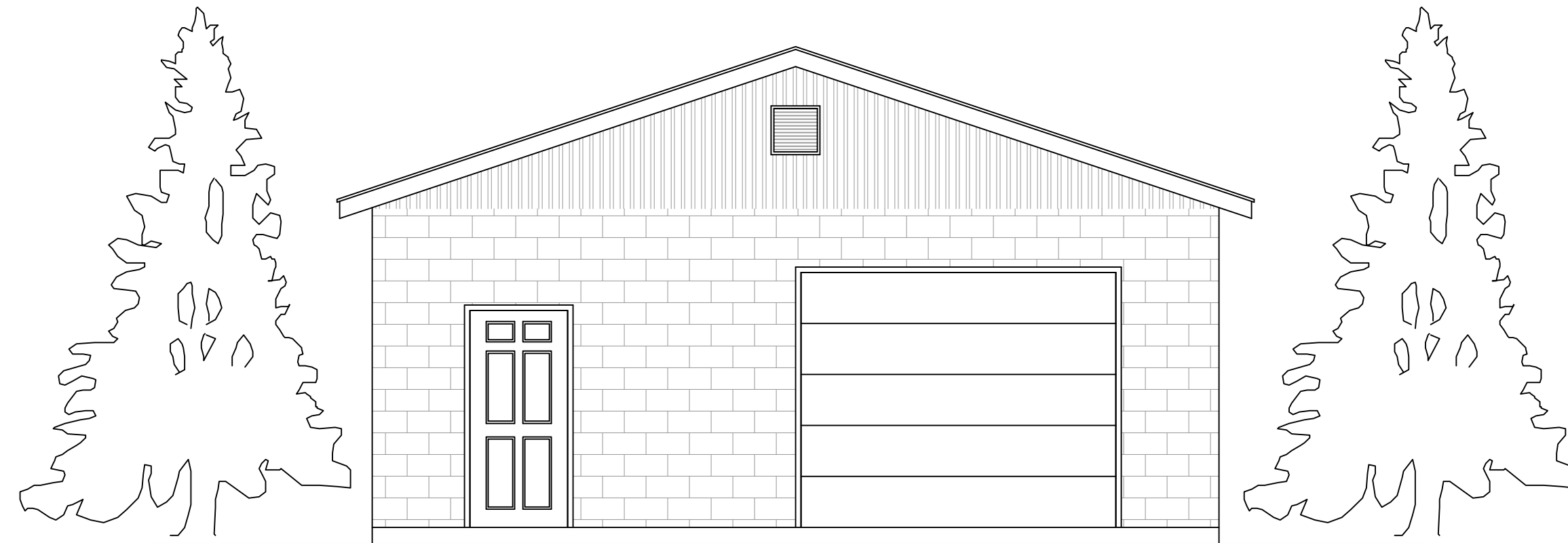


SALEM PARKS RESTROOM

SALEM CITY CORPORATION
 STAN & KALLE COLE PARK
 60 SOUTH 300 WEST
 SALEM, UT 84653



SALEM CITY CONTACT INFORMATION

MATT MARZIALE
 60 NORTH 100 EAST
 SALEM, UT 84653
 801-404-7064
 Mattm@salemcity.org

DESIGN

L & L DESIGNS
 3355 WEST 7900 SOUTH
 BENJAMIN, UT 84660
 801-798-0707
 duanelundell@hotmail.com

BUILDER

TBD
 X
 X
 X
 X

ENGINEER

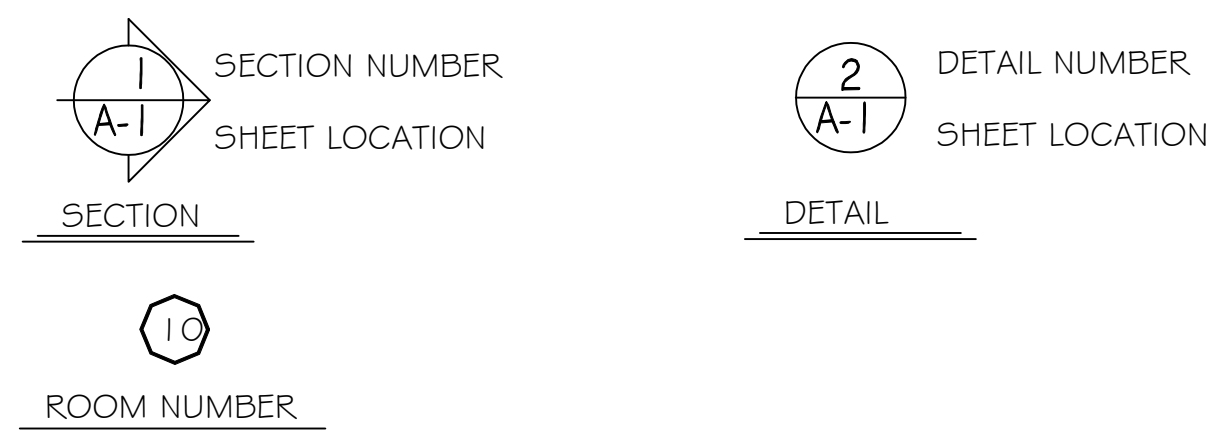
ACUTE ENGINEERING
 744 SOUTH 400 EAST
 OREM, UT 84097
 801-229-9020

INDEX TO DRAWINGS

- A1 COVER SHEET
- A2 FLOOR PLAN AND ELEVATIONS
- S1 FOUNDATION AND FRAMING PLANS
- SD.1 STRUCTURAL DETAILS
- SN.1 STRUCTURAL NOTES
- P1 PLOT PLAN

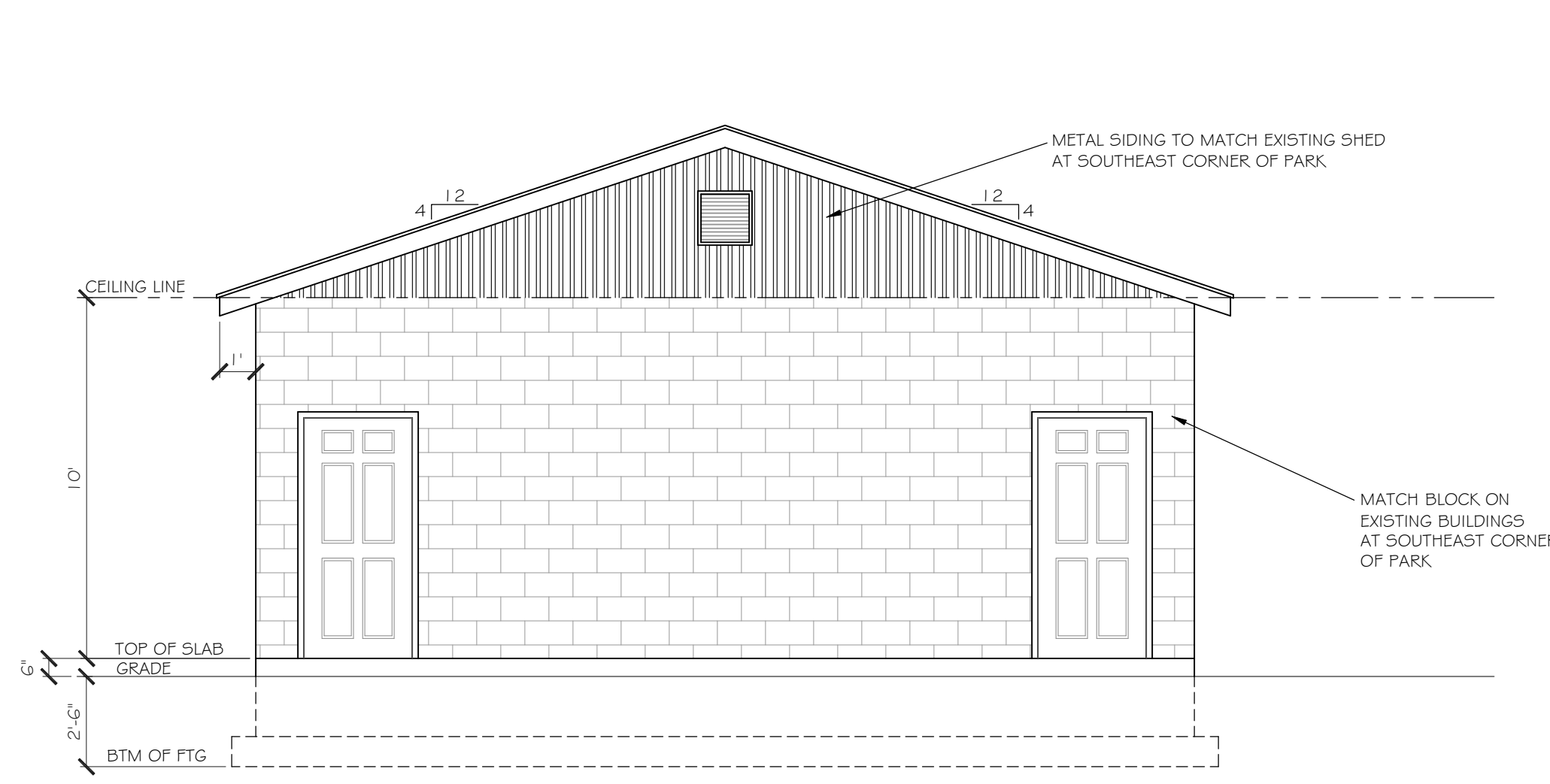


SYMBOLS



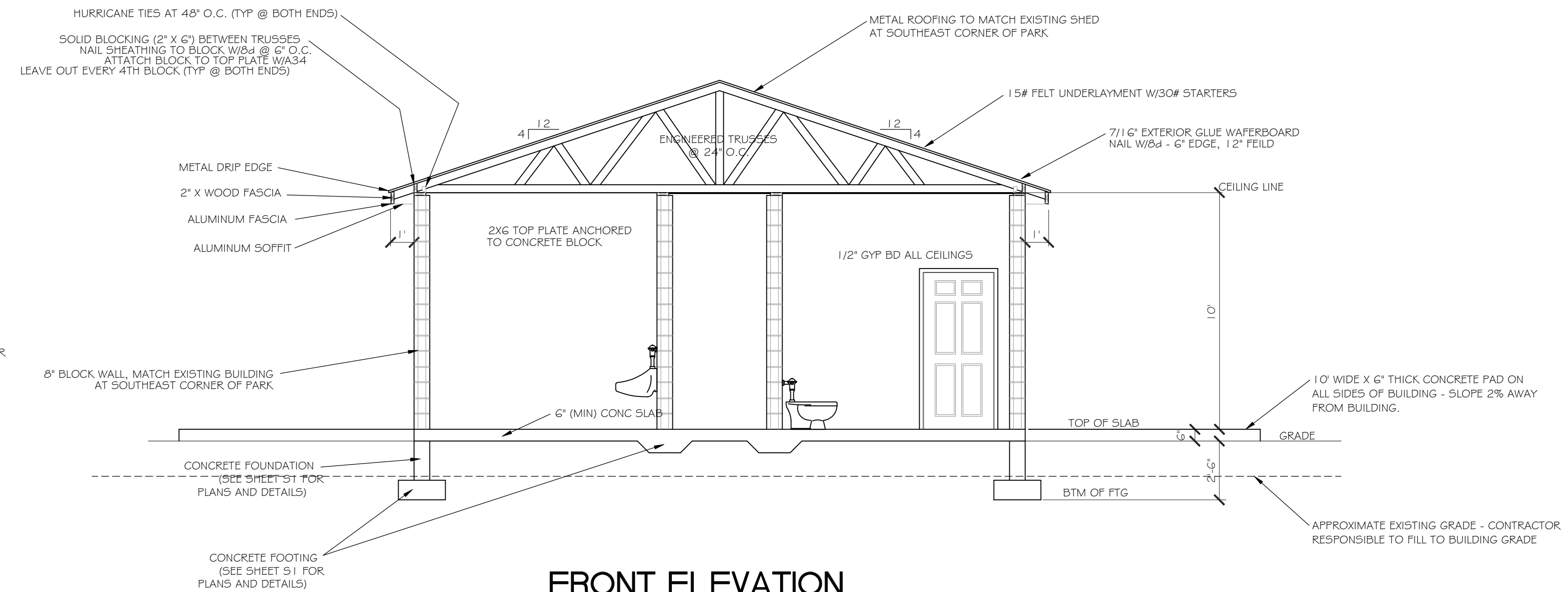
SQUARE FOOT:
 FOORPRINT: 884 SQ FT

A1



FRONT ELEVATION

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



FRONT ELEVATION

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

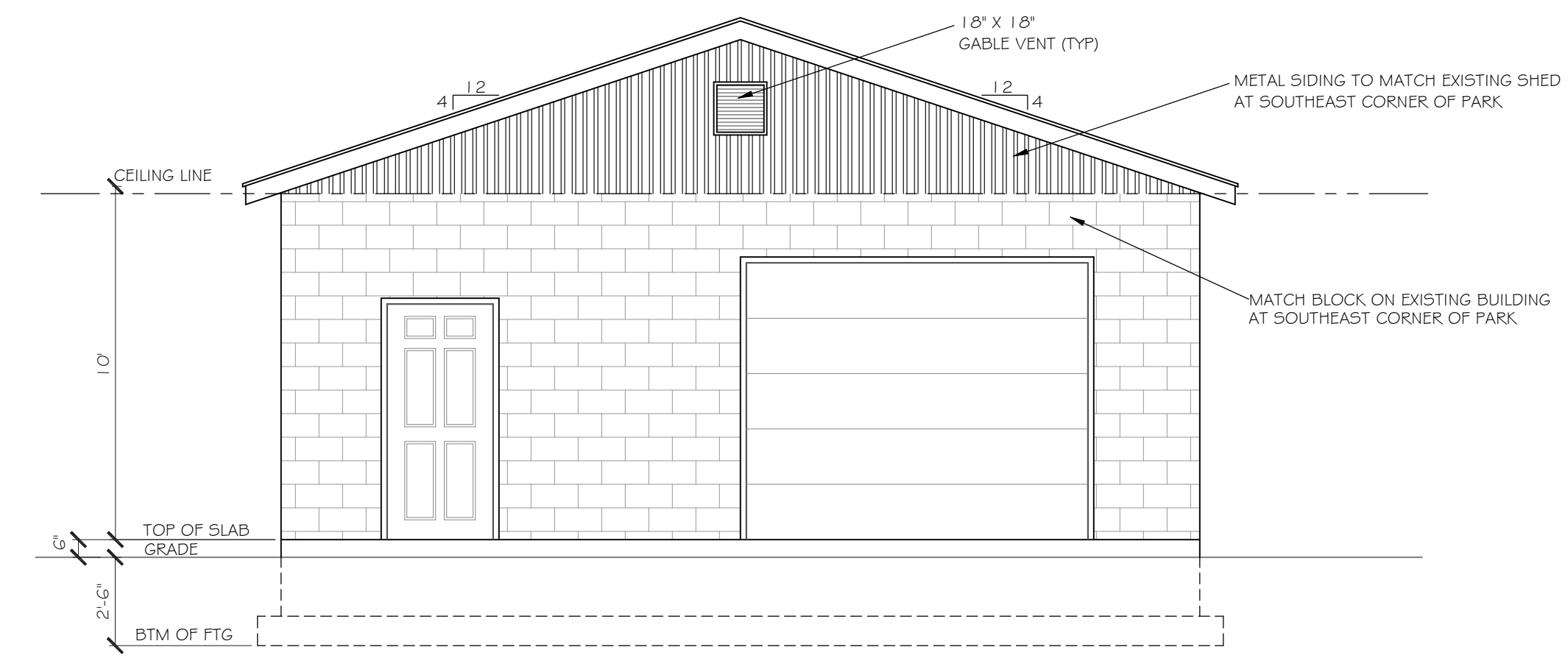
- NOTE:**
1. ALL INTERIOR CONCRETE BLOCK WALLS ARE DETAILED AT 8" BLOCK WALLS.
 2. ALL PIPE TO BE PEX PIPE.

MARK	TYPE	BLOCK PROPERTIES	REINFORCEMENT			GROUT
			VERTICAL	HORIZONTAL	LAYER	
MW-1	CMU	8" NORMAL WEIGHT	(1) #4 @ 32" O.C.	(2) #4 @ 48" O.C.	CENTER	PARTIAL
MW-2	CMU	8" NORMAL WEIGHT	(1) #4 @ 32" O.C.	(2) #4 @ 48" O.C.	CENTER	PARTIAL

THESE STRUCTURAL DRAWINGS ARE BASED ON ARCHITECTURAL DRAWINGS. SEE CURRENT ISSUE OR REVISION DATE.

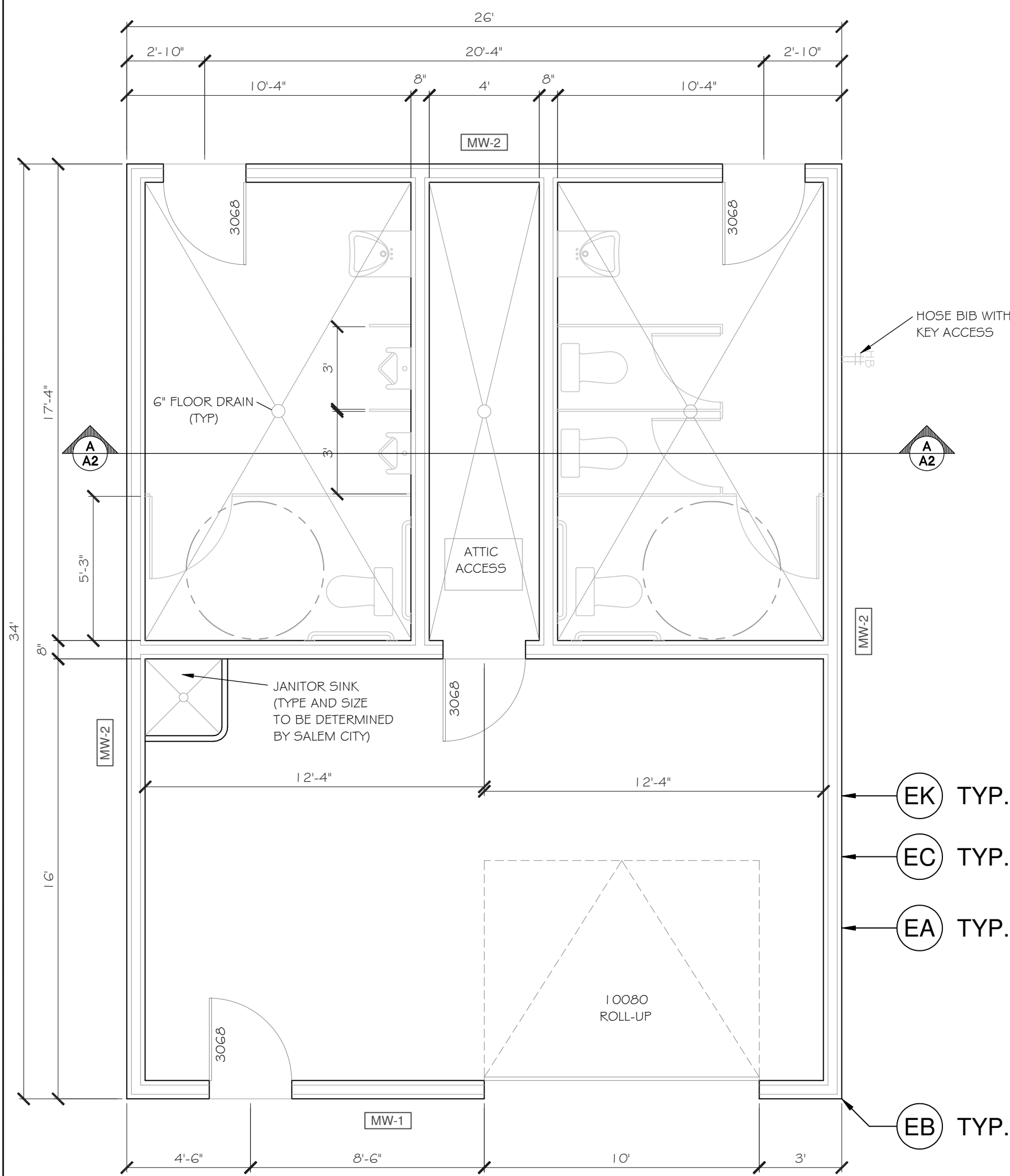
DIMENSIONS AND ELEVATIONS ARE SUPPLIED BY THE ARCHITECT. THEY MAY BE PROVIDED ON THE STRUCTURAL PLANS AND DETAILS FOR THE CONVENIENCE OF THE CONTRACTOR. VERIFY DIMENSIONS AND ELEVATIONS WITH ARCHITECTURAL DRAWINGS.

ACUTE ENGINEERING, INC.
 744 S 400 E
 Orem, Utah 84097
 Phone 801.229.9020
 Fax 801.224.0050
 info@acuteengineering.com



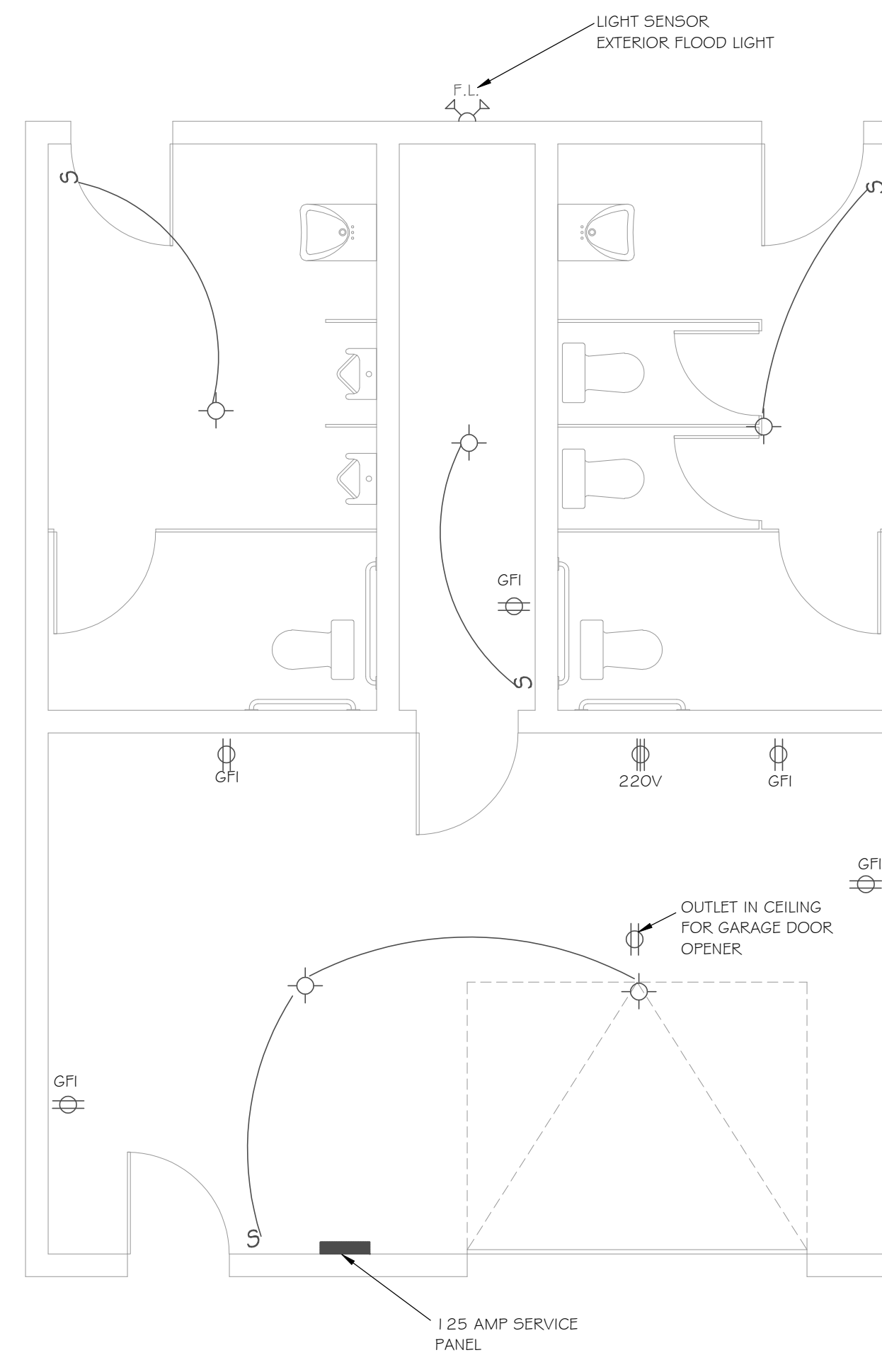
REAR ELEVATION

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



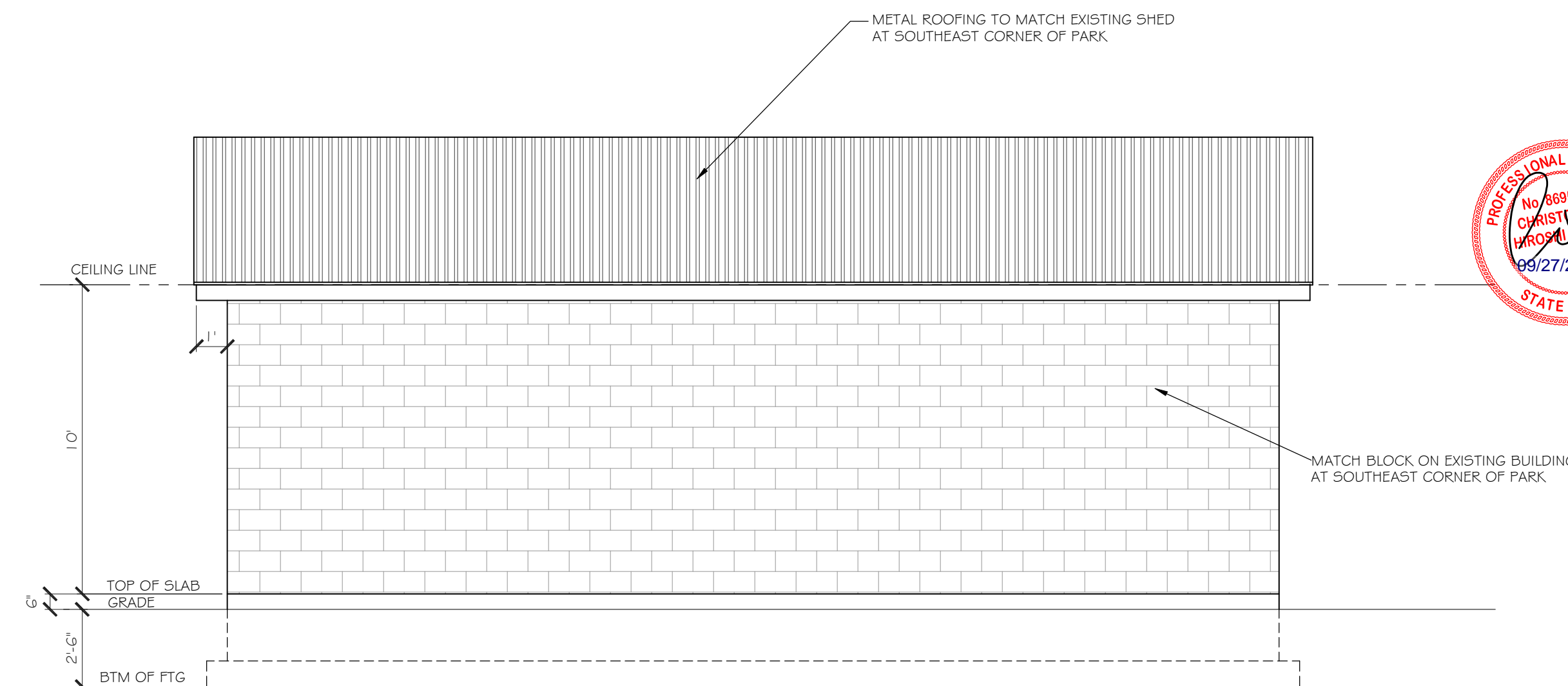
MAIN LEVEL FLOOR PLAN

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



ELECTRICAL PLAN

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



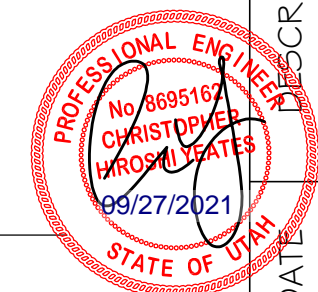
LEFT AND RIGHT SIDE ELEVATION

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

L & I DESIGNS
 3355 WEST 7900 SOUTH
 BENJAMIN, UT 84660
 TELE: (801) 798-0707
 FAX: (801) 798-0707
 Ddlundell@AOL.COM

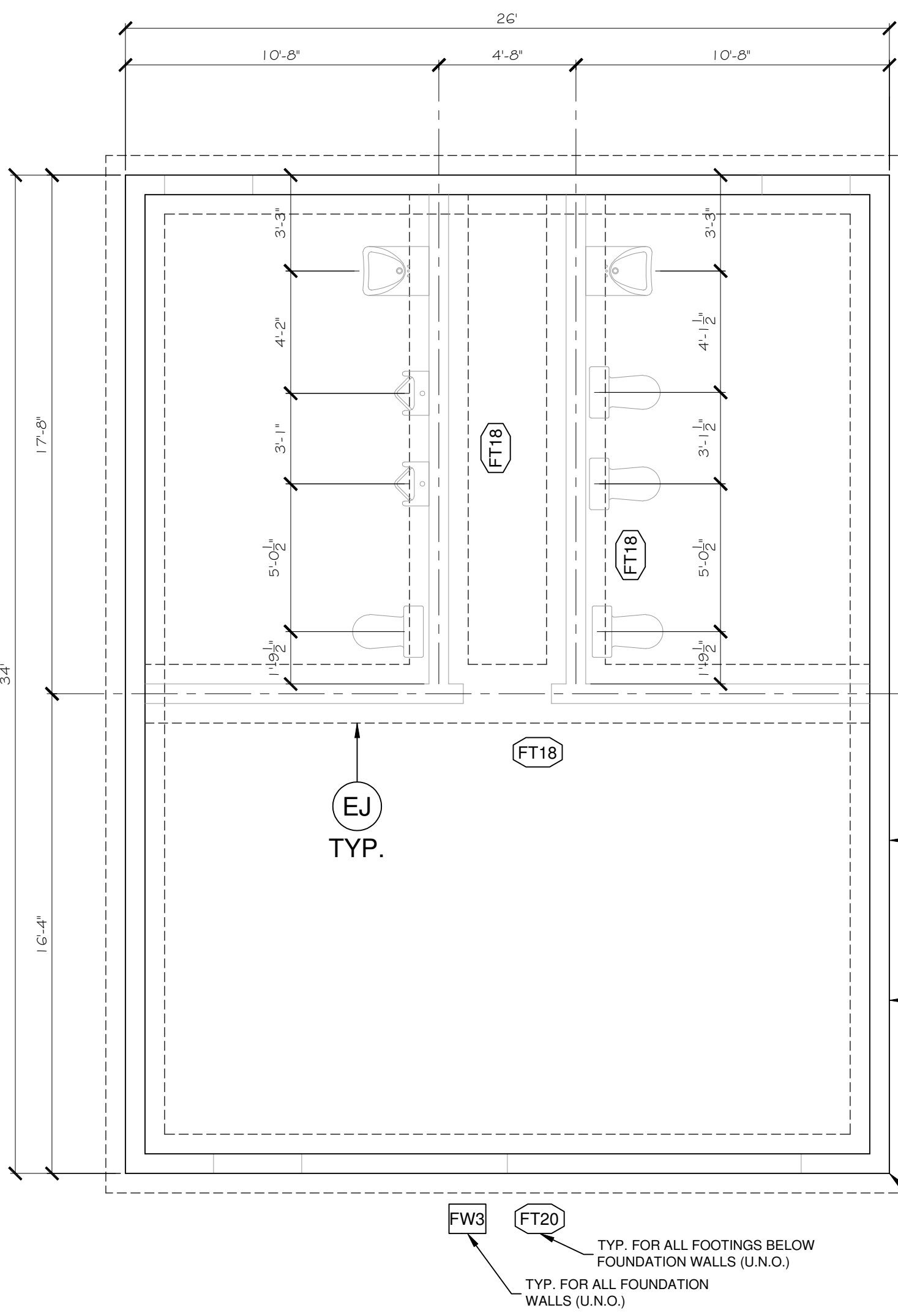
PLANS AND ELEVATIONS

SALEM REC RESTROOM
 STAN & KALLE COLE PARK
 60 SOUTH 300 WEST
 SALEM, UT 84653



NO.	DATE	DESCRIPTION

DATE: 5/24/21
 FILE NAME: Salem2021-A2
 NO. OF SHEETS: 2 of 6
 SHEET NO. **A2**



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

THESE STRUCTURAL DRAWINGS ARE BASED ON ARCHITECTURAL DRAWINGS. SEE CURRENT ISSUE OR REVISION DATE.

ACUTE ENGINEERING, INC.
744 S 400 E
Orem, Utah 84097
Phone 801.229.9020
Fax 801.224.0050
info@acuteengineering.com

FOUNDATION WALL SCHEDULE					
MARK	HEIGHT	WIDTH	REINFORCEMENT		
			VERTICAL	HORIZONTAL	PLACEMENT
FW3	3'	8"	#4 @ 18"	(3) #4	CENTER

- DOWEL VERTICAL BARS INTO FOOTING.
- PLACE TOP AND BOTTOM BARS WITHIN 4" OF TOP AND BOTTOM OF WALL.
- PLACE REINFORCEMENT IN CENTER OF WALL OR NEAR EACH FACE, AS NOTED.

FOOTING SCHEDULE					
MARK	WIDTH	LENGTH	THICKNESS	REINFORCEMENT	
				TRANSVERSE	LENGTHWISE
FT18	18"	CONT.	10"	-	(2) #4
FT20	20"	CONT.	10"	-	(2) #4

- CONTINUOUS FOOTINGS SHALL BE CENTERED UNDER WALLS AND SPOT FOOTINGS SHALL BE CENTERED UNDER COLUMNS UNLESS NOTED OTHERWISE.
- FOOTINGS AND FOUNDATIONS, EXCAVATIONS, GRAZING, AND FILL SHALL COMPLY WITH THE PROVISIONS OF THE GEOTECHNICAL REPORT (SEE GSW).

MASONRY COLUMN SCHEDULE				
MARK	TYPE	SIZE	REINFORCEMENT	
			VERTICAL	HORIZONTAL
MC-1	CMU	8" x 16"	#4 @ 8" O.C.	#4 BARS @ 24" O.C.

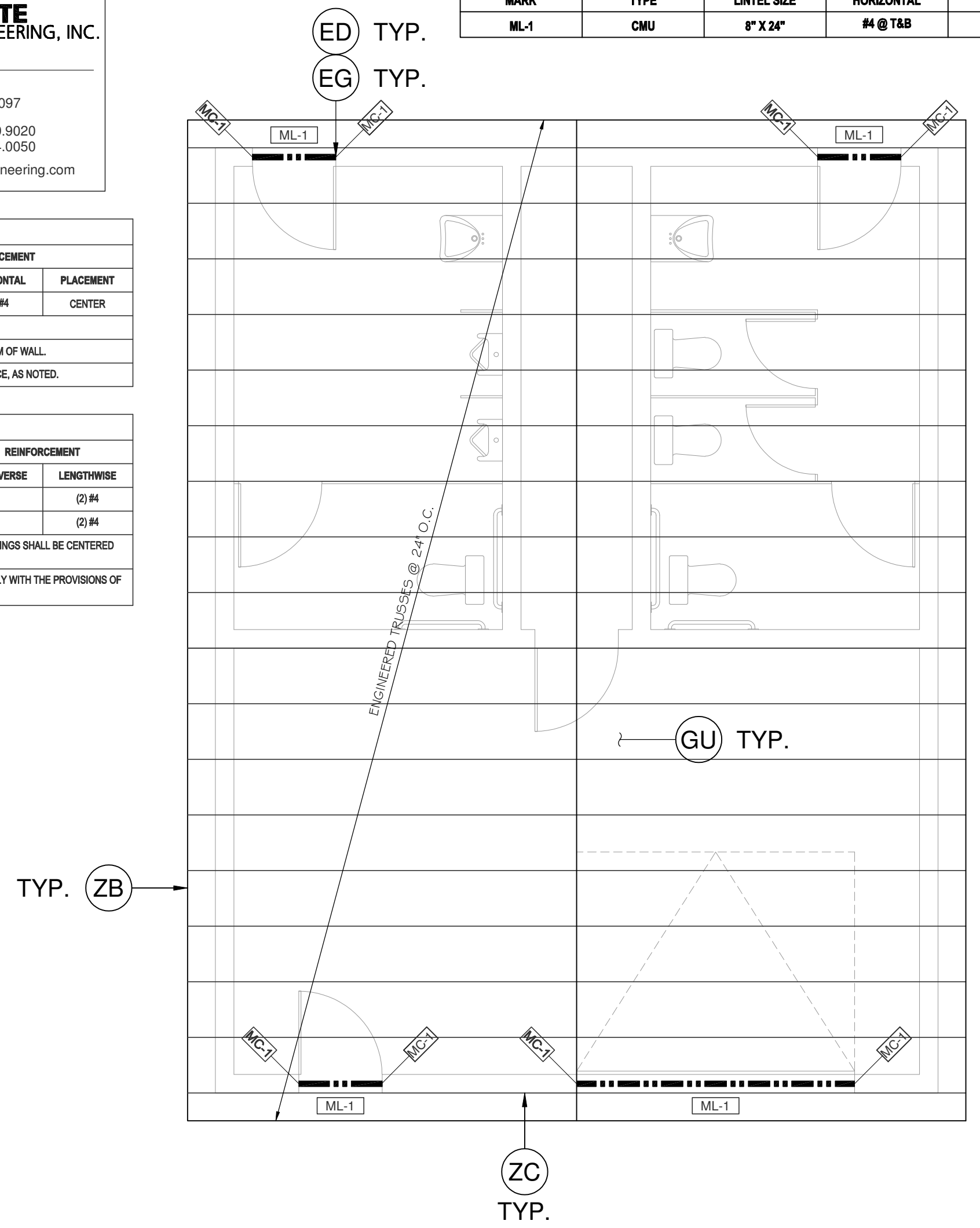
MASONRY LINTEL SCHEDULE				
MARK	TYPE	LINTEL SIZE	REINFORCEMENT	
			HORIZONTAL	TIES
ML-1	CMU	8" X 24"	#4 @ T&B	NONE

SHEATHING SCHEDULE	
TYPE	THICKNESS
ROOF	7/8" OSB (24/16 SPAN RATING)

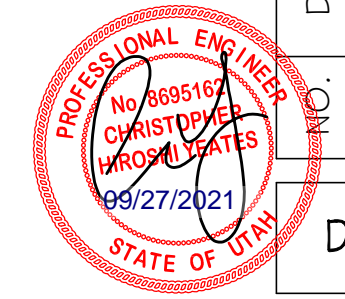
- SHEATHING PERPENDICULAR TO SUPPORTS.
- FLOOR SHEATHING NAILED & GLUED TO SUPPORT.
- 8d COMMON NAILS # O.C. (EDGES) 12" O.C. (FIELD)
- NAILING NO CLOSER THAN 3/8" FROM PANEL EDGE

WOOD TRUSS LOADS	
GROUND SNOW LOAD, P _g	= 54 PSF
FLAT ROOF SNOW LOAD	= 24 PSF
TOP CHORD DEAD LOAD	= 10 PSF
BOTTOM CHORD DEAD LOAD	= 5 PSF

- DESIGN SNOW LOADS SHALL BE IN ACCORDANCE WITH ASCE 7-16 CHAP.7 (2018 IBC 1608.1)



ROOF FRAMING PLAN
SCALE: 1/4" = 1'-0"



DESCRIPTION	DATE	NO.

DATE 5/24/21
FILE NAME Salem2021-51
NO. OF SHEETS 2 of 6

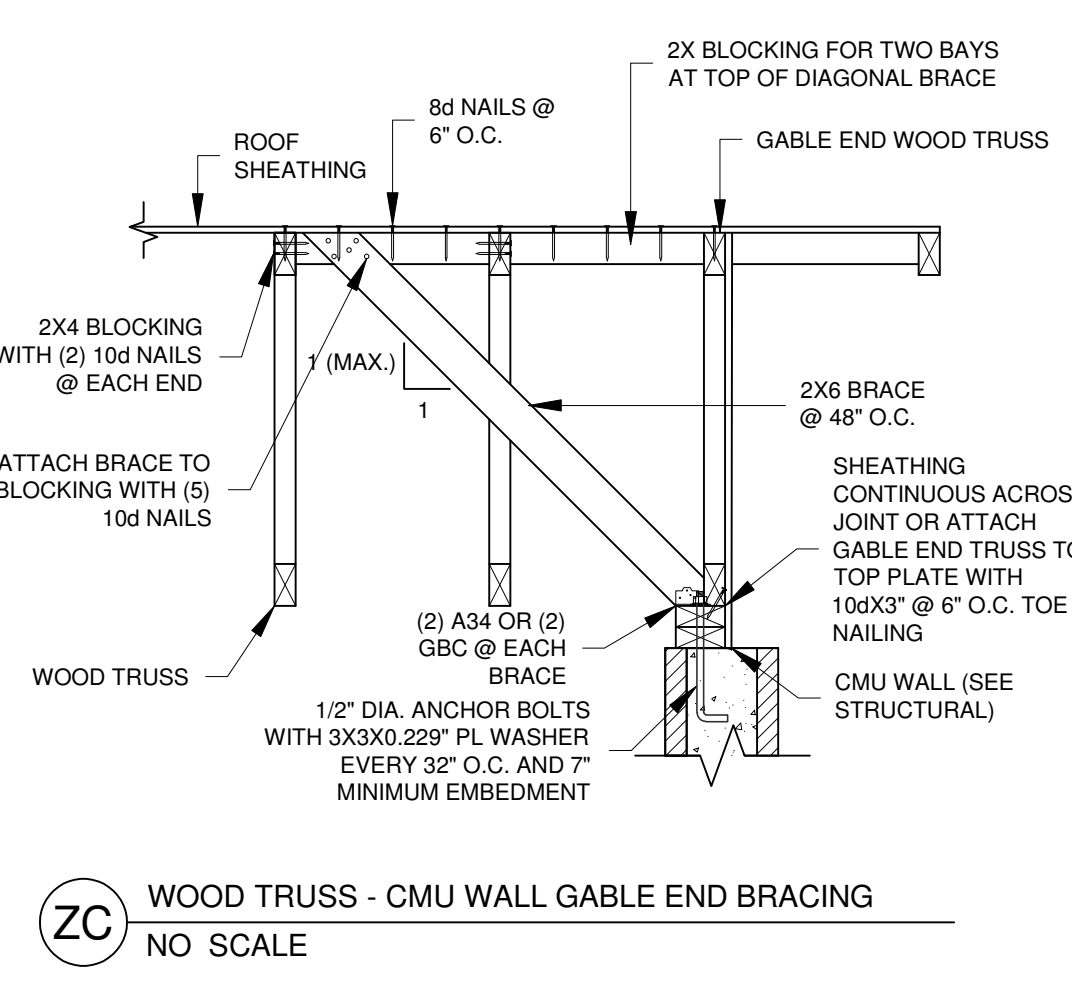
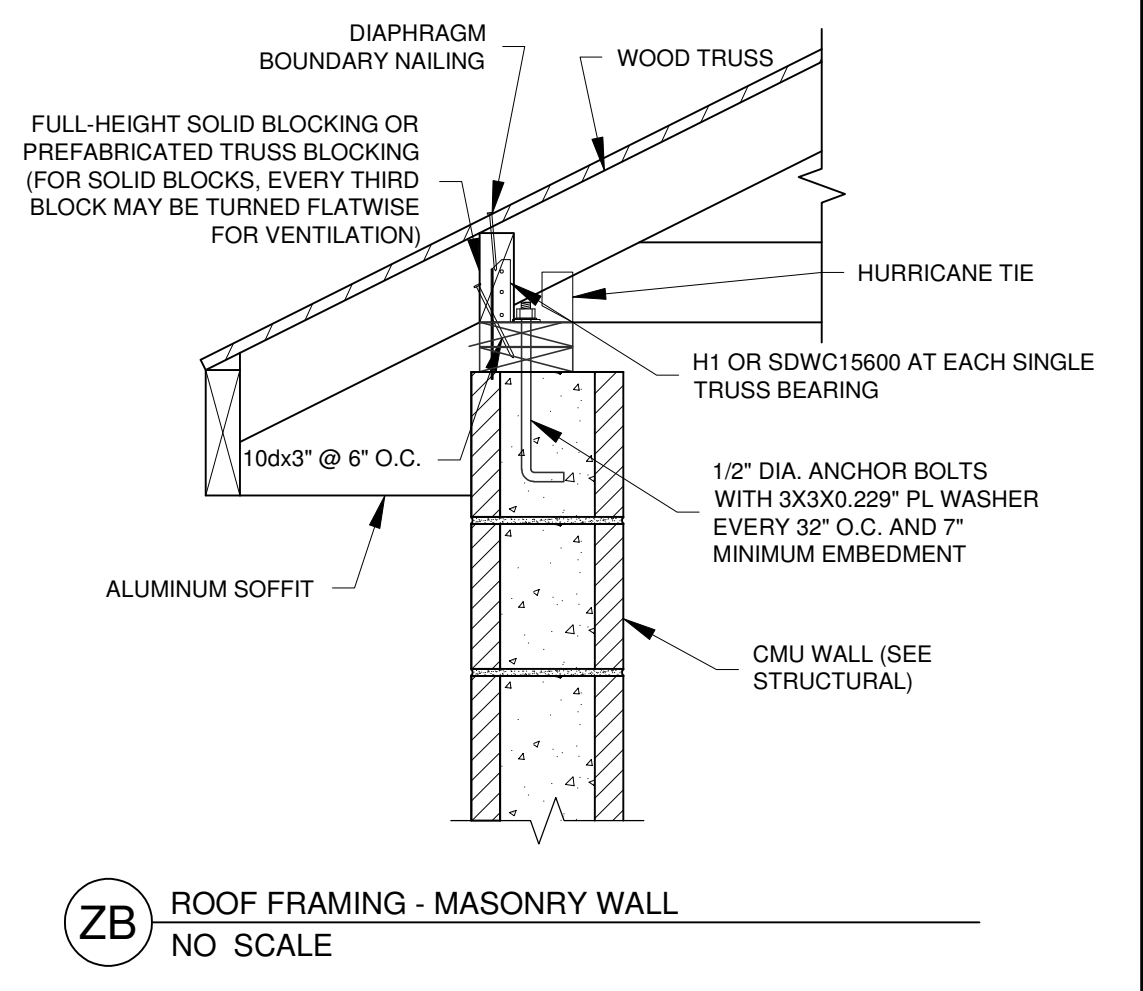
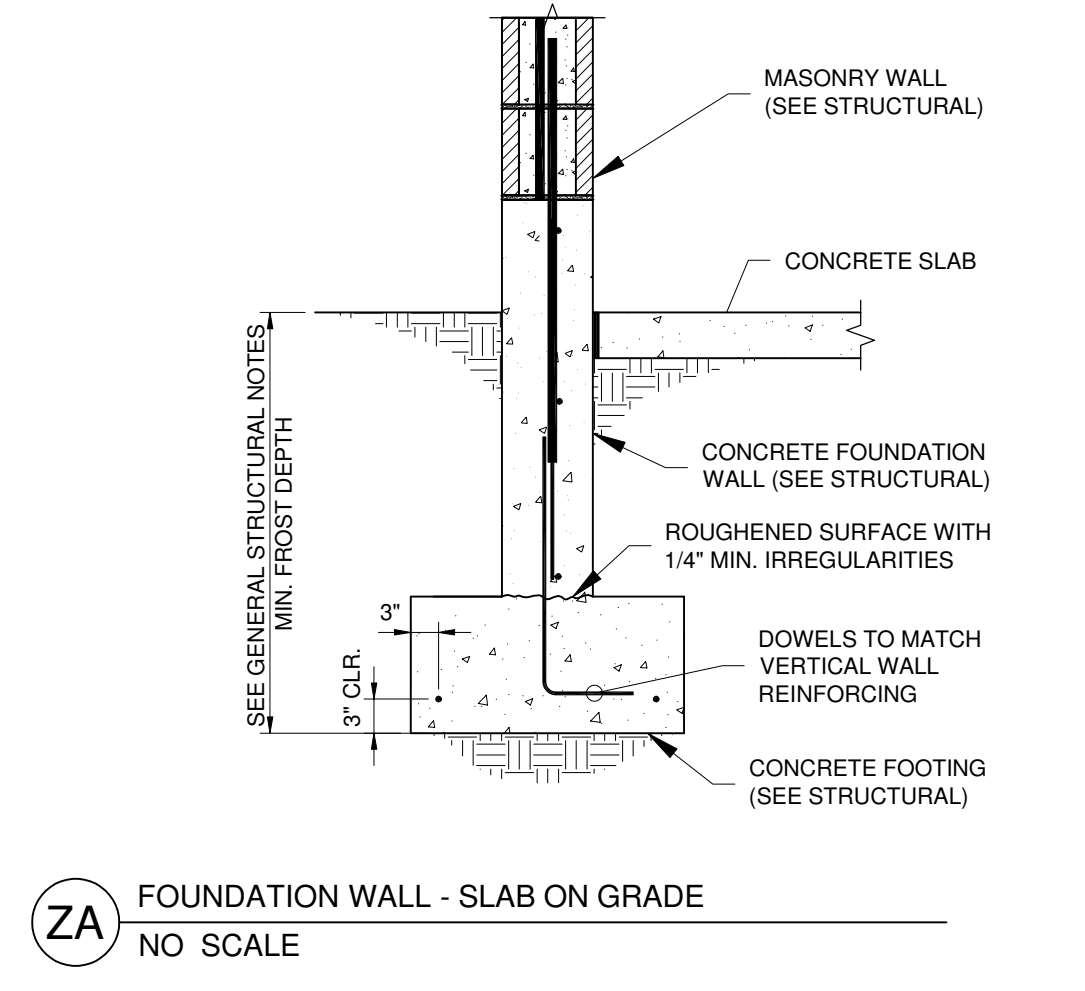
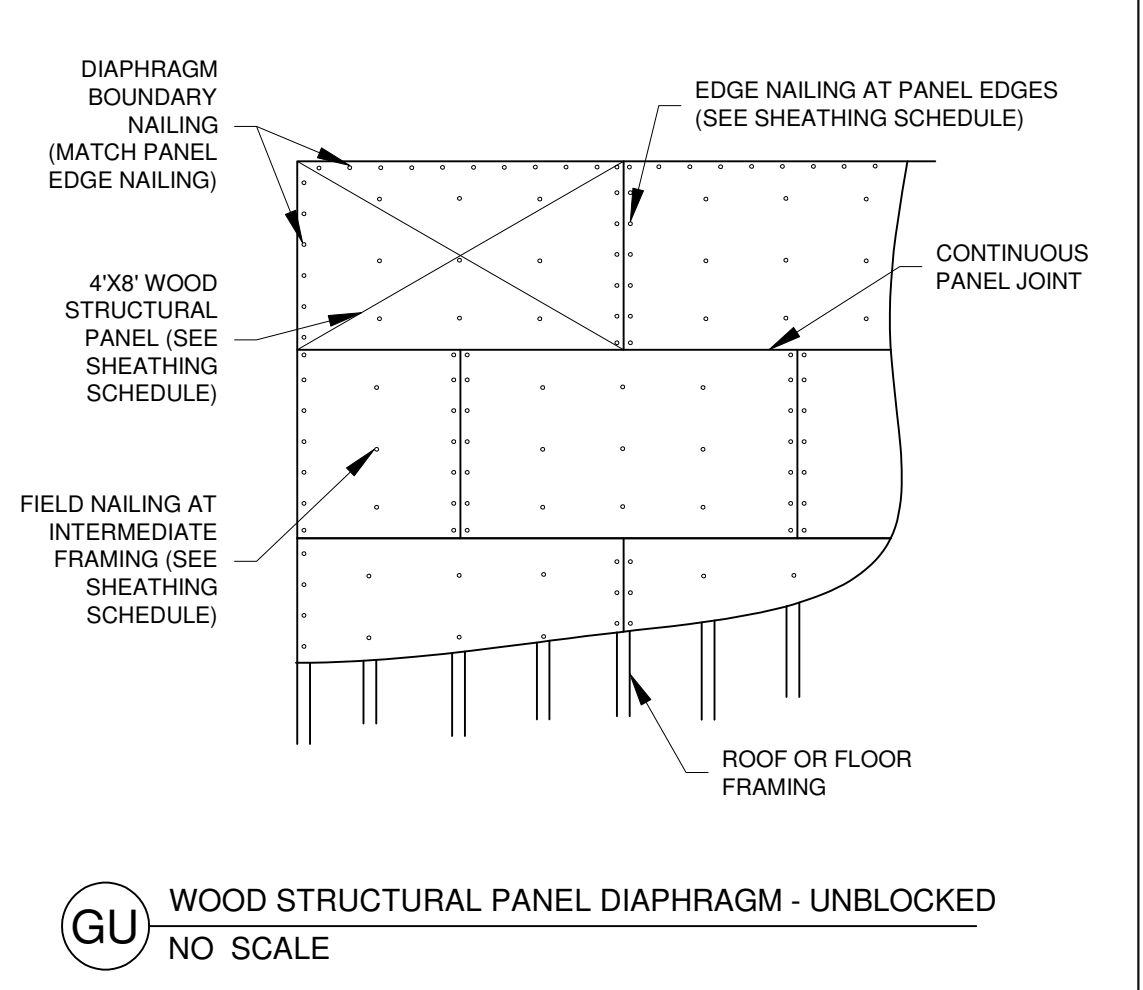
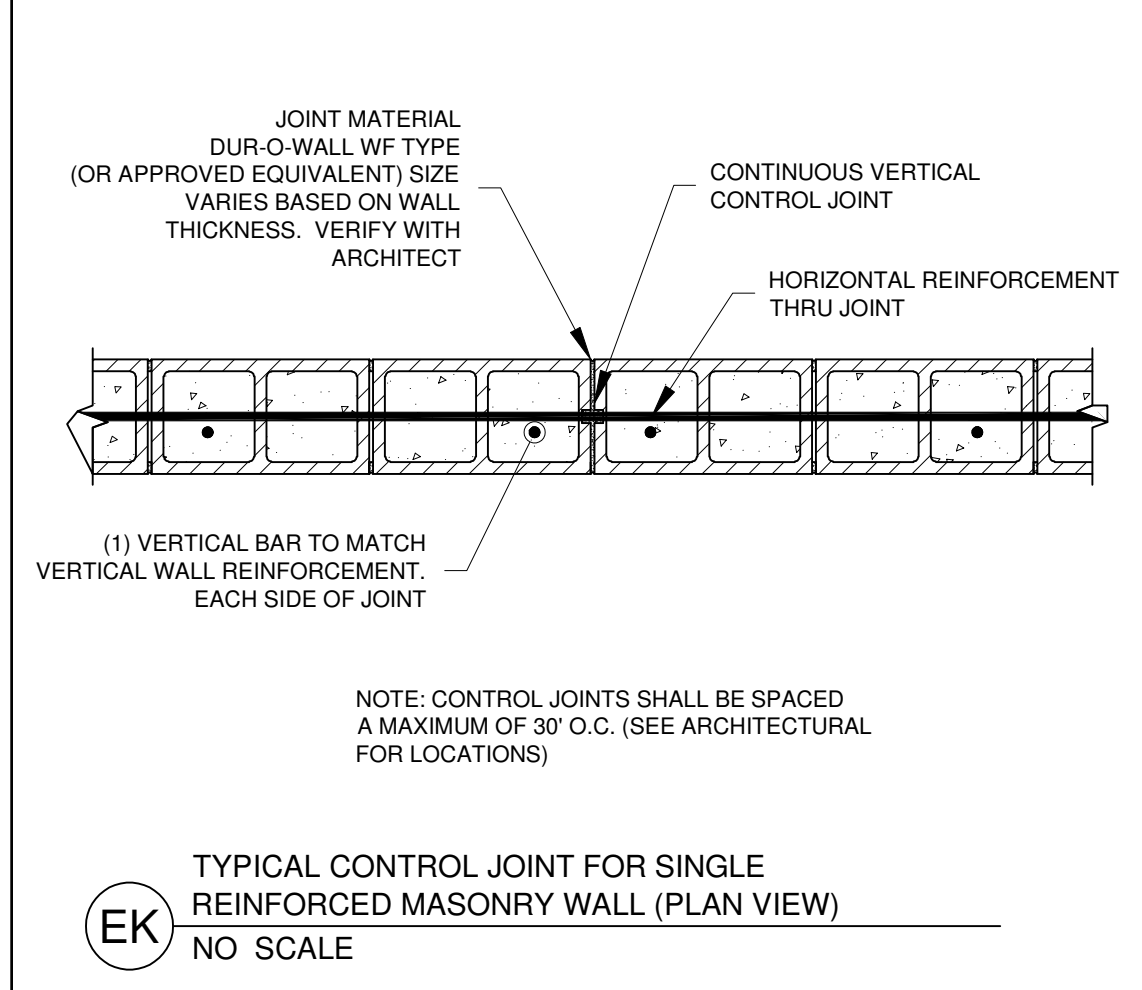
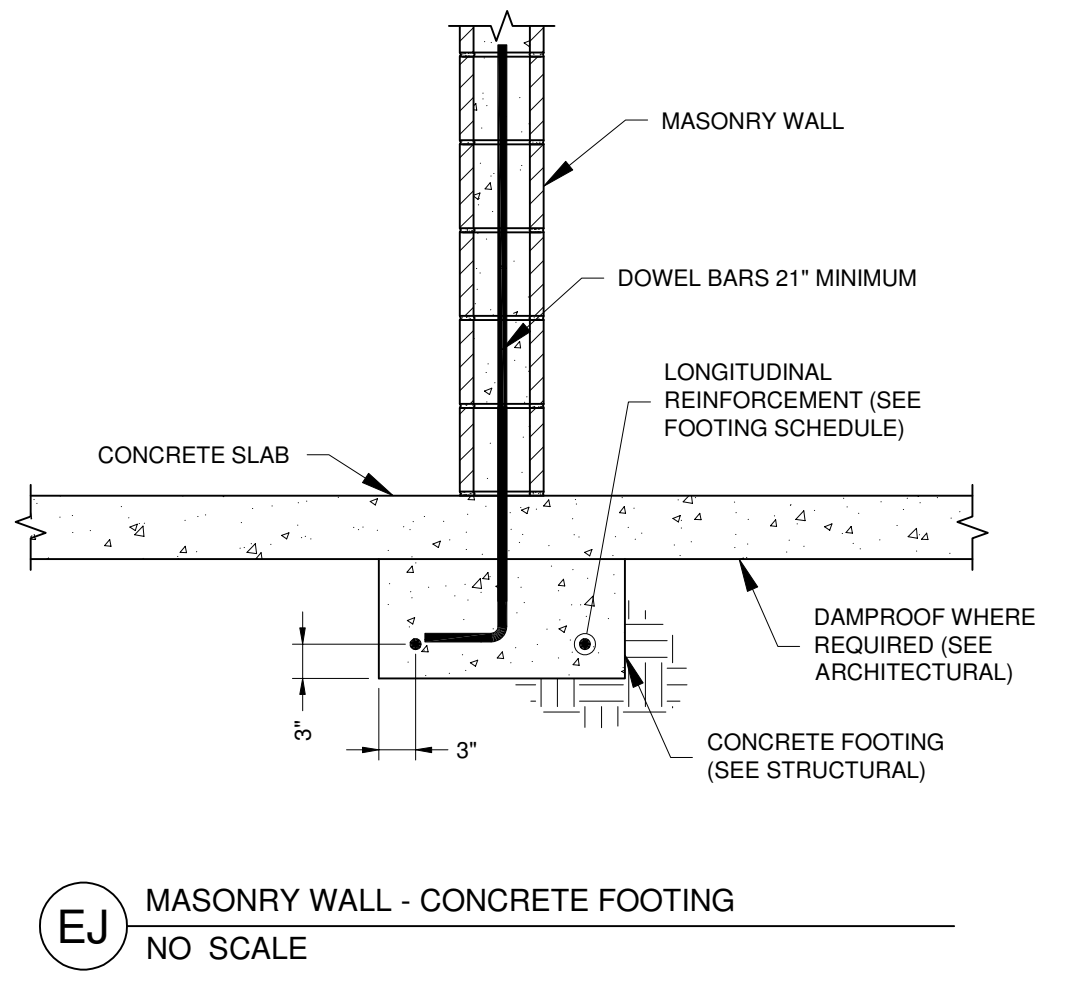
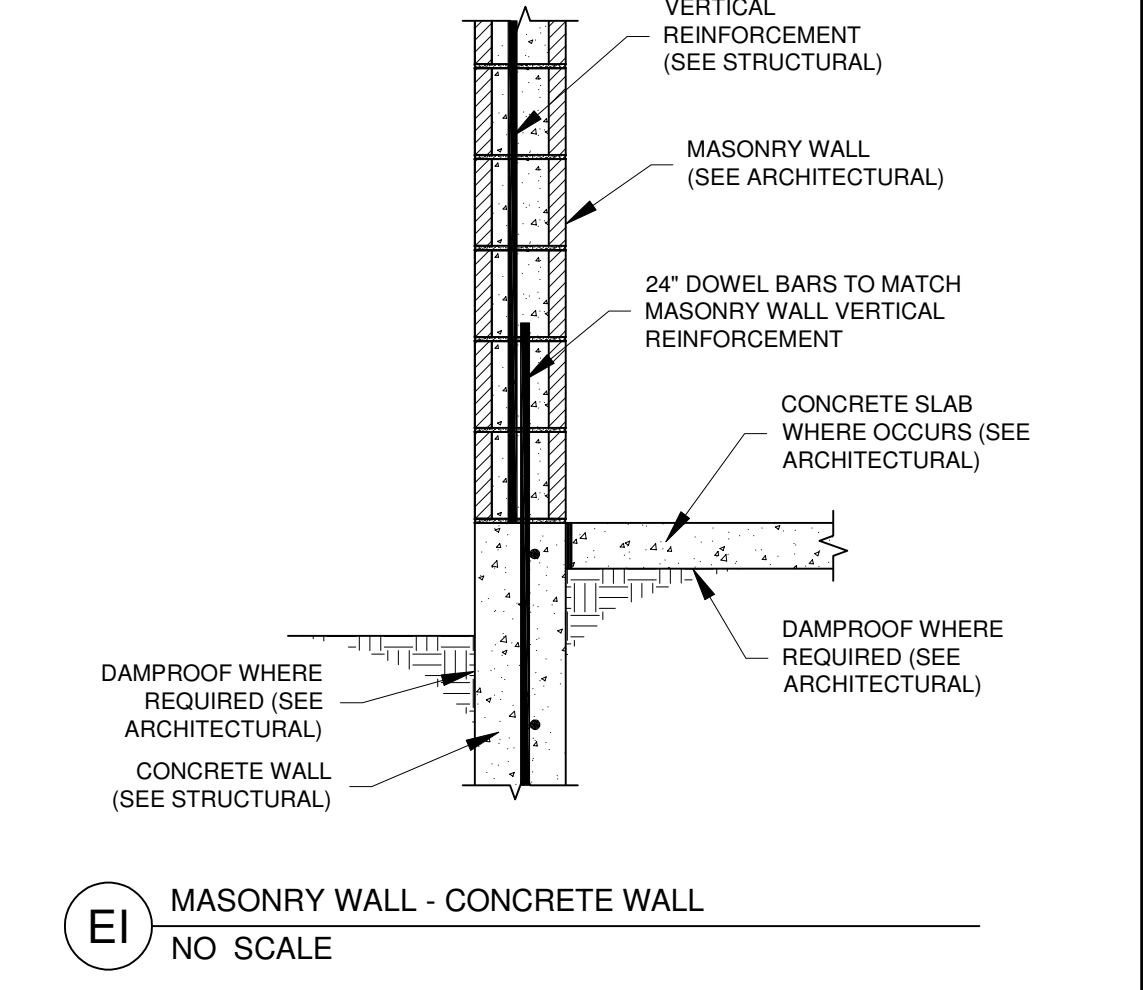
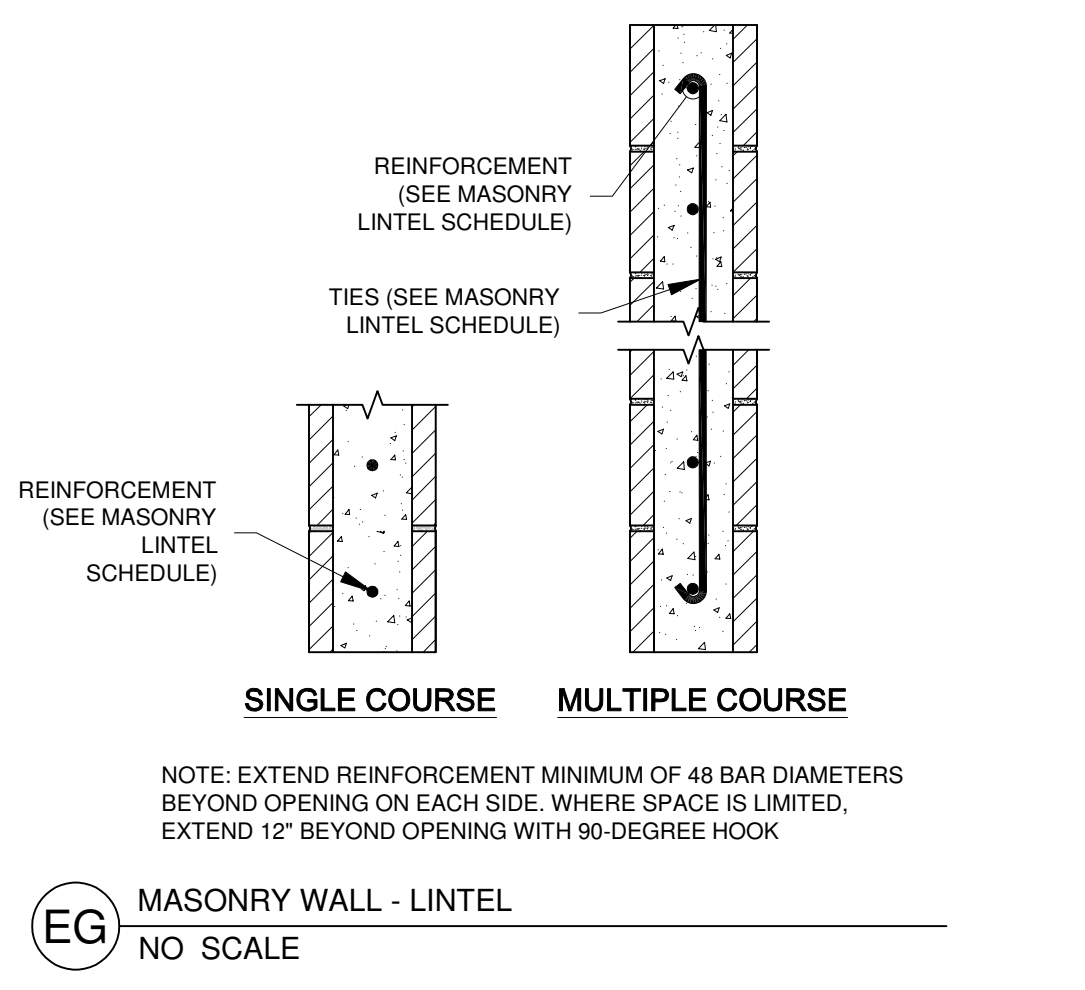
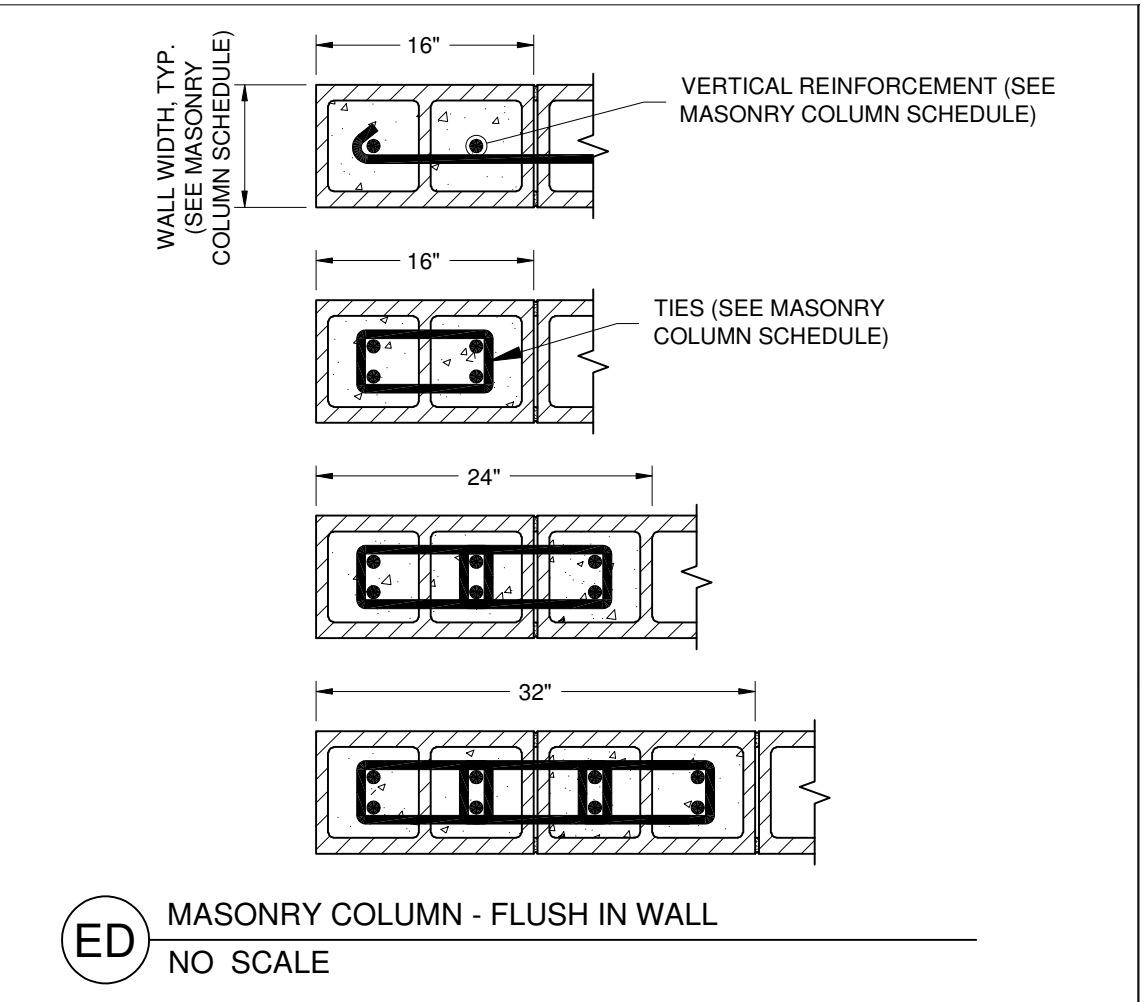
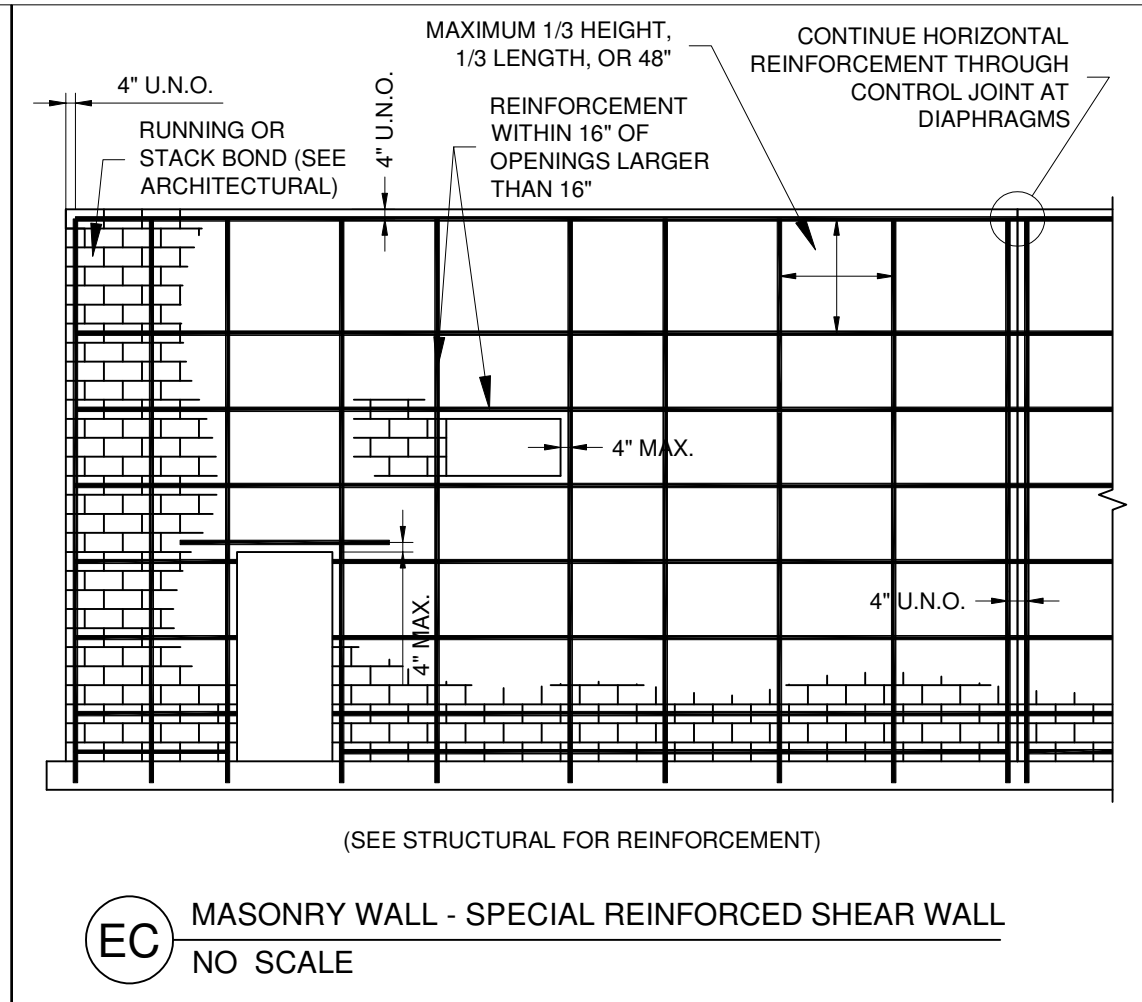
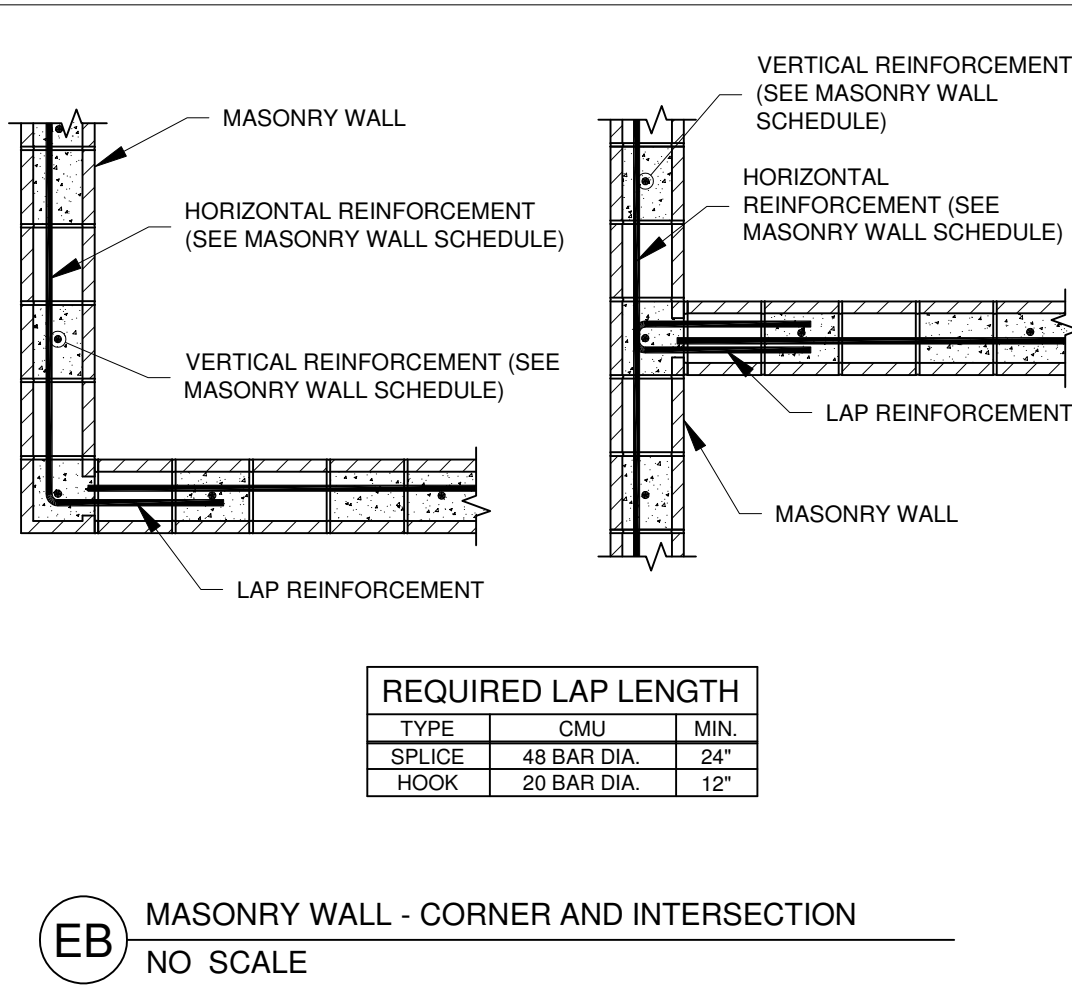
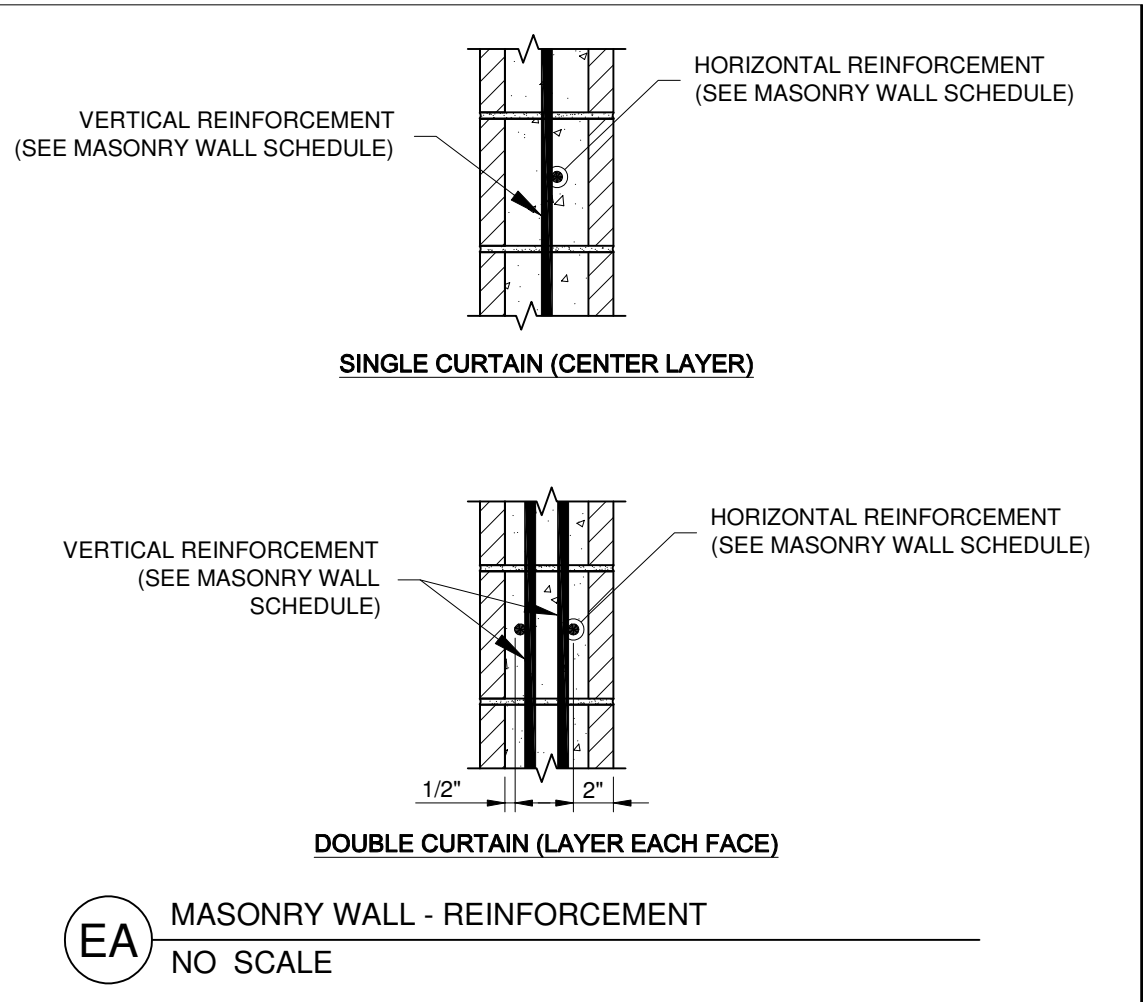
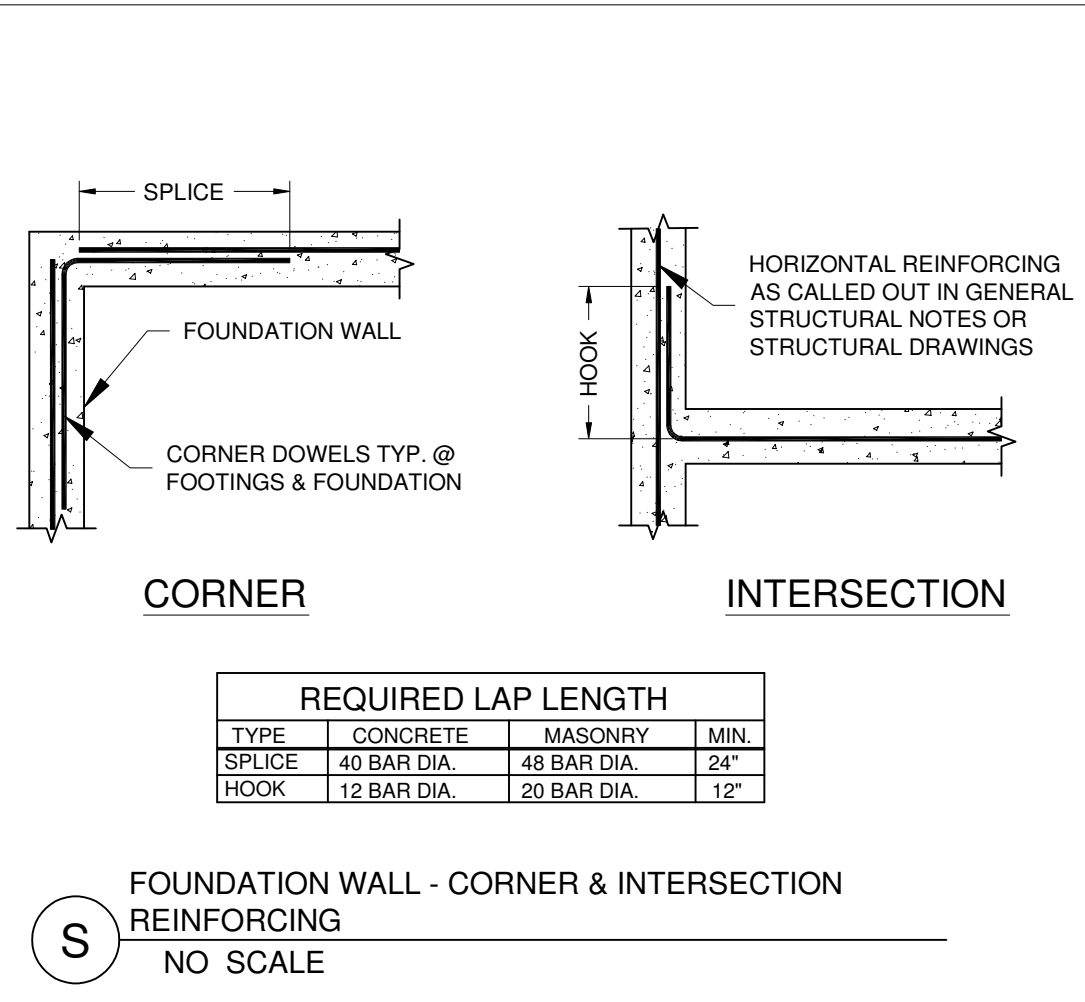
NOTE!
ALL INTERIOR CONCRETE BLOCK WALLS
AARE DETAILED AT 8" BLOCK WALLS.

SHEET NO. **S1**

L & I DESIGNS
3355 WEST 7900 SOUTH
BENJAMIN, UT 84660
TELE: (801) 798-0707
FAX: (801) 798-0707
Dlundell@AOL.COM

FOUNDATION AND FRAMING PLANS

SALEM REC RESTROOM
STAN & KALLE COLE PARK
60 SOUTH 300 WEST
SALEM, UT 84653



ACUTE ENGINEERING, INC.
744 S 400 E
Orem, UT 84097
Phone 801.229.9020
Fax 801.224.0050
info@acuteengineering.com

THESE STRUCTURAL DRAWINGS ARE BASED ON ARCHITECTURAL DRAWINGS. SEE CURRENT ISSUE OR REVISION DATE.
DIMENSIONS AND ELEVATIONS ARE SUPPLIED BY THE ARCHITECT. THEY MAY BE PROVIDED ON THE STRUCTURAL PLANS AND DETAILS FOR THE CONVENIENCE OF THE CONTRACTOR. VERIFY DIMENSIONS AND ELEVATIONS WITH ARCHITECTURAL DRAWINGS.

ORIGINAL PROJECT # 11100621
DRAWN BY: MFR
CHECKED BY: MCW
SCALE: NTS
DATE: 19 JUL 2021

SALEM CITY COLE PARK RESTROOM STRUCTURE (SALEM)

STRUCTURAL DETAILS

ISSUES / REVISIONS

PROFESSIONAL ENGINEER
No. 289510
CHRISTOPHER W. HOSKINS
05/27/2021
STATE OF UTAH

SD1

GENERAL STRUCTURAL NOTES

DESIGN CRITERIA Salem City Cole Park Restroom Structure (Salem) 11100621

1. Building code: Utah Code, Title 15A
 - 1.1 Model building code: 2018 IBC
 - 1.2 Use and occupancy classification: A-3 (Assembly - worship, recreation, amusement)
 - 1.3 Risk Category: II (Not occupancy categories I, III, IV)
2. Dead loads
 - 2.1 Roof = 15 psf (10 psf top chord, 5 psf bottom chord)
 - 2.2 Floor = 12 psf
 - 2.3 Walls = 0 psf (interior walls), 87 psf (exterior walls)
3. Live loads
 - Roofs (ordinary construction) = 20 psf (or 300 lb point load)
4. Rain load
 - 4.1 Median 15-minute duration rainfall intensity = 4.01 in/hr
 - 4.2 Median 60-minute duration rainfall intensity = 1.67 in/hr
5. Snow load
 - 5.1 Ground snow load, P_g = 34 psf (elevation 4645 ft)
 - 5.2 Exposure factor, C_e = 1
 - 5.3 Thermal factor, C_t = 1
 - 5.4 Snow importance factor, I_s = 1
 - 5.5 Flat roof snow load, P_f = 24 psf
 - 5.6 Roof slope factor, C_s = 1
6. Earthquake design data
 - 6.1 Mapped acceleration parameters
 - 6.1.1 Latitude, Longitude: 40.046, -111.681
 - 6.1.2 MCE short period
 - 6.1.3 MCE 1.0 sec. period

S _s = 1.6	SDS = 1.28
S ₁ = 0.6	SD1 = 0.68
 - 6.2 Seismic design category: D
 - 6.3 Seismic importance factor, I_e = 1
 - 6.4 Basic structural system: Bearing wall systems
 - 6.5 Seismic force-resisting system: Special RM shear walls
 - 6.5.1 Response modification factor, R = 5
 - 6.5.2 System overstrength factor, Omega = 2.5
 - 6.5.3 Deflection amplification factor, Cd = 3.5
 - 6.6 Equivalent Lateral Force Procedure
 - 6.6.1 Seismic response coefficient, C_s = 0.26
 - 6.6.2 Seismic base shear (LRFD), V = 17180 lb
7. Wind design data
 - 7.1 Exposure category: C
 - 7.2 Basic design wind speed, V = 105 mph
 - 7.3 Components and cladding pressure = 24 psf (end), 21 psf (interior)
 - 7.4 Internal pressure coeff., Gcpi = 0.18
8. Geotechnical design basis:
 - Presumptive values, 2018 IBC Table 1806.2
 - 8.2 Site class = D-Default
 - 8.3 Soil notes: None
 - 8.4 Lateral earth pressure
 - 8.4.1 Active = 30 psf/ft
 - 8.4.2 At-rest = 60 psf/ft
 - 8.5 Allowable foundation parameters
 - 8.5.1 Allowable soil bearing, Q_a = 1500 psf
 - 8.5.2 Allowable lateral bearing = 150 psf/ft
 - 8.5.3 Coefficient of friction = 0.25
 - 8.6 Minimum frost cover = 30 in.

DEFERRED SUBMITTALS

1. The following items are to be submitted subsequent to the time of application (deferred submittals):
 - Prefabricated metal plate wood trusses - roof (truss manufacturer)
2. Deferred submittals shall have the prior approval of the building official (2018 IBC 107.3.4.1).
3. Deferred submittal documents shall be submitted to the registered design professional in responsible charge who shall review and forward them to the building official with a notation indicating that the documents have been reviewed and found to be in general conformance to the design of the building (2018 IBC 107.3.4.1).
4. Deferred submittal items shall not be installed until the design and submittal documents have been approved by the building official (2018 IBC 107.3.4.1).

GENERAL

1. Construction documents are valid for a single use at the project location and shall not be reused, copied, or reproduced without written approval of the registered design professional in responsible charge.
2. General notes and typical details are provided as a supplement to the construction documents and apply where specific notes and details are not available. Specific notes and structural details shall take precedence over general notes and typical details. Structural requirements shown in the framing plans and in structural details shall take precedence over structural notes indicated in architectural sections.
3. Printed dimensions shall take precedence over scales shown on construction documents. The registered design professional in responsible charge does not warrant the accuracy of scaled dimensions.
4. Approval by the inspector does not imply approval by the registered design professional in responsible charge. Structural specifications that are unclear or ambiguous shall be referred to the registered design professional in responsible charge for interpretation or clarification.
5. The registered design professional in responsible charge assumes no liability for the accuracy, completeness, or code compliance of architectural, electrical, mechanical, drainage, or other non-structural specifications.
6. Omissions in and conflicts between the various elements of the construction documents shall be brought to the immediate attention of the registered design professional in responsible charge and shall be resolved by the same before proceeding with any work involved.
7. Requests for substitutions shall be submitted in writing to the registered design professional in responsible charge and shall include the reasons for the request and any cost differentials. Substitutions are not allowed unless approved in writing by the registered design professional in responsible charge.
8. The contractor shall become familiar with all portions of the construction documents and shall ensure that all subcontractors are familiar with those portions pertaining to their area of work. The contractor shall verify all site conditions, dimensions, elevations, coordinate all doors, windows, non-bearing interior and exterior walls, elevations, slopes, stairs, curbs, drains, recesses, depressions, railings, waterproofing, finishes, chamfer, kerfs, and so forth, and immediately notify the registered design professional in responsible charge regarding actual conditions which are not in agreement with the construction documents.
9. The contractor is responsible for the method, means, and sequence of all structural erection except when specifically noted otherwise in the construction documents. The contractor shall provide temporary shoring and bracing, providing adequate vertical and lateral support during erection. Shoring and bracing shall remain in place until all permanent members are placed and all final connections are completed.
10. The contractor is responsible for standard connections, unless noted otherwise. The contractor shall obtain additional assistance from the registered design professional in responsible charge for non-standard connections.

SOIL AND FOUNDATIONS

1. Geotechnical investigations shall conform to 2018 IBC 1803. Excavation, grading and fill shall conform to 2018 IBC 1804. Footings and foundations shall be constructed in accordance with 2018 IBC 1807 through 1810.
2. Where required, the owner shall submit a geotechnical investigation report to the building official in accordance with 2018 IBC 1803. The contractor shall inform the registered design professional in responsible charge if the soil conditions are not consistent with the investigation report and the foundation design data.
3. Excavations for any purpose shall not remove lateral support from any footing or foundation without first underpinning or protecting the footing or foundation against settlement or lateral translation (2018 IBC 1804.1).
4. Excavation outside the foundation shall be backfilled with soil that is free of organic material, construction debris, cobbles and boulders or with a controlled low-strength material (CLSM). The backfill shall be placed in lifts and compacted, in a manner that does not damage the foundation or the waterproofing or dampproofing material (2018 IBC 1804.3).
5. The ground immediately adjacent to the foundation shall have a 5-percent slope away from the building for a minimum distance of 10 feet measured perpendicular to the face of the foundation wall. If physical obstructions or lot lines prohibit 10 feet of horizontal distance, a 5-percent slope shall be provided to an approved alternative method of diverting water away from the foundation. Impervious surfaces within 10 feet of the building foundation shall have a minimum 2-percent slope (2018 IBC 1804.4).
6. Footings and foundations shall be built on undisturbed soil, compacted fill material or CLSM. Compacted fill material and CLSM shall conform to 2018 IBC 1804.5 and 2018 IBC 1804.7, respectively (2018 IBC 1809.2).
7. The top surface of the footings shall be level. The bottom surface of footings is permitted to have a maximum 10-percent slope. Footings shall be stepped where it is necessary to change the elevation of the top surface of the footing or where the surface of the ground has more than a 10-percent slope (2018 IBC 1809.3).
8. The minimum depth of footings below the undisturbed ground surface shall be 12 inches (2018 IBC 1809.4). Foundation walls, piers and other permanent supports shall be extended below the frost line, except where otherwise protected from frost (2018 IBC 1809.5).
9. The placement of footings on or adjacent to 33-percent slopes and steeper shall conform to 2018 IBC 1808.7.
10. Floors of basements shall be placed over base course not less than 4 inches in thickness and a drain shall be installed around the foundation perimeter that consists of gravel or crushed stone containing not more than 10-percent material that passes through a No. 4 sieve (2018 IBC 1805.4.1, 1805.4.2).
11. Backfill shall not be placed against a foundation wall until the wall has sufficient strength and is anchored to the floor above, or is sufficiently braced to prevent damage by the backfill, except bracing is not required for walls supporting less than 4 feet of unbalanced backfill (R404.1.7).

CONCRETE

1. Concrete materials, quality control, and construction shall comply with 2018 IBC Chapter 19 and ACI 318-14.
 - 2.1 Footings:
 - 2.1.1. Ex = 3,000 psi (2018 IBC 1808.8.1) (2,500 psi used in design)
 - 2.2. Interior floor slabs on grade: 4,000 psi
 - 2.3. Exterior floor slabs on grade: 4,000 psi
 - 2.4. Suspended slabs: 4,000 psi
 - 2.5. Walls: 3,000 psi (2018 IBC 1904.1) for R-2, R-3 occupancies and appurtenances
 - 2.6. Fasteners: 4,000 psi for other occupancies
3. Materials
 - 3.1. Cements (ASTM C 150). Concrete exposed to freezing and thawing or deicing chemicals shall conform to the maximum water-cementitious material ratios and minimum compressive strength requirements of ACI 318-14 Table 19.3.1.1 & 19.3.2.1.
 - 3.2. Aggregates (ASTM C 33): nominal maximum size of coarse aggregate shall not be larger than 1/5 the narrowest dimension between forms, nor 1/3 the depth of slabs, nor 3/4 the minimum clear spacing between reinforcing bars or wires, tendons, or ducts (ACI 318-14 26.4.2.1).
 - 3.3. Water used in mixing concrete shall be potable, clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances deleterious to concrete or reinforcement (ACI 318-14 26.4.1.4.1.b).
 - 3.4. Admixtures shall be subject to prior approval by the registered design professional in responsible charge (ACI 318-14 26.4.1.4.1.a).
 - 3.5. Concrete exposed to freezing and thawing or deicing chemicals shall be air-entrained with air content indicated in ACI 318-14 Table 19.3.3.1. Tolerance on air content as delivered shall be plus/minus 1.5 percent (ACI 318-14 R26.4.2.1(a)(5)).
 4. Steel Reinforcement
 - 4.1. Deformed bars:
 - f_y = 60 ksi (ASTM A615)
 - 4.2. Welded plain wire:
 - f_y = 60 ksi (ASTM A1064)
 - 4.3. Deformed Bar Anchors (DBA) (ASTM A1064)
 - 4.4. Headed Stud Anchors (HSA) (ASTM A1064)
 - 4.5. At the time concrete is placed, reinforcement shall be free from ice, mud, oil, or other nonmetallic coatings that decrease bond (ACI 318-14 26.6.1.2).
 - 4.6. Reinforcement shall be accurately placed and adequately supported before concrete is placed, and shall be secured against displacement (ACI 318-14 26.6.2.2).
 - 4.7. Details of reinforcement shall conform to ACI 318-14 Chapter 25.
5. Minimum concrete cover (ACI 318-14 Table 20.6.1.3.1)
 - 5.1. Concrete cast against and exposed to earth: 3 inches
 - 5.2. Concrete exposed to earth or weather:
 - 5.2.1. No. 6 through No. 18 bars: 2 inches
 - 5.2.2. No. 5 bar, W31 wire, and smaller: 1.5 inches
 - 5.3. Concrete not exposed to earth or weather:
 - 5.3.1. Slabs, walls, joists No. 11 bar and smaller: 0.75 inches
 - 5.3.2. Beams, columns primary reinf., ties, stirrups: 1.5 inches
 - 5.4. Formwork shall conform to ACI 318-14 Sections 26.11 and 26.12 and ACI 347. Forms shall be removed in a manner as not to impair safety and serviceability of the structure. Concrete exposed by form removal shall have sufficient strength to be damaged by removal operation (ACI 318-14 26.11.2).
7. Conducts, pipes, and sleeves of any material not harmful to concrete and within the limitations of ACI 318-14 20.7 shall be approved by the registered design professional in responsible charge (ACI 318-14 20.7).
8. Construction joints shall be so made and located as not to impair the strength of the structure (ACI 318-14 18.10.9).
9. The thickness of concrete floor slabs on grade shall not be less than 3.5 inches. A 6-mil polyethylene vapor retarder with joints lapped not less than 6 inches (or an equivalent material) shall be placed between the base course or subgrade and the concrete floor slab, except a vapor retarder is not required in detached utility buildings or other unheated facilities (2018 IBC 1907).

MASONRY

1. Masonry materials, construction, and quality shall conform to 2018 IBC 2103-2105, TMS 402-602-16
 - 1.1. Compressive strength: f_c = 2,000 psi (TMS 602-16 1.4B.2 TABLE 2)
2. Concrete masonry units (CMU) (ASTM C 90)
 - 2.1. Grade N
 - 2.2. Compressive strength: f_m = 2,000 psi (TMS 602-16 1.4B.2 TABLE 2)
3. Mortar (ASTM C 270)
 - 3.1. Type S Portland cement (TMS 402-16 7.4.4.2.2)
 - 3.2. Compressive strength: f_c = 2,000 psi (TMS 602-16 1.4B.2 TABLE 2)
4. Grout (ASTM C 476)
 - 4.1. Type: fine or coarse (2018 IBC 2103.3)
 - 4.2. Compressive strength (minimum specified at 28 days): f_c = 2,000 psi (ASTM C 1019)
5. Steel reinforcement
 - 5.1. Deformed bars: f_y = 60 ksi (ASTM A 615 Gr. 60)
 - 5.2. Deformed Bar Anchors (DBA) (ASTM A1064)
 - 5.3. Headed Stud Anchors (HSA) (ASTM A1064)
6. Bed joint thickness shall be 5/8 inch maximum (TMS 602-16 1.4B.2)
7. Grout shall have an 8"-11" slump using a 3/8" maximum aggregate. Grout lifts shall not exceed 5 feet in height unless noted otherwise. Consolidate by mechanical vibration pours that exceed 12 inches in height.
8. The clear distance between parallel bars shall not be less than the nominal diameter of the bars, nor less than 1 inch (TMS 402-16 6.1.3). Joint reinforcement shall have cover not less than 5/8". (TMS 402-16 6.1.4.2)
9. The diameter of bend measured on the inside of reinforcing bars, other than for stirrups and ties, shall not be less than specified in table 6.1.8 (TMS 402-16 6.1.8.2)
10. All masonry below grade shall be solid grouted.
11. Control joint spacing not to exceed 30'-0". See Architectural for locations.

MASONRY AND STONE VENEER

1. Masonry veneer materials, construction, and quality shall conform to 2018 IBC 2103-2105 and TMS 402-16 Chap. 6.
 - 1.1. Lintels
 - 2.1. Veneer shall not support any vertical load other than the dead load of the veneer above. Veneer above openings shall be supported on lintels of noncombustible materials. Lintels shall have 1 inch of bearing for each 1 foot of span, but not less than 4 inches of bearing.
 3. Anchorage
 - 3.1. Veneer shall be anchored to the supporting wall framing with hot-dipped galvanized metal ties. (Strand wire or corrugated sheet metal)
 - 3.2. Engage all anchor ties with a No. 9 gage wire in the center of the veneer and embedded in the mortar joint. (R703.8.4.1)
 - 3.3. Each tie shall be spaced not more than 16 inches on center horizontally and vertically and shall support not more than 2 square feet of wall area. Additional metal ties shall be provided around all wall openings greater than 16 inches in either dimension. (R703.8.4.1)

WOOD

1. Wood materials, quality, and construction shall conform to 2018 IBC Chapter 23 and Table 2304.10.
 2. Structural lumber (2018 IBC 2303.1.1-9, 2018 NDS)
 - 2.1. Bearing walls: Douglas-Fir Larch (DF) Stud (ASTM D 1990, DOC PS 20)
 - 2.2. Posts: Douglas-Fir Larch (DF) Stud (ASTM D 1990, DOC PS 20)
 - 2.3. Beams and headers: Douglas-Fir Larch (DF) No. 2 (ASTM D 1990, DOC PS 20)
 - 2.4. Heavy timber: Douglas-Fir Larch (DF) No. 1 (ASTM D 1990, DOC PS 20)
 - 2.5. Sill plates: Preservative-treated wood, redwood (AWPA U1 M4)
 - 2.6. Naturally durable or preservative-treated wood shall be used where structural lumber is 18 inches or closer to exposed ground; where structural lumber is in contact with exterior masonry or concrete walls below grade; where sleepers, sills, posts, and columns are on a concrete or masonry slab or footing that is in direct contact with earth; and where structural lumber is attached directly to exterior masonry or concrete walls, unless a 0.5 inch air space on top, sides, and end is provided (2018 IBC 2304.12).
 3. Structural logs (ASTM D 3957) - ICC - 400 standard for the design and construction of log structures
 4. Structural glued-laminated timber (2018 IBC 2303.1.3, 2018 NDS 5.1.1)
 - 4.1. Single span: 24F-1.8E (24F-V4) (ASTM D 3737, ANSI/AITC A190.1)
 - 4.2. Multiple span: 24F-1.8E Balanced layout (24F-V8) (ASTM D 3737, ANSI/AITC A190.1)
 - 4.3. Cantilever span: 24F-1.8E (ASTM D 3737, ANSI/AITC A190.1)
 5. Structural composite lumber and engineered wood (2018 IBC 2303.1.10, 2018 NDS 8.1.1)
 - 5.1. Laminated strand lumber (LSL)
 - 5.1.1. Ex = 1.3E (ASTM D 5456)
 - 5.1.2. Ex = 1.5E (ASTM D 5456)
 - 5.1.3. Ex = 1.5E (ASTM D 5456)
 - 5.1.4. 1/2 inch APA Performance-Rated (or equivalent) rim board - (2018 IBC 2303.1.13, ASTM 7672, ANSI/APA PR410)
 - 5.2. Laminated veneer lumber (LVL)
 - 5.2.1. Ex = 2.0E (ASTM D 5456)
 - 5.3. Parallel strand lumber (PSL)
 - 5.3.1. Ex = 2.0E (beams) (ASTM D 5456)
 - 5.3.2. Ex = 1.8E (columns) (ASTM D 5456)
 - 5.4. Prefabricated wood I-joist (2018 IBC 2303.1.2, 2018 NDS 7.1.1) (ASTM D 5055)
 6. Wood structural panels (2018 IBC 2304.8, 2018 NDS 9.1.3)
 - 6.1. Roof, floor, and wall sheathing: oriented strand board (OSB) (DOC PS 1.2)
 - 6.2. Sheathing shall be manufactured with exterior glue and not less than 4X8 feet, except at boundaries and at changes in framing (2018 IBC 2305.1, AWC SDPWS-2015).
 - 6.3. Wall sheathing
 - 6.3.1. Oriented strand board (OSB) (DOC PS 1.2)
 - 6.3.2. All panel joints in walls shall occur over studs or blocking using a minimum of 8d common nails spaced a maximum of 6 inches at panel edges and 12 inches at intermediate framing (2018 IBC 2306.3).
 - 6.4. Roof and floor sheathing shall be placed perpendicular to supporting framing. Stagger sheathing joints.
 7. Fasteners
 - 7.1. Nails (2018 IBC 2303.6, 2018 NDS Table L4) (ASTM F 1667)

Pennyweight	Common	Box	Sinker
7.1.1. 8d	= 0.131" X 2.5"	0.113" X 2.5"	0.113" X 2.375"
7.1.2. 10d	= 0.148" X 3.0"	0.128" X 3.0"	0.120" X 2.875"
7.1.3. 16d	= 0.185" X 3.5"	0.135" X 3.5"	0.148" X 3.250"
7.1.4. 20d	= 0.192" X 4.0"	0.148" X 4.0"	0.177" X 3.750"
7.1.5. 30d	= 0.207" X 4.5"	0.148" X 4.5"	0.192" X 4.250"
 - 7.2. Staples (2018 IBC 2303.6)
 - 7.2.1. 16 gage = 1.5X0.4375 inch crown (ASTM F 1667)
 - 7.3. Bolts (2018 NDS 12.1.1.3, Table L1)
 - 7.3.1. Connector bolts (A307)
 - 7.3.2. Anchor bolts (A307) with a 3X3X0.229 inch washer (2018 IBC 2308.3.1) and 7" min embedment.
 - 7.3.3. Bolt holes shall be drilled with a bit 1/32 inch to 1/16 inch larger than the nominal bolt diameter.
 - 7.4. Lag Screws (2018 NDS 12.1.4, Table L2) (A307)
 - 7.4.1. Lag screws shall be inserted in a drilled pilot hole that is 60%-75% of the shank diameter by turning with a wrench. Do not drive screws with a hammer. Lag screws shall be provided with an oversized washer.
 - 7.5. Fasteners in preservative-treated and fire-retardant-treated wood shall be of hot dipped zinc-coated galvanized steel, silicon bronze or copper (2018 IBC 2304.10.5).
 - 7.6. Sheathing fasteners shall be driven so the head or crown is flush with the sheathing surface (2018 IBC 2304.10.2).
 8. Joist hangers and connectors (2018 IBC 2303.5)
 - 8.1. Hanger hardware and other wood connections shall be designed to carry the capacity of the supporting members.
 9. Floor framing (2018 IBC 2308.4)
 - 9.1. Joists shall not have less than 1.5 inches of bearing on wood or metal, or less than 3 inches on masonry (2018 IBC 2308.4.2.2). Pre-fabricated wood I-joists shall have minimum bearing according to the manufacturer's recommendations and specifications.
 - 9.2. Joists shall be supported laterally at the ends and at each support by full-depth solid blocking, except where nailed to a header or band or rim joist. Solid blocking shall not be less than 2 inches thick (2018 IBC 2308.4.2.3).
 - 9.3. Where the nominal depth-to-thickness ratio of the framing member exceeds 6:1, there shall be one line of bridging for each 8 feet of span. Bridging shall consist of not less than 1X3 inch lumber, metal bracing, or full-depth solid blocking (2018 IBC 2308.4.6).
 - 9.4. Notches on the ends of joists shall not exceed one-fourth the joist depth. Holes bored in joists shall not be within 2 inches of the top or bottom of the joist. Notches in the top or bottom of joists shall not exceed one-sixth the depth and shall not be located in the middle third of the span (2018 IBC 2308.4.2.4).
 - 9.5. The diameter of holes bored or cut into structural floor members shall not exceed one-third the depth of the member. Holes shall not be closer than 2 inches to the top or bottom of the member, or to any other hole located in the member. Where the member is also notched, the hole shall not be closer than 2 inches to the notch (R502.8.1).
 10. Wall construction (2018 IBC 2308.5)
 - 10.1. Studs shall be placed within their wide dimension perpendicular to the wall. Not less than three studs shall be installed at each corner of an exterior wall (2018 IBC 2308.5.2).
 - 10.2. Bearing and exterior wall studs shall be capped with 2-inch thick nominal double top plates, have a width at least equal to the width of the studs, and shall be installed to provide overlapping at corners and intersections with other partitions. End joints in partitions shall be offset at least 48 inches, and shall be nailed with not less than eight 16d common face nails on each side of the joint. (2018 IBC 2308.5.3.2).
 - 10.3. In nonbearing walls and partitions studs shall be capped with not less than a single top plate installed to provide overlapping at corners and at intersections with other walls and partitions. The plate shall be continuously tied at joints by solid blocking at least 16 inches in length and equal in size to the plate or metal ties with spliced sections fastened on each side of the joint (2018 IBC 2308.5.4).
 - 10.4. Studs shall have full bearing on a 2-inch thick nominal (or larger) bottom plate or sill having a width at least equal to the width of the stud (2018 IBC 2308.5.3.1).
 - 10.5. Bearing partitions perpendicular to joists shall not be offset from supporting girders, walls or other bearing partitions. Bearing partitions perpendicular to joists shall not be offset from supporting girders, walls or partitions more than the joist depth unless noted otherwise (2018 IBC 2308.4.5).
 - 10.6. In exterior walls and bearing partitions, any wood stud is permitted to be cut or notched to a depth not exceeding 25 percent of its width. In nonbearing partitions, cutting or notching of studs to a depth of not greater than 40 percent of the width is permitted (2018 IBC 2308.5.3).
 - 10.7. A hole with a diameter not greater than 40 percent of the stud width is permitted to be bored in any wood stud. In no case shall the edge of the bored hole be nearer than 0.625 inches to the edge of the stud. Bored holes shall not be located at the same section of stud as a cut or notch (2018 IBC 2308.5.10).
 - 10.8. Bearing walls without wood sheathing or gypsum wall board on either side shall have blocking between wall studs at mid-height.
 - 10.9. Studs shall be spaced at 16 inches on center for exterior walls, interior bearing walls, and shear walls, unless noted otherwise on the plans.
 11. Posts and columns
 - 11.1. Columns shall be as wide as the member they support, laterally supported at all floor levels, and extend down through the structure to the foundation. Provide squash blocking at rim joist below all columns, trimmers, and posts.
 - 11.2. Wood columns and posts shall be framed to provide full end bearing (2018 IBC 2304.10.7).
 - 11.3. Posts and columns shall be supported by concrete piers or metal pedestals projecting above concrete or masonry floors or decks exposed to weather or water splash, or in basements, and which support permanent structures, unless naturally durable or preservative-treated wood is used. The pedestal shall project at least 6 inches above exposed earth and at least 1 inch above floors.
 12. Roof and ceiling framing (2018 IBC 2308.7).
 - 12.1. Roof rafters and ceiling joists shall be supported laterally to prevent rotation and lateral displacement in accordance with 2018 IBC 2308.7.6.
 - 12.2. Rafters and joists over three feet long shall be supported using hanger hardware if not supported by bearing.

PRE-FABRICATED METAL PLATE WOOD TRUSSES

1. Prefabricated metal plate wood trusses shall be designed in accordance with 2018 IBC 2303.4 and shall conform to the structural specifications and design criteria.
2. The truss designer shall provide a truss package that includes the following items:
 - 2.1. Design drawings of each individual truss (2018 IBC 2303.4.3).
 - 2.2. Truss placement diagram for the project (2018 IBC 2303.4.2).
 - 2.3. Truss member permanent bracing specification (2018 IBC 2303.4.1.2).
3. Transfer of loads and anchorage of each truss to the supporting structure shall be approved by the registered design professional in responsible charge (2018 IBC 2303.4.4).
4. Truss members and components shall not be cut, notched, drilled, spliced or otherwise altered in any way without written concurrence and approval of the registered design professional in responsible charge. Alterations resulting in the addition of loads to any member (e.g. HVAC equipment) shall not be permitted without verification that the truss is capable of supporting such additional loading (2018 IBC 2303.4.5).

STEEL

1. Structural steel work shall conform to 2018 IBC 2205, AISC 341-16, AISC 358-16, and AISC 360-16.
2. Structural shapes
 - 2.1. W: f_y = 50 ksi (ASTM A992)
 - 2.2. M,S,C,M,C, and L: f_y = 36 ksi (ASTM A36)
 - 2.3. HP: f_y = 50 ksi (ASTM A572 Gr. 50)
 - 2.4. HSS Rectangular: f_y = 46 ksi (ASTM A500 Gr.B)
 - 2.5. HSS Round: f_y = 42 ksi (ASTM A500 Gr.B)
 - 2.6. Pipe: f_y = 35 ksi (ASTM A53 Gr.B)
- 2.7. All structural steel shall be properly primed and painted.
3. Plates and bars: f_y = 36 ksi (ASTM A36)
4. Structural fasteners
 - 4.1. High-strength bolts: f_u = 120-150 ksi (ASTM F3125)
 - 4.2. Common bolts: f_u = 60 ksi (ASTM A307 Gr. A)
 - 4.2.1. Nuts (ASTM A563)
 - 4.2.2. Washers (ASTM F436)
- 4.2.3. Steel to steel bolted connections shall be made with high strength-bolts, unless noted otherwise. Bolts shall carry the identifying mark of three radial lines. All other bolted connections shall be made with bolts and nuts conforming to ASTM A307 unless note otherwise. Bolted connections shall be tightened and shall have washers as required by AISC unless noted otherwise. Enlarging holes shall be accomplished by means of reaming. Do not use a torch on any bolt holes.
- 4.3. Shear studs: f_u = 65 ksi (ASTM A108)
- 4.4. Threaded rods: f_u = 36 ksi (ASTM A36)
- 4.5. Anchor rods: f_y = 36 ksi (ASTM F1554 Gr. 36)
5. Steel deck f_y = 36 ksi (ASTM A1008)
6. Welding
 - f_u = 70 ksi.
 - 6.1. Welding work shall comply with the American Welding Society (AWS) "Structural Welding Code," excluding items conflicting with AISC requirements.

POST-INSTALLED ANCHORS

1. Epoxy adhesive anchoring systems:
 - 1.1. Concrete: Hilti HIT-RE 500 V3 (ICC ES ESR-3814) or Simpson SET-XP (ICC ES ESR-2508) or USP/Mitek CIA-GEL 7000-C (IAMPO ER-473)
 - 1.2. Masonry (grouted): Hilti HIT-RE 100 (ICC ES ESR-3829) or Simpson SET (ICC ES ESR-1772) or USP/Mitek CIA-GEL 7000 (ICC ES ESR-1702)
 - 1.3. The calculated strength of anchorage assumes the following conditions for installation: 21 day minimum age of concrete, maximum short term concrete temperature = 150 °F, maximum long term concrete temperature = 110 °F, dry concrete surface, and normal weight concrete. See adhesive manufacturer notes for minimum temperature requirements. If conditions are otherwise, contact engineer for anchor specifications.
 - 1.4. Steel reinforcement and rods shall be embedded 10 bar diameters unless noted otherwise in the structural drawings and details. Where 10 bar diameters exceeds the member thickness minus minimum cover, steel