	MODEL	MATERIAL DESCRIPTION		SPECIFICATION	REMARKS
				DRAIN BODY	STRAINER		
FD-1	FLOOR DRAIN	MIFAB	F1000	EPOXY COATED CAST IRON	STAINLESS STEEL	CAST IRON BODY, ANCHOR FLANGE. SECURED ROUND ADJUSTABLE STRAINER HEAD WITH HOLE GRATE, LOOSE GRATE AND SEDIMENT BUCKETS, MIFAB TRAP GUARD, REFER TO PLANS FOR SIZES.	

PIPING MATERIAL SCHEDULE

DESCRIPTION	MATERIAL
ABOVE GROUND SANITARY SEWER AND VENT	PVC SCHEDULE 40 PIPE AND FITTINGS EXCEPT IN PLENUM RETURN AREAS. IN PLENUM RETURN AREAS WRAP PVC WITH 1" FIRE WRAP.
UNDERGROUND SANITARY SEWER AND VENT PIPING INSIDE BUILDING AND OUTSIDE BUILDING	PVC SCHEDULE 40 PIPE AND FITTINGS.
WATER DISTRIBUTION PIPE	WATER DISTRIBUTION PIPE SHALL CONFORM TO NSF 61 AND SHALL BE COPPER AND CONFORM TO THE STANDARDS LISTED IN TABLE 605.4 OF THE I.P.C
WATER SERVICE PIPE	WATER SERVICE PIPE SHALL CONFORM TO NSF 61 AND SHALL BE COPPER AND CONFORM TO THE STANDARDS LISTED IN TABLE 605.3 OF THE I.P.C

PLUMBING PIPING INSULATION SCHEDULE

DESCRIPTION	INSULATION TYPE	INSULATION THICKNESS				
		NOMINAL PIPE SIZE				
		<1	1 TO <1-1/2	1-1/2 TO <4	4 TO <8	≥8
DOMESTIC COLD WATER PIPING BELOW GRADE	PVC OR HDPE JACKET ONLY, NO INSULATION	1	1	1.5	1.5	1.5
WATER COOLER TRAPS, ALL EXPOSED LAVATORY AND SINK TRAPS, TAILPIECES, HOT AND COLD WATER SUPPLY LINE/SINGLE VALVES TO THESE DEVICES	EQUIVALENT TO TRUEBRO 102 E-Z PIPE COVER	0.125	0.125	0.125	0.125	0.125
DOMESTIC COLD WATER, HOT WATER, AND HOT WATER RETURN PIPING ABOVE GRADE	ELASTOMERIC, ADD ASTM E84 COMPLIANT JACKET IN AIR PLENUM SPACES	1	1	1.5	1.5	1.5
PVC WASTE DRAIN IN WALLS, AND WASTE VENT IN ALL AREAS ABOVE GRADE	COMPRESSED FIBERGLASS OR ELASTOMERIC WITH ASTM E84 COMPLIANT JACKET	1"	1"	1.5"	1.5"	1.5"



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PHILLIPS PARK

3108 SE J Street
Bentonville, AR

Key Plan

[illegible]

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PROJECT NO: 21108300

ISSUE DATE: 01/30/26

CONTACT: W. BURGESS

QC BY: _____

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PLUMBING SCHEDULES

P-601

ABBREVIATIONS			
Ø	ROUND	LVR	LOUVER
ABV	ABOVE	LWT	LEAVING WATER TEMPERATURE
AC	AIR CONDITIONING	MA	MIXED AIR
AD	AREA DRAIN	MAX	MAXIMUM
ADD	ADDENDUM	MBH	ONE THOUSAND BTU PER HOUR
AFB	AFTER FINISHED FLOOR	MCF	ONE THOUSAND CUBIC FEET
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	MD	MOTORIZED DAMPER
ALT	ALTERNATE	MECH	MECHANICAL
AP	ACCESS PANEL	MFR	MANUFACTURER
ARCH	ARCHITECT/ARCHITECTURAL	MIN	MINIMUM
BFF	BELT FINISHED FLOOR	MC	MISCELLANEOUS
BLW	BELOW	MTR	MOTOR
BTU	BRITISH THERMAL UNITS	MUJA	MAKE-UP/AIR
BTUH	BRITISH THERMAL UNITS PER HOUR	NC	NOISE CRITERIA
CAP	CAPACITY	NC	NORMALLY CLOSED
CB	CATCH BASIN	NIC	NOT IN CONTRACT
CFM	CUBIC FEET PER MINUTE	NO	NUMBER
CLG	CEILING	NO	NORMALLY OPEN
CO	CLEAN OUT	NTS	NOT TO SCALE
CW	COLD WATER	O	OXYGEN
D	DEGREE	O/A	OUTSIDE AIR
DB	DRY BULB	ORD	OVERFLOW ROOF DRAIN
DIA	DIAMETER	PD	PRESSURE DROP
DN	DOWN	PV	POST INDICATOR VALVE
DW	DISTILLED WATER	PLBG	PLUMBING
E	EACH	PRESS	PRESSURE
EAT	ENTERING AIR TEMPERATURE	PRV	PRESSURE REDUCING VALVE
ELEC	ELECTRICAL	PSI	POUNDS PER SQUARE INCH
EQUIP	EQUIPMENT	PSIG	POUNDS PER SQUARE INCH GAUGE
EW	ELECTRIC WATER COOLER	PWR	POWER
EWT	ENTERING WATER TEMPERATURE	R	DUCT RISER
EIA	EXHAUST AIR	RA	RETURN AIR
EXIST	EXISTING	RCP	RADIANT CEILING PANEL
F	DEGREES FAHRENHEIT	RD	ROOF DRAIN
FCO	FLOOR CLEAN OUT	REC	RECESSED
FD	FLOOR DRAIN	RED	REDUCER
FDC	FIRE DEPARTMENT CONNECTION	RH	RELATIVE HUMIDITY
FL	FLOOR	RLA	RELIEF AIR
FO	FUEL OIL	RM	ROOM
FVO	FUEL OIL VENT	RPM	REVOLUTIONS PER MINUTE
FOR	FUEL OIL RETURN	RW	RAIN WATER
FOS	FUEL OIL SUPPLY	SF	SQUARE FOOT
FBM	FEET PER MINUTE	S/A	SUPPLY AIR
FS	FLOOR SINK	SAN	SANITARY
FT	FOOT/FEET	SF	SQUARE FOOT
FTR	FIN TUBE RADIATION	SD	SMOKE DAMPER
GAL	GALLON	SM	SURFACE MOUNT
GC	GAS FIRED	SP	STANDPIPE
GC	GENERAL CONTRACTOR	SP	STATIC PRESSURE
GPM	GALLONS PER MINUTE	STM	STEAM
GW	GREASE WASTE	T	THERMOSTAT
HB	HOSE BIB	TD	TEMPERATURE DROP
HP	HORSE POWER	TDR	TEMPERATURE
HTG	HEATING	TEMP	TEMPERATURE
HTR	HEATER	TYP	TYPICAL
HW	HOT WATER	UG	UNDERGROUND
HYD	HYDRANT	VAC	VACUUM
ID	INDIRECT	V	VENT
IN	INCH	VAV	VARIABLE AIR VOLUME
INV	INVERT	VENT	VENTILATION
LB	POUND	VTR	VENT THROUGH ROOF
LBHR	POUNDS PER HOUR	W	WASTE
LAT	LEAVING AIR TEMPERATURE	WB	WET BULB
LP	LOW PRESSURE	WCO	WALL CLEAN OUT
LPG	LIQUEFIED PETROLEUM GAS	WH	WALL HYDRANT

HVAC SYMBOLS

DUCT SIZE TAGS

- 18"x12" SQUARE DUCT SIZE TAG (WIDTH x HEIGHT)
- 18"/12" OVAL DUCT SIZE TAG (WIDTH / HEIGHT)
- 18"Ø ROUND DUCT SIZE TAG (DIAMETER)
- 18"Ø SPIRAL DUCT SIZE TAG (DIAMETER)
- (E) EXISTING DUCT TAG
- DUCT BEING DEMOLISHED
- 18"x18" S/A SUPPLY AIR
- 18"x18" S-O/A CONDITIONED OUTSIDE AIR
- 18"x18" O/A OUTSIDE AIR
- 18"x18" R/A RETURN AIR
- 18"x18" T/A TRANSFER AIR
- 18"x18" E/A EXHAUST AIR
- 18"x18" L/A RELIEF AIR
- 18"x18" GE/A GREASE EXHAUST AIR
- 18"x18" CE/A CONDENSATE EXHAUST AIR
- 18"x18" SE/A SMOKE EXHAUST AIR
- 6"Ø BLUE EXHAUST GAS FLUE
- 6"Ø C/A COMBUSTION AIR

DUCT RISES

- DROP RECTANGULAR SUPPLY/OUTSIDE AIR DUCT RISE
- DROP ROUND SUPPLY/OUTSIDE AIR DUCT RISE
- DROP RECTANGULAR RETURN/TRANSFER AIR DUCT RISE
- DROP ROUND RETURN/TRANSFER AIR DUCT RISE
- DROP RECTANGULAR EXHAUST/RELIEF AIR DUCT RISE
- DROP ROUND EXHAUST/RELIEF AIR DUCT RISE

GRILLES, REGISTERS & DIFFUSERS TAG

TYPE (SEE SCHEDULE)

- SD1 400 10" / 24x24 22 H-5/7/14 CFM, NECK SIZE / MODULE SIZE, THROW-150FPM / 100FPM / 50FPM, THROW PATTERN, MAX NC RATING
- SD3 300 10" / 24x24 PERFORATED DIFFUSER WITH DEFLECTORS
- SD9 400 12" 1" ROUND DIFFUSER WITH ADJUSTABLE PATTERNS
- SG5 500 12"x10" LOUVERED DOUBLE DEFLECTION GRILLE
- SLB3 400 48"x2 1/2" LINEAR BAR GRILLE
- RG2 500 12"x10" / 24x24 18 EGGCRATE RETURN GRILLE
- RG11 500 12"x10" / 24x24 LOUVERED GRILLE

LINEAR DIFFUSER TAG

TYPE (SEE SCHEDULE)

- LSD1 200 1 1/4" - 0" / 8" 8" - 0" AFF CFM, NUMBER OF SLOTS / ACTIVE SLOT LENGTH (PLENUM LENGTH) / NECK SIZE, ELEVATION (CENTER OF FACE), SECTION TOTAL TRACK LENGTH
- LSD1 200 1 1/4" - 0" / 8"
- LSD1 200 1 1/4" - 0" / 8"

MECHANICAL EQUIPMENT TAGS

HEATING COIL FLOW Htg. 3.7 GPM VAV-XX VAV BOX

BOTTOM OF EQUIPMENT ELEVATION VAV-XX 10' - 0"

EXISTING EQUIPMENT TO REMAIN VAV-XX

EXISTING RELOCATED EQUIPMENT VAV-XX

EQUIPMENT BY OTHERS (REFER TO OTHER DISCIPLINE FOR ADDITIONAL INFORMATION) VAV-XX

OPERATING WEIGHT NOT INCLUDING CURB RTU-XX 590 lb

NOMINAL COOLING CAPACITY RTU-XX 4.0 ton

FUEL INPUT GAS PIPE FLOW RTU-XX 115000 Btu/h 115 CFH

ROOFTOP UNIT

DATA DEVICE TAGS

CARBON DIOXIDE SENSOR CO2 TH RTU-XX TEMPERATURE & HUMIDITY SENSOR

CARBON MONOXIDE SENSOR CO TS VAV-XX TEMPERATURE SENSOR

NITROGEN DIOXIDE SENSOR NO2 T THERMOSTAT

HUMIDITY SENSOR HS MS MANUAL SWITCH

HUMIDISTAT H S SENSOR

PANEL NAME BMS CONTROL PANEL HVAC-CP-X

DAMPER TAGS

COMB. FIRE/SMOKE DAMPER F

SMOKE DAMPER S

FIRE DAMPER C

MANUAL BALANCING DAMPER B

MOTORIZED DAMPER M

BACKDRAFT DAMPER D

12"x12" S/A

PIPING SYMBOLS	
	CHWR CHILLED WATER RETURN
	CHWS CHILLED WATER SUPPLY
	CD CONDENSATE DRAINAGE
	CWR CONDENSER WATER RETURN
	CWS CONDENSER WATER SUPPLY
	GWR GEOTHERMAL WATER RETURN
	GWS GEOTHERMAL WATER SUPPLY
	HWR HEATING WATER RETURN
	HWS HEATING WATER SUPPLY
	G NATURAL GAS
	PG PROPANE GAS
	REF-L REFRIGERANT-LIQUID
	REF-S REFRIGERANT-SUCTION
	REF-HG REFRIGERANT-HOT GAS
	STM STEAM
	CDR CONDENSATE RETURN
PIPE ACCESSORY TAGS	
2" DOM. WM DOMESTIC WATER METER	2" M-CNTRL MOTORIZED CONTROL VALVE
2" BALANCING BALANCING VALVE	2" 3-WAY CNTRL 3 WAY MOTORIZED CONTROL VALVE
2" SHUTOFF 1/4 TURN BALL VALVE	2" PRV PRESSURE REDUCING VALVE
2" CHECK CHECK VALVE	3/8" SOLENOID REFRIGERANT SOLENOID VALVE
2" TMV 3-WAY MIXING VALVE	2" BUTTERFLY BUTTERFLY VALVE
* NOTE * ALL OF GENERAL NOTES ON THIS SHEET ARE TO BE APPLIED TO ALL OTHER DRAWINGS IN THIS SET. THE SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET MAY OR MAY NOT BE USED IN THIS SET OF DRAWINGS.	

HVAC SHEET INDEX	
M-001	HVAC NOTES & LEGEND
M-002	MECHANICAL SPECIFICATIONS
M-003	MECHANICAL SPECIFICATIONS
M-100	OVERALL MECHANICAL SITE PLAN
M-104	MECHANICAL & DETAILS PLAN - RESTROOM PAVILIONS
M-601	MECHANICAL SCHEDULES
GENERAL MECHANICAL NOTES	
1	SUBMISSION OF PROPOSAL. IN CONNECTION WITH THIS WORK SHALL IMPLY THAT THE BIDDER HAS EXAMINED THE JOB SITE UNDER WHICH HE WILL BE OBLIGATED TO OPERATE SHOULD HE BE AWARDED THE WORK UNDER THIS CONTRACT. NO EXTRA CHARGE WILL BE ALLOWED FOR FAILURE OF ANY BIDDER TO EXAMINE THE SITE PRIOR TO BID.
2	DUCT DIMENSIONS LISTED ON DRAWINGS REPRESENT THE AIRFLOW FREE AREAS AND DO NOT HAVE ALLOWANCES FOR INSULATION LAYER, WHERE APPLICABLE. INSIDE THE DUCTS, OR DUAL WALL DIMENSIONS. DUCTS SHALL BE CONSTRUCTED TO INCLUDE INSULATION REQUIREMENTS AND MAINTAIN AIRFLOW DIMENSIONS INDICATED ON PLANS. FOR CLASH COORDINATION INCLUDE INSULATION THICKNESS PER SCHEDULE.
3	ALL WORK SHALL CONFORM TO STATE AND LOCAL CODES, RULES, REGULATIONS, AND ORDINANCES WHICH SHALL TAKE PRECEDENCE OVER THE PLANS IF CONFLICTS EXIST BETWEEN THEM.
4	THE DRAWINGS INDICATE THE GENERAL LAYOUT REQUIREMENTS FOR EQUIPMENT, FIXTURES, PIPING, DUCTWORK, ETC. FINAL LAYOUT SHALL BE MODIFIED TO FIT ACTUAL SITE CONDITIONS. ALL REQUIRED REVISIONS SHALL BE RECORDED ON A DESIGNATED HARD COPY SET OF REDLINE PLANS TO BE UPDT TO JOSEPH PROGRESS. AT MINIMUM, THIS DOCUMENT SHALL BE UPDATED WEEKLY AND REDILY AVAILABLE FOR REVIEW AND REFERENCE.
5	COORDINATE ALL WORK WITH THE OWNER AND ALL OTHER CONTRACTORS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RIGGING, HANDLING, AND PROTECTION OF MATERIALS. PROVIDE LABOR TO RECEIVE UNLOAD, STORE, PROTECT, AND TRANSFER TO POINT OF INSTALLATION OF ANY OWNER-FURNISHED ITEMS.
6	IN CASES OF EQUIPMENT SUBSTITUTION, CONTRACTOR IS RESPONSIBLE FOR VERIFYING THAT ALL SYSTEMS AND COMPONENTS WILL FIT PROPERLY PRIOR TO FABRICATION OR ORDERING. INSTALLED DUCTS MAY BE RESIZED BY THE CONTRACTOR TO FIT FIELD CONDITIONS AS LONG AS THE SIZES AND DUCTS DO NOT HAVE A LOSS OF STATIC PRESSURE LOSS TO THOSE SHOWN. RECTANGULAR DUCTS SHALL NOT BE CHANGED TO ROUND DUCTS. PROVIDE COMPLETE SHEET METAL SHOP DRAWINGS TO ENGINEER SHOWING ACTUAL DUCT SIZES, ARRANGEMENTS, AND UNIT LOCATIONS TO BE INSTALLED. THIS SHALL BE DONE PRIOR TO FABRICATION OR INSTALLATION.
7	INSTALL ACOUSTIC TURNING VANES IN ELBOWS IN RECTANGULAR DUCTS 20" AND LARGER. INSTALL RADIUS TYPE ELBOWS IN RECTANGULAR DUCTS SMALLER THAN 20".
8	USE 45 DEGREE TAKE-OFF FITTINGS AT ALL ROUND SUPPLY BRANCH TAKEOFFS. PROVIDE BALANCE DAMPERS AT ALL SUPPLY DUCT RUNOUTS TO GRILLES. LOCATE AS FAR AS POSSIBLE FROM GRILLES IN AN ACCESSIBLE LOCATION. PROVIDE ACCESS PANELS IN SOLID WALLS AND CEILINGS FOR BALANCING DAMPERS.
9	USE FLEX DUCTS FOR FINAL CONNECTION TO ALL CEILING DIFFUSERS, AND WHERE NECESSARY, SIDEWALL DIFFUSERS, AND LIMIT TO 6' MAX. LENGTHS.
10	PROVIDE A COMPLETE AND OPERATING MECHANICAL SYSTEM, INCLUDING ALL INCIDENTAL ITEMS AND CONNECTIONS NECESSARY FOR PROPER OPERATION OR CUSTOMARILY INCLUDED, EVEN THOUGH EACH AND EVERY ITEM MAY NOT BE INDICATED.
11	THE MECHANICAL INSTALLATION SHALL BE SAFE, RELIABLE, ENERGY EFFICIENT AND EASILY MAINTAINED WITH ADEQUATE PROVISIONS ALLOWED FOR ACCESS TO EQUIPMENT.
12	THE MECHANICAL SYSTEM SHALL OPERATE QUIETLY WITH NOISE LEVELS BELOW THE CRITERIA RECOMMENDED FOR THE APPLICATION BY ASHRAE. PROVIDE CORRECTIVE ACTION AS REQUIRED TO REDUCE OBJECTIONABLE NOISE OR VIBRATION.
13	UNDERCUT DOORS 34 INCH HIGH WITH NO RETURN NOR EXHAUST GRILLE IS SHOWN TO ALLOW FOR AIR TRANSFER (DO NOT UNDERCUT FIRE-RATED DOORS).
14	REFER TO ARCH. PLANS AND DETAILS FOR EXACT LOCATION OF ALL WALL AND CEILING MOUNTED DEVICES. ADJUST LOCATION OF SIDEWALL DEVICES AS NECESSARY TO AVOID INTERFERENCE WITH MOLDING OR OTHER ELECTRICAL DEVICES.
15	WHERE CONDUIT, CABLES, DUCTWORK OR PIPING PASSES THROUGH FIRE-RATED FLOORS OR WALLS, THE SLEEVES SHALL BE COMPLETELY SEALED WITH A FIRE STOP MATERIAL, THAT IS UL LISTED AND ACCEPTED BY LOCAL AUTHORITIES HAVING JURISDICTION (AHJ) AS BEING SUITABLE FOR THIS SERVICE SUCH AS DOWN CORNING CORP./SILICONE ELASTOMER, RTV FOAM, OR SIMILAR MATERIAL, TO MAINTAIN FIRE RATINGS OF THE WALL OR FLOOR.
16	CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CORING AND BEAM PENETRATIONS AS IT RELATES TO HIS WORK.
17	CONTRACTOR SHALL NOT INSTALL ANY MAINTENANCE ITEMS ABOVE HARD CEILINGS. THIS SHALL INCLUDE VALVES, DAMPERS, OR ANY OTHER ITEMS THAT REQUIRE ACCESS AFTER CONSTRUCTION IS COMPLETED. IF INSTALLATION ABOVE A HARD CEILING OF THESE ITEMS CANNOT BE AVOIDED, THEN PROVIDE CEILING ACCESS DOORS EQUIVALENT TO ACDUOR MODEL PW-505 WHERE REQUIRED. AT FIRE-RATED WALLS, USE EQUIVALENT OF ACDUOR MODEL FB-5060. MINIMUM SIZE SHALL BE 12"x12". USE 18"x18" WHEN PERSONNEL ACCESS IS REQUIRED.
18	PROVIDE AN INSULATED BACK ON ALL THERMOSTATS AND TEMPERATURE SENSORS THAT ARE MOUNTED ON CMU OR HOLLOW WALLS. PROVIDE SHALLOW DEVICE EXTENSION BOX BEHIND T-STATS AND SENSORS ON MASONRY WALLS IN COMMERCIAL, RETAIL, SPACES.
19	PROVIDE FIRE DAMPERS AT ALL FIRE-RATED WALLS AND FLOOR PENETRATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE BARRIER WALLS AND CEILINGS.
20	IF A CENTRAL FIRE ALARM SYSTEM IS REQUIRED FOR THIS PROJECT, MECHANICAL CONTRACTOR SHALL INSTALL DUCT MOUNTED SMOKE DETECTORS PROVIDED BY FIRE ALARM CONTRACTOR. REFER TO ELECTRICAL NOTES FOR EXACT REQUIREMENTS. MECHANICAL CONTRACTOR SHALL IDENTIFY A SET OF TERMINALS FOR EQUIPMENT SHUTDOWN ON ALL FAN POWERED EQUIPMENT REQUIRING SHUTDOWN CONTROLS. FIRE ALARM CONTRACTOR SHALL WIRE FROM DUCT MOUNTED SMOKE DETECTOR TO SHUTDOWN TERMINALS TO SHUT DOWN FAN OPERATION WHEN SMOKE IS DETECTED.
21	AT PENETRATIONS THROUGH FIRE WALLS, ANY NON-METALLIC PIPE OR DUCT SHOULD BE EXTERNALLY SLEEVED WITH STEEL, FERROUS, OR COPPER MATERIALS, SECURELY FASTENED TO THE FIRE RATED ASSEMBLY, AND ANY SPACE BETWEEN THE SLEEVE AND THE ASSEMBLY PENETRATED SHALL BE PROTECTED USING MATERIAL THAT CONFORMS TO ASTM E 814 OR UL 1479, SUCH AS FIRE STOP FS-1900, OR FLAME STOPPER 5000.
22	REFER TO ELECTRICAL DRAWINGS FOR SMOKE DAMPER AND FIRE/SMOKE DAMPER DETAIL. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL DAMPERS WITH MOTORIZED ACTUATORS AND INSTALL SMOKE DETECTORS AND PROVIDE WIRING FOR FAN SHUTDOWN CONTROLS. COORDINATE WITH ELECTRICAL CONTRACTOR AND PROVIDE DAMPER ACTUATOR COMPATIBLE WITH ELECTRICAL WIRING PROVIDED. PROVIDE ANY WIRING OR COMPONENTS NOT PROVIDED BY THE ELECTRICAL CONTRACTOR THAT ARE REQUIRED TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
23	AHEAD OF ALL VAV BOX INLETS, INSTALL STRAIGHT DUCT EQUIVALENT TO AT LEAST 2 DIAMETERS IN LENGTH WHETHER SHOWN ON PLANS OR NOT.
24	SEISMIC PROTECTION FOR CONCERNS OF ALL BUILDING SYSTEMS INCLUDING BUT NOT LIMITED TO MECHANICAL, PLUMBING, AND ELECTRICAL MUST MEET MINIMUM REQUIREMENTS OF ALL APPLICABLE CODES FOR BUILDINGS CLASSIFIED SEISMIC PROTECTION MEASURES TO BE APPLIED. SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND/OR FEDERAL CODES AND WITH MANUFACTURER'S REQUIREMENTS, THE MOST STRINGENT SHALL APPLY.
26	NO RECTANGULAR DUCT SMALLER THAN 10"X10"
27	ANY LINE VOLTAGE WIRING THAT IS RUN BY THE MECHANICAL CONTRACTOR SHALL BE INSTALLED IN ACCORDANCE WITH THE ELECTRICAL PLANS, NOTES, AND SPECIFICATIONS.
28	WHERE DUCTS PASS THROUGH FIRE RATED WALLS AND NO FIRE DAMPER IS REQUIRED, PROVIDE A STEEL SLEEVE (MIN. 12" LONG BY 0.60" THICK) IN EACH DUCT OPENING PER IBC 714.

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REF. SCALE IN INCHES PROJECT #221019R

23A HEATING, VENTILATING, AND AIR CONDITIONING
rev – 20150529

23A 1 GENERAL INSTRUCTIONS

23A 1-1 GENERAL REQUIREMENTS

Requirements under Division 1 and the general and supplementary condions of these specifications apply to this section and division. Where the requirements of this section and division exceed those of Division 1, this section and division take precedence. Become thoroughly familiar with all their contents as to requirements that affect this division, section or both. The work required under this section includes material, equipment, appliances, transportation, services, and labor required to complete the entire system as required by the drawings and specifications, or reasonably inferred to be necessary to facilitate each system's functioning as implied by the design and the equipment specified.

The specifications and drawings for the project are complementary, and portions of the work described in one, shall be provided as if described in both. In the event of discrepancies, notify the engineer and request clarification prior to proceeding with the work involved.

Drawings are graphic representations of the work upon which the contract is based. They show the materials and their relationship to one another, including sizes, shapes, locations, and connections. They also convey the scope of work, indicating the intended general arrangement of the equipment and other materials without showing all of the exact details as to elevations, offsets, control lines, and other installation requirements. Use the drawings as a guide when laying out the work and to verify that materials and equipment will fit into the designated spaces, and which, when installed per manufacturers' requirements, will ensure a complete, coordinated, satisfactory and properly operating system. Determine exact locations by job measurements, by checking the requirements of other trades, and by reviewing all contract documents. Correct errors that could have been avoided by proper checking and inspection, at no additional cost to the owner.

Specifications define the qualitative requirements for products, materials, and workmanship upon which the contract is based.

23A 1-2 DEFINITIONS

Whenever used in these specifications or drawings, the following terms shall have the indicated meanings:

Furnish: "to supply and deliver to the project site, ready for unloading, unpacking, assembling, installing, and similar operations."

Install: "to perform all operations at the project site, including, but not limited to, and as required: unloading, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, testing, commissioning, starting up and similar operations, complete, and ready for the intended use."

Provide: "to furnish and install complete, and ready for the intended use."

Furnished by owner (or owner furnished) or furnished by others: "an item furnished by the owner or under other divisions or contracts, and installed under the requirements of this division, complete, and ready for the intended use, including all items and services incidental to the work necessary for proper installation and operation. Include the installation under the warranty required by this division.

Engineer: where referenced in this division, "engineer" is the engineer of record and the design professional for the work under this division, and is a consultant to, and an authorized representative of, the architect, as defined in the general and/or supplementary conditions. When used in this division, it means increased involvement by, and obligations to, the engineer, in addition to involvement by, and obligations to, the "architect".

AHJ: the local code and/or inspection agency (authority) having jurisdiction over the work.

NRTL: nationally recognized testing laboratory, as defined and listed by OSHA in 29 CFR 1910.7 (e.g., UL, ETL, CSA), and acceptable to the AHJ over this project.

The terms "approved equal", "equivalent", or "equal" are used synonymously and shall mean "accepted by or acceptable to the engineer as equivalent to the item or manufacturer specified". The term "approved" shall mean labeled, listed, certified, or all three, by an NRTL, and acceptable to the AHJ over this project.

23A 1-3 PRE-BID SITE VISIT

Prior to submitting bid, visit the site of the proposed work and become fully informed as to the conditions under which the work is to be done. Failure to do so will not be considered sufficient justification to request or obtain extra compensation over and above the contract price.

23A 1-4 MATERIAL AND WORKMANSHIP

Provide all material and equipment new and in first class condition. Provide markings or a nameplate for all material and equipment identifying the manufacturer and providing sufficient reference to establish quality, size and capacity. In general, provide the following quality grade(s) for all materials and equipment:

Commercial Specification Grade

Light Duty and Residential Grade

Pipe, pipe fittings, pipe specialties and valves shall be manufactured in plants located in the United States.

Work performed under this contract shall provide a neat and "workmanlike" appearance when completed, to the satisfaction of the architect and engineer. Workmanship shall be the finest possible by experienced mechanics of the proper trade.

The complete installation shall function as designed and intended with respect to efficiency, capacity, noise level, etc. Abnormal or excessive noise from equipment, devices or other system components will not be acceptable.

Remove from the premises waste material present as a result of work. Clean equipment installed under this contract to present a neat and clean installation at the termination of the work.

Repair or replace public and private property damaged as a result of work performed under this contract to the satisfaction of authorities and regulations having jurisdiction.

23A 1-5 MANUFACTURERS

In other articles where lists of manufacturers are introduced, subject to compliance with requirements, provide products by one of the manufacturers specified.

Where a list is provided, manufacturers listed are not in accordance with any ranking or preference.

Where manufacturers are not listed, provide products subject to compliance with requirements from manufacturers that have been actively involved in manufacturing the specified product for no less than 5 years.

23A 1-6 COORDINATION

Coordinate all work with other divisions and trades so that the various components of the systems will be installed at the proper time, fit the available space, and will allow proper service access to those items requiring maintenance. Refer to all other division's drawings, and to relevant equipment submittals and shop drawings to determine the extent of clear spaces. Components which are installed without regard to the above shall be relocated at no additional cost to the owner.

Unless otherwise indicated, the general contractor will provide chases and openings in building construction required for installation of the systems specified herein. Contractor shall furnish the general contractor with information where chases and openings are required. Make all offsets required to clear equipment, beams and other structural members, and to facilitate concealing system components in the manner anticipated in the design. Keep informed as to the work of other trades engaged in the construction of the project, and execute work in a manner as to not interfere with or delay the work of other trades.

Figured dimensions shall be taken in preference to scale dimensions. Contractor shall take his own measurements at the building, as variations may occur. Contractor will be held responsible for errors that could have been avoided by proper checking and inspection

Provide materials with trim that will properly fit the types of ceiling, wall, or floor finishes actually installed. Model numbers listed in the construction documents are not necessarily intended to designate the required trim.

23A 1-7 ORDINANCES, CODES, AND STANDARDS

Work performed under this contract shall, at a minimum, be in conformance with applicable national, state and local codes having jurisdiction. Equipment furnished and associated installation work performed under this contract shall be in strict compliance with current applicable codes adopted by the local AHJ including any amendments and standards as set forth by the National Fire Protection Association (NFPA), Underwriters Laboratories (UL), Occupational Safety and Health Administration (OSHA), American Society of Mechanical Engineers (ASME), American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), American National Standards Institute (ANSI), American Society of Testing Materials (ASTM) and other national standards and codes where applicable. Additionally, comply with rules and regulations of public utilities and municipal departments affected by connection of services. Where the contract documents exceed the requirements of the referenced codes, standards, etc., the contract documents shall take precedence.

Promptly bring all conflicts observed between codes, ordinances, rules, regulations, referenced standards, and these documents to the engineer's attention for final resolution. Contractor will be held responsible for any violation of the law.

Procure and pay for permits and licenses required for the accomplishment of the work herein described. Where required, obtain, pay for and furnish certificates of inspection to owner. Contractor will be held responsible for violations of the law.

23A 1-8 PROTECTION OF EQUIPMENT AND MATERIALS

Store and protect from damage equipment and materials delivered to job site, in accordance with manufacturers' recommendations. For materials and equipment susceptible to changing weather conditions, dampness, or temperature variations, store inside in conditioned spaces. For materials and equipment not susceptible to these conditions, cover with waterproof, heavy tarp or polyethylene plastic as required to protect from plaster, dirt, paint, water, or physical damage. Equipment and material that has been damaged by construction activities will be rejected, and contractor shall furnish new equipment and material as required at no additional cost to the owner.

Keep premises broom clean from foreign material created during work performed under this contract. Piping, equipment, etc. shall have a neat and clean appearance at the termination of the work.

Plug or cap open ends of ductwork and piping systems while stored and installed during construction when not in use to prevent the entrance of debris into the systems.

23A 1-9 SUBSTITUTIONS

Include in the base bid the products specifically named in these specifications or on the drawings. Submit, in the form of alternates, with bid, products of any other manufacturers for similar use, provided the differences in cost, if any, are included for each proposed alternate.

No substitutions will be considered with receipt of Bids, unless the Architect and Engineer have received from the Bidder a written request for approval to bid a substitution at least ten calendar days prior to the date for receipt of Bids, and have approved the substitution request. Include, with each such request, the name of the material or equipment for which substitution is being requested, and a complete description of the proposed substitution, including drawings, cut sheets, performance and test data, and all other information necessary for an evaluation. Include also a statement setting forth changes in other materials, equipment or other work that would be required to incorporate the substitution. The burden of proof of the merit of the proposed substitute is upon the proposer. The proposer of any substitutions shall compensate the Engineer at a rate of \$150.00 per hour for time spent evaluating proposed substitutions and or the subsequent revisions to the design required to utilize the substitution.

The Architect's or Engineer's decision to approve or disapprove a substitution in a Bid is final.

If the proposed substitution is approved prior to receipt of Bids, such approval will be stated in an Addendum. Bidders shall not rely upon approvals made in any other manner, including verbal.

No substitutions will be considered after receipt of Bids and before award of the Contract.

No substitutions will be considered after the Contract is awarded unless specifically provided in the Contract Documents.

23A 1-10 SUBMITTALS

Assemble and submit to the architect, for engineer's review, manufacturers' product literature for material and equipment to be furnished, installed, or both, under this division, including shop drawings, manufacturers' product data and performance sheets, samples, and other submittals required by this division. Highlight, mark, list or indicate the materials, performance criteria and accessories that are being proposed. Provide the number of submittals required by division 1; however, at a minimum, submit two (2) sets. Before submitting, verify that all materials and equipment submitted are mutually compatible and suitable for the intended use, fit the available spaces, and allow ample and code-required room for access and maintenance. Submittals shall contain the following information. Submittals not so identified will be returned to the contractor without action:

The project name.

The applicable specification section and paragraph.

The submittal date.

The contractor's stamp, which shall certify that the stamped drawings have been checked by the contractor, comply with the drawings and specifications, and have been coordinated with other trades.

Submittals and shop drawings shall not contain HP Engineering's firm name or logo, nor shall it contain the HP Engineering's engineers' seal and signature. They shall not be copies of HP Engineering's work product.

Transmit submittals as early as required to support the project schedule. Allow for two weeks engineer review time, plus mailing time, plus a duplication of this time for re-submittals, if required. The engineer's submittal reviews will not relieve the contractor from responsibility for errors in dimensions, details, size of members, or quantities; or for omitting components or fittings; or for not coordinating items with actual building conditions.

Refer to division 1 for acceptance of electronic submittals for this project. For electronic submittals, contractor shall submit the documents in accordance with the procedures specified in division 1. Contractor shall notify the architect and engineer that the shop drawings have been posted. If electronic submittal procedures are not defined in division 1, contractor shall include the website, user name and password information needed to access the submittals. For submittals sent by e-mail, contractor shall copy the architect and engineer's designated representatives. Contractor shall allow the engineer review time as specified above in the construction schedule. Contractor shall submit only the documents required to purchase the materials and/or equipment in the electronic submittal and shall clearly indicate the materials, performance criteria and accessories being proposed. General product catalog data not specifically noted to be part of the specified product will be rejected and returned without review.

23A 1-11 ELECTRONIC DRAWING FILES

In preparation of shop drawings or record drawings, contractor may, as an option, obtain electronic drawing files in Revit, AutoCAD, or DXF format from the engineer for a fee of \$200 for the first sheet and \$100 per sheet for each additional sheet. Contact the architect for written authorization; and, contact the engineer to obtain the necessary release agreement form and to indicate the desired shipping method and drawing format. In addition to payment, architect's written authorization and engineer's release agreement form must be received before electronic drawing files will be sent.

23A 1-12 OPERATION AND MAINTENANCE MANUALS

Submit to the architect, for engineer's review, copies each of operations and maintenance instruction manuals, appropriately bound into manual form including approved copies of the following, revised if necessary to show system and equipment as actually installed. Paper clips, staples, rubber bands, and mailing envelopes are not considered approved binders. Provide the number of submittals required by Division 1; however, at a minimum, submit two (2) sets, and include, at a minimum, the following information:

Cover sheet that lists the project name, date, owner, architect, consulting engineer, general contractor, sub-contractor, and an index of contents.

Manufacturers' catalogs and product data sheets

Wiring diagrams

Operation and Maintenance instructions

Parts lists

Approved shop drawings

Test reports as defined for the systems and equipment provided or furnished or installed under this contract.

Names, addresses, telephone numbers, and e-mail addresses of local contacts for warranty services and spare parts.

Submit manuals prior to requesting the final punch list and before any requests for substantial completion. Final approval of this division's systems installed under this contract will be withheld until this equipment brochure is received and deemed complete by the architect and engineer.

Provide "as-built" drawings (see Division 1 and general conditions).

23A 1-13 TRAINING

At a time mutually agreed upon between the owner and contractor, provide the services of a factory trained and authorized representative to train owner's designated personnel on the operation and maintenance of the equipment provided for this project.

Provide training to include but not be limited to an overview of the system and/or equipment as it relates to the facility as a whole; operation and maintenance procedures and schedules related to startup and shutdown, troubleshooting, servicing, preventive maintenance and appropriate operator intervention; and review of data included in the operation and maintenance manuals.

Submit a certification letter to the architect stating that the owner's designated representative has been trained as specified herein. Letter shall include date, time, attendees and subject of training. The contractor and the owner's representative shall sign the certification letter indicating agreement that the training has been provided.

Schedule owner training with at least 7 days' advance notice.

23A 1-14 WARRANTIES

Warrant each system and each element thereof against all defects due to faulty workmanship, design or material for a period of 12 months from date of substantial completion, unless specific items are noted to carry a longer warranty in the construction documents or manufacturer's standard warranty exceeds this duration. Warranties shall include labor and material. Remedy all defects, occurring within the warranty period(s), as stated in the general conditions and Division 1 without any additional costs to the owner.

Perform any required remedial work promptly, upon written notice from the engineer or owner.

At the time of substantial completion, deliver to the owner all warranties, in writing and properly executed, including term limits for warranties extending beyond the required period, each warranty instrument being addressed to the owner and stating the commencement date and term.

23A 1-15 CUTTING AND PATCHING

Perform cutting of walls, floors, ceilings, etc. as required to install work under this section. Obtain permission from the architect prior to cutting. Do not cut or disturb structural members without prior approval from the architect. Out holes as small as possible. General contractor shall patch walls, floors, etc. as required by work under this section. Patching shall match the original material and construction. Repair and refinish areas disturbed by work to the condition of adjoining surfaces in a manner satisfactory to the architect.

23A 1-16 ROUGH-IN

Coordinate without delay roughing-in with general construction. Conceal piping and conduit rough-in except in unfinished areas and where otherwise shown.

23A 1-17 CONCRETE BASES

Provide concrete bases for equipment where indicated on the drawings and as specified herein. Concrete bases shall have chamfered edges. Size of pad shall be a minimum of 4" greater than the footprint of the equipment that it is supporting and shall have a minimum height of 3-1/2".

Construct equipment bases and housekeeping pads shall be of a minimum 28 day, 4000 psi concrete conforming to American Concrete Institute standard building code for reinforced concrete (ACI 318-99) and the latest applicable recommendations of the ACI standard practice manual. Concrete shall be composed of cement conforming to ASTM C 150 Type I, aggregate conforming to ASTM C33, and potable water. Exposed exterior concrete shall contain 5 to 7 percent air entrainment.

Unless otherwise specified or shown on the structural drawings, reinforce equipment bases and housekeeping pads with No. 4 reinforcing bars conforming to ASTM A 615 or 6x6 - W2.9 x W2.9 welded wire mesh conforming to ASTM A185. Place reinforcing bars 24" on center with a minimum of two bars each direction.

Provide galvanized anchor bolts for equipment placed on concrete equipment bases and housekeeping pads or on concrete slabs. Anchor bolts size, number and placement shall be as recommended by the manufacturer of the equipment.

23A 1-18 STRUCTURAL STEEL

Structural steel used for support of equipment, ductwork and piping shall be new, clean, and conform to ASTM designation A-36.

Support mechanical components from the building structure. Do not support mechanical components from ceilings, other mechanical or electrical components, and other non-structural elements.

23A 1-19 ACCESS DOORS

Provide access doors in ceilings, walls, etc. where indicated or required for access or maintenance to concealed valves and equipment installed under this section. Provide concealed hinges, screwdriver-type lock, anchor straps, manufactured by Milcor, Zum, Titus, or equal. Obtain architect's approval of type, size, location and color before ordering.

23A 1-20 PENETRATIONS

Provide sleeves for pipes passing through above grade concrete or masonry walls, concrete floor or roof slabs. Sleeves are not required for core drilled holes in existing masonry walls, concrete floors or roofs. Provide 10 gauge galvanized steel sleeves for sleeves 6" and smaller. Provide galvanized sheet metal sleeves for larger than 6". Schedule 40 PVC sleeves are acceptable for installation in areas without return air plenums.

Seal elevated floor, exterior wall and roof penetrations watertight and weathertight with non-shrink, non-hardening commercial sealant. Pack with mineral wool and seal both ends with minimum of 1/2" of sealant.

Seal around penetrations of fire rated assemblies. Coordinate fire ratings and locations with the architectural drawings. Refer to architectural specifications for fire stoppings. Provide a product schedule for UL listing, location, wall or floor rating and installation drawing for each penetration fire stop system.

Extend pipe insulation for insulated pipe through floor, wall and roof penetrations, including fire rated walls and floors. The vapor barrier shall be maintained. Size sleeve for a minimum of 1" annular clear space between inside of sleeve and outside of insulation.

Provide prefabricated roof curbs manufactured by Custom Curb, Inc., Pate Company, Thycurb or approved equal. Provide roof curb with factory installed wood nailer; welded, 18 gauge galvanized steel shell, base plate and flashing; 1-1/2" thick, 3 pound rigid insulation; fully mitered 3-inch raised cant; cover of weather-resistant, weather-proof material and pipe collar of weather-resistant material with stainless steel pipe clamps.

Provide box frames for rectangular openings welded 12 gauge galvanized steel attached to forms and of a maximum dimension established by the architect. Notify the general contractor or architect before installing any box openings not shown on the architectural or structural drawings.

Seal concrete or masonry exterior wall penetrations below grade with "wall pipes" and mechanical sleeve seals. Provide cast iron "wall pipes" with integral watertight ring manufactured by Josam, Jay R. Smith, Wade, Watts or Zum. Provide modular mechanical sleeve seals, manufactured by Thunderville / Linik Seal, Calpico, Inc. and Metraflex.

Seal elevated concrete slab with water proof membrane penetrations with "wall pipes" and water proof sealant. Secure waterproof membrane flashing between "wall pipe" clamping flange and clamping ring. Provide cast iron "wall pipes" with integral watertight ring manufactured by Josam, Jay R. Smith, Wade, Watts or Zum.

Provide sleeves for horizontal pipe passing through or under foundation. Sleeves shall be cast iron soil pipe two nominal pipe sizes larger than the pipe served.

Provide Schedule 40 PVC pipe sleeves for vertical pressure pipe passing through concrete slab on grade. Sleeves shall be one nominal pipe size larger than the pipe served and two pipe sizes larger than pipe served for ductile iron pipes with restraining rods. Seal water-tight with silicone caulk.

Provide 1/2" thick cellular foam insulation around perimeter of non-pressure pipe passing thru concrete slab on grade. Insulation shall extend to 2" above and below the concrete slab.

23A 1-21 AIR FILTERS

Provide MERV 8 pleated, throwaway type filters, unless otherwise indicated. Air units shall have new filters installed when they are operated before final acceptance. Filters shall be manufactured by American Air Filter, Farr, Flanders, or approved equal.

If HVAC equipment is used during the construction period, contractor shall provide one set of filters when the unit is started and replace filters when needed, but not less than every month. Install new filters prior to testing, adjusting, and balancing work. On the day of substantial completion, the contractor shall clean the unit and provide a new set of filters in the unit before turning system over to owner.

Furnish to owner, with receipt, One set of spare filters of each type required for each unit.

23A 1-22 MOTORS AND STARTERS

Provide motors and starting equipment where not furnished with the equipment package. Motors shall have copper windings, Class B insulation, and be standard squirrel cage with starting torque characteristics suitable for the equipment served. Motors for air handling equipment shall be selected for quiet operation. Each motor shall be checked for proper rotation after electrical connection has been completed. Provide drip-proof enclosure for locations protected from weather and not in air stream of fan; and totally enclosed fan cooled enclosure for motors exposed to weather. Motors shall be manufactured by Century, General Electric, Westinghouse, Louis Allis, or approved equal.

Furnish to owner, with receipt, one complete set of belts for each relative motor utilizing a belt drive.

Provide every motor, except fractional horsepower single phase motors with an approved type of "built-in" thermal overload protection, with a motor starter. Each starter shall be provided with overload heaters sized to the motor rating, and every three phase motor starter shall have overload heaters in each phase. Ambient compensated heaters shall be installed wherever necessary. Unless noted otherwise, motor starters shall be furnished by this Divisions contractor for installation and connection by the Division 26 contractor. Starters shall be Allen-Bradley, Clark, Furnas, Square D, or approved equal.

23A 1-23 ELECTRICAL WIRING

Line Voltage control and interlock wiring shall be provided by the Division 26 contractor. Low Voltage control wiring shall be provided by the Division 23 contractor. Required conduit and rough-ins for low Voltage control wiring shall be provided by the Division 26 contractor. Furnish wiring diagrams to the Division 26 contractor as required for proper equipment hookup. Coordinate with the Division 26 contractor the actual wire sizing amps for the equipment (from the equipment nameplate) to ensure proper installation.

23A 1-24 REFRIGERANT AND OIL

Provide full refrigerant and oil charge in new air conditioning refrigeration systems, and maintain it for full term of the guarantee.

23A 1-25 FINAL TESTING AND ADJUSTMENTS

Final system testing, balancing and adjustments shall be performed by a contractor certified by the National Environmental Balancing Bureau (NEBB), Associated Air Balance Council (AABC) or other approved agency. Perform test readings on fans, units, coils, etc. and adjust equipment to deliver specified amounts of air.

Prepare testing and balancing report log showing air supply quantities, air entering and leaving temperatures and pressures, fan and unit test readings, motor voltage and amp draws, etc., and submit six copies of the final compilation of data to the architect for evaluation and approval before final inspection of the project. Balance air systems to within plus or minus 10 percent for terminal devices and branch lines and plus or minus 5 percent for main ducts and air handling equipment of the amount of air shown on the drawings. Further adjustments shall be made to obtain uniform temperature in spaces.

Adjust equipment to operate as intended by the specification. Align bearings and replace bearings that have dirt or foreign material in them with new bearings without additional cost to the owner. Balance contractor shall include in the report any improperly installed or missing balancing devices that would negatively impact the system operation.

Adjust thermostats and control devices to operate as intended. Adjust burners, pumps, fans, etc. for proper and efficient operation. Certify to architect that adjustments have been made and that system is operating satisfactorily. Further adjustments shall be made to obtain uniform temperature in spaces. Calibrate, set, and adjust automatic temperature controls. Check proper sequencing of interlock systems, and operation of safety controls.

23A 1-26 EQUIPMENT FURNISHED BY OTHERS

Provide necessary equipment and accessories that are not provided by the equipment supplier or owner to complete installation of cooking equipment, washing equipment, etc., furnished by others, in locations as indicated on the drawings and/or described in the general notes to this contract. Equipment and accessories not provided by the equipment supplier may include flues, vents, intakes, associated roof jacks and caps to outdoors, dampers, in-line fans, roof fans, control interlocks, etc. as required for proper operation of the complete system in accordance with the manufacturer's instructions.

Contractor shall be responsible for correct rough-in dimensions, and shall verify same with architect and/or equipment supplier prior to service installations.

23A 1-28 BUILDING OPERATION

Comply with the schedule of operations as outlined in the architectural portions of this specification. Building shall be in continuous operation. Accomplish work requiring interruption of building operation at a time when the building is not in operation, and only with written approval of building owner and/or tenant. Coordinate interruption of building operation with the owner and/or tenant a minimum of seven days in advance of work.

23A 1-29 VIBRATION ISOLATION

Manufacturers: Provide vibration isolation equipment and materials by a single manufacturer. Approved manufacturers provided their systems are in compliance with the specified design and performance requirements include Amber Booth, Kinetics Noise Control, Mason Industries, Inc., Vibration Eliminator Co., Inc., and Vibration Mounting and Controls.

General requirements: Select vibration isolators by the weight distribution to produce uniform deflection. Vibration isolators shall have either known un-deflected heights or calibration markings so that, after adjustment, the static deflection can be verified, thus determining that the load is within the proper range of the isolator. Isolators shall operate in the linear portion of their load versus deflection curves. Spring isolators shall have 50 percent excess capacity without becoming coil bound. Coast vibration isolators with factory-applied paint. Coast vibration isolators exposed to weather and other corrosive environments with factory-applied corrosion resistance protection. Install and adjust vibration isolators in accordance with manufacturers written instructions.

Pipe connections: Provide flexible connectors for piping system connections on equipment side of shutoff valves for all pumps, mechanical equipment supported or suspended by spring isolators, and where indicated on drawings. Fabricate flexible piping connectors from stainless steel, bronze or rubber materials as suitable for system fluid. Flexible piping connectors shall be bellows, spherical or braided hose type as recommended by the manufacturer for the application.

Isolator types:

Type WP (waffle pads): Provide 5/16" thick neoprene pads ribbed or waffled on both sides. Manufacture pads with bridge bearing quality neoprene, and select for a maximum durometer of 50 and designed for 15 percent strain. Incorporate steel load-spreading plates where required between the equipment and the neoprene pad. If the isolator is bolted to the structure, install a neoprene vibration isolation washer and sleeve (Uniroyal Type 620/660 or as approved) shall be installed under the bolt head between the steel washer and the base plate. Provide Mason Industries Type W or equal.

Type SPNH (spring and neoprene hangers): Provide a steel spring in series with a neoprene isolating element. The spring shall have a minimum additional travel to solid equal to 50 percent of the specified deflection. The neoprene element shall have a static deflection of not less than 0.3" with a strain not exceeding 15 percent. Unless otherwise specified, the static deflection of SPNH hangers shall be 2". Spring diameter and hanger box hole size shall be large enough to permit the hanger rod to swing through a 30 degree arc. Provide neoprene sleeve where the lower hanger rod passes through the steel hanger box, such that the longer rod cannot contact the steel hanger. The diameter of the clear hole in the hanger box shall be at least 3/4 inch larger than the diameter of the hanger rod. When installed, do not cock the spring element and do not allow the hanger box to rotate through a full 360 degree arc without encountering obstructions. Provide Mason Industries Type 30N or equal.

Type SPNM (spring and neoprene mounts): Provide free-standing and laterally stable steel spring without a housing. Design springs so the ratio of the horizontal to vertical spring constant is between one and two. The spring diameter shall be not less than 80% of the compressed height of the spring at rated load. Loaded springs shall have a minimum additional travel to solid equal to 50% of the specified static deflection. Unless otherwise specified, the minimum static deflection of SPNM isolators for equipment mounted on grade slabs shall be 1", and the minimum static deflection for equipment mounted above grade level shall be 2". Bond two Type WP isolation pads sandwiching a 16 gauge stainless or galvanized steel separator plate to the isolator baseplate. Unless otherwise specified, isolators need not be bolted to the floor for indoor installations. If the base plates are bolted to the structure, install a neoprene vibration isolation washer and sleeve (Uniroyal Type 620/660 or as approved) under the bolt head between the steel washer and the base plate. Provide Mason Industries Type SLFH or equal.

Type CMB (curb mounted base): Curb mounted base for roof-mounted equipment shall be a structural steel base mounted directly to the structure with an upper floating section on adjustable steel springs. The upper frame shall provide continuous support for the equipment. Steel springs shall rest on 1/4" min. thickness neoprene pads and shall have a minimum static deflection of 2" unless otherwise specified. All-directional snubber bushings shall be 1/4" minimum thickness neoprene. All hardware shall be cadmium or zinc electroplated to provide a rust resistant finish. Weather proofing shall consist of a continuous galvanized flexible counterflashing nailed over the lower curb's waterproofing and joined at the corners by EPDM bellows. All spring locations shall have access ports with removable waterproof covers to allow for adjustment or replacement of springs. Lower curbs shall have provision for 2" insulation. Duct connections shall be made using a length of flexible duct dimensioned to match the equipment opening, using a foam rubber gasket to seal against the unit bottom. Provide Mason Industries Type RSC or equal.

23A 1-30 MECHANICAL IDENTIFICATION

Provide manufacturer's standard pre-printed, semi-rigid snap-on or permanent adhesive, pressure-sensitive vinyl pipe markers. Color code pipe markers to comply with ANSI A13.1.

Install pipe markers on each HVAC piping system and include arrows to show normal direction of flow.

Locate pipe markers and color bands wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior non-concealed locations.

Provide plastic laminate or brass valve tag on every valve, cock and control device in each HVAC piping system; exclude check valves, valves within factory fabricated equipment units, and shut-off valves at HVAC terminal devices and similar rough-in connections of end-use fixtures and units.

Provide manufacturer's standard laminated plastic, color coded equipment markers. Conform to the following color code: green for cooling; yellow for heating; yellow/green for combination cooling and heating; brown for energy reclamation; blue for other equipment types. Conform to ANSI A13.1 for hazardous equipment.

Provide stenciled signs for equipment identification at contractor's option or where distance of required identification requires lettering larger than 1" height. Stencil paint shall be exterior type, oil-based, alkyl enamel, minimum 1-1/4" height or greater as required for long distance identification, white or black color for best contrast.

Provide duct markers or provide stenciled signs and arrows indicating ductwork service and flow direction in black or white lettering for best contrast with duct or insulation color. Locate markers maximum 50 feet along each duct side and within 5 feet of all control and balancing dampers or branch ducts more than 25 feet length and within 5 feet on each side of wall, floor, and ceiling penetrations. Provide additional markers in congested areas or at multiple duct runs as required for clarity.

23A 1-31 SEISMIC REQUIREMENTS

Seismic protection for seismic concerns of all building systems including but not limited to mechanical, plumbing, and electrical must meet minimum requirements of all applicable codes for buildings' classified seismic use group and seismic design category. Any requirements for seismic protection measures to be applied shall be installed in strict accordance with all applicable local, state, and/or federal codes and with manufacturer's requirements, the most stringent shall apply.

1 OVERALL MECHANICAL SITE PLAN
M-100 1" = 80'-0"

 **IMEG** 5504 W. PINNACLE POINTE DRIVE
SUITE 200
ROGERS, AR 72758
P. 479.899.6370
www.imegcorp.com

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REF. SCALE IN INCHES PROJECT #221019R

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Key Plan

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PROJECT NO: 21108300
ISSUE DATE: 01/30/26
CONTACT: W. BURGESS
QC BY:
QC DATE:

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M-100



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QC DATE: _____

MECHANICAL & DETAILS PLAN -
RESTROOM PAVILIONS

M-104

GRILLES, REGISTERS AND DIFFUSERS SCHEDULE													
ID	DESCRIPTION	MANUFACTURER	MODEL	NECK		BLADE DESIGN				INSTALLATION	SPECIFICATION	NOTES	
				WIDTH	HEIGHT	THICKNESS	SPACING	DEFLECTION ANGLE		ORIENTATION			BORDER TYPE
								SINGLE					
RG11	LOUVERED GRILLE	Titus	350FL	6"	6"	1/8"	3/4"	35.0°		LONG	TYPE 1 (SURFACE)	LOUVERED EXHAUST GRILLE, ALUMINUM	COORDINATE COLOR WITH ARCH
RG11	LOUVERED GRILLE	Titus	350FL	12"	8"	1/8"	3/4"	35.0°		LONG	TYPE 1 (SURFACE)	LOUVERED EXHAUST GRILLE, ALUMINUM	COORDINATE COLOR WITH ARCH

LOUVER SCHEDULE

REMARKS:

- 1.INSTALL PER THE MANUFACTURER'S RECOMMENDATIONS.
- 2.PROVIDE THE EQUIPMENT FROM THE SCHEDULED MANUFACTURER OR AN APPROVED EQUAL. REFER TO SPECIFICATIONS.
- 3.FACTORY BAKED ENAMEL FINISH-COLOR TO BE SELECTED BY ARCHITECT.
- 4.PROVIDE WITH BUG SCREEN.
- 5.WIND DRIVEN RAIN RESISTANT.
- 6.SNOW RESISTANT.
- 7.INTERLOCK WITH EF-9.

ID	DESCRIPTION	MANUFACTURER	MODEL NO.	MATERIAL	DESIGN AIRFLOW	FREE AREA	FREE AREA VELOCITY	PD	DIMENSIONS		UNIT WEIGHT	REMARKS
									WIDTH	HEIGHT		
L-1	WIND DRIVEN RAIN	GREENHECK	EHH-501	ALUMINUM	280 CFM	0.6 SF	462 FPM	0.03 in-wg	24"	14"	15 lb	ALL
L-2	WIND DRIVEN RAIN	GREENHECK	EHH-501	ALUMINUM	420 CFM	0.9 SF	461 FPM	0.03 in-wg	24"	18"	20 lb	ALL

EXHAUST FAN SCHEDULE

GENERAL NOTES APPLICABLE TO ALL UNITS:

1. PROVIDE PRE-WIRED FACTORY MOUNTED INTEGRAL DISCONNECT DEVICE (NEMA 3R FOR EXTERIOR).
2. PROVIDE VARIABLE SPEED CONTROLLER (FACTORY INSTALLED IF AVAILABLE) ON ALL DIRECT DRIVE FANS FOR FAN BALANCING.
3. MOUNT FAN SPEED CONTROLLER IN ACCESSIBLE LOCATION ABOVE CEILING UNLESS OTHERWISE NOTED.
4. PROVIDE ROOF CURB TO MATCH ROOF TYPE AND SLOPE AT ALL ROOF MOUNTED FANS.

ACCEPTABLE MANUFACTURERS AND REPRESENTATION

1. GREENHECK
2. COOK

NOTES:

- A. PROVIDE MOTORIZED DAMPER WITH TIME DELAY FAN START. MECHANICAL CONTRACTOR RESPONSIBLE FOR INSTALLING FAN, ROOF CURB, BACK DRAFT DAMPER, AND ALL INTERNAL POWER AND CONTROL WIRING AS REQUIRED TO PROVIDE FULLY OPERATIONAL FAN AND DAMPER.
- B. PROVIDE BIRD SCREEN
- C. PROVIDE BACKDRAFT DAMPER

ID	DESCRIPTION	MANUFACTURER	MODEL NO.	FAN					WEIGHT	VOLT	PH	CONTROL
				AIRFLOW	PRESS	RPM	DRIVE TYPE	MOTOR				
				DESIGN	ESP			POWER				TYPE
EF-9	INLINE CABINET FAN	GREENHECK	CSP-A1300	700 CFM	0.50 in-wg	940	DIRECT	0.15 hp	56 lb	120 V	1	WALL SWITCH

ELECTRIC UNIT HEATER SCHEDULE

ID	DESCRIPTION	MANUFACTURER	MODEL NO.	HEATING ELEMENT	UNIT DIMENSIONS		AMPS	VOLT	PH	REMARKS
				POWER	AFF ELEVATION					
EUH-1	WALL MOUNTED ELECTRIC UNIT HEATER	BROAN	174	1.5 kW	1" - 0"	12.5 A	120 V	1		
EUH-6	CEILING HUNG ELECTRIC UNIT HEATER	DAYTON	2YU68	7.5 kW		20.8 A	208 V	3		WALL THERMOSTAT
EUH-10	CEILING HUNG ELECTRIC UNIT HEATER	DAYTON	2YU68	10.0 kW		27.4 A	208 V	3		WALL THERMOSTAT

MECHANICAL PIPING & INSULATION SCHEDULE

NOTE: ALL EXTERIOR INSULATED PIPING TO BE PROVIDED WITH ALUMINUM JACKET.

NOMINATE PIPE SIZE							
SERVICE	PIPING TYPE	INSULATION TYPE	<1	1 TO <1-1/2	1-1/2 TO <4	4 TO <8	≥8
EQUIPMENT DRAINS, COOLING CONDENSATE LINES, AND OVERFLOWS	TYPE "L" HARD COPPER	ELASTOMERIC	0.5	0.5	1.0	1.0	1.0
REFRIGERANT PIPING	COPPER REFRIGERANT PIPING	ELASTOMERIC	0.5	1.0	1.0	1.0	1.5
ALL OUTDOOR INSULATED PIPING	PROVIDE WITH EMBOSSED ALUMINUM JACKET OVER SCHEDULED INSULATION	PER SCHEDULE					

GENERAL NOTE:
DUCT DIMENSIONS LISTED ON DRAWINGS REPRESENT THE AIRFLOW FREE AREAS AND DO NOT HAVE ALLOWANCES FOR INSULATION LINER, WHERE APPLICABLE, INSIDE THE DUCTS, OR DUAL WALL DIMENSIONS. DUCTS SHALL BE CONSTRUCTED TO INCLUDE INSULATION REQUIREMENTS AND MAINTAIN AIRFLOW DIMENSIONS INDICATED ON PLANS.

NOTE: NO LINED DUCT IN KITCHEN

MECHANICAL DUCTWORK & INSULATION SCHEDULE

SERVICE	DUCT TYPE	INSULATION TYPE	INSULATION THICKNESS
RESTROOM EXHAUST DUCT	ROUND OR RECTANGULAR, AS INDICATED ON PLANS.	FIBERGLASS WRAP OR MATTE FACED FIBERGLASS LINER, AS INDICATED ON PLANS	2" WRAP OR 1-1/2" LINER, R VALUE=6.0

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HP ENGINEERING



PHILLIPS PARK

3108 SE J Street
Bentonville, AR

Key Plan

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PROJECT NO: 21108300

ISSUE DATE: 01/30/26

CONTACT: W. BURGESS

QC BY:

STATE OF
ARKANSAS
REGISTERED
PROFESSIONAL
ENGINEER
No. 19299
STEPHEN D. EDMONDSON

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MECHANICAL SCHEDULES

M-601



3108 SE J Street
Bentonville, AR

[illegible]

STATE OF
ARKANSAS

LICENSED
PROFESSIONAL
ENGINEER
Ryan D. Moore
No. 15416
RYAN D. MOORE

01/30/2020

E-001

	SPRINKLER FLOW SWITCH
	SPRINKLER VALVE TAMPER SWITCH
	THERMAL DETECTOR
	DUCT SMOKE DETECTOR
	CEILING SMOKE DETECTOR

	SAFETY DISC. SW. (NON-FUSED)
	SAFETY DISC. SW. (FUSED)
	POWER POLE (OPEN OFFICE STYLE)
	SURGERY SERVICE COLUMN

EXISTING TO REMAIN RELOCATED DEMOLISHED

 XX-1
XX-1

 XX-1
XX-1

 XX-1
XX-1

 T1 TRANSFORMER

 LIGHTING FIXTURE TAG DESCRIPTORS:
 TOP VALUE: FIXTURE TYPE ID.
 MIDDLE VALUE, NUMBER, PANEL AND CIRCUIT NUMBER
 BOTTOM VALUE, LOWERCASE LETTER: SWITCH DESIGNATION.
 ABSENCE OF A SWITCH ID INDICATES FIXTURE IS CONTROLLED BY THE ONLY
 SWITCH IN THE SPACE.
 *"X" IN PLACE OF THE SWITCH ID INDICATES NIGHT LIGHT, UNSWITCHED.

EXIT LIGHTS. STEM INDICATES WALL MOUNTING. NO STEM INDICATES CEILING MOUNTING. SHADED AREA INDICATES ILLUMINATED FACE(S). ARROW INDICATES DIRECTIONAL ARROW ON ILLUMINATED FACE(S).

DEVICES. TAG INDICATES PANEL AND CIRCUIT NUMBER. THE SWITCH DESIGNATION IS INDICATED BY A LOWER CASE LETTER. EXAMPLE: SPLIT DUPLEX RECEPTACLE IS CONNECTED TO CIRCUIT 1 AND ONE RECEPTACLE OUTLET IS CONTROLLED BY SWITCH "d".

THE CONTROL DEVICE DESIGNATION IS INDICATED BY A LOWER CASE LETTER.
EXAMPLE: SINGLE POLE SWITCH "d" TO CONTROL LIGHTING FIXTURES INDICATED
BY "d".

WALL BOX DIMMER. EXAMPLE: CONTROL LIGHTING FIXTURES INDICATED BY "e".
SEE SPECIFICATIONS FOR WATTAGE.

FLOORBOX WITH DATA: LEGRAND WIREMOLD SERIES RF84E-OG OR RF86E-OG WITH EVOLUTION COVER. ROUTE (21)" FOR DATA FROM FLOOR BOX TO NEAREST ACCESSIBLE CEILING SPACE. ON FLOOR LEVELS WITH ACCESSIBLE SPACE BELOW, USE POKE-THRU STYLE FLOOR BOXES: LEGRAND 6AT SERIES. SEE ARCHITECTURAL PLANS FOR LOCATION UNOS. POWER AND DATA CONDUITS SHALL BE ROUTED UNDER/IN THE SLAB TO NEAREST ACCESSIBLE FULL HEIGHT WALL.

SECURITY CAMERA: PROVIDE SINGLE GANG BOX AND 3/4" CONDUIT TO ACCESSIBLE CEILING SPACE. WIRING AND EQUIPMENT BY OTHERS.

PANELBOARDS. PANELBOARD DOORS MAY BE SHOWN TO INDICATE OPENING SIDE OF RECESSED PANELBOARDS. SEE PANELBOARD IDENTIFICATION FOR DESIGNATION CODES.

MOTOR CONNECTIONS. THE MOTOR IS INDICATED BY A NUMBER WITHIN OR CHARACTERS ADJACENT TO THE MOTOR SYMBOL. SEE THE MOTOR AND EQUIPMENT SCHEDULE FOR THE MOTOR DESCRIPTION AND ELECTRICAL REQUIREMENTS.

TRANSFORMERS. THE TRANSFORMER TYPE IS INDICATED BY A NUMBER FOLLOWING THE UPPER CASE LETTER "T". SEE THE TRANSFORMER SCHEDULE OR THE SINGLE LINE DIAGRAM FOR THE TRANSFORMER DESCRIPTION AND REQUIREMENTS. EXAMPLE: TRANSFORMER TYPE "T1".

GRAPHICAL REPRESENTATION OF PHASING, TYPICAL FOR ALL SYMBOLS.

— EXISTING TO REMAIN	ITEM TO BE REMOVED	
— EXISTING TO BE REMOVED		
— NEW	AREA NOT IN CONTRACT	

REVISION NUMBER - SHOWN ON PLANS

— NUMBER OF DETAIL ON SHEET
— NUMBER OF SHEET WHERE DETAIL APPEARS

KEYED NOTE (SEE SCHEDULE

ROOM NAME AND NUMBER

A	1 POLE (2P, 3P, 4P, ETC.)	MCB	MAIN CIRCUIT BREAKER
A	AMPERE	MCC	MOTOR CONTROL CENTER
AC	ABOVE COUNTER	MDC	MAIN DISTRIBUTION CENTER
ACLG	ABOVE CEILING	MDP	MAIN DISTRIBUTION PANEL
ADO	AUTOMATIC DOOR OPENER	MFR	MANUFACTURER
AF	AMP FRAME	MFS	MAIN FUSED DISCONNECT SW
AFF	ABOVE FINISHED FLOOR	MH	MANHOLE
AG	ABOVE FINISHED GRADE	MI	MICROPHONE
AHI	ARC FAULT CIRCUIT	MIN	MINIMUM
	INTERRUPTER	MISC	MISCELLANEOUS
AHU	AIR HANDLING UNIT	MLO	MAIN LUGS ONLY
AL	ALUMINUM	MMS	MANUAL MOTOR STARTER
ALT	ALTERNATE	MOA	MULTIOUTLET ASSEMBLY
AMP	AMPERE	MSP	MOTOR STARTER PANELBOARD
ANPL	AMPLIFIER	MSBD	MAIN SWITCHBOARD
ANNUN	ANNUNCIATOR	MT	MOUNT
APPROX	APPROXIMATELY	MT C	EMPTY CONDUIT
AQ-ST	AQUASTAT	MTS	MANUAL TRANSFER SWITCH
ARCH	ARCHITECT, ARCHITECTURAL	MTR	MOTOR, MOTORIZED
AS	AMP SWITCH	N.C.	NORMALLY CLOSED
AT	AMP TRIP	NEC	NATIONAL ELECTRICAL CODE
ATS	AUTOMATIC TRANSFER SWITCH	NEMA	NATIONAL ELECTRICAL
ATO	AUTO TRANSFER	NFPA	NATIONAL SAFETY'S ASSOCIATION
AUX	AUXILIARY	NFDS	NON-FUSED SAFETY DISCONNECT SWITCH
AV	AUDIO VISUAL	NIC	NOT IN CONTRACT
AWG	AMERICAN WIRE GAUGE	NL	NIGHT LIGHT
BATT	BATTERY	N.O.	NORMALLY OPEN
BD	BOARD	NPF	NORMAL POWER FACTOR
BLDG	BUILDING	NTS	NOT TO SCALE
BMS	BUILDING MANAGEMENT SYSTEM	OVERHD	OVERHEAD
CAB	CABINET	OL	OVERLOADS
CAT	CATALOG	PA	PUBLIC ADDRESS
CATV	CABLE TELEVISION	PB	PULL BOX OR PUSHBUTTON
CB	CIRCUIT BREAKER	PE	PENEUMATIC ELECTRIC
CCTV	CLOSED CIRCUIT TELEVISION	PED	PEDESTAL
CLG	CIRCUIT	PF	POWER FACTOR
CKT	CEILING	PH	PHASE
CMR	COMBINATION	PV	POST INDICATING VALVE
CMRP	COMPRESSOR	PNL	PANEL
CONN	CONNECTION	PP	POWER POLE
CONST	CONSTRUCTION	PR	PAIR
CONT	CONTINUATION OR CONTINUOUS	PRI	PRIMARY
CONTR	CONTRACTOR	PROJ	PROJECTION
CONV	CONVECTOR	PRV	POWER ROOF VENTILATOR
CP	CIRCUIT RUMP	PT	POTENTIAL TRANSFORMER
CT	CATHODE-RAY TUBE	PVC	POLYVINYL CHLORIDE (CONDUIT)
CT	CURRENT TRANSFORMER	PWR	POWER
CTR	CENTER	QUAN	QUANTITY
CU	COPPER	RCPN	RECEPTACLE
DCP	DOMESTIC WATER CIRCULATING PUMP	REQD	REQUIRED
DEPT	DEPARTMENT	RM	ROOM
DET	DETAIL	RSU	RIGID STEEL CONDUIT
DIA	DIAMETER	RTU	ROOF TOP UNIT
DISC	DISCONNECT	SC	SURFACE CONDUIT
DIST	DISTRIBUTION	SEC	SECONDARY
DN	DOWN	SHT	SHEET
DPS	DAMPER	SIM	SIMILAR
DS	SAFETY DISCONNECT SWITCH	SIN	SOLID NEUTRAL
DT	DOUBLE THROW	SPEC	SPECIFICATION
DWG	DRAWING	SPKR	SPEAKER
EC	ELECTRICAL CONTRACTOR	SP	SPARE
ELEC	ELECTRICAL, ELECTRICAL	SS	SURFACE RACEWAY
ELEV	ELEVATOR	SS	STAINLESS STEEL
ELU	EMERGENCY LIGHTING UNIT	SSW	SELECTOR SWITCH
EM	EMERGENCY	S/S	STOP/START PUSHBUTTONS
EMS	ENERGY MANAGEMENT SYSTEM	STA	STATION
ENT	ELECTRICAL METALLIC TUBING	STD	STANDARD
EP	ELECTRIC PNEUMATIC	SURF	SURFACE MOUNTED
EQUIP	EQUIPMENT	SW	SWITCH
EW	ELECTRIC WATER COOLER	SWBD	SWITCHBOARD
EXIST	EXISTING	SYM	SYMMETRICAL
EXH	EXHAUST	SYS	SYSTEM
EXP	EXPLOSION PROOF	TEL	TELEPHONE
FA	FIRE ALARM	TEL/DATA	TELEPHONE/DATA
FABP	FIRE ALARM BOOSTER POWER	TERM	TERMINAL
FACP	SUPPLY PANEL	TL	TWIST LOCK
FAL	FIRE ALARM CONTROL PANEL	TR	TAMPER RESISTANT
FCU	FAN COIL UNIT	T-STAT	THERMOSTAT
FIX	FIXTURE	TEL	TELEPHONE TERMINAL CABINET
FLR	FLOOR	TV	TELEVISION
FLUOR	FLUORESCENT	TVTC	TELEVISION TERMINAL CABINET
FUSE	FUSE	TYP	TYPICAL
FUDS	FUSED SAFETY DISCONNECT SWITCH	UC	UNDER COUNTER
GA	GAUGE	UE	UNDERGROUND ELECTRICAL
GALLN	GALLON	UG	UNDERGROUND
GALV	GALVANIZED	UH	UNDERGROUND UNIT HEATER
GC	GENERAL CONTRACTOR	UTL	UTILITY
GEN	GENERATOR	UV	ULTRAVIOLET
GFI	GROUND FAULT CIRCUIT INTERRUPTER	V	VOLT
GFP	GROUND FAULT PROTECTOR	VA	VOLT-AMPERES
GND	GROUND	VOT	VOLT DISPLAY TERMINAL
GNS	GALVANIZED RIGID STEEL (CONDUIT)	VERT	VERTICAL
GRD	GRYSR BOARD	V	VARIABLE FREQUENCY DRIVE
HOA	HOURS-OFF-AUTOMATIC SWITCH	VOL	VOLUME
HORIZ	HORIZONTAL	W	WATT
HP	HORSEPOWER	W/	WITH
HPF	HIGH POWER FACTOR	WG	WIRE GUARD
HT	HEIGHT	WH	WATER HEATER
HTG	HEATING	W/O	WITHOUT
HTR	HEATER	WP	WEATHER
HV	HIGH VOLTAGE	WR	WEATHER RESISTANT
	HEATING, VENTILATING AND AIR	XMR	TRANSFORMER
	CONDITIONING	XFR	TRANSFER
IC	INTERRUPTING CAPACITY		

∠	ANGLE
@	AT
▲	DELTA
'	FEET
"	INCHES
#	NUMBER
∅	PHASE
CL	CENTER
P	PLATE

∠	ANGLE
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#	NUMBER
Ø	PHASE
CL	CENTER LINE
P	PLATE

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EXISTING ELECTRICAL AND DEMOLITION NOTES	
1	PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE FACILITY AND RELATED SITE. REVIEW THE GENERAL NOTES AND ALL OTHER TRADE DRAWINGS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER OR OWNER, AS SPECIFIED, OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMITTING BID.
2	ANY EXISTING CONDITIONS REFLECTED WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY ALL EXISTING CONDITIONS AND CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTING CONDITIONS.
3	PROVIDE ALL DEMOLITION OF EXISTING ELECTRICAL SYSTEMS AND NEW ELECTRICAL SYSTEM MODIFICATIONS REQUIRED BECAUSE OF BUILDING REMODELING, AS NOTED ON THE DRAWINGS, OR NECESSARY FOR PROPER OPERATION AND NEW CONSTRUCTION. REMOVE ALL ABANDONED CABLES AND WIRING ABOVE ACCESSIBLE CEILINGS AND VENTILATION SHAFTS.
4	COORDINATE INTERRUPTION OF ALL BUILDING SERVICES INCLUDING BUT NOT LIMITED TO BRANCH CIRCUITS, DATA, TELEPHONE, ETC WITH BUILDING OWNER PRIOR TO INTERRUPTION. PROVIDE LABOR AND MATERIALS AS REQUIRED TO REDUCE INTERRUPTIONS IN ORDER TO MAINTAIN EXISTING OPERATION.
5	PAY SPECIAL ATTENTION NOT TO DAMAGE THE FINISH OF EXISTING WALLS AND CEILINGS THAT ARE TO REMAIN WHEN REMOVING OR REPLACING LIGHT FIXTURES AND OTHER ELECTRICAL DEVICES. REPAIR ANY DAMAGE CAUSED DURING WORK ON AT EXTRA COST TO THE OWNER. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
6	RELOCATE ALL EXISTING ELECTRICAL, FIRE ALARM, AND OTHER LOW-VOLTAGE SYSTEMS REQUIRED TO BE IN OPERATION AT SUBSTANTIAL COMPLETION OF THE CONTRACT, IF REQUIRED, AS A RESULT OF WORK INCLUDED UNDER THIS CONTRACT, EVEN IF NOT SPECIFICALLY INDICATED IN THE DRAWINGS OR SPECIFICATIONS.
7	SEAL ALL PENETRATIONS THROUGH FLOORS, WALLS, CEILINGS, AND ROOF WHERE ELECTRICAL COMPONENTS ARE REMOVED AND WHERE NEW EXISTING PENETRATION IS NOT CALLED FOR THE NEW INSTALLATION. REPAIR DAMAGED SURFACES TO MATCH ADJACENT AREAS OR AS DIRECTED BY THE OWNER.
8	UNLESS NOTED OTHERWISE, ABANDONED CONDUIT ASSEMBLIES SERVING DEMOLISHED DEVICES SHALL BE REMOVED BACK TO NEAREST JUNCTION BOX OUTSIDE OF AREA OF DEMOLITION AND LABELED AS REQUIRED FOR FUTURE USE. ASSOCIATED WIRING SHALL BE REMOVED BACK TO SERVING PANELBOARD. UPDATE PANELBOARD CIRCUIT DIRECTORY AS REQUIRED TO INDICATE RELATED CIRCUIT(S) AS "SPARE".
9	ANY PANELBOARD CIRCUIT DISCREPANCIES SHOWN AS "existing" OR IN OTHER LOWER CASE LETTERING IS INTENDED TO REFLECT AN EXISTING CIRCUIT TO REMAIN UNLESS OTHERWISE IDENTIFIED DIFFERENTLY THRU THE COURSE OF CONSTRUCTION.
10	ALL CIRCUIT BREAKERS SERVING BRANCH CIRCUITS TO BE REMOVED SHALL REMAIN IN RESPECTIVE PANELBOARD FOR FUTURE USE UNLESS NOTED OTHERWISE.
11	EXISTING DEVICES ARE SHOWN LIGHT. NEW DEVICES ARE SHOWN BOLD.

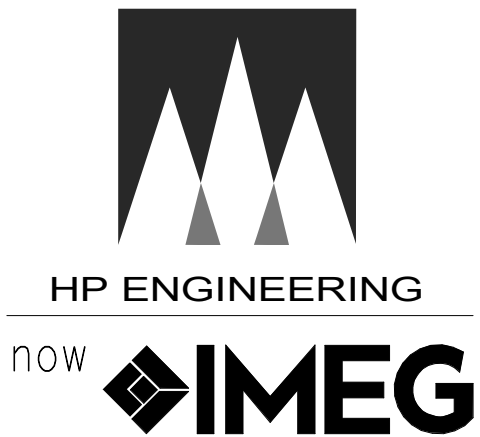
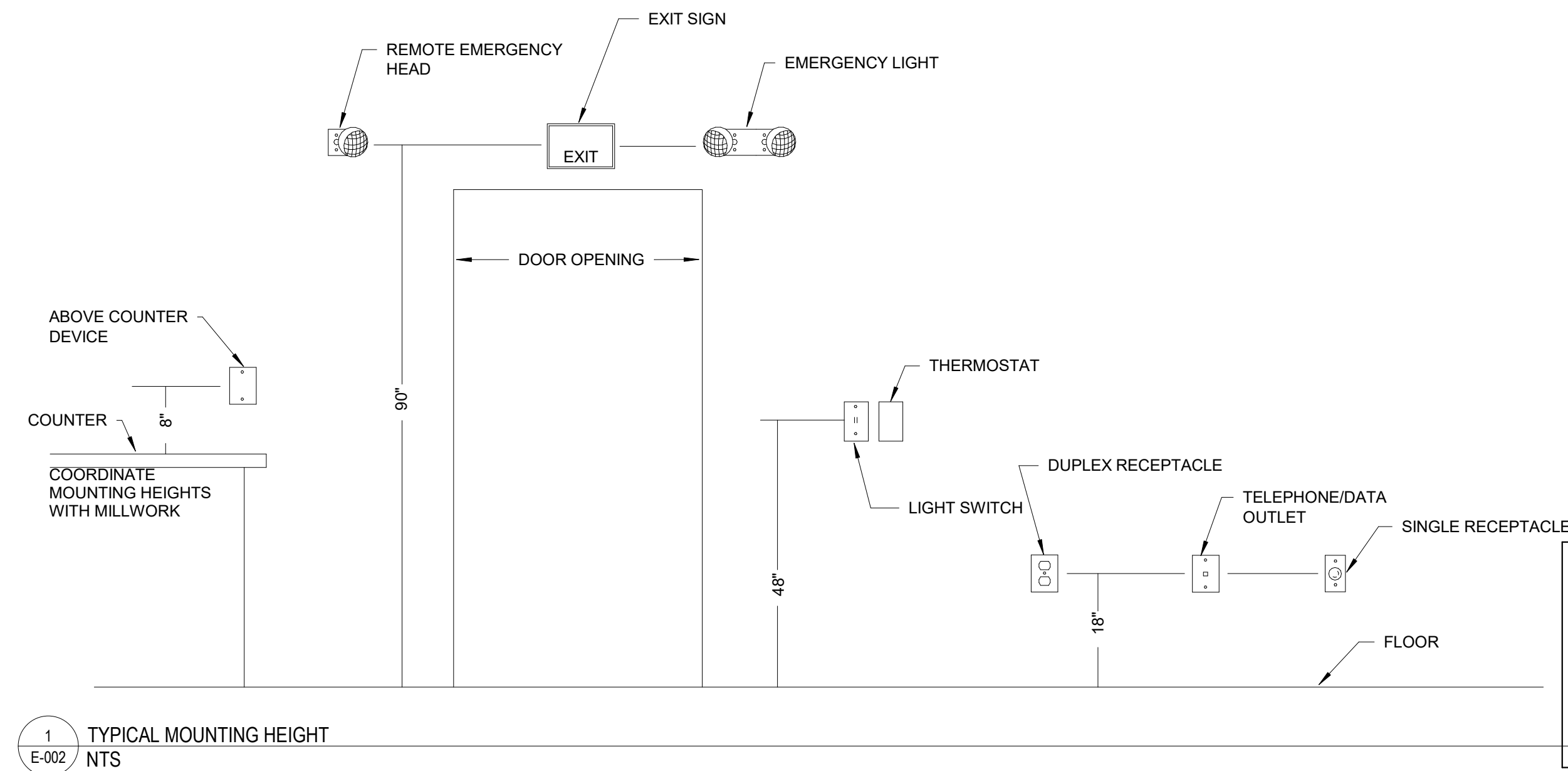
GENERAL LIGHTING NOTES	
1	WHERE RECESSED LIGHTING FIXTURES ARE INDICATED IN A FIRE RATED CEILING, PROVIDE A ONE HOUR RATED "TENT" FOR FIXTURE.
2	PRIOR TO ALL MOUNTING AND SUPPORT HARDWARE FOR LIGHT FIXTURES TO MEET SPECIFIED MOUNTING HEIGHTS, REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT MOUNTING HEIGHTS OF FIXTURES.
3	CONNECT "UN-SWITCHED" HOT CONDUCTOR FROM CIRCUIT SERVING SPACE LIGHTING TO EACH EXIT SIGN, EMERGENCY LIGHT, AND ANY FIXTURE DESIGNATED AS NIGHT LIGHT SERVING THE SPACE.
4	COORDINATE ALL DEVICES AND WALL-MOUNTED LIGHT FIXTURE LOCATIONS WITH THE ARCHITECTURAL WALL FINISHES AND ELEVATIONS. SPECIAL ATTENTION AND COORDINATION OF WALL TYPES AND FINISHES IS REQUIRED PRIOR TO ROUGH-IN. EXACT LOCATION OF DEVICES SHALL BE COORDINATED WITH THE ARCHITECT PRIOR TO ROUGH-IN TO AVOID INSTALLATION ON SPECIAL ARCHITECTURAL WALL FINISHES. DEVICES NOT PROPERLY COORDINATED WITH THE SPECIAL WALL FINISHES INDICATED IN THE CONSTRUCTION DOCUMENTS PRIOR TO ROUGH-IN SHALL BE RELOCATED AT NO ADDITIONAL COST TO THE OWNER.
5	ELECTRICAL CONTRACTOR SHALL VERIFY CHEVRON DIRECTIONS OF ALL EXIT SIGNS PRIOR TO ORDERING.
6	FOR BATTERY FED EMERGENCY LIGHTS: PROVIDE EMERGENCY BALLAST. PROVIDE "HOT" WIRE TO EMERGENCY BALLAST. SWITCH FIXTURE AS INDICATED ON PLANS.
7	COORDINATE AND PROVIDE DIMMER SWITCHES RATED FOR AND COMPATABLE WITH INTENDED LIGHT FIXTURE(S) TO BE CONTROLLED. CIRCUITS CONTROLLED WITH LINE-VOLTAGE DIMMER SWITCHES SHALL NOT SHARE NEUTRAL CONDUCTORS.

GENERAL LOW VOLTAGE NOTES	
1	PROVIDE 4"WIDE X 4" TALL X 3/4" FIRE RATED, PAINTED CDX PLYWOOD BACKBOARD WHERE SHOWN ON DRAWINGS OR AS REQUIRED FOR TELEPHONE, CATV, ALARM SYSTEM EQUIPMENT, ECT. COORDINATE EXACT LOCATION(S) WITH RESPONSIBLE CONTRACTOR(S).
2	PROVIDE (1) 1/2" CONDUIT, AND 4" SQUARE CAB WITH SINGLE GANG DEVICE RING FOR ALL THERMOSTAT LOCATIONS INDICATED ON THE MECHANICAL DRAWINGS. ROUTE CONDUIT FROM BOX TO ACCESSIBLE CEILING CAVITY. PROVIDE PLASTIC BUSHINGS ON EXPOSED CONDUIT ENDS. PROVIDE PULL STRING IN ALL EMPTY CONDUIT SYSTEMS. COORDINATE EXACT LOCATIONS AND MOUNTING HEIGHTS WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.
3	PROVIDE CABLE HOOKS ABOVE CEILING ON 6' CENTERS IN ALL CORRIDORS. MOUNT 6 INCHES ABOVE CEILING.
4	PROVIDE ROUGH-IN OF ALL BACK BOXES, CONDUITS (WITH BUSHINGS AND PULL STRINGS) AND OTHER WIRE WAYS AS REQUIRED FOR LOW VOLTAGE SYSTEMS. COORDINATE ALL REQUIRED LOCATIONS WITH OWNER AND RESPONSIBLE CONTRACTOR(S).
5	FURNISH AND INSTALL A TELEPHONE SERVICE CONDUIT(S) PER TELEPHONE SERVICE PROVIDER SPECIFICATIONS. STUB UP AT DESIGNATED EQUIPMENT BOARD +12" ABOVE FLOOR AND CAP. INSTALL 2- 4" CONDUITS UNDERGROUND TO TELEPHONE COMPANY SERVICE LOCATION.
6	FURNISH AND INSTALL A CABLE TV SERVICE CONDUIT(S) PER CABLE TV PROVIDER SPECIFICATIONS. STUB UP AT DESIGNATED EQUIPMENT BOARD +12" ABOVE FINISH FLOOR AND CAP. INSTALL 2- 4" CONDUITS UNDERGROUND TO CABLE TV COMPANY SERVICE LOCATION.

GENERAL POWER NOTES

- 1 ALL RECEPTACLES SHALL BE GROUNDING TYPE.
- 2 ALL RECEPTACLES INSTALLED IN BATHROOMS, OUTDOORS AND KITCHENS SHALL HAVE GROUND-FAULT CIRCUIT INTERRUPTER PROTECTION AS REQUIRED BY THE NATIONAL ELECTRIC CODE.
- 3 COORDINATE MECHANICAL EQUIPMENT CONNECTION REQUIREMENTS WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. LOCATE FEEDERS, DISCONNECTS AND MAINTENANCE RECEPTACLES SO THAT THEY WILL NOT INTERFERE WITH OPERATION OR MAINTENANCE OF MECHANICAL EQUIPMENT.
- 4 PROVIDE POWER TO MECHANICAL PLUMBING, AND ALL OTHER EQUIPMENT AS REQUIRED FOR PROPER OPERATION. COORDINATE AND VERIFY EACH PIECE OF EQUIPMENTS POWER/CONTROL REQUIREMENTS PRIOR TO ORDERING RELATED ELECTRICAL EQUIPMENT. REFER TO RELATED MECHANICAL, PLUMBING, AND OTHER RELATED DOCUMENTS FOR LOCATIONS OF EQUIPMENT AND REQUIRED CLEARANCES AROUND EQUIPMENT.
- 5 COORDINATE EXACT MOUNTING HEIGHT OF EACH ABOVE COUNTER RECEPTACLE WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN.
- 6 ALL OUTLETS LOCATED IN AREAS REQUIRING GROUND-FAULT CIRCUIT INTERRUPTER PROTECTION PER NEC-210 SHALL CONSIST OF A GFCI PROTECTED DEVICE. EVEN IF NOT SPECIFICALLY INDICATED IN THE DRAWINGS, THE GROUND-FAULT CIRCUIT INTERRUPTER SHALL BE INSTALLED IN A READILY ACCESSIBLE LOCATION AS DEFINED IN THE NEC. ALL RECEPTACLES SUPPLIED THROUGH A GROUND-FAULT CIRCUIT INTERRUPTER SHALL BE MARKED "GFCI PROTECTED."

GENERAL ELECTRICAL NOTES	
1	DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF THE WORK. REVIEW ALL GENERAL NOTES, SPECIFICATIONS AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS.
2	SPECIAL ATTENTION SHALL BE GIVEN TO ALL RACEWAYS WITHIN FINISHED AREAS WITHOUT CEILINGS AND EXPOSED TO STRUCTURE. IN GENERAL, ALL RACEWAYS SHALL BE CONCEALED WITHIN WALLS, ABOVE STRUCTURE FINISH, OR BELOW FLOOR SLABS WHEN SPECIFIED, WHERE EXPOSED CONDITIONS ARE NECESSARY OR UNAVOIDABLE DUE TO OTHER CONDITIONS, THE BID SHALL INCLUDE ANY REASONABLE MEANS TO MINIMIZE THE AMOUNT OF SURFACE MOUNTED EQUIPMENT. PRIOR TO ROUGH-IN, COORDINATE ALL EXPOSED RACEWAY AND BOX CONDITIONS WITH ARCHITECT PRIOR TO CONSTRUCTION OF WALLS, ROOF DECK, OR FLOOR SLABS. ATTACHMENT TO ROOF DECK OR JOIST WEBBINGS IS NOT ALLOWED. MAINTAIN A MINIMUM SPACING OF 1-1/2" FROM CONDUIT TO ROOF DECK. IN AREAS WHERE EXPOSED RACEWAYS ARE REQUIRED, INSTALL SYSTEMS SQUARE AND TIGHT TO STRUCTURE AND PAINT TO MATCH THE STRUCTURE PER ARCHITECT AND/OR OWNER SPECIFICATIONS. FAILURE TO PROPERLY COORDINATE THE ROUTING OF EXPOSED RACEWAYS MAY RESULT IN RELOCATION OF SUCH RACEWAYS AT NO ADDITIONAL COST TO THE OWNER.
3	OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE-RESISTANT-RATED WALLS, PARTITIONS, FLOORS OR CEILINGS SHALL BE FIRESTOPPED USING APPROVED METHODS TO MAINTAIN THE FIRE RESISTANCE RATING. PROVIDE PENETRATION FIRE STOPPING WITH RATINGS DERIVED FROM LISTED PRODUCTS AS E-14 OR UL 1479. FIRE STOPPING SHALL NOT BE LESS THAN FIRE RESISTANCE RATING OF CONSTRUCTED PENETRATIONS.
4	FIELD MOUNTED DEVICES SUCH AS SWITCHES, MOTOR STARTERS, RECEPTACLES, ETC., ARE SHOWN IN THEIR APPROXIMATE LOCATION. SWITCH MOUNTING HEIGHT SHALL BE 48" ABOVE FINISHED FLOOR AND RECEPTACLE MOUNTING HEIGHT SHALL BE 18" ABOVE FINISHED FLOOR UN. REFER TO THE TYPICAL MOUNTING HEIGHT DETAIL.
5	INSTALL EQUIPMENT IN A MANNER TO REMAIN ACCESSIBLE WITH REASONABLE MEANS BY THE OWNER FOLLOWING COMPLETION OF WORK. SPECIAL ATTENTION AND ADDITIONAL COORDINATION IS EXPECTED IN AREAS OF THE BUILDING WHERE THE CEILING AND STRUCTURE HEIGHTS HAVE SIGNIFICANT DIFFERENT ELEVATIONS. EQUIPMENT REQUIRING POSSIBLE FUTURE ACCESS SHALL BE INSTALLED SUCH THAT IT MAY BE SAFELY ACCESSED FROM A STAIRWELL STEP LADDER OR PLATFORM NOT SUITABLE FOR THE LOCATION AND CEILING HEIGHT, WITHOUT REMOVING OR DAMAGING THE CEILING GRID STRUCTURE.
6	COORDINATE ALL CEILING MOUNTED ELECTRICAL ITEMS WITH OTHER DISCIPLINES, WITH CEILING, AND STRUCTURE. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.
7	FIELD VERIFY LOCATIONS OF EXISTING ELECTRICAL EQUIPMENT, INCLUDING POWER POLES, TELEPHONE PEDESTALS, OVERHEAD AND UNDERGROUND FEEDERS, METERS, PANELS, DEVICES, ETC. PROVIDE FOR COORDINATION WITH EXISTING EQUIPMENT.
8	ROOM NAMES/NUMBERS SHOWN IN PANELBOARD SCHEDULES ARE PER ARCHITECTURAL FLOOR PLANS. CONTRACTOR SHALL PROVIDE FINALIZED PANELBOARD SCHEDULES AT COMPLETION OF PROJECT WITH OWNER PROVIDED ROOM NAMES/NUMBERS.
9	CONDUCTORS FOR BRANCH CIRCUITS AS DEFINED IN ARTICLE 100, SHALL BE SIZED TO PREVENT A VOLTAGE DROP EXCEEDING 3% AT THE FARTHEST LOAD, AND WHERE THE MAXIMUM TOTAL VOLTAGE DROP ON BOTH FEEDERS AND BRANCH CIRCUITS TO THE FARTHEST LOAD DOES NOT EXCEED 5%.
10	ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE, STATE LAWS, ALL AUTHORITIES HAVING JURISDICTION, AND ALL OTHER REGULATIONS GOVERNING WORK OF THIS NATURE.
11	THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIAL, AND LABOR TO SATISFY A COMPLETE AND WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.
12	CONTRACTOR TO CONFIRM EXACT LOCATION OF EXISTING AND NEW EQUIPMENT.
13	THE CONTRACTOR SHALL FURNISH AND INSTALL ALL GROUNDING SYSTEMS (AS REQUIRED) IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.
14	ALL ELECTRIC MATERIALS AND EQUIPMENT FOR THE PROJECT SHALL BE NEW AND U.L. OR EQUALLY LISTED.
15	SUBMIT TO THE OWNER CERTIFICATES OF INSPECTIONS IN DUPLICATE FROM AN APPROVED INSPECTION AGENCY UPON COMPLETION.
16	THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES AS REQUIRED.
17	THE CONTRACTOR SHALL FURNISH ALL INSTRUMENTS AND QUALIFIED PERSONNEL OR FIRM TO PERFORM ALL REQUIRED TESTS.
18	NO EQUIPMENT SHALL BE ENERGIZED UNTIL ALL TEST AND ADJUSTMENTS HAVE BEEN MADE. THREE COPIES OF ALL TEST RESULTS SHALL BE DELIVERED TO THE OWNER.
19	ALL ELECTRICAL WORK SHALL BE COORDINATED WITH THE MECHANICAL WORK AS CALLED FOR IN MECHANICAL SPECIFICATIONS AND PLANS.
20	JUNCTION BOXES LOCATED ABOVE GRID CEILINGS SHALL BE LOCATED NO GREATER THAN 4 FEET ABOVE THE CEILING IN A LOCATION ACCESSIBLE VIA A LADDER FROM THE ROOM BELOW.
21	ALL WIRING DEVICE COVERPLATES SHALL INDICATE PANELBOARD AND CIRCUIT SERVING THE DEVICE. UTILIZE CLEAR VINYL (BLACK LETTERING) IDENTIFICATION TAGS MANUFACTURED BY 3M COMPANY (OR APPROVED EQUIVALENT).
22	THE TYPE OF CONDUIT SHALL BE AS FOLLOWS FOR ALL FEEDERS AND DISTRIBUTION CIRCUITS, UNLESS OTHERWISE SPECIFIED.
APPLICATION - TYPE OF CONDUIT	
BURIED IN CONCRETE OR OUTDOORS - PVC WITH RIGID GALVANIZED STEEL ELBOWS	
SERVICE ENTRANCE - GALVANIZED RIGID STEEL OR SERVICE UTILITY SPECIFICATIONS.	
23	PROVIDE A MINIMUM OF (3) SPARE 1" CONDUITS FROM RECESSED PANELBOARD, UP TO ACCESSIBLE CEILING SPACE.
24	UNLESS NOTED OTHERWISE PROVIDE MINIMUM #8 AWG CONDUCTORS IN 1" CONDUITS FOR ALL UNDERGROUND SITE POWER AND LIGHTING CIRCUITS. INCREASE CONDUCTOR AND RELATED CONDUIT SIZE AS NOTED OR OTHERWISE REQUIRED TO LIMIT VOLTAGE DROP TO LESS THAN 5% FOR THE ENTIRE LENGTH OF SYSTEM.
25	UNDERGROUND UTILITIES/FEEDERS/BRANCH CIRCUITS/ETC. SHALL NOT BE ROUTED THROUGH OR WITHIN 25 FEET OF ANY AREAS DEDICATED FOR FUTURE BUILDING ADDITION.
26	DESIGNATED SPARE CIRCUIT BREAKERS SHALL BE PLACED IN THE OFF POSITION.
27	PROVIDE SPD AS REQUIRED FOR OWNER PROVIDED EQUIPMENT, INCLUDING BUT NOT LIMITED TO THE FOLLOWING: ACCESS CONTROL SYSTEM, COMMUNICATION SYSTEM, DATA SYSTEM, SECURITY SYSTEM.
28	COORDINATE ALL POWER, DATA, FIRE ALARM AND LIGHTING, OUTLETS/DEVICES AND EQUIPMENT WITH OWNER, OWNER'S REPRESENTATIVE, AND/OR ARCHITECTURAL MILLWORK PRIOR TO ROUGH-IN OR FINAL INSTALLATION.



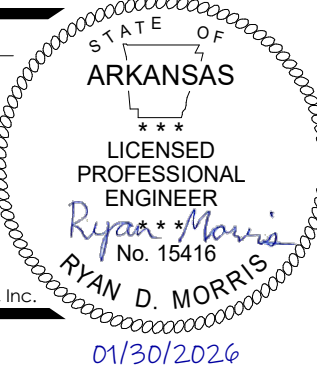
3108 SE J Street
Bentonville, AR

Key Plan

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QC DATE:



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ELECTRICAL NOTES AND DETAILS

E-002



