

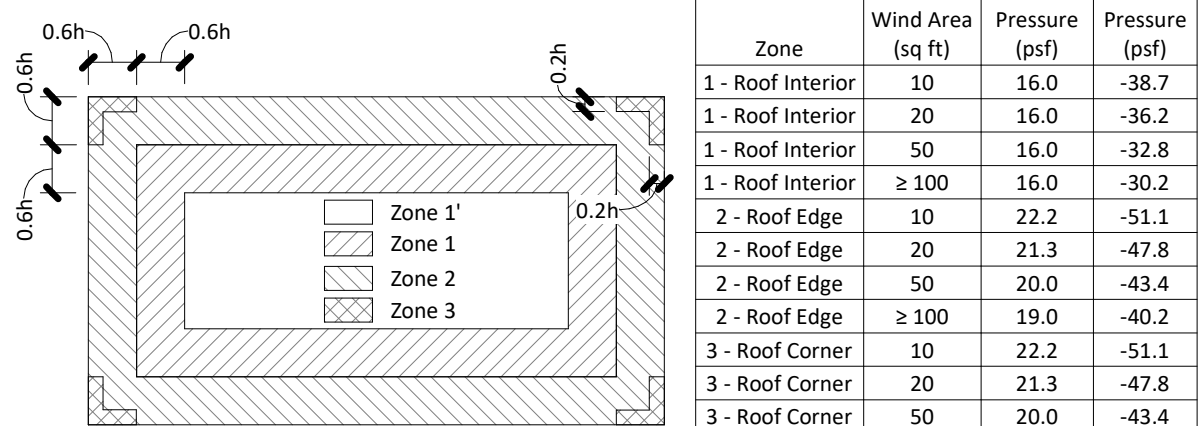
Design Specifications:

- ASCE 7-16
- ACI 318-16
- ACI 308-16
- AISI S300-15
- AISI S100-16
- ANSI / AWC NDS-18

Roof Loads:	Wind Loads:	Seismic Loads:	
• Dead Load: 20 psf	• Occupancy: III	• S _s :	1.25
• Live Load: 20 psf	• Velocity: 117 mph	• S ₁ :	0.098 g
M.E.P. Zone:	• Exposure: B	• Site Class:	0.068 g
• Dead Load: 65 psf	• Iw: 1.0	• S _{DS} :	D
		• S _{0.1} :	0.105 g
	Snow Loads:	• Seismic Design Category:	9
• Floor Loads:	• P _g :	• Seismic Force-Resisting System:	S.O.M.F.
• Dead Load: 65 psf	• P ₁ :	Design Base Shear:	C.W
• Office Live: 80 psf	• C _e :	• C _s :	0.0373
	• I _s :	• R _s :	5.5
	• C _e :	• Analysis Procedure Used:	E.L.F.P.
	Drift Load:		
	Per Plan		

Design Load Notes:

1. Dead load shown includes collateral load of 4 psf and solar load of 6 psf.
2. See components and cladding table for design wind pressures.
3. See net uplift diagram for roof framing due to wind pressures.



Components & Cladding Wind Zone Diagram

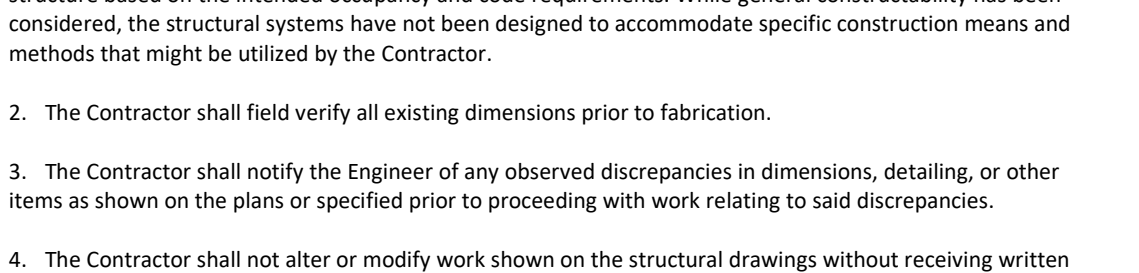
1. The components & cladding (C&C) wind pressures shown assume a mean roof height of 32'-0" above finished floor elevation. All components shall be designed to resist the provided pressures, which shall be clearly defined on all shop drawings. Refer to wind zone diagram for locations. Plus and minus signs signify pressures acting toward and away from surfaces, respectively.
2. The components & cladding wind zone diagram is generalized to show all possible conditions. The diagram shape may not match the specific layout of this project.

a = 17'-6"

b = 8 psf

c = 14 psf

d. Internal Pressure Coefficient = +0.18



(Pressures shown are service level.)

General:

1. The structural systems shown on these documents have been designed for the final, in place usage of the structure based on the intended occupancy and code requirements. While general constructability has been considered, the structural systems have not been designed to accommodate specific construction methods and methods that might be utilized by the Contractor.
2. The Contractor shall field verify all existing dimensions prior to fabrication.
3. The Contractor shall notify the Engineer of any observed discrepancies in dimensions, detailing, or other items as shown on the plans or specified prior to proceeding with work relating to said discrepancies.
4. The Contractor shall not alter or modify work shown on the structural drawings without receiving written approval from the Engineer.

5. The Contractor shall be responsible for supplying shop drawings for joist girders, bar joists, structural steel, metal deck, reinforcing steel and concrete mix designs. Shop drawings must be reviewed for conformance with the means, methods, techniques, sequences, and operations of construction, and safety precautions and programs indicated thereto, all of which are the sole responsibility of the Contractor, and shall be stamped "approved" by the Contractor prior to submittal. Shop drawings submitted without the Contractor's stamped approval will be returned "rejected". All shop drawings shall be reviewed by the Structural Engineer prior to construction.
6. See architectural, mechanical, and electrical drawings for other pertinent information related to the structural work and coordinate as required. These structural drawings are intended to be included in a complete set of construction documents, including but not limited to, architectural drawings, civil drawings, and mechanical/electrical/plumbing drawings. Contractor shall verify coordination of these drawings with contents of above drawing sets specified and only proceed with bidding and construction after such has taken place.

7. The building and the independent structural components shown in these documents are not structurally stable until all connections, framing, shear walls, diaphragms, permanent bracing, metal decking, interior and exterior concrete slabs on grade, and exterior or interior load-bearing walls are complete and have achieved their design strength. Contractor is solely responsible for maintaining structural stability during erection and construction. Temporary bracing systems shall remain in place until all structural work is complete.
8. The Contractor is responsible for verifying all existing dimensions and conditions of the existing building and reporting discrepancies from the assumed conditions shown on the structural drawings to the Engineer of record prior to fabrication and erection of any member.
9. The Contractor shall coordinate the roof drainage system with the Architect as required to ensure that no more than 3 1/2" of water can accumulate before entering an overflow drainage system.

Structural Engineer Site Observations:

1. The contract structural drawings & specifications represent the finished structure, and, except where specifically shown, do not indicate the method or means of construction. The Contractor shall supervise and direct the work and shall be solely responsible for all construction means, methods, procedures, techniques, and sequence.
2. The Engineer shall not have control or charge of and shall not be responsible for construction means, methods, techniques, sequences, or procedures, for safety precautions & programs in connection with the work, for the omission of the Contractor, subcontractor, or any other persons performing any of the work, or for the failure of any of them to carry out the work in accordance with the contract documents.

3. Periodic site observation by field representatives of BSE Structural Engineers LLC is solely for the purpose of determining if the work of the Contractor is proceeding in general accordance with the structural contract documents. This limited site observation should not be construed as exhaustive or continuous to check the quality or quantity of work, but rather periodic in an effort to guard the Client against defects or deficiencies in the work of the Contractor.
4. Anchor rods shall conform to ASTM F1554 Gr. 36 (U.N.O.) and shall be located by means of a template. Provide a not above and below template to assure proper vertical alignment.
5. All foundations shall be square and level.

6. Grout shall be dry and stiff to prevent shrinkage, with a minimum compressive strength of 4000 psi. Grout below column base plates and precast panels is required. Thoroughly compact grout beneath base plates.
7. G.C. option to provide alternate auger cast pile design per subcontractor. Design to be reviewed & approved by BSE prior to construction.

Foundations:

1. Foundations for this project have been designed in accordance with requirements set forth in a geotechnical addendum prepared by Terracon Consultants (Project #02259318.0, ACP pile foundations dated June 28, 2021). This is an addendum to geotechnical report (Project #022195181 Drilled Shafts dated August 2, 2019). Augered, cast in place (ACP) piles have been designed for an allowable soil bearing value of 40,000 psf. The Contractor shall refer to the Geotechnical Report for all requirements and recommendations pertinent to this project.

2. Anchor rods shall conform to ASTM F1554 Gr. 36 (U.N.O.) and shall be located by means of a template. Provide a not above and below template to assure proper vertical alignment.
3. All foundations shall be square and level.

4. Grout shall be dry and stiff to prevent shrinkage, with a minimum compressive strength of 4000 psi. Grout below column base plates and precast panels is required. Thoroughly compact grout beneath base plates.
5. G.C. option to provide alternate auger cast pile design per subcontractor. Design to be reviewed & approved by BSE prior to construction.

Concrete and Reinforcing Steel:

1. Concrete mix designs shall meet the following requirements:

Location	Minimum Compressive Strength (psi)	Max. Aggregate Size	Water/Cement Ratio	Slump (in.)	Air Entrainment (%)
Interior Slabs	4000	3/4"	0.50	4 ± 1	0
Exterior Slabs	3500	3/4"	0.50	4 ± 1	6 ± 1
Interior Foundations	3000	1"	0.50	4 ± 1	0
Perimeter Foundations	3000	1"	0.50	4 ± 1	6 ± 1
Exterior Walls & Prestcasts	4000	3/4"	0.50	4 ± 1	6 ± 1
Composite Floor Slab	4000	1/2"	0.48	4 ± 1	0
Interior Pier Caps	5000	1"	0.50	4 ± 1	0

2. Fly ash shall not be used unless approved in writing by the Engineer. Fly ash, if approved, shall conform to ASTM C618 and ACI 232.2R-96. Fly ash shall be limited to types C & F and shall not exceed 15% of the total cement wt.
3. The use of admixtures to increase the slump shall not be used unless approved in writing by the Engineer.
4. All concrete is reinforced unless specifically called out as unreinforced. Reinforce all concrete not otherwise shown with same steel as in similar sections or areas.
5. Construction joints in beam girders shall be at midspan unless noted otherwise. Reinforcing steel shall be continuous through construction joints unless noted otherwise.

6. No aluminum items shall be embedded in any concrete or placed in contact with concrete.
7. Reinforcing bars #4 and larger (except ties and stirrups) shall meet ASTM A615 with Supplementary Requirements (S1), Grade 60. Smaller bars shall be Grade 40.
8. Concrete coverage of reinforcement shall have the following clear distances unless noted otherwise on the drawings:
 - Cast against earth: 3"
 - Formed concrete exposed to earth or weather: 2"
 - Not exposed to earth or weather: 1" Slabs, 1 1/2" Beams and columns

9. Embedded and all reinforcing bars marked continuous shall be embedded to develop the full tensile capacity of the bars. Laps shall be Class B tension laps unless specified otherwise on the drawings. Unless shown otherwise, splice top bars near reinforcement and splice bottom bars over supports.
10. Supply corner bars 4'-0" long (min. 2'-0" in each direction) in outside face of wall at corners of all walls and grade beams, matching size and spacing of horizontal bars. Where there are no vertical bars at corner of wall, supply three (3) #4 vertical support bars for corner bars.

11. All bars are to be supported in forms and spaced with wire bar supports per ACI "Manual of Standard Practice for Detailing Concrete Structures" (latest edition). Bars shall be securely wired per the latest edition of CRSI's "Recommended Practice for Placing Reinforcing Bars." Accessories for exposed concrete shall be plastic or shall have plastic-tipped feet.
12. Concrete placed during cold weather shall conform to the requirements of the most recent version of ACI 306R. Cold weather is defined as a period when, for more than 3 successive days, the mean daily temperature drops below 40°F.
13. Concrete placed during hot weather shall conform to the requirements of the most recent version of ACI 308R. Hot weather is defined as that combination of air temperature, concrete temperature, relative humidity and wind speed that will cause a rate of evaporation of 0.2 lb/sq.ft./hr. or more as defined by Figure 2.1.5 of ACI 308R.

14. Do not allow water to concrete during delivery, at Project Site, or during placement, unless approved by the Engineer.
15. Provide 3/4" chamfer on all exposed corners unless noted otherwise on architectural or structural construction documents.
16. All cold joints shall be roughened and cleaned unless noted otherwise.

17. Vertical control joints in walls shall be placed at 30'-0" maximum spacing unless noted otherwise. Locate joints beside piers monolithic with walls, near corners, and in concealed locations where possible. Construction joints may be placed in lieu of control joints at contractor's discretion. Coordinate location of control joints with Architect.

Post-Installed Anchors:

1. Post-installed anchors shall only be used where specified in the construction documents or approved by the engineer.
2. The Contractor shall obtain written approval from the Engineer prior to installing post-installed anchors for misplaced-placed anchors.
3. Care shall be taken with placing post-installed anchors to avoid damaging existing reinforcement.
4. The holes shall be drilled and cleaned in accordance with the manufacturer's specifications.

5. Post-installed anchors shall meet ACI 318 Appendix C criteria. The following are acceptable post-installed anchors:
 - All adhesive anchoring systems referred to in these drawings shall be one of the following:
 - a. Hilti HIT HY 200 V3
 - b. Powers AC108 Gold
 - c. Simpson Strong-Tie SET-3G
 - d. Or Approved Equivalent
 - All screw anchors referred to in these drawings shall be one of the following:
 - a. Hilti KH-EZ
 - b. Powers Wedge Bolt
 - c. Simpson Strong-Tie Titan HD
 - d. Or Approved Equivalent

Minimum Thickness (in.)	Design Thickness (in.)	Inside Corner Radius (in.)	Gage No. (Reference Only)
18	0.0188	0.0843	25
27	0.0283	0.0796	22
30	0.0312	0.0781	20-Drywall
33	0.0346	0.0764	20-Structural
43	0.0451	0.0712	18
54	0.0566	0.0849	16
68	0.0713	0.1069	14
97	0.1017	0.1525	12

NOTE: Minimum Thickness represents 95% of the design thickness and is the minimum acceptable thickness delivered to the job site based on Section A3.4 of the 1996 AISI Specification.

Masonry:

1. Mortar shall be Type S for all masonry work and must achieve a minimum compressive strength of 1800 psi at the 28-day test. Masonry units shall have a minimum strength of F'm = 1900 psi.
2. Masonry grout shall be a coarse type grout and must achieve a minimum compressive strength of 2000 psi at the 28-day test. Slump shall range from 8" minimum to 10" maximum. Grout materials and proportions shall conform to ASTM C476.
3. All masonry shall be reinforced with horizontal 9 gauge truss type reinforcement at 16" o.c. vertical or as shown on the drawings.
4. Vertical reinforcing shall be installed as noted on the drawings. Reinforcing bars shall be lapped as specified on the design drawings. If lap length is shown, control the Engineer.

5. Vertical control joints in masonry shall be 3/8" wide. Full height of wall at locations shown on the Architectural drawings. Joints shall be spaced at a maximum of 25'-0" apart and coordinated with the Architect. All horizontal joint reinforcing shall be discontinuous at masonry control joints. Refer to typical details for additional information.
6. Unlts over openings shall be installed as indicated on the drawings. If no limits are indicated, notify the Engineer.
7. Provide at least (1) vertical rebar at each end of each wall, side of control joints, jamps, corner, and intersection of all reinforced masonry walls. Size of rebar to match the size of typical vertical reinforcing shown.
8. Provide (1) corner bar at each horizontal bond beam. Size of rebar to match typical bond beam reinforcing shown.

9. Submit shop drawings including plan and elevation views of reinforced masonry walls including bond beams, control joints, expansion joints, and lintels.
10. All steel beams bearing on masonry shall have (3) cores minimum grouted full directly below the bearing locations unless noted otherwise.
11. All bond beam reinforcing shall continue through control joints.

12. All cells containing reinforcement, bolts, or other metal anchors shall be grouted solid. Any cells below grade shall be grouted solid whether reinforced or not.

Structural Steel:

1. All structural steel shall conform to the following (U.N.O.):
 - Structural Steel Wide Flanges: ASTM A992
 - Miscellaneous Steel: ASTM A36
 - Structural Tubing: ASTM A500, Grade C (Fy = 50 ksi)
 - Steel Pipe: ASTM A53, Type E or S, Grade B
2. Bolts shall be as follows (U.N.O.):
 - Connection Bolts: ASTM A325
 - Anchor Rods: ASTM F1554, Grade 36
 - Shear Studs: ASTM A108, Grade 10LS through 1000
3. Welding shall conform to the latest publication of applicable codes set forth by the American Welding Society. Welding electrodes shall be E70XX.
4. All exterior steel exposed to weather shall be hot-dipped galvanized and/or painted per Architect unless noted other wise.
5. Weld all joints to supporting members with 1/8" x 2" long fillet welds on each side of the joint. In steel frames, where columns are not framed in at least two directions with structural steel members, joints at column lines shall be field-bolted at the columns to provide lateral stability during construction.
6. All roof bar joists shall be designed for uplift as stipulated by the applicable building code. Extra bracing shall be added as required, and the joist manufacturer shall certify that the joists have been designed for reverse bending due to uplift.
7. All bar joists shall have horizontal bridging as recommended by the Steel Joist Institute. Provide rigid "X" bridging in addition to horizontal bridging where horizontal bridging is discontinuous, unless horizontal bridging is connected to a wall at the top and bottom of the joist. Refer to the plans for other locations of "X" bridging. The erector shall follow the latest requirements of the Steel Joist Institute regarding additional bolted "X" bridging required for erection stability.
8. All pipe hangers supporting more than 100 lbs. and being supported from steel bar joists or joist girders shall be hung from top chords and within 2" of web panels. If interferences exist that will not allow pipe to be hung in this manner, the Contractor shall notify the Engineer for required modifications.
9. All openings in the roof shall be framed with a 4 x 4 x 1/4 angle minimum, unless noted otherwise. Mechanical units shall be supported with structural steel frames as required. If framing is not shown for mechanical units, the erector shall follow the latest requirements of the Steel Joist Institute regarding additional bolted "X" bridging required for erection stability.
10. All steel stairs, excluding the main stair, shall be designed by the steel stair manufacturer in compliance with the governing building code to meet 100 psf design live load.

Light Gauge Metal Framing:

1. All light gauge structural studs, track and accessories shall be designed in accordance with the latest edition of the American Iron and Steel Institute (AISI) "Specification for the Design of Cold-Formed Steel Structural Members," and shall be of type, size, gauge and spacing shown on the drawings.
2. All 16 gauge and heavier studs and joists shall be formed from corrosion-resistant steel corresponding to the requirements of ASTM A446, with a minimum yield strength of 50 ksi. All 18 gauge and lighter studs, joists, track and accessories shall be formed from corrosion-resistant steel corresponding to the requirements of ASTM A446, with a minimum yield strength of 53 ksi.
3. Prior to fabrication of framing, the Contractor shall submit fabrication and erection drawings to the Architect/Engineer for approval.
4. Prefabricated panels shall be square, with components attached in a manner to prevent racking and minimize distortion while lifting. The Contractor shall provide temporary bracing where required.
5. All framing components shall be cut squarely for attachment to perpendicular members, or as required, for angular fit against abutting members. Splicing of axial load members is not permitted.
6. Axially loaded studs shall be installed in a manner which will assure that their ends are positioned against the inside of the track web prior to fastening. Studs shall be securely fastened to both flanges of the top and bottom track.

7. Fastening of components shall be with self-drilling screws or welding. Wire tying of components shall not be permitted. Screws shall be of sufficient size to ensure the strength of connection. All connections shall be made with a minimum of (2) #10 screws or 1/8" fillet weld two inches long. All welds shall be touched up with a zinc-rich paint.
8. Tracks shall be securely anchored to the supporting structure as shown on the drawings. Abutting lengths of tracks shall be securely anchored to a common structural element, butt-welded or spliced together.
9. Wall stud bridging shall be attached in a manner to prevent stud rotation. Bridging rows shall be spaced according to manufacturer's specifications or recommendations. 4'-0" maximum spacing between rows of bridging.
10. Provision for structure vertical movement shall be provided where indicated on the drawings.

11. Minimum thickness values of framing specified in page values on drawings are as follows:

Minimum Thickness (in.)	Design Thickness (in.)	Inside Corner Radius (in.)	Gage No. (Reference Only)
18	0.0188	0.0843	25
27	0.0283	0.0796	22
30	0.0312	0.0781	20-Drywall
33	0.0346	0.0764	20-Structural
43	0.0451	0.0712	18
54	0.0566	0.0849	16
68	0.0713	0.1069	14
97	0.1017	0.1525	12

NOTE: Minimum Thickness represents 95% of the design thickness and is the minimum acceptable thickness delivered to the job site based on Section A3.4 of the 1996 AISI Specification.

Special Inspector:

1. The following items require special inspection in accordance with the building code.
 - a. Reinforced masonry construction - level 1 inspection
 - b. Concrete & masonry grout design mix
 - c. Placing of concrete & reinforcing steel
 - d. Bolts & anchors embedded in concrete & masonry
 - e. concrete formwork
 - f. structural steel fabrication
 - g. structural steel bolting & welding
 - h. inspection of roof & deck attachment
 - i. Post installed anchors in masonry & concrete
 - j. In-situ soils, excavations, filling & compaction
2. The Contractor shall request special inspection of the items listed above prior to those items becoming inaccessible & unobservable due to progression of the work.
3. The Special Inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection.
4. The Special Inspector shall observe the work assigned for conformance with the approved design drawings and specifications.
5. The Special Inspector shall furnish inspection reports to the Building Official, the Engineer and Architect of record, and other designated persons. All discrepancies shall be brought to the immediate attention of the Contractor for correction, then if uncorrected, to the proper design authority and to the Building Official.
6. The Special Inspector shall submit a final signed report stating whether the work requiring special inspection maximum 15' and 10' or less of wall height, but no fewer than 2 tests.
7. Trench backfill shall be tested at each compacted initial and final backfill layer, at least once for every 50 cu. yd. or less of paved or building slab areas, and at each compacted fill and backfill layer, at least once for every 2000 sq. ft. or less of paved or building slab areas, but in no case fewer than 3 tests.
8. Foundation wall backfill shall be tested at each compacted initial and final backfill layer, at least once for every 100 ft. or less of wall height, but no fewer than 2 tests.
9. Trench backfill shall be tested at each compacted initial and final backfill layer, at least once for every 150 ft. or less of trench length, but no fewer than 2 tests.
10. Test comparison of soils-in-place in accordance with ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable.
11. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.
12. Inspect framework for shape, location and dimensions of the concrete member being formed.

1. Strength test cylinders shall be prepared for each day's pour of each concrete mix and at a minimum frequency of every 50 cu. yd. on all concrete placed. Conform to ASTM C39.
2. Four (4) test cylinders are to be made and cured on site for the first 24 hours. Test one of the specimens at 7 days and two at 28 days. Hold the fourth specimen in reserve for later testing if needed.
3. Slump, air content and temperature tests shall be conducted at a minimum when strength specimens are made and at any other times as specified by the Engineer.
4. Perform slump tests on a representative concrete sample at the point of discharge. Perform additional tests when concrete consistency seems to have changed. The maximum allowable field slump is 5 inches. Conform to ASTM C443.
5. Perform air content tests on all concrete specified to be air-entrained. Conform to ASTM C231.
6. Perform a temperature test every hour when air temperature is 40°F and below, or when air temperature is 80°F and above. Conform to ASTM C 1064.
7. Prior to the closing of forms or the delivery of concrete to the job site, the inspector shall verify that the reinforcing steel is in conformance with the city-approved plans, specifications and shop drawings. The inspector shall confirm that the reinforcing steel of the concrete size and grade and ensure that the proper spacing, clearances, splice lengths and embedded items have been provided. All reinforcing steel shall be in place prior to the placement of concrete and be secured against displacement.
8. The Inspector shall verify the bolt size, location and embedment length of all anchor bolts are in conformance with the city-approved plans, specifications and shop drawings.
9. Anchor rods 3/4" or smaller may be floated in place following concrete placement, provided that anchor bolts are worked easily by hand into the fresh concrete to allow for full contact with the shank of the bolt. Bolts shall be placed by means of a template and shall be worked into concrete in vertical alignment.
10. Test Reporting: Test results must be reported to BSE and the General Contractor in writing within 24 hours after testing, via fax or email. Reports of compressive strength tests must contain the project name, the date of concrete placement, the location of concrete placement within the structure and the concrete mix design being used.

Structural Steel:

1. Bolts: Bolts that are not identified as being slip-critical nor in direct tension need not be inspected other than to verify that the plates of connected elements are brought into snug-tight condition in properly-aligned holes.
2. Field Welding: Inspection is required for single-pass fillet welds, multi-pass fillet welds, complete- and partial-penetration groove welds, floor and roof deck welding, and stairs and railing systems. Prior to the start of the work, materials, qualifications of welding procedures and welder qualifications shall be verified. Provide continuous or periodic inspection of the structural welding as indicated in Table 1704.3 of the referenced IRC. Inspections may occur periodically, as defined below. A visual inspection to ensure proper type, size, length and quality of all field welds is required prior to work being concealed by other materials.
3. Periodic inspection: "Periodic" is defined as generally once a week at a minimum, and more often as needed to observe work requiring inspections, as outlined above, prior to being covered by subsequent construction.
4. Shear connector stud welds will be inspected and tested according to AWS D1.1 for stud welding. Shear connector stud welds shall be visually inspected. Bend tests shall be performed if visual inspections reveal less than a 360-degree fish or welding repairs to any shear connector stud.

5. Structural steel bar joists and metal buildings fabricated on the premises of a facility/plant not certified by a nationally recognized organization, shall have in-plant special inspections. AISC, ICBO, CWB and SJI are certified fabricators.
6. Test Reporting: Test results must be reported to BSE and the General Contractor in writing within 24 hours of testing, via fax or email. Reports must contain the project name, the date of the test and the location of the test.

Masonry:

1. Mortar properties, grout, brick, concrete masonry unit and prism tests and evaluations are to be performed during construction for each 5,000 sq. ft. of wall area or portion thereof.
2. Mortar properties are to be tested per ASTM C 780.
3. Grout will be sampled and tested for compressive strength per ASTM C 1019.
4. Brick tests for each type and grade of brick indicated are to be performed according to ASTM C 67.
5. Concrete masonry unit tests for each type of concrete masonry unit indicated are to be performed per ASTM C 140.
6. Masonry prisms are to be tested per ASTM C 1314. Prepare one (1) set of prisms for testing at 7 days and one (1) set for testing at 28 days.
7. Special inspection of masonry construction is required during preparation and taking of any required prisms or test specimens, placing of all masonry units, placement of reinforcement and inspection of grout space immediately prior to closing claddings, and during all grouting operations.
8. Test Reporting: Test results must be reported to BSE and the general contractor in writing within 24 hours of testing, via fax. Reports must contain the project name, the date of the test and the location of the test.

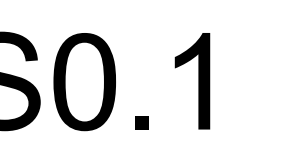
Required Verification and Inspection of Steel Construction Other Than Structural Steel Per IRC Table 1705.2.2

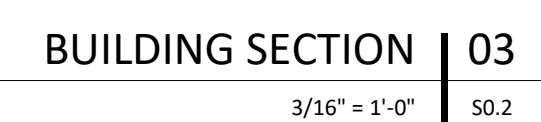
Type	Continuous Special Inspection	Periodic Special Inspection	Referenced Standard
1. Material verification of cold-formed steel deck:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	-	X	Applicable ASTM material standards
b. Manufacturer's certified test reports.	-	X	
2. Inspection of welding and attachment:			
a. Cold-formed steel deck:			
1. Floor and roof deck welds and other means of attachment.	-	X	AWS D1.3
b. Reinforcing steel:			
1. Verification of ability of reinforcing steel other than ASTM A 706.	-	X	AWS D1.4
2. Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	X	-	ACI 318: Section 3.5.2
3. Shear reinforcement.	-	X	
4. Other reinforcing steel.			

9. Where applicable, see also Section 1705.11 Special inspections for seismic resistance.

Special Inspector:

1. The following items require special inspection in accordance with the building code.
 - a. Reinforced masonry construction - level 1 inspection
 - b. Concrete & masonry grout design mix
 - c. Placing of concrete & reinforcing steel
 - d. Bolts & anchors embedded in concrete & masonry
 - e. concrete formwork
 - f. structural steel fabrication
 - g. structural steel bolting & welding
 - h. inspection of roof & deck attachment
 - i. Post installed anchors in masonry & concrete
 - j. In-situ soils, excavations, filling & compaction
2. The Contractor shall request special inspection of the items listed above prior to those items becoming inaccessible & unobservable due to progression of the work.
3. The Special Inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection.
4. The Special Inspector shall observe the work assigned for conformance with the approved design drawings and specifications.
5. The Special Inspector shall furnish inspection reports to the Building Official, the Engineer and Architect of record, and other designated persons. All discrepancies shall be brought to the immediate attention of the Contractor for correction, then if uncorrected, to the proper design authority and to the Building Official.
6. The Special Inspector shall submit a final signed report stating whether the work requiring special inspection maximum 15' and 10' or less of wall height, but no fewer than 2 tests.
7. Trench backfill shall be tested at each compacted initial and final backfill layer, at least once for every 50 cu. yd. or less of paved or building slab areas, and at each compacted fill and backfill layer, at least once for every 2000 sq. ft. or less of paved or building slab areas, but in no case fewer than 3 tests.
8. Foundation wall backfill shall be tested at each compacted initial and final backfill layer, at least once for every 100 ft. or less of wall height, but no fewer than 2 tests.
9. Trench backfill shall be tested at each compacted initial and final backfill layer, at least once for every 150 ft. or less of trench length, but no fewer than 2 tests.
10. Test comparison of soils-in-place in accordance with ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable.
11. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.</





PARAGON STAR
BLDG 2 / LOT 9

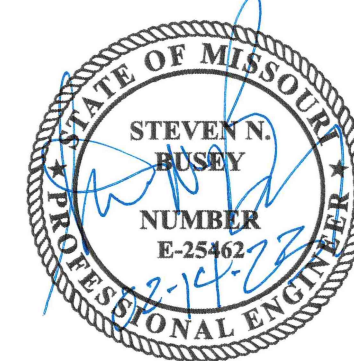
3201 NW PARAGRN PKWY
LEE'S SUMMIT, MO

Project No.: 19050.01a
Date: 09.27.22
Issued For: CONSTRUCTION

No.	Date	Description
2	09.27.22	Addendum #2
3	11.29.22	Addendum #3
6	02.14.23	ASI-03

REVISIONS

REGISTRATION



PROJECT TEAM

ARCHITECT	FINKLE-WILLIAMS ARCHITECTURE
CIVIL	GBA
LANDSCAPE	LAND 3
FOUNDATIONS	BSE STRUCTURAL ENGINEERS
STRUCTURAL	BSE STRUCTURAL ENGINEERS
PLUMBING	HENDERSON ENGINEERS
MECHANICAL	HENDERSON ENGINEERS
ELECTRICAL	HENDERSON ENGINEERS
FIRE PROTECTION	HENDERSON ENGINEERS
CONTRACTOR	GC



11320 West 79th Street
Lenexa, Kansas 66214
Phone 913.492.7400
www.BSEstructural.com
Project Number 22-125

NOTES:

- SEE DRAWING 50.0 FOR GENERAL NOTES, SYMBOLS LEGEND, MATERIALS LEGEND, & ABBREVIATION LIST.
- REFERENCE DRAWING S3.1 FOR TYPICAL FOUNDATION DETAILS INCLUDING ANCHOR ROD DETAILS, FOOTING STEP DETAILS, CONTROL JOINT & CONSTRUCTION JOINT DETAILS, REIN. LAP LENGTH TABLE, ETC.
- SEE DRAWING 50.1 & 50.2 FOR ISOMETRIC VIEW & FULL BUILDING SECTIONS.
- REIN. SHALL BE INSTALLED IN TOP 15'-0" OF PIERS.
- REFER TO GEOTECHNICAL REPORT FOR SOCKET REQUIREMENTS AT BASE OF PIER.
- VERIFY BEARING W/ GEOTECHNICAL ENGINEER.
- REFER TO GEOTECHNICAL REPORT FOR APPROXIMATE BOTTOM OF PIER ELEVATIONS.
- REFER TO GEOTECHNICAL REPORT FOR BEHIND WALL DRAINAGE RECOMMENDATIONS. COORD. W/ CIVIL AS REQ'D. REFER TO ARCHITECTURAL DRAWINGS FOR FOUNDATION WATERPROOFING & INSULATION REQUIREMENTS.
- COAT ALL EXPOSED STEEL BELOW GRADE W/ COAL TAR EPOXY OR FULLY ENCASE IN GROUT.
- ALTERNATE FOUNDATION PILE DESIGN ACCEPTABLE BASED ON STRENGTH LEVEL REACTIONS PROVIDED TO G.C.

KEY PLAN



FOUNDATION PLAN - WEST | 01
1/8" = 1'-0" S1.1

DRILLED PILE SCHEDULE						
MARK	PIER DIAMETER	VERT. REINFORCEMENT	PIER TIES	T.O.C.	PIER CAP DIMENSIONS	MIN. EMBED INTO ROCK (WHICHEVER OCCURS FIRST)
P1	14"	PER S3.3	PER S3.3	96.33		TAN GRAY P1

PILE CAP SCHEDULE							
MARK	DIMENSIONS	TYPE	REINFORCEMENT	NUMBER OF PILES	T.O.C.	T.O.P.	PILE Ø
P1	PER S3.3		BY OTHERS		96.33	BY OTHERS	PER S3.3
PC3	PER S3.3	PER S3.3	(6) #8 3-WAYS TOP & BOTT. W/STD. HOOKS ON EA. END OF ALL BARS	3	99.33	96.33	14"
PC4	7'-6" x 15'-6" x 3'-0"	PER S3.3	#8 @ 10" SPA. SHORT WAY TOP & BOTT.; #8 @ 6" SPA. LONG WAY TOP & BOTT. W/STD. HOOKS ON EA. END OF ALL BARS	4	99.33	96.33	14"
PC4A	7'-6" x 11'-6" x 3'-0"	PER S3.3	#8 @ 10" SPA. SHORT WAY TOP & BOTT.; #8 @ 6" SPA. LONG WAY TOP & BOTT. W/STD. HOOKS ON EA. END OF ALL BARS	4	99.33	96.33	14"

NOTE:

EMBED DRILLED PIER INTO ROCK PER THE GEOTECHNICAL REPORT RECOMMENDATIONS

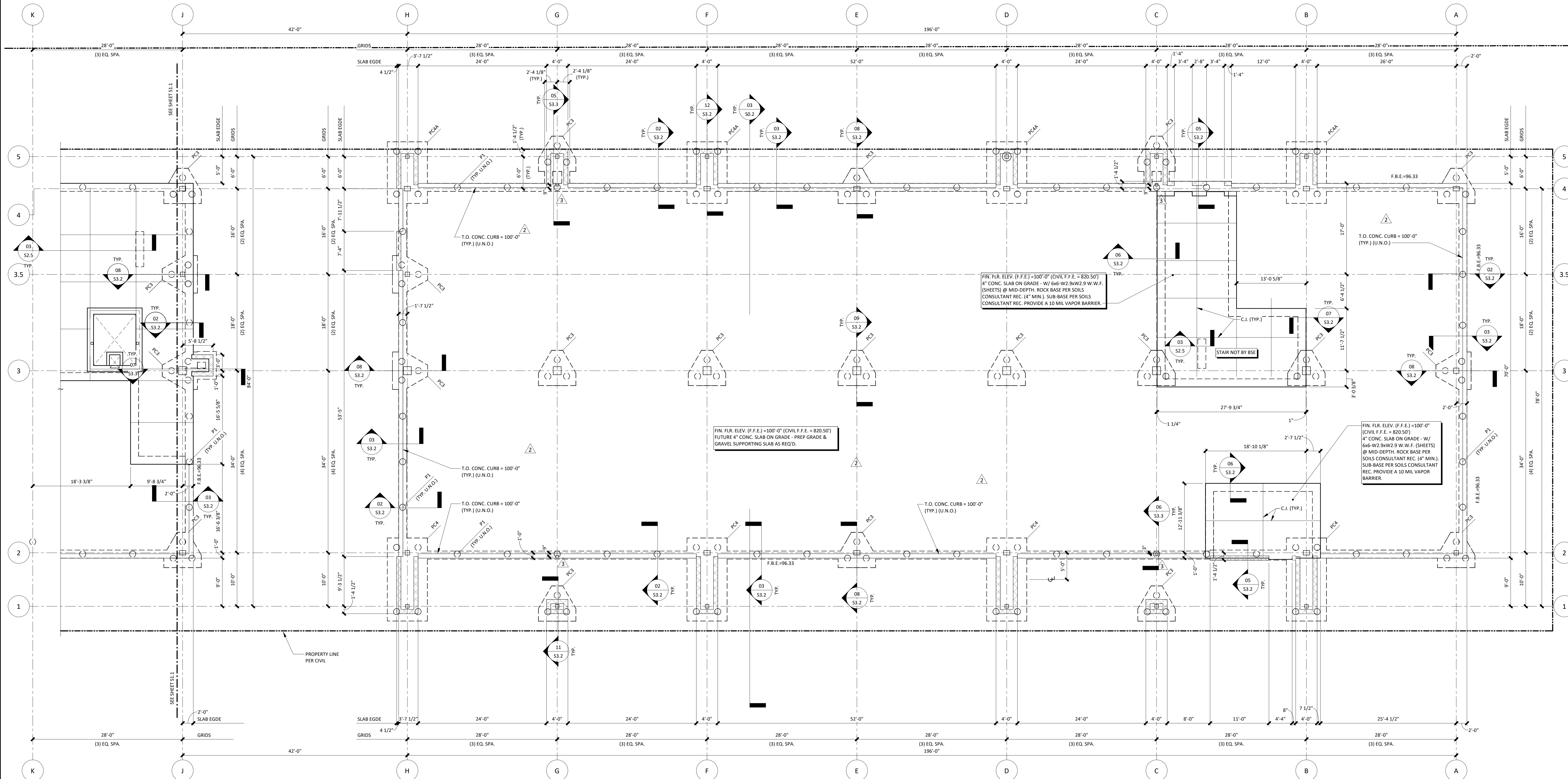


ARCHITECT	FINKLE-WILLIAMS ARCHITECTURE
CIVIL	GBA
LANDSCAPE	LAND 3
FOUNDATIONS	BSE STRUCTURAL ENGINEERS
STRUCTURAL	BSE STRUCTURAL ENGINEERS
PLUMBING	HENDERSON ENGINEERS
MECHANICAL	HENDERSON ENGINEERS
ELECTRICAL	HENDERSON ENGINEERS
FIRE PROTECTION	HENDERSON ENGINEERS
CONTRACTOR	GC

NOTES:

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- COAT ALL EXPOSED STEEL BELOW GRADE W/ COAL TAR EPOXY OR FULLY ENCASE IN GROUT.
- ALTERNATE FOUNDATION PILE DESIGN ACCEPTABLE BASED ON STRENGTH LEVEL REACTIONS PROVIDED TO G.C.

KEY PLAN



FIN. FLR. ELEV. (F.F.E.) = 100'-0" (CIVIL F.F.E. = 820.50)
4" CONC. SLAB ON GRADE - W/ 6#6-W2.9W2.9 W.W.F. (SHEETS) @ MID-DEPTH. ROCK BASE PER SOILS CONSULTANT REC. (4" MIN.) SUB-BASE PER SOILS CONSULTANT REC. PROVIDE A 10 MIL VAPOR BARRIER.

FIN. FLR. ELEV. (F.F.E.) = 100'-0" (CIVIL F.F.E. = 820.50)
FUTURE 4" CONC. SLAB ON GRADE - PREP GRADE & GRAVEL SUPPORTING SLAB AS REQ'D.

FIN. FLR. ELEV. (F.F.E.) = 100'-0" (CIVIL F.F.E. = 820.50)
4" CONC. SLAB ON GRADE - W/ 6#6-W2.9W2.9 W.W.F. (SHEETS) @ MID-DEPTH. ROCK BASE PER SOILS CONSULTANT REC. (4" MIN.) SUB-BASE PER SOILS CONSULTANT REC. PROVIDE A 10 MIL VAPOR BARRIER.

T.O. CONC. CURB = 100'-0" (TYP.) (U.N.O.)

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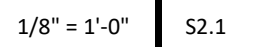
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PARAGON STAR
BLDG 2 / LOT 9

3201 NW PARAGPN PKWY
LEE'S SUMMIT, MO

Project No.: 19050.01a
Date: 09.27.22
Issued For: CONSTRUCTION

REVISIONS		
No.	Date	Description
3	11.29.22	Addendum #3
4	01.20.23	ASI #1
5	02.01.23	ASI-02
6	02.14.23	ASI-03

REGISTRATION



PROJECT TEAM

ARCHITECT	FINKLE-WILLIAMS ARCHITECTURE
CIVIL	GBA
LANDSCAPE	LAND 3
FOUNDATIONS	BSE STRUCTURAL ENGINEERS
STRUCTURAL	BSE STRUCTURAL ENGINEERS
PLUMBING	HENDERSON ENGINEERS
MECHANICAL	HENDERSON ENGINEERS
ELECTRICAL	HENDERSON ENGINEERS
FIRE PROTECTION	HENDERSON ENGINEERS
CONTRACTOR	GC



11320 West 79th Street
Lenexa, Kansas 66214
Phone 913.492.7400
www.BSEstructural.com
Project Number 22-125

NOTES:

- SEE DRAWING S0.0 FOR GENERAL NOTES, SYMBOLS LEGEND, MATERIALS LEGEND, & ABBREVIATION LIST.
- REFERENCE DRAWING S4.1 FOR TYPICAL FRAMING DETAILS.
- SEE DRAWING S0.1 FOR ISOMETRIC VIEW & FULL BUILDING SECTIONS.
- REFERENCE ARCHITECTURAL DRAWINGS TO VERIFY SIZE & LOCATIONS OF ALL FLOOR & WALL OPENINGS.
- PROVIDE JOIST BRIDGING PER SII REQUIREMENTS.
- PROVIDE 3/4" x 4 1/2" LONG HEADED SHEAR STUDS FOR COMPOSITE BEAMS. SEE TYPICAL FRAMING DETAIL SHEET FOR ADDITIONAL DETAILS.
- ATTACH COMPOSITE METAL DECK W/ 5/8" PUDDLE WELD IN A 36/4 PATTERN & (2) WELDED SIDE LAP FASTENERS PER SPAN.
- G.C. TO COORDINATE CONSTRUCTION JOINT IN CONC. SLAB POUR AT THIS GRID.
- G.C. TO COORD. COMP. CONC. SLAB PIGMENT AND FINISH W/ ARCH.
- ALL EXTERIOR STEEL EXPOSED TO WEATHER SHALL BE HOT-DIPPED GALVANIZED AND/OR PAINTED PER ARCHITECT UNLESS NOTED OTHER WISE.

KEY PLAN



2ND FLOOR FRAMING PLAN - EAST | 01

1/8" = 1'-0" S2.2



SHEET TITLE

2ND FLOOR
FRAMING PLAN -
EAST

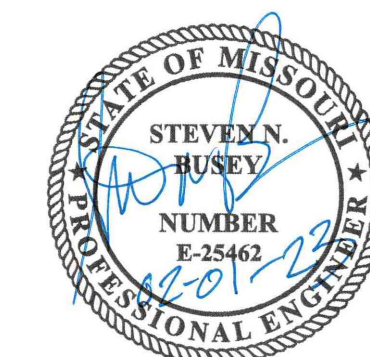
SHEET NUMBER

S2.2

No.	Date	Description
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4	01.20.23	ASI #1
5	02.01.23	ASI-02

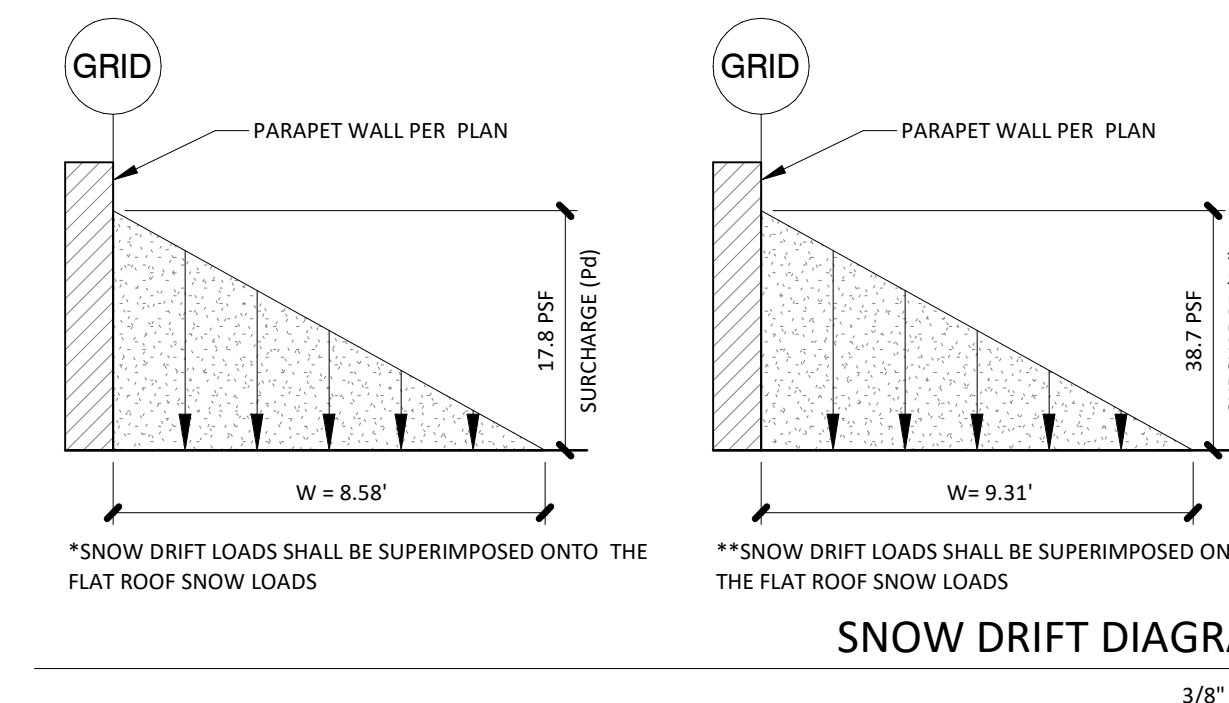
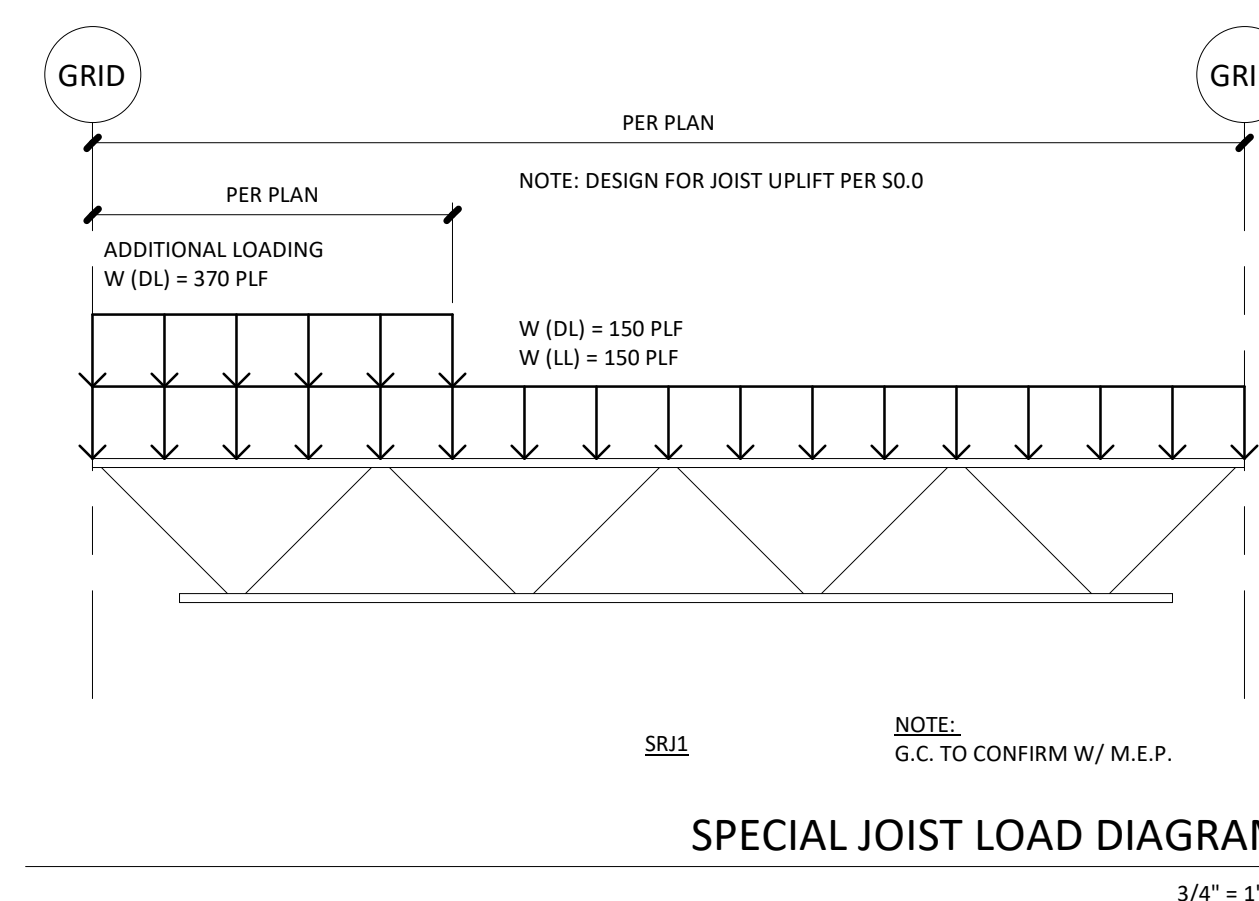
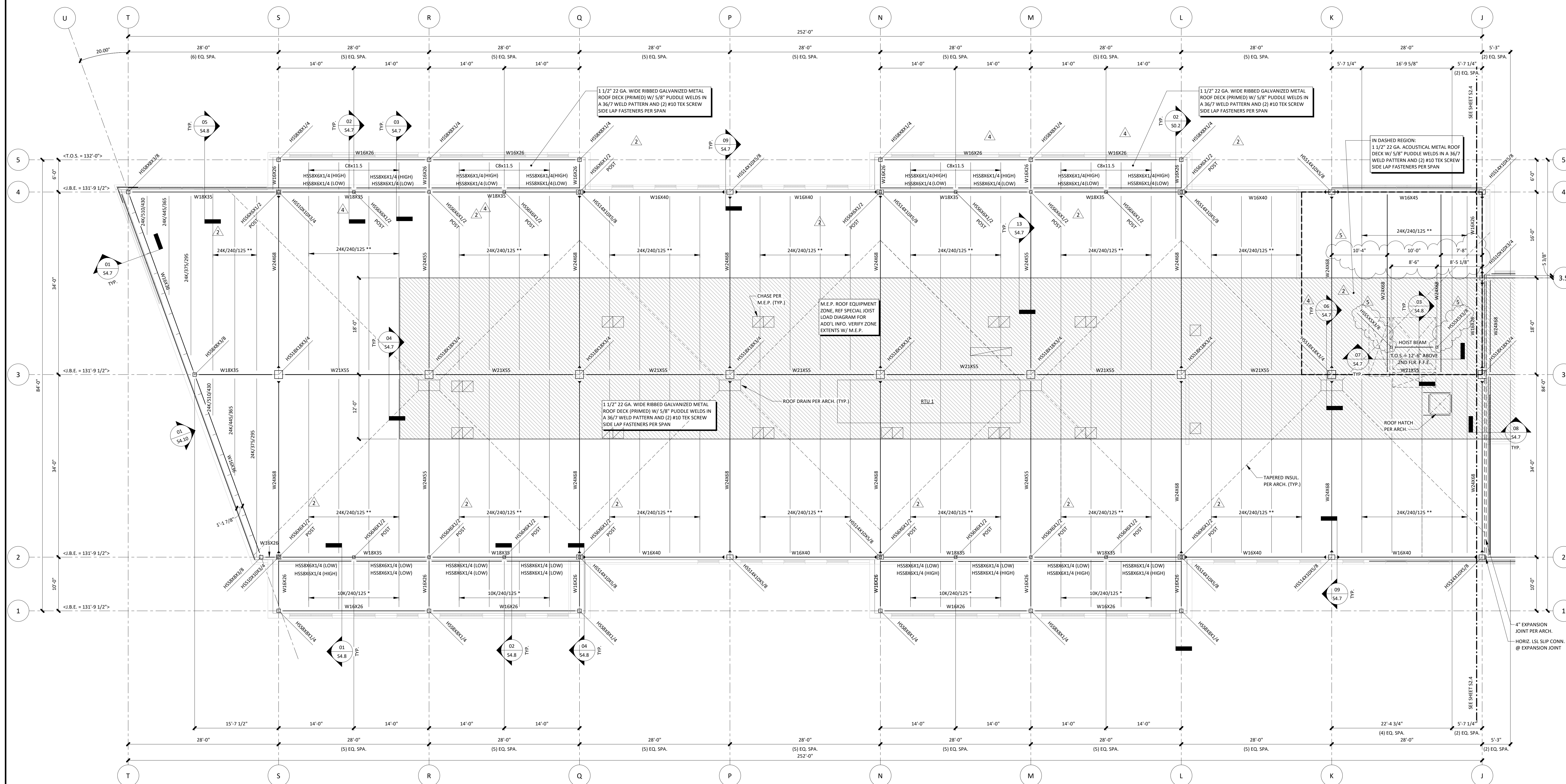
No.	Date	Description
2	09.27.22	Addendum #2
4	01.20.23	ASI #1
5	02.01.23	ASI-02

REGISTRATION



PROJECT TEAM

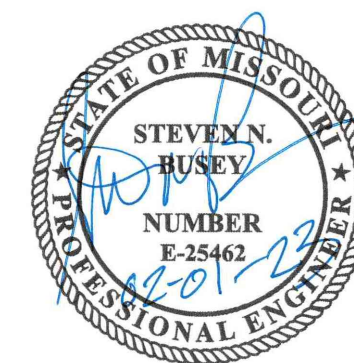
ARCHITECT	FINKLE-WILLIAMS ARCHITECTURE
CIVIL	GBA
LANDSCAPE	LAND 3
FOUNDATIONS	BSE STRUCTURAL ENGINEERS
STRUCTURAL	BSE STRUCTURAL ENGINEERS
PLUMBING	HENDERSON ENGINEERS
MECHANICAL	HENDERSON ENGINEERS
ELECTRICAL	HENDERSON ENGINEERS
FIRE PROTECTION	HENDERSON ENGINEERS
CONTRACTOR	GC



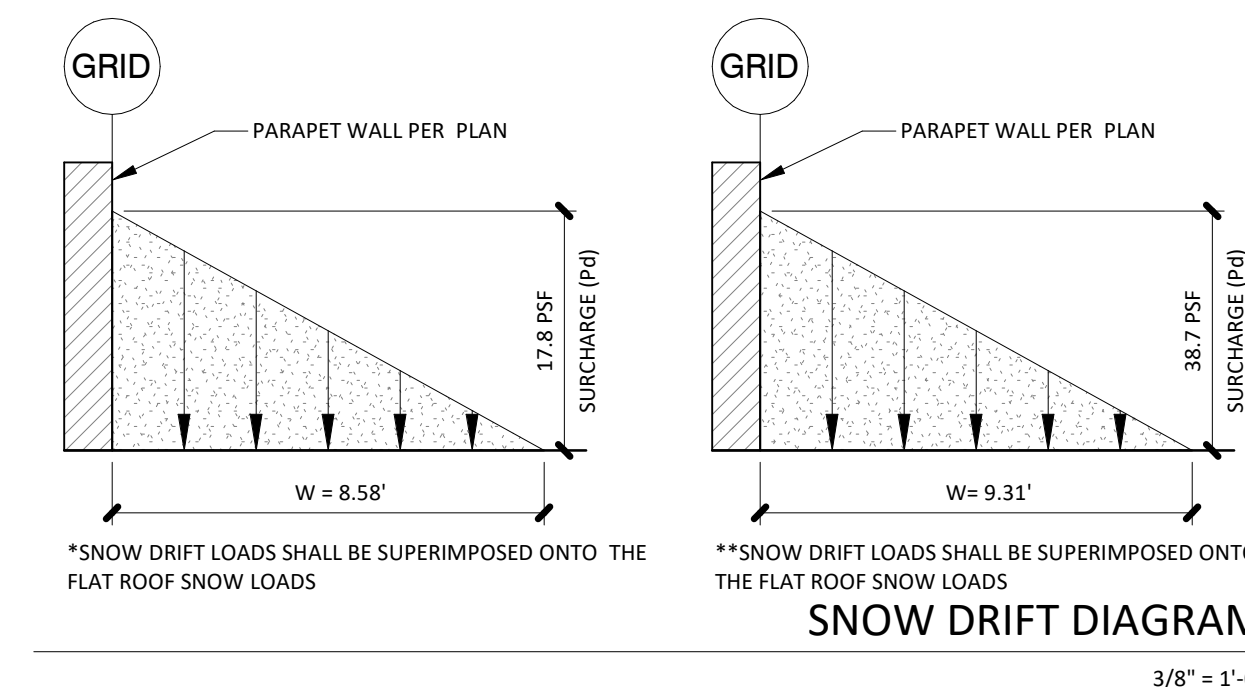
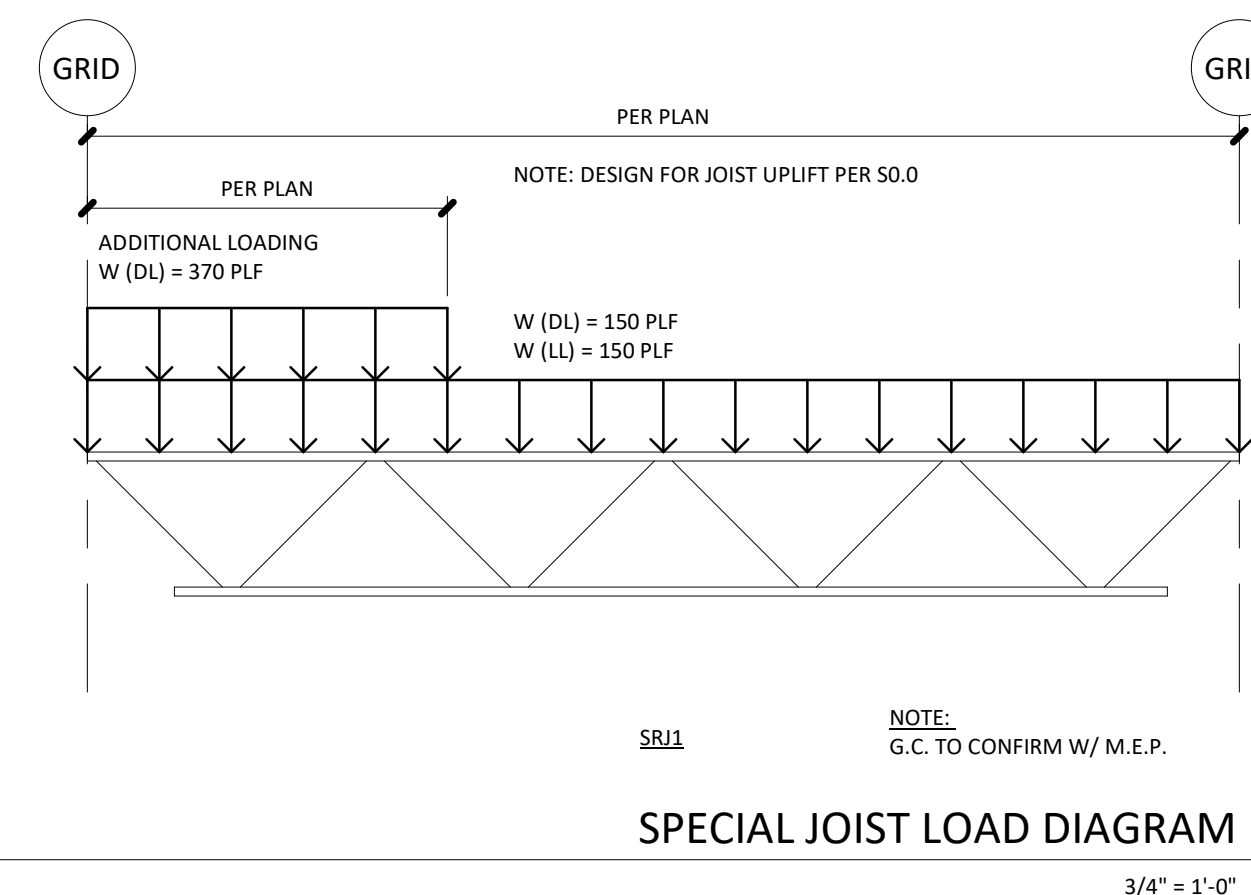
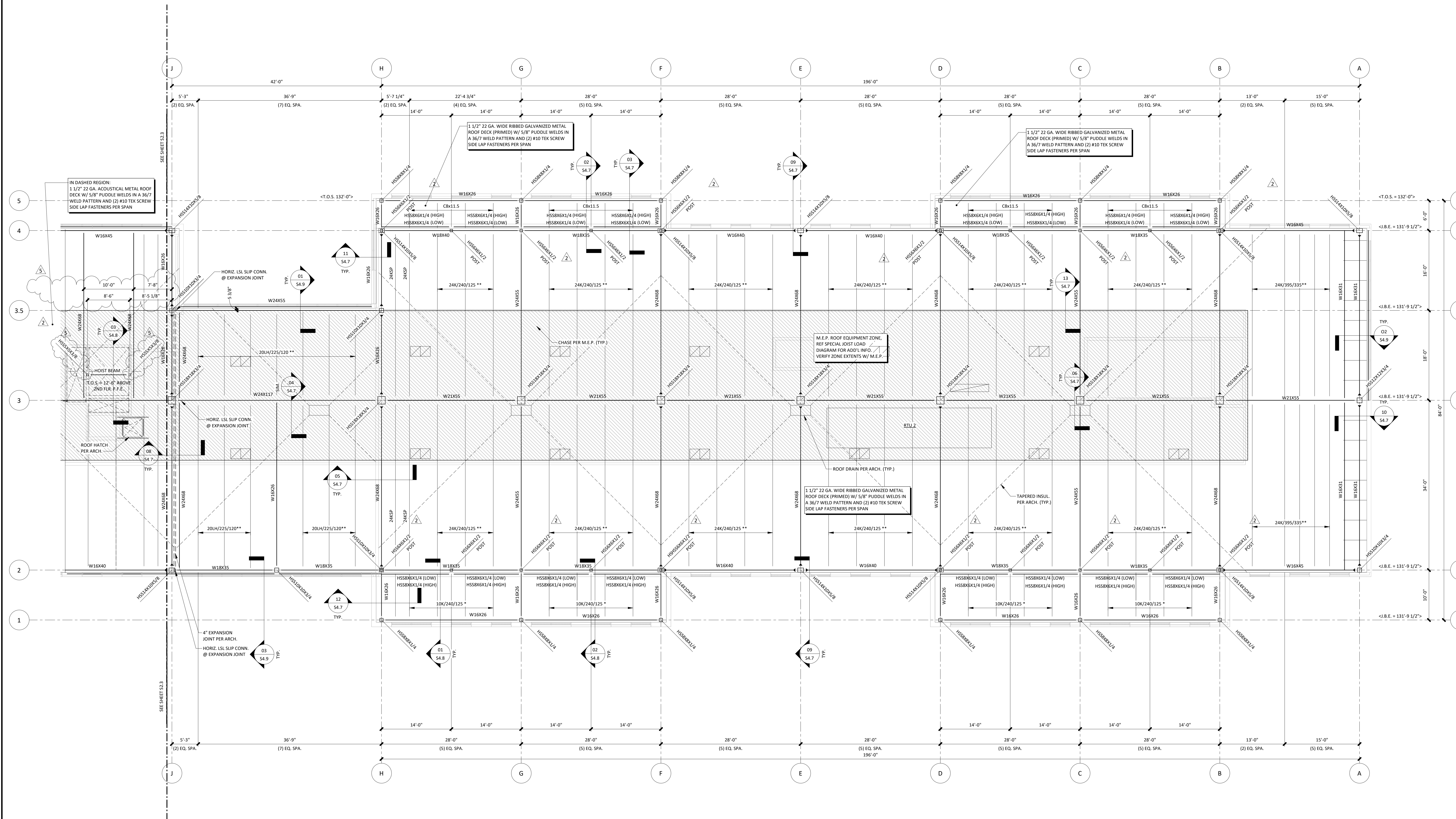
- NOTES:**
- 1.) SEE DRAWING S0.0 FOR GENERAL NOTES, SYMBOLS LEGEND, MATERIALS LEGEND, & ABBREVIATION LIST.
 - 2.) REFERENCE DRAWING S4.3 FOR TYPICAL FRAMING DETAILS.
 - 3.) SEE DRAWING S0.1 FOR ISOMETRIC VIEW & FULL BUILDING SECTIONS.
 - 4.) REFERENCE ARCHITECTURAL & MECHANICAL DRAWINGS TO VERIFY SIZE & LOCATIONS OF ALL ROOF & WALL OPENINGS AND ROOF SCREWS.
 - 5.) PROVIDE JOIST BRIDGING PER SJI REQUIREMENTS.
 - 6.) * & ** = JOIST TO BE DESIGNED FOR ADDITIONAL SNOW DRIFT - SEE SNOW DRIFT DETAIL.
 - 7.) JOIST & BRIDGING SHALL BE DESIGNED FOR UPLIFT PER GENERAL NOTES.

KEY PLAN

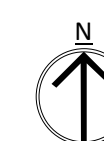




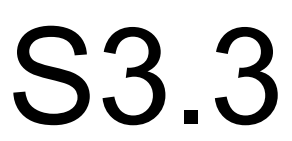
ARCHITECT	FINKLE-WILLIAMS ARCHITECTURE
CIVIL	GBA
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- NOTES:
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$$3/4" = 1'-0"$$





Project No.:	19050.01a
Date:	09.27.22
Issued For:	CONSTRUCTION

REGISTRATION



BSE STRUCTURAL
ENGINEERS

SHEET TITLE

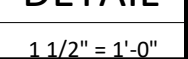
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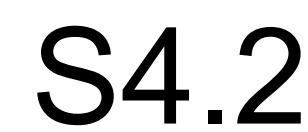
BEAM DEPTH	# OF (n) A325 BOLTS	BOLT Ø	SHEAR TAB THICKNESS
12"	3	3/4"	3/8"
14"	3	3/4"	3/8"
16"	4	3/4"	3/8"
18"	4	3/4"	3/8"
21"	5	1"	7/16"
24"	6	1"	7/16"
27"	7	1"	7/16"
30"	9	1"	7/16"
33"	9	1"	7/16"
36"	10	1"	9/16"

TYP. SHEAR TAB CONNECTION DETAIL | 04



FLOOR MEMBERS							
BEAM DEPTH	WH	WS	BOLT ROWS	ROWS SPA.	BOLT Ø	WELD SIZE	PL THICKNESS
ALL DEPTHS	12"	4"	7	4"	1-1/8"	8/16	1-1/2"







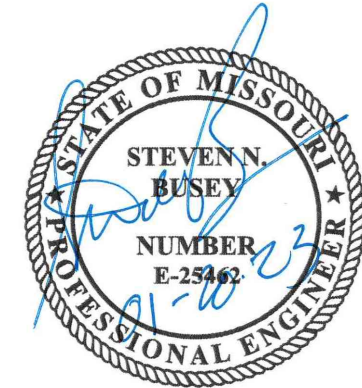
PARAGON STAR
BLDG 2 / LOT 9

3201 NW PARAGRN PKWY
LEE'S SUMMIT, MO

Project No.: 19050.01a
Date: 09.27.22
Issued For: CONSTRUCTION

REVISIONS		
No.	Date	Description
1	07/15/2022	Building Enclosure Updates
2	09.27.22	Addendum #2
3	11.29.22	Addendum #3
4	01.20.23	ASI #1

REGISTRATION



PROJECT TEAM

ARCHITECT	FINKLE-WILLIAMS ARCHITECTURE
CIVIL	GBA
LANDSCAPE	LAND 3
FOUNDATIONS	BSE STRUCTURAL ENGINEERS
STRUCTURAL	BSE STRUCTURAL ENGINEERS
PLUMBING	HENDERSON ENGINEERS
MECHANICAL	HENDERSON ENGINEERS
ELECTRICAL	HENDERSON ENGINEERS
FIRE PROTECTION	HENDERSON ENGINEERS
CONTRACTOR	GC

BSE STRUCTURAL
ENGINEERS

11320 West 79th Street
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Project Number 22-125

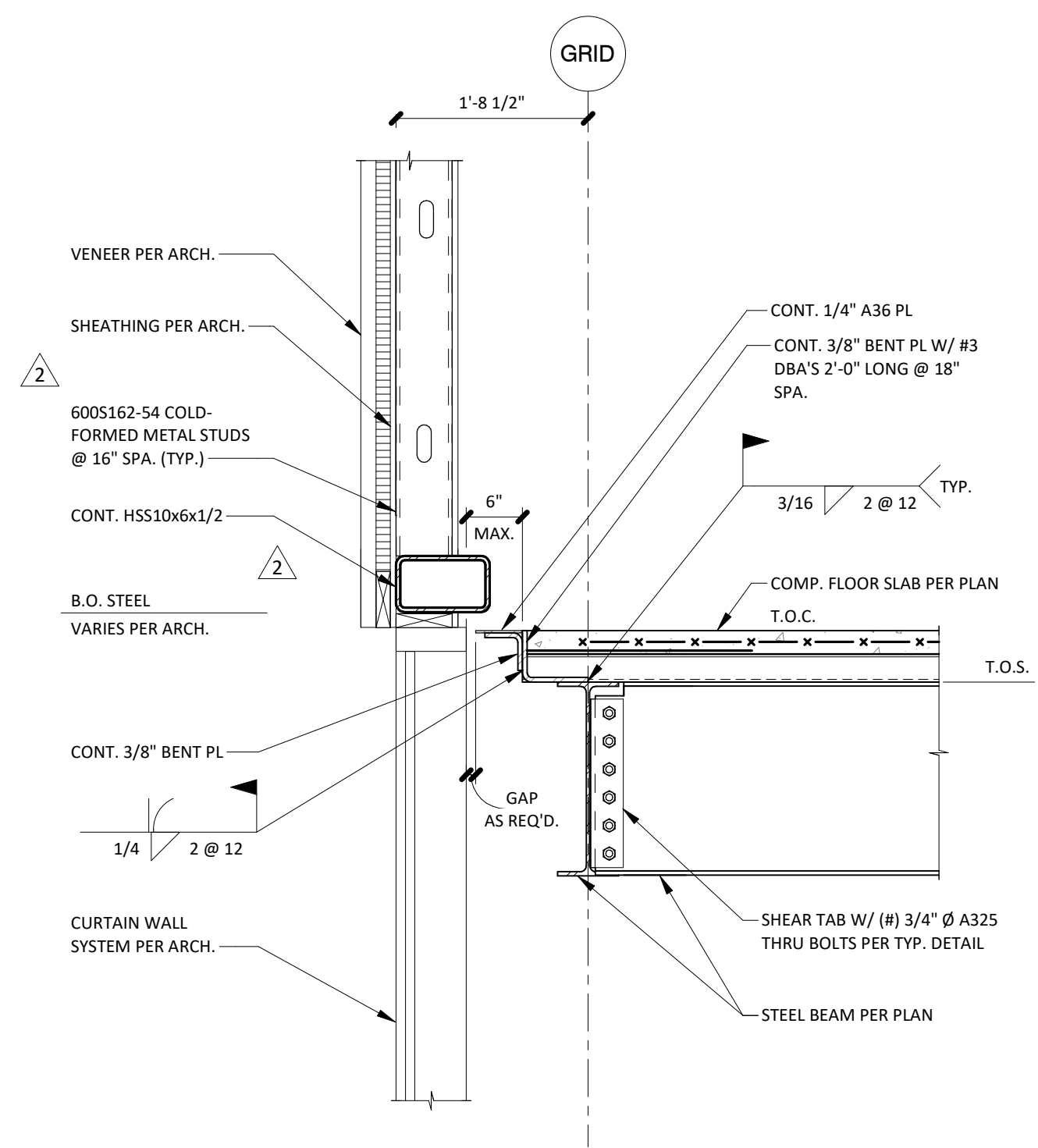
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FRAMING
DETAILS

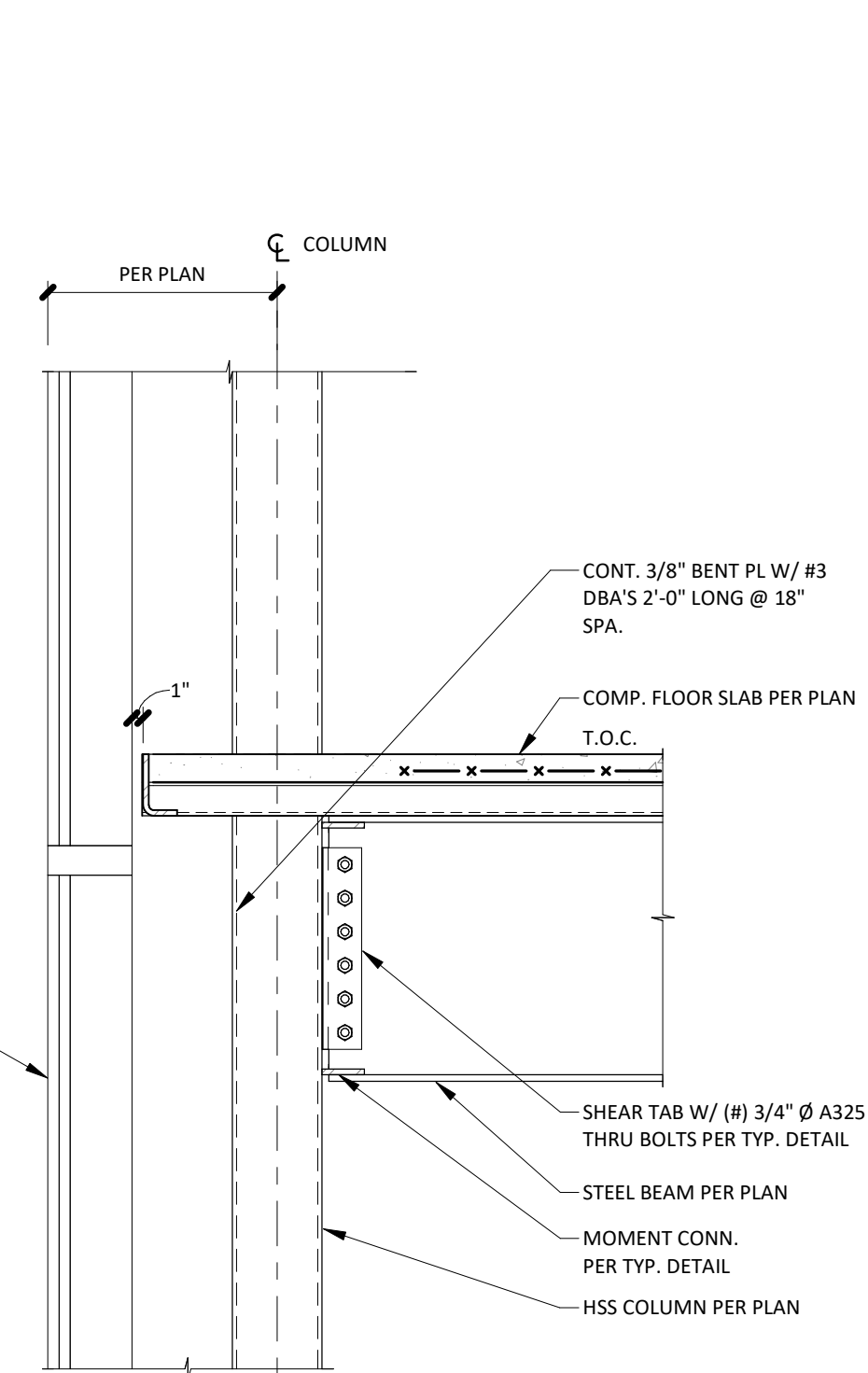
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S4.5

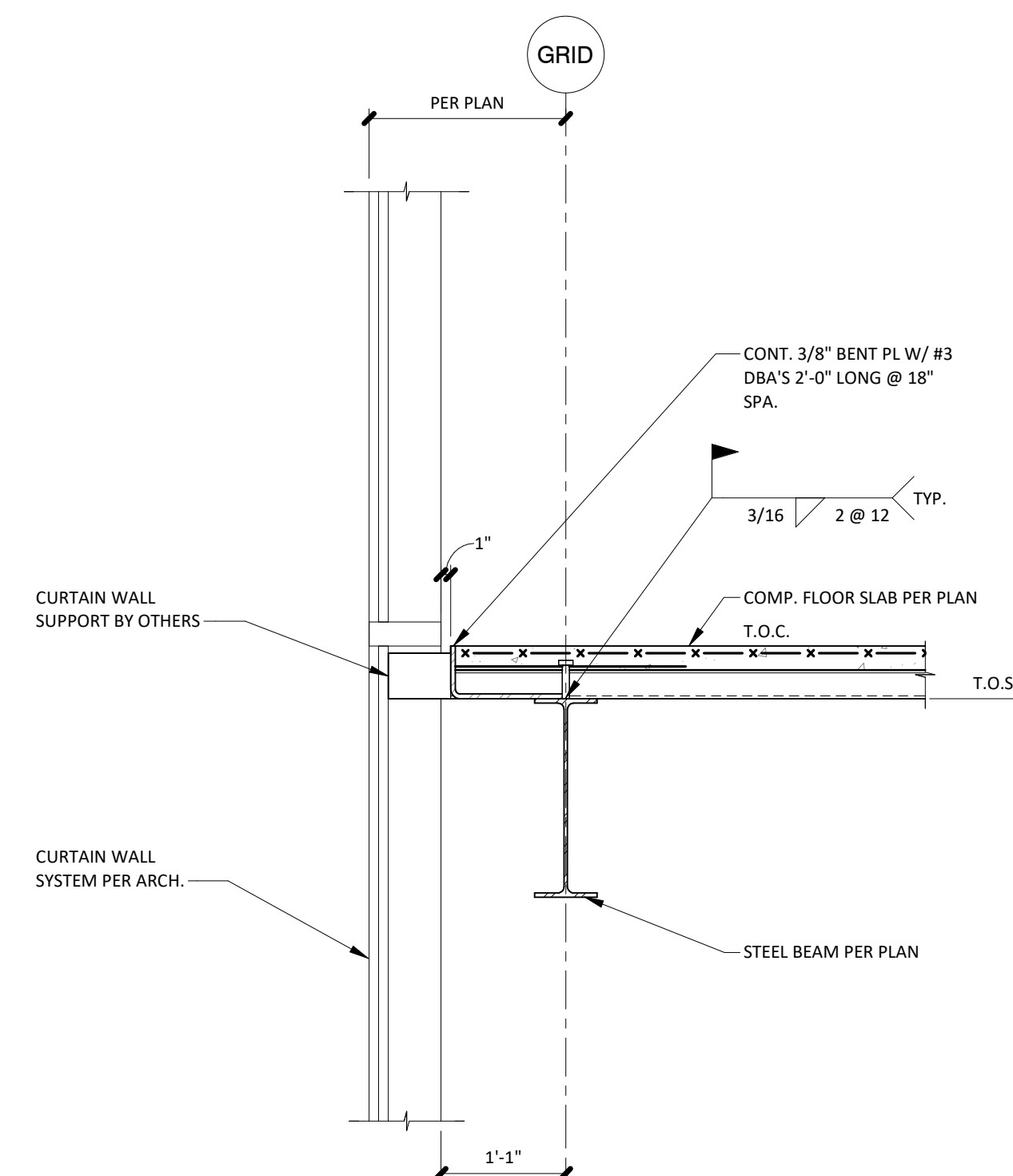
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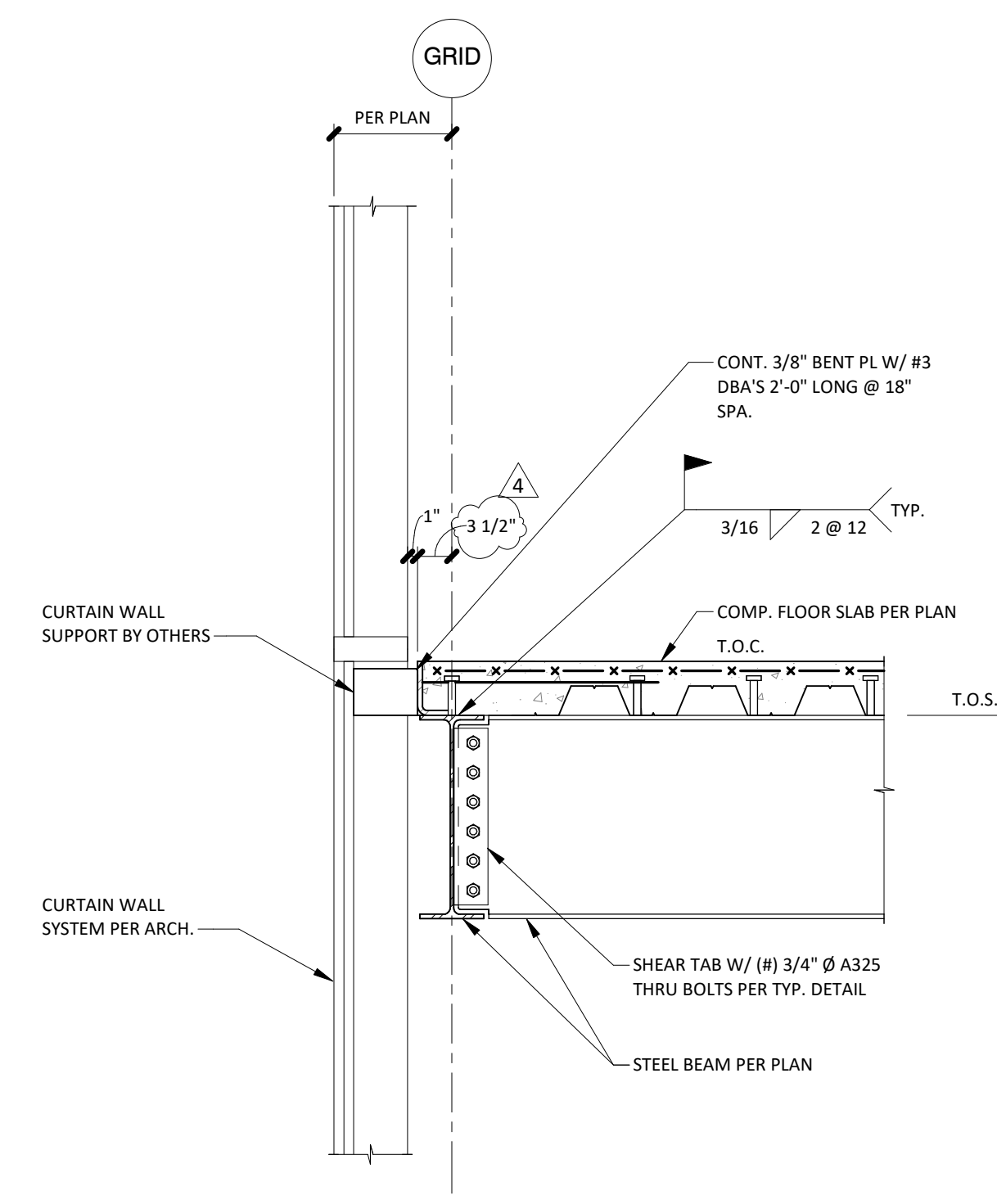
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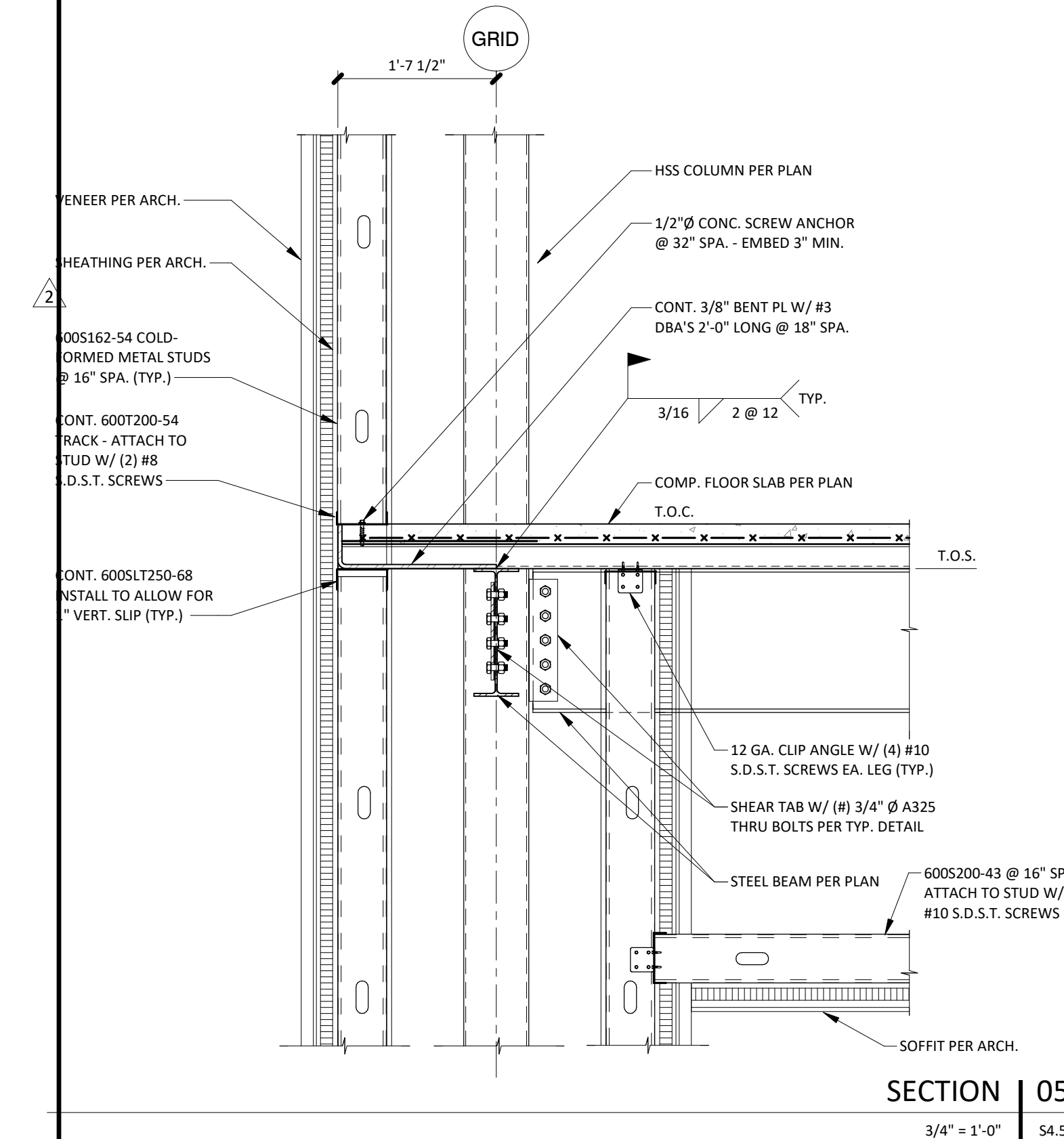
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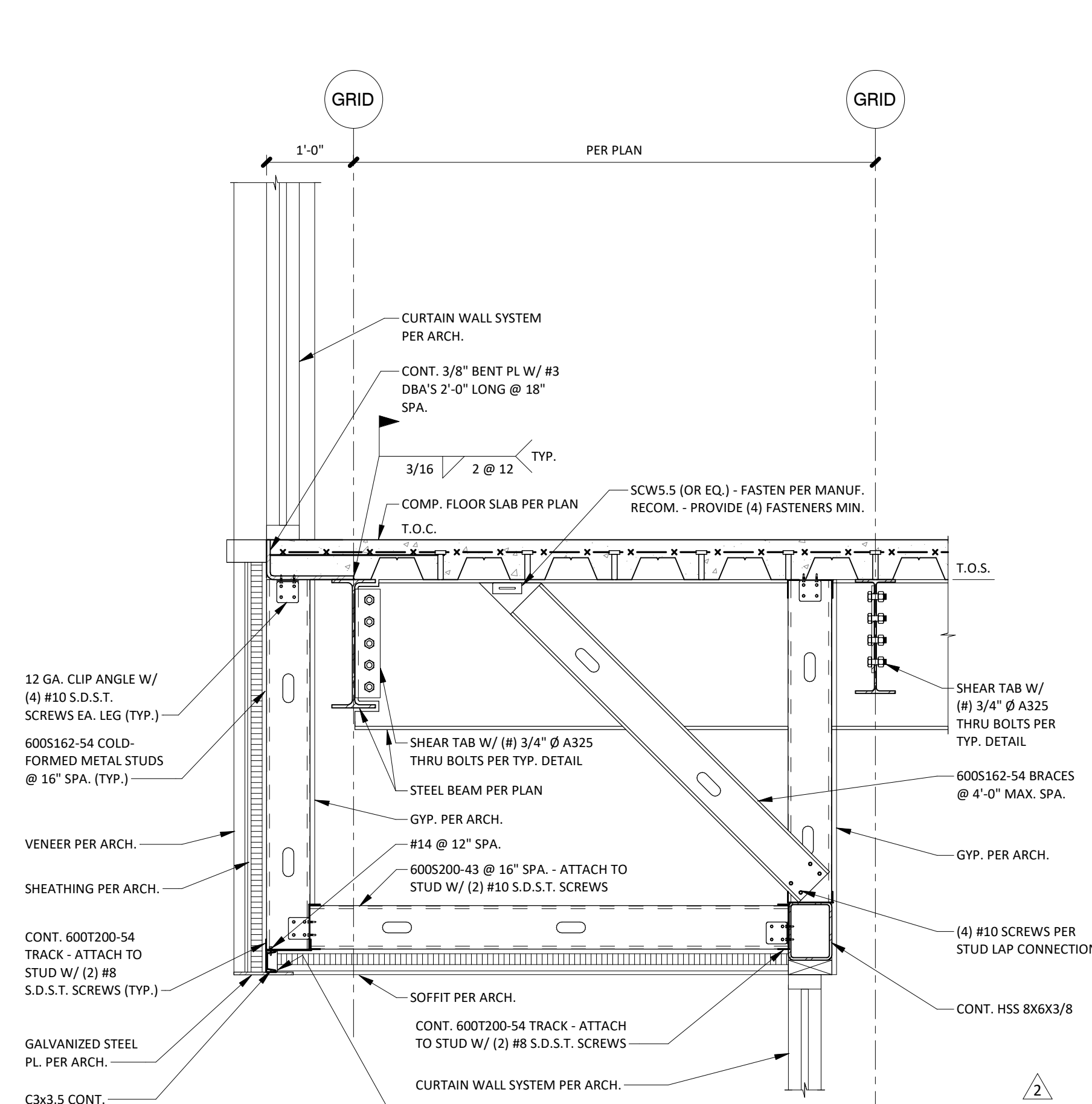
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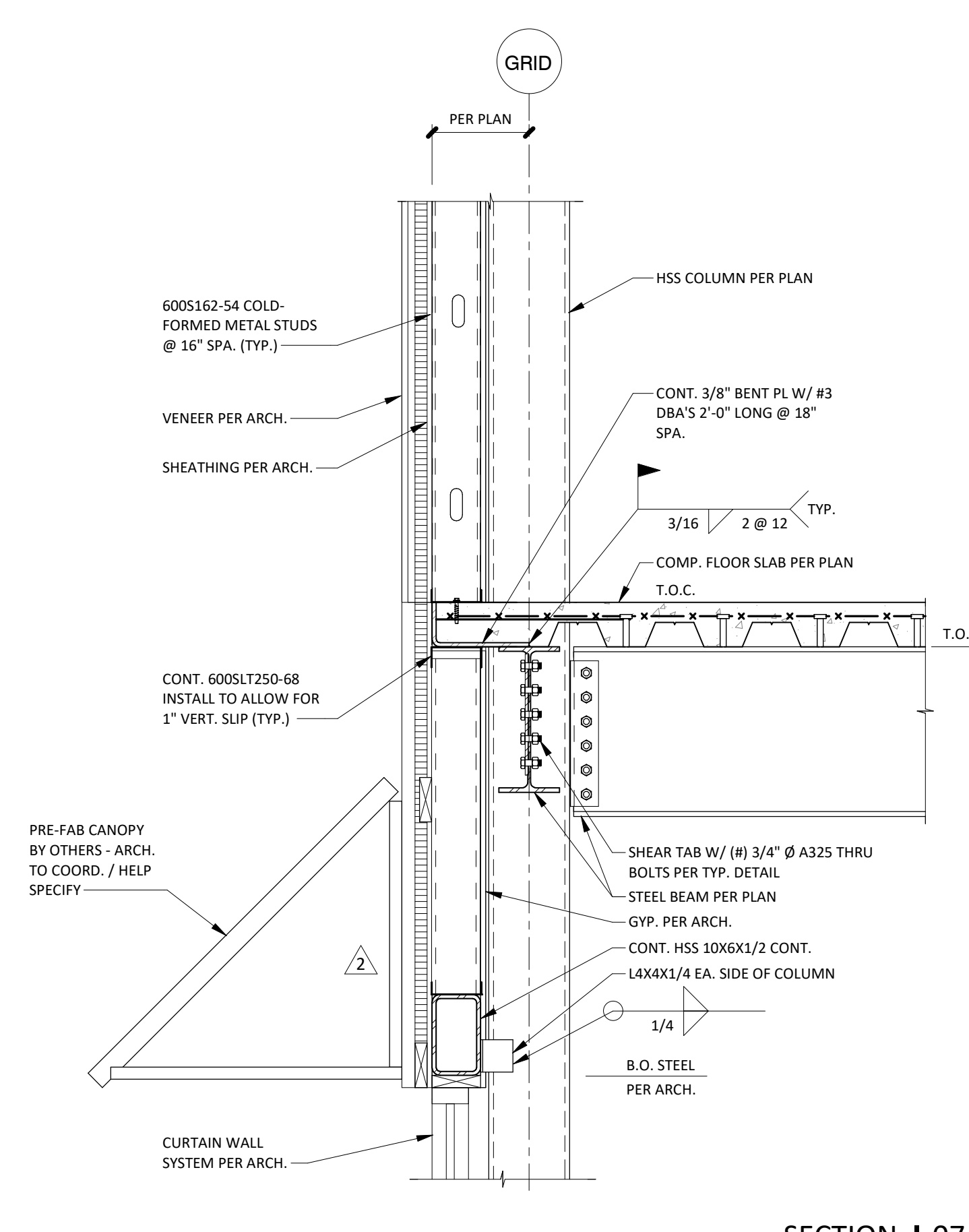
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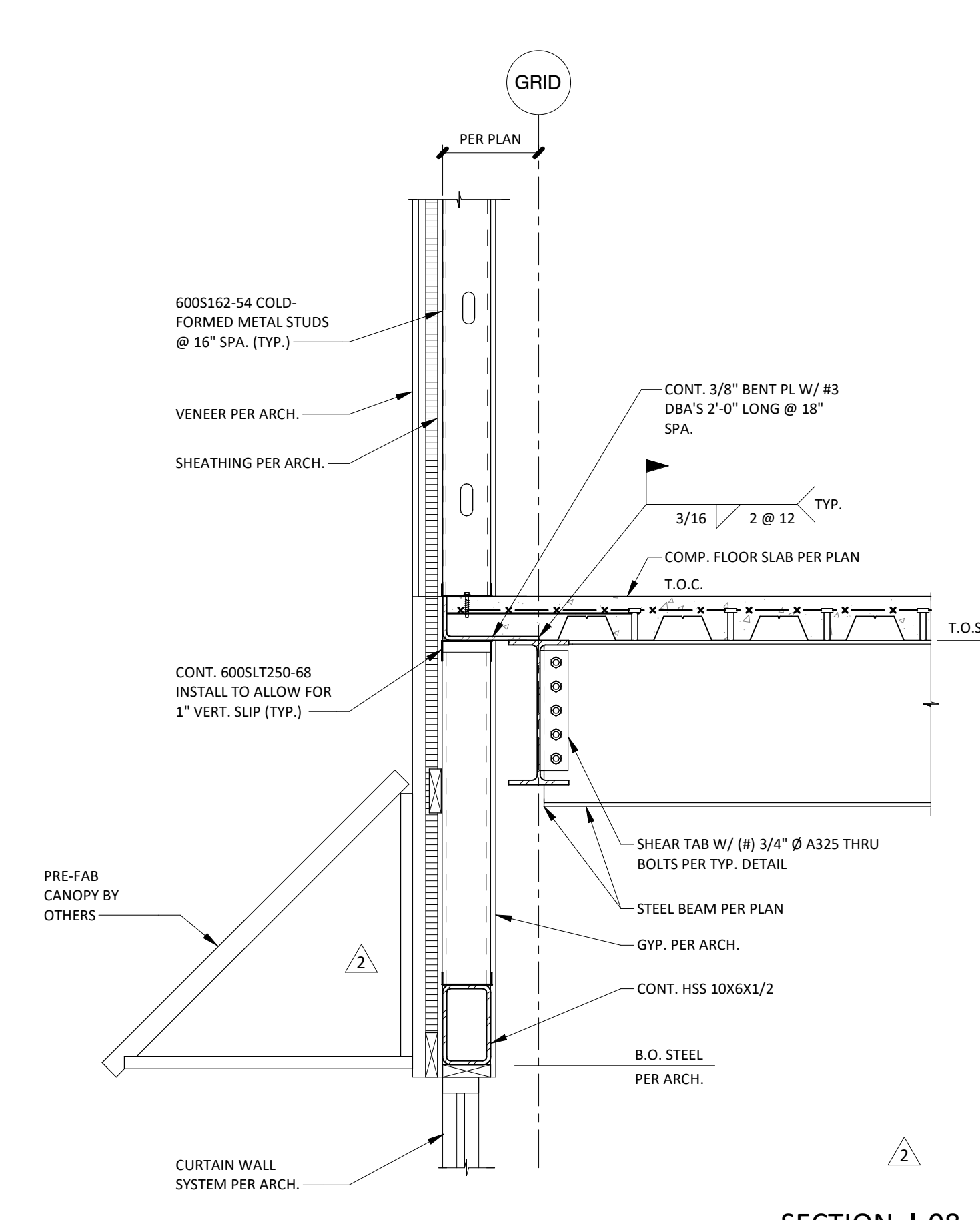
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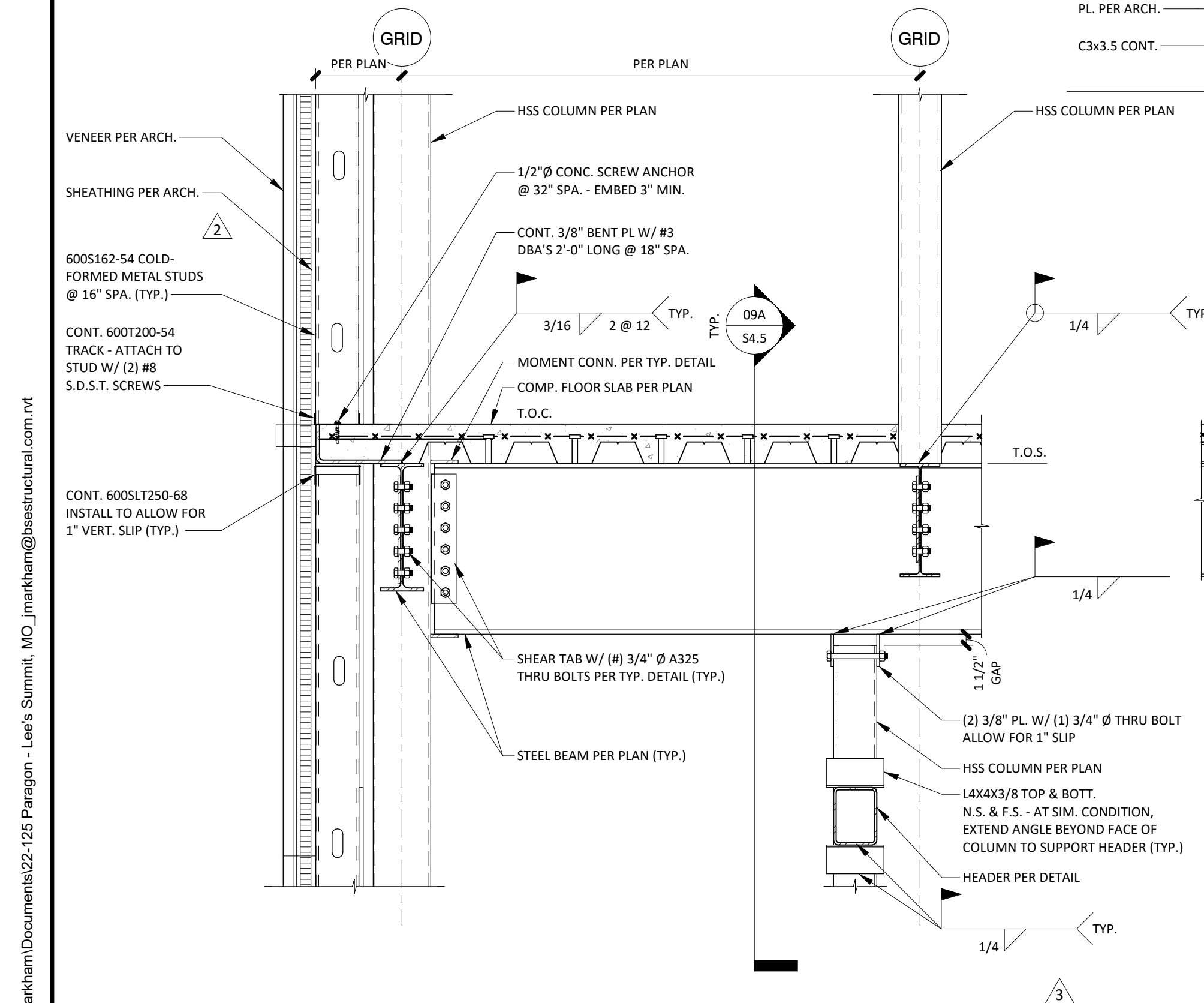
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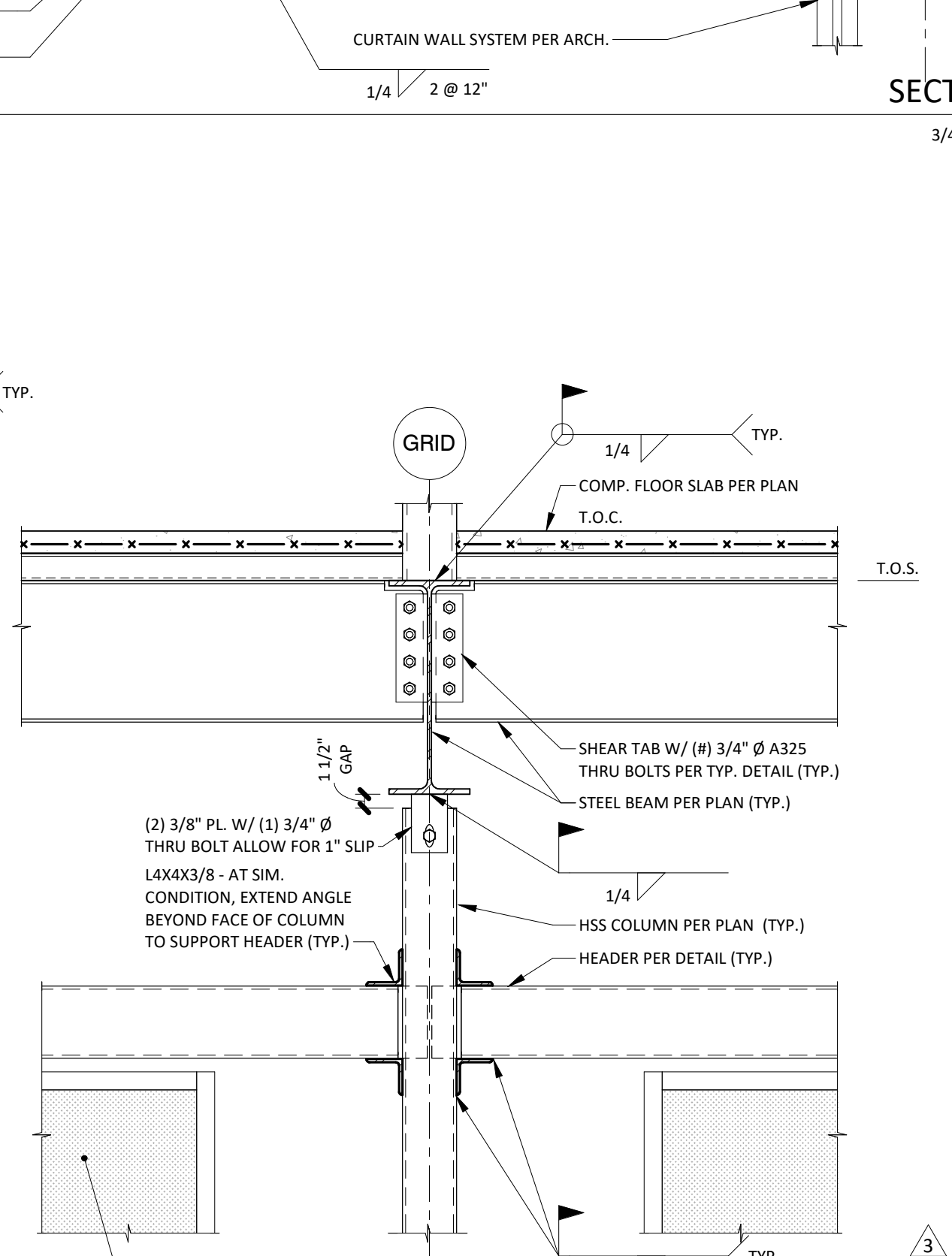
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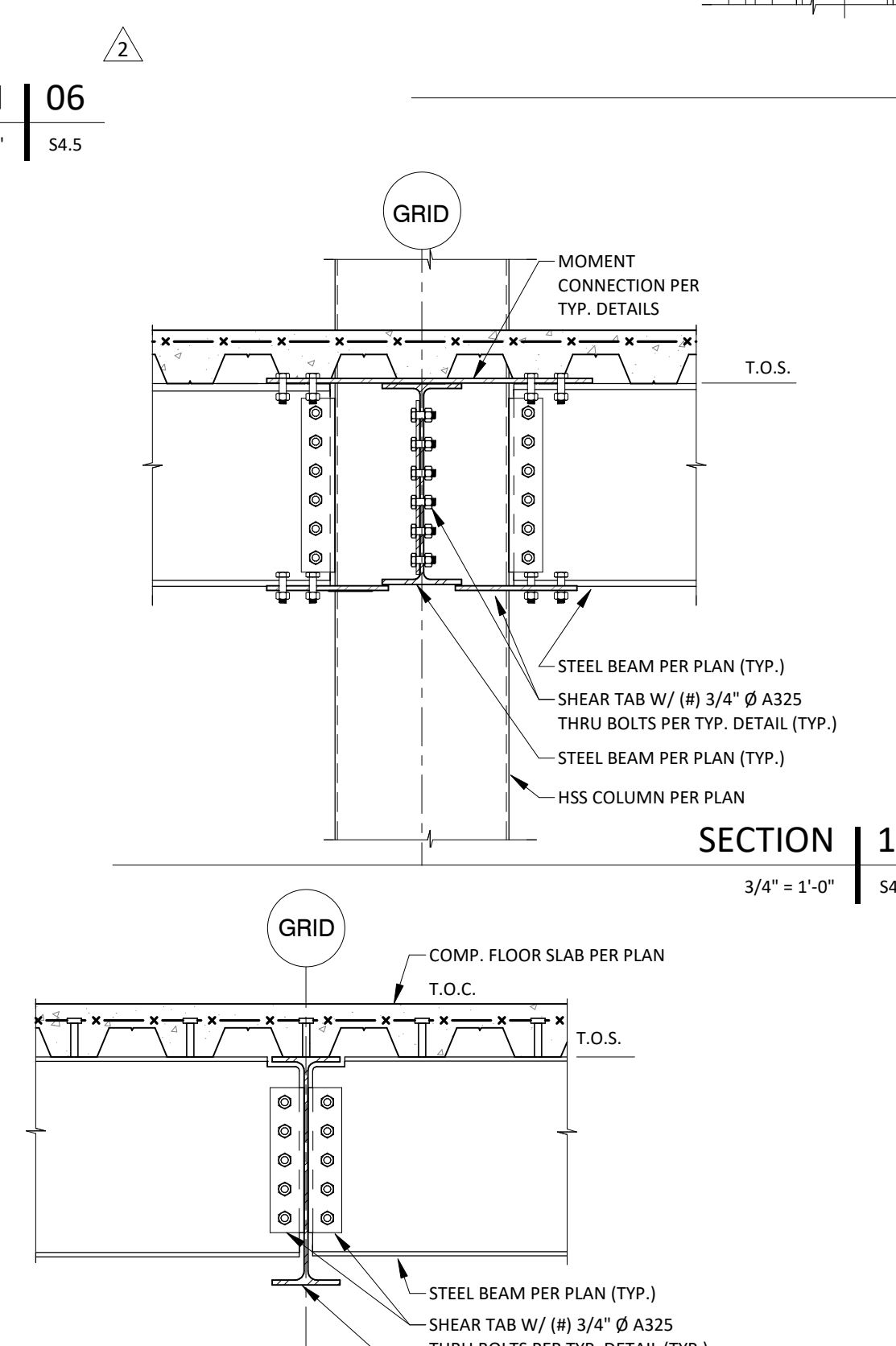
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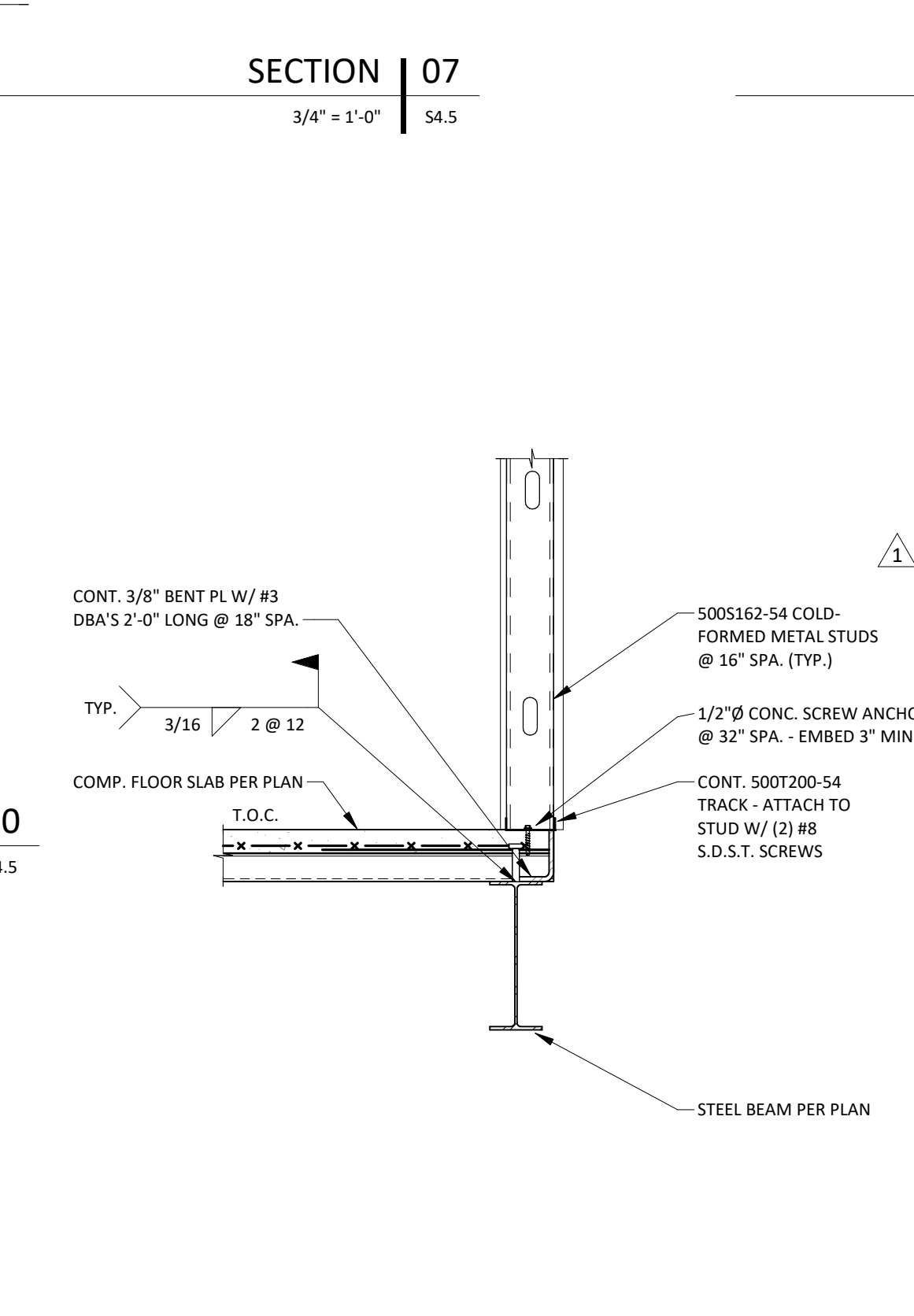
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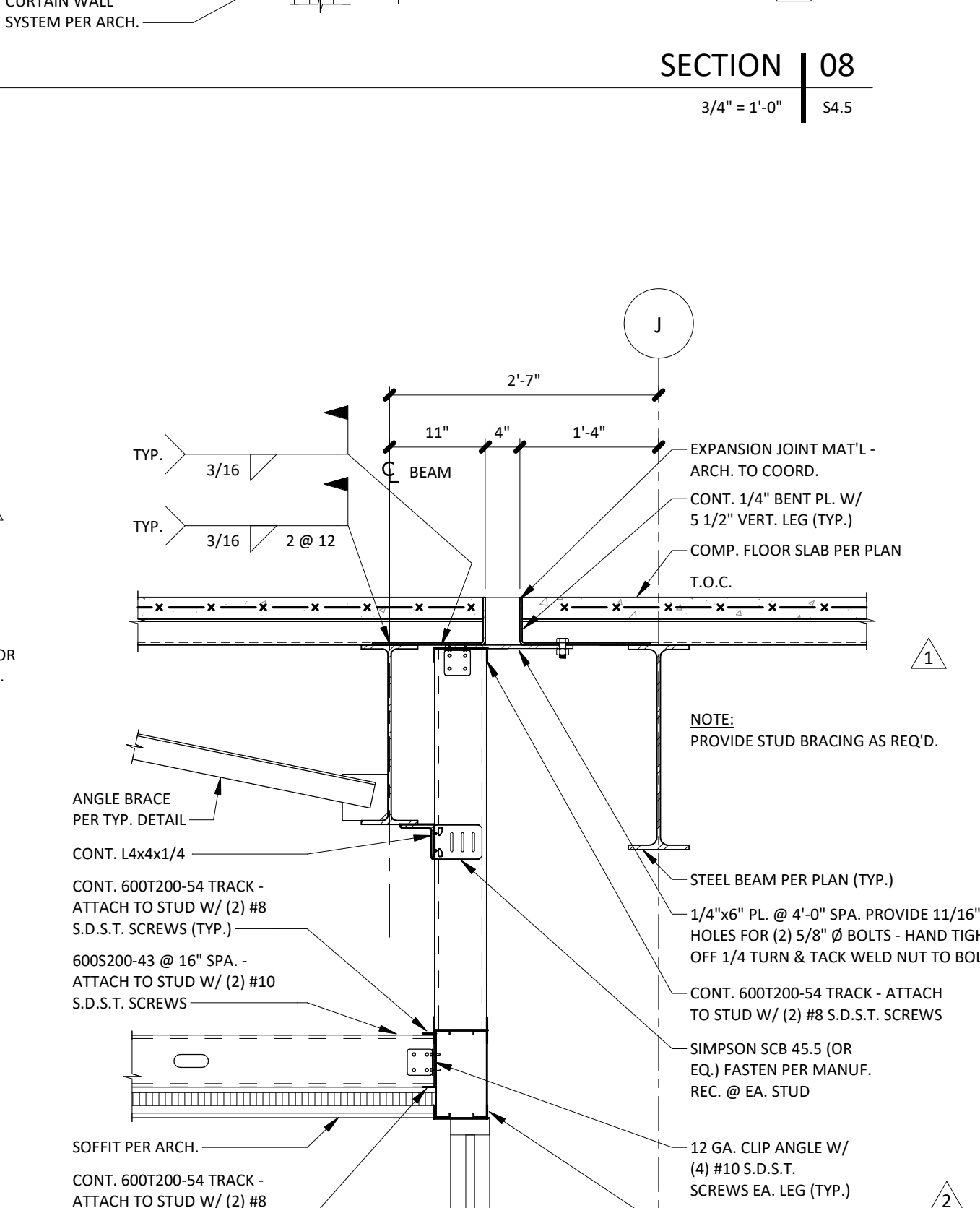
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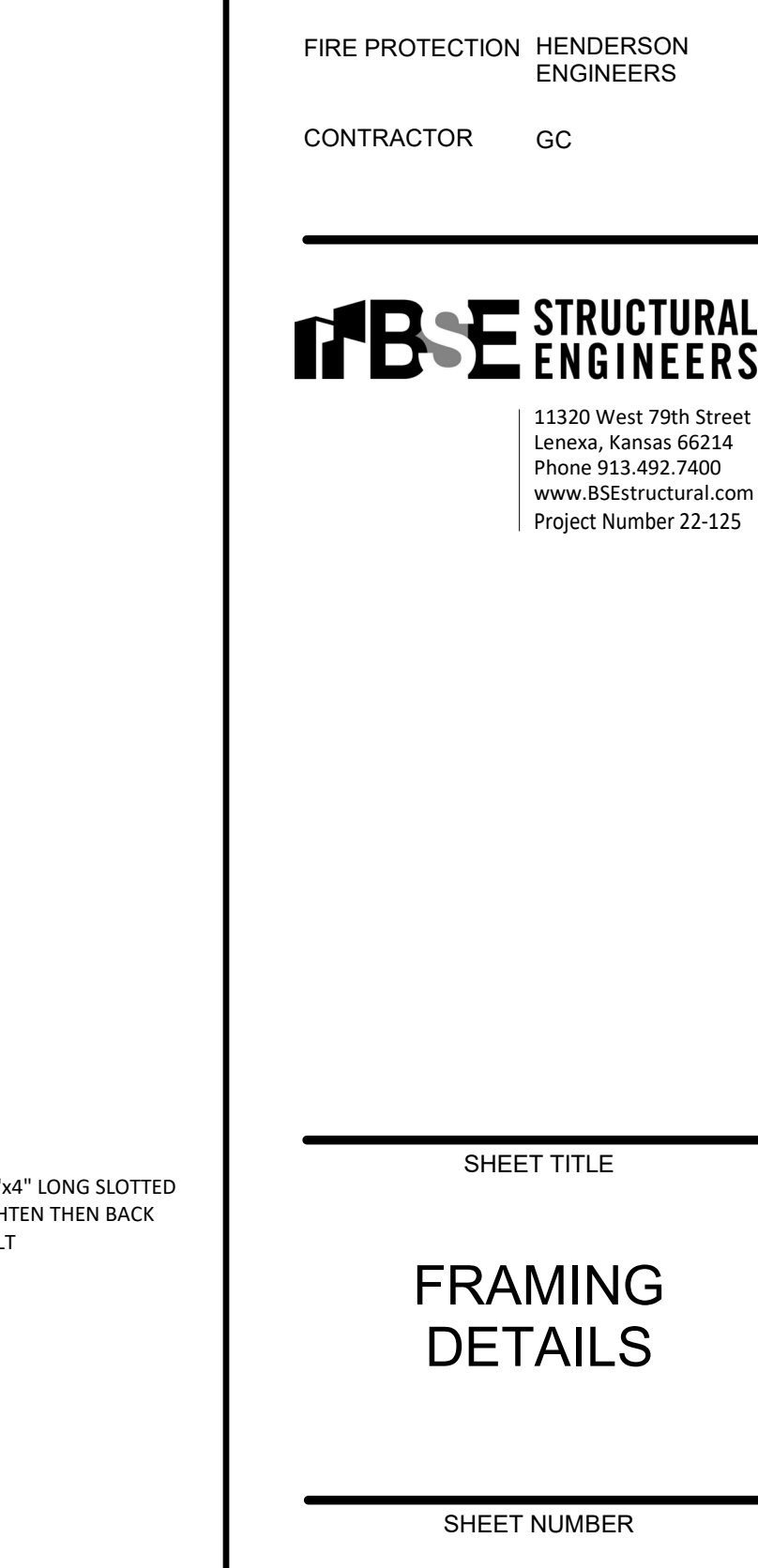
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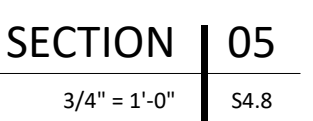
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SECTION 12
3/4\"/>



SECTION 13
3/4\"/>



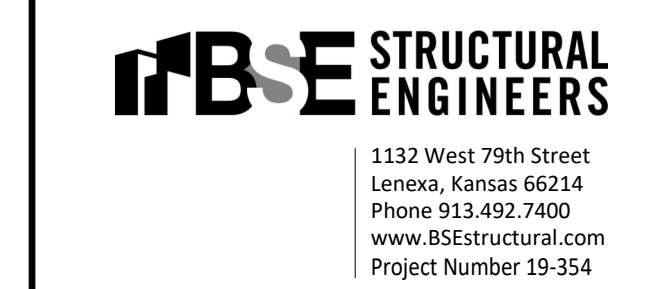
SECTION	03
3/4" = 1'-0"	\$4.9



Project No.:	19050.01
Date:	10.25.19
Issued For:	CONSTRUCTION

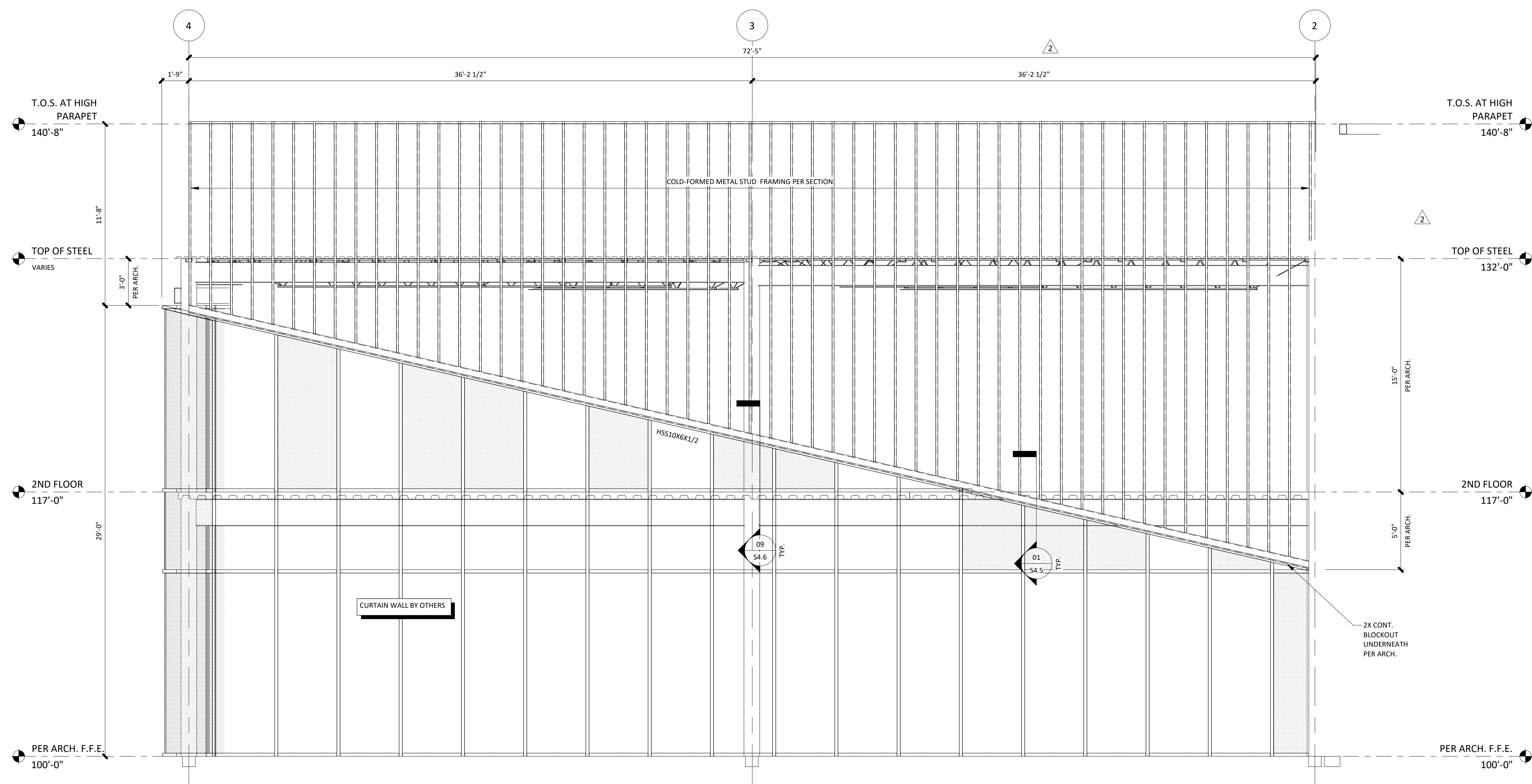
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ARCHITECT	FINKLE- WILLIAMS ARCHITECTURE
CIVIL	GBA
LANDSCAPE	HOERR SCHAUDT / LAND3
FOUNDATIONS	BSE STRUCTURAL ENGINEERS
STRUCTURAL	BSE STRUCTURAL ENGINEERS
PLUMBING	HENDERSON ENGINEERS
MECHANICAL	HENDERSON ENGINEERS
ELECTRICAL	HENDERSON ENGINEERS
FIRE PROTECTION	FIRE PROTECTION
CONTRACTOR	FOGEL ANDERSON

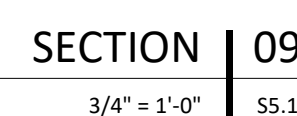


ELEVATIONS

S4.10



WEST CLADDING ELEVATION	01
1/4" = 1'-0"	\$4.10



THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED.

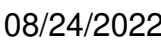
GENERAL NOTES

- paragon star

FIRST PLAT, LOT 9
LEE'S SUMMIT, MO

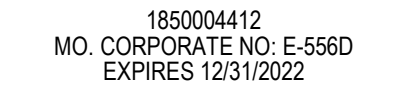
Issued For: **ADDENDUM 2**

REGISTRATION



PROJECT TEAM

PROJECT TEAM	
ARCHITECT	FINKLE-WILLIAMS ARCHITECTURE
CIVIL	GBA
LANDSCAPE	LAND 3
FOUNDATIONS	BSE STRUCTURAL ENGINEERS
STRUCTURAL	BSE STRUCTURAL ENGINEERS
PLUMBING	HENDERSON ENGINEERS
MECHANICAL	HENDERSON ENGINEERS
ELECTRICAL	HENDERSON ENGINEERS
FIRE PROTECTION	HENDERSON ENGINEERS
CONTRACTOR	GC



SHEET TITLE

MECHANICAL LEGENDS AND GENERAL NOTES

SHEET NUMBER

M000

M000

- ① MECHANICAL SECOND FLOOR PLAN - WEST
1/8" = 1'-0"



FIRST PLAT, LOT 9
LEE'S SUMMIT, MO

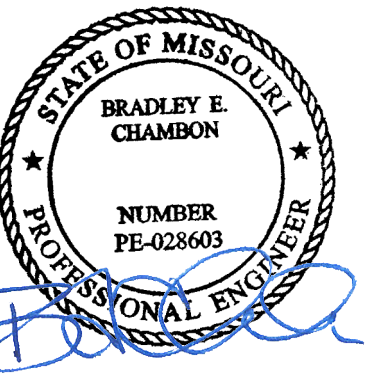
Project No.: 19050.01a

Date: 08.26.22

Issued For: **ADDENDUM 2**

[illegible]

REGISTRATION



BRADLEY E. CHAMBON
LICENSE # 028603

PROJECT TEAM

ARCHITECT FINKLE+WILLIAMS
ARCHITECTURE

CIVIL GBA

LANDSCAPE LAND 3

FOUNDATIONS BSE STRUCTURAL
ENGINEERS

STRUCTURAL BSE STRUCTURAL
ENGINEERS

PLUMBING HENDERSON
ENGINEERS

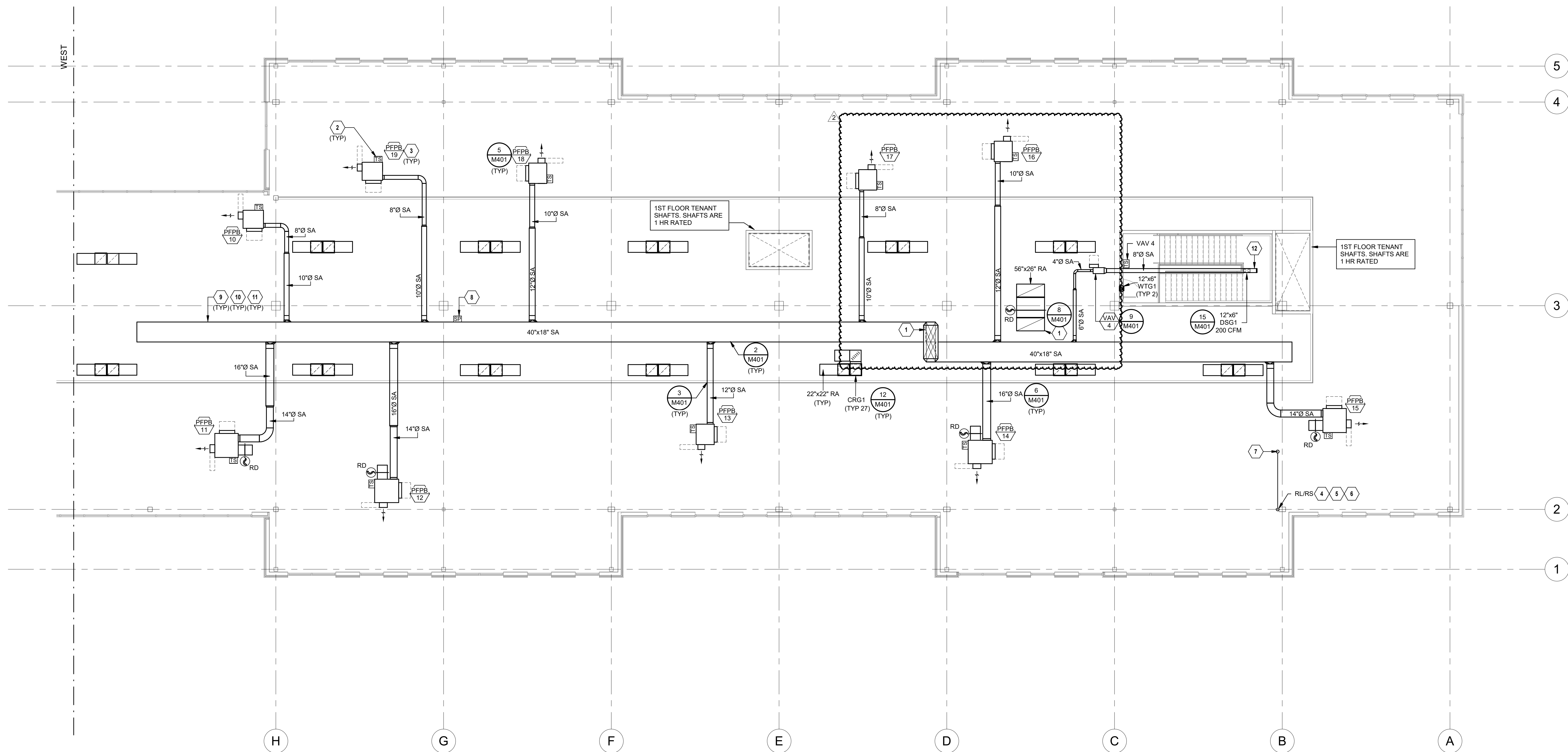
MECHANICAL HENDERSON
ENGINEERSELECTRICAL
HENDERSON
ENGINEERSFIRE PROTECTION HENDERSON
ENGINEERS

SHEET TITLE

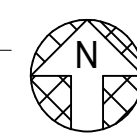
MECHANICAL
SECOND FLOOR
PLAN - EAST

SHEET NUMBER

M102.2



① MECHANICAL SECOND FLOOR PLAN - EAST
1/8" = 1'-0"



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BRADLEY E. CHAMBON

REVISIONS

No.	Date	Description
2	08/26/22	ADDENDUM 02
4	01/20/23	ASI 01

REGISTRATION

BRADLEY E. CHAMBERN
LICENSE # 028603

PROJECT TEAM

ARCHITECT	FINKLE-WILLIAMS ARCHITECTURE
CIVIL	GBA
LANDSCAPE	LAND 3
FOUNDATIONS	BSE STRUCTURAL ENGINEERS
STRUCTURAL	BSE STRUCTRAL ENGINEERS
PLUMBING	HENDERSON ENGINEERS
MECHANICAL	HENDERSON ENGINEERS
ELECTRICAL	HENDERSON ENGINEERS
FIRE PROTECTION	HENDERSON ENGINEERS
CONTRACTOR	GC



165004412
MO. CORPORATE NO. E-556D
EXPIRES 12/31/2023

SHEET TITLE

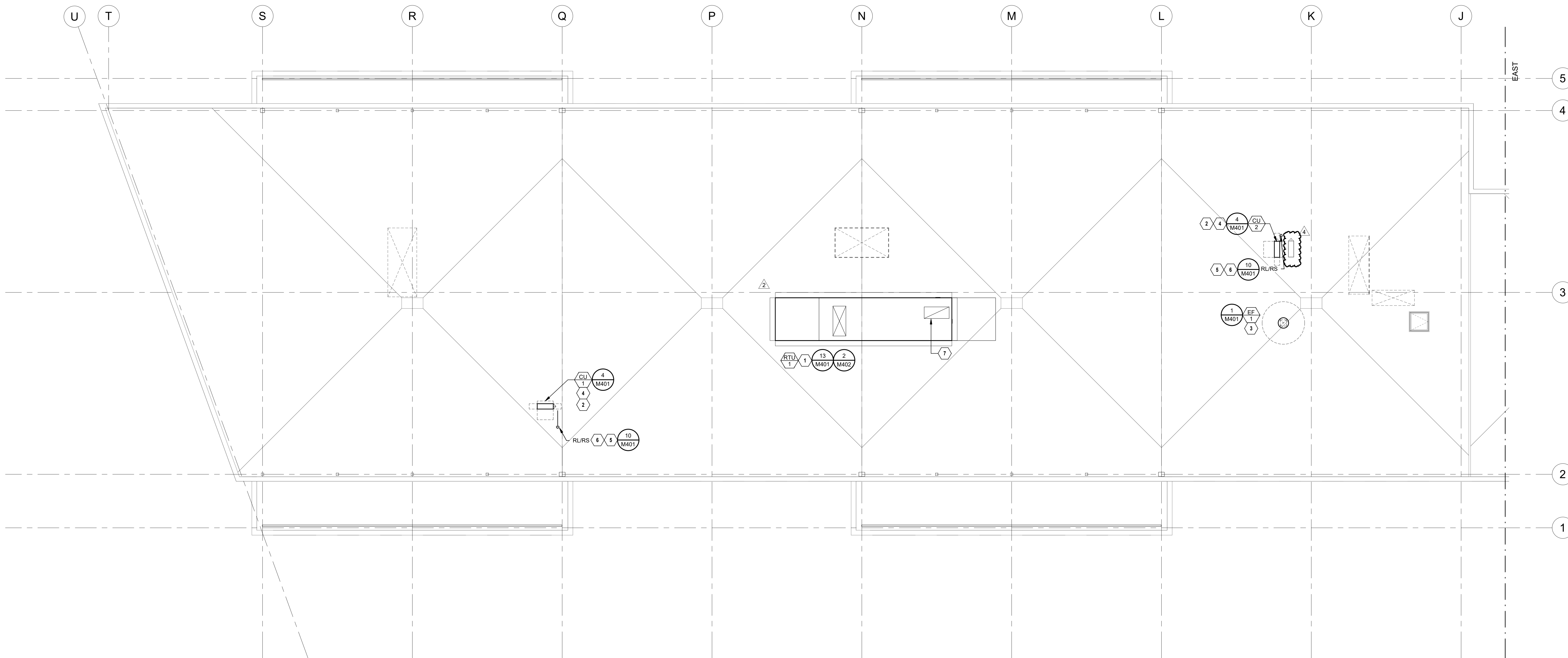
MECHANICAL
ROOF PLAN -
WEST

SHEET NUMBER

M201.1

MECHANICAL PLAN NOTES:

- 1 PROVIDE ROOF TOP UNIT APPROXIMATELY WHERE SHOWN. COORDINATE FINAL LOCATION WITH ARCHITECT AND STRUCTURAL ENGINEER. ROOF CURB SHALL ACCOUNT FOR SLOPE OF ROOF. TRANSITION SUPPLY DUCTWORK AS SHOWN ON PLANS.
- 2 PROVIDE SPLIT SYSTEM CONDENSING UNIT WHERE SHOWN. ROUTE REFRIGERANT PIPING TO ASSOCIATED INTERIOR FAN COIL. COORDINATE EXACT REFRIGERANT PIPING ROUTING AND SIZE WITH MANUFACTURER.
- 3 PROVIDE ROOF MOUNTED EXHAUST FAN APPROXIMATELY WHERE SHOWN. MAINTAIN MINIMUM 10'-0" CLEARANCE FROM BUILDING INTAKE.
- 4 MOUNT AND ANCHOR CONDENSING UNIT ON ROOF RAIL. ROUTE REFRIGERANT PIPING TO AND FROM FAN COIL UNIT BELOW PER MANUFACTURER'S RECOMMENDATIONS AND IN APPROXIMATE LOCATION SHOWN ON PLANS. REFER TO DETAILS SHEET FOR MORE INFORMATION.
- 5 REFRIGERANT PIPE DOWN TO FLOOR BELOW.
- 6 REFRIGERANT PIPING IS SHOWN SINGLE LINE FOR CLARITY. VERIFY WITH MANUFACTURER THE PIPE SIZE AND QUANTITY WITH THE FINAL SYSTEM PURCHASED.
- 7 MECHANICAL CONTRACTOR SHALL TRANSITION DUCT DIMENSIONS TO RETURN AIR OPENING CONNECTION. BLANK OFF OPENING THAT IS IN CONFLICT WITH RETURN AIR CONNECTION.



1 MECHANICAL ROOF PLAN - WEST
1/8" = 1'-0"





FIRST PLAT, LOT 9
LEE'S SUMMIT, MO

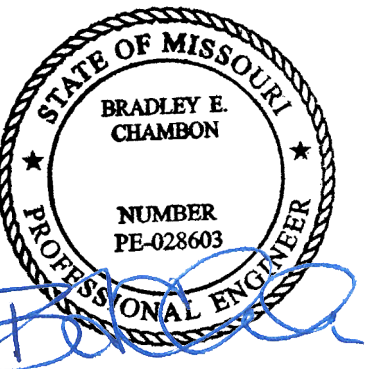
Project No.: 19050.01a

Date: 08.26.22

Issued For: ADDENDUM 2

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REGISTRATION



8/24/2022

BRADLEY E. CHAMBON
LICENSE # 028603

PROJECT TEAM

ARCHITECT FINKLE+WILLIAMS
ARCHITECTURE

CIVIL GBA

LANDSCAPE LAND 3

FOUNDATIONS BSE STRUCTURAL
ENGINEERS

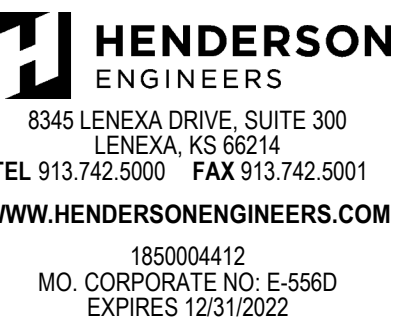
STRUCTURAL BSE STRUCTURAL
ENGINEERS

PLUMBING HENDERSON
ENGINEERS

MECHANICAL HENDERSON
ENGINEERSELECTRICAL HENDERSON
ENGINEERS

FIRE PROTECTION HENDERSON
ENGINEERS

CONTRACTOR GC

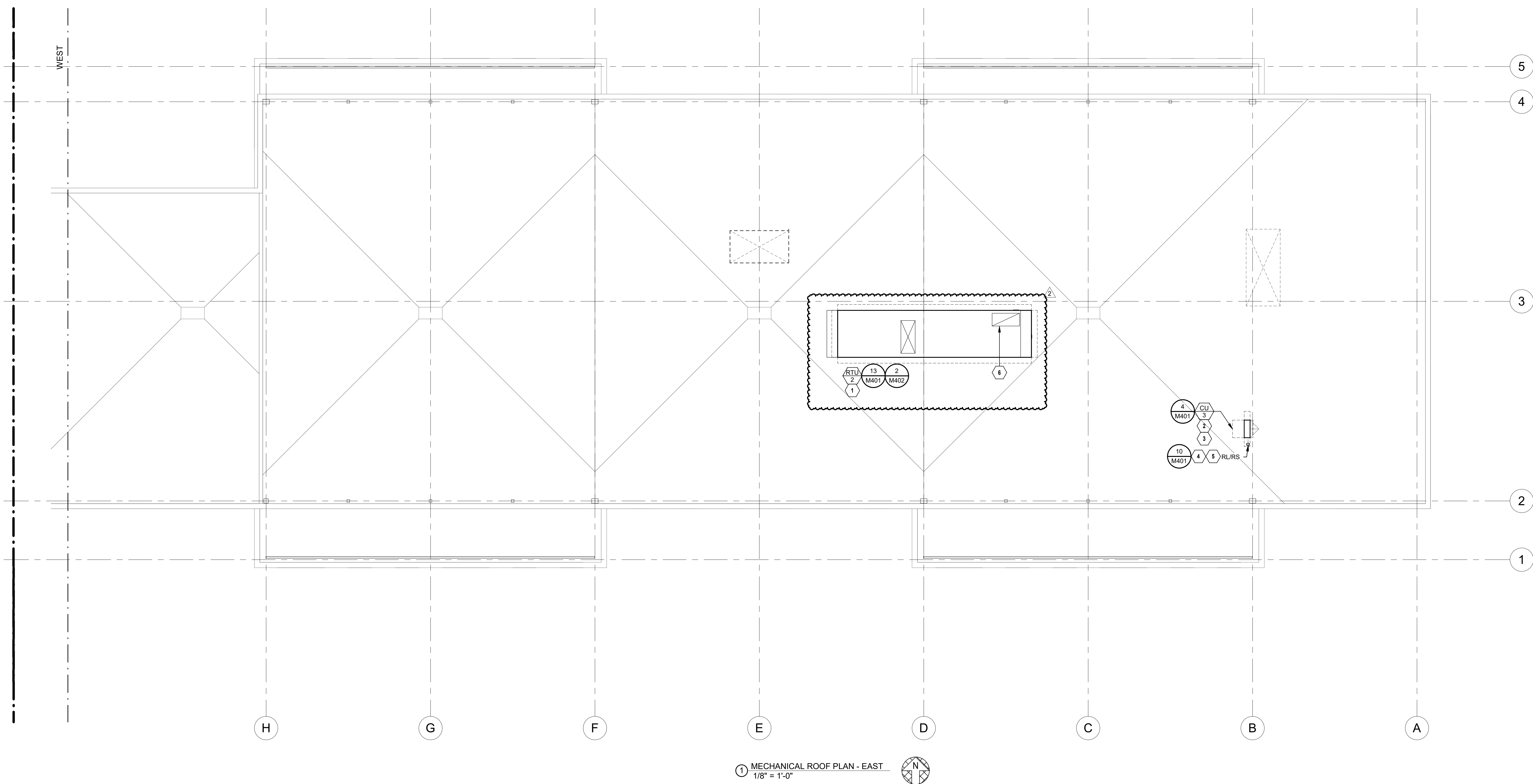


SHEET TITLE

MECHANICAL
ROOF PLAN -
EAST

SHEET NUMBER

M201.2



① MECHANICAL ROOF PLAN - EAST
1/8" = 1'-0"



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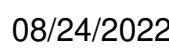
BRADLEY E. CHAMBON



Project No.: 19050.01a
Date: 08.26.22
Issued For: ADDENDUM 2

[illegible]

REGISTRATION



BRADLEY E. CHAMBERLAIN
LICENSE # 028603

PROJECT TEAM

ARCHITECT	FINKLE+WILLIAMS ARCHITECTURE
CIVIL	GBA
LANDSCAPE	LAND 3
FOUNDATIONS	BSE STRUCTURAL ENGINEERS
STRUCTURAL	BSE STRUCTURAL ENGINEERS
PLUMBING	HENDERSON ENGINEERS
MECHANICAL	HENDERSON ENGINEERS
ELECTRICAL	HENDERSON ENGINEERS
FIRE PROTECTION	HENDERSON ENGINEERS
CONTRACTOR	GC

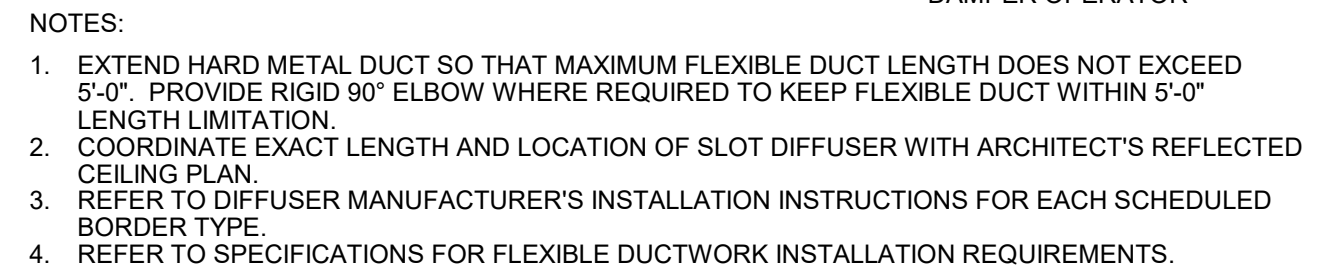


SHEET TITLE

MECHANICAL DETAILS

SHEET NUMBER

M402

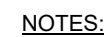


⑤ LINEAR SLOT DIFFUSER IN GYP CEILING DETAIL
NTS



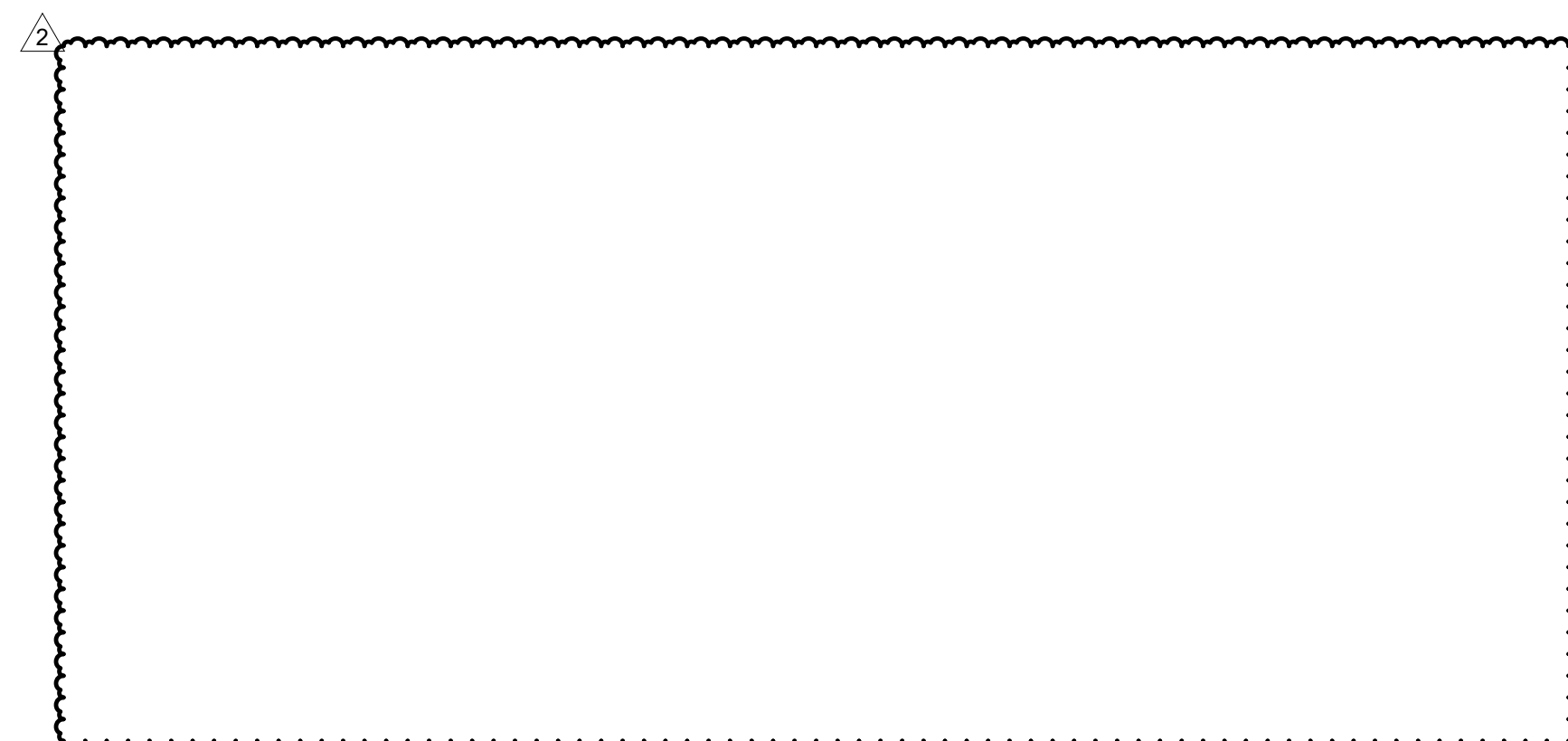
1. ARRANGEMENT SHOWN IS SCHEMATIC, ADJUST TO SUIT FIELD CONDITIONS OR MEET LOCAL CODE REQUIREMENTS.
2. PROVIDE MINIMUM 3.5" OF CLEARANCE AT THE TOP OF THE UNIT.
3. ATTACH FAN COIL UNIT TO MANUFACTURER'S PROVIDED INSTALLATION PLATE. MOUNT INSTALLATION PLATE TO WALL PER MANUFACTURER'S RECOMMENDATIONS.

① FAN COIL UNIT - WALL MOUNTED
NTS



1. CUT METAL DECKING TO ALLOW CURB INSTALLATION ON STEEL FRAMING. AFTER CURB IS SET IN PLACE, TRIM REMAINING METAL DECKING AND INSTALL WITHIN CURB. TACK WELD DECKING TO SUPPORT STEEL. DO NOT WELD INTERIOR DECKING TO ROOF CURB. PROVIDE ADDITIONAL CROSS FRAMING TO SUPPORT INTERIOR DECKING AND FILL MATERIAL AS REQUIRED.

② VIBRATION ISOLATION ROOF CURB AND DUCT ISOLATION DETAIL
NTS



1. EXTEND HARD METAL DUCT SO THAT MAXIMUM FLEXIBLE DUCT LENGTH DOES NOT EXCEED 5'-0". PROVIDE RIGID 90° ELBOW WHERE REQUIRED TO KEEP FLEXIBLE DUCT WITHIN 5'-0" LENGTH LIMITATION.
2. COORDINATE EXACT LENGTH AND LOCATION OF SLOT DIFFUSER WITH ARCHITECT'S REFLECTED CEILING PLAN.
3. REFER TO DIFFUSER MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR EACH SCHEDULED BORDER TYPE.
4. REFER TO SPECIFICATIONS FOR FLEXIBLE DUCTWORK INSTALLATION REQUIREMENTS.

④ SIDEWALL LINEAR SLOT DIFFUSER DETAIL
NTS

No.	Date	Description
2	08/26/22	ADDENDUM 02
4	01/20/23	ASI 01

ROOFTOP UNIT SCHEDULE (DX COOLING, NATURAL GAS HEAT)

MARK	MANUFACTURER	NOMINAL TONS	MODEL	SUPPLY FAN						RELIEF FAN						COOLING COIL										HEAT EXCHANGER										ELECTRICAL				WEIGHT (LBS)	NOTES
				CFM	MIN CFM	ESP (IN)	BHP	NOM (Y/N)	VFD (Y/N)	CFM	ESP (IN)	BHP	NOM (Y/N)	VFD (Y/N)	TH (MBH)	SH (MBH)	EAT		LAT		REFR (°F DB)	MIN EFF (EER)	MIN EFF (IEER)	MIN NO STAGES	MAX VEL (FPM)	MIN OUT (°F DB)	INPUT (°F DB)	MIN EFF (%)	EAT (°F DB)	LAT (°F DB)	MOD HEAT	MAX VEL (FPM)	MIN OIA CFM	V/PH	MCA	MOCP					
																	(°F DB)	(°F WB)	(°F DB)	(°F WB)																(°F DB)	(°F WB)	(°F DB)	(°F WB)		
RTU-1	TRANE	55	IPAK1	18,500	5,550	2	21.1	30.0	Y	18,500	(IN)	7.7	10.0	Y	560.6	456.3	78.1	64.5	55.4	54.6	84.5	8.9	10.5	4	500	151.6	500	30.1	55.0	4.1	500	2725	4803	151.95	175	9.730	ALL				
RTU-2	TRANE	55	IPAK1	18,500	5,550	2	21.1	30.0	Y	18,500	(IN)	7.7	10.0	Y	560.6	456.3	78.1	64.5	55.4	54.6	84.5	8.9	10.5	4	500	151.6	500	30.1	55.0	4.1	500	2725	4803	151.95	175	9.730	ALL				

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:

- REFER TO SHEET M601 FOR PACKAGED MULTI-ZONE VAV ROOFTOP UNIT CONTROL DRAWING, POINTS LIST, AND SEQUENCE.
- EQUIPMENT SIZED FOR 100°F AMBIENT TEMPERATURE.
- PROVIDE MERV 13 EFFICIENT FLEATED THROWAWAY AIR FILTERS.
- PROVIDE FACTORY MOUNTED DISCONNECT INSTALLED ON SERVICE SIDE OF UNIT.
- STARTERS FOR ALL MOTORS SHALL BE FURNISHED INTEGRAL WITH UNIT.
- PROVIDE FACTORY MOUNTED VARIABLE FREQUENCY DRIVE TO FACILITATE MODULATING FAN SPEED CONTROL.
- PROVIDE SHUNT GROUNDING SYSTEM ON MOTOR. REFER TO MOTOR SPECIFICATION FOR ADDITIONAL INFORMATION.
- PROVIDE SINGLE POINT POWER CONNECTION.
- COORDINATE SIZE OF CONDUCTOR TERMINATION LUGS WITH CONDUCTOR SIZES SHOWN ON ELECTRICAL DRAWINGS.
- PROVIDE 125 VAC, 20 AMP DUPLEX CONVENIENCE RECEPTACLE MOUNTED TO UNIT READY FOR FIELD WIRING WITH A COVER UL LISTED FOR WET AND DAMPER LOCATIONS WHEN IN USE.
- SPECIFIED FAN ESP ACCOUNTS FOR DUCT LOSSES EXTERNAL TO UNIT.
- PROVIDE MOTOR HORSEPOWER TO OVERCOME INTERNAL UNIT STATIC PRESSURE DROP PLUS SPECIFIED EXTERNAL STATIC PRESSURE DROP. NOMINAL MOTOR HP SHALL BE NO LARGER THAN THE FIRST AVAILABLE NOMINAL MOTOR SIZE GREATER THAN THE REQUIRED BHP.
- PROVIDE VIBRATION ISOLATION INSULATED ROOF CURB WITH MINIMUM HEIGHT OF 14" INCHES. REFER TO DETAILS SHEET M401 FOR CURB FILL AND SPRING DEFLECTION REQUIREMENTS. PROVIDE SLOPED CURB IF NEEDED TO MATCH ROOF SLOPE.
- PROVIDE FULL PERIMETER ISOLATION CURB.
- COOLING COIL LAT IS LEAVING AIR TEMPERATURE OF COIL.
- PROVIDE GUARDS TO PROTECT CONDENSER COIL FROM HAIL OR OTHER DAMAGE.
- PROVIDE HEATER TO MEET OR EXCEED SCHEDULED MINIMUM MBH OUTPUT. NOMINAL INPUT IS BASED ON LISTED MANUFACTURER'S STANDARD PRODUCT. COORDINATE EQUIPMENT GAS LOAD WITH PLUMBING CONTRACTOR IF DIFFERENT FROM THAT SCHEDULED. MEET MINIMUM EFFICIENCY SCHEDULED.

UNIT HEATER SCHEDULE (ELECTRIC)

MARK	MANUFACTURER	MODEL	NOM (KW)	CFM	V/PH	NOTES
UW-1 THRU UW-21	QMARK	MU65-71	5	350	277/1	A, B, D, E
WUH-1 THRU WUH-3	QMARK	SSAR4807	4.8	350	277/1	A, B, C, E

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:

- PROVIDE WITH UNIT MOUNTED THERMOSTAT.
- PROVIDE MANUAL SUMMER/WINTER CHANGE-OVER SWITCH.
- PROVIDE NECESSARY MOUNTING BRACKET AND ACCESSORIES FOR RECESSED WALL MOUNTING.
- PROVIDE NECESSARY MOUNTING BRACKET AND ACCESSORIES FOR CEILING MOUNTING.
- PROVIDE FACTORY MOUNTED DISCONNECT INSTALLED ON SERVICE SIDE OF UNIT.

FAN-POWERED VARIABLE AIR VOLUME TERMINAL SCHEDULE (ELECTRIC HEAT)

MARK	SERVED FROM	ZONE SERVED	MANUFACTURER	MODEL	BOX TYPE	BOX SIZE	INLET SIZE (IN)	PRIMARY CFM	MIN PRIM CFM	PRIM AIR TEMP (F)	FAN				HEATING COIL				CP TRANS	SOUND POWER		NOTES		
											CFM	MOTOR TYPE	HP	V/PH	EAT	LAT	KW	STEPS		HTG CTRL	V / PH		RADIATED	DISCHARGE
PPFB-01	RTU-1	LOBBY	TITUS	DTQP	Parallel	06	14	2340	702	55	1170	EC MOTOR	1	277V / 1PH	66	83	16.0	-	SCR	480V / 3PH / 4W	INTEGRAL	33	25	A-O
PPFB-02	RTU-1	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	03	10	925	278	55	465	EC MOTOR	1/2	277V / 1PH	66	83	6.5	-	SCR	480V / 3PH / 4W	INTEGRAL	36	22	A-N
PPFB-03	RTU-1	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	03	8	625	188	55	315	EC MOTOR	1/2	277V / 1PH	66	84	4.5	-	SCR	480V / 3PH / 4W	INTEGRAL	32	21	A-N
PPFB-04	RTU-1	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	03	10	800	240	55	400	EC MOTOR	1/2	277V / 1PH	66	83	5.5	-	SCR	480V / 3PH / 4W	INTEGRAL	35	21	A-N
PPFB-05	RTU-1	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	06	14	2475	743	55	1240	EC MOTOR	1	277V / 1PH	66	83	17.0	-	SCR	480V / 3PH / 4W	INTEGRAL	33	25	A-O
PPFB-06	RTU-1	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	05	14	2125	638	55	1065	EC MOTOR	1	277V / 1PH	66	83	15.0	-	SCR	480V / 3PH / 4W	INTEGRAL	40	25	A-O
PPFB-07	RTU-1	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	04	12	1700	510	55	850	EC MOTOR	1/2	277V / 1PH	66	92	11.5	-	SCR	480V / 3PH / 4W	INTEGRAL	38	25	A-N
PPFB-08	RTU-1	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	05	14	2125	638	55	1065	EC MOTOR	1	277V / 1PH	66	83	15.0	-	SCR	480V / 3PH / 4W	INTEGRAL	40	25	A-O
PPFB-09	RTU-1	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	04	12	1700	510	55	850	EC MOTOR	1/2	277V / 1PH	66	92	11.5	-	SCR	480V / 3PH / 4W	INTEGRAL	38	25	A-N
PPFB-10	RTU-2	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	04	8	750	225	55	465	EC MOTOR	1/2	277V / 1PH	66	84	6.0	-	SCR	480V / 3PH / 4W	INTEGRAL	32	21	A-N
PPFB-11	RTU-2	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	05	14	2150	645	55	1075	EC MOTOR	1	277V / 1PH	66	83	15.0	-	SCR	480V / 3PH / 4W	INTEGRAL	40	27	A-O
PPFB-12	RTU-2	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	05	14	2125	638	55	1065	EC MOTOR	1	277V / 1PH	66	83	15.0	-	SCR	480V / 3PH / 4W	INTEGRAL	40	25	A-O
PPFB-13	RTU-2	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	04	12	1700	510	55	850	EC MOTOR	1/2	277V / 1PH	66	92	11.5	-	SCR	480V / 3PH / 4W	INTEGRAL	38	25	A-N
PPFB-14	RTU-2	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	06	16	2975	893	55	1490	EC MOTOR	1	277V / 1PH	66	92	20.0	-	SCR	480V / 3PH / 4W	INTEGRAL	40	25	A-O
PPFB-15	RTU-2	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	05	14	2025	608	55	1015	EC MOTOR	1	277V / 1PH	66	83	14.0	-	SCR	480V / 3PH / 4W	INTEGRAL	38	25	A-O
PPFB-16	RTU-2	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	04	10	1150	345	55	690	EC MOTOR	1/2	277V / 1PH	66	92	8.5	-	SCR	480V / 3PH / 4W	INTEGRAL	36	24	A-N
PPFB-17	RTU-2	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	03	8	700	210	55	350	EC MOTOR	1/2	277V / 1PH	66	84	5.0	-	SCR	480V / 3PH / 4W	INTEGRAL	34	22	A-N
PPFB-18	RTU-2	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	03	10	800	240	55	480	EC MOTOR	1/2	277V / 1PH	66	83	6.0	-	SCR	480V / 3PH / 4W	INTEGRAL	36	22	A-N
PPFB-19	RTU-2	2ND FLOOR PERIMETER	TITUS	DTQP	Parallel	03	8	650	195	55	325	EC MOTOR	1/2	277V / 1PH	66	83	4.5	-	SCR	480V / 3PH / 4W	INTEGRAL	34	22	A-N

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NOTES:

- HEATING COIL CAPACITY BASED ON 32 F MAX. AIR TEMPERATURE RISE AND 450 FPM MINIMUM COIL FACE VELOCITY.
- INSTALL FLEXIBLE DUCT CONNECTOR AT ALL CONNECTIONS.
- PROVIDE INTEGRAL DISCONNECT SWITCH.
- PROVIDE CONTROL POWER (CP) TRANSFORMER FACTORY INSTALLED. COORDINATE PRIMARY POWER WITH ELECTRICAL DRAWINGS.
- BOX NOT TO EXCEED SCHEDULED DISCHARGE OR RADIATED SOUND NC LEVEL USING 0.5 INCH PRESSURE DROP.
- PROVIDE FACTORY-INSTALLED, PRESSURE INDEPENDENT DDC CONTROL PACKAGE.
- PROVIDE BOX WITH EITHER RIGHT HAND OR LEFT HAND CONFIGURATION AS SHOWN ON DRAWINGS.
- INLET SIZE SHOWN IS THE MINIMUM ALLOWABLE INLET SIZE. NO SMALLER SIZES SHALL BE ACCEPTED.
- VAV BOXES SHALL BE SIZED TO MEET THE SCHEDULED VALUES BASED ON THE FOLLOWING PRIORITIES: 1 - HEATING COIL CAPACITY, 2 - LEAVING AIR TEMPERATURE, 3 - WATER PRESSURE DROP.
- PROVIDE FILTER FRAME WITH 1 INCH THROWAWAY FILTERS.
- MOUNT HEATING COIL ON SUPPLY AIR DISCHARGE DUCT.
- FAN CFM BASED ON 0.35 INCH MINIMUM STATIC PRESSURE LEAVING BOX.
- INTERNALLY LINE BOX WITH MINIMUM R-3.5 FIBERGLASS LINER HAVING MINIMUM R-3.5 VALUE AND COMPLYING WITH UL 181 AND NFPA-901 PER SPECIFICATION.
- DIVISION 26 CONTRACTOR SHALL PROVIDE SMOKE DETECTORS IN RETURN AIR DUCT.

VAV TERMINAL SCHEDULE (COOLING ONLY)

MARK	SERVED FROM	ZONE SERVED	MANUFACTURER	MODEL	INLET SIZE (IN)	PRIMARY CFM	MIN PRIM CFM	CP TRANS	V/PH	SOUND POWER		CONTROL		NOTES
										RADIATED	DISCHARGE	TYPE	TYPE	
VAV-1	RTU-1	RESTROOMS/JANITOR	TITUS	DESV	8	600	150	120V / 1PH	22	28		SINGLE MAXIMUM	A-H	
VAV-2	RTU-1	ELECTRICAL/TELECOM	TITUS	DESV	8	550	165	120V / 1PH	20	28		SINGLE MAXIMUM	A-H	
VAV-3	RTU-1	WEST STAIRWELL	TITUS	DESV	4	200	60	120V / 1PH	27	34		SINGLE MAXIMUM	A-H	
VAV-4	RTU-2	EAST STAIRWELL	TITUS	DESV	4	200	60	120V / 1PH	27	34		SINGLE MAXIMUM	A-H	

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:

- INSTALL FLEXIBLE DUCT CONNECTOR AT INLET CONNECTION.
- PROVIDE INTEGRAL DISCONNECT SWITCH.
- PROVIDE CONTROL POWER (CP) TRANSFORMER FACTORY INSTALLED. COORDINATE PRIMARY POWER WITH ELECTRICAL DRAWINGS.
- BOX NOT TO EXCEED SCHEDULED DISCHARGE OR RADIATED SOUND NC LEVEL USING 0.5 INCH PRESSURE DROP.
- PROVIDE FACTORY-INSTALLED, PRESSURE INDEPENDENT, DDC CONTROL PACKAGE.
- PROVIDE BOX WITH EITHER RIGHT HAND OR LEFT HAND CONFIGURATION AS SHOWN ON DRAWINGS.
- INLET SIZE SHOWN IS THE MINIMUM ALLOWABLE INLET SIZE. NO SMALLER SIZES SHALL BE ACCEPTED.
- INTERNALLY LINE BOX WITH MINIMUM R-3.5 FIBERGLASS LINER HAVING MINIMUM R-3.5 VALUE AND COMPLYING WITH UL 181 AND NFPA-901 PER SPECIFICATION.

FAN SCHEDULE

MARK	SERVICE DESCRIPTION	MANUFACTURER	MOUNTING	MODEL	CFM	ESP (IN)	BHP	NOM HP	FAN RPM	DRIVE (BELT/DIRECT)	VFD (Y/N)	ELECTRICAL V/PH	WEIGHT (LBS)	NOTES
EF-1	EXHAUST AIR	COOK	DOWNBLAST	ACE-D 101C15D	700	0.4	0.11	1.8	1,550	DIRECT	N	120/1	100	A-E
EF-2	EXHAUST AIR	GREENHECK	INLINE	SQ-90-VG	650	0.2	0.07	1/10	1,635	DIRECT	N	115/1	50	D-F

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:

- PROVIDE STANDARD INSULATED ROOF CURB WITH MINIMUM HEIGHT OF 15 INCHES. PROVIDE SLOPED CURB IF NEEDED TO MATCH ROOF SLOPE.
- PROVIDE STAINLESS STEEL BIRDSCREEN AND BACKDRAFT DAMPER.
- PROVIDE NEMA 3R FACTORY MOUNTED DISCONNECT SWITCH.
- PROVIDE WITH MANUFACTURER'S FAN SPEED CONTROLLER FOR BALANCING PURPOSES.
- PROVIDE WITH MANUFACTURERS ELECTRONICALLY COMMUTATED (EC) MOTOR.
- PROVIDE WITH 2" FILTER RACK AND CHARCOAL FILTER.

FAN COIL AND CONDENSING UNIT SCHEDULE

MARK	MANUFACTURER	MODEL	REFR. TYPE
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Project No.:	19050.01a
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Issued For:	ADDENDUM

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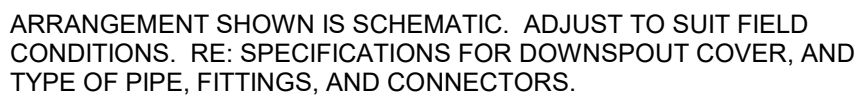
STATE OF MISSOURI
BRADLEY E. CHAMBON
NUMBER
PE-028603
PROFESSIONAL ENGINEER

BRADLEY E. CHAMBERLAIN
LICENSE # 028603

PROJECT TEAM	
ARCHITECT	FINKLE+WILLIAMS ARCHITECTURE
CIVIL	G&B
LANDSCAPE	LAND 3
FOUNDATIONS	BSE STRUCTURAL ENGINEERS
STRUCTURAL	BSE STRUCTURAL ENGINEERS
PLUMBING	HENDERSON ENGINEERS
MECHANICAL	HENDERSON ENGINEERS
ELECTRICAL	HENDERSON ENGINEERS
FIRE PROTECTION	HENDERSON ENGINEERS
CONTRACTOR	GC



P401

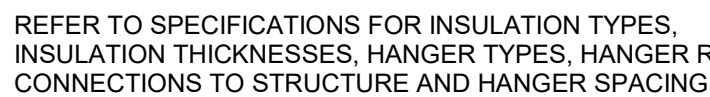


ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS. RE: SPECIFICATIONS FOR DOWNSPOUT COVER, AND TYPE OF PIPE, FITTINGS, AND CONNECTORS.

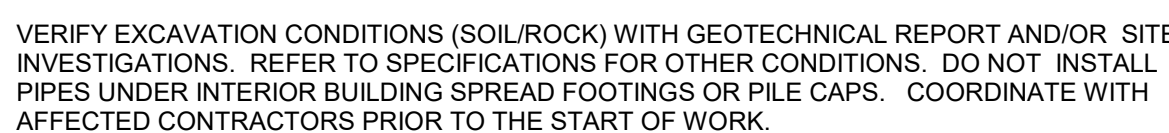


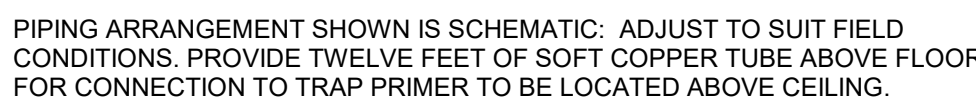
SECURE PIPE HANGER
TO STRUCTURE (TYP)

THREADED STEEL
ROD WITH NUT AND
WASHER BOTH
SIDES (TYP).



MINIMUM SIDE SLOPE OF





CONCEAL PIPE(S) IN PARTITION OR CHASE IN FINISHED AREAS. TRAP PRIMER AND PIPES MAY BE INSTALLED EXPOSED IN UNFINISHED, NON-PUBLIC AREAS.

INSTALL TRAP PRIMER LINE(S) DOWNSTREAM OF TRAP PRIMER OR DISTRIBUTION UNIT USING 1/2" SOFT COPPER TUBING. INSTALL WITHOUT KINKS, AND SLOPE CONTINUOUSLY TOWARDS FLOOR DRAIN.

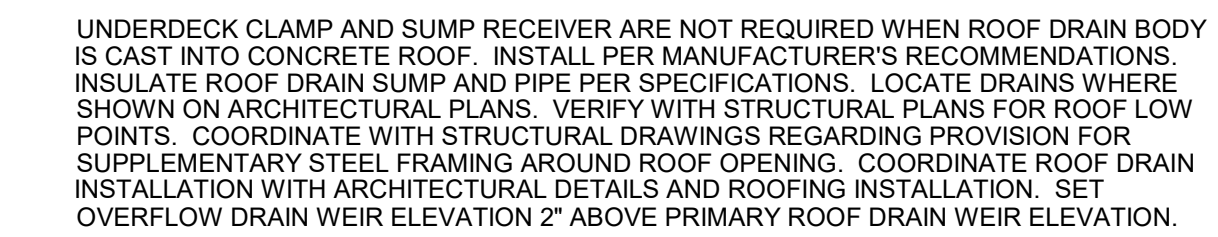
PROVIDE FLOOR DRAIN BODY OR P-TRAP WITH THREADED TRAP PRIMER CONNECTION. PROVIDE SWEAT TO THREADED ADAPTER. BRAZE JOINT BELOW FLOOR SLAB ON GRADE.

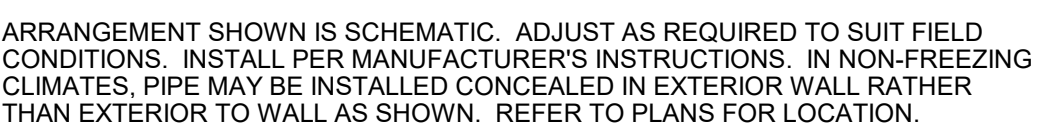
IF PIPE IS BELOW FLOOR SLAB ON GRADE, PROVIDE 1/2" ELASTOMERIC INSULATION FROM PRIMER CONNECTION TO 1" ABOVE FLOOR SLAB.

Diagram illustrating the components and assembly of a trapeze hanger system:

- PROVIDE METAL 360° INSULATION SHIELD AND HIGH DENSITY INSULATION OR PRE-ENGINEERED THERMAL HANGER-SHIELD INSERT OF CALCIUM SILICATE INSULATION, FOR PIPES 4" AND SMALLER, PRE-ENGINEERED THERMAL HANGER-SHIELD INSERT OF FLEXIBLE UNICELLULAR INSULATION MAY BE PROVIDED
- CUT INSULATION TO FIT AROUND TRAPEZE HANGER. SEAL BOTH ENDS OF EXPOSED INSULATION WITH JOINT SEALANT
- PROVIDE 1-5/8"x1-5/8" 14 GA. CHANNEL SUPPORT
- SIZE AND QUANTITY OF HANGER RODS PER MANUFACTURER'S RECOMMENDATIONS
- PROVIDE TWO-PIECE PIPE CLAMP (TYP)
- SUPPORT NUT (TYP)
- UNINSULATED STEEL OR PLASTIC PIPE
- PROVIDE PLASTIC GALVANIC ISOLATOR FOR COPPER PIPE (TYP)
- UNINSULATED COPPER PIPE
- COLD INSULATED PIPE
- PIPE INSULATION (TYP)
- HOT INSULATED PIPE

PIPING ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS. REFER TO SPECIFICATIONS FOR MORE INFORMATION. PIPE AND CONDUIT OF ALL TRADES MAY BE COMBINED ON THE SAME SUPPORT CHANNEL. COORDINATE SUPPORT CHANNEL LENGTH WITH PIPING AND CONDUIT TO BE SUPPORTED. SUPPORT CHANNEL SPACING SHALL BE DETERMINED BY SMALLEST PIPE TO BE SUPPORTED. CHANNEL SUPPORT MAY BE USED AS A WALL BRACKET, ATTACH TO WALL WITH ANCHOR BOLTS PER SPECIFICATIONS. FOR HORIZONTAL INSULATED PIPING, ATTACH CLAMPS AS INDICATED ABOVE. FOR VERTICAL INSULATED PIPING, ATTACH CLAMPS TO THE PIPE AND SEAL INSULATION AT BOTH CLAMP ENDS.





COLD WATER MAIN

BRANCH PIPE WITH SHUT-OFF VALVE FEEDING PLUMBING FIXTURE(S)

AUTOMATIC TRAP PRIMER VALVE WITH INTEGRAL AIR GAP. INSTALL TRAP PRIMER MINIMUM 12" ABOVE FLOOR FOR EVERY 20' OF PRIMER DISCHARGE PIPE.

PROVIDE DISTRIBUTION UNIT(S) WHERE MORE THAN ONE TRAP PRIMER IS SERVED BY ONE TRAP PRIMER VALVE.

IF TRAP PRIMER IS INSTALLED ABOVE HARD CEILING, PROVIDE ACCESS DOOR PER SPECIFICATIONS.

PROVIDE FLOOR DRAIN BODY OR P-TRAP WITH THREADED TRAP PRIMER CONNECTION. PROVIDE SWEAT TO THREADED ADAPTER BRACE JOIN BELOW FLOOR SLAB ON GRADE.

CONNECT 1/2" PIPE (WITHOUT SHUT-OFF VALVE IN BRANCH) TO TRAP PRIMER VALVE OFF TOP OF BRANCH PIPE. INSULATE PIPE UPSTREAM OF TRAP PRIMER, BUT NOT DOWNSTREAM.

INSTALL TRAP PRIMER LINE(S) DOWNSTREAM OF TRAP PRIMER OR DISTRIBUTION UNIT USING 1/2" SDR11 COPPER TUBING. INSTALL WITHOUT KINKS, AND SLOPE CONTINUOUSLY TOWARDS FLOOR DRAIN.

CONCEAL PIPE(S) IN PARTITION OR CHASE IN FINISHED AREA. TRAP PRIMER AND PIPES MAY BE INSTALLED EXPOSED IN UNFINISHED, NON-PUBLIC AREAS.

IF PIPE IS BELOW FLOOR SLAB, PROVIDE 1/2" ELASTOMERIC INSULATION FROM PRIMER CONNECTION TO 1' ABOVE FLOOR SLAB.

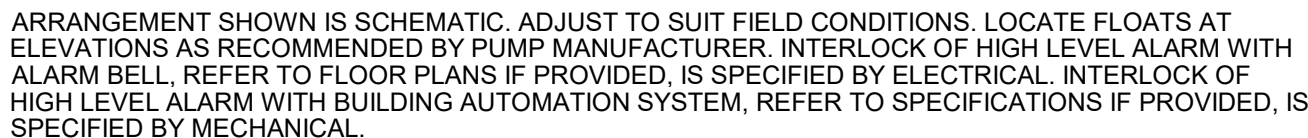
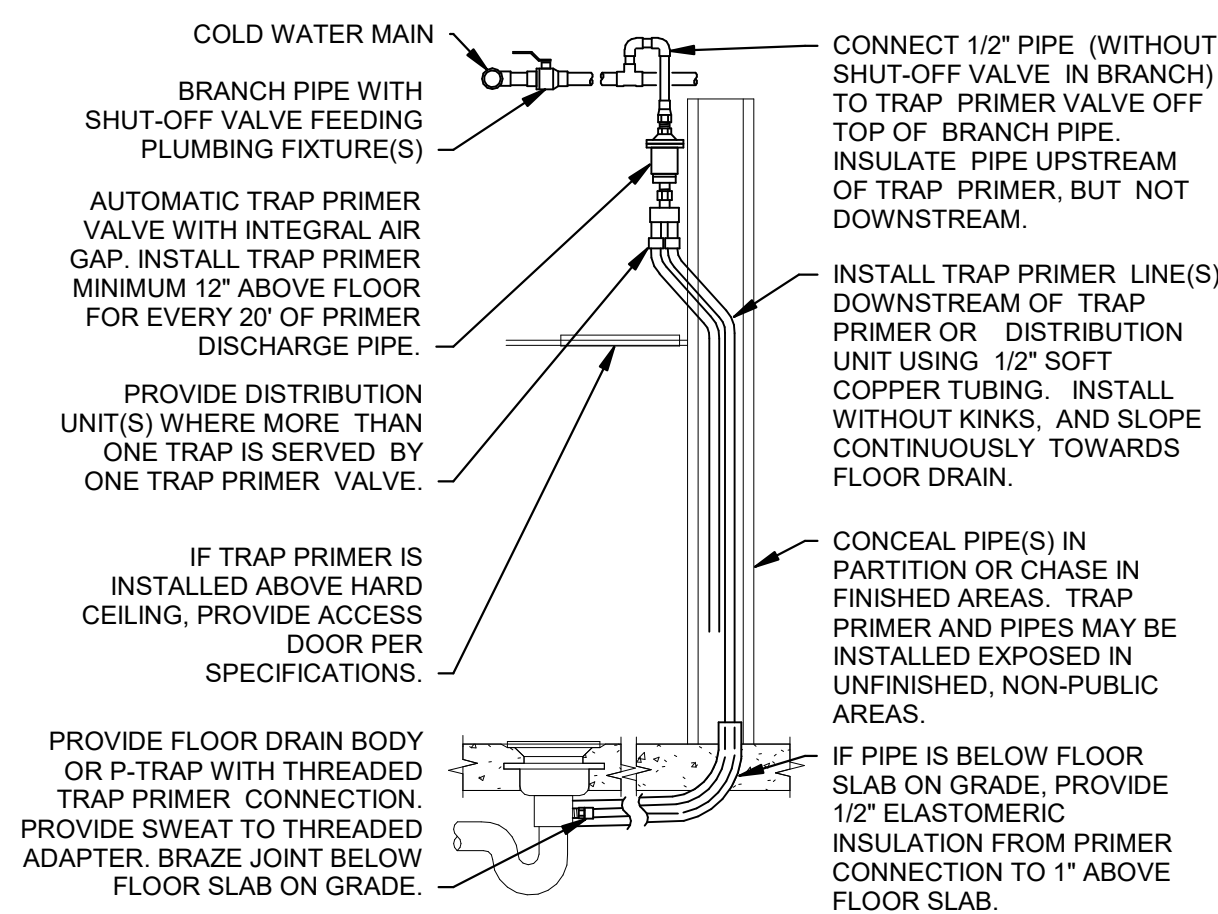


Diagram illustrating the installation of a roof penetration assembly, showing the relationship between the roof structure, insulation, flashing, and the penetration pipe.

Labels and Callouts:

- COORDINATE INSTALLATION OF FLASHING AND COUNTERFLASHING WITH ROOF INSULATION
- CORE DRILL ROOF OR PROVIDE SLEEVE IF REQUIRED BY TYPE OF ROOF DECK
- PROVIDE FIRE STOP SEAL BETWEEN PIPE AND SLEEVE OR DECK
- PROVIDE PIPE INCREASER ON SMALLER VENT IF HURR CODE REQUIRES A MINIMUM 3" VENT THRU ROOF
- MINIMUM 12" ABOVE ROOF NORMALLY EXTEND TO HEIGHT OF PARAPET WHEN WITHIN 10' OF PARAPET, OR ABOVE MAXIMUM LOCAL SNOW DEPTH.
- ANCHOR PIPE TO STRUCTURE
- ROOF DECK
- MINIMUM 12" BELOW ROOF
- REFER TO SPECIFICATIONS FOR TYPE OF PIPE, FITTINGS, AND CONNECTORS. REFER TO

LOCATE VTR MINIMUM THREE FEET FROM PROPERTY LINE, TEN FEET HORIZONTAL OR THREE FEET VERTICAL ABOVE ANY BUILDING OPENING FOR FRESH AIR INTAKE, TYPE II AIR INTAKE, TYPE III AIR INTAKE OR FRESH AIR INTAKE IN MEDICAL FACILITIES AND ONE FOOT FROM ANY VERTICAL SURFACE. REFER TO LOCAL CODES FOR OTHER VENT TERMINATION REQUIREMENTS. LOCATE VTR MINIMUM 18" FROM ADJACENT WALL, PARAPET, EXPANSION JOINT, ROOF DRAIN, EQUIPMENT CURB, OR OTHER ROOF FEATURE. OFFSET IN CEILING SPACE WHERE REQUIRED TO MEET THESE CONDITIONS. INSULATE LAST SIX FEET OF VENT PIPE INSIDE BUILDING PER SPECIFICATIONS

FIELD VERIFY EXACT DEPTH

SAWCUT EXISTING CONCRETE WHERE REQUIRED

FLOOR SLAB

REMOVE SURFACE MATERIAL TO LIMITS SHOWN. REPLACE WITH NEW TO MATCH EXISTING FOR CONCRETE OR ASPHALT. COORDINATE WITH ARCHITECT FOR FINAL BUILDING BASE MATERIALS

SUBGRADE LEVEL

ASTIC PIPE MARKER OR WARNING TAPE EXTERIOR BUILDING ONLY.

TER FABRIC.

IMPACT IN MAXIMUM 8" YERS LOOSE (LIFTS)

CONCRETE PIPE DETECTION SLAB WHERE REQUIRED. SEE NOTE 2.

TING WITH TPO INSULATION

BOTTOM OF TRENCH CAVATION

DEPTH PER ARCHITECT

UNDISTURBED EARTH OR GRAVEL BUILDING FILL

SUB BASE FILL MATERIAL

SEE NOTE 3.

BEDDING MATERIAL BACKFILL HAND FLAGED AND TAMPERD - MINIMUM 6" COVER OVER TOP OF THE LARGEST PIPE

BEDDING MATERIAL MINIMUM 6" DEPTH

NOTES:

1. PROVIDE FILTER FABRIC LINER FOR TRENCH WHEN BUILDING FILT IS GRAVEL IN LIEU OF NATURAL SOIL.
2. VERIFY WITH LOCAL CODE AND OWNER FOR SPECIFIC LOCATION AND CONCRETE COLOR PRIOR TO INSTALLATION.
3. TRENCH WALLS MAY BE VERTICAL TO MAXIMUM OF 4-FEET DEEP IF ALLOWED BY OSHA. REQUIREMENTS AND/OR SOIL ENGINEER, ARCHITECT AND CIVIL ENGINEER. OTHERWISE, PROVIDE A MINIMUM SIDE SLOPE OF 1 TO 1 UNLESS OTHERWISE REQUIRED BY SOILS ENGINEER OR CIVIL ENGINEER.

REVISIONS		
No.	Date	Description
2	08/26/22	ADDENDUM 02

REGISTRATION



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LICENSE # 028603

PROJECT TEAM

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STRUCTURAL	BSE STRUCTRAL ENGINEERS
PLUMBING	HENDERSON ENGINEERS
MECHANICAL	HENDERSON ENGINEERS
ELECTRICAL	HENDERSON ENGINEERS
FIRE PROTECTION	HENDERSON ENGINEERS
CONTRACTOR	GC

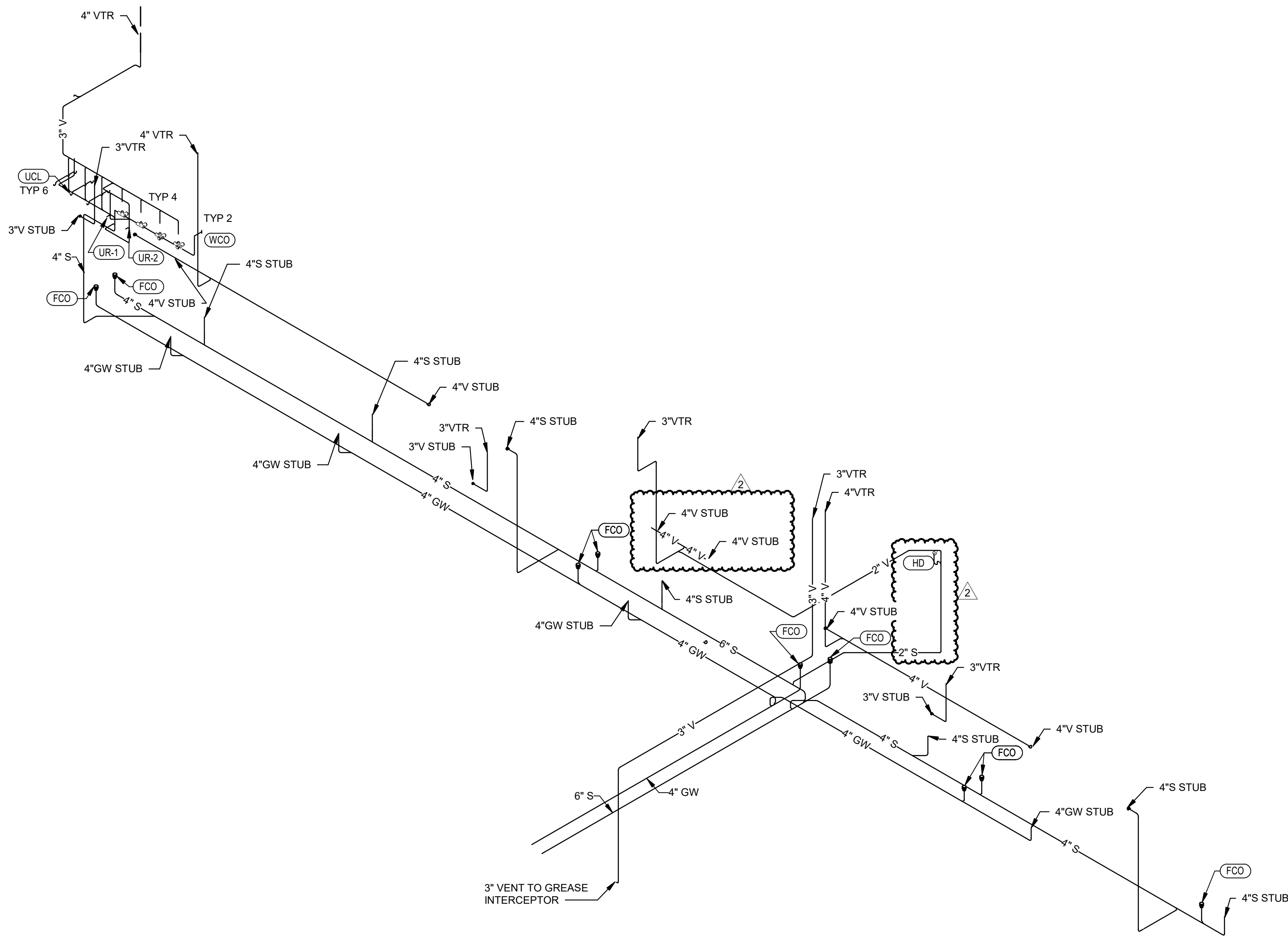
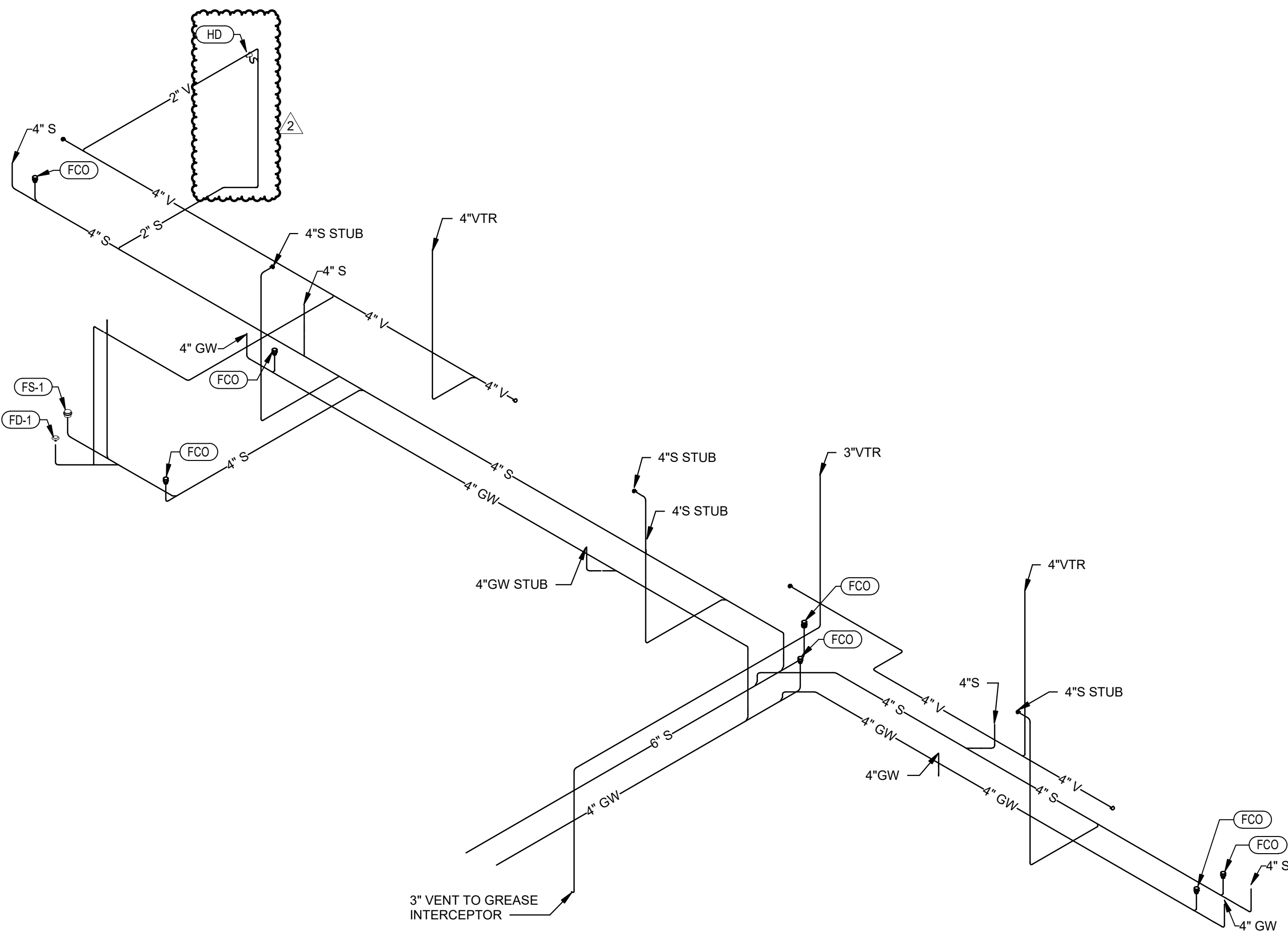
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EXPIRES 12/31/2022

SHEET TITLE

PLUMBING
WASTE & VENT
RISER DIAGRAM

SHEET NUMBER

P602



1 PLUMBING WASTE AND VENT RISER DIAGRAM



FIRST PLAT, LOT 9
REE'S SUMMIT, MO

Project No.: 19050.01a

Date: 08.26.22

Issued For: ADDENDUM 2

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REGISTRATION



08/24/2022

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STRUCTURAL BSE STRUCTURAL
ENGINEERS

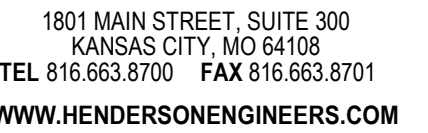
LUMBING HENDERSON
ENGINEERS

MECHANICAL HENDERSON
ENGINEERS

ELECTRICAL HENDERSON
ENGINEERS

FIRE PROTECTION HENDERSON
ENGINEERS

CONTRACTOR GC



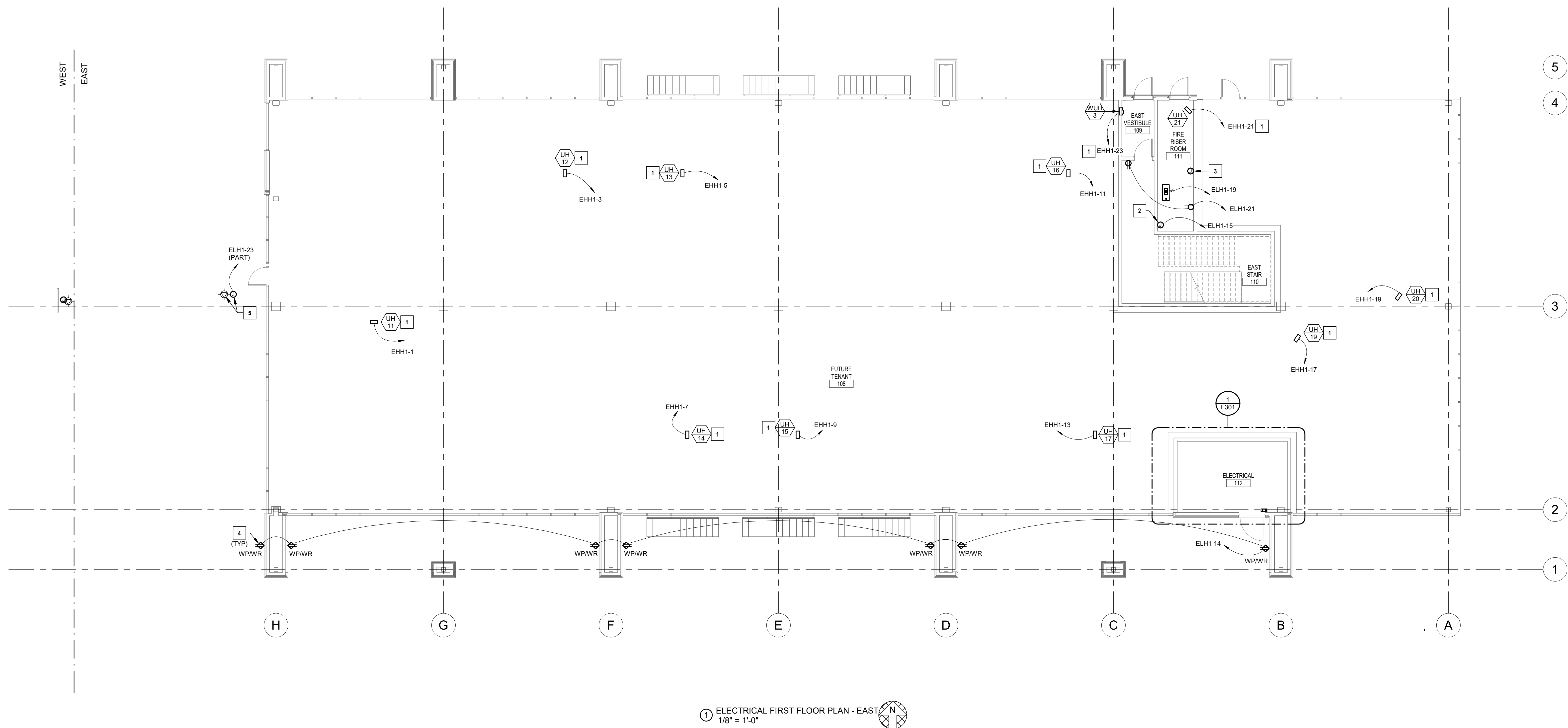
1850004412
MO. CORPORATE NO: E-556D
EXPIRES 12/31/2022

SHEET TITLE

ELECTRICAL
FIRST FLOOR
PLAN - EAST

SHEET NUMBER

E101.2



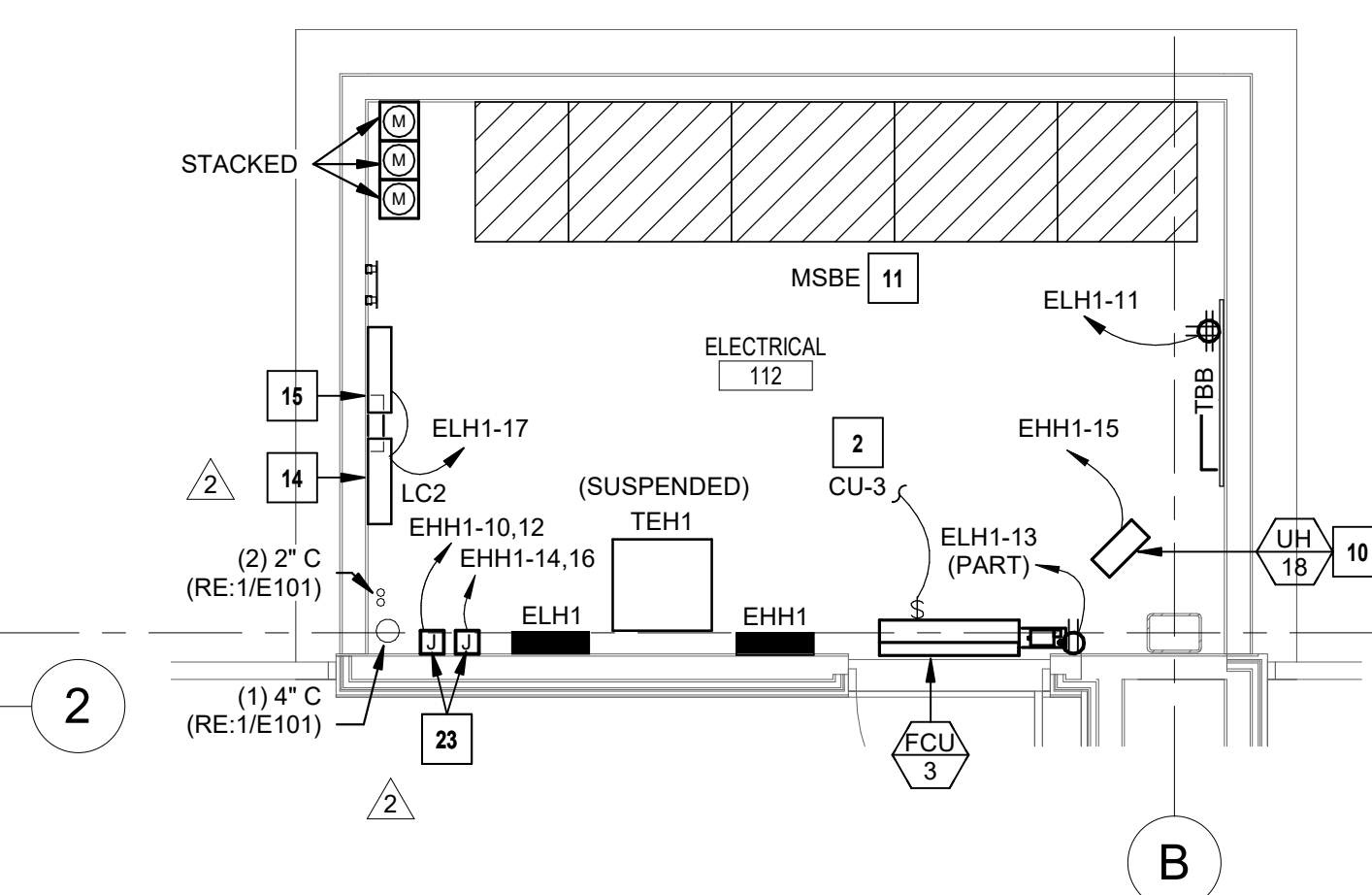
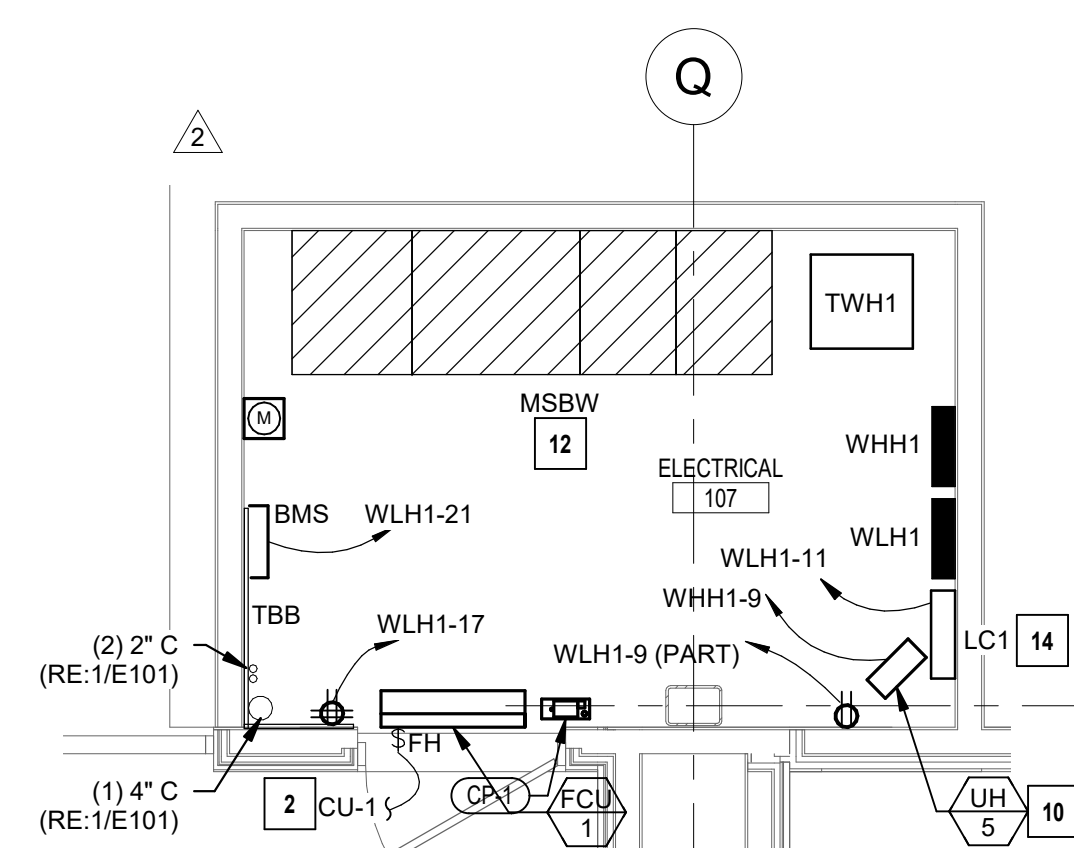
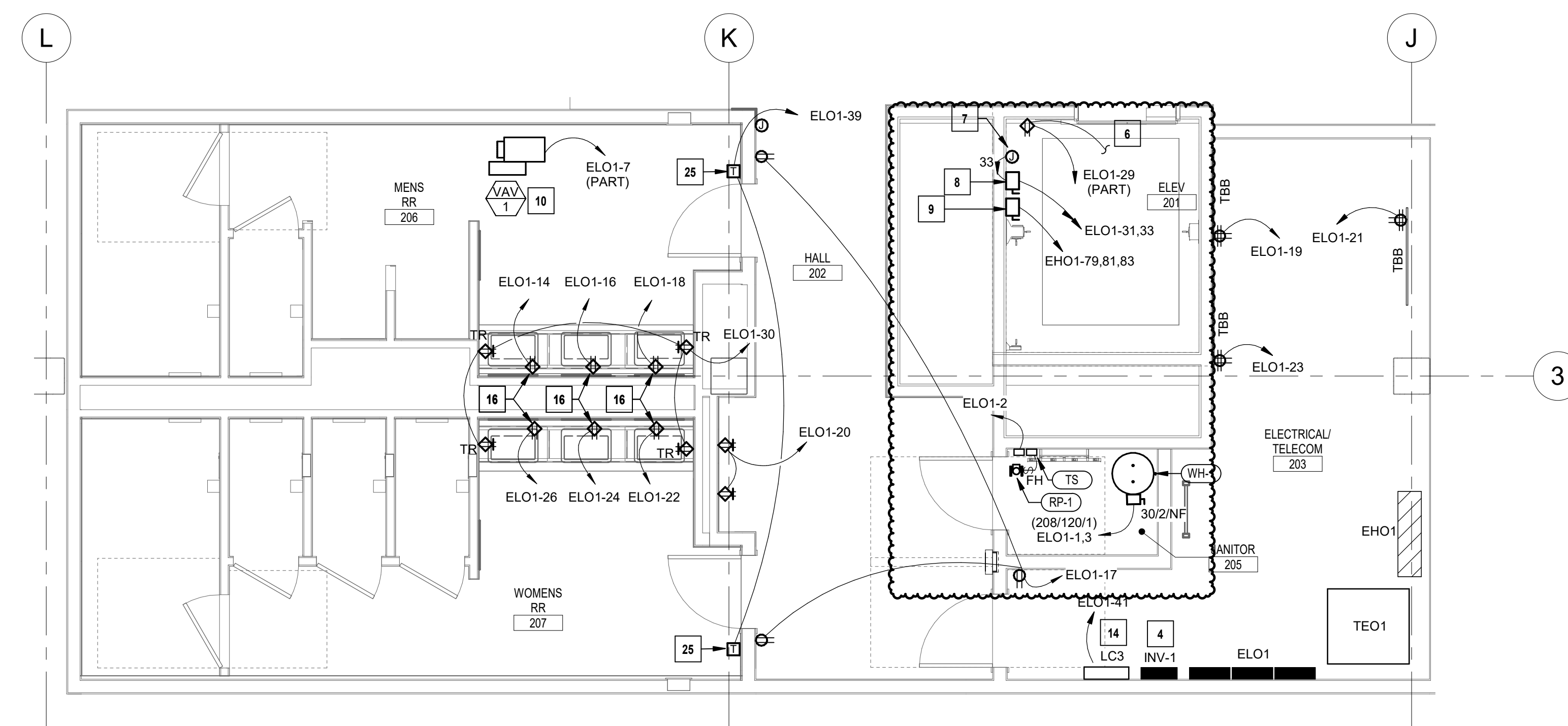
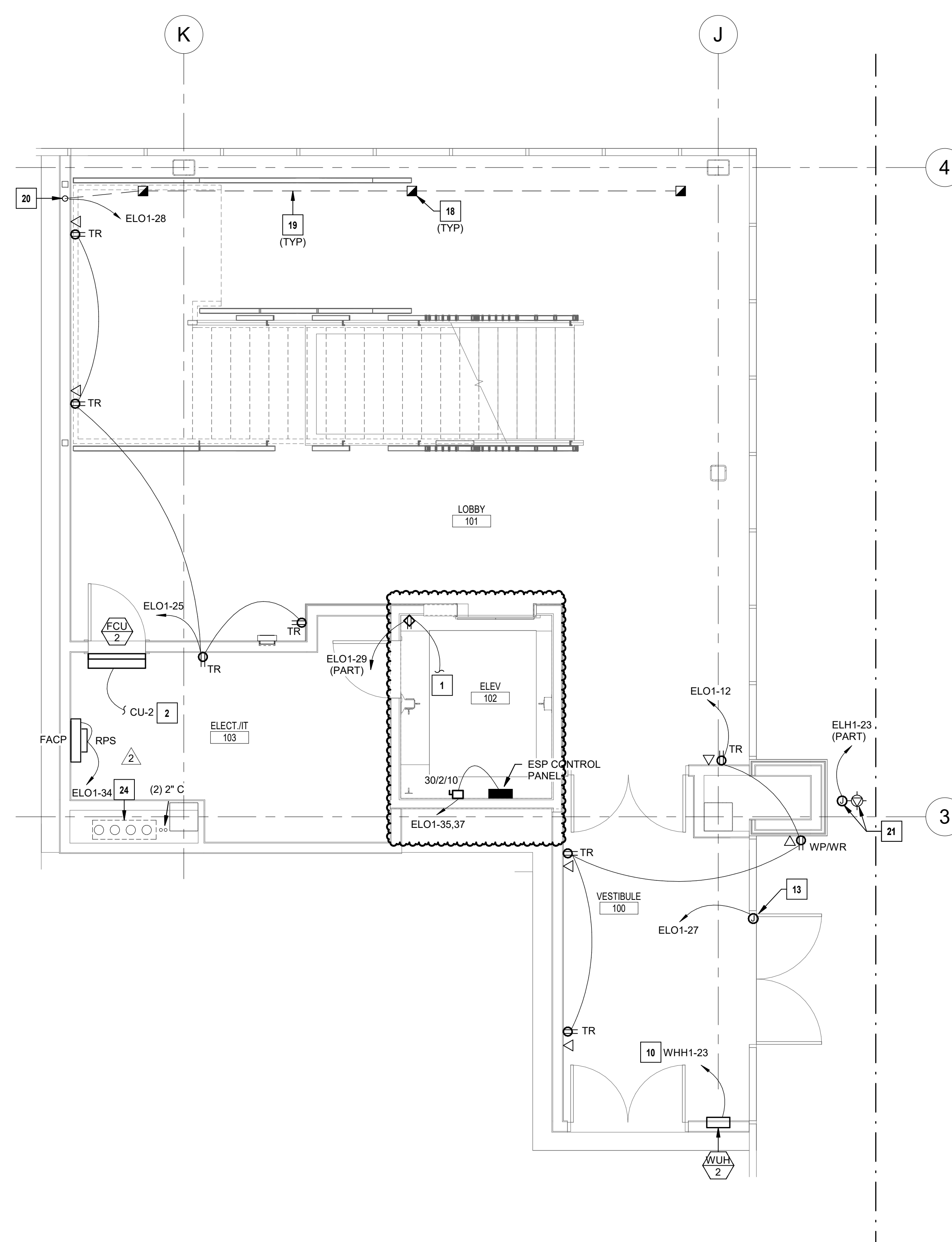
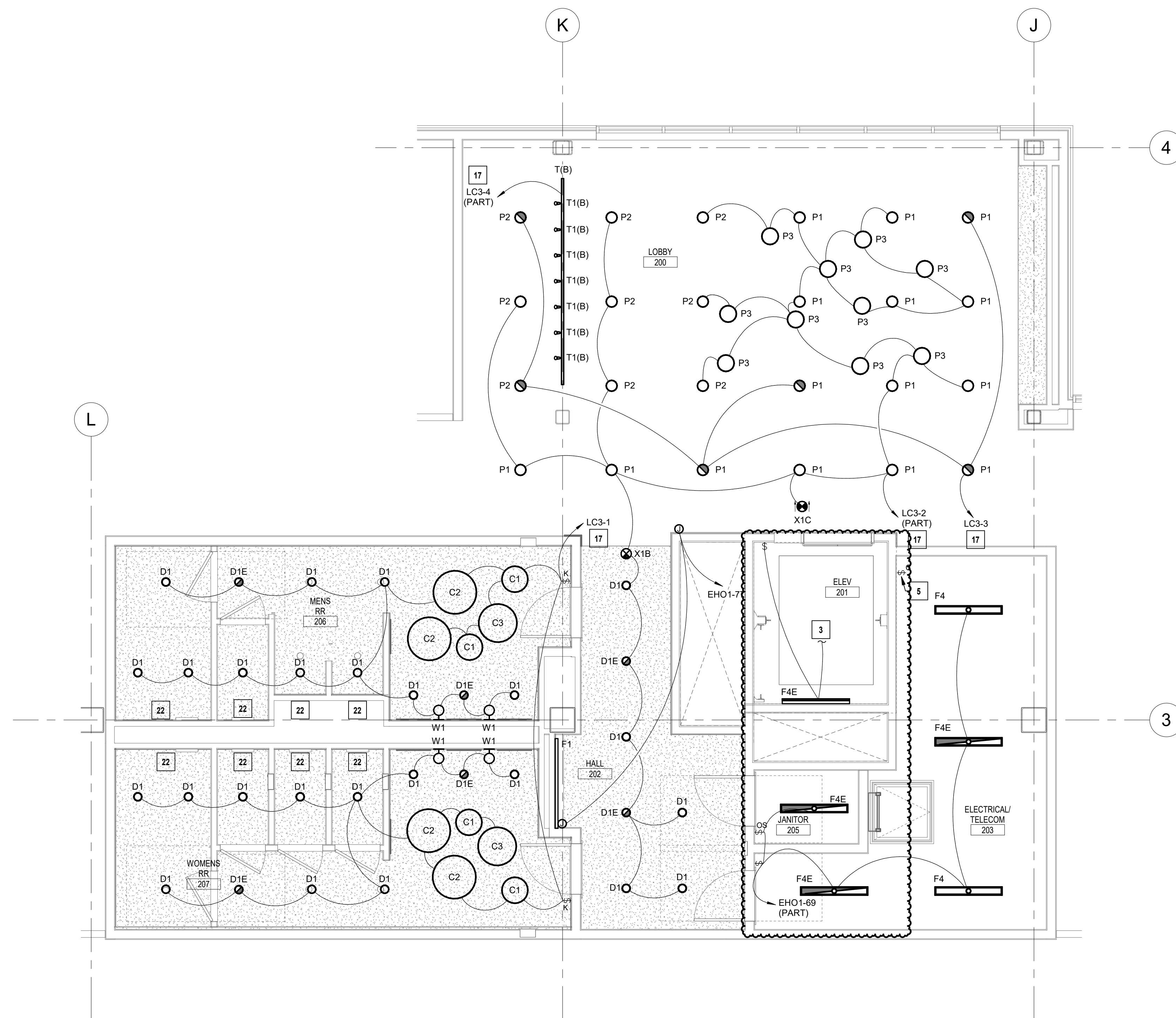
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ANDREA C. MULVANY

1. THE EMERGENCY LIGHTING SYSTEM HAS BEEN DESIGNED TO PROVIDE AN INITIAL FLOOR ILLUMINANCE LEVEL OF 1 FC AVERAGE, 0.1 FC MINIMUM AND NO MORE THAN 10 FC MAXIMUM RATIO ALONG THE EMERGENCY EGRESS PATHS. WHAT IS APPLICABLE, A MINIMUM AMOUNT OF EMERGENCY LIGHTS IS REQUIRED TO PROVIDE PROPER ILLUMINATION AT FLOOR AVOIDING OBSTACLES AND SHADOWS. THE LIGHTS MUST BE SET UP IN CORRIDORS.
2. WALL MOUNTED EXIT SIGNS SHALL BE MOUNTED 17' ABOVE DOOR FRAME AND CENTERED ABOVE DOOR OPENING. UNLESS NOTED OTHERWISE, CEILING/PENDANT MOUNTED EXIT SIGNS SHALL BE SUSPENDED TO 12'-0" AFF IN OPEN STRUCTURE AREAS. UNLESS NOTED OTHERWISE, EXIT SIGNS SHALL BE APPLIED IN THE SAME DIRECTION OF EGRESS TRAVEL. COORDINATE FINAL EXIT SIGN LOCATIONS WITH AHJ AND OWNER.
3. PROVIDE LABEL AT EACH MANUAL LIGHT SWITCH INDICATING THE LIGHT FIXTURE(S) THAT THE SWITCH CONTROLS AND THE REASON FOR THE LABELING. PROVIDE A SIGN FOR A MANUAL SWITCH FOR A SMALL ROOM DOES NOT NEED TO INDICATE THE SPACE CONTROLLED SINCE IT IS INTUITIVELY OBVIOUS. COORDINATE LABEL WITH THE ARCHITECTS WITH THE SIGNAGE LABELING. REFER TO THE SPECIFICATIONS FOR MORE INFORMATION.
4. ALL REMOTELY LOCATED LIGHT FIXTURE POWER SUPPLIES SHALL BE LOCATED IN AN ACCESSIBLE LOCATION FOR PROPER VENTILATION IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. COORDINATE LOCATIONS AND ACCESS WITH THE ARCHITECTS FOR PUBLIC USE. PROVIDE ENCLOSURE IF REQUIRED. COORDINATE LOCATION AND ENCLOSURE TYPE WITH ARCHITECT AND OWNER PRIOR TO INSTALLATION.
5. PER 2017 NEC 700.2 AND 700.2.4, ALL DIRECTLY CONTROLLED LUMINAIRE USED FOR EMERGENCY LIGHTING SHALL BE LISTED AND APPLICABLE CATALOG SHALL HAVE UL 924 LISTING OR EQUIVALENT NRTL LISTING. IF EMERGENCY LUMINAIRE OR CONTROL EQUIPMENT OTHER THAN THE LUMINAIRE IS USED, THE EQUIPMENT THEN LISTED LISTING OF EQUIPMENT IS ACCEPTABLE (AT CONTRACTOR'S COST). IF APPROVED BY THE AHJ, ALTERNATIVELY AS ALLOWED PER 2017 NEC 700.2.4, CONTRACTOR MAY SUBMIT A LETTER OF REQUEST TO THE AHJ AND SUBMIT BY THE AHJ PERMISSION IN WRITINGS TO THE ENGINEER FOR REVIEW. IF USING NON-LISTED EQUIPMENT FOR APPLICABLE EMERGENCY LIGHTING SYSTEM, CONTRACTOR MUST BE FIELD TESTED AND ACHIEVE EQUIVALENT OBJECTIVES TO CODE INTENT. IN ADDITION, ALTERNATE METHOD AND EQUIPMENT USED MUST BE DEMONSTRATED AND ACCEPTABLE TO BOTH THE AHJ AND THE ENGINEER.

- 1 REFER TO DETAIL 5 SHEET E301 FOR CIRCUIT CONTINUATION.
- 2 ROUTE LIGHTING BRANCH CIRCUIT THROUGH LIGHTING CONTROL PANEL. REFER TO PANELBOARD SCHEDULES ON SHEET E501 AND LIGHTING CONTROL PANEL SCHEDULES ON SHEET E502 FOR MORE INFORMATION.





- ELECTRICAL PLAN NOTES:**
1. REFER TO SHEET E121 FOR CIRCUIT CONTINUATION.
 2. FAN COIL UNIT TO BE POWERED FROM ASSOCIATED CONDENSING UNIT ON ROOF. COORDINATE CONNECTION WITH MECHANICAL CONTRACTOR AND MANUFACTURERS SCHEDULES PRIOR TO ROUGH-IN.
 3. REFER TO DETAIL 3 SHEET E301 FOR CIRCUIT CONTINUATION.
PROVIDE 500V/72V/1PH INSULATED/NOT EMERGENCY OVERCURRENT PROTECTION (2500V/0 APPROVED EQUAL) FOR EMERGENCY BATTERY BACKUP OF LIGHTING FIXTURES. ROUTE BRANCH CIRCUIT "E40-175" THROUGH THE ELEVATOR SHAFT TO ELEVATOR BATTERY BACKUP. REFER TO LIGHTING PLANS FOR ADDITIONAL INFORMATION.
PROVIDE SWITCH FOR CONTROL OF TYPE 1 RGB LED LIGHTING ABOVE ELEVATOR BATTERY BACKUP. ROUTE ABOVE ELECTRIC WATER COOLER ALCOVE. REFER TO LIGHTING CONTROL DEVICE SCHEDULE ON SHEET E602 FOR ADDITIONAL INFORMATION.
COORDINATE ELEVATOR LOCATION AND LIGHT FIXTURE AND CONTROLS MANUFACTURERS PRIOR TO DEPENDENT CONNECTION.
 4. REFER TO DETAIL 6 SHEET E301 FOR CIRCUIT CONTINUATION.
 5. PROVIDE 120V, 20A ELECTRICAL CONNECTION FOR ELEVATOR CAB LIGHTING. PROVIDE 30A/1P, 15A FRN/RATED DISCONNECT TO ELEVATOR CAB LIGHTING AND REQUIREMENTS WITH ELEVATOR CONTRACTOR AND SHOP DRAWINGS PRIOR TO ROUGH-IN.
 6. PROVIDE 120V, 20A ELECTRICAL CONNECTION FOR ELEVATOR CAB LIGHTING. PROVIDE 30A/1P, 15A FRN/RATED DISCONNECT TO ELEVATOR CAB LIGHTING AND REQUIREMENTS WITH ELEVATOR CONTRACTOR AND SHOP DRAWINGS PRIOR TO ROUGH-IN.
 7. PROVIDE 120V, 30A/1P, 15A FRN/RATED DISCONNECT TO ELEVATOR MOTOR. COORDINATE LOCATION AND REQUIREMENTS WITH ELEVATOR CONTRACTOR AND SHOP DRAWINGS PRIOR TO ROUGH-IN.
 8. PROVIDE CONNECTION TO FACTORY FURNISHED DISCONNECT ON DIVISION 23 EQUIPMENT.
 9. BUILDING ELECTRICAL SERVICE 1 OF 2. PROVIDE PERMANENT PLAQUE OR DIRECTORY AT SERVICE DISCONNECT INDICATING NAME OF LOCATION OF SECOND ELECTRICAL SERVICE SERVING BUILDING TO MEET REQUIREMENTS OF NEC 225.37.
 10. BUILDING ELECTRICAL SERVICE 2 OF 2. PROVIDE PERMANENT PLAQUE OR DIRECTORY AT SERVICE DISCONNECT INDICATING NAME OF LOCATION OF FIRST ELECTRICAL SERVICE SERVING BUILDING TO MEET REQUIREMENTS OF NEC 225.37.
 11. PROVIDE JUNCTION BOX AND 120V CONNECTION FOR DOOR ACCESS CONTROL. PROVIDE 30A/1P, 15A FRN/RATED DISCONNECT TO DOOR ACCESS CONTROLS AND REQUIREMENTS WITH ARCHITECTURAL DOOR HARDWARE SCHEDULES, GENERAL CONTRACTOR AND SECURITY CONTRACTOR PRIOR TO ROUGH-IN.
 12. PROVIDE LIGHTING CONTROL PANEL. REFER TO DETAIL 3, SHEET E401 FOR ADDITIONAL INFORMATION. REFER TO DETAIL 4 FOR LIGHTING CONTROL PANEL SCHEDULES.
 13. PROVIDE LIGHTING CONTROLS PROCESSOR WITH LAN FOR INTERNET INTERFACE. REFER TO DETAIL 4, SHEET E401 FOR ADDITIONAL INFORMATION.
 14. PROVIDE 120V/240V 1P/2P 15A/30A RATED AND DEDICATED 120V, 20A ELECTRICAL CONNECTION FOR RESTROOM WASHBASIN STATION. COORDINATE LOCATION AND REQUIREMENTS WITH PLUMBING CONTRACTOR AND MANUFACTURERS RECOMMENDATIONS PRIOR TO ROUGH-IN.
 15. ROUTE LIGHTING BRANCH CIRCUIT THROUGH LIGHTING CONTROL PANEL. REFER TO PANELBOARD SCHEDULES ON SHEET E502 FOR MORE INFORMATION.
PROVIDE RECESSED FLOOR BOX WITH (2) DUPLEX OUTLET RECESSED FLOOR BOXES FOR LIGHTING APPLICATIONS. BASIS OF DESIGN RFB2-OG FLOOR BOX OR APPROVED EQUIVALENT. COORDINATE EXACT LOCATION BOX TO MEET ELECTRICAL CODE REQUIREMENTS.
 16. PROVIDE 1" CONDUIT RACEWAY THROUGH SLAB FOR POWER CONDUITS AS INDICATED. COORDINATE EXACT LOCATION, DEPTH, AND METHOD OF CONDUIT ROUTING THROUGH SLAB. PROVIDE 1" CONDUIT RACEWAY THROUGH SLAB TO ROUGH-IN. XRAY SLAB PRIOR TO TRENCHING TO AVOID STRUCTURAL DAMAGE.
 17. PROVIDE 1" CONDUIT RISER CONCEALED IN WALL FOR POWER CONDUCTORS.
 18. PROVIDE POWER AND DATA CONNECTION AT AN ACCESSIBLE LOCATION IN THE CEILING. COORDINATE LOCATION OF ACCESSIBLE LOCATION PRIOR TO ROUGH-IN.
 19. PROVIDE ADD ALTERNATE PRICING FOR COVER LIGHTING FIXTURES AND LIGHTING CONTROL PANEL. PROVIDE 1" CONDUIT RACEWAY THROUGH SLAB FOR POWER CONDUITS AS INDICATED. COORDINATE EXACT LOCATION BOX TO MEET ELECTRICAL CODE REQUIREMENTS.
 20. PROVIDE 1" CONDUIT RACEWAY THROUGH SLAB FOR POWER CONDUITS AS INDICATED. COORDINATE EXACT LOCATION BOX TO MEET ELECTRICAL CODE REQUIREMENTS.
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 78. PROVIDE 1" CONDUIT RACEWAY THROUGH SLAB FOR POWER CONDUITS AS IND

paragon 
star

PARAGON STAR
BLDG 2 / LOT 9

FIRST PLAT, LOT 9
LEE'S SUMMIT, MO

Project No.: 19050.01a

Date: 08.26.22

Issued For: ADDENDUM 2

REVISIONS

[illegible]

REGISTRATION

ANDREA C. MULVANY
LICENSE # PE-2013039892

PROJECT TEAM

ARCHITECT FINKLE+WILLIAMS
ARCHITECTURE

CIVIL GBA

LANDSCAPE LAND 3

FOUNDATIONS BSE STRUCTURAL

STRUCTURAL BSE STRUCTURAL
ENGINEERS

PLUMBING HENDERSON
ENGINE

MECHANICAL HENDER
ENGINE

ELECTRICAL HENDER ENGINE

FIRE PROTECTION HENDERSON
ENGINEERS

CONTRACTOR GC



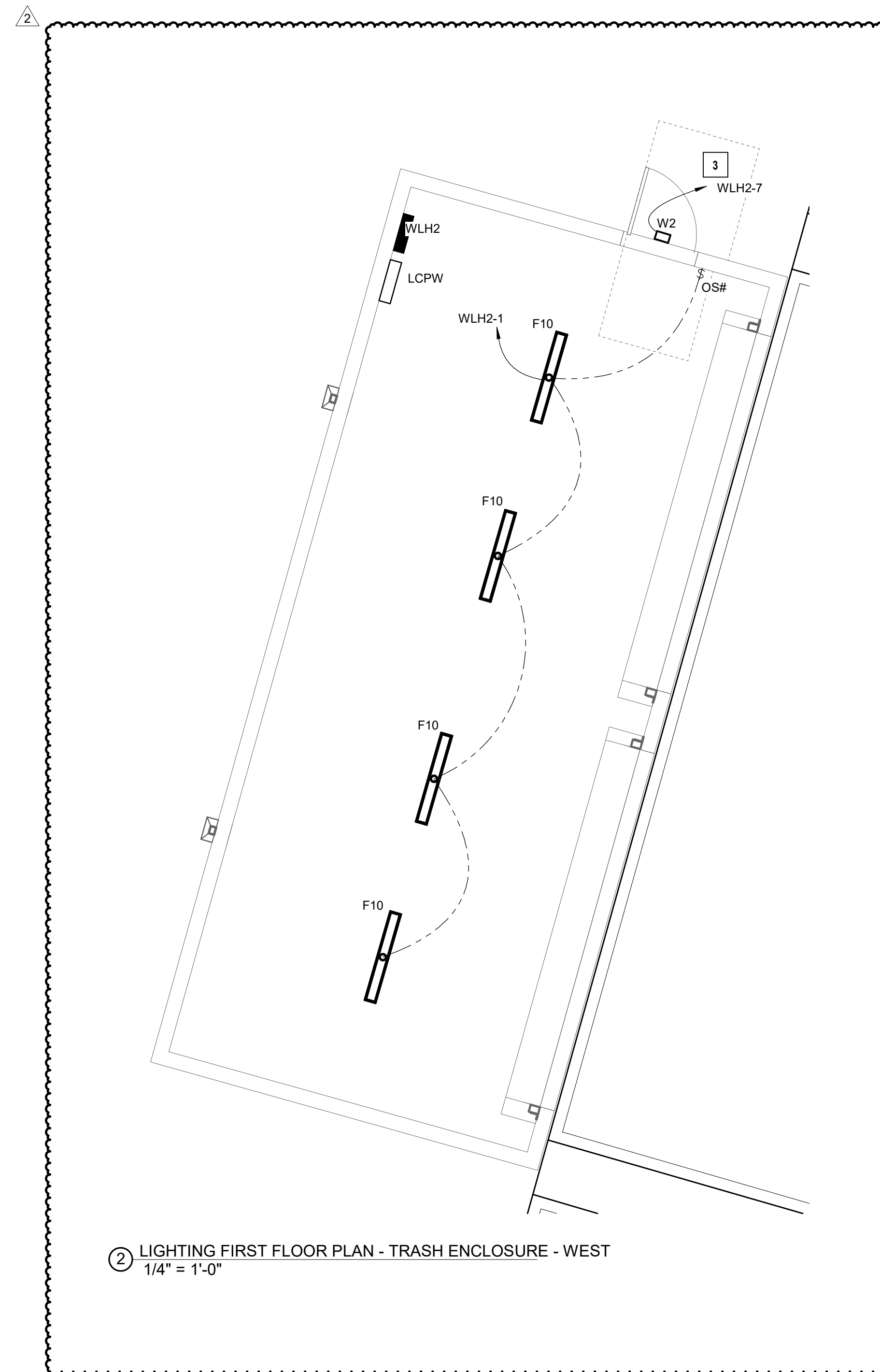
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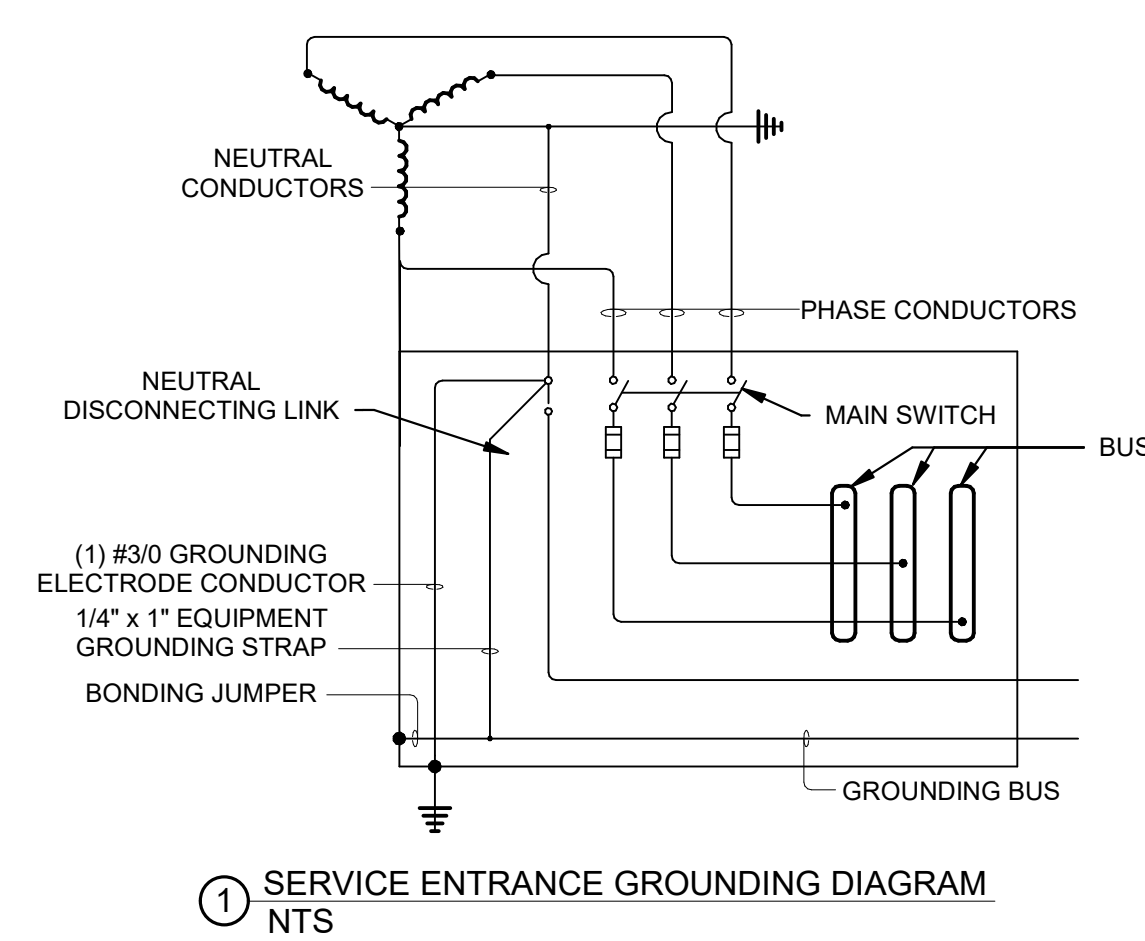
ELECTRICAL
ENLARGED
PLAN

SHEET NUMBER

E301

- 2





PANELBOARD: WLH2 (NEW)										FED FROM: WLH1										LINE-SIDE LVDS: MECHANICAL EQUIPMENT GROUND BUS									
BUS AMPS: 60A MAIN SIZE/TYPE: 60A MCB VOLT/PHASE: 208Y/120V, 3PH, 4W										A/C RATING: FCA +10% MINIMUM FULLY RATED SERVES: TRASH ENCLOSURE WEST MOUNTING SURFACE: LOCATION: TRASH ENCLOSURE WEST																			
SECTION: 1																													
CXT NO.	DESCRIPTION	VOLTAMPS/PHASE			WIRE NO.	BKR AMP	P F	BKR AMP	WIRE NO.	VOLTAMPS/PHASE			DESCRIPTION	CXT NO.															
		A	B	C						A	B	C																	
P	1 LIGHTING	128			12	20	1			400				2															
	3 RECEPTACLE		360		12	20	1	3	20	12			GARAGE DOOR 1	4															
	5 EXHAUST FAN			100	12	15	1					400		6															
	7 EXTERTIOR LTG	20			12	20	1			400				8															
	9 SPARE				20	1	3	20	12				GARAGE DOOR 2	10															
	11 SPARE					20	1					400		12															
	13 EQUIPPED SPACE						1	1					EQUIPPED SPACE	14															
	15 EQUIPPED SPACE						1	1					EQUIPPED SPACE	16															
	17 EQUIPPED SPACE						1	1					EQUIPPED SPACE	18															
		SUBTOTAL	148	360	100						800	800	800	SUBTOTAL															
TOTAL PHASE A - VA		948	LOAD		CONN. VA		DF	LOAD		CONN. VA		DF																	
AMPS		8	COOLING					REFRIG					1.00																
TOTAL PHASE B - VA		1,160	HEATING					SIGNDISP					1.25																
AMPS		10	LIGHTING		148	1.25		KITCHEN					1.00																
TOTAL PHASE C - VA		900	RECEPTACLES		360	1.0/5		EXISTING					1.00																
AMPS		8	MOTORS		2,500	1.00		LRG MOTOR					TOTAL DEMAND																
TOTAL PNBLD - VA		3,008	SUPP HEAT			1.00		SHOW WNDW					3,045 VA																
AMPS		8	MISC EQUIP			1.00		LTG TRACK					8 A																
PANELBOARD NOTES																													
RP - VA RELAY PANEL																													

PANELBOARD: ELH1 (NEW)

BUS AMPS: 100A

MAIN SIZE/TYPE: 100A MCB

PANEL PHASE: 208Y120V, 3PH, 4W

SECTION: 1

FED FROM: ELH1 VA XFMR TEH1

AFCI RATING: FCA - 10% MINIMUM FULLY RATED

SERVICES: 200V HOUSE LOADS

MOUNTING SURFACE

LOCATION: EAST ELECTRICAL ROOM

LINE-SIDE LUGS: MECHANICAL EQUIPMENT GROUND BUS

CKT NO	DESCRIPTION	VOLT/PHASE			WIRE NO	BKR AMP	P	BKR AMP	WIRE NO	VOLT/PHASE			DESCRIPTION	CKT NO	
		A	B	C						A	B	C			
1	CU-3		595		12	15	2	1	20	10	403		LTG - AWNING STRIP	2	
3			595					1	20	10		84	LTG - EAST EXT FLOODLIGHTS	4	
6	5 SPARE				20	2	1	20	10			362	LTG - EAST EXT ESCONES	6	
7								1	20	10	500		LTG - SOUTH EXT JBOXES	8	
9	RCPT - ROOF MECH CONV.		360		12	20	1	1	20	10		316	LTG - BREEZEWAY EAST COVE	10	
11	RCPT - TBS EAST			360	12	20	1	1	20	10			458	LTG - CANOPY DOWNLIGHTS	12
13	RCPT/LTG - ELEC ROOM EAST	302			12	20	1	1	20	10	1,260		RCPT - EAST SOUTH COLUMNS	14	
15	PWR - IRRIGATION CONTROL		600		12	20	1	1	20	10		720	RCPT - PLANTERS N	16	
17	PWR - RELAY PANEL			600	12	20	1	1	20	10	8		540	RCPT - PLANTERS S	18
19	PWR - AIR COMPRESSOR		1,176		12	20	1	1	20	10	1,176		PWR - SURFACE DISBURSE	20	
21	RCPT - FIRE RISER ROOM			360	12	20	1	1	20	10	720		LTG - IRRIGATION VALVE	22	
23	PWR - BREEZEWAY CEILING			720	12	20	1	1	20	10					24
25	SPACE							1	1	20				SPACE	26
27	SPACE							1	1	20				SPACE	28
29	SPACE							1	1	20				SPACE	30
SUBTOTAL		2,073	1,915	1,880						3,163	1,840	1,358	SUBTOTAL		
TOTAL PHASE A - VA		5,236			LOAD		CONN. VA		DF	LOAD		CONN. VA		DF	
AMPS		44			COOLING				1.00	REFRFRG				1.00	
TOTAL PHASE B - VA		3,755			HEATING				0	SIGN/DISO				1.25	
AMPS		31			LIGHTING		2,243		1.25	KITCHEN				1.00	
TOTAL PHASE C - VA		3,038			RECEPTACLES		4,500	10/5		EXISTING				1.00	
AMPS		25			MOTORS		1,176	100		LRG MOTOR				1.25	
TOTAL PNLBD - VA		12,029			SUPP HEAT		1,000			SHOW WINDW				1.25	
AMPS		33			MISC EQUIP		4,110	1.00		LTG TRACK				1.00	
														12,590 VA	
														35 A	

PANELBOARD NOTES

RP - ROUTE THRU RELAY PANEL

VD - WIRE SIZE INCREASED FOR VOLTAGE/DROP

PANELBOARD: ELO1 (FCA)				FED FROM: EHO1 VAV XFMR TEO1												EQUIPMENT GROUND BUS			
BUS AMPS: 600A				A/C RATING: FCA +10% MINIMUM FULLY RATED															
MAIN SIZE/TYPE: MLO				SERVES: 200V OFFICE LOADS															
VOLT/PHASE: 208Y/120, 3PH, 4W				MOUNTING: SURFACE												FEED THRU LUGS			
SECTION: 1				LOCATION: 2ND FLOOR ELECTRICAL ROOM															
CKT NO.	DESCRIPTION	VOLT/AMPS/PHASE			WIRE	BKR	AMP	P	BKR	AMP	WIRE	VOLT/AMPS/PHASE			DESCRIPTION	CKT NO.			
		A	B	C								A	B	C					
1	PWR - WH-1	2,500			10	30	2	1	20	12				RP-1, TIME SWTCH	2				
3			2,500					1	20	12			360	RCPT - LOBBY 200	4				
5	PWR - EF-1			528	12	15	1	15	12				208	LTG - TRACK	6				
D	PWR - VAV-1, VAV-2, VAV-3	150			12	20	1	1	20	12				SPARE	8				
	RCPT - OFFICE N EAST MECH		540		10	20	1	1	20	12				SPARE	10				
D	RCPT - OFFICE N EAST MECH			720	10	20	1	1	20	12			720	RCPT - LOBBY VEST.	12				
	RCPT - OFFICE N WEST MECH	720			12	20	1	1	20	12	1,200			PWR - M RR WASHBAR 1	14				
	RCPT - OFFICE S WEST MECH		540		12	20	1	1	20	12		1,200		PWR - M RR WASHBAR 2	16				
	RCPT - ELEC. JAN. HALL			720	12	20	1	1	20	12			1,200	PWR - M RR WASHBAR 3	18				
19	RCPT - TBB WEST	360			12	20	1	1	20	12	500			PER - WATER FOUNTAINS	20				
21	RCPT - TBB EAST		360		12	20	1	1	20	12		1,200		PWR - W RR WASHBAR 1	22				
23	RCPT - TBB WEST			360	12	20	1	1	20	12			1,200	PWR - W RR WASHBAR 2	24				
	RCPT - LOBBY	720			12	20	1	1	20	12	1,200			PWR - W RR WASHBAR 3	26				
	PWR - LOBBY DOOR				12	20	1	1	20	12		1,080		RCPT - LOBBY FLOOR	28				
M	RCPT/LTG - ELEVATOR SHAFT			820	12	20	1	1	20	12		1,248		RCPT - RRS / EWC	30				
	PWR - ELEVATOR CONTROL	600			12	20	1	1	20	12	50			NAVA	32				
	PWR - ELEVATOR CAB LVS		600		12	20	1	1	20	12			360	FACP, RPS	34				
	PWR - ELEVATOR SLUMP			1,040	12	20	2	2	15					SPARE	36				
			1,040											SPARE	38				
	PWR - RR SENSOR XFMRs			100	12	20	1	2	15	12			595	CU-2	40				
41	PWR - RELAY PANEL			600	12	20	1						595		42				
SECTION 2:																			
43	SPACE						1	1						SPACE	44				
45	SPACE						1	1						SPACE	46				
47	SPACE						1	1						SPACE	48				
49	SPACE						1	1						SPACE	50				
51	SPACE						1	1						SPACE	52				
53	SPACE						1	1						SPACE	54				
55	SPACE						1	1						SPACE	56				
57	SPACE						1	1						SPACE	58				
59	SPACE						1	1						SPACE	60				
61	SPACE						1	1						SPACE	62				
63	SPACE						1	1						SPACE	64				
65	SPACE						1	1						SPACE	66				
67	SPACE						1	1						SPACE	68				
69	SPACE						1	1						SPACE	70				
71	SPACE						1	1						SPACE	72				
73	SPACE						1	1						SPACE	74				
75	SPACE						1	1						SPACE	76				
77	SPACE						1	1						SPACE	78				
79	SPACE						1	1						SPACE	80				
81	SPACE						1	1						SPACE	82				
83	SPACE						1	1						SPACE	84				






SECTION: 3									
85	SPACE								
86	SPACE							SPACE	86
87	SPACE							SPACE	88
89	SPACE							SPACE	90
91	SPACE							SPACE	92
93	SPACE							SPACE	94
95	SPACE							SPACE	96
97	SPACE							SPACE	98
99	SPACE							SPACE	100
101	SPACE							SPACE	102
103	SPACE							SPACE	104
105	SPACE							SPACE	106
107	SPACE							SPACE	108
109	SPACE							SPACE	110
111	SPACE							SPACE	112
113	SPACE							SPACE	114
115	SPACE							SPACE	116
117	SPACE							SPACE	118
119	SPACE							SPACE	120
121	SPACE							SPACE	122
123	SPACE							SPACE	124
125	SPACE							SPACE	126
SUBTOTAL		6,090	5,240	4,788		2,950	4,795	5,171	SUBTOTAL

TOTAL PHASE A - VA		9,040	LOAD	CONN. VA	DF	LOAD	CONN. VA	DF
AMPS	75	COOLING	1,000			REFRIG	1,000	
TOTAL PHASE B - VA		10,035	HEATING	0		SIGN/OSP	1,25	
AMPS	84	LIGHTING	908	1.25		KITCHEN	1,00	
TOTAL PHASE C - VA		9,959	RECEPTACLES	5,000	10.0/5	EXISTING	1,00	
AMPS	83	MOTORS	122	1,00		LRG MOTOR	2,486	1.25
TOTAL PNLB - VA		29,034	SUPP HEAT	12,598	1,00	SW V WINDW	1,25	
AMPS	81	MISC EQUIP	12,598	1,00		LTG TRACK	1,800	1,00
								TOTAL DEMAND
								31,683 VA
								88 A

PANELBOARD NOTES

FEED THRU CONNECTION: (2) Sets of 350kcmil

LTG TRACK - TRACK LENGTH

LIGHTING CONTROL DEVICE SCHEDULE						
LINE-VOLTAGE WALL SWITCH OCCUPANCY SENSORS						
SYMBOL TAG	MANUFACTURER MODEL/SERIES	ALTERNATE MANUFACTURER	DEVICE DESCRIPTION	COVERAGE (W X D) (W X D)	VOLTAGE	NOTES
 508	LEGRAND PW-100	ACUTY, COOPER HUBBELL, LEVITON LUTRON	WALL MOUNT PASSIVE INFRARED OCCUPANCY SENSOR. INTEGRAL MANUAL OVERRIDE SWITCH. SINGLE RELAY. LINE VOLTAGE. LOAD: 120V=800W, 277V=1200W.	MAJOR 30" x 35" MINOR 15" x 20"	120V 277	
STAND-ALONE LOW-VOLTAGE LIGHTING CONTROL SYSTEMS						
STAND-ALONE LOW-VOLTAGE OCCUPANCY SENSORS						
SYMBOL TAG	MANUFACTURER MODEL/SERIES	ALTERNATE MANUFACTURER	DEVICE DESCRIPTION	COVERAGE (W X D) (W X D)	VOLTAGE	NOTES
 101	LEGRAND CI-300	ACUTY, COOPER HUBBELL, LEVITON	CEILING MOUNT PASSIVE INFRARED OCCUPANCY SENSOR. 360 DEGREE COVERAGE. LOW VOLTAGE. ISOLATED RELAY.	MAJOR 44" Ø MINOR 25" Ø	24	
 102	LEGRAND UT-300-1	COOPER, HUBBELL, LEVITON	CEILING MOUNT ULTRASONIC OCCUPANCY SENSOR. 360 DEGREE COVERAGE. LOW VOLTAGE. ISOLATED RELAY.	24" x 24"	24	
STAND-ALONE LOW-VOLTAGE POWER PACKS						
SYMBOL TAG	MANUFACTURER MODEL/SERIES	ALTERNATE MANUFACTURER	DEVICE DESCRIPTION		VOLTAGE	NOTES
 201	LEGRAND BZ-250	ACUTY, COOPER HUBBELL, LEVITON	POWER PACK FOR LOW VOLTAGE OCCUPANCY SENSORS. 20A LOAD. (1) RELAY. MANUAL- AND AUTO-ON MODES. HOLD-ON AND -OFF INPUTS. LOAD: 16A AT 120V OR 277V. OUTPUT: 225mA AT 24V. PLENUM RATED.		120V 277	
STAND-ALONE LOW-VOLTAGE SWITCHES						
SYMBOL TAG	MANUFACTURER MODEL/SERIES	ALTERNATE MANUFACTURER	DEVICE DESCRIPTION		VOLTAGE	NOTES
 301	SUPERBRIGHT LEDS E2D-RGB-WW E2D-4CBA	ACUTY, COOPER HUBBELL, LEGRAND	WALL MOUNT WIRELESS RGB LED CONTROLLER. LOW VOLTAGE.		24	
GENERAL NOTES: A. OCCUPANCY SENSOR LAYOUT DESIGNED FROM BASIS-OF-DESIGN COVERAGE PATTERNS. IF SUBMITTING ALTERNATE PER EQUIVALENT MANUFACTURER COLUMN, ADJUST SENSOR QUANTITIES AND LOCATIONS PER MANUFACTURER-SPECIFIC SPACING CRITERIA. B. PROVIDE SHOP DRAWINGS FOR ENGINEER AND ARCHITECT REVIEW THAT INCLUDE PRODUCT CUTSHEETS AND PROJECT-SPECIFIC LAYOUTS. LAYOUTS MUST INCLUDE SENSOR LOCATIONS, HEIGHTS, ORIENTATION, AND COVERAGE AREAS. SHOW COORDINATION WITH ALL OTHER CEILING DEVICES INCLUDING BUT NOT LIMITED TO HVAC SUPPLY AND RETURN GRILLES, SPRINKLERS, LIGHT FIXTURES, AND OTHER OWNER-PROVIDED CEILING MOUNTED DEVICES SUCH AS SPEAKERS, SECURITY CAMERAS, PROJECTORS, ETC. (SENSORS MAY BE ADVERSELY AFFECTED IF LOCATED TOO CLOSE TO OTHER CEILING MOUNTED DEVICES) ALSO PROVIDE SCHEMATICS AND SCHEDULES WHEN APPLICABLE. C. LIGHTING CONTROLS PRICING SHALL BE COMPLETELY SEPARATE OF ANY LIGHT FIXTURE PRICING. D. VERIFY COLOR(S) FOR ALL WALL AND CEILING MOUNTED DEVICES WITH THE ARCHITECT. E. ALL WALL SWITCH AND CEILING SENSORS SHALL HAVE AN ADJUSTABLE TIME DELAY RANGE OF 0-30 MIN. UNO. CONFIRM SENSOR SETTINGS WITH SEQUENCE OF OPERATIONS AND OWNER PRIOR TO SYSTEM COMMISSIONING. F. PROVIDE COPIES OF OPERATION AND MAINTENANCE INSTRUCTIONS FOR ALL DEVICES TO OWNER. G. PROVIDE A NEUTRAL CONDUCTOR TO ALL WALL SWITCH LOCATIONS PER NEC REQUIREMENTS. H. DO NOT SHARE NEUTRAL CONDUCTOR ON LOAD SIDE OF DIMMERS.						
VERSION 4						

LIGHTING CONTROL PANEL SCHEDULE					
PANEL NAME: LC1		MOUNTING: SURFACE			
LOCATION: WEST ELECTRICAL ROOM		VOLTAGE: 120V			
RELAY	CIRCUIT	LOAD CONTROLLED	MODULE TYPE	LOAD (WATTS)	ZONE
1	WLH1-2	BREEZEWAY WEST COVE	ELV	316	
2	WLH1-4	WEST CANOPY DOWNLIGHTS	NON-DIM	627	
3	WLH1-22	BREEZEWAY CEILING	ELV	105	
4	WLH1-8	WEST EXTERIOR SCONCES	NON-DIM	324	
5	WLH1-12	NORTH PLANTERS RECEPTACLES	NON-DIM	1080	
6	WLH1-14	SOUTH PLANTERS RECEPTACLES	NON-DIM	1080	
7	WLH1-16	CENTRAL PLANTERS RECEPTACLES	NON-DIM	720	
8	WLH1-6	WEST EXTERIOR FLOODLIGHTS	NON-DIM	75	
9	WLH1-10	SOUTH EXTERIOR JUNCTION BOXES	NON-DIM	500	
10	WLH-24	EXTERIOR AWNING STRIP LIGHTS	0-10V	300	
11		SPARE			
12		SPARE			
MODULE TYPE LEGEND: ELV = ELECTRONIC LOW VOLTAGE DIMMING MLV = MAGNETIC LOW VOLTAGE DIMMING NON-DIM = SWITCHING ONLY LOAD (NO DIMMING) FAN = FAN SPEED CONTROL MOTOR = MOTOR CONTROL					
0-10V = 0-10V DIMMING 2-WIRE = 2-WIRE DIMMING 3-WIRE = 3-WIRE DIMMING DMX = COLOR CHANGING DIMMING					
NOTE: RELAY NUMBERING ON SCHEDULE IS INTENDED TO COMMUNICATE DESIGN INTENT AND IS FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING FINAL RELAY CONFIGURATION WITH LIGHTING CONTROL VENDOR AND FIELD CONDITIONS.					

LIGHTING CONTROL PANEL SCHEDULE					
PANEL NAME: LC2		MOUNTING: SURFACE			
LOCATION: EAST ELECTRICAL ROOM		VOLTAGE: 120V			
RELAY	CIRCUIT	LOAD CONTROLLED	MODULE TYPE	LOAD (WATTS)	ZONE
1	ELH1-10	BREEZEWAY EAST COVE	ELV	316	
2	ELH1-4	EAST EXTERIOR FLOODLIGHTS	ELV	75	
3	ELH1-6	EAST EXTERIOR SCONCES	0-10V	324	
4	ELH1-12	EAST CANOPY DOWNLIGHTS	NON-DIM	456	
5	ELH1-16	NORTH PLANTERS RECEPTACLES	NON-DIM	720	
6	ELH1-18	SOUTH PLANTERS RECEPTACLES	NON-DIM	540	
7	EHH1-16,12	EXTERIOR PARKING LOT LIGHTS - SOUTH	NON-DIM	4500	
8	EHH1-14,16	EXTERIOR PARKING LOT LIGHTS - DRIVE	NON-DIM	4500	
9	ELH1-8	SOUTH EXTERIOR JUNCTION BOXES	NON-DIM	500	
10	ELH1-2	EXTERIOR AWNING STRIP LIGHTS	0-10V	360	
11		SPARE			
12		SPARE			
MODULE TYPE LEGEND: ELV = ELECTRONIC LOW VOLTAGE DIMMING MLV = MAGNETIC LOW VOLTAGE DIMMING NON-DIM = SWITCHING ONLY LOAD (NO DIMMING) FAN = FAN SPEED CONTROL MOTOR = MOTOR CONTROL					
0-10V = 0-10V DIMMING 2-WIRE = 2-WIRE DIMMING 3-WIRE = 3-WIRE DIMMING DMX = COLOR CHANGING DIMMING					
NOTE: RELAY NUMBERING ON SCHEDULE IS INTENDED TO COMMUNICATE DESIGN INTENT AND IS FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING FINAL RELAY CONFIGURATION WITH LIGHTING CONTROL VENDOR AND FIELD CONDITIONS.					

LIGHTING CONTROL PANEL SCHEDULE					
PANEL NAME: LC3		MOUNTING: SURFACE			
LOCATION: 2ND FLOOR ELECTRICAL ROOM		VOLTAGE: 120V			
RELAY	CIRCUIT	LOAD CONTROLLED	MODULE TYPE	LOAD (WATTS)	ZONE
1	EHO1-67	RESTROOM LIGHTING	NON-DIM	742	
2	EHO1-73	LOBBY NORMAL LIGHTING	0-10V	646	
3	EHO1-75	LOBBY EMERGENCY LIGHTING	0-10V	86	
4	EL01-6	LOBBY TRACK	ELV	208	
5	EHO1-62	SOUTH WEST PARAPET	NON-DIM	2744	
6	EHO1-64	NORTH WEST PARAPET	NON-DIM	2744	
7	EHO1-66	SOUTH EAST PARAPET	NON-DIM	2744	
8	EHO1-68	NORTH EAST PARAPET	NON-DIM	2744	
MODULE TYPE LEGEND: ELV = ELECTRONIC LOW VOLTAGE DIMMING MLV = MAGNETIC LOW VOLTAGE DIMMING NON-DIM = SWITCHING ONLY LOAD (NO DIMMING) FAN = FAN SPEED CONTROL MOTOR = MOTOR CONTROL					
0-10V = 0-10V DIMMING 2-WIRE = 2-WIRE DIMMING 3-WIRE = 3-WIRE DIMMING DMX = COLOR CHANGING DIMMING					
NOTE: RELAY NUMBERING ON SCHEDULE IS INTENDED TO COMMUNICATE DESIGN INTENT AND IS FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING FINAL RELAY CONFIGURATION WITH LIGHTING CONTROL VENDOR AND FIELD CONDITIONS.					

LIGHT FIXTURE SCHEDULE										
TYPE	MANUFACTURER / MODEL #	APPROVED ALTERNATES	LAMPING / LIGHT SOURCE	DIMMING TYPE	VOLTAGE	INPUT WATTS	INPUT VA	DESCRIPTION	NOTES	
C1	VIBIA - DUO - 4870 4870-18	-	LED 90 CRI, 2700K 1705 LUMENS	0-10V (120-277V)	UNV	31	34	19" ROUND LED SURFACE MOUNT DOWNLIGHT, ALUMINUM HOUSING WITH WOOD SHADE, UNIVERSAL VOLTAGE (120-277V) 0-10V DIMMING DRIVER, 1705 LUMENS, 2700K CCT, 90 CRI, BLACK FINISH		
C2	VIBIA - DUO - 4872 4872-18	-	LED 90 CRI, 2700K 4032 LUMENS	0-10V (120-277V)	UNV	62	69	31" ROUND LED SURFACE MOUNT DOWNLIGHT, ALUMINUM HOUSING WITH WOOD SHADE, UNIVERSAL VOLTAGE (120-277V) 0-10V DIMMING DRIVER, 4032 LUMENS, 2700K CCT, 90 CRI, BLACK FINISH		
C3	VIBIA - DUO - 4880 4880-18	-	LED 90 CRI, 2700K 1705 LUMENS	0-10V (120-277V)	UNV	31	34	28" ROUND LED SURFACE MOUNT DOWNLIGHT, ALUMINUM HOUSING WITH WOOD SHADE, UNIVERSAL VOLTAGE (120-277V) 0-10V DIMMING DRIVER, 1705 LUMENS, 2700K CCT, 90 CRI, BLACK FINISH		
D1	FOCAL POINT - ID+ TRIMLESS FLC4D-RT-1000L-UNV-LD1 LCA-RT-1000L-839K-DN-FL2-CD	-	LED 80 CRI, 3500K 1000 LUMENS 204,000 HRS	0-10V (120-277V)	UNV	11	12	4" TRIMLESS LED DOWNLIGHT, ALUMINUM HOUSING, UNIVERSAL VOLTAGE (120-277V) 0-10V DIMMING DRIVER, 1000 LUMENS, 3500K CCT, 80 CRI, 90 DEGREE CUT-OFF, FLOOD 2 DISTRIBUTION WITH CLEAR DIFFUSE LENS		
D1E	FOCAL POINT - ID+ TRIMLESS FLC4D-RT-1000L-UNV-LD1 LCA4EM-RT-1000L-839K-DN-FL2-CD	-	LED 80 CRI, 3500K 1000 LUMENS 204,000 HRS	0-10V (120-277V)	UNV	11	12	SAME AS FIXTURE TYPE D1 EXCEPT WITH INTEGRAL 7 WATT EMERGENCY BATTERY CAPABLE OF PROVIDING AT LEAST 60 MINUTES FOR 90 MINUTES. UL 924 LISTED.		
EM1	EELP - OMEL OMEL-10W-W-EM-CC-SD	-	LED	N/A	UNV (120-277V)	10	10	ARCHITECTURAL MULLION MOUNTED LED EMERGENCY EGRESS LIGHT, ALUMINUM HOUSING, UNIVERSAL VOLTAGE (120-277V) DRIVER. INTEGRAL BATTERY PACK CAPABLE OF PROVIDING AT LEAST 90 MINS OF RUN TIME. UL 924 LISTED SELF DIAGNOSTIC, CUSTOM COLOR	1	
F1	BEULUX - FLORENCE - RGBW CT02-F-RGB-IP20 DTR-150-IP67 POWER SUPPLY	-	LED 330 LUMENS/FT	0-10V	277-24V	7.3 PER FT	8.1 PER FT	RGB LED TAPE LIGHT, CT02 SURFACE MOUNT ALUMINUM EXTRUSION, 277-24V 0-10V DIMMING DRIVER, SATINED LENS, 330 LUMENS PER FOOT	2	
F2	FOCAL POINT - SEEM 2 FMS2LWL-FL-375L-F-35K-1C-UNV-LD1-XFN-FW-WH-XX	-	LED 80 CRI, 3500K 375 LUMENS/FT 270,000 HRS	0-10V (120-277V)	UNV	4.75 PER FT	5.2 PER FT	RECESSED WET LOCATION LED COVE LIGHT, ALUMINUM HOUSING, UNIVERSAL VOLTAGE (120-277V) 0-10V DIMMING DRIVER, 375 LUMENS PER FOOT, 3500K CCT, 80 CRI, HARD SURFACE MOUNTING HARDWARE, WHITE FINISH	2	
F3	DIODE LED - NEON BLAZE 24V-SE-NBL2-35-32	-	LED 80 CRI, 3500K 120 LUMENS/FT	0-10V	24V	2.44 PER FT	2.73 PER FT	WET LOCATION FLEXIBLE LED STRIP LIGHT, DIFFUSED LIGHT OUTPUT PROVIDE WITH 60W DRIVER PER 20 FEET OF FIXTURE LENGTH		
F4	EATON - METALUX - SNLED LENSED 4SNLED-LD5-298L-SLW-UNV-L840-CD1	-	LED 80 CRI, 4000K 2900 LUMENS 60,000 HRS	0-10V (120-277V)	UNV	25	28	4 FT LED STRIP LIGHT, COLD ROLLED STEEL HOUSING, FROSTED SQUARE LENS, UNIVERSAL (120-277V) 0-10V DIMMING DRIVER, 2900 LUMENS, 4000K CCT, 80 CRI		
F4E	EATON - METALUX - SNLED LENSED 4SNLED-LD5-298L-SLW-UNV-EL14W-L840-CD1	-	LED 80 CRI, 4000K 2900 LUMENS 60,000 HRS	0-10V (120-277V)	UNV	25	28	SAME AS FIXTURE TYPE F4 EXCEPT WITH INTEGRAL 14 WATT EMERGENCY BATTERY AND TEST / INDICATOR LIGHT CAPABLE OF PROVIDING AT LEAST 1600 LUMENS FOR 90 MINUTES. UL 924 LISTED.		
F8	EATON - METALUX - SNLED LENSED 8TSNLED-LD5-70SL-SLW-UNV-L840-CD1	-	LED 80 CRI, 4000K 7000 LUMENS 60,000 HRS	0-10V (120-277V)	UNV	61	68	8 FT LED STRIP LIGHT, COLD ROLLED STEEL HOUSING, FROSTED SQUARE LENS, UNIVERSAL (120-277V) 0-10V DIMMING DRIVER, 7000 LUMENS, 4000K CCT, 80 CRI		
F9	LITELINE - LUNA LED RA28-7F-BK	-	LED 90 CRI, 4000K 560 LUMENS	ELV	120	7	7.9	RECESSED 2" SQUARE, ALUMINUM HOUSING, 40 DEGREE BEAM SPREAD , SUITABLE FOR WET LOCATIONS PROVIDE ADD ALTERNATE FOR FULL RANGE RGB VERSION		
F10	METALUX 4VT3-LD5-4-G-120V-L835-CD1-U	-	LED 80 CRI, 3500K 4000 LUMENS	NON-DIM	120	32	32	4" LINEAR LED STRIP LIGHT WET LOCATION RATED FOR OUTDOOR USE. MOUNT TO BOTTOM OF CANOPY.		2
F8E	EATON - METALUX - SNLED LENSED 8TSNLED-LD5-70SL-SLW-UNV-EL14W-L840-CD1	-	LED 80 CRI, 4000K 7000 LUMENS 60,000 HRS	0-10V (120-277V)	UNV	61	68	SAME AS FIXTURE TYPE F8 EXCEPT WITH INTEGRAL 14 WATT EMERGENCY BATTERY AND TEST / INDICATOR LIGHT CAPABLE OF PROVIDING AT LEAST 1600 LUMENS FOR 90 MINUTES. UL 924 LISTED.		
L4	EATON - CORELITE - CONTINUUA WALL LED CT1W-F-2575-40L-835-1D-UNV-STD-W-WM-4	-	LED 80 CRI, 3500K 4000 LUMENS 121,000 HRS	0-10V (120-277V)	UNV	35	39	4 FT LED DIRECT / INDIRECT WALL MOUNT STRIP FIXTURE, ALUMINUM HOUSING WITH FROSTED LENS, UNIVERSAL VOLTAGE (120-277V) 0-10V DIMMING DRIVER, 25% UP - 75% DOWN DISTRIBUTION, 4000 LUMENS, 3500K CCT, 80 CRI WHITE FINISH		
L4E	EATON - CORELITE - CONTINUUA WALL LED CT1W-F-2575-40L-835-1D-UNV-STD-B8SL6W-WM-4	-	LED 80 CRI, 3500K 4000 LUMENS 121,000 HRS	0-10V (120-277V)	UNV	35	39	SAME AS FIXTURE TYPE L4 EXCEPT WITH INTEGRAL 6 WATT EMERGENCY BATTERY PACK CAPABLE OF PROVIDING AT LEAST 600 LUMENS FOR 90 MINUTES. UL 924 LISTED.		
P1	EATON - PORTFOLIO - LSR8B LSR8B820D10MB-ECB810208035-8LBM3B-PB38MB-SP60	-	LED 80 CRI, 3500K 1000 LUMENS 50,000 HRS	0-10V (120-277V)	UNV	11	12	8 INCH ROUND DECORATIVE SURFACE MOUNT CYLINDER, ALUMINUM HOUSING, UNIVERSAL VOLTAGE (120-277V) DIMMING DRIVER, 1000 LUMENS, 3500K CCT, 80 CRI, MATTE BLACK FINISH WITH SPECULAR BLACK MEDIUM DISTRIBUTION REFLECTOR, 60" MATTE BLACK PENDANT STEM KIT		
P2	EATON - PORTFOLIO - LSR8B LSR8B820D10MB-ECB810208035-8LBM3B-PB38MB-SP60	-	LED 80 CRI, 3500K 2000 LUMENS 50,000 HRS	0-10V (120-277V)	UNV	21	23	8 INCH ROUND DECORATIVE SURFACE MOUNT CYLINDER, ALUMINUM HOUSING, UNIVERSAL VOLTAGE (120-277V) DIMMING DRIVER, 2000 LUMENS, 3500K CCT, 80 CRI, MATTE BLACK FINISH WITH SPECULAR BLACK MEDIUM DISTRIBUTION REFLECTOR, 60" MATTE BLACK PENDANT STEM KIT		
P3	BARBICAN - SALSA 16-2001-62D-42H-XX-SM-BLK-9W/LF-277V-3500K-90CRI-DB(0-10V)	-	LED 90 CRI, 3500K 900 LUMENS	0-10V 277V	277V	18	20	DECORATIVE LED PENDANT FIXTURE, FABRIC PAIL SHADES OVER ALUMINUM HOUSING, 277V 0-10V DIMMING DRIVER, 900 LUMENS, 3500K CCT, 90 CRI, BLACK STEM AND CANOPY		
T	HALO SINGLE CIRCUIT TRACK L653-PIMB	-	TRACK	-	120	-	-	SINGLE CIRCUIT LINE VOLTAGE TRACK (W)(B) ON PLAN INDICATES WHITE OR BLACK FINISH		
T1	HALO MINI SERIES L812 TRACK HEAD L-812-11-NF-90-35-PIMB	-	LED 90 CRI, 3500K	ELV	120	15.5	17	LED MINI TRACK HEAD, (W)(B) ON PLAN INDICATES WHITE OR BLACK FINISH		
W1	TECH LIGHTING - KENWAY WALL 700WSKNWBLED930-277	-	LED 90 CRI, 3000K 734 LUMENS 30,000 HRS	0-10V	277V	11	12	17 INCH TALL WALL MOUNTED LED VANITY FIXTURE, ALUMINUM HOUSING WITH ACRYLIC SHADE, 277 VOLT 0-10V DIMMING DRIVER, 734 LUMENS, 3000K CCT, 90 CRI, MATTE BLACK FINISH		
W2	MCGRRAW-EDISON IST-SA1-A-735-1-T2-BK	-	LED 70 CRI, 3500K 2802 LUMENS	NON-DIM	120	20	20	EXTERIOR WALL SCONCE WITH TYPE II DISTRIBUTION. MOUNT AT 4'-0" AFG.		2
WL-1	MERW-638-LED-2-X-81-SC	-	80 CRI, 3000K	0-10V (120-277V)	UNV	27	31	EXTERIOR LED DECORATIVE WALL SCONCE, SATING BLACK, STEEL HOUSING, CUSTOM ACCENT MATERIAL		
WL-2	MOVIT - RECTANGULAR S-3000V-JB-REIN-D1 REMOTE DRIVER - 4548-0024-025-UNV-ND	-	LED 90 CRI, 3000K 700 LUMENS	NON-DIM	UNV (120-277V)	12.5	14	SURFACE MOUNTED, SURFACE SLIM FLOODLIGHT PROJECTOR, ASYMMETRICAL, INDIRECT PROVIDE ADD ALTERNATE FOR FULL RANGE RGB VERSION		
WL-4	SENIK G4 P2M-WWGA-120277-3000K-WH-25	-	LED 3000K 4800 LUMENS	NON-DIM	UNV (120-277V)	98	110	HEAVY DUTY 4FT LINEAR WALL WASHER PROVIDE ADD ALTERNATE FOR FULL RANGE RGB VERSION		
X1A	EATON - SURE-LITES - ES SERIES ES7-1-70-S-BL-G-W	-	LED	N/A	UNV (120-277V)	2	3.2	LED EDGE LIT SURFACE WALL MOUNT EXIT SIGN, STEEL HOUSING, GREEN LETTERS ON HIGH IMPACT ACRYLIC PANEL SINGLE FACE, NO CHEVRONS, BLACK FINISH. INTEGRAL BATTERY BACKUP CAPABLE OF PROVIDING AT LEAST 90 MINUTES OF RUN TIME. UL 924 LISTED.		
X1B	EATON - SURE-LITES - ES SERIES ES7-1-70-S-BL-G-C	-	LED	N/A	UNV (120-277V)	2	3.2	LED EDGE LIT SURFACE CEILING MOUNT EXIT SIGN, STEEL HOUSING, GREEN LETTERS ON HIGH IMPACT ACRYLIC PANEL, SINGLE FACE, NO CHEVRONS, BLACK FINISH. INTEGRAL BATTERY BACKUP CAPABLE OF PROVIDING AT LEAST 90 MINUTES OF RUN TIME. UL 924 LISTED.		
X1C	EATON - SURE-LITES - ES SERIES ES7-2-70-S-BL-G-DA-C	-	LED	N/A	UNV (120-277V)	2	3.2	LED EDGE LIT SURFACE CEILING MOUNT EXIT SIGN, STEEL HOUSING, GREEN LETTERS ON HIGH IMPACT ACRYLIC PANEL, DOUBLE FACE, DOUBLE CHEVRONS, BLACK FINISH. INTEGRAL BATTERY BACKUP CAPABLE OF PROVIDING AT LEAST 90 MINUTES OF RUN TIME. UL 924 LISTED.		
X2	EATON - SURE-LITES - LPX SERIES LPX7SD	-	LED	N/A	UNV (120-277V)	1	1	LED EXIT SIGN, GREEN LETTERING ON WHITE HIGH IMPACT POLYCARBONATE HOUSING, INTEGRAL BATTERY BACKUP CAPABLE OF PROVIDING AT LEAST 90 MINUTES OF RUN TIME, SELF DIAGNOSTIC, UL 924 LISTED.		
GENERAL NOTES: A. REFER TO LIGHT FIXTURE SCHEDULE GENERAL NOTES AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.										
NOTES: 1. COORDINATE LIGHT FIXTURE FINISH COLOR WITH ARCHITECT, GENERAL CONTRACTOR AND CURTAIN WALL SYSTEM MANUFACTURER PRIOR TO ORDERING. 2. CONTRACTOR TO FIELD VERIFY AND COORDINATE LENGTHS WITH ARCHITECT PRIOR TO ORDERING.										

LIGHT FIXTURE SCHEDULE GENERAL NOTES:

- ALL LIGHT FIXTURES AND RELATED COMPONENTS SHALL BE PROVIDED BY THE CONTRACTOR, UNLESS NOTED OTHERWISE.
- THE PARTY SUPPLYING THE LIGHT FIXTURES IS RESPONSIBLE FOR SUPPLYING THE PROPER QUANTITY OF LIGHT FIXTURES.

LIGHT FIXTURE SCHEDULE SUPPLEMENTAL SPECIFICATIONS:

- ANY PROPRIETARY, SOLE-SOURCED LIGHT FIXTURE LISTED IN THE LIGHT FIXTURE SCHEDULE SHALL BE UNIT PRICED ONLY. NO PACKAGING OR LOT PRICING OF THESE LIGHT FIXTURES SHALL BE

Short-Circuit and Voltage Drop Calculations

Distances are for calculation purposes only and shall not be used for contractor takeoffs nor bidding - Contractor shall notify Engineer of any field condition that results in a change of 10% or greater circuit distance

The following calculations are based on the "Point-by-Point" method where:

ISC (2) = ISC(1) x M(1)
ISC (1) = short circuit current at fault point 1
ISC (2) = short circuit current at fault point 2

M = 1/(1+I)

Feeder: f (30) = $1.732 \times L \times I_{sc}$
C x E

XFMR: f (30) = $I_{sc} \times V_p \times 1.73 \times \%Z$
100,000 x KVA

IS(sca) = $V_p \times M \times I_{sc}$
Vs

VOLTAGE DROP (30):

%VD = $((R \times \cos(\arccos(pf))) + X \times \sin(\arccos(pf))) \times L / \# \times 1.73 \times I$
VOLTAGE DROP (10):

%VD = $((R \times \cos(\arccos(pf))) + X \times \sin(\arccos(pf))) \times 2 \times L / \# \times I$
E

%VD CUM= Cumulative Voltage Drop from Fault Point 1 to Fault Point #

R= resistance in ohms per LF
X= reactances in ohms per LF

IP = Primary short circuit current
Vp = Primary voltage
IS= Secondary short circuit current
Vs= Secondary voltage
L= Length of circuit
E = Line to line volts
C = "C" Factor from Bussman table where "C" = 1 / impedance per linear foot

Feeder Types =
NM - Non Magnetic Conduit, M - Magnetic Conduit, FB - Feeder Busway, PB - Plug-in Busway, TX - Transformer

Fault Point (FP)		Bus/Feeder Description		Source (Fault Point)	Phase	Source Isc (amps)	Feeder			Conductor "C" Value	Busway "C" Value	L-L Voltage (E)	Circuit Length (L)	Load Power Factor (pf)	Circuit Load (Amperage)	Resistance (R)	Reactance (X)	Arccos (pf) (Radians)	Type	Degree Rise	kVA	New Xlmr Z	Existing Xlmr Z	Secondary Voltage	Tap Setting	f	M	Fault Current (amps)	Voltage Drop (%VD)	Cumulative Voltage Drop (%VD)	Fault Point (FP)		
1		Utility Service Point		10,472 at the secondary of the utility transformer																											1		
2		Motor Contribution		240 The connected full load motor amps (includes compressors) on the system																												2	
3		At Switchboard MSBW	1	3	11912	NM	AL	3	Set(s) of	400	kcmil	18506	--	480	175	0.9	640	0.000054	0.000040	0.451027								0.135	0.88	10491	-0.89%	-0.89%	2
4		At Panelboard WHH1	2	3	10491	M	CU	1	Set(s) of	30	AWG	12844	--	480	25	0.9	160	0.000079	0.000052	0.451027								0.074	0.93	9771	-0.14%	-1.02%	3
5		At Transformer TWH1	3	3	9771	M	CU	1	Set(s) of	4	AWG	3906	--	480	5	0.9	40	0.000310	0.000060	0.451027								0.046	0.96	9339	-0.02%	-1.05%	4
6		Thru Transformer TWH1	4	3	9338	TX														DOE	150	30	2.44		208		6.314	0.14	2946	-1.05%	-1.05%	5	
7		At Panelboard WLH2	6	3	2872	NM	CU	1	Set(s) of	2	AWG	6044	--	208	230	0.9	48	0.000190	0.000045	0.451027								0.910	0.52	1504	-1.75%	-2.88%	7

Short-Circuit and Voltage Drop Calculations

Distances are for calculation purposes only and shall not be used for contractor takeoffs nor bidding - Contractor shall notify Engineer of any field condition that results in a change of 10% or greater circuit distance

The following calculations are based on the "Point-by-Point" method where:

ISC (2) = ISC(1) x M(1)
ISC (1) = short circuit current at fault point 1
ISC (2) = short circuit current at fault point 2

M = 1/(1+I)

Feeder: f (30) = $1.732 \times L \times I_{sc}$
C x E

XFMR: f (30) = $I_{sc} \times V_p \times 1.73 \times \%Z$
100,000 x KVA

IS(sca) = $V_p \times M \times I_{sc}$
Vs

VOLTAGE DROP (30):

%VD = $((R \times \cos(\arccos(pf))) + X \times \sin(\arccos(pf))) \times L / \# \times 1.73 \times I$
VOLTAGE DROP (10):

%VD = $((R \times \cos(\arccos(pf))) + X \times \sin(\arccos(pf))) \times 2 \times L / \# \times I$
E

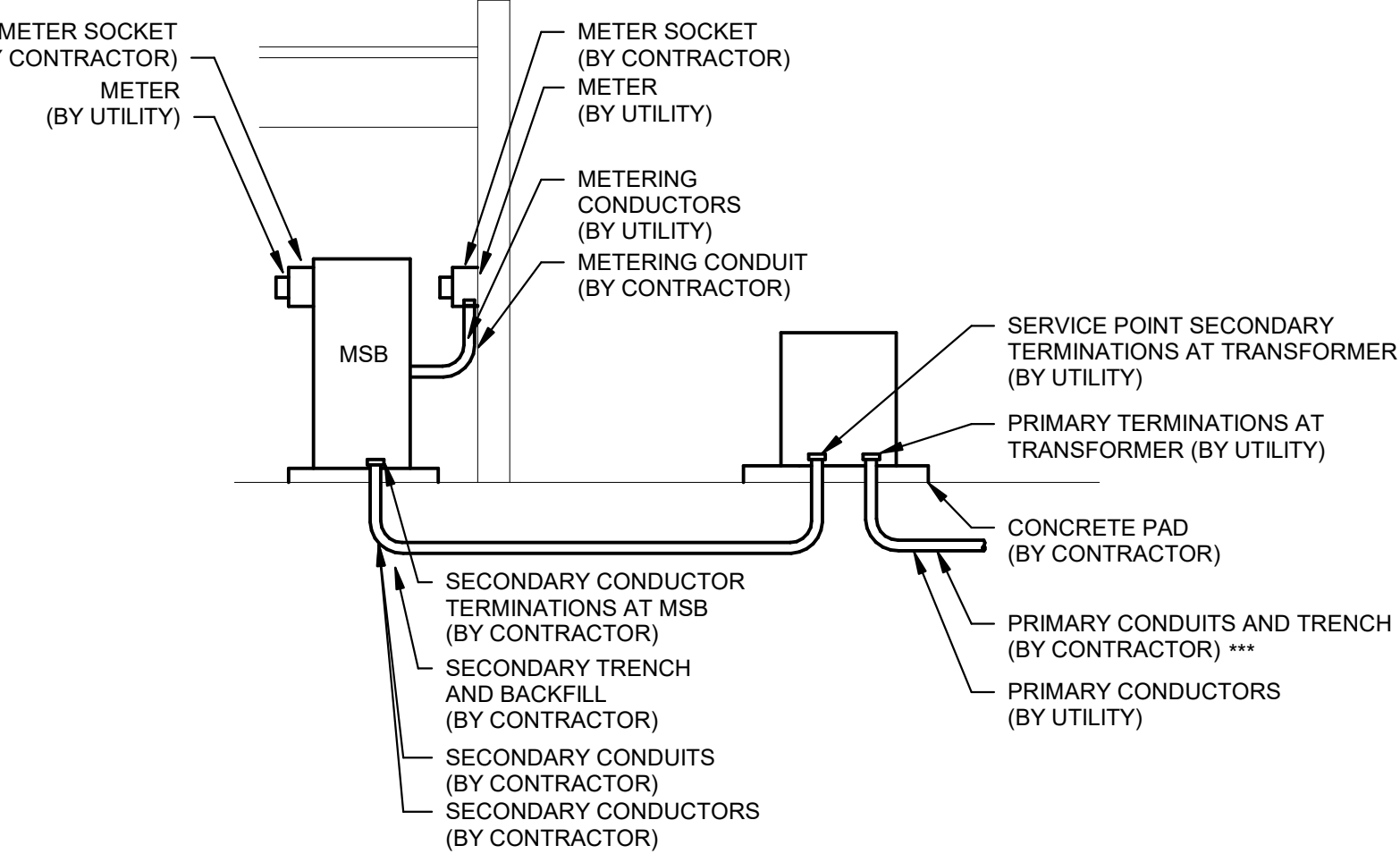
%VD CUM= Cumulative Voltage Drop from Fault Point 1 to Fault Point #

R= resistance in ohms per LF
X= reactances in ohms per LF

IP = Primary short circuit current
Vp = Primary voltage
IS= Secondary short circuit current
Vs= Secondary voltage
L= Length of circuit
E = Line to line volts
C = "C" Factor from Bussman table where "C" = 1 / impedance per linear foot

Feeder Types =
NM - Non Magnetic Conduit, M - Magnetic Conduit, FB - Feeder Busway, PB - Plug-in Busway, TX - Transformer

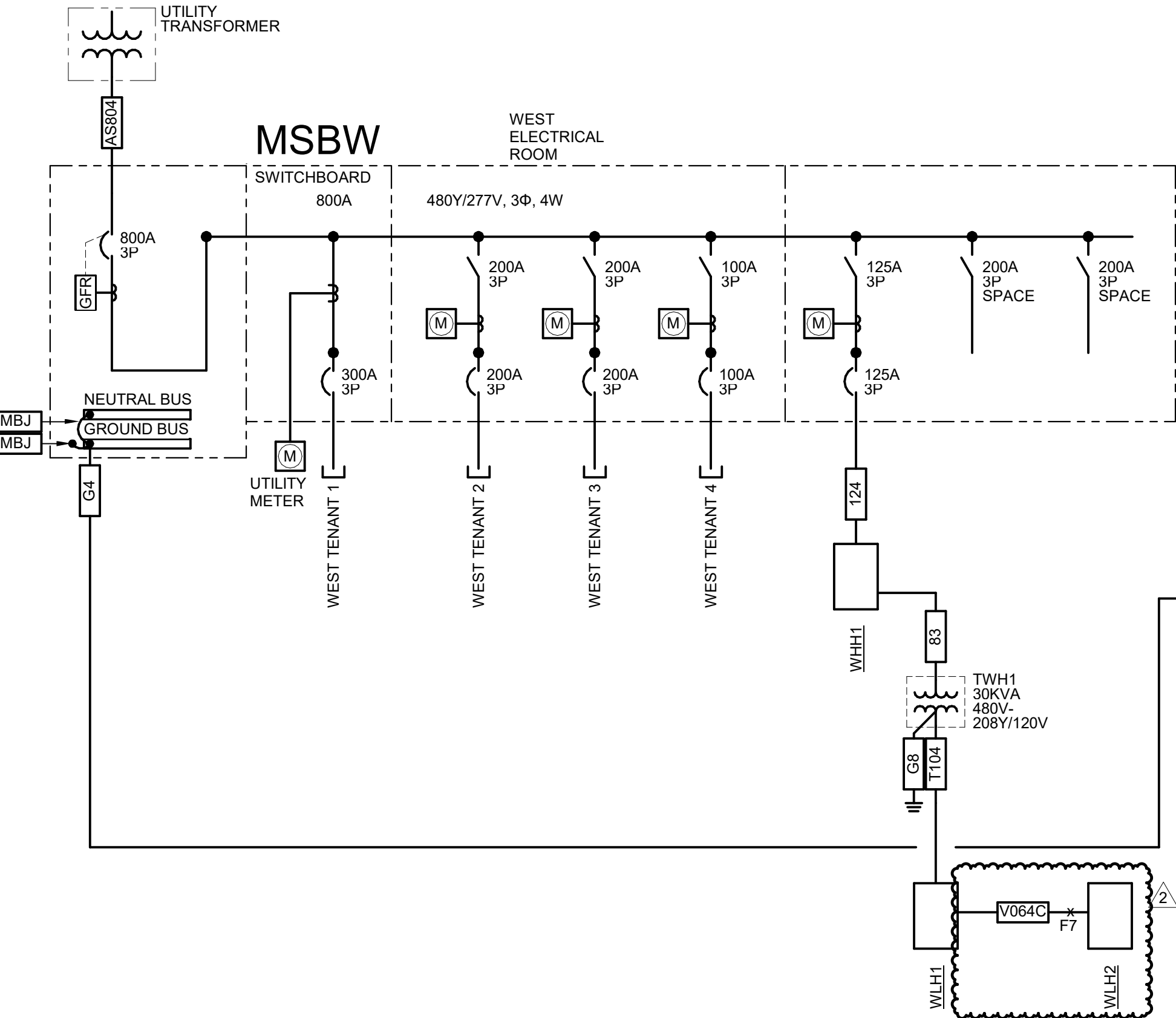
Fault Point (FP#)		Bus/Feeder Description		Source (Fault Point)	Phase	Source Isc (amps)	Feeder			Conductor "C" Value	Busway "C" Value	L-L Voltage (E)	Circuit Length (L)	Load Power Factor (pf)	Circuit Load (Amperage)	Conductor			Transformer			Degree Rise	kVA	New Xlmr Z	Existing Xlmr Z	Secondary Voltage	Tap Setting	f	M	Fault Current (amps)	Voltage Drop (%VD)	Cumulative Voltage Drop (%VD)	Fault Point (FP#)
							Conduit Type/ TX	Material	Quantity of Parallel Sets and Bus/Phase & Neutral Size							Resistance (R)	Reactance (X)	Arccos (pf) (Radians)	Type														
1	Utility Service Point	31,415 at the secondary of the utility transformer																													1		
	Motor Contribution	600 The connected full load motor amps (includes compressors) on the system																															
2	At Switchboard MSBE	1	3	35015	NM	AL	6	Set(s) of	600	kcmil	23451	--	480	145	0.9	1600	0.000036	0.000039	0.451027									0.130	0.88	30981	-0.69%	-0.69%	2
3	At Panelboard EHO1	2	3	30981	M	CU	3	Set(s) of	600	kcmil	22965	--	480	330	0.9	700	0.000025	0.000048	0.451027									0.535	0.65	20177	-1.21%	-1.90%	3
4	At Transformer TEO1	3	3	20177	M	CU	1	Set(s) of	250	kcmil	16483	--	480	5	0.9	200	0.000054	0.000052	0.451027									0.022	0.98	19741	-0.03%	-1.92%	4
5	Thru Transformer TEO1	4	3	19741	TX															DOE	150	150	3.46		208		3.786	0.21	9519	-1.92%	-1.92%	5	
6	At Panelboard ELO1	5	3	9519	M	CU	2	Set(s) of	350	kcmil	19704	--	208	5	0.9	480	0.000039	0.000050	0.451027									0.010	0.99	9424	-0.06%	-1.98%	6
7	At Panelboard EHH1	2	3	30981	M	CU	1	Set(s) of	1	AWG	7293	--	480	20	0.9	100	0.000160	0.000057	0.451027									0.307	0.77	23712	-0.12%	-0.81%	7
8	At Transformer TEH1	7	3	23712	M	CU	1	Set(s) of	4	AWG	3806	--	480	5	0.9	40	0.000310	0.000060	0.451027									0.112	0.90	21316	-0.02%	-0.83%	8
9	Thru Transformer TEH1	8	3	21316	TX															DOE	150	30	2.44		208		14.413	0.06	3191	-0.83%	-0.83%	9	
10	At Panelboard ELH1	9	3	3191	M	CU	1	Set(s) of	3	AWG	4774	--	208	5	0.9	80	0.000250	0.000059	0.451027									0.028	0.97	3105	-0.08%	-0.92%	10



UTILITY COORDINATION DETAIL
12" = 1'-0"

PANELBOARD MSBW LOAD SUMMARY		480Y/277V, 3PH, 4W		
LOAD DESCRIPTION	Connected KVA	Demand FACTOR	Demand KVA	
HVAC - SUMMER	0.00	100%	0.00	
HVAC - WINTER	59.60	100%	59.60	
LIGHTING	1.31	125%	1.64	
RECEPTACLES	5.40	100%/50%	5.40	
KITCHEN EQUIPMENT	0.00	65%	0.00	
MOTOR LOADS	0.00	100%	0.00	
LARGEST MOTOR LOAD	0.00	125%	0.00	
SUPPLEMENTAL ELECTRIC HEAT	1.20	100%	1.20	
MISCELLANEOUS EQUIPMENT	4.09	100%	4.09	
REFRIGERATION EQUIPMENT	0.00	100%	0.00	
SHOW WINDOW	0.00	PER NEC	0.00	
EXTERIOR LIGHTING	2.34	125%	2.93	
TOTAL LOAD	73.95	KVA	74.86	
TOTAL AMPACITY	88.95	AMPS	90.05	
PANEL AMPACITY	800	AMPS	800.00	
SPARE CAPACITY		AMPS	710	

PANELBOARD MSBE LOAD SUMMARY		480Y/277V, 3PH, 4W		
LOAD DESCRIPTION	Connected KVA	Demand FACTOR	Demand KVA	
HVAC - SUMMER	134.35	100%	0.00	
HVAC - WINTER	267.82	100%	267.82	
LIGHTING	6.32	125%	7.90	
RECEPTACLES	11.70	100%/50%	10.85	
KITCHEN EQUIPMENT	0.00	65%	0.00	
MOTOR LOADS	132.33	100%	132.33	
LARGEST MOTOR LOAD	22.45	125%	26.06	
SUPPLEMENTAL ELECTRIC HEAT	6.20	100%	6.20	
MISCELLANEOUS EQUIPMENT	17.90	100%	17.90	
DISPLAY CASE	0.00	125%	0.00	
SHOW WINDOW	3.60	PER NEC	3.60	
EXTERIOR LIGHTING	23.38	125%	29.22	
TOTAL LOAD	626.04	KVA	503.88	
TOTAL AMPACITY	753.01	AMPS	606.07	
PANEL AMPACITY	2000	AMPS	2000.00	
SPARE CAPACITY		AMPS	1394	



Division 26: GENERAL ELECTRICAL REQUIREMENTS

1. GENERAL INSTRUCTIONS

A. GENERAL REQUIREMENTS

All requirements under Division 01 and all the general and supplementary conditions of these specifications apply to this section and division. Where the requirements of this section and division exceed those of Division 01, this section and division take precedence. Become thoroughly familiar with all its contents so as requirements that affect this section, division, or both. Work required under this division includes all material, equipment, appliances, transportation, services, and labor required to complete the entire system as required by the drawings and specifications, or reasonably inferred to be necessary to facilitate the function of each system as implied by the design and the equipment specified.

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

Drawings are graphic representations of the work upon which the contract is based. They show the materials and their relationship to one another, including sizes, shapes, locations, and connections. They convey the intended general arrangement of the systems without showing all of the exact details as to elevations, offsets, control lines, and other installation requirements. Use the drawings as a guide when laying out the work and to verify that materials and equipment will fit into the designated spaces, and which when installed per manufacturers' requirements, will ensure a complete, coordinated, satisfactory, and properly operating system.

B. DEFINITIONS

Division: References contained in this specification follow the numbering system defined in the Construction Specifications Institute (CSI) MasterFormat 2004 Edition. Specification Division 01 through 13 provided with this project may reference the CSI MasterFormat 1995 Edition. The corresponding division references between the 2004 Edition and 1995 Edition are as follows:

2004 Edition	1995 Edition
1. Division 21 - Fire Suppression	Division 15
2. Division 22 - Plumbing	Division 15
3. Division 23 - HVAC	Division 15
4. Division 26 - Electrical	Division 16
5. Division 27 - Communications	Division 16
6. Division 28 - Electronic Safety and Security	Division 16

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

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

Provide: "to furnish and install."

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

Engineer: Where referenced in this Division, "Engineer" is the Engineer of Record and the Design Professional for the work under this division, and is a consultant to, and an authorized representative of the Architect, as defined in the General and Supplementary Conditions. When used in this division, Engineer means increased involvement by and obligations to the Engineer, in addition to involvement by and obligations to the Architect.

AHJ: The local code official or inspection agency (Authority Having Jurisdiction over the Work

NRTL: National Recognized Testing Laboratory, as defined and listed by OSHA in 29 CFR 1910.7 (e.g., UL, ETL, CSA), and acceptable to the AHJ over this project. Nationally recognized testing laboratories and standards listed are only to represent the characteristics required and are not intended to restrict the use of other NRTLs that are acceptable to the AHJ and standards that meet the specified criteria.

Header: That portion of an electrical circuit originating at a junction box, termination box, receptacle, or switch with termination at an electrical panelboard. Note: Where MC cable is utilized for receptacle and/or lighting branch circuits including loads, the originating point of the header shall be at the first load in the circuit or at a junction box located in an accessible ceiling space as close as possible to the first load.

Substitution: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor. Substitutions include Value Engineering proposals.

- Substitution for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
- Substitution for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

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

C. PRE-BID SITE VISIT

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

D. MATERIAL AND WORKSMANSHIP

Provide new material, equipment, and apparatus under this contract unless otherwise stated herein, of best quality normally used for the purpose in good commercial practice, and free from defects. Model numbers listed in the specifications or shown on the drawings are not necessarily intended to designate the required trim, written descriptions of the trim govern model numbers.

Provide markings or a nomenclature for all material and equipment identifying the manufacturer and providing sufficient information to establish quality, size, and capacity. All workmanship shall be of the finest possible by experienced mechanics of the proper trade. In general, provide the following quality grade(s) for all materials and equipment.

Commercial specification grade:

Provide all hoists, scaffolds, staging, runways, ladders, tools, machinery, and equipment required for the performance of the electrical work. Store and maintain material and equipment in clean condition, and protected from weather, moisture, and physical damage.

Furnish only material and equipment that are listed, labeled, certified, or all three, by an NRTL whenever any listing or labeling exists for the types of material and equipment specified.

At a minimum, general work practices for electrical construction shall be in accordance with NECA 1 (latest edition), "Standard Practices for Good Workmanship in Electrical Construction".

E. MANUFACTURERS

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

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

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

F. COORDINATION

Coordinate all work with other divisions and trades so that various components of the systems are installed at the proper time, fit available space, and allow proper service access to those items requiring maintenance. Components which are installed without regard to the above shall be relocated at no additional cost to the Owner.

Unless otherwise indicated, the General Contractor shall provide chases and openings in building construction required for installation of the systems specified herein. Contractor shall furnish the General Contractor with information where chases and openings are required. Contractor shall keep informed as to the work of other trades engaged in the construction of the project and shall execute work in a manner as to not interfere with or delay the work of other trades.

Figured dimensions shall be taken in preference to scale dimensions. Contractor shall take his own measurements at the building; as variations may occur. Contractor shall be held responsible for errors that cannot be avoided by proper checking and inspection.

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

Make all efforts required to protect clean rooms, and other structural members, and to facilitate concealing raceways in the manner indicated in the design. Provide materials with trim that will fit properly the types of ceiling, wall, or floor finishes actually installed.

G. ORDINANCES AND CODES

Work performed under this contract shall, at a minimum, be in conformance with applicable national, state and local codes having jurisdiction. Equipment furnished and associated installation work performed under this contract shall be in strict compliance with current applicable codes adopted by the local AHJ, including any amendments and standards as set forth by the following:

- National Fire Protection Association (NFPA)
- Underwriters Laboratories (UL)
- Occupational Safety and Health Administration (OSHA)
- American National Standards Institute (ANSI)
- American Society of Testing Materials (ASTM)
- Rules and regulations of public utilities and municipal departments affected by connection of services.
- Other national standards and codes where applicable.

Where the contract documents exceed the requirements of the referenced codes, standards, etc., the contract documents shall take precedence. Where conflicts between various codes, ordinances, rules, and regulations exist, comply with the most stringent.

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

Procure and pay for permits and licenses required for the accomplishment of the work herein described. Where required, obtain, pay for, and furnish certificates of inspection to Owner. Provide all safety lights, guards, and warning signs required for the performance of the work and for the safety of the public.

H. PROTECTION OF EQUIPMENT AND MATERIALS

Store and protect from damage equipment and materials delivered to job site. For materials and equipment susceptible to changing weather conditions, dampness, or temperature variations, store inside in conditioned spaces. For materials and equipment not susceptible to these conditions, cover with waterproof, tear-resistant, heavy duty or polyethylene plastic as required to protect from plaster, dirt, paint, water, or physical damage. Equipment and material damaged by construction activities shall be rejected, and Contractor shall furnish new equipment and material of a like kind at his own expense.

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

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

I. SUBSTITUTIONS

Materials, products, equipment, and systems described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by the proposed substitution. The base bid shall include only the products from manufacturers specifically named in the drawings and specifications. To request a substitution, request the Substitution Request Form from the Architect or Engineer. Complete and send the Substitution Request Form for each material, product, equipment, or system that is proposed to be substituted. The burden of proof of the proposed substitution is upon the proposer.

Unless stated otherwise in writing to the Engineer by the Contractor, Contractor warrants to the Engineer, Architect, and Owner the following:

- Proposed substitution has been fully investigated and determined to not exceed the specified Work in all respects unless stated otherwise in the substitution request.
- Proposed substitution is consistent with the Contract Documents and will produce indicated results, including functional characteristics, maintenance service, and sourcing of replacement parts.
- Proposed substitution has received necessary approvals of authorities having jurisdiction.
- Same warranty will be furnished for proposed substitution as for specified Work.
- If accepted substitution fails to perform as required, Contractor shall replace substitute material or system with that originally specified and bear costs incurred thereby.
- Coordination, installation and changes in the Work is necessary for accepted substitution will be complete in all respects.

No substitutions will be considered unless the Substitution Request Form is completed and attached with the appropriate substitution documentation. No substitution will be considered prior to receipt of bids unless written request for approval has been received by the Engineer at least ten (10) calendar days prior to the date for receipt of bids. Verbal approval will not be given. No substitutions will be considered after the contract is awarded unless specifically provided in the contract documents.

Provide factory generated point-by-point calculations for all exterior light fixtures (photometric files supplied so the engineer can generate a point-by-point or do surface for the point-by-point calculations). Provide interior point-by-point calculations at the discretion of the engineer.

J. SUBMITTALS

Assemble and submit for review shop drawings, material lists, manufacturer product literature for equipment to be furnished, and items requiring coordination between contractors under this project. Provide submittals in sufficient detail so as to demonstrate compliance with these Contract Documents and the design concept. Prior to transmitting submittals, verify that the equipment submitted is mutually compatible with suitable for the intended use, will fit the available space, and maintain manufacturer recommended service clearances. If the size of equipment furnished makes necessary any change in location or configuration, submit a shop drawing showing the proposed layout.

Transmit submittals as early as required to support the project schedule. Allow two weeks for Engineer review time, plus sufficient mailing time via the Architect, plus a duplication of this time for resubmittals, if required. Only resubmit those sections requiring resubmittal.

Submittals shall contain the project name, applicable specification section, submittal data, equipment identification specifications as used on the drawings, and the Contractor's stamp. The stamp shall certify that the submittal has been checked by the Contractor, complies with the drawings and specifications, and is coordinated with other trades. Manufacturer product literature shall include shop drawings, product data, performance sheets, samples, and other submittals required for the intended use. Highlight mark, list, or indicate the materials, performance criteria, and accessories that are being proposed. General product catalog data not specifically noted to be part of the specified product will be rejected and returned without review.

Separate and shop drawings shall not contain firm name, logo, the seal, or signature of the Engineer. They shall not be copies of the work product of the Engineer. If the Contractor desires to use elements of such product, refer to paragraph "Electronic Drawing Files" for procedures to be used.

Submit submittals according to individual specification sections. Flagable submittals will be rejected and returned without review. Catalog data shall be properly bound, identified, indexed and tabbed in a 3-ring binder. Each item or model number shall be clearly marked and accessories indicated. Label the catalog data with the equipment identification number or number as used on the drawings and include performance curves, capacities, sizes, and weights. Materials, finishes, wiring diagrams, electrical requirements and deviations from specified equipment or materials. Mark on insupportable items. Shop drawings will be returned without review if the above mentioned requirements are not met.

Provide the quantity of submittals required by Division 01. If not indicated and hand-copy sets as provided, submit a minimum of six (6) copies. Refer to Division 01 for acceptance of electronic submittals for this project. For electronic submittals, Contractor shall submit the documents in accordance with the procedures specified in Division 01. Contractor shall notify the Architect that the submittals have been submitted. If electronic submittal procedures are not defined in Division 01, Contractor shall include the website, user name, and password information needed to access the submittals. For submittals sent by e-mail, Contractor shall send only the designated representatives of the Architect and Engineer. Contractor shall allow for the Engineer review time as specified above in the construction schedule. Contractor shall submit only the documents required to purchase the material and/or equipment in the submittal.

The checking and subsequent acceptance of submittals by the Engineer and/or Architect shall not relieve the Contractor from responsibility for deviations from the drawings and specifications, errors in dimensions, details, sizes of equipment, or quantities, omissions of components or fittings, coordination of electrical requirements, and coordinating items with actual building conditions and adjacent work. Contractor shall request and secure written acceptance from the Engineer and Architect prior to implementing any deviation.

K. ELECTRONIC DRAWING FILES

In preparation of shop drawings or record drawings, Contractor may, at his option, obtain electronic drawing files in AutoCAD or DXF format on CD-ROM disk, DVD disk, flash drive, or direct download, as desired, from the Engineer for a shipping and handling fee of \$200 for a drawing set up to 12 sheets and \$15 per sheet for each additional sheet. Contractor the Architect for written authorization and Engineer for the necessary agreement form and to specify shipping method and drawing format. In addition to payment, the written authorization from the Architect and release agreement from the Engineer must be received before electronic drawing files will be sent.

L. RECORD DRAWINGS (AS-BUILT DRAWINGS)

During progress of the work in this division, Contractor shall maintain an accurate record of all changes made during the installation of the system. Upon completion of the work, accurately transfer all record information to three identical sets of the approved shop drawings. Insert one set into each copy of the manual described below.

See Division 01 and General Conditions for additional information.

M. OPERATION AND MAINTENANCE INSTRUCTIONS

During the course of construction, collect and compile a complete brochure of equipment furnished and installed on this project. Include operational and maintenance instructions, manufacturer's catalog sheets, wiring diagrams, parts lists, approved submittals and shop drawings, warranties, and descriptive literature as furnished by the equipment manufacturer. Include an inside cover sheet that lists the project name, date, Owner, Architect, Engineer, General Contractor, Sub-Contractor, and an index of contents.

Submit three copies of literature bound in approved binders with index and tabs separating equipment items to the Architect, for Engineer's review, at the termination of the work. Paper clips, staples, rubber bands, loose-leaf binding, and mailing envelopes are not considered approved binders. Final apporo of systems installed under this contract shall be withheld until this equipment brochure is received and deemed complete by the Architect and Engineer. Insure workmen to save required literature shipped with the equipment itself for inclusion in this brochure.

Include Record Drawings as described above.

Refer to Division 01 for acceptance of electronic manuals for this project. For electronic manuals, refer to paragraph "Submittals" for requirements.

N. WARRANTIES

Warrant each system and each element thereof against all defects due to faulty workmanship, design, or material for a period of 12 months from date of Substantial Completion, unless specific items are noted to carry a longer warranty in these construction documents or manufacturer's standard warranty exceeds 12 months. Remedy all defects occurring within the warranty period(s) as stated in the General Conditions and Division 01.

Warranties shall include labor and material, including travel expenses. Make repairs or replacements without any additional costs to the Owner, and to the satisfaction of the Owner, Architect, and Engineer.

Perform the remedial work promptly upon written notice from the Engineer or Owner.

Also warrant the following additional items:

- All raceways are free from obstructions, holes, crushing, or breaks of any nature.
- All raceway seals are effective.
- The entire electrical system is free from all short circuits and unwanted open circuits and grounds.

At the time of Substantial Completion, deliver to the Owner all warranties, in writing and properly executed, including time limits for warranties extending beyond the one year period and any actions the Owner must take in order to maintain warranty status. Each warranty instrument shall be addressed to the Owner and state the commencement date and term.

2. GENERAL MATERIALS AND INSTALLATION

A. BUILDING OPERATION

Comply with the schedule of operations as outlined in the architectural portions of this specification. Building shall be in operation during normal workday hours. Accomplish work requiring interruption of building operation at a time when the building is not in operation and only with written approval of building Owner and/or tenant. Coordinate interruption of building operation with the Owner and/or tenant in maximum 6-inch layers of wall lapped by earth in a manner to prevent future settlement.

B. EXCAVATION AND BACKFILLING

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

Excavation as specified herein shall be classified as common excavation. Common excavation shall comprise the satisfactory removal and disposition of material of whatever substances and of every description encountered, including rock, if any, within the limits of the work as specified and shown on the drawings. Excavation shall be performed to the lines and grades indicated on the drawings. Dispose of excavated materials that are considered unsuitable for backfill, and surplus of excavated material, which is not required for backfill, all to the satisfaction of the Engineer.

C. COINCIDENTAL DAMAGE

Repair stairs, sidewalks, drives, paving, walls, finishes, and other facilities damaged in the course of this Work. Repair materials shall match existing construction. Repair work shall meet all requirements of the Owner, local authorities having jurisdiction, and meet the satisfaction of the Architect. Repair work shall be thoroughly first class.

D. CUTTING AND PATCHING

Conform to the requirements in Division 01. Cut walls, floors, ceilings, and other portions of the facility as required to install work under this division. Obtain permission of the Architect prior to cutting. Do not cut or disturb structural members without prior approval from the Architect. Cut holes as small as possible. Patch walls, floors, and other portions of the facility as required by work under this division. Patching shall match the original material and construction including fire ratings, if applicable. Repair and refinish areas disturbed by work to the condition of adjoining surfaces in a manner satisfactory to the Architect.

E. ROUGH-IN

Coordinate without delay all rough-in with other divisions. Consider all conduit and raceways except in unfinished areas and where otherwise indicated on the drawings.

F. CONCRETE BASES

Provide concrete bases (e.g., housekeeping pads) for equipment where indicated on the drawings and as specified herein. Concrete bases shall have chamfered edges. Size of base shall be a minimum of 4 inches greater than the footprint of the equipment that it is supporting and shall have a minimum height of 3-1/2 inches.

Construct equipment bases of a minimum 28-day, 4000-psi concrete conforming to American Concrete Institute Standard Building Code for Reinforced Concrete (ACI 318) and the most applicable recommendations of the ACI standard practice manual. Concrete shall be composed of concrete conforming to ASTM C150 Type I, aggregate conforming to ASTM C33, and potable water. Exposed exterior concrete shall contain 5 to 7 percent air entrainment.

Provide equipment specified or shown on the structural drawings, reinforce equipment bases with No. 4 reinforcing bars conforming to ASTM A615 or 6-#2 x W-29 welded wire mesh conforming to ASTM A185. Place reinforcing bars 24 inches on center with a minimum of two bars each direction.

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

G. SUPPORT SYSTEMS

Steel Slotted Support Systems (Slotted Channel): Comply with MFMA-3, factory-fabricated components for field assembly; 12-gauge, 1-5/8-inch by 1-5/8-inch.

Finishes:

- Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-3.

Aluminum Slotted Support Systems (Slotted Channel): Comply with MFMA-3, Type 6063-T6, per ASTM B221; factory-fabricated components for field assembly; 12-gauge, 1-5/8-inch by 1-5/8-inch.

Manufacturers: Cooper B-Line, EBCO International, Hilti, Power-Strut, Thomas and Betts, or Unistrut.

Field Fabrication:

Where field cutting of standard lengths of channel are required, make cuts straight and perpendicular to manufactured surfaces.

For field-cut or damaged surfaces of coated channels, dress cut ends, damaged surfaces, or both, with an abrasive material (e.g., file, grinding stone, or similar) and cleanser to remove oils, rust, sharp edges, and burrs.

For channel with a factory applied coating, re-finish edges with a coating compatible with the factory finish and as recommended by the manufacturer (e.g., manufacturer's touch-up paint or zinc-rich cold galvanizing compound, as applicable).

H. ACCESS DOORS

Provide access doors for all concealed equipment where indicated or as required, except where above lay-in ceilings. Access doors shall be adequately sized for the device served with a minimum size of 18 inches x 18 inches. Access doors must be of the proper construction in which it is installed. Obtain Architect's approval of type, size, location and color before ordering. Provide factory fabricated and assembled units, complete with attachment devices and fasteners ready for installation, concealed hinges, flush screwdriver-operated cam lock, and anchor straps. Provide access doors manufactured by: Bus Co., J.L. Industries, Key Associates, McKee Systems Building Products, Koeck, or Zum.

I. PENETRATIONS

Coordinate sleeve selection and application with selection and application of fire-stopping specified in Division 07 section "Through-Penetration Firestop Systems."

Roofs:

- Coordinate all roof penetrations with Engineer, Owner, and as applicable, the roofing contractor providing a roof warranty.
- Keep all raceway penetrations within mechanical equipment bases wherever possible. Coordinate with Division 01.
- Flash and counterflash all openings through roof, and/or provide pre-fabricated molded seals compatible with the roof construction installed, or as required by the Engineer, Owner, or roofing contractor. All roof penetrations shall be leaktight at the termination of the work and shall not void any new or existing roof warranties.

Walls and Floors:

- Steel Pipe Sleeves for Raceways and Cables: ASTM A53/A55M, Type E, Grade B, Schedule 40, galvanized steel, plain ends, and drill rings.
- Cut Steel Pipe Sleeves for Raceways and Cables: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral warranty, unless otherwise specified.
- Sleeves for Rectangular Openings: Galvanized steel sheet with minimum 0.052 inch thickness and of length to suit application.

J. FIRESTOPPING

Sealants and accessories shall have fire-resistance ratings indicated, as established by testing identical assemblies in accordance with UL 2079 or ASTM E 814, or other NRTL acceptable to AHJ.

Manufacturers: Hilti, RecoSeal, Specified Technologies Inc., United States Gypsum Company, or 3M Corp.

Through and Membrane Penetration Firestopping Systems Product Schedule: Provide UL listing, label, or floor rating, and installation drawing for each penetration fire stop system.

Where project conditions require modification to qualified testing and inspecting agency's illustrations for a particular firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire protection engineer as an engineering judgment or equivalent fire-resistance rated assembly. Include qualifications data for testing agency.

K. EQUIPMENT FURNISHED BY OTHERS

Provide necessary equipment and accessories that are not provided by the equipment supplier or Owner to complete installation of equipment furnished by others in locations as indicated on the drawings, specified herein, or both. Equipment and accessories not provided by the equipment supplier may include, but are not limited to, flexible conduits and plugs as required for proper operation of the complete system, in accordance with the manufacturer's instructions.

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

L. SYSTEM TESTING AND ADJUSTING

Adjust, align, and test all electrical equipment on this project provided under this division and all electrical equipment furnished by others for installation or wiring under this division for proper operation.

Test all systems and equipment according to the requirements in NFPA 70E (latest edition) and all additional requirements specified in following sections.

Maintain the following on the project premises at all times: a RMS reading voltmeter, a true RMS reading ammeter, and a megohmmeter insulation resistance tester. Provide test data readings as requested or as required by the Engineer.

M. EQUIPMENT IDENTIFICATION

Provide equipment identification nomenclature on all switchboards, panelboards, electrical equipment enclosures, access doors, transformers, disconnect switches, enclosed circuit breakers, motor starters, feeder devices in switchboards, distribution panelboards, and motor control centers.

Nomenclature:

- Engraved, contrasting color, three-layer, laminated plastic - indicating the name of the equipment, load, or circuit as designated on the drawings and in the specifications;
- Field-applied permanent epoxy adhesive, compatible with the equipment finish.

Attachment method shall be acceptable to the manufacturers of the equipment to which the nomenclatures are being applied.

Nomenclature Color:

- Black background with white letters for Normal Power;
- Letter height: 3/8-inch minimum.

N. SYSTEM START UP

Perform the following prior to starting up the electrical systems:

- Check all components and devices and liberate items accordingly.
- Tighten screws and bolts and tighten nuts according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 484A and UL 486B.
- Adjust tap on the transformer for rated secondary voltage when the transformer is at minimum load.
- Check and record building's service entrance voltage, grounding conditions, grounding resistance, and proper phasing.
- Replace all burned-out lamps and lamps used for temporary construction lighting in permanent light fixtures.
- After all systems have been inspected and adjusted, confirm all operating functions required by the drawings and specifications and make final adjustments as necessary.

END OF SECTION 26

Division 26: BASIC ELECTRICAL MATERIALS AND METHODS

1. RACEWAYS

A. METALLIC CONDUIT AND TUBING

Electrical Metallic Tubing, Couplings, and Fittings (EMT): ANSI C80.3, UL 797. Only steel products allowed. Reduced wall EMT is not allowed.

Flexible Metal Conduit (FMC): Zinc-coated steel or aluminum; UL 1. Reduced-wall FMC is not allowed.

Intermediate Metal Conduit (IMC): Hot-dip Galvanized Rigid Steel Conduit; ANSI C80.3, UL 1242.

Liquidtight Flexible Metal Conduit (LFMC): Flexible steel conduit with PVC jacket, UL 360; Fittings: NEMA FB 1.

Rigid Metal Conduit (RMC):

- Hot-dip Galvanized Rigid Steel Conduit (GRS): ANSI C80.1, UL 6.
- Black Steel Conduit (BSC), RMC, and Fittings: NEMA RST 1, NRTL listed. Coating thickness of 0.04 inches minimum.

DAC and RMC Fittings: NEMA FB 1; compatible with conduit type and material, NRTL listed.

Manufacturers: AFC Cable, Alfeset, Ansumet Electrical, Electri-Flex, Indalex, Manhattan/CDT/Cole-Flex, O-Z/Geshey, Republic Raceway, Tyco International, Western Tube and Conduit, or Wheelabrator Tube.

B. NON-METALLIC CONDUIT AND TUBING

Rigid Nonmetallic Conduit (RNC): Schedule 40 PVC, 90 deg C rated, NEMA TC-2, UL 651

Fittings: NEMA TC-3, TC 6-UL 651, compatible with conduit/tubing type and material, NRTL listed.

Manufacturers: AFC Cable, American International, Ansumet Electrical, Amco, Conco, Certainteed, Condux International, Eclayco, Electri-Flex, Lamson and Sessions, Manhattan/CDT/Cole-Flex, Prime Conduit, Raco, Spiralex, Superflex Ltd., or Thomas and Betts.

2. RACEWAY INSTALLATION

A. GENERAL RACEWAY INSTALLATION REQUIREMENTS

Install raceways parallel and perpendicular to building lines.

Install raceways to requirements of structure, to requirements of all other work on the project, and to clear all openings, depressions, pipes, ducts, reinforcing steel, and other immovable obstacles.






































Install raceways set in forms for concrete structure in such a manner that installation will not affect the strength of the structure.

Except where approved in writing by the Engineer, install no raceway in a slab-on-groove. Locate raceway below granular fill below slabs-on-grade.

Install raceways continuous between connections to outlets, boxes, and cabinets with a minimum possible number of bends and not more than the equivalent of four 90-degree bends between connections. Use manufactured elbows for all 45- and 90-degree bends, unless approved by the Engineer in advance. Make other bends smooth and even and without fluting ripples or all underground installations, where necessary, be

1. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. THE BIDDER SHALL BE RESPONSIBLE FOR OBTAINING ALL SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS WHICH MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PROJECT. THE BIDDER SHALL BE RESPONSIBLE FOR VERIFYING THE ARCHITECT, ENGINEER AND/OR OWNER OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
2. SYSTEM DESIGN, INSTALLATION AND MATERIALS SHALL BE IN ACCORDANCE WITH APPLICABLE NFPA STANDARDS. SYSTEM DESIGN SHALL MEET ALL CITY, STATE AND FEDERAL CODES, FIRE CODES AND THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION AND INSURANCE CARRIER. VERIFY REQUIREMENTS PRIOR TO SUBMITTAL.
3. INFORMATION ON CONTRACT DOCUMENTS IS GENERAL INFORMATION ONLY. THE BIDDER SHALL BE RESPONSIBLE FOR THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE FINAL SYSTEM DESIGN AND LAYOUT OF ALL COMPONENTS; COORDINATION WITH OTHER TRADES; AND OBTAINING ALL PERMITS REQUIRED FOR APPROVAL BY THE AUTHORITY HAVING JURISDICTION, ENGINEER, AND OWNER'S INSURER.
4. THE CONTRACTOR SHALL FOLLOW THE ENGINEER OF RECORD'S SYSTEM DESIGN AND LAYOUT OF ALL COMPONENTS. ANY MODIFICATIONS TO THE DESIGN ARE NECESSARY, MODIFICATIONS SHALL BE REFLECTED IN THE CONTRACTOR'S SHOP DRAWINGS AND CALCULATIONS.
5. DEVIATIONS FROM ENGINEER'S DESIGN WILL NOT BE CONSIDERED UNLESS A FORMALLY SUBMITTED RFI IS REVIEWED AND APPROVED.
6. THE CONTRACTOR SHALL PROVIDE ALL EQUIPMENT AND LABOR REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM AS INDICATED IN THE DRAWINGS AND SPECIFICATIONS.
7. PROVIDE ADDITIONAL MATERIALS AND LABOR REQUIRED DUE TO MODIFICATION OR TO MEET AUTHORITY HAVING JURISDICTION AND INSURANCE CARRIER REQUIREMENTS AT NO ADDITIONAL COST TO THE OWNER.
8. FORWARD COMPLETED CERTIFICATE OF COMPLETION AND CONTRACTOR MATERIAL TEST CERTIFICATES TO THE OWNER.
9. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

V2.01

ABBREVIATIONS		FIRE ALARM	
AF	ABOVE FINISHED FLOOR	NIC	NOT IN CONTRACT
AFB	ABOVE FINISHED GRADE	OC	ON CENTER
CAN	CANDELA	PV	POST INDICATOR VALVE
DI	DUCTILE IRON	PROV	PROVIDE FURNISH AND INSTALL
ESFR	EARLY SUPPRESSION FAST RESPONSE	PRV	PRESSURE REDUCING VALVE
ETR	EXISTING TO REMAIN	RD	RETURN DUCT
FHC	FIRE HOSE CABINET	REV	REVISION
FP	FIRE PROTECTION	SD	SUPPLY DUCT
GC	CONTRACTOR	SF	SQUARE FEET
GPM	GALLONS PER MINUTE	TYP	TYPICAL
JBL-BX	JUNCTION BOX	UNO	UNLESS NOTED OTHERWISE
MAX	MAXIMUM	VOLTS	VOLTS
MIN	MINIMUM	W	WATTS
NA	NOT APPLICABLE	WP	WEATHERPROOF
ANNOTATION			
	FIRE PROTECTION PLAN NOTE CALLOUT		FIRE ALARM CONTROL PANEL/UNIT
	CONNECTION POINT OF NEW WORK TO EXISTING		RECESSED FIRE ALARM CONTROL PANEL/UNIT
	DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER		FIRE ALARM ANNUNCIATOR PANEL
	SECTION CUT DESIGNATION		RECESSED FIRE ALARM ANNUNCIATOR PANEL
STANDARD MOUNTING HEIGHTS			AMPLIFIER PANEL
FIRE ALARM			REMOTE POWER SUPPLY
AUDIBLE APPLIANCES (CENTERLINE)	90"		REMOTE TEST STATION WITH INDICATING LIGHT
FIRE ALARM ANNUNCIATOR PANEL (DISPLAY)	60"		REMOTE INDICATING LIGHT
FIRE ALARM BELL (EXTERIOR)	120"		PRESSURE SWITCH LOW/HIGH
FIRE ALARM CONTROL PANEL/UNIT (DISPLAY)	60"		WATERFLOW ALARM SWITCH
PULL STATIONS (HANDLE)	48"		CONTROL VALVE TAMPER SWITCH
VISIBLE APPLIANCES (CENTERLINE)	84"		MAGNETIC DOOR HOLD OPEN DEVICE
			CONTROL MODULE
			MONITOR MODULE
			FIRE DEPARTMENT KEY BOX
			PULL STATION
			FIREFIGHTER'S PHONE JACK
			HEAT DETECTOR (E INDICATES ELEVATOR RECALL)
			SMOKE DETECTOR (E INDICATES ELEVATOR RECALL)
			SINGLE STATION SMOKE DETECTOR
			PROJECTED BEAM SMOKE DETECTOR
			DUCT MOUNTED SMOKE DETECTOR (SD=SUPPLY/RD=RETURN)
			CARBON MONOXIDE DETECTOR
			AREA OF REFUGE 2-WAY COMMUNICATION SYSTEM
			WALL MOUNTED AUDIBLE NOTIFICATION APPLIANCE #W INDICATES WATTAGE (VOICE EVACUATION SYSTEMS ONLY)
			WALL MOUNTED VISIBLE NOTIFICATION APPLIANCE ## INDICATES CANDELA
			WALL MOUNTED AUDIBLE/VISIBLE NOTIFICATION APPLIANCE ## INDICATES CANDELA
			WALL MOUNTED AUDIBLE/VISIBLE NOTIFICATION APPLIANCE ## INDICATES WATTAGE (VOICE EVACUATION SYSTEMS ONLY)
			CEILING MOUNTED AUDIBLE NOTIFICATION APPLIANCE ## INDICATES WATTAGE (VOICE EVACUATION SYSTEMS ONLY)
			CEILING MOUNTED VISIBLE NOTIFICATION APPLIANCE ## INDICATES CANDELA
			CEILING MOUNTED AUDIBLE/VISIBLE NOTIFICATION APPLIANCE ## INDICATES CANDELA
			CEILING MOUNTED AUDIBLE/VISIBLE NOTIFICATION APPLIANCE ## INDICATES WATTAGE (VOICE EVACUATION SYSTEMS ONLY)
			END OF LINE RESISTOR
			ABORT SWITCH
			BELL

PARAGON STAR
BLDG 2 / LOT 9

FIRST PLAT, LOT 9
LEE'S SUMMIT, MO

Project No.: 19050.01a

Date: _____

Issued For: **ADDENDUM 2**

[illegible]

REGISTRATION



08/24/2022

CHRISTOPHER J. CULP
LICENSE # PE-2013037646

PROJECT TEAM

ARCHITECT	FINKLE+WILLIAMS ARCHITECTURE
CIVIL	GBA
LANDSCAPE	LAND 3
FOUNDATIONS	BSE STRUCTURAL ENGINEERS
STRUCTURAL	BSE STRUCTURAL ENGINEERS
PLUMBING	HENDERSON ENGINEERS
MECHANICAL	HENDERSON ENGINEERS
ELECTRICAL	HENDERSON ENGINEERS
FIRE PROTECTION	HENDERSON ENGINEERS
CONTRACTOR	GC

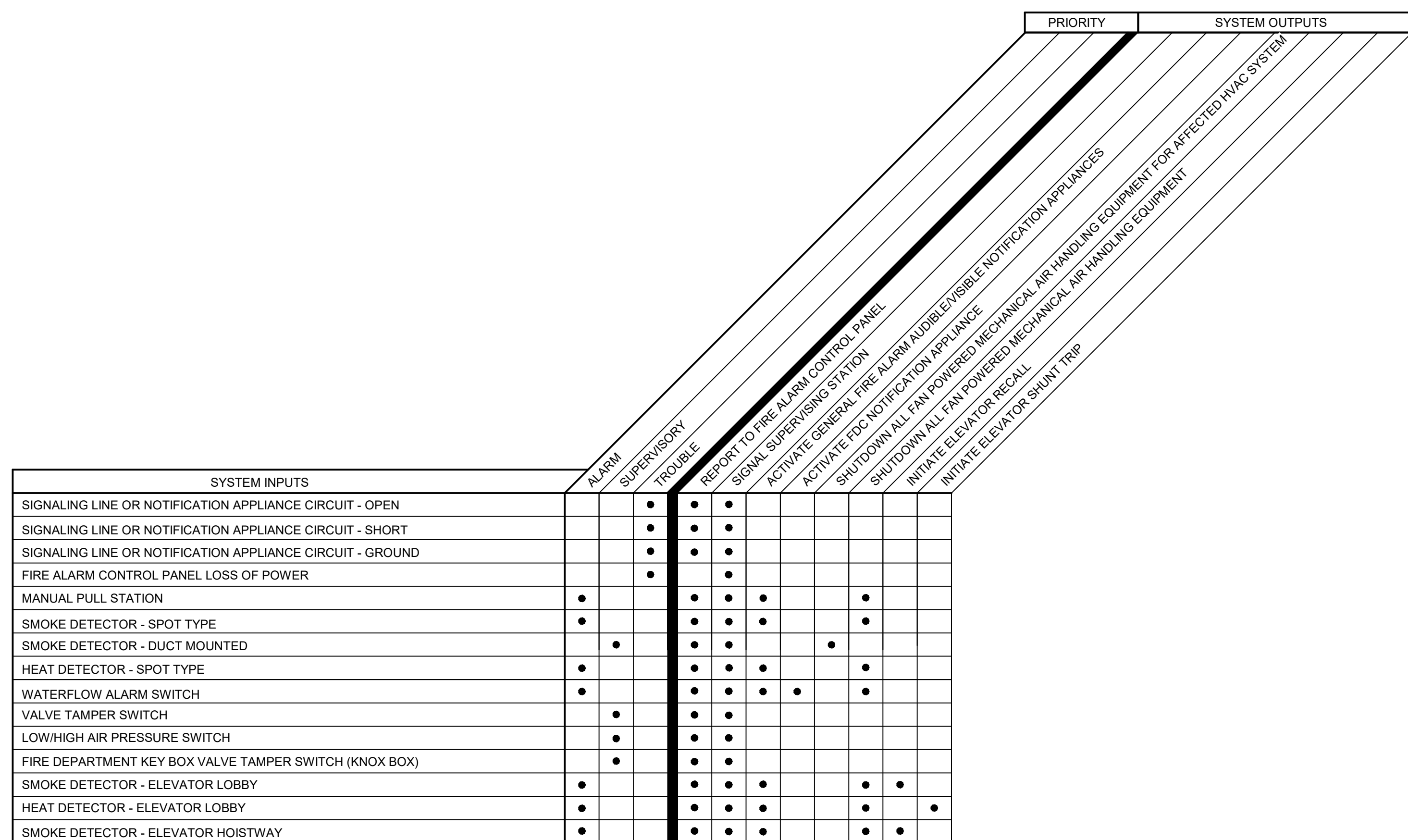


SHEET TITLE

FIRE ALARM LEGENDS AND GENERAL NOTES

SHEET NUMBER

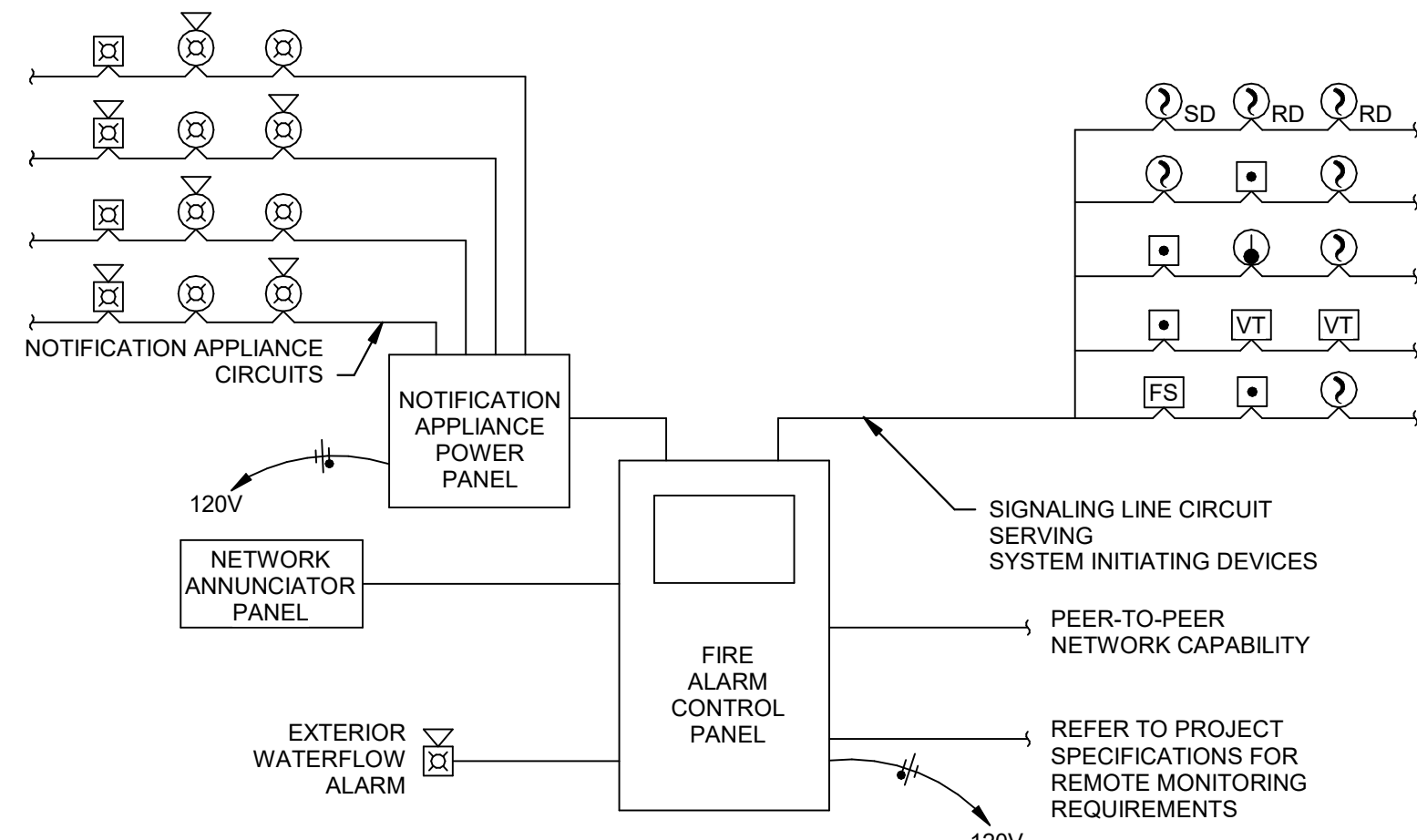
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CONTRACTOR TO PROVIDE ALL NECESSARY EQUIPMENT AND CONNECTIONS REQUIRED TO ACCOMPLISH THE FUNCTIONS INDICATED. AT MINIMUM

SEQUENCE OF OPERATIONS INDICATED IS SCHEMATIC. MODIFY TO SUIT CONDITIONS AND MEET APPLICABLE CODE REQUIREMENTS

② SEQUENCE OF OPERATIONS



RISER DIAGRAM IS SCHEMATIC IN NATURE. NOT ALL DEVICES ARE SHOWN. REFER TO PLANS FOR EQUIPMENT QUANTITIES AND LOCATIONS.

DUCT DETECTORS MAY HAVE INTEGRAL RELAYS FOR AIR HANDLING UNIT SHUT-DOWN AND FIRE/SMOKE DAMPER CONTROL. WIRING FOR THIS FUNCTION HAS NOT BEEN SHOWN. COORDINATE WITH MECHANICAL SYSTEM INSTALLER.

REFER TO PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

① FIRE ALARM RISER DIAGRAM - ADDRESSABLE SYSTEM (NON-VOICE)
NTS



CHRISTOPHER J. CULP

