



Purchasing Division

## ADDENDUM NO. 5

**DATE:** April 10, 2020  
**FROM:** City of Grand Junction Purchasing Division  
**TO:** All Offerors  
**RE:** Las Colonias Amphitheater Addition IFB-4774-20-DH

Offerors responding to the above referenced solicitation are hereby instructed that the requirements have been clarified, modified, superseded and supplemented as to this date as hereinafter described.

Please make note of the following clarifications:

1. Q. Section 2.12 of the IFB documents requires all permits to be paid for by the Contractor. Section 011000 1.6 A of the Specifications says Owner is responsible for payment of all Plan review and Building Department Fees. Please clarify who is responsible for the permitting fees?
  - A. All permits and fees are the Contractors responsibility.
2. Q. Section 01500 2.1 of the specifications manual requires 10' high chain link fence with barbs on the top. Section 011000 1.5 C of the specification manual requires a 6' chain link fence and references section 015000. Please clarify the fencing requirements for this project.
  - A. 6' chain link is sufficient.
3. Q. There is a Conex box and shed in or near the construction area. At the Prebid it was discussed the Owner would move prior to construction. Please confirm that the city will remove the Conex and shed prior to construction.
  - A. Prior to construction the City will remove the conex box and shed.
4. Q. There is a chain link fence in or near the construction area that will need to be removed prior to construction. Who is responsible for removing the existing chain link fence? If it is the contractor's responsibility please define which portions are to be removed.
  - A. City staff will remove/reset fence per contractor's request.
5. Q. Section 013233 1.4 A of the specifications manual requires a professional photographer with three years of experience taking construction photos to take pictures for photographic documentation. Our project superintendents take daily photos of work performed and have done so for years. Will

their experience in construction photographing be accepted in lieu of hiring a professional photographer for this project assuming all other requirements are met?

A. The Contractors experience would suffice for this project.

6. Q. Section 015000 2.2 B 2 of the specifications manual requires a field office with a conference room able to accommodate meetings of 20 individuals. Considering the size and scope of this project will the owner consider a smaller size field office for this project?

A. A conference room to accommodate 6-8 would suffice.

7. Q. Section 015000 3.4 F of the specifications manual requires the contractor to engage a pest control service to keep the project free from pests. Will this be required for the entire facility or just the construction area?

A. The construction area only.

8. Q. Section 017900 of the specifications manual requires video recorded demonstration and training to be provided to Owner personnel with performance-based testing at the end of each module for all the different systems. How many people will require this level of training?

A. 4-6 City Staff

9. Q. Sheet AE101 calls for a C2 wall type on the north side of the woman's restroom (A130). Are we to demo the existing wall and rebuild per C2 wall requirements or just add the 6" metal stud framing, insulation, gyp board etc. to the existing exterior wall? If we are to demo please provide a demo plan for this section.

A. The intent was that the metal stud wall would be placed against the existing CMU wall, no demo required.

10. Q. Will you accept Aluminum -Framed Entrances and storefronts from Manko Windows as an equal substitute to the manufacturers specified?

A. Yes, Manko Windows can be used as a substitute.

11. Q. On Page 5 of the specification manual under Division 31 – Earthwork it says to refer to the City of Grand Junction Standards. Can we get a copy of these standards?

A. The Standards are available on the City's website

<http://www.gjcity.org/contentassets/cb6a97ece8934558b98cbf9437746986/2010-scd-manual-final.pdf>

12. Q. At the pre-bid it was discussed that some exterior concrete will be required to tie into the existing on the east side of the addition. Can you please provide a detail for the exterior concrete ( sub grade requirements / depth of slab / reinforcing and connection requirements) and define where exactly it is to be placed on the site plan?

A. Duane, it was my understanding that someone at the city would be doing the civil drawings, including any hardscape that extends to the new addition. So I don't have any answer for this one.

13. Q. Sheet AE310 Details A2 and A4 are drawn with the steel stud wall stopping 6" above scheduled ceiling and insulation continuing to the roof deck above. Sheet G004 Wall Type General Notes number 13 requires insulation to be supported with chicken wire on partitions without gyp board on both sides to structure. Please confirm that the steel stud wall extends to the structure above so that the chicken wire can be fastened to it.

A. The steel stud wall can extend to the structure to make installation of the insulation more straight forward.

14. Q. Sheet AE310 wall type C1 shows a 1/2" gap between the masonry wall and the steel stud wall. Does the side of the wall without gyp board require chicken wire to support the insulation per Wall Type General Notes #13?

A. No, chicken wire is not required to install the insulation in these walls.

15. Q. Please clarify earthwork requirements at slab on grade. Sheet S101 indicates 24" minimum of structural fill over suitable natural materials. Please clarify what "suitable natural materials" means and what the earthwork requirements are prior to placement of 24" minimum structural fill.

A. See attached soils report.

16. Q. Is geotechnical report available? It was noted to be provided as part of Addendum 4 but was not included.

A. See attached soils report.

17. Q. Window detail 5/S502 indicates a precast concrete sill and refers to architectural. However, unable to locate a window sill detail in architectural drawings. Please clarify.

A. The structural detail will not callout window details. See added window sill detail in architectural drawings, sheet AE601.

18. Q. Radon piping arrangement and sizing does not match between sheets AE101 and MH101. Please clarify.

A. The layout shown on the architectural plan shall be used. Sheet MH101 has been updated to reflect AE101.

19. Q. Unable to locate fixture models for plumbing fixtures SS-1 and UR. Please advise.

A. The engineer has updated his fixture schedule to include these two fixtures.

20. Q. Please clarify roof assembly. Drawings show only insulation and membrane whereas spec section 075423 lists substrate board, vapor barrier, insulation, and membrane. Roof on existing building includes 2" insulation base layer, tapered insulation, 5/8" cover board, and membrane.

A. New roof shall match existing roof assembly with 2" insulation base, tapered insulation, 5/8" cover board and membrane.

21. Q. Please clarify if roof is to be mechanically fastened or fully adhered as spec section 075423 indicates both. Existing roof includes mechanically attached insulation and cover board with fully adhered membrane.

A. New roof shall match existing roof attachment method, mechanically attach insulation and cover board with fully adhered membrane.

22. Q. Is any gyp bd texture finish to be included? Spec section 092900 lists level 4 and texture finishes but does not indicate which finish is to be included.

A. Drywall finish shall be smooth, no texture.

23. Q. Please clarify mirror type. Detail A3/AE501 indicates a frameless plate glass mirror whereas spec section 102800 paragraph 2.1.C indicates a framed Bradley mirror.

A. The submittal from the existing building's restrooms used a framed Bradley mirror. Please match the existing building.

24. Q. Is a mirror to be included above the base cabinets in the green room? Spec section 102800 paragraph 2.1.C indicates a 96"x36" mirror in this location, but elevation C1/AE401 does not. Please clarify.

A. A 36x96 mirror shall be placed in the green room but not over the counter. Place on east wall of green room across from restroom.

25. Q. Are hand dryers to be provided by owner or contractor? Spec section 102800 paragraph 2.1.D indicates to be provided by contractor whereas keynote 26.10 on sheet AE401 indicates to be provided by owner. Please clarify.

A. Hand dryers to be provided by Contractor.

26. Q. Are hand dryers AND paper towel dispensers to be installed? Drawings do not indicate paper towel dispensers but spec section 102800 paragraph 2.1.E indicates them to be installed (OFCI).

A. Yes.

27. Q. Are fire sprinkler as-builts available to aid in pricing?

A. We do not have access to the fire sprinkler as-builts.

28. Q. Is existing sanitary sewer outside building SDR 35? If so, it will need to be replaced with SCH 40 PVC under this addition to comply with code.

A. Existing SS is SDR 35.

29. Q. On plumbing plan they are showing tying onto existing 4" SS at point of connections for new sewer branch lines. I would think since this pipe is exterior presently, that it is SDR35, if so it would need to be replaced with SCH 40, per code. Is this correct?

A. On plumbing plan they are showing tying onto existing 4" SS at point of connections for new sewer branch lines. I would think since this pipe is exterior presently, that it is SDR35, if so it would need to be replaced with SCH 40, per code. Is this correct? Plan Sheet PL101 is not an accurate representation of the existing sanitary sewer service and mainline alignment. See Site Utility Plan issued in Addendum No. 1 for detail. Sanitary sewer service from the existing structure (amphitheater) to the mainline shall be upgraded to SCH 40 by the contractor. The mainline will be removed/replaced with SCH 40 prior to the beginning of construction by others.

30. Q. Will we be given a soils report for the project?

A. See attached soils report.

31. Q. Will the city be providing any civil plans that will show exterior concrete prep?

A. There will be no drawing provided for the site concrete. The area between the restroom foundation and existing concrete is approximately 1.5'x 24'. The concrete shall be GV-Class B and placed per City Spec. It shall be 6" thick over 10" of Class 6 aggregate base course and include #4 x 13" rebar 18" o.c. This item will not be measured or paid for separately.

The original solicitation for the project noted above is amended as noted.

All other conditions of subject remain the same.

Respectfully,



Duane Hoff Jr., Senior Buyer  
City of Grand Junction, Colorado



**SPECTRUM**  
ENGINEERS

## Addendum #1

**Project:** GJ Las Colonias Amphitheatre  
Addition

**From** Mike Nielsen

**Project No:** 20190529

**Date:** 04/07/2020

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### DISCIPLINES

Mechanical Engineering  
Electrical Engineering  
Technology Design  
Acoustical Engineering  
Lighting Design  
Theatre Design  
Fire Protection Engineering  
Building Commissioning

### CENTERS OF

### ENGINEERING EXCELLENCE

Healthcare  
Higher Education  
K-12 Education  
Government  
Houses of Worship  
Special Projects

## Summary of drawing changes:

### MH101 (See attached sheet)

1. Radon piping system updated to match architectural layout.
2. Radon exhaust fan indicated.
3. Existing exhaust fan ducts to be re-routed to roof.

### ME601 (See attached sheet)

1. Radon exhaust fan schedule added.

### PL101 (See attached sheet)

1. Hot water recirculation balance valves indicated on plans reflecting specification requirements.
2. Water hammer arrestors indicated on plans reflecting specification requirements.

### PE601 (See attached sheet)

1. Fixture specifications for Urinal 'UR' and sink "SS-1" added to plumbing fixture schedule.
2. Superfluous fixtures removed.

### EP101 & EP601 (See attached sheets)

1. Provide electrical connection to new in-line exhaust fan.
2. Refer to updated mechanical equipment schedule.

End

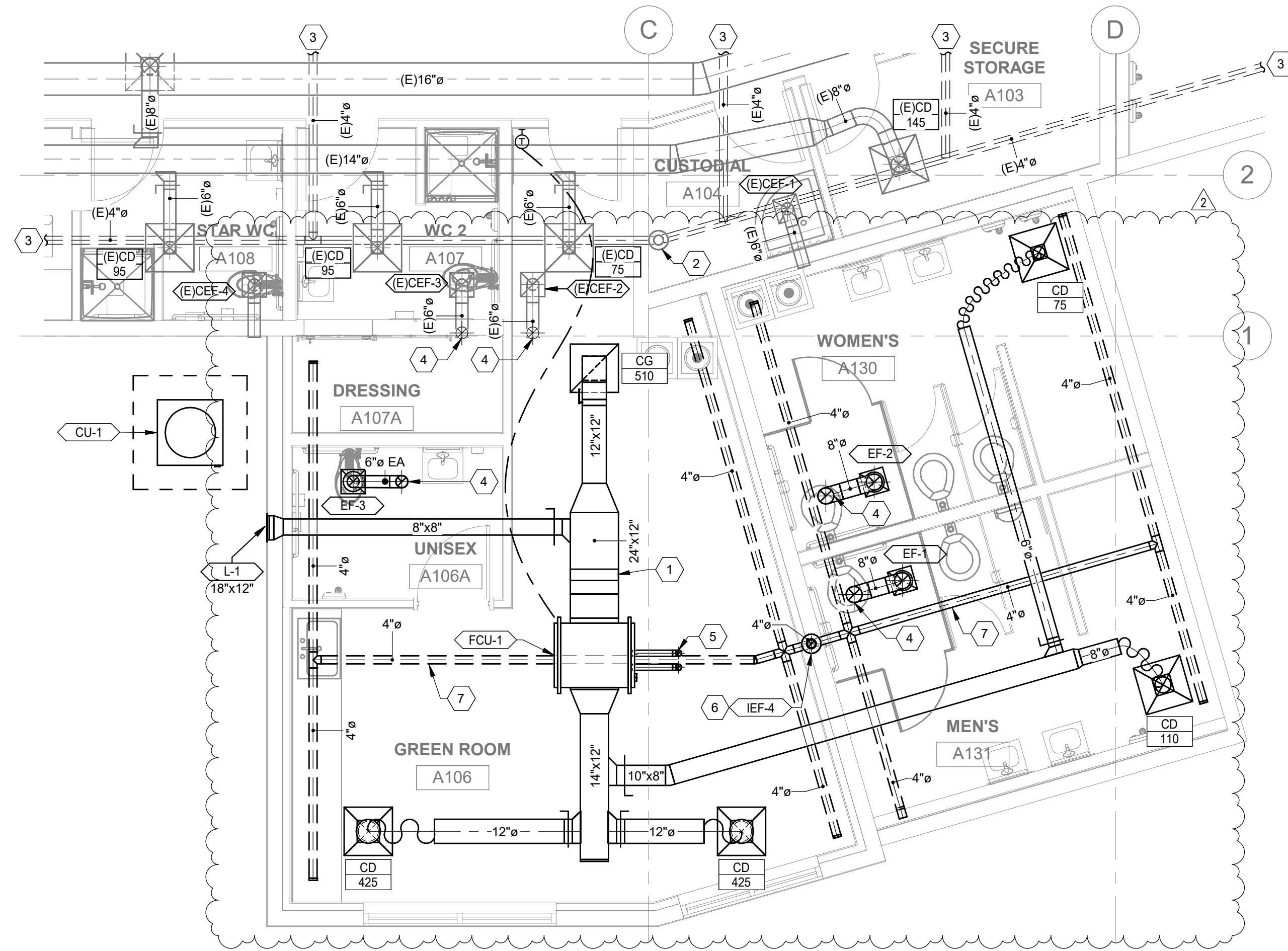
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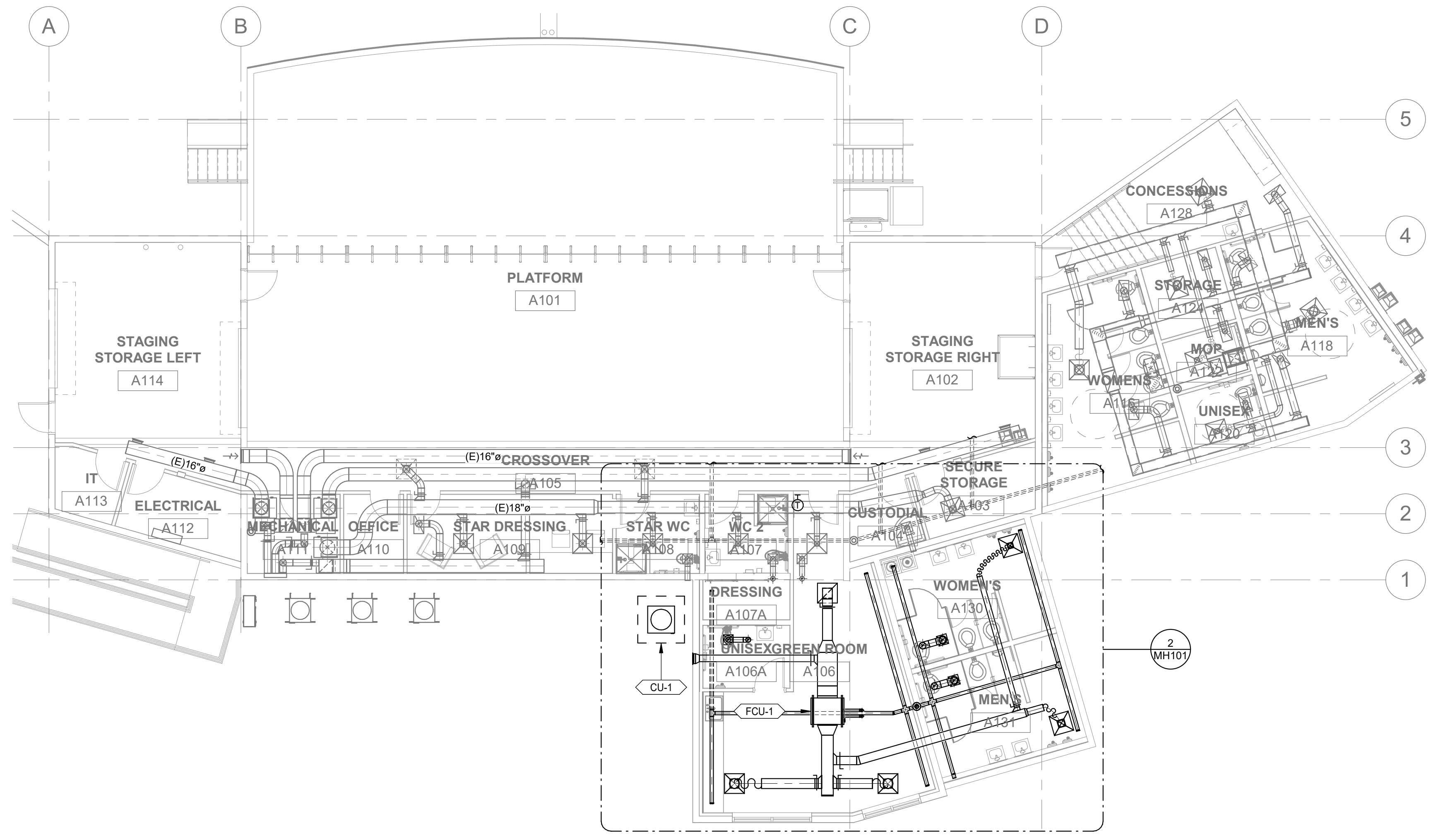
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**2 ENLARGED MECHANICAL PLAN**  
1/4" = 1'-0"



**1 STAGE LEVEL MECHANICAL PLAN**  
1/8" = 1'-0"

**SHEET KEYNOTES**

- 1 CONTRACTOR TO PROVIDE ACCESS PANEL AND MERV 8 FILTER.
- 2 EXISTING RADON EXHAUST FAN.
- 3 EXISTING PERFORATED PIPING UNDERSLAB CONTINUES THROUGH BUILDING.
- 4 EXTEND RESTROOM EXHAUST DUCT THROUGH ROOF. PATCH AND SEAL ROOF PER ROOF MANUFACTURER'S WARRANTY REQUIREMENTS.
- 5 EXTEND FURNACE COMBUSTION AIR AND VENT PIPING TO MANUFACTURER'S CONCENTRIC VENT KIT THROUGH ROOF. PATCH AND SEAL ROOF PENETRATION PER ROOF MANUFACTURER'S WARRANTY REQUIREMENTS.
- 6 EXTEND RADON PIPING UP THROUGH WALL TO ABOVE CEILING INLINE FAN (SEE DETAIL).
- 7 CORRUGATED PERFORATED PVC PIPE BELOW FLOOR.

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**RADON SYSTEM NOTES**

1. RADON SYSTEM SHALL MEET ALL THE REQUIREMENTS OF COLORADO DEPARTMENT OF PUBLIC HEALTH - URANIUM MILL TAILINGS MANAGEMENT PLAN (MAY 2015).
2. PROVIDE A 4" LAYER OF 1/2" TO 3/4" CLEAN WASHED GRAVEL UNDER THE FLOOR SLAB.
3. PROVIDE 10 MIL HDPE SHEETING ON TOP OF GRAVEL AND BELOW CONCRETE FLOOR SLAB. SHEETING SHALL EXTEND UP THE FOUNDATION WALLS AND SEAL TO WALL.
4. ALL PENETRATIONS THROUGH PLASTIC SHEETING SHALL BE SEALED WITH APPROVE TAPE.
5. UNDERFLOOR PIPING SHALL BE 4" CORRUGATED PERFORATED ADS PIPE. PERFORATED PIPE SHALL HAVE A MINIMUM OF TEN (10) 3/4" DIAMETER PERFORATIONS PER FOOT.
6. VENT PIPE SHALL BE SCHEDULE 40 DWV PVC PIPE.
7. ALL PENETRATIONS THROUGH FLOOR SHALL BE SEALED WITH POLYURETHANE CAULKING.
8. ALL COLD JOINTS IN CONCRETE FLOOR SHALL BE SEALED WITH POLYURETHANE CAULKING.
9. ALL SAWS CUT CONTROL JOINTS SHALL BE SEALED WITH POLYURETHANE CAULKING.
10. EXTEND VENT PIPE A MINIMUM OF 12" ABOVE ROOF. PROVIDE 1/2" BIRD SCREEN OVER OPENING OF PIPE.
11. RADON VENTILATION FAN SHALL BE LOCATE NEAR ROOF.
12. ALL EXPOSED PIPING SHALL BE PROPERLY APPROVED LABELED AS A RADON SYSTEM.
13. INSTALL A RADON U-TUBE MANOMETER ON VERTICAL EXPOSED VENT PIPE.
14. BUILDING SHALL BE RADON TESTED PRIOR TO OCCUPANCY.

**project:**  
**LAS COLONIAS AMPHITHEATER - ADDITION**  
  
Grand Junction, CO  
**CITY OF Grand Junction COLORADO**

**project#:** 19-0270  
**date:** February 20, 2020  
**revisions:**  
2 ADD 1 04/08/2020

**title:**  
**MECHANICAL PLANS**

**sheet:**  
**MH101**

PERMIT SET

## FAN COIL & AC UNIT SCHEDULE

SYMBOL	AREA SERVED	MANUFACTURER	MODEL NO.	BLOWER SECTION			CAPACITY		ELECTRICAL				SEER	DIMENSIONS (INCHES)	NOTES
				ARRANGEMENT	SUPPLY AIRFLOW (CFM)	E.S.P.	TOTAL COOLING (BTUH)	TOTAL HEATING (BTUH)	MOTOR (HP)	V/PH/ HZ	MCA	MOCP			
FCU-1	GREEN ROOM	TRANE	TUH1B040-SUB-1E	HORIZONTAL	1050	0.5	--	58,000	0.5	115/1/60	7.9	15	--	36X19X31	(1-8)
CU-1	GREEN ROOM	TRANE	4TWR4018G1000A	CURB MOUNT	N/A	N/A	60,000	--	0.125	208/3/60	12	20	15	33X32X30	(1-8)
ACCEPTABLE MANUFACTURERS				NOTES											
STULTZ LEIBERT TRANE				(1) COOLING CAPACITY BASED UPON 72°F DB & 30% RH INDOOR & 95°F OUTDOOR DB (2) PROVIDE SINGLE SOURCE POWER OPTION (3) ESTABLISH CONTROL CONNECTION TO BMS TO MONITOR STATUS, ALARM, ENABLE/DISABLE (4) PROVIDE REPLACEMENT MERV & FILTER AND REPLACEMENT FAN BELT WITH UNIT (5) REMOTE PROGRAMMABLE THERMOSTAT (6) ROUTE PRE-CHARGED REFRIGERANT PIPING FROM INDOOR TO OUTDOOR UNIT. PROVIDE UV RESISTIVE JACKET FOR EXPOSED PIPING INSULATION. (7) CUSTOM FILTER BANK (8) MOUNT CONDENSING UNIT ON 6" CONCRETE PAD, ATTACHED WITH NEOPRENE VIBRATION ISOLATORS.											

## LOUVER SCHEDULE

SYMBOL	MANUFACTURER	MODEL NO.	OVERALL SIZE (IN.) L x H	TYPE	MINIMUM FREE AREA (FT²)	CFM	ACCESSORIES AND REMARKS
L-1	RUSKIN	ELFD6375	18 x 12	DRAINABLE	0.58	210	(1)(2)(3)
NOTES:							
(1) EXTRUDED ALUMINUM CONSTRUCTION							
(2) GRAVITY BACKDRAFT DAMPER							
(3) COLOR BY ARCHITECT. PROVIDE FINISH SAMPLE FOR REVIEW							

## DUCT INSULATION REQUIREMENTS

DUCT SYSTEM	DUCT LOCATION	INSULATION MATERIAL	MINIMUM THERMAL RESISTANCE ("R")	FIELD APPLIED JACKET	VAPOR RETARDER REQ'D
SUPPLY AIR	BUILDING INTERIOR, CONCEALED	MINERAL-FIBER BLANKET	6.0	NONE	NO
	BUILDING INTERIOR, EXPOSED, OUTSIDE CONDITIONED SPACE	MINERAL-FIBER BLANKET	6.0	NONE	NO
	BUILDING EXTERIOR (OUTSIDE BUILDING INSULATION)	MINERAL-FIBER BLANKET	12.0	ALUMINUM	NO
RETURN AIR	BUILDING INTERIOR, CONCEALED	MINERAL-FIBER BLANKET	6.0	NONE	NO
	BUILDING INTERIOR, EXPOSED, OUTSIDE CONDITIONED SPACE	MINERAL-FIBER BLANKET	6.0	NONE	NO
	BUILDING EXTERIOR (OUTSIDE BUILDING INSULATION)	MINERAL-FIBER BLANKET	8.0	ALUMINUM	NO
EXHAUST AIR	ALL	NONE	---	---	---
OUTSIDE AIR	BUILDING INTERIOR, CONCEALED OR EXPOSED	MINERAL-FIBER BLANKET	8.0	NONE	NO
NOTES					
(1) ALL DUCT INSULATION SHALL HAVE ALL SERVICE JACKET MANUFACTURED FROM KRAFT PAPER, REINFORCED SCRIM, ALUMINUM FOIL OR VINYL FILM.					
(2) DUCT INSULATION SHALL BE MECHANICAL FASTENED TO DUCTS WIDER THAN 24" AND SHALL BE AFFIXED TO BOTTOM OF DUCT WITH WELDED METAL PINS AND 2" WAHSERS AT 18" MAXIMUM SPACING.					
(3) DUCT LINER, WHERE SHOWN ON DRAWINGS, SHALL BE A MINIMUM OF 1" THICK AND SHALL HAVE A MINIMUM "R" VALUE OF 6.0.					
(4) DUCT LINER SHALL NOT BE SUBSTITUTED FOR DUCT LINER UNLESS THE MINIMUM "R" VALUE OF THE DUCT LINER IS INCREASED TO A MINIMUM OF 6.0.					
(5) DUCT DIMENSIONS SHOWN ON THE DRAWINGS ARE NET FREE AREA. WHERE DUCT LINER IS SHOWN, INCREASE METAL DUCT SIZE TO ALLOW FOR THICKNESS OF DUCT LINER.					
(6) TOTAL LENGTH OF FLEXIBLE DUCT RUN SHALL NOT EXCEED 10'-0". EXTEND SHEET METAL DUCT TO WITHIN 3'-0" OF THE AIR INLET OR AIR OUTLET DEVICE.					
(7) OFFSET OF FLEXIBLE DUCT SHALL NOT EXCEED ONE-HALF (1/2) OF THE DUCT DIAMETER.					
(8) ALL DUCT CHANGES IN DIRECTION SHALL BE MADE WITH RIGID ELBOWS OR OTHER RIGID METAL FITTINGS.					
(9) INDOOR DUCT INSULATION AND RELATED MATERIALS SHALL HAVE A FLAME-SPREAD INDEX OF 25 OR LESS, AND SMOKE-DEVELOPED INDEX OF 50 OR LESS WHEN TESTED TO ASTM E 84.					
(10) OUTDOOR DUCT INSULATION AND RELATED MATERIALS SHALL HAVE A FLAME-SPREAD INDEX OF 75 OR LESS, AND SMOKE-DEVELOPED INDEX OF 150 OR LESS WHEN TESTED TO ASTM E 84.					
(11) ALL DUCT COVERINGS AND LININGS SHALL NOT FLAME, GLOW, SMOLDER OR SMOKE WHEN TESTED IN ACCORDANCE WITH ASTM C 411.					
(12) ALL MATERIALS USED AS INTERNAL INSULATION AND EXPOSED TO THE AIR STREAM IN DUCTS SHALL BE SHOWN TO BE DURABLE WHEN TESTED IN ACCORDANCE WITH UL 181.					

## CEILING DIFFUSER, REGISTER & GRILLE SCHEDULE

SYMBOL	DESCRIPTION	SIZES		ACCEPTABLE MANUFACTURERS
		NOMINAL SIZE (NECK SIZE)	AIR FLOW (CFM)	
CD	CEILING DIFFUSER: REMOVABLE PERFORATED FACEPLATE, 24" X 24" PANEL SIZE, 4-WAY PATTERN, ROUND NECK, ALUMINUM CONSTRUCTION NC-35 MAXIMUM, TESTED IN ACCORDANCE WITH ADC TEST 1062. OPTIONS & ACCESSORIES: BAKED ENAMEL WHITE FINISH. PROVIDE CEILING MOUNT TO MATCH CEILING TYPE.	6" DIA.	120	KRUEGER 13SD TITUS PRICE
		8" DIA.	200	
		10" DIA.	400	
		12" DIA.	700	
		14" DIA.	1000	
CG	CEILING GRILLE: REMOVABLE PERFORATED FACEPLATE, ALUMINUM, 24" X 24" PANEL SIZE, NC-35 MAXIMUM, TESTED IN ACCORDANCE WITH ADC TEST 1062. ROUND NECK OR SQUARE NECK, SEE DRAWINGS FOR NECK SIZE. OPTIONS & ACCESSORIES: BAKED ENAMEL WHITE FINISH. PROVIDE CEILING MOUNT TO MATCH CEILING TYPE.	6" DIA. (6" X 6")	120	KRUEGER 13SD TITUS PRICE
		8" DIA. (8" X 8")	200	
		10" DIA. (10" X 10")	420	
		12" DIA. (12" X 12")	700	
		14" DIA. (14" X 14")	1000	
	22" X 22"	2000		

## EXHAUST FAN SCHEDULE

SYMBOL	AREA SERVED	MANUFACTURER	MODEL NO.	CONFIG.	AIR FLOW (CFM)	STATIC PRESSURE (INCHES W.G.)	FAN SPEED (RPM)	MOTOR				MAXIMUM NOISE LEVEL (SONES)	WEIGHT (LBS)	OPTIONS AND ACCESSORIES	CONTROLS	NOTES / COMMENTS
								WATTS	VOLTS	PHASE	HERTZ					
EF-1	RESTROOM	LOREN COOK	GC-168	CEILING	150	0.35000	1160	46.1	120	1	60	3.50000	12	(1)	(11)	(101)
EF-2	RESTROOM	LOREN COOK	GC-168	CEILING	150	0.35000	1160	46.1	120	1	60	3.50000	12	(1)	(11)	(101)
EF-3	RESTROOM	LOREN COOK	GC-128	CEILING	50	0.25000	1160	23.0	120	1	60	3.50000	12	(1)	(11)	(101)
ACCEPTABLE MANUFACTURERS		OPTIONS & ACCESSORIES		CONTROLS				NOTES & COMMENTS								
LOREN COOK, TWIN CITY, GREENHECK		(1) GRAVITY BACKDRAFT DAMPER.		(11) OPERATE DURING OCCUPIED MODE, PROVIDE TIMER.				(101) ALL CAPACITIES AT JOB SITE ELEVATION								

## INLINE EXHAUST FAN (RADON) SCHEDULE

SYMBOL	AREA SERVED	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NO.	AIR FLOW (CFM)	STATIC PRESSURE (INCHES W.G.)	FAN SPEED (RPM)	MOTOR				MAXIMUM NOISE LEVEL (SONES)	OPTIONS AND ACCESSORIES	CONTROLS	NOTES / COMMENTS
							WATTS	VOLTS	PHASE	HERTZ				
IEF-4	RADON SYSTEM	FANTECH	HP 220	166	1.26	2886	152	120	1	60	10.0	(1)(2)	(12)	(A)
ACCEPTABLE MANUFACTURER		OPTIONS & ACCESSORIES		CONTROLS				NOTES & COMMENTS						
FANTECH		(1) BACKDRAFT DAMPER (2) INTEGRAL THERMAL OVERLOAD PROTECTION (3) U-TUBE MANOMETER (4) RADON SYSTEM LABELS		(11) FAN TO RUN CONTINUOUSLY				(A) CAPACITY AT JOB SITE ELEVATION.						

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**project:**

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO

**CITY OF Grand Junction COLORADO**

**project#:** 19-0270

**date:** February 20, 2020

**revisions:**

2 ADD 1 04/08/2020

**title:**

**MECHANICAL SCHEDULES**

**sheet:**

**ME601**

PERMIT SET



**SHEET KEYNOTES**

- 1 BATHROOM GROUP SERVED BY WET VENT.
- 2 PRIMARY ROOF DRAIN PIPING UP TO PRIMARY ROOF DRAIN ON ROOF. BASIS OF DESIGN JR SMITH 1010-AD-R-C. DRAINAGE COVERAGE: 950 SQFT; 20 GPM. EXISTING 4" LINE SERVES 2100 SQFT; 43.6 GPM. TOTAL: 63.6 GPM. MAXIMUM DRAINAGE CAPACITY ON A 4" LINE SLOPING AT 1/8" PER FT: 115 GPM.
- 3 SECONDARY ROOF DRAIN PIPING UP TO SECONDARY ROOF DRAIN ON ROOF. BASIS OF DESIGN JR SMITH 1080-AD-R-C. DRAINAGE COVERAGE: 950 SQFT; 20 GPM. EXISTING 4" LINE SERVES 2100 SQFT; 43.6 GPM. TOTAL: 63.6 GPM. MAXIMUM DRAINAGE CAPACITY ON A 4" LINE SLOPING AT 1/8" PER FT: 115 GPM.
- 4 CIRCUIT SETTER. SET AT 0.5 GPM. RECIRCULATION PIPING TO EXTEND TO LEVEL OF STOP VALVES.
- 5 PROVIDE WATER HAMMER ARRESTOR. BASIS OF DESIGN SIOUX CHIEF 652-A FOR SINGLE TOILET RESTROOM AND 652-C FOR MULTI TOILET RESTROOM.

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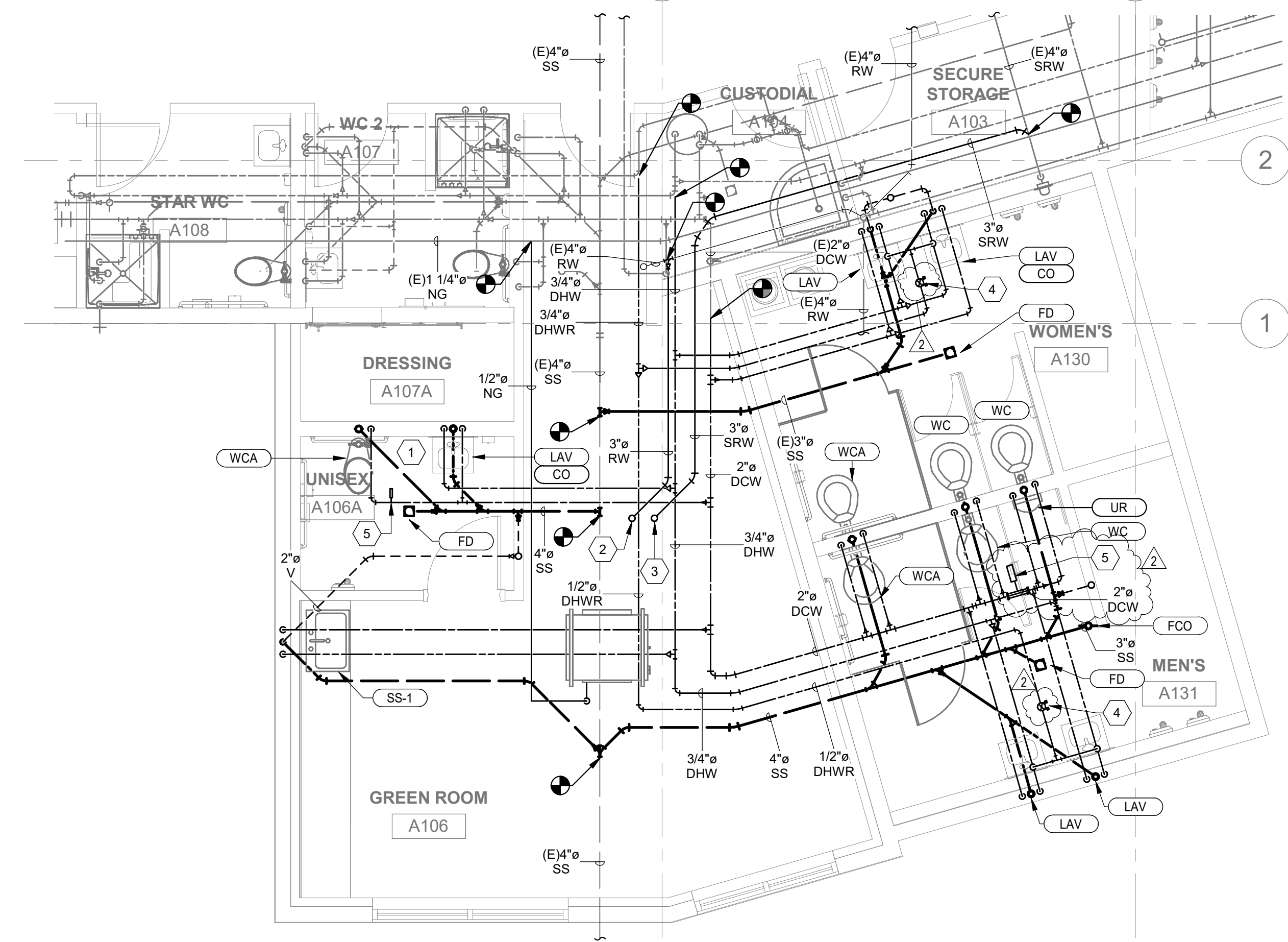
**project:**  
 LAS COLONIAS AMPHITHEATER - ADDITION  
 Grand Junction, CO  
**CITY OF Grand Junction**  
 COLORADO

**project#:** 19.0270  
**date:** February 20, 2020  
**revisions:**  
 2 ADD 1 04/08/2020

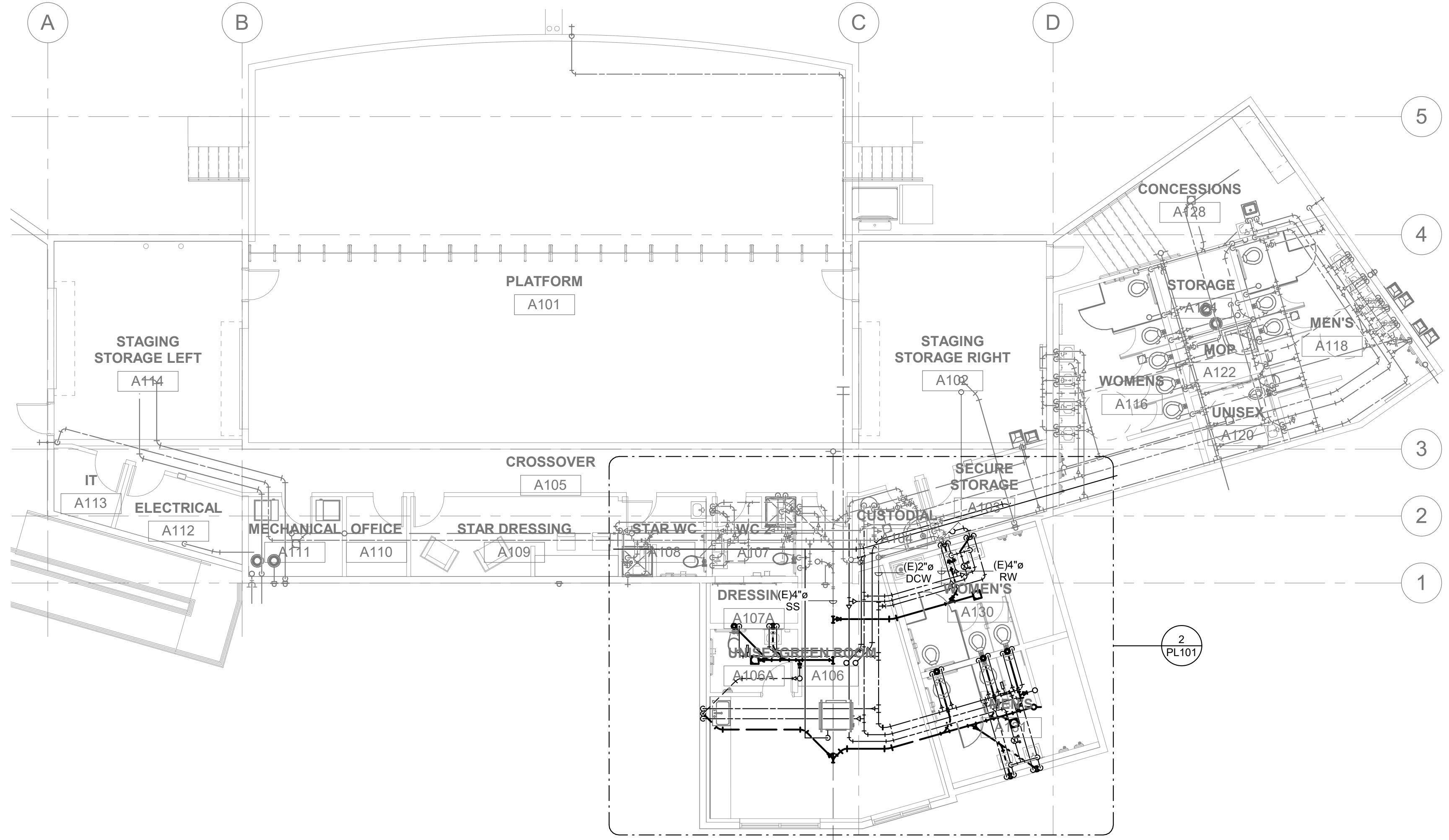
**title:**  
**PLUMBING PLANS**

**sheet:**  
**PL101**

PERMIT SET



**2 ENLARGED PLUMBING PLAN**  
 1/4" = 1'-0"



**1 STAGE LEVEL PLUMBING PLAN**  
 1/8" = 1'-0"

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## PLUMBING FIXTURE SCHEDULE

SYMBOL	FIXTURE	TRAP	WASTE	VENT	DOMESTIC COLD WATER	DOMESTIC HOT WATER	DESCRIPTION	BASIS OF DESIGN MANUFACTURER AND MODEL	NOTES
WC	WATER CLOSET	INT.	3"	2"	1"	---	FLOOR MOUNTED, FLUSH VALVE, VITREOUS CHINA, ELONGATED, 1-1/2" TOP SPUD, 15" RIM HEIGHT, SIPHON JET, 2-1/8" MINIMUM TRAPWAY. DIAPHRAGM TYPE FLUSH VALVE, SENSOR ACTIVATED, DUAL FLUSH, 1.60/1.10 GALLONS PER FLUSH, POLISHED CHROME PLATED BRASS, BATTERY, COURTESY FLUSH OVERRIDE BUTTON, VACUUM BREAKER. OPEN FRONT SEAT, LESS SEAT, HEAVY DUTY PLASTIC, ELONGATED, STAINLESS STEEL HINGE POSTS.	AMERICAN STANDARD 2234.001  SLOAN 111-1.6/1.1  BEMIS 1955C	MINIMUM MaP RATING = 1,000
WC-A	WATER CLOSET (ACCESSIBLE ROOM)	INT.	3"	2"	1"	---	FLOOR MOUNTED, FLUSH VALVE, VITREOUS CHINA, ELONGATED, 1-1/2" TOP SPUD, 16-1/2" RIM HEIGHT, SIPHON JET, 2-1/8" MINIMUM TRAPWAY. DIAPHRAGM TYPE FLUSH VALVE, SENSOR ACTIVATED, DUAL FLUSH, 1.60/1.10 GALLONS PER FLUSH, POLISHED CHROME PLATED BRASS, BATTERY, COURTESY FLUSH OVERRIDE BUTTON, VACUUM BREAKER. OPEN FRONT SEAT, LESS SEAT, HEAVY DUTY PLASTIC, ELONGATED, STAINLESS STEEL HINGE POSTS.	AMERICAN STANDARD 3043.001  SLOAN 111-1.6/1.1  BEMIS 1955C	MINIMUM MaP RATING = 1,000  INSTALL FLUSH VALVE WITH HANDLE ON ACCESSIBLE SIDE OF WATER CLOSET
UR	URINAL (ACCESSIBLE)	INT.	2"	2"	1"	---	WALL MOUNTED, FLUSHING RIM, WASHOUT, VITREOUS CHINA, 3/4" TOP SPUD. ELECTRONIC, BATTERY POWERED, DIAPHRAGM TYPE FLUSH VALVE, 0.125 GALLON PER FLUSH POLISHED CHROME PLATED BRASS FLOOR MOUNTED SUPPORT, FLOOR BEARING PLATE, TOP AND BOTTOM BEARING STUDS	KOHLER K-4904-ET SLOAN ECOS 8186-0.125  J.R. SMITH 0615	
SS-1	SINGLE BOWL	1-1/2"	1-1/2"	1-1/2"	1/2"	1/2"	FIXTURE: SINGLE COMPARTMENT, 18 GAUGE, 304 STAINLESS STEEL, 19" X 18" X 7.5" BOWL. 4" FAUCET LEDGE, SELF RIMMING. FAUCET: GOOSENECK SWING MOUNT, SINGLE HANDLE MIXING FAUCET, WRISTBLADE HANDLES, 8" CENTERSET AERATOR: POLISHED CHROME PLATED LEAD-FREE BRASS, LAMINAR FLOW, 1.5 GPM. DRAINS: STAINLESS STEEL CRUMB CUP STRAINER, REMOVABLE STAINLESS STEEL BASKET, 4" LONG TAILPIECE, CHROME PLATE BRASS CONDENSATE DRAIN TAILPIECE. TRAP: WHITE POLYVINYL CHLORIDE (PVC). STOPS: 1/2" I.P.S. X 3/8" O.D. COMPRESSION, POLISHED CHROME PLATED HEAVY PATTERN LEAD FREE BRASS ANGLE BALL VALVE. SUPPLIES: PEX TUBING, FORMED WITH FLANGE, RUBBER WASHER OR GASKET PLASTIC COMPRESSION SLEEVE, ASTM A112.18.6, ASTM F877.	ELKAY DSESR127224  ELKAY LK810GN05T6  OMIN A-400-05-LF DEARBORN 701-1  POWERS LFe480-11 BRASSCRAFT KTCR19XC  BRASSCRAFT 1-15 C  INSINKERATOR BADGER 5' AMERICAN STANDARD 0356.012 SYMMONS SLS-2010 OMIN A-400-05-LF  MCQUIRE 155A DEARBORN 9701-1 BRASSCRAFT KTCR19XC  BRASSCRAFT 1-15 C TRUEBORG "LAV SHIELD" 2018 J.R. SMITH 0710-Z	CONFIRM CABINET SIZE PRIOR TO ORDER
LAV	LAVATORY (ACCESSIBLE)	1-1/4"	1-1/2"	1-1/2"	1/2"	1/2"	WALL MOUNTED, 20" X 18", VITREOUS CHINA, ADA ACCEPTABLE FAUCET LEDGE, 4" CENTER FAUCET HOLES. SINGLE LEVER FAUCET, CHROME PLATED LEAD FREE BRASS, CERAMIC COMPONENTS, DECK PLATE. LAMINAR FLOW AERATOR, POLISHED CHROME PLATED LEAD FREE BRASS, 0.5 GPM. COMBINATION TEMPERATURE & PRESSURE MIXING VALVE, CHROME PLATED LEAD FREE BRASS. INTEGRAL CHECKS, ASSE 1070 LISTED. CHROME PLATED BRASS GRID DRAIN, CHROME PLATED BRASS TAILPIECE, OFFSET TAILPIECE WHITE POLYVINYL CHLORIDE (PVC) TRAP ANGLE BALL VALVE STOP, HEAVY DUTY, POLISHED CHROME PLATED LEAD FREE BRASS, 1/2" IPS X 3/8" O.D. COMPRESSION. POLISHED CHROME PLATED COPPER TUBING SUPPLY, 3/8" O.D, FORMED NOSEPIECE WITH FLANGE, WATER WASHER OR GASKET, COMPRESSION SLEEVE, ASTM A112.18.6. ENCLOSURE: RIGID POLYVINYL CHLORIDE ENCLOSURE, ADA ACCESSIBLE UL LISTED SUPPORT: CONCEALED ARM, FLOOR MOUNTED, NARROW WALL, TUBULAR STEEL VERTICAL SUPPORTS, STEEL FLOOR PLATES.	AMERICAN STANDARD 0356.012 SYMMONS SLS-2010 OMIN A-400-05-LF  MCQUIRE 155A DEARBORN 9701-1 BRASSCRAFT KTCR19XC  BRASSCRAFT 1-15 C TRUEBORG "LAV SHIELD" 2018 J.R. SMITH 0710-Z	SET DISCHARGE WATER TEMPERATURE AT 110 F.

## PLUMBING FIXTURE SCHEDULE (DRAINS)

SYMBOL	FIXTURE	TRAP	WASTE	VENT	DOMESTIC COLD WATER	DOMESTIC HOT WATER	DESCRIPTION	BASIS OF DESIGN MANUFACTURER AND MODEL	NOTES
FD	FLOOR DRAIN	2"	2"	2"	---	---	LACQUER COATED CAST IRON BODY FLOOR DRAIN, FLASHING COLLAR, 5" ROUND NICKEL BRONZE ADJUSTABLE STRAINER 3.5" BARRIER TYPE TRAP PRIMER, ABS, NEOPRENE RUBBER DIAPHRAGM, ASSE STANDARD 1072-AF-GW DEEP SEAL P-TRAP	J. R. SMITH 2010-5A J.R. SMITH 5A SURESEAL SS 3509	INSTALL TRAP SEAL BEHIND STRAINER FACE
RD-4	ROOF DRAIN	---	3"	---	---	---	LACQUER COATED CAST IRON BODY, COMBINED FLASHING CLAMP AND GRAVEL STOP, SUMP RECEIVER, UNDERDECK CLAMP.	J. R. SMITH 1010-AD-R-C	3,760 SQ. FT. CAPACITY AT 2" PER HOUR RAINFALL AND 1/8" PER FOOT SLOPE.
SRD-4	SECONDARY ROOF DRAIN	---	3"	---	---	---	LACQUER COATED CAST IRON BODY, COMBINED FLASHING CLAMP AND GRAVEL STOP, 2" WATER DAM, SUMP RECEIVER, UNDERDECK CLAMP.	J. R. SMITH 1080-AD-R-C	3,760 SQ. FT. CAPACITY AT 2" PER HOUR RAINFALL AND 1/8" PER FOOT SLOPE.
DSN-4	DOWNSPOUT NOZZLE	---	3"	---	---	---	CAST BRONZE NOZZLE AND FLANGE	J.R. SMITH 1771	

## PLUMBING FIXTURE SCHEDULE (CLEANOUTS)

SYMBOL	FIXTURE	TRAP	WASTE	VENT	DOMESTIC COLD WATER	DOMESTIC HOT WATER	DESCRIPTION	BASIS OF DESIGN MANUFACTURER AND MODEL	NOTES
CO	CLEANOUT	---	SAME AS PIPE	---	---	---	CAST IRON BLIND PLUG	CHARLOTTE PIPE NH-50	
FCO	FLOOR CLEANOUT	---	SAME AS PIPE	---	---	---	HEAVY DUTY NICKEL BRONZE TOP, BRASS PLUG	J. R. SMITH 4113S-NB	
COTG	CLEANOUT TO GRADE	---	SAME AS PIPE	---	---	---	HEAVY DUTY NICKEL BRONZE TOP, BRASS PLUG	J. R. SMITH 4113S-NB	
WCO	WALL CLEANOUT	---	SAME AS PIPE	---	---	---	ROUND FLAT STAINLESS STEEL WALL PLATE	J.R. SMITH 4532S	

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**project:**

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO

**CITY OF Grand Junction**  
COLORADO

project#: 19.0270  
date: February 10, 2020

revisions:  
2 ADD 1 04/08/2020

**title:**

**PLUMBING SCHEDULES**

**sheet:**

**PE601**

PERMIT SET

GENERAL SHEET NOTES

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SHEET KEYNOTES

- 1 PROVIDE ELECTRICAL CONNECTIONS TO ELECTRIC HAND DRYERS. CIRCUIT WITH 2#10, #10G IN 0.75" CND. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH THE INSTALLERS PRIOR TO ROUGH-IN.

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**project:**  
 LAS COLONIAS AMPHITHEATER - ADDITION  
 Grand Junction, CO  
**CITY OF Grand Junction COLORADO**

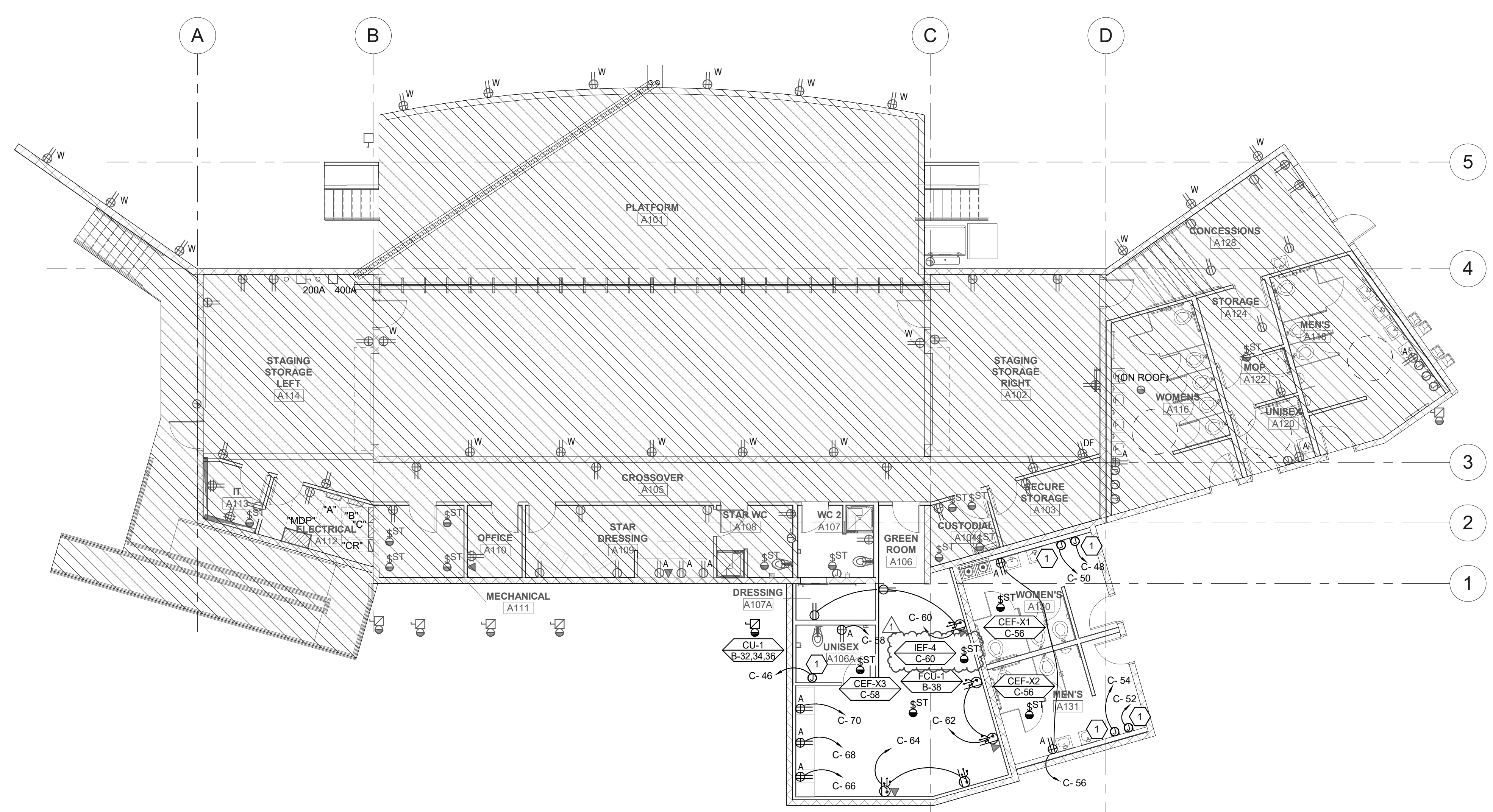
**project#:** 19.0270  
**date:** February 10, 2020

**revisions:**  
 1 ADD #01 4/7/2020

**title:**  
**STAGE LEVEL POWER PLAN**

**sheet:**  
**EP101**

PERMIT SET



**1 STAGE LEVEL POWER PLAN**  
 SCALE: 1/8" = 1'-0"

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# EQUIPMENT SCHEDULE

XXXXXXXX

**EQUIPMENT SCHEDULE KEY**  
 E - DIVISION 28  
 Q - FURNISHED WITH EQUIPMENT  
 \* - COORDINATE WITH THE DIVISION 23 TEMPERATURE CONTROL INSTALLER  
 \*\* - AUTOMATIC CONTROL WIRING BY DIVISION 23

MARK	QTY	ITEM DESCRIPTION	LOAD DATA						WIRE AND CONDUIT SIZE	OVERCURRENT PROTECTION			DISCONNECT			STARTER					MARK			
			HP	KW	MCA	FLA	VOL T	PH		HZ	FURN BY	DEVICE	LOCATION	FURN BY	DEVICE	LOCATION	FURN BY	DEVICE	SIZES	SELECTOR SWITCH		PILOT LAMP	NORMALLY OPEN CONTACT	NORMALLY CLOSED CONTACT
CEF-X1	1	CEILING EXHAUST FAN	1/6	-	-	1	120	1	60	2 #12, #12 GR 0.75" CND	E	20/1 CB	C	E	TOGGLE SWITCH	ADJ TO EQUIP	Q	-	-	-	-	-	-	CEF-X1
CEF-X2	1	CEILING EXHAUST FAN	1/6	-	-	1	120	1	60	2 #12, #12 GR 0.75" CND	E	20/1 CB	C	E	TOGGLE SWITCH	ADJ TO EQUIP	Q	-	-	-	-	-	CEF-X2	
CEF-X3	1	CEILING EXHAUST FAN	1/6	-	-	1	120	1	60	2 #12, #12 GR 0.75" CND	E	20/1 CB	C	E	TOGGLE SWITCH	ADJ TO EQUIP	Q	-	-	-	-	-	CEF-X3	
CU-1	1	CONDENSING UNIT	-	-	12	12	208	3	60	3 #10, #10 GR 0.75" CND	E	30/3 CB	B	E	30A/3P FRS-20	ADJ TO EQUIP	Q	-	-	-	-	-	CU-1	
FCU-1	1	FAN COIL UNIT	-	-	-	7.9	120	1	60	2 #12, #12 GR 0.75" CND	E	15/1 CB	B	E	TOGGLE SWITCH	ADJ TO EQUIP	Q	-	-	-	-	-	FCU-1	
IEF-4	1	INLINE EXHAUST FAN	1/6	-	-	1	120	1	60	2 #12, #12 GR 0.75" CND	E	20/1 CB	C	E	TOGGLE SWITCH	ADJ TO EQUIP	Q	-	-	-	-	-	IEF-4	

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**project:**  
 LAS COLONIAS AMPHITHEATER - ADDITION

Grand Junction, CO  
**CITY OF Grand Junction COLORADO**

**project#:** 19-0270  
**date:** February 20, 2020

**revisions:**  
 1 ADD #01 4/7/2020

**title:**  
**ELECTRICAL SCHEDULES**

**sheet:**

**EP601**

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## PANEL: "C"

VOLTS/PHASE/WIRE:		PANEL SIZE & TYPE:		MAIN SIZE AND TYPE:		LOCATION:		CABINET:		NOTES:											
120/208V, 3 PH 4 WIRE		22" W x 6" D, BOLT-ON		225 AMPERE		ELECTRICAL A112		SURFACE													
ACCESSORIES: PANEL DIRECTORY, IDENTIFICATION, GROUNDING BAR																					
AIC RATING:																					
CKT NO	AMP	POLE	LOAD (kVA) LTG	PWR	CO	PHASE LOAD			DESCRIPTION	LOAD (kVA) CO	PWR	LTG	POLE	AMP	CKT NO						
1	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	0.4				4						
3	--	--	--	--	--										4						
5	--	--	--	--	--										6						
7	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	0.4				8						
9	--	--	--	--	--										10						
11	--	--	--	--	--										12						
13	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	0.6				14						
15	--	--	--	--	--										16						
17	--	--	--	--	--										18						
19	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	0.0				20						
21	--	--	--	--	--										22						
23	--	--	--	--	--										24						
25	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	0.5				26						
27	--	--	--	--	--										28						
29	--	--	--	--	--										30						
31	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	0.9				32						
33	--	--	--	--	--										34						
35	--	--	--	--	--										36						
37	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	1.2				38						
39	--	--	--	--	--										40						
41	--	--	--	--	--										42						
43	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	1.2				44						
45	--	--	--	--	--										46						
47	--	--	--	--	--										48						
49	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	1.5				50						
51	--	--	--	--	--										52						
53	--	--	--	--	--										54						
55	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	0.6				56						
57	--	--	--	--	--										58						
59	--	--	--	--	--										60						
61	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	0.2				62						
63	--	--	--	--	--										64						
65	--	--	--	--	--										66						
67	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	0.2				68						
69	--	--	--	--	--										70						
71	--	--	--	--	--										72						
73	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	0.0				74						
75	--	--	--	--	--										76						
77	--	--	--	--	--										78						
79	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	0.1				80						
81	--	--	--	--	--										82						
83	--	--	--	--	--										84						
<b>TOTALS:</b>												9	9	9	CONNECTED TOTAL kVA = 26						
												71	72	71	AVERAGE CONNECTED AMPS PER PHASE = 72						
<b>NEC DIVERSIFIED LOAD CALCULATIONS</b>																					
LIGHTING & CONTINUOUS LOADS: 13.2 kVA @ 125% = 16.5 kVA												- 100% CONNECTED LOAD PLUS 25%									
RECEPTACLES: 1.9 kVA @ 100% = 1.9 kVA												- FIRST 10kVA @ 100%, REMAINDER @ 50%									
ALL OTHER LOADS @ 100%: 10.7 kVA												- MOTOR TOTALS INCLUDED IN ALL OTHER LOADS WITH LARGEST MOTOR CALCULATED @ 125% PER NEC									
												DIVERSIFIED TOTAL kVA = 29									
												AVERAGE AMPS PER PHASE = 81									

## PANEL: "A"

VOLTS/PHASE/WIRE:		PANEL SIZE & TYPE:		MAIN SIZE AND TYPE:		LOCATION:		CABINET:		NOTES:											
120/208V, 3 PH 4 WIRE		22" W x 6" D, BOLT-ON		225 AMPERE		ELECTRICAL A112		SURFACE													
ACCESSORIES: PANEL DIRECTORY, IDENTIFICATION, GROUNDING BAR																					
AIC RATING:																					
CKT NO	AMP	POLE	LOAD (kVA) LTG	PWR	CO	PHASE LOAD			DESCRIPTION	LOAD (kVA) CO	PWR	LTG	POLE	AMP	CKT NO						
1	20	1	0.0	0.0	0.9				CO STAGE LEFT A114	0.9	0.5				2						
3	20	1	0.0	0.0	0.7				CO STAGE RIGHT A102			0.7	0.5		4						
5	20	1	0.0	0.0	0.9				CO Room A102, A105, A114					0.9	0.7						
7	20	1	0.0	0.0	0.7				CO STAGE RIGHT A102	0.7	0.5				8						
9	20	1	0.0	0.1	0.9				CO Room A104, A103, A110, A111			1.0	0.5		10						
11	20	1	0.0	0.0	0.7				CO STAR DRESSING A109				0.7	0.5	12						
13	20	1	0.0	0.0	0.2				CO STAR DRESSING A109	0.2	0.3				14						
15	20	1	0.0	0.0	0.2				CO STAR DRESSING A109			0.2	0.3		16						
17	20	1	0.0	0.0	0.2				CO STAR DRESSING A109				0.2	0.3	18						
19	20	1	0.0	0.1	0.2				CO STAR WC A108	0.3	1.5				20						
21	20	1	0.0	0.1	0.2				CO Room A106, A107			0.3	1.5		22						
23	20	1	0.0	0.0	0.2				CO: IT A113				0.2	0.2	24						
25	20	1	0.0	0.0	0.4				CO: IT A113	0.4	0.2				26						
27	20	1	0.0	0.0	0.4				CO: IT A113			0.4	0.2		28						
29	20	1	0.0	0.0	0.2				CO ELECTRICAL A112				0.2	0.2	30						
31	20	1	0.0	0.0	0.4				CO Room A118	0.4	0.2				32						
33	20	1	0.0	0.0	0.4				CO ROOM A120, A122			0.4	0.2		34						
35	20	1	0.0	0.0	0.9				PWR: STRG/CONCESSIONS A128				0.9	0.2	36						
37	20	1	0.0	0.0	0.2				PWR: CONCESSIONS A128	0.2	6.7				38						
39	20	1	0.0	0.0	0.2				PWR: CONCESSIONS A128			0.2	6.7		40						
41	20	1	--	--	--				SPARE					0.0	6.7						
<b>TOTALS:</b>												13	13	12	CONNECTED TOTAL kVA = 38						
												109	110	99	AVERAGE CONNECTED AMPS PER PHASE = 105						
<b>NEC DIVERSIFIED LOAD CALCULATIONS</b>																					
LIGHTING & CONTINUOUS LOADS:												- 100% CONNECTED LOAD PLUS 25%									
RECEPTACLES: 12.2 kVA @ 91% = 11.1 kVA												- FIRST 10kVA @ 100%, REMAINDER @ 50%									
ALL OTHER LOADS @ 100%: 25.7 kVA												- MOTOR TOTALS INCLUDED IN ALL OTHER LOADS WITH LARGEST MOTOR CALCULATED @ 125% PER NEC									
												DIVERSIFIED TOTAL kVA = 37									
												AVERAGE AMPS PER PHASE = 102									

## PANEL: "B"

VOLTS/PHASE/WIRE:		PANEL SIZE & TYPE:		MAIN SIZE AND TYPE:		LOCATION:		CABINET:		NOTES:					
120/208V, 3 PH 4 WIRE		22" W x 6" D, BOLT-ON		225 AMPERE		ELECTRICAL A112		SURFACE							
ACCESSORIES: PANEL DIRECTORY, IDENTIFICATION, GROUNDING BAR															
AIC RATING:															
CKT NO	AMP	POLE	LOAD (kVA) LTG	PWR	CO	PHASE LOAD			DESCRIPTION	LOAD (kVA) CO	PWR	LTG	POLE	AMP	CKT NO
1	20	1	0.0	0.5	0.0				PWR: F-1	0.5	1.0				2
3	20	1	0.0	0.5	0.0				PWR: F-2			0.5			

## GENERAL NOTES - DEMOLITION

CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS, MATERIALS, FINISHES AND DIMENSIONS BEFORE AND AFTER DEMOLITION, AND TO CONTACT THE ARCHITECT IF ANY UNFORESEEN CONDITIONS OCCUR.

CONTRACTOR SHALL PROTECT EXISTING STRUCTURE, ASSEMBLIES AND EQUIPMENT AS REQUIRED FROM DEMOLITION WORK. REPAIR, PATCH AND/OR REPLACE EXISTING CONSTRUCTED ITEMS AND EQUIPMENT THAT ARE TO REMAIN AS REQUIRED FOR NEW CONSTRUCTION.

THE CONTRACTOR SHALL PATCH AND REPAIR TO MATCH EXISTING FINISHES AT WALLS, FLOORS, CEILINGS, SOFFITS, ETC. AS REQUIRED IN THOSE AREAS NOT SPECIFICALLY CALLED OUT IN THE DRAWINGS, BUT THAT ARE EFFECTED BY CONSTRUCTION.

CONTRACTOR TO PATCH/REPAIR ALL AREAS RESULTING FROM DEMOLITION AND PREPARE SUCH SURFACES TO RECEIVE SCHEDULED FINISHES.

REFER TO MECHANICAL, PLUMBING & ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION COORDINATION.

CONTRACTOR SHALL PROVIDE A 6 MIL. POLYETHYLENE DUST BARRIER FROM FLOOR TO DECK ABOVE TO ENSURE THAT ALL CORRIDORS OUTSIDE OF CONSTRUCTION AREA ARE KEPT CLEAN AND CLEAR OF DEBRIS & OBSTRUCTIONS AT ALL TIMES.

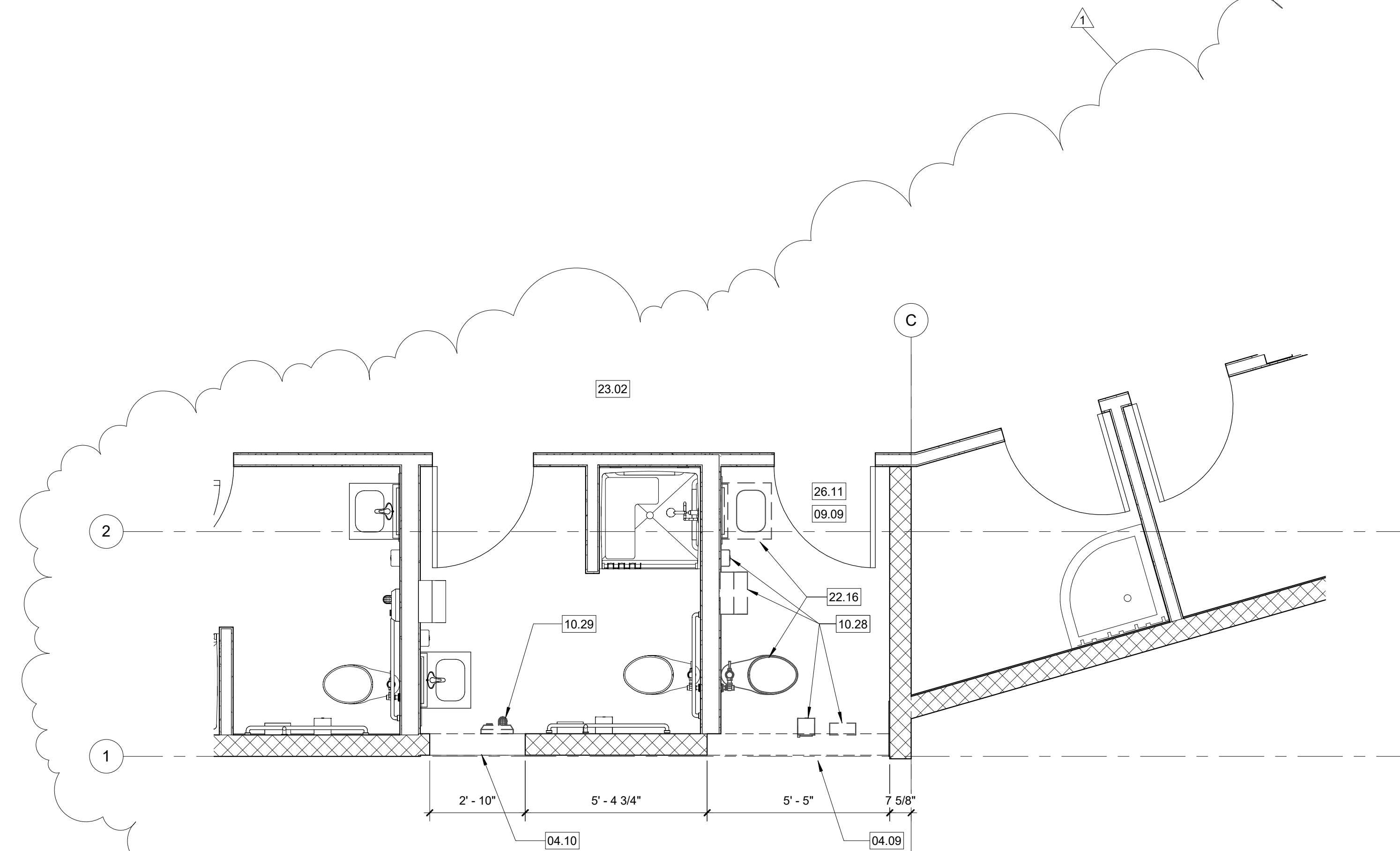
UPON COMPLETION OF CONSTRUCTION IT IS THE GENERAL CONTRACTOR'S RESPONSIBILITY TO THOROUGHLY CLEAN ALL AREAS IN WHICH CONSTRUCTION TOOK PLACE AND AREAS AFFECTED BY CONSTRUCTION. THE GENERAL CONTRACTOR SHALL CLEAN ALL FLOORING, REMOVE ALL DUST, CLEAN DOORS AND FRAMES, LIGHT FIXTURES, CEILING SYSTEMS, MECHANICAL GRILLES, ELECTRICAL PANELS, WINDOW SYSTEMS, GLAZING, ETC.

CONTRACTOR TO KEEP AN ACTIVE PEDESTRIAN PATHWAY & EGRESS ROUTES FREE OF OBSTRUCTION AT ALL TIMES THROUGHOUT THE PROJECT.

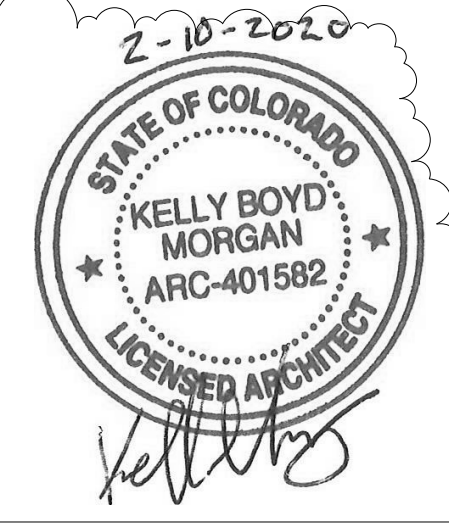
CONTRACTOR TO PREVENT WATER BUILD UP AND/OR DAMAGE TO FOUNDATIONS ON THE CONSTRUCTION SITE OR ADJACENT AREAS.

### Keynote Legend

04.09	REMOVE CMU BLOCK ACCORDING TO DIMENSION SHOWN. REMOVE TO A HEIGHT OF 10'-0" ABOVE STAGE LEVEL.
04.10	REMOVE CMU BLOCK ACCORDING TO DIMENSION SHOWN. REMOVE TO A HEIGHT OF 7'-4" ABOVE STAGE LEVEL.
09.09	REMOVE EXISTING GRID CEILING IN THIS ROOM
10.28	REMOVE RESTROOM ACCESSORIES AND PATCH/REPAIR WALL AS REQUIRED
10.29	REMOVE HAND DRYER AND RELOCATE NEAR SHOWER. SEE NEW FLOOR PLAN
22.16	REMOVE PLUMBING FIXTURES, CAP PLUMBING LINES AND REPAIR DRYWALL
23.02	CONTRACTOR TO VERIFY LOCATIONS AND SIZES OF EXISTING PIPING, DUCTWORK, AND PLUMBING SYSTEMS FOR TIE INS. MINOR MODIFICATIONS ARE ANTICIPATED, CONTRACTOR TO MAKE THESE ADJUSTMENTS ACCORDINGLY
26.11	EXISTING ELECTRICAL DEVICES AND EQUIPMENT IN THIS AREA ARE TO BE REMOVED INCLUDING LIGHT FIXTURE, SWITCH, SENSOR, DUPLEX RECEPTACLE AND EXHAUST FAN CONNECTION. REMOVE DEVICES AND CAP EXISTING BOXES THAT REMAIN. MAINTAIN EXISTING CIRCUITING TO DEVICES AND CIRCUITS THAT REMAIN.



**A3** Enlarged Demolition Floor Plan  
3/8" = 1'-0"



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**project:**

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO

CITY OF  
**Grand Junction**  
COLORADO

**project#:** 19.0270

**date:** February 10, 2020

**revisions:**

▲ Bid Addendum 01 4-7-20

**title:**

**Demolition  
Plan**

**sheet:**

**AD101**

PERMIT SET

DOOR SCHEDULE																
Number	Door						Frame			Head	Jamb	Sill	Fire Rating	Hardware Set	Comments	
	Width	Height	Thickness	Type	Door Material	Door Finish	Frame Type	Frame Finish	Frame Material							
106	3' - 0"	7' - 0"	1 3/4"	A	HM	PAINT	2	PAINT	HM	A3/A601	A3/A601	A3/A601	-	01		
106A	3' - 0"	7' - 0"	1 3/4"	A	HM	PAINT	2	PAINT	HM	A3/A601	A3/A601	A3/A601	-	04		
107A	3' - 0"	7' - 0"	1 3/4"	B	SOLID CORE WOOD	STAINED	-	-	-	-	-	-	-	02		
130	3' - 0"	7' - 0"	1 3/4"	A	HM	PAINT	1	PAINT	HM	A4/A601	A4/A601	A4/A601	-	03		
131	3' - 0"	7' - 0"	1 3/4"	A	HM	PAINT	1	PAINT	HM	A4/A601	A4/A601	A4/A601	-	03		



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**project:**  
 LAS COLONIAS  
 AMPHITHEATER -  
 ADDITION  
 Grand Junction, CO  
**CITY OF Grand Junction**  
 COLORADO

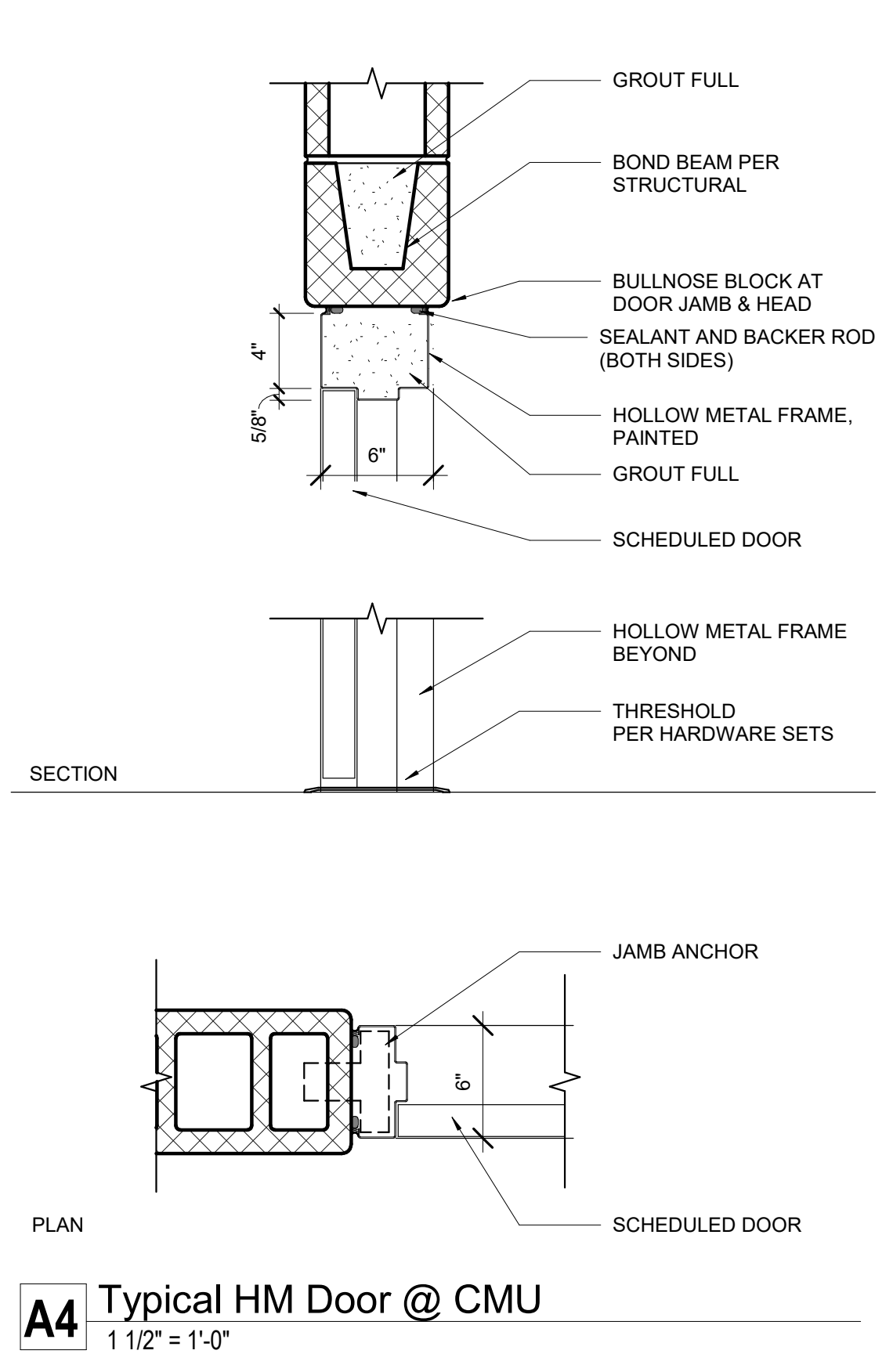
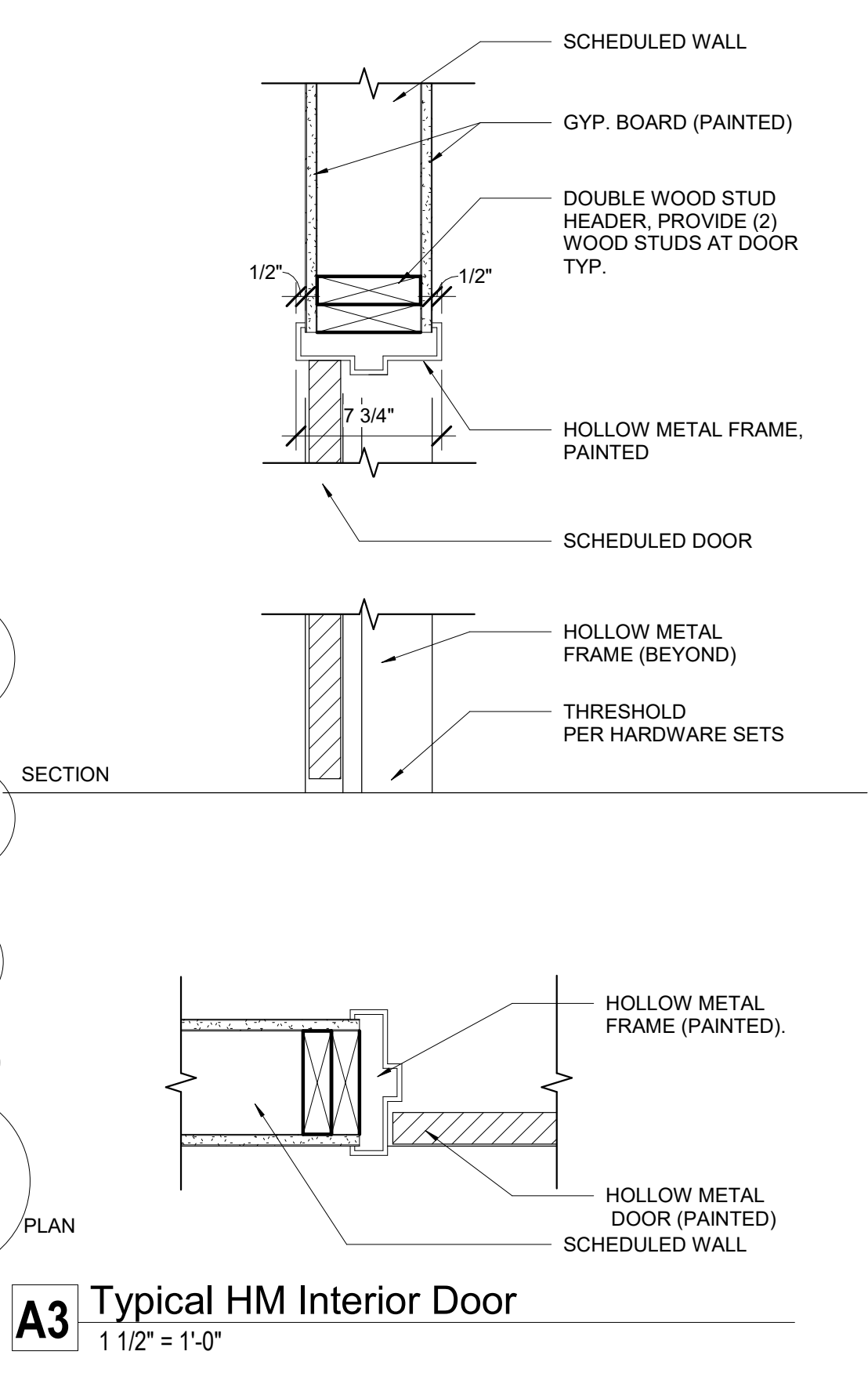
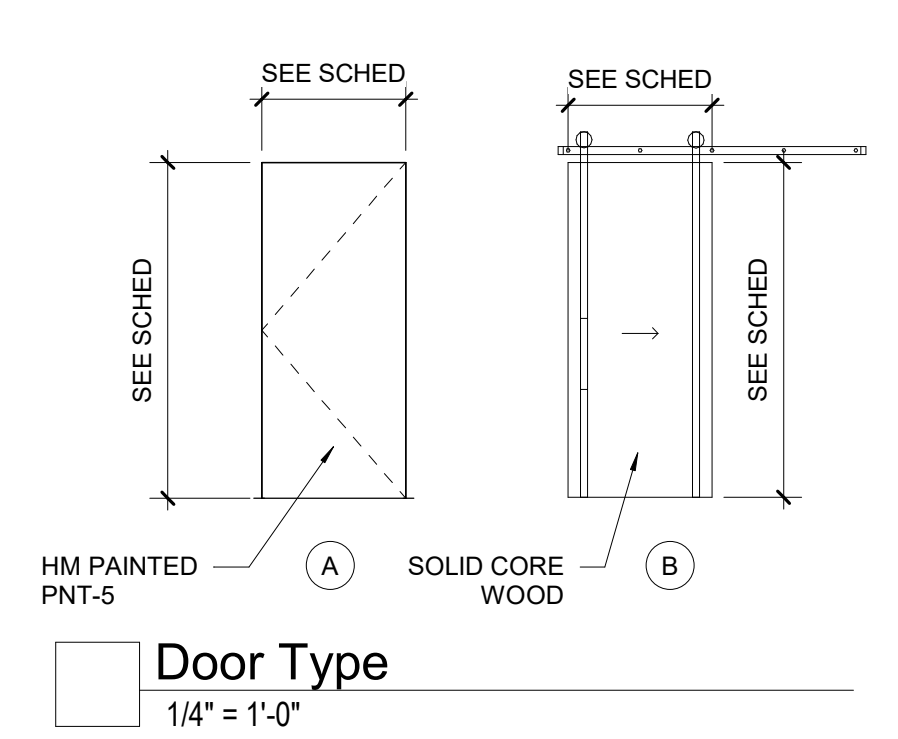
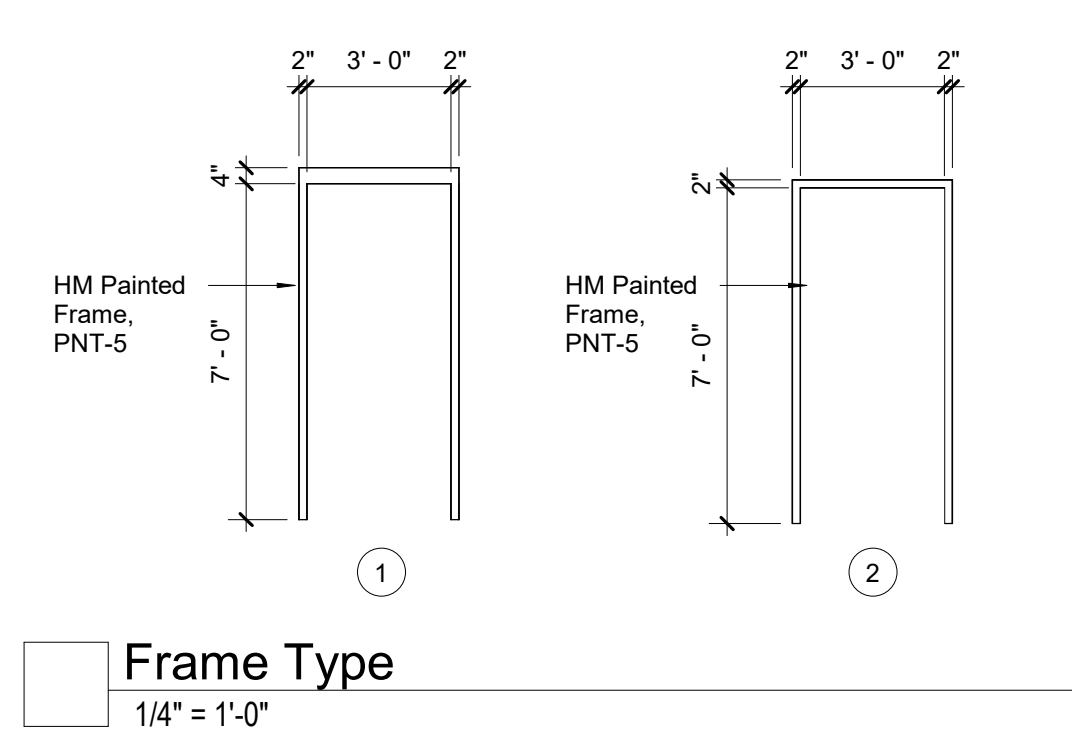
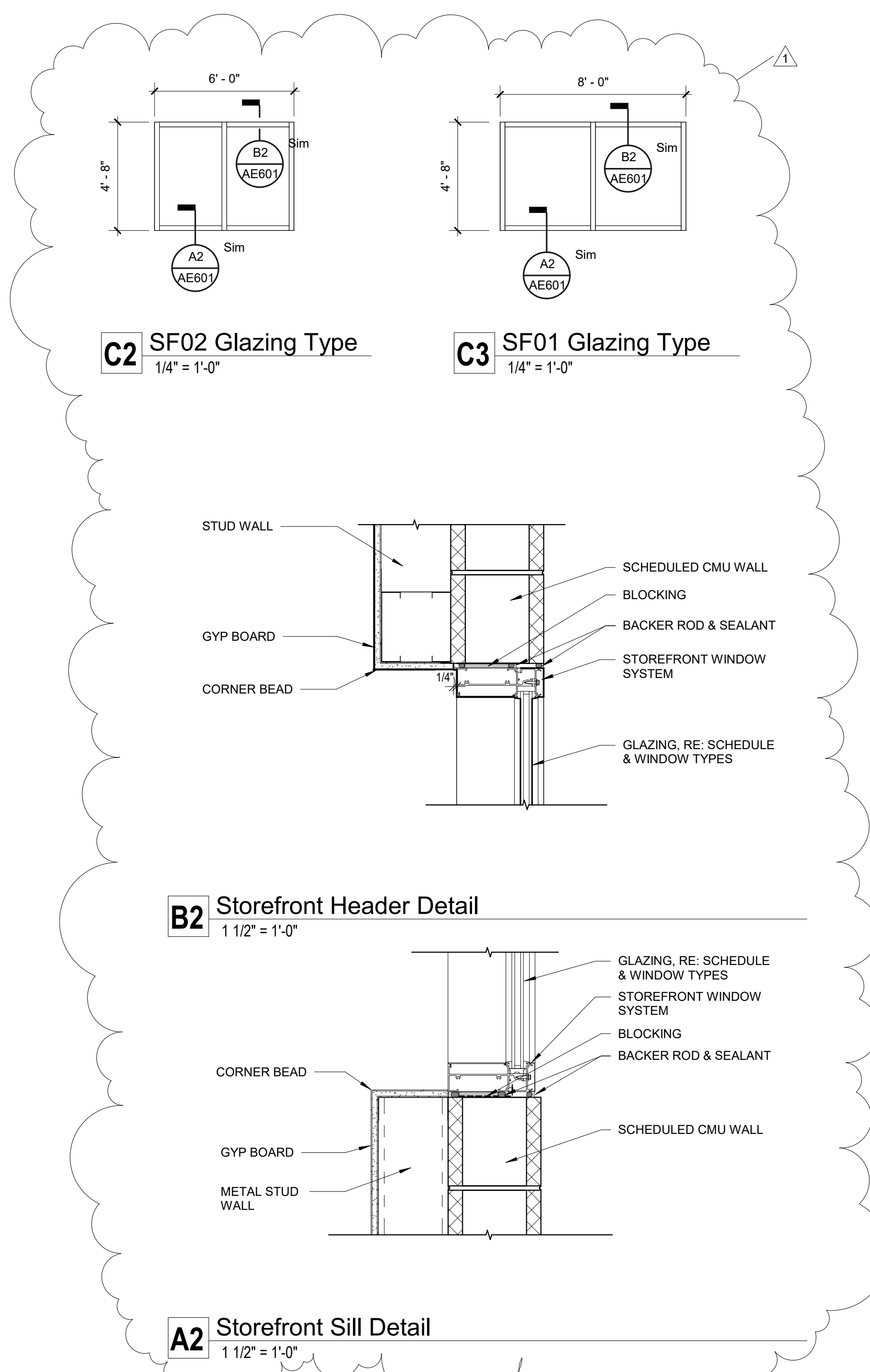
**project#:** 19-0270  
**date:** February 20, 2020

**revisions:**  
 Bid Addendum 01 4-7-20

**title:**  
**Door/Window Schedules & Types**

**sheet:**  
**AE601**

PERMIT SET



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**STRUCTURAL ENGINEER**

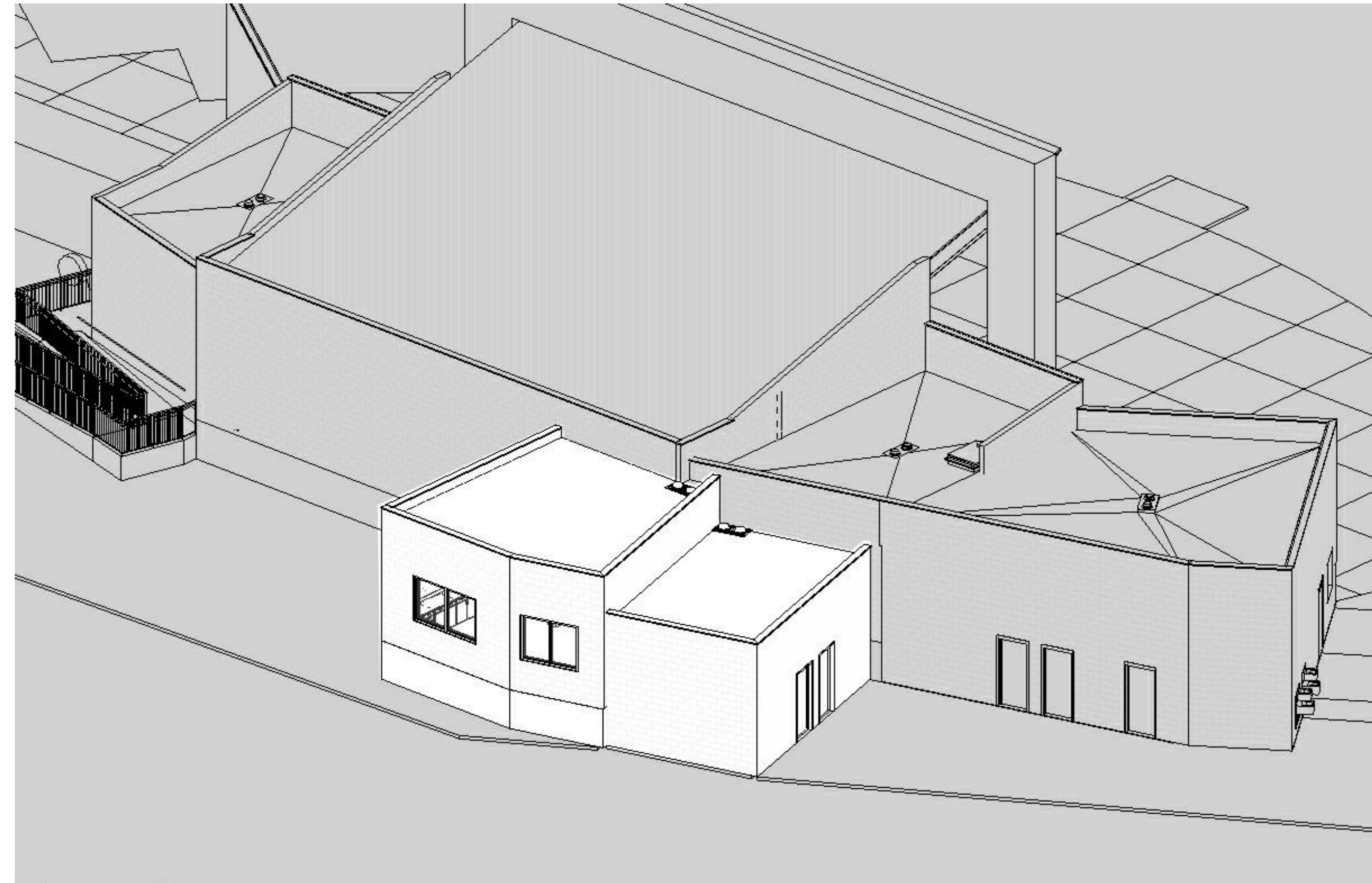
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**SPECTRUM ENGINEERS**  
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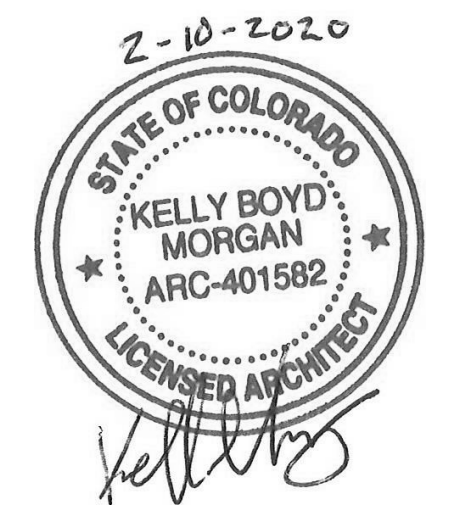
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# LAS COLONIAS AMPHITHEATER - ADDITION

PERMIT SET February 10, 2020



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**project:**

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO



**project#:** 19-0270  
**date:** February 10, 2020

**revisions:**

**title:**

## Cover Sheet

**sheet:**

# G001

PERMIT SET

## ABBREVIATION SCHEDULE

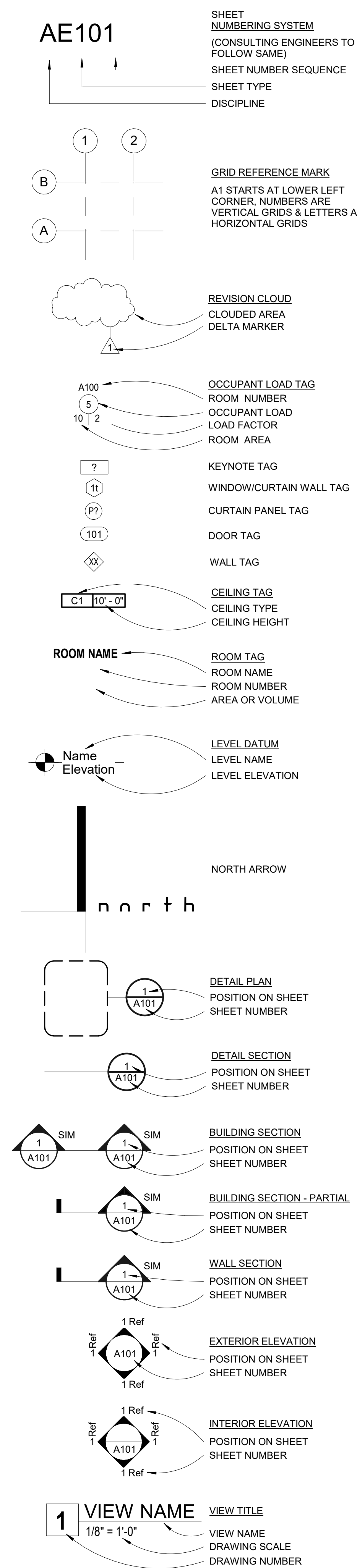
Abbrev.	Description
0	
#	NUMBER OR POUND
&	2 HORIZONTAL TO 1 VERTICAL SLOPE
2:1 SL	
@	CHANNEL
AD	AREA DRAIN
CL	CENTERLINE
L	ANGLE
±	PLUS MINUS
≤	LESS THAN OR EQUAL TO
≥	GREATER THAN OR EQUAL TO
A	
AB	ANCHOR BOLT
AC	ASPHALTIC CONCRETE
ACST	ACOUSTIC
ADJ	ADJUSTABLE
AFF	ABOVE FINISH FLOOR
AL	ALUMINUM
ALT	ALTERNATE
ARCH	ARCHITECTURAL, ARCHITECT, ARCHITECTURE
ASPH	ASPHALT
B	
B	BASELINE
B	BOTTOM
BEJ	BRICK EXPANSION JOINT
BLDG	BUILDING
BLK	BLOCK
BM	BEAM
BO	BOARD
BRG	BEARING
BSMT	BASEMENT
C	
C&G	CURB & GUTTER
CAP	CAPACITY
CEM	CEMENT
CG	CORNER GUARD
CIP	CAST IN PLACE, CAST IRON PIPE
CIR	CIRCULATING
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNITS
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
CPT	CARPET
CSK	COUNTERSUNK
CT	CERAMIC TILE
CTR	CENTER
D	
D	DEPTH
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DS	DOWNSPOUT
DWG	DRAWING
E	
E	EAST
E/P	EDGE OF PAVEMENT
EA	EACH
EL	ELEVATION
ELECT	ELECTRICAL
ELEV	ELEVATOR
EMER	EMERGENCY
EQ	EQUAL
EQUIP	EQUIPMENT
EW	EACH WAY
EW	ELECTRIC WATER COOLER
EXIST	EXISTING
EXP	EXPANSION
EXP JT	EXPANSION JOINT
EXT	EXTERIOR
F	
FD	FLOOR DRAIN
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FFE	FINISHED FLOOR ELEVATION
FH	FIRE HYDRANT
FHC	FIRE HOSE CABINET
FIN	FINISH
FLR	FLOOR
FR	FRAME
FTG	FOOTING
FXTR	FIXTURE
G	
G	GROUND
GA	GALVANIZED
GALV	
GL	GLASS
GR	GRADE
GRD	GROUND
GWB	GYPSUM WALL BOARD
H	
HB	HOSE BIBS
HC	HANDICAPPED
HDW	HARDWARE
HGT	HEIGHT
HORZ	HORIZONTAL
HR	HOUR
HW	HOT WATER
I	
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
INSUL	INSULATION
INT	INTERIOR
INTX	INTERSECTION
INV	INVERT
J	
JB	JUNCTION BOX
JCT	JUNCTION

## ABBREVIATION SCHEDULE

Abbrev.	Description
JST	JOIST
JT	JOINT
L	
L	LENGTH
LC	LENGTH OF CURVE
LDC	LEAD COVERED
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LT	LIGHT
M	
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MET	METAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MTD	MOUNTED
MTG	MOUNTING
MULL	MULLION
MWP	MEMBRANE WATERPROOFING
N	
N	NORTH
NA	NOT APPLICABLE
NE	NORTHEAST
NEC	NATIONAL ELECTRIC CODE
NEUT	NEUTRAL
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
NW	NORTHWEST
O	
OA	OUTSIDE AIR
OA	OUTSIDE AIR
OC	ON CENTER
OPP	OPPOSITE
OVHD	OVERHEAD
P	
PI	POINT IF INTERSECTION
PL	PLATE
PLAS	PLASTER
PLYWD	PLYWOOD
PNL	PANEL
PNT	PAINT
PRELIM	PRELIMINARY
PRESS	PRESSURE
PRIM	PRIMARY
PRTN	PARTITION
PT	POINT, POINT OF TANGENT
Q	
QT	QUARRY TILE
R	
R	RADIUS
RA	RETURN AIR
RB	RESILIENT VINYL BASE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
RECP	RECEPTACLE
REINF	REINFORCEMENT
REQD	REQUIRED
REV	REVISION
RF	ROOF
RFLCP	REFLECTIVE CEILING PLAN
RM	ROOM
RVT	RESILIENT VINYL TILE
S	
S	SOUTH
SCH	SCHEDULE
SD	STORM DRAIN
SE	SOUTHEAST
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SL	SLOPE
SPEC	SPECIFICATION
SQ	SQUARE
STL	STEEL
SUSP	SUSPENDED
T	
T	TOP
T&B	TOP AND BOTTOM
TEL	TELEPHONE
TEMP	TEMPORARY
TERM	TERMINAL
THRSLD	THRESHOLD
TO	TOP OF
TOS	TOP OF STEEL, TOP OF SLAB
TOW	TOP OF WALL
TYP	TYPICAL
V	
VCT	VINYL COMPOSITION TILE
VENT	VENTILATING
VERT	VERTICAL
VEST	VESTIBULE
VWC	VINYL WALL COVERING
W	
W	WIDTH, WEST
W	WITH
W/O	WITHOUT
WC	WATER CLOSET
WD	WIDTH
WT	WEIGHT
WWF	WELED WIRE FABRIC
X	
X	TRANSFORMER

## ARCHITECTURAL SYMBOLS

(SEE RESPECTIVE DISCIPLINES FOR SYMBOLS)



## MATERIAL LEGEND

02 SITE CONSTRUCTION	06 WOODS AND PLASTICS
EARTH (existing)	CONTINUOUS WOOD
EARTH (backfill)	INTERMITTENT WOOD
DRAINAGE FILL COMPACTED FILL	SHEATHING
CONCRETE - CAST-IN-PLACE	FINISH WOOD
CONCRETE - PRECAST	HARDBOARD
BRICK	PARTICLE BOARD
CONCRETE MASONRY UNITS	BATT INSULATION
GLASS BLOCK	LOOSE FILL INSULATION
STONE	RIGID INSULATION
CAST STONE	GYPSUM BOARD
GROUT	
STEEL	
ALUMINUM	

### MISCELLANEOUS GENERAL NOTES

- THE PROJECT MANUAL, UNDER SEPARATE COVER, IS AN INTEGRAL PART OF THESE CONSTRUCTION DRAWINGS.
- PLANS, SECTIONS, ELEVATIONS, DETAILS AND DIMENSIONS LABELED "TYPICAL" SHALL APPLY TO ALL SITUATION OCCURRING THAT ARE THE SAME OR SIMILAR TO THOSE SPECIFICALLY KEYS ON THE DRAWINGS.
- ALL WORK, MATERIALS, AND METHODS SHALL BE IN CONFORMANCE WITH THE CODES, ORDINANCES AND REGULATIONS OF ALL GOVERNMENTAL AGENCIES HAVING JURISDICTION AT THE PROJECT LOCATION.
- UNLESS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS AS BEING NOT IN CONTRACT (N.I.C.) OR EXISTING, ALL ITEMS, MATERIALS AND INSTALLATION OF SAME ARE PART OF THE CONTRACT AS DEFINED BY THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL ACCESSORIES, COMPONENTS AND ASSEMBLIES REQUIRED FOR THE WORK DEPICTED OR SPECIFIED.
- CONTRACTORS ARE RESPONSIBLE FOR ALL WORK REGARDLESS OF THE LOCATION OF THE INFORMATION ON THE DOCUMENTS.
- KEEP SITE CLEAN AND CLEAR OF DEBRIS AND IN ORDERLY CONDITION THAT DOES NOT DETRACT FROM THE SURROUNDING SITE AND REPAIR ANY DAMAGE CAUSED BY WORK OF THE CONTRACT.
- ALL DIMENSIONS ARE TO THE FACE OF METAL OR WOOD STUD FRAMED WALLS AND TO THE FACE OF CONCRETE AND MASONRY WALLS AS SHOWN, UNLESS NOTED OTHERWISE.
- INSTALL SEALANT AT EXTERIOR SIDE OF ALL JOINTS, SEAMS, CONNECTIONS OR OPENINGS WHICH WOULD ALLOW WATER OR AIR INFILTRATION EXCEPT AS NOTED OTHERWISE. SEALANT COLOR TO MATCH ADJACENT SURFACE. COLOR REQUIRES ARCHITECTS APPROVAL.
- DOOR OPENINGS IN FRAME CONSTRUCTION WHICH ARE NOT DIMENSIONED ARE EITHER CENTERED IN THE WALL, FACE OF JAMB OR LOCATED 4" FROM THE FACE OF STUD TO THE FINISHED JAMB.
- ALL SPECIAL ACCESSIBLE FACILITIES SHALL BE IDENTIFIED WITH APPROVED SIGNAGE.
- THE CONTRACTOR IS RESPONSIBLE FOR PRODUCING A WEATHER TIGHT BUILDING, DETAILS AND OMISSIONS TO DRAWINGS NOTWITHSTANDING. ALL DRAWING CONFLICTS WHICH MAY NOT ALLOW A WEATHER TIGHT CONDITION SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.
- DISCREPANCIES BETWEEN ACTUAL CONDITIONS AND PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT. CONTRACTOR SHALL SUBMIT SPECIFIC DISCREPANCIES FOR ARCHITECT REVIEW.
- PROVIDE FULL METAL BACKING PLATE (16 GAUGE X 6" HIGH SECURED TO 3 STUDS MIN.) OR WOOD BLOCKING AS REQUIRED TO SECURELY ANCHOR ALL WALL MOUNTED EQUIPMENT (CABINETS, TOILET ROOM ACCESSORIES, HARDWARE, ETC.). BLOCKING SHALL PROVIDE A RIGID CONNECTION CAPABLE OF SUPPORTING DESIGN LOADS. PROVIDE A 16 GAUGE X 6" STL. STUD/TRACK SECURED TO 2 STUDS TO SECURELY SUPPORT ALL WALL STOPS (DOOR BUMPER).
- COORDINATE WITH ALL TRADES, SIZES AND LOCATIONS OF ALL OPENINGS FOR MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT, EQUIPMENT PADS OR BASES, AS WELL AS ELECTRIC POWER, WATER, AND DRAIN INSTALLATIONS, BEFORE PROCEEDING WITH WORK. CONTRACTOR SHALL PROVIDE COORDINATION DRAWINGS FOR PROPER PLACEMENT OF ALL TRADES' WORK. ANY CONCERNS, SPACE LIMITATIONS OR STRUCTURAL CONFLICTS, SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT. A REASONABLE RESPONSE TIME SHALL BE ALLOWED AS NOTED IN THE SPECIFICATIONS.
- ALL FLOOR OR WALL OPENINGS REQUIRED FOR PIPES, DUCTS, CONDUITS, ETC. SHALL BE SEALED IN AN APPROVED MANNER.
- FIRE SPRINKLER DESIGN TO BE DONE BY A CERTIFIED SUB-CONTRACTOR AND WILL REQUIRE APPROVALS BY THE CITY AND STATE FIRE MARSHAL. APPROVALS BY THE FIRE MARSHAL ARE TO BE OBTAINED BY THE CONTRACTOR PRIOR TO SUBMITTAL TO ARCHITECT. SUBMITTAL TO THE ARCHITECT ALSO INDICATES THAT THE CONTRACTOR HAS REVIEWED AND COORDINATED FIRE SPRINKLER PIPING LOCATIONS WITH ALL TRADES.
- ROOMS ENCLOSED WITH RATED WALLS REQUIRE RATED DOORS. ANY DUCTS PASSING THROUGH WALLS REQUIRE FIRE DAMPERS AND OR FIRE/SMOKE DAMPERS. ANY CONDUIT OR PIPING REQUIRES RATED SEALANT AT JOINTS.
- GENERAL STRUCTURAL NOTES GOVERN TYPICAL CONDITIONS WHETHER OR NOT SPECIFICALLY DETAILED OR NOTED.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE AND LOCATE ELECTRICAL, DATA AND PHONE RECEPTACLES, SWITCHES, ETC. TO AVOID CASEWORK, DOORS, ETC.
- THE DRAWINGS AND SPECIFICATIONS INDICATE THE GENERAL SCOPE OF THE PROJECT IN TERMS OF THE ARCHITECTURAL AND STRUCTURAL DESIGN CONCEPT, THE DIMENSIONS OF THE BUILDING, THE TYPE OF STRUCTURAL, MECHANICAL, ELECTRICAL AND UTILITY SYSTEMS AND MAJOR ARCHITECTURAL ELEMENTS OF CONSTRUCTION AS "SCOPE" DOCUMENTS.
- THE DRAWINGS AND SPECIFICATIONS DO NOT NECESSARILY INDICATE OR DESCRIBE ALL WORK REQUIRED FOR THE FULL PERFORMANCE AND COMPLETION OF THE WORK. CONTRACTS SHALL BE LET ON THE BASIS OF SUCH DOCUMENTS, WITH THE UNDERSTANDING THAT THE CONTRACTOR IS TO FURNISH ALL ITEMS REQUIRED FOR PROPER COMPLETION OF THE WORK WITH OUT ADJUSTMENT TO CONTRACT PRICE. IT IS INTENDED THAT THE WORK TO BE OF SOUND AND QUALITY CONSTRUCTION AND THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE INCLUSION OF ADEQUATE AMOUNTS TO COVER INSTALLATION OF ALL ITEMS INDICATED, DESCRIBED OR REASONABLY IMPLIED.

## DRAWING INDEX

G001	COVER SHEET
G002	GENERAL INFORMATION

## CIVIL

NONE

## ARCHITECTURAL

G003	ACCESSORY MOUNTING HEIGHTS
G004	WALL TYPES
G101	CODE PLAN - CODE ANALYSIS
AD101	DEMOLITION PLAN
AE101	FLOOR PLAN AND CEILING PLANS
AE102	ROOF PLAN
AE201	EXTERIOR ELEVATIONS
AE301	BUILDING SECTIONS
AE310	WALL SECTIONS
AE401	INTERIOR ELEVATIONS
AE501	DETAILS
AE601	DOOR/WINDOW SCHEDULES & TYPES
AF100	FINISH FLOOR PLAN

## STRUCTURAL

S001	GENERAL STRUCTURAL NOTES
S002	GENERAL STRUCTURAL NOTES
S003	SPECIAL INSPECTIONS
S004	SPECIAL INSPECTIONS
S101	FOOTING AND FOUNDATION PLAN
S111	ROOF FRAMING PLAN
S501	DETAILS
S502	DETAILS
S511	DETAILS
S601	SCHEDULES

## MECHANICAL/PLUMBING

ME001	MECHANICAL COVER SHEET
ME002	HVAC NOTES
ME003	HVAC NOTES
MH101	MECHANICAL PLANS
ME501	HVAC DETAILS
ME601	MECHANICAL SCHEDULES
PE001	PLUMBING COVER SHEET
PE002	PLUMBING NOTES
PE003	PLUMBING NOTES
PL101	PLUMBING PLANS
PE501	PLUMBING DETAILS
PE601	PLUMBING SCHEDULES

## ELECTRICAL

EE001	SHEET INDEX, ABBREVIATIONS, AND GENERAL NOTES
EE501	ELECTRICAL DETAILS
EE701	TYPICAL MOUNTING HEIGHT DETAILS
EE702	TYPICAL MOUNTING HEIGHT DETAILS
EP101	STAGE LEVEL POWER PLAN
EP601	ELECTRICAL SCHEDULES
EL101	STAGE LEVEL LIGHTING PLAN
EL601	LIGHTING FIXTURE SCHEDULE



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**project:**

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO

**CITY OF**  
**Grand Junction**  
COLORADO

**project#:** 19-0270  
**date:** February 10, 2020

**revisions:**

**title:**

**General**  
**Information**

**sheet:**

**G002**

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**project:**  
LAS COLONIAS  
AMPHITHEATER -  
ADDITION  
Grand Junction, CO  
**CITY OF Grand Junction**  
COLORADO

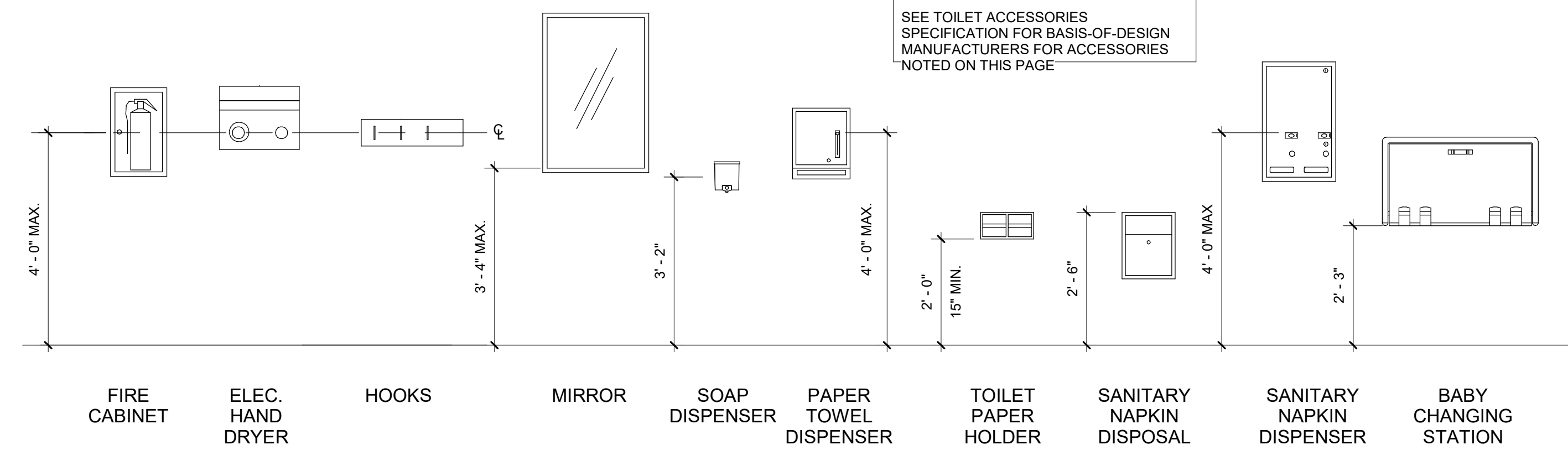
**project#:** 19.0270  
**date:** February 20, 2020

**revisions:**

**title:**  
**Accessory  
Mounting  
Heights**

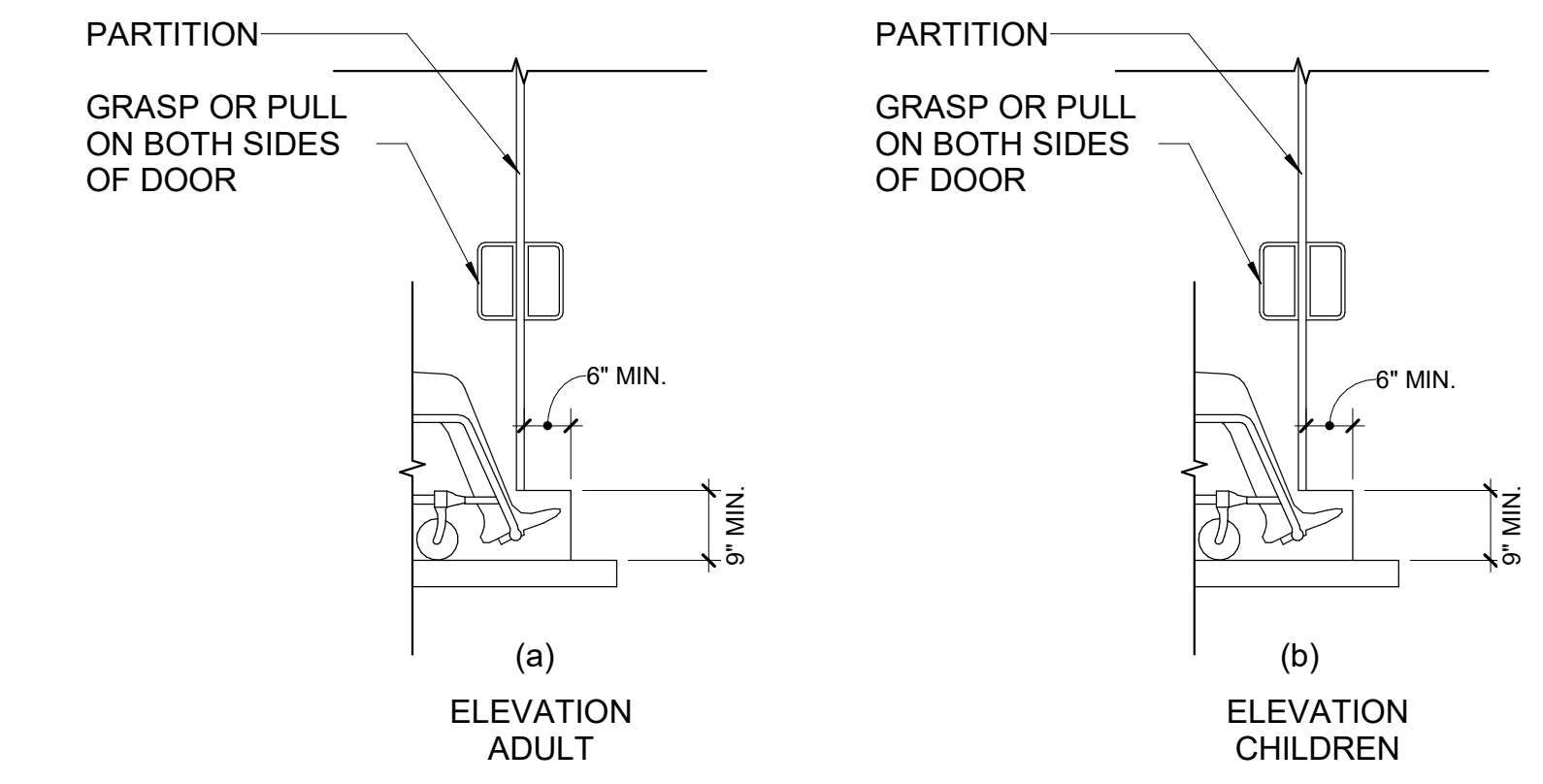
**sheet:**  
**GO03**

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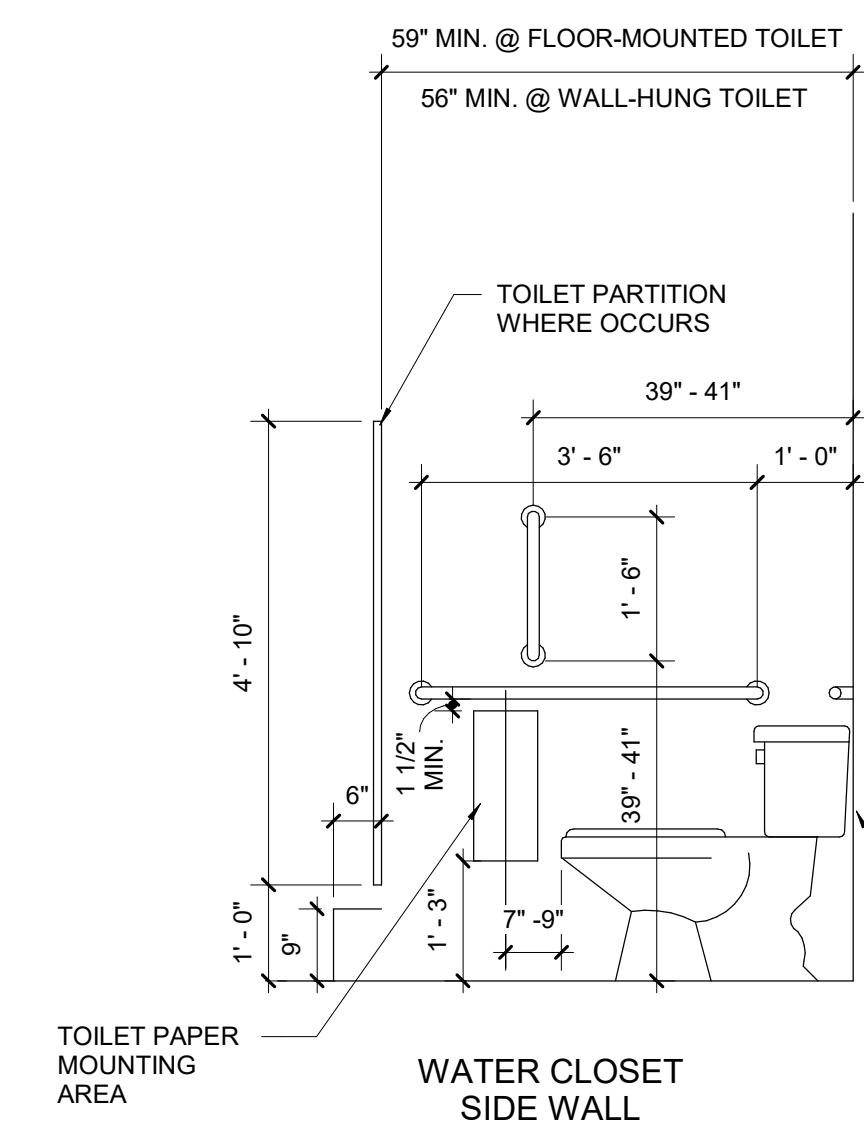


**MISC MOUNTING HEIGHTS**

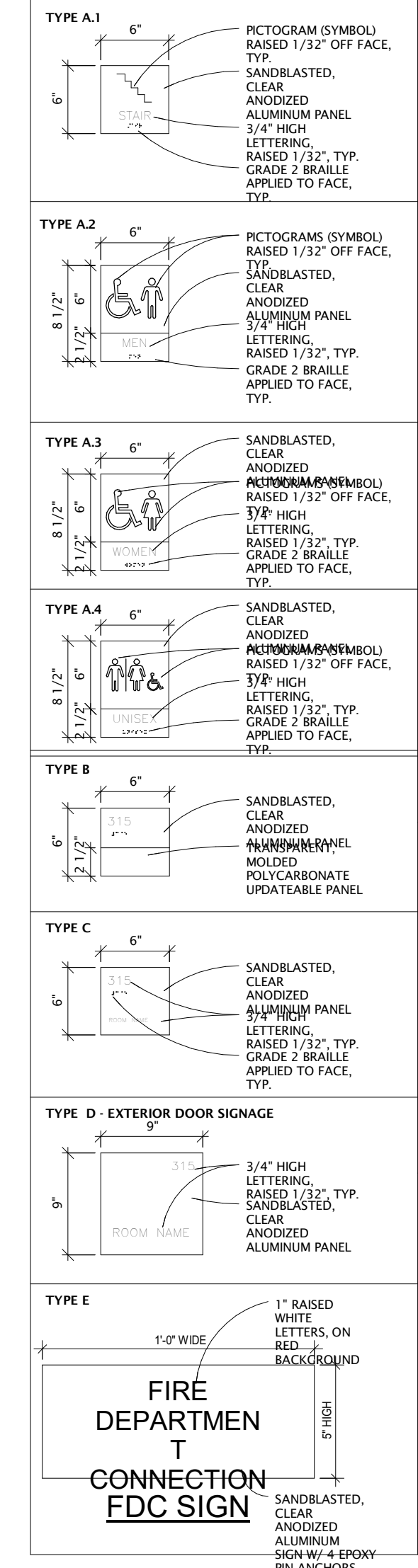
**TYPICAL TOILET ACCESSORIES MOUNTING HEIGHTS**



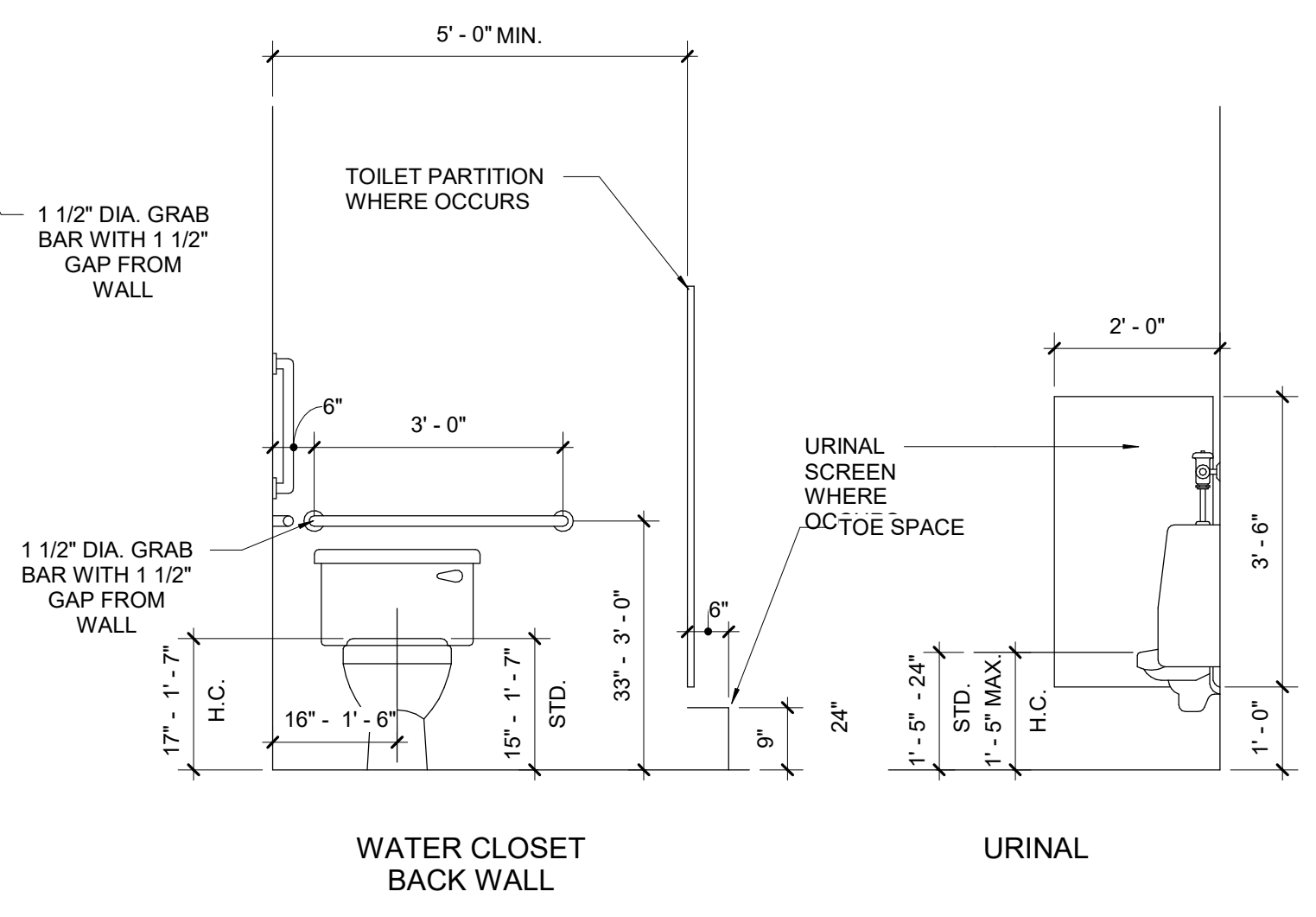
**TOE CLEARANCE**



**SIGNAGE LEGEND**

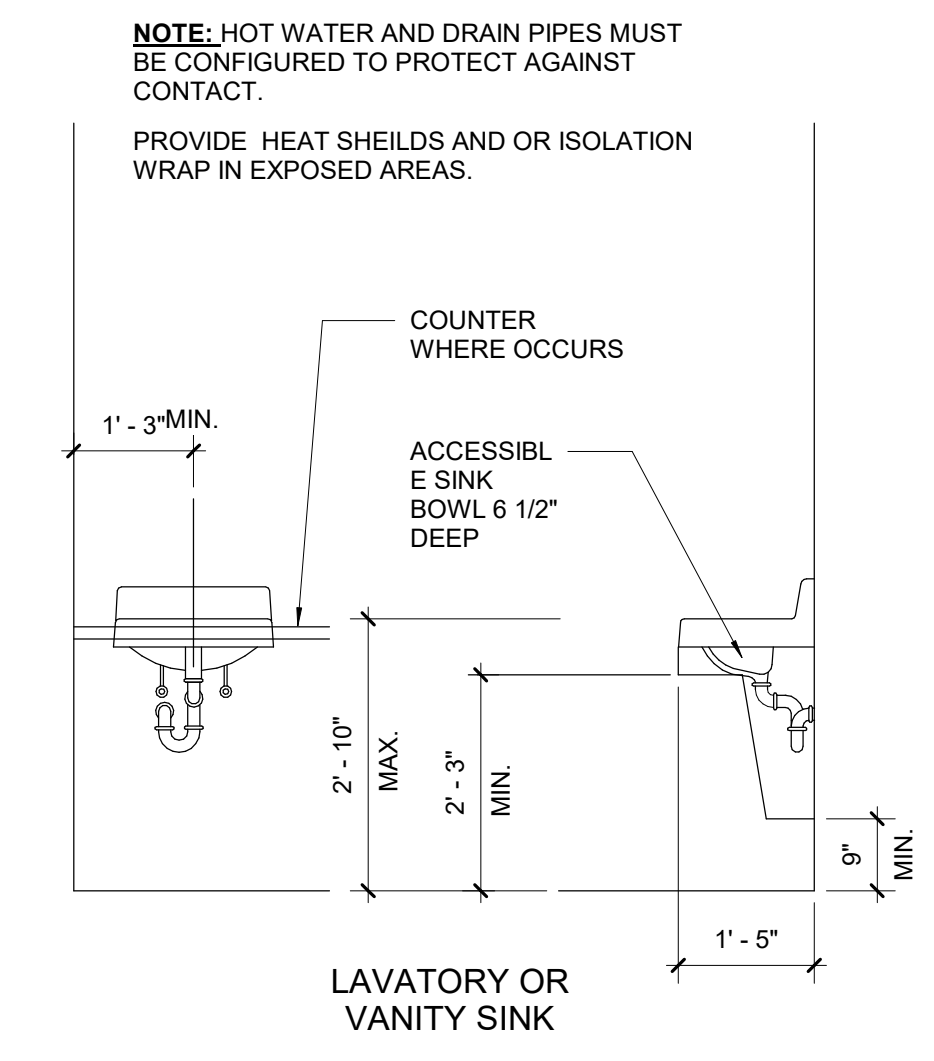


**SIGNAGE**

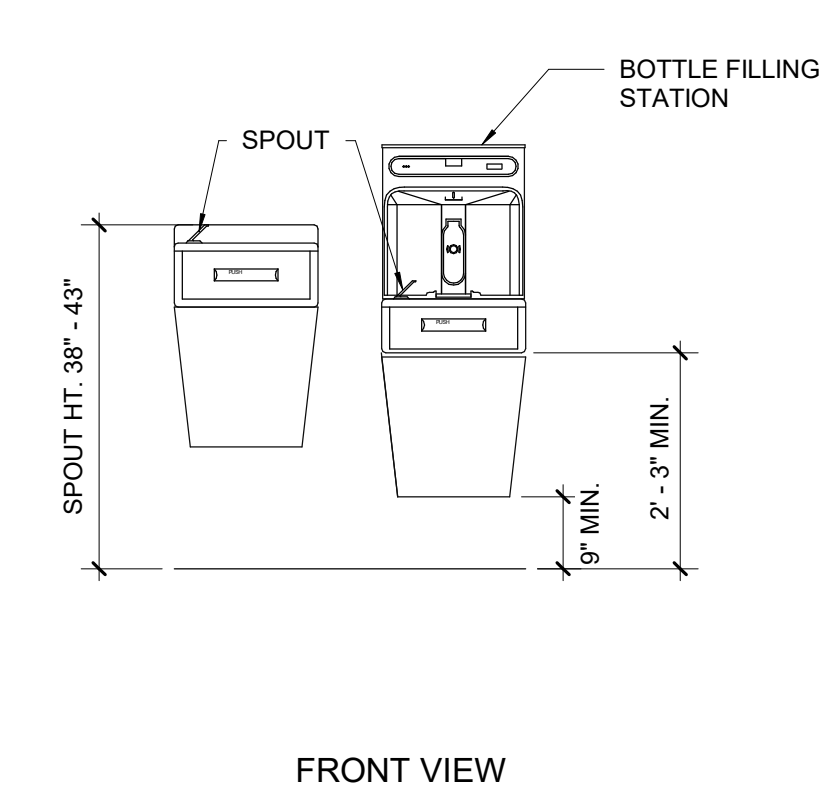


**WATER CLOSET BACK WALL**

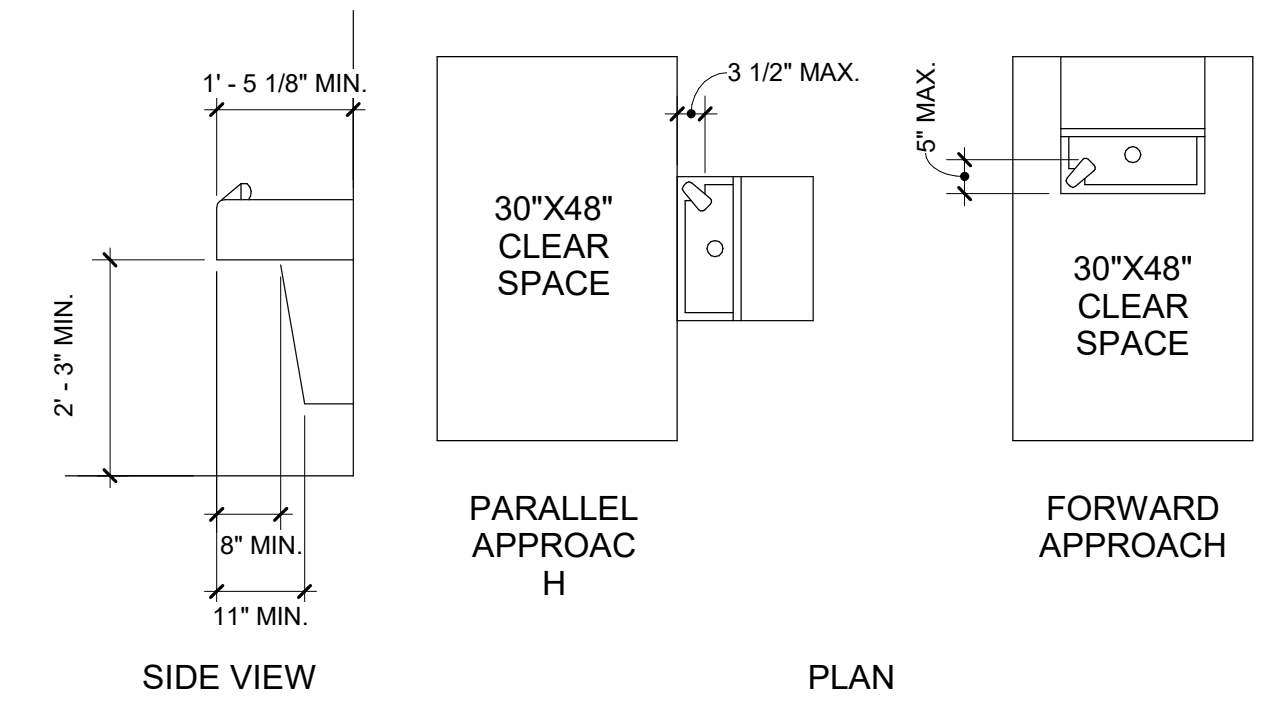
**URINAL**



**LAVATORY OR VANITY SINK**



**FRONT VIEW**



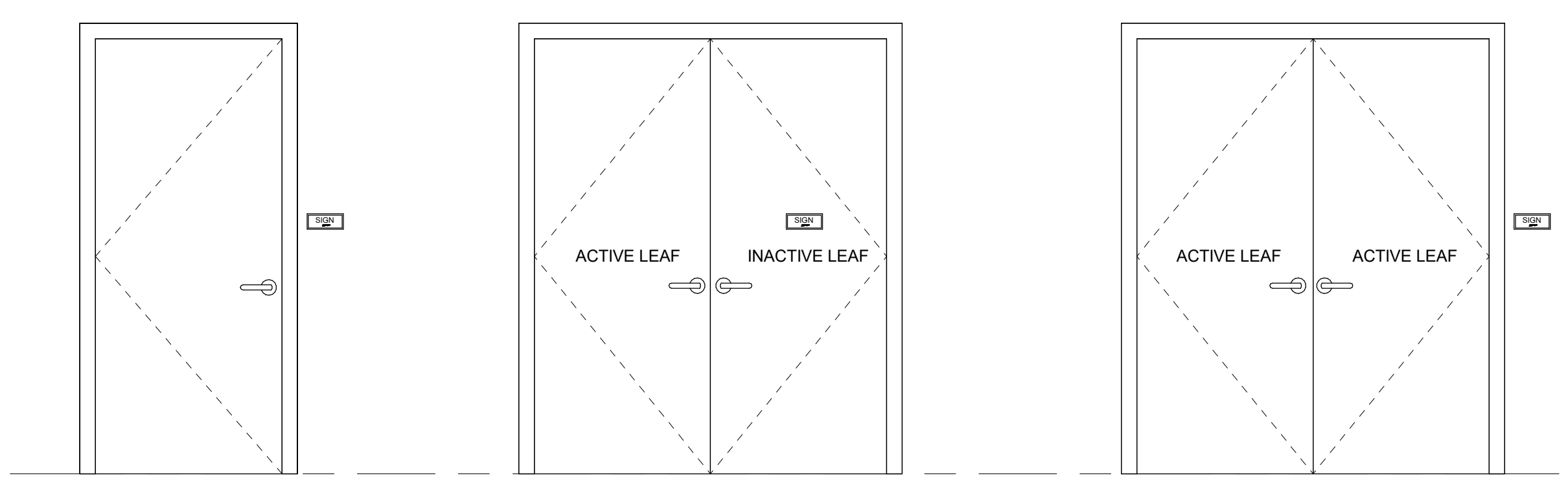
**SIDE VIEW**

**PARALLEL APPROACH**

**PLAN**

**FORWARD APPROACH**

**TYPICAL PLUMBING FIXTURES AND ACCESSORIES MOUNTING HEIGHTS**



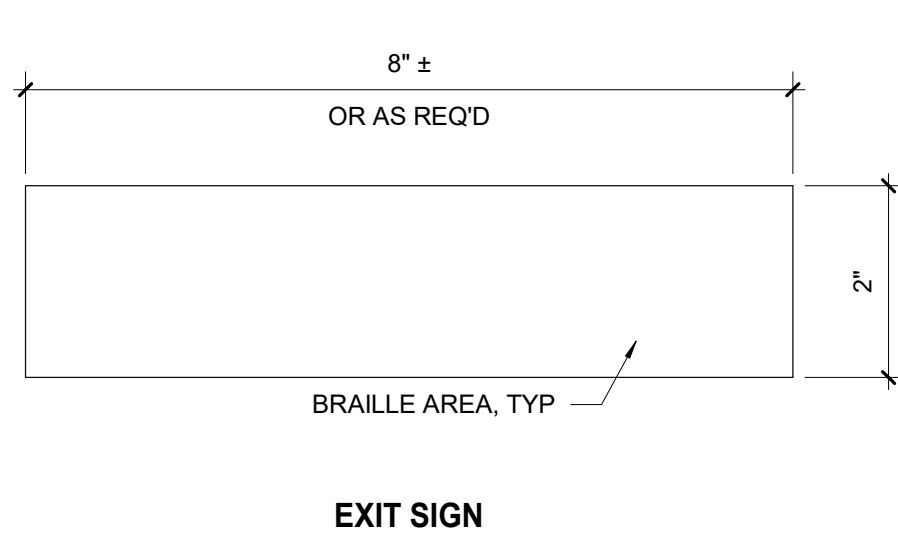
**SIGNAGE LOCATIONS**

NOTE: HOT WATER AND DRAIN PIPES MUST BE CONFIGURED TO PROTECT AGAINST CONTACT.  
PROVIDE HEAT SHIELDS AND OR ISOLATION WRAP IN EXPOSED AREAS.

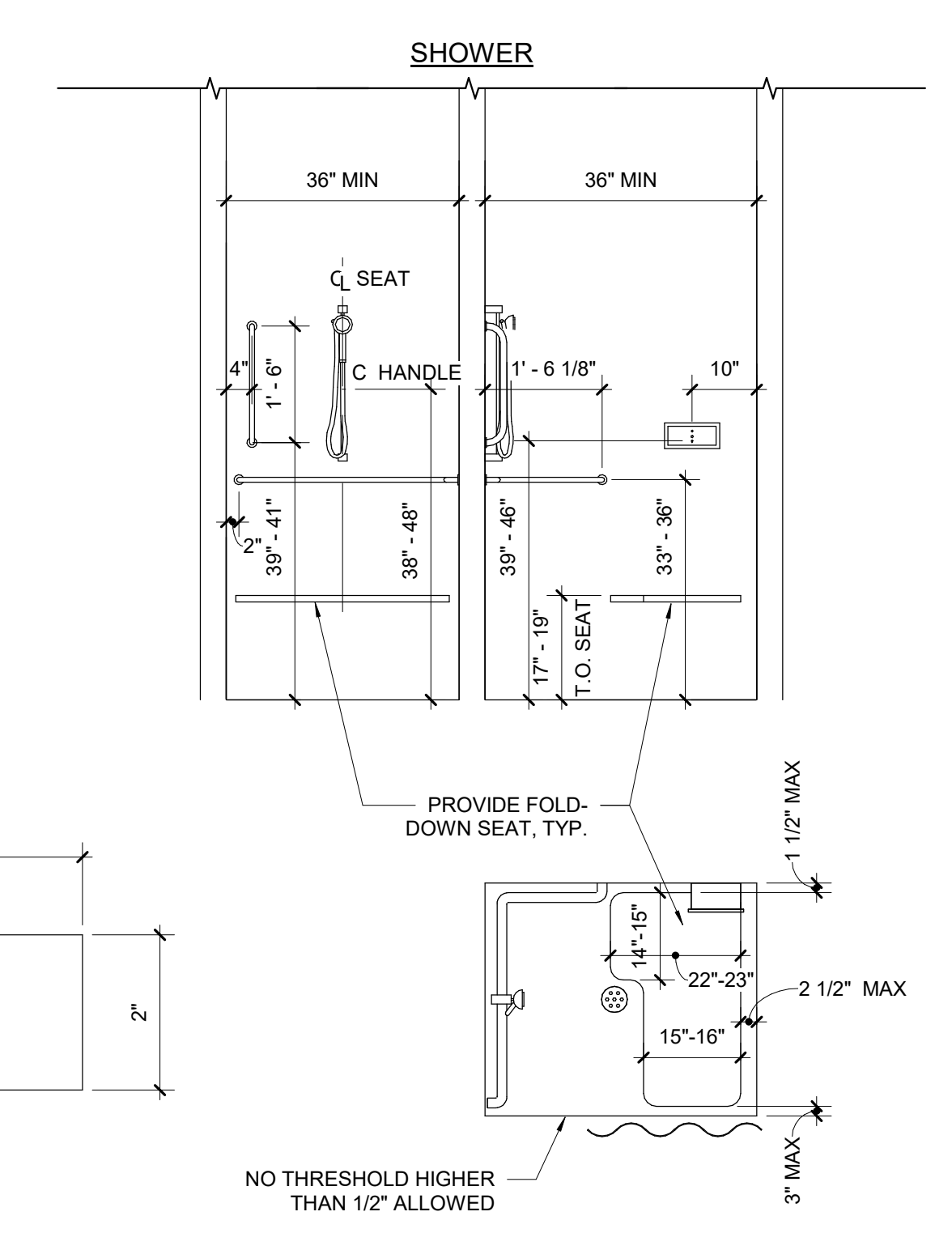
NOTE: SIGN HEIGHT ABOVE THE FLOOR. TACTILE CHARACTERS SHALL BE 48 INCHES MINIMUM ABOVE THE FLOOR. MEASURED TO THE BASELINE OF THE LOWEST TACTILE CHARACTER AND 60 INCHES MAXIMUM ABOVE THE FLOOR. MEASURED TO THE BASELINE OF THE HIGHEST TACTILE CHARACTER. (ICC/ANSI 703.3.10)

NOTE: SIGN LOCATION. WHERE A TACTILE SIGN IS PROVIDED AT A DOOR. THE SIGN SHALL BE ALONGSIDE THE DOOR AT THE LATCH SIDE. WHERE A TACTILE SIGN IS PROVIDED AT DOUBLE DOORS WITH ONE ACTIVE LEAF. THE SIGN SHALL BE LOCATED ON THE INACTIVE LEAF. WHERE A TACTILE SIGN IS PROVIDED AT DOUBLE DOORS WITH TWO ACTIVE LEAVES. THE SIGN SHALL BE TO THE RIGHT OF THE RIGHT HAND DOOR. WHERE THERE IS NO WALL SPACE ON THE NEAREST SIDE OF A SINGLE DOOR, OR TO THE RIGHT SIDE OF DOUBLE DOORS. SIGNS SHALL BE ON THE NEAREST ADJACENT WALL. SIGNS SHALL BE ON THE NEAREST WALL BE LOCATED SO THAT A CLEAR FLOOR AREA 18 INCHES MINIMUM BUY 18 INCHES MINIMUM, CENTERED ON THE TACTILE CHARACTERS, IS PROVIDED BEYOND THE ARC OF THE ANY DOOR SWING BETWEEN THE CLOSED POSITION AND 45 DEGREE OPEN POSITION. (ICC/ANSI 703.3.11)

NOTE: COLOR AS SELECTED BY ARCHITECT  
-CHARACTER SIZE AND BRAILLE LOCATION PER ANSI A117.1, CH. 7



**EXIT SIGN**



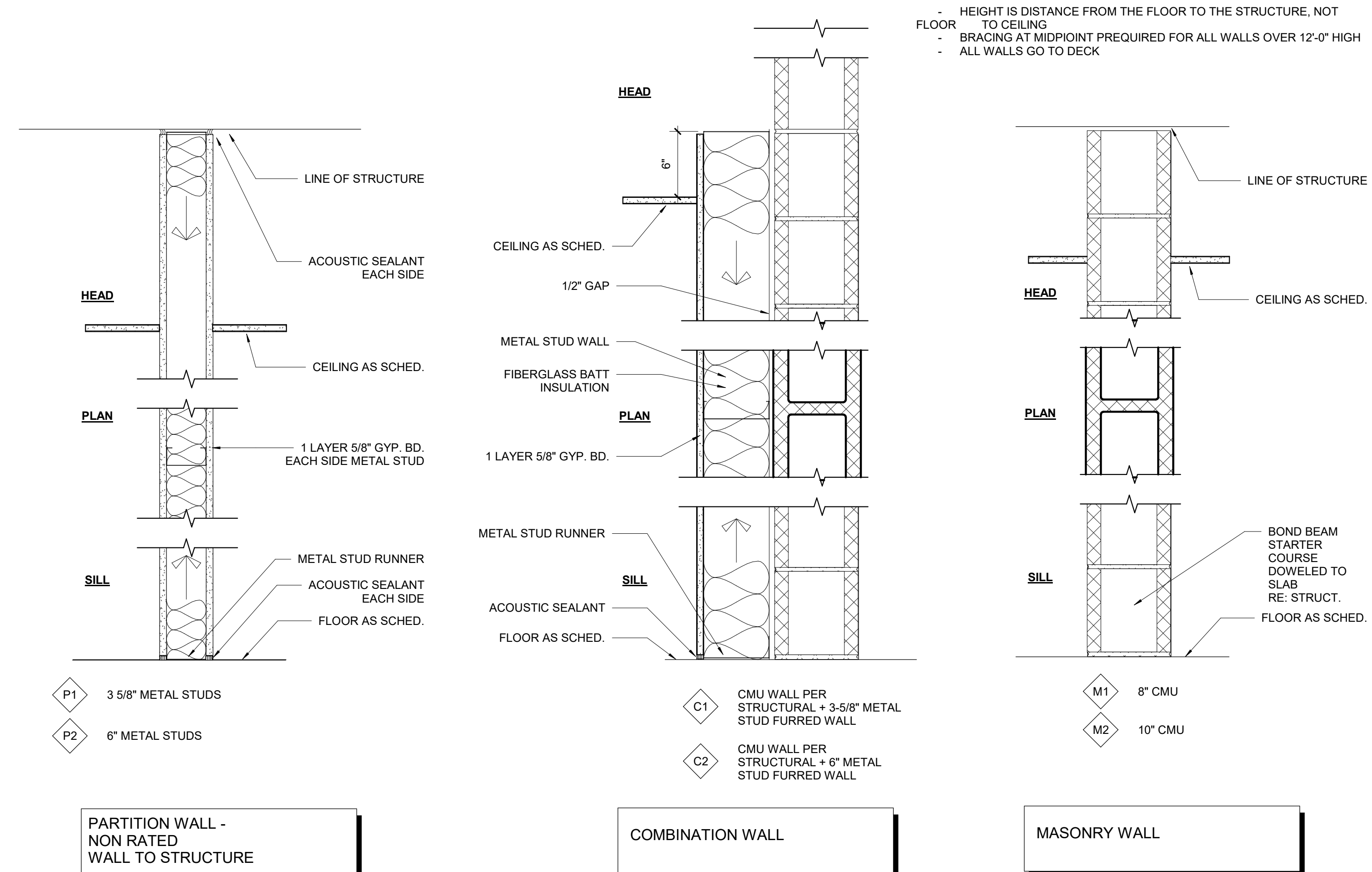
**TRANSFER ADA SHOWER PLAN & ELEVATIONS**

**WALL TYPES GENERAL NOTES -**

- REFER TO FLOOR PLAN "AE" SERIES FOR LOCATION OF WALL TYPES. ALL WALLS ARE TYPE "P2" UNLESS NOTED OTHERWISE.
- REFER TO SCHEDULES & DETAILS FOR FINISHES. WALL TYPES REVER TO BASE WALL ONLY.
- "LINE OF STRUCTURE" AS SHOWN AT THE HEAD CONDITIONS OF EACH WALL TYPE IS DIAGRAMMATIC ONLY AND DOES NOT INDICATE THE EXACT CONSTRUCTION CONDITION. RATED WALLS ARE TO TERMINATE AT STRUCTURAL MEMBERS WITH A FIRE RESISTANT RATING. WHERE REQ'D APPROPRIATE FRAMING AND GYP BOARD IS TO BE INSTALLED AND OFFSET AROUND STRUCTURAL MEMBERS OR OTHER OBSTRUCTIONS SUCH AS PIPING OR DUCTWORK. TO MAINTAIN THE FIRE RESISTANCE RATING. NON-RATED WALLS THAT CONTINUE TO STRUCTURE ARE TO TERMINATE AT PROPER LOCATIONS TO MAINTAIN THE INTENT OF THE CONTINUOUS PLANE OF ONE LAYER OF GYP BOARD AS A NOISE, SMOKE OR OTHER TYPE OF BARRIER.
- ALL GYP BOARD SHALL BE 5/8", UNLESS NOTED OTHERWISE.
- ALL RATED WALLS SHALL BE CONSTRUCTED FIRST. SECONDARY WALLS TO ABUTT, BUT NOT PENETRATION RATED WALLS.
- APPROPRIATE SUBMITTAL INFORMATION MUST BE PROVIDED TO SUBSTANTIATE THAT THE MATERIALS AND ASSEMBLY USED BY THE CONTRACTOR HAVE BEEN TESTED BY A RECOGNIZED TESTING AGENCY TO MEET THE FIRE RESISTANCE RATING SCHEDULED ON THESE WALL TYPES.
- FIRESTOPPING TO BE PROVIDED AT PENETRATIONS THROUGH RATED WALLS AS SPECIFIED.
- ALL GYPSUM WALL BOARD MUST BE MOISTURE RESISTANT AT THE FOLLOWING LOCATIONS:
  - TOILET ROOMS
  - WET WALLS
  - SHOWERS
  - JANITOR'S CLOSETS
- SOUND ATTENUATION BLANKETS SHALL EXTEND THE FULL HEIGHT IF THE WALLS.
- SPACING OF THE METAL STUDS HAS NOT BEEN INDICATED ON THE WALL TYPES OR DETAILS. STUD SPACING IS TO BE DETERMINED BY THE HEIGHT OF THE PARTITION AS SHOWN IN THE TABLE BELOW. EACH STUD GOING TO STRUCTURE AND EXCEEDING ALLOWABLE HEIGHTS SHALL BE BRACED 45 DEGREES DIAGONALLY 12" ABOVE CEILING WITH EQUAL SIZE 20 GA. METAL STUDS. THIS TABLE IS TO BE USED FOR THE INTERIOR WALL TYPES ONLY AND DOES NOT APPLY TO EXTERIOR STUDS. USE 20 GA STUDS AT ALL HEAD AND JAMB LOCATIONS.
- REFER TO INTERIOR DETAILS FOR ADDITIONAL INFORMATION.
- UL DESIGN NUMBERS REFER TO FIRE RESISTANCE IN MOST CURRENT EDITION OF THE UL DIRECTORY.
- SUPPORT INSULATION WITH CHICKEN WIRE IN PARTITIONS WITHOUT GYP BOARD ON BOTH SIDES TO STRUCTURE.
- MAINTAIN 1/2" SPACE BETWEEN FLOOR SLAB AND BOTTOM OF GYP BOARD ON ALL WALLS.
- STOP STUD 1" BELOW METAL RUNNER (TOP TRACK) TO ALLOW FOR VERTICAL EXPANSION DO NOT ATTACH STUDS OR GYP BOARD TO TOP TRACK.

FACING ON SIDES OF STUDS	STUD SPACING ON CENTER	STUD DEPTH 2 1/2" MAX. HT.	STUD DEPTH 3 5/8" MAX. HT.	STUD DEPTH 6" MAX. HT.
1 LAYER 5/8" GYP BD - 1 SIDE ONLY	16 24	11'-0" 9'-9"	14'-6" 12'-9"	14'-6" 12'-9"
1 LAYER 5/8" GYP BD - EACH SIDE	16 24	12'-0" 10'-9"	16'-0" 13'-6"	16'-0" 13'-6"
2 LAYER 5/8" GYP BD - EACH SIDE	16 24		16'-9" 13'-6"	20'-0" 15'-0"

- HEIGHT IS DISTANCE FROM THE FLOOR TO THE STRUCTURE, NOT FLOOR TO CEILING
- BRACING AT MIDPOINT PREQUIRED FOR ALL WALLS OVER 12'-0" HIGH
- ALL WALLS GO TO DECK



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LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO  
**CITY OF Grand Junction**  
COLORADO

**project#:** 19.0270  
**date:** February 10, 2020

**revisions:**

**title:**  
**Wall Types**

**sheet:**

**0004**

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Grand Junction, CO  
**CITY OF Grand Junction**  
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**project#:** 19.0270  
**date:** February 20, 2020

**revisions:**

**title:**  
**Code Plan -  
Code  
Analysis**

**sheet:**  
**G101**

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**CODE REFERENCES**

ALL CONSTRUCTION SHALL COMPLY WITH THE FOLLOWING CODES:

- 2018 INTERNATIONAL BUILDING CODE (IBC)
- 2018 INTERNATIONAL PLUMBING CODE (IPC)
- 2018 INTERNATIONAL MECHANICAL CODE (IMC)
- 2018 INTERNATIONAL FIRE CODE (IFC)
- 2017 NATIONAL ELECTRICAL CODE (NEC)
- 2009 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
- NATIONAL FIRE PROTECTION ASSOCIATION CODES (IN TOTAL)
- ASHRAE 90-1-89 AND SUBSEQUENT ADDENDA
- IAQ GUIDELINES FOR OCCUPIED BUILDINGS UNDER CONSTRUCTION (SMACNA)
- 2009 ANSI A117.1

**Chapter 3 Use and Occupancy Classification:**  
Group A1 - Assembly

**Chapter 5 General Building Heights & Areas:**

Allowable Height	60 feet	Table 504.3
Allowable Stories	2	Table 504.4
Tabular Area per Story (At)	22,000 SF	Table 506.5

Allowable Area (Aa) per story = 22,000 sf

Actual Addition Stories/Height 1 story/14 Feet

**Actual Addition Area**

Level 1	830 sf
<b>Total</b>	<b>830 sf</b>

**Chapter 6 Types of Construction**

602.2 Type V-B

**Table 601 Fire-Resistance Rating Req's for Bldg Elements (hrs):**

Construction Type V-B				
Structural Frame				0
Exterior Bearing Walls				0
Interior Bearing Walls				0
Nonbearing Walls and Interior Partitions				0
Floor Construction (Supporting beams and joists)				0
Roof (Beams and joists)				0

**Table 602 Fire-Resistance Rating Req's for Exterior Walls Based on Fire Separation Distance**

Fire Separation Distance = x (feet)	X<5	5<X<10	10<X<30	X>30
Type of Construction	All	Others	VB	All
Occupancy A	1	1	0	0

**Chapter 7 Fire & Smoke Protection Features**

**Maximum Area of Exterior Wall Openings (Table 705.8)**

Fire Separation Distance:	30 or greater
Protection	UP, S
Allowable Area	No Limit

**Fire Partitions (709.3)**

Fire partitions shall have a fire-resistance rating of not less than 1 hour.

**IBC Table 803.13 Interior Wall And Ceiling Finish Requirements By Occupancy:**

Occupancy Group A1 (Sprinkled):  
Vertical exits and exit passageways - Class B  
Exit access corridors and other exitways - Class B.  
Rooms and enclosed spaces - Class C

**Fire Protection System: NFPA 13**

Fully sprinklered with approved system as required by Sec. 903.2.1.1  
Portable fire extinguishers are required by Sec 906.1

**Occupancy Load and Exit Requirements**

Occupant Load Calculations (Table 1004.5)

Total Building Occupancy = 298 occupants

**Egress Width (Sec 1005.3/1005.3.2)**

**Stairs -**  
**Stage Level -**  
298 occ x 0.3" per occ = 89.4" min. required  
All other egress components -  
298 occ x 0.2" per occ = 59.6"

Actual stairway width provided -  
From Stage Level = 168"  
All others allowed per code, 36" min

**IBC Table 1006.3.2 Minimum Number Of Exits For Occupant Load:**

Occupant Load: <500  
Minimum Number of Required Exits: 2  
Number of Exits provided: 2 from Stage  
2 from Building

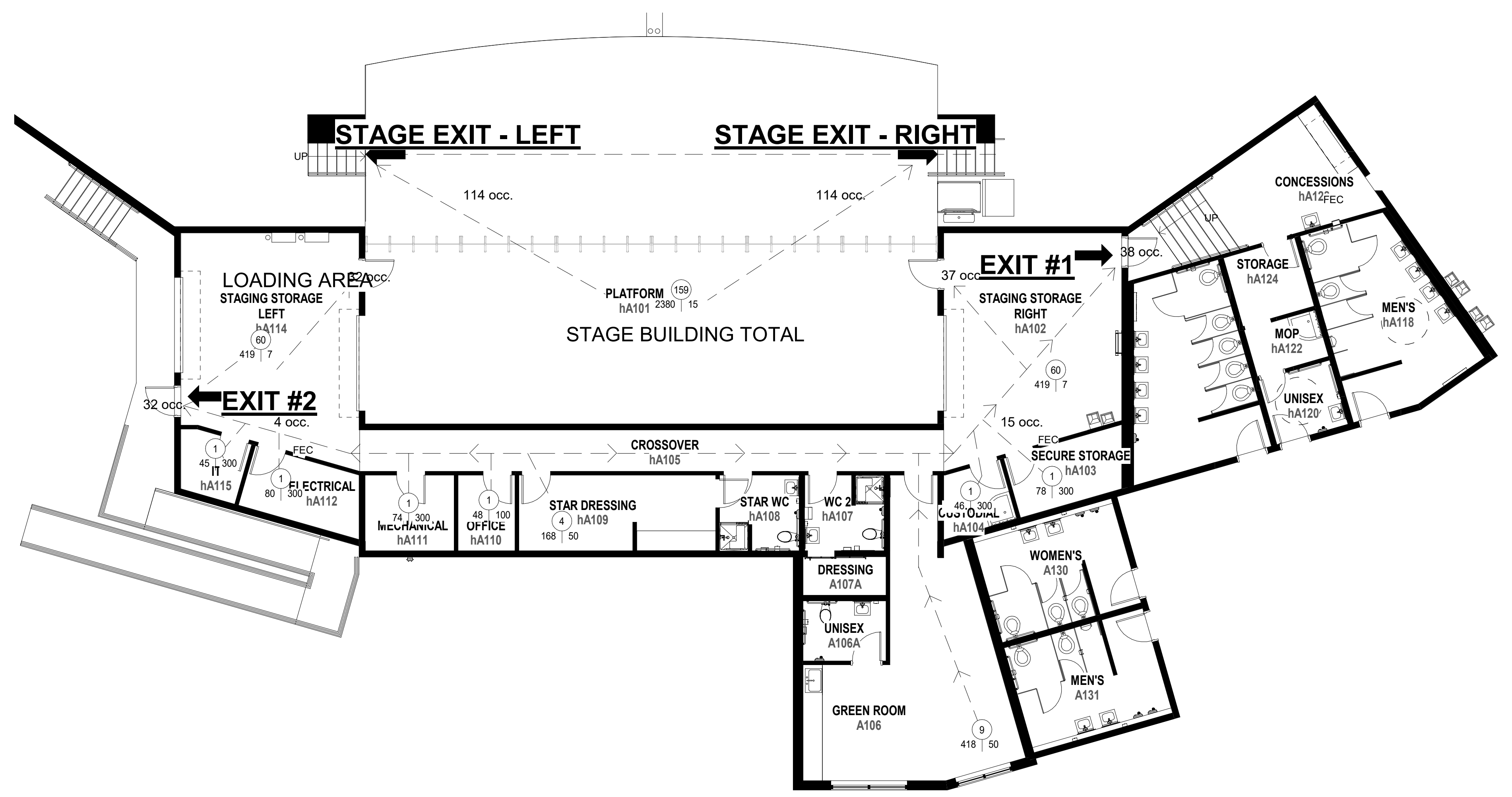
**Minimum number of Plumbing Fixtures (Table 2902.1)**

Assembly - Theaters/Performing Arts  
Occupant Load = 298

Fixtures Required:  
Water Closets: (M) 1 per 125, 2 Req'd (F) 1 per 65, 3 Req'd  
Lavatories: (M & F) 1 per 200, 2 Req'd  
Drinking Fountains: 1 per 500, 1 Req'd

Fixtures Provided:  
Water Closets: (M) 9, (F) 10  
Lavatories: (M & F) 15 Total  
Drinking Fountains: 6 Total

**LEGEND**  
FEC = FIRE EXTINGUISHER CABINET LOCATION



**HEALTH DEPARTMENT NOTE:**  
THIS PROJECT SHALL ADHERE TO THE CURRENT VERSION OF THE "URANIUM MILL TAILINGS MANAGEMENT PLAN" (UMTMP)  
[https://www.colorado.gov/pacific/sites/default/files/HM\\_umilltail-mgt-plan.pdf](https://www.colorado.gov/pacific/sites/default/files/HM_umilltail-mgt-plan.pdf)  
PER THE DOCUMENT MENTIONED ABOVE, IF ANY SITE MATERIAL IS TO BE REMOVED FROM THE SITE, IT MUST BE FIRST CHECKED FOR RADIOACTIVITY. IF IT IS UNDER THE LIMITS FOUND IN THE UMTMP THEN IT MAY BE REMOVED, BUT NOT BEFORE A LOG OF THIS SHOULD BE KEPT. IF IT IS NOT UNDER THE LIMITS, THEN IT MAY LEAVE THE SITE TO A LICENSED DISPOSAL FACILITY OR TO THE INTERIM STORAGE FACILITY AT THE CITY YARD, AS DESCRIBED IN THE UMTMP.

**A2** Main Level Code Analysis  
1/8" = 1'-0"

## GENERAL NOTES - DEMOLITION

CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS, MATERIALS, FINISHES AND DIMENSIONS BEFORE AND AFTER DEMOLITION, AND TO CONTACT THE ARCHITECT IF ANY UNFORESEEN CONDITIONS OCCUR.

CONTRACTOR SHALL PROTECT EXISTING STRUCTURE, ASSEMBLIES AND EQUIPMENT AS REQUIRED FROM DEMOLITION WORK. REPAIR, PATCH AND/OR REPLACE EXISTING CONSTRUCTED ITEMS AND EQUIPMENT THAT ARE TO REMAIN AS REQUIRED FOR NEW CONSTRUCTION.

THE CONTRACTOR SHALL PATCH AND REPAIR TO MATCH EXISTING FINISHES AT WALLS, FLOORS, CEILINGS, SOFFITS, ETC. AS REQUIRED IN THOSE AREAS NOT SPECIFICALLY CALLED OUT IN THE DRAWINGS, BUT THAT ARE EFFECTED BY CONSTRUCTION.

CONTRACTOR TO PATCH/REPAIR ALL AREAS RESULTING FROM DEMOLITION AND PREPARE SUCH SURFACES TO RECEIVE SCHEDULED FINISHES.

REFER TO MECHANICAL, PLUMBING & ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION COORDINATION.

CONTRACTOR SHALL PROVIDE A 6 MIL. POLYETHYLENE DUST BARRIER FROM FLOOR TO DECK ABOVE TO ENSURE THAT ALL CORRIDORS OUTSIDE OF CONSTRUCTION AREA ARE KEPT CLEAN AND CLEAR OF DEBRIS & OBSTRUCTIONS AT ALL TIMES.

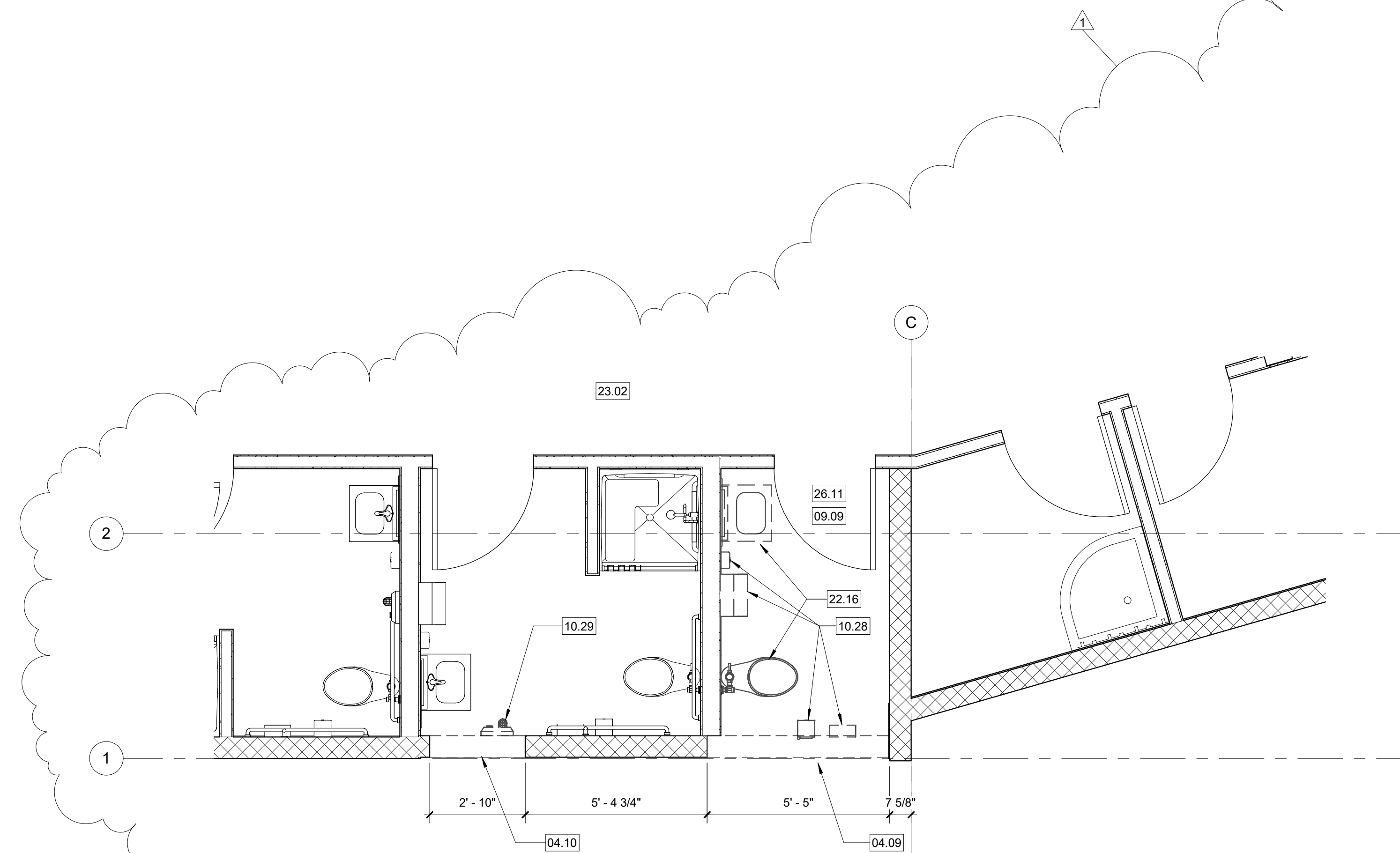
UPON COMPLETION OF CONSTRUCTION IT IS THE GENERAL CONTRACTOR'S RESPONSIBILITY TO THOROUGHLY CLEAN ALL AREAS IN WHICH CONSTRUCTION TOOK PLACE AND AREAS AFFECTED BY CONSTRUCTION. THE GENERAL CONTRACTOR SHALL CLEAN ALL FLOORING, REMOVE ALL DUST, CLEAN DOORS AND FRAMES, LIGHT FIXTURES, CEILING SYSTEMS, MECHANICAL GRILLES, ELECTRICAL PANELS, WINDOW SYSTEMS, GLAZING, ETC.

CONTRACTOR TO KEEP AN ACTIVE PEDESTRIAN PATHWAY & EGRESS ROUTES FREE OF OBSTRUCTION AT ALL TIMES THROUGHOUT THE PROJECT.

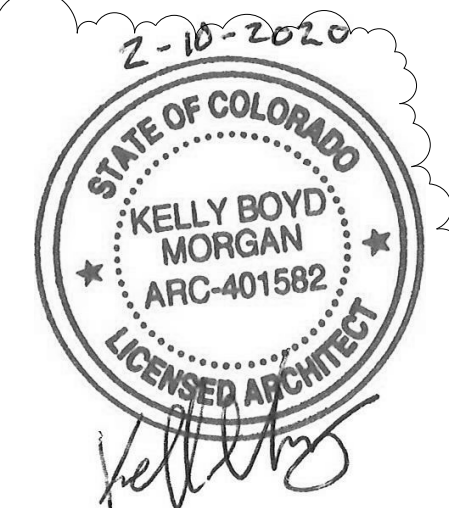
CONTRACTOR TO PREVENT WATER BUILD UP AND/OR DAMAGE TO FOUNDATIONS ON THE CONSTRUCTION SITE OR ADJACENT AREAS.

### Keynote Legend

04.09	REMOVE CMU BLOCK ACCORDING TO DIMENSION SHOWN. REMOVE TO A HEIGHT OF 10'-0" ABOVE STAGE LEVEL.
04.10	REMOVE CMU BLOCK ACCORDING TO DIMENSION SHOWN. REMOVE TO A HEIGHT OF 7'-4" ABOVE STAGE LEVEL.
09.09	REMOVE EXISTING GRID CEILING IN THIS ROOM
10.28	REMOVE RESTROOM ACCESSORIES AND PATCH/REPAIR WALL AS REQUIRED
10.29	REMOVE HAND DRYER AND RELOCATE NEAR SHOWER. SEE NEW FLOOR PLAN
22.16	REMOVE PLUMBING FIXTURES, CAP PLUMBING LINES AND REPAIR DRYWALL
23.02	CONTRACTOR TO VERIFY LOCATIONS AND SIZES OF EXISTING PIPING, DUCTWORK, AND PLUMBING SYSTEMS FOR TIE INS. MINOR MODIFICATIONS ARE ANTICIPATED, CONTRACTOR TO MAKE THESE ADJUSTMENTS ACCORDINGLY
26.11	EXISTING ELECTRICAL DEVICES AND EQUIPMENT IN THIS AREA ARE TO BE REMOVED INCLUDING LIGHT FIXTURE, SWITCH, SENSOR, DUPLEX RECEPTACLE AND EXHAUST FAN CONNECTION. REMOVE DEVICES AND CAP EXISTING BOXES THAT REMAIN. MAINTAIN EXISTING CIRCUITING TO DEVICES AND CIRCUITS THAT REMAIN.



**A3** Enlarged Demolition Floor Plan  
3/8" = 1'-0"



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**project:**

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO



**project#:** 19.0270

**date:** February 10, 2020

**revisions:**

▲ Bid Addendum 01 4-7-20

**title:**

**Demolition  
Plan**

**sheet:**

**AD101**

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 AMPHITHEATRE -  
 ADDITION

Grand Junction, CO  
**CITY OF Grand Junction**  
 COLORADO

**project#:** 19.0270  
**date:** February 20, 2020

**revisions:**

**title:**  
**Floor Plan  
 and Ceiling  
 Plans**

**sheet:**  
**AE101**

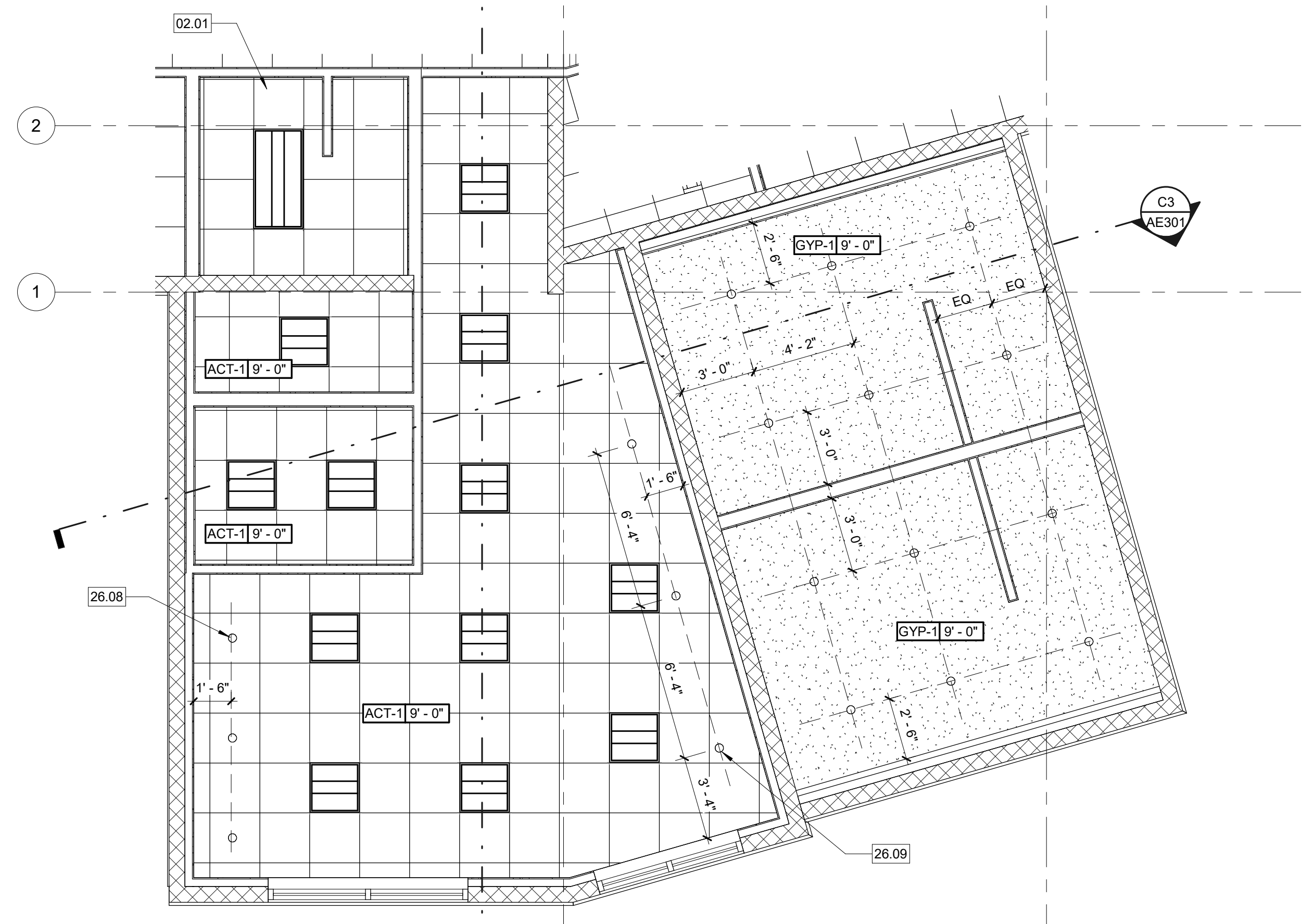
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CEILING LEGEND	
TYPE A	2' X 2' LAY-IN ACOUSTICAL TILE IN SUSPENDED GRID
	2'X2' LIGHT FIXTURE, SEE ELECTRICAL
	2'X4' LIGHT FIXTURE, SEE ELECTRICAL
	CAN LIGHT FIXTURE, SEE ELECTRICAL
	4' LINEAR FLOURESCENT LIGHT FIXTURE, SEE ELECTRICAL

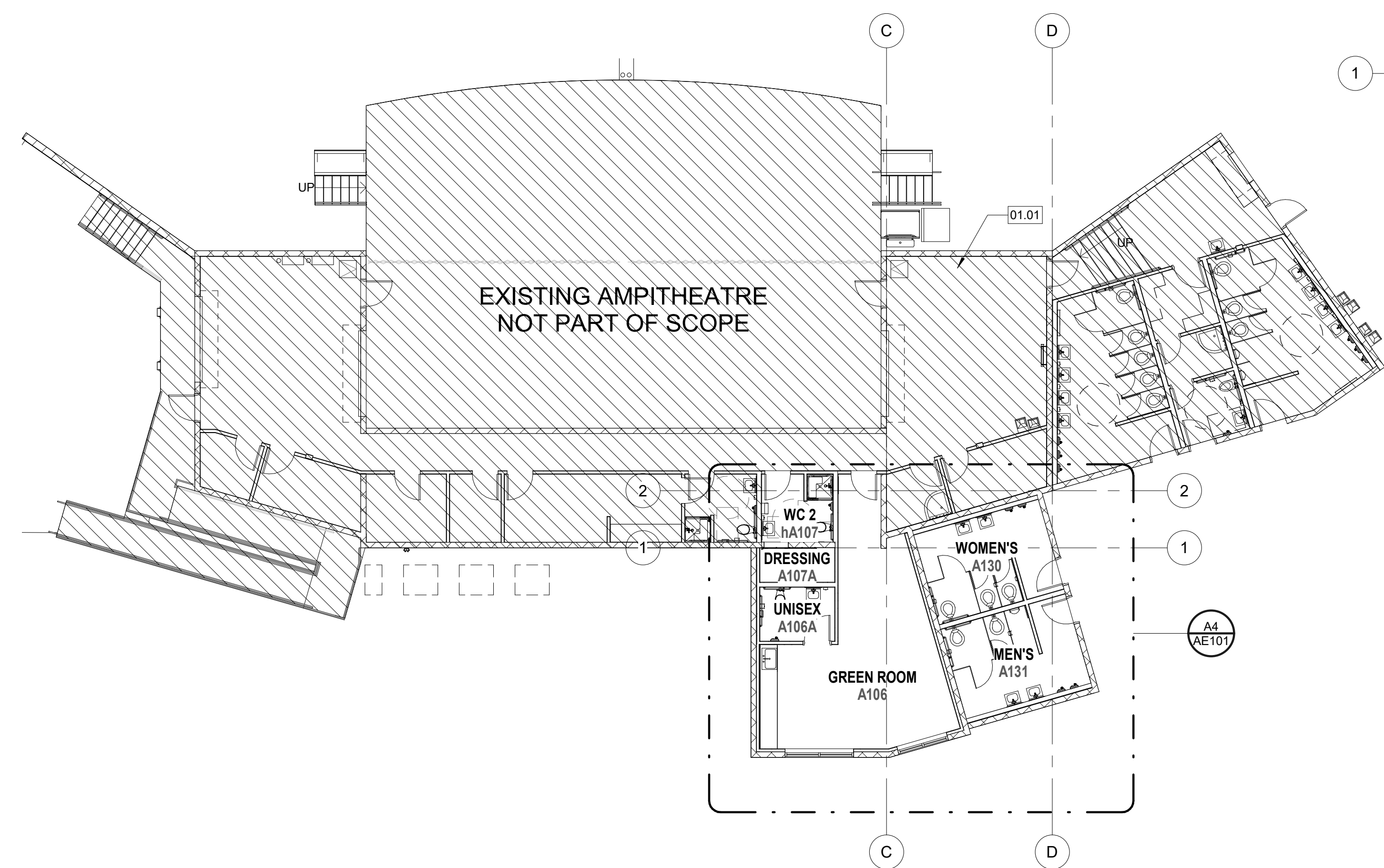
GENERAL NOTES - FLOOR PLAN	
1	SEE SHEET AE210 FOR TYPICAL MOUNTING HEIGHTS
2	ALL DIMENSIONS ARE TO FACE OF CMU OR STUD, TYP.
3	REFER TO SHEET AE601 FOR DOOR SCHEDULE
4	REFER TO SHEET G004 FOR WALL TYPES

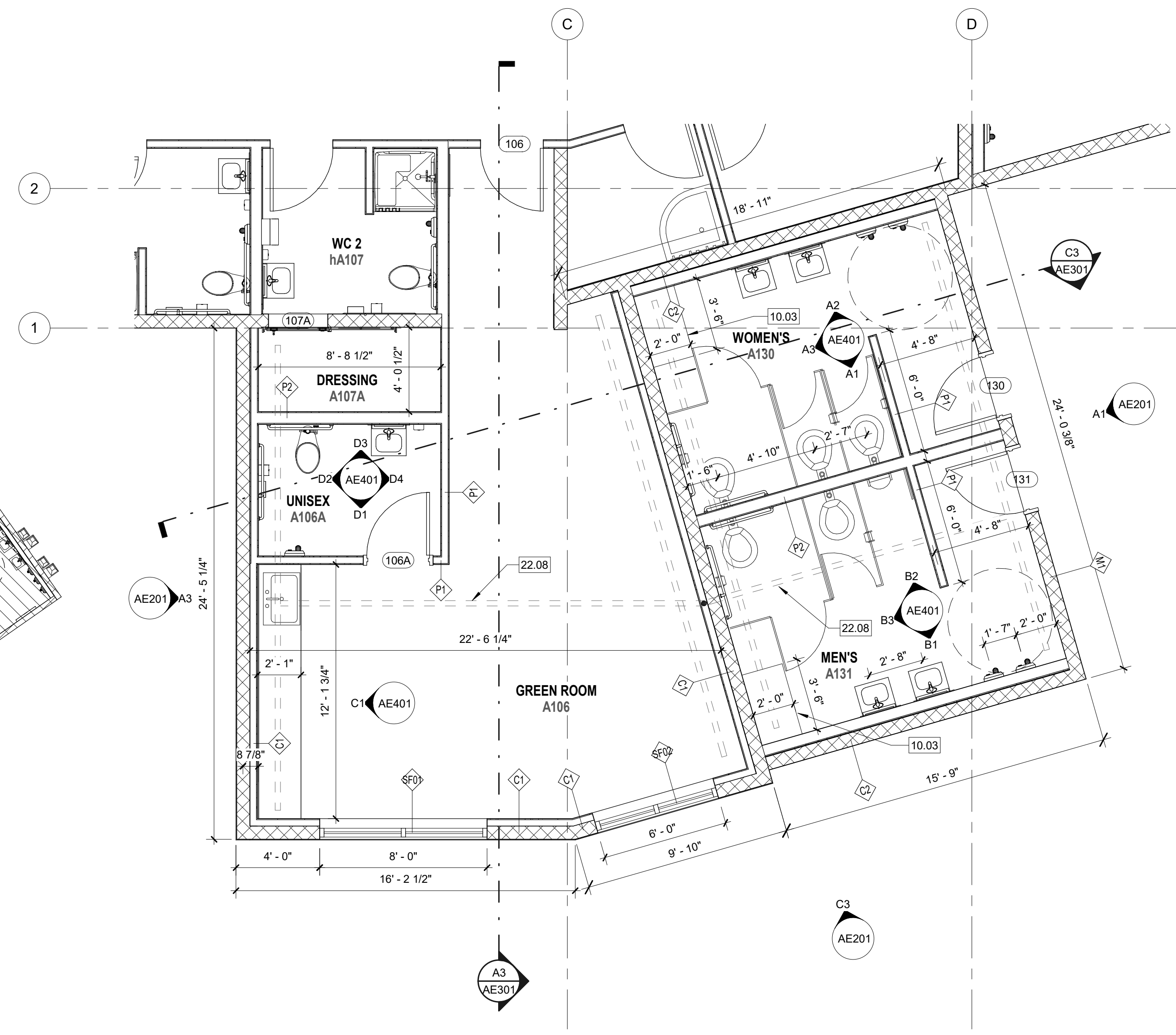
Keynote Legend	
01.01	THIS AREA NOT INCLUDED IN THE REMODEL SCOPE
02.01	EXISTING CEILING AND LIGHT FIXTURE TO REMAIN
10.03	FIXED CHANGING TABLE, RE: DETAIL C2/AE501
22.08	3" MINIMUM DIA. HORIZONTAL PVC PIPE IN "H" SHAPE @ 1'-0" INSIDE THE EXTERIOR FOUNDATION WALLS IN GRAVEL UNDER THE SLAB. THIS PIPE SHALL BE PERFORATED. AVOID PLUMBING LINES UNDER SLAB.
26.08	LOCATE IN CENTER OF (THREE) 2X2 GRID PANELS AS SHOWN, RE: ELECTRICAL
26.09	LOCATE THESE CAN FIXTURES USING THESE DIMENSIONS AS A GUIDE. FIXTURES SHOULD BE LOCATED AT LEAST 3" AWAY FROM EDGE OF GRID, MIN. AND EQUAL DISTANCE APART



**C1** Reflected Ceiling Plan  
 1/4" = 1'-0"



**A1** Stage Level Floor Plan  
 3/32" = 1'-0"



**A4** Enlarged Restroom/Greenroom Floor Plan  
 1/4" = 1'-0"



Keynote Legend	
03.15	EXPOSED FOUNDATION WALL WITH ARCHITECTURAL CONCRETE FINISH
04.08	8X8X16 INTEGRAL COLORED, HONED CMU BLOCK LAID IN STANDARD RUNNING BOND PATTERN MATCHING MAIN BUILDING. COLOR TO BE "BUFF" BY BRICKYARD GJ, OR EQUAL.
07.17	PARAPET COPING, RE: DETAIL AE501
08.02	PAINTED HOLLOW METAL DOOR AND FRAME, RE: DOOR SCHEDULE
08.12	ALUMINUM STOREFRONT WINDOWS, RE: AE601. GLASS SHALL BE TINTED SO THAT ONE CAN SEE OUT OF THE BUILDING BUT NOT INTO THE BUILDING



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**CITY OF Grand Junction**  
 COLORADO

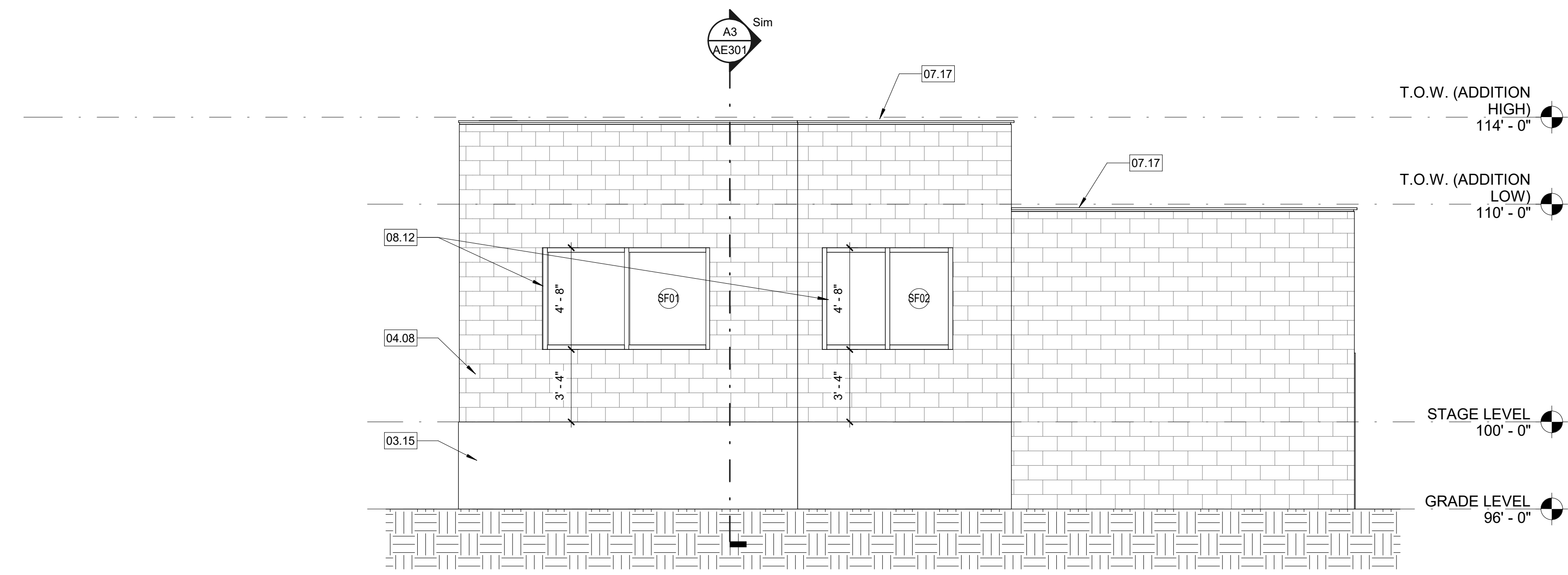
**project#:** 19.0270  
**date:** February 10, 2020

**revisions:**

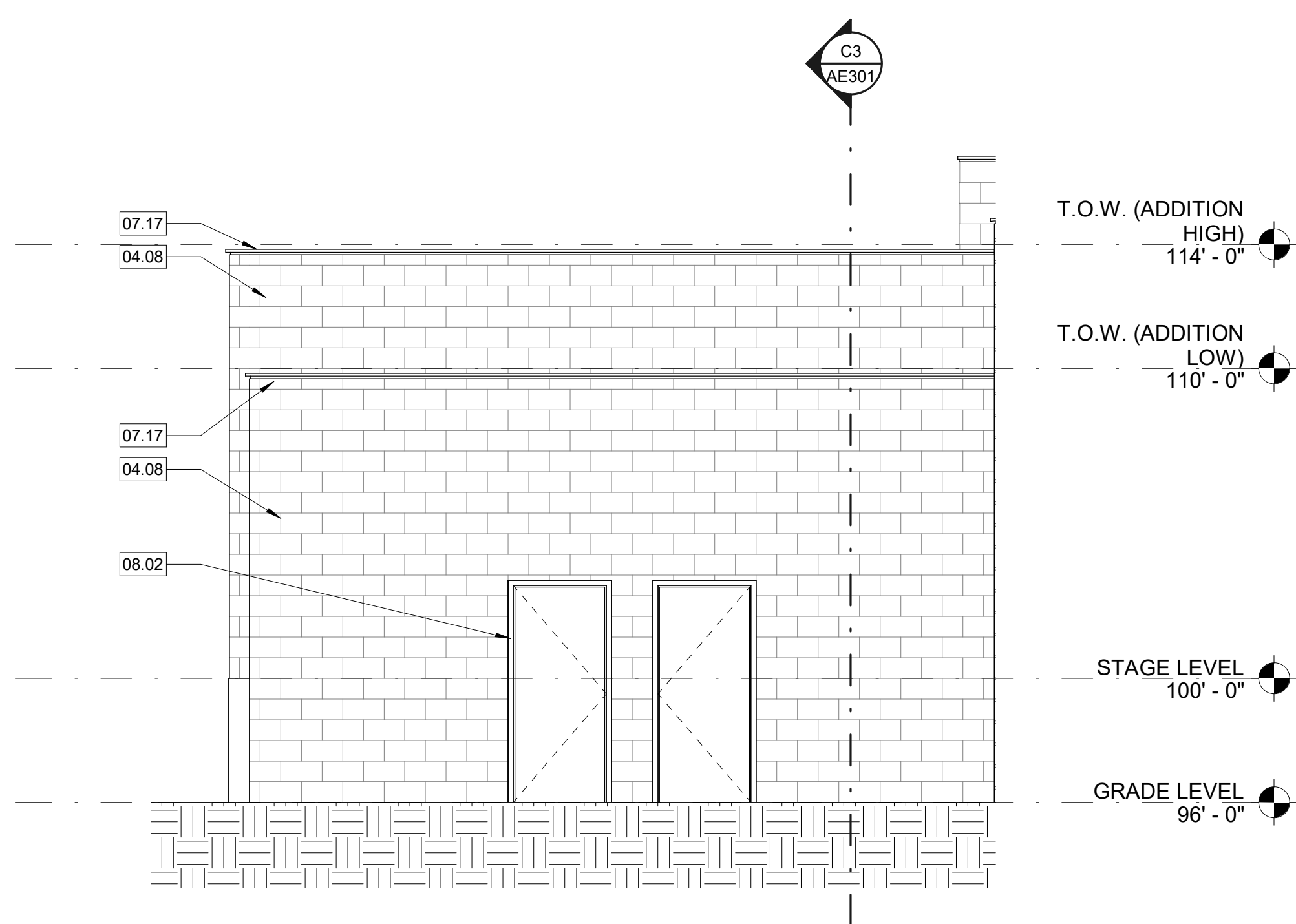
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**Exterior Elevations**

**sheet:**  
**AE201**

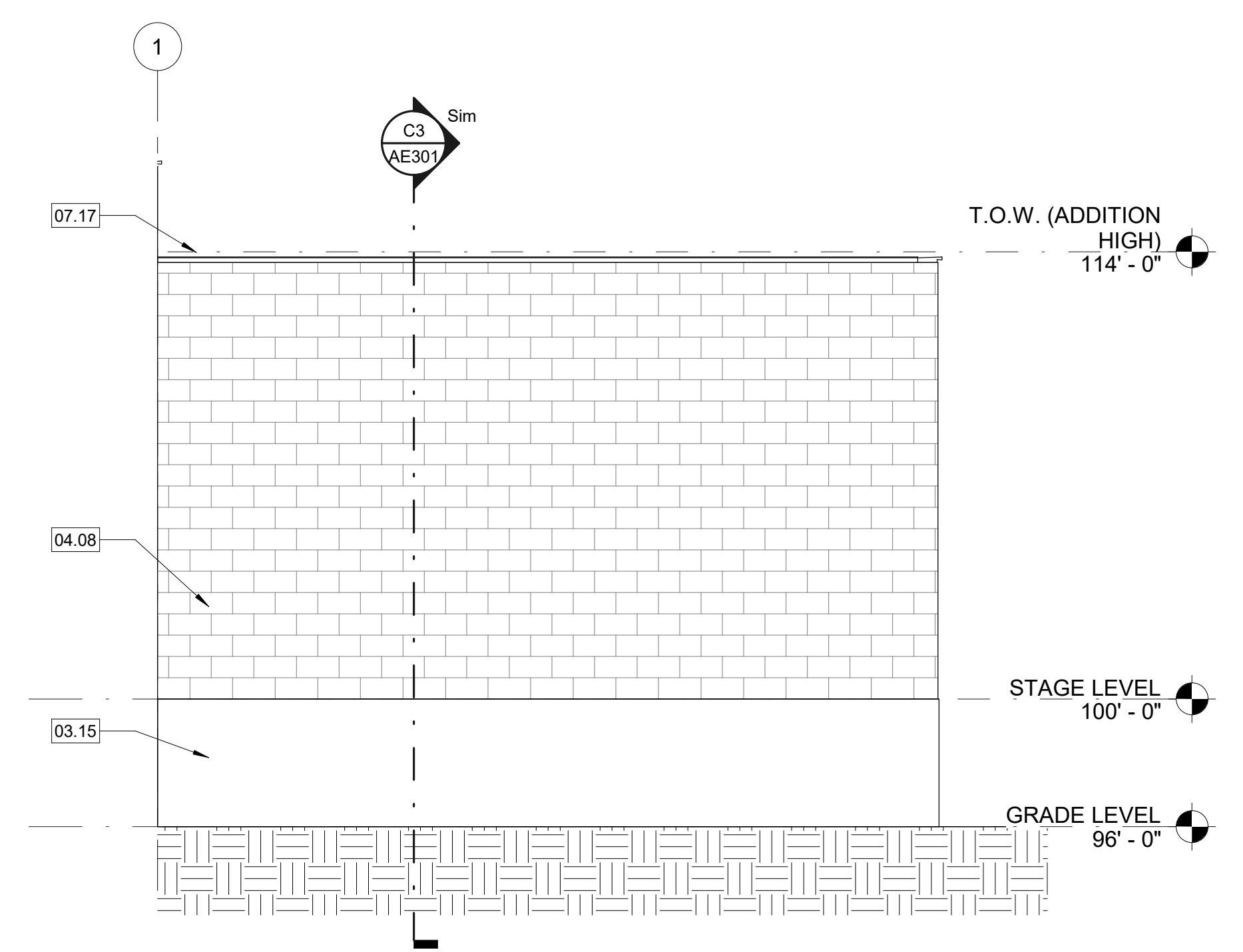
PERMIT SET



**C3** Exterior Elevation - South  
 1/4" = 1'-0"

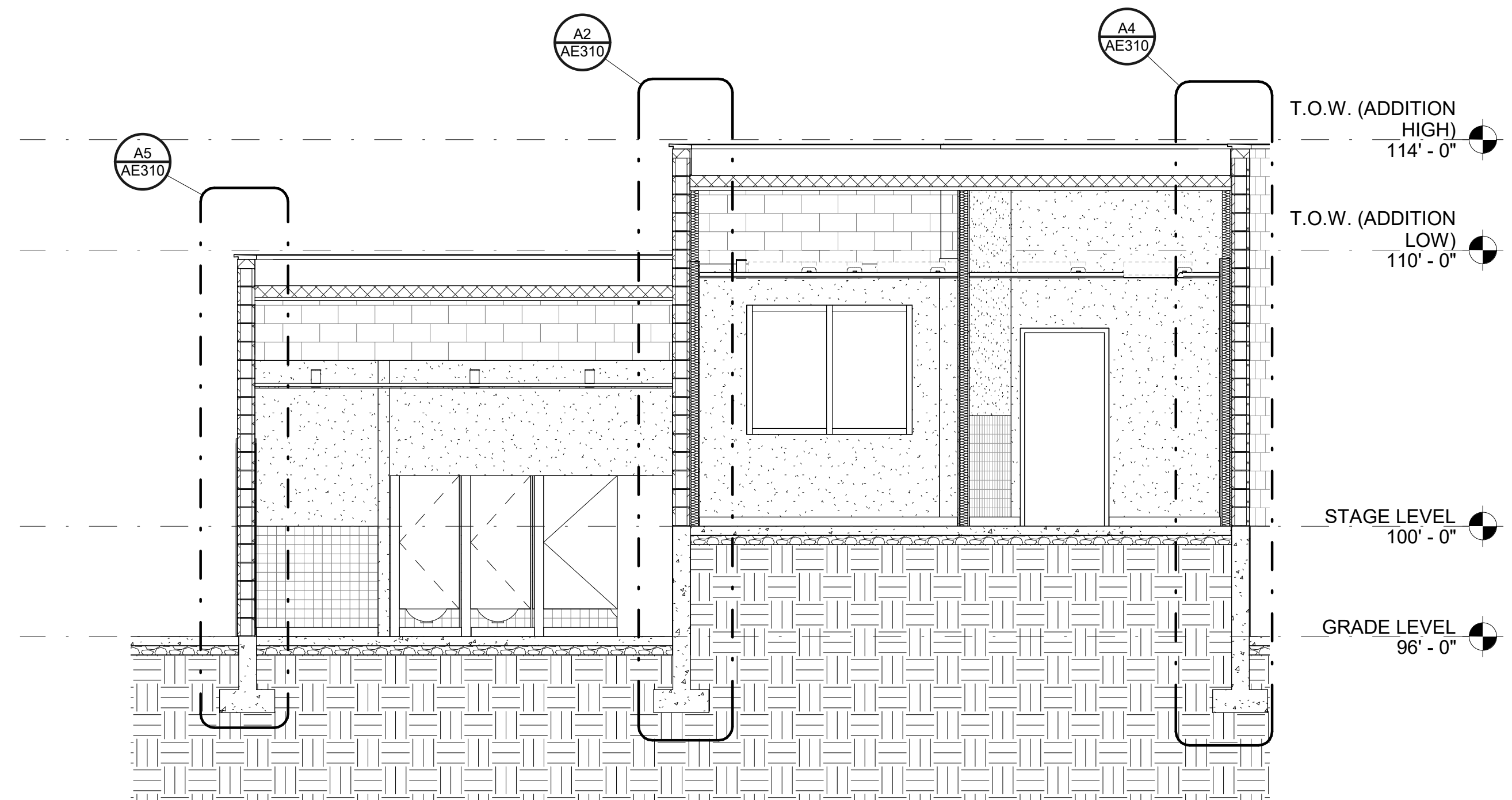


**A1** Exterior Elevation - East  
 1/4" = 1'-0"

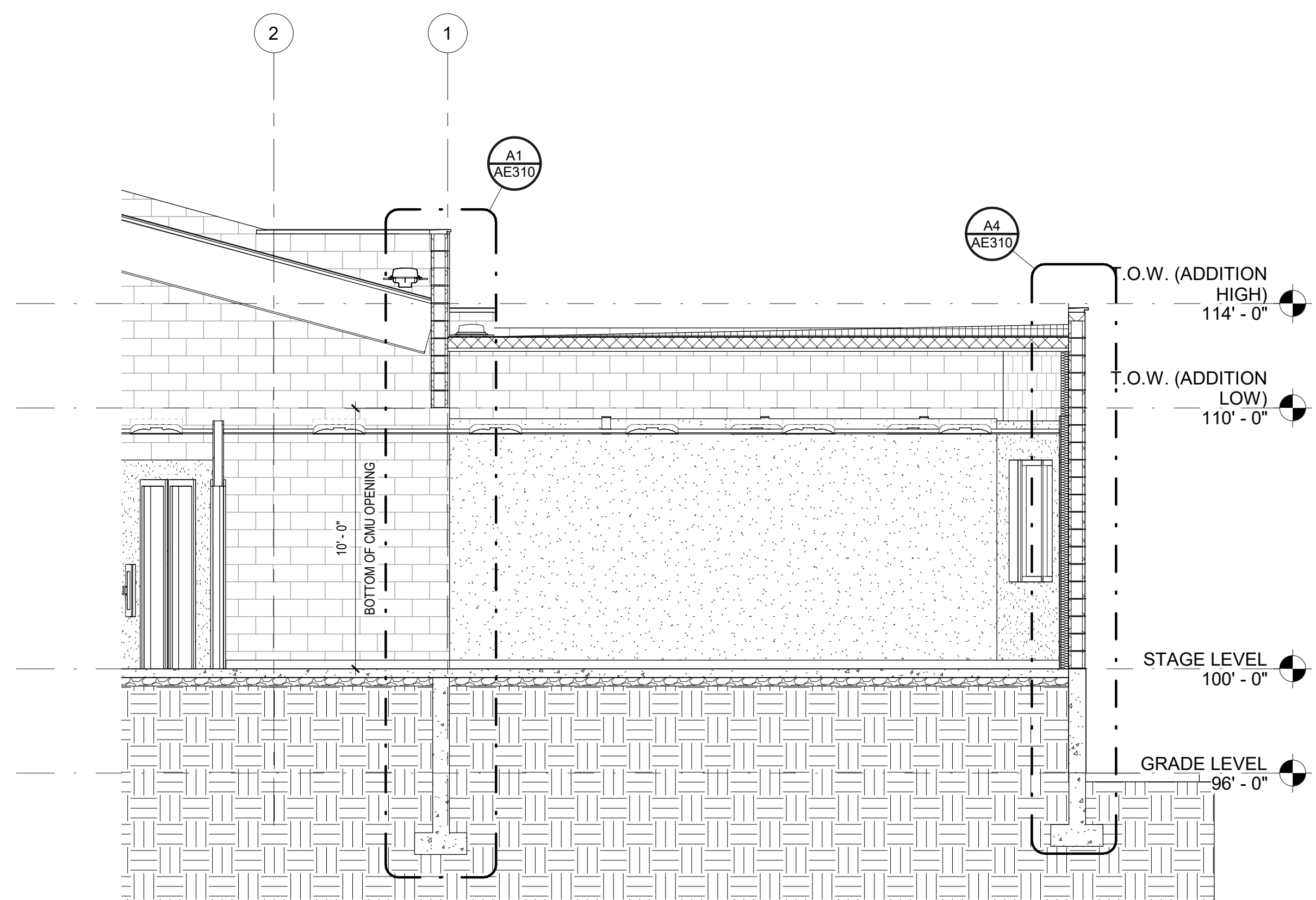


**A3** Exterior Elevation - West  
 1/4" = 1'-0"

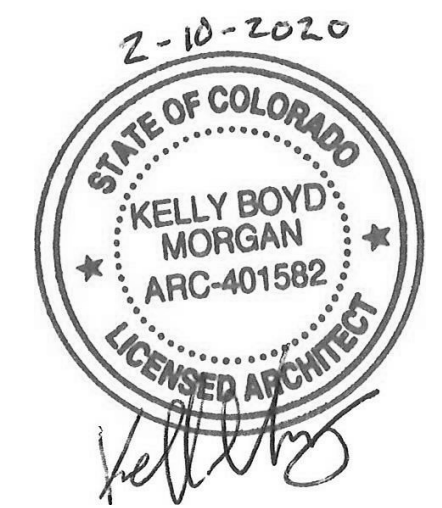
Keynote Legend



**C3** Building Section  
1/4" = 1'-0"



**A3** Building Section  
1/4" = 1'-0"



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**project:**

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO



**project#:** 19.0270  
**date:** February 10, 2020

**revisions:**

**title:**

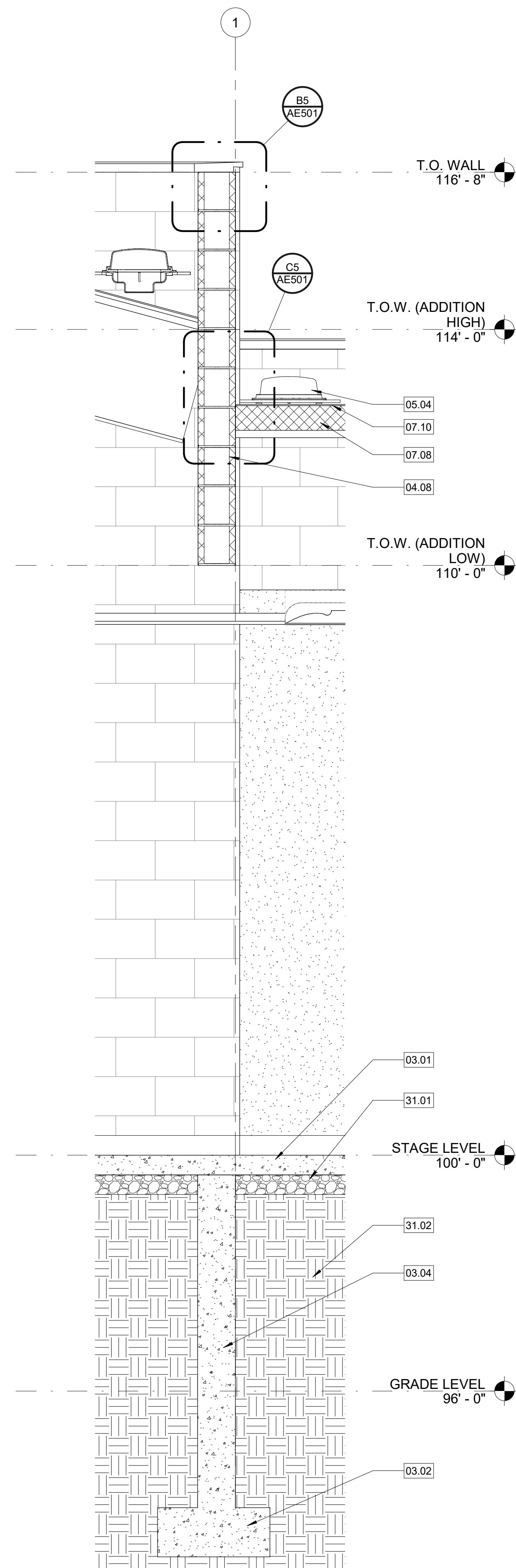
**Building  
Sections**

**sheet:**

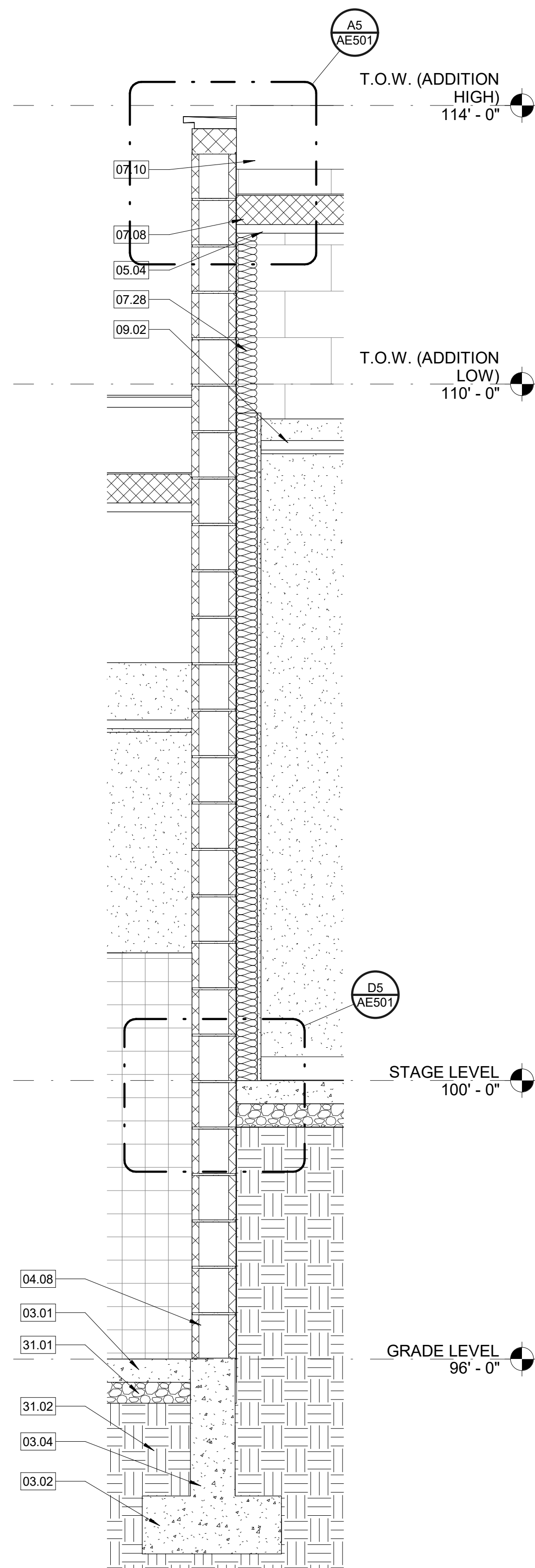
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PERMIT SET

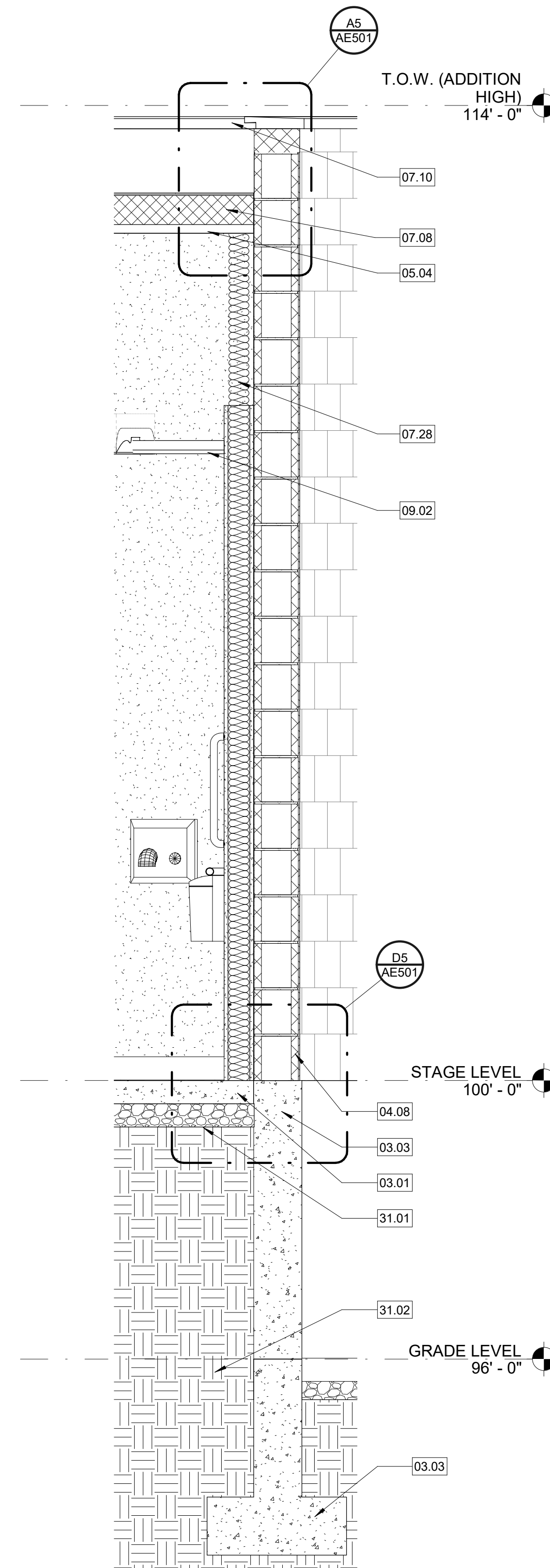




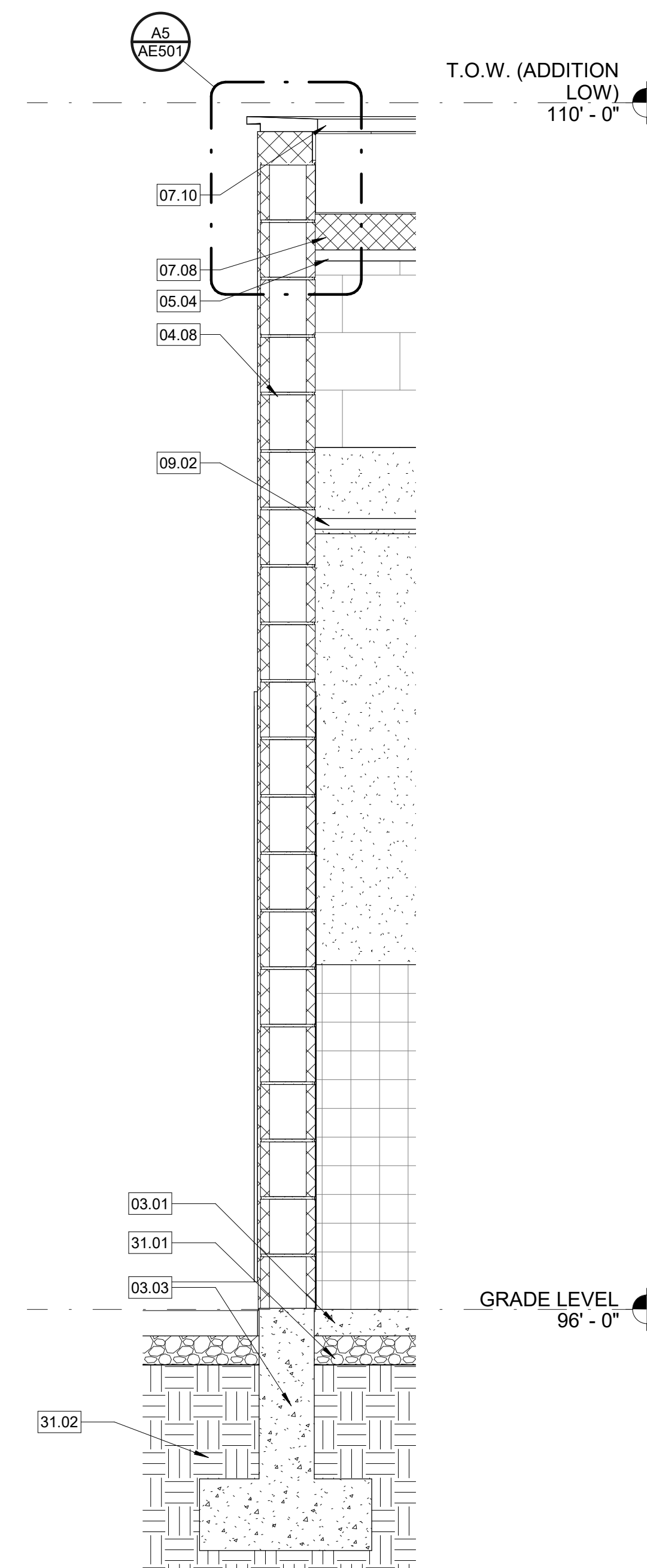
**A1** Wall Section 1A  
3/4" = 1'-0"



**A2** Wall Section 2A  
3/4" = 1'-0"



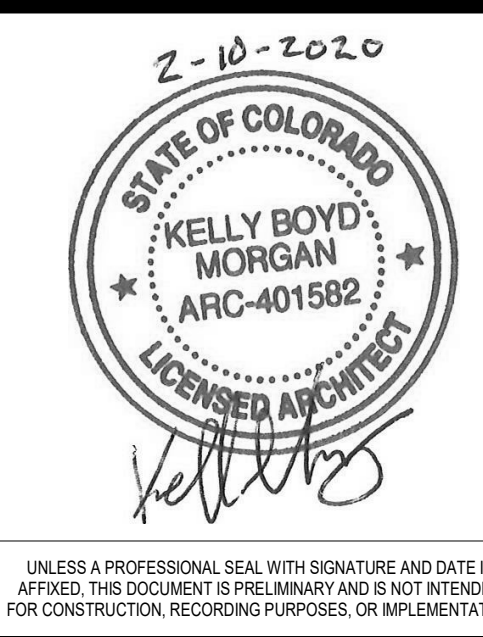
**A4** Wall Section 3A  
3/4" = 1'-0"



**A5** Wall Section 4A  
3/4" = 1'-0"

**Keynote Legend**

03.01	CONCRETE SLAB OVER CONT. VAPOR BARRIER OVER MIN 4" FREE DRAINAGE GRAVEL; RE: STRUCT
03.02	CONCRETE FTG, RE: STRUCT'L
03.03	CONCRETE FDN, RE: STRUCT'L
03.04	CONCRETE WALL, RE: STRUCT'L
04.08	8X8X16 INTEGRAL COLORED, HONED CMU BLOCK LAID IN STANDARD RUNNING BOND PATTERN MATCHING MAIN BUILDING. COLOR TO BE "BUFF" BY BRICKYARD GJ, OR EQUAL.
05.04	METAL DECK, RE: STRUCTURAL
07.08	RIGID INSULATION
07.10	SINGLE-PLY ROOFING MEMBRANE
07.28	5 1/2" BATT INSULATION
09.02	SCHEDULED CEILING
31.01	4" FREE DRAIN GRAVEL FILL
31.02	EARTH



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**project:**  
LAS COLONIAS  
AMPHITHEATER -  
ADDITION  
  
Grand Junction, CO  
**CITY OF Grand Junction**  
COLORADO

**project#:** 19.0270  
**date:** February 20, 2020

**revisions:**

**title:**  
**Wall**  
**Sections**

**sheet:**  
**AE310**

PERMIT SET

**GENERAL NOTES - INTERIOR ELEVATIONS**

1. SEE SHEET G003 FOR STANDARD AND ADA MOUNTING HEIGHTS FOR ALL ACCESSORIES

**Keynote Legend**

06.05	PLASTIC LAMINATE COUNTER TOP AND BACKSPLASH, USE PL-1
06.08	PLASTIC LAMINATE MILLWORK, USE PL-2
09.01	5/8" GYP. BD, PAINTED, RE: FINISH SCHEDULE
09.03	BASE AS SCHEDULED, RE FINISH SCHEDULE
09.04	CERAMIC TILE; RE: FINISH SCHEDULE
09.07	4" x 4" WALL TILE, SEE SPECIFICATIONS
09.08	MIRROR, SEE DETAIL ON SHEET AE501 FOR MIRROR MOUNTED PARTIALLY ON TILE AND PARTIALLY ON GYP BD WALL
10.03	FIXED CHANGING TABLE, RE: DETAIL C2/AE501
10.05	TOILET PAPER DISPENSER, RE: ACCESSORY SPEC
10.07	SANITARY NAPKIN DISPOSAL, RE: ACCESSORY SPEC
10.08	SOAP DISPENSER, RE: ACCESSORY SPEC
10.11	GRAB BAR, RE: TYPICAL MOUNTING HEIGHTS SHEET G003
22.02	TOILET FIXTURE, RE: PLUMBING PLANS
22.03	SINK, RE: PLUMBING PLANS
22.04	ADA HEIGHT TOILET FIXTURE, RE PLUMBING PLANS
22.14	URINALS, TYP. PER PLANS AND SPECIFICATIONS
26.10	OWNER PROVIDED HAND DRYER



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**project:**

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO



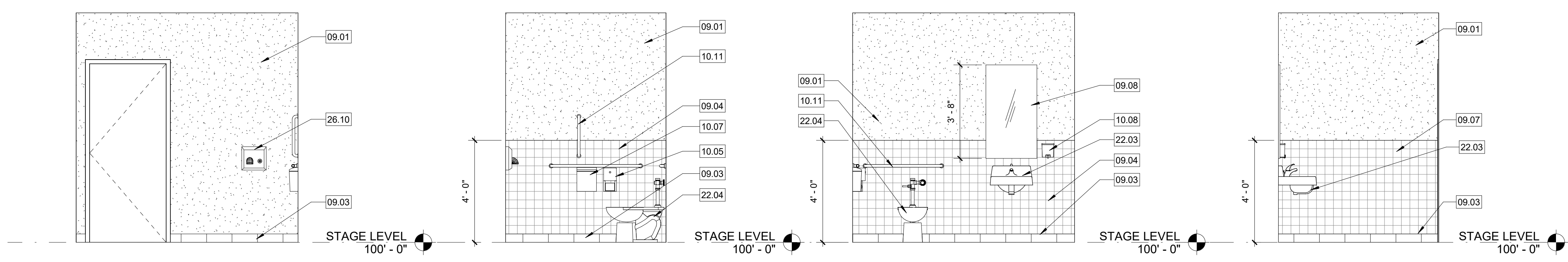
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date: February 20, 2020

**revisions:**

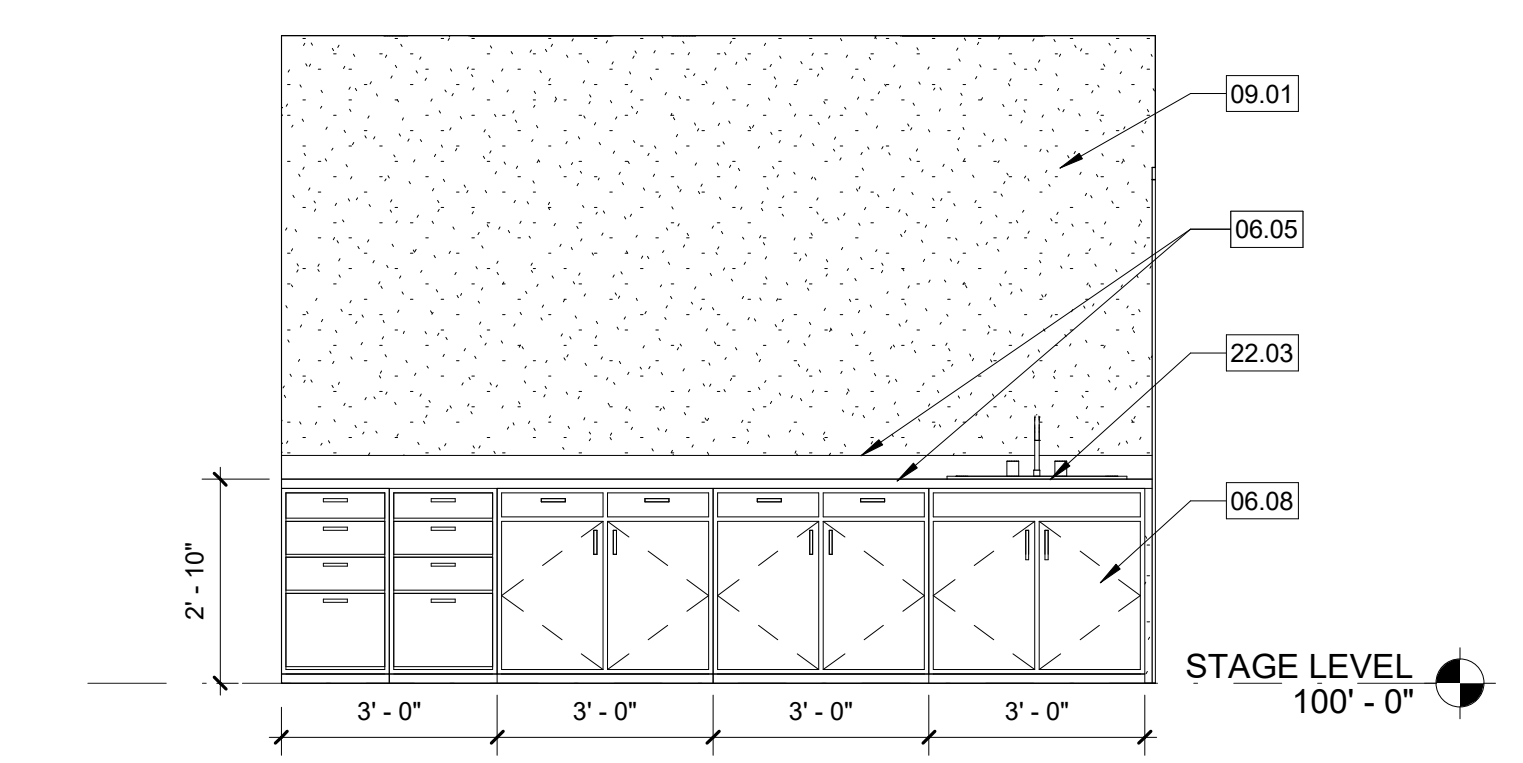
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**Interior  
Elevations**

**sheet:**  
**AE401**

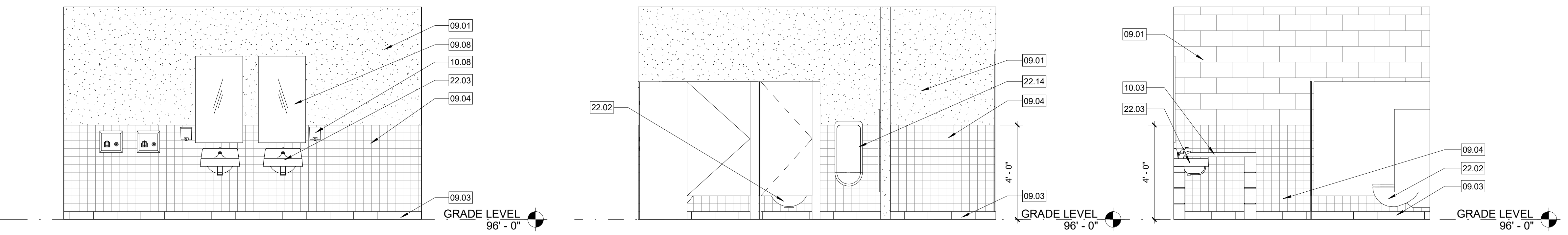
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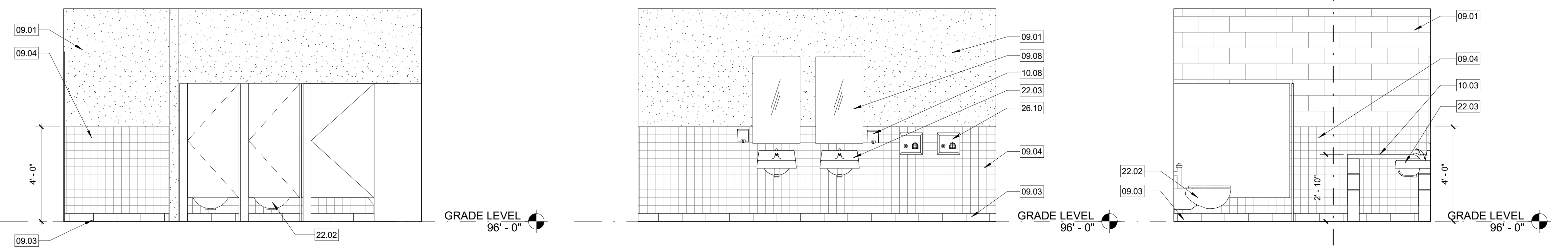
**D1 UNISEX SOUTH** 3/8" = 1'-0"  
**D2 UNISEX WEST** 3/8" = 1'-0"  
**D3 UNISEX NORTH** 3/8" = 1'-0"  
**D4 UNISEX EAST** 3/8" = 1'-0"



**C1 GREEN ROOM WEST** 3/8" = 1'-0"



**B1 NEW MEN'S SOUTH** 3/8" = 1'-0"  
**B2 NEW MEN'S NORTH** 3/8" = 1'-0"  
**B3 NEW MEN'S WEST** 3/8" = 1'-0"



**A1 NEW WOMEN'S SOUTH** 3/8" = 1'-0"  
**A2 NEW WOMEN'S NORTH** 3/8" = 1'-0"  
**A3 NEW WOMEN'S WEST** 3/8" = 1'-0"



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Grand Junction, CO



**project#:** 19.0270  
**date:** February 10, 2020

**revisions:**

**title:**

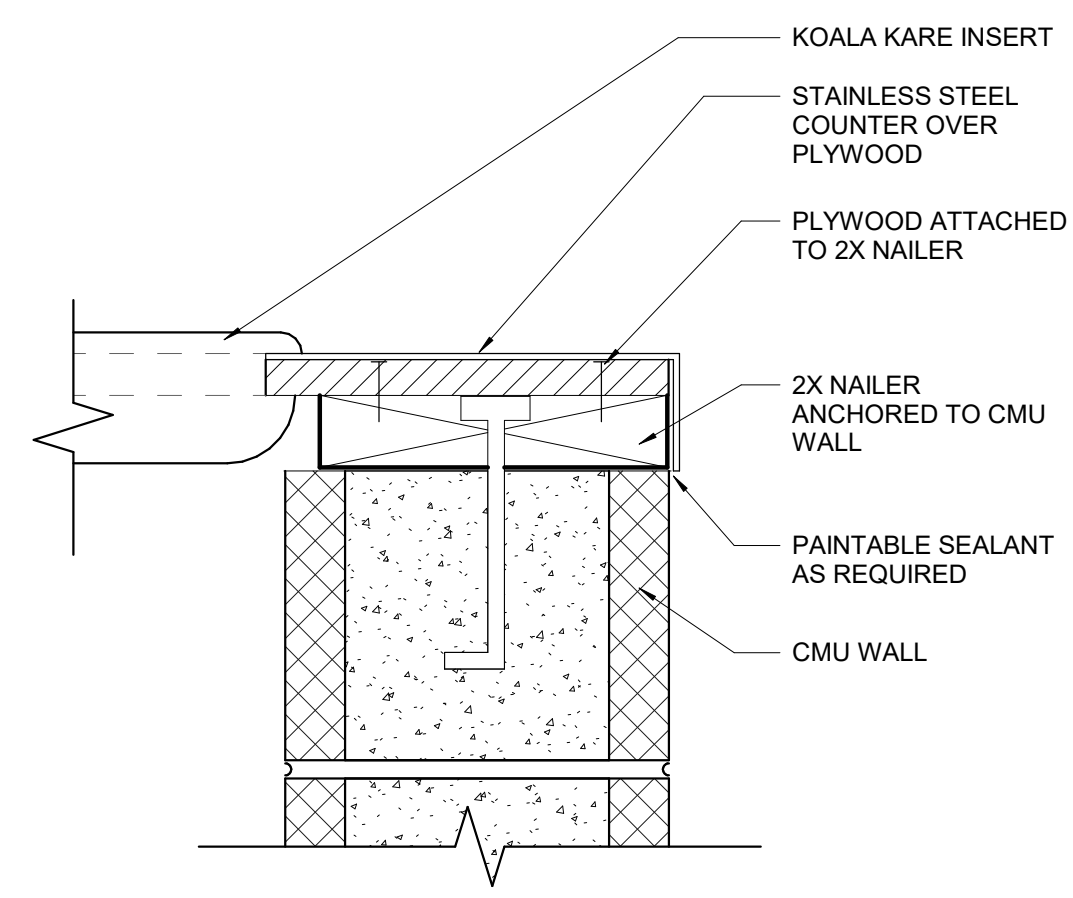
**Details**

**sheet:**

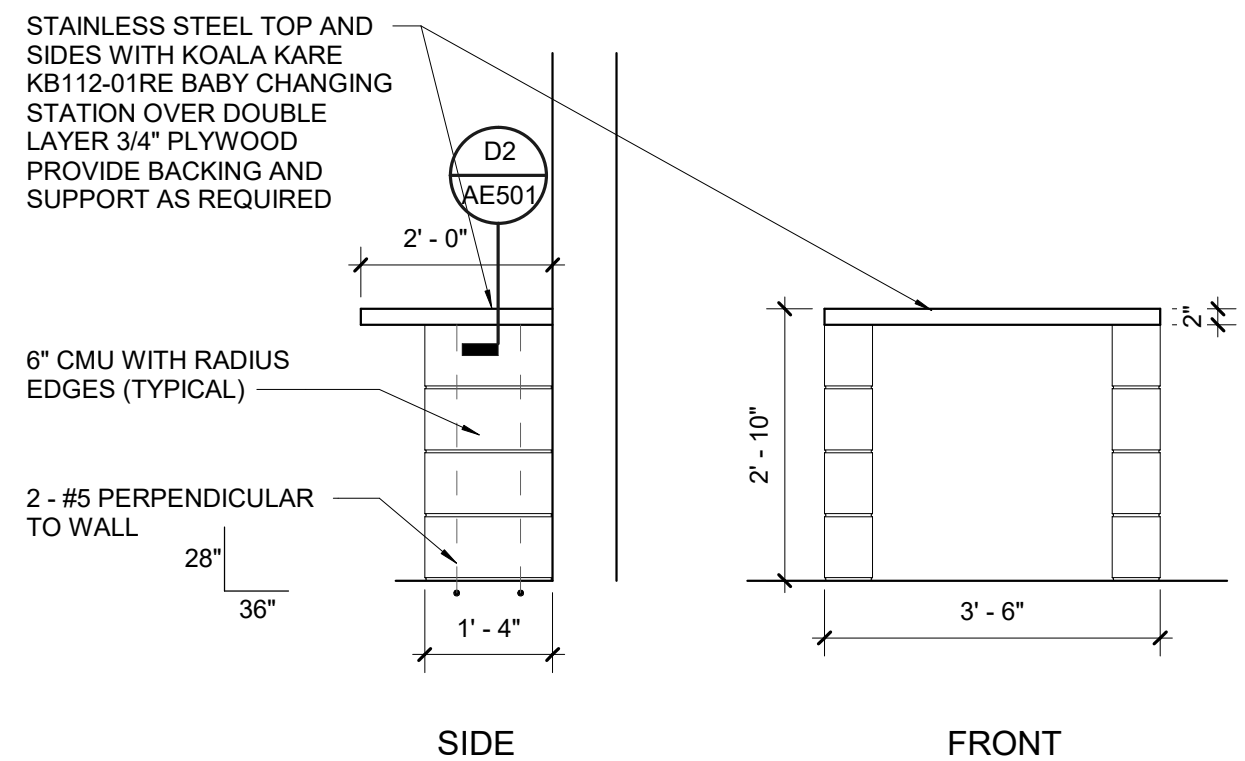
**AE501**

PERMIT SET

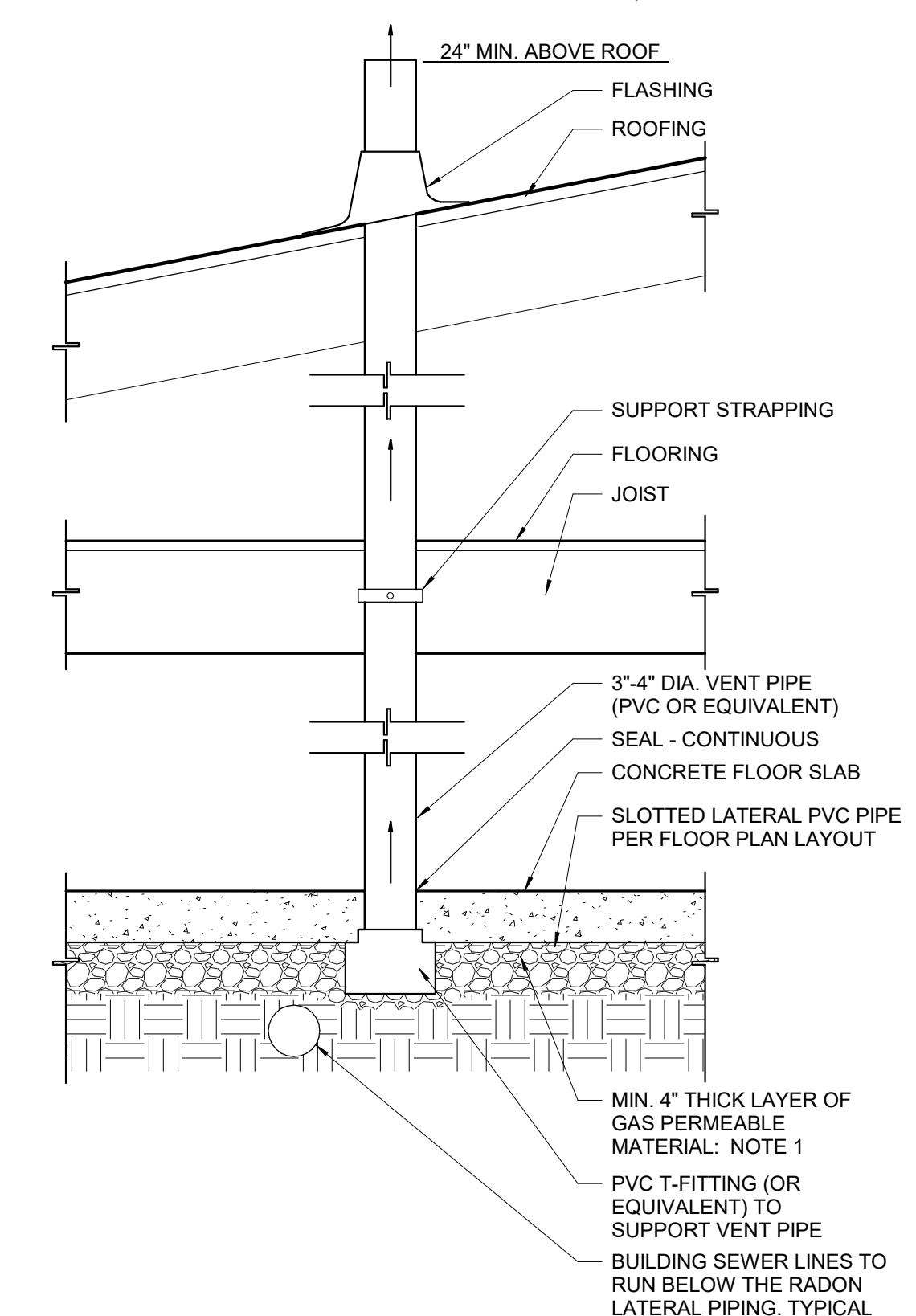
- NOTES:**
1. ALL CONCRETE SLABS THAT COME IN CONTACT WITH THE GROUND SHALL BE LAID OVER A GAS PERMEABLE MATERIAL MADE UP OF EITHER A MINIMUM 4" THICK UNIFORM LAYER OF CLEAN AGGREGATE, OR A MINIMUM 4" THICK UNIFORM LAYER OF SAND, OVERLAIN BY A LAYER OR STRIPS OF MANUFACTURED MATTING DESIGNED TO ALLOW THE LATERAL FLOW OF SOIL GASES.
  2. ALL OPENINGS, GAPS, AND JOINTS IN FLOOR AND WALL ASSEMBLIES IN CONTACT WITH SOIL OR GAPS AROUND PIPES, TOILETS, BATHTUBS OR DRAINS PENETRATING THESE ASSEMBLIES SHALL BE FILLED OR CLOSED WITH MATERIALS THAT PROVIDE A PERMANENT AIR-TIGHT SEAL. SEAL LARGE OPENINGS WITH NON-SHRINK MORTAR, GROUTS OR EXPANDING FOAM MATERIALS AND SMALLER GAPS WITH AN ELASTOMERIC JOINT SEALANT, AS DEFINED IN ASTM C920-87.
  3. VENT PIPES SHALL BE INSTALLED SO THAT ANY RAINWATER OR CONDENSATION DRAINS DOWNWARD INTO THE GROUND BENEATH THE SLAB OR SOIL-GAS-RETARDER MEMBRANE.



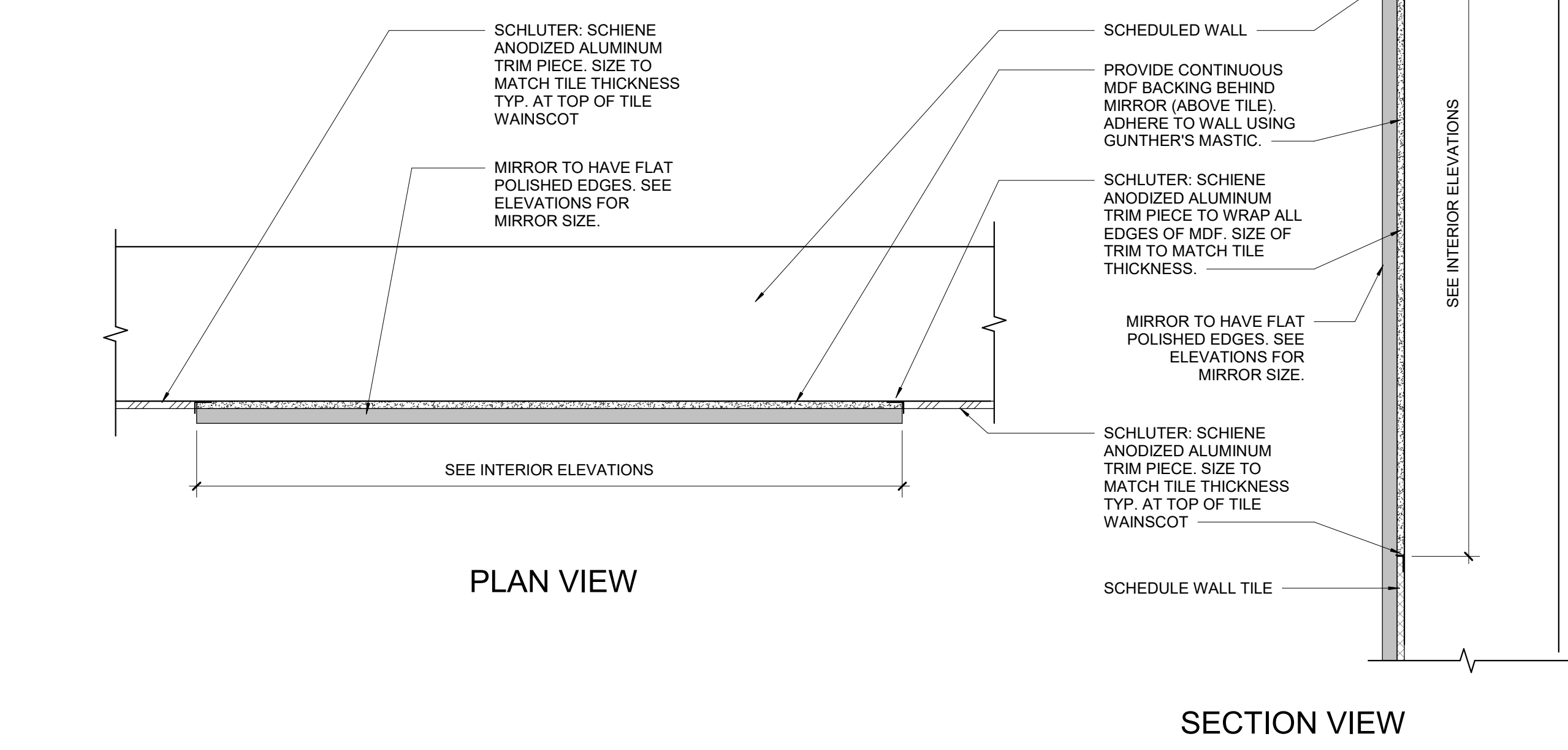
**D2** CHANGING TABLE DETAIL  
 3" = 1'-0"



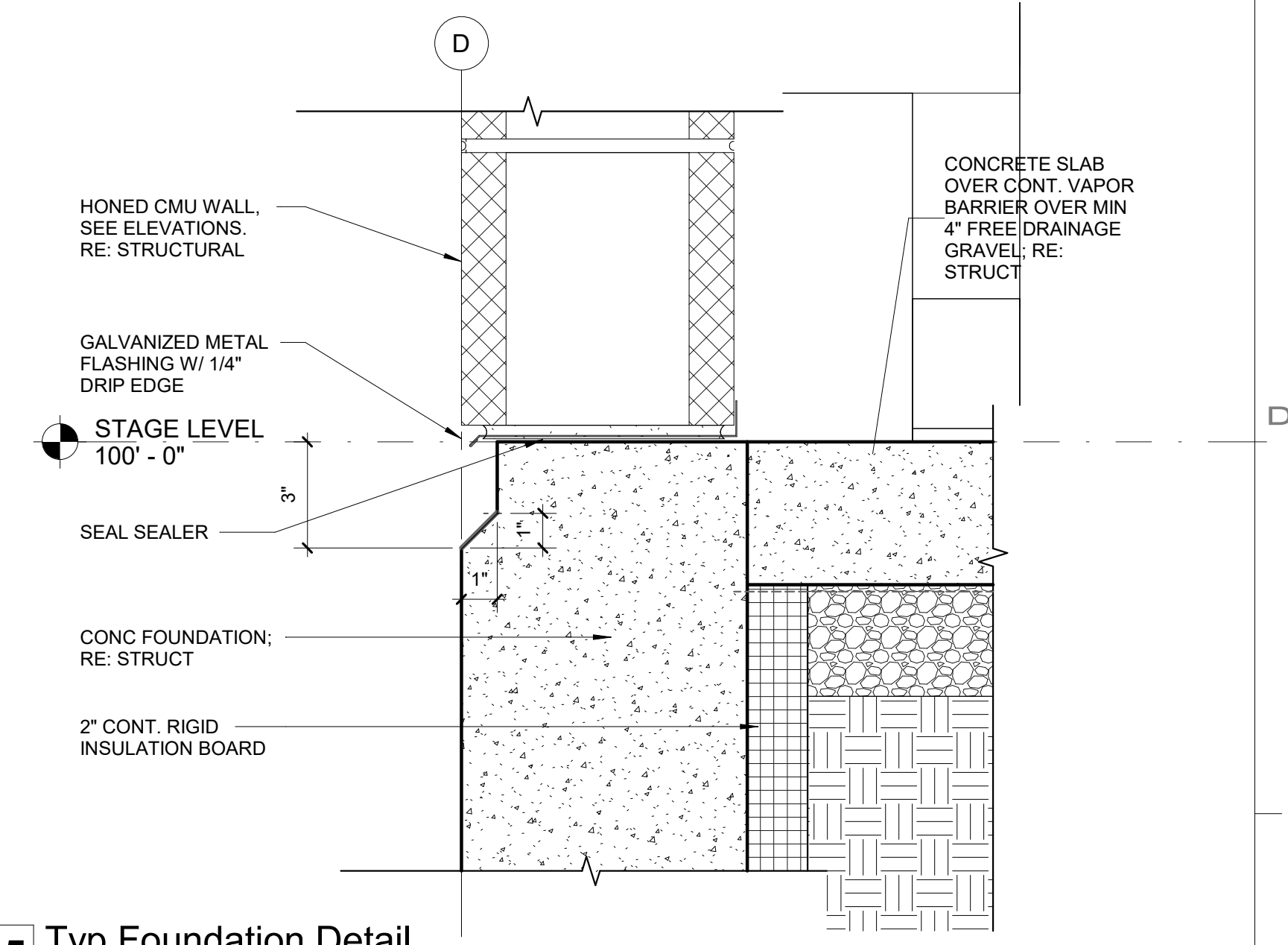
**C2** FIXED CHANGING TABLE ELEVATIONS  
 1/2" = 1'-0"



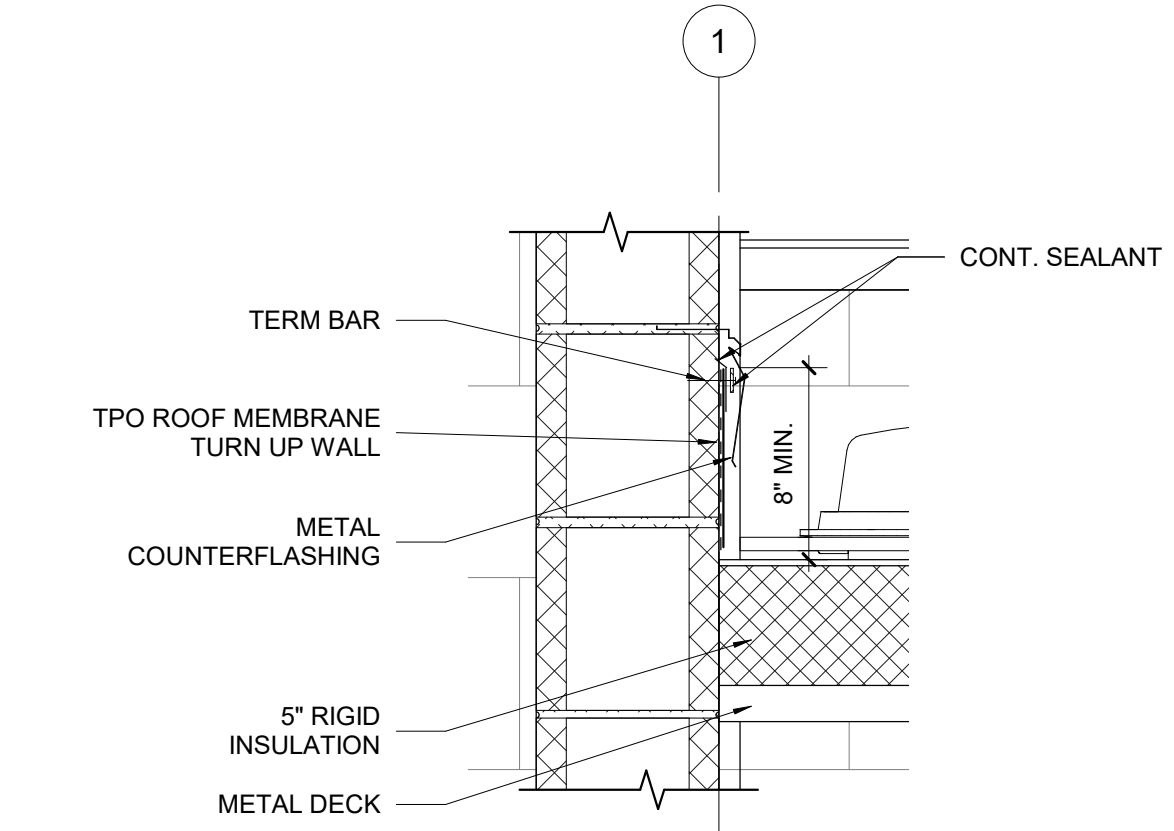
**C3** RADON PASSIVE SYSTEM  
 1" = 1'-0"



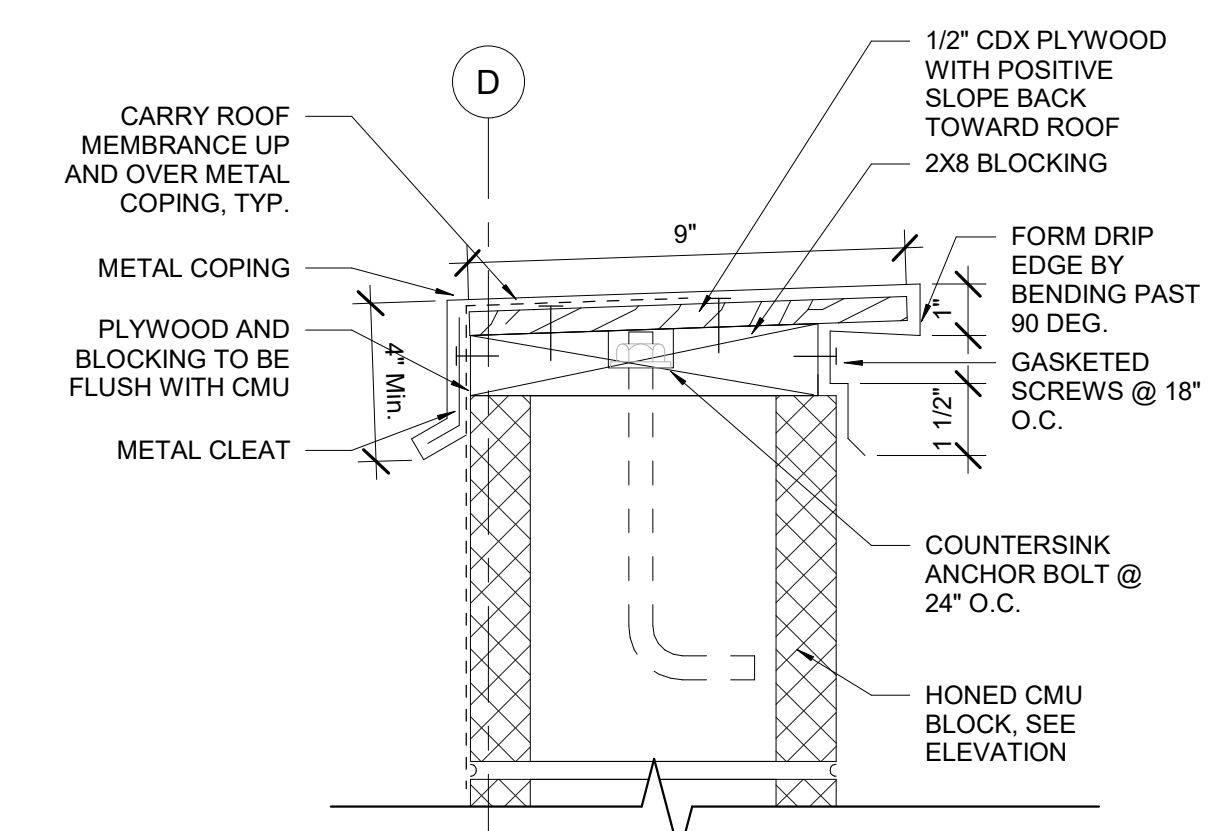
**A3** MIRROR DETAIL  
 3" = 1'-0"



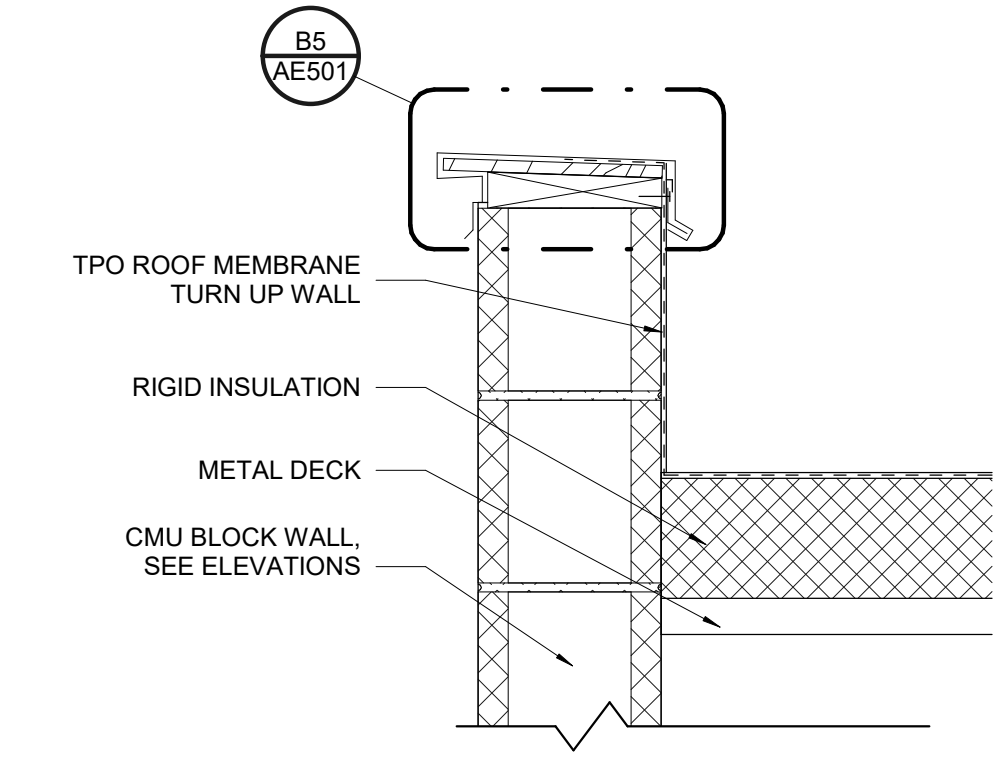
**D5** Typ Foundation Detail  
 3" = 1'-0"



**C5** TPO Roof To Wall Detail  
 1 1/2" = 1'-0"

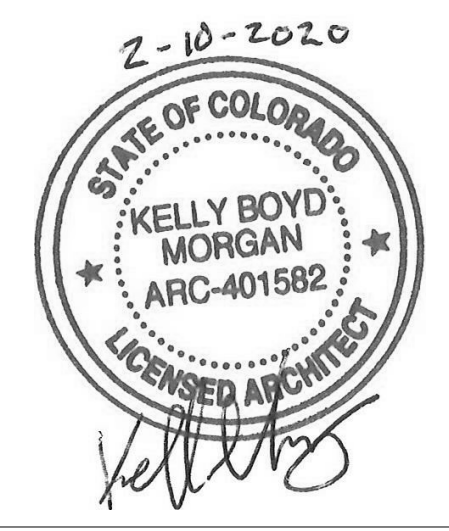


**B5** Parapet Detail  
 3" = 1'-0"



**A5** Roof Canopy CMU Edge Detail  
 1 1/2" = 1'-0"

DOOR SCHEDULE																
Number	Door						Frame			Head	Jamb	Sill	Fire Rating	Hardware Set	Comments	
	Width	Height	Thickness	Type	Door Material	Door Finish	Frame Type	Frame Finish	Frame Material							
106	3' - 0"	7' - 0"	1 3/4"	A	HM	PAINT	2	PAINT	HM	A3/A601	A3/A601	A3/A601	-	01		
106A	3' - 0"	7' - 0"	1 3/4"	A	HM	PAINT	2	PAINT	HM	A3/A601	A3/A601	A3/A601	-	04		
107A	3' - 0"	7' - 0"	1 3/4"	B	SOLID CORE WOOD	STAINED	-	-	-	-	-	-	-	02		
130	3' - 0"	7' - 0"	1 3/4"	A	HM	PAINT	1	PAINT	HM	A4/A601	A4/A601	A4/A601	-	03		
131	3' - 0"	7' - 0"	1 3/4"	A	HM	PAINT	1	PAINT	HM	A4/A601	A4/A601	A4/A601	-	03		



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**project:**  
 LAS COLONIAS  
 AMPHITHEATER -  
 ADDITION  
 Grand Junction, CO  
**CITY OF Grand Junction**  
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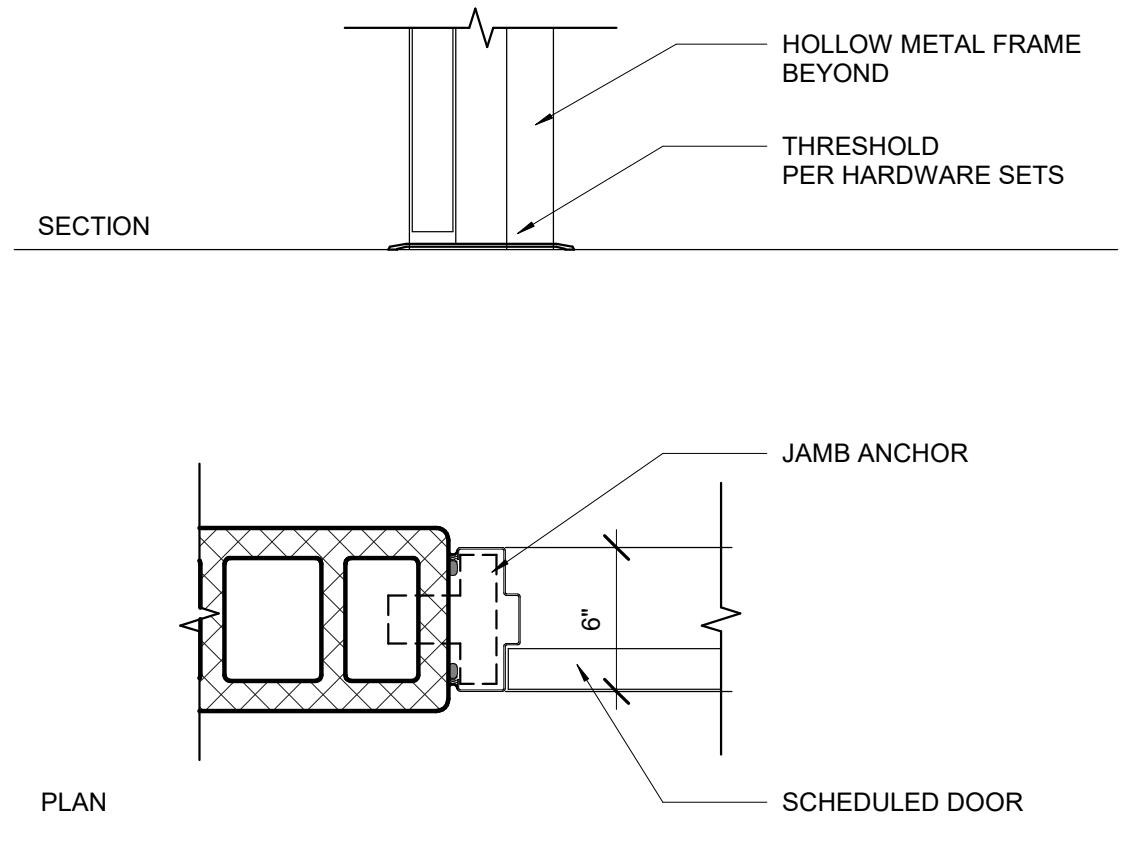
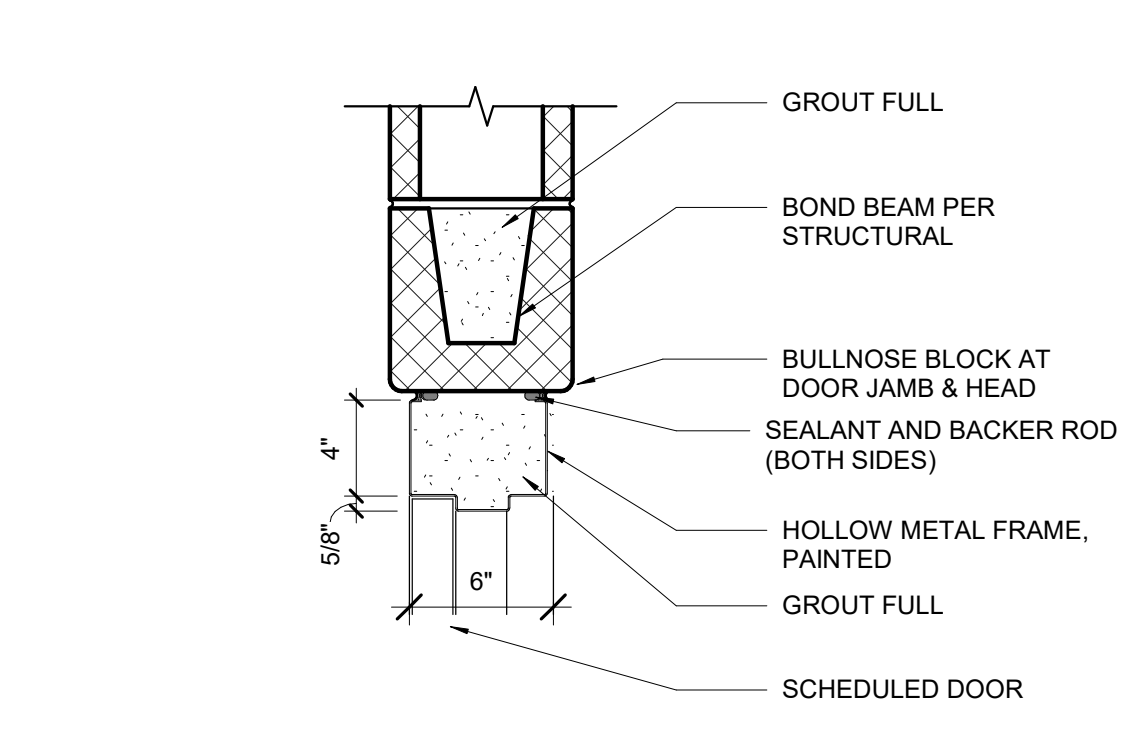
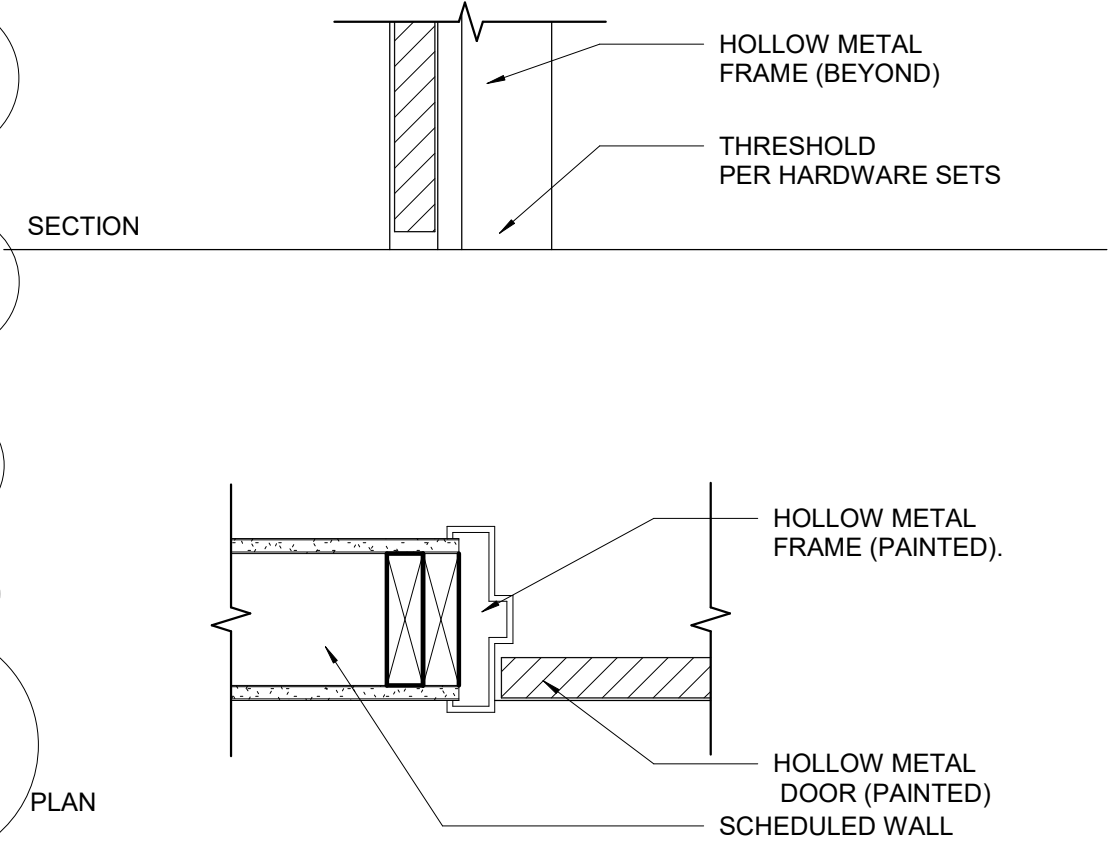
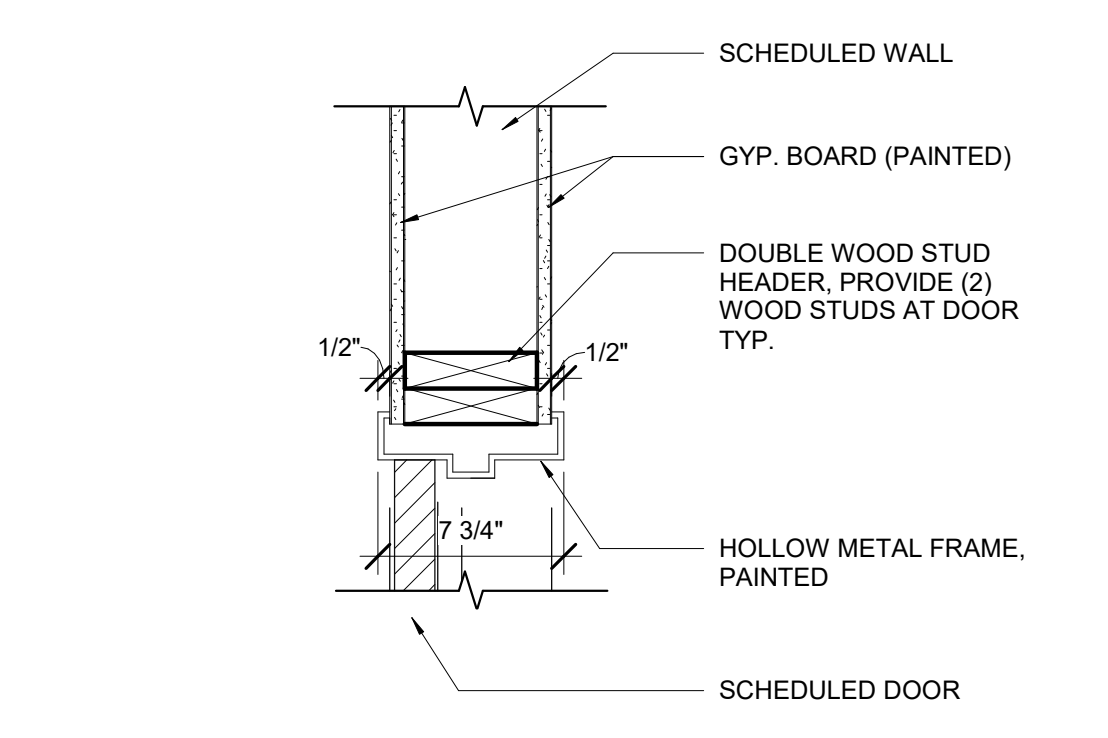
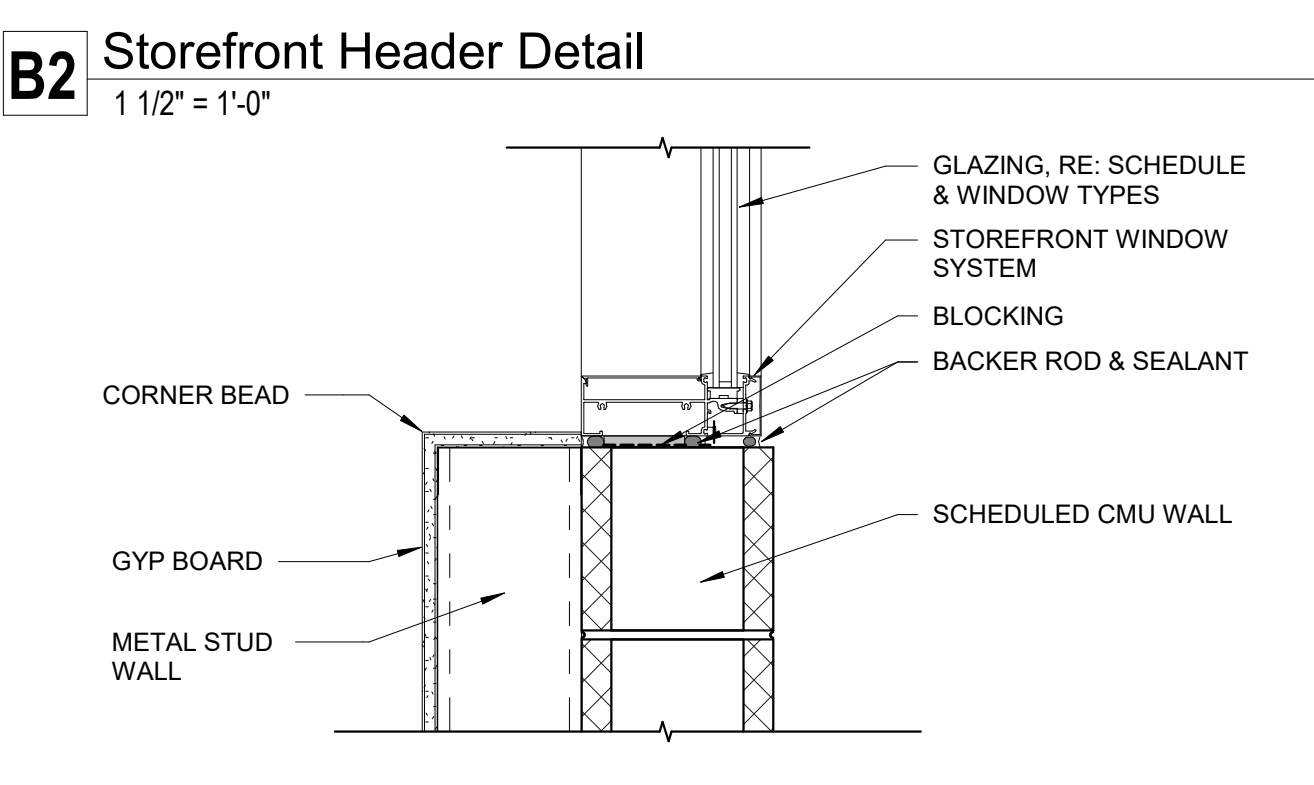
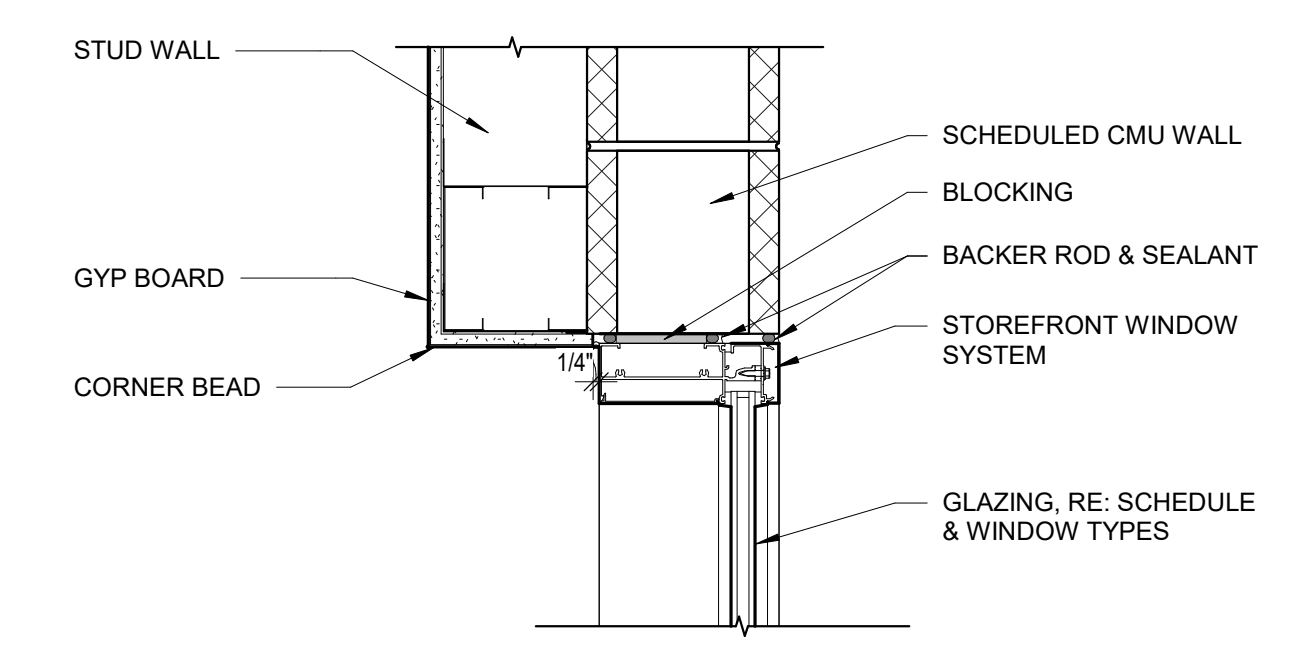
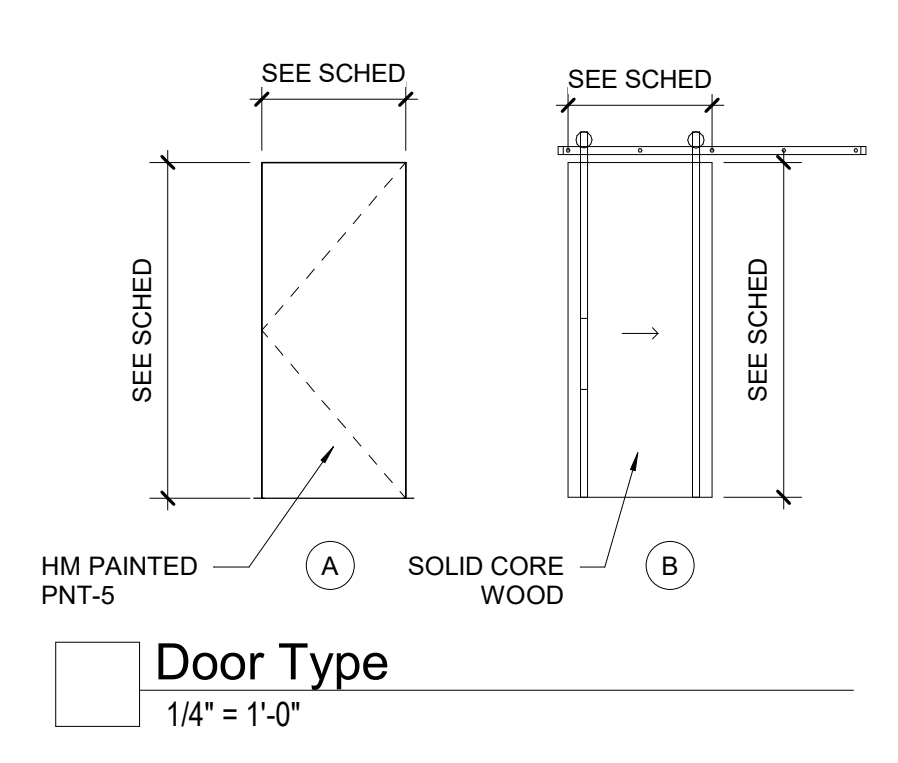
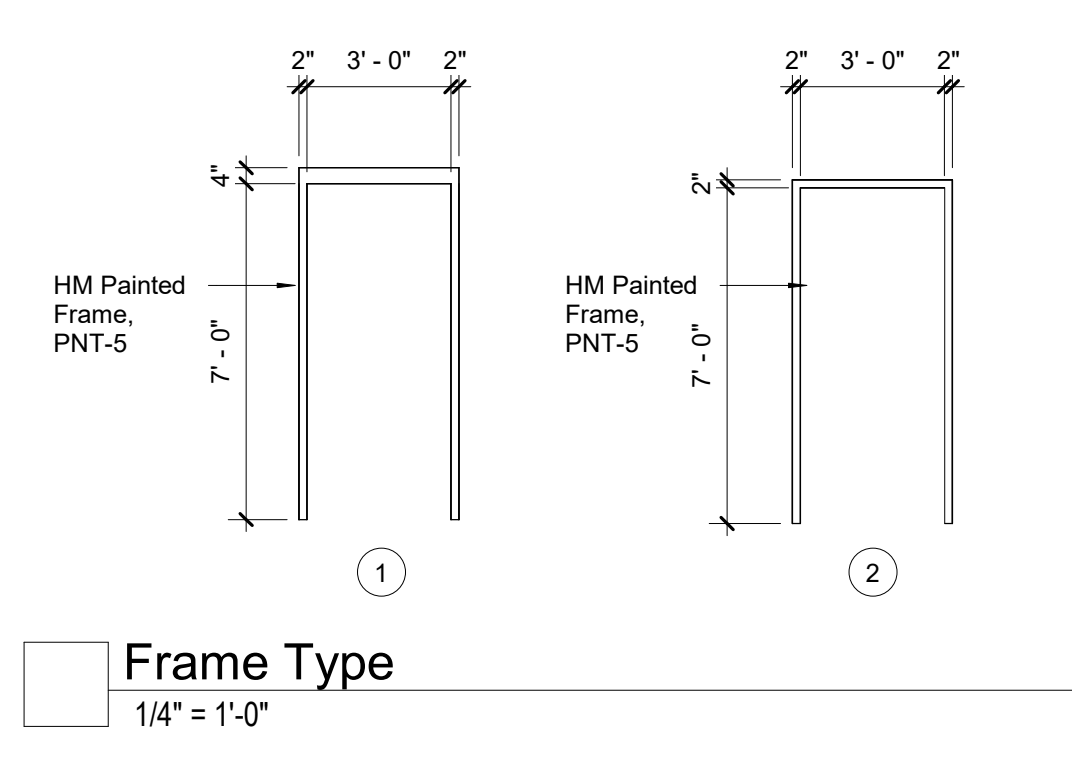
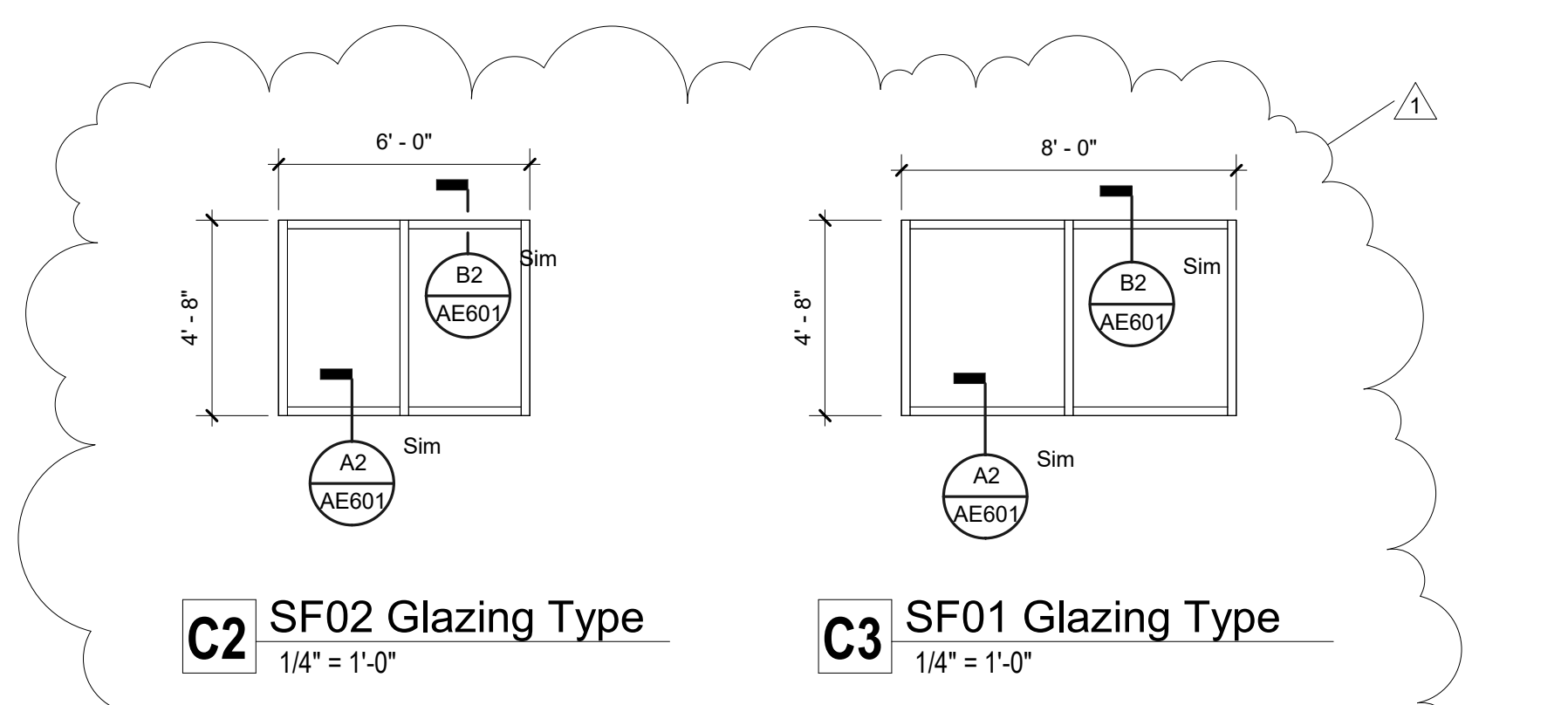
**project#:** 19-0270  
**date:** February 20, 2020

**revisions:**  
 Bid Addendum 01 4-7-20

**title:**  
**Door/Window Schedules & Types**

**sheet:**  
**AE601**

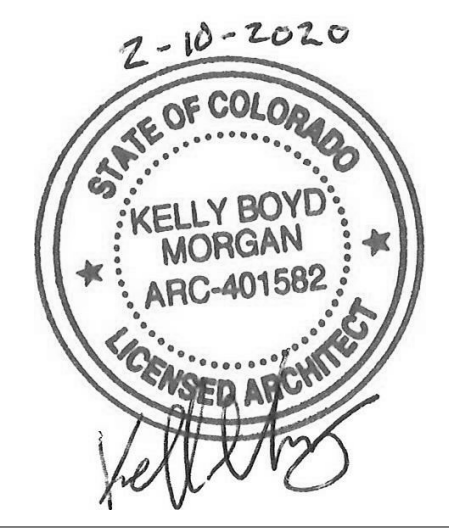
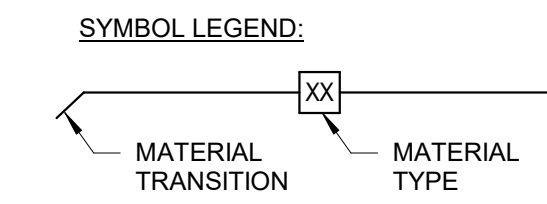
PERMIT SET



INTERIOR FINISH LEGEND						
CODE	MATERIAL	MANUFACTURER	PRODUCT NAME / NUMBER	COLOR / FINISH	SIZE	COMMENTS
<b>TILE</b>						
FT-1	Ceramic Tile	Daltile	Paver Surface / 0078	Golden Brown / Quarry Paver	6" x 6"	
WT-1	Ceramic Tile	Daltile	Matte Group 1	Matte Almond X735	3" x 6"	Lay in Subway Tile brick pattern - Rittenhouse Collection
<b>CEILING</b>						
ACT-1	Suspended Acoustical Tile	USG	Frost 419 FLB Edge	Flat White 050	24" x 24"	On Centricitee DXT Grid. See Reflected Ceiling Plan for layout
GYP-1	5/8" gyp board			PNT-1		
<b>CARPET</b>						
CPT-1	Carpet	Tandus Centiva	Crosscut Collection	Aggregate, Storm Sash 28307	24" x 24"	
<b>BASE</b>						
RB-1	Rubber Base	Roppe	700 Series	123 Charcoal	4" H	
TB-1	Ceramic Tile	Daltile	Matte Group 1 / S3419T	Matte Almond X735	4 1/4" x 6"	
<b>PAINT</b>						
PNT-1	Paint	Sherwin Williams	Interior Paint- SemiGloss Sheen	SW 7627 White Heron		
PNT-2	Paint	Sherwin Williams	Interior Paint- Satin Sheen	SW 7627 White Heron		
PNT-3	NOT USED	NOT USED	NOT USED	NOT USED		
PNT-4	Paint	Sherwin Williams	Interior Paint- Satin Sheen	SW 7068 Grizzle Gray		
PNT-5	Paint	Sherwin Williams	Interior Paint- SemiGloss	SW 7068 Grizzle Gray		Epoxy Paint, applies to Exterior HM Doors/Frames
<b>LAMINATE</b>						
PL-1	Plastic Laminate	Formica	7264	Limestone		Bullnose Edge
PL-2	Plastic Laminate	Formica	8908-NG	Cascara Teakwood		Bullnose Edge
<b>TRANSITION STRIPS</b>						
TS-1	Tile to Concrete	Schluter	RENO-RAMP	Aluminum		Use appropriate size RENO-RAMP height based on adjacent materials

ROOM FINISH SCHEDULE						
Number	Name	Finishes				Comments
		Floor	Wall	Base	Ceiling	
A106	GREEN ROOM	CPT-1	* PNT-2/PNT-4	RB-1	ACT-1	* SEE FINISH PLAN
A106A	UNISEX	FT-1	* WT-1/PNT-1	TB-1	ACT-1	* SEE ELEVATIONS
A107A	DRESSING	CPT-1	PNT-2	RB-1	ACT-1	
A130	WOMEN'S	FT-2	* WT-1/PNT-1	TB-1	GYP-1	* SEE ELEVATIONS
A131	MEN'S	FT-2	* WT-1/PNT-1	TB-1	GYP-1	* SEE ELEVATIONS

GENERAL NOTES - FINISH PLAN	
1	SEE FLOOR PLANS FOR INTERIOR ELEVATIONS
2	PROVIDE DEFLECTION TRACKS AT ALL STUD WALLS, EXTENDING TO STRUCTURE
3	ALL MATERIALS TO BE INSTALLED PER SPECIFIC MANUFACTURER'S INSTALLATION RECOMMENDATIONS
4	ALL EXPOSED METAL TO BE INSTALLED PER SPECIFIC MANUFACTURER'S INSTALLATION RECOMMENDATIONS
5	FLOORING MATERIAL TRANSITIONS TO OCCUR AT CENTER LINE OF DOOR THRESHOLDS, U.N.O.
6	PREPARE FLOORS/WALLS TO RECEIVE FINISH MATERIAL. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SURFACE PREPARATION. NOTIFY ARCHITECT IF CONDITIONS ARE INADEQUATE FOR REQUIRED INSTALLATION.
7	SEE G104 FOR WALL TYPES
8	CONTRACTOR TO PROVIDE SOLID BLOCKING AT ALL CASE WORK, FIXED FURNISHINGS AND EQUIPMENT. COORDINATE WITH ELEVATIONS, SECTIONS AND FURNITURE AND FIXTURE SHEETS AND SPECIFICATIONS.



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**project:**  
 LAS COLONIAS  
 AMPHITHEATER -  
 ADDITION  
 Grand Junction, CO  
**CITY OF**  
**Grand Junction**  
 COLORADO

**project#:** 19.0270  
**date:** February 10, 2020

**revisions:**

**title:**  
**Finish Floor**  
**Plan**

**sheet:**  
**AF100**

PERMIT SET

**A3** Finish Floor Plan  
 1/4" = 1'-0"

GENERAL STRUCTURAL NOTES

GENERAL

- The structural notes are intended to complement the project specifications. Specific notes and details in the drawings shall govern over the structural notes and typical details.
- Typical details and sections shall apply where specific details are not shown.
- The structural drawings are not all-inclusive and do not contain all dimensions, elevations, openings, mechanical shafts and penetrations needed to build the structure. The contractor shall coordinate these items with the Architectural, Mechanical and Electrical drawings.
- The contractor shall verify all site conditions and dimensions. If actual conditions differ from those shown in the contract drawings, the contractor shall immediately notify the architect/engineer before proceeding with the fabrication or construction of any affected elements.
- Omissions or conflicts between the contract drawings and/or specifications shall be brought to the attention of the architect/engineer before proceeding with any work involved. In case of conflict, follow the most stringent requirement as directed by the architect/engineer at no additional cost to the owner.
- The contractor shall submit a written request to the architect/engineer before proceeding with any changes, substitutions or modifications. Any work done by the contractor before receiving written approval will be at the contractor's risk.
- The contractor shall coordinate with all trades any items that are to be integrated into the structural system such as openings, penetrations, mechanical and electrical equipment, etc. Sizes and locations of mechanical and other equipment that differs from those shown on the contract drawings shall be reported to the architect/engineer.
- The contractor shall provide adequate shoring and bracing as required for the chosen method of erection. Shoring and bracing shall remain in place until final connections for the permanent members are completed. The building shall not be considered stable until all connections are completed. Walls shall not be considered self-supporting and shall be braced until the roof system is completed.
- The contractor shall not cut or core any holes in masonry or concrete walls without prior review by the architect/engineer.
- Site observations by BHB Consulting Engineers, P.C.'s field representative shall not be construed as approval of construction procedures nor special inspection.
- Detailing and shop drawing production for structural elements will require information (including dimensions) contained in the architectural, structural and/or other consultants' drawings. The structural drawings shall be used in conjunction with the architectural and other consultants' drawings. Some dimensions and elements such as elevations, depressions, slopes, mechanical housekeeping pads, etc. are not shown in the structural drawings. All dimensions shown on structural drawings shall be verified by contractor with architectural, mechanical and electrical drawings.
- Review of shop drawing submittals by BHB Consulting Engineers, P.C. is for general compliance only and is not intended for approval. The shop drawing review shall not relieve the contractor from the responsibility of completing the project according to the contract documents.
- Shop drawings made from reproductions of the contract drawings will be rejected unless the contractor signs a release agreement prior to the shop drawings being reviewed.
- Only an authorized representative of BHB Consulting Engineers, P.C. may make changes to these contract drawings. BHB Consulting Engineers, P.C. shall not be held responsible or liable for any claims arising directly or indirectly from changes made without written authorization by an authorized representative of BHB Consulting Engineers, P.C.

BASIS OF DESIGN

- Governing Code
  - Risk Category
- Snow Loads
  - Ground Snow Load
  - Snow Importance Factor
  - Snow Exposure Coefficient
  - Thermal Exposure Coefficient
  - Roof Snow Load
  - Min Snow load used for design
- Rain Loads
  - Rain Intensity
- Roof Live Load
- Seismic Loads
  - Seismic Importance Factor,  $I_e$
  - Seismic Design Category
  - Site Specific Ground Motion Hazard Analysis
  - Mapped Spectral Acceleration
  - Soil Site Class
  - Soil Site Coefficients
  - 5% Damped Design Spectral Response Acceleration
  - Seismic-Force-Resisting System
  - Response Modification Coefficient
  - System Over-strength Factor
  - Deflection Amplification Factor
  - Redundancy Factors
  - Fundamental Building Period
  - Seismic Response Coefficient
  - W
  - Base Shear
  - Analysis Procedure
- Wind Loads
  - Basic Wind Velocity (3 Second Gust)
  - Exposure Type
  - Internal Pressure Coefficient,  $G_{Cpi}$
  - Topographic Factor,  $K_{zt}$

FOUNDATION

- Soils Report
  - Author: Huddleston-Berry
  - Dated: January 27, 2015
  - Project No: 00208-0057
- Soil Bearing Pressure: 1500 psf, on Compacted Fill.
- Frost Protection: 12" minimum to top of footing. Contractor shall field verify that the footing elevations and final grades indicated on the plans will provide the minimum frost protection. The contractor shall notify the architect/engineer if there are any locations where the minimum frost protection might not be achieved prior to placing concrete.
- Lateral Soil Pressure Fluid Equivalent Density:
  - Active: 35 pcf (retaining walls)
  - At Rest: 55 pcf (rigid foundation walls)
  - Passive: 300 pcf
- Coefficient of Friction: 0.4

EARTHWORK

- All footings shall bear on 2'-0" of compacted structural fill. See detail 10/S501.
- Consult the project specifications and soils report for further earthwork requirements.

CONCRETE

- Materials, unless noted otherwise:
  - Normal weight aggregates: ASTM C 33
    - Combined aggregate gradation for slabs on grade and other designated concrete shall be 8% - 18% for large top size aggregates (1.1/2") or 8% - 22% for smaller top size aggregates (1" or 3/4") retained on each sieve below the top size and above the No. 100. The range for the No. 30 and No.50 sieves shall be 8% - 15% retained in each. To avoid gap gradation the following shall occur:
      - The percent retained on two adjacent sieves shall not fall below 5%.
      - The percent retained on three adjacent sieves shall not fall below 8%.
      - When the percent retained on two adjacent sieves is less than 8%, the total retained on either of these sieves and the adjacent outside sieve shall be at least 13%. See ACI 302 Section 5.4.3.3 for more information.
    - Maximum Aggregate Size shall not be larger than:
      - 3.1/2" or 1/5 the narrowest dimension of the forms
      - 1/3 the depth of the slab
      - 3/4 the minimum clear spacing between bars
  - Reinforcing Steel: ASTM 615 Grade 60 ( $F_y = 60$  ksi)  
Use Grade 40 ( $F_y = 40$  ksi) for field bent dowels with spacings indicated reduced by 1/3.
  - Deformed Bar Anchors (DBA): ASTM A496
  - Headed Stud Anchors (HSA): ASTM A108
  - Anchor Rods: ASTM F1554, Grade 36, with ASTM A563 heavy hex nuts and hardened washers Grade A
  - Admixtures:
    - Air-entraining admixtures shall comply with ASTM C 260 (when used).
    - Calcium chloride shall not be added to the concrete mix.
    - Water-reducing admixture shall comply with ASTM C 494/C 494M, Type A (when used)
    - Retarding admixture shall comply with ASTM C 494/C 494M, Type B (when used).
    - Water-reducing and retarding admixture shall comply with ASTM C 494/C 494M, Type D (when used).
    - High-range, water-reducing admixture shall comply with ASTM C 494/C 494M, Type F (when used).
    - High-range, water-reducing and retarding admixture shall comply with ASTM C 494/C 494M Type G (when used).
    - Admixture manufacturer shall have ISO 9001 Quality Certification. To ensure compatibility all admixtures shall be from the same manufacturer.
    - Type I/II cement complying with ASTM C-150 shall be used for all concrete. Cement source shall remain the same for the entire job.
    - The water/cementitious materials ratios shall meet the requirements of Table 19.3.2.1 of ACI 318-14.
    - Fly Ash - ASTM C618, Class F - 25% maximum cementitious content.
    - Provide air entraining as recommended by Table 19.3.3.1 of ACI 318-14. Concrete that extends above grade and is exposed to freezing and thawing while moist shall be air-entrained.
    - Concrete shall have, at the point of delivery, a slump of 4". Determine the slump by ASTM C143. Slump tolerance shall meet the requirements of ACI 117. When use high-range, water-reducing admixture or plasticizing admixture conforming to ASTM C494, it is permitted to increase the slump of concrete 8" maximum with a verified slump of 2 to 4 in. before the admixture is added.
    - No aluminum conduit or product containing aluminum or any other material injurious to concrete shall be embedded in concrete.
- Compressive strengths of concrete at 28 days shall be as follows
  - Interior Footings & Interior Foundation Walls
 

Strength	3,000 psi
Classification	F0, S0, W0, C0
  - Exterior Footings & Exterior Foundation Walls
 

Strength	4,500 psi
Classification	F1, S0, W0, C0
  - Interior Slabs on Grade
 

Strength	3,000 psi
Classification	F0, S0, W0, C0
  - All Site Concrete with Reinforcement
 

Strength	5,000 psi
Classification	F3, S0, W1, C2
  - All Site Concrete without Reinforcement
 

Strength	4,500 psi
Classification	F3, S0, W1, C2

- Reinforcement for concrete slabs on grade:
  - 4" thick concrete slab on grade. Reinforce slab with #3 bars at 18" o.c. each way with 1.1/2" max cover below the top surface of the concrete.
    - At contractor's option, macro-synthetic fiber or welded wire fabric may be used in lieu of reinforcing bars with the following requirements:
      - 3 lbs minimum per cubic yard of macro-synthetic fiber reinforcing (ASTM C 1116 Type 3) with the following requirements:
        - Length 1.1/2" - 2"
        - Equivalent diameter of 0.016" to 0.05"
        - Minimum aspect ratio (length to equivalent diameter) of 50 to 90.
        - Provide a fiber dosage to achieve a minimum post-crack residual strength ( $f_{cs}$ ) of 200 psi when tested according to ASTM C1609.
      - Maximum concrete shrinkage shall be 0.04% when tested according to ASTM C157 or C157 modified.
      - Fiber manufacturer shall provide the following:
        - Fiber dosage
        - Mix design
        - Finishing practices
    - 6" x 6" - W2.5/W2.5 welded wire fabric (ASTM A185 and A497) minimum, unless noted otherwise. Welded Wire Fabric with 1.1/2" of cover below the top surface of the concrete.

- Only one grade or type of concrete shall be poured on the site at any given time.
- The contractor shall be responsible for the design, detailing, care, placement and removal of all formwork and shores.
  - Supporting forms and shoring shall not be removed until structural members have acquired sufficient strength to safely support their own weight and any construction load to which they may be subjected. In no case, however, shall forms and shoring be removed in less than 24 hours after concrete placement.

- Reinforcement shall have the following concrete cover:
 

Cast-in-place Concrete	Clear Cover
Cast against and permanently exposed to earth	3"
Formed concrete exposed to earth or weather: #6 thru #18 bars	2"
#5 and smaller bars	1.1/2"
Concrete not exposed to weather or in contact with ground: Slabs, Walls, piers, Joists; #11 bars and smaller	3/4"
Beams, Columns; Primary Reinf., Ties, Stirrups, Spirals	1.1/2"

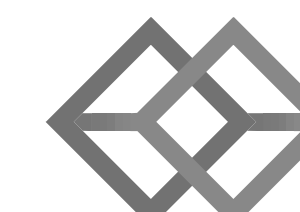
- Detailing:
  - Lap splice lengths shall be detailed to comply with the "Concrete Reinforcing Bar Lap Splice Schedule" on sheet S601. Splices may be made with mechanical splices capable of 125% tension capacity of the bar being spliced. Mechanical splices shall be the positive connecting type coupler and shall meet all International Building Code requirements and shall have a current ICC-ES report or IAPMO Certification. Use "Lenton" Standard Couplers (ICC ER-3967), "Bar-Lock" (ICC ESR-2495) or equal with internal protector. If mechanical splices are used, splices or couplers on adjacent bars shall be staggered a minimum of 24" apart along the longitudinal axis of the reinforcing bars.
  - At joints, provide reinforcing dowels to match the member reinforcing, unless noted otherwise.
  - At all discontinuous control or construction slab on grade joints, provide 2 - #4 x 48".
  - Corner Bars: Provide corner bars at intersecting wall corners using the same bar size and spacing as the horizontal wall reinforcing. Corner bars shall lap the horizontal reinforcing with the required lap splice length. See detail 3/S501.
  - All vertical reinforcing shall be doweled to footings, or to the structure below with the same size and spacing as the vertical reinforcing for the element above. Dowels extending into footings shall terminate with a 90-degree standard hook and shall extend to within 4" of the bottom of the footing. Footing dowels (#8 bars and smaller) with hooks need not extend more than 20" into footings.
  - Horizontal wall reinforcing shall be continuous through construction and control joints.
  - See detail 8/S501 for reinforcing around miscellaneous openings (8" to 36" wide). For openings wider than 36", contact the engineer. All recesses that interrupt reinforcing shall be reinforced the same as an opening.
- Construction Joints, Control (Contraction) Joints:
  - Construction joints in all horizontal and vertical construction joints including between top of footing and foundation walls shall be intentionally roughened to a full amplitude of approximately 1/4". The laitance on the concrete (thin, flaky layer of harden, weakened hydrated cement) shall be mechanically removed from the surface after the concrete has achieved final set. Construction joints in slabs on grade shall not exceed a distance of 125'-0" o.c. in any direction.
  - Control joints shall be installed in slabs on grade so the length to width ratio of the slab is no more than 1.25:1. Control joints shall be completed as soon as final set is achieved and it is okay to operate the cutter on the slab. Final set is typically achieved within the first 4 to 12 hours after the slab has been finished in an area (depending on weather conditions and concrete hydration rate; 4 hours in hot weather to 12 hours in cold weather). For early entry saw cutting, joints should be cut within the first 1 to 4 hours (depending on weather conditions and concrete hydration rate; 1 hour for hot weather and 4 hours for cold weather). Where saw cut joints cannot be cut along the entire projected length of the joint, a 90 degree hand grinder or other tool shall be used to complete the joint. Control joints may be installed by:
    - Saw cut a depth of 1/4 the thickness of the slab (1.1/4" ± for early entry saws) minimum.
    - Tooled joints a depth of 1/4 the thickness of the slab
  - For interior concrete slabs-on-grade that are to receive **no** floor covering, install construction or control joints in slabs on grade at a spacing not to exceed 24 times the slab thickness in any direction, unless noted otherwise. For interior concrete slabs-on-grade that are to receive floor coverings the contractor has the option to increase the control joint spacing to 36 times the slab thickness in any direction.
  - For architectural exposed concrete walls, including retaining walls, provide contraction joints at a uniform spacing of not more than 20 ft o/c by placing deep (1.5 times the maximum aggregate size), narrow rustication strips on both wall faces to induce cracking. Place contraction joints at any locations in which the wall changes thickness. At all contraction joints, reduce horizontal reinforcing crossing the joint by 1/2 of the horizontal reinforcement elsewhere in the wall. Coordinate location with the architectural drawings.
- Construction
  - Use chairs or other support devices recommended by the CRSI to support and tie reinforcement bars prior to placing concrete. Reinforcing steel for slabs on grade shall be adequately supported. Support reinforcing steel of slabs on grade with precast concrete units. Lifting the reinforcing off the grade during placement of concrete is not permitted.
  - Concrete to be mechanically consolidated during placement per ACI standards.
  - Contractor shall coordinate placement of all openings, curbs, dowels, sleeves, conduits, bolts, inserts and other embedded items prior to concrete placement.
  - All embeds, anchors and dowels shall be securely tied to formwork or to adjacent reinforcing prior to the placement of concrete.
  - No pipes, ducts, sleeves, etc shall be placed in structural concrete unless specifically detailed or approved by the structural engineer. Penetrations through walls when approved shall be built into the wall prior to concrete placement. Penetrations will not be allowed in footings or grade beams unless detailed. Piping shall be routed around footings and grade beams and unless detailed. Footings shall be stepped to avoid piping.
  - Reinforcing Bars shall not be welded. Do not substitute reinforcing bars for DBAs or HSAs.



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project:

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO



project#: 190527  
date: Feb. 10, 2020

revisions:

title:

GENERAL  
STRUCTURAL  
NOTES

sheet:

S001

PERMIT SET

## GENERAL STRUCTURAL NOTES

### POST-INSTALLED ANCHORS

1. General Post-Installed Anchor Notes
  - a. Do not install adhesive anchors in concrete if less than 21 days old; do not install mechanical anchors, screw anchor or powder actuated anchors in concrete less than 7 days old. Contractor must obtain written approval from the engineer to install prior to these time periods. Do not apply full load to anchors until concrete has reached 28-day compression strength.
  - b. Anchors or adhesives specified in details shall be provided; alternative anchors or adhesives may be used if the contractor provides calculations demonstrating that the alternative can achieve the performance values of the specified product. These calculations, along with an ICC-ES ESR or IAPMO-UES ER approval compliant with the specified codes herein, must be submitted to the structural engineer prior to use.
  - c. Follow all the manufacturer's recommendations and certification testing reports for anchor installation. See specific anchors below for more information.
  - d. No anchor shall be installed within 1.5 anchor rod diameters of an abandoned hole that has been filled with non-shrink grout; increase distance to 3 anchor rod diameters when the abandoned hole has not been filled.
2. Adhesive Anchors
  - a. For anchors in concrete, the adhesives shall be divided into two groups: Standard Adhesives and High Strength Adhesives. Standard adhesives can be used in general applications when details reference the "Standard Adhesive Embedment Schedule" on sheet S601. High Strength adhesive groups will be specified for the particular application in the drawings and details. When a High Strength Adhesive is specified, the contractor has the option to use any of the adhesives in the High Strength group. When a Standard Adhesive is specified, the contractor has the option to use any of the adhesives in either group.
    - i. Standard Adhesive Group for anchors in concrete includes the following adhesives:
      1. SET-XP (ICC-ES ESR-2508) by Simpson Strong-Tie
      2. Pure 50+ (ICC-ES ESR-3576) by Dewart
      3. AC100+ Gold (ICC-ES ESR-2582) by Dewart
      4. HIT-RE 100 (ICC-ES ESR-3829) by Hilti, Inc.
    - ii. High Strength Adhesive Group for anchors in concrete includes the following adhesives:
      1. SET-3G (ICC-ES ESR-4057) by Simpson Strong-Tie
      2. Pure 110+ (ICC-ES ESR-3298) by Dewart
      3. AC200+ (ICC-ES ESR-4027) by Dewart
      4. HIT-RE 500-V3 (ICC-ES ESR-3814) by Hilti Inc.
      5. HIT-HY 200 (ICC-ES ESR-3187) by Hilti Inc.
  - b. For anchors in grouted masonry, the adhesive shall be HIT-HY 70 (ICC-ES ESR-2682), HIT-HY-200 (ICC-ES ESR-3963) by Hilti Inc., SET-XP (IAPMO UES ER-265) by Simpson Strong-Tie Inc. or AT-XP (IAPMO UES ER-281) by Simpson Strong-Tie Inc., AC100+ (ICC-ES ESR-3200) by Powers Fasteners Inc. or CIA GEL (ICC-ES ESR-1702) by USP.
  - c. For anchors in ungrouted masonry, the adhesive shall be HIT-HY 70 (ICC-ES ESR-2682) by Hilti Inc., or SET (ICC-ES ESR-1772) by Simpson Strong-Tie Inc. or AC100+ (ICC-ES ESR-3200) by Powers Fasteners Inc. Plastic mesh or stainless steel screen tubes shall be used.
  - d. Adhesive shall be within the manufacturer's recommended life time and prior to expiration date. Do not use adhesive that has not been stored per manufacturer's recommendations or may have experienced freeze thaw cycles or extreme heat.
  - e. Do not install adhesive anchor in wet or damp hole unless product is approved for such conditions without strength reduction. Do not install adhesive anchors if concrete temperature is below 50-degree F unless adhesive is approved for lower temperature without strength reduction. Refer to manufacturer's published installation instructions.
  - f. Follow all the manufacturer's recommendations and certification testing reports regarding hole cleaning prior to epoxy installation. All holes shall be drilled with ANSI standard bits designed for concrete. Diamond core drilled holes are not allowed unless indicated in specific details or approved by the structural engineer prior to use.
3. Mechanical Anchors
  - a. For concrete, the mechanical anchor shall be Kwik Bolt TZ (ICC-ES ESR-1917) by Hilti Inc., Strong-Bolt 2 (ICC-ES ESR-3037) by Simpson Strong-Tie Inc. or Power-Stud+ SD2 (ICC-ES ESR-2502) by Powers Fasteners Inc.
  - b. For grouted masonry, the mechanical anchor shall be Kwik Bolt 3 (ICC-ES ESR-1385) by Hilti Inc., Wedge-All (ICC-ES ESR-1396) by Simpson Strong-Tie or Strong-Bolt 2 (IAPMO-UES ER-240) by Simpson Strong-Tie or Power-Stud+ SD1 (ICC-ES ESR-2966) by Powers Fasteners Inc.
4. Screw Anchors
  - a. For concrete and grouted masonry, the screw anchors shall be Titen HD (ICC-ES ESR-2713 for concrete only and ICC-ES ESR-1056 for grouted masonry) by Simpson Strong-Tie, or Screw Bolt + (ICC-ER ESR-3889 for concrete only) by DeWalt, Wedge-Bolt + (ICC-ES ESR-1678 for grouted masonry) by Powers Fasteners Inc. or Kwik HUS-EZ (ICC-ES ESR-3027 for concrete only and ICC-ES ESR-3056 for grouted masonry) by Hilti Inc.
5. Powder Actuated Fasteners
  - a. For fasteners driven into steel, the fastener shall be X-U P8 TH Universal Knurled Shank Fastener (ICC-ES ESR-2269) by Hilti Inc., PDPA (ICC-ES ESR-2138) by Simpson Strong-Tie Inc. or 8mm Head Spiral CSI Drive Pin (ICC-ES ESR-2024) by Powers Fasteners Inc.

### MASONRY

1. Materials, unless noted otherwise:
  - a. Concrete Masonry Units (CMU) ASTM C90: Lightweight Grade N (minimum net area unit strength of 2,000 psi).  $f_m = 2,000$  psi.
  - b. Mortar Cement: Use Type "S"
  - c. Masonry Grout ASTM C476: grout shall attain a minimum compressive strength of 2,500 psi at 28 days.
  - d. Reinforcing Steel ASTM 615 Grade 60 ( $F_y = 60$  ksi)
  - e. Deformed Bar Anchors (DBA) ASTM A496
  - f. Headed Stud Anchors (HSA) ASTM A108
  - g. Anchor Rods ASTM F1554, Grade 36, with ASTM A563 heavy hex nuts and ASTM F436 hardened washers
2. Reinforcement shall have the following cover:
  - a. Typical reinforcement shall have a minimum coverage of one bar diameter over all the bars, but not less than 3/4". When masonry is exposed to soil, minimum coverage shall be 1.1/2".
3. Detailing Requirement
  - a. Lap all masonry reinforcing per "Masonry Reinforcing Lap Schedule" on sheet S601.
  - b. All vertical reinforcing shall be doweled to the foundation wall, footing (structure below) and to the structure below with the same size dowel, spacing (and in the same core) as the vertical wall reinforcing above.
  - c. Corner Bars: Provide corner bars at intersecting wall corners using the same bar size and spacing as the horizontal wall reinforcing. Corner bars shall lap the horizontal reinforcing with the required lap splice length. See detail 3/S501.
  - d. Wall Openings: For unscheduled openings wider than 24", provide reinforcing on all sides per detail 7/S501. Also, for all scheduled openings, provide horizontal bar at bottom of opening per detail 7/S501. Vertical bars shall extend from floor level below to the floor, or roof level above. Horizontal bars for all openings shall extend a minimum of 48 bar diameters beyond the corners of the opening. Where a 48 bar diameter extension is not possible, extend bars as far beyond the opening as possible and terminate the bar(s) with a 90 degree standard ACI hook.
  - e. Horizontal wall reinforcing shall be continuous through joining concrete walls, masonry walls, columns, and pilasters. Provide a key between the wall and the column or pilaster. Horizontal wall reinforcing shall be placed inside the column vertical reinforcing.
  - f. Horizontal wall reinforcing shall terminate with a hook at edge of openings and at each side of control joints except at floor and roof levels, lintels, beams and at top of parapets. See details 4/S502 and 6/S502.
  - g. All masonry column ties shall terminate with 135 degree hooks plus a 6 bar diameter extension (4" minimum).
4. Construction Requirements:
  - a. Masonry coursing shall be coordinated with the architectural drawings.
  - b. All units shall be laid with full mortar beds on the face shells. All head joints shall be filled solidly with mortar for a distance in from the face of the units not less than the thickness of the longitudinal face shells. Cells which are to be grouted shall have full head joints.
  - c. Masonry walls, beams and columns shall be constructed with running bond, unless noted otherwise.
  - d. All cells containing reinforcement, embeds, anchor bolts, etc. shall be filled solid with grout. Grout shall be placed by mechanical vibration during placing and re-vibrated after excess moisture has been absorbed but before workability is lost. Rodding of grout is not allowed.
  - e. Where walls are not grouted solid, each grout pour shall terminate flush with the top of the uppermost unit except at cells with vertical reinforcing where the grout shall be 1.1/2" below top of unit to provide construction key.
  - f. Grout pours shall be limited to 4'-0" unless written approval is obtained from the engineer of record.
  - g. All walls below grade shall be grouted solid.
  - h. Vertical cells to be filled with grout shall have vertical alignment sufficient to maintain a clear, unobstructed vertical cell measuring not less than 2" by 3". All steel reinforcement shall be secured against displacement prior to grouting by wire positioners or other suitable devices at intervals not exceeding 200 bar diameters or 10 ft maximum, or at bar splice locations. Vertical reinforcing shall be located at the center of the wall unless noted otherwise.
  - i. Reinforcing Bars shall not be welded. Do not substitute reinforcing bars for DBAs or HSAs.
  - j. Control Joints: Spacing shall not exceed 30'-0". Control joints shall be not be placed any closer than 4'-0" to edge of openings. Control joints shall not be placed in the middle of masonry piers. See architectural drawings for locations.
  - k. Grout all beam and joint pockets solid after installation of beams and joists.
  - l. Embed channels and plates shall be placed so as to create a flush surface with the face of the wall.
  - m. Anchor bolts and headed stud anchors shall be set in a grouted cell. Anchor bolts and headed stud anchors shall have 1" grout surrounding the shank at its penetration. Grout shall be flush with the face or top of the masonry.

### STRUCTURAL STEEL

1. Material:
  - a. Wide Flanges Section ASTM A992 (50 ksi)
  - b. All Thread Rods, Other Shapes & Plates ASTM A36 (36 ksi)
  - c. Square or Rectangular HSS ASTM A500 (50 ksi) Grade C or ASTM A1085 (50ksi)
  - d. Deformed Bar Anchors (DBA) ASTM A496
  - e. Headed Stud Anchors (HSA) ASTM A108
  - f. Non-Metallic Shrinkage Resistant Grout ASTM C 1107
  - g. Anchor Rods ASTM F1554, Grade 36, with ASTM A563 heavy hex nuts and ASTM F436 hardened washers Grade A
  - h. Bolted Connections: ASTM F3125 Grade A325 with ASTM A563 nuts and ASTM F436 hardened washers.
2. Fabrication and construction shall comply with the latest edition of the following Codes and Standards:
  - a. American Institute of Steel Construction (AISC), "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings," with "Commentary".
  - b. AISC "Code of Standard Practice" excluding the following: Section 3.2, Section 4.4, Section 4.4.1,
  - c. AISC "Specification for Structural Joints Using High-Strength Bolts"
  - d. American Welding Society (AWS), Structural Welding Code (specific items do not apply when they conflict with the AISC requirements).
  - e. AISC "Seismic Provision for Structural Steel Buildings"- ANSI/AISC 341
  - f. All exterior steel elements, including anchor rods and bolts shall be hot-dip galvanized in accordance with ASTM A123 and A153 where applicable.
3. Welding
  - a. Field weld flags that have been put in these documents are for suggestion only. The contractor has the option to substitute shop welding for field welding or vice versa. The steel fabrication and steel erection drawings must clearly distinguish between shop welds and field welds prior to any work being performed.
  - b. Steel fabricators shall indicate the shop welds that are excluded from their bids. Steel erectors shall indicate the field welds that are excluded from their bids. It is the responsibility of the contractor to coordinate shop welding and field welding with the appropriate subcontractors.
  - c. All welding and cutting shall be performed by AWS certified welders.
  - d. Use E-70 XX or as noted otherwise. E60 XX may be used for welding steel roof decks.
  - e. All intersecting steel shapes which are not bolted shall be connected by a fillet weld all around, unless noted otherwise. Where fillet weld sizes are not shown they shall be 1/16" less than the thinnest of the connected parts for thicknesses 1/4" and larger. Fillet welds on plates less than 1/4" shall be of the same size as the thinnest of the connected part.
  - f. Reinforcing Bars: Do not weld rebar. Do not substitute reinforcing bars for deformed bar anchors (DBAs), machine bolts, or headed stud anchors (HSAs).
  - g. Do not weld anchor bolts, including "lack" welds.
  - h. Headed Stud Anchors (HSAs) welding and deformed bar anchor welding shall conform to the manufacturer's specifications.

4. Bolted Connections:
  - a. Use bolts for steel to steel connections, as noted herein or as noted on the drawings. Bolts shall be used in connections for simple span framing and beam (or girder) to bearing plate connections. Tighten bolts to a snug tight condition.
  - b. Use hardened washers beneath the turned element of all bolts or nuts. Use hardened beveled washers, to compensate for the lack of parallelism, where the outer face of the bolted parts has a slope greater than one in twenty with respect to the plane normal to the bolt axis. At oversized holes hardened washers or plates shall conform with ASTM F-436 and shall completely cover the slot after installation.
  - c. Where a steel to steel beam connection is not shown, provide a standard AISC framed connection for one half the total uniform load capacity of the beam for the span and steel specified.
  - d. Bolts, nuts and washers shall not be reused.
5. Provide full-depth web-stiffener plates at each side of all beams at all bearing points. Stiffener plates shall be the thickness called out below unless noted otherwise and shall be welded both sides with fillet welds all around:
 

FLANGE WIDTH	STIFFENER THICKNESS	WELD SIZE
Less than 8 1/4"	1/4"	3/16"
8 1/4" to 12 1/4"	3/8"	1/4"
12 1/4" to 16 1/2"	1/2"	5/16"
16 1/2" to 20 3/4"	5/8"	3/8"

### METAL DECKING

1. Steel deck shall comply with the latest requirements of the Steel Deck Institute.
2. All deck shall be 3-span continuous minimum. In areas where 3-span conditions are not possible, the contractor shall provide heavier gage deck as required to provide the equivalent loading of the deck under a three span condition.
3. Steel roof deck shall not be used to support loads from plumbing, HVAC ducts, light fixtures, architectural elements or equipment of any kind, unless specifically noted. Light weight suspended acoustical ceilings with a total weight of 50 lbs per attachment may be hung from roof deck. The hangers shall be staggered to distribute the loads over multiple deck flutes.
4. All deck supporting members shall be dry before welding.
5. Clinch seams before welding interlocking seams.

### Steel Roof Deck

- a. Steel roof deck shall be 1.1/2" deep X 20 gage minimum painted, type "B" wide rib deck with interlocking side seams with the following properties:
 

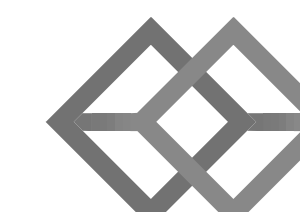
	20 Gage
Minimum S ( $in^3/n$ ) =	0.237
Minimum I ( $in^4/n$ ) =	0.231
- b. Minimum allowable deck diaphragm shear values shall be 796 lbs/ft for a 7'-0" deck span.
- c. Maximum diaphragm flexibility factor shall be 13.1 for a 7'-0" deck span.
- d. Weld steel roof deck to supporting framing members with 3/4" diameter puddle welds at the following spacings (Closer spacing may be used to develop minimum shear requirements.):
  - i. 6" o.c. to all supports perpendicular to deck corrugations (7 welds per 36" sheet).
  - ii. 6" o.c. to all supports parallel to deck corrugations.
- e. Hilti or Pnutek power driven fasteners are acceptable as an alternative to welds provided the connection meets the diaphragm shear capacity given above. For Hilti call 800-879-8000 extension 6337 for connection information comparison. For Pnutek, call 800-431-8665. If Hilti or Pnutek power driven fasteners are used, the contractor shall submit Hilti's / Pnutek calculations to the Architect/Engineer for review. Also if Hilti or Pnutek power driven fasteners are used, a Hilti / Pnutek representative shall be present before the decking is installed to make sure the installer is properly trained in using the equipment. The Hilti / Pnutek representative shall also make a site visit the day after deck has been started to be installed to verify the power driven fasteners are being installed correctly.
- f. Attach interlocking seams with one of the following:
  - i. 1 1/2" long top seam welds at 24 o.c. maximum
  - ii. Verco PunchLok II System at 24" o.c. maximum
  - iii. ASC Delta Grip System at 36" o.c. maximum
  - iv. CSI Inter-Knek System at 36" o.c. maximum
 Closer spacing may be used to develop minimum shear requirements. A standard button punch can not be used in place of Verco PunchLok, DeltaGrip or CSI Inter-Knek
- g. Provide a 2" minimum bearing and a 4" lap at the splice points.



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### project:

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO

CITY OF  
**Grand Junction**  
COLORADO

project#: 190527  
date: Feb. 10, 2020

### revisions:

### title:

**GENERAL  
STRUCTURAL  
NOTES**

### sheet:

**S002**

PERMIT SET

REQUIREMENTS FOR SPECIAL INSPECTION, MATERIAL TESTING, AND STRUCTURAL OBSERVATION

LEGEND OF MARKS AND ABBREVIATIONS

AB	ANCHOR BOLT(S)	k	KIP(S) = 1000 POUNDS
ABV	ABOVE	KLF	KIPS PER LINEAL FOOT
ALT	ALTERNATE	KSF	KIPS PER SQUARE FOOT
APPROX	APPROXIMATE		
ARCH	ARCHITECT(URAL)	LBS	POUNDS
		LF	LINEAL FOOT
BLDG	BUILDING	LLH	LONG LEG HORIZONTAL
BLW	BELOW	LLV	LONG LEG VERTICAL
BM	BEAM	LSH	LONG SIDE HORIZONTAL
BOT	BOTTOM	LSV	LONG SIDE VERTICAL
BRG	BEARING		
BTWN	BETWEEN	MAS	MASONRY
		MAX	MAXIMUM
CC.	CENTER-TO CENTER	MCI	MASONRY CONTROL JOINT
C.J.	CONST/CONTROL JOINT	MC-x	MASONRY COLUMN MARK
CJP	COMPLETE JOINT PENETRATION	MECH	MECHANICAL
	GROOVE WELD (FULL PEN WELD)	MFR	MANUFACTURER
CMU	CONCRETE MASONRY UNIT	MIN	MINIMUM
COL	COLUMN	MISC	MISCELLANEOUS
CONC	CONCRETE	ML-x	MASONRY LINTEL
CONST	CONSTRUCTION	MP-x	MASONRY PIER
CTR	CENTER	MW-x	MASONRY WALL
CW-x	CONCRETE WALL		
		NIC	NOT IN CONTRACT
		NTS	NOT TO SCALE
DB	DECK BEARING		
DBA	DEFORMED BAR ANCHOR		
DBE	DECK BEARING ELEVATION	O.C.	ON CENTER
DBL	DOUBLE	O.F.	OUTSIDE FACE
DET	DETAIL	OPNG	OPENING
DIA	DIAMETER	OPP	OPPOSITE
DIM	DIMENSION		
DN	DOWN	PAF	POWDER-ACTUATED FASTENER
DWG	DRAWING	PCF	POUNDS PER CUBIC FOOT
DWL	DOWEL	PL	PLATE
		PLF	POUNDS PER LINEAL FOOT
(E)	EXISTING	PSF	POUNDS PER SQUARE FOOT
EA	EACH	PSI	POUNDS PER SQUARE INCH
E.F.	EACH FACE	PT	POINT
E.J.	EXPANSION JOINT		
ELEC	ELECTRICAL	REINF	REINFORCING
ELEV	ELEVATION	REQD	REQUIRED
EQUIP	EQUIPMENT	R.D.	ROOF DRAIN
EQ	EQUAL	RTU	ROOF TOP UNITS
E.W.	EACH WAY		
EXST	EXISTING		
EXP	EXPANSION	SHT	SHEET
EXT	EXTERIOR	SI	SPECIAL INSPECTION
		SIM	SIMILAR
FC-x	CONTINUOUS FOOTING MARK	SMU	SUSPENDED MECHANICAL UNITS
F.D.	FLOOR DRAIN	SOG	SLAB-ON-GRADE
FDN	FOUNDATION	SQ	SQUARE
F.F.	FINISHED FLOOR	STAG	STAGGERED
FR-x	RECTANGULAR FOOTING	STD	STANDARD
FS-x	SQUARE FOOTING MARK	STL	STEEL
FT	FOOT	STR	STRUCTURAL
FTG	FOOTING	STS	SELF TAPPING SCREWS
FTS-x	THICKENED SLAB MARK		
		T&B	TOP AND BOTTOM
GA	GAUGE	TEMP	TEMPERATURE
GALV	GALVANIZED	THDS	THREADS
GSN	GENERAL STRUCTURAL NOTES	T.O.	TOP OF
		TOC	TOP OF CONCRETE
		TOD	TOP OF DECK
HORIZ	HORIZONTAL	TOF	TOP OF FOOTING
HSA	HEADED STUD ANCHOR	TOW	TOP OF WALL
HT	HEIGHT	TYP	TYPICAL
ICC	INTERNATIONAL CODE COUNCIL	UNO	UNLESS NOTED OTHERWISE
IBC	INTERNATIONAL BUILDING CODE		
I.F.	INSIDE FACE	VERT	VERTICAL
IN.	INCH		
INT	INTERIOR	W/	WITH
		WT	WALL THICKNESS
JT	JOINT	WWF	WELDED WIRE FABRIC
JST	JOIST	WWM	WELDED WIRE MESH

STATEMENT OF SPECIAL INSPECTION AND QUALITY ASSURANCE

Special inspection and quality assurance (including structural testing), as required by section 1704 and 1705 of the 2018 IBC, shall be provided by an independent agency employed by the owner for the items in this section and other areas of the approved construction documents, unless waived by the building official.

The names and credentials of the Special Inspectors to be used shall be submitted to the Building Official for approval.

Responsibilities of the Special Inspector	
Special Inspector shall review all work listed in the special inspection schedules herein for conformance with the approved construction plans, specifications and 2018 IBC.	
Testing and inspection reports shall be sent on a weekly basis to the architect, engineer, building official and contractor for review. All items not in compliance shall be brought to the immediate attention of the contractor for correction, and if uncorrected, to the architect, engineer and building official.	
Once corrections have been made by the contractor, the special inspector shall submit a final signed report to the building official stating that the work requiring special inspection was, to the best of the special inspector's knowledge, in conformance with the approved construction plans, specifications and 2018 IBC.	
Responsibilities of the Contractor	
The contractor shall submit a written statement of responsibility to the owner and the building official prior to the commencement of work in accordance with 2018 IBC section 1704.4. This statement shall indicate that the contractor will coordinate and cooperate with the required inspections contained herein.	
The contractor shall notify the designated special inspector that work is ready for inspection at least 24 hours before said inspection is required.	
All work requiring special inspection shall remain open and accessible until it has been observed by the special inspector and deemed acceptable through inspection report.	
Special inspection during fabrication is not required if the fabricator is registered and approved by the authority having jurisdiction to perform such work without special inspection. Upon completion of fabrication, the approved fabricator shall submit a certificate of compliance for submittal to the building official.	
The contractor shall be responsible for their own quality control including materials, fabrication, erection, etc.	

SOILS CONSTRUCTION INSPECTIONS

**Soils (2018 IBC Section 1705.6)**

ITEM FOR VERIFICATION & INSPECTION	INSPECTION FREQUENCY		COMMENTS
	CONTINUOUS	PERIODIC	
Site Preparation	-	X	Verify that the site has been prepared in accordance with the soils report prior to placement of prepared fill.
Fill Material	X	-	Verify that the material being used, the maximum lift thickness and the in-place dry density of the compacted fill material comply with the soils report during placement and compaction of the fill material during placement and compaction.
Continuous Footing Backfill: at least one test for each 40 linear feet or less of wall length, but no fewer than 2 tests.	-	X	At each compacted backfill layer.
Spot Footing Backfill: Minimum of one compaction test for each lift for each spot footing.	-	X	At each compacted backfill layer.
See specifications for further requirements.	-	-	

CONCRETE CONSTRUCTION INSPECTIONS

**Concrete (2018 IBC Section 1705.3, Table 1705.3, and Section 1705.12) The following concrete elements require special inspection:**

All concrete footings, All concrete walls, including foundation walls, Interior concrete slab-on-grade.

ITEM FOR VERIFICATION & INSPECTION	INSPECTION FREQUENCY		COMMENTS
	CONTINUOUS	PERIODIC	
Protection of concrete during cold and hot weather	-	X	
Verify materials used including use of the required mix design	-	X	Verify mix design meets strength and exposure requirements listed on General Structural Notes
Formwork	-	X	Verify shape, location and member dimensions
Bolts installed in concrete	X	-	Inspection of anchors or embeds cast in concrete is required when allowable loads have been increased or where strength design is used. Prior to and during concrete placement.
Embeds and Inserts installed in concrete	X	-	Prior to and during concrete placement.
Concrete reinforcing steel placement	-	X	Verify that reinforcing is of specified type, grade and size; that it is free of oil, dirt and rust; that it is located and spaced properly; that hooks, bends, ties, stirrups and supplemental reinforcement are placed correctly; that lap lengths, stagger and offsets are provided; and that all mechanical connections are installed per the manufacturer's instructions and/or evaluation report.
Concrete placement and samples	X	-	Cylinders, slump, temperature and air-entrainment shall be done for every 150 cubic yards or each day's production if the day's production is less than 150 cubic yards nor less than once for each 5000 sq. ft. of surface area for slabs and walls.

STEEL BOLTED CONSTRUCTION INSPECTIONS

Where special inspections are listed under "Random Basis", special inspection of elements and items shall be performed on a random basis. Operations need not be delayed pending these inspections. Where special inspection items are listed under "Every Element", special inspection shall be performed for each element, joint, or member, as applicable based on the task listed below.

**High Strength bolted connections (2018 IBC section 1705.2.1, section 1705.12.1 and section 1705.13.1 and AISC 360-16 Chapter N and AISC 341-16 Chapter J)**

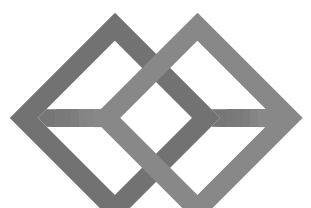
ITEM FOR VERIFICATION & INSPECTION	INSPECTION PLAN		COMMENTS
	Every Element	Random Basis	
<b>Inspection Tasks Prior to Bolting</b>			
Manufacturer's certifications available for fastener materials	X	-	
Fasteners	-	X	Marked in accordance with ASTM requirements
Proper fasteners selected for the joint detail	-	X	Including grade, type, bolt length if threads are to be excluded from shear plane.
Proper bolting procedure selected for joint detail	-	X	
Connecting elements	-	X	Including the appropriate faying surface condition and hole preparation, if specified, meet applicable requirements
Pre-installation verification testing by installation personnel observed and documented for fastener assemblies and methods used	-	X	Not required if only snug-tight joints are specified per [Section N5.6(1) of AISC 360-16]
Proper storage	-	X	Storage provided for bolts, nuts, washers and other fastener components
<b>Inspection Tasks During Bolting</b>			
Fastener assemblies, of suitable condition	-	X	Verify that fasteners placed in all holes and washers (if required) are positioned as required.
Joint	-	X	Verify that joint brought to the snug-tight condition (min) unless noted otherwise.
Fastener component	-	X	Verify that fastener component not turned by the wrench prevented from rotating
Pretensioned Fasteners	-	X	Verify that pretensioned fasteners are pretensioned in accordance with the RCSC Specification, progressing systematically from the most rigid point toward the free edges (Not required if only snug-tight joints are specified per [Section N5.6(1) of AISC 360-16]; Not required for pretensioned joints using turn-of-the-nut method with match-marking, direct-tension-indicators or twist-off type tension control bolt methods)
<b>Inspection Tasks After Bolting</b>			
Document acceptance or rejection of each bolted connection	X	-	



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**project:**

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO



project#: 190527  
date: Feb. 10, 2020

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**SPECIAL  
INSPECTIONS**

**sheet:**

**S003**

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REQUIREMENTS FOR SPECIAL INSPECTION, MATERIAL TESTING, AND STRUCTURAL OBSERVATION

STEEL WELDED CONSTRUCTION INSPECTIONS

Definition of Terms			
Where special inspections are listed under "Random Basis", special inspection of elements and items shall be performed on a random basis. Operations need not be delayed pending these inspections. Where special inspection items are listed under "Every Element", special inspection shall be performed for each element, joint, or member, as applicable based on the task listed below.			
<b>Structural Welding (2018 IBC section 1705.2 and section 1705.12.1 and section 1705.13.1 and AISC 360-16 Chapter N and AISC 341-16 Chapter J)</b>			
ITEM FOR VERIFICATION & INSPECTION	INSPECTION PLAN		COMMENTS
	Every Element	Random Basis	
<b>Inspection Tasks Prior to Welding</b>			
Welding procedures specifications and manufacturer certifications for welding consumables shall be available	X	-	Welding procedures shall be submitted to the Engineer of Record for review.
Material identification (type/grade)	-	X	
Welder identification system	-	X	Verify there is a system in place to identify the welder who has welded a joint or member.
Fit-up of groove welds		X	Including joint geometry, joint preparation, dimensions, cleanliness, tacking and backing type and fit.
Configuration and finish of access holes	-	X	
Fit-up of fillet welds		X	Including alignment, gaps at root, dimensions, cleanliness and tacking.
Check welding equipment	-	X	
<b>Inspection Tasks During Welding</b>			
Use of qualified welders	-	X	
Control and handling of welding consumables	-	X	Including packaging and exposure control
Cracked tack welds	-	X	Verify no welding over cracked tack welds.
Environmental conditions	-	X	Including wind speed within limits and precipitation and temperature
WPS followed	-	X	Including settings on welding equipment, travel speed, selected welding materials, shielding gas type/flow rate, preheat applied, interpass temperature (min./max.) maintained, proper position (E, V, H, OH)
Welding techniques	-	X	Including interpass and final cleaning, each pass within profile limitations, each pass meets quality requirements
<b>Inspection Tasks After Welding</b>			
Welds cleaned	-	X	
Size, length and location of welds	X	-	
Welds meet visual acceptance criteria	X	-	Including crack prohibition, weld/base-metal fusion, crater cross section, weld profiles, weld size, undercut and porosity.
Arc strikes, k-area, weld access holes for flanges greater than 2", backing removed and weld tabs removed (if required), repair activities	X	-	When welding of doubler plates, continuity plates, or stiffeners has been performed in the k-area, visually inspect the web k-area for cracks within 3" of the weld.
Ultrasonic testing (UT) for complete-joint-penetration (CJP) groove welds, partial penetration groove welds when used in column splices, and welds subject to fatigue	-	X	Perform UT on 10% of welds subject to transversely applied tension loading in butt, T- and corner joints, in material 5/16" thick or greater. For materials less than 5/16" thick, ultrasonic testing is not required. The UT rate must be increased to 100% if the rejection rate exceeds 5% of the welds tested. See Sections N5.5d and N5.5f for more information. (Engineers Note: Use this row and delete the next row if you are a Risk Category II building)
Document acceptance or rejection of each welded joint or member	X	-	

MISCELLANEOUS STEEL CONSTRUCTION INSPECTIONS

Metal Deck Construction (2018 IBC section 1705.2.2, AWS D1.3, and section 6.1 of SDI QA/QC-2011)			
ITEM FOR VERIFICATION & INSPECTION	INSPECTION FREQUENCY		COMMENTS
	CONTINUOUS	PERIODIC	
Material verification of metal deck(s)	-	X	Confirm that identification markings are provided that conform to applicable ASTM standards specified on construction documents
Placement and installation of metal deck	-	X	Confirm that the deck is installed per the approved construction documents, installation drawings, shop drawings and applicable reference standards.
Roof deck welding/fastening	-	X	Visual inspection is required to verify size and spacing of welds/fasteners for deck attachment to the supporting structure. Also verify spacing and size of side-seam attachments. Confirm that welds/fasteners meet acceptance criteria of applicable referenced standards and manufacturer's instructions. Where applicable, welder qualifications should be verified.

MASONRY CONSTRUCTION INSPECTIONS

Prior to Construction (2018 IBC section 1705.4 and TMS 602)			
ITEM FOR VERIFICATION	COMMENTS		
Verification of compliance of submittals	Verify that materials conform to the requirements of the approved submittals. Mix design, test results, material certificates, and construction procedures should be submitted for review.		
Verification of f'm	Verify that materials conform to the requirements of the approved construction documents.		
Verification of material certificates, mix designs, and test results	Mortar mix designs shall conform to ASTM C 270 while grout shall conform to ASTM C 476. Material certificates shall be provided for the following: reinforcement; anchors, ties, fasteners, and metal accessories; masonry units; mortar and grout materials. Construction procedures for cold-weather or hot-weather construction shall be reviewed.		
<b>As masonry construction begins (2018 IBC section 1705.4 and TMS 602 Table 4)</b>			
ITEM FOR VERIFICATION & INSPECTION	INSPECTION FREQUENCY		COMMENTS
	CONTINUOUS	PERIODIC	
Proportions of site-prepared mortar, construction of mortar	-	X	
Grade, type and size of reinforcement, connector, and anchors	-	X	
Sample wall panel construction	-	X	Use materials and procedures accepted for the Work to create a minimum sample panel size of 4 ft by 4 ft. The acceptable standard for the Work is established by the accepted panel and retained at the project site until Work has been accepted.
<b>Prior to grouting and during construction - Structural Masonry shall have Level B special inspection (2018 IBC section 1705.4 and TMS 602 Table 4)</b>			
ITEM FOR VERIFICATION & INSPECTION	INSPECTION FREQUENCY		COMMENTS
	CONTINUOUS	PERIODIC	
Grout Space	-	X	Verify grout space is clean prior to grouting
Placement, grade, type and size of reinforcement, connectors and anchor bolts and anchorages	-	X	
Proportions of site-prepared grout	-	X	
Materials and procedures with the approved submittals	-	X	
Placement of masonry units and mortar joint construction	-	X	
Size and location of structural members	-	X	
Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction	-	X	
Protection of masonry during cold weather (below 40 deg F) and hot weather (above 90 deg F)	-	X	
Grout placement (including verification of Slump flow and Visual Stability Index (VSI) when self-consolidating grout is delivered to the project site.)	X	-	
Observe preparation of grout specimens, mortar specimens and/or prisms	-	X	The contractor has the option of using the "Prism Test Method" per ACI 530.1/ASCE 6/TMS 602 in lieu of the "Unit Strength Method."

POST-INSTALLED ANCHOR INSPECTIONS

ITEM FOR VERIFICATION & INSPECTION	INSPECTION FREQUENCY		COMMENTS
	CONTINUOUS	PERIODIC	
<b>Post Installed Anchors and Reinforcing Bars (2018 IBC Section 1705.1.1)</b>			
Epoxy Anchors and Reinforcing Bars	X	-	Special inspection shall be performed per manufacturer's requirements and approved ICC-ES reports noted in POST-INSTALLED ANCHOR section of the General Structural Notes prior to installation of epoxy and anchor rod. If the anchor is not installed in a horizontal, upwardly inclined or overhead orientation meant to resist sustained tension loads, special inspection may be reduced to a periodic frequency.
Mechanical Anchors and Screw Anchors	-	X	Special inspection shall be provided per manufacturer's requirements and approved ICC-ES reports noted in POST-INSTALLED ANCHOR section of the General Structural Notes prior to installation of mechanical or screw anchor.

NON-STRUCTURAL COMPONENT CONSTRUCTION INSPECTIONS

Architectural Components located in Seismic Design Categories C, D, E and F (2018 IBC Sections 1705.12.5 and 1705.12.7)			
ITEM FOR VERIFICATION & INSPECTION	INSPECTION FREQUENCY		COMMENTS
	CONTINUOUS	PERIODIC	
Erection and fastening of interior and exterior nonbearing walls	-	X	Verify appropriate materials, fasteners and attachment at commencement of work and at completion. (Not required if <30 feet or for interior walls < 15 psf.)
<b>Mechanical and Electrical Components located in Seismic Design Categories C, D, E and F (2018 IBC Sections 1705.12.4 and 1705.12.6)</b>			
ITEM FOR VERIFICATION & INSPECTION	INSPECTION FREQUENCY		COMMENTS
	CONTINUOUS	PERIODIC	
Designated seismic systems	-	X	Verify that manufacturer's certificate of compliance conforms to the requirements of Section 13.2 of ASCE 7-16. Verify that the label, anchorage or mounting conforms to the manufacturer's certificate of compliance.

STRUCTURAL OBSERVATION PROGRAM

If structural observations are required, they shall be done by the Engineer of Record or an approved subordinate at the stages of construction listed in the Construction Notification Phases section of these notes. At the conclusion of the project, the designated structural observer shall submit to the building official a written statement that the site visits have been made and identify any reported deficiencies that to the best of the structural observer's knowledge have not been resolved (See IBC 2018 1704.6).

STRUCTURAL OBSERVATION PROGRAM REQUIRED BY CODE:	YES	NO
		X

CONSTRUCTION MILESTONE SCHEDULE

CONTRACTOR TO NOTIFY ENGINEER AT THE FOLLOWING CONSTRUCTION PHASES:	
<b>CONCRETE</b>	
Footings, stem walls and piers	Prior to pouring concrete
<b>STEEL</b>	
Roof framing	After substantial portion of framing is erected
Roof deck	After welding/fastening and prior to roofing
<b>MASONRY</b>	
Masonry walls	Prior to pouring grout

DEFERRED SUBMITTALS

For the purposes of this section, deferred submittals are defined as per section 107.3.4.1 of the IBC 2018. Submittal documents for deferred submittal items shall be submitted to the engineer, architect and building official for their review for general conformance with the design of the building.

DEFERRED STRUCTURAL SUBMITTALS FOR THIS PROJECT ARE

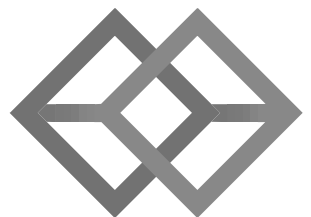
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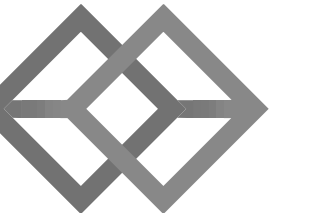


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**project:**

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO



**project#:** 190527  
**date:** Feb. 10, 2020

**revisions:**

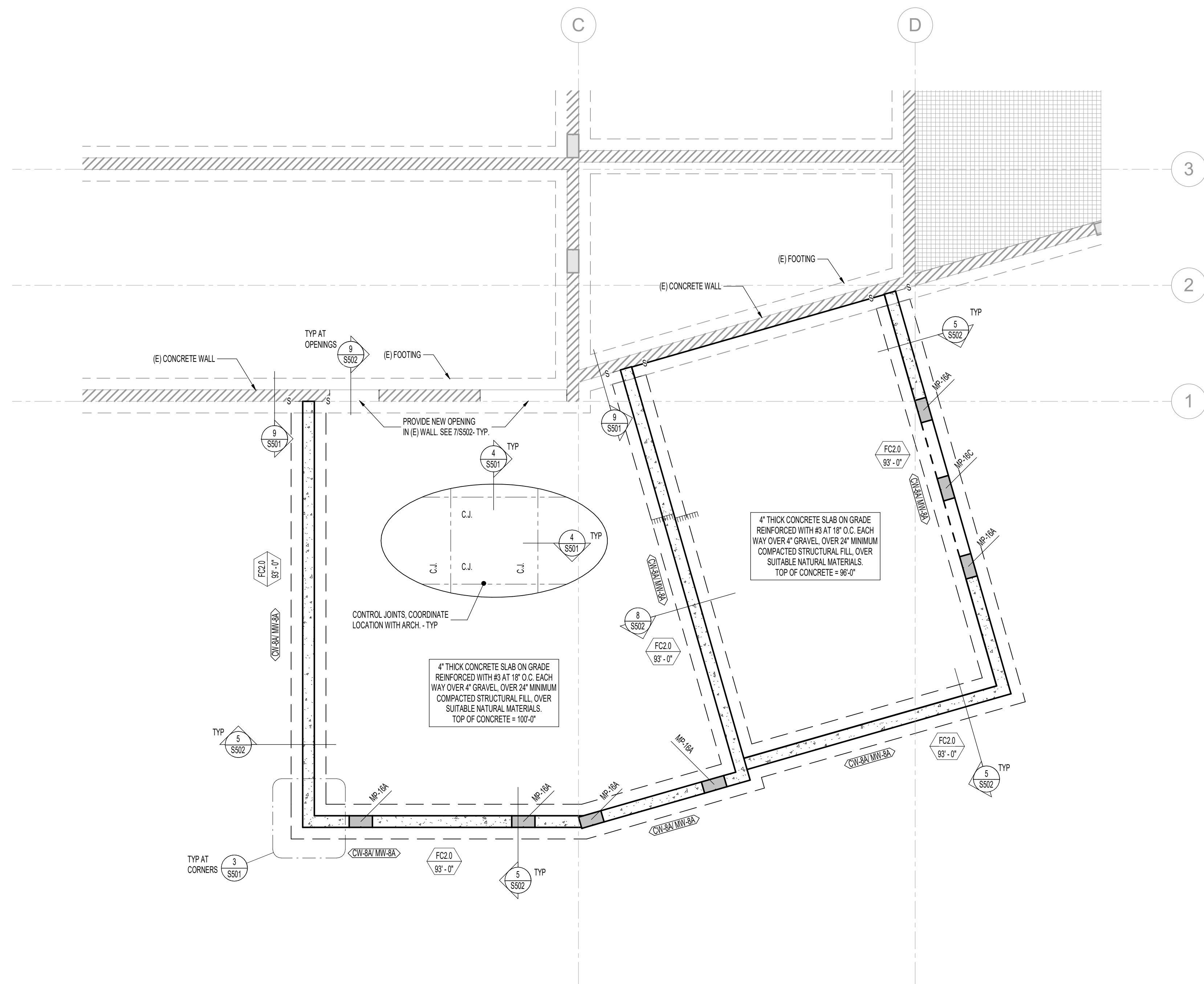
**title:**

**FOOTING AND  
FOUNDATION  
PLAN**

**sheet:**

**S101**

PERMIT SET

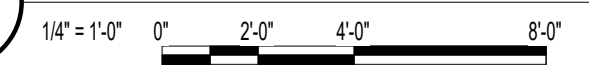


MARKS AND SYMBOLS LEGEND	
	SECTION MARK
	SHEET NUMBER
	FOOTING DESIGNATION
	INDICATES CONCRETE WALL DASHED WALLS STOP AT DECK
	INDICATES EXISTING WALL
	DEPRESS FOUNDATION WALL AND POUR SLAB OVER. SEE DETAIL 5/S502
	INDICATES MASONRY WALL (AND TYPE) OVER CONCRETE WALL (AND TYPE). SEE SCHEDULE ON SHEET S601
	INDICATES FOOTING STEP. SEE DETAIL 9/S501
	INDICATES FLOOR OFFSET. SEE DETAILS
	INDICATES MASONRY PIER TYPE. SEE SCHEDULE ON SHEET S601
	INDICATES CONTINUOUS FOOTING. SEE SCHEDULE ON SHEET S601

**FOOTING AND FOUNDATION PLAN NOTES**

- COORDINATE LOCATION OF DEPRESSED SLABS, SLOPED SLABS, AND FLOOR DRAINS WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
- SEE ARCHITECTURAL AND CIVIL DRAWINGS FOR EXTERIOR CONCRETE WORK AT DOORS, SIDEWALKS, ETC.
- SEE ARCHITECTURAL DRAWINGS FOR CONTROL JOINT LOCATIONS.
- SEE "EARTHWORK" NOTES ON SHEET S001 AND DETAIL 10/S501 FOR MINIMUM FILL REQUIRED BENEATH FOOTINGS.
- SEE DETAILS 1/S502 AND 2/S502 FOR CONDITION WHERE BURIED PIPES RUN PARALLEL AND PERPENDICULAR TO FOOTINGS.
- SEE DETAIL 4/S501 FOR TYPICAL CONTROL/CONSTRUCTION JOINTS IN CONCRETE SLAB ON GRADE.
- SEE DETAIL 6/S501 FOR SLAB REINFORCING WHERE CONTROL JOINTS ARE DISCONTINUOUS.
- SEE DETAIL 7/S501 FOR ADDITIONAL REINFORCING AT MISCELLANEOUS OPENINGS IN MASONRY WALLS.
- SEE DETAIL 8/S501 FOR ADDITIONAL REINFORCING AT MISCELLANEOUS OPENINGS IN CONCRETE WALLS.
- SEE DETAIL 3/S502 FOR CONDITION AT RECESSES IN MASONRY WALLS.
- SEE DETAIL 4/S502 FOR TYPICAL CONTROL JOINTS IN MASONRY WALLS.
- SEE DETAIL 6/S502 FOR TERMINATION OF HORIZONTAL REINFORCING IN MASONRY WALLS.

**1** FOOTING AND FOUNDATION PLAN



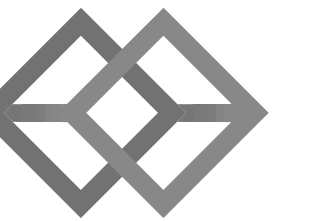


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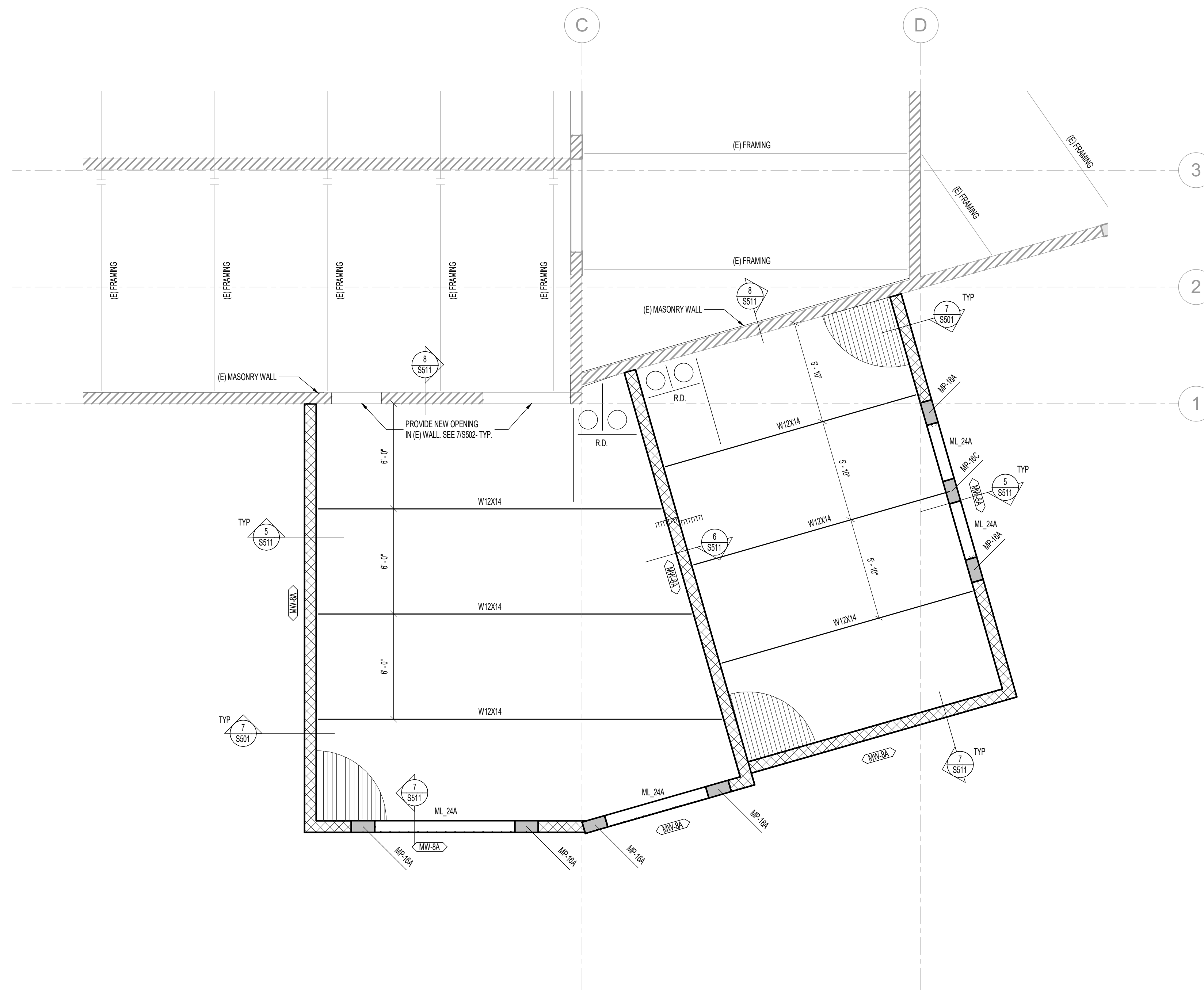
**title:**

**ROOF  
FRAMING  
PLAN**

**sheet:**

**S111**

PERMIT SET



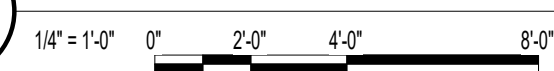
**MARKS AND SYMBOLS LEGEND**

	SECTION MARK
	SHEET NUMBER
	INDICATES MASONRY WALL. DASHED WALLS STOP AT DECK.
	INDICATES EXISTING WALL.
	INDICATES MASONRY LINTEL TYPE. SEE SCHEDULE ON SHEET S601
	INDICATES METAL ROOF DECK. SEE GENERAL STRUCTURAL NOTES ON SHEET S601
	INDICATES MASONRY LINTEL TYPE. SEE SCHEDULE ON SHEET S601
	INDICATES MASONRY PIER TYPE. SEE SCHEDULE ON SHEET S601
	INDICATES ROOF DRAIN. SEE DETAIL 2SS11
	INDICATES FLOOR OFFSET. SEE DETAILS

**ROOF FRAMING PLAN NOTES**

1. VERIFY ALL ROOF OPENINGS FOR MECHANICAL SHAFTS, DRAINS, ETC. WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
2. ALL ROOF OPENINGS GREATER THAN, OR EQUAL TO, 12" x 12" SHALL BE FRAMED AS INDICATED IN DETAILS 1SS11 AND 2SS11. FOR OPENINGS WHICH CUT LESS THAN TWO DECK FLUTES, SEE DETAIL 3SS11.
3. COORDINATE OPENINGS WITH MECHANICAL, ELECTRICAL, AND GENERAL CONTRACTORS.
4. LOCATE MISCELLANEOUS MECHANICAL OPENINGS BETWEEN JOISTS. NOT UNDERNEATH THEM.
5. SEE DETAIL 7SS01 FOR ADDITIONAL REINFORCING AT MISCELLANEOUS OPENINGS IN MASONRY WALLS.
6. SEE DETAIL 3SS02 FOR CONDITION AT RECESSES IN MASONRY WALLS.
7. SEE DETAIL 4SS02 FOR TYPICAL CONTROL JOINTS IN MASONRY WALLS.
8. SEE DETAIL 6SS02 FOR TERMINATION OF HORIZONTAL REINFORCING IN MASONRY WALLS.

**1 ROOF FRAMING PLAN**

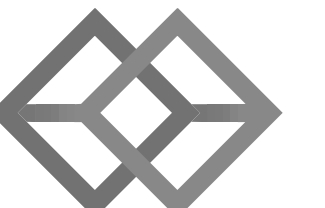




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ADDITION

Grand Junction, CO



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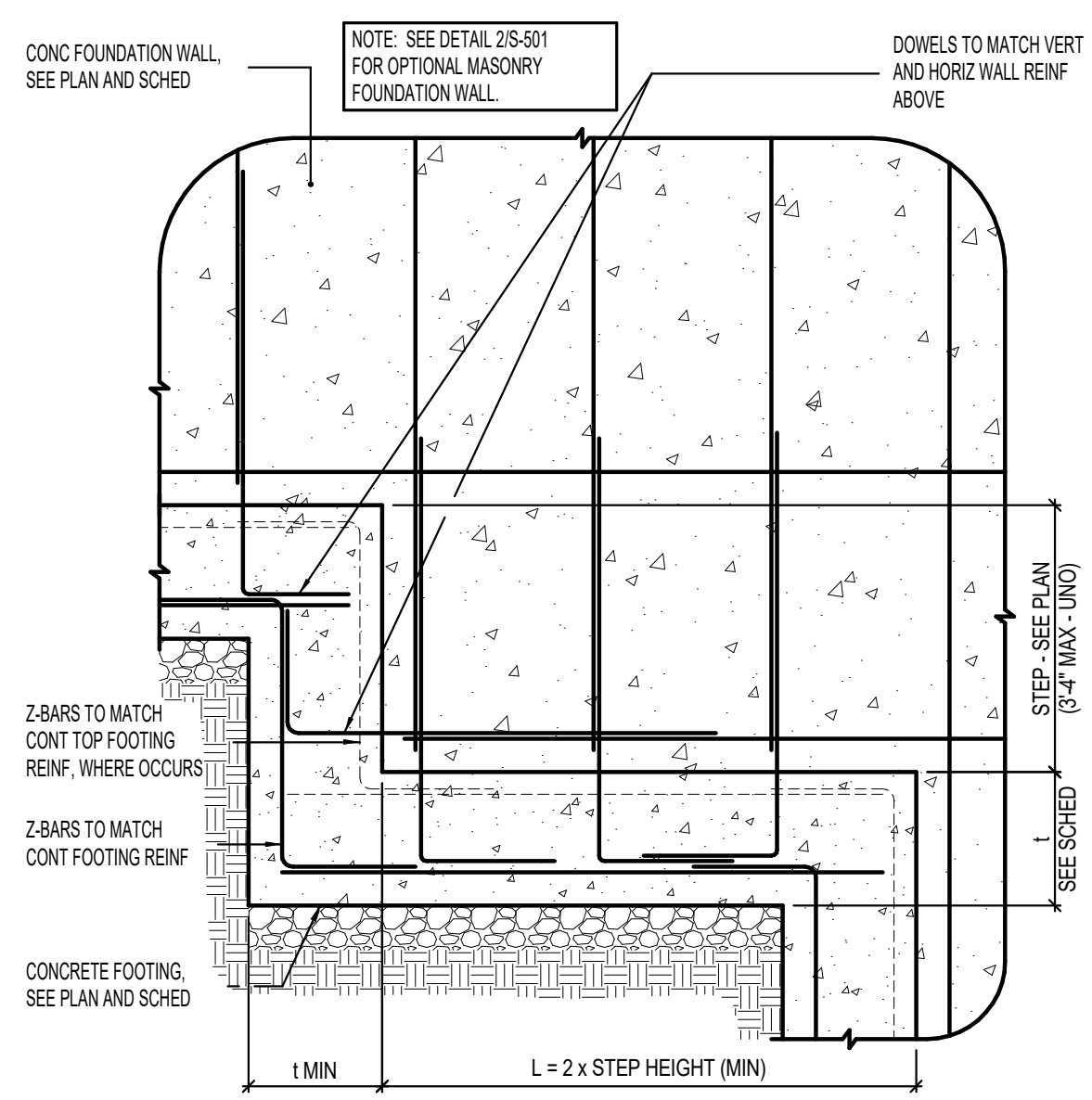
**revisions:**

**title:**  
**DETAILS**

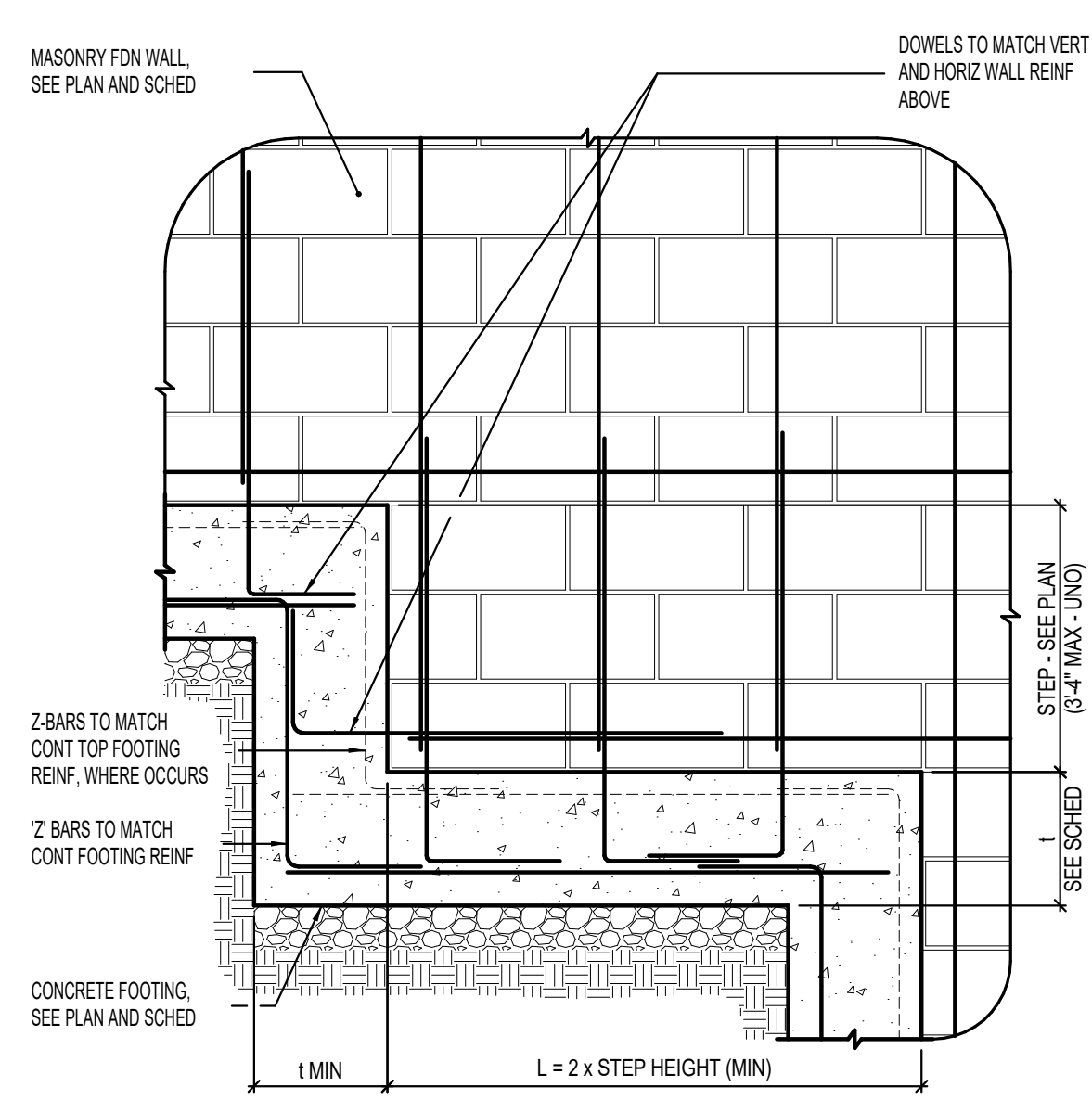
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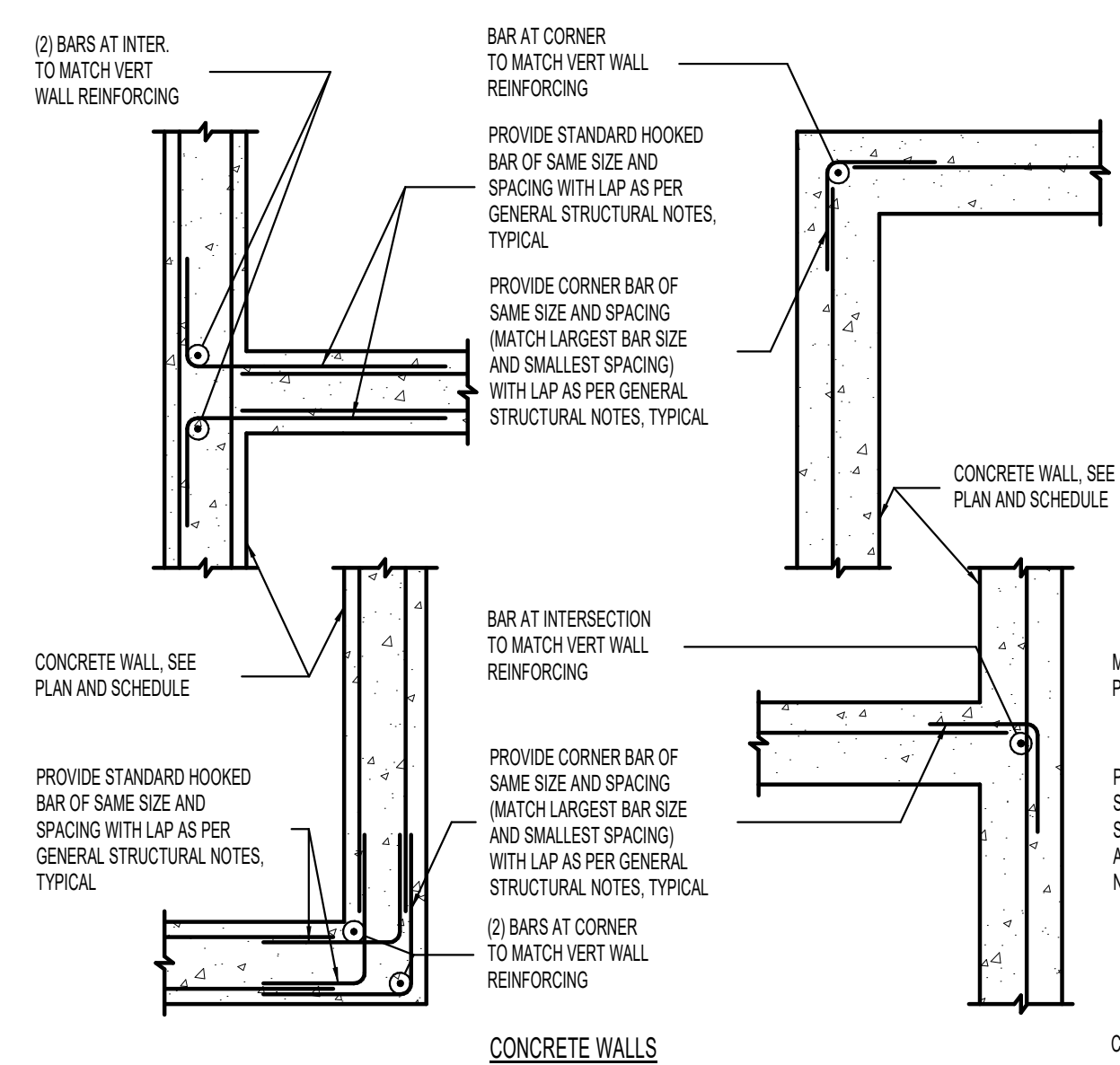
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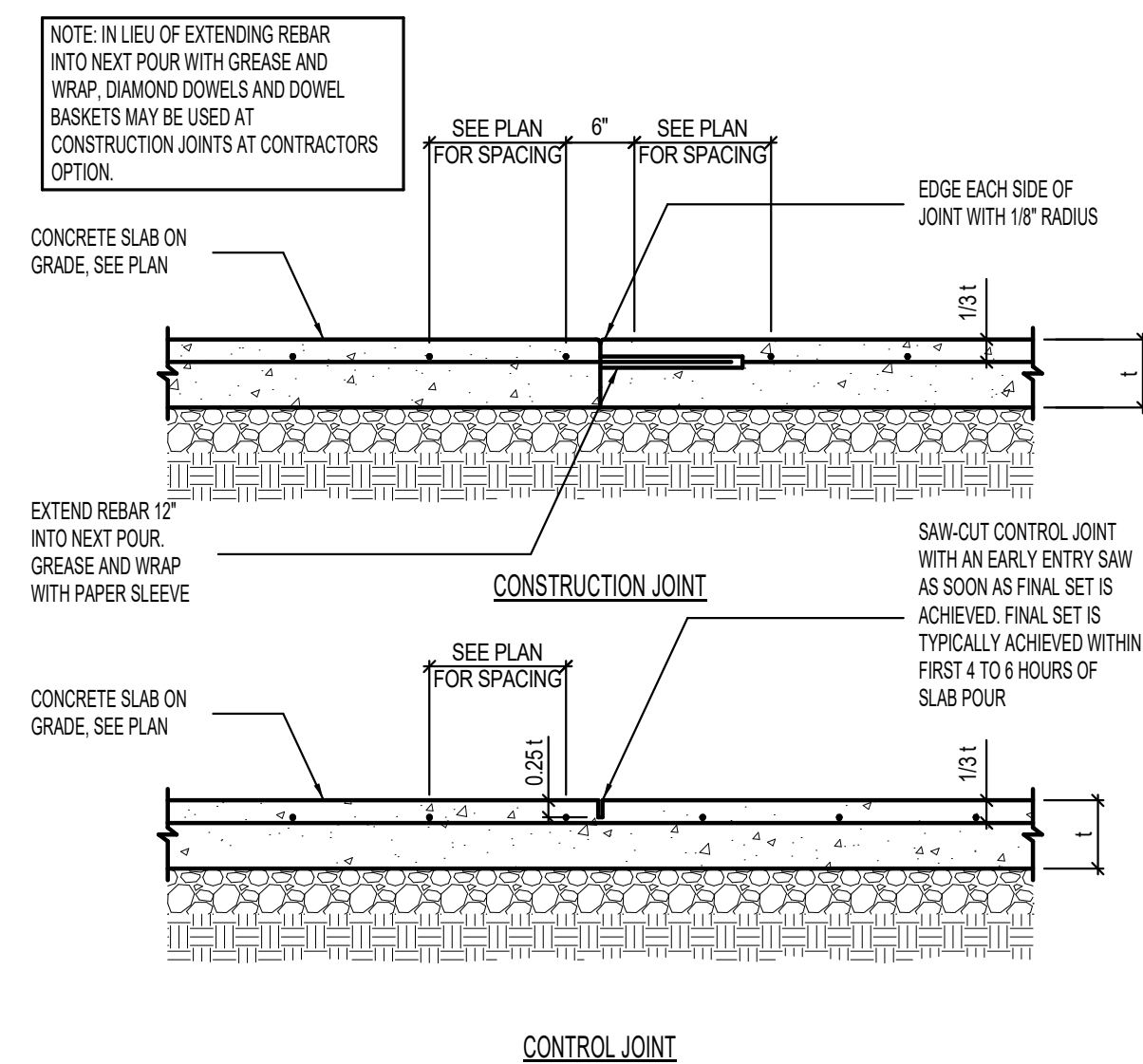
**1** TYPICAL FOOTING STEP DETAIL  
NO SCALE



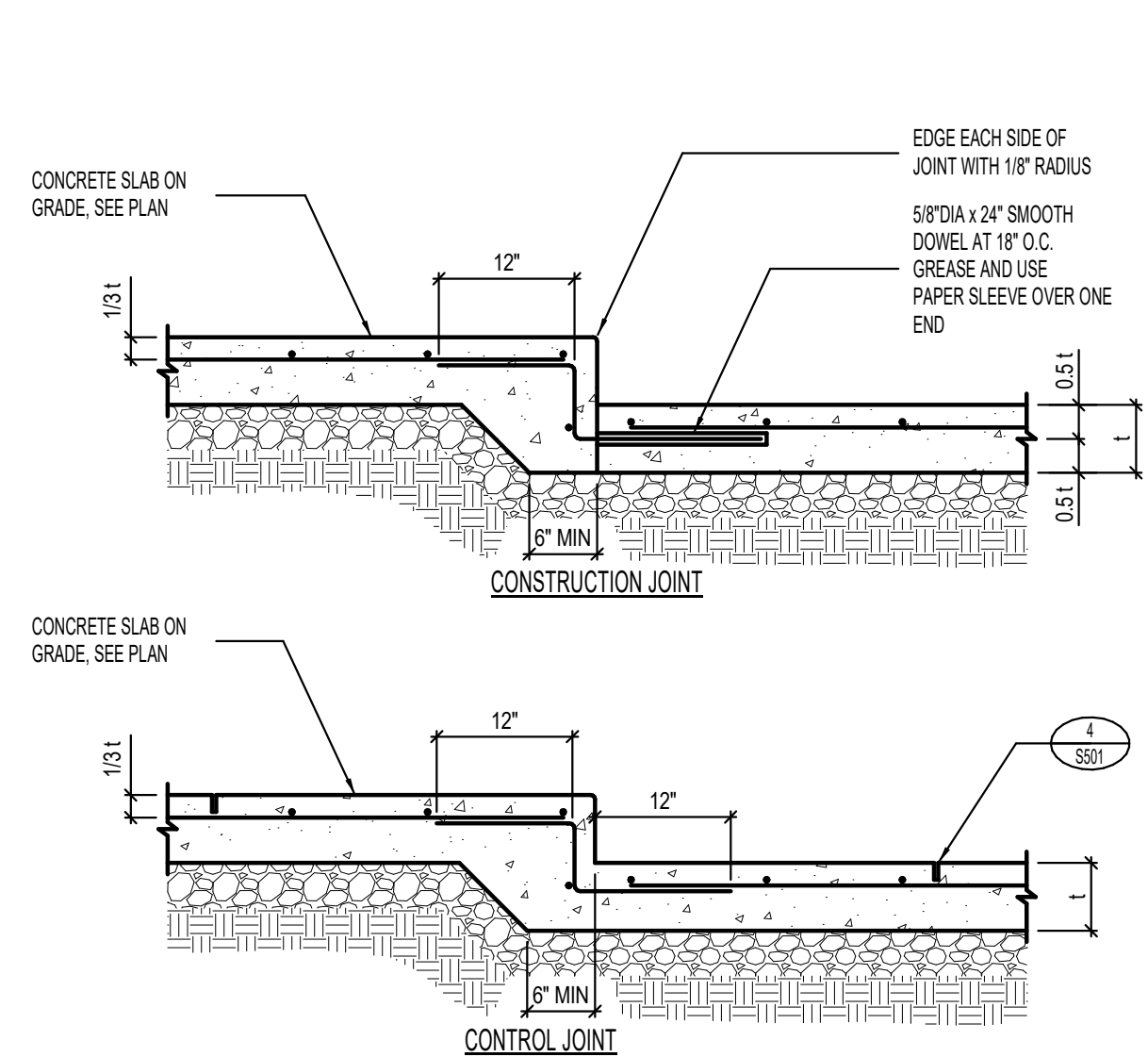
**2** TYPICAL FOOTING STEP AT MASONRY FOUNDATION WALL [OPTIONAL]  
NO SCALE



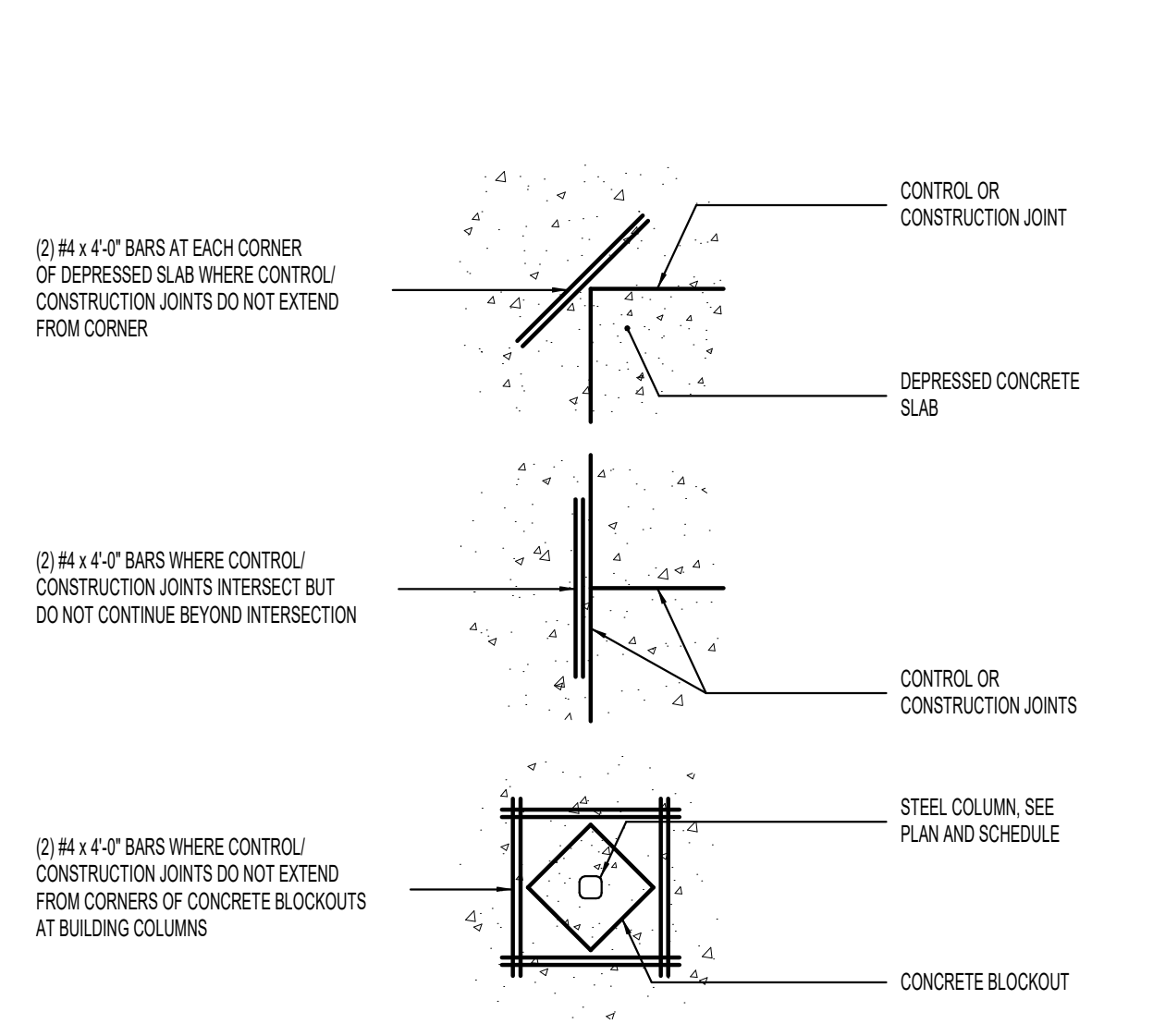
**3** TYPICAL CORNER WALL REINFORCING [PLAN VIEW]  
NO SCALE



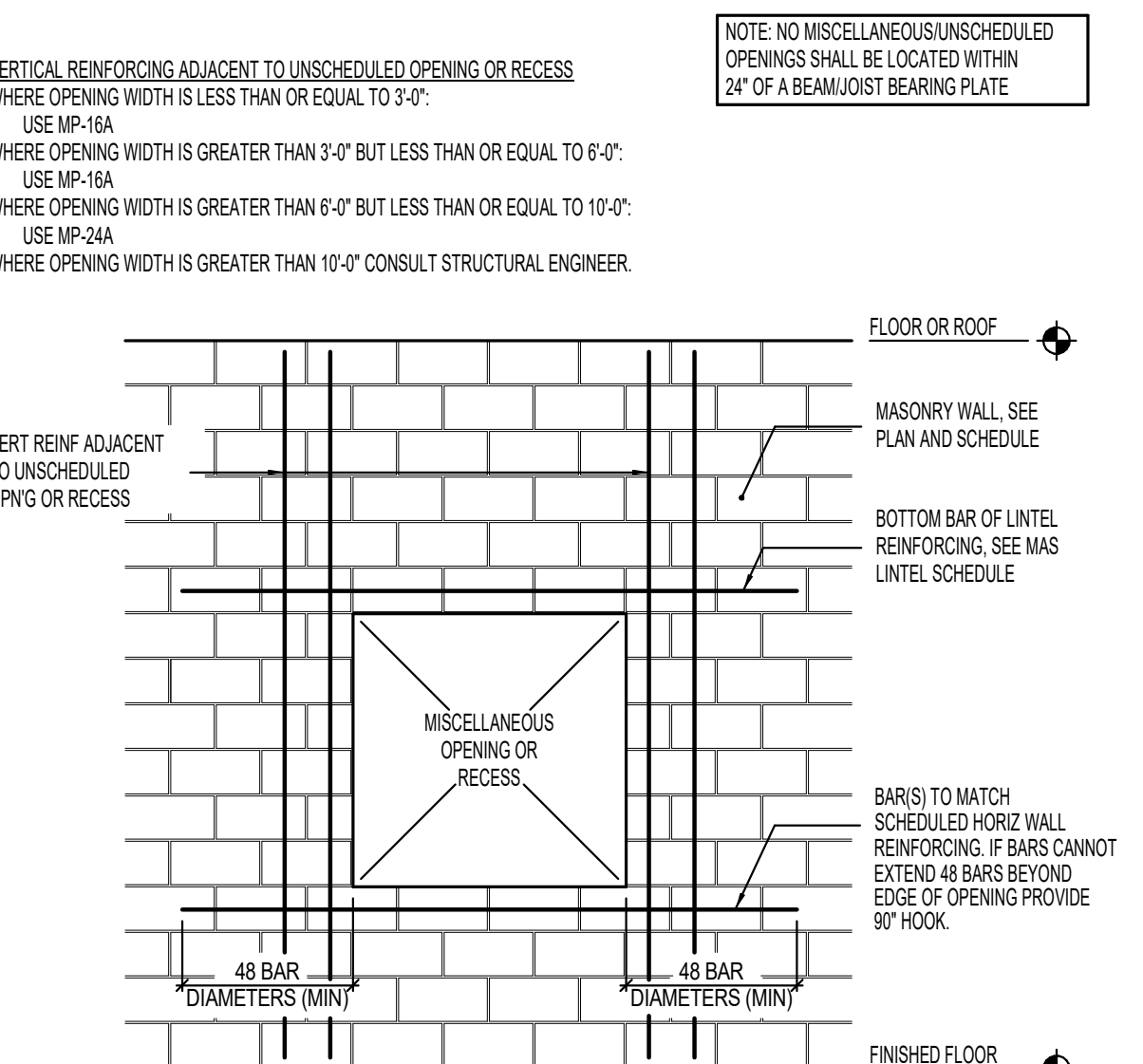
**4** TYPICAL SLAB ON GRADE JOINT DETAILS  
NO SCALE



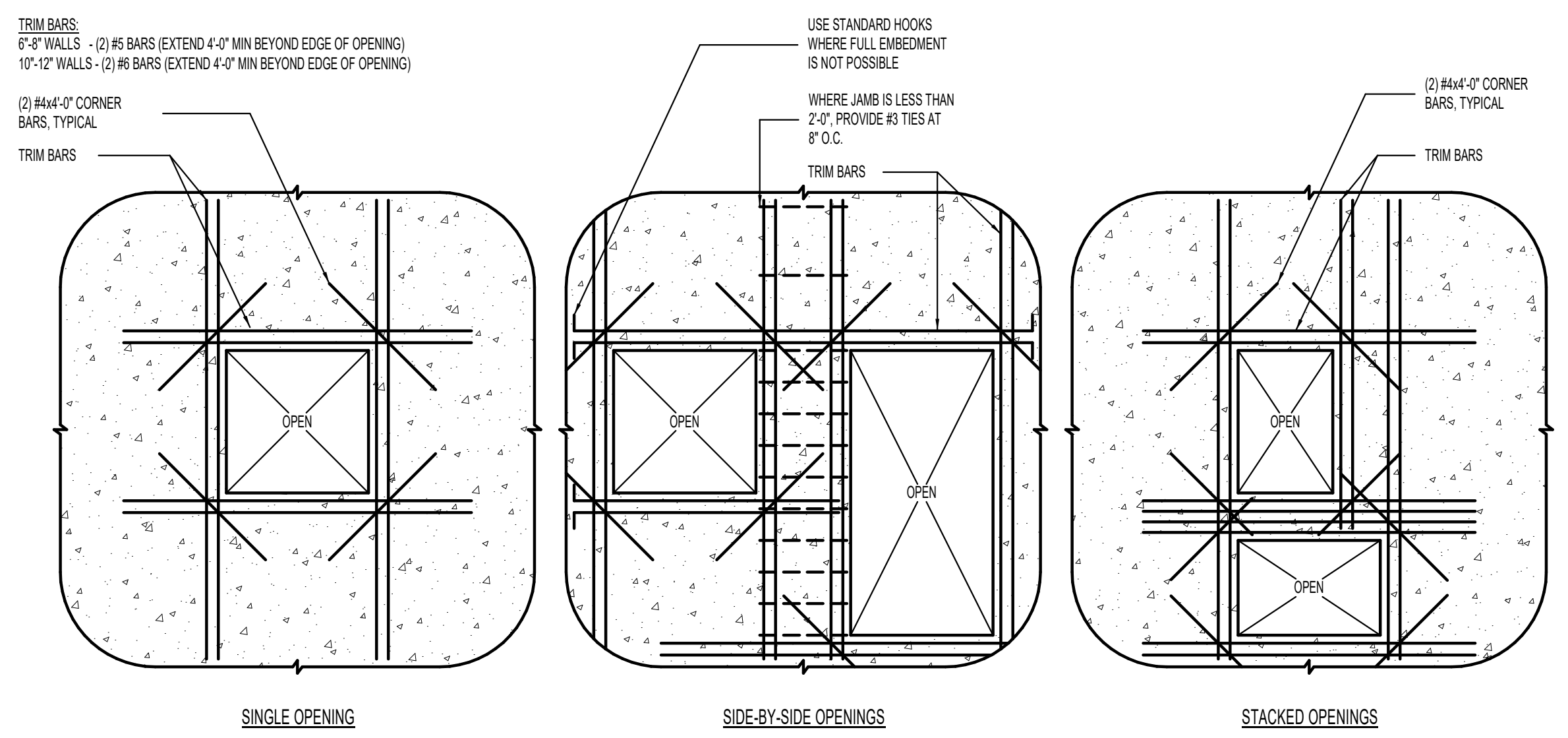
**5** JOINT DETAILS AT SLAB DEPRESSIONS  
NO SCALE



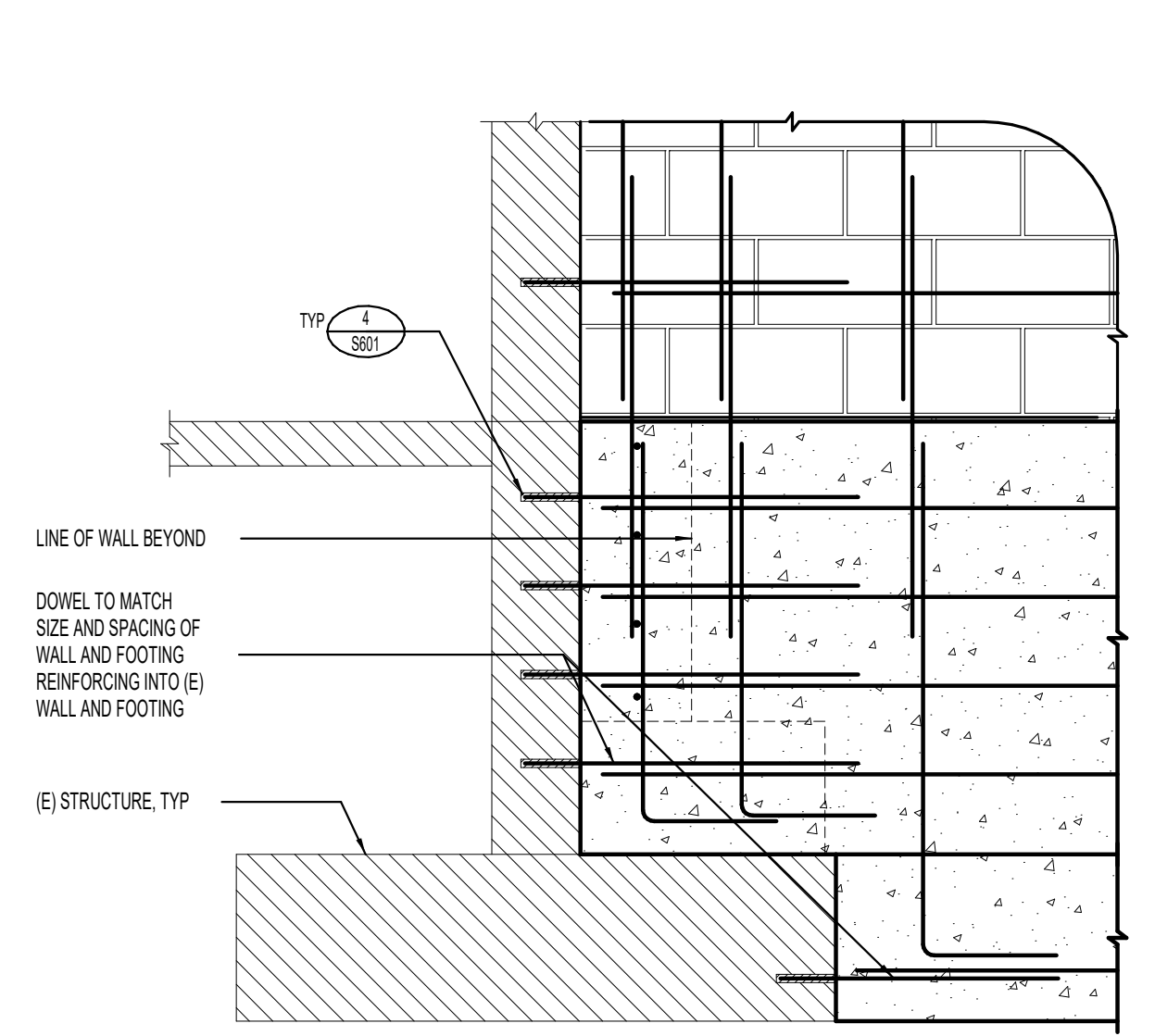
**6** LOCATIONS REQUIRING ADDITIONAL SLAB REINFORCING [PLAN VIEW]  
NO SCALE



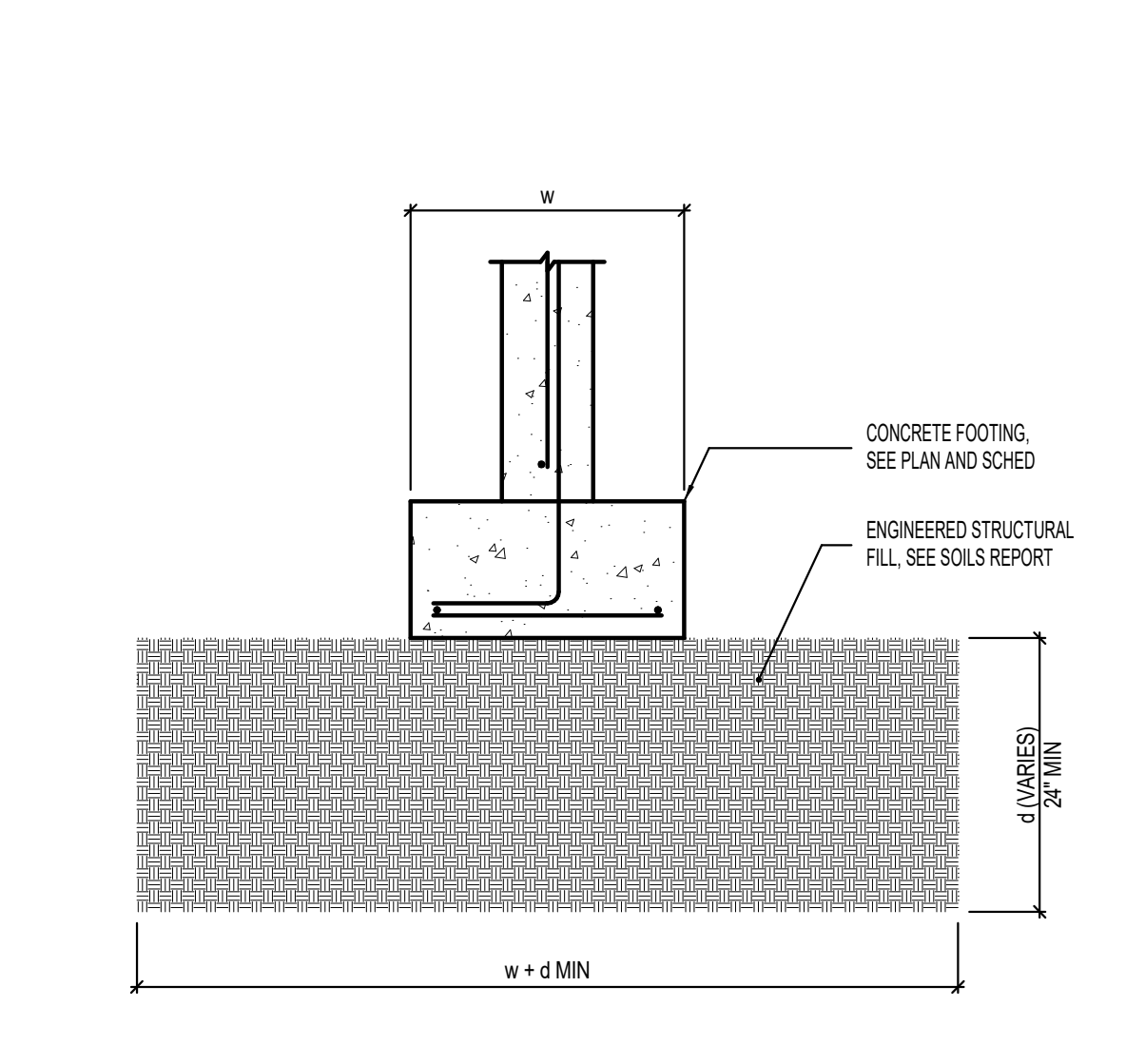
**7** REINFORCING AT UNSCHEDULED MISCELLANEOUS OPENINGS OR RECESSES IN MASONRY WALLS  
NO SCALE



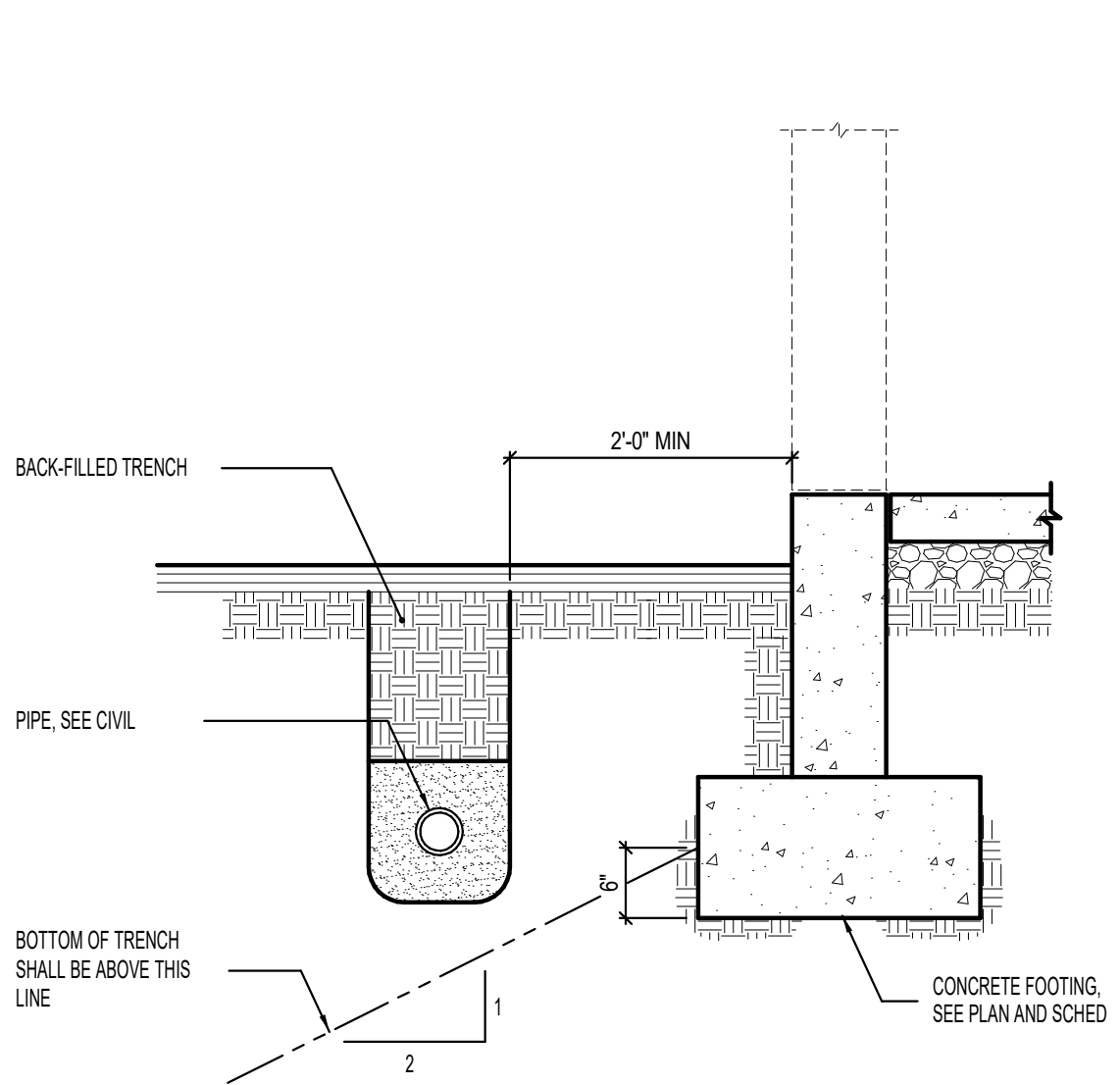
**8** TYPICAL REINFORCING FOR MISCELLANEOUS OPENINGS LESS THAN 3'-0" IN CONCRETE WALLS WHERE MISCELLANEOUS OPENING WIDTH IS GREATER THAN 3'-0" WIDE, CONTACT STRUCTURAL ENGINEER.  
NO SCALE



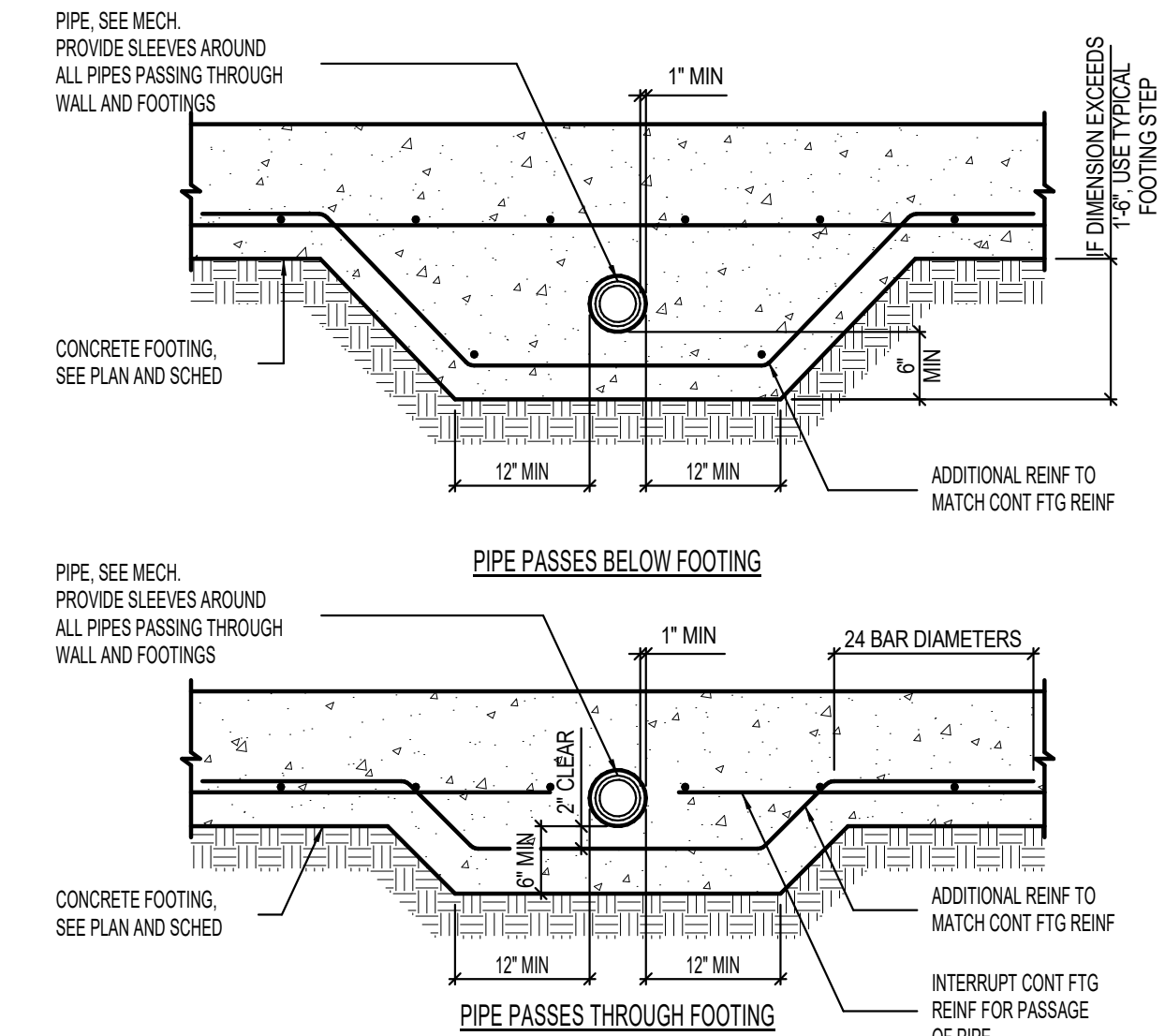
**9** FOUNDATION WALL AT EXISTING STRUCTURE  
NO SCALE



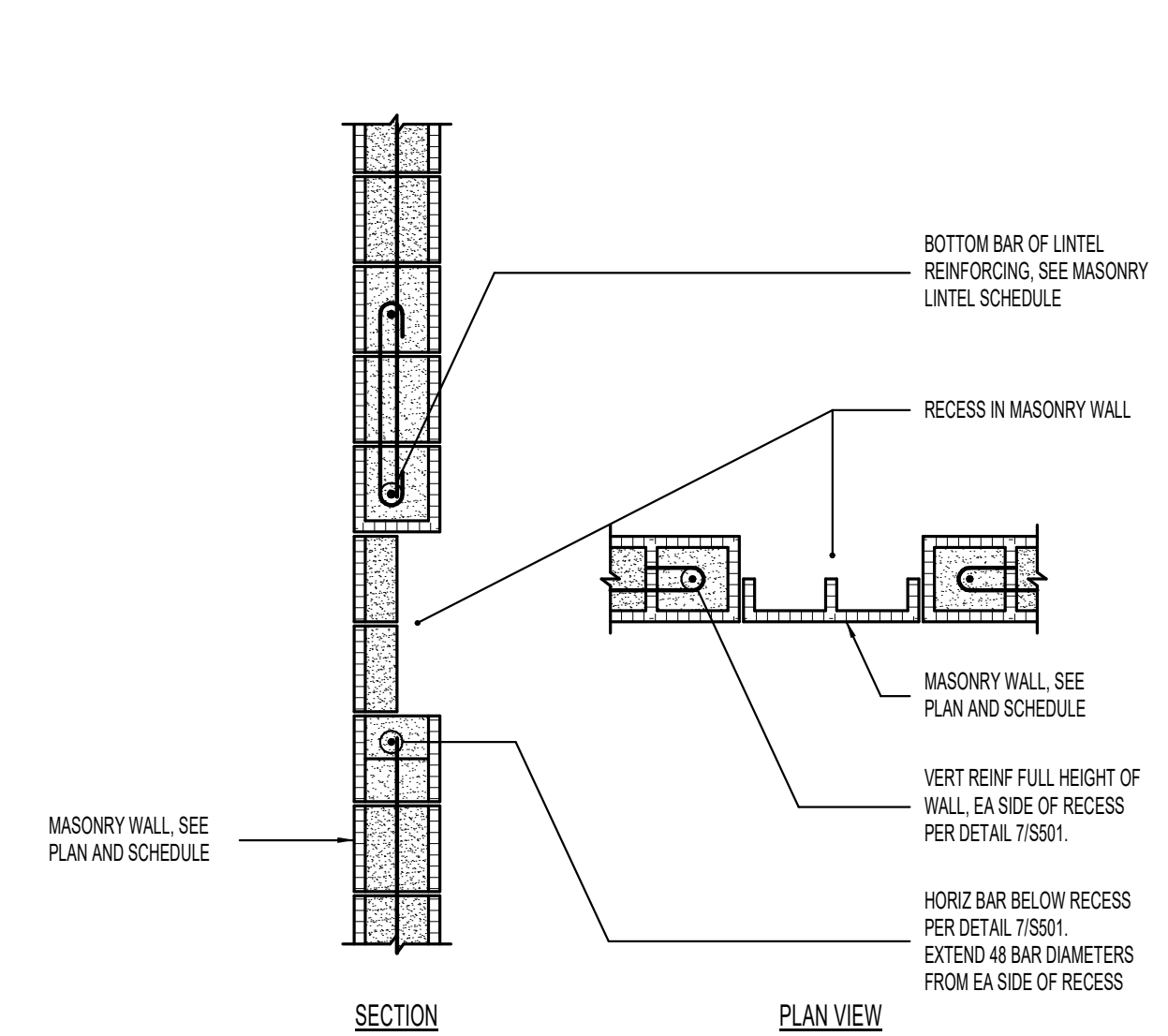
**10** ENGINEERED STRUCTURAL FILL DETAIL  
NO SCALE



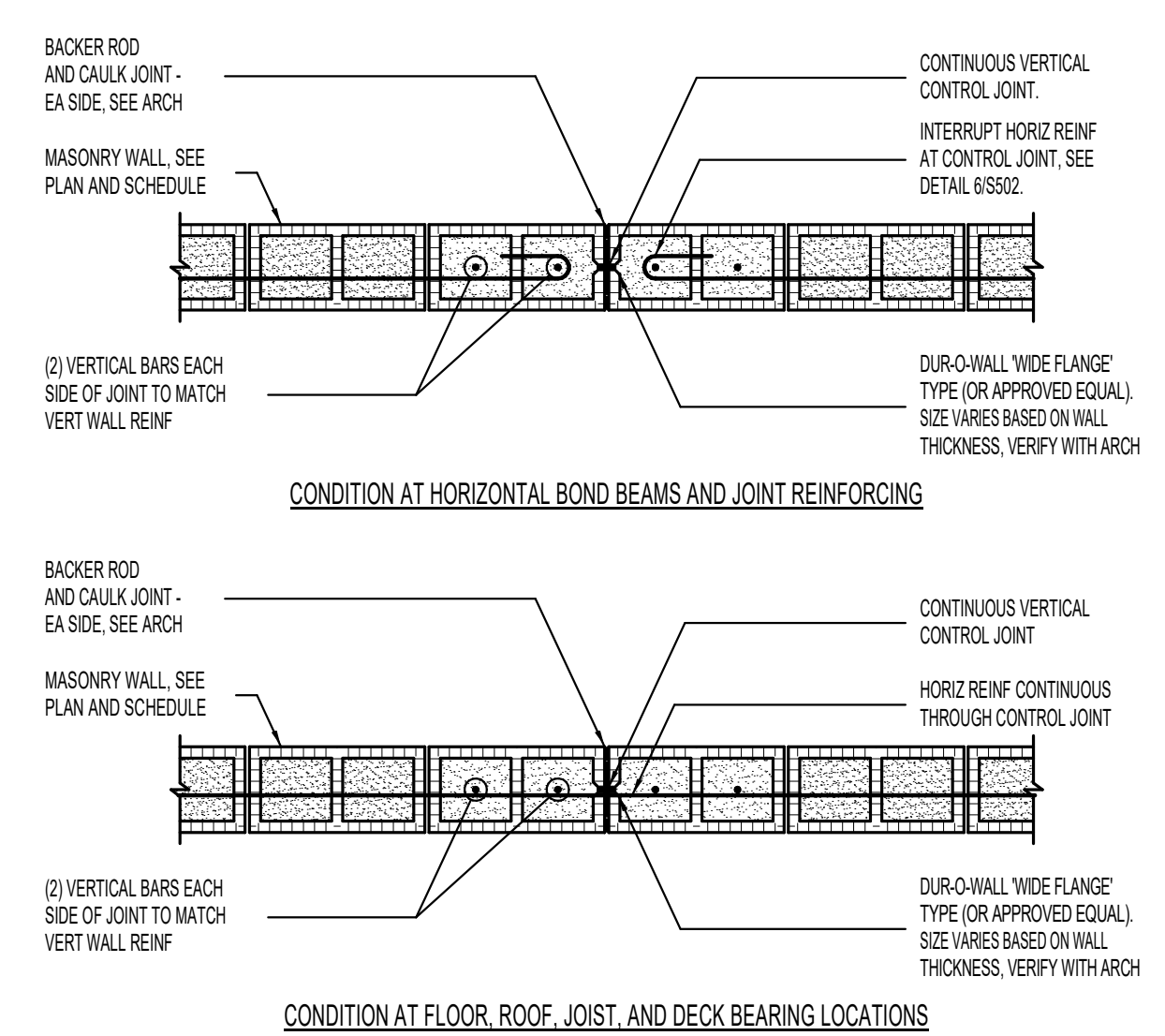
1 CONDITION AT PIPE PARALLEL TO CONCRETE FOOTING NO SCALE



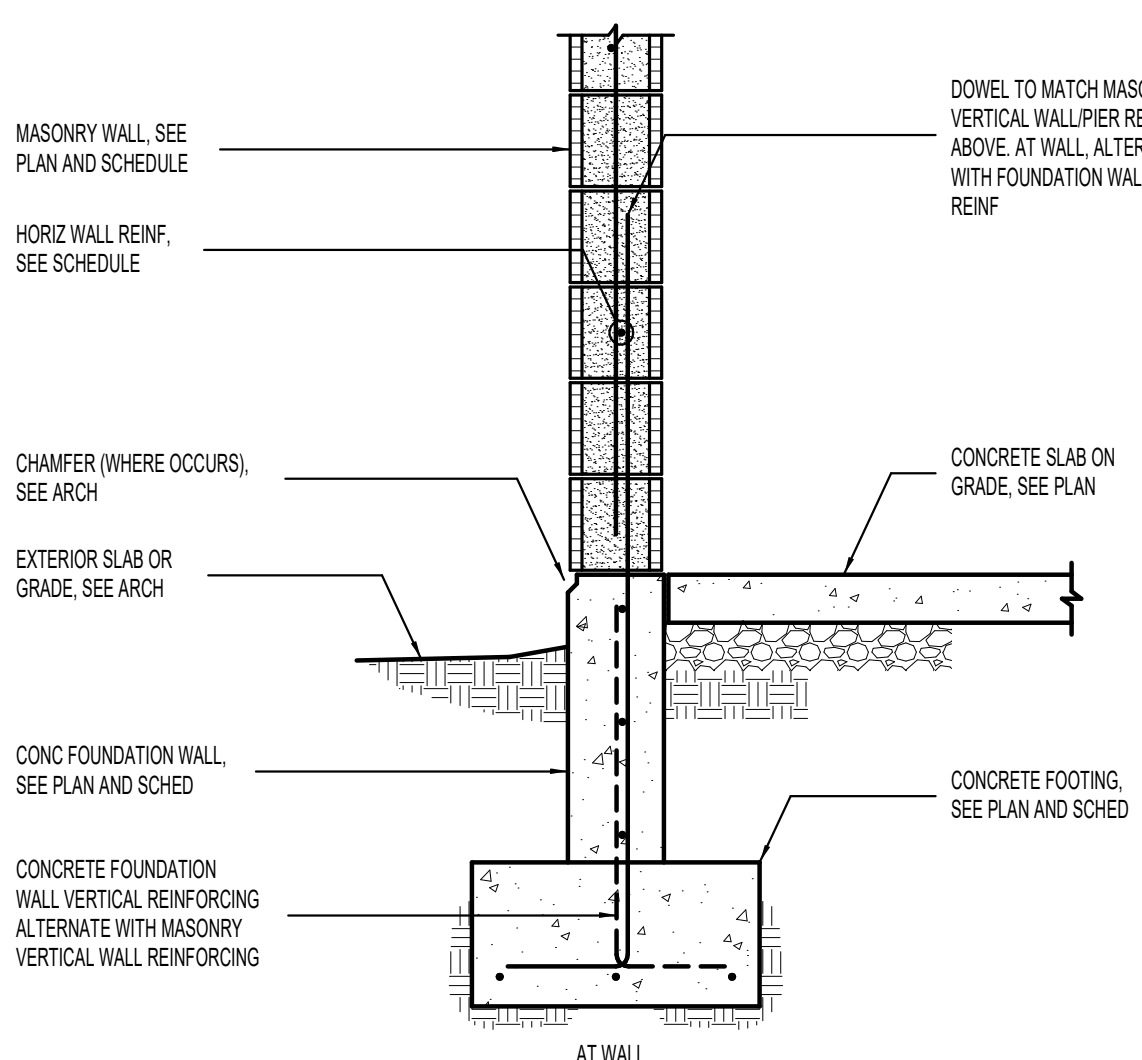
2 CONDITIONS AT PIPE PERPENDICULAR TO FOOTING NO SCALE



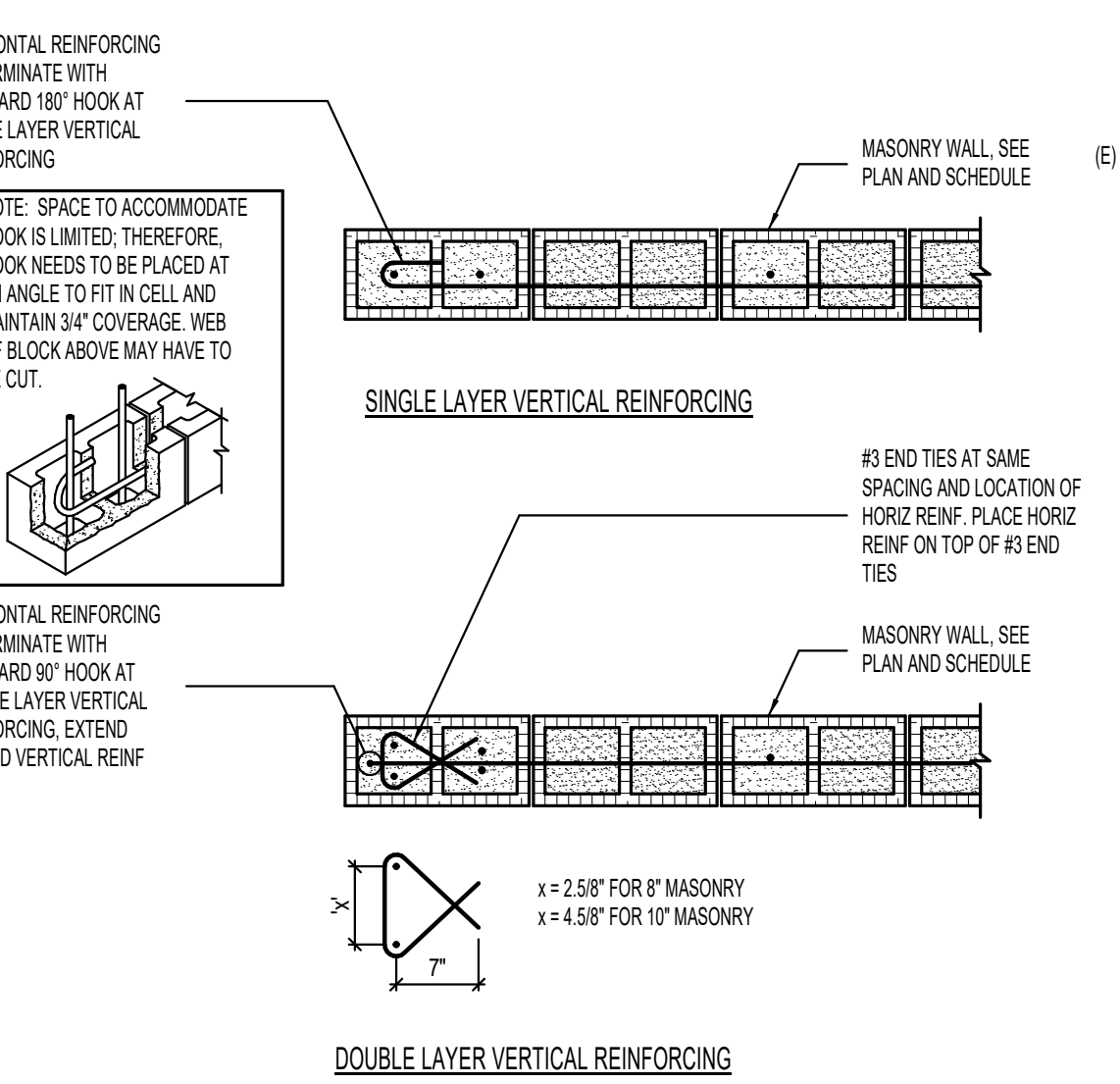
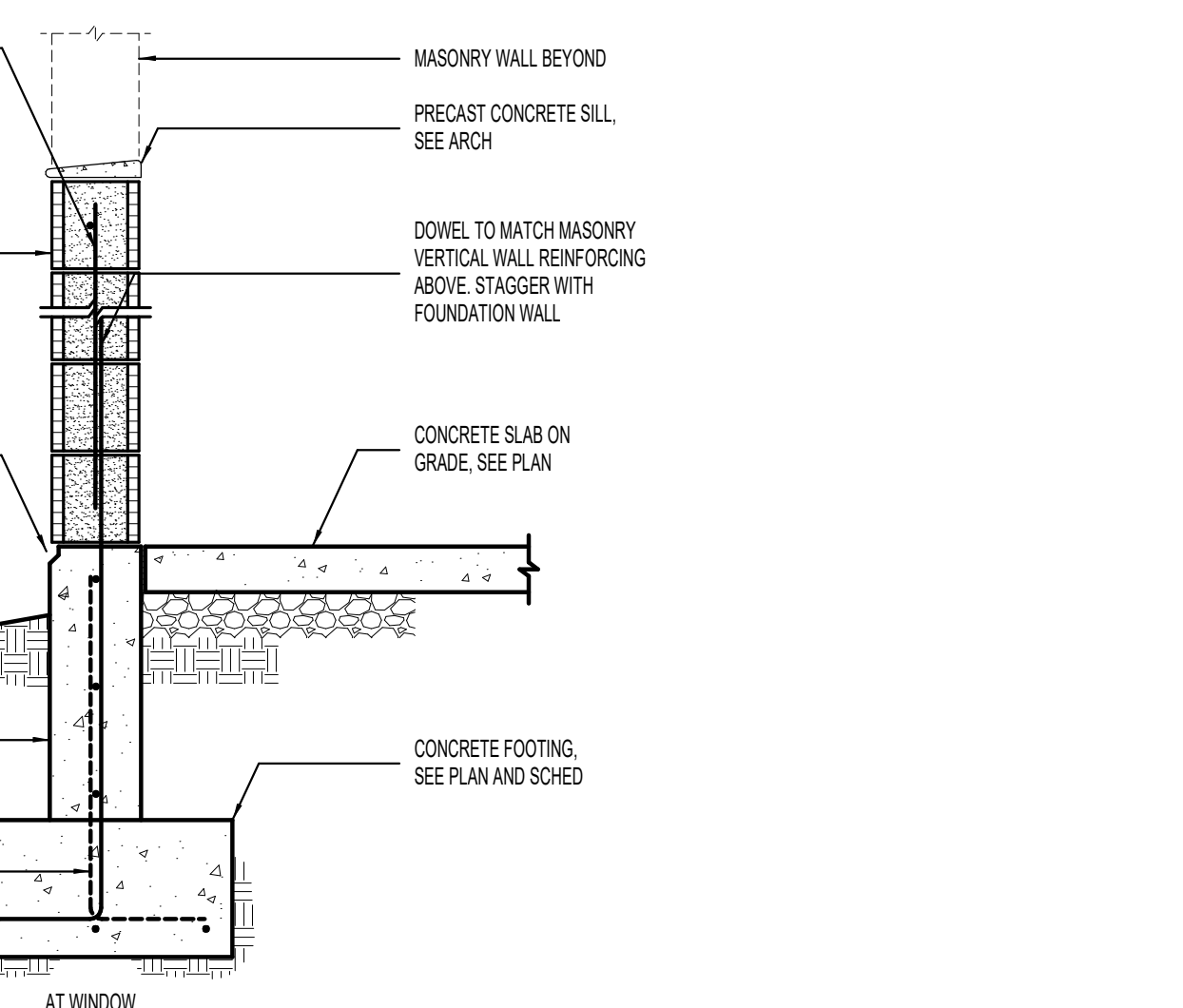
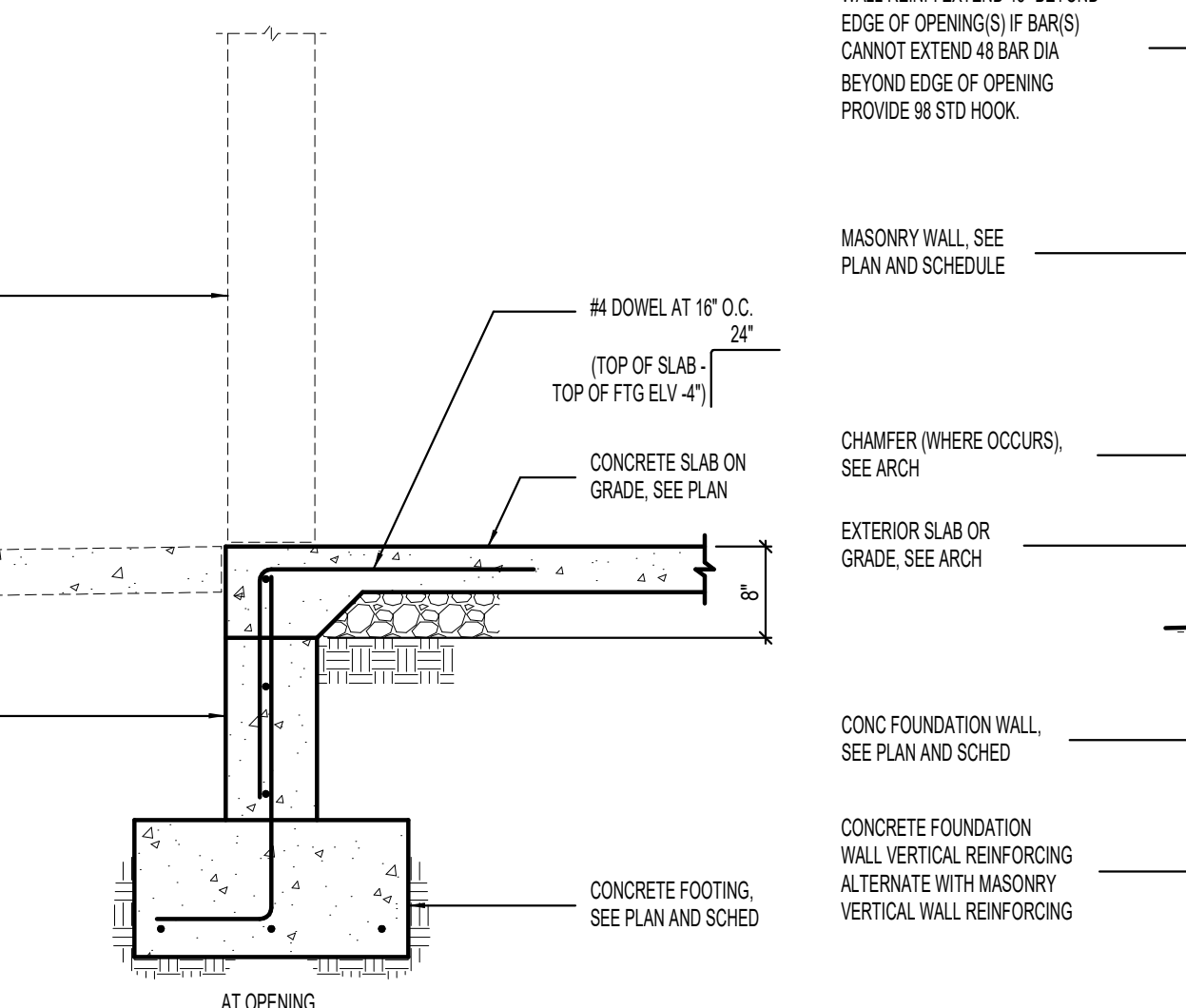
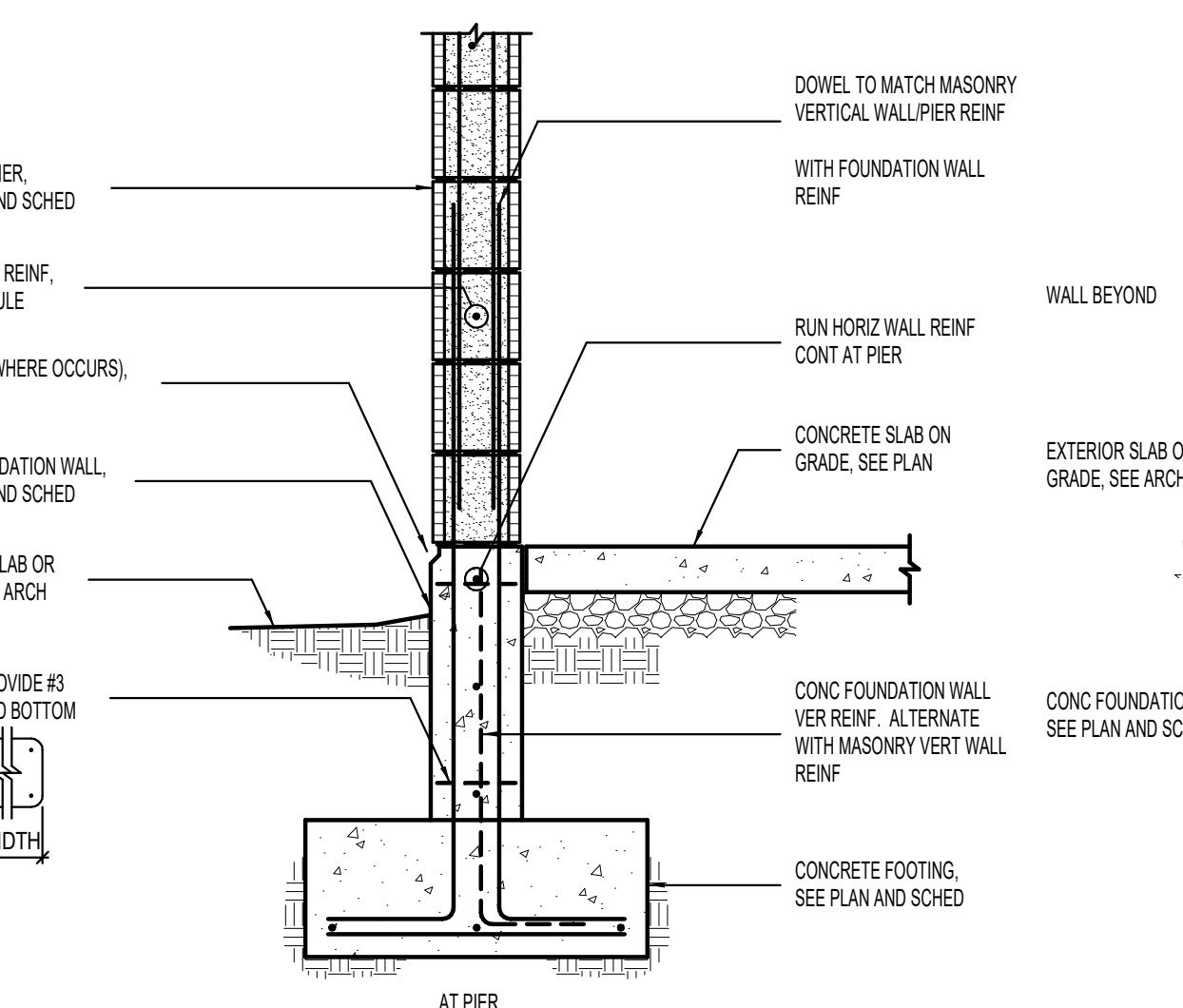
3 TYPICAL REINFORCING AT RECESS IN 8" OR 10" MASONRY WALLS NO SCALE



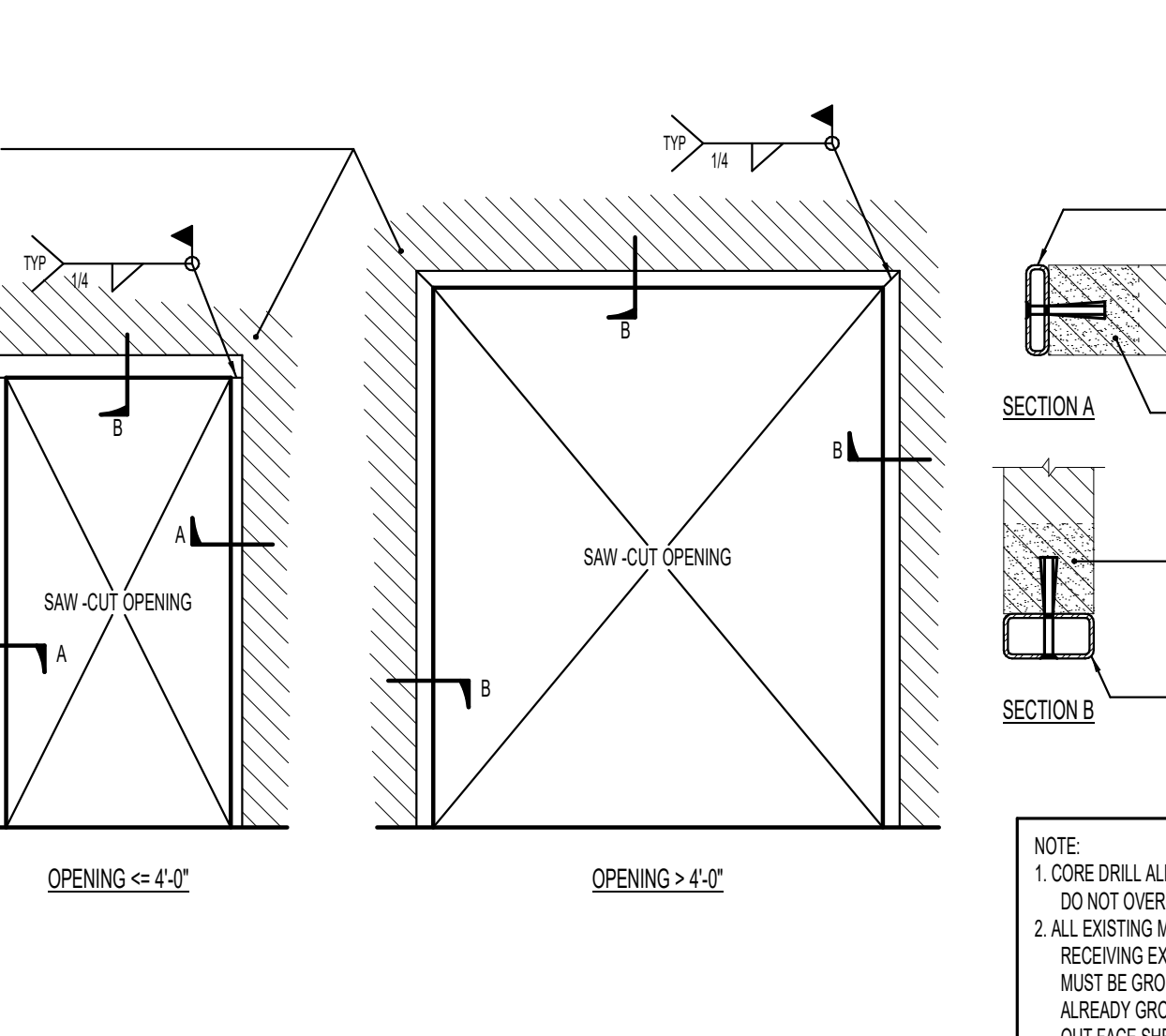
4 MASONRY CONTROL JOINT DETAIL AT 8" OR 10" MASONRY WALLS NO SCALE



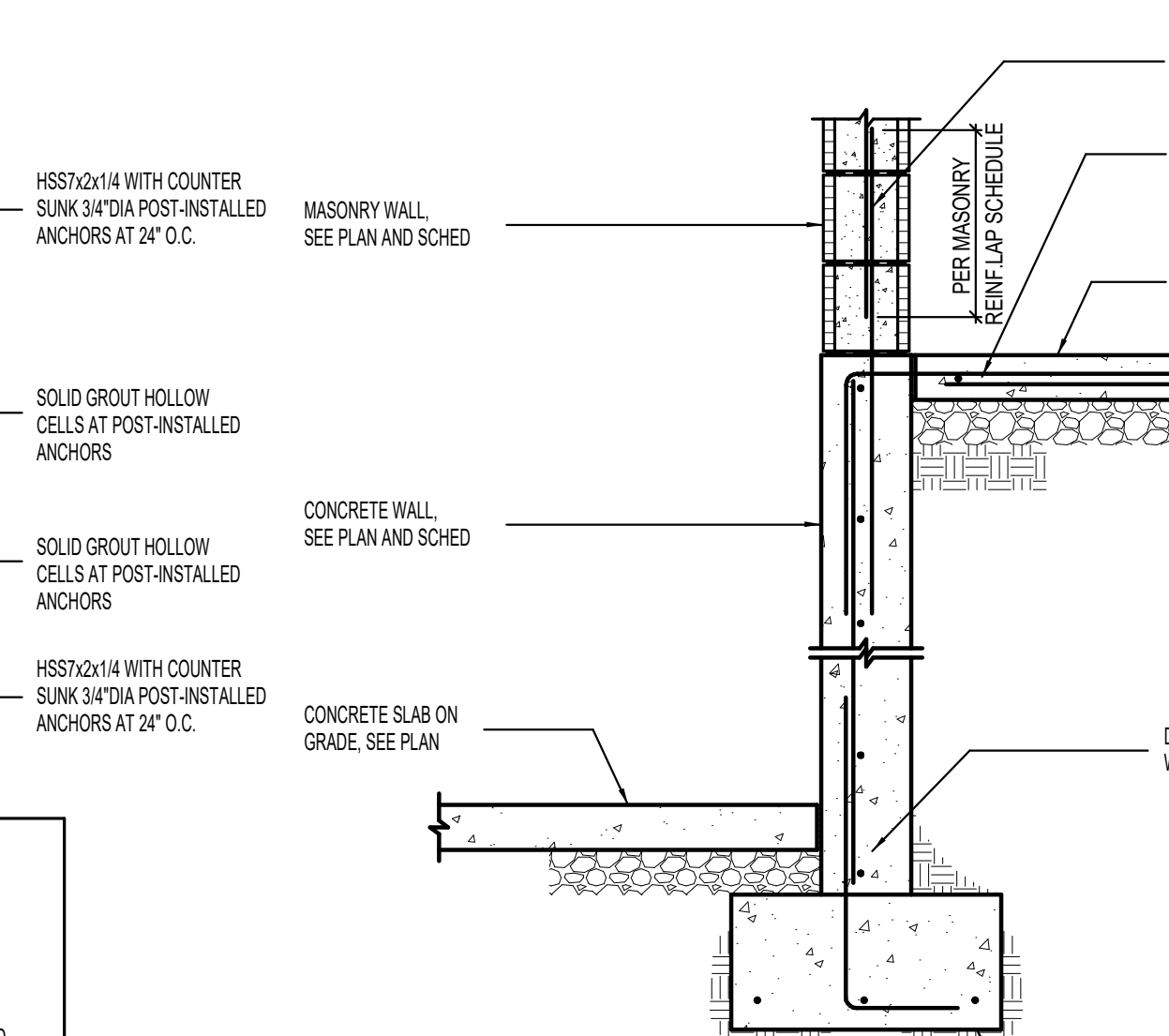
5 FOUNDATION WALL DETAIL AT 8" OR 10" MASONRY NO SCALE



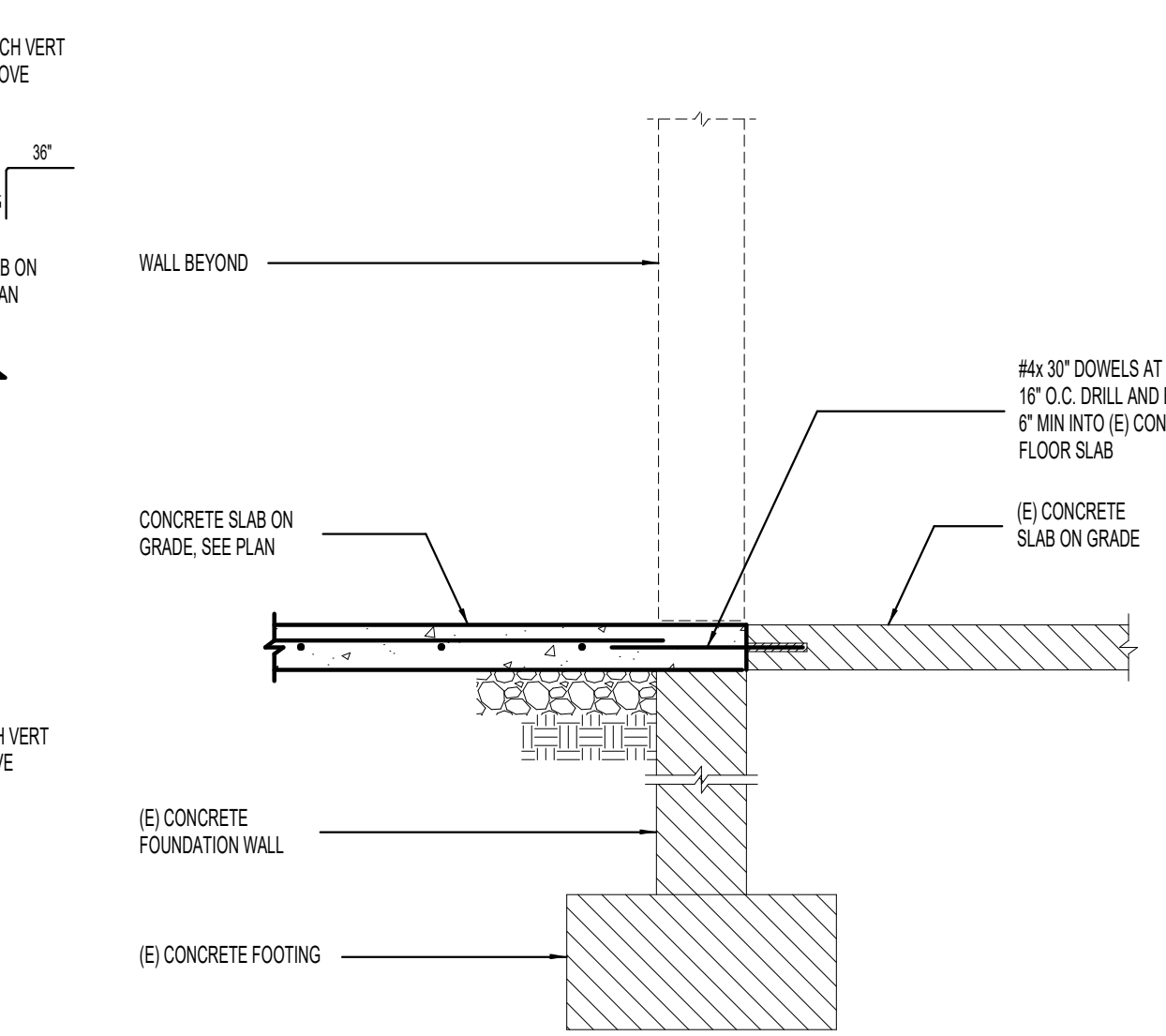
6 TERMINATION OF HORIZONTAL REINFORCING IN 8" OR 10" MASONRY WALL [PLAN VIEW] NO SCALE



7 NEW OPENING THROUGH EXISTING MASONRY WALL NO SCALE



8 OFFSET CONCRETE FOUNDATION WALL NO SCALE



9 NEW SLAB AT OPENING IN EXISTING WALL NO SCALE



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project:  
LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO  
CITY OF  
Grand Junction  
COLORADO

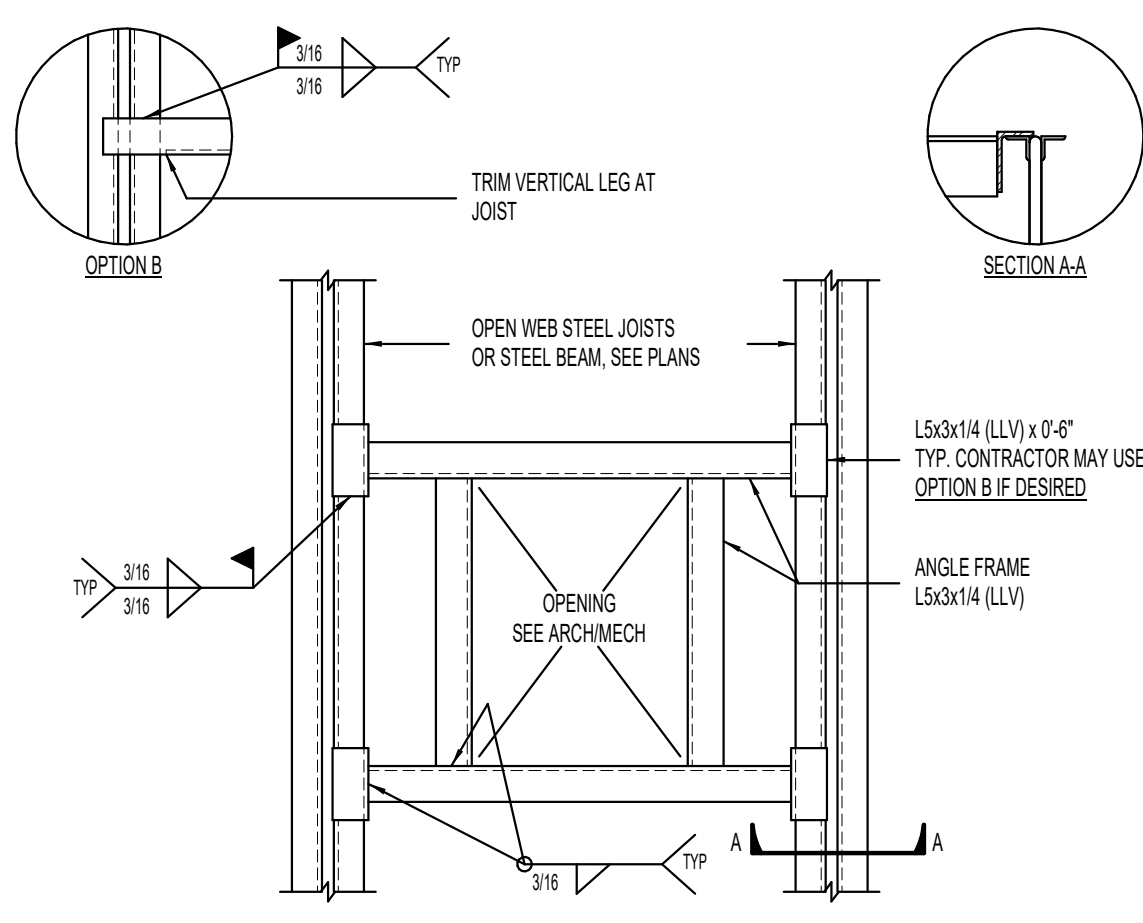
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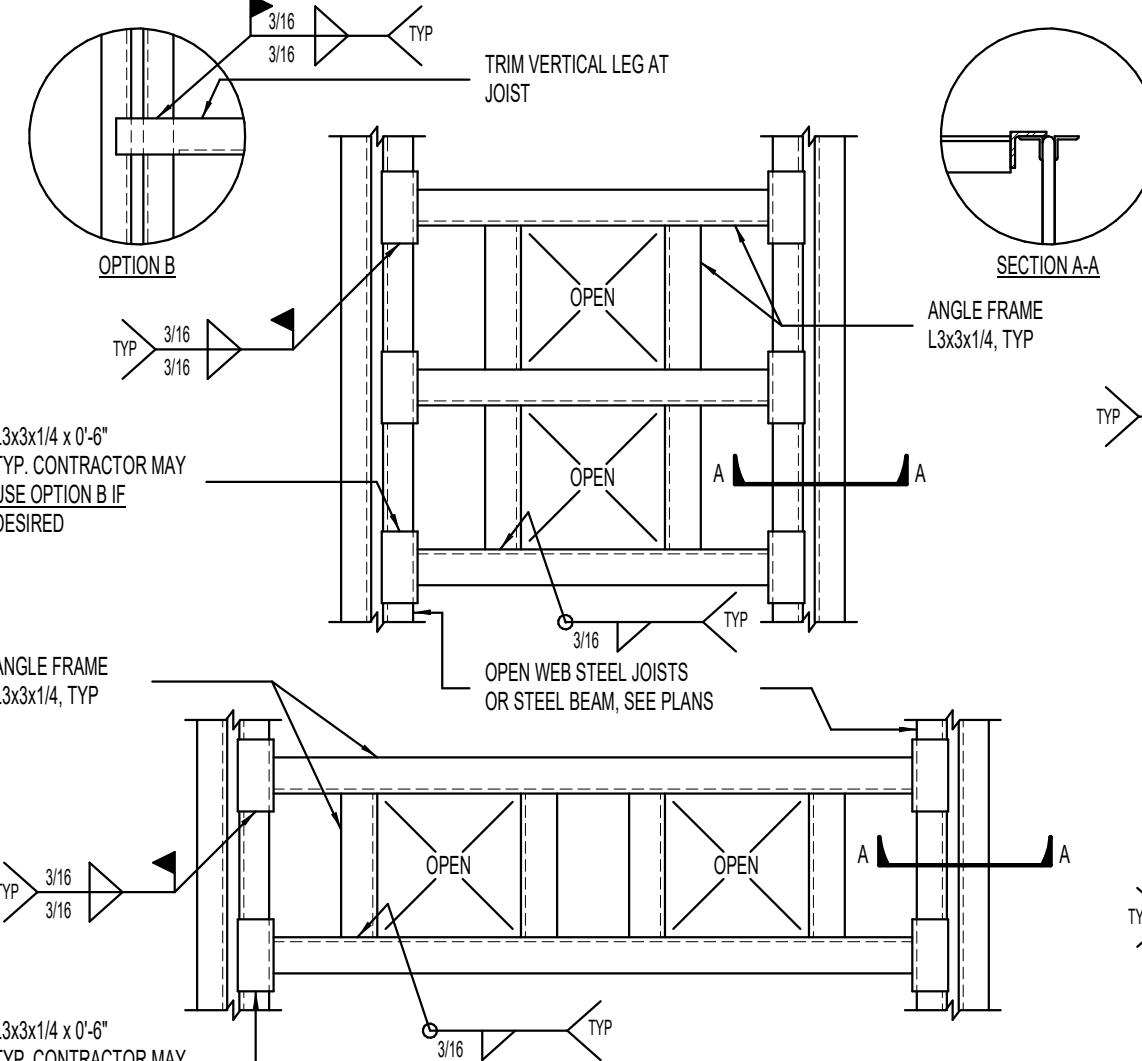
sheet:  
S502

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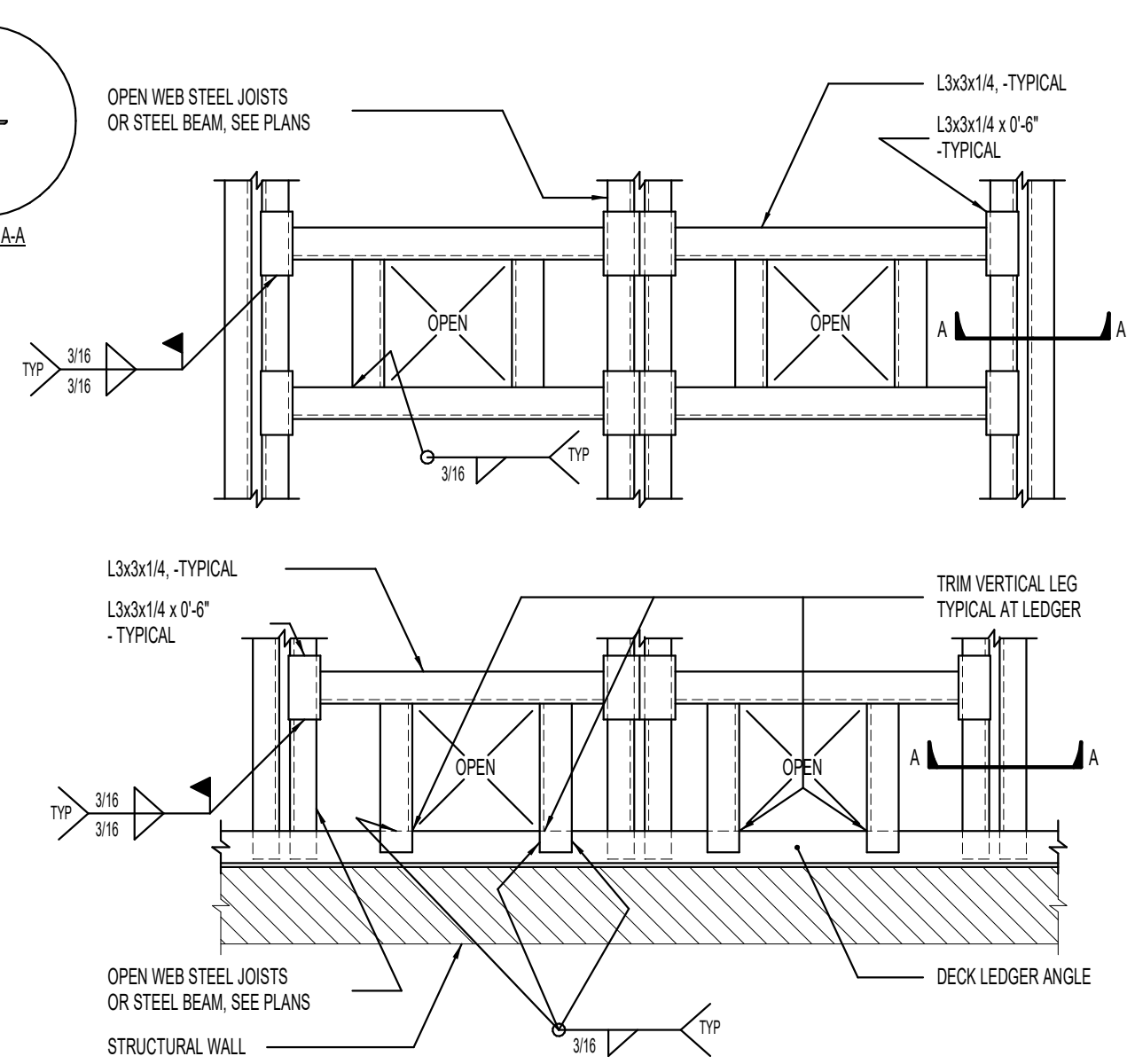


- NOTES:**
- SEE DETAIL FOR OPENINGS LESS THAN 12" IN DIAMETER.
  - PROVIDE EXTRA WEB MEMBERS PER DETAIL FOR OPENINGS 6" AND LARGER.
  - SEE TYPICAL ROOF TOP MECHANICAL UNIT SUPPORT DETAILS(S) FOR FRAMES UNDER MECHANICAL UNITS.
  - ROOF DECK TO BE WELDED TO ANGLE FRAMING.

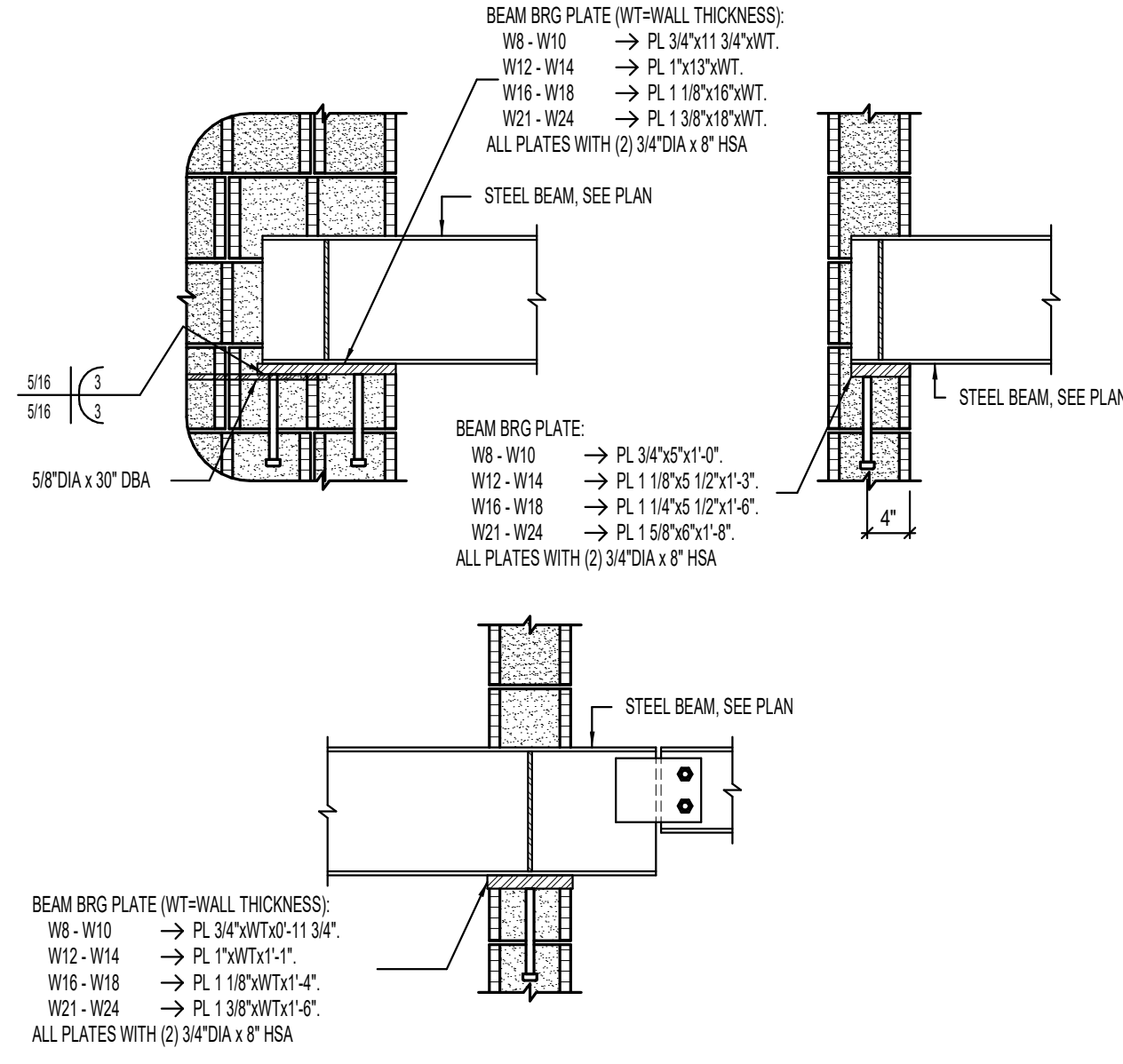
**1** TYPICAL ROOF OPENING DETAIL [PLAN VIEW] NO SCALE



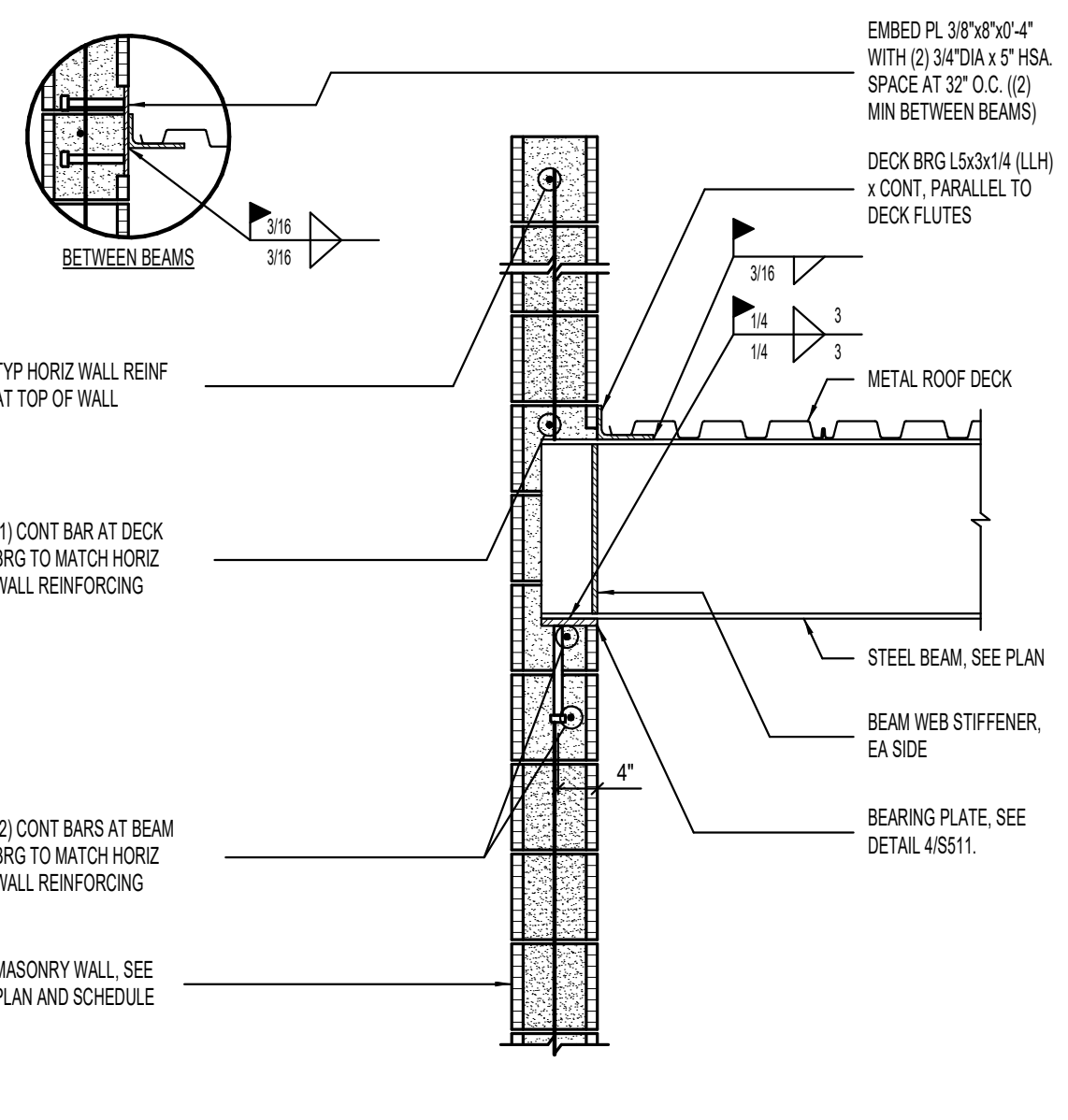
**2** TYPICAL ROOF DRAIN SUPPORT DETAIL [PLAN VIEW] NO SCALE



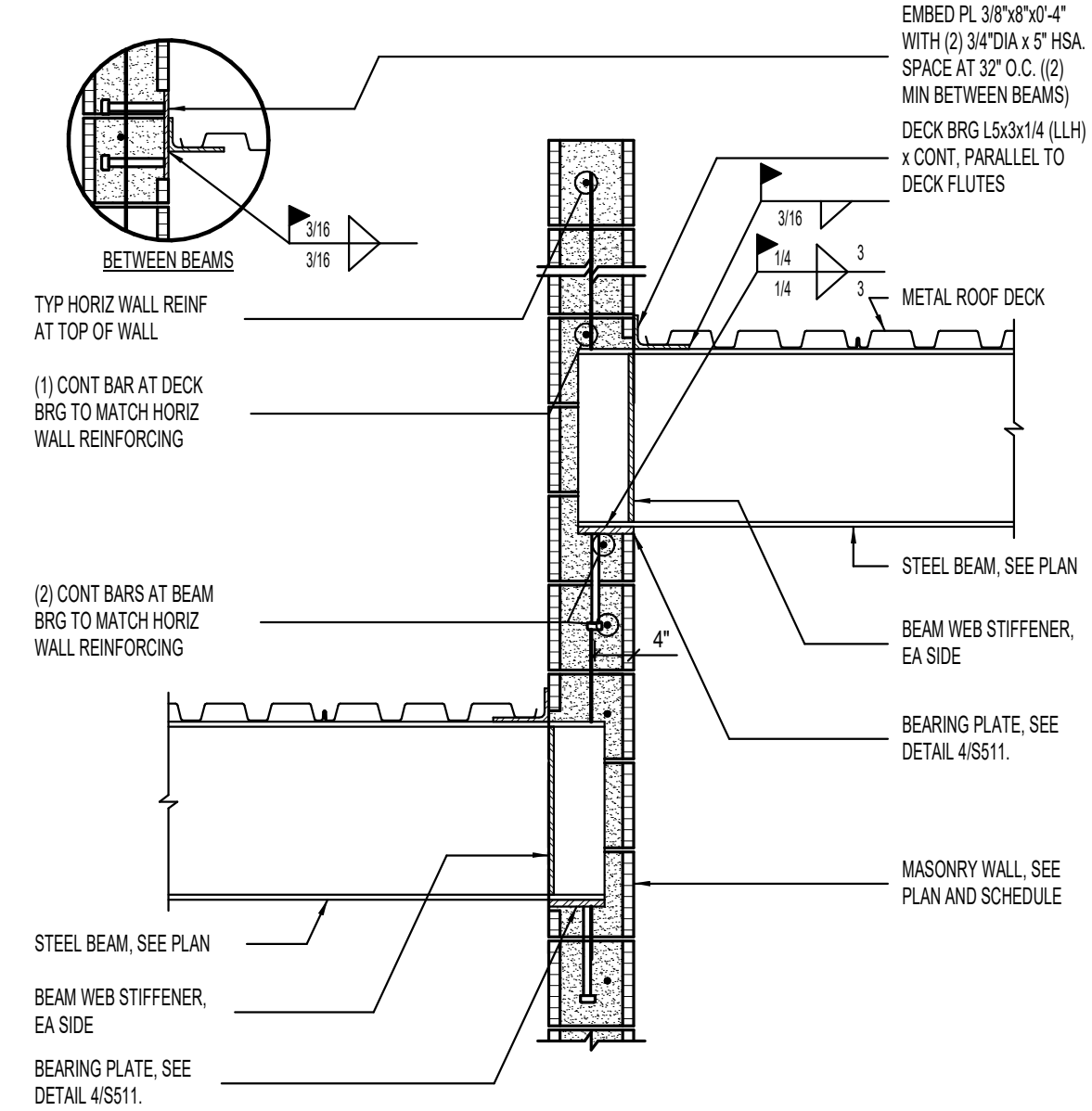
**3** TYPICAL PIPE SLEEVE THROUGH ROOF DECK NO SCALE



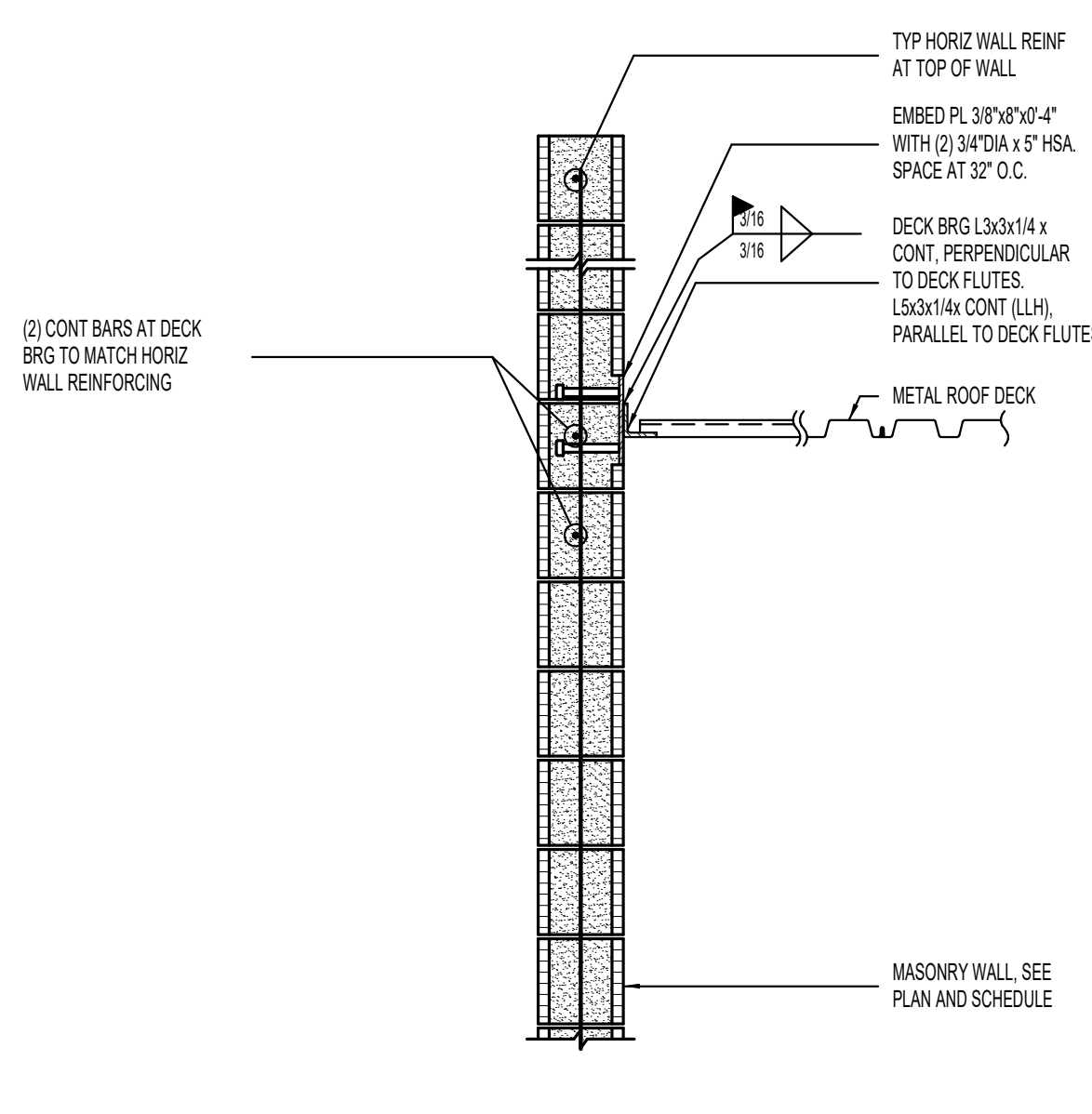
**4** BEARING PLATE SCHEDULE FOR ROOF JOIST/BEAM BEARING AT MASONRY WALLS NO SCALE



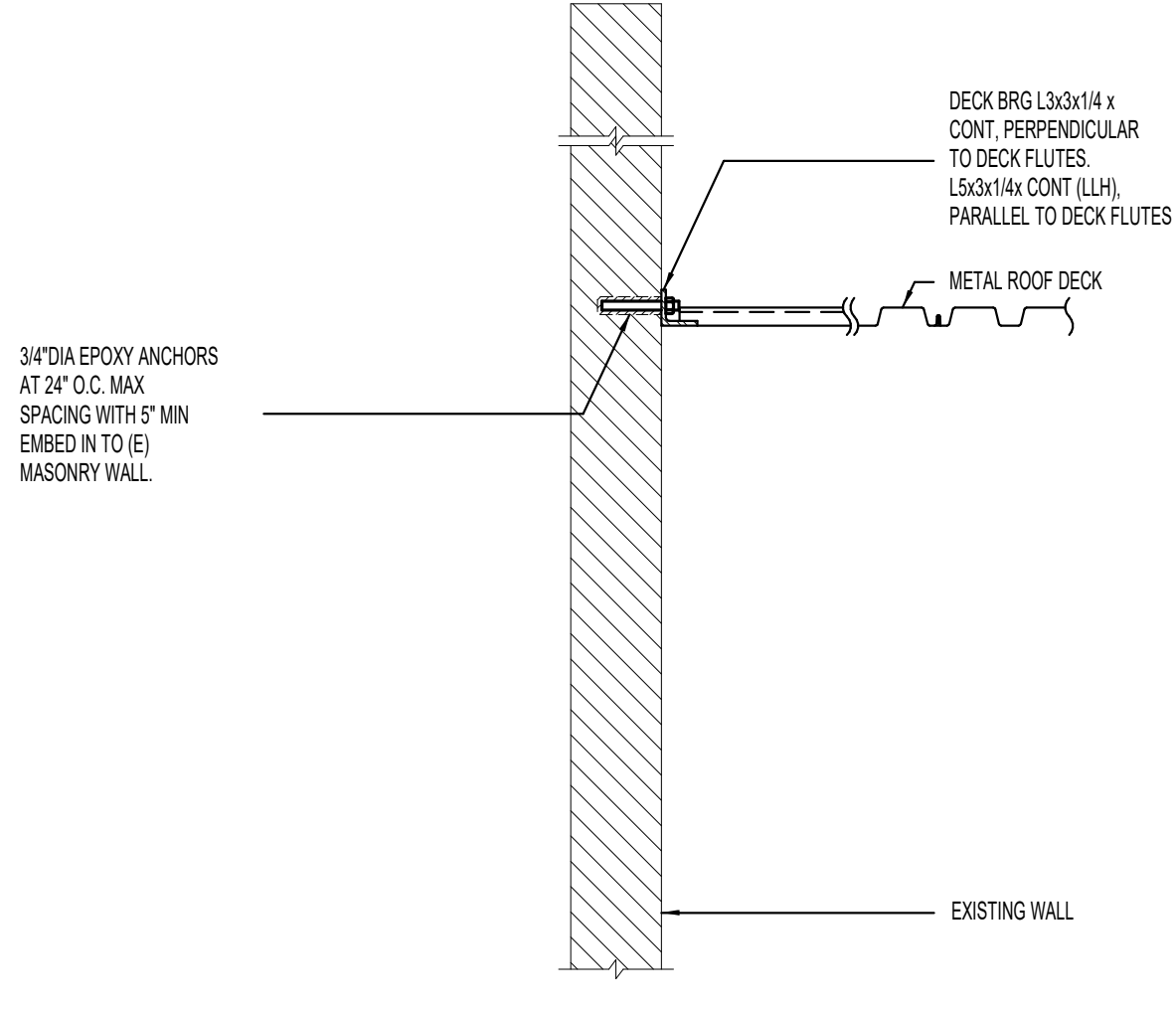
**5** TYPICAL STEEL BEAM/DECK BEARING DETAIL AT 8" MASONRY WALLS NO SCALE



**6** TYPICAL STEEL BEAM/DECK BEARING DETAIL AT 8" MASONRY WALLS NO SCALE



**7** DECK BEARING AT MASONRY WALL NO SCALE



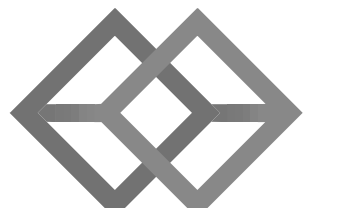
**8** DECK BEARING AT EXISTING WALL NO SCALE



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COLORADO

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**title:**  
**DETAILS**

**sheet:**  
**S511**

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CONCRETE FOOTING SCHEDULE											
MARK	WIDTH	LENGTH	DEPTH	REINFORCING CROSSWISE				REINFORCING LENGTHWISE		COMMENTS	
				No.	SIZE	LENGTH	SPACING	No.	SIZE		LENGTH
FC2.0	2'-0"	CONT	12"	-	#4	1'-6"	48"	3	#4	CONT	EO

**CONCRETE FOOTING NOTES:**

1. PLACE ALL FOOTING REINFORCING IN THE BOTTOM OF THE FOOTING WITH 3" CLEAR CONCRETE COVER (UNO).
2. TOP REINFORCING, WHERE OCCURS, SHALL BE PLACED IN THE TOP OF THE FOOTING WITH 2" MINIMUM CONCRETE COVER.
3. IF FOOTINGS ARE EARTH-FORMED, FOOTINGS SHALL BE 6" LONGER AND WIDER THAN SCHEDULED.
4. RUN CONTINUOUS FOOTING REINFORCEMENT THROUGH SPOT FOOTINGS.
5. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.
6. SOME SCHEDULED FOOTINGS MAY NOT BE USED, SEE FOOTING AND FOUNDATION PLAN FOR FOOTING MARKS.

**1 CONCRETE FOOTING SCHEDULE**

NO SCALE

CONCRETE WALL SCHEDULE						
MARK	THICKNESS	REINFORCING			WALL TYPE	COMMENTS
		VERTICAL	HORIZONTAL	TOP AND BOTTOM		
CM-6A	8"	#4 AT 18" O.C.	#4 AT 12" O.C.	(1) #4	A	

**WALLS NOT DESIGNATED IN PLAN**

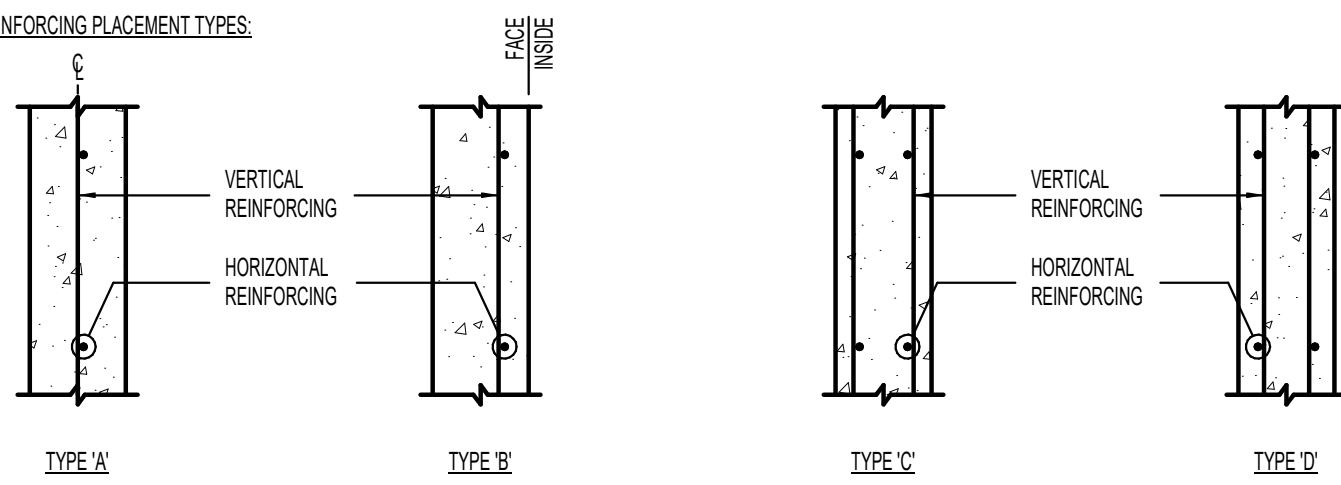
THICKNESS	REINFORCING	
	VERTICAL	HORIZONTAL
6"	#4 AT 18" O.C.	#4 AT 18" O.C.
8"	#4 AT 18" O.C.	#4 AT 12" O.C.
10"	#4 AT 18" O.C.	#5 AT 18" O.C.
12"	#4 AT 18" O.C. E.F.	#4 AT 18" O.C. E.F.

**ABBREVIATIONS:**  
E.F. EACH FACE  
I.F. INSIDE FACE  
O.F. OUTSIDE FACE

**CONCRETE FOUNDATION WALL NOTES:**

1. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.

**WALL REINFORCING PLACEMENT TYPES**



**2 CONCRETE WALL SCHEDULE**

NO SCALE

CONCRETE REINFORCING BAR LAP SPLICE SCHEDULE																
BAR SIZE	$f_c = 3000\text{psi} \& f_c = 3500\text{psi}$				$f_c = 4000\text{psi} \& f_c = 4500\text{psi}$				$f_c = 5000\text{psi}$							
	REGULAR		TOP		REGULAR		TOP		REGULAR		TOP					
	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS	CLASS				
#3	17"	22"	22"	28"	15"	19"	19"	24"	13"	17"	17"	22"	12"	16"	15"	20"
#4	22"	28"	28"	37"	19"	25"	25"	32"	17"	22"	22"	28"	16"	20"	20"	27"
#5	28"	36"	36"	47"	24"	31"	31"	40"	22"	28"	28"	36"	20"	26"	26"	33"
#6	33"	43"	43"	56"	29"	37"	37"	48"	26"	33"	33"	42"	24"	31"	31"	40"
#7	48"	63"	63"	81"	42"	54"	54"	70"	37"	48"	48"	62"	34"	44"	44"	56"
#8	55"	72"	72"	93"	48"	62"	62"	80"	43"	56"	56"	72"	39"	51"	51"	66"
#9	62"	81"	81"	105"	54"	70"	70"	91"	48"	63"	63"	81"	44"	57"	57"	74"
#10	70"	91"	91"	118"	61"	79"	79"	102"	54"	70"	70"	91"	50"	64"	64"	83"
#11	78"	101"	101"	131"	67"	87"	87"	113"	60"	78"	78"	101"	55"	71"	71"	93"

TABULATED VALUES ARE FOR CASE 1 REINFORCEMENT, WHERE THE REQUIREMENTS OF TABLE BELOW ARE MET. WHERE THESE CONDITIONS ARE NOT MET, MULTIPLY THE LAP LENGTHS (  $l_d$  ) BY 1.5.

REQUIREMENT FOR CASE 1 LAP LENGTHS		
BAR CLEAR SPACING	CLEAR COVER	STIRRUPS OR TIES
$>=4d_b$	$>=d_b$	$\geq$ CODE FOR MINIMUM THROUGHOUT $l_d$
$>=2d_b$	$>=d_b$	NO REQUIREMENT

**CONCRETE REINFORCING BAR LAP SPLICE NOTES:**

1. THIS SCHEDULE SHALL BE USED FOR ALL BAR SPLICES IN CONCRETE WALLS, UNLESS NOTED OTHERWISE.
2. CLASS 'A' SPLICES MAY BE USED ONLY IN CASES WHERE 50% OR LESS OF THE BARS ARE SIZED WITHIN THE LAP SPLICE LENGTH.
3. CLASS 'B' SPLICES SHALL BE USED FOR ALL SPLICES UNLESS THE REQUIREMENTS OF NOTE NO. 2 ABOVE ARE MET.
4. TIES AND STIRRUPS SHALL NOT BE SPLICED.
5. DO NOT SPLICE VERTICAL BARS IN RETAINING WALLS UNLESS SPECIFICALLY SHOWN.
6. THE VALUES TABULATED IN SCHEDULE ARE FOR GRADE 60 REINFORCING BARS. FOR GRADE 75, MULTIPLY LAP LENGTHS BY 1.25 AND FOR GRADE 80, MULTIPLY BY 1.33.
7. THE VALUES TABULATED IN SCHEDULE ARE MINIMUM REQUIREMENTS. LONGER LENGTHS MAY BE USED FOR CONSTRUCTIBILITY.
8. TOP BARS ARE CLASSIFIED AS HORIZONTAL BARS WHERE 12" OR MORE OF FRESH CONCRETE IS CAST BELOW THE REINFORCING BAR.
9. FOR EPOXY-COATED OR ZINC AND EPOXY DUAL-COATED BARS WITH CLEAR COVER  $< 3d_b$  OR CLEAR SPACING  $< 6d_b$ , MULTIPLY LAP LENGTHS BY 1.5. FOR ALL OTHER CASES MULTIPLY BY 1.2.
10. FOR LIGHT WEIGHT CONCRETE, MULTIPLY LAP LENGTHS BY 1.33 UNLESS THE AVERAGE SPLITTING TENSILE STRENGTH (  $f_t$  ) IS SPECIFIED. FOR LIGHT WEIGHT CONCRETE WHERE  $f_t$  IS SPECIFIED, REFER TO AC308-14 SECTION 19.2.4.3.
11. SPLICES FOR BUNDLED BARS:
  - a. FOR BUNDLED BARS OF THREE OR LESS, LAP SPLICE LENGTHS SHALL BE MULTIPLIED BY 1.2.
  - b. FOR BUNDLED BARS OF FOUR OR MORE, LAP SPLICE LENGTHS SHALL BE MULTIPLIED BY 1.33.
  - c. INDIVIDUAL BAR SPLICES WITHIN A BUNDLE SHALL NOT OVERLAP.
  - d. ENTIRE BUNDLES SHALL NOT BE LAP SPLICED.
12. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.

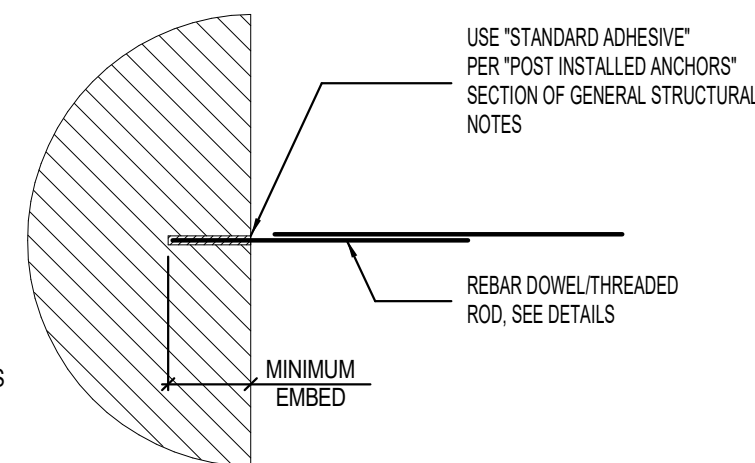
**3 CONCRETE REINFORCING BAR LAP SPLICE SCHEDULE**

NO SCALE

STANDARD ADHESIVE EMBEDMENT SCHEDULE		
REBAR DOWEL (THREADED ROD SIZE)	MINIMUM EMBEDMENT INTO CONCRETE OR GROUTED MASONRY	TENSION SHEAR CAPACITIES (ALLOWABLE)
#3 (#3)	3.38"	820lb
#4 (#4)	4.12"	1250lb
#5 (#5)	5.58"	1670lb
#6 (#3/4)	6.34"	2145lb

**STANDARD ADHESIVE EMBEDMENT NOTES:**

1. SPECIFIC EMBEDMENTS, NOTES AND DETAILS IN DRAWINGS SHALL GOVERN OVER THIS SCHEDULE.
2. HOLE DIAMETER SHALL BE DOWEL/ROD DIAMETER PLUS 1/8". FOLLOW MANUFACTURER'S INSTRUCTIONS FOR HOLE PREPARATION.
3. PROVIDE A 3" MINIMUM EDGE DISTANCE TO CENTER OF HOLE.
4. CONTACT STRUCTURAL ENGINEER IF MINIMUM EMBEDMENTS INDICATED ABOVE ARE NOT ACHIEVABLE.
5. SEE "POST INSTALLED ANCHORS" SECTION OF GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.



**4 STANDARD ADHESIVE EMBEDMENT SCHEDULE**

NO SCALE

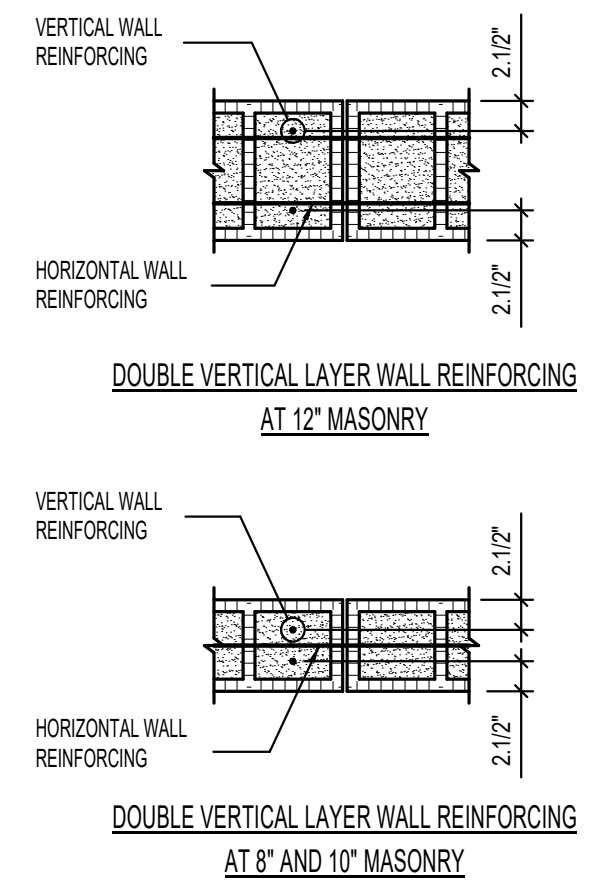
MASONRY WALL SCHEDULE							
MARK	THICKNESS	MATERIAL	SOLID GROUT	REINFORCING			COMMENTS
				VERTICAL	HORIZONTAL	JOINTS	
MW-6A	8"	SEE ARCH	YES	#5 AT 32" O.C.	#4 AT 24" O.C.	NONE	SEE NOTE 10

**MASONRY WALLS NOT DESIGNATED IN PLAN**

THICKNESS	REINFORCING		
	VERTICAL	HORIZONTAL (NOT SOLID GROUTED)	HORIZONTAL (SOLID GROUTED)
6"	#5 AT 32" O.C.	#4 AT 48" O.C.	#4 AT 24" O.C.
8"	#5 AT 32" O.C.	#5 AT 48" O.C.	#4 AT 24" O.C.
10"	#5 AT 24" O.C.	#5 AT 48" O.C.	#5 AT 24" O.C.
12"	#5 AT 24" O.C.	(2) #5 AT 48" O.C.	(2) #4 AT 24" O.C.

**MASONRY WALL NOTES:**

1. COORDINATE WALL FINISHES, MATERIALS, COURSING, ETC. WITH ARCHITECTURAL DRAWINGS.
2. DO NOT SOLID GROUT WALLS UNLESS REQUIRED BY SCHEDULE, NOTES, OR DETAILS.
3. SOLID GROUT ALL MASONRY COURSES BELOW GRADE.
4. SINGLE LAYER OF VERTICAL REINFORCING SHALL BE CENTERED IN WALL (UNO).
5. VERTICAL REINFORCING SHALL EXTEND INTO FOOTINGS AND TERMINATE WITH STANDARD HOOK. FOR CONCRETE FOUNDATION WALLS 4'-0" OR TALLER, VERTICAL WALL REINFORCING SHALL DOWEL 3'-0" MINIMUM INTO THE FOUNDATION WALL (UNO).
6. PROVIDE TWO VERTICAL BARS (MIN) AT ALL CORNERS AND END OF WALLS.
7. HORIZONTAL WALL REINFORCING SHALL BE PLACED BETWEEN A DOUBLE LAYER OF VERTICAL MASONRY REINFORCING.
8. HORIZONTAL WALL REINFORCING SHALL CONTINUE THROUGH MASONRY LINTELS, WHERE BOTH HORIZONTAL WALL REINFORCING AND LINTEL REINFORCING OCCUR IN THE SAME COURSE, USE THE LARGER REINFORCING.
9. SEE DETAILS 6/S502 FOR WHERE HORIZONTAL REINFORCING TERMINATES AT EDGE OF OPENINGS.
10. IN CONCRETE FOUNDATION WALL BELOW, ALTERNATE VERTICAL CONCRETE WALL REINFORCING WITH VERTICAL MASONRY REINFORCING.
11. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.



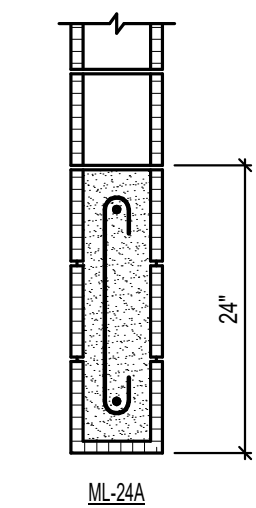
**5 MASONRY WALL SCHEDULE**

NO SCALE

MASONRY LINTEL SCHEDULE					
MARK	DEPTH	MAXIMUM SPAN FOR UNSCHEDULED OPENINGS	REINFORCING		COMMENTS
			HORIZONTAL	STIRRUPS	
ML-24A	24"	8'-0"	(1) #6 X CONT TOP AND BOTTOM	#4 AT 8" O.C.	

**MASONRY LINTEL NOTES:**

1. LINTEL WIDTH AND MATERIAL TYPE SHALL BE THE SAME AS THE WALL IN WHICH THE LINTEL IS CONSTRUCTED.
2. GROUT MASONRY LINTELS MONOLITHICALLY WITH THE SUPPORT WALL OR PIER AT EACH END.
3. MASONRY LINTELS ML-8A, ML-16A, ML-24A, AND ML-32A SHALL BE USED OVER OPENINGS IN MASONRY WALLS WHEN A SPECIFIC MASONRY LINTEL IS NOT OTHERWISE SPECIFIED. WHEN A LINTEL IS SPECIFIED ON THE PLANS, THE MAXIMUM SPAN AS NOTED IN THIS SCHEDULE SHALL NOT APPLY. CONSULT THE STRUCTURAL ENGINEER FOR LINTELS NOT SPECIFIED ON THE PLANS WHICH HAVE A SPAN GREATER THAN 10'-0".
4. MASONRY LINTELS ML-8A, ML-16A, ML-24A, AND ML-32A SHALL NOT BE LOCATED DIRECTLY BELOW FLOOR OR ROOF BEAMS OR GIRDERS UNLESS NOTED OTHERWISE ON THE PLANS. JOISTS SHALL NOT BEAR ON ANY LINTEL LESS THAN 18" DEEP. CONSULT THE STRUCTURAL ENGINEER FOR LINTELS NOT SHOWN ON THE PLANS WHICH ARE LOCATED DIRECTLY BELOW FLOOR OR ROOF BEAMS OR GIRDERS.
5. EXTEND ALL HORIZONTAL REINFORCING 48 BAR DIAMETERS MINIMUM BEYOND THE EDGE OF ALL OPENINGS. IF HORIZONTAL REINFORCING CANNOT EXTEND 48 BAR DIAMETERS BEYOND EDGE OF OPENING, PROVIDE 90° STANDARD HOOK.
6. SPLICE TOP BARS AT MIDSPAN OF LINTEL ONLY AND BOTTOM BARS OVER SUPPORTS ONLY.
7. HORIZONTAL WALL REINFORCING SHALL CONTINUE THROUGH MASONRY LINTELS, WHERE BOTH HORIZONTAL WALL REINFORCING AND LINTEL REINFORCING OCCUR IN THE SAME COURSE, USE THE LARGER REINFORCING.
8. DOWEL VERTICAL REINFORCING OF WALL ABOVE LINTEL INTO THE FULL DEPTH OF LINTEL OR 48 BAR DIAMETERS, WHICHEVER IS LESS.
9. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.



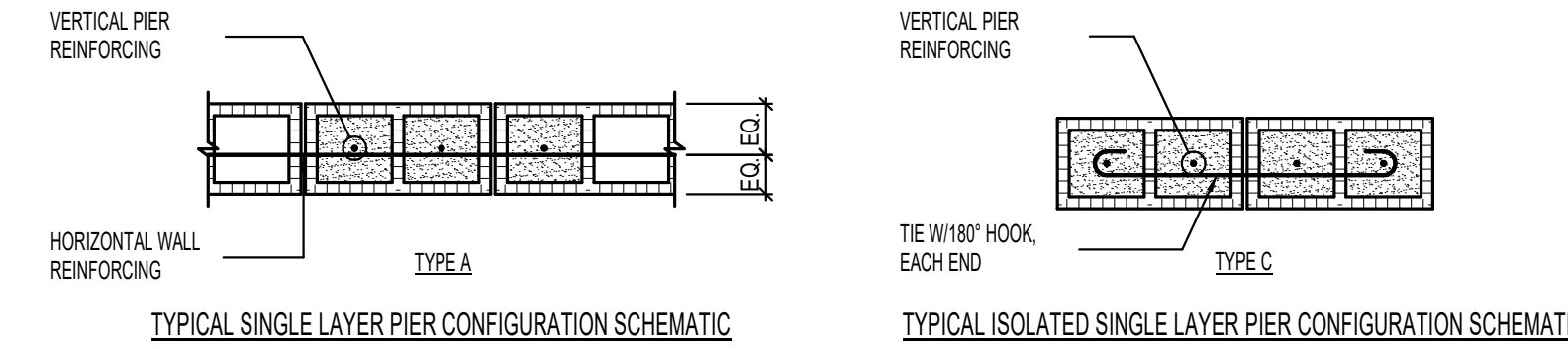
**6 MASONRY LINTEL SCHEDULE**

NO SCALE

MASONRY PIER SCHEDULE					
MARK	SIZE	REINFORCING		REINFORCING SCHEMATIC	COMMENTS
		VERTICAL	TIES		
MP-16A	WT x 16"	(2) #5	NONE		SEE NOTE NO. 7
MP-16C	WT x 16"	(2) #5	#3 AT 8" O.C.		SEE NOTE NO. 6

**MASONRY PIER NOTES:**

1. HORIZONTAL WALL REINFORCING SHALL BE LOCATED TO THE INSIDE OF THE VERTICAL BARS FOR DOUBLE LAYER MASONRY PIERS.
2. VERTICAL REINFORCING AND TIES SHALL EXTEND FULL HEIGHT OF WALL (UNO).
3. VERTICAL MASONRY PIER REINFORCING SHALL EXTEND INTO THE FOOTING AND TERMINATE WITH A STANDARD 90° HOOK. FOR CONCRETE FOUNDATION WALLS 4'-0" OR TALLER, VERTICAL PIER REINFORCING SHALL DOWEL 3'-0" MINIMUM INTO THE FOUNDATION WALL (UNO).
4. FOR MP TYPES B, D, AND E IN CONCRETE FOUNDATION WALLS, PROVIDE #3 TIE AT TOP AND BOTTOM OF FOUNDATION WALL. SEE DETAILS 6/S502 AND 6/S502.
5. HORIZONTAL REINFORCING OF ADJACENT WALLS SHALL RUN CONTINUOUS THROUGH MASONRY PIERS.
6. WHERE NOTED IN SCHEDULE, TIES EXTEND FROM BOTTOM TO TOP OF OPENING AND REPLACE HORIZONTAL WALL REINFORCING.
7. FOR TYPE 'A' PIERS, AT EDGE OF OPENING, TERMINATE HORIZONTAL REINFORCING WITH 180° HOOK. SEE DETAIL 6/S502.
8. FOR TYPE 'B' PIERS, AT EDGE OF OPENING, PROVIDE #3 END TIE AT SAME SPACING AS HORIZONTAL REINFORCING. SEE DETAIL 6/S502.
9. SEE GENERAL STRUCTURAL NOTES FOR ADDITIONAL REQUIREMENTS.



**7 MASONRY PIER SCHEDULE**

NO SCALE

MASONRY REINFORCING LAP SCHEDULE		
BAR SIZE	(1) BAR PER CELL	(2) BARS PER CELL
#3	13"	13"
#4	21"	21"
#5	34"	34"
#6	37"	USE MECH SPLICE COUPLER
#7	USE MECH SPLICE COUPLER	USE MECH SPLICE COUPLER
#8	USE MECH SPLICE COUPLER	USE MECH SPLICE COUPLER

**8 MASONRY REINFORCING LAP SCHEDULE (2000psi)**

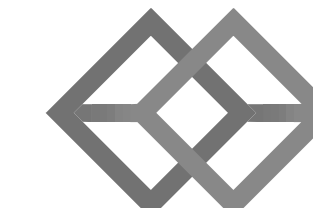
NO SCALE



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**project:**

**LAS COLONIAS  
AMPHITHEATER -  
ADDITION**

Grand Junction, CO



**project#:** 190527  
**date:** Feb. 10, 2020

**revisions:**

**title:**

**SCHEDULES**

**sheet:**

**S601**

PERMIT SET

### SYMBOL LEGEND

SYMBOL	DESCRIPTION
<b>VALVES, METERS, AND GAUGES</b>	
	SHUT OFF VALVE
	GATE VALVE
	CHECK VALVE
	AUTO 2-WAY VALVE
	AUTO 3-WAY VALVE
	GLOBE VALVE
	BALL VALVE
	RELIEF VALVE
	CHAIN OPERATED GATE VALVE
	PRESSURE REDUCING VALVE
	BUTTERFLY VALVE
	SOLENOID VALVE
	ANGLE VALVE
	VENTURI
	BALANCING OR PLUG COCK
	FLOW SETTER
	EXPANSION VALVE (REFRIG.)
	GAS COCK
	MANUAL AIR VENT
	STRAINER
	GAUGE COCK
	FLEXIBLE CONNECTION
	PRESSURE GAUGE
	THERMOMETER
	VICTUALIC COUPLING
	REDUCER CONCENTRIC
	REDUCER ECCENTRIC
	REFRIGERANT SITE GLASS
	REFRIGERANT STRAINER
	REFRIGERANT FILTER DRIER
	90 DEG ELBOW UP
	90 DEG ELBOW DOWN
	90 DEG TEE UP
	90 DEG TEE DOWN
	UNION
	CAPPED PIPE
	ANCHOR
	FLOAT AND THERMOSTATIC TRAP
<b>HVAC SYMBOLS</b>	
	THERMOSTAT
	TEMPERATURE SENSOR
	HUMIDISTAT

### SYMBOL LEGEND

SYMBOL	DESCRIPTION
<b>DUCT WORK</b>	
<b>SINGLE LINE</b>	<b>DOUBLE LINE</b>
	RECTANGULAR SUPPLY DUCT UP
	RECTANGULAR SUPPLY DUCT DOWN
	RECTANGULAR RETURN DUCT UP
	RECTANGULAR RETURN DUCT DOWN
	RECTANGULAR EXHAUST DUCT UP
	RECTANGULAR EXHAUST DUCT DOWN
	ROUND DUCT UP
	ROUND DUCT DOWN
	ACCOUSTICALLY LINED RECTANGULAR DUCT
	90° RECTANGULAR ELBOW WITH TURNING VANES
	90° RADIUS ELBOW R=1.5
	DUCT SIZE OR SHAPE TRANSITION
	OPPOSED BLADE BALANCING DAMPER (O.B.D.) IN RECT DUCT
	BUTTERFLY BALANCING DAMPER IN ROUND DUCTS
	COMBINATION TEE
	SPLITTER DAMPER
	SQUARE OR RECTANGULAR CEILING DIFFUSER
	ROUND CEILING DIFFUSER
	SIDEWALL REGISTER SUPPLY OR RETURN
	ROUND FLEXIBLE DUCT
	RETURN GRILLE
	EXHAUST GRILLE
	FIRE SMOKE DAMPER
	FIRE DAMPER
	SMOKE DAMPER
	FLEXIBLE CONNECTION
	FLEXIBLE CONNECTION
	DUCT TO BE REMOVED

### PIPING LEGEND

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.

HPS	HIGH PRESSURE STEAM
MPS	MEDIUM PRESSURE STEAM
LPS	LOW PRESSURE STEAM
HPC	HIGH PRESSURE CONDENSATE RETURN
MPC	MEDIUM PRESSURE CONDENSATE RETURN
LPC	LOW PRESSURE CONDENSATE RETURN
PC	PUMP DISCHARGE
TWS	TEMPERED WATER SUPPLY
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
HHWR	HEATING HOT WATER RETURN
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUPPLY
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
D	DRAIN LINE
HG	HOT GAS BYPASS
GS	GLYCOL SUPPLY
GR	GLYCOL RETURN
FOS	FUEL OIL SUPPLY
FOV	FUEL OIL VENT

### DEFINITIONS

NOTE: ALL DEFINITIONS MAY NOT BE USED.

INDICATED: THE TERM "INDICATED" REFERS TO GRAPHIC REPRESENTATIONS, NOTES, OR SCHEDULES ON THE DRAWINGS, OTHER PARAGRAPHS OR SCHEDULES IN THE SPECIFICATIONS, AND SIMILAR REQUIREMENTS IN THE CONTRACT DOCUMENTS. WHERE TERMS SUCH AS "SHOWN", "NOTED", "SCHEDULED", AND "SPECIFIED" ARE USED, IT IS TO HELP THE READER LOCATE THE REFERENCE. NO LIMITATION ON LOCATION IS INTENDED.

DIRECTED: TERMS SUCH AS "DIRECTED", "REQUESTED", "AUTHORIZED", "SELECTED", "APPROVED", "REQUIRED", AND "PERMITTED" MEAN "DIRECTED BY THE ENGINEER", "REQUESTED BY THE ENGINEER", AND SIMILAR PHRASES.

APPROVED: THE TERM "APPROVED", WHERE USED IN CONJUNCTION WITH THE ENGINEER'S ACTION ON THE CONTRACTOR'S SUBMITTALS, APPLICATIONS, AND REQUESTS, IS LIMITED TO THE ENGINEER'S DUTIES AND RESPONSIBILITIES AS STATED IN GENERAL AND SUPPLEMENTARY CONDITIONS.

FURNISH: THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."

INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."

PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

INSTALLER: AN "INSTALLER" IS THE CONTRACTOR OR AN ENTITY ENGAGED BY THE CONTRACTOR, EITHER AS AN EMPLOYEE, SUBCONTRACTOR, OR SUB-SUBCONTRACTOR, FOR PERFORMANCE OF A PARTICULAR CONSTRUCTION ACTIVITY, INCLUDING INSTALLATION, ERECTION, APPLICATION, AND SIMILAR OPERATIONS. INSTALLERS ARE REQUIRED TO BE EXPERIENCED IN THE OPERATIONS THEY ARE ENGAGED TO PERFORM.

### SYMBOL LEGEND

SYMBOL	DESCRIPTION
<b>REFERENCE LINES AND SYMBOLS</b>	
	DETAIL INDICATOR: # INDICATES DETAIL NUMBER, SHEET INDICATES DRAWING SHEET WHERE DETAIL IS SHOWN.
	ELEVATION OR SECTION INDICATOR, EXTERIOR: # INDICATES ELEVATION OR SECTION NUMBER, SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
	ELEVATION OR SECTION INDICATOR, INTERIOR: # INDICATES ELEVATION OR SECTION NUMBER, SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
	SPACE NUMBER
	KEYNOTE INDICATOR
	REVISION INDICATOR
	EQUIPMENT INDICATOR
	PLUMBING FIXTURE INDICATOR
	DIFFUSER/GRILLE INDICATOR
	DIFFUSER/GRILLE INDICATOR
	BREAK, STRAIGHT
	BREAK, ROUND
	MATCHLINE INDICATOR
	HIDDEN FEATURES LINE: HIDDEN, THIN LINE
	CONTRACT LIMIT LINE: DASHDOT, WIDE LINE
	NEW CONNECTION TO EXISTING
	POINT OF DEMOLITION

### ABBREVIATIONS

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.

(E)	EXISTING
(F)	FUTURE
AD	ACCESS DOOR
AIR COND	AIR CONDITION(-ING,-ED)
APD	AIR PRESSURE DROP
BD	BALANCING DAMPER
BHP	BRAKE HORSE POWER
BTU	BRITISH THERMAL UNIT
BTUH	BTU/HOUR
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CLG	COOLING
COMP	COMPONENT
COND	CONDENS(-ER, -ING, -ATION)
CV	CONTROL VALVE
DB	DRY BULB TEMPERATURE
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWRC	DOMESTIC HOT WATER RECIRC
DIA	DIAMETER
DISCH	DISCHARGE
DP	DEPTH OR DEEP
EA	EXHAUST AIR
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENCY
EG	ETHYLENE GLYCOL
ELEC	ELECTRIC
ELEV	ELEVATION
ENT	ENTERING
EVAP	EVAPORAT(-E, -ING, -ED, -OR)
EWT	ENTERING WATER TEMPERATURE
EXT	EXTERNAL
FC	FLEXIBLE CONNECT(-OR, -ION)
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FPI	FINS PER INCH
PPM	FEET PER MINUTE
FPS	FEET PER SECOND
FSD	FIRE SMOKE DAMPER
GAL	GALLON(S)
GE	GREASE EXHAUST
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HD	HEAD
HG	MERCURY
HP	HORSEPOWER
HR	HOUR
HT	HEIGHT
HTG	HEATING
HZ	HERTZ (FREQUENCY)
ID	INSIDE DIAMETER
IN	INCH
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LG	LENGTH
LH	LATENT HEAT
LRA	LOCKED ROTOR AMPS
LVG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSAND BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MFR	MANUFACTUR(-ER, -ED)
NC	NOISE CRITERIA
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER
OZ	OUNCE
PD	PRESSURE DROP OR DIFFERENCE
PG	PROPYLENE GLYCOL
PH	PHASE
PPM	PARTS PER MILLION
PRESS	PRESSURE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	PSI ABSOLUTE
PSIG	PSI GAUGE
R	THERMAL RESISTANCE
RA	RETURN AIR
RECIRC	RECIRCULATE
REFR	REFRIGERATION
REQD	REQUIRED
RLA	RATED LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SC	SHADING COEFFICIENT
SCFM	STANDARD CUBIC FEET PER MINUTE
SCW	SOFT COLD WATER
SF	SAFETY FACTOR
SH	SENSIBLE HEAT
SP	STATIC PRESSURE
SPEC(S)	SPECIFICATION(S)
SQ	SQUARE
STD	STANDARD
SW	SOIL, WASTE
TA(R)	TRANSFER AIR (RETURN)
TA(S)	TRANSFER AIR (SUPPLY)
TD	TEMP. DROP OR DIFF.
TEMP	TEMPERATURE
THERM	THERMAL
TOT	TOTAL
TSTAT	THERMOSTAT
V	VOLT
VENT	VENT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY TEMPERATURE
VEL	VELOCITY
VENT	VENT, VENTILATION
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
WB	WET BULB TEMP
WC	WATER COLUMN
WG	WATER GAUGE
WPD	WATER PRESSURE DROP
WT	WEIGHT
WTR	WATER

### MECHANICAL GENERAL NOTES

- THE MECHANICAL DRAWINGS SHOW THE GENERAL DESIGN, ARRANGEMENT & EXTENT OF THE MECHANICAL SYSTEM. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, THESE DRAWINGS DO NOT SHOW ALL OFFSETS, BENDS OR ELBOWS NECESSARY FOR THE COMPLETE INSTALLATION IN THE SPACE PROVIDED. CONTRACTOR SHALL MAKE SUCH SLIGHT ALTERATIONS AS MAY BE NECESSARY TO MAKE THE SYSTEM COMPLETE & OPERATIONAL IN ACCORDANCE WITH THE DESIGN INTENT.
- MAJOR DEVIATIONS SUCH AS CHANGES IN COMPONENT SIZES, WEIGHTS, QUANTITIES OR MATERIAL REQUIRE PRIOR APPROVAL BY THE DESIGN ENGINEER.
- THE DRAWINGS & SPECIFICATIONS HAVE BEEN PREPARED TO SUPPLEMENT EACH OTHER & SHALL BE INTERPRETED AS AN INTEGRAL UNIT WITH THE ITEMS SHOWN ON ONE & NOT THE OTHER BEING FURNISHED & INSTALLED AS THOUGH SHOWN & CALLED OUT IN BOTH.
- THE ENTIRE MECHANICAL INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE MOST RECENTLY ADOPTED BUILDING CODES, MECHANICAL CODE, PLUMBING CODE, ELECTRICAL CODE, & ALL OTHER APPLICABLE CITY, COUNTY, STATE, & FEDERAL CODES & REGULATIONS IN EFFECT.
- THE ENTIRE MECHANICAL INSTALLATION SHALL CONFORM TO ANY CODES, RULES, REGULATIONS & REQUIREMENTS OF THE BUILDING OWNER.
- PRIOR TO FABRICATION & INSTALLATION OF ANY MECHANICAL COMPONENT THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL MECHANICAL WORK WITH ALL OTHER BUILDING TRADES, INCLUDING BUILDING TRADES HIRED DIRECTLY BY THE OWNER. WHERE CONFLICTS MAY OCCUR, THEY SHALL BE RESOLVED PRIOR TO INSTALLATION.
- THE SPACE ABOVE ALL CEILINGS IS LIMITED. CAREFUL COORDINATION IS REQUIRED WITH ALL TRADES BEFORE ANY PIPE, DUCT, OR EQUIPMENT IS ORDERED & OR INSTALLED. ANY CONFLICTS &/OR CHANGES FOUND DURING INSTALLATION THAT RESULTS FROM THE LACK OF COORDINATION BY THE CONTRACTORS DURING THE SHOP DRAWING PROCESS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL MECHANICAL INFORMATION IS NOT SHOWN ON THE MECHANICAL DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL INFORMATION ON ALL OTHER CONSTRUCTION DOCUMENT.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO REVIEW & USE, WHERE APPROPRIATE, ALL THE MECHANICAL DETAILS SHOWN ON THE DRAWINGS. DETAILS MAY OR MAY NOT BE CALLED OUT ON THE DRAWINGS WITH SYMBOLS OR KEYED NOTES. ANY CHANGES RESULTING FROM FAILURE TO INSTALL THE MECHANICAL SYSTEM WITHOUT USING THE INCLUDED DETAILS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- THE STRUCTURE SHOWN ON ALL DETAILS MAY OR MAY NOT PERTAIN TO A PORTION OR ANY PORTION OF THE BUILDING. COORDINATE ALL MOUNTING REQUIREMENTS WITH ARCHITECTURAL & STRUCTURAL DRAWINGS.
- ANY PART OF THE MECHANICAL INSTALLATION THAT FAILS, IS UNFIT, OR BECOMES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF ALL CEILING DIFFUSERS & GRILLES.
- CONTRACTOR SHALL OPERATE THE SYSTEM & DEMONSTRATE ALL ASPECTS OF THE SYSTEM TO THE ENGINEER &/OR OWNER TO PROVE ALL SYSTEMS ARE OPERATIONAL.
- DURING CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN A SET OF AS-BUILT REDLINED RECORD DRAWING AT THE PROJECT SITE. ALL CHANGES IN LAYOUT, ROUTING, EQUIPMENT, COMPONENTS, & ACCESSORIES SHALL BE RECORDED. THESE REDLINED DRAWINGS SHALL BE GIVEN TO THE ARCHITECT/ENGINEER AFTER THE FINAL INSPECTION IN ACCORDANCE WITH SPECIFICATIONS.

### GENERAL EQUIPMENT NOTES

- ALL CAPACITIES ARE AT JOB SITE CONDITIONS & ARE MINIMUM CAPACITY.
- ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED TO CONFORM WITH LOCAL SEISMIC REQUIREMENTS & THE REQUIREMENTS OF THESE CONSTRUCTION DOCUMENTS.
- VERIFY ALL REQUIRED SERVICE CONNECTIONS, INCLUDING ELECTRICAL CHARACTERISTICS FOR ALL EQUIPMENT PRIOR TO ORDERING EQUIPMENT.
- ALL EQUIPMENT SHALL BE INDEPENDENTLY SUPPORTED FROM STRUCTURAL MEMBERS.
- ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
- ALL SIMILAR EQUIPMENT SHALL BE OF THE SAME MANUFACTURER.
- AIR INLETS & OUTLETS SHALL BE OF THE SAME MANUFACTURER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE HVAC EQUIPMENT CHECK-IN, SAFEKEEPING, & DAMAGE.

### MECHANICAL SHEET INDEX

ME001	MECHANICAL COVER SHEET
ME002	HVAC NOTES
ME003	HVAC NOTES
MIH01	MECHANICAL PLANS
ME501	HVAC DETAILS
ME601	MECHANICAL SCHEDULES

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**project:**  
LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO  
**CITY OF**  
**Grand Junction**  
COLORADO

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**title:**  
**MECHANICAL**  
**COVER SHEET**

**sheet:**  
**ME001**

PERMIT SET



### FIRE SPRINKLER NOTES

1. THE AUTOMATIC FIRE SPRINKLER SYSTEM SHALL BE MODIFIED IN ACCORDANCE WITH NFPA 13 AND THE APPLICABLE REQUIREMENTS OF THE LOCAL BUILDING OFFICIAL.
2. A FIRE SPRINKLER FLANS SHALL BE PREPARED BY A LICENSED FIRE SPRINKLER COMPANY AND SUBMITTED TO THE ARCHITECT, DESIGN ENGINEER, LOCAL FIRE MARSHALL, AND BUILDING OFFICIAL FOR REVIEW AND APPLICABLE APPROVALS PRIOR TO BEGINNING ANY WORK.
3. THE CONTRACTOR SHALL CALL AND SCHEDULE INSPECTIONS FOR THE REVISIONS TO THE FIRE SPRINKLER SYSTEM IN A TIMELY MANNER WITH THE PROJECT SCHEDULE. INSPECTIONS SHALL BE SCHEDULED A MINIMUM OF 24 HOURS IN ADVANCE OF REQUIREMENTS.
4. UPON COMPLETION OF THE FIRE SPRINKLER SYSTEM, THE CONTRACTOR SHALL HYDROSTATICALLY TEST THE PIPING SYSTEM AT 200 PSIG FOR TWO (2) HOURS OR AS REQUIRED BY THE BUILDING OFFICIAL OR FIRE MARSHALL.
5. PROPERLY COMPLETED "SPRINKLER CONTRACTOR'S MATERIAL AND TEST CERTIFICATES" SHALL BE FURNISHED TO THE ARCHITECT, AND DESIGN ENGINEER.
6. SHUTDOWN OF THE EXISTING FIRE SPRINKLER SYSTEM, TO FACILITATE REMODELING OPERATIONS SHALL BE COORDINATED WITH THE OWNER.
7. SEE REFLECTED CEILING PLAN FOR EXACT LOCATION OF FIRE SPRINKLER HEADS
8. FIRE SPRINKLER HEADS SHALL BE LOCATED IN THE CENTER OF EACH CEILING TILE.

### HVAC ENERGY CODE NOTES

1. THE MECHANICAL SYSTEMS ARE BASED ON CHAPTERS 1, 2, 3, 6 AND 6 OF THE 2012 INTERNATIONAL ENERGY CONSERVATION CODE PUBLISHED BY THE INTERNATIONAL CODE COUNCIL.
2. THE BUILDING HEATING AND COOLING LOADS ARE BASE ON TRANE "TRACE" PROGRAM WHICH MEETS THE REQUIREMENTS OF ASHARE STANDARD 183.
3. ALL MECHANICAL EQUIPMENT SHALL MEET THE MINIMUM EFFICIENCY REQUIREMENTS SPECIFIED ON THE DRAWING OR THE MINIMUM EFFICIENCY REQUIREMENTS SPECIFIED IN THE ENERGY CONSERVATION CODE, WHICHEVER IS HIGHER.
4. ALL MECHANICAL DUCTWORK AND PLENUMS SHALL BE INSULATED IN ACCORDANCE WITH THE DUCT INSULATION TABLE SHOWN ON THE DRAWINGS OR THE REQUIREMENTS OF THE ENERGY CONSERVATION CODE, WHICHEVER IS HIGHER.
5. ALL LONGITUDINAL SEAMS AND TRANSVERSE JOINTS OF ALL MECHANICAL DUCTWORK SHALL BE SEALED IN ACCORDANCE WITH THE THE ENERGY CODE AND SMACNA DUCT CONSTRUCTION REQUIREMENTS.
6. ALL HEATING AND AIR CONDITIONING EQUIPMENT WITH A CAPACITY OF 54,000 BTUH OR HIGHER SHALL BE PROVIDED WITH AN AIR SIDE ECONOMIZER.

### EQUIPMENT SUPPORT NOTES

1. ALL FLOOR MOUNTED EQUIPMENT SHALL BE SECURELY ATTACHED TO HOUSEKEEPING PAD.
2. ALL FLOOR MOUNTED EQUIPMENT WITH FAN(S) OR MOTOR(S) SHALL BE SUPPORTED BY VIBRATION ISOLATORS.
3. ALL SUSPENDED EQUIPMENT SHALL BE INDEPENDENTLY SUPPORTED FROM STRUCTURAL MEMBERS.
4. ALL SUSPENDED EQUIPMENT WITH FAN(S) OR MOTOR(S) SHALL BE PROVIDED WITH VIBRATION ISOLATORS BETWEEN THE EQUIPMENT AND THE STRUCTURAL MEMBERS.
5. EQUIPMENT SHALL NOT BE SUPPORTED FROM ROOF DECK
6. EQUIPMENT SUSPENDED MORE THAN 12' FROM STRUCTURE SHALL BE PROVIDED WITH SEISMIC BRACING

### AIR FILTER INSTALLATION NOTES

1. INSTALL FILTERS WITH CLEARANCE FOR NORMAL SERVICE AND MAINTENANCE.
2. INSTALL FILTERS IN POSITION TO PREVENT PASSAGE OF UNFILTERED AIR.
3. DO NOT OPERATE FAN SYSTEMS WITHOUT FILTERS.
4. PROVIDE ONE SET OF FILTERS DURING CONSTRUCTION.
5. PROVIDE AN ADDITIONAL SET OF NEW FILTERS FOR TESTING, ADJUSTING AND BALANCING OF AIR SYSTEMS.
6. AFTER COMPLETING SYSTEM INSTALLATION AND TESTING, ADJUSTING, AND BALANCING OF AIR-HANDLING AND AIR-DISTRIBUTION SYSTEMS, CLEAN FILTER HOUSINGS AND INSTALL NEW FILTER MEDIA.

### FIELD VERIFICATION NOTES

1. DESIGN DRAWINGS ARE SCHEMATIC. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING OR AWARD OF CONTRACTOR TO INSPECT EXISTING FIELD CONDITIONS.
2. THIS CONTRACTOR SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS TO TO EXISTING CONDITIONS.
3. THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN HIS BID ALL COSTS TO MEET THE DESIGN INTENT.
4. CLARIFICATIONS MADE BY THE ARCHITECT, ENGINEER OR OWNER AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT THE CONTRACTOR'S COST.
5. BIDDING CONTRACTORS SHALL HAVE A WORKING KNOWLEDGE OF ALL LOCAL CODES AND ORDINANCES AND SHALL INCLUDE IN THEIR BID THE COSTS FOR ALL WORK INSTALLED IN STRICT ACCORDANCE WITH GOVERNING CODES.
6. THE CONTRACTOR SHALL ALERT THE ARCHITECT, ENGINEER AND OWNER OF ANY APPARENT DISCREPANCIES BETWEEN GOVERNING CODES AND DESIGN INTENT.

### TEST ADJUST & BALANCE NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE COMPLETE TESTING ADJUSTING AND BALANCING FOR THIS PROJECT.
2. THE MECHANICAL SYSTEMS SHALL BE TESTED, ADJUSTED AND BALANCED, INCLUDING SUPPLY AIR SYSTEM, RETURN AIR SYSTEM, EXHAUST AIR SYSTEM, OUTSIDE AIR SYSTEM AND ALL ASSOCIATED EQUIPMENT.
3. CONTRACTOR PERFORMING TESTING ADJUSTING AND BALANCING WORK SHALL BE EITHER AABC OR NEBB CERTIFIED.
4. TESTING ADJUSTING AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE NEBB OR AABC TEST PROCEDURES.
5. TESTING ADJUSTING AND BALANCING REPORT FORMS SHALL BE STANDARD FORMS FROM EITHER AABC OR NEBB.
6. CONTRACTOR SHALL VERIFY QUANTITIES AND LOCATIONS OF ALL BALANCING DEVICES. CONTRACTOR SHALL VERIFY THAT THESE BALANCING DEVICES ARE ACCESSIBLE AN APPROPRIATE FOR BALANCING AND FOR EFFICIENT SYSTEM AND EQUIPMENT OPERATION PRIOR TO COMMENCING WORK.
7. MECHANICAL (HVAC) EQUIPMENT SHALL BE ADJUSTED TO WITHIN ZERO TO PLUS 10 PERCENT OF SPECIFIED VALUES.
8. MECHANICAL AIR INLETS AND OUTLETS SHALL BE ADJUSTED TO WITHIN 10 PERCENT OF SPECIFIED VALUES.
9. WATER SYSTEMS SHALL BE ADJUSTED TO WITHIN 10 PERCENT OF SPECIFIED VALUES.
10. FINAL BALANCE REPORT SHALL INCLUDE THE FOLLOWING: TEST CONDITIONS FOR FANS, SYSTEM DIAGRAMS, AIR CONDITIONING UNIT TEST REPORTS, FAN TEST REPORTS, AIR TERMINAL DEVICE REPORTS.
11. AFTER THE FINAL BALANCING REPORT IS SUBMITTED TO THE DESIGN ENGINEER AND OWNER, CONTRACTOR SHALL REQUEST THAT A FINAL INSPECTION BE MADE BY THE DESIGN ENGINEER. DURING THE FINAL INSPECTION, DESIGN ENGINEER MAY RANDOMLY SELECT MEASUREMENTS DOCUMENTS IN THE FINAL REPORT TO BE RECHECK BY THE CONTRACTOR.
12. APPROXIMATELY 90 DAYS AFTER SUBMISSION OF THE FINAL BALANCING REPORT, CONTRACTOR SHALL PERFORM ADDITIONAL TESTING ADJUSTING AND BALANCING TO VERIFY THAT BALANCED CONDITIONS ARE BEING MAINTAINED THROUGHOUT EACH SYSTEM AND TO CORRECT UNUSUAL CONDITIONS.
13. ADDITIONAL TESTING ADJUSTING AND BALANCING SHALL BE MADE AS DIRECTED BY THE DESIGN ENGINEER TO CORRECT UNUSUAL CONDITIONS. ADDITIONAL TESTING WILL NOT EXCEED THREE (3) DAYS DURING THE FIRST SIX MONTHS OF OPERATION.
14. IF INITIAL TESTING ADJUSTING AND BALANCING PROCEDURES WERE NOT PERFORMED DURING NEAR-PEAK SUMMER AND WINTER CONDITIONS, PERFORM ADDITIONAL TESTING ADJUSTING AND BALANCING DURING NEAR PEAK SUMMER AND WINTER CONDITIONS.
15. ALL AIR SIDE MECHANICAL (HVAC) SYSTEMS SHALL BE TESTED AND ADJUSTED, AND BALANCED.
16. ALL WATER SIDE MECHANICAL (HVAC) AND PLUMBING PIPING SYSTEMS SHALL BE TESTED, ADJUSTED, AND BALANCED INCLUDING DOMESTIC HOT WATER CIRCULATING PUMPS.

### REFRIGERATION PIPING NOTES

1. THESE NOTES APPLY TO REFRIGERANT LINE SETS. SEE MECHANICAL SPECIFICATION FOR FIELD ASSEMBLED REFRIGERANT PIPING.
2. REFRIGERATION SYSTEM SHALL USES R-410A REFRIGERANT
3. REFRIGERATION PIPING SHALL BE TYPE L REFRIGERANT GRADE, ARC TYPE LINE SETS.
4. REFRIGERATION SUCTION AND REFRIGERANT PIPING SHALL BE INSULATED.
5. REFRIGERANT PIPING SHALL BE SUPPORTED FROM OVERHEAD STRUCTURE WITH PLASTIC COATED OR COPPER PLATED CLEVIS HANGERS
6. ENGINEERED STRUTS AND HANGER RODS ARE PERMITTED TO SUPPORT REFRIGERANT.
7. REFRIGERANT PIPING SHALL NOT COME IN CONTACT WITH HANGERS OR ENGINEERED STRUT. ISOLATE REFRIGERANT PIPING FROM HANGER WITH PIPE INSULATION OR ELASTOMERIC SLEEVE.
8. REFRIGERANT PIPING SHALL BE INSTALLED A MINIMUM OF 12" FROM ANY WATER PIPING OR DUCTWORK
9. LIQUID LINE FILTER-DRIVER SHALL BE INSTALLED AT INDOOR (EVAPORATOR) COIL.
10. REFRIGERANT TUBE AND INDOOR (EVAPORATOR) COIL SHALL BE EVACUATED TO 500 MICRONS.
11. THE REFRIGERANT PIPING SYSTEM SHALL HOLD A VACUUM OF 1000 MICRONS FOR 7 MINUTES.
12. REFRIGERATING COMPRESSOR SHALL NOT BE USES AS A VACUUM PUMP.
13. PROVIDE PROPER PROVISIONS FOR EXPANSION OR MOVEMENT OF ALL PIPING.
14. SERVICE VALVES AND LIQUID LINE FILTER-DRYER SHALL BE WRAPPED WITH A HEAT-SINKING MATERIAL DURING ALL BRAZING PROCESSES.

### OPER. & MAINT. MANUAL NOTES

1. SUBMIT OPERATIONS AND MAINTENANCE MANUALS IN A PDF ELECTRONIC FILE. ASSEMBLE EACH MANUAL INTO A COMPOSITE ELECTRONICALLY INDEXED FILE. SUBMIT ON DIGITAL MEDIA ACCEPTABLE TO ARCHITECT. NAME EACH INDEXED DOCUMENT FILE IN COMPOSITE ELECTRONIC INDEX WITH APPLICABLE ITEM NAME. INCLUDE A COMPLETE ELECTRONICALLY LINKED OPERATION AND MAINTENANCE DIRECTORY. ENABLE INSERTED REVIEWER COMMENTS ON DRAFT SUBMITTALS.
2. ADDITIONALLY, PROVIDE THREE PAPER COPIES. INCLUDE A COMPLETE OPERATION AND MAINTENANCE DIRECTORY. ENCLOSE TITLE PAGES AND DIRECTORIES IN CLEAR PLASTIC SLEEVES. ARCHITECT WILL RETURN TWO COPIES.
3. SUBMIT EACH MANUAL IN FINAL FORM PRIOR TO REQUESTING INSPECTION FOR SUBSTANTIAL COMPLETION AND AT LEAST 15 DAYS BEFORE COMMENCING DEMONSTRATION AND TRAINING. ARCHITECT WILL RETURN COPY WITH COMMENTS. CORRECT OR REVISE EACH MANUAL TO COMPLY WITH ARCHITECT'S COMMENTS. SUBMIT COPIES OF EACH CORRECTED MANUAL WITHIN 15 DAYS OF RECEIPT OF ARCHITECT'S COMMENTS AND PRIOR TO COMMENCING DEMONSTRATION AND TRAINING.
4. OPERATION MANUALS CONTENT: INCLUDE OPERATION DATA REQUIRED IN INDIVIDUAL SPECIFICATION SECTIONS AND THE FOLLOWING INFORMATION:
  - a. SYSTEM, SUBSYSTEM, AND EQUIPMENT DESCRIPTIONS. (USE DESIGNATIONS FOR SYSTEMS AND EQUIPMENT INDICATED ON CONTRACT DOCUMENTS);
  - b. PERFORMANCE AND DESIGN CRITERIA IF CONTRACTOR IS DELEGATED DESIGN RESPONSIBILITY; OPERATING STANDARDS;
  - c. OPERATING PROCEDURES;
  - d. OPERATING LOGS;
  - e. WIRING DIAGRAMS;
  - f. CONTROL DIAGRAMS;
  - g. PIPED SYSTEM DIAGRAMS;
  - h. PRECAUTIONS AGAINST IMPROPER USE;
  - i. LICENSE REQUIREMENTS INCLUDING INSPECTION AND RENEWAL DATES.
5. OPERATION MANUALS DESCRIPTIONS: INCLUDE THE FOLLOWING:
  - a. PRODUCT NAME AND MODEL NUMBER. (USE DESIGNATIONS FOR PRODUCTS INDICATED ON CONTRACT DOCUMENTS);
  - b. MANUFACTURER'S NAME;
  - c. EQUIPMENT IDENTIFICATION WITH SERIAL NUMBER OF EACH COMPONENT;
  - d. EQUIPMENT FUNCTION;
  - e. OPERATING CHARACTERISTICS;
  - f. LIMITING CONDITIONS;
  - g. PERFORMANCE CURVES;
  - h. ENGINEERING DATA AND TESTS;
  - i. COMPLETE NOMENCLATURE AND NUMBER OF REPLACEMENT PARTS. WARRANTY
  - j. WARRANTY
6. OPERATING PROCEDURES: INCLUDE THE FOLLOWING, AS APPLICABLE:
  - a. STARTUP PROCEDURES;
  - b. EQUIPMENT OR SYSTEM BREAK-IN PROCEDURES;
  - c. ROUTINE AND NORMAL OPERATING INSTRUCTIONS;
  - d. REGULATION AND CONTROL PROCEDURES;
  - e. INSTRUCTIONS ON STOPPING;
  - f. NORMAL SHUTDOWN INSTRUCTIONS;
  - g. SEASONAL AND WEEKEND OPERATING INSTRUCTIONS;
  - h. REQUIRED SEQUENCES FOR ELECTRIC OR ELECTRONIC SYSTEMS; SPECIAL OPERATING INSTRUCTIONS AND PROCEDURES;
  - i. SYSTEMS AND EQUIPMENT CONTROLS;
  - j. DESCRIBE THE SEQUENCE OF OPERATION, AND DIAGRAM CONTROLS AS INSTALLED;
  - k. PIPED SYSTEMS;
  - l. DIAGRAM PIPING AS INSTALLED, AND IDENTIFY COLOR-CODING WHERE REQUIRED FOR IDENTIFICATION.
7. PRODUCT MAINTENANCE MANUALS CONTENT:
  - a. ORGANIZE MANUAL INTO A SEPARATE SECTION FOR EACH PRODUCT, MATERIAL, AND FINISH.
  - b. INCLUDE SOURCE INFORMATION, PRODUCT INFORMATION, MAINTENANCE PROCEDURES, REPAIR MATERIALS AND SOURCES, AND WARRANTIES AND BONDS.

### GENERAL EQUIPMENT NOTES

1. HEATING & AIR CONDITIONING EQUIPMENT IS SIZE IN ACCORDANCE WITH ASHRAE STANDARD 183.
2. ALL MECHANICAL EQUIPMENT SHALL BE LISTED, LABELED AND INSTALLED IN ACCORDANCE THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. AT LEAST ONE COPY OF THE INSTALLATION INSTRUCTIONS SHALL BE ON THE JOB SITE AT ALL TIMES.
3. ALL CAPACITIES ARE AT JOB SITE CONDITIONS AND ARE MINIMUM CAPACITY.
4. ALL AIR CONDITIONING EQUIPMENT SHALL BE AHRI CERTIFIED AND UL LISTED.
5. ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED TO CONFORM TO LOCAL SEISMIC REQUIREMENTS AND THE REQUIREMENTS OF THESE CONSTRUCTION DOCUMENTS.
6. VERIFY ALL REQUIRED SERVICE CONNECTIONS, INCLUDING ELECTRICAL CHARACTERISTICS FOR ALL EQUIPMENT PRIOR TO ORDERING EQUIPMENT.
7. ALL SIMILAR EQUIPMENT SHALL BE OF THE SAME MANUFACTURER.
8. AIR SIMILAR INLETS AND OUTLETS SHALL BE OF THE SAME MANUFACTURER.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE HVAC EQUIPMENT CHECK-IN, SAFEKEEPING, AND DAMAGE.
10. ALL SYSTEM COMPONENTS, WHERE REQUIRED, SHALL BE CERTIFIED AND LISTED BY A THIRD PARTY.
11. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
12. PROVIDE CONCRETE HOUSEKEEPING PADS FOR ALL MECHANICAL EQUIPMENT SUPPORT FROM THE FLOOR OR GROUND. MINIMUM THICKNESS OF HOUSEKEEPING PAD SHALL BE 4". CONCRETE HOUSEKEEPING PAD SHALL EXTEND BEYOND THE EQUIPMENT A MINIMUM OF 6" ON EACH SIDE. COORDINATE EXACT LOCATION OF CONCRETE HOUSEKEEPING PAD WITH ALL TRADES.
13. CONDENSATE DRAIN FROM AIR CONDITIONING EQUIPMENT SHALL BE PIPED FULL SIZE OF EQUIPMENT OUTLET TO NEAREST DRAIN.

### HVAC SUBMITTAL NOTES

1. SUBMITTAL SHALL BE SUBMITTED BY 9/01/2015.
2. MECHANICAL SUBMITTALS SHALL BE SUBMITTED AS A COMPLETE ELECTRONIC PACKAGE ASSEMBLED BY SPECIFICATION DIVISIONS.
3. ASSEMBLE COMPLETE ELECTRONIC SUBMITTAL PACKAGE INTO A SINGLE INDEXED FILE INCORPORATING SUBMITTAL REQUIREMENTS OF A SINGLE SPECIFICATION SECTION AND TRANSMITTAL FORM WITH LINKS ENABLING NAVIGATION TO EACH ITEM.
  - a. LITERATURE SHALL INCLUDE REFERENCE TO EQUIPMENT CALLOUT AND SPECIFICATION SECTION;
  - b. FILE NAME SHALL USE PROJECT IDENTIFIER AND SPECIFICATION SECTION NUMBER FOLLOWED BY A DECIMAL POINT AND THEN A SEQUENTIAL NUMBER (E.G., LNHS-061000.01).
  - c. RE-SUBMITTALS SHALL INCLUDE AN ALPHABETIC SUFFIX AFTER ANOTHER DECIMAL POINT (E.G., LNHS-061000.01.A).
  - d. PROVIDE MANUFACTURER'S CATALOG DATA SHEETS FOR EACH MANUFACTURED ITEM LISTED ON THE DRAWINGS AND SPECIFICATIONS;
4. INCLUDE MANUFACTURER'S CATALOG DATA OF EACH MANUFACTURED ITEM AND ENOUGH INFORMATION TO SHOW COMPLIANCE WITH CONTRACT DOCUMENT REQUIREMENTS.
  - a. LITERATURE SHALL SHOW CAPACITIES AND SIZE OF EQUIPMENT USED AND BE MARKED INDICATING EACH SPECIFIC ITEM WITH APPLICABLE DATA UNDERLINED;
  - b. INCLUDE NAME, ADDRESS, AND PHONE NUMBER OF EACH SUPPLIER;
  - c. DEVIATIONS AND ADDITIONAL INFORMATION:
    - i. ON AN ATTACHED SEPARATE SHEET, PREPARED ON CONTRACTOR'S LETTERHEAD, RECORD RELEVANT INFORMATION, REQUESTS FOR DATA, REVISIONS OTHER THAN THOSE REQUESTED BY ENGINEER CONTRACT DOCUMENTS, INCLUDING MINOR VARIATIONS AND LIMITATIONS.
    - ii. INCLUDE SAME IDENTIFICATION INFORMATION AS RELATED SUBMITTAL.
5. COLLECT PRODUCT DATA INFORMATION INTO A SINGLE SUBMITTAL FOR EACH ELEMENT OF CONSTRUCTION AND TYPE OF PRODUCT OR EQUIPMENT.
  - a. IF INFORMATION MUST BE SPECIALLY PREPARED FOR SUBMITTAL BECAUSE STANDARD PUBLISHED DATA ARE NOT SUITABLE FOR USE, SUBMIT AS SHOP DRAWINGS, NOT AS PRODUCT DATA.
  - b. MARK EACH COPY OF EACH SUBMITTAL TO SHOW WHICH PRODUCTS AND OPTIONS ARE APPLICABLE.
6. INCLUDE THE FOLLOWING PRODUCT INFORMATION, AS APPLICABLE:
  - a. MANUFACTURER'S CATALOG CUTS;
  - b. MANUFACTURER'S PRODUCT SPECIFICATIONS;
  - c. STANDARD COLOR CHARTS;
  - d. STATEMENT OF COMPLIANCE WITH SPECIFIED REFERENCED STANDARDS;
  - e. TESTING BY RECOGNIZED TESTING AGENCY;
  - f. APPLICATION OF TESTING AGENCY LABELS AND SEALS;
  - g. NOTATION OF COORDINATION REQUIREMENTS;
  - h. AVAILABILITY AND DELIVERY TIME INFORMATION;
7. INCLUDE THE FOLLOWING EQUIPMENT INFORMATION:
  - a. WIRING DIAGRAMS SHOWING FACTORY-INSTALLED WIRING;
  - b. PRINTED PERFORMANCE CURVES;
  - c. OPERATIONAL RANGE DIAGRAMS;
  - d. CLEARANCES REQUIRED TO OTHER CONSTRUCTION, IF NOT INDICATED ON ACCOMPANYING SHOP DRAWINGS.
8. PREPARE PROJECT-SPECIFIC SHOP DRAWINGS, DRAWN ACCURATELY TO SCALE.
  - a. DO NOT BASE SHOP DRAWINGS ON REPRODUCTIONS OF THE CONTRACT DOCUMENTS OR STANDARD PRINTED DATA.
  - b. FULLY ILLUSTRATE REQUIREMENTS IN THE CONTRACT DOCUMENTS.
  - c. INCLUDE THE FOLLOWING INFORMATION, AS APPLICABLE:
    - i. IDENTIFICATION OF PRODUCTS;
    - ii. SCHEDULES;
    - iii. COMPLIANCE WITH SPECIFIED STANDARDS;
    - iv. NOTATION OF COORDINATION REQUIREMENTS;
    - v. NOTATION OF DIMENSIONS ESTABLISHED BY FIELD MEASUREMENT;
    - vi. RELATIONSHIP AND ATTACHMENT TO ADJOINING CONSTRUCTION CLEARLY INDICATED;
    - vii. SEAL AND SIGNATURE OF PROFESSIONAL ENGINEER IF SPECIFIED.
9. ALLOW TIME FOR SUBMITTAL REVIEW, INCLUDING TIME FOR RE-SUBMITTALS. TIME FOR REVIEW SHALL COMMENCE ON ENGINEERS RECEIPT OF SUBMITTAL. NO EXTENSION OF THE CONTRACT TIME WILL BE AUTHORIZED BECAUSE OF FAILURE TO TRANSMIT SUBMITTALS ENOUGH IN ADVANCE OF THE WORK TO PERMIT PROCESSING, INCLUDING RE-SUBMITTALS.
  - a. ALLOW 10 DAYS FOR INITIAL REVIEW OF MECHANICAL SUBMITTAL.
  - b. ALLOW 10 DAYS FOR REVIEW OF EACH RE-SUBMITTAL.
10. PROVIDE DEVIATIONS AND ADDITIONAL INFORMATION ON AN ATTACHED SEPARATE SHEET, PREPARED ON CONTRACTOR'S LETTERHEAD, RECORD RELEVANT INFORMATION, REQUESTS FOR DATA, REVISIONS OTHER THAN THOSE REQUESTED BY DESIGN ENGINEER ON PREVIOUS SUBMITTALS, AND DEVIATIONS FROM REQUIREMENTS IN THE CONTRACT DOCUMENTS, INCLUDING MINOR VARIATIONS AND LIMITATIONS. INCLUDE SAME IDENTIFICATION INFORMATION AS RELATED SUBMITTAL.

### HVAC PROJECT SUBMIT. NOTES

1. MECHANICAL SUBMITTALS SHALL BE SUBMITTED AS A COMPLETE ELECTRONIC PACKAGE ASSEMBLED BY SPECIFICATION DIVISIONS.
2. PROVIDE EQUIPMENT SUBMITTAL INFORMATION FOR THE FOLLOWING EQUIPMENT:
  - A. FURNACE
  - B. CONDENSING UNIT
  - C. ROOF EXHAUST FANS
  - D. CEILING EXHAUST FANS
  - E. CEILING DIFFUSERS (CD)
  - F. REGISTERS & GRILLES (CG, SR, WG)
  - G. DAMPERS, & AIR DUCT ACCESSORIES
  - H. DUCT TAKE-OFF
  - I. VIBRATION ISOLATORS
  - J. AIR FILTERS
3. PROVIDE MATERIAL SUBMITTAL INFORMATION FOR THE FOLLOWING MATERIAL:
  - A. REFRIGERATION PIPING & VALVES
  - B. HANGERS AND SUPPORTS
  - C. DUCT INSULATION
  - D. DUCT LINER
  - E. PIPE INSULATION
  - F. EQUIPMENT IDENTIFICATION
  - G. PIPE IDENTIFICATION
  - H. BUILDING AUTOMATION SYSTEM
  - I. FIRE SPRINKLER SYSTEM
  - J. TESTING ADJUSTING AND BALANCING CONTRACTOR QUALIFICATIONS.

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project:  
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AMPHITHEATER -  
ADDITION  
Grand Junction, CO

CITY OF  
**Grand Junction**  
COLORADO

project#: 19-0270  
date: February 20, 2020

revisions:

title:  
**HVAC NOTES**

sheet:  
**ME002**

PERMIT SET

### EQUIPMENT LABELING

- ALL MECHANICAL EQUIPMENT SHALL BE LABELED.
- PROVIDE 1/16" THICK MULTIPLE LAYERED, MULTIPLE COLORED PLASTIC LABEL WITH MECHANICAL ENGRAVING.
- LABEL SHALL HAVE BLACK BACKGROUND, 1/2" HIGH WHITE LETTERING.
- MINIMUM SIZE OF LABEL SHALL BE 2-1/2" X 1"
- LABEL SHALL BE SECURED TO EQUIPMENT WITH STAINLESS STEEL SELF-TAPPING SCREWS.
- MINIMUM CONTENT OF LABEL SHALL INCLUDE DRAWING DESIGNATION (UNIQUE NUMBER), AND AREA SERVED.

### SEISMIC DUCTWORK NOTES

- THE TOP OF ALL DUCTWORK SHALL BE INSTALLED WITHIN 12-INCHES OR LESS FROM STRUCTURAL SUPPORT MEMBER. THE 12-INCHES SHALL BE MEASURED FROM THE TOP OF THE DUCT TO THE BOTTOM OF THE SUPPORT WHERE THE HANGER IS ATTACHED. DUCT HANGERS MUST BE ATTACHED WITHIN 2" OF THE TOP OF THE DUCT WITH A MINIMUM OF TWO #10 SHEET METAL SCREWS.
- IF ANY HANGER IN THE RUN EXCEEDS THE 12 INCH LIMIT, SEISMIC BRACING IS REQUIRED FOR THE RUN.
- ALL RECTANGULAR AND SQUARE DUCTS 6 SQUARE FEET OR LESS DO NOT REQUIRE SEISMIC BRACING.
- ALL ROUND DUCTS LESS THAN 28 INCHES IN DIAMETER DO NOT REQUIRE SEISMIC BRACING.
- DEVICES, WEIGHING 50 POUND OR GREATER, AND MOUNTED IN-LINE AND RIGIDLY ATTACHED TO THE DUCTWORK AT BOTH ENDS MUST BE SUPPORTED AND BRACED INDEPENDENTLY FROM THE DUCTWORK IF THE UNIT WEIGHT IS 50 LBS. OR GREATER OR THE
- DEVICES, WEIGHING BETWEEN 20 AND 49 LBS. SHALL BE SEPARATED FROM THE DUCT WITH A FLEXIBLE CONNECTOR.

### HVAC PIPE HANGER NOTES

- ALL PIPING SHALL BE SUPPORT WITH STEEL CLEVIS HANGERS (MSS TYPE 1).
- PERFORATED METAL STRAPS OR PLASTIC STRAPPING (PLUMBER TAPE) SHALL NOT BE USED TO SUPPORT OR BRACE ANY PIPE.
- PROVIDE PIPE HANGERS WITHIN 18-INCHES OF ALL CHANGES OF DIRECTION.
- ALL STEEL CLEVIS HANGERS USED TO SUPPORT COPPER PIPING SHALL BE COPPER PLATED OR PLASTIC COATED
- ALL STEEL CLEVIS HANGERS USED TO SUPPORT PLASTIC PIPING SHALL BE PLASTIC COATED.
- PROVIDE ELASTOMERIC CUSHION (COOPER B-LINE B1999 "VIBRA CUSHION") BETWEEN COPPER PIPING AND GALVANIZED CHANNEL SUPPORT CLAMPS. PLASTIC PIPE WRAP TAPE IS NOT ACCEPTABLE.
- PROVIDE ELASTOMERIC INSERT (COOPER B-LINE BVP "VIBRACLAMPS") BETWEEN PLASTIC PIPE AND GALVANIZED CHANNEL SUPPORT CLAMPS. PLASTIC PIPE WRAP TAPE IS NOT ACCEPTABLE.
- PROVIDE SWAY BRACING FOR ALL PIPING 4" AND LARGER AT ALL CHANGES IN DIRECTION GREATER THAN 45-DEGREES.

### DUCT SUPPORT NOTES

- SUPPORT ALL METAL DUCTWORK FROM STRUCTURAL MEMBERS.
- ALL DUCT SUPPORTS SHALL BE GALVANIZED STEEL.
- DUCT SUPPORTS SHALL NOT BE ATTACHED TO ROOF DECK.
- DUCT SUPPORTS SHALL NOT BE ATTACHED TO STRUCTURAL CROSS BRACING.
- HANGER STRAPS AND HANGER ROD SIZES FOR RECTANGULAR DUCTWORK SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," TABLE 5-1 "RECTANGULAR DUCT HANGERS MINIMUM SIZE."
- HANGER STRAPS AND HANGER ROD SIZES FOR ROUND DUCTWORK SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," TABLE 5-2, "MINIMUM HANGER SIZES FOR ROUND DUCT."
- SUSPEND ALL METAL DUCTWORK NOT EXCEEDING 30' LONGEST SIDE AT EVERY JOINT. DO NOT EXCEED 10'-0" HANGER SPACING. USE 1" X 18 GAGE GALVANIZED STRAPS (MINIMUM) ATTACHED TO BOTTOM AND SIDES OF DUCT
- SUSPEND ALL METAL DUCTWORK EXCEEDING 30' LONGEST SIDE AT MAXIMUM 8'-0" SPACING USING ANGLES AND RODS.

### DUCT CONSTRUCTION NOTES

- DUCTWORK HAS BEEN DESIGNED AND SIZED IN ACCORDANCE WITH AMERICAN SOCIETY OF HEATING REFRIGERATION AND AIR CONDITIONING ENGINEERS (ASHRAE) HANDBOOK OF FUNDAMENTALS AND SMACNA'S HVAC DUCT CONSTRUCTION STANDARDS HANDBOOK.
- ALL RECTANGULAR AND ROUND DUCTWORK SHALL BE FABRICATED AND CONSTRUCTED TO COMPLY WITH THE SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA'S) "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
- ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL, EXCEPT WHERE INDICATED OTHERWISE.
- ALL DUCTWORK SHALL BE A MINIMUM OF 26 GAUGE.
- ALL RECTANGULAR AND ROUND DUCTWORK SHALL BE CONSTRUCTED TO THE FOLLOWING SHEET METAL DUCT STATIC PRESSURE CLASSIFICATION:
  - SUPPLY AIR DUCT: 2" W.C.
  - RETURN AIR DUCT: 2" W.C. (NEGATIVE)
  - EXHAUST AIR DUCT: 2" W.C. (NEGATIVE)
  - OUTSIDE AIR DUCT: 2" W.C.
- DUCT SIZES SHALL BE VERIFIED FOR CLEARANCES AT THE JOB SITE PRIOR TO FABRICATION. DIMENSIONS MAY BE CHANGED TO ACCOMMODATE CONSTRUCTION CLEARANCES. FREE AREA OF DUCT SHALL BE MAINTAINED.
- DUCT TRANSITIONS SHALL BE CONSTRUCTED WITH SLOPE OF 1/4."
- FLEXIBLE DUCTWORK SHALL BE LIMITED TO A MAXIMUM OF 3'-0" TO AIR INLET OR AIR OUTLET.
- FLEXIBLE CONNECTORS SHALL NOT BE USED.

### HVAC PIPING NOTES

- CAULK AROUND ALL PIPING THAT PASSES THROUGH FIRE RATED PARTITIONS WITH A NON-HARDENING CAULKING SIMILAR TO 3M "FIRE BARRIER".
- PROVIDE PROPER PROVISIONS FOR EXPANSION OR MOVEMENT OF ALL PIPING.
- PROVIDE LARGE ENOUGH PIPE SLEEVES THROUGH WALLS OR FLOORS TO ALLOW FOR ANTICIPATED DEFERENTIAL MOVEMENTS.
- ALL PIPING SHALL BE INSTALLED IN A NEAT ARRANGEMENT PARALLEL TO BUILDING STRUCTURE.

### SEISMIC EQUIP. SUPPORT NOTES

- ALL EQUIPMENT SHALL BE INSTALLED WITH SEISMIC RESTRAINTS.
 

EXEMPTIONS:

  - FLOOR OR CURB-MOUNTED EQUIPMENT WEIGHING LESS THAN 400 LBS AND NOT RESILIENTLY MOUNTED, WHERE THE IMPORTANCE FACTOR, IP = 1.0 AND THERE IS NO POSSIBILITY OF CONSEQUENTIAL DAMAGE.
  - EQUIPMENT WEIGHING LESS THAN 20 LBS AND DISTRIBUTION SYSTEMS WEIGHING LESS THAN 5 LBS/LINEAL FOOT, WITH AN IP = 1.0 AND WHERE FLEXIBLE CONNECTIONS EXIST BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING OR CONDUIT.
- ALL HVAC EQUIPMENT WITH MOTORS, FANS, ETC. SHALL BE INSTALLATION WITH VIBRATION ISOLATORS BETWEEN THE EQUIPMENT AND THE BUILDING STRUCTURE.
- ALL FLOOR MOUNTED EQUIPMENT SHALL BE INSTALLED A 4" HIGH CONCRETE HOUSEKEEPING PAD, VIBRATION ISOLATOR OR EQUIPMENT ATTACHMENT TO THE CONCRETE HOUSEKEEPING SHALL BE A MINIMUM OF 6-INCHES FROM THE EDGE OF THE HOUSEKEEPING PAD.
- ALL COMPONENTS SHALL BE INSTALLED ON BLOCKS TO THE OPERATING HEIGHT OF THE ISOLATORS. AFTER THE ENTIRE INSTALLATION IS COMPLETE AND UNDER FULL LOAD INCLUDING WATER, THE ISOLATORS SHALL BE ADJUSTED SO THAT THE LOAD IS TRANSFERRED FROM THE BLOCKS TO THE ISOLATORS. REMOVE ALL DEBRIS FROM BENEATH THE EQUIPMENT AND VERIFY THAT THERE ARE NO SHORT CIRCUITS OF THE ISOLATION. THE EQUIPMENT SHALL BE FREE TO MOVE IN ALL DIRECTIONS, WITHIN THE LIMITS OF THE RESTRAINTS.
- NO RIGID CONNECTIONS BETWEEN EQUIPMENT AND THE BUILDING STRUCTURE SHALL BE MADE THAT DEGRADES THE NOISE AND VIBRATION CONTROL SYSTEM.
- OVERSTRESSING OF THE BUILDING STRUCTURE MUST NOT OCCUR DUE TO OVERHEAD SUPPORT OF EQUIPMENT.
- SEISMIC CABLE RESTRAINTS SHALL BE INSTALLED SLIGHTLY SLACK TO AVOID SHORT CIRCUITING THE ISOLATED SUSPENDED EQUIPMENT OR PIPING.

### SMOKE DETECTOR NOTES

- SMOKE DETECTOR SHALL BE PHOTOELECTRIC TYPE AND SHALL BE EQUIVALENT TO "SYSTEM SENSOR" DH100ACDCLP.
- SMOKE DETECTOR SHALL BE INSTALLED IN THE RETURN AIR DUCT OF ALL AIR HANDLING UNITS WITH CAPACITY GREATER THAN 2,000 CFM.
- PROVIDE SMOKE DETECTORS WHERE MULTIPLE AIR-HANDLING SYSTEMS SHARE COMMON SUPPLY OR RETURN AIR DUCTS OR PLENUMS WITH A COMBINED DESIGN CAPACITY GREATER THAN 2,000 CFM.
- THE SMOKE DETECTORS SHALL BE INSTALLED TO MONITOR THE ENTIRE AIRFLOW CONVEYED BY THE SYSTEM INCLUDING RETURN AIR AND EXHAUST.
- PROVIDE ACCESS TO ALL SMOKE DETECTORS FOR INSPECTION.
- SMOKE DETECTOR SHALL BE INTERLOCKED WITH SUPPLY FAN ELECTRICAL STARTER TO SHUT DOWN SUPPLY AIR FAN(S) ON SENSING SMOKE.
- SMOKE DETECTOR SHALL BE INTERLOCKED WITH EXISTING FIRE ALARM SYSTEM.
- THE ACTUATION OF A DUCT SMOKE DETECTOR SHALL ACTIVATE A VISIBLE AND AUDIBLE SUPERVISORY SIGNAL AT A CONSTANTLY ATTENDED LOCATION.
- IN ADDITIONAL TO INTERLOCKING THE SMOKE DETECTOR TO THE FIRE ALARM SYSTEM, THE SMOKE DETECTOR SHALL BE CONNECTED TO A MULTI-SIGNALING ANNUNCIATOR PANEL (SYSTEM SENSOR SSK 451).
- MULTI-SIGNALING ANNUNCIATOR PANEL (SYSTEM SENSOR SSK 451) SHALL BE INSTALLED AS SHOWN ON DRAWING AND AS REQUIRED BY BUILDING OFFICIAL.

### DUCT SEALING NOTES

- ALL TRANSVERSE JOINTS AND LONGITUDINAL SEAMS ON ALL RECTANGULAR AND ROUND DUCTWORK SHALL BE SEAL TO SMACNA SEAL CLASS B.
- APPROVED METHODS OF SEALING DUCTWORK INCLUDES TAPES, MASTICS, GASKETS OR OTHER APPROVED CLOSURE SYSTEMS.
- TAPES AND MASTICS USED TO SEAL DUCTWORK MUST BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A AND SHALL BE MARKED "181A-P FOR PRESSURE-SENSITIVE TAPE, "181A-M" FOR MASTIC OR "181A-H FOR HEAT-SENSITIVE TAPE.
- TAPES AND MASTICS USED TO SEAL FLEXIBLE AIR DUCTS SHALL COMPLY WITH UL 181B AND SHALL BE MARKED "181B-FX" FOR PRESSURE SENSITIVE TAPE, OR "181B-M FOR MASTIC.
- MECHANICAL FASTENERS USED WITH FLEXIBLE NON-METALLIC AIR DUCTS SHALL COMPLY WITH UL 181 AND SHALL BE MARKED "181B-".
- TAPE ALONE CANNOT BE SUBSTITUTED FOR MECHANICAL FASTENERS
- DO NOT USE GRAY DUCT TAPE, FOIL BACKED TAPE, OIL BASED CAULKING AND GLAZING COMPOUNDS TO SEAL METAL DUCTS.

### RECT. DUCT CONSTR. NOTES

- ALL TRANSVERSE JOINTS SHALL BE FABRICATED & INSTALLED ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-1, "RECTANGULAR DUCT/TRANSVERSE JOINTS."
- ALL LONGITUDINAL SEAMS SHALL BE FABRICATED AND INSTALLED ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-2, "RECTANGULAR DUCT/LONGITUDINAL SEAMS."
- ALL ELBOWS, TRANSITIONS, OFFSETS, BRANCH CONNECTIONS, AND OTHER FITTINGS AND COMPONENTS SHALL BE FABRICATED AND INSTALLED ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," CHAPTER 4, "FITTINGS AND OTHER CONSTRUCTION."
- CROSS-BREAK ALL DUCT SURFACES 15" THROUGH 60". USE ANGLE REINFORCING FOR DUCTS SURFACES OVER 60".
- PROVIDE SINGLE VANE TURNING VANES IN ALL ELBOWS AND CHANGES IN DIRECTION.

### SEISMIC DESIGN REQUIREMENTS

- THE SEISMIC REQUIREMENTS FOR THIS PROJECT SHALL BE IN ACCORDANCE WITH CHAPTER 17 OF THE 2012 INTERNATIONAL BUILDING CODE (IBC) AND CHAPTER 13 OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE) 7-10 "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES".
- 2012 INTERNATIONAL BUILDING CODE RISK CATEGORY = II
- BUILDING SEISMIC IMPORTANCE FACTOR (I) = 1.0.
- BUILDING SEISMIC DESIGN CATEGORY = D
- 5% DAMPED DESIGN SPECTRAL RESPONSE ACCELERATION SDS = 0.95 g  
SD1 = 0.48 G
- VRF SYSTEM COMPONENT IMPORTANCE FACTOR (I) = 1.0
- ALL OTHER HVAC SYSTEM COMPONENT IMPORTANCE FACTOR = 1.0

### SEISMIC PIPING NOTES

- THE TOP OF ALL PIPING SHALL BE INSTALLED WITHIN 12-INCHES (OR LESS) FROM STRUCTURAL SUPPORT MEMBER. THE 12-INCHES SHALL BE MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE SUPPORT WHERE THE HANGER IS ATTACHED.
- IF PIPING IS SUPPORT GREATER THAN 12-INCHES FROM THE SUPPORT MEMBER, ADDITIONAL SEISMIC SUPPORT IS REQUIRED. CONTRACTOR WILL BE REQUIRED TO ENGAGE A STRUCTURAL ENGINEER TO PROVIDE SEISMIC CALCULATIONS.
- ALL PIPING LESS THAN 1-1/4 INCHES NOMINAL DIAMETER AND LOCATED IN BOILER, MECHANICAL EQUIPMENT AND REFRIGERATION MECHANICAL ROOMS DO NOT REQUIRE SEISMIC SUPPORTS.
- ALL PIPING LESS THAN 2" INCHES NOMINAL DIAMETER DO NOT REQUIRE SEISMIC SUPPORTS.
- THE LATERAL MOTION OF PIPING WILL NOT CAUSE DAMAGING IMPACT WITH SURROUNDING SYSTEMS (E.G. OTHER PIPE, DUCT, EQUIPMENT, SPRINKLER HEADS ETC.) OR CAUSE LOSS OF SYSTEM VERTICAL SUPPORT.

### FLEXIBLE DUCT NOTES

- FLEXIBLE DUCT SHALL NOT BE USED ON EXPOSED DUCTWORK.
- FLEXIBLE DUCTWORK SHALL BE LIMITED TO A MAXIMUM OF 3'-0" FOR CONNECTION OF RIGID DUCTWORK TO AIR INLETS AND AIR OUTLETS.
- FLEXIBLE AIR DUCTS SHALL BE LISTED AND LABELED AS UL 181 CLASS G OR CLASS F FLEXIBLE AIR DUCTS.
- FLEXIBLE CONNECTORS SHALL NOT BE USED.
- FLEXIBLE AIR DUCTS SHALL BE INSTALLED FULLY EXTENDED.
- DO NOT BEND FLEXIBLE AIR DUCTS ACROSS SHARP CORNERS OR INCIDENTAL CONTACT WITH METAL FIXTURES, PIPES, OR CONDUITS.
- RADIUS AT CENTERLINE OF FLEXIBLE DUCT SHALL BE NOT LESS THAN ONE DUCT DIAMETER.
- DO NOT INSTALL FLEXIBLE AIR DUCTS NEAR HOT EQUIPMENT (I.E. FURNACES, BOILERS, STEAM PIPES, ETC) THAT IS ABOVE THE RECOMMENDED FLEXIBLE DUCT USE TEMPERATURE.
- DO NOT INSTALL FLEXIBLE AIR DUCT IN CONCRETE, BURIED BELOW GRADE OR IN CONTACT WITH THE GROUND.
- ALL TAPES, MASTICS AND NON-METALLIC FASTENERS (PLASTIC CLAMPS) SHALL BE LISTED AND LABELED TO UL 181B.

### ROUND DUCT CONSTR. NOTES

- ALL TRANSVERSE JOINTS SHALL BE FABRICATED ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-1, "ROUND DUCT TRANSVERSE JOINTS."
- ALL LONGITUDINAL SEAMS SHALL BE FABRICATED AND INSTALLED ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-2, "ROUND DUCT LONGITUDINAL SEAMS."
- ALL ROUND TEES AND LATERALS SHALL BE FABRICATED AND INSTALLED ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-5, "90 DEGREE TEES AND LATERALS."
- ALL CONICAL TEES SHALL BE FABRICATED AND INSTALLED ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-6, "CONICAL TEES."
- FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT-SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."

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#### project:

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO



project#: 19.0270  
date: February 20, 2020

#### revisions:

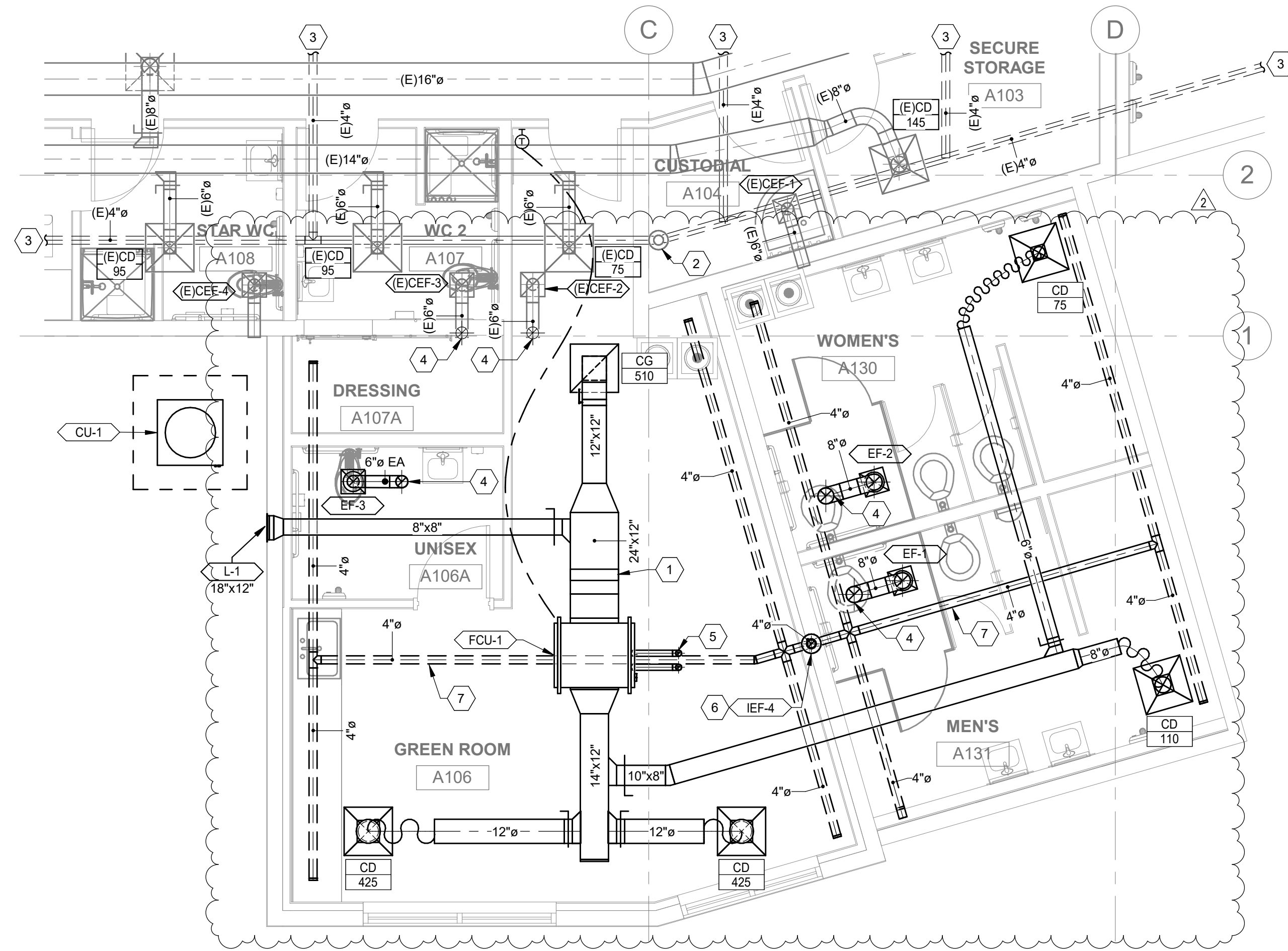
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**HVAC NOTES**

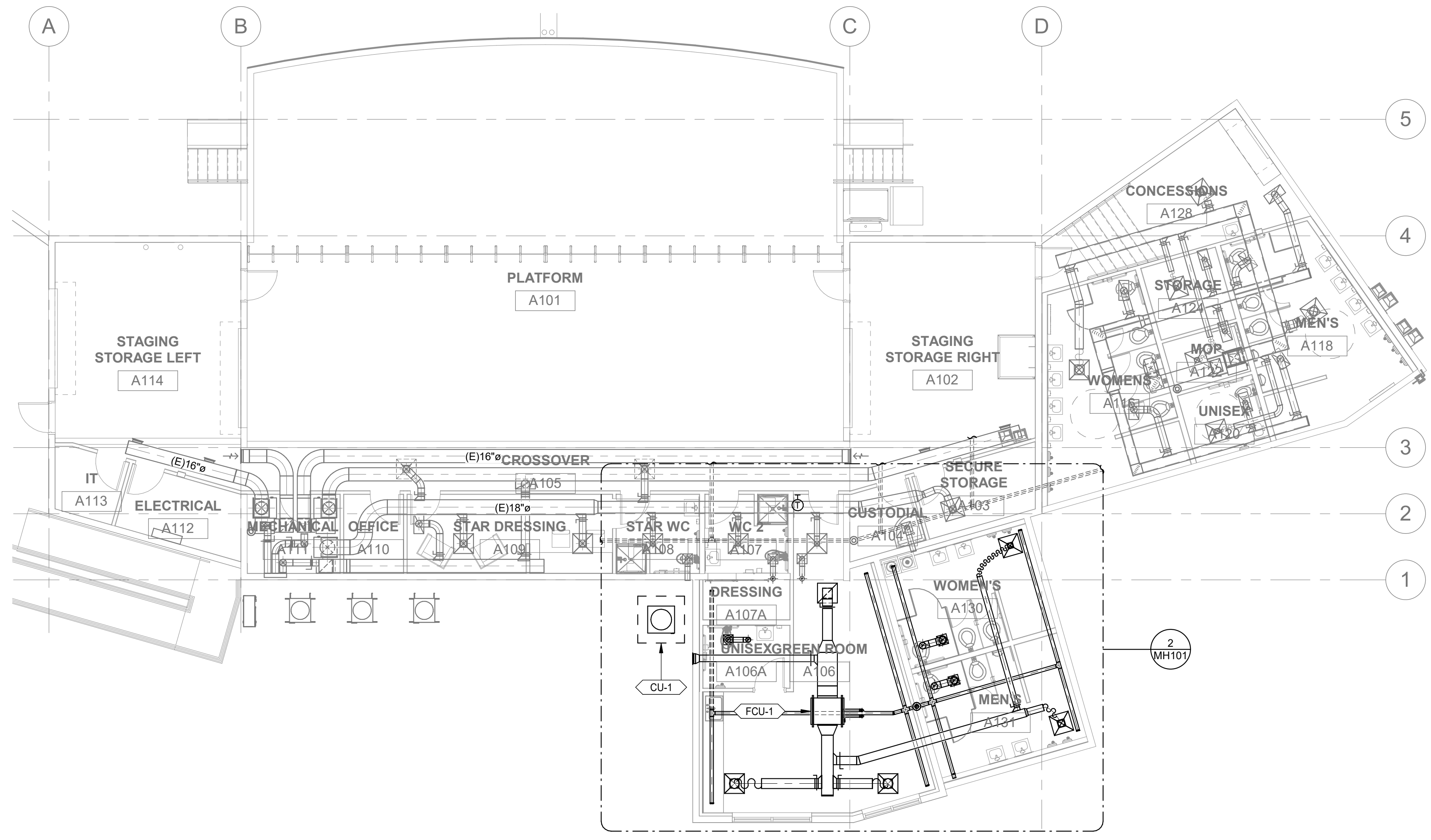
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**ME003**

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**2 ENLARGED MECHANICAL PLAN**  
1/4" = 1'-0"



**1 STAGE LEVEL MECHANICAL PLAN**  
1/8" = 1'-0"

**SHEET KEYNOTES**

- 1 CONTRACTOR TO PROVIDE ACCESS PANEL AND MERV 8 FILTER.
- 2 EXISTING RADON EXHAUST FAN.
- 3 EXISTING PERFORATED PIPING UNDERSLAB CONTINUES THROUGH BUILDING.
- 4 EXTEND RESTROOM EXHAUST DUCT THROUGH ROOF. PATCH AND SEAL ROOF PER ROOF MANUFACTURER'S WARRANTY REQUIREMENTS.
- 5 EXTEND FURNACE COMBUSTION AIR AND VENT PIPING TO MANUFACTURER'S CONCENTRIC VENT KIT THROUGH ROOF. PATCH AND SEAL ROOF PENETRATION PER ROOF MANUFACTURER'S WARRANTY REQUIREMENTS.
- 6 EXTEND RADON PIPING UP THROUGH WALL TO ABOVE CEILING INLINE FAN (SEE DETAIL).
- 7 CORRUGATED PERFORATED PVC PIPE BELOW FLOOR.

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**CITY OF Grand Junction**  
COLORADO

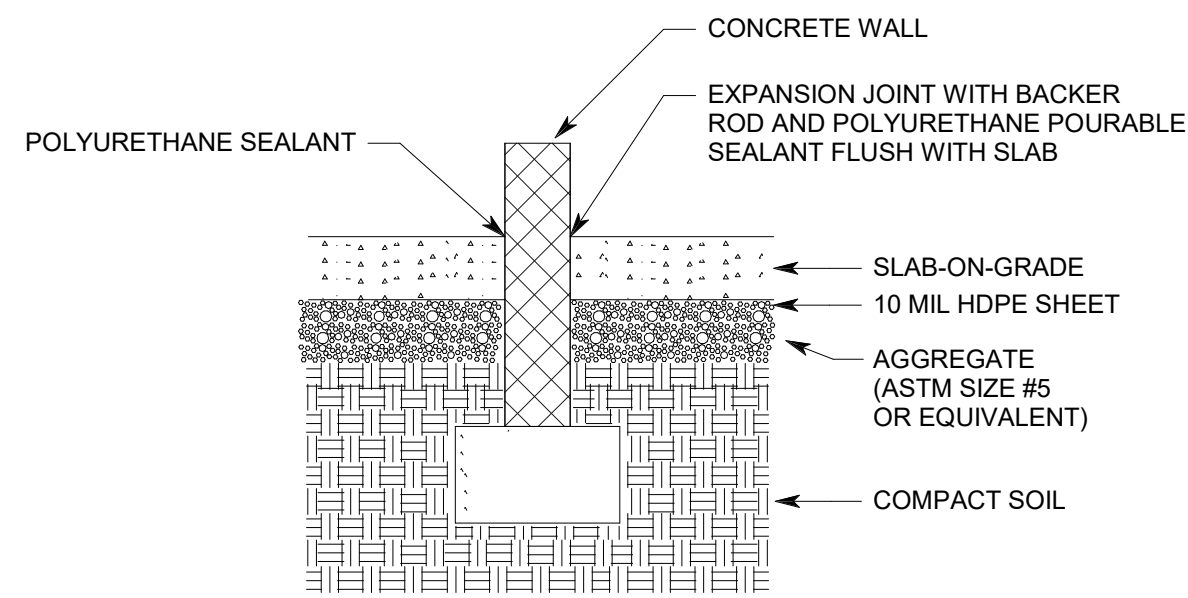
**project#:** 19-0270  
**date:** February 20, 2020

**revisions:**  
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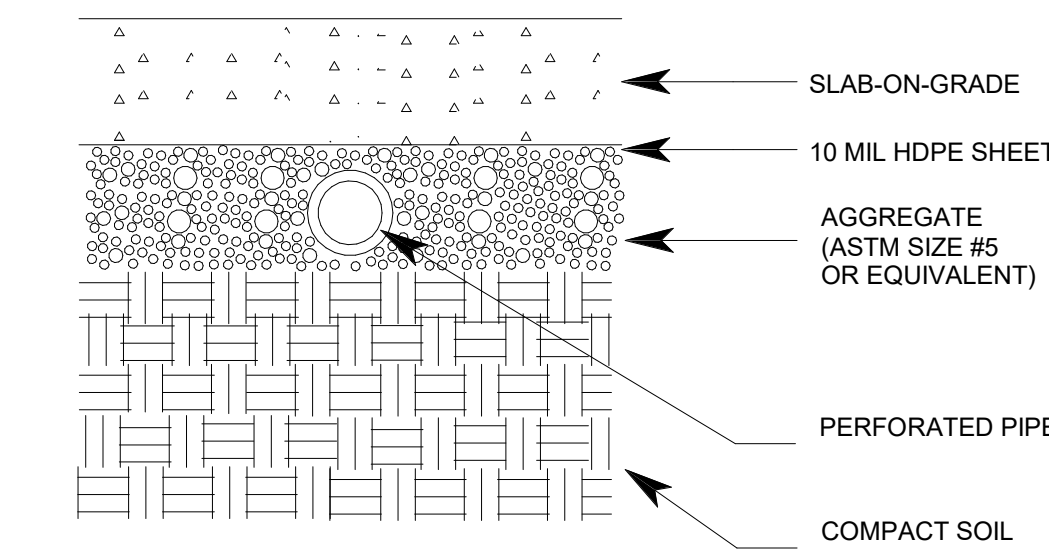
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**sheet:**  
**MH101**

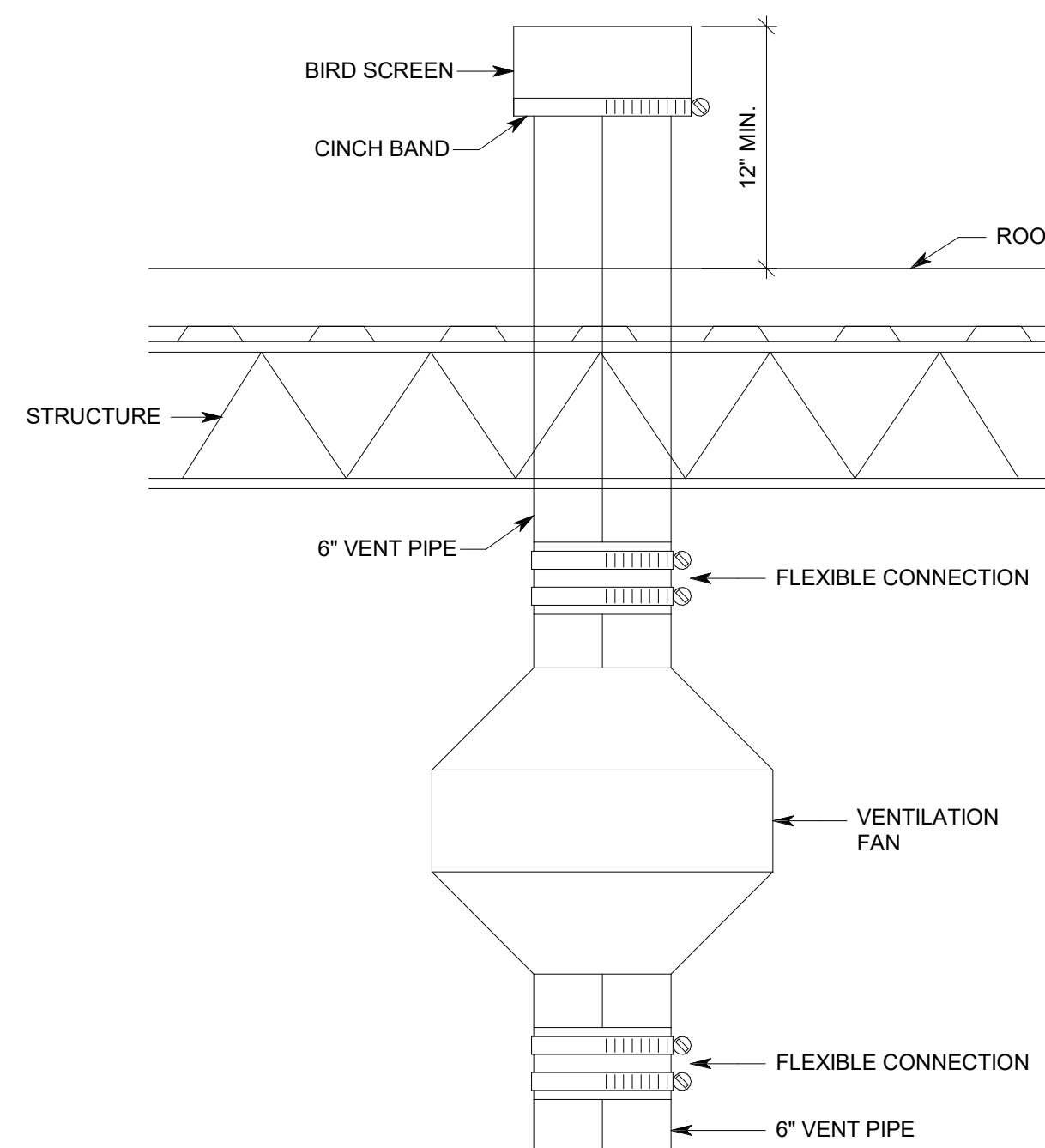
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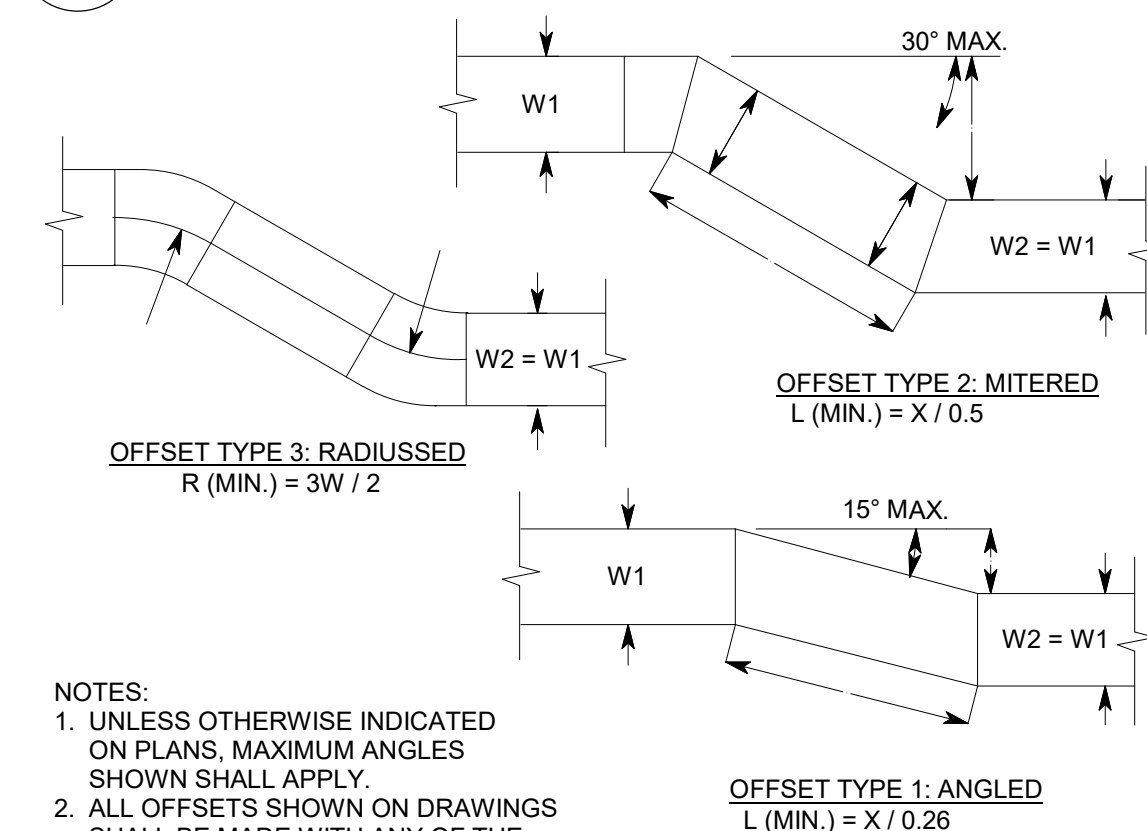
**16 RADON HDPE DETAIL**  
SCALE: 1/8" = 1'-0"



**15 RADON PIPING**  
SCALE: NTS

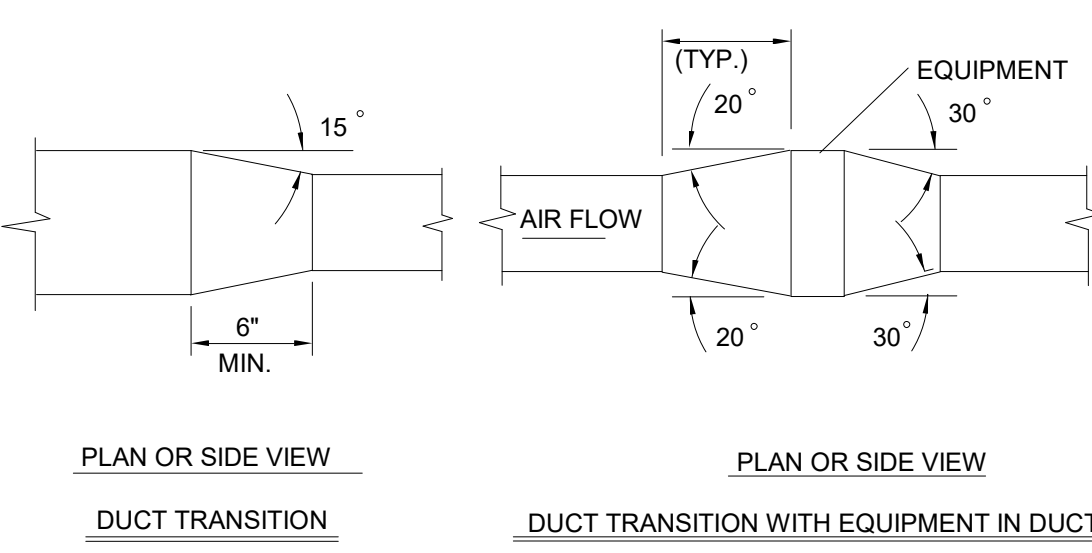


**14 RADON VENTILATION FAN**  
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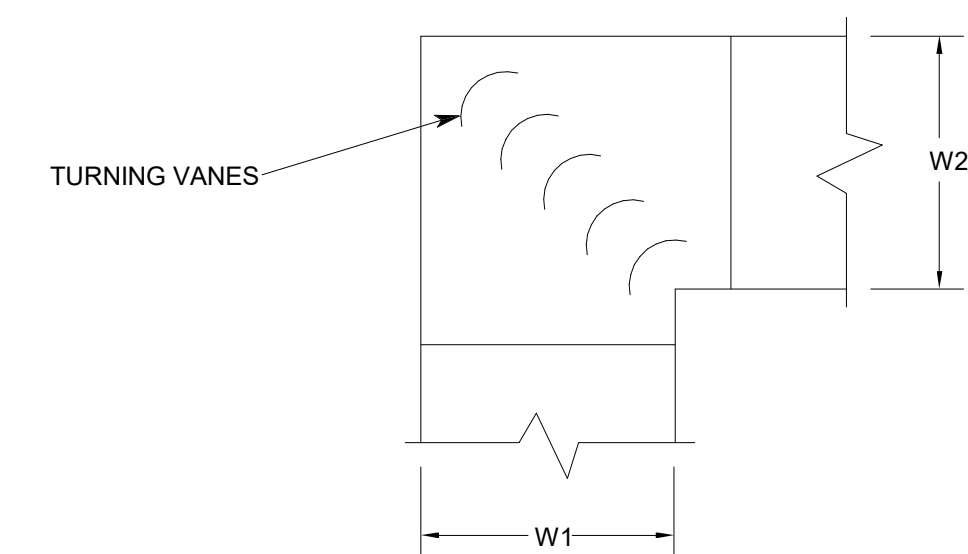


**13 DUCT OFFSETS**  
SCALE: NTS

NOTE: UNLESS OTHERWISE INDICATED ON PLANS, MAXIMUM ANGLES SHOWN SHALL APPLY.

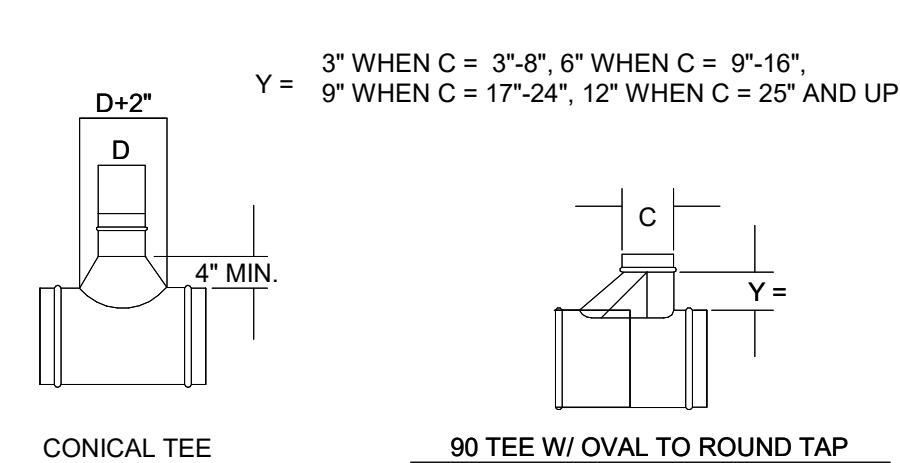


**12 DUCT TRANSITIONS**  
SCALE: NTS

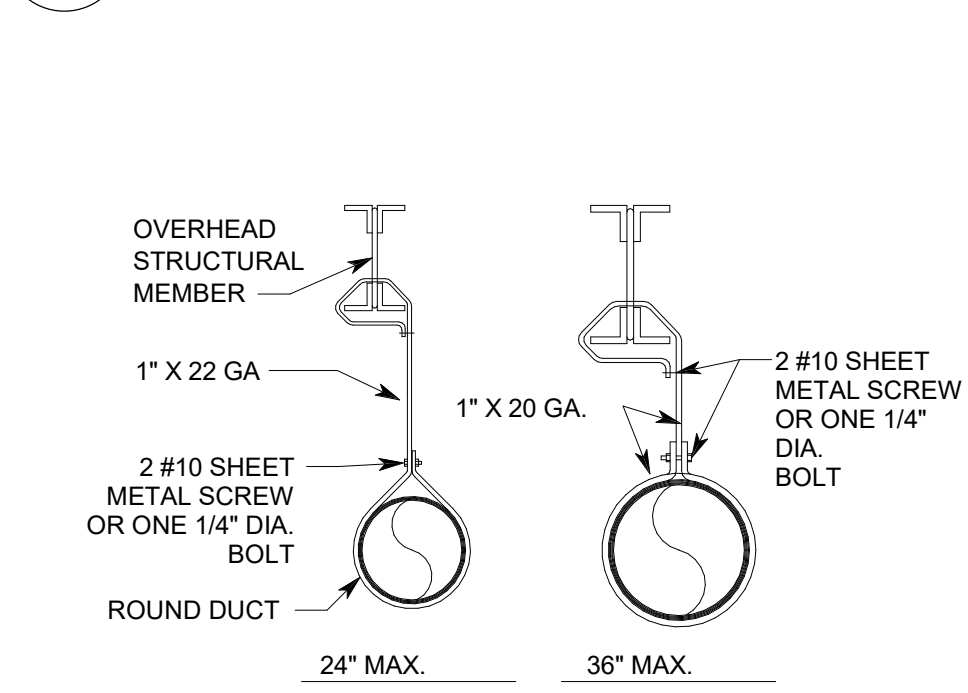


NOTES:  
1. ALL TURNING VANES SHALL BE SINGLE VANE TYPE REGARDLESS OF DIMENSION.  
2. ALL SINGLE VANES SHALL HAVE A 2 INCH RADIUS, 1 INCH MAXIMUM SPACE BETWEEN VANES.

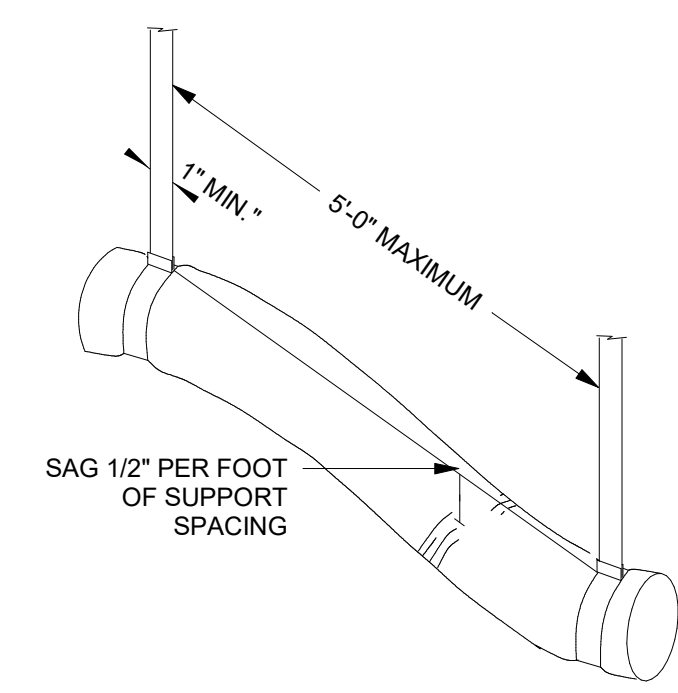
**11 SQUARE ELBOW**  
SCALE: NTS



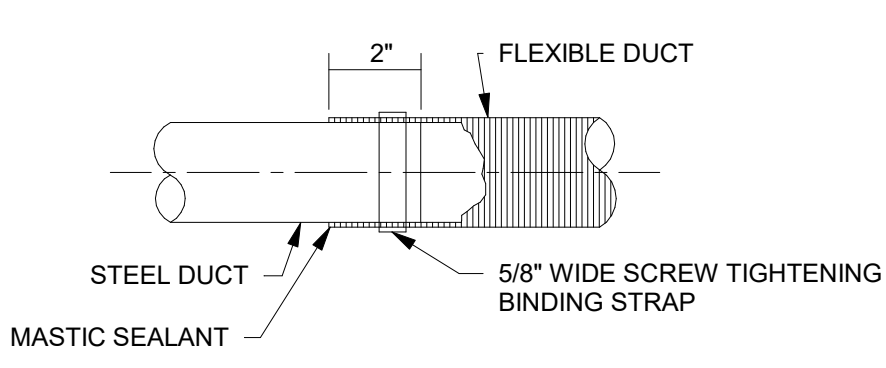
**10 ROUND BRANCH FITTINGS**  
SCALE: NTS



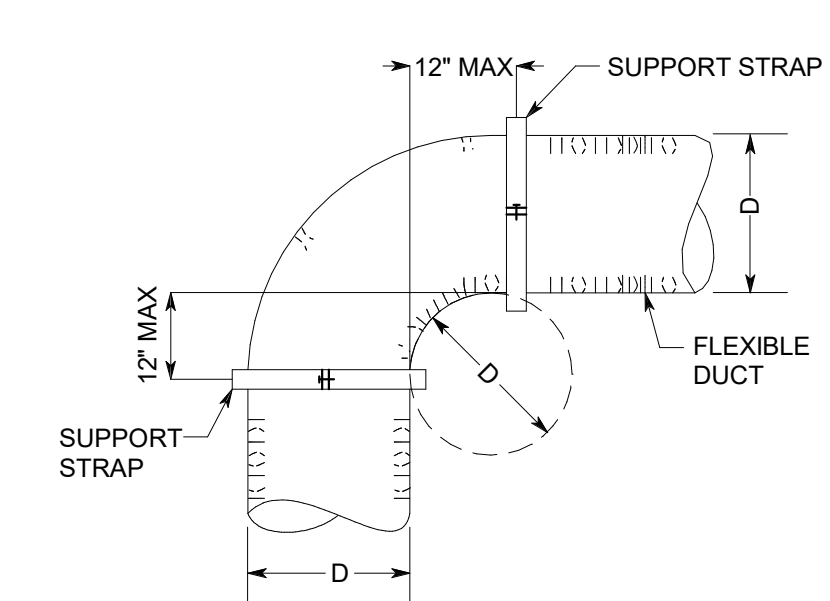
**9 DUCT HANGER - ROUND**  
SCALE: NTS



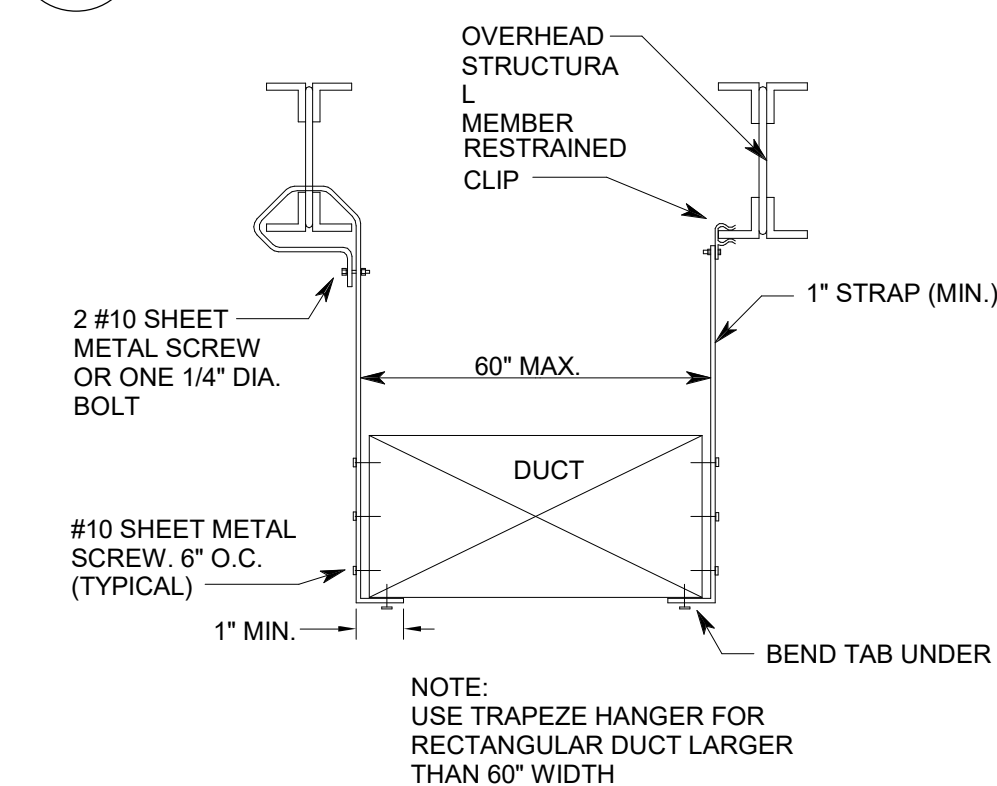
**8 FLEX DUCT SUPPORT**  
SCALE: NTS



**7 FLEX DUCT CONNECTION**  
SCALE: NTS

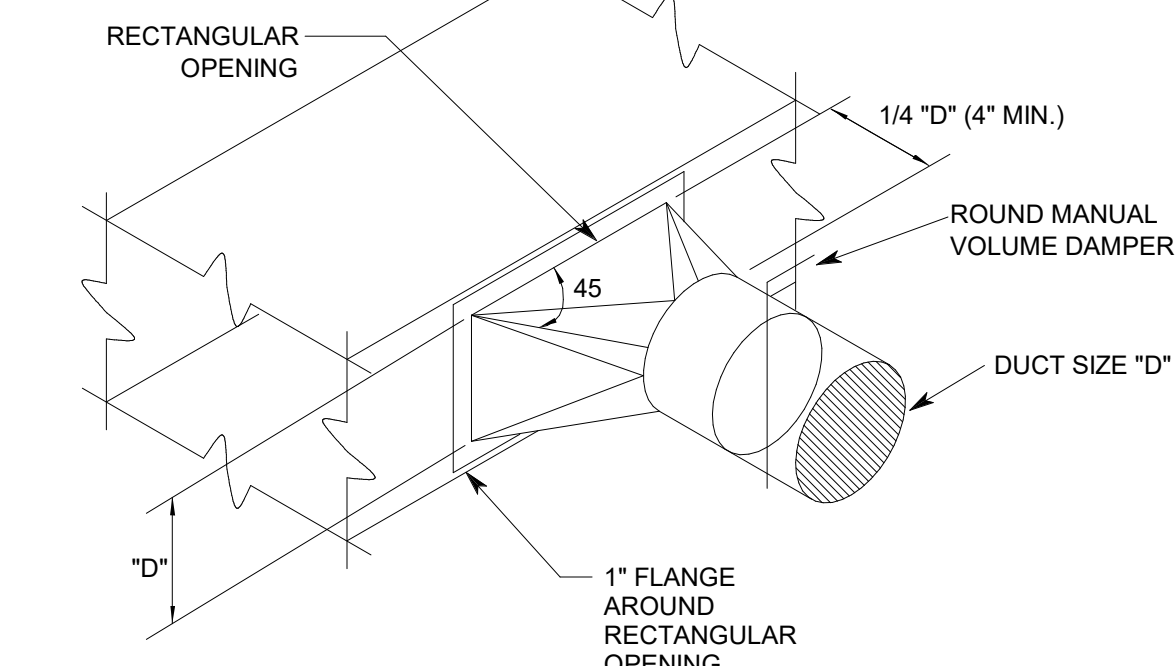


**6 FLEX DUCT RADIUS**  
SCALE: NTS



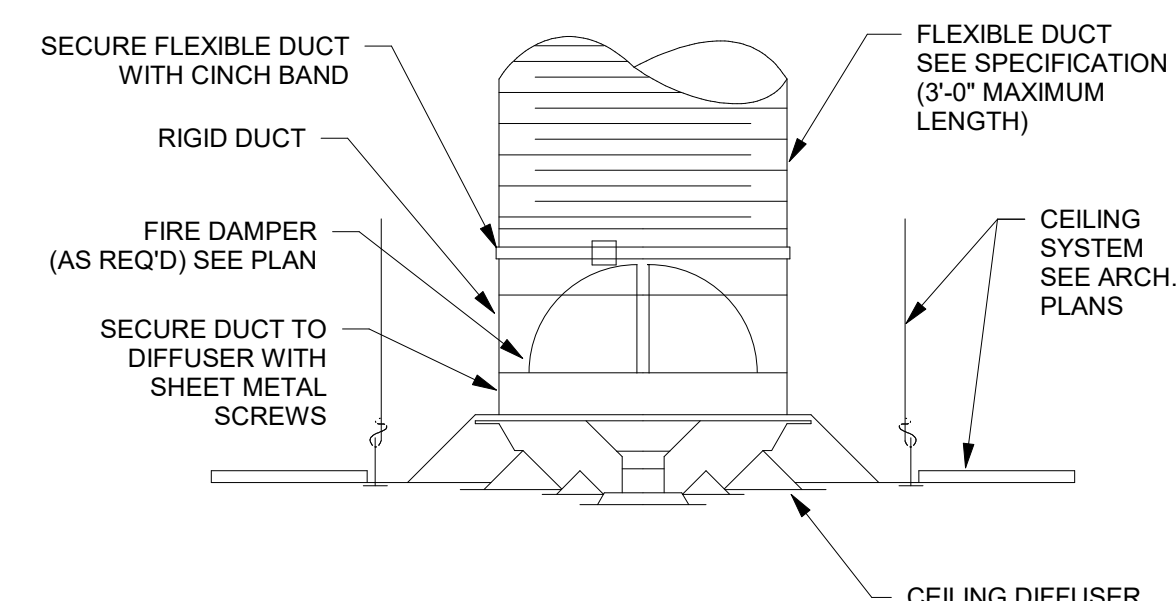
**5 DUCT HANGER - RECT.**  
SCALE: NTS

NOTE: HIGH EFFICIENCY TAKE-OFF SHALL COMPLY WITH FIGURE 2-6 OF SMACNA DUCT CONSTRUCTION STANDARDS



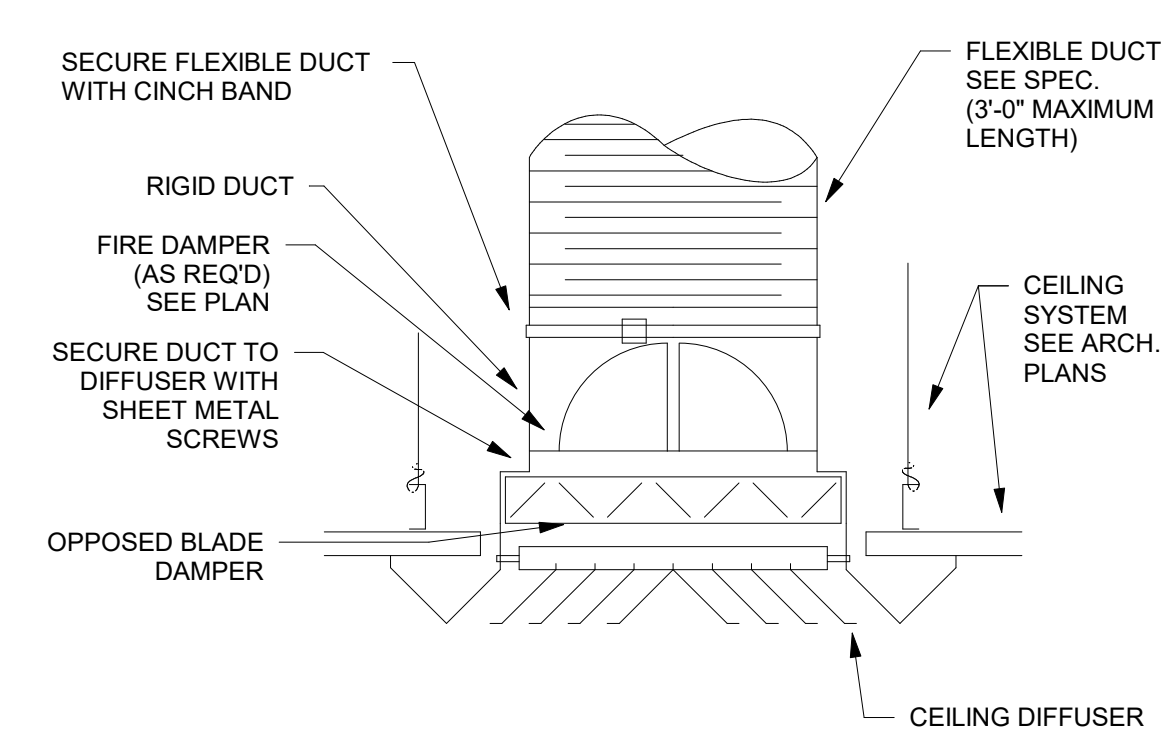
**4 HIGH EFFICIENCY TAKE-OFF**  
SCALE: NTS

NOTE: CEILING INLETS AND OUTLETS SHALL BE INDEPENDENTLY SUPPORTED.



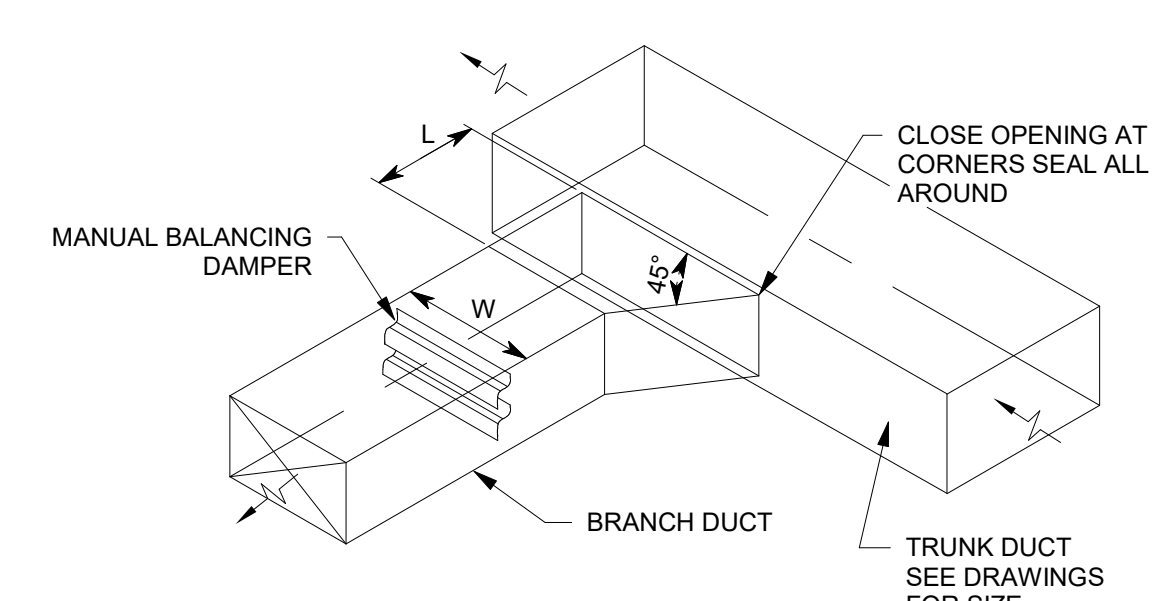
**3 CEILING DIFFUSER(LAY-IN)**  
SCALE: NTS

NOTE: CEILING INLETS AND OUTLETS SHALL BE INDEPENDENTLY SUPPORTED.



**2 CEILING DIFFUSER(SURFACE)**  
SCALE: NTS

NOTE: L=1/4 W (6\"/>



**1 BRANCH DUCT TAKE-OFF**  
SCALE: NTS

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COLORADO

**project#:** 19.0270  
**date:** February 20, 2020

**revisions:**

**title:**  
**HVAC DETAILS**

**sheet:**  
**ME501**

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## FAN COIL & AC UNIT SCHEDULE

SYMBOL	AREA SERVED	MANUFACTURER	MODEL NO.	BLOWER SECTION			CAPACITY		ELECTRICAL				SEER	DIMENSIONS (INCHES)	NOTES
				ARRANGEMENT	SUPPLY AIRFLOW (CFM)	E.S.P.	TOTAL COOLING (BTUH)	TOTAL HEATING (BTUH)	MOTOR (HP)	V/PH/ HZ	MCA	MOCP			
FCU-1	GREEN ROOM	TRANE	TUH1B040-SUB-1E	HORIZONTAL	1050	0.5	--	58,000	0.5	115/1/60	7.9	15	--	36X19X31	(1-8)
CU-1	GREEN ROOM	TRANE	4TWR4018G1000A	CURB MOUNT	N/A	N/A	60,000	--	0.125	208/3/60	12	20	15	33X32X30	(1-8)
ACCEPTABLE MANUFACTURERS				NOTES											
STULTZ LEIBERT TRANE				(1) COOLING CAPACITY BASED UPON 72°F DB & 30% RH INDOOR & 95°F OUTDOOR DB (2) PROVIDE SINGLE SOURCE POWER OPTION (3) ESTABLISH CONTROL CONNECTION TO BMS TO MONITOR STATUS, ALARM, ENABLE/DISABLE (4) PROVIDE REPLACEMENT MERV & FILTER AND REPLACEMENT FAN BELT WITH UNIT (5) REMOTE PROGRAMMABLE THERMOSTAT (6) ROUTE PRE-CHARGED REFRIGERANT PIPING FROM INDOOR TO OUTDOOR UNIT. PROVIDE UV RESISTIVE JACKET FOR EXPOSED PIPING INSULATION. (7) CUSTOM FILTER BANK (8) MOUNT CONDENSING UNIT ON 6" CONCRETE PAD, ATTACHED WITH NEOPRENE VIBRATION ISOLATORS.											

## LOUVER SCHEDULE

SYMBOL	MANUFACTURER	MODEL NO.	OVERALL SIZE (IN.) L x H	TYPE	MINIMUM FREE AREA (FT²)	CFM	ACCESSORIES AND REMARKS
L-1	RUSKIN	ELFD6375	18 x 12	DRAINABLE	0.58	210	(1)(2)(3)
NOTES:							
(1) EXTRUDED ALUMINUM CONSTRUCTION							
(2) GRAVITY BACKDRAFT DAMPER							
(3) COLOR BY ARCHITECT. PROVIDE FINISH SAMPLE FOR REVIEW							

## DUCT INSULATION REQUIREMENTS

DUCT SYSTEM	DUCT LOCATION	INSULATION MATERIAL	MINIMUM THERMAL RESISTANCE ("R")	FIELD APPLIED JACKET	VAPOR RETARDER REQ'D
SUPPLY AIR	BUILDING INTERIOR, CONCEALED	MINERAL-FIBER BLANKET	6.0	NONE	NO
	BUILDING INTERIOR, EXPOSED, OUTSIDE CONDITIONED SPACE	MINERAL-FIBER BLANKET	6.0	NONE	NO
	BUILDING EXTERIOR (OUTSIDE BUILDING INSULATION)	MINERAL-FIBER BLANKET	12.0	ALUMINUM	NO
RETURN AIR	BUILDING INTERIOR, CONCEALED	MINERAL-FIBER BLANKET	6.0	NONE	NO
	BUILDING INTERIOR, EXPOSED, OUTSIDE CONDITIONED SPACE	MINERAL-FIBER BLANKET	6.0	NONE	NO
	BUILDING EXTERIOR (OUTSIDE BUILDING INSULATION)	MINERAL-FIBER BLANKET	8.0	ALUMINUM	NO
EXHAUST AIR	ALL	NONE	---	---	---
OUTSIDE AIR	BUILDING INTERIOR, CONCEALED OR EXPOSED	MINERAL-FIBER BLANKET	8.0	NONE	NO
NOTES					
(1) ALL DUCT INSULATION SHALL HAVE ALL SERVICE JACKET MANUFACTURED FROM KRAFT PAPER, REINFORCED SCRIM, ALUMINUM FOIL OR VINYL FILM.					
(2) DUCT INSULATION SHALL BE MECHANICALLY FASTENED TO DUCTS WIDER THAN 24" AND SHALL BE AFFIXED TO BOTTOM OF DUCT WITH WELDED METAL PINS AND 2" WASHERS AT 18" MAXIMUM SPACING.					
(3) DUCT LINER, WHERE SHOWN ON DRAWINGS, SHALL BE A MINIMUM OF 1" THICK AND SHALL HAVE A MINIMUM "R" VALUE OF 6.0.					
(4) DUCT LINER SHALL NOT BE SUBSTITUTED FOR DUCT LINER UNLESS THE MINIMUM "R" VALUE OF THE DUCT LINER IS INCREASED TO A MINIMUM OF 6.0.					
(5) DUCT DIMENSIONS SHOWN ON THE DRAWINGS ARE NET FREE AREA. WHERE DUCT LINER IS SHOWN, INCREASE METAL DUCT SIZE TO ALLOW FOR THICKNESS OF DUCT LINER.					
(6) TOTAL LENGTH OF FLEXIBLE DUCT RUN SHALL NOT EXCEED 10'-0". EXTEND SHEET METAL DUCT TO WITHIN 3'-0" OF THE AIR INLET OR AIR OUTLET DEVICE.					
(7) OFFSET OF FLEXIBLE DUCT SHALL NOT EXCEED ONE-HALF (1/2) OF THE DUCT DIAMETER.					
(8) ALL DUCT CHANGES IN DIRECTION SHALL BE MADE WITH RIGID ELBOWS OR OTHER RIGID METAL FITTINGS.					
(9) INDOOR DUCT INSULATION AND RELATED MATERIALS SHALL HAVE A FLAME-SPREAD INDEX OF 25 OR LESS, AND SMOKE-DEVELOPED INDEX OF 50 OR LESS WHEN TESTED TO ASTM E 84.					
(10) OUTDOOR DUCT INSULATION AND RELATED MATERIALS SHALL HAVE A FLAME-SPREAD INDEX OF 75 OR LESS, AND SMOKE-DEVELOPED INDEX OF 150 OR LESS WHEN TESTED TO ASTM E 84.					
(11) ALL DUCT COVERINGS AND LININGS SHALL NOT FLAME, GLOW, SMOLDER OR SMOKE WHEN TESTED IN ACCORDANCE WITH ASTM C 411.					
(12) ALL MATERIALS USED AS INTERNAL INSULATION AND EXPOSED TO THE AIR STREAM IN DUCTS SHALL BE SHOWN TO BE DURABLE WHEN TESTED IN ACCORDANCE WITH UL 181.					

## CEILING DIFFUSER, REGISTER & GRILLE SCHEDULE

SYMBOL	DESCRIPTION	SIZES		ACCEPTABLE MANUFACTURERS
		NOMINAL SIZE (NECK SIZE)	AIR FLOW (CFM)	
CD	CEILING DIFFUSER: REMOVABLE PERFORATED FACEPLATE, 24" X 24" PANEL SIZE, 4-WAY PATTERN, ROUND NECK, ALUMINUM CONSTRUCTION NC-35 MAXIMUM, TESTED IN ACCORDANCE WITH ADC TEST 1062. OPTIONS & ACCESSORIES: BAKED ENAMEL WHITE FINISH. PROVIDE CEILING MOUNT TO MATCH CEILING TYPE.	6" DIA.	120	KRUEGER 13SD TITUS PRICE
		8" DIA.	200	
		10" DIA.	400	
		12" DIA.	700	
		14" DIA.	1000	
CG	CEILING GRILLE: REMOVABLE PERFORATED FACEPLATE, ALUMINUM, 24" X 24" PANEL SIZE, NC-35 MAXIMUM, TESTED IN ACCORDANCE WITH ADC TEST 1062. ROUND NECK OR SQUARE NECK, SEE DRAWINGS FOR NECK SIZE. OPTIONS & ACCESSORIES: BAKED ENAMEL WHITE FINISH. PROVIDE CEILING MOUNT TO MATCH CEILING TYPE.	6" DIA. (6" X 6")	120	KRUEGER 13SD TITUS PRICE
		8" DIA. (8" X 8")	200	
		10" DIA. (10" X 10")	420	
		12" DIA. (12" X 12")	700	
		14" DIA. (14" X 14")	1000	
	22" X 22"	2000		

## EXHAUST FAN SCHEDULE

SYMBOL	AREA SERVED	MANUFACTURER	MODEL NO.	CONFIG.	AIR FLOW (CFM)	STATIC PRESSURE (INCHES W.G.)	FAN SPEED (RPM)	MOTOR				MAXIMUM NOISE LEVEL (SONES)	WEIGHT (LBS)	OPTIONS AND ACCESSORIES	CONTROLS	NOTES / COMMENTS
								WATTS	VOLTS	PHASE	HERTZ					
EF-1	RESTROOM	LOREN COOK	GC-168	CEILING	150	0.35000	1160	46.1	120	1	60	3.50000	12	(1)	(11)	(101)
EF-2	RESTROOM	LOREN COOK	GC-168	CEILING	150	0.35000	1160	46.1	120	1	60	3.50000	12	(1)	(11)	(101)
EF-3	RESTROOM	LOREN COOK	GC-128	CEILING	50	0.25000	1160	23.0	120	1	60	3.50000	12	(1)	(11)	(101)
ACCEPTABLE MANUFACTURERS		OPTIONS & ACCESSORIES		CONTROLS				NOTES & COMMENTS								
LOREN COOK, TWIN CITY, GREENHECK		(1) GRAVITY BACKDRAFT DAMPER.		(11) OPERATE DURING OCCUPIED MODE, PROVIDE TIMER.				(101) ALL CAPACITIES AT JOB SITE ELEVATION								

## INLINE EXHAUST FAN (RADON) SCHEDULE

SYMBOL	AREA SERVED	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL NO.	AIR FLOW (CFM)	STATIC PRESSURE (INCHES W.G.)	FAN SPEED (RPM)	MOTOR				MAXIMUM NOISE LEVEL (SONES)	OPTIONS AND ACCESSORIES	CONTROLS	NOTES / COMMENTS
							WATTS	VOLTS	PHASE	HERTZ				
IEF-4	RADON SYSTEM	FANTECH	HP 220	166	1.26	2886	152	120	1	60	10.0	(1)(2)	(12)	(A)
ACCEPTABLE MANUFACTURER		OPTIONS & ACCESSORIES		CONTROLS				NOTES & COMMENTS						
FANTECH		(1) BACKDRAFT DAMPER (2) INTEGRAL THERMAL OVERLOAD PROTECTION (3) U-TUBE MANOMETER (4) RADON SYSTEM LABELS		(11) FAN TO RUN CONTINUOUSLY				(A) CAPACITY AT JOB SITE ELEVATION.						

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**sheet:**  
**ME601**

PERMIT SET

### MISC. SYMBOL LEGEND

SYMBOL	DESCRIPTION
	DETAIL INDICATOR: # INDICATES DETAIL NUMBER. SHEET INDICATES DRAWING SHEET WHERE DETAIL IS SHOWN.
	ELEVATION OR SECTION INDICATOR, EXTERIOR: # INDICATES ELEVATION OR SECTION NUMBER. SHEET INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
	ROOM OR SPACE NUMBER.
	KEYNOTE INDICATOR.
	REVISION INDICATOR.
	EQUIPMENT INDICATOR.
	PLUMBING FIXTURE INDICATOR.
	DIFFUSER/GRILLE INDICATOR.
	DIFFUSER/GRILLE INDICATOR.
	BREAK, STRAIGHT.
	BREAK, ROUND.
	MATCH LINE INDICATOR.
	HIDDEN FEATURES LINE: HIDDEN, THIN LINE.
	CONTRACT LIMIT LINE: DASHDOT, WIDE LINE.
	NEW CONNECTION POINT TO EXISTING

### PLUMBING SYMBOL LEGEND

SYMBOL	DESCRIPTION
	CATCH BASIN
	MANHOLE
	WALL HYDRANT
	HOSE BIBB
	CLEANOUT TO GRADE
	FLOOR CLEANOUT
	WALL CLEANOUT
	1/2 GRATE
	3/4 GRATE
	FULL GRATE

### PLUMBING PIPING LEGEND

SYMBOL	DESCRIPTION
	SANITARY SEWER (SS)
	GREASE WASTE (GW)
	VENT (V)
	ACID VENT
	ACID WASTE
	DOMESTIC COLD WATER (DCW)
	DOMESTIC HOT WATER (DHW)
	DOMESTIC HOT WATER RECIRC (DHWR)
	180°F HOT WATER
	180° HOT WATER RETURN
	160° HOT WATER
	160° HOT WATER RETURN
	RAINWATER
	SECONDARY RAINWATER
	STORM DRAIN
	VENT THRU ROOF
	NON POTABLE WATER
	EXISTING PIPE
	EXISTING PIPE TO BE REMOVED
	IRRIGATION WATER
	SANITARY SEWER
	LOW PRESSURE STEAM
	CHILLED WATER SUPPLY
	CHILLED WATER RETURN
	HEATING HOT WATER SUPPLY
	HEATING HOT WATER RETURN
	CONDENSER WATER SUPPLY
	CONDENSER WATER RETURN
	GLYCOL SUPPLY
	GLYCOL RETURN
	GAS
	FIRE PROTECTION
	PROPANE
	VACUUM
	COMPRESSED AIR
	MEDICAL AIR
	OXYGEN
	NITROUS OXIDE
	NITROGEN
	CARBON DIOXIDE
	EVACUATION

### SYMBOL LEGEND

SYMBOL	DESCRIPTION
<b>VALVES, METERS, AND GAUGES</b>	
	SHUT OFF VALVE
	GATE VALVE
	CHECK VALVE
	AUTO 2-WAY VALVE
	AUTO 3-WAY VALVE
	GLOBE VALVE
	BALL VALVE
	RELIEF VALVE
	CHAIN OPERATED GATE VALVE
	PRESSURE REDUCING VALVE
	BUTTERFLY VALVE
	SOLENOID VALVE
	ANGLE VALVE
	VENTURI
	BALANCING OR PLUG COCK
	FLOW SETTER
	EXPANSION VALVE (REFRIG.)
	GAS COCK
	MANUAL AIR VENT
	STRAINER
	GAUGE COCK
	FLEXIBLE CONNECTION
	PRESSURE GAUGE
	THERMOMETER
	VICTUALIC COUPLING
	REDUCER CONCENTRIC
	REDUCER ECCENTRIC
	REFRIGERANT SITE GLASS
	REFRIGERANT STRAINER
	REFRIGERANT FILTER DRIER
	90 DEG ELBOW UP
	90 DEG ELBOW DOWN
	90 DEG TEE UP
	90 DEG TEE DOWN
	UNION
	CAPPED PIPE
	ANCHOR
	FLOAT AND THERMOSTATIC TRAP

### DEFINITIONS

NOTE: ALL DEFINITIONS MAY NOT BE USED.

INDICATED: THE TERM "INDICATED" REFERS TO GRAPHIC REPRESENTATIONS, NOTES, OR SCHEDULES ON THE DRAWINGS, OTHER PARAGRAPHS OR SCHEDULES IN THE SPECIFICATIONS, AND SIMILAR REQUIREMENTS IN THE CONTRACT DOCUMENTS. WHERE TERMS SUCH AS "SHOWN", "NOTED", "SCHEDULED", AND "SPECIFIED" ARE USED, IT IS TO HELP THE READER LOCATE THE REFERENCE. NO LIMITATION ON LOCATION IS INTENDED.

DIRECTED: TERMS SUCH AS "DIRECTED", "REQUESTED", "AUTHORIZED", "SELECTED", "APPROVED", "REQUIRED", AND "PERMITTED" MEAN "DIRECTED BY THE ENGINEER", "REQUESTED BY THE ENGINEER", AND SIMILAR PHRASES.

APPROVED: THE TERM "APPROVED", WHERE USED IN CONJUNCTION WITH THE ENGINEER'S ACTION ON THE CONTRACTOR'S SUBMITTALS, APPLICATIONS, AND REQUESTS, IS LIMITED TO THE ENGINEER'S DUTIES AND RESPONSIBILITIES AS STATED IN GENERAL AND SUPPLEMENTARY CONDITIONS.

FURNISH: THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."

INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."

PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

INSTALLER: AN "INSTALLER" IS THE CONTRACTOR OR AN ENTITY ENGAGED BY THE CONTRACTOR, EITHER AS AN EMPLOYEE, SUBCONTRACTOR, OR SUB-SUBCONTRACTOR, FOR PERFORMANCE OF A PARTICULAR CONSTRUCTION ACTIVITY, INCLUDING INSTALLATION, ERECTION, APPLICATION, AND SIMILAR OPERATIONS. INSTALLERS ARE REQUIRED TO BE EXPERIENCED IN THE OPERATIONS THEY ARE ENGAGED TO PERFORM.

### ABBREVIATIONS

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.

(E)	EXISTING
(F)	FUTURE
AD	ACCESS DOOR
AIR COND	AIR CONDITION(-ING,-ED)
APD	AIR PRESSURE DROP
BD	BALANCING DAMPER
BHP	BRAKE HORSE POWER
BTU	BRITISH THERMAL UNIT
BTU/HOUR	BTU/HOUR
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CLG	COOLING
COMP	COMPONENT
COND	CONDENS(-ER, -ING, -ATION)
CV	CONTROL VALVE
DB	DRY BULB TEMPERATURE
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RECIRC
DIA	DIAMETER
DISCH	DISCHARGE
DP	DEPTH OR DEEP
EA	EXHAUST AIR
EER	ENERGY EFFICIENCY RATIO
EFF	EFFICIENCY
EG	ETHYLENE GLYCOL
ELEC	ELECTRIC
ELEV	ELEVATION
ENT	ENTERING
EVAP	EVAPORATE(-E, -ING, -ED, -OR)
EWI	ENTERING WATER TEMPERATURE
EXT	EXTERNAL
FC	FLEXIBLE CONNECT(-OR, -ION)
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FPI	FINS PER INCH
FSM	FEET PER MINUTE
FPS	FEET PER SECOND
FSD	FIRE SMOKE DAMPER
GAL	GALLONS
GE	GREASE EXHAUST
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HD	HEAD
HG	MERCURY
HP	HORSEPOWER
HR	HOUR
HT	HEIGHT
HTG	HEATING
HZ	HERTZ (FREQUENCY)
ID	INSIDE DIAMETER
IN	INCH
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LG	LENGTH
LH	LATENT HEAT
LRA	LOCKED ROTOR AMPS
LYG	LEAVING
LWT	LEAVING WATER TEMPERATURE
MBH	THOUSAND BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPS
MFR	MANUFACTUR(-ER, -ED)
NC	NOISE CRITERIA
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NPISH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OD	OUTSIDE DIAMETER
OZ	OUNCE
PD	PRESSURE DROP OR DIFFERENCE
PG	PROPYLENE GLYCOL
PH	PHASE
PPM	PARTS PER MILLION
PRESS	PRESSURE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	PSI ABSOLUTE
PSIG	PSI GAUGE
R	THERMAL RESISTANCE
RA	RETURN AIR
RECIRC	RECIRCULATE
REFR	REFRIGERATION
REQD	REQUIRED
RLA	RATED LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SC	SHADING COEFFICIENT
SCFM	STANDARD CUBIC FEET PER MINUTE
SCW	SOFT COLD WATER
SF	SAFETY FACTOR
SH	SENSIBLE HEAT
SP	STATIC PRESSURE
SPEC(S)	SPECIFICATION(S)
SQ	SQUARE
STD	STANDARD
SW	SOIL, WASTE
TA(R)	TRANSFER AIR (RETURN)
TA(S)	TRANSFER AIR (SUPPLY)
TD	TEMP DROP OR DIFF.
TEMP	TEMPERATURE
THERM	THERMAL
TOT	TOTAL
TSTAT	THERMOSTAT
V	VOLT
V	VENT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY TEMPERATURE
VEL	VELOCITY
VENT	VENT, VENTILATION
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
WB	WET BULB TEMP
WC	WATER COLUMN
WG	WATER GAUGE
WPD	WATER PRESSURE DROP
WT	WEIGHT
WTR	WATER

### PLUMBING GENERAL NOTES

- THE PLUMBING DRAWINGS SHOW THE GENERAL DESIGN, ARRANGEMENT AND EXTENT OF THE PLUMBING SYSTEM. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, THESE DRAWINGS DO NOT SHOW ALL OFFSETS, BENDS OR ELBOWS NECESSARY FOR THE SPACE PROVIDED FOR INSTALLATION IN THE SPACE PROVIDED. CONTRACTOR SHALL MAKE SUCH SLIGHT ALTERATIONS AS MAY BE NECESSARY TO MAKE THE SYSTEM COMPLETE AND OPERATIONAL IN ACCORDANCE WITH THE DESIGN INTENT. MAJOR DEVIATIONS SUCH AS CHANGES IN COMPONENT SIZES, WEIGHTS, QUANTITIES OR MATERIAL REQUIRE PRIOR APPROVAL BY THE DESIGN ENGINEER.
- THE DRAWINGS AND SPECIFICATIONS HAVE BEEN PREPARED TO SUPPLEMENT EACH OTHER AND SHALL BE INTERPRETED AS AN INTEGRAL UNIT WITH THE ITEMS SHOWN ON ONE AND NOT THE OTHER BEING FURNISHED AND INSTALLED AS THOUGH SHOWN AND CALLED OUT IN BOTH.
- THE ENTIRE PLUMBING INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE MOST RECENTLY ADOPTED BUILDING CODES, MECHANICAL CODE, PLUMBING CODE, ELECTRICAL CODE, AND ALL OTHER APPLICABLE CITY, COUNTY, STATE, AND FEDERAL CODES AND REGULATIONS IN EFFECT.
- THE ENTIRE PLUMBING INSTALLATION SHALL CONFORM TO ANY CODES, RULES, REGULATIONS AND REQUIREMENTS OF THE BUILDING OWNER.
- PRIOR TO FABRICATION AND INSTALLATION OF ANY PLUMBING COMPONENT THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL PLUMBING WORK WITH ALL OTHER BUILDING TRADES, INCLUDING BUILDING TRADES HIRED DIRECTLY BY THE OWNER. WHERE CONFLICTS MAY OCCUR, THEY SHALL BE RESOLVED PRIOR TO INSTALLATION.
- ALL PLUMBING INFORMATION IS NOT SHOWN ON THE PLUMBING DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL INFORMATION ON ALL OTHER CONSTRUCTION DOCUMENTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO REVIEW AND USE, WHERE APPROPRIATE, ALL THE PLUMBING DETAILS SHOWN ON THE DRAWINGS. DETAILS MAY OR MAY NOT BE CALLED OUT ON THE DRAWINGS WITH SYMBOLS OR KEYED NOTES. ANY CHANGES RESULTING FROM FAILURE TO INSTALL THE PLUMBING SYSTEM WITHOUT USING THE INCLUDED DETAILS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- ANY PART OF THE PLUMBING INSTALLATION THAT FAILS, IS UNFIT, OR BECOMES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- PROVIDE PROPER PROVISIONS FOR EXPANSION, CONTRACTION, OR MOVEMENT OF ALL PIPING.
- PROVIDE LARGE ENOUGH PIPE SLEEVES THROUGH WALL OR FLOOR TO ALLOW FOR ANTICIPATED DIFFERENTIAL MOVEMENT.
- ALL PIPING SHALL BE SUPPORT WITH CLEVIS HANGERS (MSS TYPE 1). PERFORATED METAL STRAPS OR PLASTIC STRAPPING (PLUMBER TAPE) SHALL NOT BE USED TO SUPPORT OR BRACE ANY PIPE.
- PROVIDE PIPE HANGERS WITHIN 18-INCHES OF ALL CHANGES OF DIRECTION.
- PROVIDE SWAY BRACING FOR ALL PIPING 4" AND LARGER AT ALL CHANGES IN DIRECTION GREATER THAN 45-DEGREES.
- ALL STEEL CLEVIS HANGERS USED TO SUPPORT COPPER PIPING SHALL BE COPPER OR PLASTIC COATED.
- COPPER PIPING SHALL NOT COME IN CONTACT WITH FIRE TREATED LUMBER. PROVIDE 1/2" THICK SLIP-ON CLOSED CELL INSULATION WHERE COPPER PIPING IS ADJACENT TO FIRE TREATED LUMBER. CLOSED CELL INSULATION SHALL EXTEND A MINIMUM OF 1-1/2" PAST LUMBER.
- ALL EXPOSED PIPING SHALL BE INSTALLED IN A NEATLY ARRANGED MANNER PARALLEL TO THE BUILDING STRUCTURE.
- ALL EXPOSED DOMESTIC WATER PIPE IN OCCUPIED SPACES SHALL BE POLISHED CHROME PLATED.
- ALL EXPOSED DRAINAGE PIPING IN OCCUPIED SPACES INCLUDING TRAPS UNDER SINKS SHALL BE POLISHED CHROME PLATED.
- DRAWINGS SHOW GENERAL ARRANGEMENT OF THE DRAIN WASTE AND VENT SYSTEM WITH THE REQUIRED CLEANOUTS. CONTRACTOR SHALL PROVIDE ALL ADDITIONAL CLEANOUTS AS REQUIRED BY THE PLUMBING CODE.
- ALL SANITARY DRAINAGE SYSTEM PIPING 3" AND LARGER SHALL BE SLOPED IN DIRECTION OF FLOW AT A MINIMUM OF 1/8" PER FOOT.
- ALL SANITARY DRAINAGE SYSTEM PIPING SMALLER THAN 3" SHALL BE SLOPED IN DIRECTION OF FLOW AT A MINIMUM OF 1/4" PER FOOT.
- SLOPE VENT SYSTEM TOWARDS DRAINAGE SYSTEM.
- SIMILAR EQUIPMENT SHALL BE OF THE SAME MANUFACTURER.
- ALL EQUIPMENT SHALL PROVIDE THE SCHEDULED PERFORMANCE AT THE JOB SITE ELEVATION.
- FIXTURE AND EQUIPMENT MODEL NUMBERS SHOWN IN PLUMBING FIXTURE SCHEDULE AND PLUMBING EQUIPMENT SCHEDULE ARE SHOWN TO ESTABLISH THE TYPE OF PRODUCT THAT SHALL BE USED. THE SELECTED PRODUCT SHALL MEET THE SCHEDULED PERFORMANCE DATA SHOWN ON THE SCHEDULE EVEN IF A DIFFERENT MODEL IS SUPPLIED THAT IS DIFFERENT THAN THAT SCHEDULED.
- ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE ALL NECESSARY FITTINGS, TRANSITIONS, VALVES AND OTHER DEVICES AND ACCESSORIES REQUIRED FOR A COMPLETE, WORKABLE INSTALLATION.
- SEE "PLUMBING FIXTURE SCHEDULE" FOR INDIVIDUAL TRAPS, WASTE, VENT, AND DOMESTIC WATER PIPING FOR INDIVIDUAL FIXTURES.
- ALL PLUMBING EQUIPMENT SHALL BE LISTED AND LABELED BY AN APPROVED TESTING AGENCY.
- FIXTURES, EQUIPMENT AND PIPING INSTALLATION SHALL MEET NSF STANDARDS.

### PLUMBING SHEET INDEX

PE001	PLUMBING COVER SHEET
PE002	PLUMBING NOTES
PE003	PLUMBING NOTES
PL101	PLUMBING PLANS
PE501	PLUMBING DETAILS
PE601	PLUMBING SCHEDULES

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project:

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO

CITY OF  
Grand Junction  
COLORADO

project#: 19-0270  
date: February 20, 2020

revisions:

title:

PLUMBING  
COVER SHEET

sheet:

PE001

PERMIT SET

## TEST ADJUST & BALANCE NOTES

- CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE COMPLETE TESTING ADJUSTING AND BALANCING FOR THIS PROJECT.
- THE MECHANICAL SYSTEMS SHALL BE TESTED, ADJUSTED AND BALANCED, INCLUDING SUPPLY AIR SYSTEM, RETURN AIR SYSTEM, EXHAUST AIR SYSTEM, OUTSIDE AIR SYSTEM AND ALL ASSOCIATED EQUIPMENT.
- CONTRACTOR PERFORMING TESTING ADJUSTING AND BALANCING WORK SHALL BE EITHER AABC OR NEBB CERTIFIED.
- TESTING ADJUSTING AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE NEBB OR AABC TEST PROCEDURES.
- TESTING ADJUSTING AND BALANCING REPORT FORMS SHALL BE STANDARD FORMS FROM EITHER AABC OR NEBB.
- CONTRACTOR SHALL VERIFY QUANTITIES AND LOCATIONS OF ALL BALANCING DEVICES. CONTRACTOR SHALL VERIFY THAT THESE BALANCING DEVICES ARE ACCESSIBLE AN APPROPRIATE FOR BALANCING AND FOR EFFICIENT SYSTEM AND EQUIPMENT OPERATION PRIOR TO COMMENCING WORK.
- MECHANICAL (HVAC) EQUIPMENT SHALL BE ADJUSTED TO WITHIN ZERO TO PLUS 10 PERCENT OF SPECIFIED VALUES.
- MECHANICAL AIR INLETS AND OUTLETS SHALL BE ADJUSTED TO WITHIN 10 PERCENT OF SPECIFIED VALUES.
- WATER SYSTEMS SHALL BE ADJUSTED TO WITHIN 10 PERCENT OF SPECIFIED VALUES.
- FINAL BALANCE REPORT SHALL INCLUDE THE FOLLOWING: TEST CONDITIONS FOR FANS, SYSTEM DIAGRAMS, AIR CONDITIONING UNIT TEST REPORTS, FAN TEST REPORTS, AIR TERMINAL DEVICE REPORTS.
- AFTER THE FINAL BALANCING REPORT IS SUBMITTED TO THE DESIGN ENGINEER AND OWNER, CONTRACTOR SHALL REQUEST THAT A FINAL INSPECTION BE MADE BY THE DESIGN ENGINEER. DURING THE FINAL INSPECTION, DESIGN ENGINEER MAY RANDOMLY SELECT MEASUREMENTS DOCUMENTS IN THE FINAL REPORT TO BE RECHECK BY THE CONTRACTOR.
- APPROXIMATELY 90 DAYS AFTER SUBMISSION OF THE FINAL BALANCING REPORT, CONTRACTOR SHALL PERFORM ADDITIONAL TESTING ADJUSTING AND BALANCING TO VERIFY THAT BALANCED CONDITIONS ARE BEING MAINTAINED THROUGHOUT EACH SYSTEM AND TO CORRECT UNUSUAL CONDITIONS.
- ADDITIONAL TESTING ADJUSTING AND BALANCING SHALL BE MADE AS DIRECTED BY THE DESIGN ENGINEER TO CORRECT UNUSUAL CONDITIONS. ADDITIONAL TESTING WILL NOT EXCEED THREE (3) DAYS DURING THE FIRST SIX MONTHS OF OPERATION.
- IF INITIAL TESTING ADJUSTING AND BALANCING PROCEDURES WERE NOT PERFORMED DURING NEAR-PEAK SUMMER AND WINTER CONDITIONS, PERFORM ADDITIONAL TESTING ADJUSTING AND BALANCING DURING NEAR PEAK SUMMER AND WINTER CONDITIONS.
- ALL AIR SIDE MECHANICAL (HVAC) SYSTEMS SHALL BE TESTED AND ADJUSTED, AND BALANCED.
- ALL WATER SIDE MECHANICAL (HVAC) AND PLUMBING PIPING SYSTEMS SHALL BE TESTED, ADJUSTED, AND BALANCED INCLUDING DOMESTIC HOT WATER CIRCULATING PUMPS.

## PIPE HANGER NOTES

- ALL PIPING SHALL BE SUPPORT WITH STEEL CLEVIS HANGERS (MSS TYPE 1).
- PERFORATED METAL STRAPS OR PLASTIC STRAPPING (PLUMBER TAPE) SHALL NOT BE USED TO SUPPORT OR BRACE ANY PIPE.
- PROVIDE PIPE HANGERS WITHIN 18-INCHES OF ALL CHANGES OF DIRECTION.
- ALL STEEL CLEVIS HANGERS USED TO SUPPORT COPPER PIPING SHALL BE COPPER PLATED OR PLASTIC COATED.
- ALL STEEL CLEVIS HANGERS USED TO SUPPORT PLASTIC PIPING SHALL BE PLASTIC COATED.
- PROVIDE ELASTOMERIC CUSHION (COOPER B-LINE B1999 "VIBRA CUSHION") BETWEEN COPPER PIPING AND GALVANIZED CHANNEL SUPPORT CLAMPS. PLASTIC PIPE WRAP TAPE IS NOT ACCEPTABLE.
- PROVIDE ELASTOMERIC INSERT (COOPER B-LINE BVP "VIBRACLAMPS") BETWEEN PLASTIC PIPE AND GALVANIZED CHANNEL SUPPORT CLAMPS. PLASTIC PIPE WRAP TAPE IS NOT ACCEPTABLE.
- PROVIDE SWAY BRACING FOR ALL PIPING 4" AND LARGER AT ALL CHANGES IN DIRECTION GREATER THAN 45-DEGREES.

## OPER. & MAINT. MANUAL NOTES

- SUBMIT OPERATIONS AND MAINTENANCE MANUALS IN A PDF ELECTRONIC FILE. ASSEMBLE EACH MANUAL INTO A COMPOSITE ELECTRONICALLY INDEXED FILE. SUBMIT DIGITAL MEDIA ACCEPTABLE TO ARCHITECT. NAME EACH INDEXED DOCUMENT FILE IN COMPOSITE ELECTRONIC INDEX WITH APPLICABLE ITEM NAME. INCLUDE A COMPLETE ELECTRONICALLY LINKED OPERATION AND MAINTENANCE DIRECTORY. ENABLE INSERTED REVIEWER COMMENTS ON DRAFT SUBMITTALS.
- ADDITIONALLY, PROVIDE THREE PAPER COPIES. INCLUDE A COMPLETE OPERATION AND MAINTENANCE DIRECTORY. ENCLOSE TITLE PAGES AND DIRECTORIES IN CLEAR PLASTIC SLEEVES. ARCHITECT WILL RETURN TWO COPIES.
- SUBMIT EACH MANUAL IN FINAL FORM PRIOR TO REQUESTING INSPECTION FOR SUBSTANTIAL COMPLETION AND AT LEAST 15 DAYS BEFORE COMMENCING DEMONSTRATION AND TRAINING. ARCHITECT WILL RETURN COPY WITH COMMENTS. CORRECT OR REVISE EACH MANUAL TO COMPLY WITH ARCHITECT'S COMMENTS. SUBMIT COPIES OF EACH CORRECTED MANUAL WITHIN 15 DAYS OF RECEIPT OF ARCHITECT'S COMMENTS AND PRIOR TO COMMENCING DEMONSTRATION AND TRAINING.
- OPERATION MANUALS CONTENT: INCLUDE OPERATION DATA REQUIRED IN INDIVIDUAL SPECIFICATION SECTIONS AND THE FOLLOWING INFORMATION:
  - SYSTEM, SUBSYSTEM, AND EQUIPMENT DESCRIPTIONS. (USE DESIGNATIONS FOR SYSTEMS AND EQUIPMENT INDICATED ON CONTRACT DOCUMENTS);
  - PERFORMANCE AND DESIGN CRITERIA IF CONTRACTOR IS DELEGATED DESIGN RESPONSIBILITY; OPERATING STANDARDS;
  - OPERATING PROCEDURES;
  - OPERATING LOGS;
  - WIRING DIAGRAMS;
  - CONTROL DIAGRAMS;
  - PIPED SYSTEM DIAGRAMS;
  - PRECAUTIONS AGAINST IMPROPER USE;
  - LICENSE REQUIREMENTS INCLUDING INSPECTION AND RENEWAL DATES.
- OPERATION MANUALS DESCRIPTIONS: INCLUDE THE FOLLOWING:
  - PRODUCT NAME AND MODEL NUMBER. (USE DESIGNATIONS FOR PRODUCTS INDICATED ON CONTRACT DOCUMENTS);
  - MANUFACTURER'S NAME;
  - EQUIPMENT IDENTIFICATION WITH SERIAL NUMBER OF EACH COMPONENT;
  - EQUIPMENT FUNCTION;
  - OPERATING CHARACTERISTICS;
  - LIMITING CONDITIONS;
  - PERFORMANCE CURVES;
  - ENGINEERING DATA AND TESTS;
  - COMPLETE NOMENCLATURE AND NUMBER OF REPLACEMENT PARTS.
  - WARRANTY.
- OPERATING PROCEDURES: INCLUDE THE FOLLOWING, AS APPLICABLE:
  - STARTUP PROCEDURES;
  - EQUIPMENT OR SYSTEM BREAK-IN PROCEDURES;
  - ROUTINE AND NORMAL OPERATING INSTRUCTIONS;
  - REGULATION AND CONTROL PROCEDURES;
  - INSTRUCTIONS ON STOPPING;
  - NORMAL SHUTDOWN INSTRUCTIONS;
  - SEASONAL AND WEEKEND OPERATING INSTRUCTIONS;
  - REQUIRED SEQUENCES FOR ELECTRIC OR ELECTRONIC SYSTEMS;
  - SPECIAL OPERATING INSTRUCTIONS AND PROCEDURES;
  - SYSTEMS AND EQUIPMENT CONTROLS;
  - DESCRIBE THE SEQUENCE OF OPERATION, AND DIAGRAM CONTROLS AS INSTALLED;
    - PIPED SYSTEMS;
    - DIAGRAM PIPING AS INSTALLED, AND IDENTIFY COLOR-CODING WHERE REQUIRED FOR IDENTIFICATION.
- PRODUCT MAINTENANCE MANUALS CONTENT:
  - ORGANIZE MANUAL INTO A SEPARATE SECTION FOR EACH PRODUCT, MATERIAL, AND FINISH;
  - INCLUDE SOURCE INFORMATION, PRODUCT INFORMATION, MAINTENANCE PROCEDURES, REPAIR MATERIALS AND SOURCES, AND WARRANTIES AND BONDS.

## EQUIPMENT LABELING

- ALL MECHANICAL EQUIPMENT SHALL BE LABELED.
- PROVIDE 1/16" THICK MULTIPLE LAYERED, MULTIPLE COLORED PLASTIC LABEL WITH MECHANICAL ENGRAVING.
- LABEL SHALL HAVE BLACK BACKGROUND, 1/2" HIGH WHITE LETTERING.
- MINIMUM SIZE OF LABEL SHALL BE 2-1/2" X 1"
- LABEL SHALL BE SECURED TO EQUIPMENT WITH STAINLESS STEEL SELF-TAPPING SCREWS.
- MINIMUM CONTENT OF LABEL SHALL INCLUDE DRAWING DESIGNATION (UNIQUE NUMBER), AND AREA SERVED.

## DOMESTIC WATER NOTES

- ALL EXPOSED DOMESTIC WATER PIPING IN OCCUPIED SPACES SHALL BE POLISHED CHROME PLATED.
- PROVIDE ISOLATION VALVES IN DOMESTIC WATER PIPING TO EACH SET OF RESIDENT ROOMS.
- INSTALL PIPING SO THAT VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, AND ALL OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
- VALVES (EXCEPT CONTROL VALVES) AND STRAINERS SHALL BE FULL SIZE OF PIPE BEFORE REDUCING PIPE SIZE TO MAKE CONNECTIONS TO EQUIPMENT.
- VALVES SHALL BE INSTALLED SO THAT VALVES REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON EQUIPMENT SIDE OF VALVE IS REMOVED.
- PROVIDE DOMESTIC WATER BOOSTER PUMP IF WATER PRESSURE FROM LOCAL UTILITY IS INADEQUATE TO SERVE BUILDING. BOOSTER PUMP SHALL BE INCLUDED IF REQUIRED.
- PROVIDE MANIFOLD PIPING AT WATER HEATERS PER MANUFACTURER'S WRITTEN RECOMMENDATIONS. BALANCE WATER FLOW THROUGH WATER HEATERS AFTER INSTALLATION.
- INSTALL DOMESTIC WATER PIPING ABOVE OR BEHIND WATER HEATERS TO ALLOW FOR WATER HEATER REMOVAL.

## POTABLE WATER DISINFECTION

- DOMESTIC COLD WATER AND DOMESTIC HOT WATER SYSTEMS (I.E. ALL POTABLE WATER) SHALL BE PURGED OF ALL DELETERIOUS MATTER AND DISINFECTED PRIOR TO UTILIZATION OF POTABLE WATER SYSTEM.
- FOLLOW THE METHOD PRESCRIBED BY THE LOCAL HEALTH AUTHORITY OR WATER PURVEYOR HAVING JURISDICTIONS.
- IN THE ABSENCE OF A PRESCRIBED METHOD, THE PROCEDURE DESCRIBED IN EITHER AWWA C651 OR AWWA C652 OR AS DESCRIBED BELOW SHALL BE FOLLOWED.
- THESE PROCEDURES SHALL APPLY TO "ON-SITE" OR "IN-PLANT" FABRICATION OF A SYSTEM OR TO A MODULAR PORTION OF A SYSTEM.
- FOLLOW EITHER METHOD 1 OR METHOD 2
- DISINFECTION PROCEDURE (METHOD 1):
  - THE PIPING SYSTEM, INCLUDING FIXTURES AND EQUIPMENT, SHALL BE FLUSHED WITH CLEAR, POTABLE WATER UNTIL DIRTY WATER DOES NOT APPEAR AT THE POINTS OF OUTLET.
  - THE SYSTEM OR PARTS THEREOF SHALL BE FILLED WITH A WATER/CHLORINE SOLUTION CONTAINING NOT LESS THAN 50 PARTS PER MILLION OF CHLORINE, AND THE SYSTEM OR PART THEREOF SHALL BE VALVES OFF AND ALLOWED TO STAND FOR 24-HOURS;
- DISINFECTION PROCEDURE (METHOD 2):
  - THE SYSTEM OR PART THEREOF SHALL BE FILLED WITH A WATER/CHLORINE SOLUTION CONTAINING NOT LESS THAN 200 PARTS PER MILLION OF CHLORINE AND ALLOWED TO STAND FOR 3-HOURS
  - FOLLOWING THE REQUIRED STANDING TIME, THE SYSTEM SHALL BE FLUSHED WITH CLEAN POTABLE WATER UNTIL THE CHLORINE IS PURGED FROM THE SYSTEM.
  - THE PROCEDURE SHALL BE REPEATED WHERE SHOWN BY A BACTERIOLOGICAL EXAMINATION THAT CONTAMINATION REMAINS PRESENT IN THE SYSTEM.
  - DURING THE DISINFECTION PROCEDURE, WARNING SIGNS SHALL BE PLACED AT BUILDING ENTRANCES, ROOM ENTRANCES AND WATER OUTLETS INDICATING THAT POTABLE WATER HAS A HIGH CONCENTRATION OF CHLORINE AND IS NOT SAFE TO DRINK OR USE.

## PLUMBING PIPING NOTES

- PROVIDE PROPER PROVISIONS FOR EXPANSION, CONTRACTION, OR MOVEMENT OF ALL PIPING.
- INSTALL PIPING WITHOUT FORCING OR SPRINGING.
- INSTALL PIPING TO CLEAR DOORS AND WINDOWS.
- PROVIDE LARGE ENOUGH PIPE SLEEVES THROUGH WALL OR FLOOR TO ALLOW FOR ANTICIPATED DIFFERENTIAL MOVEMENT.
- ALL EXPOSED PIPING SHALL BE INSTALLED IN A NEAT ARRANGED PARALLEL TO THE BUILDING TO BUILDING STRUCTURE.
- COPPER PIPING SHALL NOT COME IN CONTACT WITH FIRE TREATED LUMBER. PROVIDE 1/2" THICK SLIP-ON CLOSED CELL INSULATION WHERE COPPER PIPING IS ADJACENT TO FIRE TREATED LUMBER. CLOSED CELL INSULATION SHALL EXTEND A MINIMUM OF 1-1/2" PAST LUMBER.
- INSTALL EXTERIOR WATER PIPING, SEWER AND WASTE PIPING AND ROOF DRAINAGE BELOW FROST LEVEL (4'-0" MINIMUM). VERIFY EXACT LOCAL REQUIREMENTS WITH AND CIVIL ENGINEER AND SITE UTILITY DRAWINGS PRIOR TO INSTALLATION.

## PLUMBING PIPE TESTING

- DRAIN WASTE AND VENT SYSTEM:
  - ALL SECTIONS OF THE DRAIN WASTE AND VENT SYSTEM SHALL BE PRESSURE TESTED WITH WATER AT A MINIMUM PRESSURE OF TEN (10) FEET OF HEAD
  - ALL SECTIONS OF THE DRAIN WASTE AND VENT SYSTEM SHALL BE PRESSURE TESTED WITH WATER FOR A MINIMUM OF 15 MINUTES.
- ROOF DRAINAGE SYSTEM:
  - ALL SECTIONS OF ROOF DRAINAGE SYSTEM SHALL BE PRESSURE TESTED WITH WATER AT A MINIMUM PRESSURE OF TEN(10) FEET OF HEAD
  - ALL SECTIONS OF THE ROOF DRAINAGE SYSTEM SHALL BE PRESSURE TESTED WITH WATER FOR A MINIMUM OF 15 MINUTES.
- DOMESTIC WATER SYSTEM:
  - ALL SECTIONS OF THE DOMESTIC WATER SYSTEM SHALL BE PRESSURE TESTED WITH POTABLE WATER AT A MINIMUM PRESSURE AT 125 PSIG.
  - ALL SECTIONS OF THE DOMESTIC WATER SYSTEM SHALL BE PRESSURE TESTED WITH POTABLE WATER FOR A MINIMUM OF 15 MINUTES.

## PLUMBING FIXTURE NOTES

- SIMILAR EQUIPMENT SHALL BE OF THE SAME MANUFACTURER.
- ALL EQUIPMENT SHALL PROVIDE THE SCHEDULED PERFORMANCE AT THE JOB SITE ELEVATION.
- FIXTURE AND EQUIPMENT MODEL NUMBERS SHOWN IN PLUMBING FIXTURE SCHEDULE AND PLUMBING EQUIPMENT SCHEDULE ARE SHOWN TO ESTABLISH THE TYPE OF PRODUCT THAT SHALL BE USED. THE SELECTED PRODUCT SHALL MEET THE SCHEDULED PERFORMANCE DATA SHOWN ON THE SCHEDULE EVEN IF A DIFFERENT MODEL IS SUPPLIED THAT IS DIFFERENT THAN THAT SCHEDULED.
- ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE ALL NECESSARY FITTINGS, TRANSITIONS, VALVES AND OTHER DEVICES AND ACCESSORIES REQUIRED FOR A COMPLETE, WORKABLE INSTALLATION.
- ALL MOTOR STARTING EQUIPMENT, NOT PROVIDES AS A PART OF THE PLUMBING EQUIPMENT, SHALL BE PROVIDED BY DIVISIONS 16.
- SEE "PLUMBING FIXTURE SCHEDULE" FOR INDIVIDUAL TRAPS, WASTE, VENT, AND DOMESTIC WATER PIPING FOR INDIVIDUAL FIXTURES.
- ALL PLUMBING EQUIPMENT SHALL BE LISTED AND LABELED BY AN APPROVED THIRD PARTY TESTING AGENCY.
- FIXTURES, EQUIPMENT AND PIPING INSTALLATION SHALL MEET NSF STANDARDS.
- PROVIDE WATER HAMMER ARRESTERS (WHA-A) AT ALL PIPING CONNECTIONS TO PLUMBING FIXTURES AND PLUMBING EQUIPMENT PROVIDED WITH QUICK CLOSING VALVE AND INSTALLATIONS WHICH RESULT IN EXCESS PIPE VIBRATION OR MOVEMENT.
- ALL OWNER FURNISHED EQUIPMENT WITH DIRECT CONNECTION TO THE DOMESTIC WATER SYSTEM SHALL BE PROVIDED WITH AN APPROVED BACKFLOW DEVICE.
- INSTALLATION AND FINAL CONNECTION OF ALL OWNER FURNISHED EQUIPMENT SHALL BE BY DIVISION 15.

## PLUMBING GENERAL NOTES

- THE PLUMBING DRAWINGS SHOW THE GENERAL DESIGN, ARRANGEMENT AND EXTENT OF THE PLUMBING SYSTEM. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, THESE DRAWINGS DO NOT SHOW ALL OFFSETS, BENDS OR ELBOWS NECESSARY FOR THE COMPLETE INSTALLATION IN THE SPACE PROVIDED. CONTRACTOR SHALL MAKE SUCH MINOR ALTERATIONS AS MAY BE NECESSARY TO MAKE THE SYSTEM COMPLETE AND OPERATIONAL IN ACCORDANCE WITH THE DESIGN INTENT.
- MAJOR DEVIATIONS SUCH AS CHANGES IN COMPONENT SIZES, WEIGHTS, QUANTITIES OR MATERIAL REQUIRE PRIOR APPROVAL BY THE DESIGN ENGINEER.
- THE DRAWINGS AND SPECIFICATIONS HAVE BEEN PREPARED TO SUPPLEMENT EACH OTHER AND SHALL BE INTERPRETED AS AN INTEGRAL UNIT WITH THE ITEMS SHOWN ON ONE AND NOT THE OTHER BEING FURNISHED AND INSTALLED AS THOUGHT SHOWN AND CALLOUT IN BOTH.
- THE ENTIRE PLUMBING INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE MOST RECENTLY ADOPTED BUILDING CODES, MECHANICAL CODE, PLUMBING CODE, ELECTRICAL CODE, AND ALL OTHER APPLICABLE CITY, COUNTY, STATE, OR FEDERAL CODES OR REGULATIONS IN EFFECT.
- PRIOR TO FABRICATION AND INSTALLATION OF ANY PLUMBING COMPONENT THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL PLUMBING WORK WITH ALL OTHER BUILDING TRADES, INCLUDING BUILDING TRADES HIRED DIRECTLY BY THE OWNER. WHERE CONFLICTS MAY OCCUR, THEY SHALL BE RESOLVED PRIOR TO INSTALLATION.
- ALL PLUMBING INFORMATION IS NOT SHOWN ON THE PLUMBING DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL INFORMATION ON ALL OTHER CONSTRUCTION DOCUMENT.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO REVIEW AND USE, WHERE APPROPRIATE, ALL THE PLUMBING DETAILS SHOWN ON THE DRAWINGS. DETAILS MAY OR MAY NOT BE CALLED OUT ON THE DRAWINGS WITH SYMBOLS OR KEYED NOTES. ANY CHANGES RESULTING FROM FAILURE TO INSTALL THE PLUMBING SYSTEM WITHOUT USING THE INCLUDED DETAILS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- ANY PART OF THE PLUMBING INSTALLATION THAT FAILS, IS UNFIT, OR BECOMES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACES BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

## DEFINITIONS

- NOTE: ALL DEFINITIONS MAY NOT BE USED
- INDICATED: REFERS TO GRAPHIC REPRESENTATIONS, NOTES, OR SCHEDULES ON THE DRAWINGS, OR OTHER PARAGRAPHS OR SCHEDULES IN THE SPECIFICATIONS, AND SIMILAR REQUIREMENTS IN THE CONTRACT DOCUMENTS WHERE TERMS SUCH AS "INDICATED", "SHOWN", "NOTED", "SCHEDULED", AND "SPECIFIED" ARE USED, IT IS TO HELP THE READER LOCATE THE REFERENCE. NO LIMITATION ON LOCATION IS INTENDED.
- DIRECTED: TERMS SUCH A "DIRECTED", "REQUESTED", "AUTHORIZED", "SELECTED", "APPROVED", "REQUIRED", "PERMITTED" MEANS "DIRECTED BY THE ENGINEER", "REQUESTED BY THE ENGINEER", AND SIMILAR PHRASES.
- APPROVED: WHERE USED IN CONJUNCTION WITH THE ENGINEER'S ACTION ON THE CONTRACTOR'S SUBMITTALS, APPLICATIONS AND REQUESTS, THE TERM "APPROVED" IS LIMITED TO THE ENGINEER'S DUTIES AND RESPONSIBILITIES AS STATED IN THE GENERAL AND SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION DOCUMENTS.
- FURNISHED\* REFERS TO SUPPLY AND DELIVERY TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, AND INSTALLATION AND SIMILAR OPERATIONS.
- INSTALL: REFERS TO OPERATIONS AT THE PROJECT SITE INCLUDING THE ACTUAL, UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING WORKING TO DIMENSION, FINISHING, CURING, PROTECTION, CLEANING AND SIMILAR OPERATIONS.
- PROVIDE: MEANS TO "FURNISH AND INSTALL COMPLETE AND READY FOR THE INTENDED USE".
- INSTALLER: IS THE CONTRACTOR OR AN ENTITY ENGAGED BY THE CONTRACTOR, EITHER AS AN EMPLOYEE, SUBCONTRACTOR, SUB-SUBCONTRACTOR FOR PERFORMANCE OF A PARTICULAR CONSTRUCTION ACTIVITY, INCLUDING INSTALLATION, ERECTION, APPLICATIONS, AND SIMILAR OPERATIONS. INSTALLERS ARE REQUIRED TO BE EXPERIENCED IN THE OPERATIONS THEY ARE ENGAGED TO PERFORM.

UNLESS A PROFESSIONAL SEAL WITH SIGNATURE AND DATE IS AFFIXED, THIS DOCUMENT IS PRELIMINARY AND IS NOT INTENDED FOR CONSTRUCTION, RECORDING PURPOSES, OR IMPLEMENTATION

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ADDITION

Grand Junction, CO

CITY OF  
Grand Junction  
COLORADO

project#: 19.0270  
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PLUMBING  
NOTES

sheet:

PE002

PERMIT SET

## PLUMBING SUBMITAL NOTES

1. PLUMBING SUBMITTALS SHALL BE SUBMITTED AS A COMPLETE ELECTRONIC PACKAGE ASSEMBLED BY SPECIFICATION DIVISIONS.
2. ASSEMBLE COMPLETE ELECTRONIC SUBMITTAL PACKAGE INTO A SINGLE INDEXED FILE INCORPORATING SUBMITTAL REQUIREMENTS OF A SINGLE SPECIFICATION SECTION AND TRANSMITTAL FORM WITH LINKS ENABLING NAVIGATION TO EACH ITEM. LITERATURE SHALL INCLUDE REFERENCE TO EQUIPMENT CALLOUT AND SPECIFICATION SECTION; FILE NAME SHALL USE PROJECT IDENTIFIER AND SPECIFICATION SECTION NUMBER FOLLOWED BY A DECIMAL POINT AND THEN A SEQUENTIAL NUMBER (E.G., LNHS-061000.01). RE-SUBMITTALS SHALL INCLUDE AN ALPHABETIC SUFFIX AFTER ANOTHER DECIMAL POINT (E.G., LNHS-061000.01.A); PROVIDE MANUFACTURER'S CATALOG DATA SHEETS FOR EACH MANUFACTURED ITEM LISTED ON THE DRAWINGS AND SPECIFICATIONS;
3. INCLUDE MANUFACTURER'S CATALOG DATA OF EACH MANUFACTURED ITEM AND ENOUGH INFORMATION TO SHOW COMPLIANCE WITH CONTRACT DOCUMENT REQUIREMENTS. LITERATURE SHALL SHOW CAPACITIES AND SIZE OF EQUIPMENT USED AND BE MARKED INDICATING EACH SPECIFIC ITEM WITH APPLICABLE DATA UNDERLINED. INCLUDE NAME, ADDRESS, AND PHONE NUMBER OF EACH SUPPLIER. DEVIATIONS AND ADDITIONAL INFORMATION: ON AN ATTACHED SEPARATE SHEET, PREPARED ON CONTRACTOR'S LETTERHEAD, RECORD RELEVANT INFORMATION, REQUESTS FOR DATA, REVISIONS OTHER THAN THOSE REQUESTED BY ENGINEER CONTRACT DOCUMENTS, INCLUDING MINOR VARIATIONS AND LIMITATIONS. INCLUDE SAME IDENTIFICATION INFORMATION AS RELATED SUBMITTAL.
3. COLLECT PRODUCT DATA INFORMATION INTO A SINGLE SUBMITTAL FOR EACH ELEMENT OF CONSTRUCTION AND TYPE OF PRODUCT OR EQUIPMENT. IF INFORMATION MUST BE SPECIALLY PREPARED FOR SUBMITTAL BECAUSE STANDARD PUBLISHED DATA ARE NOT SUITABLE FOR USE, SUBMIT AS SHOP DRAWINGS, NOT AS PRODUCT DATA. MARK EACH COPY OF EACH SUBMITTAL TO SHOW WHICH PRODUCTS AND OPTIONS ARE APPLICABLE.
4. INCLUDE THE FOLLOWING PRODUCT INFORMATION, AS APPLICABLE: MANUFACTURER'S CATALOG CUTS; MANUFACTURER'S PRODUCT SPECIFICATIONS; STANDARD COLOR CHARTS; STATEMENT OF COMPLIANCE WITH SPECIFIED REFERENCED STANDARDS; TESTING BY RECOGNIZED TESTING AGENCY; APPLICATION OF TESTING AGENCY LABELS AND SEALS; NOTATION OF COORDINATION REQUIREMENTS; AVAILABILITY AND DELIVERY TIME INFORMATION;
5. INCLUDE THE FOLLOWING EQUIPMENT INFORMATION: WIRING DIAGRAMS SHOWING FACTORY-INSTALLED WIRING; PRINTED PERFORMANCE CURVES; OPERATIONAL RANGE DIAGRAMS; CLEARANCES REQUIRED TO OTHER CONSTRUCTION, IF NOT INDICATED ON ACCOMPANYING SHOP DRAWINGS.
4. PREPARE PROJECT-SPECIFIC SHOP DRAWINGS, DRAWN ACCURATELY TO SCALE. DO NOT BASE SHOP DRAWINGS ON REPRODUCTIONS OF THE CONTRACT DOCUMENTS OR STANDARD PRINTED DATA. FULLY ILLUSTRATE REQUIREMENTS IN THE CONTRACT DOCUMENTS. INCLUDE THE FOLLOWING INFORMATION, AS APPLICABLE: IDENTIFICATION OF PRODUCTS; SCHEDULES; COMPLIANCE WITH SPECIFIED STANDARDS; NOTATION OF COORDINATION REQUIREMENTS; NOTATION OF DIMENSIONS ESTABLISHED BY FIELD MEASUREMENT; RELATIONSHIP AND ATTACHMENT TO ADJOINING CONSTRUCTION CLEARLY INDICATED; SEAL AND SIGNATURE OF PROFESSIONAL ENGINEER IF SPECIFIED.
5. ALLOW TIME FOR SUBMITTAL REVIEW, INCLUDING TIME FOR RE-SUBMITTALS. TIME FOR REVIEW SHALL COMMENCE ON ENGINEER'S RECEIPT OF SUBMITTAL. NO EXTENSION OF THE CONTRACT TIME WILL BE AUTHORIZED BECAUSE OF FAILURE TO TRANSMIT SUBMITTALS ENOUGH IN ADVANCE OF THE WORK TO PERMIT PROCESSING, INCLUDING RE-SUBMITTALS.
  - a. ALLOW 15 DAYS FOR INITIAL REVIEW OF MECHANICAL SUBMITTAL.
  - a. ALLOW 15 DAYS FOR REVIEW OF EACH RE-SUBMITTAL.
6. PROVIDE DEVIATIONS AND ADDITIONAL INFORMATION ON AN ATTACHED SEPARATE SHEET, PREPARED ON CONTRACTOR'S LETTERHEAD, RECORD RELEVANT INFORMATION, REQUESTS FOR DATA, REVISIONS OTHER THAN THOSE REQUESTED BY DESIGN ENGINEER ON PREVIOUS SUBMITTALS, AND DEVIATIONS FROM REQUIREMENTS IN THE CONTRACT DOCUMENTS, INCLUDING MINOR VARIATIONS AND LIMITATIONS. INCLUDE SAME IDENTIFICATION INFORMATION AS RELATED SUBMITTAL.

## PLBG. PROJECT SUBMIT. NOTES

1. MECHANICAL SUBMITTALS SHALL BE SUBMITTED AS A COMPLETE ELECTRONIC PACKAGE ASSEMBLED BY SPECIFICATION DIVISIONS.
2. PROVIDE EQUIPMENT SUBMITTAL INFORMATION FOR THE FOLLOWING EQUIPMENT:
  - A. PLUMBING FIXTURES(PORCELAIN FIXTURE, FLUSH VALVES, WATER COOLERS, ETC)
  - B. SINKS
  - C. DRAINS
  - D. MISC. VALVES
  - E. WATER HEATERS, (WH)
  - F. DOMESTIC EXPANSION TANKS (DET)
  - G. DOMESTIC CIRCULATING PUMPS (DCP)
  - H. WATER HAMMER ARRESTORS (WHA)
3. PROVIDE MATERIAL SUBMITTAL INFORMATION FOR TH FOLLOWING MATERIAL:
  - A. PIPING MATERIAL
  - B. PIPE INSULATION
  - C. HANGER AND SUPPORTS
  - D. VALVES
  - E. PLUMBING SPECIALTIES (METERS, GAGES, ETC.)
  - F. PIPE IDENTIFICATION
  - G. EQUIPMENT IDENTIFICATION.

## DRAIN WASTE & VENT NOTES

1. ALL EXPOSED DRAINAGE PIPING ON OCCUPIED SPACES INCLUDING TRAPS UNDER SINKS SHALL BE POLISHED CHROME PLATED.
2. DRAWINGS SHOW GENERAL ARRANGEMENT OF THE DRAIN WASTE AND VENT SYSTEM WITH THE REQUIRED CLEANOUTS. CONTRACTOR SHALL PROVIDE ALL ADDITIONAL CLEANOUTS AS REQUIRED BY THE PLUMBING CODE.
3. INVERTS ELEVATION SHOWN ON THE PLUMBING DRAWINGS MAY BE REFERENCED FROM THE FINISHED FLOOR ELEVATION. COORDINATE ALL INVERTS WITH BOTH CIVIL AND ARCHITECTURAL DRAWINGS PRIOR TO INSTALLATION.
4. ALL VENTS THROUGH ROOF SHALL BE A MINIMUM OF 10 FEET FROM ANY AIR INTAKE.
5. SLOPE VENT SYSTEM TOWARDS DRAINAGE SYSTEM.
6. ALL SANITARY DRAINAGE AND GREASE WASTE SYSTEM 3" AND LARGER SHALL BE SLOPED IN DIRECTION OF FLOW AT A MINIMUM OF 1/8" PER FOOT.
7. ALL SANITARY DRAINAGE AND GREASE WASTE SYSTEM SMALLER THAN 3" SHALL BE SLOPED IN DIRECTION OF FLOW AT A MINIMUM OF 1/4" PER FOOT.
8. DRAINAGE PATTERN FITTINGS SHALL BE USED ON ALL VENT PIPING LOCATED BELOW THE FLOOR LEVEL RIM OF THE FIXTURES.
9. SEE 2012 INTERNATIONAL PLUMBING CODE TABLE 706.3 FOR ACCEPTABLE DRAINAGE PATTERN FITTINGS.

## CONDENSATE DRAIN NOTES

1. DRAWINGS SHOW GENERAL ARRANGEMENT OF THE CONDENSATE DRAIN SYSTEM.
2. PROVIDE PIPING VENTS AT ALL TRAPPED CONNECTION TO INDIVIDUAL PIECES OF EQUIPMENT.
3. ALL CONDENSATE DRAINAGE PIPING SHALL BE SLOPED IN DIRECTION OF FLOW AT A MINIMUM OF 1/8" PER FOOT.
4. PROVIDE INDIRECT CONNECTION AT DISCHARGE END OF CONDENSATE DRAIN PIPE.
5. PROVIDE UL508 AUXILIARY WATER LEVEL DETECTION DEVICE FOR ALL EQUIPMENT REQUIRING CONDENSATE DRAIN CONNECTION. INTERLOCK WATER LEVEL DETECTION DEVICE WITH UNIT TO TURN OFF UNIT WHEN CONDENSATE IS DETECTED.

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project:

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO



project#: 19.0270  
date: February 20, 2020

revisions:

title:

**PLUMBING**  
**NOTES**

sheet:

**PE003**

PERMIT SET



**SHEET KEYNOTES**

- 1 BATHROOM GROUP SERVED BY WET VENT.
- 2 PRIMARY ROOF DRAIN PIPING UP TO PRIMARY ROOF DRAIN ON ROOF. BASIS OF DESIGN JR SMITH 1010-AD-R-C. DRAINAGE COVERAGE: 950 SQFT; 20 GPM. EXISTING 4" LINE SERVES 2100 SQFT; 43.6 GPM. TOTAL: 63.6 GPM. MAXIMUM DRAINAGE CAPACITY ON A 4" LINE SLOPING AT 1/8" PER FT: 115 GPM.
- 3 SECONDARY ROOF DRAIN PIPING UP TO SECONDARY ROOF DRAIN ON ROOF. BASIS OF DESIGN JR SMITH 1080-AD-R-C. DRAINAGE COVERAGE: 950 SQFT; 20 GPM. EXISTING 4" LINE SERVES 2100 SQFT; 43.6 GPM. TOTAL: 63.6 GPM. MAXIMUM DRAINAGE CAPACITY ON A 4" LINE SLOPING AT 1/8" PER FT: 115 GPM.
- 4 CIRCUIT SETTER. SET AT 0.5 GPM. RECIRCULATION PIPING TO EXTEND TO LEVEL OF STOP VALVES.
- 5 PROVIDE WATER HAMMER ARRESTOR. BASIS OF DESIGN SIOUX CHIEF 652-A FOR SINGLE TOILET RESTROOM AND 652-C FOR MULTI TOILET RESTROOM.

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**project:**  
 LAS COLONIAS AMPHITHEATER - ADDITION  
 Grand Junction, CO  
**CITY OF Grand Junction**  
 COLORADO

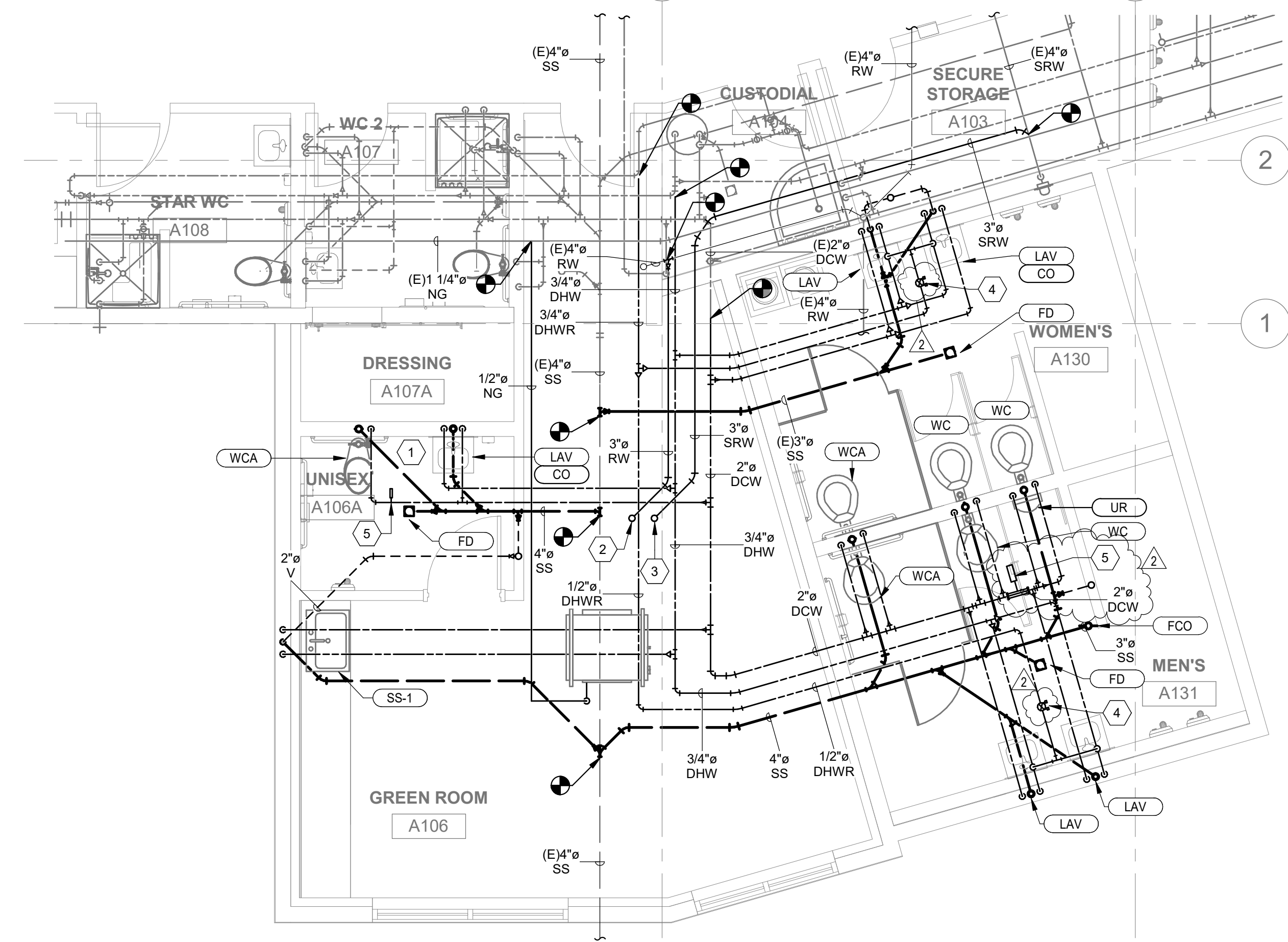
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**date:** February 20, 2020

**revisions:**  
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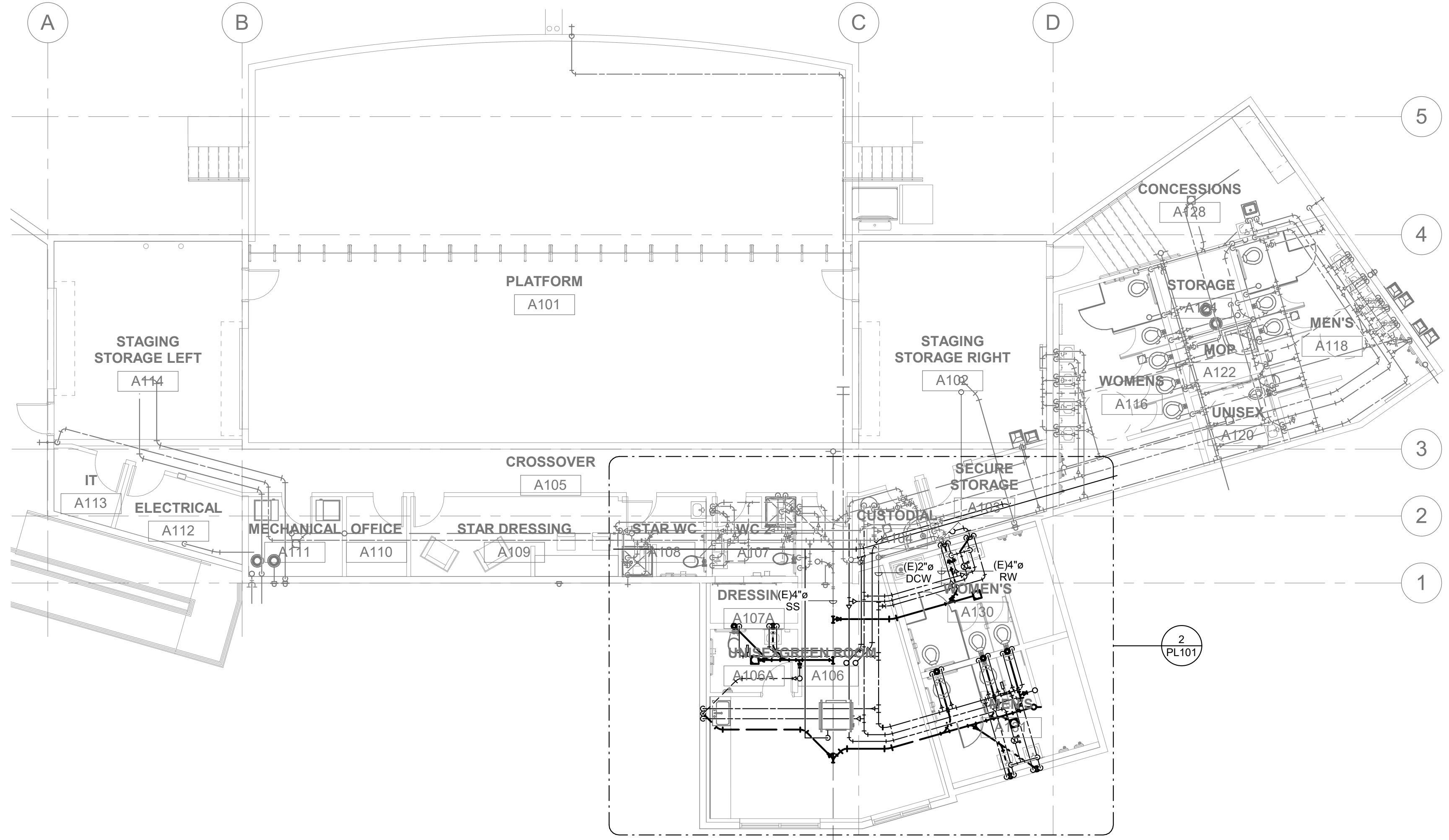
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**sheet:**  
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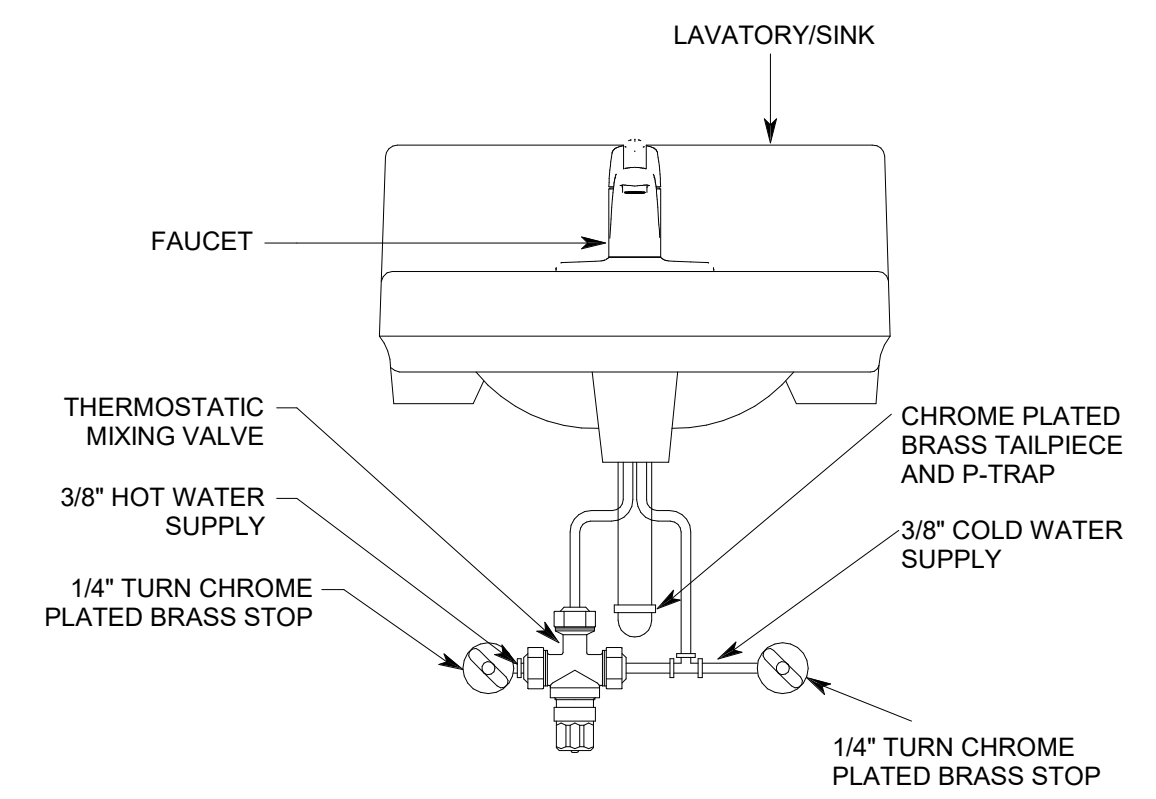
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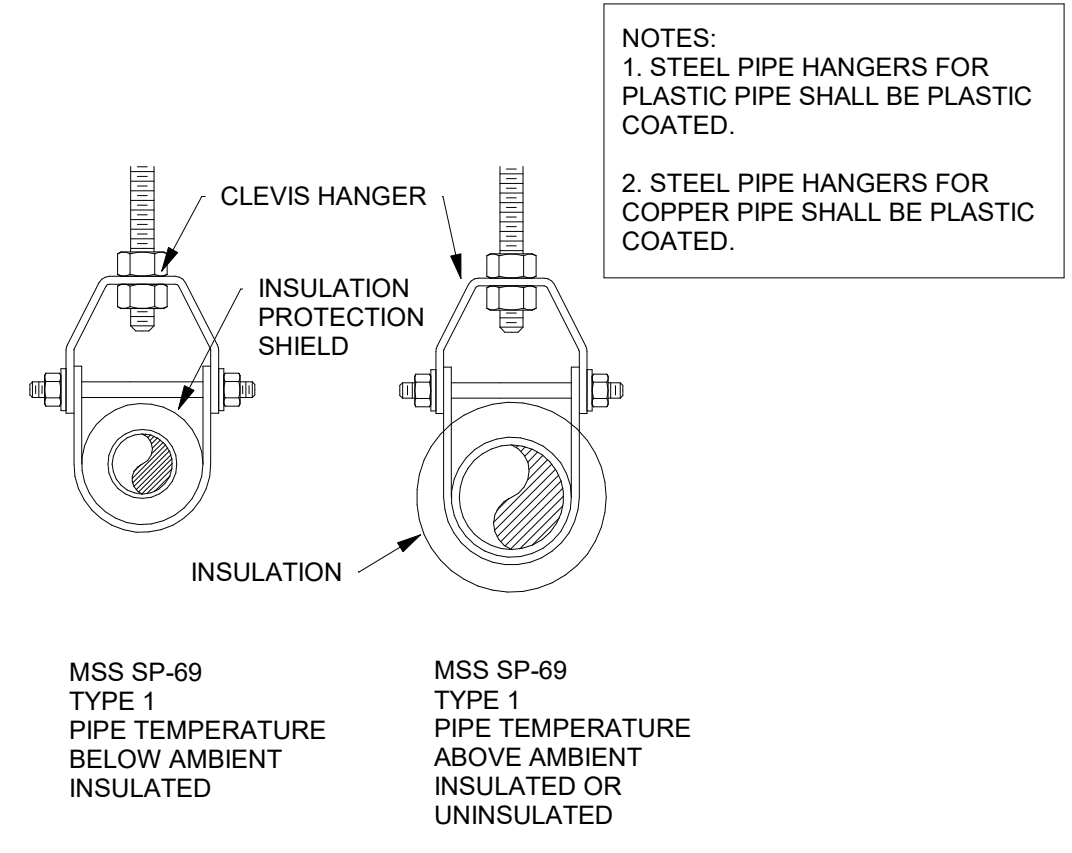
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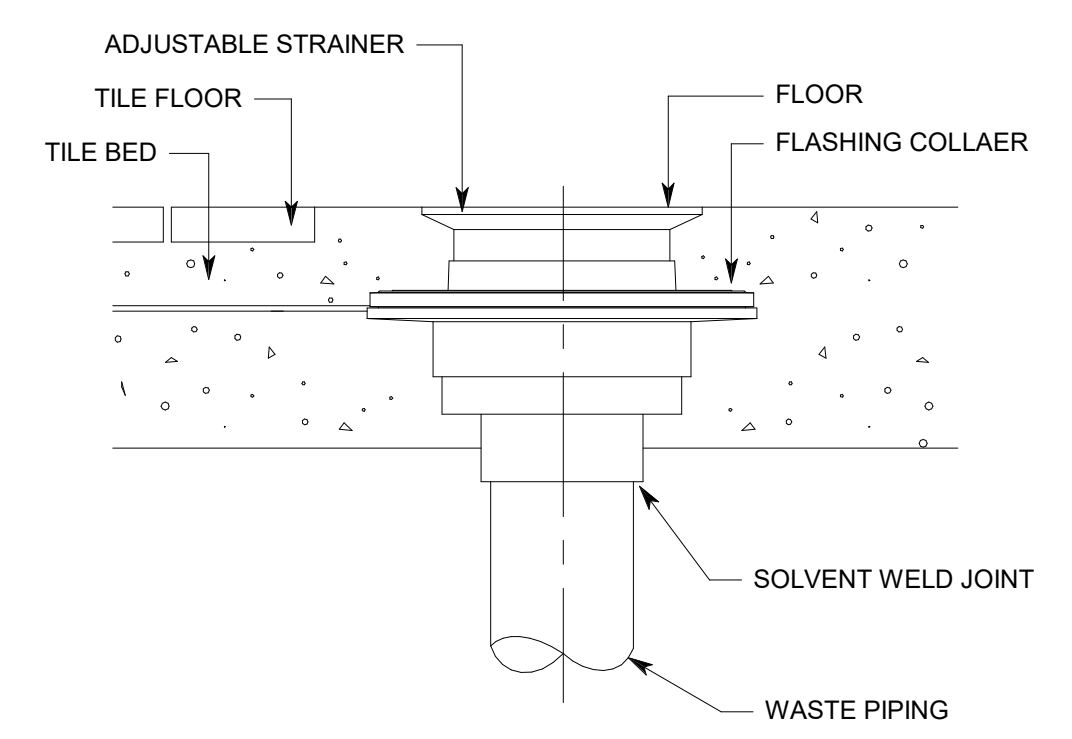
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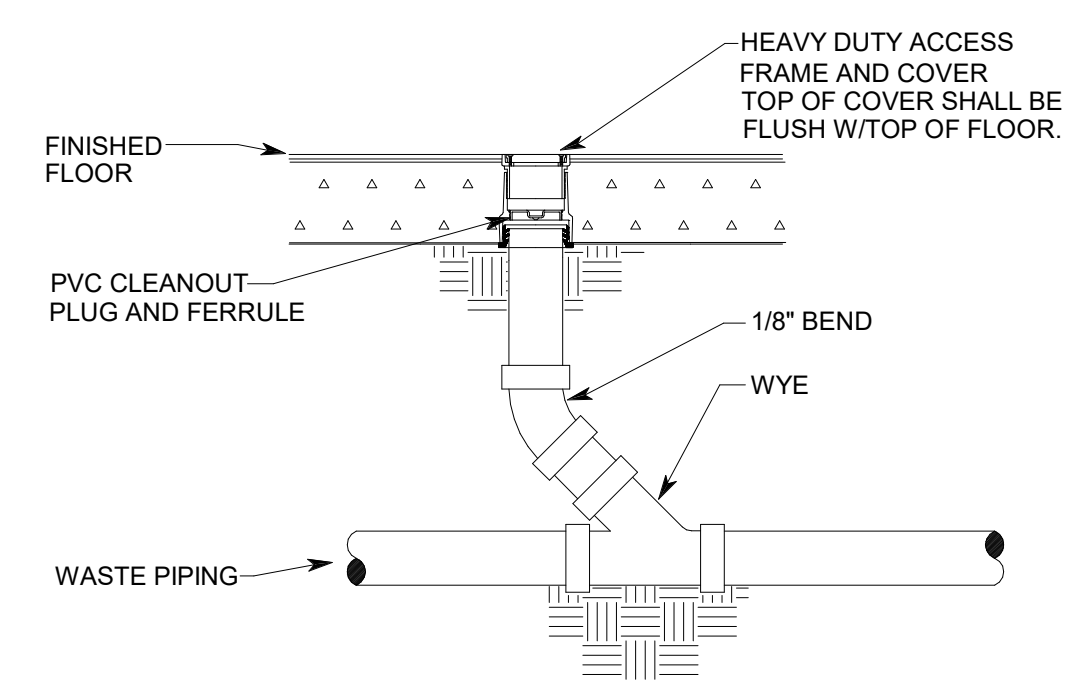
**4 THERMOSTATIC MIX VALVE**  
SCALE: NTS



**3 PIPE HANGER**  
SCALE: NTS



**2 FLOOR DRAIN**  
SCALE: NTS



**1 FLOOR CLEANOUT**  
SCALE: NTS

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**project:**  
LAS COLONIAS AMPHITHEATER - ADDITION  
Grand Junction, CO  
**CITY OF Grand Junction COLORADO**

**project#:** 19.0270  
**date:** February 20, 2020

**revisions:**

**title:**  
**PLUMBING DETAILS**

**sheet:**  
**PE501**

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## PLUMBING FIXTURE SCHEDULE

SYMBOL	FIXTURE	TRAP	WASTE	VENT	DOMESTIC COLD WATER	DOMESTIC HOT WATER	DESCRIPTION	BASIS OF DESIGN MANUFACTURER AND MODEL	NOTES
WC	WATER CLOSET	INT.	3"	2"	1"	---	FLOOR MOUNTED, FLUSH VALVE, VITREOUS CHINA, ELONGATED, 1-1/2" TOP SPUD, 15" RIM HEIGHT, SIPHON JET, 2-1/8" MINIMUM TRAPWAY. DIAPHRAGM TYPE FLUSH VALVE, SENSOR ACTIVATED, DUAL FLUSH, 1.60/1.10 GALLONS PER FLUSH, POLISHED CHROME PLATED BRASS, BATTERY, COURTESY FLUSH OVERRIDE BUTTON, VACUUM BREAKER. OPEN FRONT SEAT, LESS SEAT, HEAVY DUTY PLASTIC, ELONGATED, STAINLESS STEEL HINGE POSTS.	AMERICAN STANDARD 2234.001  SLOAN 111-1.6/1.1  BEMIS 1955C	MINIMUM MaP RATING = 1,000
WC-A	WATER CLOSET (ACCESSIBLE ROOM)	INT.	3"	2"	1"	---	FLOOR MOUNTED, FLUSH VALVE, VITREOUS CHINA, ELONGATED, 1-1/2" TOP SPUD, 16-1/2" RIM HEIGHT, SIPHON JET, 2-1/8" MINIMUM TRAPWAY. DIAPHRAGM TYPE FLUSH VALVE, SENSOR ACTIVATED, DUAL FLUSH, 1.60/1.10 GALLONS PER FLUSH, POLISHED CHROME PLATED BRASS, BATTERY, COURTESY FLUSH OVERRIDE BUTTON, VACUUM BREAKER. OPEN FRONT SEAT, LESS SEAT, HEAVY DUTY PLASTIC, ELONGATED, STAINLESS STEEL HINGE POSTS.	AMERICAN STANDARD 3043.001  SLOAN 111-1.6/1.1  BEMIS 1955C	MINIMUM MaP RATING = 1,000  INSTALL FLUSH VALVE WITH HANDLE ON ACCESSIBLE SIDE OF WATER CLOSET
UR	URINAL (ACCESSIBLE)	INT.	2"	2"	1"	---	WALL MOUNTED, FLUSHING RIM, WASHOUT, VITREOUS CHINA, 3/4" TOP SPUD. ELECTRONIC, BATTERY POWERED, DIAPHRAGM TYPE FLUSH VALVE, 0.125 GALLON PER FLUSH POLISHED CHROME PLATED BRASS FLOOR MOUNTED SUPPORT, FLOOR BEARING PLATE, TOP AND BOTTOM BEARING STUDS	KOHLER K-4904-ET SLOAN ECOS 8186-0.125  J.R. SMITH 0615	
SS-1	SINGLE BOWL	1-1/2"	1-1/2"	1-1/2"	1/2"	1/2"	FIXTURE: SINGLE COMPARTMENT, 18 GAUGE, 304 STAINLESS STEEL, 19" X 18" X 7.5" BOWL. 4" FAUCET LEDGE, SELF RIMMING. FAUCET: GOOSENECK SWING MOUNT, SINGLE HANDLE MIXING FAUCET, WRISTBLADE HANDLES, 8" CENTERSET AERATOR: POLISHED CHROME PLATED LEAD-FREE BRASS, LAMINAR FLOW, 1.5 GPM. DRAINS: STAINLESS STEEL CRUMB CUP STRAINER, REMOVABLE STAINLESS STEEL BASKET, 4" LONG TAILPIECE, CHROME PLATE BRASS CONDENSATE DRAIN TAILPIECE. TRAP: WHITE POLYVINYL CHLORIDE (PVC). STOPS: 1/2" I.P.S. X 3/8" O.D. COMPRESSION, POLISHED CHROME PLATED HEAVY PATTERN LEAD FREE BRASS ANGLE BALL VALVE. SUPPLIES: PEX TUBING, FORMED WITH FLANGE, RUBBER WASHER OR GASKET PLASTIC COMPRESSION SLEEVE, ASTM A112.18.6, ASTM F877.	ELKAY DSESR127224  ELKAY LK810GN05T6  OMIN A-400-05-LF DEARBORN 701-1  POWERS LFe480-11 BRASSCRAFT KTCR19XC  BRASSCRAFT 1-15 C  INSINKERATOR BADGER 5' AMERICAN STANDARD 0356.012 SYMMONS SLS-2010 OMIN A-400-05-LF  MCQUIRE 155A DEARBORN 9701-1 BRASSCRAFT KTCR19XC  BRASSCRAFT 1-15 C TRUEBORG "LAV SHIELD" 2018 J.R. SMITH 0710-Z	CONFIRM CABINET SIZE PRIOR TO ORDER
LAV	LAVATORY (ACCESSIBLE)	1-1/4"	1-1/2"	1-1/2"	1/2"	1/2"	WALL MOUNTED, 20" X 18", VITREOUS CHINA, ADA ACCEPTABLE FAUCET LEDGE, 4" CENTER FAUCET HOLES. SINGLE LEVER FAUCET, CHROME PLATED LEAD FREE BRASS, CERAMIC COMPONENTS, DECK PLATE. LAMINAR FLOW AERATOR, POLISHED CHROME PLATED LEAD FREE BRASS, 0.5 GPM. COMBINATION TEMPERATURE & PRESSURE MIXING VALVE, CHROME PLATED LEAD FREE BRASS. INTEGRAL CHECKS, ASSE 1070 LISTED. CHROME PLATED BRASS GRID DRAIN, CHROME PLATED BRASS TAILPIECE, OFFSET TAILPIECE WHITE POLYVINYL CHLORIDE (PVC) TRAP ANGLE BALL VALVE STOP, HEAVY DUTY, POLISHED CHROME PLATED LEAD FREE BRASS, 1/2" IPS X 3/8" O.D. COMPRESSION. POLISHED CHROME PLATED COPPER TUBING SUPPLY, 3/8" O.D, FORMED NOSEPIECE WITH FLANGE, WATER WASHER OR GASKET, COMPRESSION SLEEVE, ASTM A112.18.6. ENCLOSURE: RIGID POLYVINYL CHLORIDE ENCLOSURE, ADA ACCESSIBLE UL LISTED SUPPORT: CONCEALED ARM, FLOOR MOUNTED, NARROW WALL, TUBULAR STEEL VERTICAL SUPPORTS, STEEL FLOOR PLATES.	AMERICAN STANDARD 0356.012 SYMMONS SLS-2010 OMIN A-400-05-LF  MCQUIRE 155A DEARBORN 9701-1 BRASSCRAFT KTCR19XC  BRASSCRAFT 1-15 C TRUEBORG "LAV SHIELD" 2018 J.R. SMITH 0710-Z	SET DISCHARGE WATER TEMPERATURE AT 110 F.

## PLUMBING FIXTURE SCHEDULE (DRAINS)

SYMBOL	FIXTURE	TRAP	WASTE	VENT	DOMESTIC COLD WATER	DOMESTIC HOT WATER	DESCRIPTION	BASIS OF DESIGN MANUFACTURER AND MODEL	NOTES
FD	FLOOR DRAIN	2"	2"	2"	---	---	LACQUER COATED CAST IRON BODY FLOOR DRAIN, FLASHING COLLAR, 5" ROUND NICKEL BRONZE ADJUSTABLE STRAINER 3.5" BARRIER TYPE TRAP PRIMER, ABS, NEOPRENE RUBBER DIAPHRAGM, ASSE STANDARD 1072-AF-GW DEEP SEAL P-TRAP	J. R. SMITH 2010-5A J.R. SMITH 5A SURESEAL SS 3509	INSTALL TRAP SEAL BEHIND STRAINER FACE
RD-4	ROOF DRAIN	---	3"	---	---	---	LACQUER COATED CAST IRON BODY, COMBINED FLASHING CLAMP AND GRAVEL STOP, SUMP RECEIVER, UNDERDECK CLAMP.	J. R. SMITH 1010-AD-R-C	3,760 SQ. FT. CAPACITY AT 2" PER HOUR RAINFALL AND 1/8" PER FOOT SLOPE.
SRD-4	SECONDARY ROOF DRAIN	---	3"	---	---	---	LACQUER COATED CAST IRON BODY, COMBINED FLASHING CLAMP AND GRAVEL STOP, 2" WATER DAM, SUMP RECEIVER, UNDERDECK CLAMP.	J. R. SMITH 1080-AD-R-C	3,760 SQ. FT. CAPACITY AT 2" PER HOUR RAINFALL AND 1/8" PER FOOT SLOPE.
DSN-4	DOWNSPOUT NOZZLE	---	3"	---	---	---	CAST BRONZE NOZZLE AND FLANGE	J.R. SMITH 1771	

## PLUMBING FIXTURE SCHEDULE (CLEANOUTS)

SYMBOL	FIXTURE	TRAP	WASTE	VENT	DOMESTIC COLD WATER	DOMESTIC HOT WATER	DESCRIPTION	BASIS OF DESIGN MANUFACTURER AND MODEL	NOTES
CO	CLEANOUT	---	SAME AS PIPE	---	---	---	CAST IRON BLIND PLUG	CHARLOTTE PIPE NH-50	
FCO	FLOOR CLEANOUT	---	SAME AS PIPE	---	---	---	HEAVY DUTY NICKEL BRONZE TOP, BRASS PLUG	J. R. SMITH 4113S-NB	
COTG	CLEANOUT TO GRADE	---	SAME AS PIPE	---	---	---	HEAVY DUTY NICKEL BRONZE TOP, BRASS PLUG	J. R. SMITH 4113S-NB	
WCO	WALL CLEANOUT	---	SAME AS PIPE	---	---	---	ROUND FLAT STAINLESS STEEL WALL PLATE	J.R. SMITH 4532S	

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**project:**

LAS COLONIAS  
AMPHITHEATER -  
ADDITION

Grand Junction, CO

**CITY OF Grand Junction**  
COLORADO

project#: 19.0270  
date: February 10, 2020

revisions:  
2 ADD 1 04/08/2020

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**PLUMBING SCHEDULES**

**sheet:**

**PE601**

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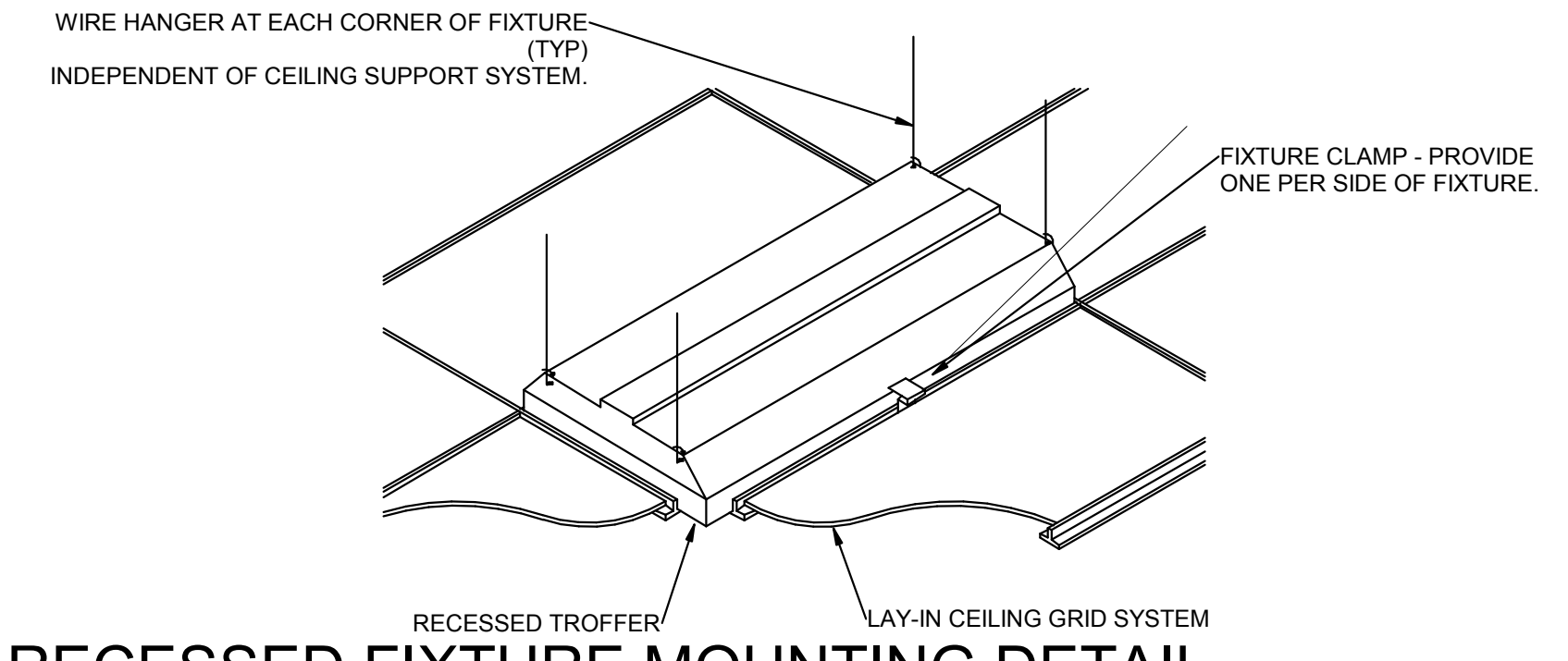
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**date:** February 10, 2020

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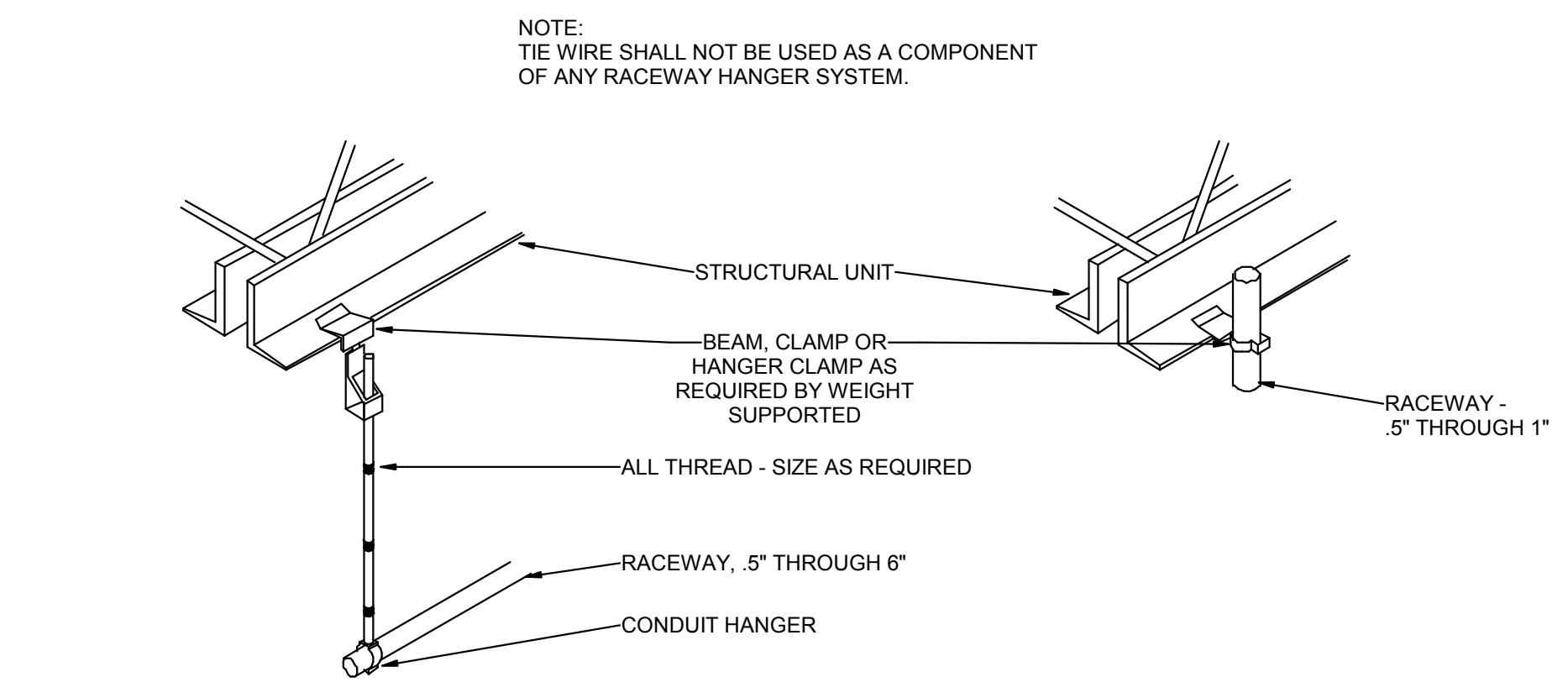
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 DETAILS**

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**EE501**

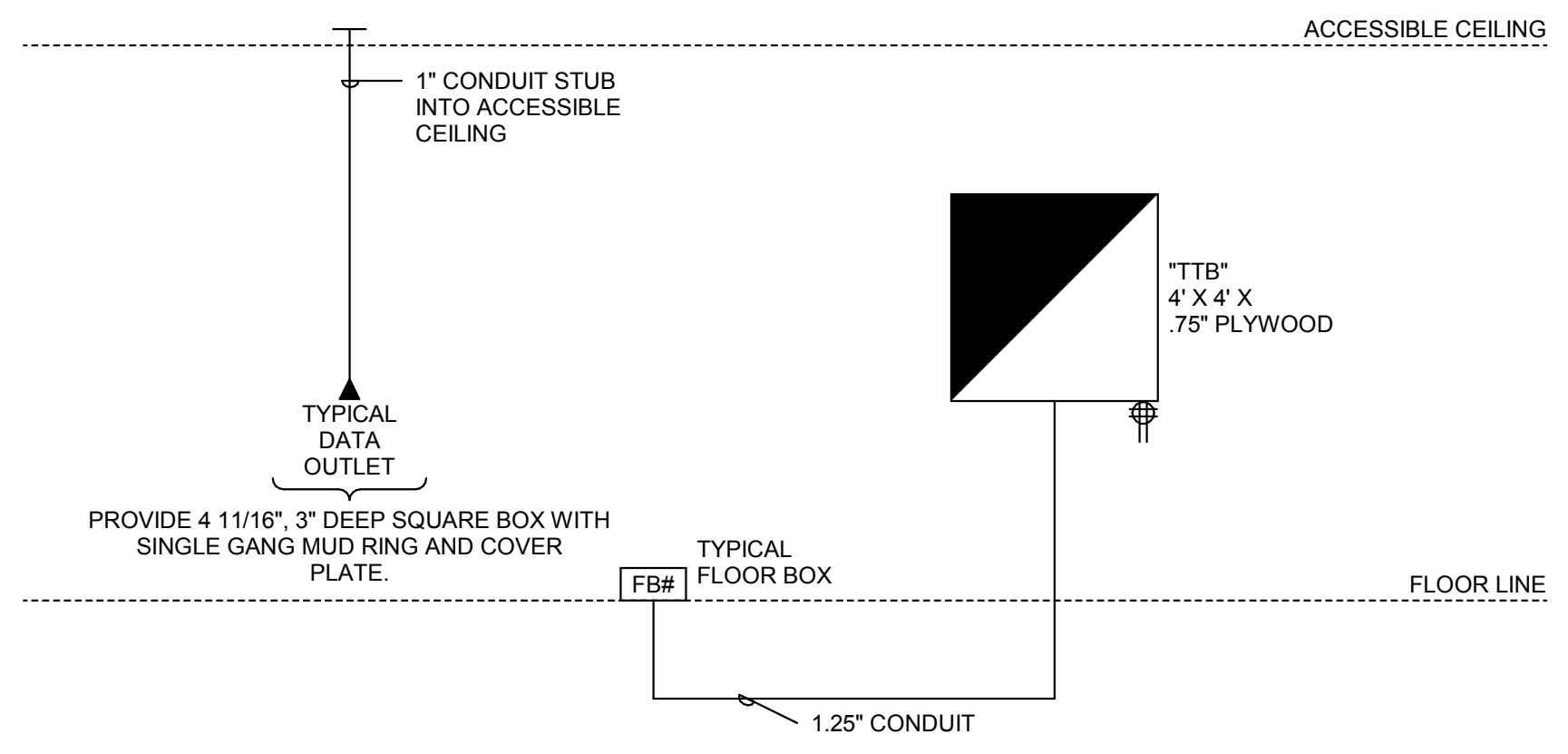
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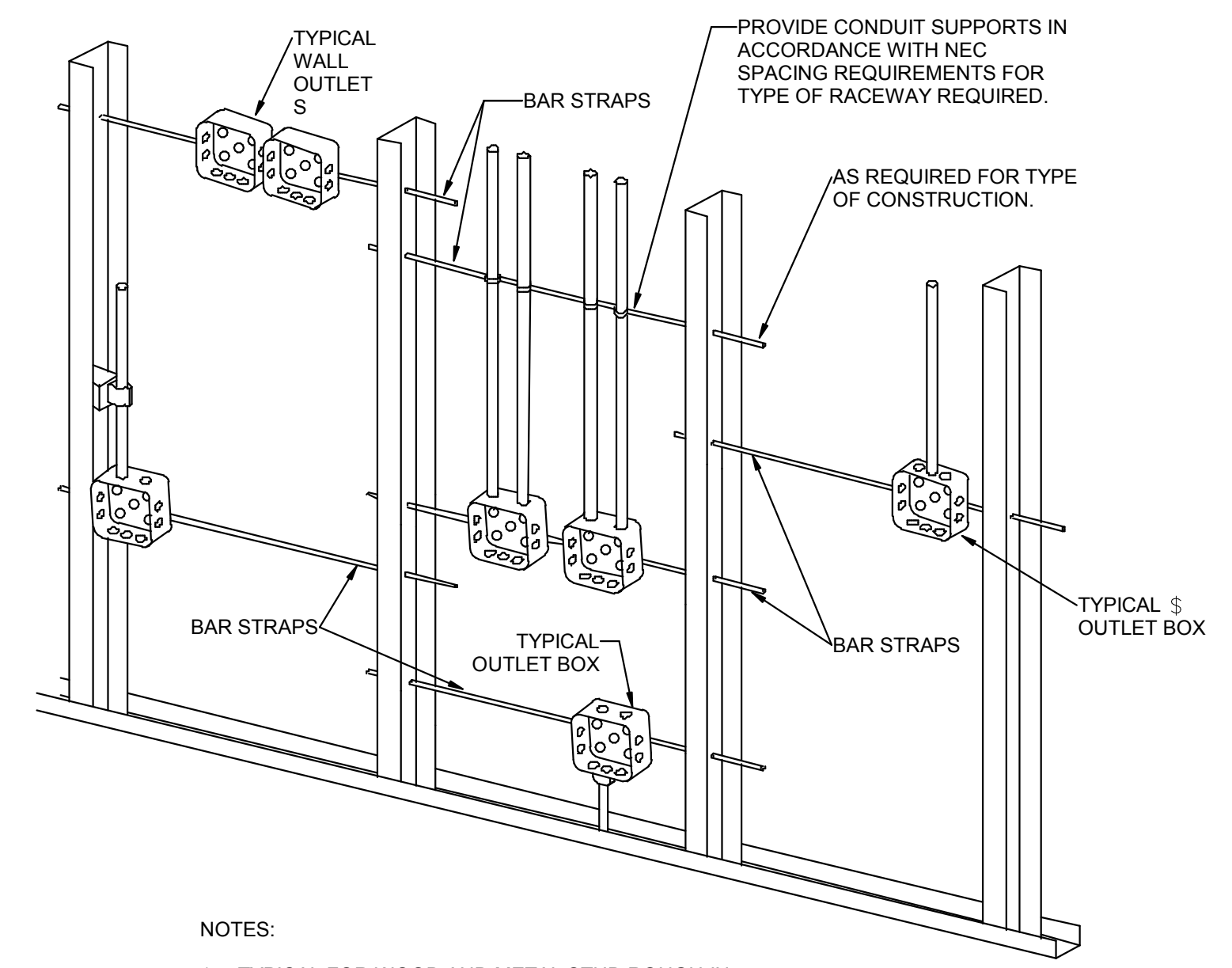
**C3 RECESSED FIXTURE MOUNTING DETAIL**  
 SCALE: 1/8" = 1'-0"



**B3 TYPICAL RACEWAY SUPPORT METHODS DETAIL**  
 SCALE: 1/8" = 1'-0"



**A3 VOICE/DATA RISER DIAGRAM**  
 SCALE: 1/8" = 1'-0"



- NOTES:**
1. TYPICAL FOR WOOD AND METAL STUD ROUGH-IN.
  2. PLASTER RINGS NOT SHOWN.
  3. LOCATE ALL OUTLET BOXES IN ACCORDANCE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS AND WITH ALL APPLICABLE SHOP DRAWINGS.
  4. IN ACCORDANCE WITH IBC 714.3.2 EXCEPTION 1, OUTLETS ON OPPOSITE SIDES OF WALLS OR PARTITIONS IN THE SAME STUD SPACE IN A RATED FIRE SEPARATION WALL MUST BE SEPARATED BY A MINIMUM OF 24" HORIZONTAL DISTANCE.
  5. IN NON-RATED WALLS, OUTLETS ON OPPOSITE SIDES OF WALLS OR PARTITIONS MUST BE SEPARATED BY 16" FOR SOUND ATTENUATION.

**A1 TYPICAL ROUGH-IN REQUIREMENTS DETAIL**  
 SCALE: 1/8" = 1'-0"

2/10/2020 3:20:07 PM C:\Users\eam2\Documents\20190529 ELEC CENTRAL\_sam2XYCWG.rvt

# GENERAL SHEET NOTES

1. DETERMINE MOUNTING HEIGHTS OF ELECTRICAL AND ELECTRONIC EQUIPMENT IN THE FOLLOWING ORDER OF PRIORITY:
  - 1 - ELEVATIONS (ARCHITECTURAL, ELECTRICAL, MECHANICAL, ETC.)
  - 2 - EQUIPMENT SHOP DRAWINGS.
  - 3 - FIELD INSTRUCTIONS.
2. LOCATE RECEPTACLES SERVING THE SAME TYPE OF USE AT A UNIFORM HEIGHT UNLESS DIRECTED OTHERWISE.
3. MECHANICAL, ELECTRICAL, AND COMMUNICATION ROOMS: COORDINATE LOCATION OF LIGHTING AND POWER RECEPTACLES WITH EQUIPMENT, PIPING, AND DUCTWORK. DO NOT INSTALL RECEPTACLES BEHIND EQUIPMENT OR WHERE OTHERWISE INACCESSIBLE. POSITION LIGHTING REGARDLESS OF WHERE SHOWN ON DRAWING TO PROVIDE PROPER ILLUMINATION.
4. MOUNT RECEPTACLE BOXES FOR SWITCHES AND RECEPTACLES WITH LONG AXIS OF THE DEVICE VERTICAL UNLESS OTHERWISE INDICATED.
5. SET BOXES WITH PLASTER RINGS FLUSH WITH FINISHED SURFACE.
6. LOCATE BOX COVERS OR DEVICE PLATES SO THEY WILL NOT SPAN DIFFERENT TYPES OF BUILDING FINISHES EITHER VERTICALLY OR HORIZONTALLY.
7. VERIFY ALL DOOR CONDITIONS ON ARCHITECTURAL DRAWINGS PRIOR TO INSTALLING SWITCHES.
8. LOCATE WIRING DEVICES WHICH ARE ADJACENT AND ARE COMPATIBLE VOLTAGES IN ONE PLATE.
9. WHERE DEVICES ARE LOCATED IN CLOSE PROXIMITY OF THE SAME VERTICAL PLANE, ALIGN DEVICES VERTICALLY PER THE TYPICAL WALL MOUNTED DEVICES ALIGNMENT DETAIL, UNLESS OTHERWISE INDICATED.

# SHEET KEYNOTES

1. LOCATE RECEPTACLES BEHIND DRINKING FOUNTAINS.
2. REFER TO ARCHITECTURAL ELEVATIONS FOR PLACEMENT OF OUTLETS.
3. LOCATE AT BOTTOM OF BEAMS (OR JOISTS) OR AT CEILING. (REDUCE SPACING BY 5 PERPENDICULAR TO BEAM OR JOIST DIRECTION.) FOR OTHER CONDITIONS, REFER TO NFPA 72.
4. LOCATE DETECTOR ANYWHERE IN SHADED AREA BUT NOT IN TOP 4" OF PEAK.
5. LOCATE AT BOTTOM OF BEAMS IF  $D/H < 1$  OR  $W/H < 4$ ; OTHERWISE, LOCATE IN BEAM POCKET. FOR  $D > 4$  REDUCE SPACING .33 PERPENDICULAR TO BEAMS.



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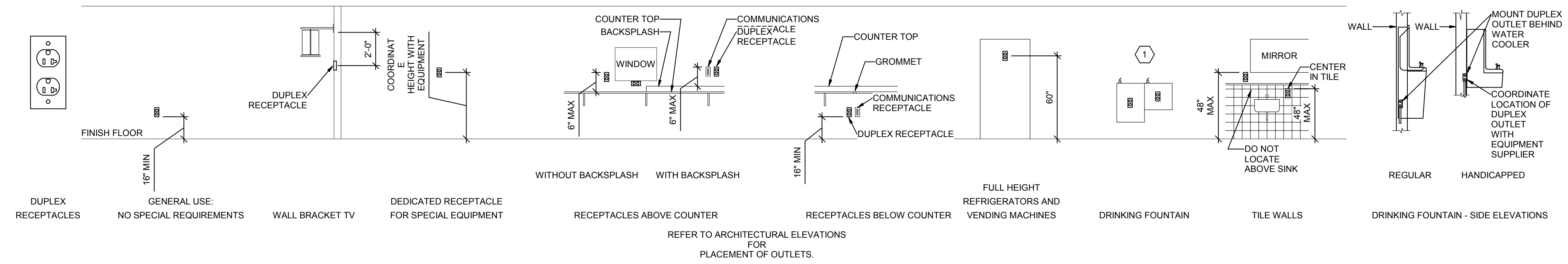
**project#:** 19.0270  
**date:** February 20, 2020

**revisions:**

**title:**  
**TYPICAL MOUNTING HEIGHT DETAILS**

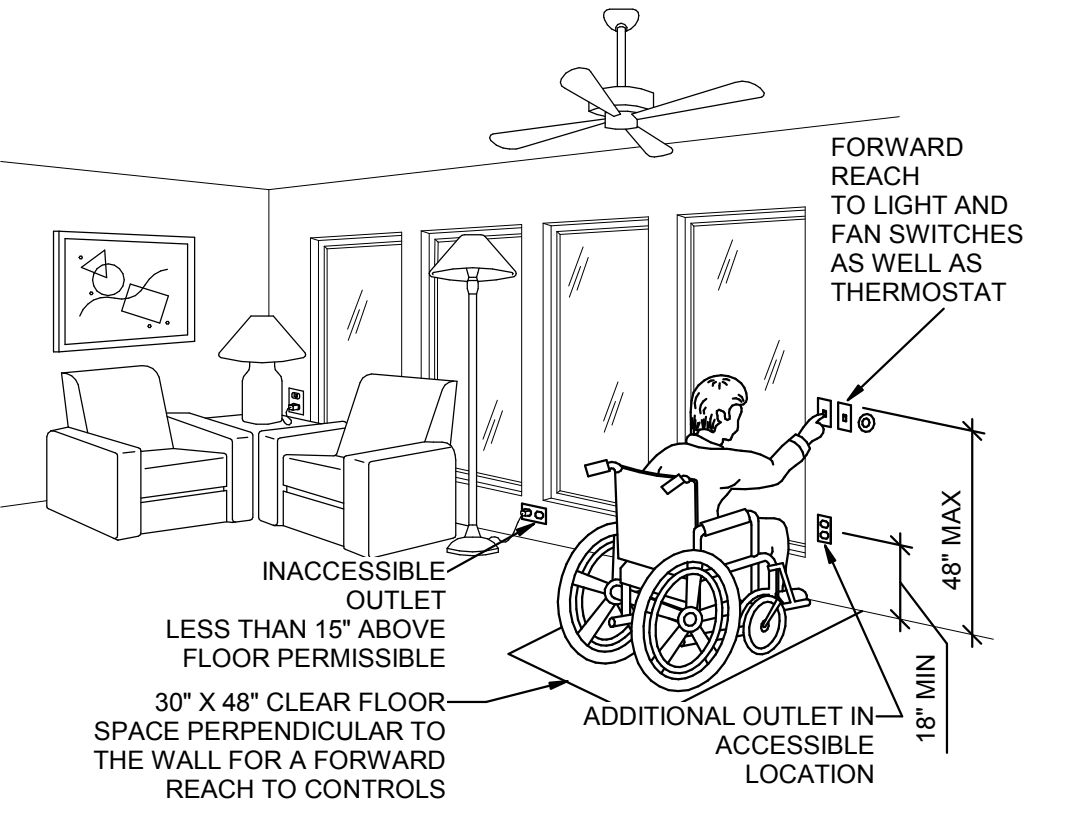
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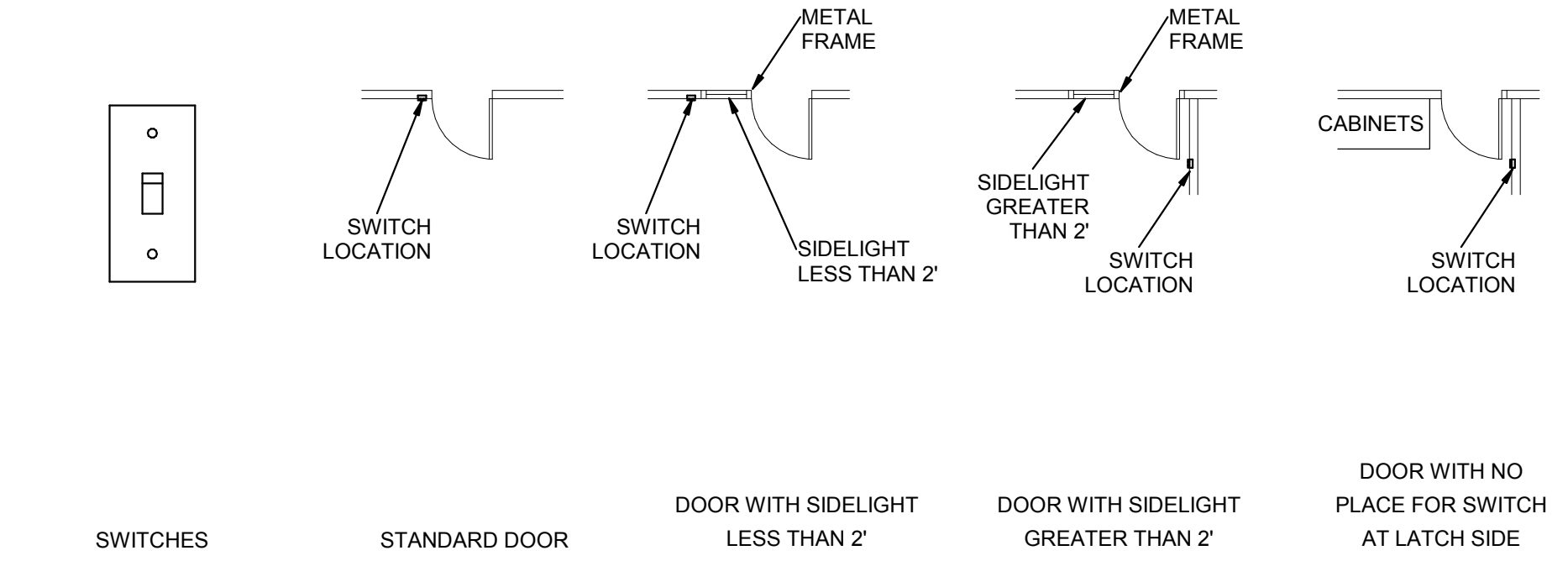
## D1 RECEPTACLE MOUNTING DETAILS

SCALE: NTS



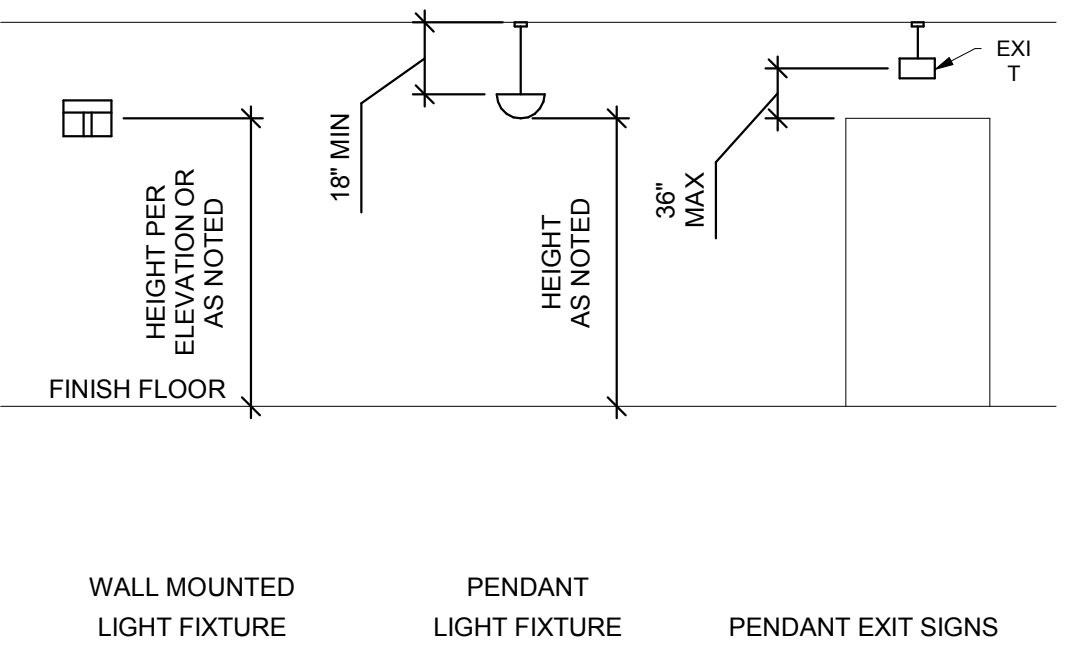
## C2 ADA DETAIL

SCALE: NTS



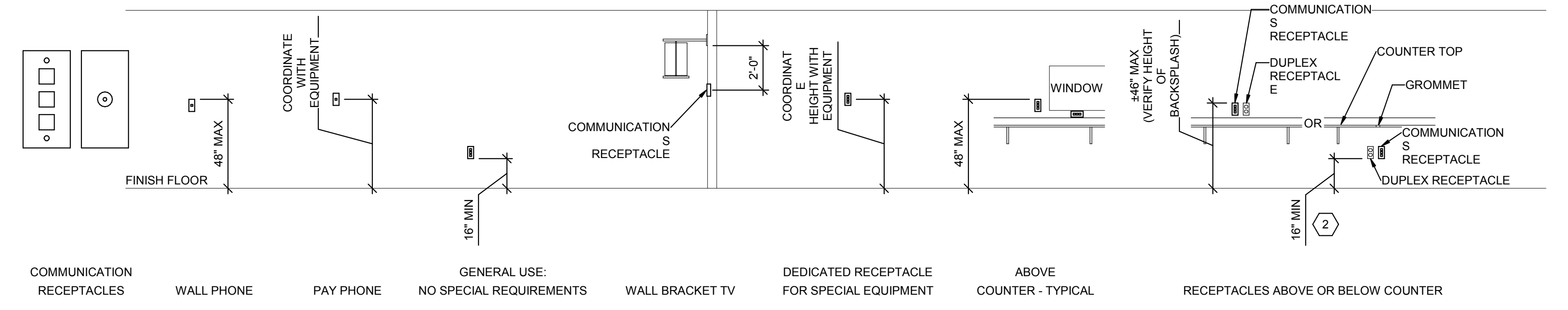
## C1 SWITCH MOUNTING DETAILS

SCALE: NTS



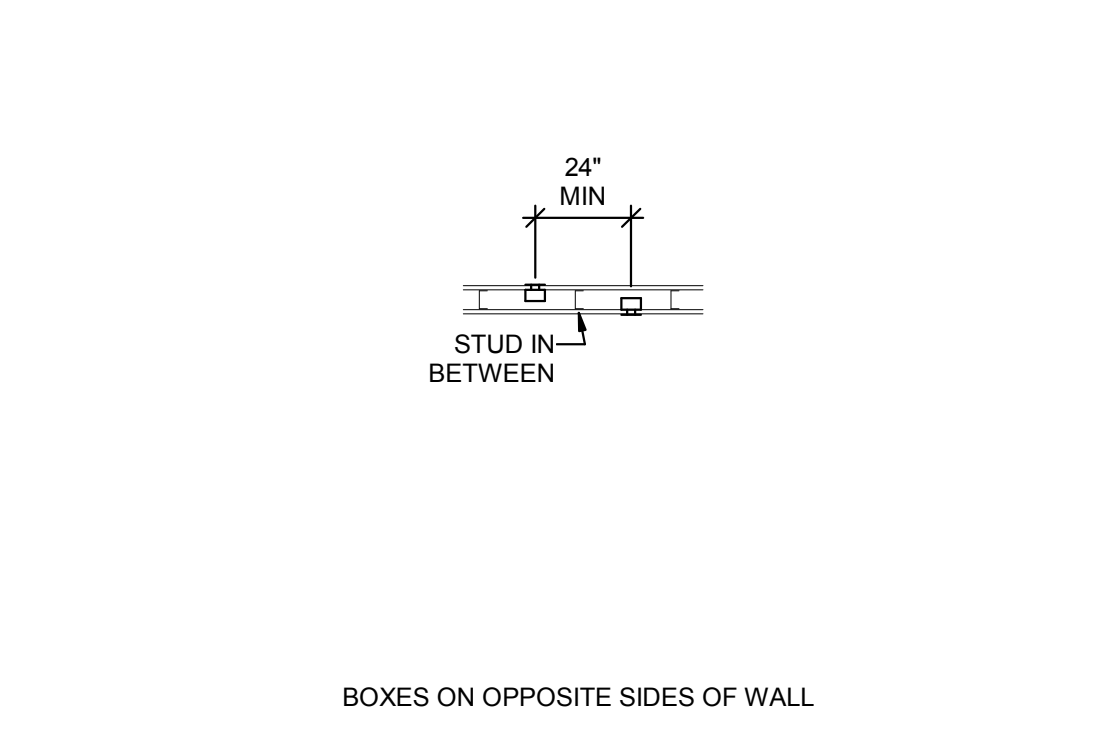
## B3 LIGHTING MOUNTING DETAILS

SCALE: NTS



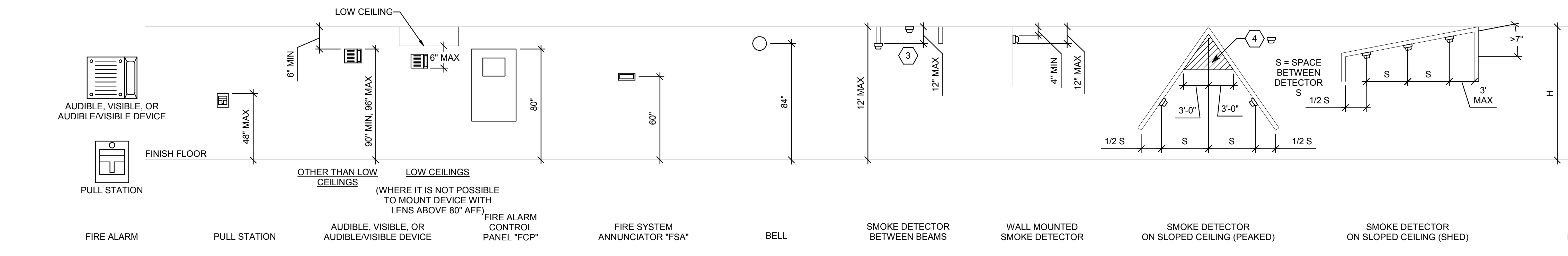
## B2 COMMUNICATIONS MOUNTING DETAILS

SCALE: NTS



## B1 BOX MOUNTING DETAILS

SCALE: NTS



## A1 FIRE ALARM MOUNTING DETAILS

SCALE: NTS

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## GENERAL SHEET NOTES

1. DETERMINE MOUNTING HEIGHTS OF ELECTRICAL AND ELECTRONIC EQUIPMENT IN THE FOLLOWING ORDER OF PRIORITY:
  - 1 - ELEVATIONS (ARCHITECTURAL, ELECTRICAL, MECHANICAL, ETC).
  - 2 - EQUIPMENT SHOP DRAWINGS.
  - 3 - FIELD INSTRUCTIONS.
2. LOCATE RECEPTACLES SERVING THE SAME TYPE OF USE AT A UNIFORM HEIGHT UNLESS DIRECTED OTHERWISE.
3. MECHANICAL, ELECTRICAL, AND COMMUNICATION ROOMS: COORDINATE LOCATION OF LIGHTING AND POWER RECEPTACLES WITH EQUIPMENT, PIPING, AND DUCTWORK. DO NOT INSTALL RECEPTACLES BEHIND EQUIPMENT OR WHERE OTHERWISE INACCESSIBLE. POSITION LIGHTING REGARDLESS OF WHERE SHOWN ON DRAWING TO PROVIDE PROPER ILLUMINATION.
4. MOUNT RECEPTACLE BOXES FOR SWITCHES AND RECEPTACLES WITH LONG AXIS OF THE DEVICE VERTICAL UNLESS OTHERWISE INDICATED.
5. SET BOXES WITH PLASTER RINGS FLUSH WITH FINISHED SURFACE.
6. LOCATE BOX COVERS OR DEVICE PLATES SO THEY WILL NOT SPAN DIFFERENT TYPES OF BUILDING FINISHES EITHER VERTICALLY OR HORIZONTALLY.
7. VERIFY ALL DOOR CONDITIONS ON ARCHITECTURAL DRAWINGS PRIOR TO INSTALLING SWITCHES.
8. LOCATE WIRING DEVICES WHICH ARE ADJACENT AND ARE COMPATIBLE VOLTAGES IN ONE PLATE.
9. WHERE DEVICES ARE LOCATED IN CLOSE PROXIMITY OF THE SAME VERTICAL PLANE, ALIGN DEVICES VERTICALLY PER THE TYPICAL WALL MOUNTED DEVICES ALIGNMENT DETAIL, UNLESS OTHERWISE INDICATED.

## SHEET KEYNOTES

1. LOCATE RECEPTACLES BEHIND DRINKING FOUNTAINS.
2. REFER TO ARCHITECTURAL ELEVATIONS FOR PLACEMENT OF OUTLETS.
3. LOCATE AT BOTTOM OF BEAMS (OR JOISTS) OR AT CEILING. (REDUCE SPACING BY 5 PERPENDICULAR TO BEAM OR JOIST DIRECTION.) FOR OTHER CONDITIONS, REFER TO NFPA 72.
4. LOCATE DETECTOR ANYWHERE IN SHADED AREA BUT NOT IN TOP 4" OF PEAK.
5. LOCATE AT BOTTOM OF BEAMS IF D/H < .1 OR W/H < .4; OTHERWISE, LOCATE IN BEAM POCKET. FOR D > 4 REDUCE SPACING .33 PERPENDICULAR TO BEAMS.



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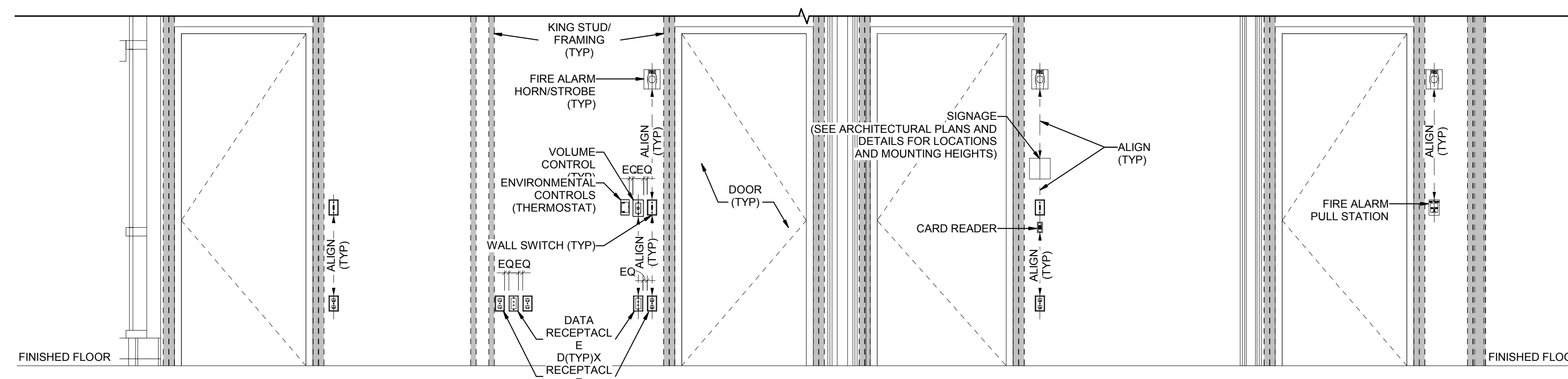
**project:**  
LAS COLONIAS  
AMPHITHEATER -  
ADDITION  
  
Grand Junction, CO  
**CITY OF Grand Junction**  
COLORADO

**project#:** 19.0270  
**date:** February 10, 2020

**revisions:**

**title:**  
**TYPICAL MOUNTING HEIGHT DETAILS**  
**Sheet**  
**EE702**

PERMIT SET



**A2** TYPICAL WALL MOUNTED DEVICES ALIGNMENT DETAIL  
SCALE: NTS

GENERAL SHEET NOTES

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SHEET KEYNOTES

- 1 PROVIDE ELECTRICAL CONNECTIONS TO ELECTRIC HAND DRYERS. CIRCUIT WITH 2#10, #10G IN 0.75" CND. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH THE INSTALLERS PRIOR TO ROUGH-IN.

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project:

LAS COLONIAS  
 AMPHITHEATER -  
 ADDITION

Grand Junction, CO



project#: 19.0270  
 date: February 10, 2020

revisions:  
 1 ADD #01 4/7/2020

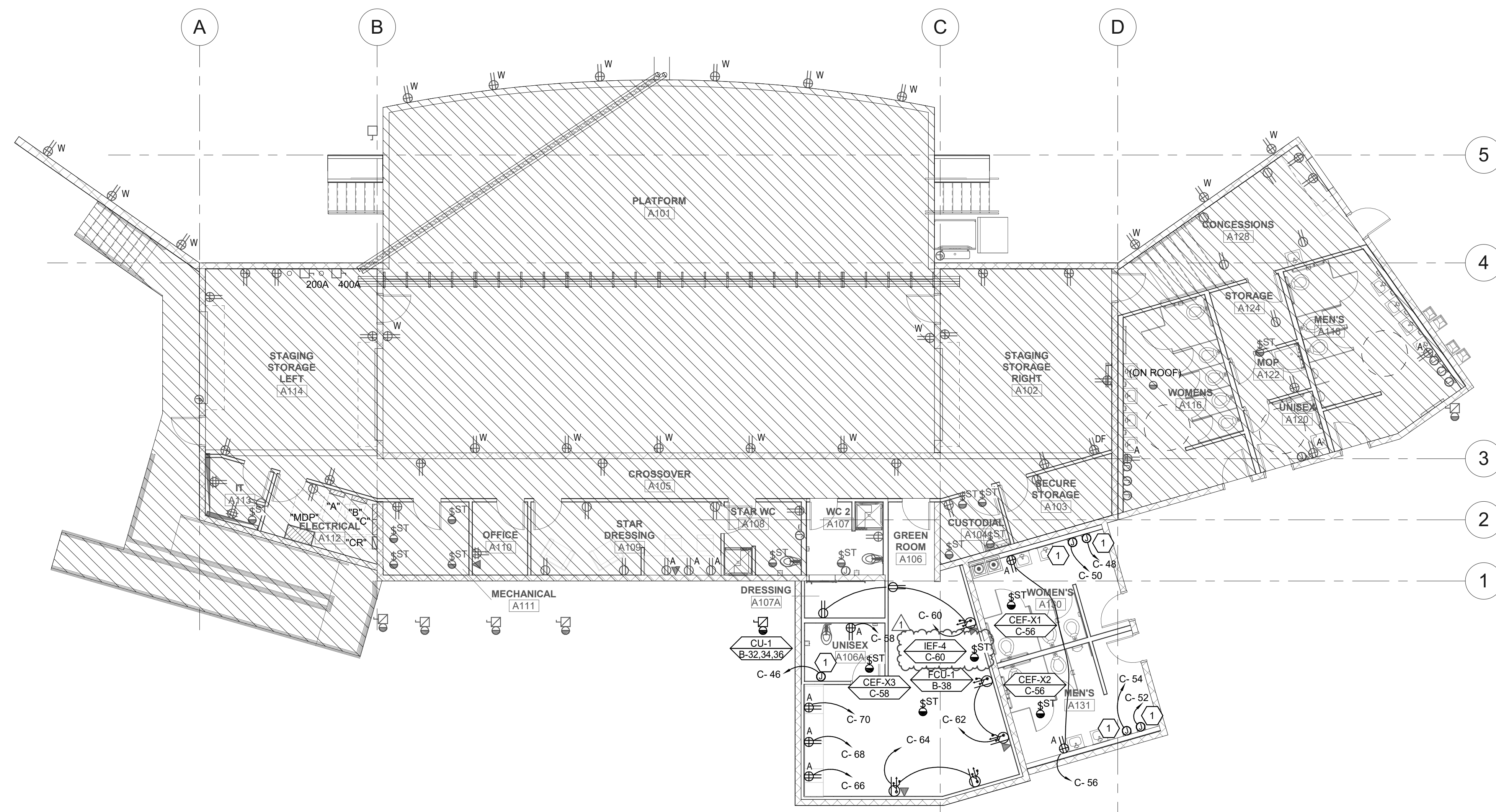
title:

**STAGE LEVEL  
 POWER PLAN**

sheet:

**EP101**

PERMIT SET



**1 STAGE LEVEL POWER PLAN**

SCALE: 1/8" = 1'-0"

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# EQUIPMENT SCHEDULE

XXXXXXXX

**EQUIPMENT SCHEDULE KEY**  
 E - DIVISION 28  
 Q - FURNISHED WITH EQUIPMENT  
 \* - COORDINATE WITH THE DIVISION 23 TEMPERATURE CONTROL INSTALLER  
 \*\* - AUTOMATIC CONTROL WIRING BY DIVISION 23

MARK	QTY	ITEM DESCRIPTION	LOAD DATA						WIRE AND CONDUIT SIZE	OVERCURRENT PROTECTION			DISCONNECT			STARTER					MARK			
			HP	KW	MCA	FLA	VOL T	PH		HZ	FURN BY	DEVICE	LOCATION	FURN BY	DEVICE	LOCATION	FURN BY	DEVICE	SIZES	SELECTOR SWITCH		PILOT LAMP	NORMALLY OPEN CONTACT	NORMALLY CLOSED CONTACT
CEF-X1	1	CEILING EXHAUST FAN	1/6	-	-	1	120	1	60	2 #12, #12 GR 0.75" CND	E	20/1 CB	C	E	TOGGLE SWITCH	ADJ TO EQUIP	Q	-	-	-	-	-	-	CEF-X1
CEF-X2	1	CEILING EXHAUST FAN	1/6	-	-	1	120	1	60	2 #12, #12 GR 0.75" CND	E	20/1 CB	C	E	TOGGLE SWITCH	ADJ TO EQUIP	Q	-	-	-	-	-	CEF-X2	
CEF-X3	1	CEILING EXHAUST FAN	1/6	-	-	1	120	1	60	2 #12, #12 GR 0.75" CND	E	20/1 CB	C	E	TOGGLE SWITCH	ADJ TO EQUIP	Q	-	-	-	-	-	CEF-X3	
CU-1	1	CONDENSING UNIT	-	-	12	12	208	3	60	3 #10, #10 GR 0.75" CND	E	30/3 CB	B	E	30A/3P FRS-20	ADJ TO EQUIP	Q	-	-	-	-	-	CU-1	
FCU-1	1	FAN COIL UNIT	-	-	-	7.9	120	1	60	2 #12, #12 GR 0.75" CND	E	15/1 CB	B	E	TOGGLE SWITCH	ADJ TO EQUIP	Q	-	-	-	-	-	FCU-1	
IEF-4	1	INLINE EXHAUST FAN	1/6	-	-	1	120	1	60	2 #12, #12 GR 0.75" CND	E	20/1 CB	C	E	TOGGLE SWITCH	ADJ TO EQUIP	Q	-	-	-	-	-	IEF-4	

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**project:**  
 LAS COLONIAS AMPHITHEATER - ADDITION

Grand Junction, CO  
**CITY OF Grand Junction COLORADO**

**project#:** 19-0270  
**date:** February 20, 2020

**revisions:**  
 1 ADD #01 4/7/2020

**title:**  
**ELECTRICAL SCHEDULES**

**sheet:**

**EP601**

PERMIT SET

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PANEL: "C"																	
VOLTS/PHASE/WIRE:		PANEL SIZE & TYPE:		MAIN SIZE AND TYPE:		LOCATION:		CABINET:		NOTES:							
120/208V, 3 PH 4 WIRE		22" W x 6" D, BOLT-ON		225 AMPERE		ELECTRICAL A112		SURFACE									
ACCESSORIES: PANEL DIRECTORY, IDENTIFICATION, GROUNDING BAR																	
AIC RATING:																	
CKT NO	AMP	POLE	LOAD (kVA) LTG	PWR	CO	PHASE LOAD			DESCRIPTION	LOAD (kVA) CO	PWR	LTG	POLE	AMP	CKT NO		
1	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	0.4				4		
3	--	--	--	--	--			0.1	0.4						4		
5	--	--	--	--	--			0.1	0.4						6		
7	40	3	0.0	0.2	0.0				PWR: OUTDOOR...	0.1	0.4				8		
9	--	--	--	--	--			0.1	0.2						10		
11	--	--	--	--	--			0.1	0.2						12		
13	40	3	0.0	0.2	0.0			0.1	0.6						14		
15	--	--	--	--	--			0.1	0.6						16		
17	--	--	--	--	--			0.1	0.0						18		
19	40	3	0.0	0.2	0.0			0.1	0.0						20		
21	--	--	--	--	--			0.1	0.3						22		
23	--	--	--	--	--			0.1	0.3						24		
25	40	3	0.0	0.2	0.0			0.1	0.5						26		
27	--	--	--	--	--			0.1	0.5						28		
29	--	--	--	--	--			0.1	0.9						30		
31	40	3	0.0	0.2	0.0			0.1	0.9						32		
33	--	--	--	--	--			0.1	0.9						34		
35	--	--	--	--	--			0.1	0.9						36		
37	40	3	0.0	0.2	0.0			0.1	1.2						38		
39	--	--	--	--	--			0.1	1.2						40		
41	--	--	--	--	--			0.1	1.2						42		
43	40	3	0.0	0.2	0.0			0.1	1.2						44		
45	--	--	--	--	--			0.1	1.5						46		
47	--	--	--	--	--			0.1	1.5						48		
49	40	3	0.0	0.2	0.0			0.1	1.5						50		
51	--	--	--	--	--			0.1	1.5						52		
53	--	--	--	--	--			0.1	1.5						54		
55	40	3	0.0	0.2	0.0			0.1	0.6						56		
57	--	--	--	--	--			0.1	0.3						58		
59	--	--	--	--	--			0.1	0.6						60		
61	40	3	0.0	0.2	0.0			0.1	0.2						62		
63	--	--	--	--	--			0.1	0.2						64		
65	--	--	--	--	--			0.1	0.2						66		
67	40	3	0.0	0.2	0.0			0.1	0.2						68		
69	--	--	--	--	--			0.1	0.2						70		
71	--	--	--	--	--			0.1	0.0						72		
73	40	3	0.0	0.2	0.0			0.1	0.0						74		
75	--	--	--	--	--			0.1	0.0						76		
77	--	--	--	--	--			0.1	0.0						78		
79	40	3	0.0	0.2	0.0			0.1	0.1						80		
81	--	--	--	--	--			0.1	0.1						82		
83	--	--	--	--	--			0.1	0.1						84		
<b>TOTALS:</b>			CONNECTED kVA PER PHASE			9	9	9	CONNECTED TOTAL kVA = 26								
			CONNECTED AMPS PER PHASE			71	72	71	AVERAGE CONNECTED AMPS PER PHASE = 72								
<b>NEC DIVERSIFIED LOAD CALCULATIONS</b>																	
LIGHTING & CONTINUOUS LOADS: 13.2 kVA @ 125% = 16.5 kVA - 100% CONNECTED LOAD PLUS 25% DIVERSIFIED TOTAL kVA = 29																	
RECEPTACLES: 1.9 kVA @ 100% = 1.9 kVA - FIRST 10kVA @ 100%, REMAINDER @ 50% AVERAGE AMPS PER PHASE = 81																	
ALL OTHER LOADS @ 100%: 10.7 kVA - MOTOR TOTALS INCLUDED IN ALL OTHER LOADS WITH LARGEST MOTOR CALCULATED @ 125% PER NEC																	

PANEL: "A"																	
VOLTS/PHASE/WIRE:		PANEL SIZE & TYPE:		MAIN SIZE AND TYPE:		LOCATION:		CABINET:		NOTES:							
120/208V, 3 PH 4 WIRE		22" W x 6" D, BOLT-ON		225 AMPERE		ELECTRICAL A112		SURFACE									
ACCESSORIES: PANEL DIRECTORY, IDENTIFICATION, GROUNDING BAR																	
AIC RATING:																	
CKT NO	AMP	POLE	LOAD (kVA) LTG	PWR	CO	PHASE LOAD			DESCRIPTION	LOAD (kVA) CO	PWR	LTG	POLE	AMP	CKT NO		
1	20	1	0.0	0.0	0.9			0.9	0.5						2		
3	20	1	0.0	0.0	0.7			0.7	0.5						4		
5	20	1	0.0	0.0	0.9			0.9	0.7						6		
7	20	1	0.0	0.0	0.7			0.7	0.5			0.9	0.7		8		
9	20	1	0.0	0.1	0.9			1.0	0.5						10		
11	20	1	0.0	0.0	0.7			0.7	0.5						12		
13	20	1	0.0	0.0	0.2			0.2	0.3						14		
15	20	1	0.0	0.0	0.2			0.2	0.3						16		
17	20	1	0.0	0.0	0.2			0.2	0.3			0.2	0.3		18		
19	20	1	0.0	0.1	0.2			0.3	1.5						20		
21	20	1	0.0	0.1	0.2			0.3	1.5						22		
23	20	1	0.0	0.0	0.2			0.2	0.2						24		
25	20	1	0.0	0.0	0.4			0.4	0.2						26		
27	20	1	0.0	0.0	0.4			0.4	0.2						28		
29	20	1	0.0	0.0	0.2			0.2	0.2						30		
31	20	1	0.0	0.0	0.4			0.4	0.2						32		
33	20	1	0.0	0.0	0.4			0.4	0.2						34		
35	20	1	0.0	0.0	0.9			0.9	0.2						36		
37	20	1	0.0	0.0	0.2			0.2	6.7						38		
39	20	1	0.0	0.0	0.2			0.2	6.7						40		
41	20	1	--	--	--			--	--			0.0	6.7		42		
<b>TOTALS:</b>			CONNECTED kVA PER PHASE			13	13	12	CONNECTED TOTAL kVA = 38								
			CONNECTED AMPS PER PHASE			109	110	99	AVERAGE CONNECTED AMPS PER PHASE = 105								
<b>NEC DIVERSIFIED LOAD CALCULATIONS</b>																	
LIGHTING & CONTINUOUS LOADS: 12.2 kVA @ 91% = 11.1 kVA - 100% CONNECTED LOAD PLUS 25% DIVERSIFIED TOTAL kVA = 37																	
RECEPTACLES: 12.2 kVA @ 91% = 11.1 kVA - FIRST 10kVA @ 100%, REMAINDER @ 50% AVERAGE AMPS PER PHASE = 102																	
ALL OTHER LOADS @ 100%: 25.7 kVA - MOTOR TOTALS INCLUDED IN ALL OTHER LOADS WITH LARGEST MOTOR CALCULATED @ 125% PER NEC																	

PANEL: "B"															
VOLTS/PHASE/WIRE:		PANEL SIZE & TYPE:		MAIN SIZE AND TYPE:		LOCATION:		CABINET:		NOTES:					
120/208V, 3 PH 4 WIRE		22" W x 6" D, BOLT-ON		225 AMPERE		ELECTRICAL A112		SURFACE							
ACCESSORIES: PANEL DIRECTORY, IDENTIFICATION, GROUNDING BAR															
AIC RATING:															
CKT NO	AMP	POLE	LOAD (kVA) LTG	PWR	CO	PHASE LOAD			DESCRIPTION	LOAD (kVA) CO	PWR	LTG	POLE	AMP	CKT NO
1	20	1	0.0	0.5	0.0			0.5	1.0						2
3	20	1	0.0	0.5	0.0			0.5	1.2						4
5	20	1	0.0	0.5	0.0			0.5	1.0						6
7															



## INTERIOR LIGHTING FIXTURE SCHEDULE

### ABBREVIATIONS

<b>LUMINAIRE OPTIONS</b> ARHR - AIR RETURN AND HEAT REJECTION DL - DAMP LOCATION EQC - EARTHQUAKE CLIPS F - FUSING HLD - HINGED AND LATCHED DOOR HS - HOUSE SIDE SHIELD PS - PHOTOCELL SWITCH QRS - QUARTZ RESTRIKE ST - STATIC WG - WIRE GUARD WL - WET LOCATION	<b>MOUNTING</b> B - BASE C - CEILING F - FLANGE G - GRID P - PENDANT PL - POLE R - RECESSED S - SURFACE W - WALL	<b>EMERGENCY</b> NE - NORMAL AND EMERGENCY CONNECTIONS EB - EMERGENCY BATTERY PACK ET - EMERGENCY TRANSFER DEVICE	<b>BALLAST</b> IS - INSTANT START RS - RAPID START PS - PROGRAM START, PARALLEL OPERATION PSMH - PULSE START METAL HALLIDE (CWA OR ELECTRONIC) PPLF - PROVIDE POWER LINE FILTER LVTM - LOW VOLTAGE TRANSFORMER (MAGNETIC) LVTE - LOW VOLTAGE TRANSFORMER (ELECTRONIC)  <b>DIMMING BALLAST</b> D2 - 2 WIRE DIMMER D3 - 3 WIRE DIMMER D4 - 4 WIRE DIMMER DD - DIGITAL DIMMER SDP - STEP DIMMER BALLAST  <b>BALLAST NOTATION</b> ANSI WATTS = Maximum Wattage at Connected Voltage BB-#L = Ballast Type #L = Number of Lamps Example: PS-2L = (2) Lamp, Program Start Ballast	<b>FINISH</b> MW - MATTE WHITE BL - BLACK SL - SILVER GL - GOLD CL - CLEAR PW - PAINTED WHITE EA - EXTRUDED ALUMINUM S - STEEL GS - GALVANIZED STEEL C - CAST CBA - COLOR BY ARCHITECT SCBA - STANDARD COLOR BY ARCHITECT CCA - CUSTOM COLOR BY ARCHITECT FS - MEETS FEDERAL STANDARD 209D TP - THERMALLY PROTECTED FL - FLUSH R - REGRESS M - MITERED	<b>LENS</b> #A - ACRYLIC #THICK #OA - ACRYLIC #THICK (OPAL) GC - GLASS (CLEAR) GO - GLASS (OPAL) GF - GLASS (FROSTED) SGL - SOFT GLOW LENS HPL - HIGH PERFORMANCE LENS DO - DROP OPAL CGL - CONVEX GLASS LENS S - SATIN LENS  <b>OPTICS</b> PRF - PERFORATED DIFFUSER DT - DETENTION BC - BLACK CONE BB - BLACK BAFFLE TP - THERMALLY PROTECTED VGL - VERTICAL GRAIN LOUVERS PPL - LOUVERS IN PLASTIC PROTECTOR WW - WALL WASH ESL - ELECTROSTATIC SHIELDED LENS	<b>REFLECTOR</b> OP - NONE/OPEN SP - SPECULAR SS - SEMI-SPECULAR D - DIFFUSE (WHITE ENAMEL) SC - SPECULAR (COLORED) PR - PRISMATIC FDR - FULL DEPTH REFLECTOR DS - DIFFUSE (SEM SPECULAR) SILVER LI - LOW IRIDESCENT IR - IRIDESCENT SL - SILVER GL - GOLD CA - CLEAR ALZAK  <b>CIE CLASSIFICATIONS</b> DIR - DIRECT LIGHTING SD - SEMIDIRECT LIGHTING GEN - GENERAL DIFFUSE SI - SEMI-INDIRECT LIGHTING IND - INDIRECT LIGHTING ADJ - ADJUSTABLE
--	---	--	---	--	---	--

**NOTES**

- PROVIDE UNIT PRICES AND FIXTURE BRAND SELECTED FOR ADD/DELETE CHANGES FOR EACH FIXTURE TYPES SHOWN WITHIN 48 BUSINESS HOURS OF THE BID DATE. FAILURE TO COMPLY WITH THIS REQUIREMENT MAY DISQUALIFY THE PRODUCTS AND EMPLOYER THE ENGINEER TO DETERMINE FAIR VALUE FOR FIXTURE AND INSTALLATION CHANGES, WITHOUT FURTHER INPUT FROM THE CONTRACTOR OR INSTALLER.
- CONTRACTOR ALLOWANCE PRICES ARE ACCURATE WHEN THIS JOB WAS SPECIFIED, CONTRACTOR AND ELECTRICAL DISTRIBUTOR SHALL VERIFY THIS ALLOWANCE AND REPORT ANY PROBLEMS TO THE ENGINEER BEFORE THE BID. ALLOWANCE PRICE MAY OR MAY NOT INCLUDE LAMP(S) OR FREIGHT AS NOTED, AND DO NOT INCLUDE ANY TAXES.

- VERIFY THE PROPER MOUNTING KITS OR ACCESSORIES TO FACILITATE INSTALLATION AS SHOWN AT EACH LOCATION ON THE DRAWINGS.
- COMPLY WITH THE "INTERIOR LIGHTING" SECTION OF THE SPECIFICATIONS.
- REFER TO SPECIFICATIONS FOR IMPORTANT TECHNICAL REQUIREMENTS FOR LIGHTING FIXTURES, BALLASTS, AND LAMPS.
- ALL FIXTURES SHALL BE APPROVED BY UL OR ANOTHER ACCEPTABLE TESTING LAB FOR THE PURPOSE INTENDED AND WITH THE LAMP AND BALLAST PROPOSED.

#### LIGHTING FIXTURE SCHEDULE - INTERIOR

ID	TYPE	LUMINAIRE NOMINAL SIZE				MOUNTING	OPTIONS	LAMP			CONFIGURATION	BALLAST CONNECTED			FINISH			OPTICS			MANUFACTURER (CATALOG SERIES)										
		LENGTH	WIDTH	MAX DEPTH	DIAMETER/APERTURE			TYPE	LAMP COLOR	QUANTITY		LAMP LUMENS	VOLTS	WATTS	BALLAST FACTOR	HARMONICS (THD)	HOUSING	TRIM	OTHER	CIE TYPE	FINISH	DIFFUSER	REFLECTOR	LUMINAIRE LUMENS	OPTION 1	OPTION 2	OPTION 3	OPTION 4	OPTION 5	OPTION 6	
(G-1)	2' X 2' LED INDIRECT LAY-IN TROFFER, 4000 LUMENS, 4000K. PROVIDE FLANGE KIT FOR FIXTURES INSTALLED IN HARD LID CEILINGS.	24"	24"	6"	-	CRG	EQC,HLD,ST	LED	4000K	1	4000	LED DRIVER	120/277	120	35	0.00					4000	LITHONIA (2ALL2-40L-EZ1-LP84)	METALUX (22CZ-LD4-39-UN V-L840-CD1-U/EQ-CLIP-U)	LUMENWERX (VEGR22-MTC-H LO-LED-80-4200-40-277-1-TBX-SC BA)	H.E. WILLIAMS (AT1-22-L4/840-D -DRV-UNV)						
(LD-1)	LED DOWNLIGHT, 6" OPEN.	15"	15"	12"	6"	C,R	ST	LED	3500K	1	1500	LED DRIVER (0-10V DIMMING)	120V	120	25	1.00					1500	PORTFOLIO (LD6A15DE010 ERMBA15840 6LM1L1-HB26)	VANTAGE	PRESCOLITE	BRUCK	GOTHAM	OMEGA				
(WB-2)	DECORATIVE WALL MOUNT VANITY LIGHT	2'						LED	3000K	1	1400	LED DRIVER	120V	120	20	1.00					1400	ALW (TRPSMBINT-2'-LOW-0/10V-SCBA-UNV)									

## EXTERIOR LIGHTING FIXTURE SCHEDULE

### ABBREVIATIONS

<b>LUMINAIRE</b> ARHR - AIR RETURN AND HEAT REJECTION DL - DAMP LOCATION EQC - EARTHQUAKE CLIPS F - FUSING HLD - HINGED AND LATCHED DOOR HS - HOUSE SIDE SHIELD PS - PHOTOCELL SWITCH QRS - QUARTZ RESTRIKE ST - STATIC WG - WIRE GUARD WL - WET LOCATION	<b>EMERGENCY</b> NE - NORMAL AND EMERGENCY CONNECTIONS EB - EMERGENCY BATTERY PACK ET - EMERGENCY TRANSFER DEVICE	<b>BALLAST</b> IS - INSTANT START RS - RAPID START PS - PROGRAM START, PARALLEL OPERATION PSMH - PULSE START METAL HALLIDE (CWA OR ELECTRONIC) PPLF - PROVIDE POWER LINE FILTER LVTM - LOW VOLTAGE TRANSFORMER (MAGNETIC) LVTE - LOW VOLTAGE TRANSFORMER (ELECTRONIC)  <b>DIMMING BALLAST</b> D2 - 2 WIRE DIMMER D3 - 3 WIRE DIMMER D4 - 4 WIRE DIMMER DD - DIGITAL DIMMER SDP - STEP DIMMER BALLAST	<b>FINISH</b> MW - MATTE WHITE BL - BLACK SL - SILVER GL - GOLD CL - CLEAR PW - PAINTED WHITE EA - EXTRUDED ALUMINUM S - STEEL GS - GALVANIZED STEEL C - CAST CBA - COLOR BY ARCHITECT SCBA - STANDARD COLOR BY ARCHITECT CCA - CUSTOM COLOR BY ARCHITECT FS - MEETS FEDERAL STANDARD 209D TP - THERMALLY PROTECTED FL - FLUSH R - REGRESS M - MITERED	<b>LENS</b> #A - ACRYLIC #THICK #OA - ACRYLIC #THICK (OPAL) GC - GLASS (CLEAR) GO - GLASS (OPAL) GF - GLASS (FROSTED) SGL - SOFT GLOW LENS HPL - HIGH PERFORMANCE LENS DO - DROP OPAL CGL - CONVEX GLASS LENS S - SATIN LENS  <b>REFLECTOR AND DISTRIBUTION</b> I - TYPE I II - TYPE II III - TYPE III IV - TYPE IV V - TYPE V VSQ - TYPE V SQUARE SA - SPRUN ALUMINUM SR - SEGMENTED REFLECTOR BW# - NEMA BEAM WIDTH 1 THRU 7  <b>CUTOFF CLASSIFICATION</b> FC - FULL CUTOFF CO - CUTOFF SC - SEMI CUTOFF NC - NONCUTOFF	<b>MOUNTING</b> B - BASE C - CEILING F - FLANGE G - GRID P - PENDANT PL - POLE R - RECESSED S - SURFACE W - WALL  <b>CONFIGURATION</b> BA - BANNER ARMS BH - BULL HORN DL - 2"L SHAPE DS - 2 @ 180 PT - INLINE POST TOP Q - QUAD SH - SHEPHERDS HOOK SL - SINGLE T - 3" T SHAPE  <b>POLE</b> RS - ROUND STRAIGHT RT - ROUND TAPERED SS - SQUARE STRAIGHT ST - SQUARE TAPERED
--	--	--	--	--	--

**NOTES**

- PROVIDE UNIT PRICES AND FIXTURE BRAND SELECTED FOR ADD/DELETE CHANGES FOR EACH FIXTURE TYPES SHOWN WITHIN 48 BUSINESS HOURS OF THE BID DATE. FAILURE TO COMPLY WITH THIS REQUIREMENT MAY DISQUALIFY THE PRODUCTS AND EMPLOYER THE ENGINEER TO DETERMINE FAIR VALUE FOR FIXTURE AND INSTALLATION CHANGES, WITHOUT FURTHER INPUT FROM THE CONTRACTOR OR INSTALLER.
- CONTRACTOR ALLOWANCE PRICES ARE ACCURATE WHEN THIS JOB WAS SPECIFIED, CONTRACTOR AND ELECTRICAL DISTRIBUTOR SHALL VERIFY THIS ALLOWANCE AND REPORT ANY PROBLEMS TO THE ENGINEER BEFORE THE BID. ALLOWANCE PRICE MAY OR MAY NOT INCLUDE LAMP(S) OR FREIGHT AS NOTED, AND DO NOT INCLUDE ANY TAXES.

- VERIFY THE PROPER MOUNTING KITS OR ACCESSORIES TO FACILITATE INSTALLATION AS SHOWN AT EACH LOCATION ON THE DRAWINGS.
- COMPLY WITH THE "EXTERIOR LIGHTING" SECTION OF THE SPECIFICATIONS.
- REFER TO SPECIFICATIONS FOR IMPORTANT TECHNICAL REQUIREMENTS FOR LIGHTING FIXTURES, BALLASTS, AND LAMPS.
- ALL FIXTURES SHALL BE APPROVED BY UL OR ANOTHER ACCEPTABLE TESTING LAB FOR THE PURPOSE INTENDED AND WITH THE LAMP AND BALLAST PROPOSED.

ID	TYPE	LUMINAIRE BUG RATING					LUMINAIRE SIZE (NOMINAL)				OPTIONS	LAMP		QUANTITY	LUMINAIRE LUMENS	BALLAST			FINISH			DIFFUSER			REFLECTOR		MOUNTING				MANUFACTURER (CATALOG SERIES)			ALLOWANCE			
		BACK	UP	GLARE	LENGTH	WIDTH	DEPTH	DIAMETER/APERTURE	COLOR	TYPE		INITIAL LUMENS @ 1.0BF	VOLTS			ANSI WATTS	BALLAST FACTOR	HARMONICS	OPTIONS	HOUSING	TRIM	OTHER	TYPE	FINISH	CONFIGURATION	OPTIONS	DISTRIBUTION TYPE	FINISH	EFFICIENCY	TYPE	CONFIGURATION	POLE BASE HEIGHT	POLE HEIGHT		WIND RATING	OPTIONS	OPTION 1
(EOC-32)	EXTERIOR EGRESS WALL PACK, WITH REMOTE BATTERY PACK.				11"	9"	7"		4000K		4400	1	4400	120	41	1.00									0			0' - 0"	0' - 0"				EATON (XTOR5A-PC1-CBP-REMOTE BATTERY)				



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**project:**  
 LAS COLONIAS  
 AMPHITHEATER -  
 ADDITION  
 Grand Junction, CO  
**CITY OF Grand Junction**  
 COLORADO

**project#:** 19.0270  
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**FIXTURE**  
**SCHEDULES**

**sheet:**  
**EL601**

PERMIT SET



**Huddleston-Berry**  
Engineering & Testing, LLC

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**GEOLOGIC HAZARDS AND  
GEOTECHNICAL INVESTIGATION  
LAS COLONIAS AMPHITHEATER  
GRAND JUNCTION, COLORADO  
PROJECT#00208-0057**

**CITY OF GRAND JUNCTION  
1340 GUNNISON AVENUE  
GRAND JUNCTION, COLORADO 81501**

**JANUARY 27, 2015**

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**Huddleston-Berry Engineering and Testing, LLC  
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## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION</b> .....	<b>1</b>
1.1	Scope.....	1
1.2	Site Location and Description.....	1
1.3	Proposed Construction.....	1
<b>2.0</b>	<b>GEOLOGIC SETTING</b> .....	<b>2</b>
2.1	Soils.....	2
2.2	Geology.....	2
2.3	Groundwater .....	2
<b>3.0</b>	<b>FIELD INVESTIGATION</b> .....	<b>2</b>
3.1	Subsurface Investigation.....	2
<b>4.0</b>	<b>LABORATORY TESTING</b> .....	<b>3</b>
<b>5.0</b>	<b>GEOLOGIC INTERPRETATION</b> .....	<b>3</b>
5.1	Geologic Hazards.....	3
5.2	Geologic Constraints.....	3
5.3	Water Resources .....	3
5.4	Mineral Resources .....	4
<b>6.0</b>	<b>CONCLUSIONS</b> .....	<b>4</b>
<b>7.0</b>	<b>RECOMMENDATIONS</b> .....	<b>4</b>
7.1	Foundations.....	4
7.2	Drainage.....	5
7.3	Seismic Design Criteria .....	5
7.4	Corrosion of Concrete.....	6
7.5	Non-Structural Floor Slab and Concrete Seating Area.....	6
7.6	Lateral Earth Pressures .....	6
7.7	Excavations.....	6
7.8	Pavements .....	6
<b>8.0</b>	<b>GENERAL</b> .....	<b>8</b>

### FIGURES

Figure 1 – Site Location Map

Figure 2 – Site Plan

### APPENDICES

Appendix A – UDSA NRCS Soil Survey Data

Appendix B – Typed Test Pit Logs

Appendix C – Laboratory Testing Results

## 1.0 INTRODUCTION

As part of continued development in Western Colorado, the City of Grand Junction proposes to construct an amphitheater at Las Colonias Park in Grand Junction. As part of the design development process, Huddleston-Berry Engineering and Testing, LLC (HBET) was retained by the City of Grand Junction to conduct a geologic hazards and geotechnical investigation at the site.

### 1.1 Scope

As discussed above, a geologic hazards and geotechnical investigation was conducted for Las Colonias Park in Grand Junction, Colorado. The scope of the investigation included the following components:

- Conducting a subsurface investigation to evaluate the subsurface conditions at the site.
- Collecting soil samples and conducting laboratory testing to determine the engineering properties of the soils at the site.
- Providing recommendations for foundation types and subgrade preparation.
- Providing recommendations for bearing capacity.
- Providing recommendations for lateral earth pressure.
- Providing recommendations for drainage, grading, and general earthwork.
- Providing recommendations for pavements.
- Evaluating potential geologic hazards at the site.

The investigation and report were completed by a Colorado registered professional engineer in accordance with generally accepted geotechnical and geological engineering practices. This report has been prepared for the exclusive use of the City of Grand Junction.

### 1.2 Site Location and Description

The site is located between Struthers Avenue and the Colorado River in Grand Junction, Colorado. The project location is shown on Figure 1 – Site Location Map.

At the time of the investigation, the site was generally open with a slight slope down to the south. A concrete path ran through the site. Vegetation consisted primarily of scattered weeds. The site was bordered to the north by Struthers Avenue, to the south by the Colorado River, to the west by existing commercial property, and to the east by open land.

### 1.3 Proposed Construction

The proposed construction is anticipated to include a stage structure, concrete seating area, raised grass seating areas, parking lots, concrete paths, and utilities. A generalized site plan is included as Figure 2.

## 2.0 GEOLOGIC SETTING

### 2.1 Soils

Soils data was obtained from the USDA Natural Resource Conservation Service Web Soil Survey. The data indicates that the site is underlain by Massadona silty clay loam, 0 to 2 percent slopes, and Bebeever and Green River soils, and Riverwash, 0 to 2 percent slopes. Soil survey data is included in Appendix A.

Structure construction in the Massadona soils is described as being somewhat limited due to shrink-swell. Construction in the Bebeever and Green River soils is described as being very limited due to flooding. Excavation in the site soils is described as being somewhat limited to very limited due to unstable excavation walls, depth to saturated zone, clay content, and/or dust. The site soils are indicated to have a low to high potential for frost action, moderate to high risk of corrosion of steel, and low to high risk of corrosion of concrete.

### 2.2 Geology

According to the *Geologic Map of Colorado* by Ogden Tweto (1979), the site is underlain by Quaternary gravels. The gravels are underlain by Mancos shale bedrock. The Mancos shale unit is thick in the Grand Valley and has a low to moderate potential for expansion.

### 2.3 Groundwater

Groundwater was encountered in two of the test pits in the eastern portion of the site. Groundwater was encountered in TP-5 at a depth of 8.0 feet and in TP-6 at a depth of 9.0 feet.

## 3.0 FIELD INVESTIGATION

### 3.1 Subsurface Investigation

The subsurface investigation was conducted on December 19, 2014 and consisted of six test pits. The test pits were excavated to depths of between 9.5 and 11.0 feet below the existing ground surface. Test pit locations are shown on Figure 2 – Site Plan. Typed test pit logs are included in Appendix B. Samples of the native soils were collected using hand driven sample tubes and using bulk sampling methods at the locations shown on the logs.

As shown on the logs, the subsurface conditions were slightly variable. Test Pits TP-1 through TP-4, conducted in the western portion of the site, encountered 1.0 foot of lean clay topsoil above brown to black, dry to moist, stiff lean clay with sand to the bottoms of the excavations. Cobbles and boulders were observed in some of the clay soils. Groundwater was not encountered in TP-1 through TP-4 at the time of the investigation.

Test Pit TP-5, conducted in the southeastern portion of the site, encountered 6.0 feet of brown, dry to moist, stiff lean clay with sand above black, moist to wet, dense sandy gravel and cobbles to the bottom of the excavation. Groundwater was encountered in TP-5 at a depth of 8.0 feet at the time of the investigation.

Test Pit TP-6, conducted in the northeastern portion of the site, encountered 1.0 foot of lean clay topsoil above brown shale fill to a depth of 3.0 feet. The fill was underlain by brown to black, moist, stiff lean clay with sand to a depth of 5.0 feet. Below the clay, black, moist to wet, dense sandy gravel and cobbles extended to the bottom of the excavation. Groundwater was encountered in TP-6 at a depth of 9.0 feet at the time of the investigation.

#### **4.0 LABORATORY TESTING**

Selected native soil samples collected from the borings were tested in the Huddleston-Berry Engineering and Testing LLC geotechnical laboratory for natural moisture and density, grain size analysis, Atterberg limits, maximum dry density and optimum moisture (Proctor), California Bearing Ratio (CBR), and water soluble sulfates content. The laboratory testing results are included in Appendix C.

The laboratory testing results indicate that the native clay soils are slightly plastic. In addition, the CBR results indicate that the native clay soils are slightly expansive with up to approximately 0.7% expansion measured in the laboratory. Water soluble sulfates were detected in the site soils in a concentration of 0.2%.

#### **5.0 GEOLOGIC INTERPRETATION**

##### **5.1 Geologic Hazards**

The most significant geologic hazard identified on the site is the potential impacts to the site of flooding of the Colorado River. However, moisture sensitive soils were also encountered at the site. In addition, shallow groundwater was encountered in portions of the site.

##### **5.2 Geologic Constraints**

In general, the primary geologic constraint to construction at the site is the presence of moisture sensitive soils. However, shallow groundwater may also impact the construction.

##### **5.3 Water Resources**

No water supply wells were observed on the property. As discussed previously, the site lies adjacent to the Colorado River. In general, with proper design and construction, the development of the property is not anticipated to adversely impact surface water or groundwater.



## 5.4 Mineral Resources

Potential mineral resources in western Colorado generally include gravel, uranium ore, and commercial rock products such as flagstone. The site is mapped in the Mesa County GIS database as containing potential gravel resources. As indicated in the test pit logs, gravels were encountered during the subsurface investigation. However, due to the size and location of the property, the existing gravel resources likely do not reflect an economically recoverable resource.

## 6.0 CONCLUSIONS

Based upon the available data sources, field investigation, and nature of the proposed construction, HBET does not believe that there are any geologic conditions which should preclude construction at this site. However, foundations, pavements, and earthwork may have to consider the impacts of moisture sensitive soils, potential flooding of the Colorado River, and/or shallow groundwater.

## 7.0 RECOMMENDATIONS

### 7.1 Foundations

As discussed previously, moisture sensitive soils were encountered at the site. However, based upon the nature of the proposed construction, shallow foundations are recommended. Spread footings and monolithic (turndown edge or mat) structural slabs are both appropriate foundation alternatives. However, to provide a uniform subgrade and limit the potential for excessive differential movements, it is recommended that the foundations be constructed above a minimum of 24-inches of structural fill.

As discussed previously, the native clay soils were shown to be slightly expansive. However, the magnitude of expansion measured in the laboratory was small. Therefore, with careful moisture control and proper compaction, the native clay soils, exclusive of topsoil, may be reused as structural fill, provided particles in excess of 6-inches in diameter are removed. Imported structural fill should consist of a granular, non-expansive, non-free draining material such as pit-run with high fines content, crusher fines, or CDOT Class 6 base course. However, if pit-run is used as structural fill, a minimum of 6-inches of base course, crusher fines, or other suitable fill material should be placed above the pit-run to prevent large point stresses on the bottoms of the foundations due to large particles in the pit-run.

Prior to placement of structural fill, it is recommended that the bottoms of the foundation excavations be scarified to a depth of 9 to 12-inches, moisture conditioned, and compacted to a minimum of 95% of the standard Proctor maximum dry density, within  $\pm 2\%$  of the optimum moisture content, as determined in accordance with ASTM D698. However, depending upon the depth of excavation and time of year during construction, shallow groundwater and associated soft soil conditions may exist. It may be necessary to utilize geotextile and/or geogrid in conjunction with up to approximately 30-inches of granular fill to stabilize the subgrade.

Structural fill should extend laterally beyond the edges of the foundation a distance equal to the thickness of structural fill. Structural fill should be moisture conditioned, placed in maximum 8-inch loose lifts, and compacted to a minimum of 95% of the standard Proctor maximum dry density for fine grained soils and 90% of the modified Proctor maximum dry density for coarse grained soils, within  $\pm 2\%$  of the optimum moisture content as determined in accordance with ASTM D698 and D1557C, respectively. Pit-run used as structural fill should be proofrolled to the Engineer's satisfaction.

For the foundation building pad prepared as recommended with structural fill consisting of the native soils or imported granular materials, a maximum allowable bearing capacity of 1,500 psf may be used. In addition, a modulus of subgrade reaction of 150 pci may be used for structural fill consisting of the native clay soils and a modulus of 250 pci may be used for structural fill consisting of crusher fines, pit-run, or base course. The bottoms of exterior foundations should extend a minimum of 24-inches below grade for frost protection.

## 7.2 Drainage

Based upon information provided to HBET, the proposed stage structure will be elevated above the existing grade between 4 and 6 feet. In addition, a basement is proposed below the stage. As indicated previously, groundwater was not encountered in the immediate vicinity of the stage structure. However, the subsurface investigation was conducted during the winter months where groundwater is typically lowest.

In order to evaluate the magnitude of potential groundwater fluctuations, HBET reviewed data from several monitoring wells at the site. The monitoring well data suggest that high groundwater is at approximately elevation 4568 feet. This is at a depth of approximately 8 feet in the vicinity of the stage at the location of Test Pit TP-1. However, during significant flood events, the groundwater elevation could rise even higher.

In most cases, a perimeter foundation drain system with sumps should be sufficient to limit the potential for groundwater to impact the basement. However, HBET understands that there are special Department of Energy (DOE) rules at the site due to the previous use of the site. As a result, a perimeter foundation drain may not be suitable.

As an alternative to the use of a perimeter foundation drain, it may be necessary to waterproof the basement. In this case, a slab foundation with special connections to the basement walls would likely be required. In addition, waterproofing concrete additives or finishes may be necessary. Also, it may be necessary to design the structure for buoyancy forces.

## 7.3 Seismic Design Criteria

In general based upon the results of the subsurface investigation, the site classifies as Site Class D for a stiff soil profile.

#### 7.4 Corrosion of Concrete

As indicated previously, water soluble sulfates were encountered in the site soils in a concentration of 0.2%. This concentration represents a severe degree of potential sulfate attack on concrete. Therefore, Type V cement is recommended in accordance with the International Building Code. However, Type V cement can be difficult to obtain in Western Colorado. Where Type V cement is unavailable, Type I-II sulfate resistant cement is recommended.

#### 7.5 Non-Structural Floor Slab and Concrete Seating Area

As mentioned above, expansive materials are present in the subsurface at the site. In general, slabs-on-grade cannot develop sufficient bearing pressures to resist swelling pressures. Therefore, some movement of slabs-on-grade should be expected. The only way to eliminate the potential for excessive differential movements would be to utilize structural slabs supported by deep foundations. However, where deep foundation supported slabs are not used, while the risk of movement cannot be eliminated, the risk can be reduced by constructing the floor slab and/or concrete seating area above a minimum of 18-inches of structural fill.

Floating slabs-on-grade should not be tied in or connected to the foundations in any manner. If a non-structurally supported floor slab is used, interior non-bearing partitions should include a slip-joint or framing void which permits a minimum of 2-inches of vertical movement.

#### 7.6 Lateral Earth Pressures

Stemwalls and/or any retaining walls should be designed to resist lateral earth pressures. For backfill consisting of the native soils or imported granular, non-free draining, non-expansive material, we recommend that the walls be designed for an equivalent fluid unit weight of 55 pcf in areas where no surcharge loads are present. Lateral earth pressures should be increased as necessary to reflect any surcharge loading behind the walls.

#### 7.7 Excavations

Excavations in the soils at the site may stand for short periods of time but should not be considered to be stable. The native soils generally classify as Type C soil with regard to OSHA's *Construction Standards for Excavations*. For Type C soils, the maximum allowable slope in temporary cuts is 1.5H:1V.

#### 7.8 Pavements

The proposed construction is anticipated to include new parking lots and concrete paths. As discussed previously, the pavement subgrade materials at the site consist primarily of lean clay soils. The design California Bearing Ratio (CBR) of the native clay soils was determined in the laboratory to be approximately 2.2. This corresponds to a Resilient Modulus of 3,300 psi.

Based upon the subgrade conditions and anticipated traffic loading, pavement section alternatives were developed in accordance with the *Guideline for the Design and Use of Asphalt Pavements for Colorado Roadways* by the Colorado Asphalt Pavement Association and *CDOT Pavement Design Manual*. The following pavement section alternatives are recommended:

**Automobile Parking Areas (Limited Truck Traffic)**

ESAL's = 100,000, Structural Number = 3.10

ALTERNATIVE	PAVEMENT SECTION (Inches)				TOTAL
	Hot-Mix Asphalt Pavement	CDOT Class 6 Base Course	CDOT Class 3 Subbase Course	Concrete Pavement	
Full Depth HMA	7.0				7.0
A	3.0	13.0			16.0
B	4.0	10.0			14.0
C	3.0	6.0	10.0		19.0
Rigid Pavement		6.0		6.0	12.0

**Mixed Use Areas (Higher Truck Traffic)**

ESAL's = 350,000; Structural Number = 3.50

ALTERNATIVE	PAVEMENT SECTION (Inches)				TOTAL
	Hot-Mix Asphalt Pavement	CDOT Class 6 Base Course	CDOT Class 3 Subbase Course	Concrete	
Full Depth HMA	9.0				9.0
A	4.0	14.0			18.0
B	5.0	11.0			16.0
C	4.0	6.0	11.0		21.0
Concrete Pavement		6.0		8.0	14.0

**Concrete Paths**

ALTERNATIVE	PAVEMENT SECTION (Inches)		
	CDOT Class 6 Base Course	Concrete	TOTAL
No Maintenance Traffic	6.0	5.0	11.0
Some Maintenance Traffic	6.0	6.0	12.0

Prior to new pavement placement, areas to be paved should be stripped of all topsoil, fill, or other unsuitable materials. It is recommended that the subgrade soils be scarified to a depth of 12-inches; moisture conditioned, and recompact to a minimum of 95% of the standard Proctor maximum dry density, within  $\pm 2\%$  of optimum moisture content as determined by AASHTO T-99. However, as discussed previously, soft soils may be encountered associated with shallow groundwater. It may be necessary to utilize geotextile and/or geogrid in conjunction with up to approximately 30-inches of granular fill to stabilize the subgrade.

Aggregate base course and subbase course should be placed in maximum 9-inch loose lifts, moisture conditioned, and compacted to a minimum of 95% and 93% of the maximum dry density, respectively, at -2% to +3% of optimum moisture content as determined by AASHTO T-180. In addition to density testing, base course should be proofrolled to verify subgrade stability.

It is recommended that Hot-Mix Asphaltic (HMA) pavement conform to CDOT grading SX or S specifications and consist of an approved 75 gyration Superpave method mix design. HMA pavement should be compacted to between 92% and 96% of the maximum theoretical density. An end point stress of 50 psi should be used. It is recommended that rigid pavements consist of CDOT Class P concrete or alternative approved by the Engineer. In addition, pavements should conform to local specifications.

The long-term performance of the pavements is dependent on positive drainage away from the pavements. Ditches, culverts, and inlet structures in the vicinity of paved areas must be maintained to prevent ponding of water on the pavement

## 8.0 GENERAL

The recommendations included above are based upon the results of the subsurface investigation and on our local experience. These conclusions and recommendations are valid only for the proposed construction.

As discussed previously, the subsurface conditions at the site were slightly variable. However, the precise nature and extent of any subsurface variability may not become evident until construction. Therefore, it is recommended that a representative of HBET observe the foundation excavations prior to structural fill placement to verify that the subsurface conditions are consistent with those described herein. In addition, it is recommended that a representative of HBET test compaction of structural fill materials.

As discussed previously, moisture sensitive soils were encountered at the site. The recommendations contained herein are designed to reduce the potential for excessive differential movements; however, HBET cannot predict long-term changes in subsurface moisture conditions and/or the precise magnitude or extent of volume change. Where significant changes in subsurface moisture occur due to poor grading, improper stormwater management, utility line failure, excess irrigation, significant groundwater fluctuations, or other cause either during or after construction, significant movements are possible.

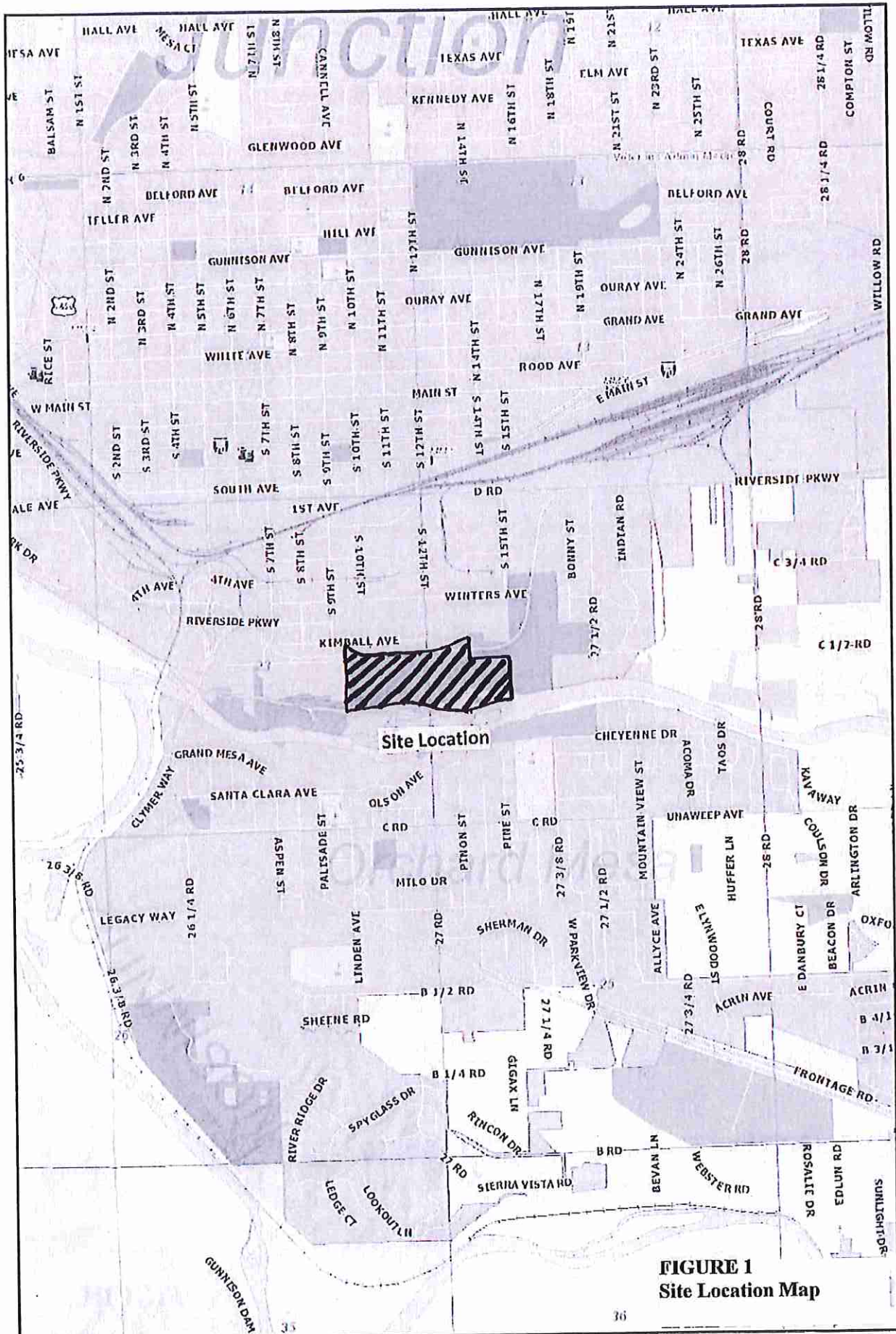
Huddlestone-Berry Engineering and Testing, LLC is pleased to be of service to your project. Please contact us if you have any questions or comments regarding the contents of this report.

Respectfully Submitted:  
Huddlestone-Berry Engineering and Testing, LLC



Michael A. Berry, P.E.  
Vice President of Engineering

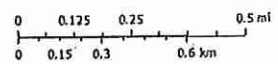
**FIGURES**

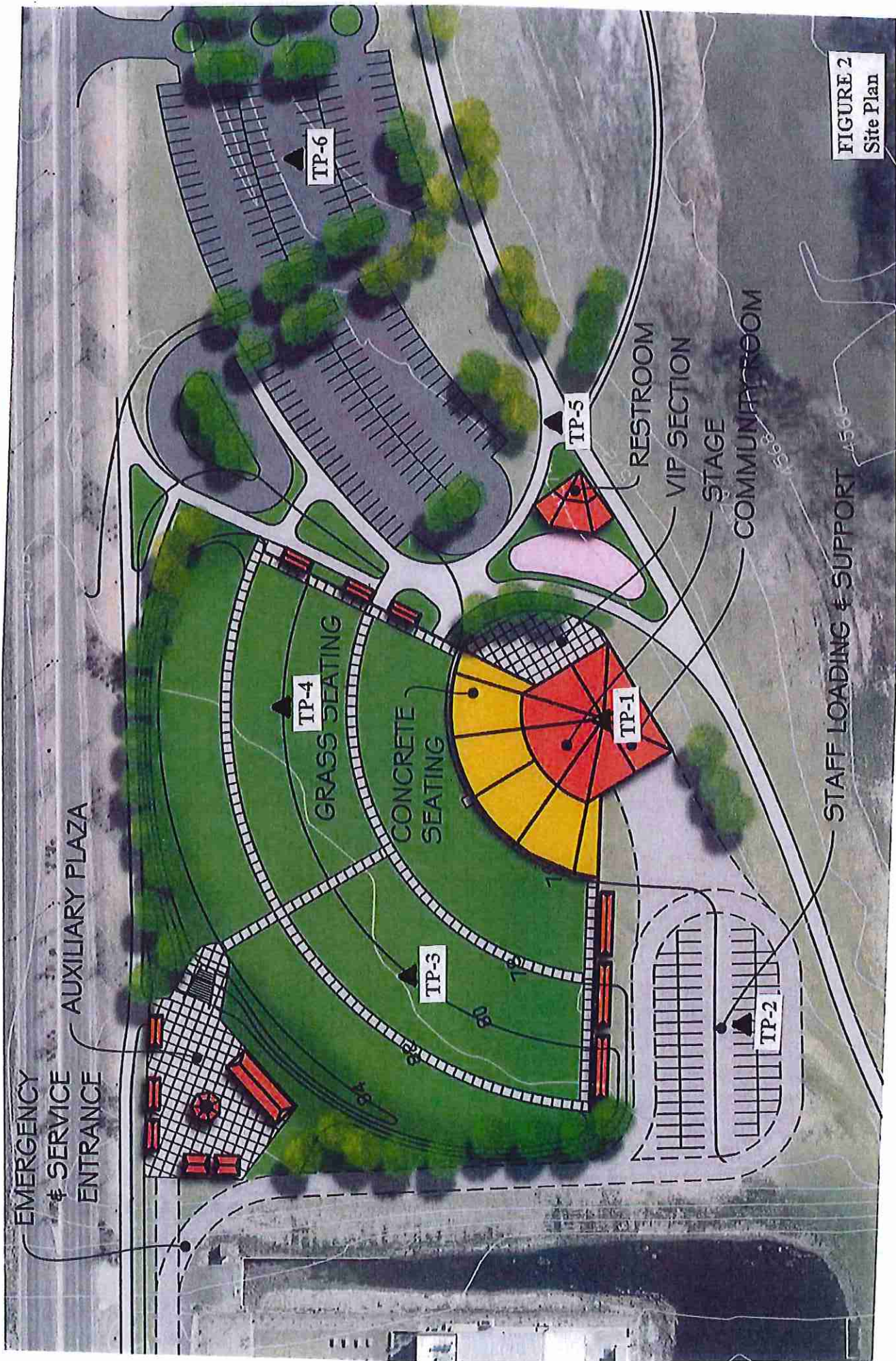


**FIGURE 1**  
**Site Location Map**

Mesa County Map

The information on this map is derived from the most current data available. The user assumes all responsibility for the use of this information. The user agrees to hold Mesa County, Colorado, and its employees harmless for any and all claims, damages, losses, or expenses, including reasonable attorneys' fees, arising from the use of this information, whether or not such claims, damages, losses, or expenses are caused in whole or in part by the negligence of Mesa County, Colorado, or its employees.



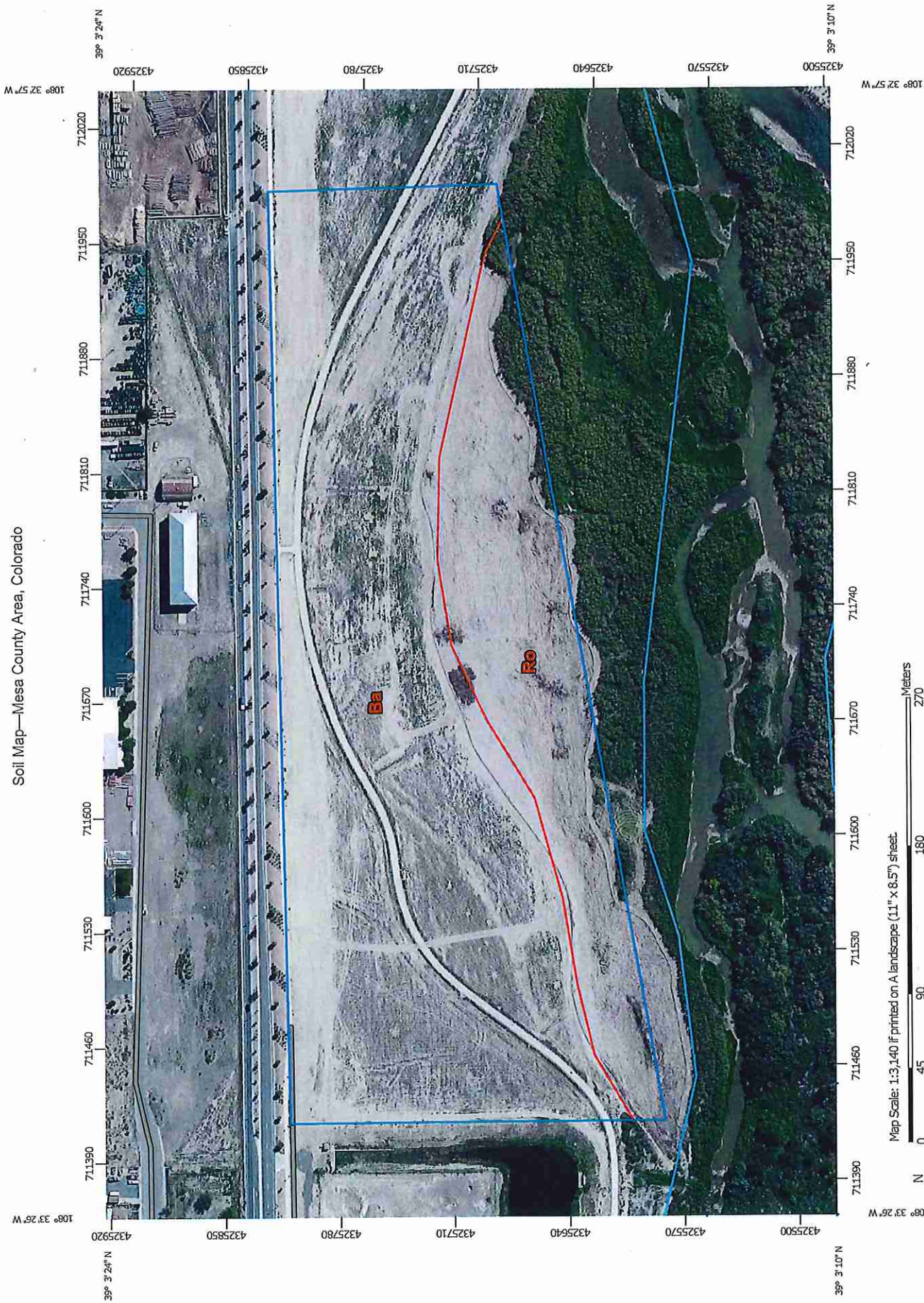


**FIGURE 2**  
Site Plan



**APPENDIX A**  
**Soil Survey Data**

Soil Map—Mesa County Area, Colorado



Map Scale: 1:3,140 if printed on A landscape (11" x 8.5") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.










































Soil Survey Area: Mesa County Area, Colorado  
 Survey Area Data: Version 5, Sep 22, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 22, 2010—Sep 2, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## MAP LEGEND

 Area of Interest (AOI)	 Spoil Area
 Soils	 Stony Spot
 Soil Map Unit Polygons	 Very Stony Spot
 Soil Map Unit Lines	 Wet Spot
 Soil Map Unit Points	 Other
 Special Point Features	 Special Line Features
 Blowout	 Water Features
 Borrow Pit	 Streams and Canals
 Clay Spot	 Transportation
 Closed Depression	 Rails
 Gravel Pit	 Interstate Highways
 Gravelly Spot	 US Routes
 Landfill	 Major Roads
 Lava Flow	 Local Roads
 Marsh or swamp	 Background
 Mine or Quarry	 Aerial Photography
 Miscellaneous Water	
 Perennial Water	
 Rock Outcrop	
 Saline Spot	
 Sandy Spot	
 Severely Eroded Spot	
 Sinkhole	
 Slide or Slip	
 Sodic Spot	

## Map Unit Legend

Mesa County Area, Colorado (CO680)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ba	Massadona silty clay loam, 0 to 2 percent slopes	19.4	74.6%
Ro	Bebevar and Green River soils, and Riverwash, 0 to 2 percent slopes	6.6	25.4%
Totals for Area of Interest		26.0	100.0%



## Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

## Report—Map Unit Description

### Mesa County Area, Colorado

#### Ba—Massadona silty clay loam, 0 to 2 percent slopes

##### Map Unit Setting

*National map unit symbol:* k06n

*Elevation:* 4,500 to 4,900 feet

*Mean annual precipitation:* 7 to 10 inches

*Mean annual air temperature:* 50 to 54 degrees F

*Frost-free period:* 150 to 190 days

*Farmland classification:* Not prime farmland

### Map Unit Composition

*Massadona and similar soils: 70 percent*

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Massadona

#### Setting

*Landform: Fan remnants*

*Down-slope shape: Concave*

*Across-slope shape: Linear*

*Parent material: Alluvium derived from clayey shale*

#### Typical profile

*A - 0 to 2 inches: silty clay loam*

*Bw - 2 to 12 inches: silty clay*

*Bky - 12 to 24 inches: silty clay*

*BCky1 - 24 to 48 inches: stratified silty clay loam to fine sandy loam*

*BCky2 - 48 to 60 inches: stratified silty clay loam to fine sandy loam*

#### Properties and qualities

*Slope: 0 to 2 percent*

*Depth to restrictive feature: More than 80 inches*

*Natural drainage class: Well drained*

*Runoff class: High*

*Capacity of the most limiting layer to transmit water (Ksat):*

*Moderately low to moderately high (0.06 to 0.20 in/hr)*

*Depth to water table: More than 80 inches*

*Frequency of flooding: None*

*Frequency of ponding: None*

*Calcium carbonate, maximum in profile: 15 percent*

*Gypsum, maximum in profile: 2 percent*

*Salinity, maximum in profile: Moderately saline to strongly saline  
(10.0 to 32.0 mmhos/cm)*

*Available water storage in profile: High (about 10.0 inches)*

#### Interpretive groups

*Land capability classification (irrigated): 3s*

*Land capability classification (nonirrigated): 7s*

*Hydrologic Soil Group: C*

### Ro—Bebevar and Green River soils, and Riverwash, 0 to 2 percent slopes

#### Map Unit Setting

*National map unit symbol: k0d4*

*Elevation: 4,430 to 4,820 feet*

*Mean annual precipitation: 7 to 10 inches*

*Mean annual air temperature: 50 to 54 degrees F*

*Frost-free period: 135 to 190 days*

*Farmland classification: Not prime farmland*

### Map Unit Composition

*Bebeever and similar soils:* 45 percent

*Green river and similar soils:* 35 percent

*Riverwash:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Bebeever

#### Setting

*Landform:* Flood plains

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Alluvium over sandy and gravelly alluvium derived from sandstone and shale

#### Typical profile

*Ap - 0 to 9 inches:* loam

*C1 - 9 to 14 inches:* loam

*C2 - 14 to 18 inches:* fine sandy loam

*2C - 18 to 32 inches:* sand

*3C - 32 to 59 inches:* very cobbly sand

#### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Moderately well drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):*

Moderately high to high (0.60 to 2.00 in/hr)

*Depth to water table:* About 24 to 48 inches

*Frequency of flooding:* Rare

*Frequency of ponding:* None

*Calcium carbonate, maximum in profile:* 5 percent

*Salinity, maximum in profile:* Nonsaline (0.0 to 2.0 mmhos/cm)

*Available water storage in profile:* Low (about 4.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 3s

*Land capability classification (nonirrigated):* 7s

*Hydrologic Soil Group:* C

### Description of Green River

#### Setting

*Landform:* Flood plains, terraces

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Clayey alluvium over coarse-loamy alluvium derived from sandstone and shale



### Typical profile

*Ap* - 0 to 10 inches: silty clay loam  
*C1* - 10 to 16 inches: fine sandy loam  
*C2* - 16 to 24 inches: fine sandy loam  
*C3* - 24 to 32 inches: fine sandy loam  
*C4* - 32 to 44 inches: fine sandy loam  
*C5* - 44 to 52 inches: fine sandy loam  
*2C* - 52 to 60 inches: very cobbly sand

### Properties and qualities

*Slope*: 0 to 2 percent  
*Depth to restrictive feature*: More than 80 inches  
*Natural drainage class*: Moderately well drained  
*Runoff class*: Low  
*Capacity of the most limiting layer to transmit water (Ksat)*:  
Moderately high (0.20 to 0.60 in/hr)  
*Depth to water table*: About 24 to 48 inches  
*Frequency of flooding*: Rare  
*Frequency of ponding*: None  
*Calcium carbonate, maximum in profile*: 5 percent  
*Salinity, maximum in profile*: Nonsaline to moderately saline (2.0 to  
16.0 mmhos/cm)  
*Sodium adsorption ratio, maximum in profile*: 5.0  
*Available water storage in profile*: Moderate (about 7.7 inches)

### Interpretive groups

*Land capability classification (irrigated)*: 2e  
*Land capability classification (nonirrigated)*: 7c  
*Hydrologic Soil Group*: C

### Description of Riverwash

#### Setting

*Landform*: Flood plains  
*Down-slope shape*: Linear  
*Across-slope shape*: Linear  
*Parent material*: Sandy and gravelly alluvium

#### Typical profile

*C1* - 0 to 6 inches: very gravelly sand  
*C2* - 6 to 60 inches: stratified extremely gravelly coarse sand to  
gravelly sand

#### Properties and qualities

*Slope*: 0 to 2 percent  
*Natural drainage class*: Somewhat excessively drained  
*Runoff class*: Low  
*Capacity of the most limiting layer to transmit water (Ksat)*: High to  
very high (6.00 to 20.00 in/hr)  
*Depth to water table*: About 0 to 24 inches  
*Frequency of flooding*: Frequent  
*Available water storage in profile*: Very low (about 1.8 inches)

**Interpretive groups**

*Land capability classification (irrigated): 6w*

*Land capability classification (nonirrigated): 7w*

*Hydrologic Soil Group: A*

**Data Source Information**

Soil Survey Area: Mesa County Area, Colorado

Survey Area Data: Version 5, Sep 22, 2014

## Dwellings and Small Commercial Buildings

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Dwellings* are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

*Small commercial buildings* are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

## Report—Dwellings and Small Commercial Buildings

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Dwellings and Small Commercial Buildings—Mesa County Area, Colorado							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ba—Massadona silty clay loam, 0 to 2 percent slopes							
Massadona	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.99	Shrink-swell	0.96	Shrink-swell	0.99
Ro—Bebeever and Green River soils, and Riverwash, 0 to 2 percent slopes							
Bebeever	45	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.96		
Green river	35	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.96		
Riverwash	20	Not rated		Not rated		Not rated	

## Data Source Information

Soil Survey Area: Mesa County Area, Colorado  
Survey Area Data: Version 5, Sep 22, 2014

## Roads and Streets, Shallow Excavations, and Lawns and Landscaping

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

*Local roads and streets* have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

*Shallow excavations* are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

*Lawns and landscaping* require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

### Report—Roads and Streets, Shallow Excavations, and Lawns and Landscaping

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Roads and Streets, Shallow Excavations, and Lawns and Landscaping—Mesa County Area, Colorado							
Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ba—Massadona silty clay loam, 0 to 2 percent slopes							
Massadona	70	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Dusty	0.50	Dusty	0.50
		Low strength	1.00	Too clayey	0.02		
		Shrink-swell	0.99	Unstable excavation walls	0.01		

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Mesa County Area, Colorado							
Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ro--Bebeever and Green River soils, and Riverwash, 0 to 2 percent slopes							
Bebeever	45	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.40	Unstable excavation walls	1.00	Dusty	0.19
				Depth to saturated zone	0.96		
				Dusty	0.19		
Green river	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Flooding	0.40	Depth to saturated zone	0.96	Dusty	0.29
				Dusty	0.29	Salinity	0.13
				Unstable excavation walls	0.01		
Riverwash	20	Not rated		Not rated		Not rated	

### Data Source Information

Soil Survey Area: Mesa County Area, Colorado  
 Survey Area Data: Version 5, Sep 22, 2014



## Soil Features

This table gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

*Subsidence* is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage, or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

*Potential for frost action* is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

*Risk of corrosion* pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

## Report—Soil Features

Soil Features—Mesa County Area, Colorado										
Map symbol and soil name	Restrictive Layer			Hardness	Subsidence		Potential for frost action	Risk of corrosion		Concrete
	Kind	Depth to top	Thickness		Initial	Total		Uncoated steel	Concrete	
Ba—Massadona silty clay loam, 0 to 2 percent slopes	In	In			In	In				
Massadona	—	—			0	—	High	High	High	
Ro—Bebevar and Green River soils, and Riverwash, 0 to 2 percent slopes										
Bebevar	—	—			0	—	Low	Moderate	Low	
Green river	—	—			0	—	Low	High	Moderate	
Riverwash	—	—			0	—	Low	High	Low	

## Data Source Information

Soil Survey Area: Mesa County Area, Colorado  
 Survey Area Data: Version 5, Sep 22, 2014

**APPENDIX B**  
**Typed Test Pit Logs**



Huddlestone-Berry Engineering & Testing, LLC  
 640 White Avenue, Unit B  
 Grand Junction, CO 81501  
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 970-255-6818

**TEST PIT NUMBER TP-1**

PAGE 1 OF 1

CLIENT City of Grand Junction PROJECT NAME Las Colonias Amphitheater  
 PROJECT NUMBER 00208-0057 PROJECT LOCATION Grand Junction, CO  
 DATE STARTED 12/19/14 COMPLETED 12/19/14 GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE \_\_\_\_\_  
 EXCAVATION CONTRACTOR Hi-River GROUND WATER LEVELS:  
 EXCAVATION METHOD Mini-Excavator AT TIME OF EXCAVATION dry  
 LOGGED BY NWB CHECKED BY MAB AT END OF EXCAVATION dry  
 AFTER EXCAVATION ---  
 NOTES \_\_\_\_\_

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		Lean CLAY with Sand and Organics (TOPSOIL), brown, dry										
2.5		Lean CLAY with Sand (cl), brown, dry, stiff	MC 1				134	8				
5.0		Lean CLAY with Sand, Boulders, and Cobbles (cl), brown to black, moist, stiff	GB 1									
10.0		Bottom of test pit at 11.0 feet.										

GEOTECH BH COLUMNS 00208-0057 LAS COLONIAS AMPHITHEATER GP J GINT US LAB GDT 12/7/15



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**TEST PIT NUMBER TP-2**

CLIENT City of Grand Junction PROJECT NAME Las Colonias Amphitheater  
 PROJECT NUMBER 00208-0057 PROJECT LOCATION Grand Junction, CO  
 DATE STARTED 12/19/14 COMPLETED 12/19/14 GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE \_\_\_\_\_  
 EXCAVATION CONTRACTOR Hi-River GROUND WATER LEVELS: \_\_\_\_\_  
 EXCAVATION METHOD Mini-Excavator AT TIME OF EXCAVATION dry  
 LOGGED BY NWB CHECKED BY MAB AT END OF EXCAVATION dry  
 AFTER EXCAVATION --

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (FOOD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		Lean CLAY with Sand and Organics (TOPSOIL), brown, dry										
2.5		Lean CLAY with Sand (cl), brown, dry, stiff	GB 1									
5.0		Lean CLAY with Sand, Boulders, and Cobbles (cl), brown, moist, stiff										
7.5												
10.0												
		Bottom of test pit at 10.5 feet.										

GEO TECH BH COLUMNS 00208-0057 LAS COLONIAS AMIPITHEATER.GPJ GINT US LAB.GDT 1/27/15



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 Grand Junction, CO 81501  
 970-255-8005  
 970-255-6818

**TEST PIT NUMBER TP-3**

PAGE 1 OF 1

CLIENT City of Grand Junction PROJECT NAME Las Colonias Amphitheater  
 PROJECT NUMBER 00208-0057 PROJECT LOCATION Grand Junction, CO  
 DATE STARTED 12/19/14 COMPLETED 12/19/14 GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE \_\_\_\_\_  
 EXCAVATION CONTRACTOR Hi-River GROUND WATER LEVELS:  
 EXCAVATION METHOD Mini-Excavator AT TIME OF EXCAVATION dry  
 LOGGED BY NWB CHECKED BY MAB AT END OF EXCAVATION dry  
 AFTER EXCAVATION ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		Lean CLAY with Sand and Organics (TOPSOIL), brown, dry										
2.5		Lean CLAY with Sand (cl), brown, dry, stiff										
5.0		Lean CLAY with Sand, Boulders, and Cobbles (cl), brown, moist, stiff										
7.5												
10.0												
		Bottom of test pit at 11.0 feet.										

GEOTECH BH COLUMNS: 00208-0057 LAS COLONIAS AMPHITHEATER.GPJ GINT US LAB.GDT 12/27/15



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 970-255-8005  
 970-255-6818

# TEST PIT NUMBER TP-4

PAGE 1 OF 1

CLIENT City of Grand Junction PROJECT NAME Las Colonias Amphitheater  
 PROJECT NUMBER 00208-0057 PROJECT LOCATION Grand Junction, CO  
 DATE STARTED 12/19/14 COMPLETED 12/19/14 GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE \_\_\_\_\_  
 EXCAVATION CONTRACTOR Hi-River GROUND WATER LEVELS:  
 EXCAVATION METHOD Mini-Excavator AT TIME OF EXCAVATION dry  
 LOGGED BY NWB CHECKED BY MAB AT END OF EXCAVATION dry  
 NOTES \_\_\_\_\_ AFTER EXCAVATION ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		Lean CLAY with Sand and Organics (TOPSOIL), brown, dry										
2.5		Lean CLAY with Sand, Boulders, and Cobbles (cl), brown, dry to moist, stiff										
5.0												
7.5												
10.0		Bottom of test pit at 10.0 feet.										

GEOTECH BH COLUMNS: 00208-0057 LAS COLONIAS AMPHITHEATER.GPJ GINT US LAB.GDT 1/27/15



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# TEST PIT NUMBER TP-5

PAGE 1 OF 1

CLIENT City of Grand Junction PROJECT NAME Las Colonias Amphitheater  
 PROJECT NUMBER 00208-0057 PROJECT LOCATION Grand Junction, CO  
 DATE STARTED 12/19/14 COMPLETED 12/19/14 GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE \_\_\_\_\_  
 EXCAVATION CONTRACTOR HI-River GROUND WATER LEVELS:  
 EXCAVATION METHOD Mini-Excavator  AT TIME OF EXCAVATION 8.0 ft  
 LOGGED BY NWB CHECKED BY MAB  AT END OF EXCAVATION 8.0 ft  
 NOTES \_\_\_\_\_ AFTER EXCAVATION \_\_\_\_\_

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS				FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		
0.0		Lean CLAY with Sand (CL) and Boulders and Cobbles, brown, dry to moist, stiff											
2.5		*** Lab Classified GB1 ***	GB 1					7	27	13	14	71	
5.0		Sandy GRAVEL and COBBLES (gw), trace boulders, black, moist to wet, dense											
7.5		Bottom of test pit at 9.5 feet.											

GEOTECH BH COLUMNS 00208-0057 LAS COLONIAS AMPHITHEATER.GPJ GINT US LAB.GDT 1/27/15





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**TEST PIT NUMBER TP-6**

PAGE 1 OF 1

CLIENT City of Grand Junction PROJECT NAME Las Colonias Amphitheater  
 PROJECT NUMBER 00208-0057 PROJECT LOCATION Grand Junction, CO  
 DATE STARTED 12/19/14 COMPLETED 12/19/14 GROUND ELEVATION \_\_\_\_\_ TEST PIT SIZE \_\_\_\_\_  
 EXCAVATION CONTRACTOR Hi-River GROUND WATER LEVELS:  
 EXCAVATION METHOD Mini-Excavator ▽ AT TIME OF EXCAVATION 9.0 ft  
 LOGGED BY NWB CHECKED BY MAB ▽ AT END OF EXCAVATION 9.0 ft  
 NOTES \_\_\_\_\_ AFTER EXCAVATION --

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		Lean CLAY with Sand and Organics (TOPSOIL), brown, dry										
2.5		SHALE, brown, very soft, moderately weathered										
5.0		Lean CLAY with Sand (cl) and Boulders and Cobbles, brown to black, moist, stiff										
7.5		Sandy GRAVEL and COBBLES (gw), trace Boulders, black, moist to wet, dense										
10.0		Bottom of test pit at 10.0 feet.										

GEOTECH BH COLUMNS 00208-0057 LAS COLONIAS AMPHITHEATER.GPJ GINT US LAB.GDT 1/27/15.

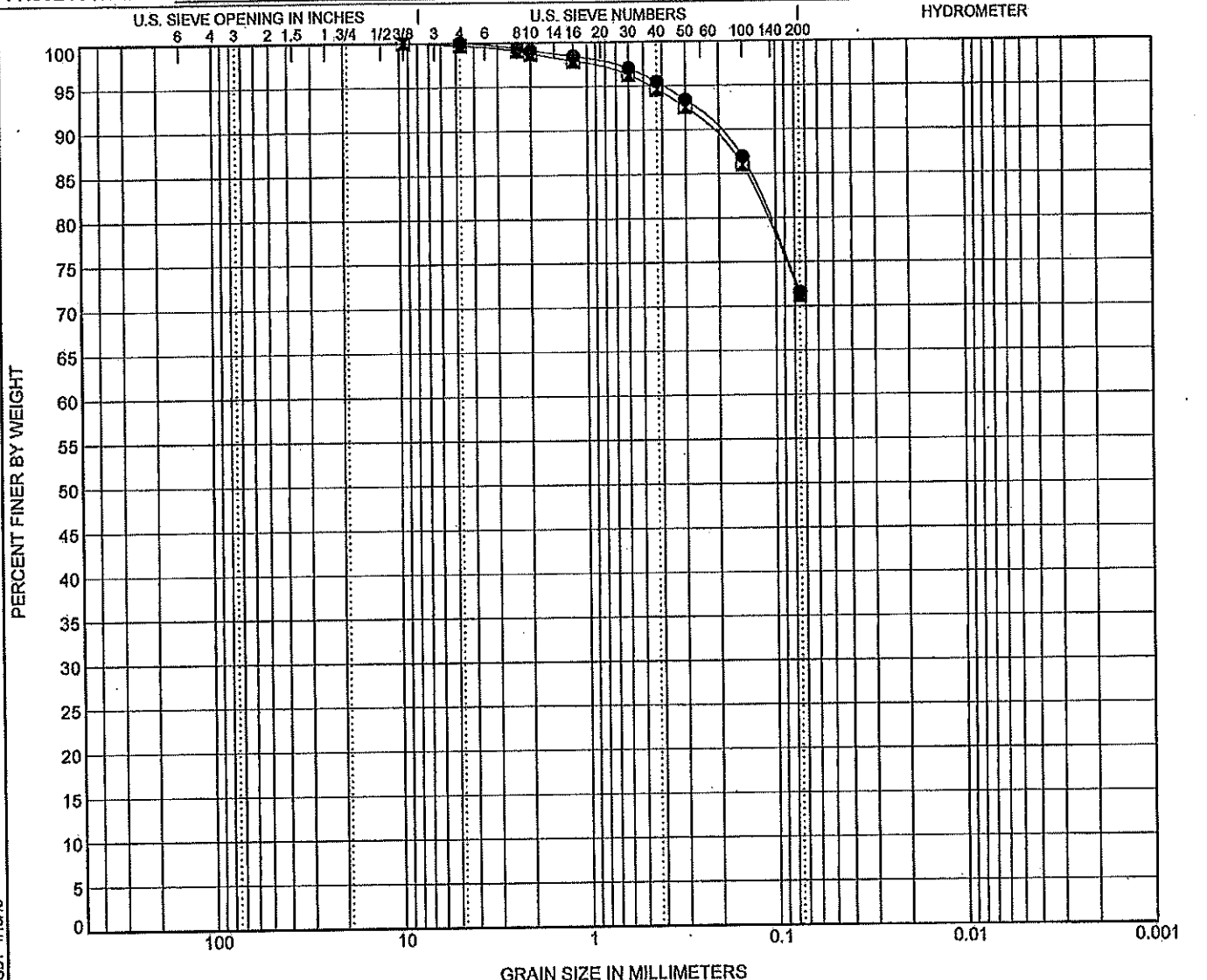
**APPENDIX C**  
**Laboratory Testing Results**



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# GRAIN SIZE DISTRIBUTION

CLIENT City of Grand Junction PROJECT NAME Las Colonias Amphitheater  
 PROJECT NUMBER 00208-0057 PROJECT LOCATION Grand Junction, CO



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● Composite 12/2014	LEAN CLAY with SAND(CL)	25	14	11		
☒ TP-5, GB1 12/2014	LEAN CLAY with SAND(CL)	27	13	14		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● Composite 12/2014	4.75				0.0	28.4	71.6	
☒ TP-5, GB1 12/2014	9.5				0.3	28.5	71.2	

GRAIN SIZE: 00208-0057 LAS COLONIAS AMPHITHEATER.GPJ GINT US LAB.GDT 1/15/15





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# MOISTURE-DENSITY RELATIONSHIP

CLIENT City of Grand Junction

PROJECT NAME Las Colonias Amphitheater

PROJECT NUMBER 00208-0057

PROJECT LOCATION Grand Junction, CO

Sample Date: 12/19/2014  
Sample No.: \_\_\_\_\_  
Source of Material: Composite  
Description of Material: LEAN CLAY with SAND(CL)  
Test Method: ASTM D698A

## TEST RESULTS

Maximum Dry Density 114.0 PCF  
Optimum Water Content 14.0 %

### GRADATION RESULTS (% PASSING)

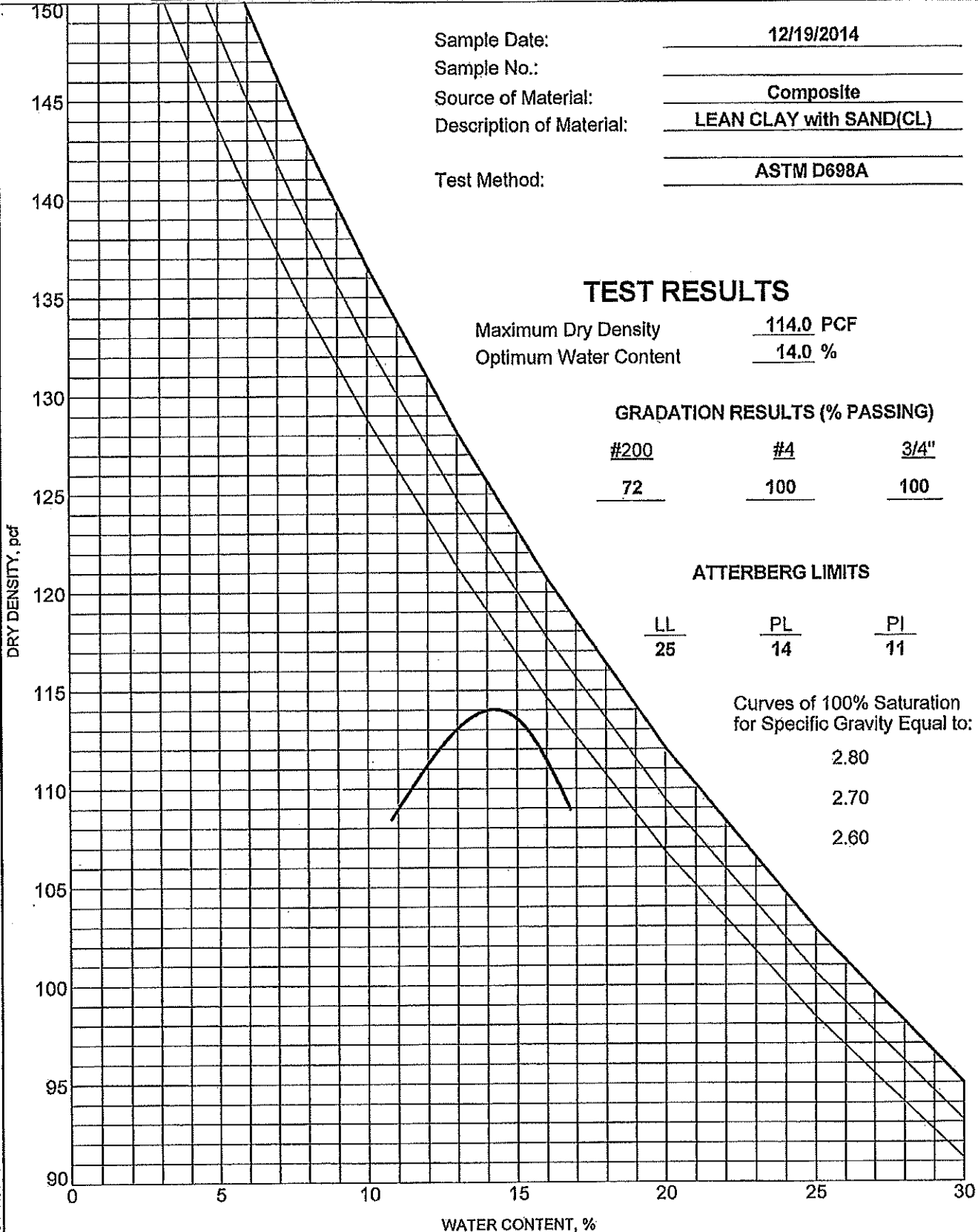
#200	#4	3/4"
<u>72</u>	<u>100</u>	<u>100</u>

### ATTERBERG LIMITS

LL	PL	PI
<u>25</u>	<u>14</u>	<u>11</u>

Curves of 100% Saturation  
for Specific Gravity Equal to:

2.80  
2.70  
2.60





**Huddleston-Berry**  
Engineering & Testing, LLC

**CALIFORNIA BEARING RATIO**  
ASTM D1883

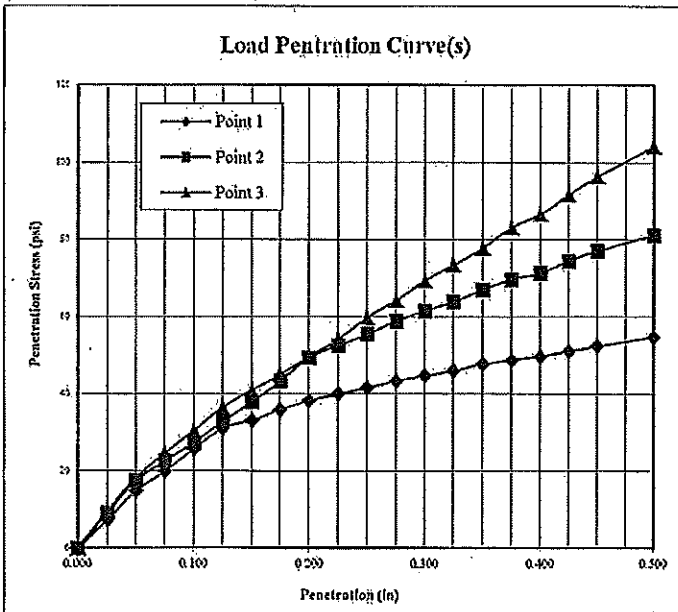
Project No.: 00208-0057  
 Project Name: Las Colonias Amphitheater  
 Client Name: City of Grand Junction  
 Sample Number: 14-0788 Location: Composite

Authorized By: Client Date: 12/19/14  
 Sampled By: NB Date: 12/19/14  
 Submitted By: NB Date: 01/15/15  
 Reviewed By: MAB Date: 01/21/15

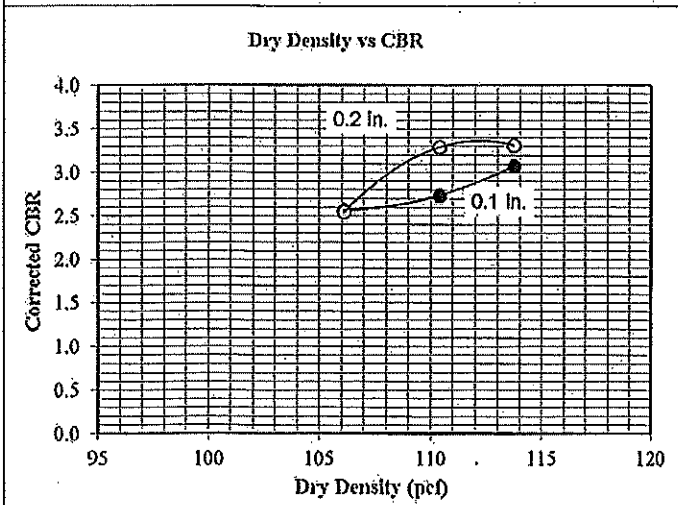
Compaction Method ASTM D698, Method A

Maximum Dry Density (pcf):  
114.0  
 Opt. Moisture Content (%):  
14.0  
 Sample Condition:  
Soaked  
 Remarks:

Sample Data			
	Point 1	Point 2	Point 3
Blows per Compacted Lift:	15	25	56
Surcharge Weight (lbs):	10.0	10.0	10.0
Dry Density Before Soak (pcf):	106.1	110.4	113.7
Dry Density After Soak (pcf):	105.5	109.6	112.9
Moisture Content (%)	Bottom Pre-Test	14.7	14.6
	Top Pre-Test	14.7	15.6
	Top 1" After Test	20.4	19.8
	Average After Soak:	19.4	17.9
Percent Swell After Soak:	0.6	0.7	0.7



Penetration Data								
Point 1			Point 2			Point 3		
Dist. (in)	Load (lbs)	Stress (psi)	Dist. (in)	Load (lbs)	Stress (psi)	Dist. (in)	Load (lbs)	Stress (psi)
0.000	0	0	0.000	0	0	0.000	0	0
0.025	22	7	0.025	27	9	0.025	29	10
0.050	44	15	0.050	52	18	0.050	54	18
0.075	59	20	0.075	67	23	0.075	73	25
0.100	76	26	0.100	81	27	0.100	90	30
0.125	92	31	0.125	97	33	0.125	108	37
0.150	98	33	0.150	112	38	0.150	121	41
0.175	106	36	0.175	128	43	0.175	133	45
0.200	113	38	0.200	146	49	0.200	147	50
0.225	118	40	0.225	155	52	0.225	160	54
0.250	123	42	0.250	164	55	0.250	177	60
0.275	128	43	0.275	174	59	0.275	190	64
0.300	132	45	0.300	182	62	0.300	205	69
0.325	136	46	0.325	189	64	0.325	217	73
0.350	141	48	0.350	198	67	0.350	230	78
0.375	144	49	0.375	206	70	0.375	246	83
0.400	147	50	0.400	211	71	0.400	256	87
0.425	151	51	0.425	220	74	0.425	271	92
0.450	155	52	0.450	228	77	0.450	285	96
0.500	162	55	0.500	240	81	0.500	308	104



Corrected CBR @ 0.1"		
2.6	2.7	3.1
Corrected CBR @ 0.2"		
2.5	3.3	3.3

Penetration Distance Correction (in)		
0.000	0.000	0.000

Figure: \_\_\_\_\_

