

I. GENERAL

A. CONSTRUCTION

1. Construction shall be in accordance with all applicable Federal, State of North Carolina, and City of Wilmington codes and ordinances (2016 North Carolina Building Code) including fire codes.
2. This structure is classified as an open parking structure, occupancy Group S-2, and as construction Type IB, Unprotected, Non-Combustible.
3. Contractor shall check all plans, sections, and details drawn on Structural Drawings for compatibility with Architectural Drawings. Structural Drawings show only structural elements of parking structure. Discrepancies, if any, shall be reported to Engineer for clarification or adjustments before proceeding with work.

B. DESIGN LOADS (All loads are service loads unless noted)

Description	Load
1. Dead Loads	
a. Floor system and framing	Self-Weight
b. Mechanical, Electrical, Plumbing	3 psf
2. Live Loads	
a. Roof (Stair / Elevator Towers)	20 psf
b. Supported parking and drive areas	40 psf unreduced 32 psf reduced 3,000 lbs
c. Concentrated wheel load (on 4' 5" x 4' 5" area)	6,000 lbs
d. Bumper impact, on 1-ft sq, 18" & 27"	1.0 (not concurrently) above finished floor
e. Slabs on grade	40 psf
f. Stairs, landings, and lobbies	100 psf
g. Elevator mechanical room	100 psf

3. Snow loads
- a. Ground snow load ( $P_g$ )
- b. Flat roof snow load ( $P_f$ )
- c. Minimum Snow load ( $P_{min}$ )
- d. Snow exposure factor ( $C_e$ )
- e. Snow load importance factor ( $I_s$ )
- f. Roof thermal factor ( $C_t$ )
- g. Rain-On-Snow surcharge
4. Wind Design Criteria
- a. Basic wind speed (3-second gust)
- b. Wind load importance factor ( $I_w$ )
- c. Wind exposure
- d. Internal pressure coefficient
- e. Components and cladding
5. Seismic Design Criteria
- a. Seismic importance factor ( $I_s$ )
- b. Spectral response acceleration for short period ( $S_s$ )
- c. Spectral response acceleration for 1-second period ( $S_1$ )
- d. Site class
- e. Design spectral response acceleration for short period ( $S_{DS}$ )
- f. Design spectral response acceleration for 1-second period ( $S_{D1}$ )
- g. Seismic design category
- h. Resisting system in east-west direction
1. Basic structural system
2. Design base shear ( $V$ )
3. Seismic response coefficient ( $C_s$ )
4. Response modification factor ( $R$ )
5. Deflection amplification factor ( $C_d$ )
6. Analysis procedure
- i. Resisting System in north-south direction
1. Basic structural system
2. Design base shear ( $V$ )
3. Seismic response coefficient ( $C_s$ )
4. Response modification factor ( $R$ )
5. Deflection amplification factor ( $C_d$ )
6. Analysis procedure
6. Thermal & Volume Change Design Criteria: Per PCI Design Handbook (7th Edition)
- a. Design temperature differential
- b. Annual average ambient relative humidity

Structural Element	Hours Provided	Hours Required
a. Precast concrete tees or hollow core units	1	1
b. Precast concrete beams	1	1
c. Concrete columns	2	2
d. Concrete walls	2	2
e. Stair elevator towers	2	2
f. Bridges	2	2

2. Future Expansion
- a. This parking facility is not designed for future expansion.
3. Existing Construction
- a. Field verify all existing elevations, dimensions, and conditions shown on drawings before any material fabrication and erection or concrete placement for new construction. Immediately report all discrepancies to Engineer.

C. MISCELLANEOUS

1. Fire ratings, conforming to MNL-124-89 and STM E119 are as follows: OR one hour.

Structural Element	Hours Provided	Hours Required
a. Precast concrete tees or hollow core units	1	1
b. Precast concrete beams	1	1
c. Concrete columns	2	2
d. Concrete walls	2	2
e. Stair elevator towers	2	2
f. Bridges	2	2

2. Future Expansion
- a. This parking facility is not designed for future expansion.
3. Existing Construction
- a. Field verify all existing elevations, dimensions, and conditions shown on drawings before any material fabrication and erection or concrete placement for new construction. Immediately report all discrepancies to Engineer.

II. FOUNDATION WORK

- A. Foundations, retaining walls, basement walls, foundation drainage and slabs on grade have been designed in accordance with recommendations of ECS Southeast Report Number 22-27313R2, dated February 5, 2019. For more information see sections of Specification Division 31.

Description	Allowable Load	Settlement	Differential Total
1. Spread footings	net 6,000 psf	1 1/2"	1"
2. Strip footing	net 6,000 psf	1 1/2"	1"

- C. Retaining Wall Design
1. Design equivalent fluid pressure behind basement type walls laterally supported top and bottom.
2. Design equivalent fluid pressure behind cantilevered retaining walls.
3. Coefficient of sliding friction
- $p$  = pressure (psf);  $h$  = height (ft);  
 $K_a$  = coefficient of at-rest earth pressure = 0.47  
 $K_e$  = coefficient of active earth pressure = 0.31  
 $q$  = surcharge (psf) = 40 psf @ interior, 100 psf @ exterior

- D. See Specifications Section of Division 31 for excavation, dewatering and compaction.
- E. Footings shall be on Rigid Inclusions. Rigid Inclusions shall be a delegated design by a licensed design professional.
- F. Foundation shall extend below finished grade 30" (minimum)
- G. Before placement of granular fill below slab-on-grade, entire surface shall be protoflooded and observed by testing agency for soft or unstable material. Remove unacceptable material and replace with approved granular fill. Subgrade shall be compacted to 98% maximum dry density per ASTM D698.
- H. Grain drainage layer material shall consist of: Gravel (GP, GW, GP-SM, GW-SM), Sand (SP, SW, SP-SM, SW-SM). Material shall have less than 20 percent fines, and can consist of No. 57 stone, No. 67 stone, ABC, or screenings (ACI 302.1R-15). Between the gravel or stone and the subgrade, provide a layer of non-woven geotextile (Miraf 140N or equivalent).
- I. Foundation drains shall be provided behind all retaining walls. The system shall consist of a 4-inch perforated, closed joint drain line surrounded by a minimum of 6 inches of AASHTO Size No. 57 Stone wrapped with non-woven geotextile (Miraf 140N or equivalent).

III. CONCRETE

A. Material Properties - Concrete:

	$F_c$ psi at 28 day	Max W/C Ratio	Max Slump Inches	Total Air Content (±1.5%)	Max. Nom Aggregate Size
1. Cast-In-place concrete					
a. Footings	4,000	0.45	4	No Test	2"
b. Column piers	5,000	0.45	4	5	3/4"
c. Tee toppings, pour strips	5,000	0.40	3"	7	3/4"
d. Walls	4,000	0.45	3"	5	3/4"
e. Slab on grade	4,000	0.45	4	6	1"
f. Stairs, landings, lobbies	4,000	0.45	4	7	3/4"
g. All other	4,000	0.45	4	5	3/4"
2. Precast concrete					
a. Columns	6,000	0.40	**	5 1/2	3/4"
b. Tees	6,000	0.40	**	5 1/2	3/4"
c. Beams	6,000	0.40	**	5 1/2	3/4"
d. Hollow core units	6,000	0.40	**	5 1/2	3/4"
e. Solid slabs	6,000	0.40	**	5 1/2	3/4"
f. Wall panels	6,000	0.40	**	5 1/2	3/4"

3. Other Concrete
- a. Columns base drypack
- b. Hollow core units keyway grout
- c. Masonry wall grout fill
- d. SNSG grout
- \*Prior to adding water reducer.  
\*\*No slump requirement.

4. For additional information regarding Air Entrainment, see Specification Section 03300.
5. All concrete is Normal Weight 145 pcf.

	$F_y$ psi	ASTM
1. Welded bars	60,000	A615*
2. All bars, UN	60,000	A706
3. Welded wire reinforcement (smooth)	60,000	A185
4. Prestressing strand	270,000 (fpu)	A416
5. Coil bolts and coil rods	60,000 (f)	A496
6. Headed anchor studs	60,000 (fs)	A108
9. Headed/terminator bars	60,000	A970

- \*with proper reheat per AWS standards.
- C. General Notes for Cast-In-Place and Precast Concrete:
1. Column reinforcing shall be continuous, or shall be spliced according to ACI 318-14, Section 25.5.
2. Welded wire reinforcement shall be spliced per ACI 318-14, Section 25.5.4.
3. Provide extra reinforcing around all openings, including door openings: two #5 bars all four sides of each opening and extend 2 feet beyond corners of opening. Add two #5 bars 4 feet long as diagonal bars at each corner.
4. Where shown hooked, provide standard 90 degree bar hooks unless noted.
5. When reinforcement is lap spliced, provide Class B splice typical, unless noted.
6. See details for splice locations.
7. Slab-on-grade reinforcement shall be #3 @ 18 in. o.c., ew, placed 2 in. clear from top of slab.
8. Provide a 3/4 inch chamfer on all exposed corners of concrete. Top edges of walls may be tooled.
9. All inserts and coil rods shall be Galvanized. See Specifications Section 033000 for more information.
10. P/C embed shop drawings must be approved and embedded items installed where required prior to placing concrete.
11. Stripping of forms shall be in accordance with Specification Section 033000.

- D. Additional Note for Precast Concrete:
1. Parking Structure contract Drawings are based on performance type design for precast superstructure. An integral part of this Project is preparation of final Design Drawings, Design Calculations, and Shop Drawings necessary for fabrication and construction of all precast concrete pieces and required accessories in accordance with all code and design requirements. See Specification Section 034100 for more requirements.
2. Provide all openings, reveals, drips, blockouts, inserts, etc., cast into precast according to Architectural, Mechanical and Electrical Drawings. Coordinate exact sizes and locations with respective Contractor.
3. Provide 2 #4 L bars minimum (3'-0" legs) at each corner of precast panels.
4. See Drawings for protection of embedded metals.
5. Bending requirements for reinforcing bars to be hot-dip galvanized vary slightly from ACI 318. Refer to ASTM A787 referenced in Specification Section 034100.
6. When erecting precast structure, guy and plumb structure for stability. Guying and bracing shall remain until final stability is achieved. See Specification Section 034100 for information on plumbness.
7. Structure is designed for its final service condition. Contractor shall be responsible for piece design to withstand handling and erection forces, erection sequence, guying, staving, and shoring as required to assure structural stability during construction.
8. For exterior columns, no outward out-of-plumbness tolerance is permitted.
9. Install expansion joints after all guying and bracing has been removed and column plumbness has been measured to be within tolerance.
10. Minimum additional load factor of 1.2 shall be used for design of all superstructure connections unless superseded by seismic requirements of applicable building code. See specification section 034100 for more information.
11. Floor drainage layout is based on a maximum double tee camber of 1". Design of P/C double tees shall be such that final in-service camber does not exceed this value. Precast Contractor shall review floor drainage layout and notify Engineer of any discrepancies or constructability issues prior to fabrication.
12. Steel connections providing gravity support either directly or indirectly (such as torsion connections) shall be fireproofed to meet fire rating requirement of supported structural element.

- E. Concrete Protection for Reinforcement:
1. Specified concrete protection for reinforcement shall be per ACI 318-14, Section 20.6.
2. For prestressed and non-prestressed reinforcement in prestressed/precast concrete members, specified concrete protection at top members shall be 1-1/2 inches consistent with ACI 362.1R-12, "Guide for the Design of Durable Parking Structures."
3. For reinforcement in cast-in-place concrete, specified concrete protection shall be as follows:
- | Concrete Cover (Inches)                  |       |
|--|-------|
| a. Footing top reinforcement             | 2     |
| b. Footing bottom and side reinforcement | 2     |
| c. Wall reinforcement #5 bar and smaller | 1 1/2 |
| d. Wall reinforcement #6 bar and larger  | 2     |

- F. Saw Cutting of Control Joints for Cast-In-Place Concrete Slabs:
1. The specifications specify that the concrete slab-on-grade control joints are to be tooled joints. Tooled joints provide the best performance for crack control due to the early creation of the joint with respect to the hardening timeline of the concrete.
2. The Contractor may opt to use the process of saw cutting the slab-on-grade provided the following procedure is strictly followed.
3. The procedure consists of an initial saw cut as soon as possible after the concrete pour and a secondary beveled cut along the initial cut within 24 hours to form the complete slab-on-grade control joint.
4. The procedure references the following equipment:
- a. Initial cut made from a saw with a 1/8" wide blade creating a 1/2" deep cut.
- b. A Handheld saw for completing the initial and secondary cuts at walls and columns.
- c. Secondary cut made from a decorative saw with a 5/8" beveled blade.
5. The procedure is as follows:
- a. Pour and finish slab-on-grade.
- b. Make tooled joints at locations where saw cutting may be difficult such as joints at washes where slab is sloping.
- c. Make initial saw cut as soon as the broom finish will not be damaged by the saw operating on the slab. Run the saw cut across full length of the slab and complete the cuts at the ends near walls and columns with a handheld saw.
- d. Use a vacuum or a blower to remove saw cut concrete dust so as to not affect the curing of the concrete slab.
- e. Protect all joint intersections with a "joint saver" to keep joint spalling to a minimum.
- f. Make secondary cut no later than 24 hours after the initial cut. The saw with the beveled blade shall use a guide to ride in the initial cut to create a clean joint.

IV. CONCRETE MASONRY

A. Material Properties:

1. Compressive strength of masonry,  $f_m$  = 2000 psi.
2. Mortar type "M" or "S".

B. General Concrete Masonry Notes:

1. Provide dowels between foundations and walls equal to size and spacing of vertical wall reinforcing, unless noted otherwise.
2. Minimum reinforcement for masonry wall subject to bumper loads shall be #5 @ 8 in. o.c. for a height of 2 feet 6 inches above floor and grout all block cores solid up to 2 feet 8 inches above floor. Minimum reinforcement for masonry walls not subject to bumper loads shall be #4 @ 48" o.c. plus one #4 verticals at corners, edges of openings, and ends of walls. Grout block cells with reinforcement full.
3. In masonry walls, provide 8-in.-wide bond beam lintels reinforced with two #5 bars continuous unless shown otherwise on Drawings. Concrete block for three courses directly below bond beam bearing and extending out at an angle of 45 degrees shall be solid block or shall be grouted solid, unless noted otherwise.
4. Provide control joints in masonry walls at 20 ft. on center maximum or as noted on Drawings.

V. STRUCTURAL STEEL

	$F_y$ psi	ASTM
A. Structural Shapes		
1. W-shapes	50,000	A992
2. M-shapes, S-shapes, HP-shapes, channels, angles	36,000	A36
B. Hollow Structural Sections		
1. All shapes	50,000	A1085
C. Steel Pipes	35,000	A53 GR. B
D. Structural Plates and Bars		
1. Bolts		
1. 1/2" dia. to 1" dia., UN	92,000	A325
2. 1-1/8" dia. to 1-1/2" dia. UN	81,000	A325
F. Anchor Rods	36,000	F1554 GR. 36
G. Welding Electrodes	ET0XX	AWS D1.1-11
H. General Structural Steel Notes		
1. Lintel shall have a minimum load and bearing on masonry of 8 inches, but not less than 1 inch of such bearing for each foot of opening.		

- VI. MISCELLANEOUS
- A. For exact sizes and locations of mechanical and electrical items and openings, consult respective subcontractors.
- B. See specifications for additional information.
- C. Inserts called out on Drawings shall be as designated below for diameters indicated. Nomenclature is for Dayton/Richmond Concrete Accessories.
1. 1/2 inch diameter, Type B-16
2. 3/4 inch diameter, Type F-56, 2 Strut
3. 1 inch diameter, Type F-56, 2 Strut
4. 1-1/4 inch diameter, Type F-58, 4 Strut
5. Provide coil bolts and rods with necessary penetration into inserts to develop full strength per manufacturer's recommendations.
- D. Post-Installed Anchors or Reinforcing Bars
1. Post-installed anchors shall only be used where shown on Construction Documents. Contractor shall obtain approval from Engineer-of-Record prior to installing post-installed anchors or reinforcing bars in place of missing or misplaced cast-in-place anchors or reinforcing bars. Care shall be taken in placing post-installed anchors or reinforcing bars to avoid conflicts with existing rebar. Holes shall be drilled and cleaned in accordance with manufacturer's written instructions. Substitution request for installation other than those shown shall be submitted by Contractor to Engineer-of-Record along with calculations that are prepared and sealed by a registered professional engineer. Calculations shall demonstrate that substituted product is capable of achieving pertinent equivalent performance values (minimum) of specified product using appropriate design procedure and/or standard(s) as required by building code. See Specification Section 033000.

- a. Concrete Anchors
1. Mechanical anchors for use in cracked and uncracked concrete shall have been tested and qualified for use in accordance with ACI 308.2 and ICC-ES AC108.
2. Adhesive anchors for use in cracked and uncracked concrete shall have been tested and qualified for use in accordance with ACI 308.4 as modified by ICC-ES AC308.
- b. Masonry Anchors
1. Anchorage to Solid-Grouted Concrete Masonry
- a. Mechanical and concrete screw anchors for use in solid-grouted concrete masonry shall have been tested and qualified for use in accordance with ICC-ES AC01 or AC106, respectively.
- b. Adhesive anchors for use in solid-grouted concrete masonry shall have been tested and qualified for use in accordance with ICC-ES AC08.
2. Anchorage to Hollow Concrete Masonry/Unreinforced Clay Brick Masonry
- a. Screw anchors for use in hollow concrete masonry shall have been tested and qualified in accordance with ICC-ES AC106.
- b. Adhesive anchors with screw anchors shall be tested and qualified in accordance with ICC-ES AC08 or AC60, as appropriate. Appropriate screen tube shall be used as recommended by adhesive manufacturer.

- E. Abbreviations - See Sheet S-002
- F. DO NOT SCALE THE DRAWINGS

VII. DEFERRED SUBMITTALS

- A. Following items will have a design that is informed and submitted by a specialty contractor during construction phase of project. For information, see appropriate Specification Sections related to these items.
1. Rigid Inclusions
2. Precast concrete elements
3. Light gage framing
4. Barrier Strand System
- B. Engineer of Record shall review deferred submittal drawings and calculations prepared by Contractor and forward them to Building Official with notation indicating deferred submittal documents have been reviewed and found to be in general conformance with design requirements. Deferred submittal items shall not be installed until design and submittal documents have been approved by Building Official.

VIII. CONNECTION COMPONENT RESPONSIBILITY

- A. Following specific subcontractor responsible for providing connection components. Where connections occur between two different trades, Construction Manager shall coordinate between the two subcontractors as required to locate and install these items. Refer to specifications for additional information.
- B. Embedded plates in precast concrete elements shall be provided by precast contractor. CM shall coordinate between precast contractor and appropriate subcontractor to locate embedded plates as necessary.
- C. Precast-to-precise steel connection and bearing components, including angles, tubes and other steel shapes as required by design, shall be provided by precast contractor. Where coating is removed or damaged during installation, precast contractor shall repair coating in field.
- D. Structural steel-to-precise connection components shall be provided by structural steel contractor. Embedded plates (where required) in precast for connection shall be provided by precast contractor. Where coating is removed or damaged during installation, structural steel contractor shall repair coating in field.
- E. Precast concrete-to-cast-in-place concrete connection components, including angles, shall be provided by precast contractor. Where coating is removed or damaged during installation, precast contractor shall repair coating in field.
- F. Clip angles, plates, and connection components for CMU wall to concrete elements shall be provided by miscellaneous metals contractor. General Contractor shall coordinate connections between miscellaneous metals contractor and CIP or P/C contractor as appropriate. Where coating is removed or damaged during installation, miscellaneous metals contractor shall repair coating in field.

IX. TESTING & INSPECTION NOTES

- A. Following test and inspections shall be performed by an independent testing and inspection agency employed by design/build contractor and approved by Engineer and Building Official. Test and inspection reports shall be submitted for approval to Engineer and Building Official. Conform to requirements of IBC section 109 and 1704.

SPECIAL INSPECTIONS SCHEDULE			
REQUIRED VERIFICATION & INSPECTION		CONT	PERIODIC
A. CONCRETE CONSTRUCTION			
1. Inspection of reinforcing steel, including prestressing tendons, and placing			X
2. Inspection of reinforcing steel welding:			
a. Verification of weldability of reinforcing steel other than ASTM A706			X
b. Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls	X		
c. Shear reinforcement	X		
d. Other reinforcing steel		X	
e. Bumper wall reinforcing		X	
3. Inspection of bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased or where strength design is used		X	
4. Inspection of anchors installed in hardened concrete			X
5. Verifying use of required design mix			X
6. Perform sampling and testing of concrete according to specifications	X		
7. Inspection of concrete and shotcrete placement for proper application techniques	X		
8. Inspection for maintenance of specified curing temperature and techniques			X
9. Verification of 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			X
10. Inspect formwork for shape, location and dimensions of concrete member being formed			X
11. Verify finish of concrete slabs and floors (see specification section 033000)			X
12. Verify location and construction of pour strips and joints in concrete slabs and floors (see specification section 033000 and structural drawings)			X
B. PRECAST CONCRETE			
1. Erection of precast concrete members			X
2. Verification of precast member connections in accordance with structural drawings and precast construction (shop) drawings			X
C. STEEL CONSTRUCTION			
1. Material verification of high-strength bolts, nuts, and washers:			
a. Identification markings to conform to ASTM standards specified in construction documents			X
b. Manufacturer's certificate of compliance required			X
2. Inspection of high-strength bolting:			
a. Bearing-type connections		X	
b. Slip-critical connections (see IBC 1704.3.3)		X	X
3. Material verification of structural steel:			
a. Identification markings to conform to ASTM standards in approved construction documents			X
b. Manufacturer's certified mill test reports			X
4. Material verification of weld filler materials:			
a. Identification markings to conform to AWS specification in approved construction documents			X
b. Manufacturer's certificate of compliance required			X
5. Inspection of structural steel welding:			
a. Complete and partial penetration groove welds		X	
b. Multi-pass fillet welds		X	
c. Single-pass fillet welds > 5/16"		X	
d. Single-pass fillet welds ≤ 5/16"			X
e. Floor and deck welds			X
6. Inspection of steel frame joint details for compliance with construction documents:			
a. Details such as bracing and stiffening			X
b. Member locations			X
c. Application of joint details at each connection			X
D. MASONRY CONSTRUCTION (SEE IBC SECTION 1704.5.2)			
1. Verification of slump flow and VSI as delivered to the site for self-consolidating grout		X	
2. Verification of masonry construction			
a. Proportions of site-prepared mortar			X
b. Construction of mortar joints			X
c. Location of reinforcement, connectors, and anchorages			X
3. During construction the inspection program shall verify:			
a. Size and location of structural elements			X
b. Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction			X
c. Specified size, grade, and type of reinforcement, anchor bolts, and anchorages			X
d. Preparation, construction and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F)			X
4. Prior to grouting, the following shall be verified to ensure compliance:			
a. Grout space is clean			X
b. Placement of reinforcement and connectors, and anchorages			X
c. Construction of mortar joints			X
5. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed			X
E. SOILS			
1. Verify materials below footings are adequate to achieve design bearing capacity			X
2. Verify excavations are extended to proper depth and have reached proper material			X
3. Perform classification and testing of controlled fill materials			X
4. Verify use of proper materials, densities, and lift thicknesses during placement and compaction of controlled fill		X	
5. Prior to placement of controlled fill, observe subgrade and verify that site has been prepared properly			X
F. RIGID INCLUSIONS			
1. Verify element materials, sizes, and lengths comply with requirements.		X	
2. Determine capacities of test elements and conduct additional load tests as required.		X	
3. Observe driving operations and maintain complete and accurate records for each element.		X	
4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations, and document any damage to foundation element.		X	
G. GUARDRAIL STRANDS			
1. Material verification of guardrail strands (see specification section 051617)			X
2. Inspect placement of guardrail strands			X
3. Verification of backstress to seal wedges at non-stressing ends.		X	
4. Verification of specified stressing forces and backstress at stressing ends		X	
5. Restoration of corrosion protection after back stressing			X
6. Sealing of sleeves in column			X
H. MISCELLANEOUS ITEMS			
1. Verify installation of expansion joints, traffic topping membranes, and joint sealants			X
2. Verify attachment and/or bracing of miscellaneous items such as pipes, equipment, signs, bollards, etc.			X
3. Verify fire retardant paint on telecom plywood.			X

**UNCW**  
UNIVERSITY of NORTH CAROLINA WILMINGTON  
601 S COLLEGE ROAD  
WILMINGTON, NORTH CAROLINA 28403  
PARKING DECK II AND SURFACE  
PARKING (DESIGN-BUILD)  
SOUTH CAMPUS - 4965 RIEGEL ROAD

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty**  
Construction

DESIGNER  
**CLARK NEXSEN**

1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028

**WALKER**  
CONSULTANTS









13860 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 2





ABBREVIATIONS		ABBREVIATIONS	
ABBRV	TERM	ABBRV	TERM
A/E	ARCHITECT/ENGINEER	L	ANGLE
AB	ANCHOR BOLT	LAT	LATITUDE
ABBRV	ABBREVIATION	LBS	POUND
ACI	AMERICAN CONCRETE INSTITUTE	LF	LINEAR FEET (FOOT)
ADOM	ADDITIONAL	LL	LIVE LOAD
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	LLH	LONG LEG HORIZONTAL
ALT	ALTERNATE	LLV	LONG LEG VERTICAL
ALUM	ALUMINUM	LONG	LONGITUDINAL
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	LIGHT	LIGHT GAGE
APPROX	APPROXIMATE	LT GA	LIGHT GAGE
ARCH	ARCHITECT	LT WT	LIGHTWEIGHT
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS	LVR	LAYER
ASI	ARCHITECT'S SUPPLEMENTAL INSTRUCTION	M	M-STEEL SHAPE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	M	MOMENT
AVG	AVERAGE	MAX	MAXIMUM
AWG	AMERICAN WELDING SOCIETY	MECH	MECHANICAL
B	BEAM	MECH RM	MECHANICAL ROOM
BL	BASE PLATE	MFR	MANUFACTURER
BC	BACK OF CURB	MH	MANHOLE
BC	BOLT CIRCLE	MID	MIDDLE
BLDG	BUILDING	MIN	MINIMUM
BOS	BOTTOM OF STEEL	MISC	MISCELLANEOUS
BOT	BOTTOM	MO	MASONRY OPENING
BRG	BEARING	MT	MT-STEEL SHAPE
BRG PL	BEARING PLATE	N	NORTH
BS	BOTH SIDES	NA	NOT APPLICABLE
BTWN	BETWEEN	NF	NEAR FACE
C	C SHAPE	NIC	NOT IN CONTRACT
C TO C	CENTER TO CENTER	N	NUMBER
CAM	CAMBER	NOM	NOMINAL
CANTIL	CANTILEVER	NS	NEAR SIDE
CD	CONSTRUCTION DOCUMENTS	NSNM	NON-SHRINK NON-METALLIC
CERT	CERTIFY	NTS	NOT TO SCALE
CG	CENTER OF GRAVITY	O/O	OUT TO OUT
CHFR	CHAMFER	OC	ON CENTER
CIP	CAST-IN-PLACE	OD	OUTSIDE DIAMETER
CJ	CONSTRUCTION JOINT	OF	OUTSIDE FACE
CJ	CONTROL JOINT	OPH	OPPOSITE HAND
CL	CENTER LINE	OPENGS	OPENINGS
CLR	CLEAR	OPP	OPPOSITE
CMU	CONCRETE MASONRY UNIT	ORIG	ORIGINAL
COL	COLUMN	P	AXIAL LOAD
CONC	CONCRETE	P/C	PRECAST
CONN	CONNECT	P/T	POST TENSIONED
CONN	CONNECTION	PC	PILE CAP
CONSTR	CONSTRUCTION	PCF	POUNDS PER CUBIC FOOT
CONT	CONTINUE	PCI	PRECAST/PRESTRESSED CONCRETE INSTITUTE
CONT	CONTINUOUS	PL	PROPERTY LINE
CONTR	CONTRACTOR	PL	POUNDS PER LINEAR FOOT
COORD	COORDINATE	PRCST	PRECAST
CP	CONCRETE PIER	R	RADIUS
CRSI	CONCRETE REINFORCING STEEL INSTITUTE	RC	REINFORCED CONCRETE
CTR	CENTER	RD	ROOF DRAIN
CU YD	CUBIC YARD	REBAR	REINFORCING STEEL BARS
D	DEEP	REF	REFERENCE
D	DEPTH	REINF	REINFORCEMENT
DAT	DATUM	REM	REMAINDER
DBA	DEFORMED BAR ANCHOR	REM	REMAINING
DD	DESIGN DEVELOPMENT	REQD	REQUIRED
DEG	DEGREE	REV	REVISION
DET	DETAIL	RO	ROUGH OPENING
DEV	DEVELOPMENT	ROW	RIGHT OF WAY
DIA	DIAMETER	S	SECTION MODULUS
DIAG	DIAGONAL	SCHED	SCHEDULE
DL	DEAD LOAD	SDI	STEEL DECK INSTITUTE
DOC	DOCUMENT	SE	STRUCTURAL ENGINEER
DP	DRILLED PIER	SECT	SECTION
DWG	DRAWING	SF	SHEET SQUARE FOOT (FEET)
E	MODULUS OF ELASTICITY	SF	STEP FOOTING
EA	EACH	SH	SHEET
EE	EACH END	SIM	SIMILAR
EF	EACH FACE	SJI	STEEL JOIST INSTITUTE
EJ	EXPANSION JOINT	SOG	SLAB ON GROUND
EL	ELEVATION	SPEC	SPECIFICATION
ELEV	ELEVATOR	STAG	STAGGERED
ENGR	ENGINEER	STD	STANDARD
EOS	EDGE OF SLAB	STIF	STIFFENER
EQ	EQUAL	STR	STRIP
EQUIP	EQUIPMENT	STL PL	STEEL PLATE
EQUIV	EQUIVALENT	STN STL	STAINLESS STEEL
ETC	AND SO FORTH	STRUCT	STRUCTURAL
EW	EACH WAY	SYM	SYMMETRICAL
EW EF	EACH WAY EACH FACE	SYS	SYSTEM
EWP	ELEVATION WORKING POINT	T	TORSION
EXIST	EXISTING	T&B	TOP AND BOTTOM
EXP	EXPANSION	TD	TRENCH DRAIN
EXT	EXTERIOR	TEMP	TEMPORARY
F	FAHRENHEIT	TFF	TOP OF FINISH FLOOR
FD	FLOOR DRAIN	THRU	THROUGH
FDTN	FOUNDATION	TO CP	TOP OF CONCRETE PIER
FF	FAR FACE	TO DP	TOP OF DRILLED PIER
FIN	FINISH	TO FDTN	TOP OF FOUNDATION
FIN FLR	FINISH FLOOR	TO P/C	TOP OF PRECAST
FLG	FLANGE	TO PC	TOP OF PILE CAP
FLR	FLOOR	TOB	TOP OF BEAM
FO	FINISHED OPENING	TOC	TOP OF CONCRETE
FS	FAR SIDE	TOF	TOP OF FOOTING
FT	FEET	TOF	TOP OF FOUNDATION
FT	FOOT	TOS	TOP OF SLAB
FT-K	FOOT-KIPS	TOS	TOP OF STEEL
FT-LB	FOOT-POUNDS	TOW	TOP OF WALL
FUT	FUTURE	TRANS	TRANSVERSE
G	GIRDER	TS	TUBE STEEL
GA	GAGE	TYP	TYPICAL
GALV	GALVANIZED	UL	UNDERWRITERS LABORATORIES
GALV STL	GALVANIZED STEEL	ULT	ULTIMATE
GC	GENERAL CONTRACTOR	UN	UNLESS NOTED
GRF	GLASS-FIBER-REINFORCED CONCRETE	UNIF	UNIFORM
GR	GRADE	UNO	UNLESS NOTED OTHERWISE
GR BM	GRADE BEAM		
H	HIGH		
HC	HOLLOW CORE	V	SHEAR
HORIZ	HORIZONTAL	VAR	VARIES
HP	HP-STEEL SECTION	VERT	VERTICAL
HSS	HOLLOW STRUCTURAL STEEL SECTION	VIF	VERIFY IN FIELD
HST	HOIST	VERY	VERIFY
HT	HEIGHT		
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING	W	W-STEEL SHAPE
I	MOMENT OF INERTIA	W	WIDE
IBC	INTERNATIONAL BUILDING CODE	W/	WITH
ID	INSIDE DIAMETER	W/O	WITHOUT
IF	INSIDE FACE	W/	WIDE FLANGE
IN-K	INCH-KIPS	WL	WIND LOAD
IN-LB	INCH-POUNDS	WP	WORKING POINT
INFO	INFORMATION	WT	WEIGHT
INT	INTERIOR	WT	WT-STEEL SHAPE
INV	INVERT	WWR	WELDED WIRE REINFORCEMENT
INV EL	INVERT ELEVATION	X BRACE	CROSS BRACE
ISO	ISOMETRIC	YD	YARD
K	KIPS(S)	Z	MODULUS OF SECTION
KLF	KIPS PER LINEAL FOOT		
KSF	KIPS PER SQUARE FOOT		
KSI	KIPS PER SQUARE INCH		
KWY	KEYWAY		

**STRUCTURAL GENERAL LEGEND**

	CIP
	CIP (PLAN CUT)
	PRECAST CONCRETE
	CMU
	CONCRETE WASH ON PRECAST CONCRETE
	CIP POUR STRIP
	TRAFFIC TOPPING
	SHEET NOTE



SPREAD FOOTING SCHEDULE								
MARK	SIZE			REINFORCING				REMARKS
	LENGTH	WIDTH	DEPTH	LONGITUDINAL		TRANSVERSE		
				BOTTOM	TOP	BOTTOM	TOP	
F1	16'-6"	11'-6"	2'-6"	(12) - #10		(17) - #10		
F2	13'-6"	13'-6"	2'-9"	(14) - #9		(14) - #9		
F3	12'-6"	12'-6"	2'-6"	(13) - #9		(13) - #9		
F4	14'-6"	14'-6"	2'-9"	(15) - #10		(15) - #10		
F5	16'-6"	16'-6"	3'-8"	(17) - #10		(17) - #9		
F6	17'-6"	8'-0"	2'-0"	(7) - #9		(18) - #9		
F7	36'-6"	18'-6"	2'-6"	(19) - #11	(19) - #5	(37) - #11	(37) - #5	
F8	39'-6"	20'-9"	3'-0"	(28) - #9	(28) - #5	(53) - #9	(53) - #5	
F9	SEE PLAN	SEE PLAN	2'-6"	#10 @ 8" OC	#10 @ 8" OC	#10 @ 8" OC	#10 @ 8" OC	

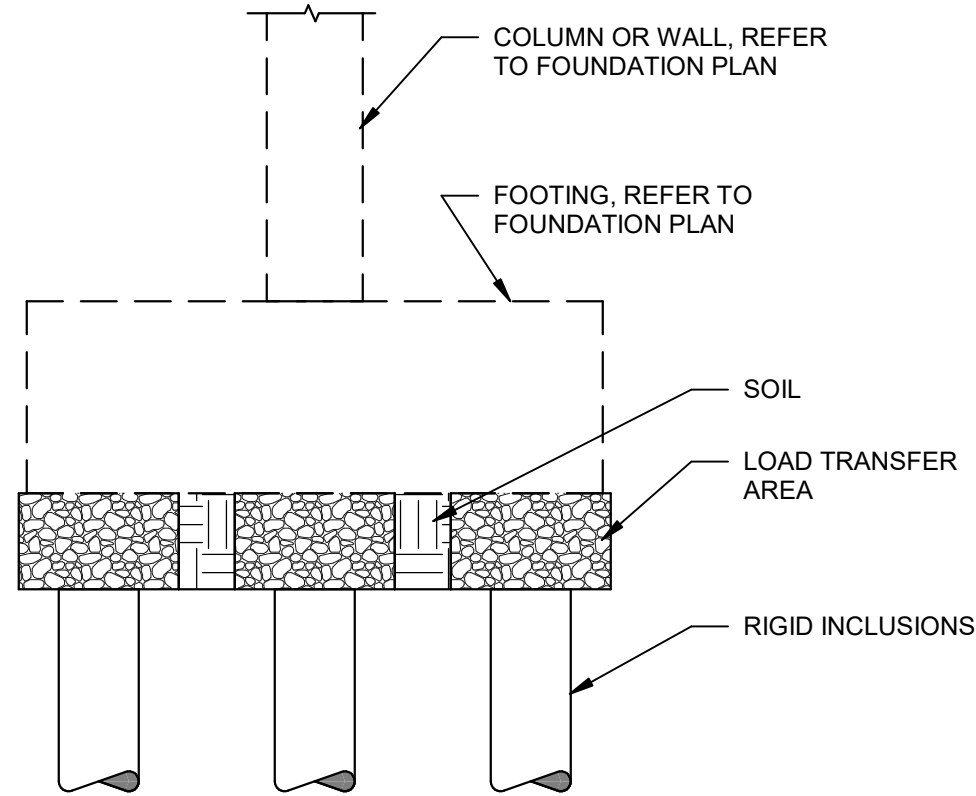
SPREAD FOOTING SCHEDULE NOTES:

- ALL REINFORCEMENT SHALL BE PLACED AT EVEN SPACING UNO.
- FOOTINGS ARE CENTERED ON GRID LINES UNO.
- MINIMUM SOIL ALLOWABLE BEARING PRESSURE SHALL BE 6000 PSF AS VERIFIED BY TESTING AGENCY. IF REQUIRED BY GEOTECHNICAL ENGINEER, UNDERCUT SUBGRADE AND REPLACE WITH STRUCTURAL FILL OR LEAN CONCRETE.
- PLACE LONGITUDINAL BARS BELOW TRANSVERSE BARS FOR BOTTOM BARS.

STRIP FOOTING SCHEDULE									
SIZE			REINFORCING				REMARKS		
MARK	WIDTH	DEPTH	LONGITUDINAL		TRANSVERSE				
			BOTTOM	TOP	BOTTOM	TOP			
SF-1	6'-6"	2'-0"	(7) - #5	(7) - #5	#7 @ 12" OC	#7 @ 12" OC			
SF-2	5'-8"	2'-0"	(6) - #5	(6) - #5	#5 @ 12" OC	#5 @ 12" OC			
SF-3	2'-8"	1'-6"	(4) - #5		#5 @ 12" OC				

STRIP FOOTING SCHEDULE NOTES:

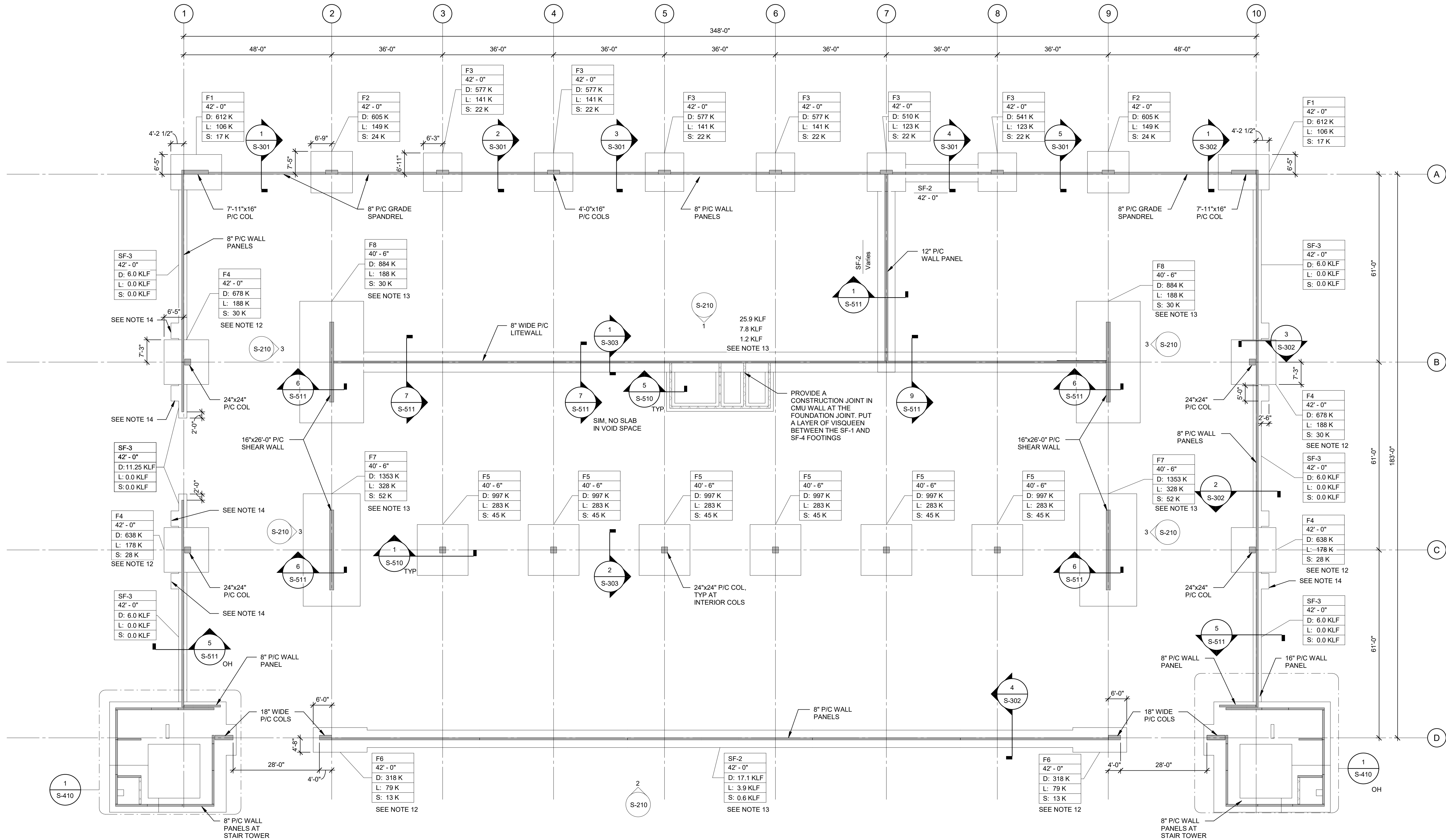
- ALL REINFORCEMENT SHALL BE PLACED AT EVEN SPACING UNO.
- SEE 6/S-510 FOR STRIP FOOTING CONSTRUCTION JOINT.
- MINIMUM SOIL BEARING CAPACITY SHALL BE 6000 PSF AS VERIFIED BY TESTING AGENCY. IF REQUIRED BY GEOTECHNICAL ENGINEER, UNDERCUT SUBGRADE AND REPLACE WITH STRUCTURAL FILL OR LEAN CONCRETE. CMU FOOTINGS ARE NONLOAD BEARING AND ARE NOT REQUIRED TO HAVE A 6000 PSF MINIMUM SOIL BEARING CAPACITY.
- FULLY DEVELOP STRIP FOOTINGS INTO ADJACENT FOOTINGS. SEE S-690 FOR DEVELOPMENT LENGTHS.
- PLACE LONGITUDINAL BARS BELOW TRANSVERSE BARS FOR BOTTOM BARS.
- SEE 2/S-510 FOR STEP FOOTING DETAIL.



- NOTE:
- RIGID INCLUSIONS SYSTEM TO BE A DELEGATED DESIGN BY THE GROUND IMPROVEMENT SUBCONTRACTOR.
  - RIGID INCLUSIONS SYSTEM TO PROVIDE 6000 PSF MIN BEARING FOR FOOTINGS. FOR BIDDING PURPOSES ASSUME ALL LOAD BEARING FOOTINGS REQUIRE 6000 PSF UNDER ENTIRE FOOTING.
  - DIAMETER OF LOAD TRANSFER AREA AROUND EACH RIGID INCLUSION SHALL BE AT LEAST 2'DIA. OF THE ASSOCIATED RIGID INCLUSION.

2 SOIL IMPROVEMENT DETAIL

1/2" = 1'-0"



1 FOUNDATION PLAN

1/16" = 1'-0"

SHEET NOTES

REFERENCES:

- GENERAL NOTES S-001
- PRECAST COLUMN SCHEDULE S-100
- TYPICAL DETAILS S-501
- ENLARGED PLANS S-400 SERIES
- FOUNDATION DETAILS S-510
- CIP FOOTING TYPICAL DETAILS S-510
- LAP SPLICE SCHEDULE S-650

NOTES:

- PROVIDE 3" CLEAR COVER FOR ALL BOTTOM REINFORCEMENT AND 2" CLEAR COVER FOR ALL TOP REINFORCEMENT, UNLESS NOTED.
- AT LOCATIONS WHERE PRECAST WALLS ARE SUPPORTED ON FOUNDATIONS, PROVIDE EMBEDDED PLATES IN FOUNDATIONS, COORDINATE WITH PRECAST SUPPLIER. SEE S-524.
- ANCHOR BOLTS, PLATES WITH WELDED ANCHORS, REINFORCING BAR CAGES WITH NMB SPLICES (OR SIMILAR) OR ANY OTHER CONNECTION MATERIALS THAT CONNECT THE PRECAST CONCRETE MEMBERS TO THE CIP CONCRETE FOUNDATIONS ARE TO BE SUPPLIED BY THE PRECAST SUPPLIER AND INSTALLED BY THE GENERAL CONTRACTOR. WARNING TO GENERAL CONTRACTOR: COORDINATE WITH PRECAST SUPPLIER TO FULLY UNDERSTAND THE LARGE MAGNITUDE OF THE EMBEDS TO BE INSTALLED AND THE VERY TIGHT TOLERANCES REQUIRED!
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF ALL TEMPORARY EXCAVATION BRACING, SHEET PILING AND SHORING.
- COORDINATE PENETRATIONS IN CAST-IN-PLACE & PRECAST MEMBERS WITH MEP AND CIVIL DRAWINGS. SHOW PENETRATIONS ON ALL SHOP DRAWINGS. SEE DETAILS.
- FOR UTILITIES-60' IAR FOUNDATIONS. SEE
- SEE CIVIL DRAWINGS FOR EXTERIOR GRA4/S-510 UTILITIES. ADJACENT STRUCTURES AND PROPERTY LINES. NOTIFY ENGINEER IN WRITING OF ANY CONFLICTS IMMEDIATELY.
- VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS.
- SEE DRAWING S-101 FOR GRADE SLAB AND SLAB SUBGRADE INFORMATION.
- FOR ANCHOR BOLT REQUIREMENTS, SEE 1/S-625 &
- Q/S-S250 ACTOR TO PROTECT SUBGRADE FROM DAMAGE DUE TO WEATHER.
- LOADS SHOWN INCLUDE COLUMN LOADS ONLY. WALL LOADS NEED TO BE INCLUDED SEPARATELY.
- WALL(S) HAVE ADDITIONAL CONTROLLING SEISMIC REVERSIBLE OVERTURNING MOMENTS. GROSS MOMENTS FOR WALL(S) ARE:  
36' WALL(S) ALONG GRID B2-9 = 6,600 KIP-FT  
28' WALLS ALONG B2, B9, C2, & C9 = 18,500 KIP-FT  
48' WALL(S) ALONG GRID D2-9 = 4,700 KIP-FT  
60' WALL(S) ALONG GRID D2-9 = 13,000 KIP-FT
- EXTEND SF-3. USE SAME REINFORCEMENT SIZE AND SPACING. DEAD LOAD IS 27 KIPS.

LEGEND

- CIP
- PRECAST CONCRETE
- CMU
- STEP



UNIVERSITY of NORTH CAROLINA WILMINGTON  
601 S COLLEGE ROAD  
WILMINGTON, NORTH CAROLINA 28403  
PARKING DECK II AND SURFACE  
PARKING (DESIGN-BUILD)  
SOUTH CAMPUS - 4965 RIEGEL ROAD

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty**  
Construction

DESIGNER



**CLARK NEXSEN**

1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028



**WALKER**  
CONSULTANTS

13660 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518

**MCKIM & CREED**

CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEAL



SUBMITTAL

04/15/2019

CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS

NO.	DESCRIPTION	DATE

KEY PLAN

SHEET

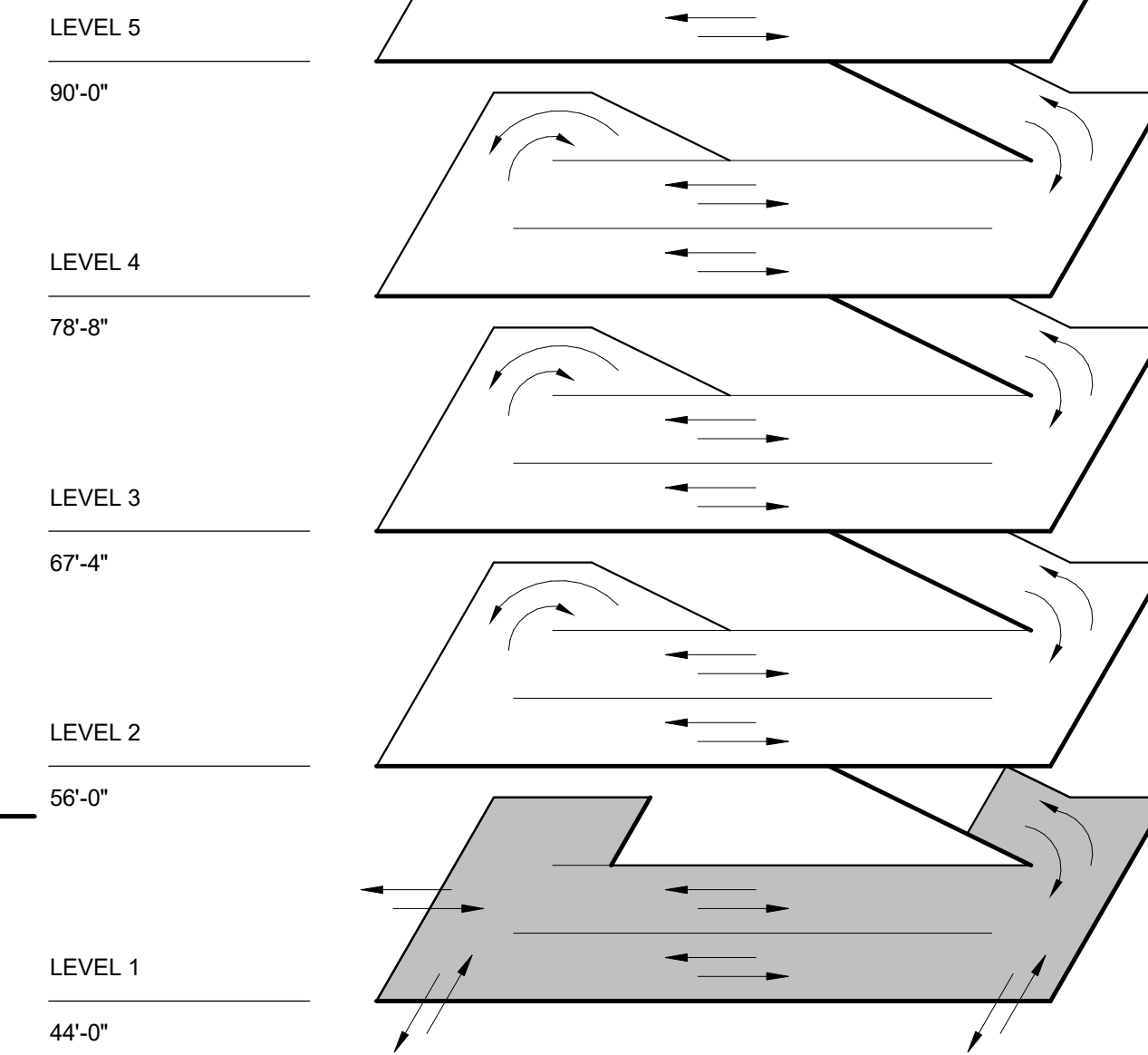
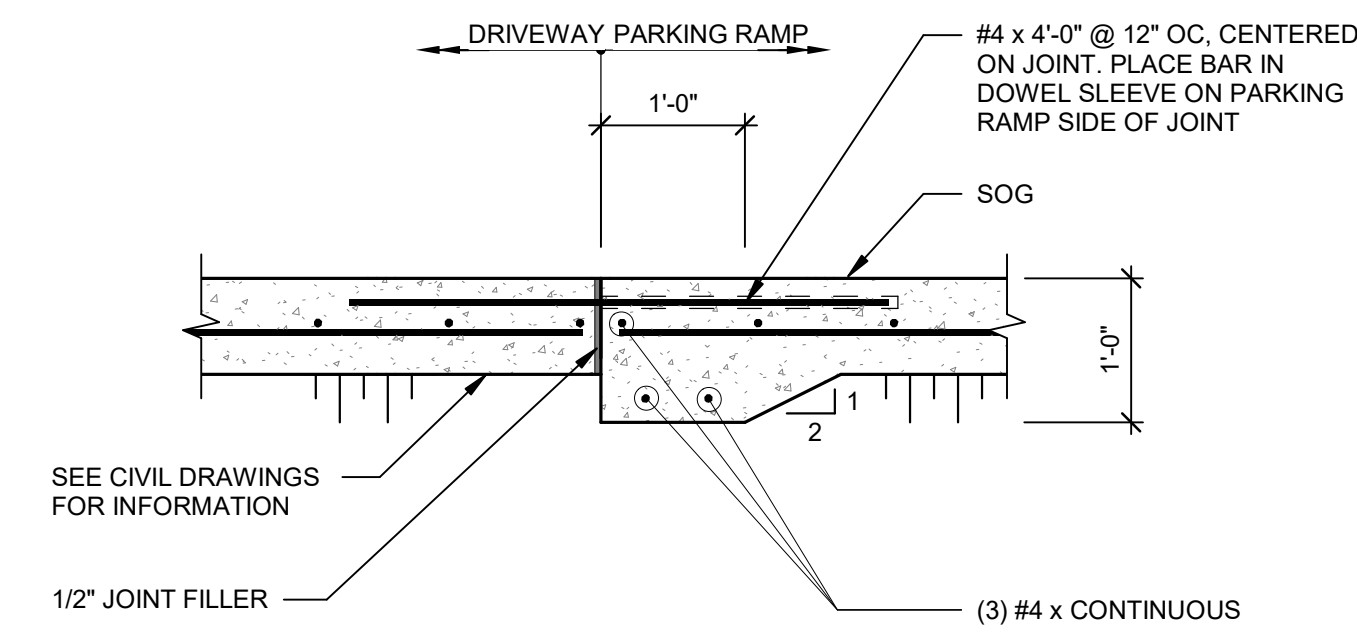
FOUNDATION PLAN

S-100

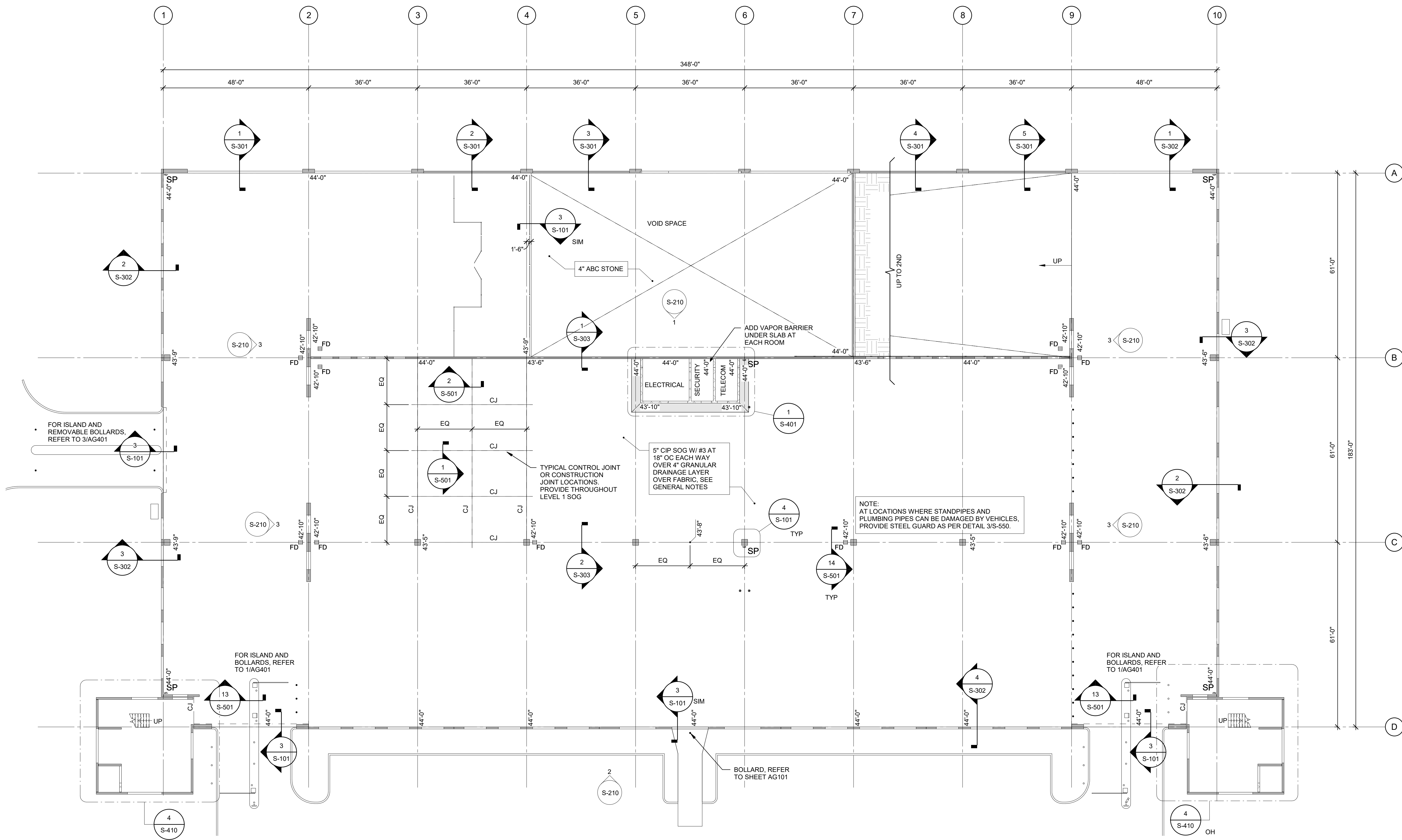
DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

ON PROJECT  
NUMBER





### EDGE OF SLAB DETAIL



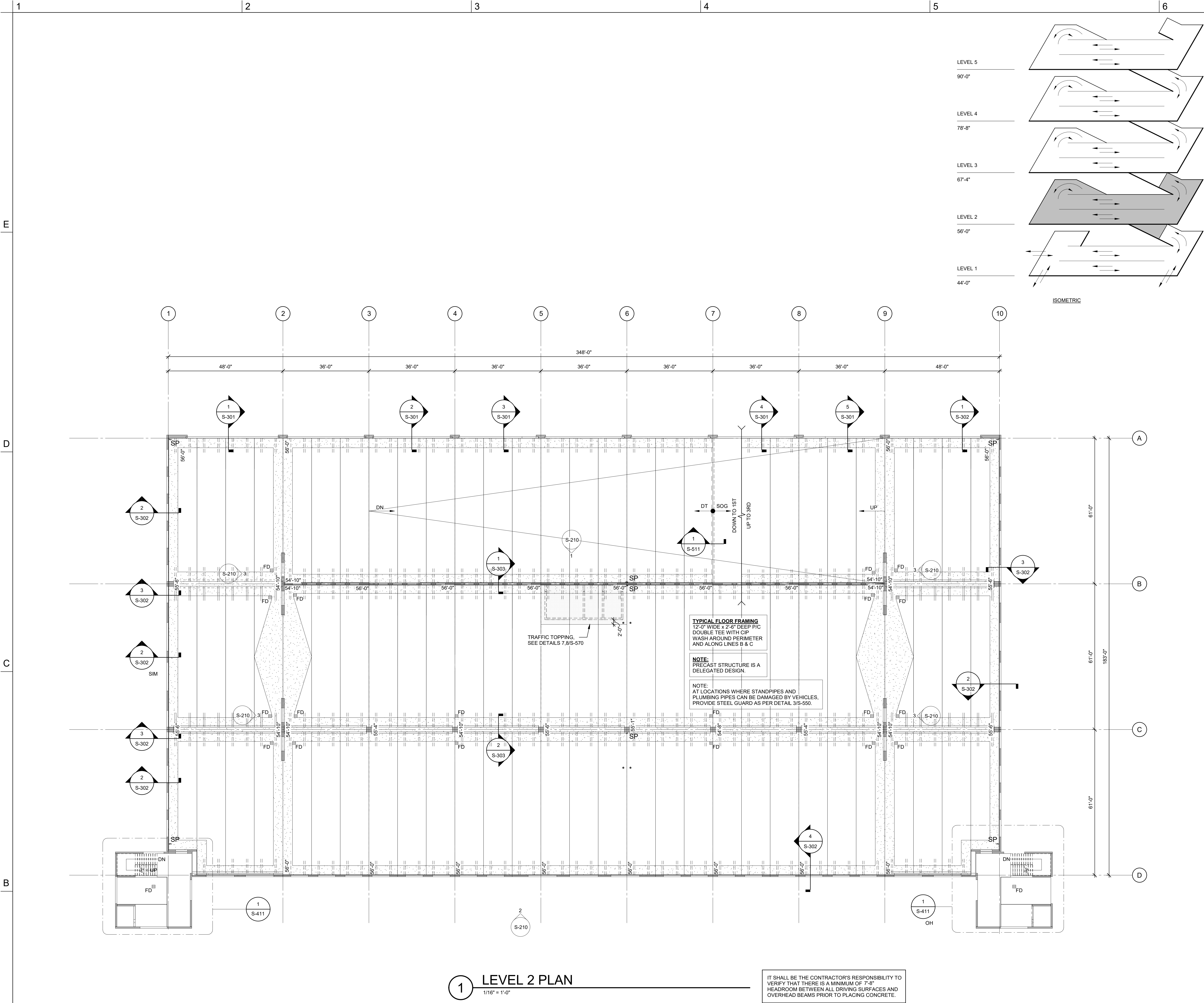
**1** LEVEL 1 PLAN  
1/16" = 1'-0"

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THERE IS A MINIMUM OF 8'-4" HEADROOM BETWEEN ALL DRIVING SURFACES AND OVERHEAD BEAMS PRIOR TO PLACING CONCRETE.

CN PROJECT  
NUMBER

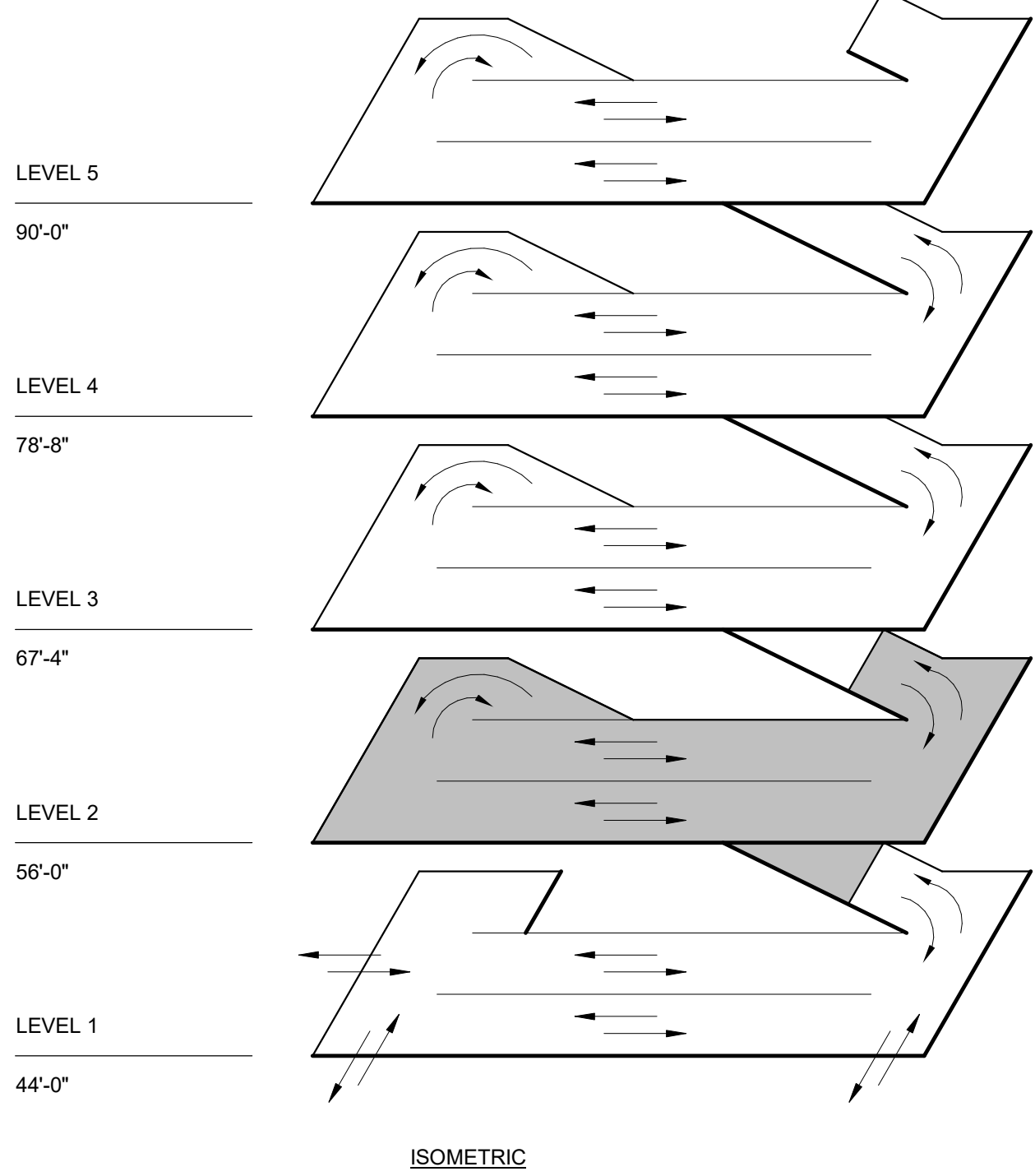


4/15/2019 5:34:50 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_royanham.rvt



1 LEVEL 2 PLAN  
1/16" = 1'-0"

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THERE IS A MINIMUM OF 7'-8" HEADROOM BETWEEN ALL DRIVING SURFACES AND OVERHEAD BEAMS PRIOR TO PLACING CONCRETE.



## SHEET NOTES

- SEE SHEET S-103 FOR TYPICAL SHEET NOTES AND LOCATIONS OF TYPICAL DETAIL REFERENCES (UNLESS NOTED).

**UNCW**  
UNIVERSITY of NORTH CAROLINA WILMINGTON  
601 S COLLEGE ROAD  
WILMINGTON, NORTH CAROLINA 28403  
PARKING DECK II AND SURFACE  
PARKING (DESIGN-BUILD)  
SOUTH CAMPUS - 4965 RIEGEL ROAD

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty**  
Construction

DESIGNER



**CLARK NEXSEN**  
1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028

**WALKER**  
CONSULTANTS

13860 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518

**MCKIM&CREED**

CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEAL



SUBMITTAL

04/15/2019

CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS

NO.	DESCRIPTION	DATE

KEY PLAN

## LEGEND

	CIP
	PRECAST CONCRETE
	CMU
	CONCRETE WASH / TOPPING
	CIP POUR STRIP
	TRAFFIC TOPPING

SHEET

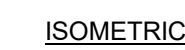
LEVEL 2 PLAN

S-102

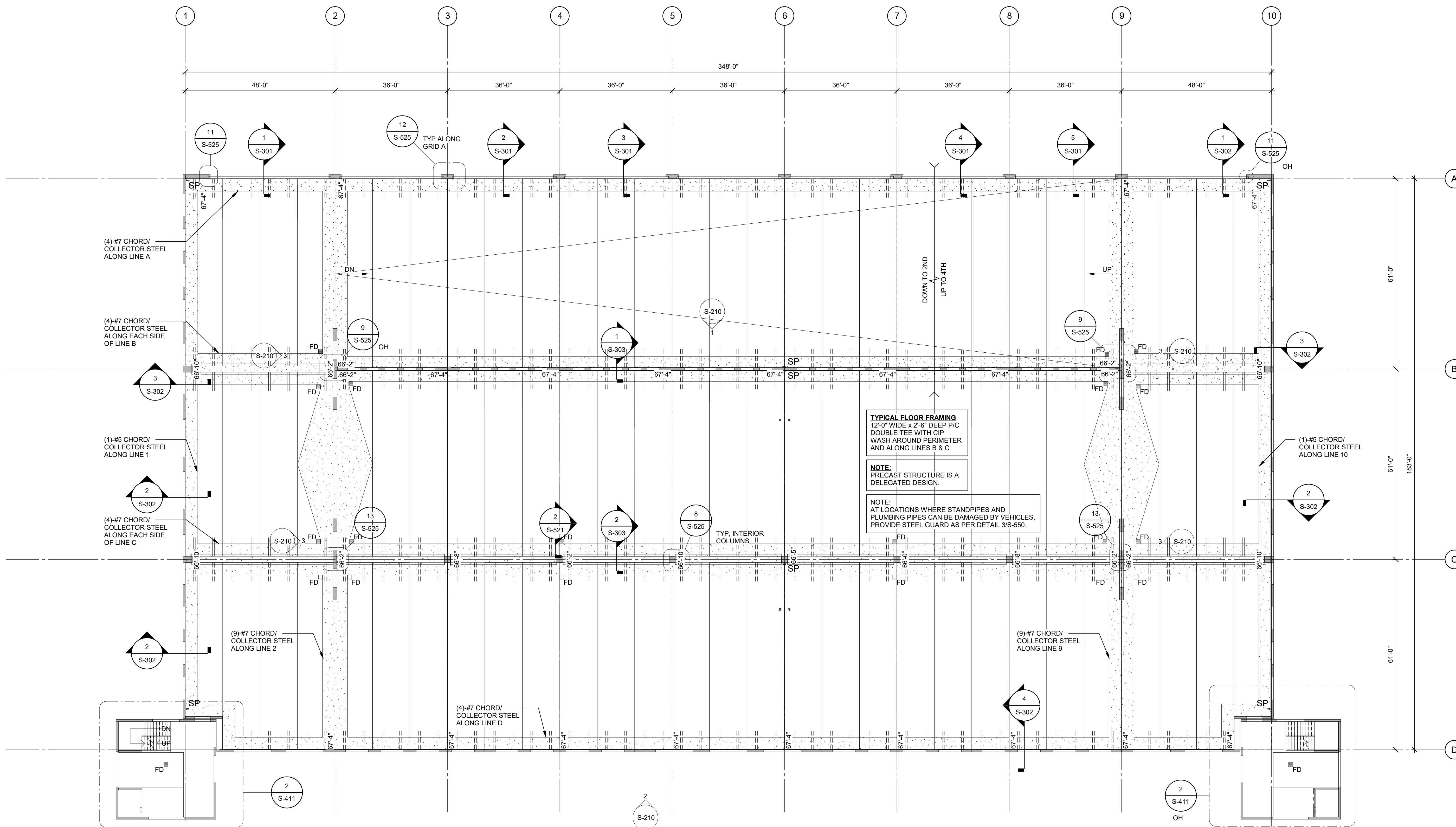
DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

ON PROJECT  
NUMBER





1. USE STRAIGHT LINE INTERPOLATION FOR FLOOR ELEVATION BETWEEN THOSE INDICATED.
2. PROVIDE TOOPED AND SEALED CONTROL JOINTS IN ALL CIP TYPING DIRECTLY OVER PRECAST JOINTS, UNLESS OTHERWISE INDICATED.
3. REFER TO ELECTRICAL DRAWINGS FOR LIGHT FIXTURE LOCATIONS & INFORMATION.
4. DETAIL CUTS AND INFORMATION SHOWN ON THIS SHEET ARE TYPICAL FOR SUPPORTED LEVELS, UNLESS NOTED OTHERWISE.
5. USE STRAIGHT LINE INTERPOLATION FOR FLOOR ELEVATION BETWEEN THOSE INDICATED.
6. USE ISOMETRIC FOR DATUM. ELEVATIONS DO NOT INCLUDE WASH HEIGHT. SEE 3/S-103.
7. TOOL JOINTS IN CIP TYPING OVER ALL PRECAST JOINTS, UNLESS OTHERWISE INDICATED.
8. SEE DETAILS 2, 3, 4, & 5/S-70 FOR TYPICAL SEALANT LOCATIONS.

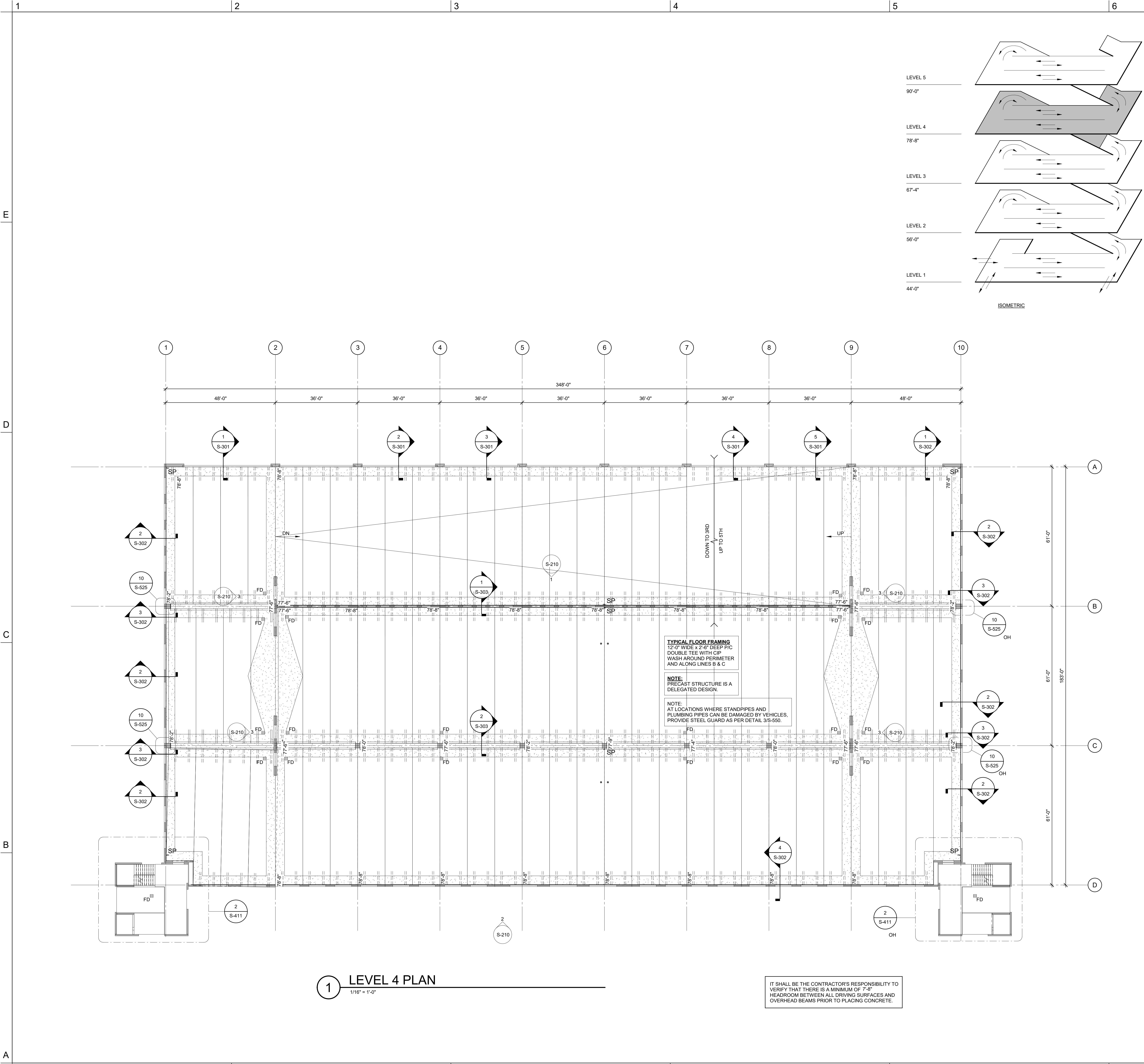


**1** LEVEL 3 PLAN  
1/16" = 1'-0"

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THERE IS A MINIMUM OF 7'-8" HEADROOM BETWEEN ALL DRIVING SURFACES AND OVERHEAD BEAMS PRIOR TO PLACING CONCRETE.

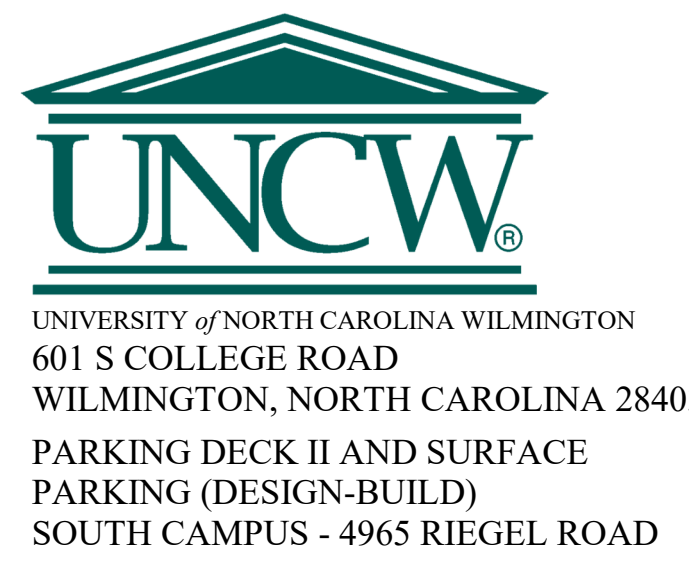


4/15/2019 5:34:57 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_09\gasham.rvt



## SHEET NOTES

- SEE SHEET S-103 FOR TYPICAL SHEET NOTES AND LOCATIONS OF TYPICAL DETAIL REFERENCES (UNLESS NOTED).



SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty Construction**

DESIGNER

**CLARK NEXSEN**  
1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028



13660 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518



CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEAL



SUBMITTAL

04/15/2019

CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS

NO.	DESCRIPTION	DATE

KEY PLAN



SHEET

LEVEL 4 PLAN

# S-104

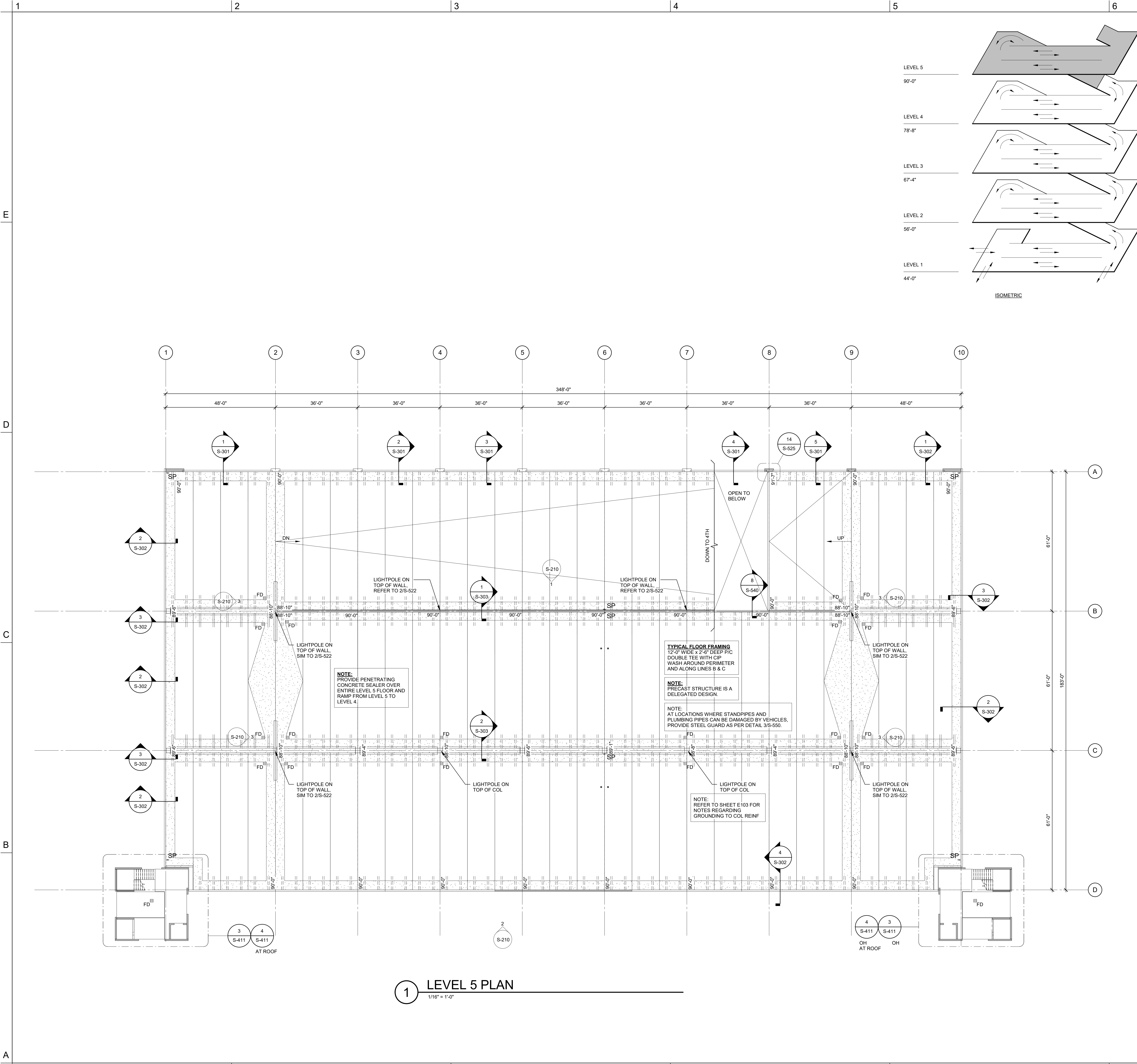
DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

ON PROJECT  
NUMBER

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THERE IS A MINIMUM OF 7'-8" HEADROOM BETWEEN ALL DRIVING SURFACES AND OVERHEAD BEAMS PRIOR TO PLACING CONCRETE.



4/15/2019 5:34:59 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_royanham.rvt



1 LEVEL 5 PLAN  
1/16" = 1'-0"

## SHEET NOTES

- SEE SHEET S-103 FOR TYPICAL SHEET NOTES AND LOCATIONS OF TYPICAL DETAIL REFERENCES (UNLESS NOTED).



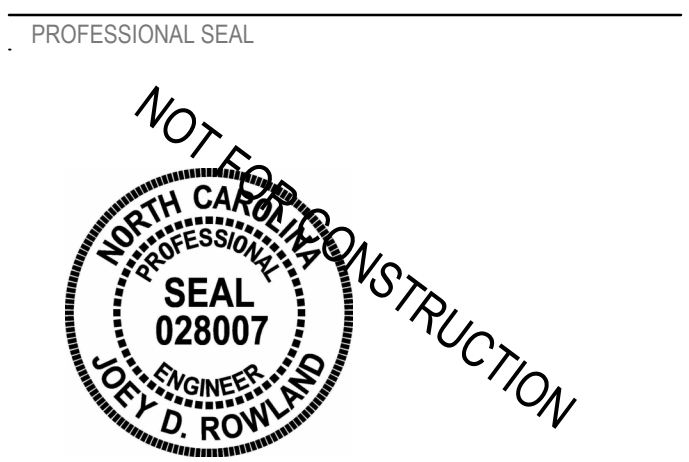
SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty Construction**

DESIGNER  
**CLARK NEXSEN**  
1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800  
CLARK NEXSEN LICENSE NUMBER: C-1028

**WALKER CONSULTANTS**  
13660 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
www.walkerconsultants.com  
NC License No. F-0518

**MCKIM&CREED**  
CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048



SUBMITTAL  
04/15/2019  
CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS	

KEY PLAN

## LEGEND

- CIP
- PRECAST CONCRETE
- CMU
- CONCRETE WASH / TOPPING
- CIP POUR STRIP
- TRAFFIC TOPPING

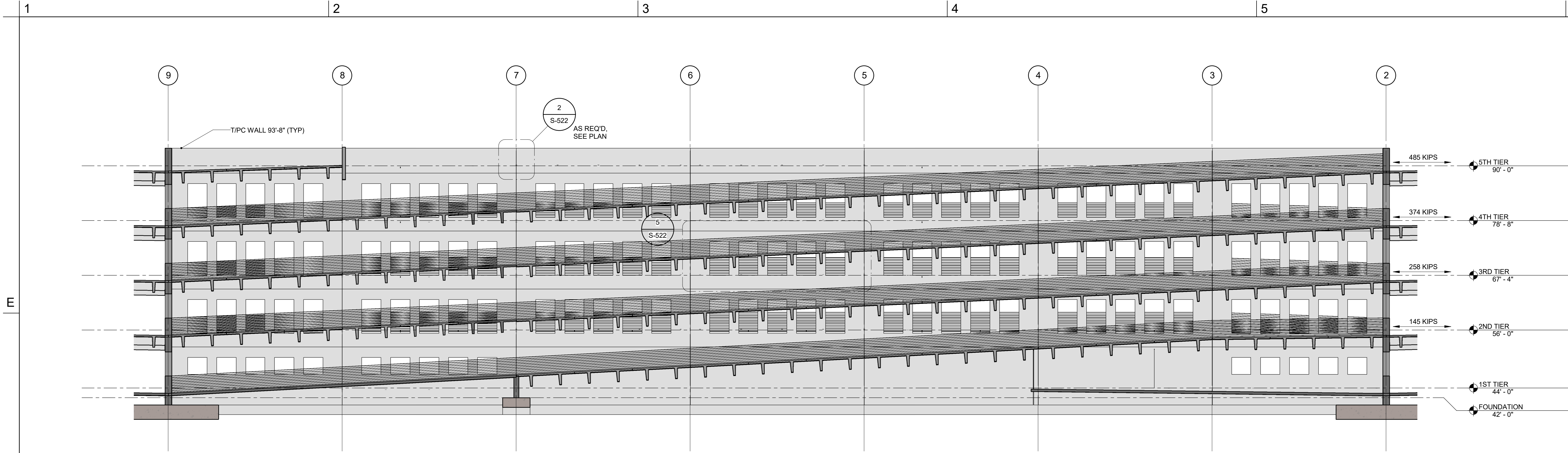
SHEET  
LEVEL 5 PLAN

S-105

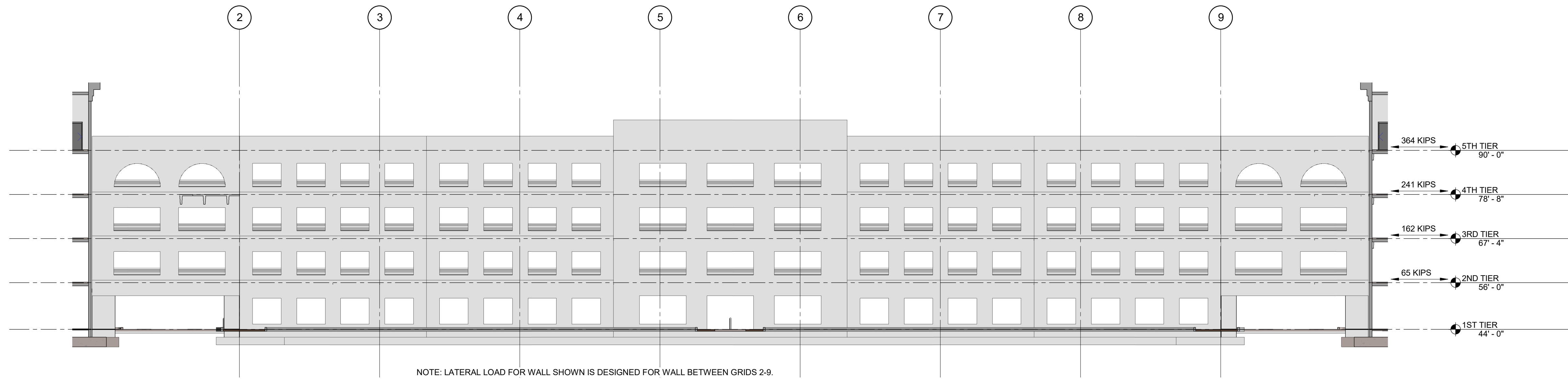
DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker  
ON PROJECT NUMBER



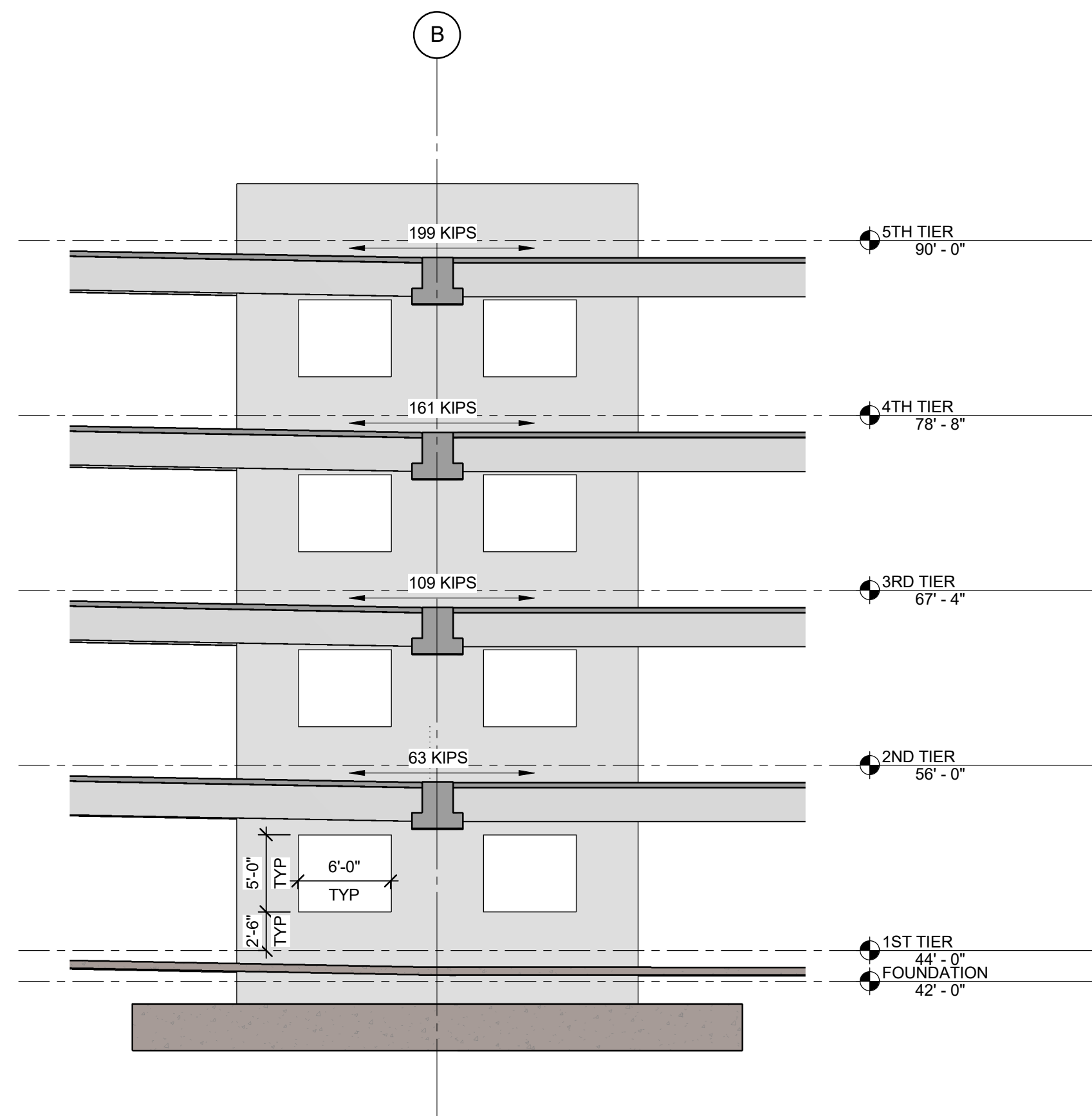
4/15/2019 5:35:02 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_09\gartham.rvt



1 LITEWALL ELEVATION  
3/32" = 1'-0"



2 EXTERIOR LATERAL WALL ELEVATION  
1/16" = 1'-0"



3 SHEAR WALL ELEVATION  
1/8" = 1'-0"

## SHEET NOTES

### REFERENCES:

- |   |              |
|---|--------------|
| 1. GENERAL NOTES                          | S-001        |
| 2. TYPICAL DETAILS                        | S-501        |
| 3. PRECAST COLUMN SCHEDULE                | S-100        |
| 4. PRECAST STRUCTURAL WALL ELEVATIONS     | S-200 SERIES |
| 5. ENLARGED PLANS                         | S-400 SERIES |
| 6. PRECAST BEAM DETAILS, SCHEDULE & NOTES | S-520        |
| 7. PRECAST TEE DETAILS & NOTES            | S-521        |
| 8. LAP SPLICE SCHEDULE                    | S-650        |

### PRECAST SHEAR WALL NOTES:

- FOR GENERAL NOTES, SEE S-001.
- SHEAR WALL DESIGN IS PERFORMANCE DESIGN AND SHALL INCLUDE SIZE, NUMBER AND LOCATION OF VERTICAL AND HORIZONTAL REINFORCING. DESIGN SHALL ALSO INCLUDE BASE CONNECTIONS, PIECE CONNECTIONS, HAUNCH OR LEDGE REINFORCEMENT, AND SIZE, NUMBER, AND SPACING OF INSERT/COLD ROD (OR OTHER SHEAR TRANSFER) CONNECTIONS INTO POUR STRIPS FOR SHEAR TRANSFER OF LATERAL LOADS. SEE SPECIFICATION 03410 FOR PRECAST CONCRETE.
- FOR SHEAR WALL SIZES, SEE SHEAR WALL ELEVATIONS 3/S-210 AND STRUCTURAL DETAILS. FOR SHEAR WALL OPENINGS, SEE 3/S-210.
- FOR EMBEDDED PLATES TO RECEIVE WELDS AS PART OF WELDED CONNECTIONS, SEE 7/S-524.
- FOR SHEAR WALL BASE CONNECTION, SEE 12/S-524.
- FOR LATERAL LOADS DUE TO SEISMIC, SEE 1, 2, & 3/S-210.
- PRECAST MANUFACTURER TO CONDUCT THEIR OWN LATERAL ANALYSIS FOR SHEAR WALL MEMBER AND CONNECTION DESIGN.



UNIVERSITY of NORTH CAROLINA WILMINGTON  
601 S COLLEGE ROAD  
WILMINGTON, NORTH CAROLINA 28403  
PARKING DECK II AND SURFACE  
PARKING (DESIGN-BUILD)  
SOUTH CAMPUS - 4965 RIEGEL ROAD

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

### CONTRACTOR

**Balfour Beatty**  
Construction

### DESIGNER

### CLARK NEXSEN

1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028



**WALKER**  
CONSULTANTS

13660 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518



CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

### PROFESSIONAL SEAL



### SUBMITTAL

04/15/2019  
CONSTRUCTION DOCUMENT  
SUBMITTAL 01

### REVISIONS

NO.	DESCRIPTION	DATE

### KEY PLAN

### SHEET

SHEAR WALL & LITEWALL  
ELEVATIONS

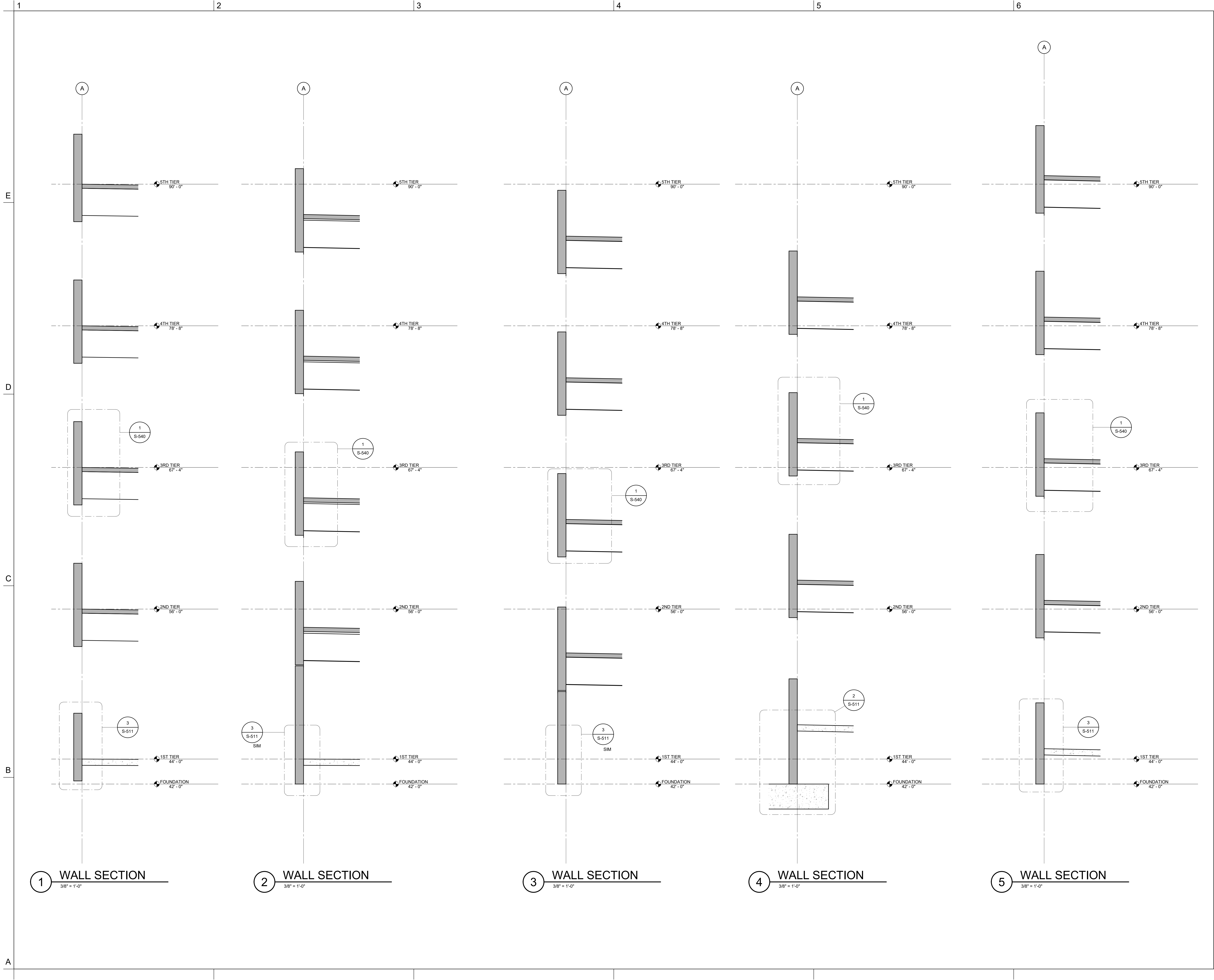
S-210

DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

ON PROJECT  
NUMBER



4/15/2019 5:35:04 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_01.gyan@ham.com



UNIVERSITY of NORTH CAROLINA WILMINGTON  
601 S COLLEGE ROAD  
WILMINGTON, NORTH CAROLINA 28403  
PARKING DECK II AND SURFACE  
PARKING (DESIGN-BUILD)  
SOUTH CAMPUS - 4965 RIEGEL ROAD

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty Construction**

DESIGNER  
**CLARK NEXSEN**  
1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800  
CLARK NEXSEN LICENSE NUMBER: C-1028

**WALKER CONSULTANTS**  
13660 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518

**MCKIM&CREED**  
CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEAL

SUBMITTAL  
04/15/2019  
**CONSTRUCTION DOCUMENT  
SUBMITTAL 01**

REVISIONS


KEY PLAN

SHEET  
**BUILDING SECTIONS**

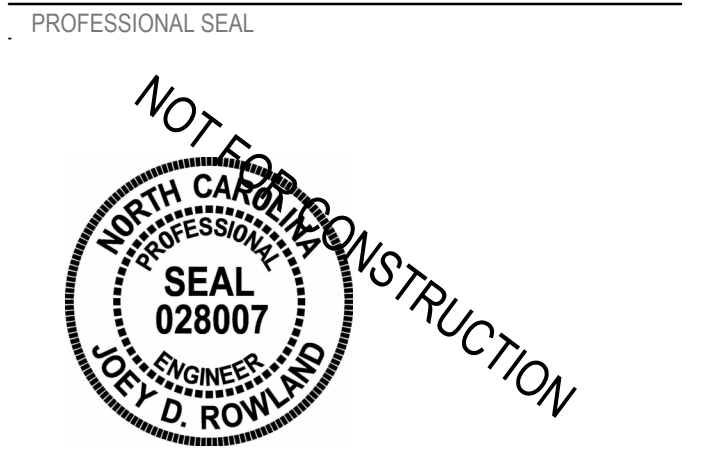
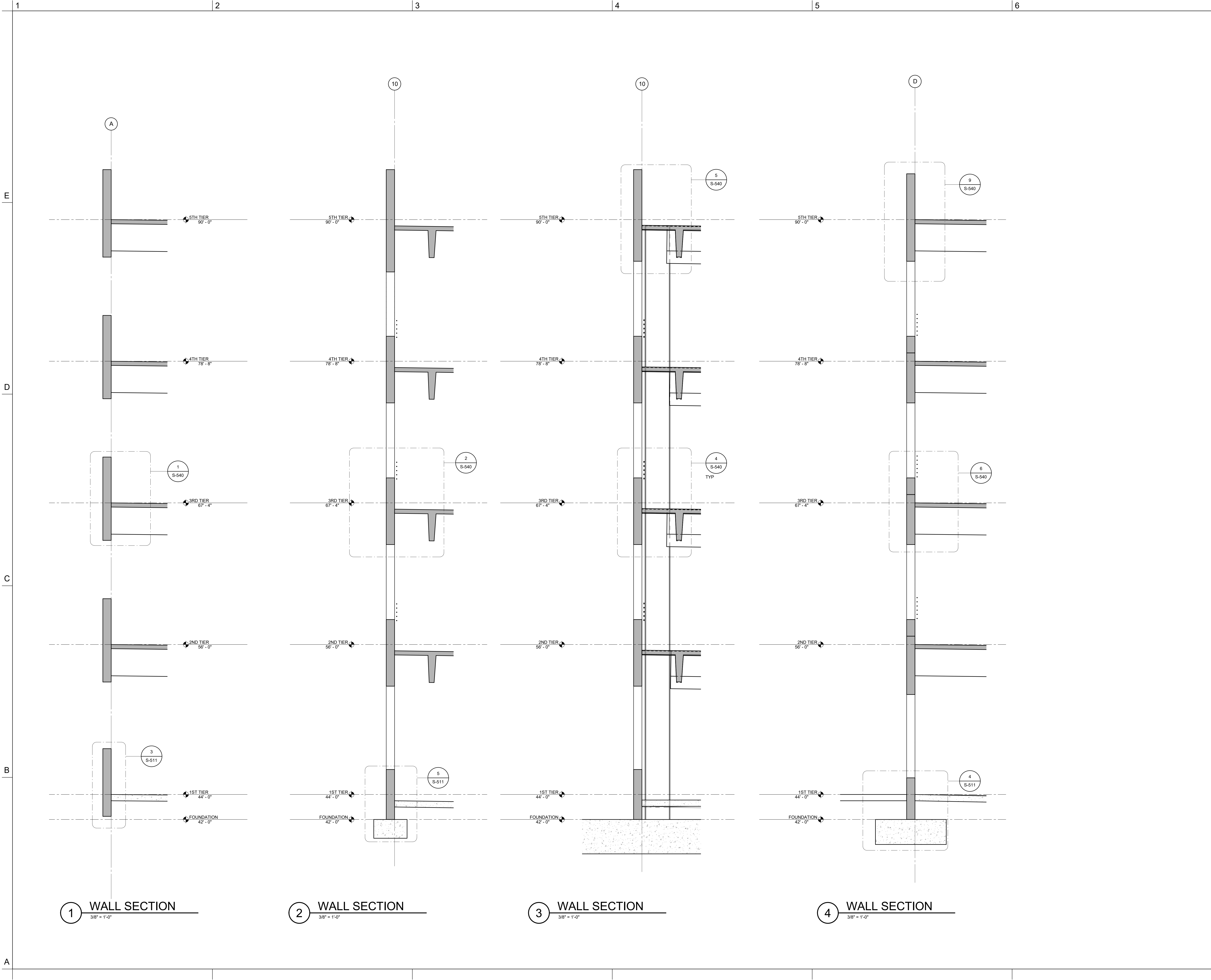
**S-301**

DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

ON PROJECT  
NUMBER



4/15/2019 5:35:05 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_roy.gardham.rvt



SUBMITTAL  
04/15/2019  
CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS	

KEY PLAN

SHEET  
BUILDING SECTIONS

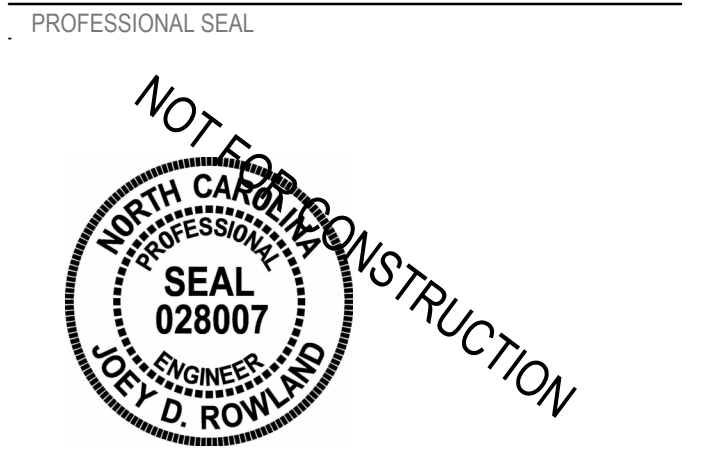
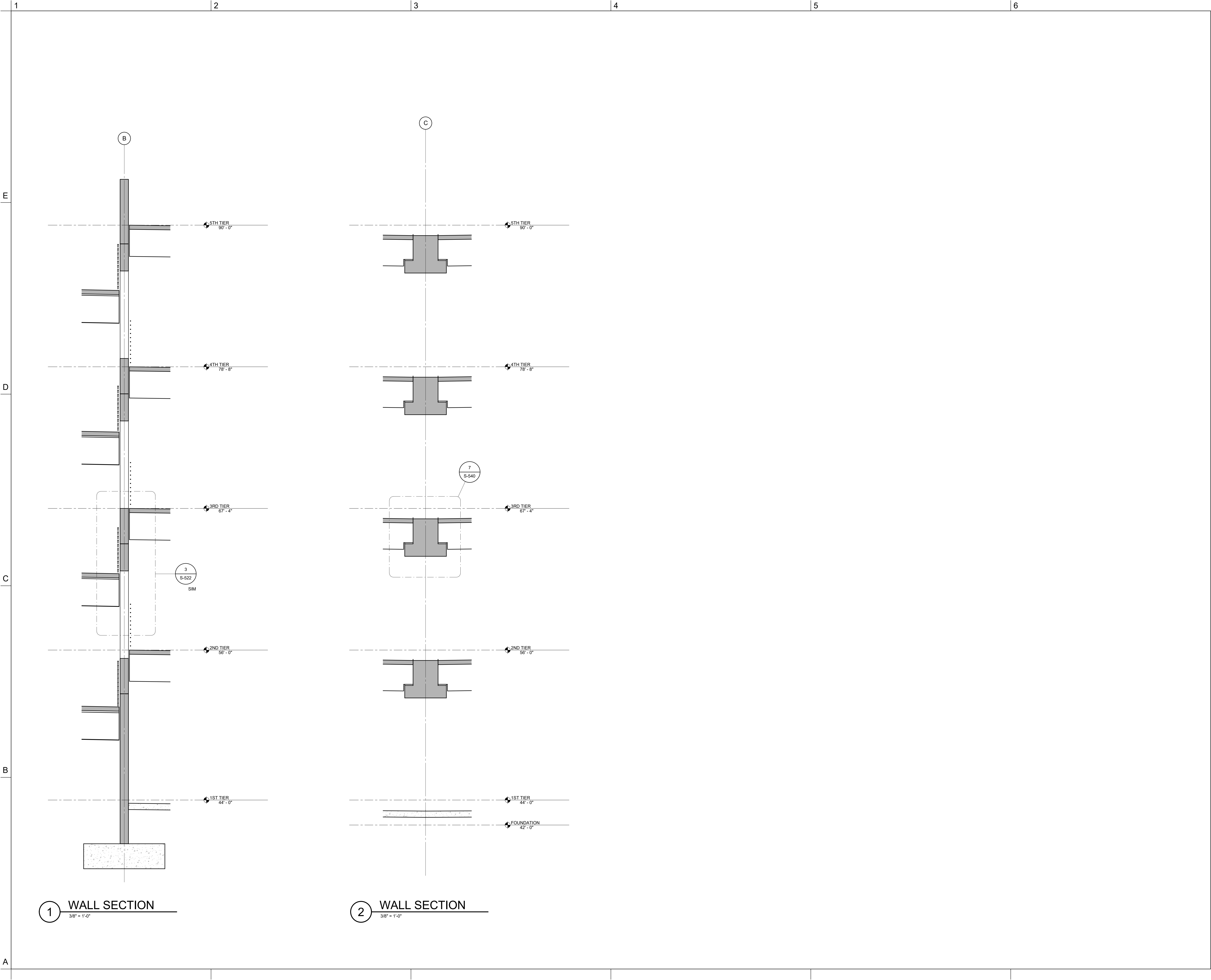
**S-302**

DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

CN PROJECT  
NUMBER



4/15/2019 5:35:08 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_09.grafham.rvt



SUBMITTAL  
04/15/2019  
CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS	

KEY PLAN

SHEET  
BUILDING SECTIONS

S-303

DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

CN PROJECT  
NUMBER



4/15/2019 5:35:07 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_09.gardham.txt

1  
E  
D  
C  
B  
A

2

3

4

5

6

## SHEET NOTES

### REFERENCES:

- |   |              |
|---|--------------|
| 1. GENERAL NOTES.                         | S-001        |
| 2. TYPICAL DETAILS                        | S-501        |
| 3. PRECAST COLUMN SCHEDULE                | S-103        |
| 4. PRECAST STRUCTURAL WALL ELEVATIONS     | S-200 SERIES |
| 5. ENLARGED PLANS                         | S-400 SERIES |
| 6. PRECAST BEAM DETAILS, SCHEDULE & NOTES | S-525        |
| 7. PRECAST TEE DETAILS & NOTES            |              |

### NOTES:

- FOR CMU REBAR, SEE DETAIL 10/S-560.
- FOR LINTEL INFORMATION, SEE DETAIL 8/S-560.



UNIVERSITY of NORTH CAROLINA WILMINGTON  
601 S COLLEGE ROAD  
WILMINGTON, NORTH CAROLINA 28403  
PARKING DECK II AND SURFACE  
PARKING (DESIGN-BUILD)  
SOUTH CAMPUS - 4965 RIEGEL ROAD

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR

**Balfour Beatty**  
Construction

DESIGNER



**CLARK NEXSEN**

1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028



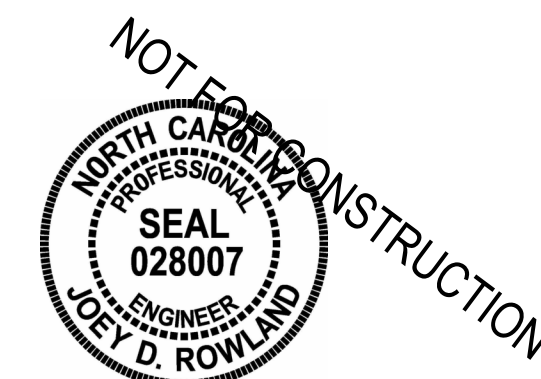
**WALKER**  
CONSULTANTS

13660 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518



CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEAL



SUBMITTAL

04/15/2019

CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS


KEY PLAN

## LEGEND

- CMU WALL TYPE, SEE 10/S-560  
LX LINTEL TYPE, SEE 8/S-560



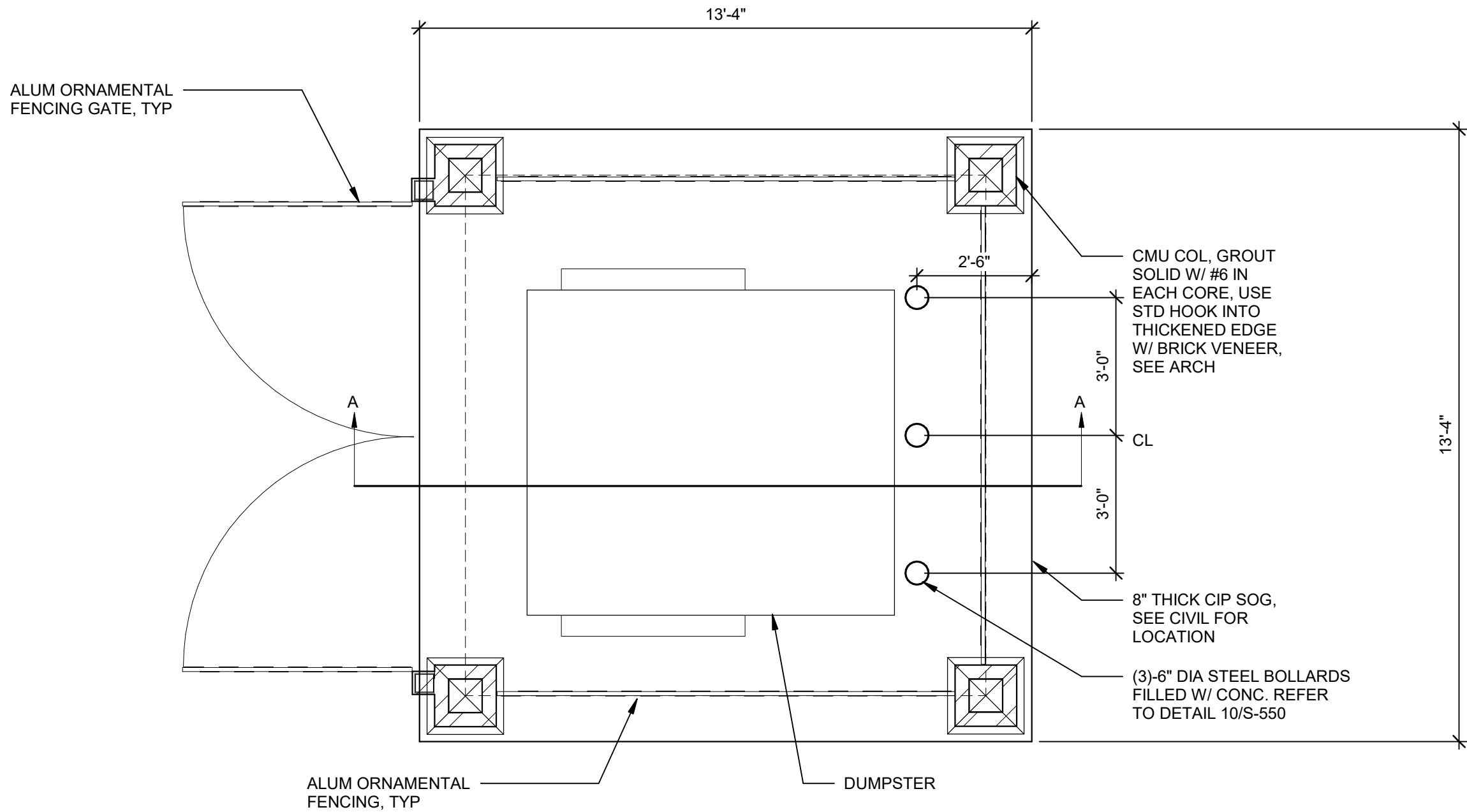
SHEET

(MISC) ENLARGED PLANS

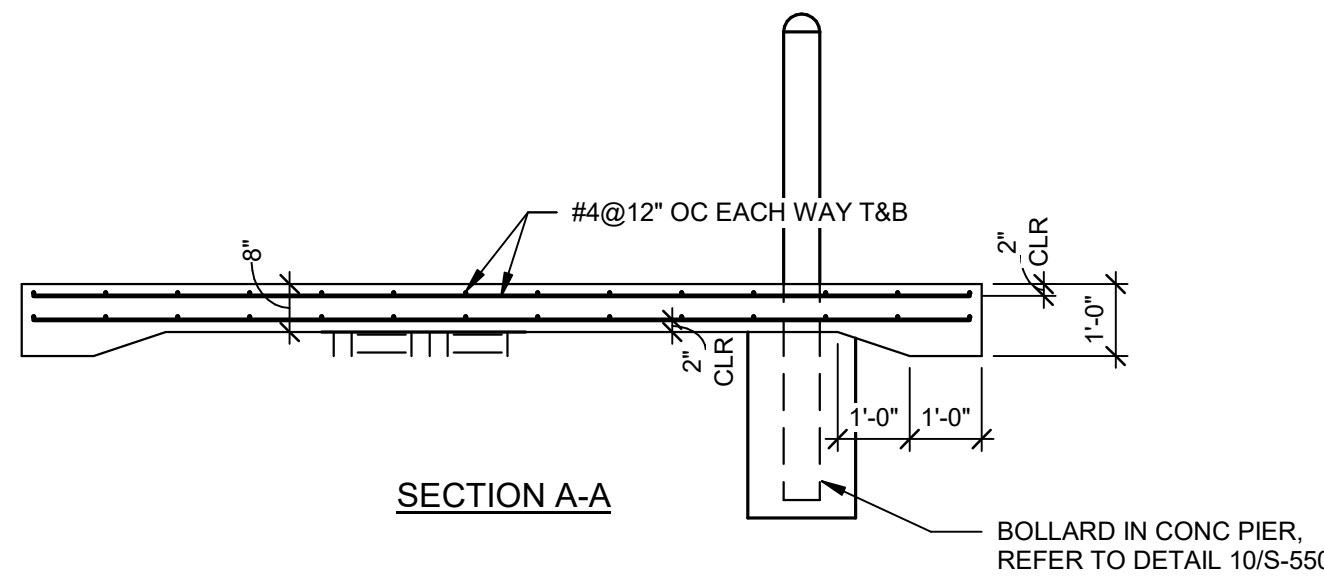
# S-401

DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

ON PROJECT  
NUMBER

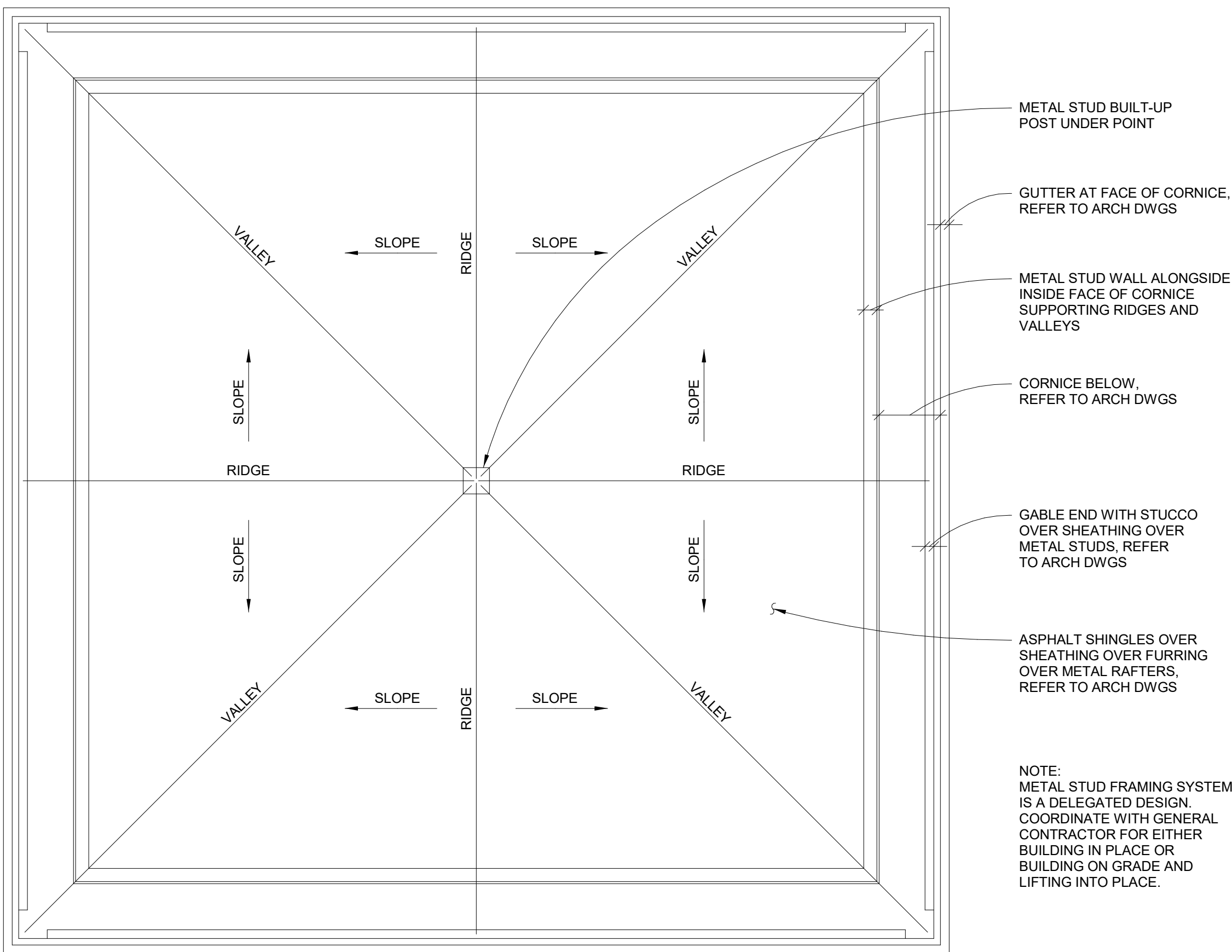


NOTE:  
FOR ADDITIONAL  
INFORMATION REFER  
TO CIVIL DWG 3/C5503



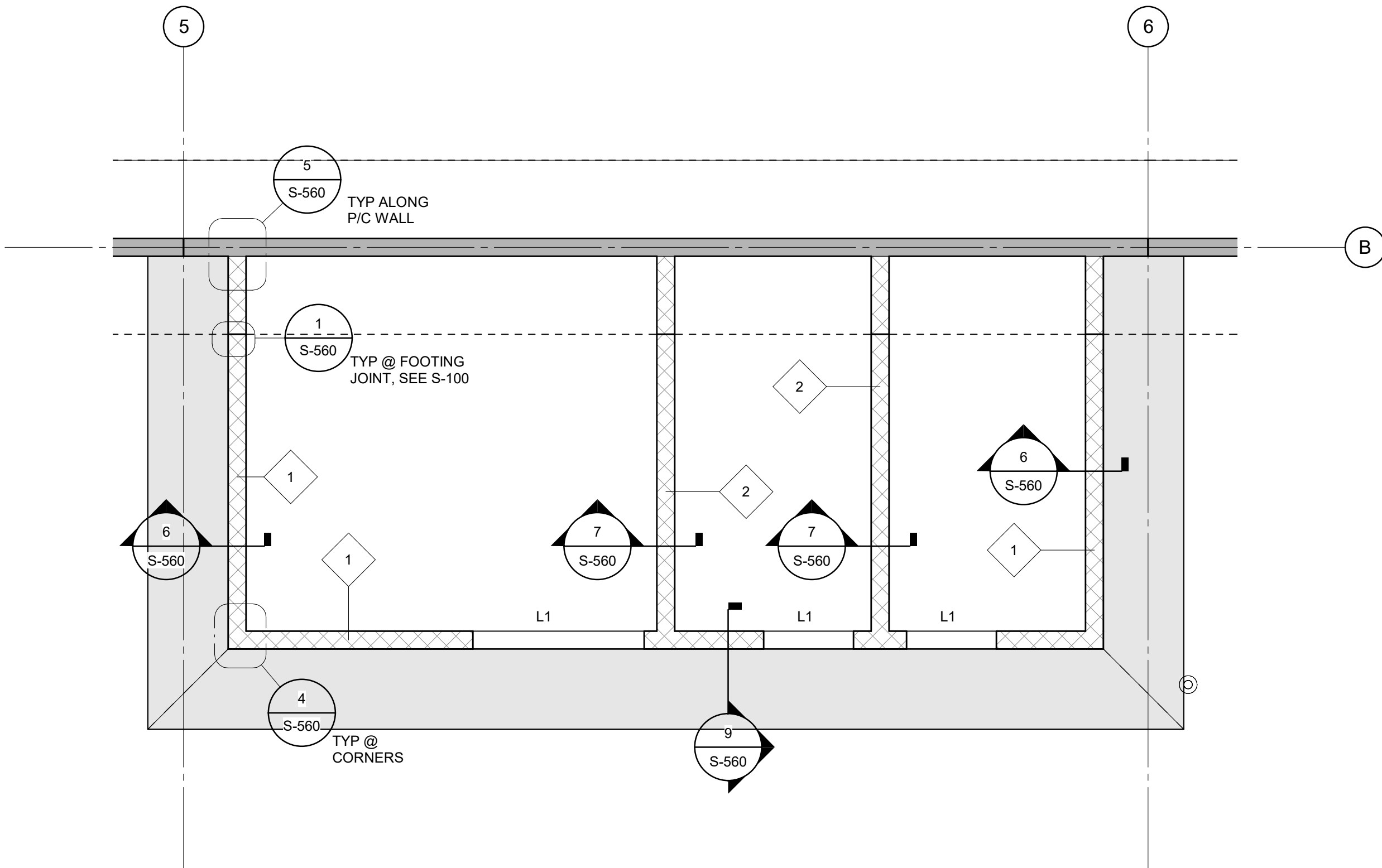
## 2 DUMPSTER PAD

3/8" = 1'-0"



## 3 METAL STUD ROOF FRAMING PLAN

1/4" = 1'-0"

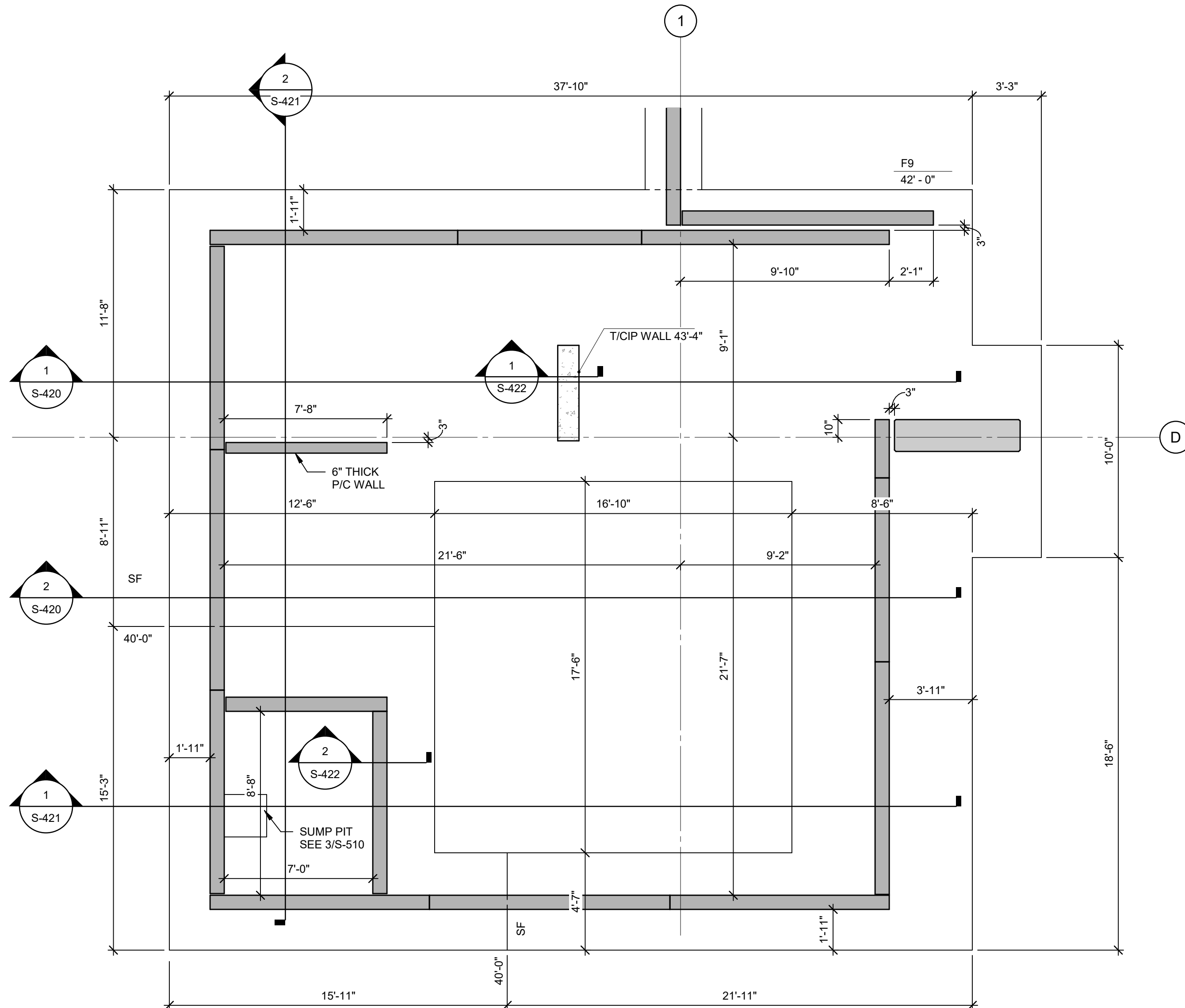
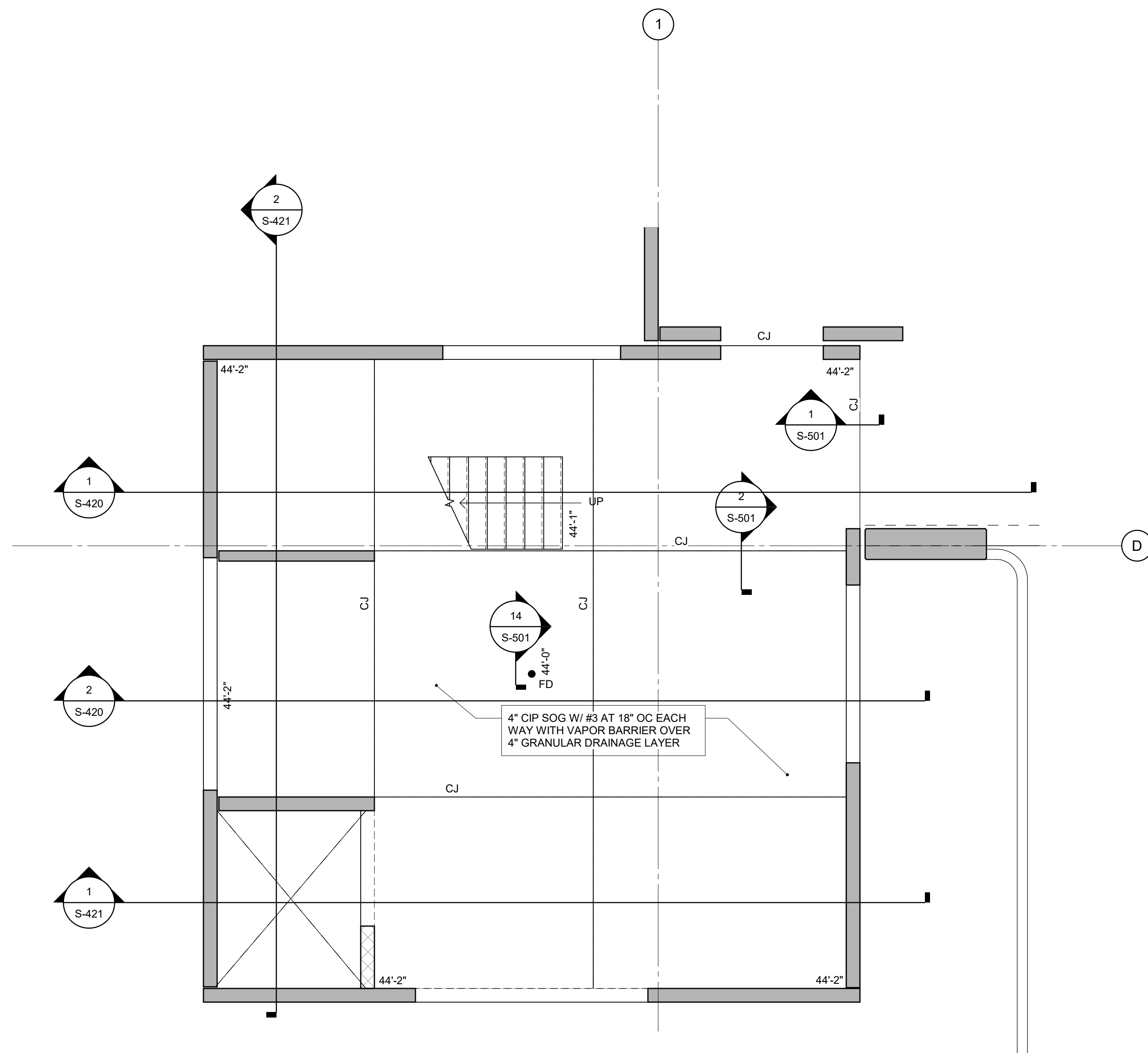
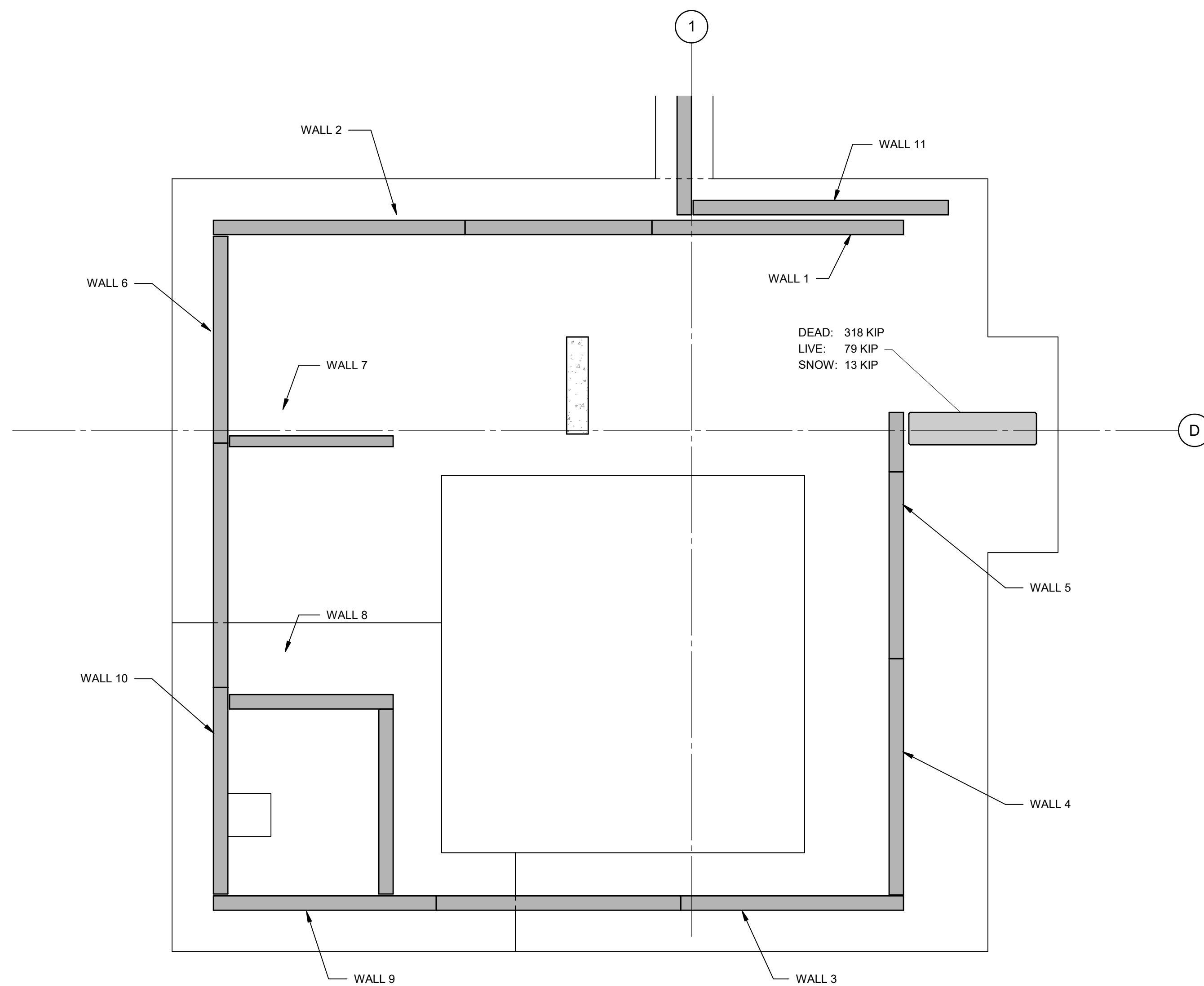


## 1 ENLARGED PLAN

1/4" = 1'-0"



	FOUNDATION LOAD TAKEDOWN				
	GRAVITY LOAD (KLF)			MOMENT (KIP-FT)	
LABEL	DEAD	LIVE	SNOW	SEISMIC	WIND
WALL 1	15.0	3.6	0.2	430	580
WALL 2	26.1	9.5	0.5	1430	1920
WALL 3	30.3	11.7	0.6	700	950
WALL 4	8.6	0.0	0.0	830	970
WALL 5	8.6	0.0	0.0	150	170
WALL 6	8.6	0.0	0.0	1480	1690
WALL 7	21.1	6.9	0.4	380	450
WALL 8	20.5	5.1	0.4	480	540
WALL 9	14.5	2.0	0.2	700	950
WALL 10	8.6	0.0	0.0	1480	1690
WALL 11	8.7	3.5	0.5	N/A	N/A



## SHEET NOTES

## REFERENCES:

- |    |   |              |
|----|---|--------------|
| 1. | GENERAL NOTES.                            | S-001        |
| 2. | TYPICAL DETAILS                           | S-501        |
| 3. | PRECAST COLUMN SCHEDULE                   | S-100        |
| 4. | PRECAST STRUCTURAL WALL<br>ELEVATIONS     | S-200 SERIES |
| 5. | ENLARGED PLANS                            | S-400 SERIES |
| 6. | PRECAST BEAM DETAILS,<br>SCHEDULE & NOTES | S-520        |
| 7. | PRECAST TEE DETAILS & NOTES               | S-521        |
| 8. | LAP SPlice SCHEDULE                       | S-650        |

## NOTES

1. USE STRAIGHT LINE INTERPOLATION FOR FLOOR ELEVATION BETWEEN THOSE INDICATED.
2. PROVIDE TOOLED AND SEALED CONTROL JOINTS IN ALL CIP TOPPING DIRECTLY OVER PRECAST JOINTS, UNO.
3. FOR LATERAL LOADS DUE TO WIND & SEISMIC, SEE TABLE BELOW.
4. PRECAST MANUFACTURER TO CONDUCT THEIR OWN LATERAL ANALYSIS FOR WALL MEMBER AND CONNECTION DESIGN.

STAIR TOWER LATERAL LOAD SCHEDULE		
STAIR TOWER NO. 1 & NO. 2		
MARK	SEISMIC ULTIMATE (1.0E) [KIPS]	WIND ULTIMATE (1.0W) [KIPS]
ROOF	29	34
LEVEL 5	23	25
LEVEL 4	17	25
LEVEL 3	12	24
LEVEL 2	7	26



UNIVERSITY of NORTH CAROLINA WILMINGTON  
601 S COLLEGE ROAD  
WILMINGTON, NORTH CAROLINA 28403  
PARKING DECK II AND SURFACE  
PARKING (DESIGN-BUILD)  
SOUTH CAMPUS - 4965 RIEGEL ROAD

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACT

**Balfour Beatty**  
Construction

DESIGNER

CLARK NEXSEN

1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028



13860 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518



CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEA



---

SUBMITTAL







04/15/2019

CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS

### KEY PLAN

## LEGEND

	CIP
	PRECAST CONCRETE
	CMU
	CONCRETE WASH / TOPPING
	CIP POUR STRIP
	TRAFFIC TOPPING

SHEET

STAIR TOWER NO. 2  
ENLARGED PLANS

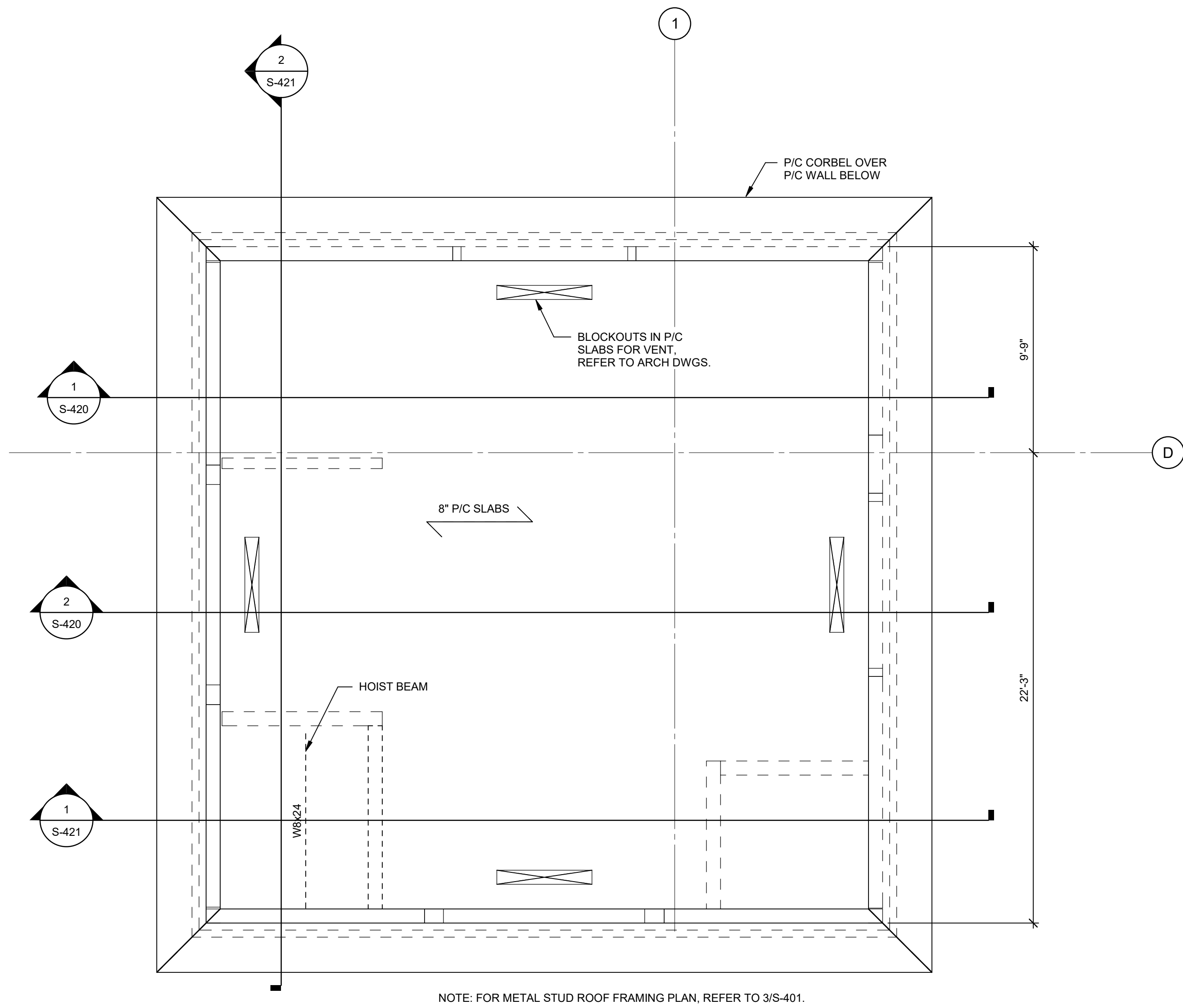
S-410

DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

CN PROJECT  
NUMBER

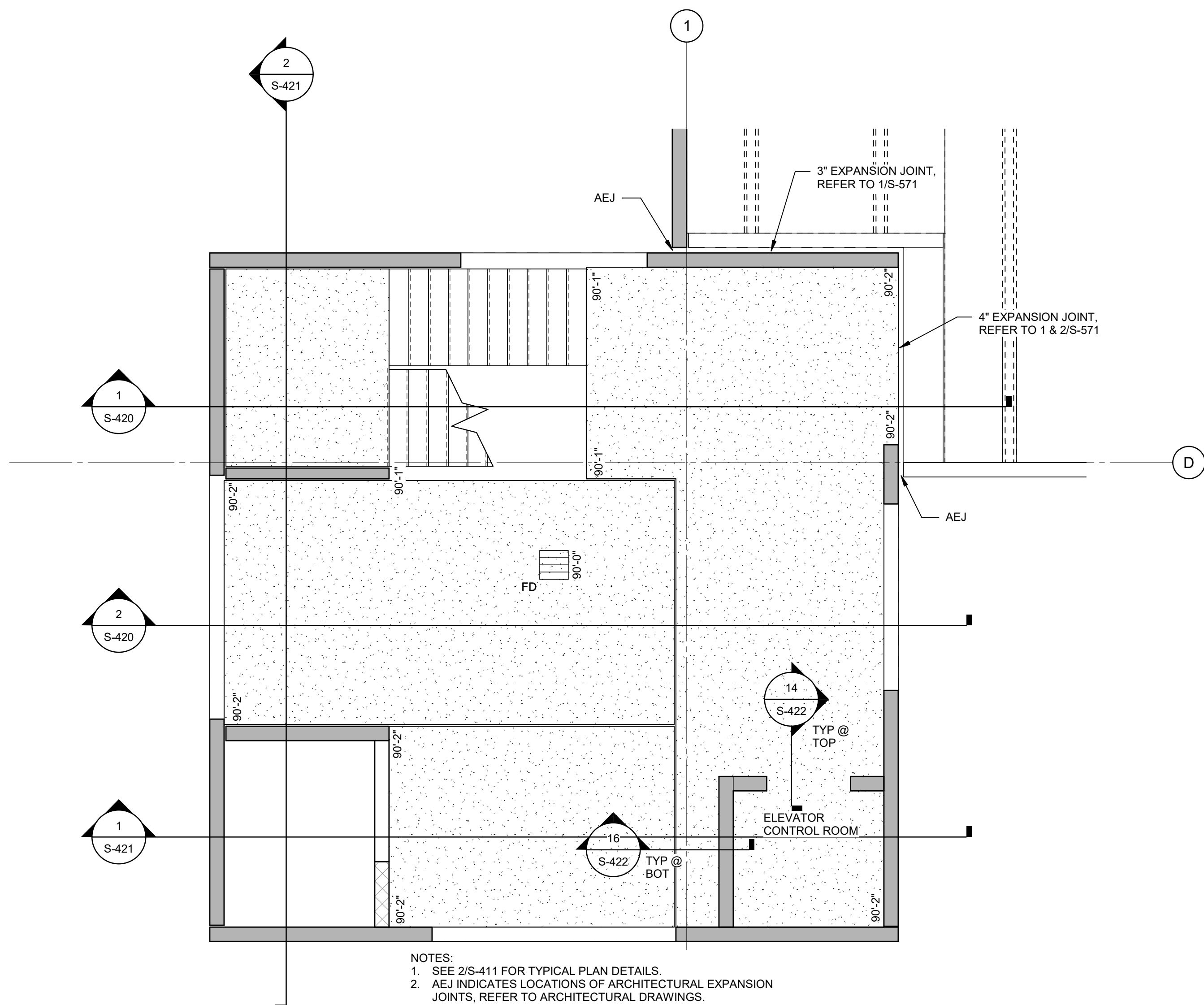


4/15/2019 5:35:10 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_roy.gardham.rvt



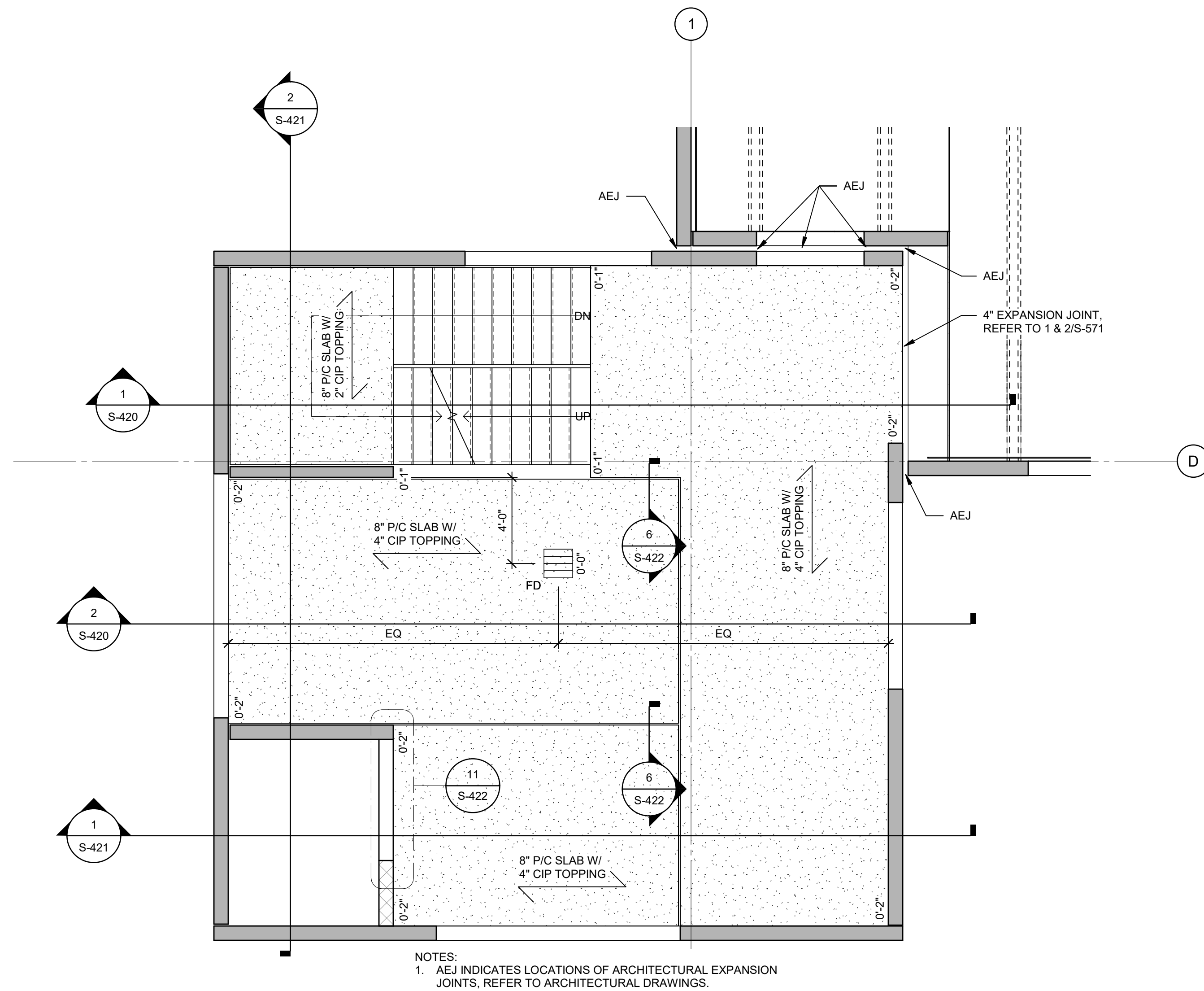
4 ROOF PLAN

1/4" = 1'-0"



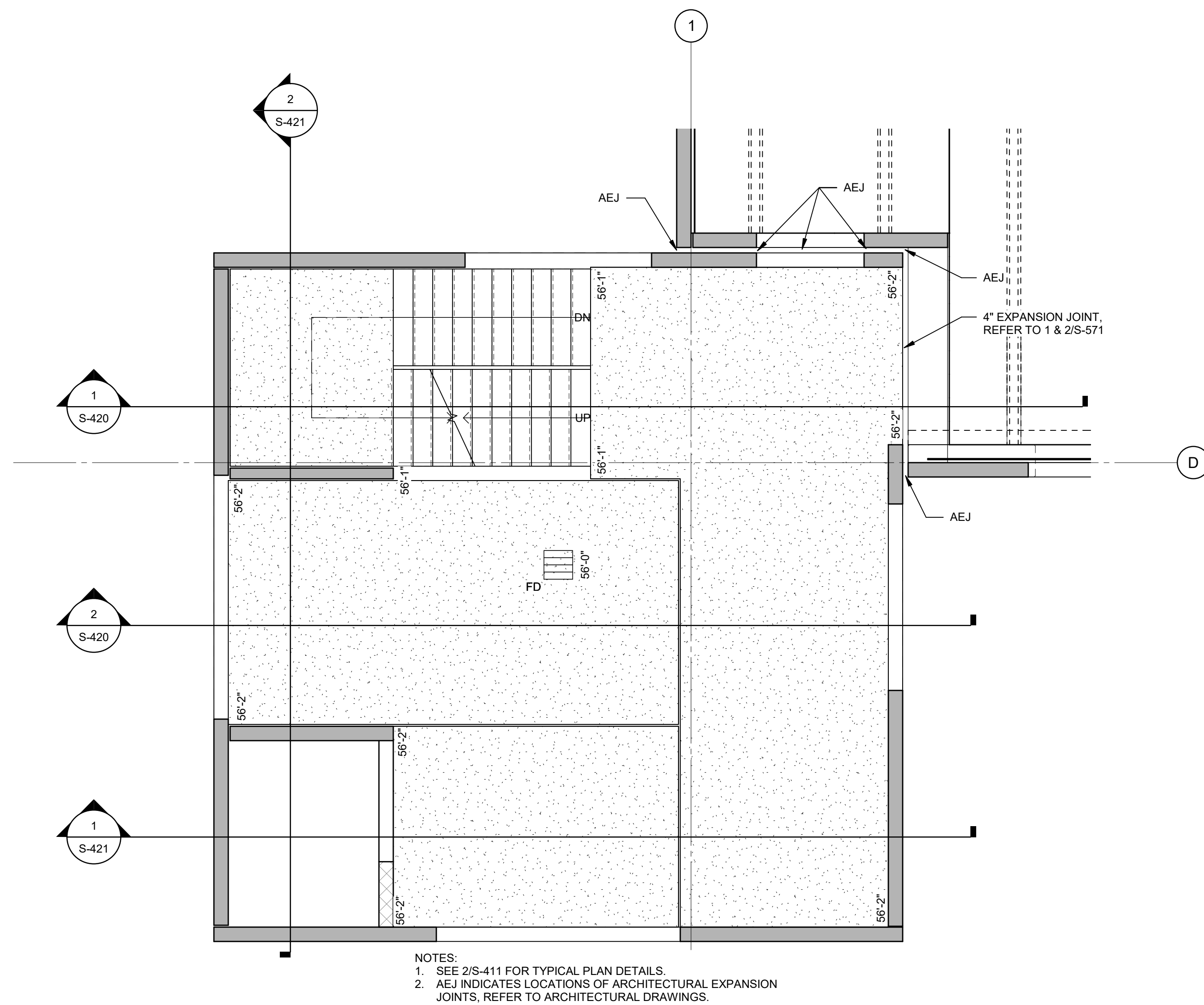
3 LEVEL 5 PLAN

1/4" = 1'-0"



2 TYPICAL LEVEL PLAN

1/4" = 1'-0"

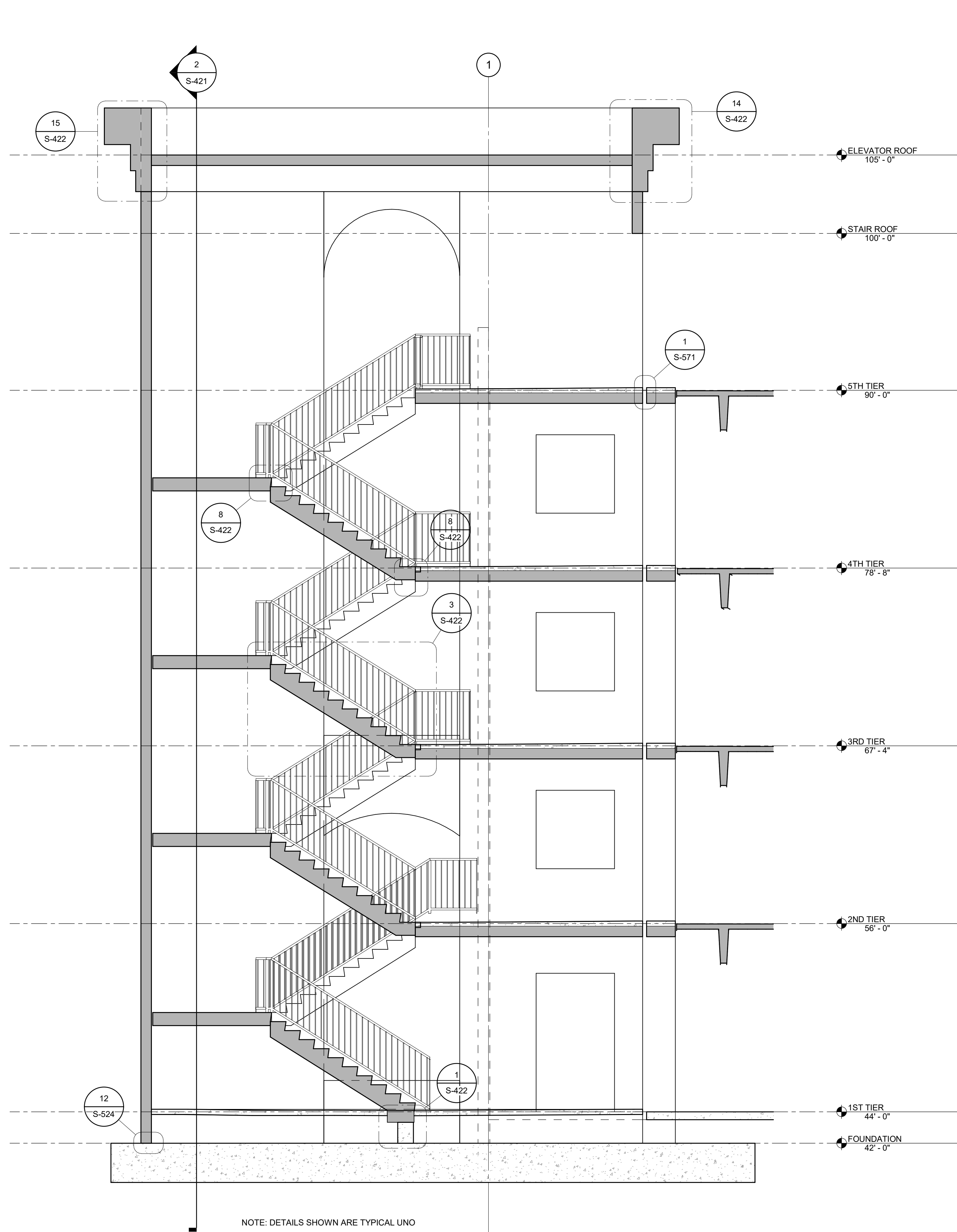


1 LEVEL 2 PLAN

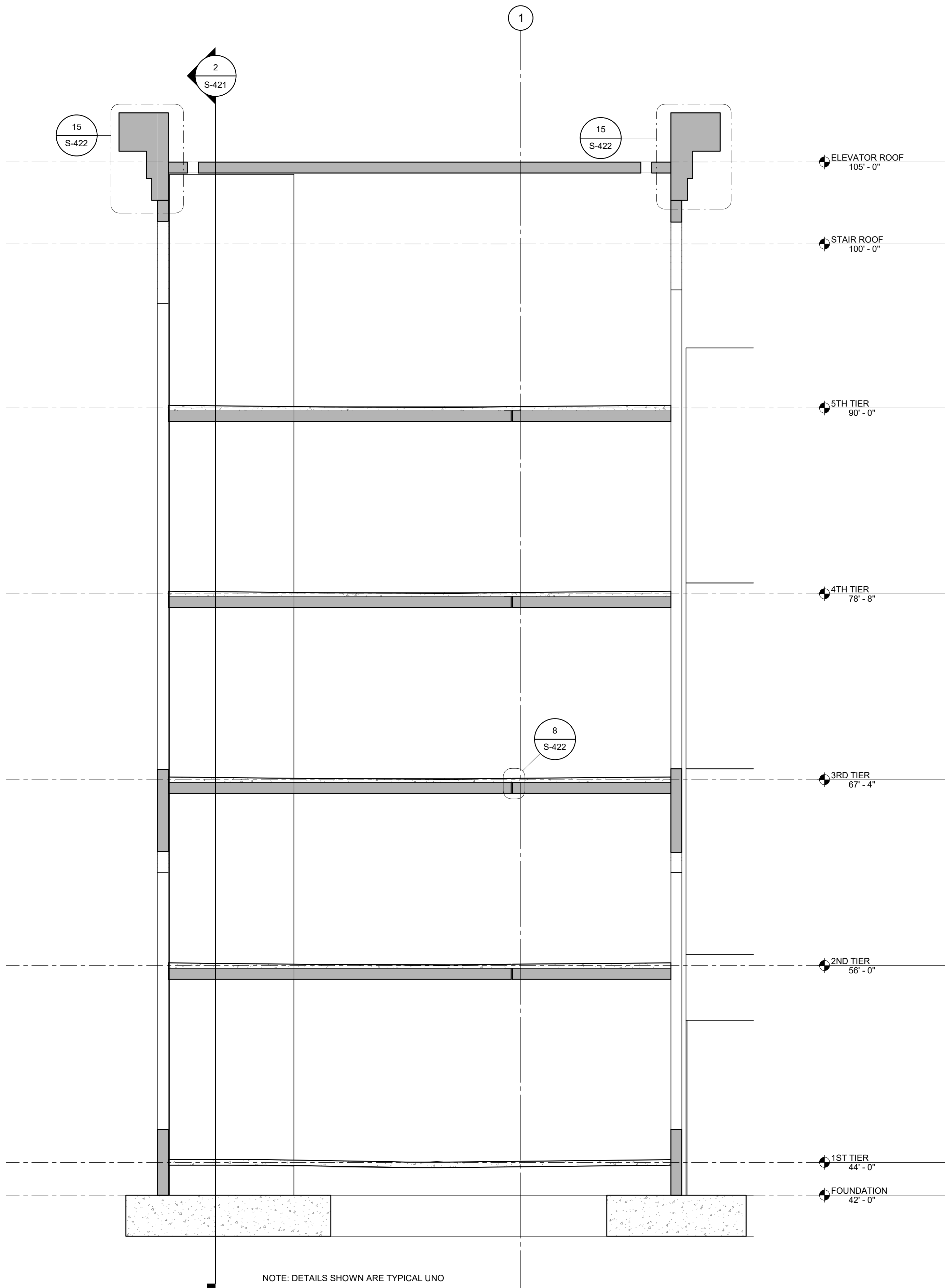
1/4" = 1'-0"



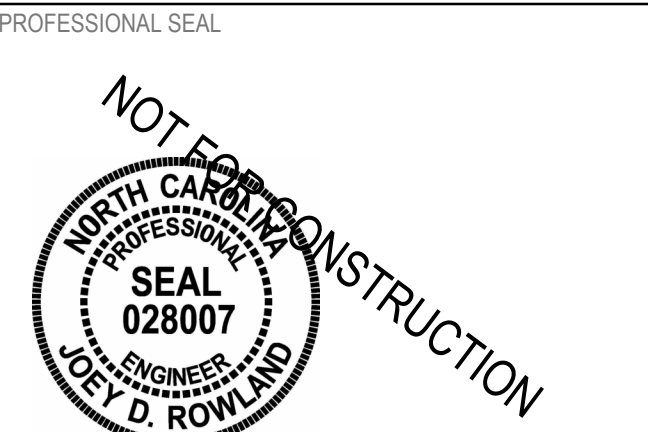
4/15/2019 5:35:12 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_01.gyan@unc.edu



1 STAIR TOWER SECTION  
1/4" = 1'-0"



2 STAIR TOWER SECTION  
1/4" = 1'-0"



SUBMITTAL  
04/15/2019  
CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS	

KEY PLAN

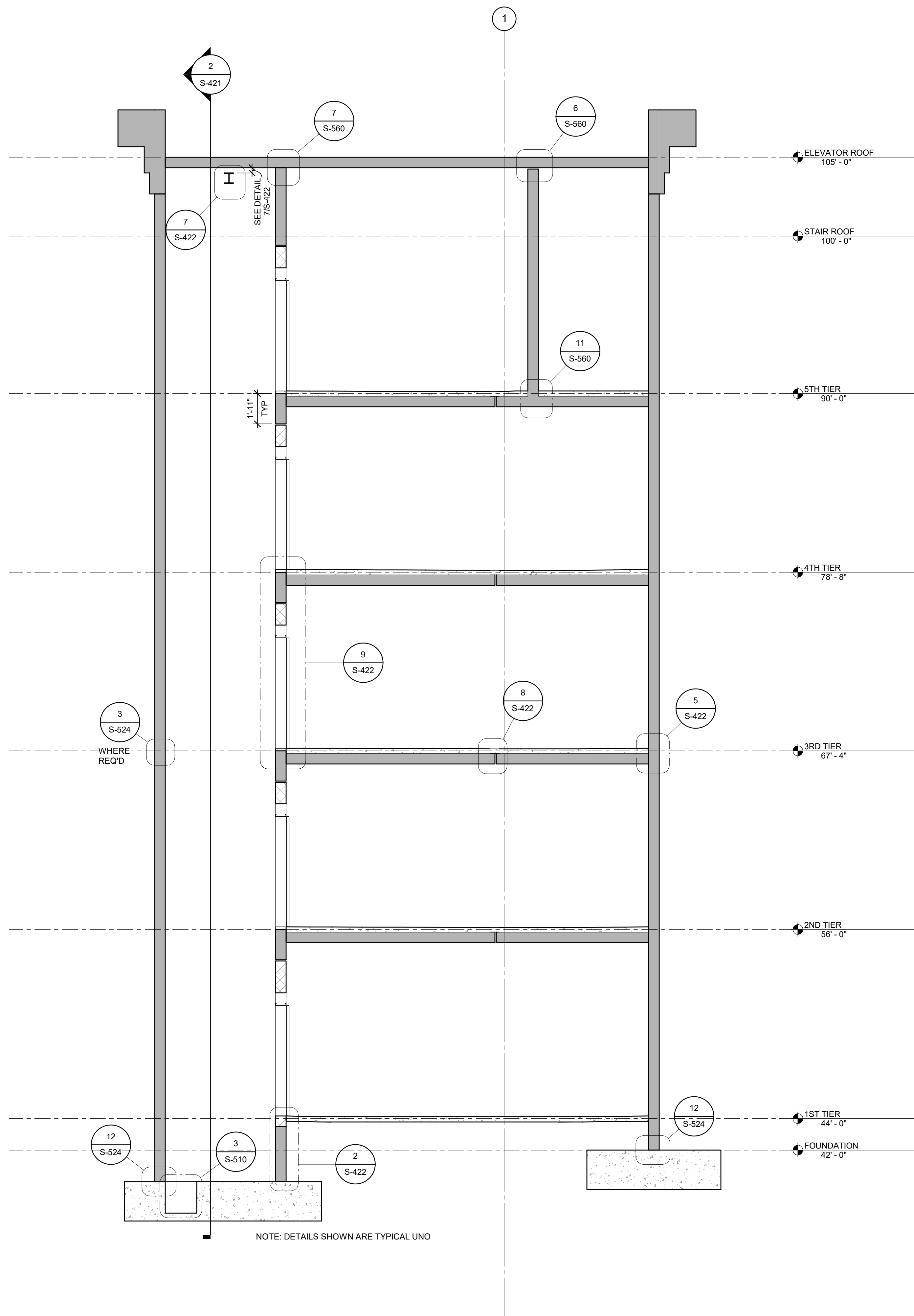
SHEET  
STAIR TOWER SECTIONS

S-420

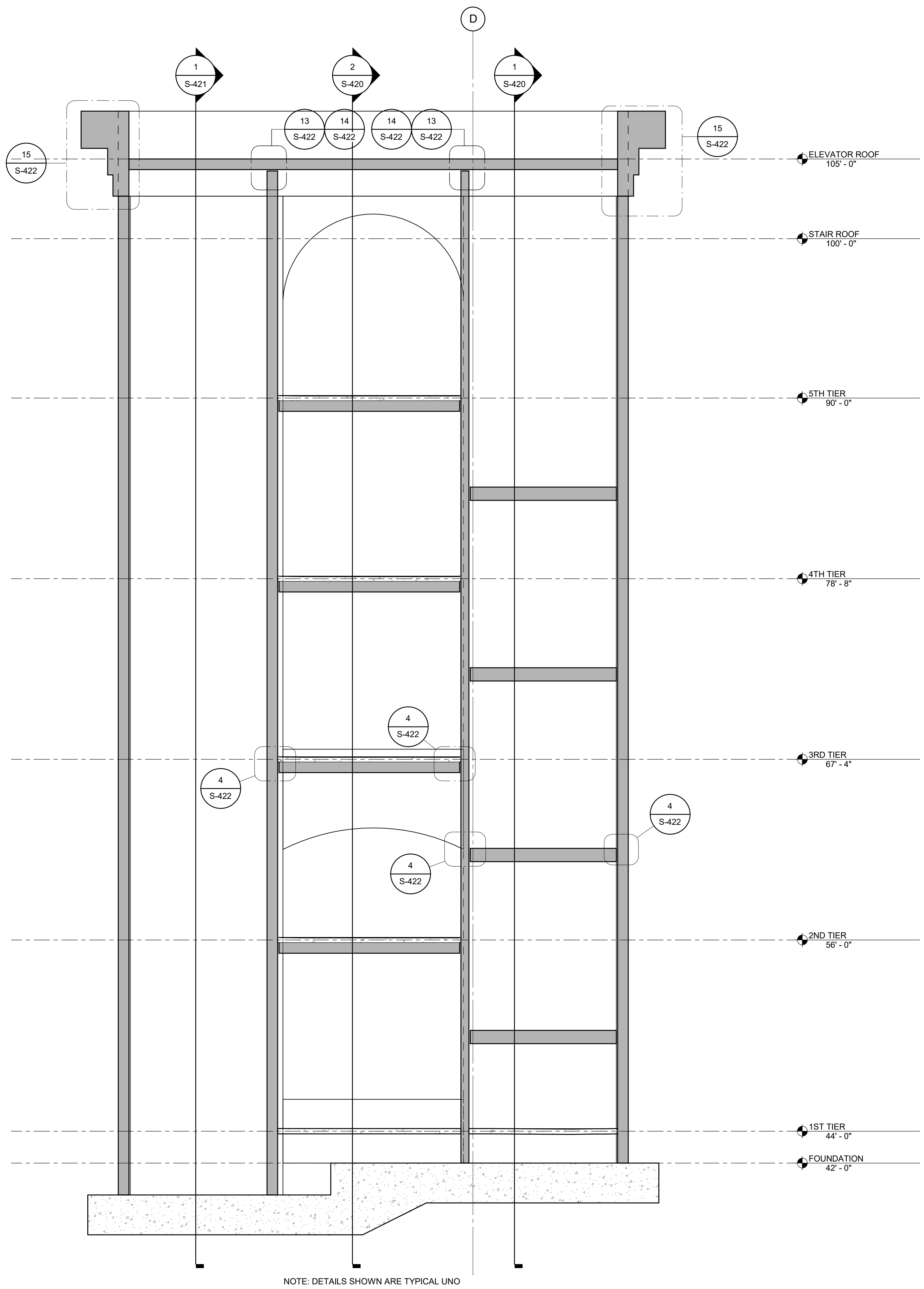
DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker  
ON PROJECT  
NUMBER



4/15/2019 5:35:13 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_oryanham.rvt



1 STAIR TOWER SECTION  
1/4" = 1'-0"



2 STAIR TOWER SECTION  
1/4" = 1'-0"



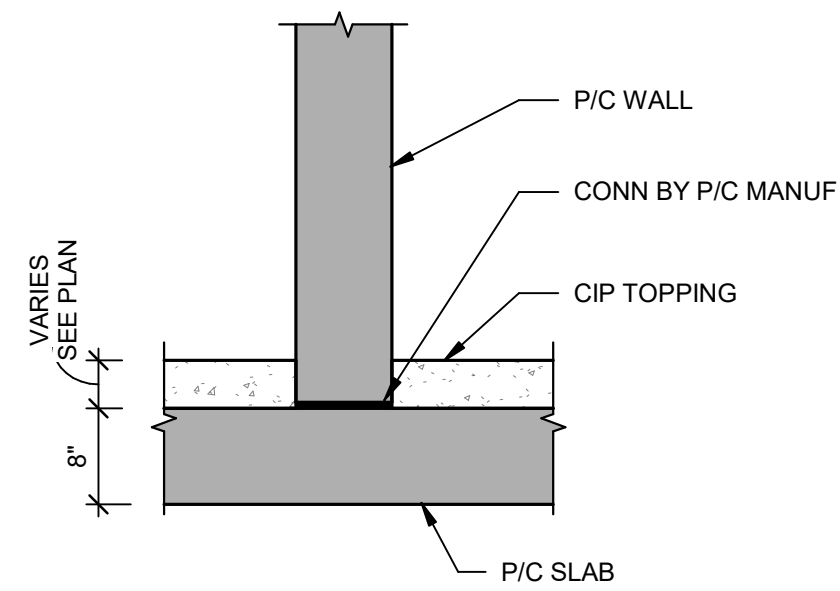
4/15/2019 5:35:16 PM  
C:\revit\Projects\UNC\Wilmington\Desk II\_r77\_oryan\stair.mxd

1  
E  
D  
C  
B  
A

1

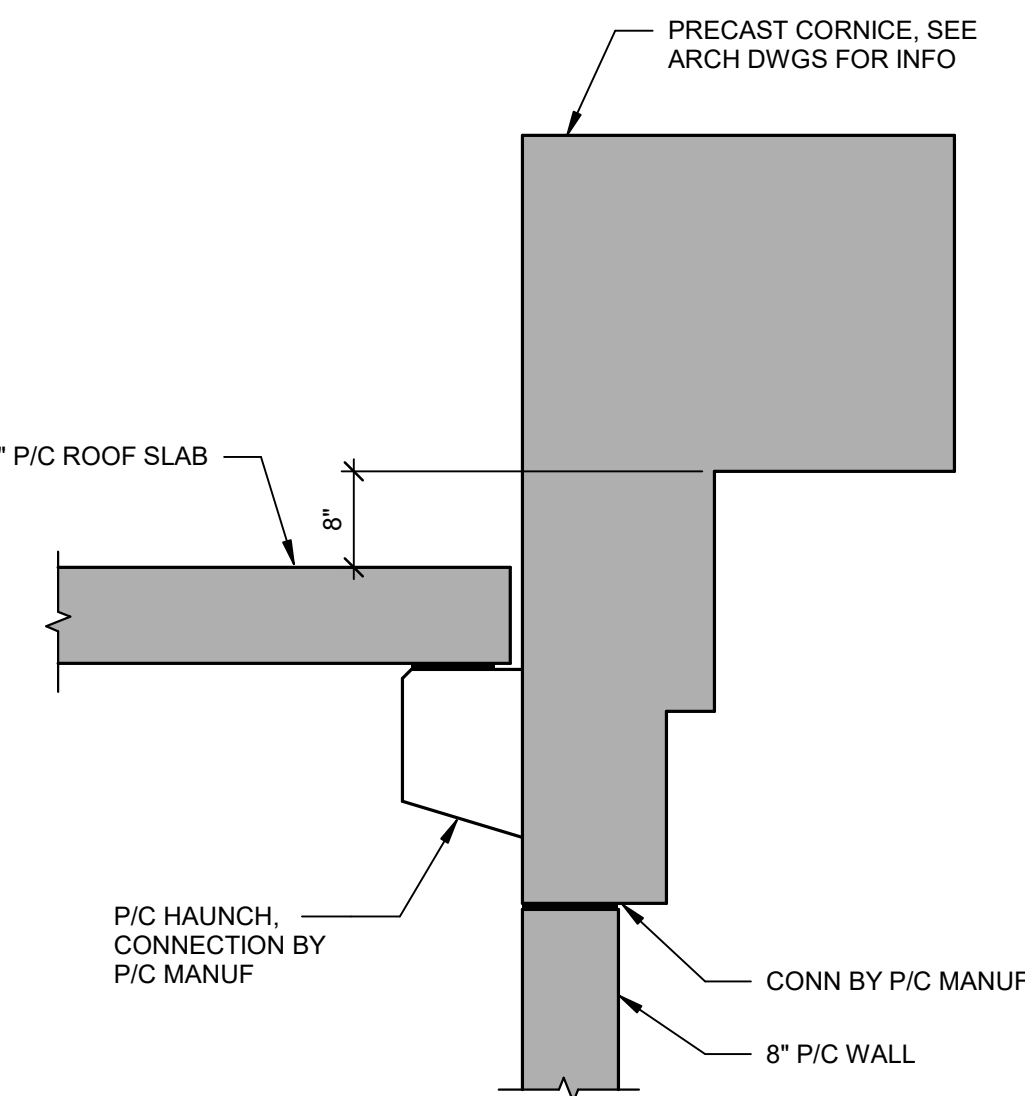
### 16 P/C WALL/SLAB

3/4" = 1'-0"



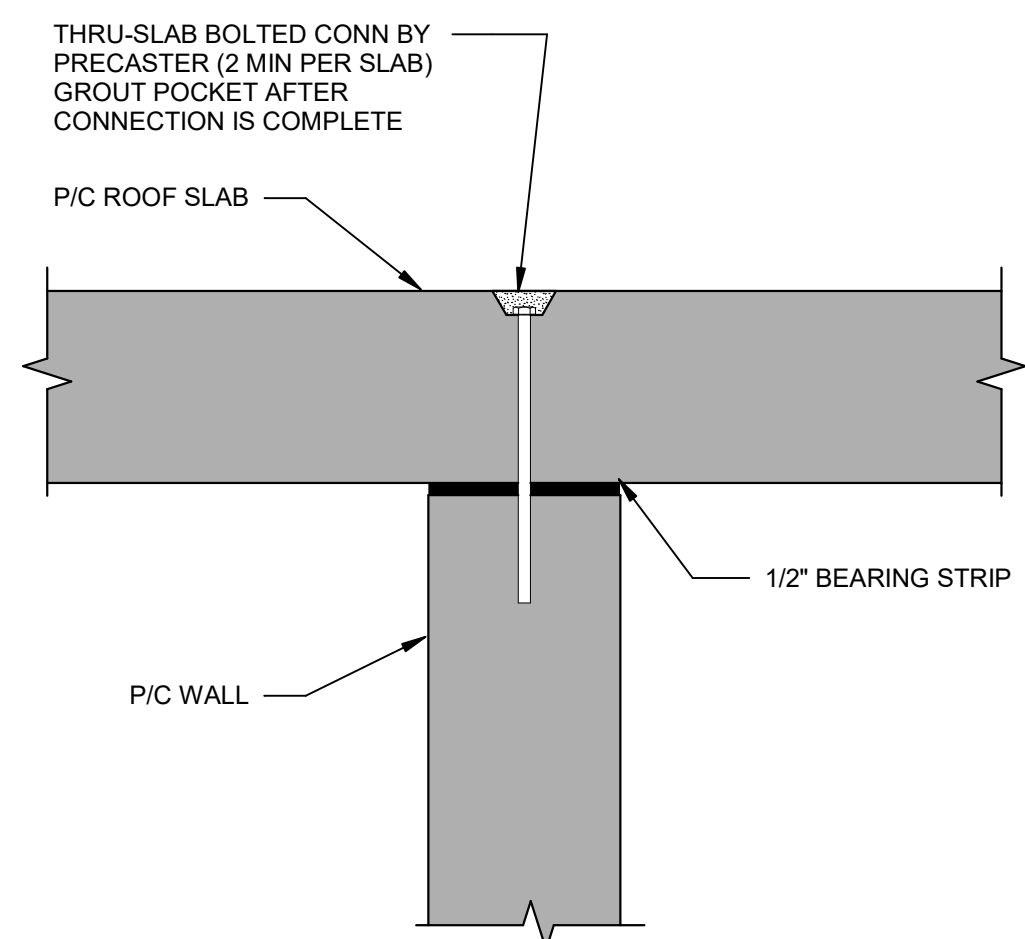
### 15 P/C CORNICE/SLAB DETAIL

3/4" = 1'-0"



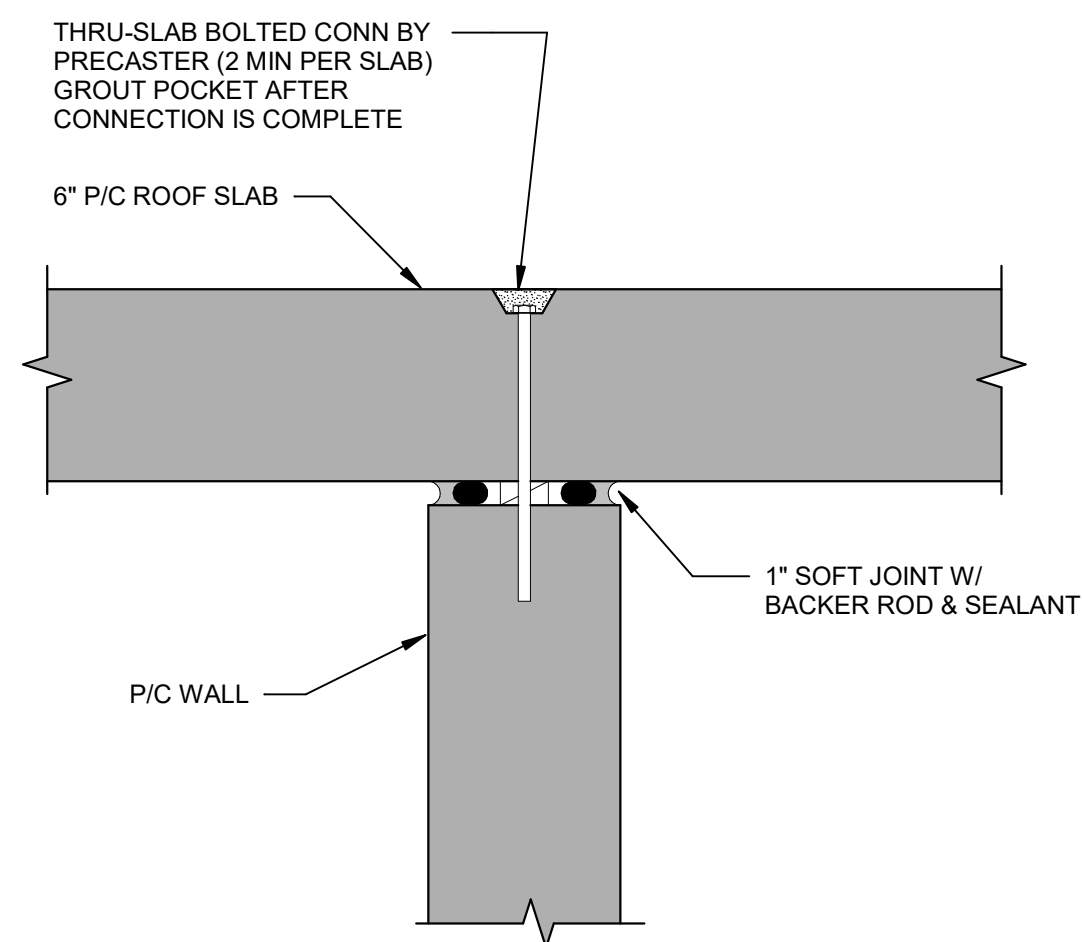
### 14 P/C SLAB/WALL DETAIL

1 1/2" = 1'-0"



### 13 P/C SLAB/ROOF DETAIL

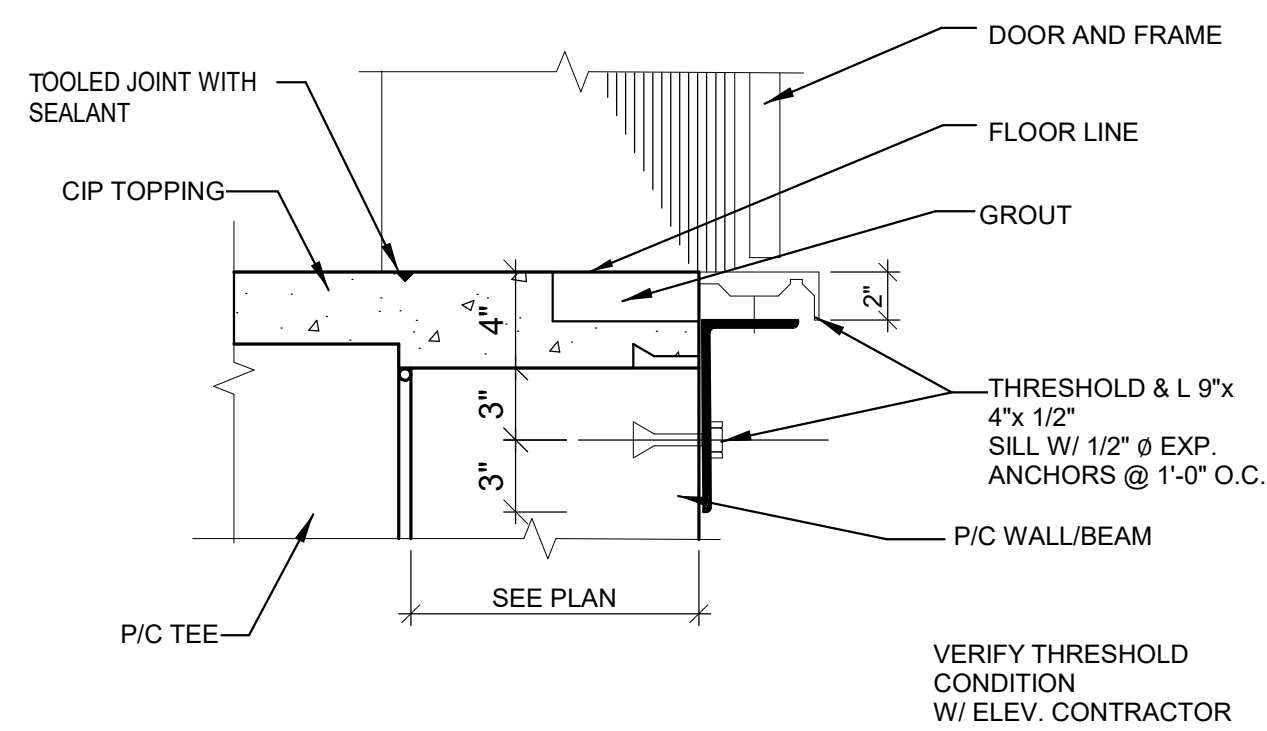
1 1/2" = 1'-0"



2

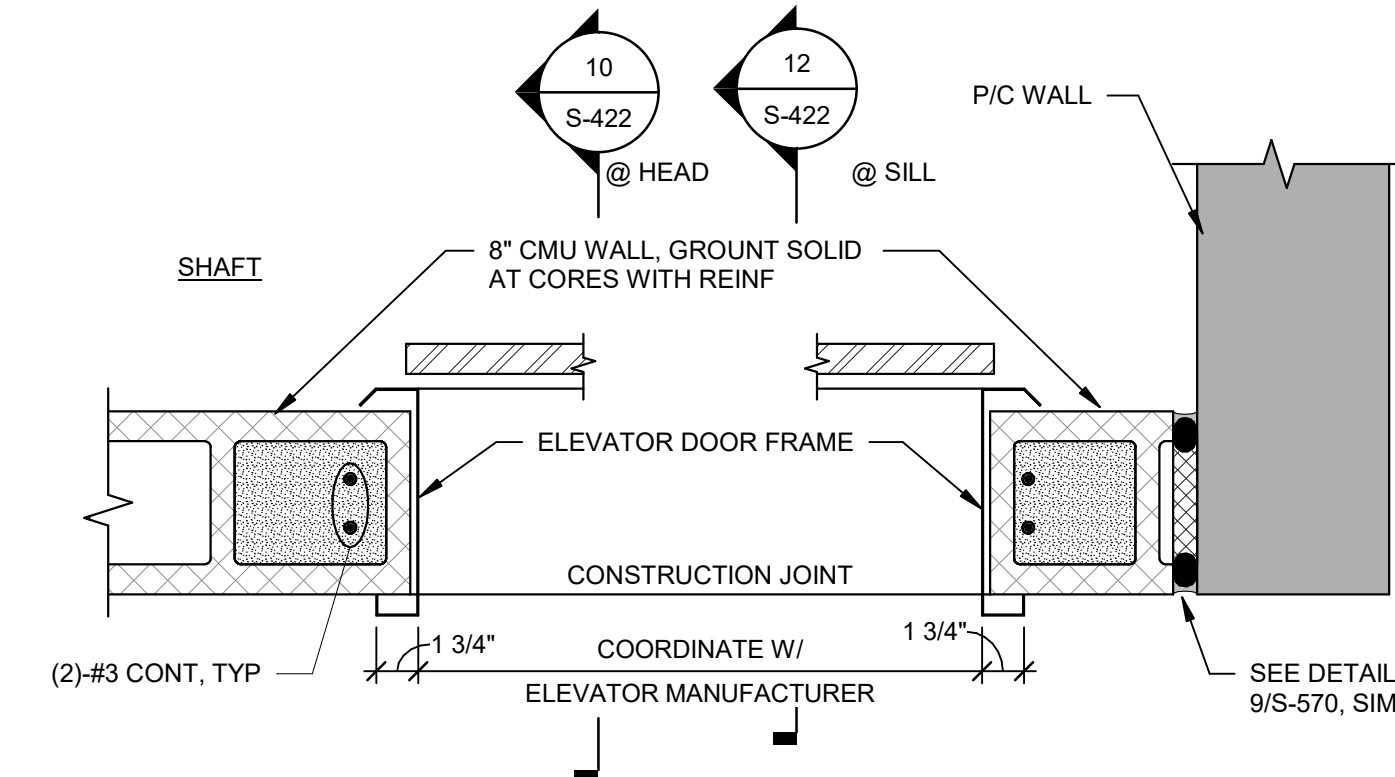
### 12 ELEVATOR SILL DETAIL

1 1/2" = 1'-0"



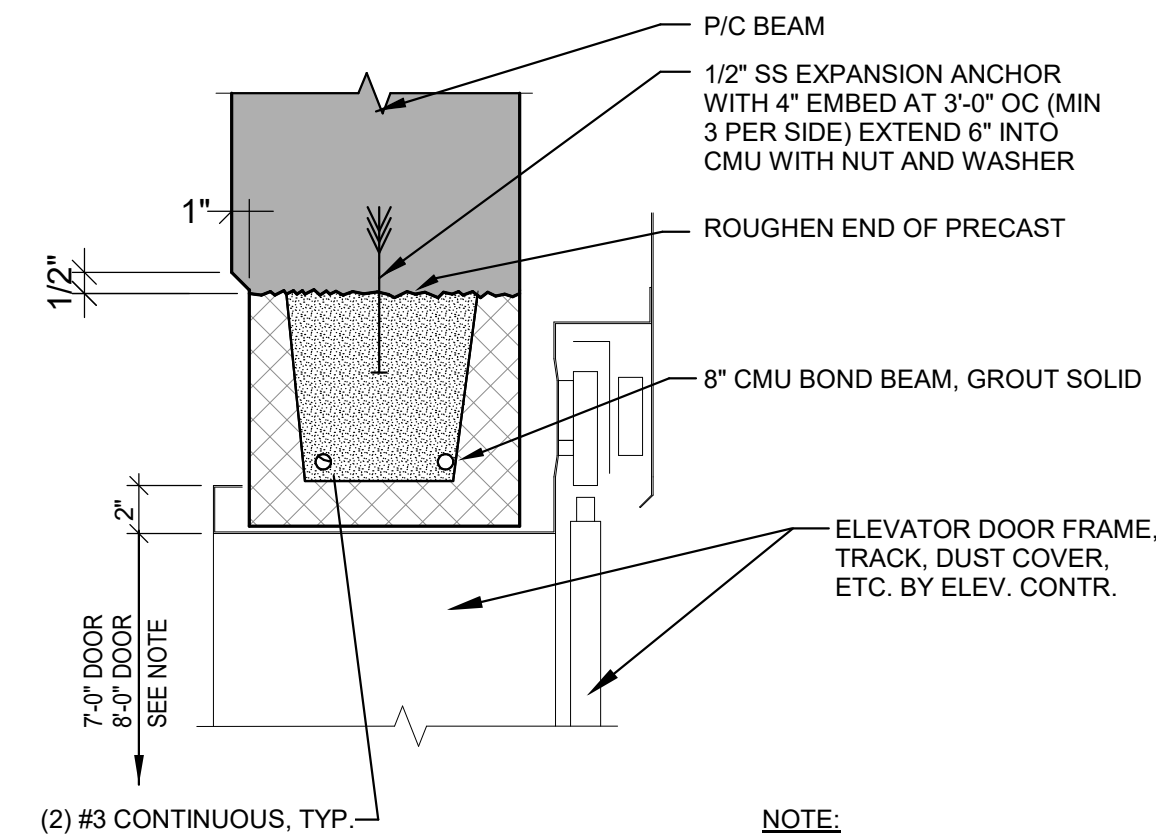
### 11 ELEVATOR JAMB DETAIL

1 1/2" = 1'-0"



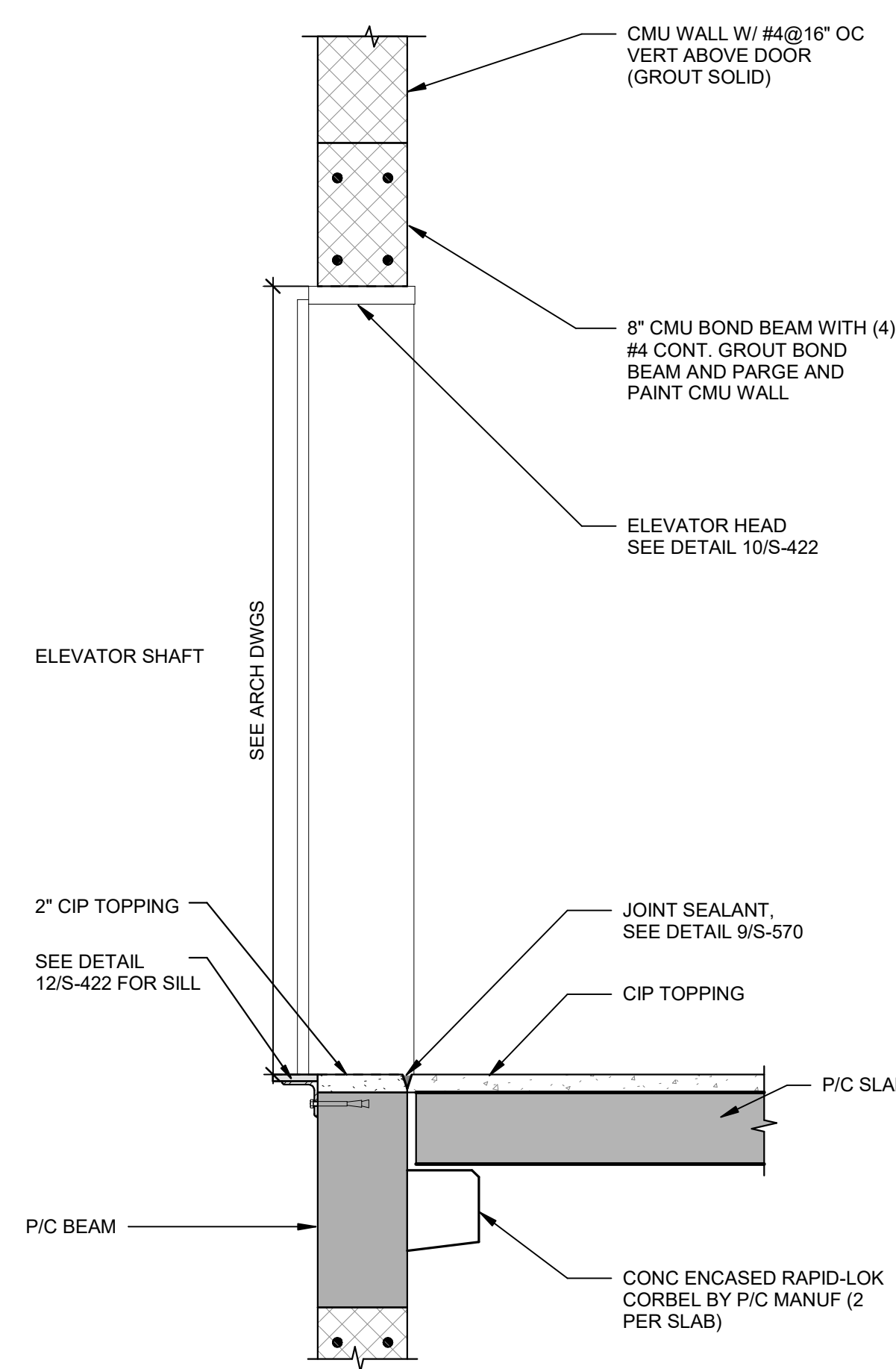
### 10 ELEVATOR HEAD DETAIL

1 1/2" = 1'-0"



### 9 ELEVATOR DOOR SECTION

3/4" = 1'-0"

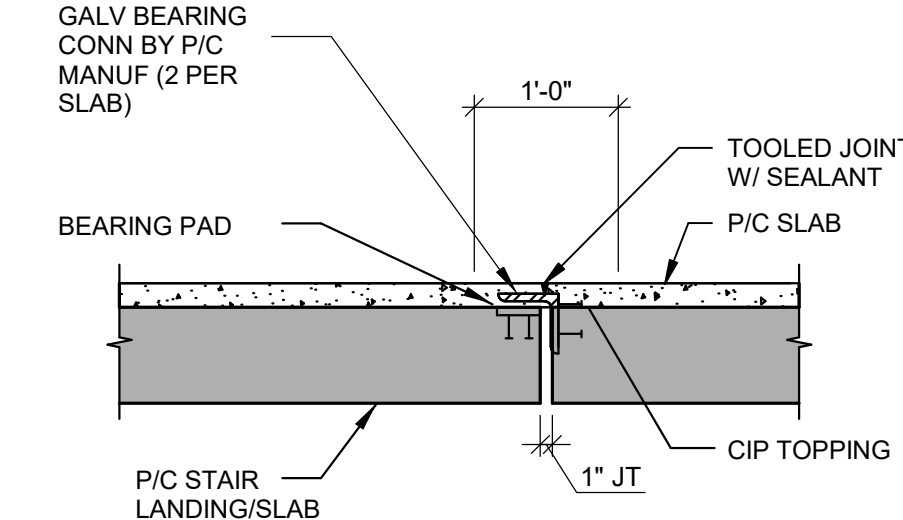


3

4

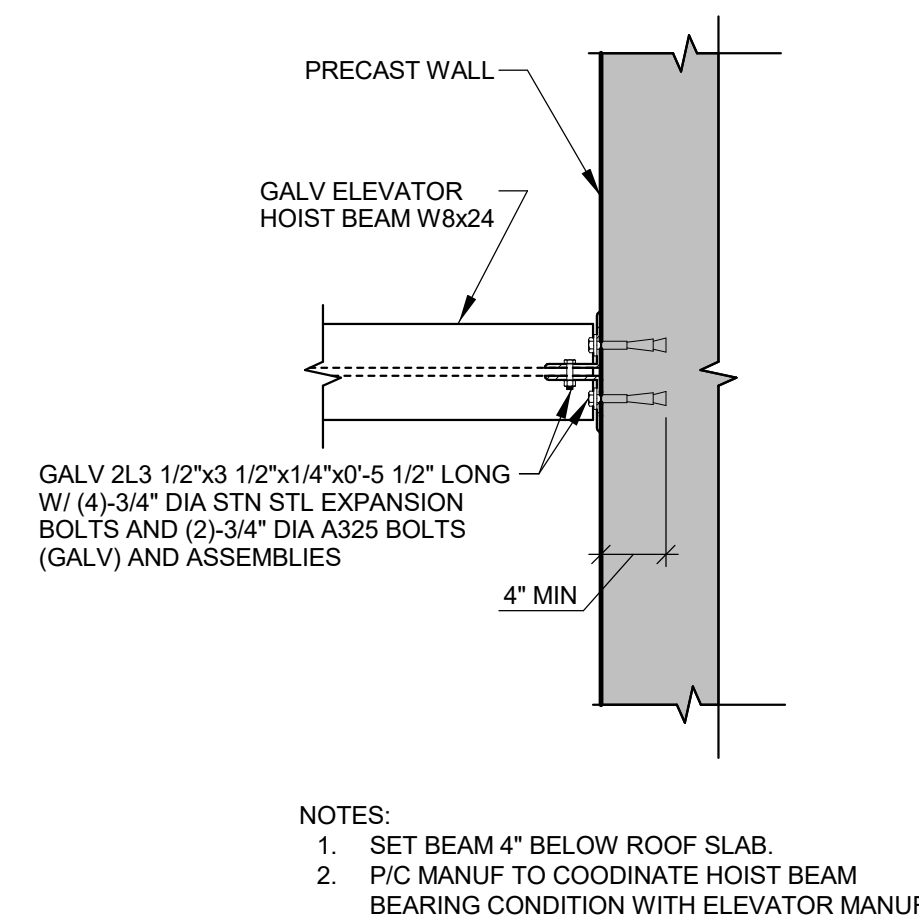
### 8 P/C STAIR/SLAB DETAIL

3/4" = 1'-0"



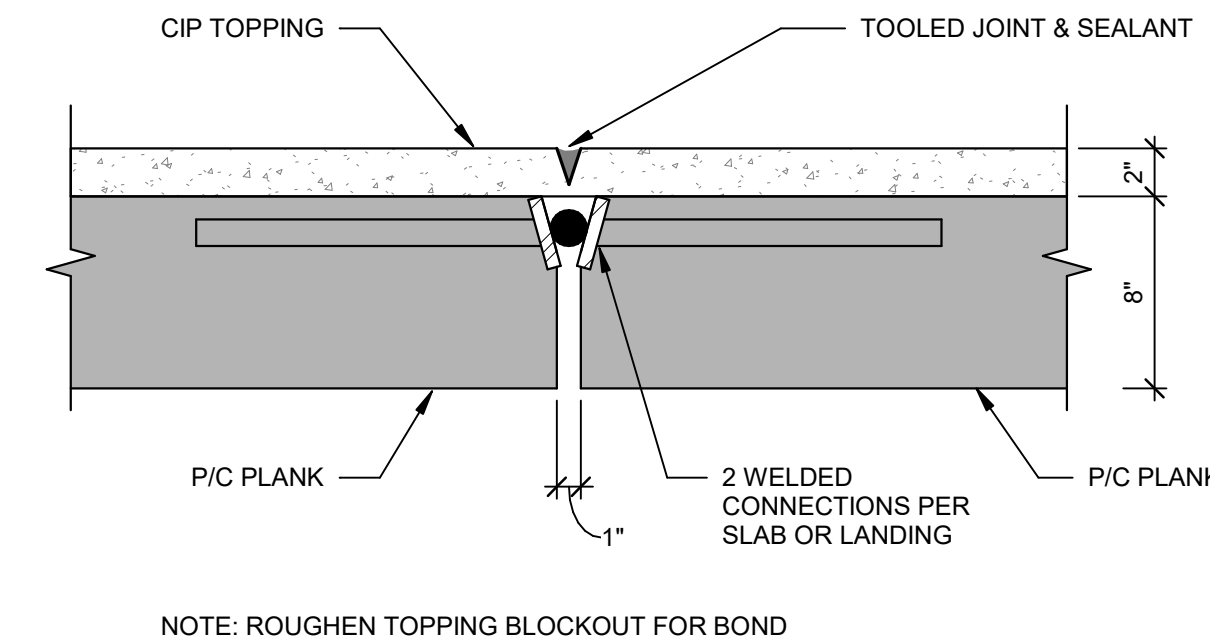
### 7 ELEVATOR HOIST BEAM DETAIL

1" = 1'-0"



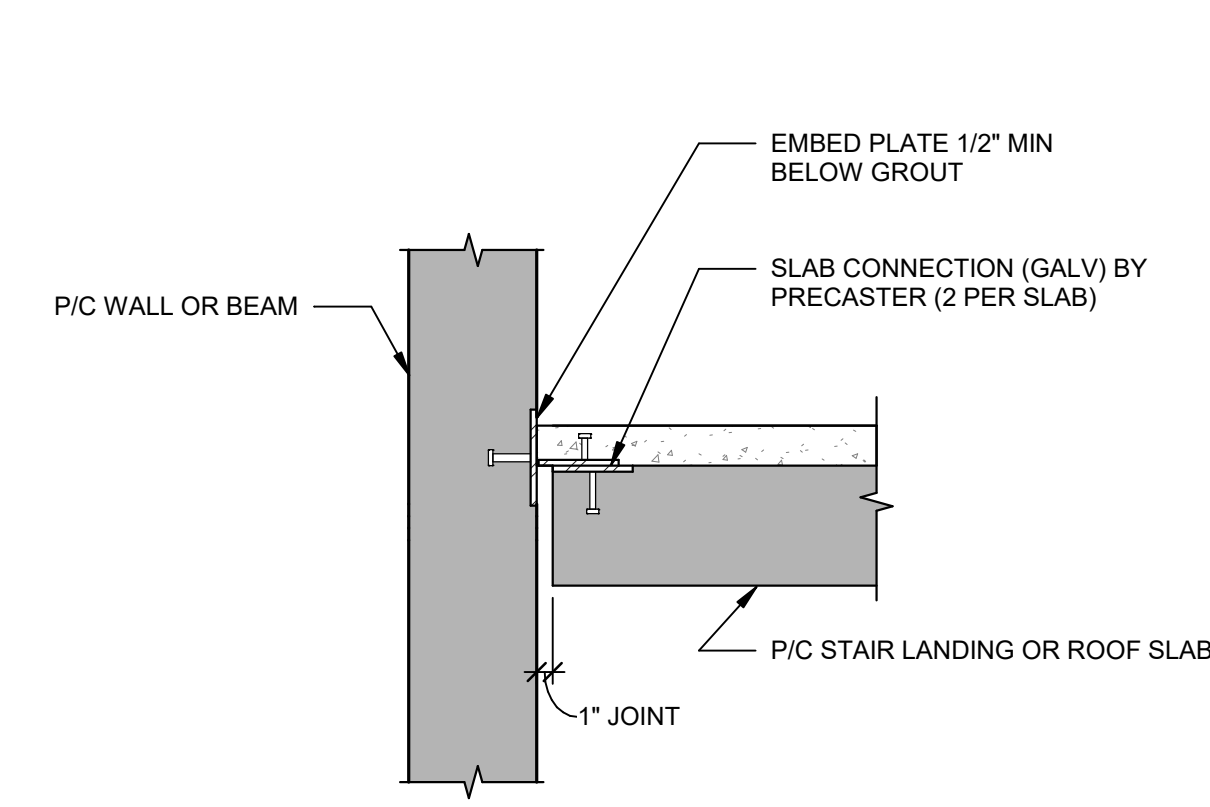
### 6 SLAB/SLAB DETAIL

1 1/2" = 1'-0"



### 5 STAIR/BAM DETAIL

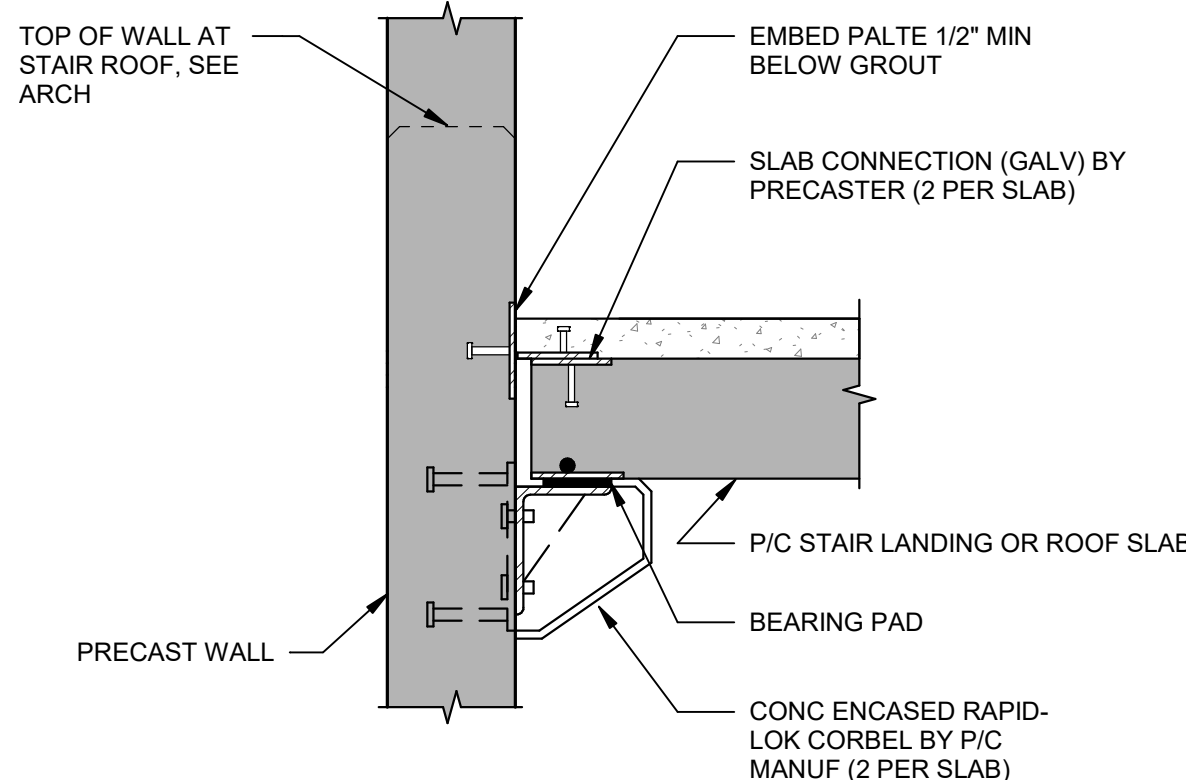
1" = 1'-0"



5

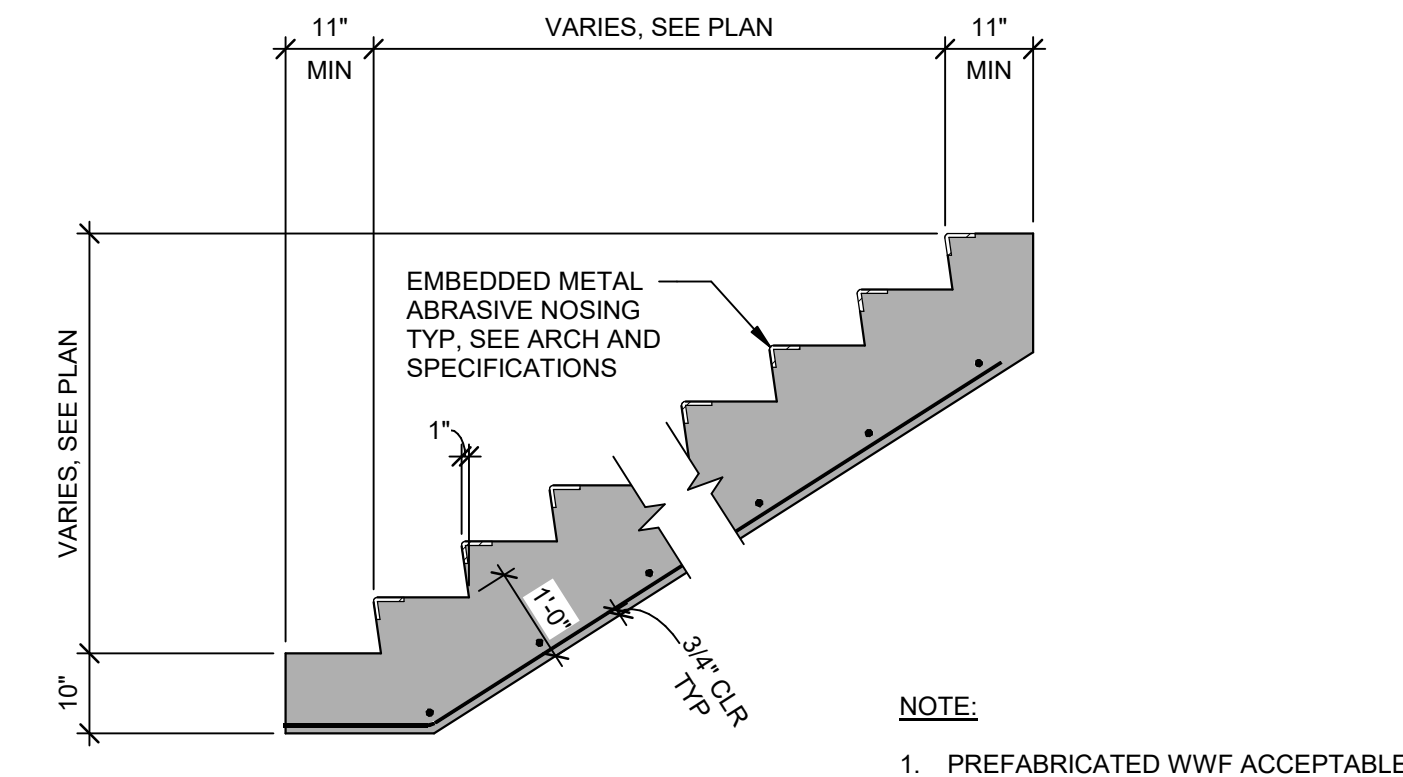
### 4 WALL/SLAB DETAIL

1" = 1'-0"



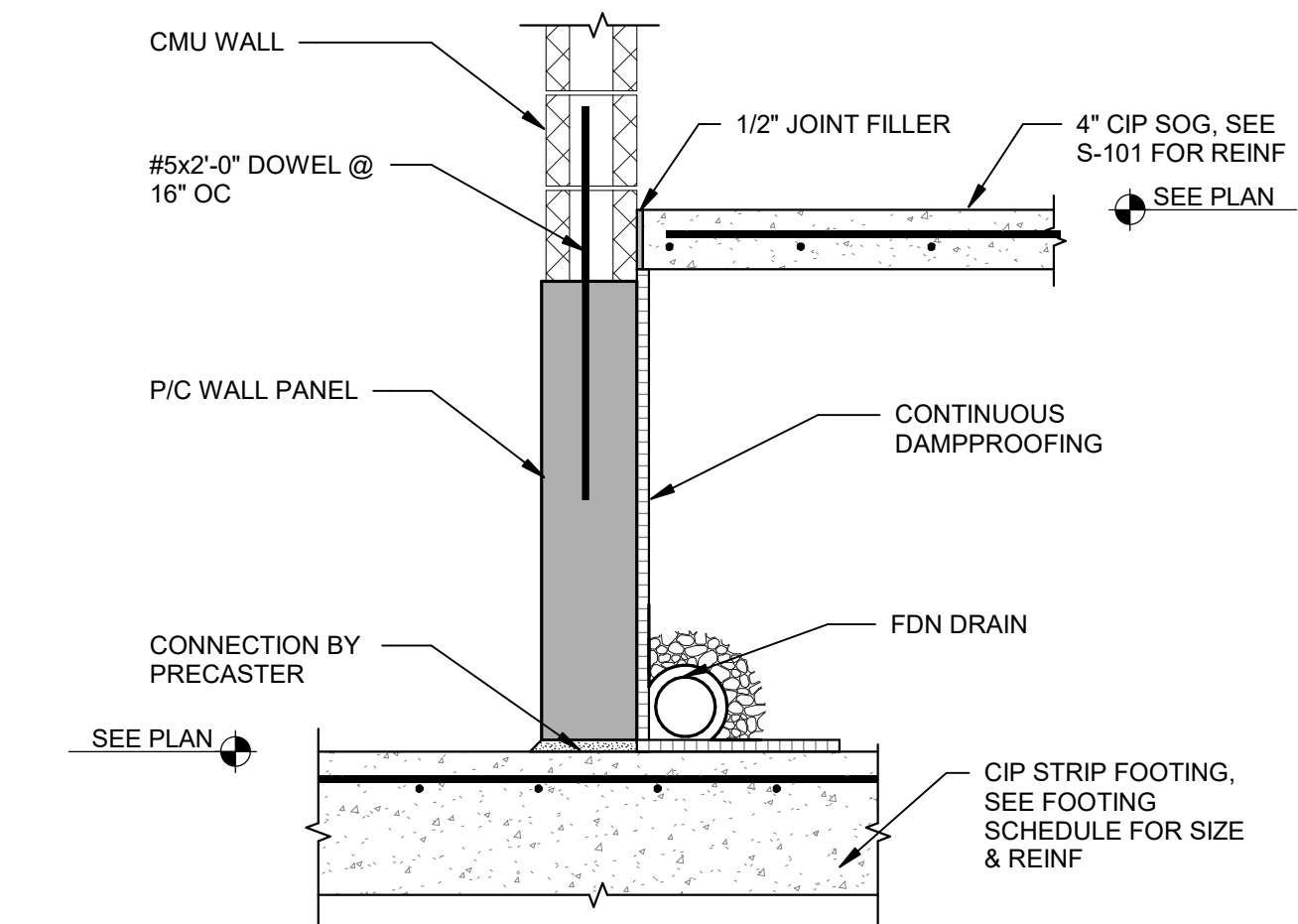
### 3 TYPICAL STAIR SECTION

1/2" = 1'-0"



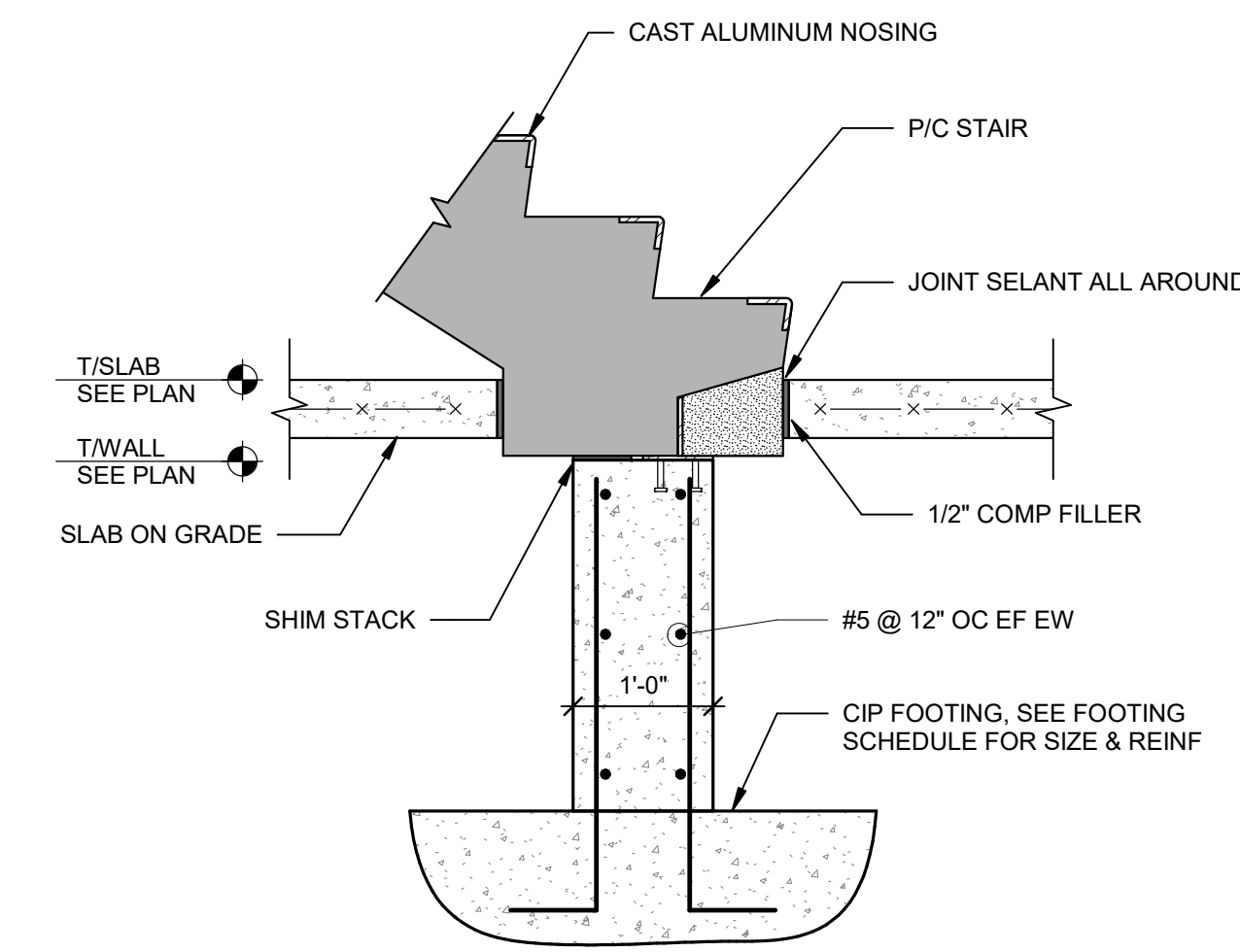
### 2 ELEVATOR FOUNDATION SECTION

3/4" = 1'-0"



### 1 P/C STAIR/SLAB DETAIL

3/4" = 1'-0"



UNIVERSITY of NORTH CAROLINA WILMINGTON  
601 S COLLEGE ROAD  
WILMINGTON, NORTH CAROLINA 28403  
PARKING DECK II AND SURFACE  
PARKING (DESIGN-BUILD)  
SOUTH CAMPUS - 4965 RIEGEL ROAD

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty**  
Construction

DESIGNER

**CLARK NEXSEN**

1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028

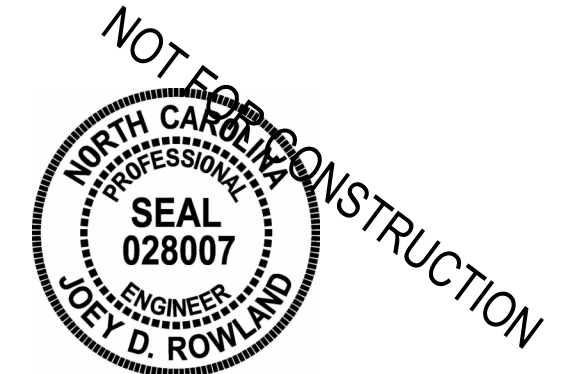


13860 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
www.walkerconsultants.com  
NC License No. F-0518



CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEAL



SUBMITTAL

04/15/2019

CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS

NO.	DESCRIPTION	DATE

KEY PLAN

SHEET

STAIR TOWER SECTIONS &  
DETAILS

S-422

DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

ON PROJECT  
NUMBER



1

2

3

4

5

6

E

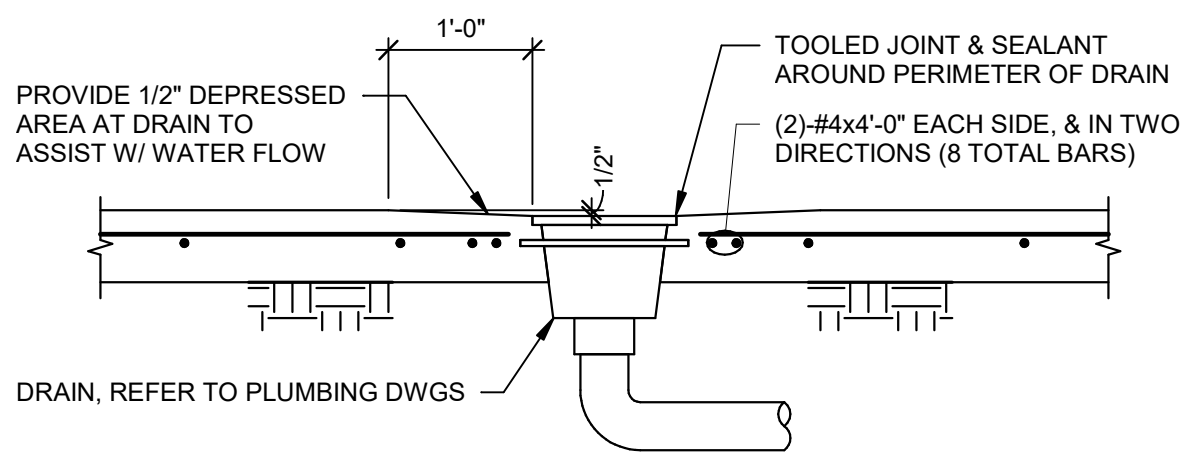
D

C

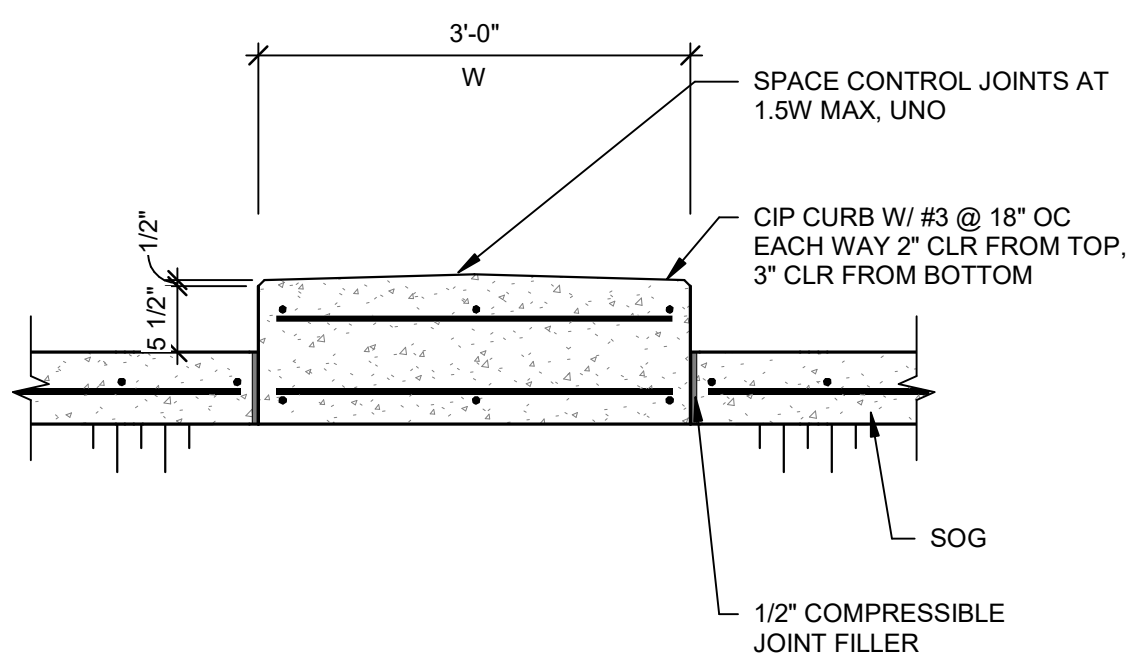
B

A

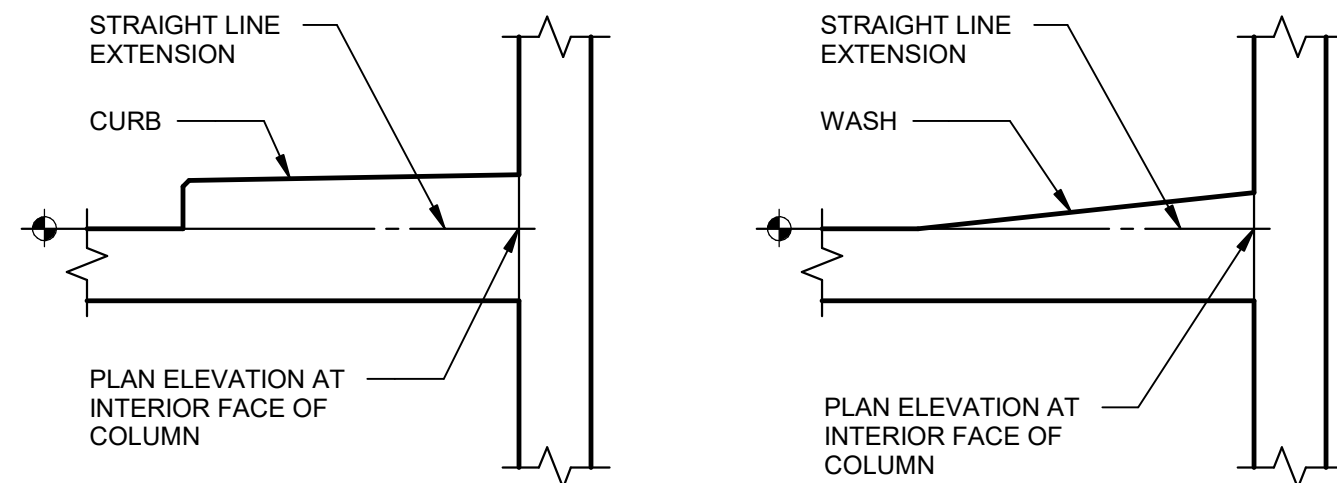
4/15/2019 5:35:17 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_roy.gardham.rvt



14 DRAIN ON GRADE DETAIL  
3/4" = 1'-0"

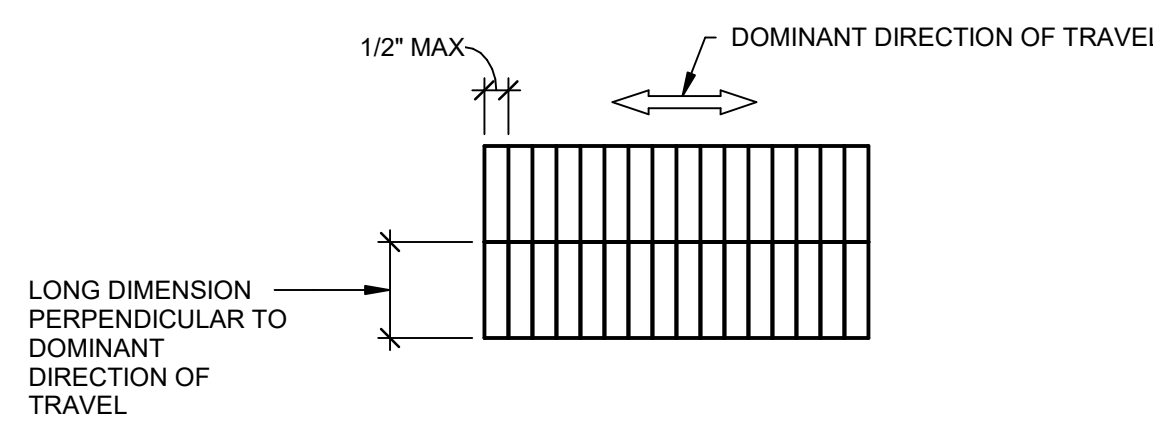


13 CURB DETAIL  
3/4" = 1'-0"



NOTE:  
1. DETAILS APPLY TO SLAB-ON-GRADE AND SUPPORTED SLABS, UNLESS OTHERWISE NOTED.

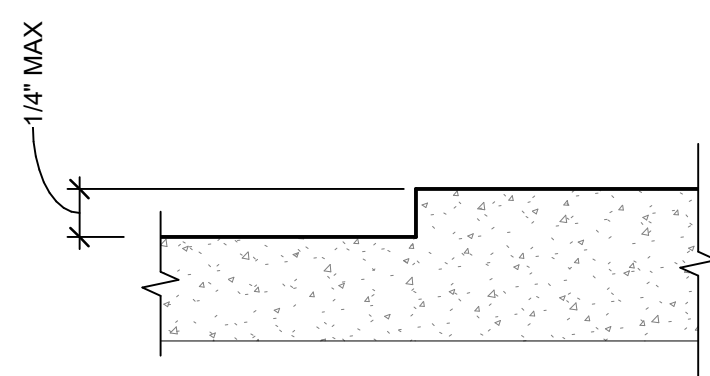
12 ARCHITECTURAL / STRUCTURAL PLAN ELEVATION KEY (P/T)  
3/4" = 1'-0"



REFERENCED REGULATIONS AND STANDARDS

1. OPENINGS IN FLOOR OR GROUND SURFACES SHALL NOT ALLOW PASSAGE OF A SPHERE OF MORE THAN 1/2" DIA EXCEPT AS ALLOWED FOR ELEVATORS ADA 408.4.3, AND ADA 407.4.3, AND PLATFORM LIFTS ADA 410.4.
2. ADA-ACCESSIBILITY GUIDELINES FIGURE 303.2 ELONGATED OPENINGS IN FLOOR OR GROUND SURFACES.
3. ASTM F1637-02 STANDARD PRACTICE FOR SAFE WALKING SURFACES IN SECTION 10.
4. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

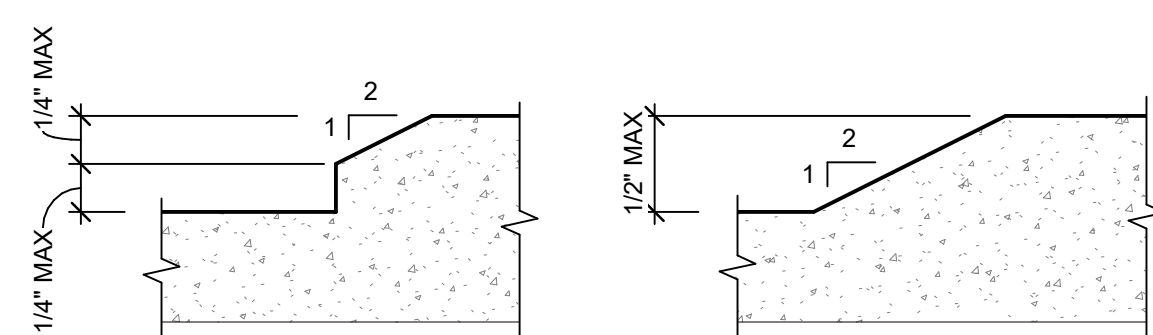
11 OPENINGS IN FLOOR SURFACES  
NTS



REFERENCED REGULATIONS AND STANDARDS

1. CHANGES IN LEVEL LESS THAN 1/4".
2. ADA-ACCESSIBILITY GUIDELINES FIGURE 303.2 CHANGE IN LEVEL FIG. 1.
3. ASTM F1637-02 STANDARD PRACTICE FOR SAFE WALKING SURFACES IN SECTION 5.2.2.
4. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

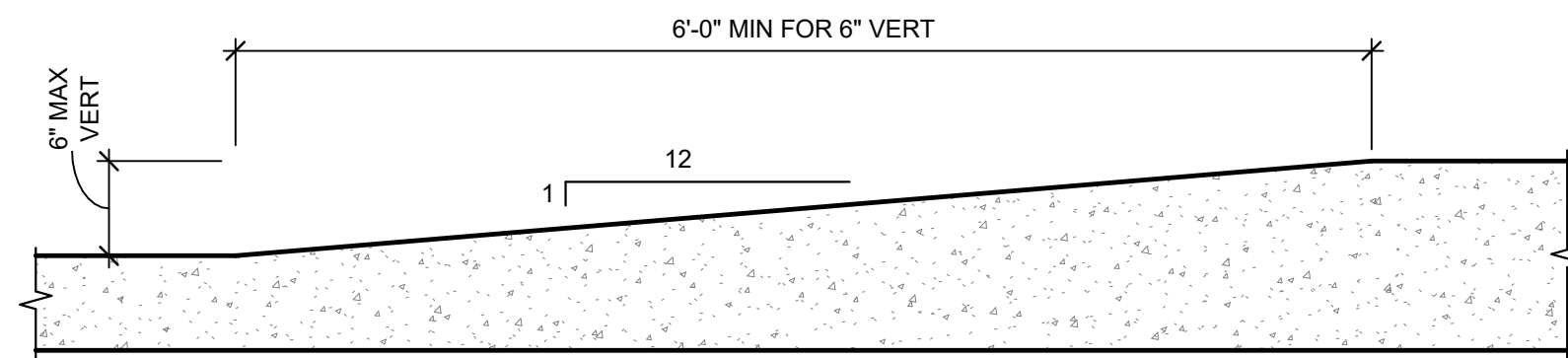
10 VERTICAL CHANGE IN LEVEL  
NTS



REFERENCED REGULATIONS AND STANDARDS

1. CHANGES IN LEVEL BETWEEN 1/4" AND 1/2".
2. ADA-ACCESSIBILITY GUIDELINES FIGURE 303.2 BEVELED CHANGE IN LEVEL.
3. ASTM F1637-02 STANDARD PRACTICE FOR SAFE WALKING SURFACES IN SECTION 5.2.3.
4. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

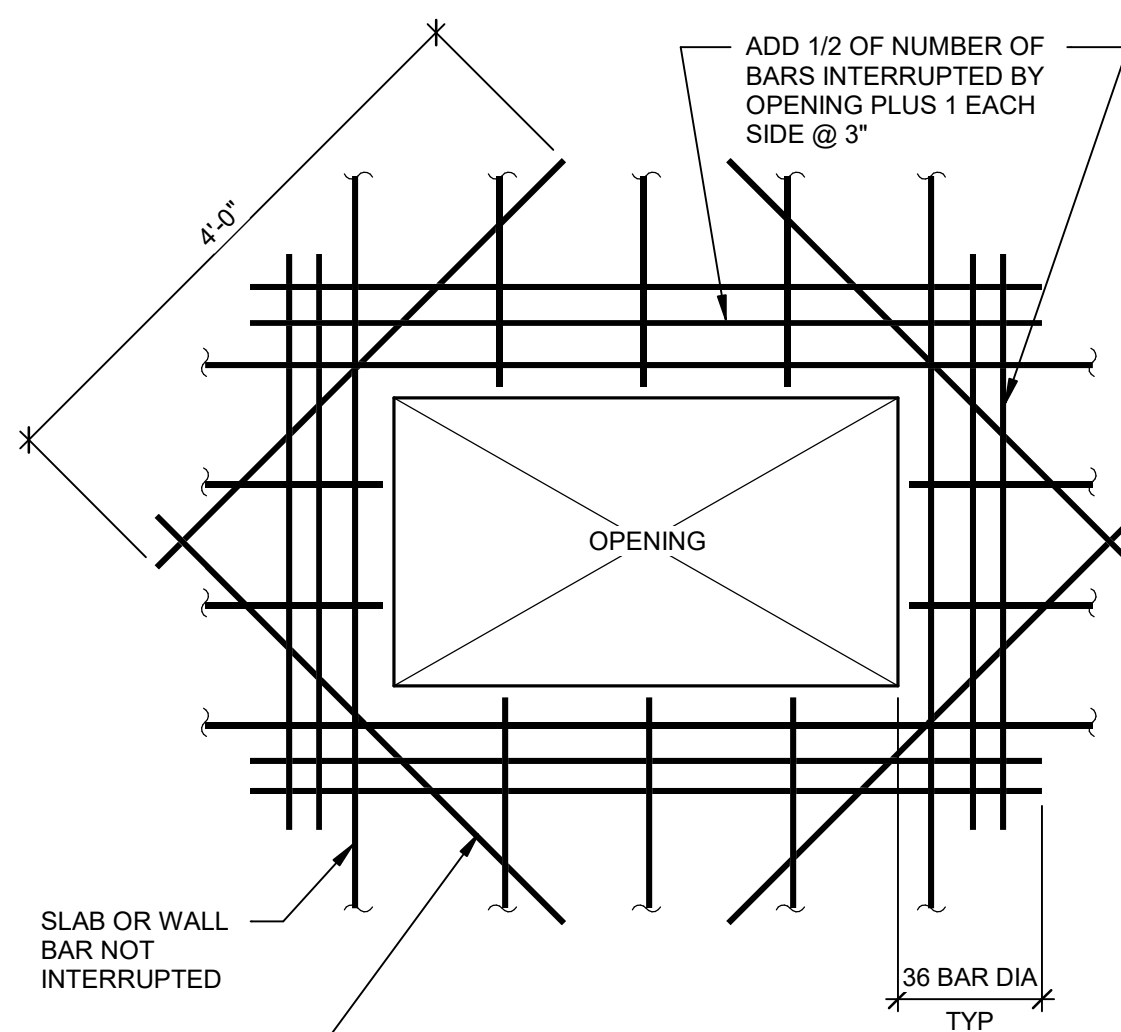
9 VERTICAL CHANGE IN LEVEL  
NTS



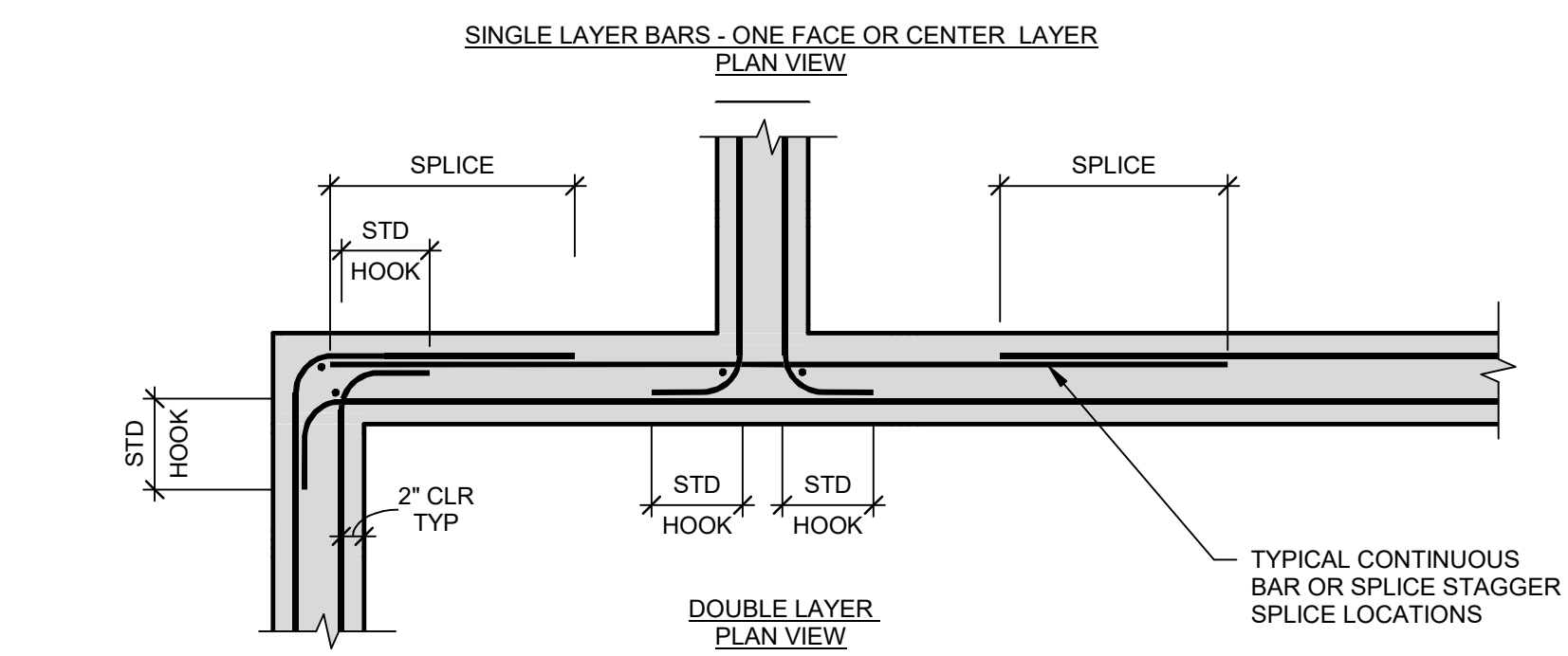
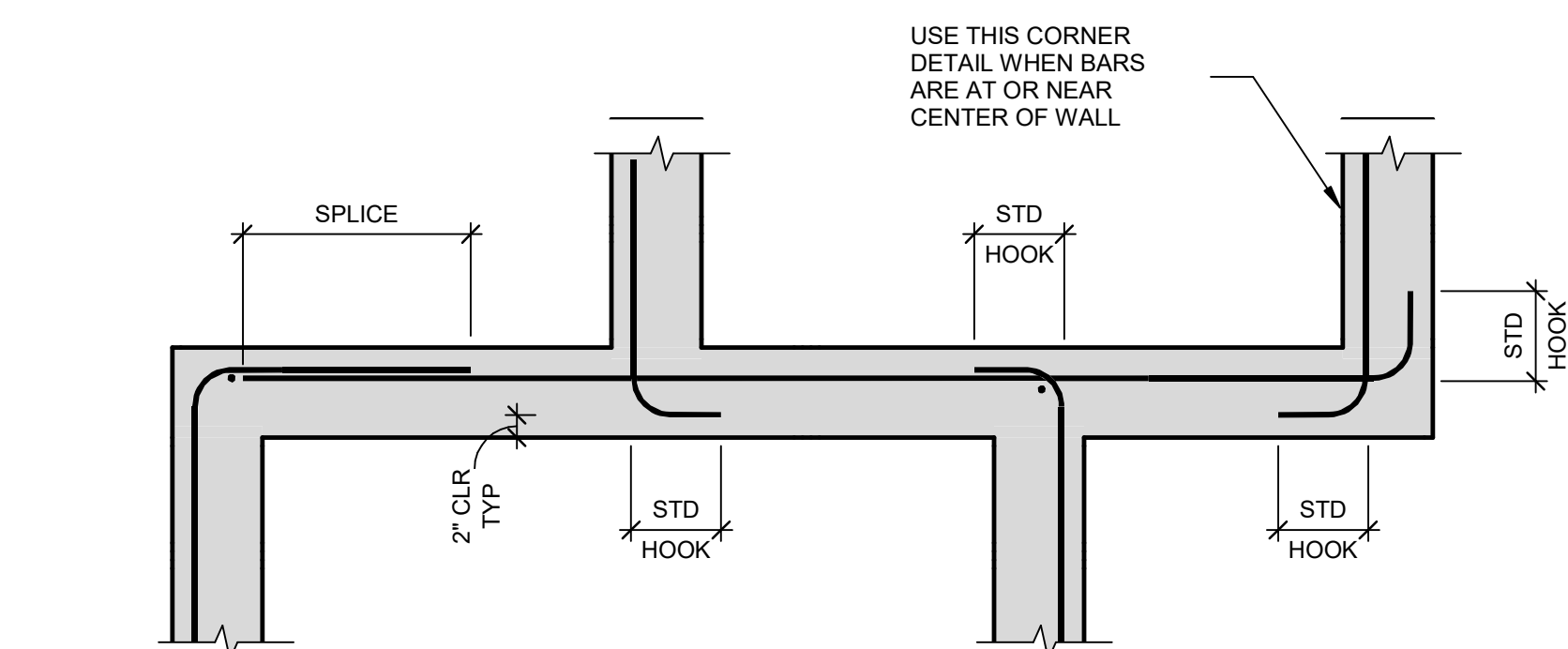
REFERENCED REGULATIONS AND STANDARDS

1. CHANGES IN LEVEL LESS THAN 1/2" AND 6".  
A. REFER TO REFERENCED STANDARDS FOR ADDITIONAL REQUIREMENTS.  
B. MAXIMUM SLOPE ON RAMP SURFACE IS 8.33%.
2. ADA-ACCESSIBILITY GUIDELINES RAMP SECTION 405 AND CURB RAMPS SECTION 406.
3. ASTM F1637-02 STANDARD PRACTICE FOR SAFE WALKING SURFACES. CHANGES IN LEVEL GREATER THAN 1/2" IN SECTION 5.2.4.
4. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

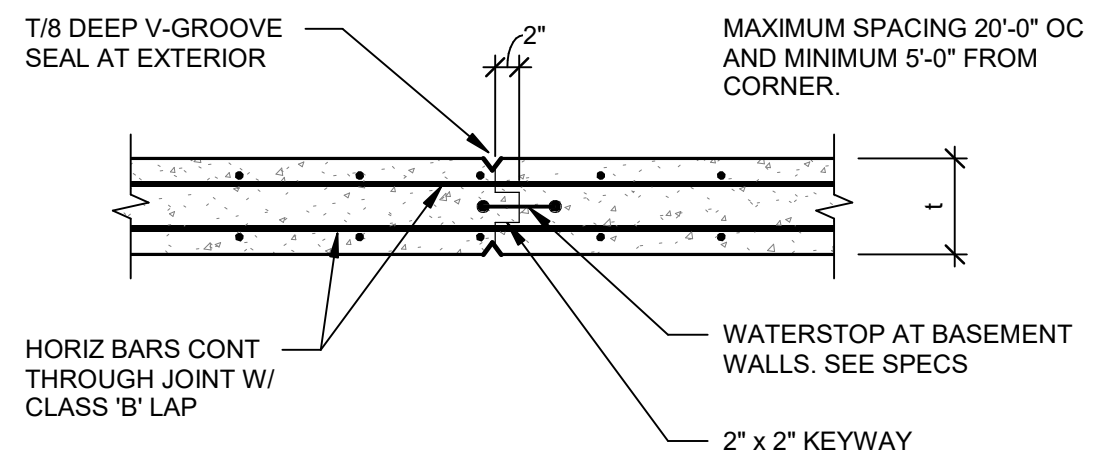
8 VERTICAL CHANGE IN LEVEL  
NTS



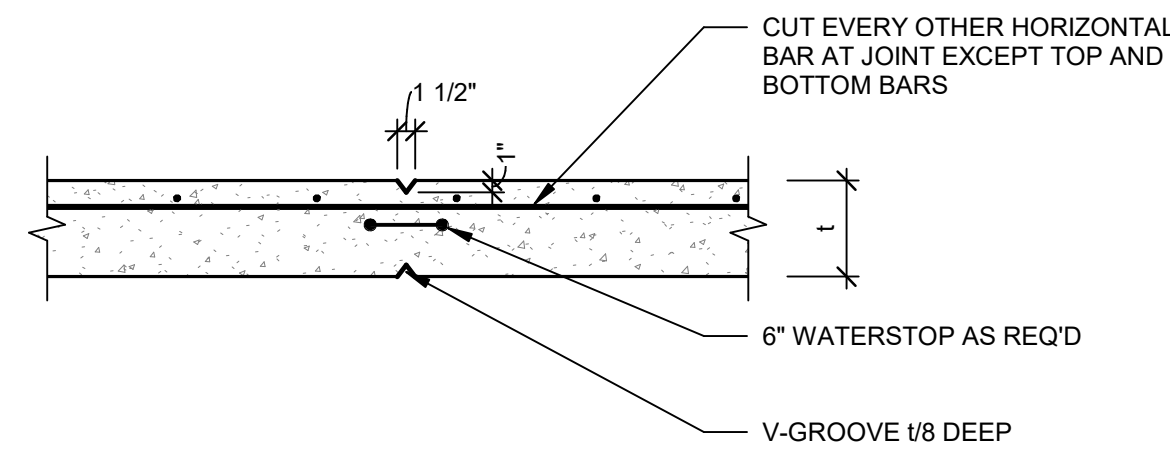
7 TYPICAL SLAB/WALL OPENING  
NTS



6 CORNER REINFORCEMENT  
3/4" = 1'-0"

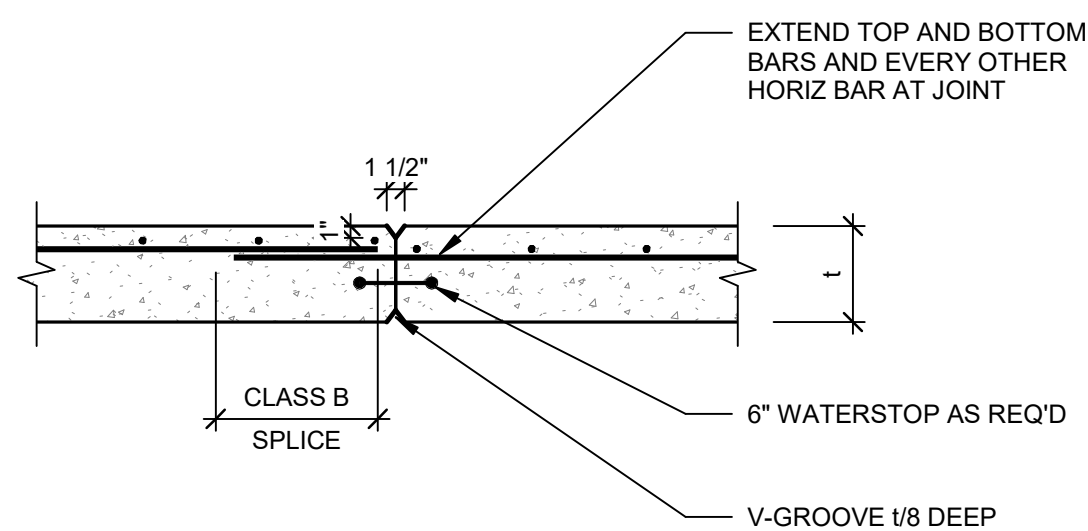


5 WALL CONSTRUCTION JOINT  
NTS

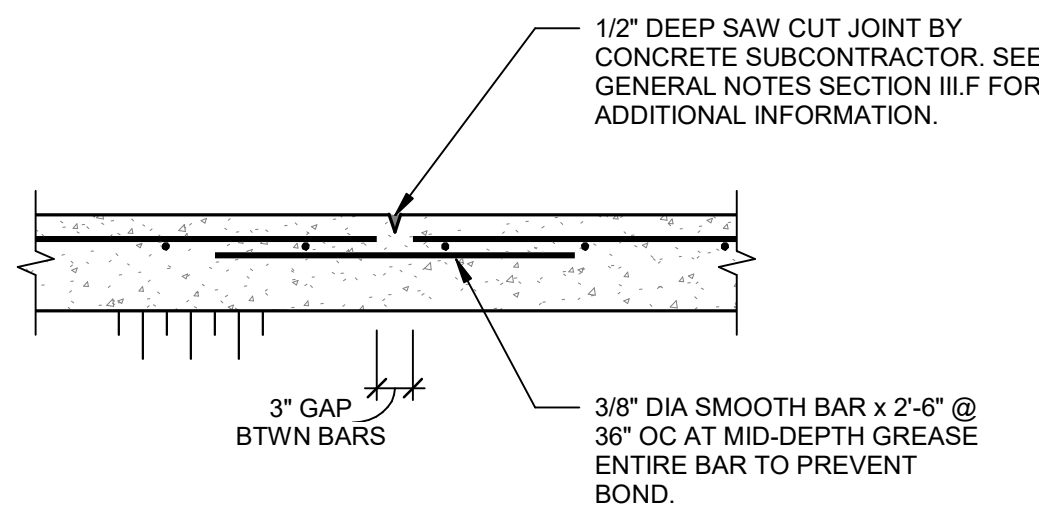


NOTE:  
1. JOINT SPACING: 20'-0" MAXIMUM AND NO MORE THAN 10'-0" FROM CORNER.

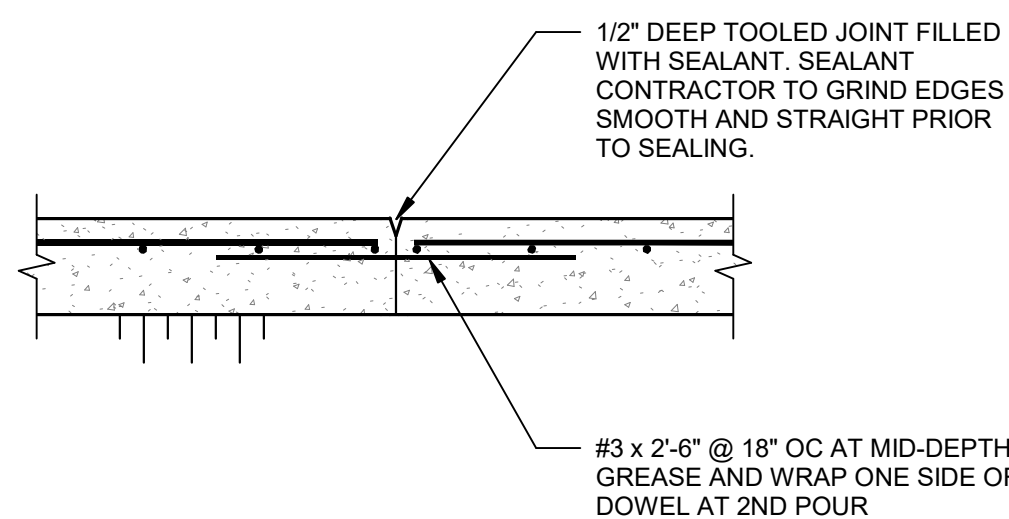
4 VERTICAL WALL CONTROL JOINT  
NTS



3 VERTICAL WALL CONSTRUCTION JOINT  
NTS



2 SLAB CONTROL JOINT  
NTS



1 SLAB CONSTRUCTION JOINT  
NTS



UNIVERSITY of NORTH CAROLINA WILMINGTON  
601 S COLLEGE ROAD  
WILMINGTON, NORTH CAROLINA 28403  
PARKING DECK II AND SURFACE  
PARKING (DESIGN-BUILD)  
SOUTH CAMPUS - 4965 RIEGEL ROAD

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty**  
Construction

DESIGNER



**CLARK NEXSEN**  
1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028



**WALKER**  
CONSULTANTS

13860 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518



CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEAL



SUBMITTAL

04/15/2019

CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS


KEY PLAN

SHEET

TYPICAL DETAILS

S-501

DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

ON PROJECT  
NUMBER



4/15/2019 5:35:19 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_09.granham.rvt

1  
E  
D  
C  
B  
A

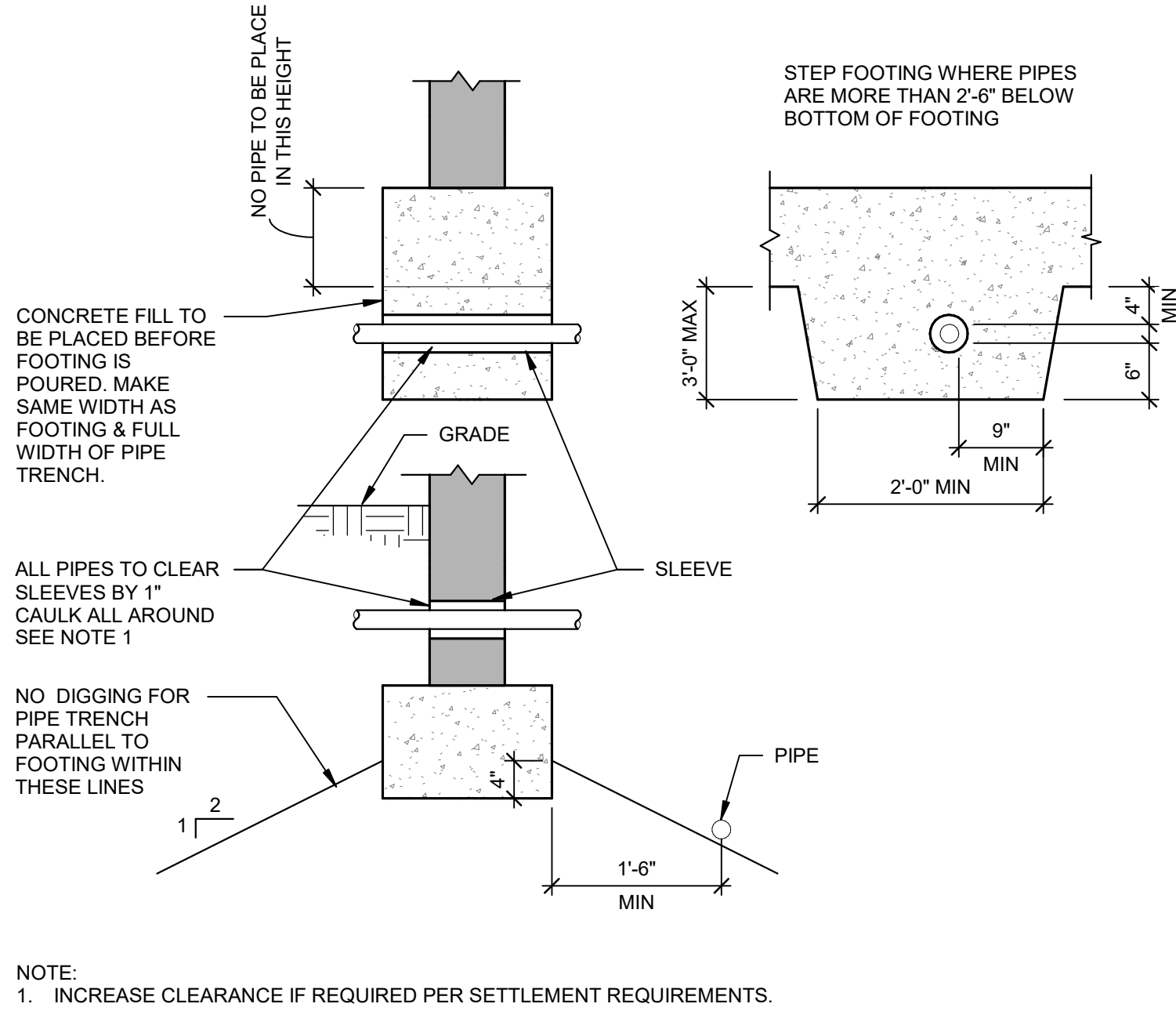
2

3

4

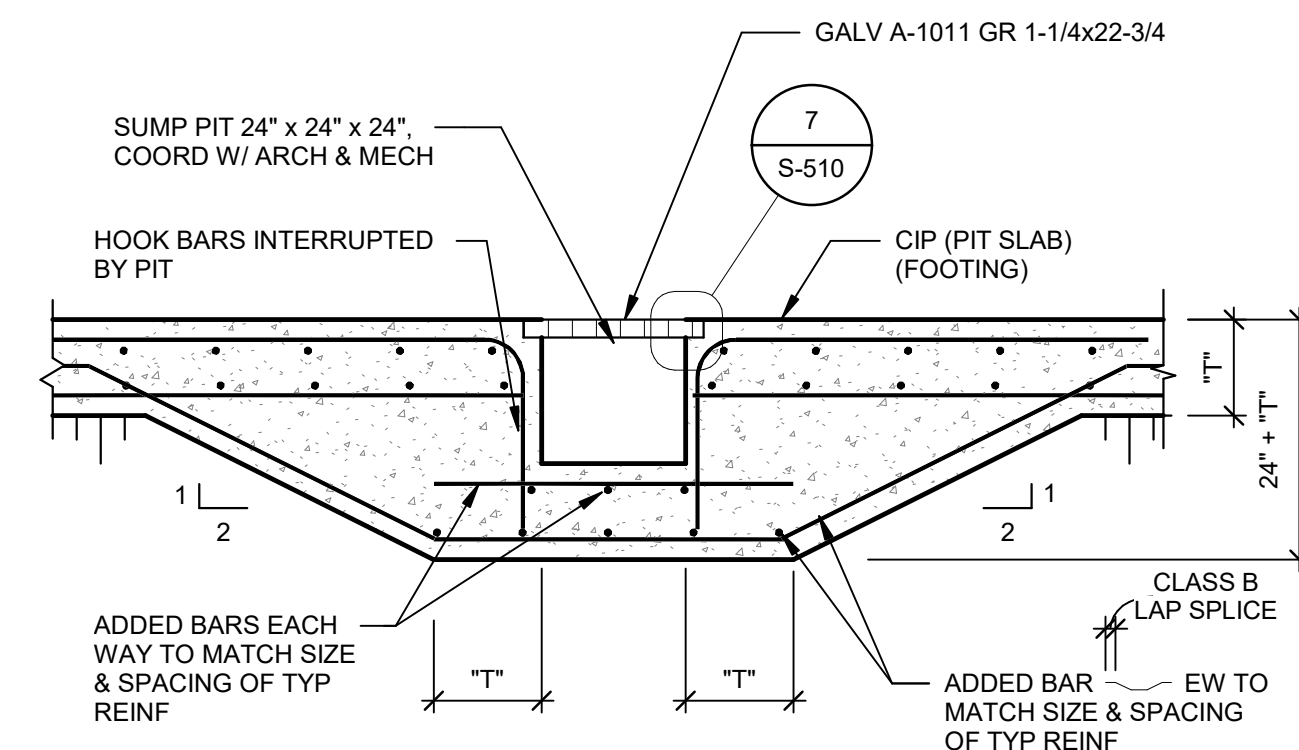
5

6



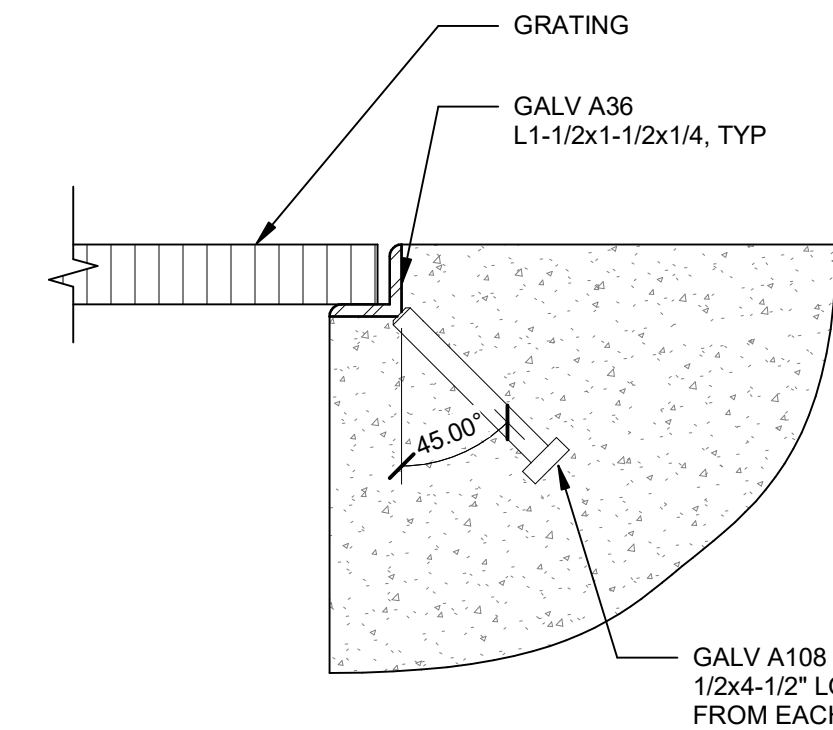
#### 4 PIPE @ WALL & FOOTING DETAIL

3/4" = 1'-0"



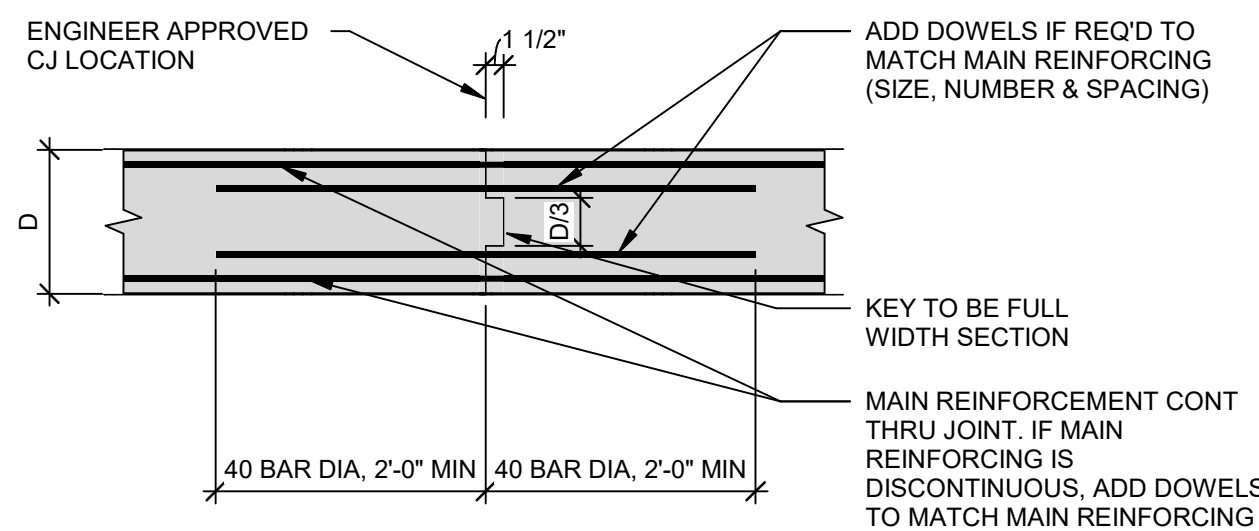
#### 3 SUMP PIT DETAIL

3/4" = 1'-0"



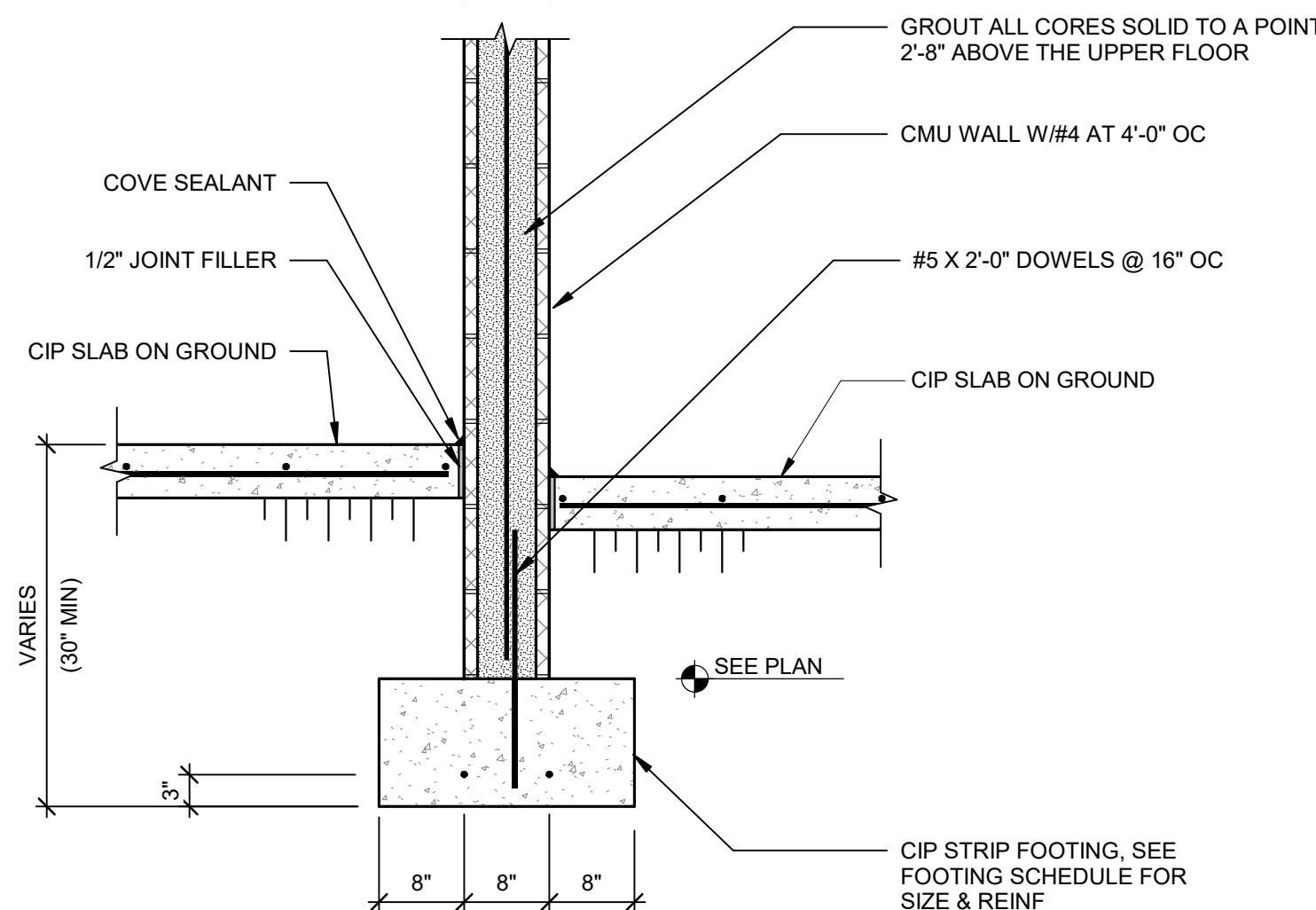
#### 7 SUMP PIT ANGLE SUPPORT SECTION

3" = 1'-0"



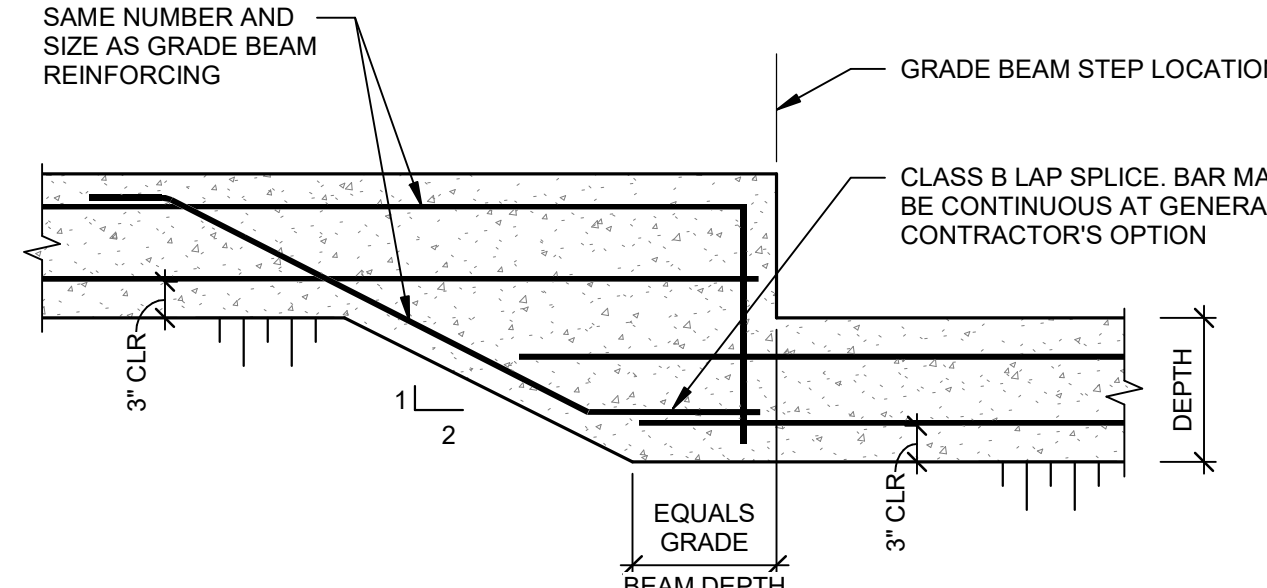
#### 6 CONSTRUCTION JOINT AT STRIP FOOTING

3/4" = 1'-0"



#### 5 MASONRY WALL DETAIL

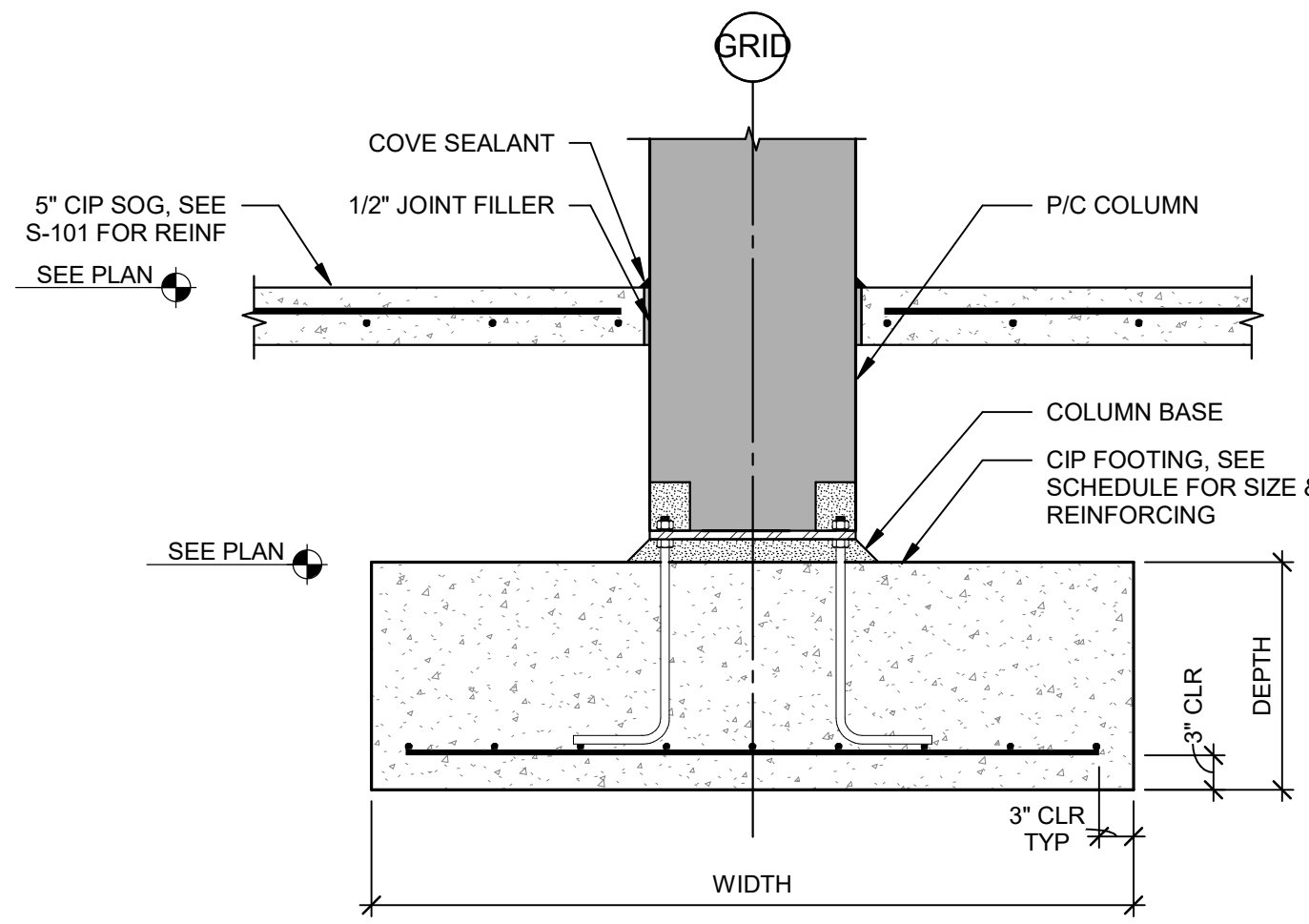
3/4" = 1'-0"



- NOTES:  
1. GRADE BEAM SHALL STEP A MAXIMUM OF 2'-0" VERTICAL IN 4'-0" HORIZONTAL.  
2. SEE GRADE BEAM SCHEDULE ON S-601 FOR DEPTH DIMENSION.  
3. SEE PLAN FOR GRADE BEAM STEP LOCATIONS.

#### 2 STEP FOOTING DETAIL

3/4" = 1'-0"



- NOTE:  
1. PRECAST COLUMN TO FOOTING SHOWN.

#### 1 COLUMN/FOOTING DETAIL

3/4" = 1'-0"

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty**  
Construction

DESIGNER



**CLARK NEXSEN**  
1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028

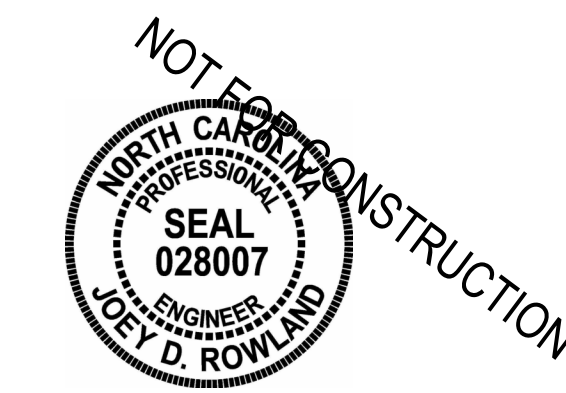


13660 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518



CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEAL



SUBMITTAL

04/15/2019

CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS


KEY PLAN

SHEET

FOUNDATION DETAILS

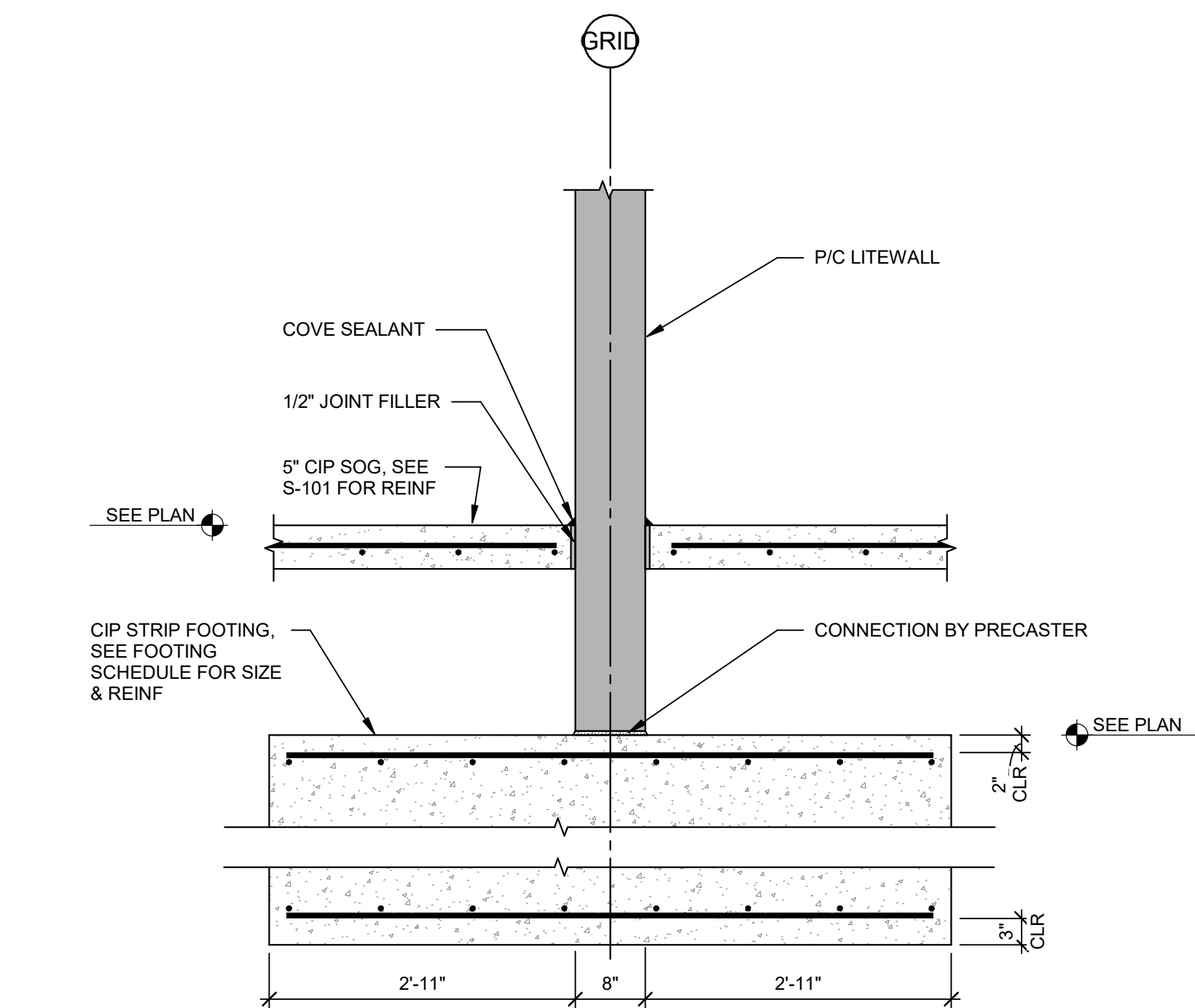
**S-510**

DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

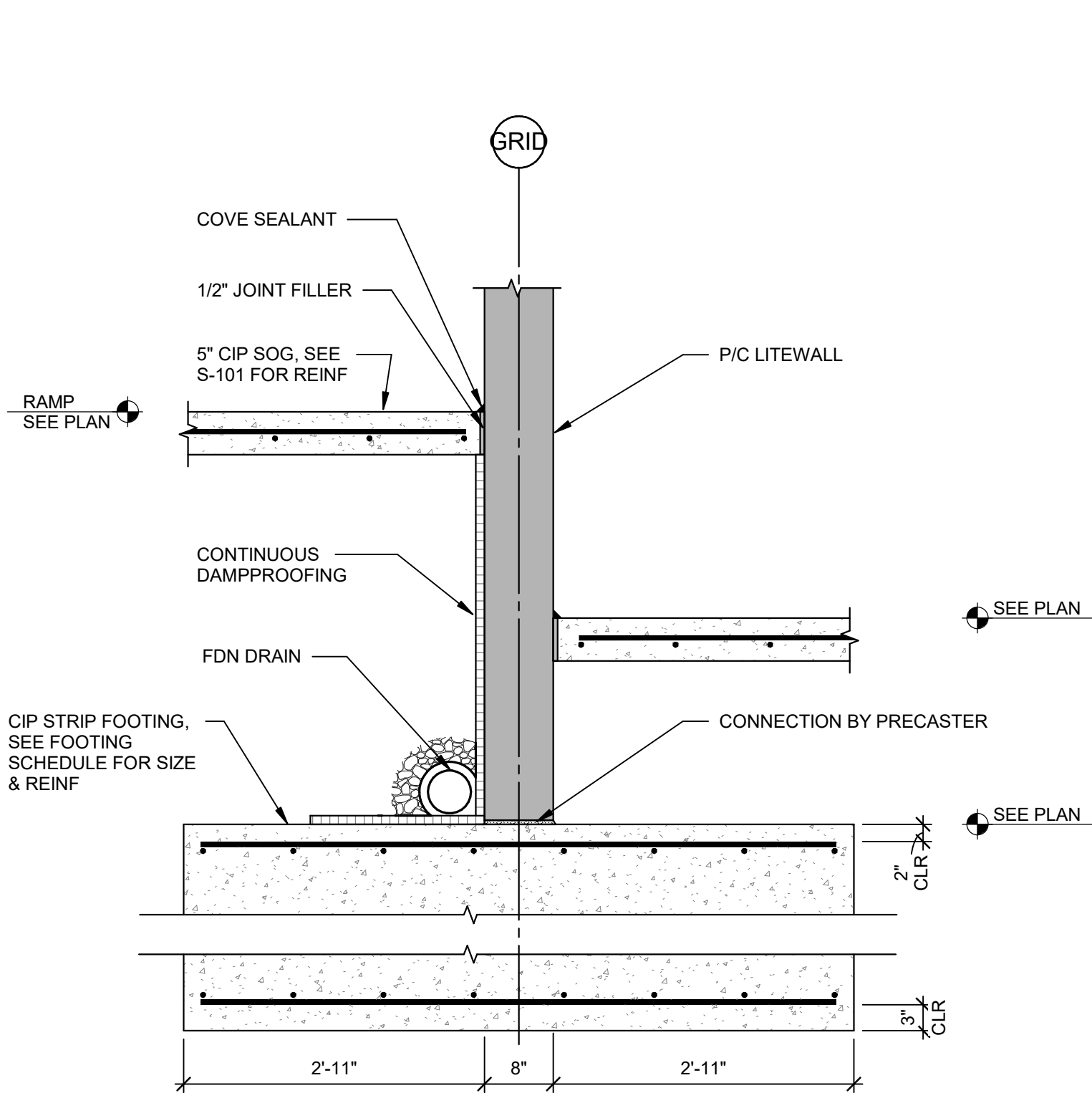
ON PROJECT  
NUMBER



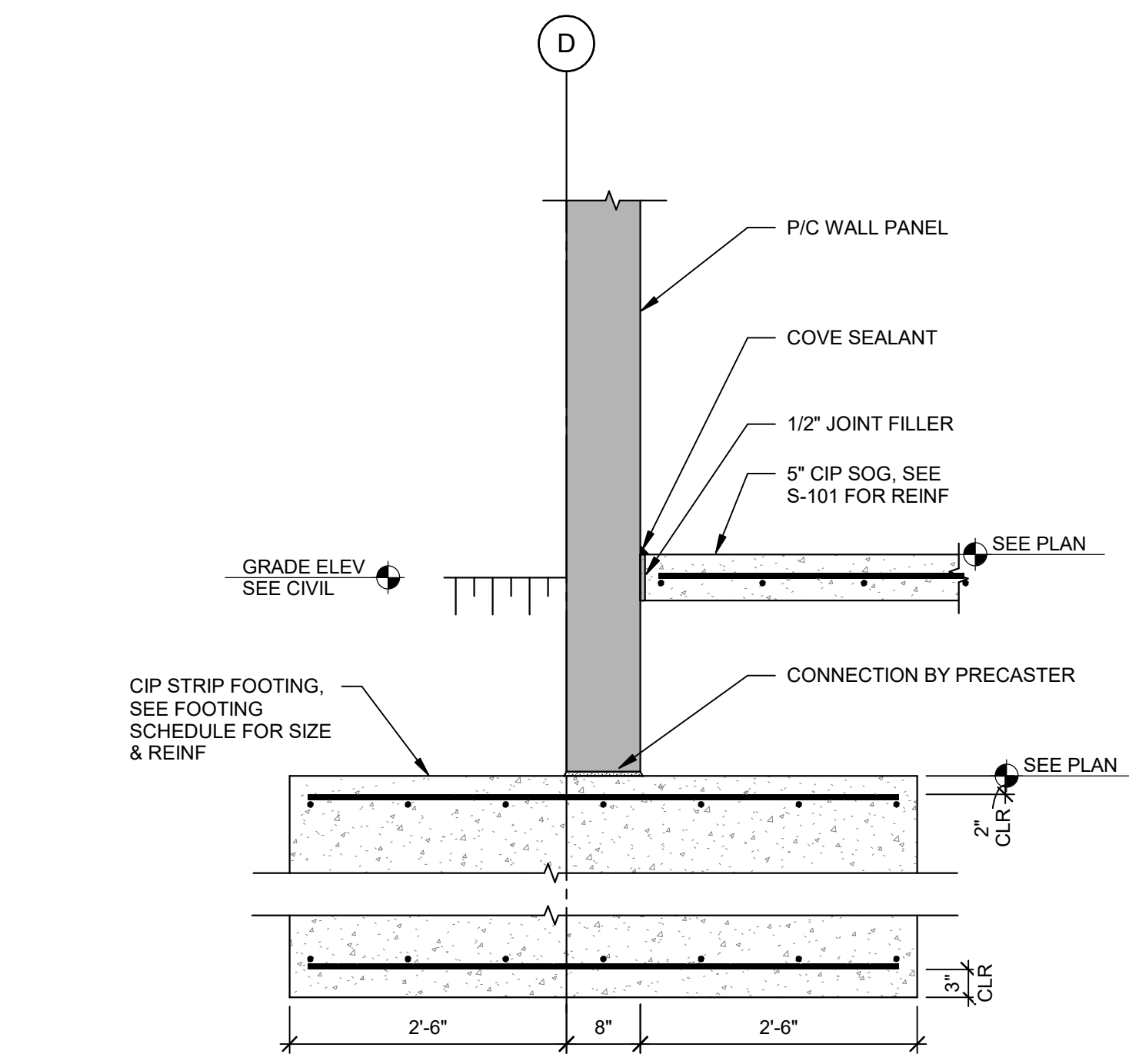
4/15/2019 5:35:21 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_roy.gardham.rvt



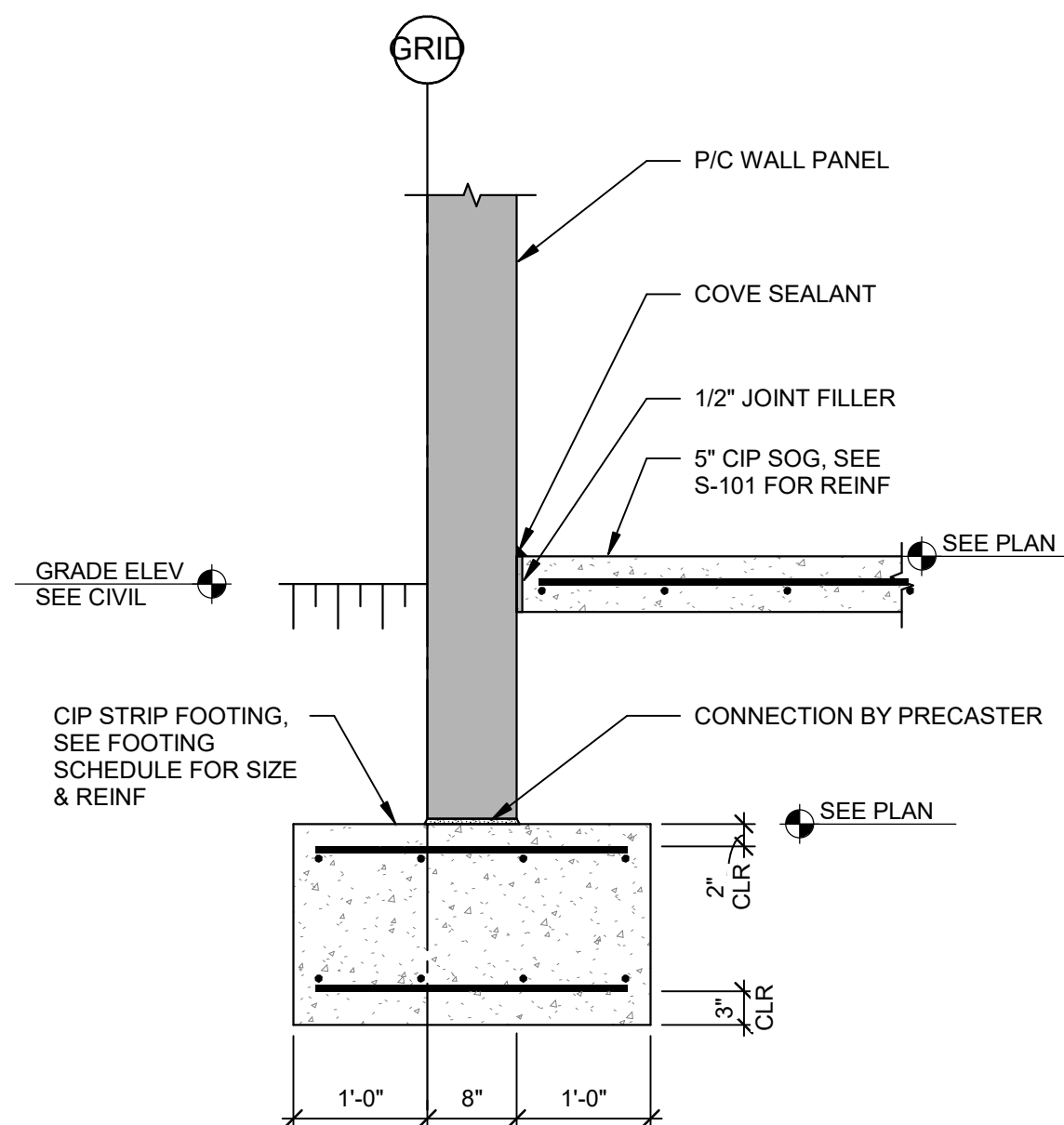
7 FOUNDATION SECTION  
3/4" = 1'-0"



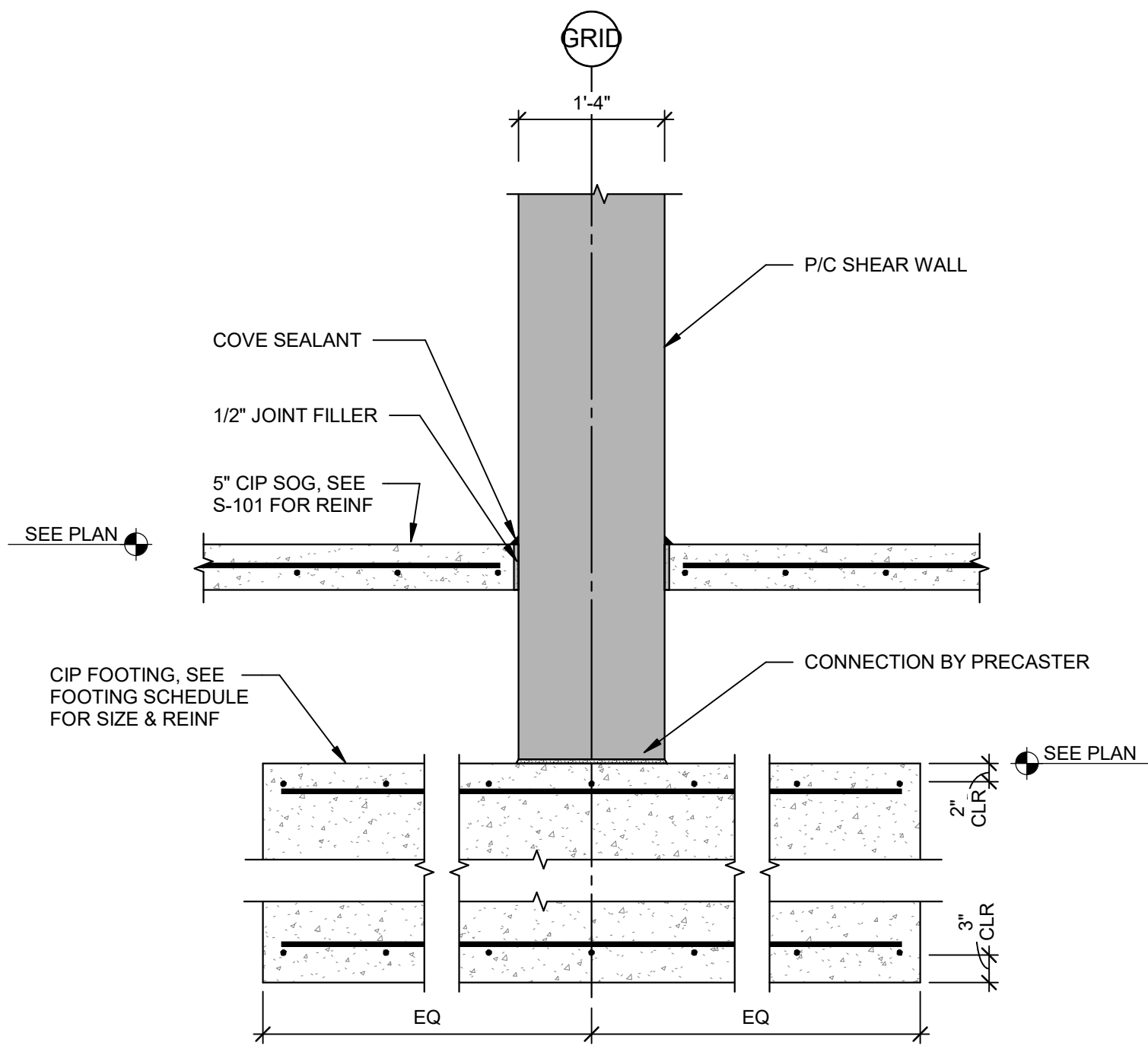
9 FOUNDATION SECTION  
3/4" = 1'-0"



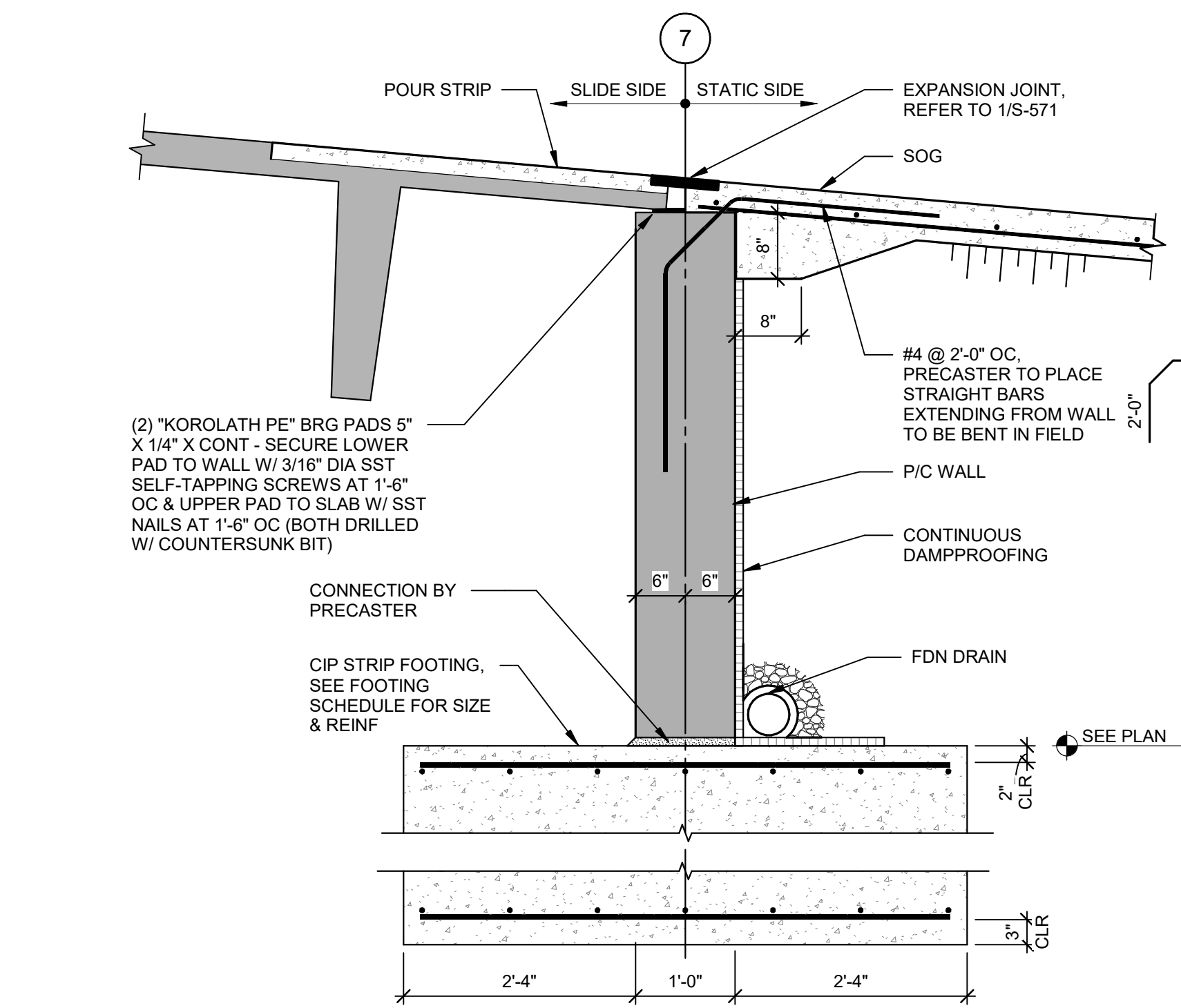
4 FOUNDATION SECTION  
3/4" = 1'-0"



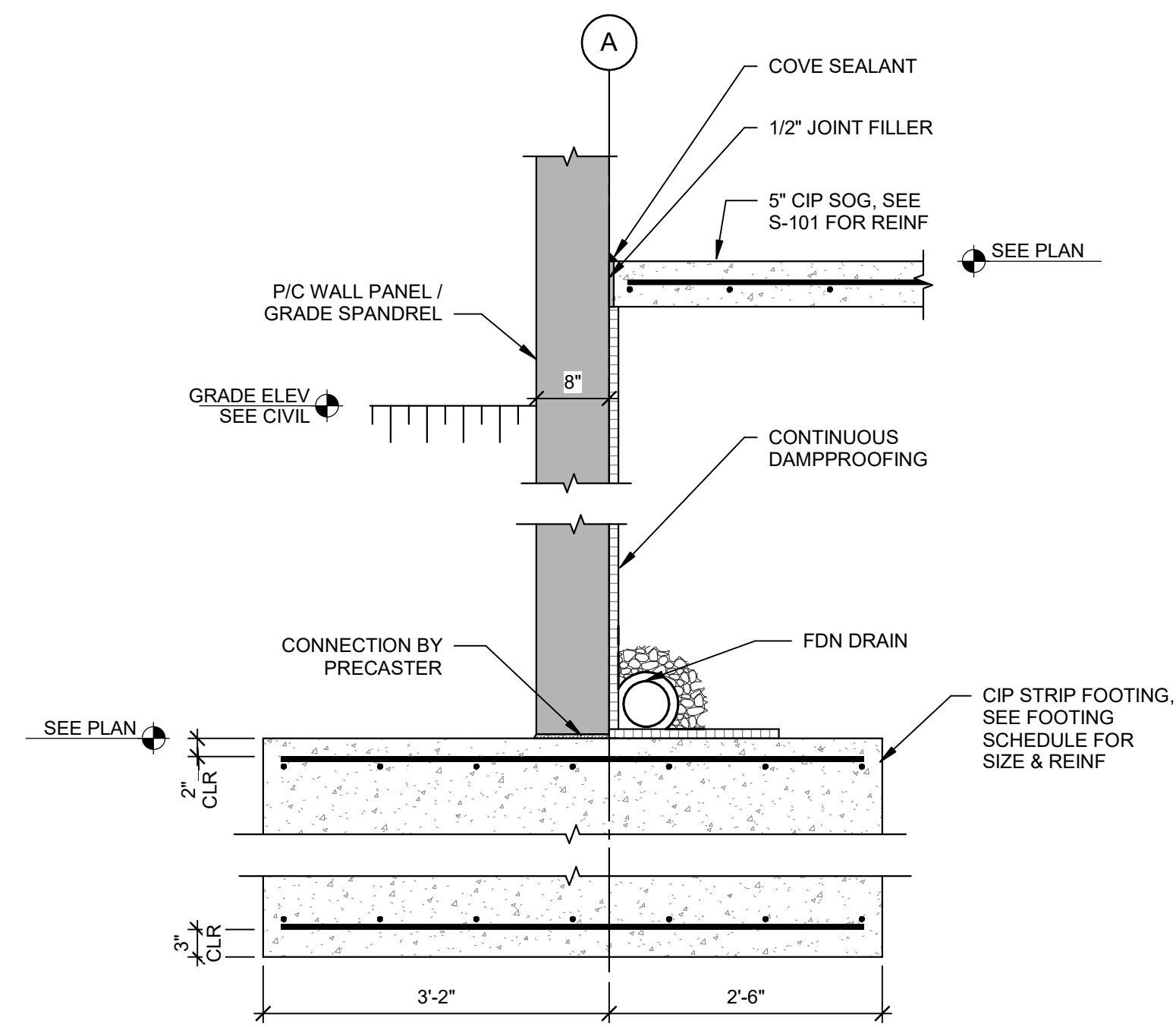
5 FOUNDATION SECTION  
3/4" = 1'-0"



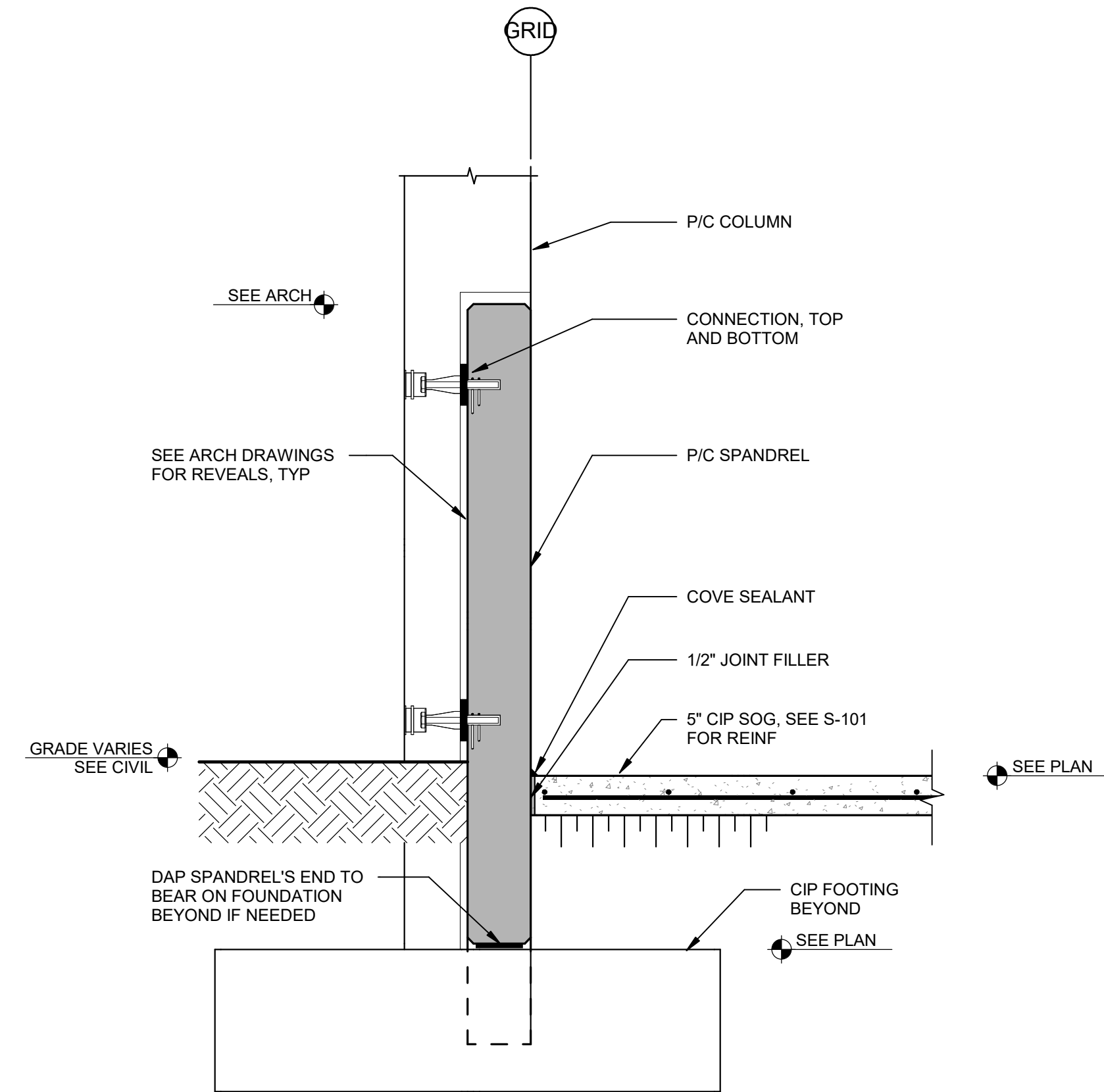
6 FOUNDATION SECTION  
3/4" = 1'-0"



1 TRANSITION WALL FOUNDATION SECTION  
3/4" = 1'-0"



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



3 GRADE SPANDREL DETAIL  
3/4" = 1'-0"



4/15/2019 5:35:25 PM C:\revit\Projects\UNC\Wilmington Deck II\_r\7\_09\granbeam.rvt

A

B

C

D

E

1

2

3

4

5

6

## SHEET NOTES

### PRECAST BEAM NOTES:

1. FOR GENERAL NOTES, SEE SHEET S-001.
2. BEAM DESIGN IS PERFORMANCE DESIGN AND SHALL INCLUDE TYPE, NUMBER, AND LOCATION OF STRANDS AND/OR CONVENTIONAL REINFORCEMENT AS WELL AS LEDGE, SHEAR/TORSION AND END OF BEAM REINFORCEMENT. DESIGN SHALL ALSO INCLUDE ALL BEAM TO COLUMN (OR OTHER SUPPORT) CONNECTIONS. SEE SPECIFICATION SECTION 034100 FOR PRECAST CONCRETE.
3. APPLY MASTIC TO EACH STRAND AT ENDS OF BEAM.
4. FOR MEMBER SIZES AND OTHER INFORMATION, SEE STRUCTURAL AND ARCHITECTURAL DETAILS.
5. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR ANY REQUIRED PENETRATIONS.
6. POCKETED BEAMS SHALL BE PRESTRESSED TO A MINIMUM P/A OF 150 psi.
7. FOR EMBEDDED PLATES TO RECEIVE WELDS AS PART OF WELDED CONNECTIONS, SEE 7/S-624.
8. FOR SEALANT REQUIREMENTS AT SPANDREL, PANEL/BEAM/COLUMN INTERFACES, REFER TO DETAILS ON SHEET S-670.
9. PROVIDE OPENINGS AT APPROXIMATELY MID-DEPTH OF STEMS OF INVERTED TEE (DOUBLE LEDGER) BEAMS. PLACE NO CLOSER THAN 9'-0" FROM END OF BEAM. COORDINATE SIZE AND LOCATION REQUIREMENTS WITH MECHANICAL AND ELECTRICAL.



UNIVERSITY of NORTH CAROLINA WILMINGTON  
601 S COLLEGE ROAD  
WILMINGTON, NORTH CAROLINA 28403  
PARKING DECK II AND SURFACE  
PARKING (DESIGN-BUILD)  
SOUTH CAMPUS - 4965 RIEGEL ROAD

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty**  
Construction

DESIGNER



**CLARK NEXSEN**

1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028



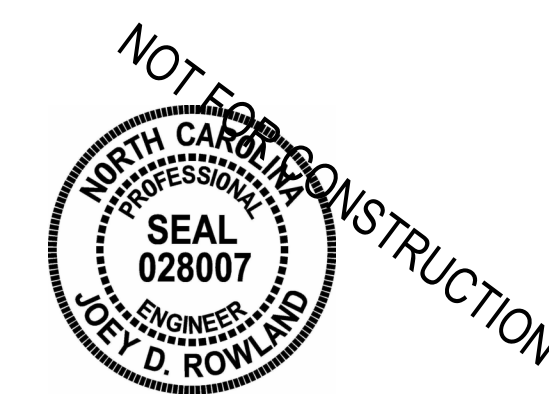
**WALKER**  
CONSULTANTS

13860 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518

**MCKIM & CREED**

CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEAL



SUBMITTAL

04/15/2019

CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS


KEY PLAN

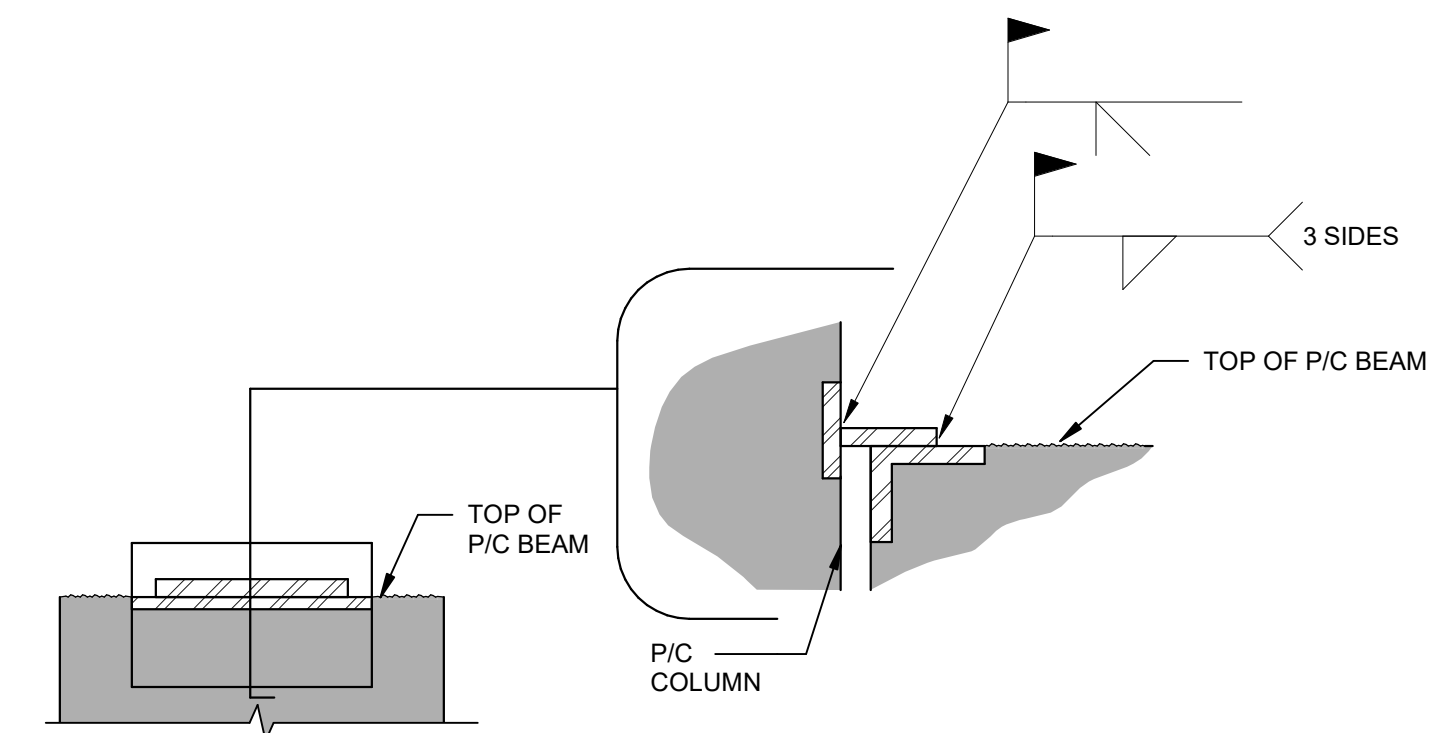
SHEET

P/C BEAM DETAILS

# S-520

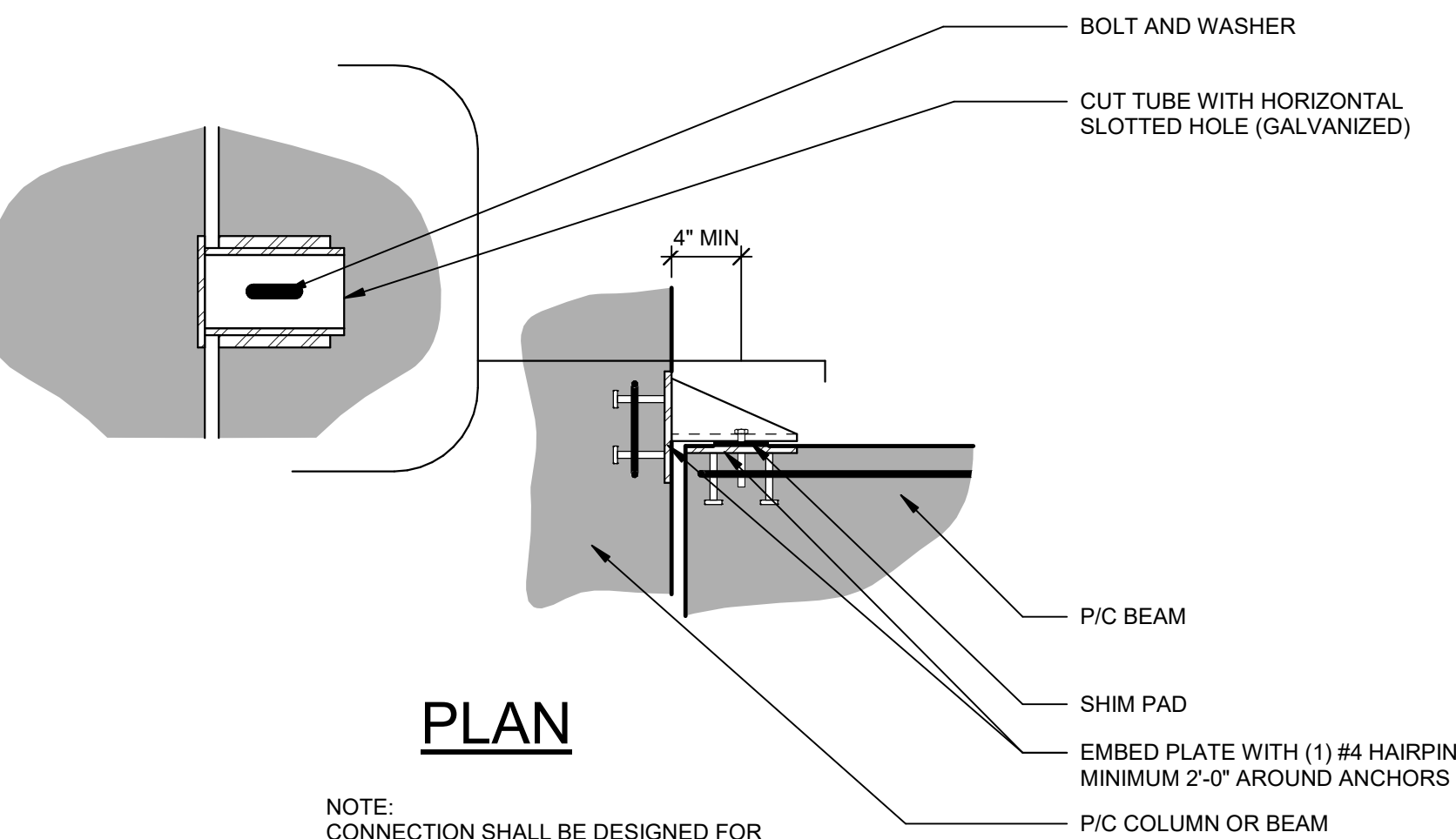
DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

ON PROJECT  
NUMBER



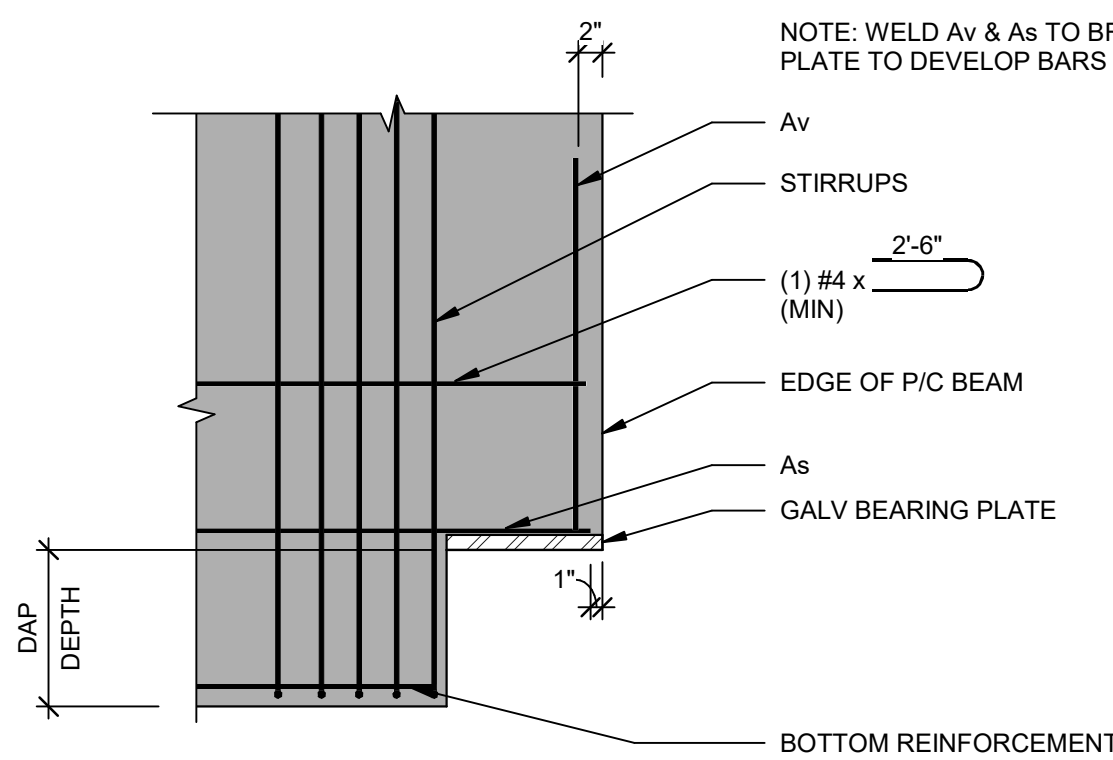
## CONNECTION DETAIL PERFORMANCE DESIGN

NTS



## BEAM/COLUMN CONNECTION DETAIL PERFORMANCE DESIGN

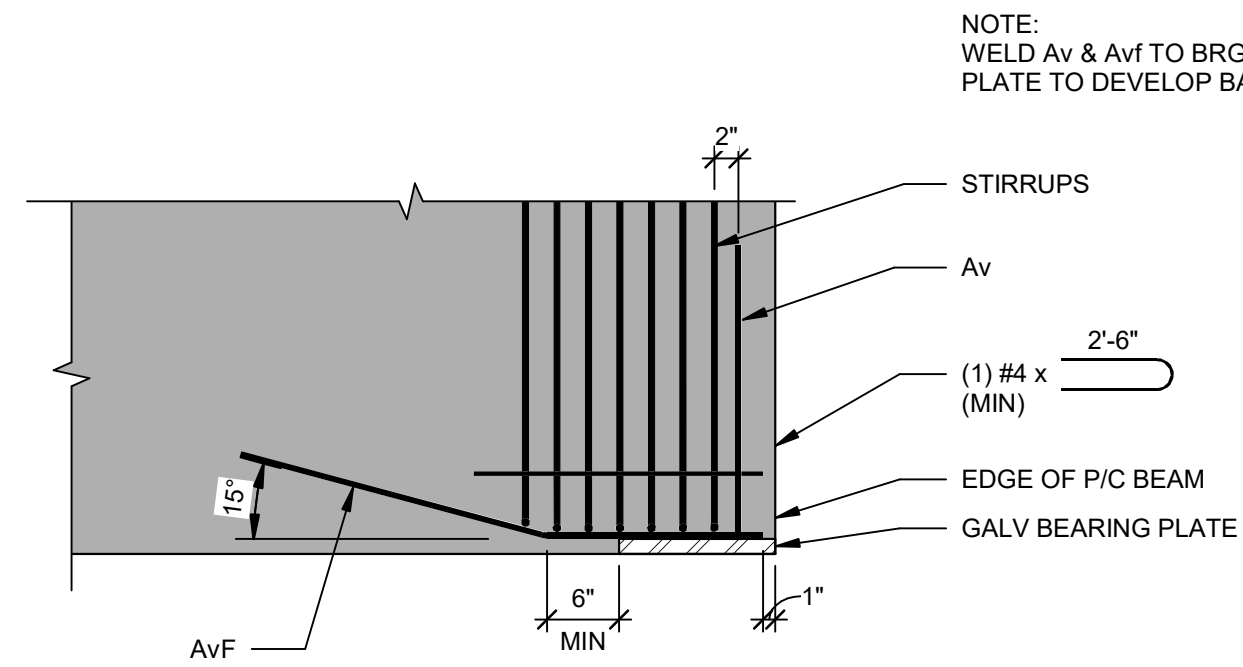
NTS



- NOTES:
1. SEE PRECAST EMBED SCHEDULE FOR MATERIALS.
  2. EQUIVALENT PREFABRICATED WWF ACCEPTABLE.

## END OF BEAM REINFORCEMENT DETAIL

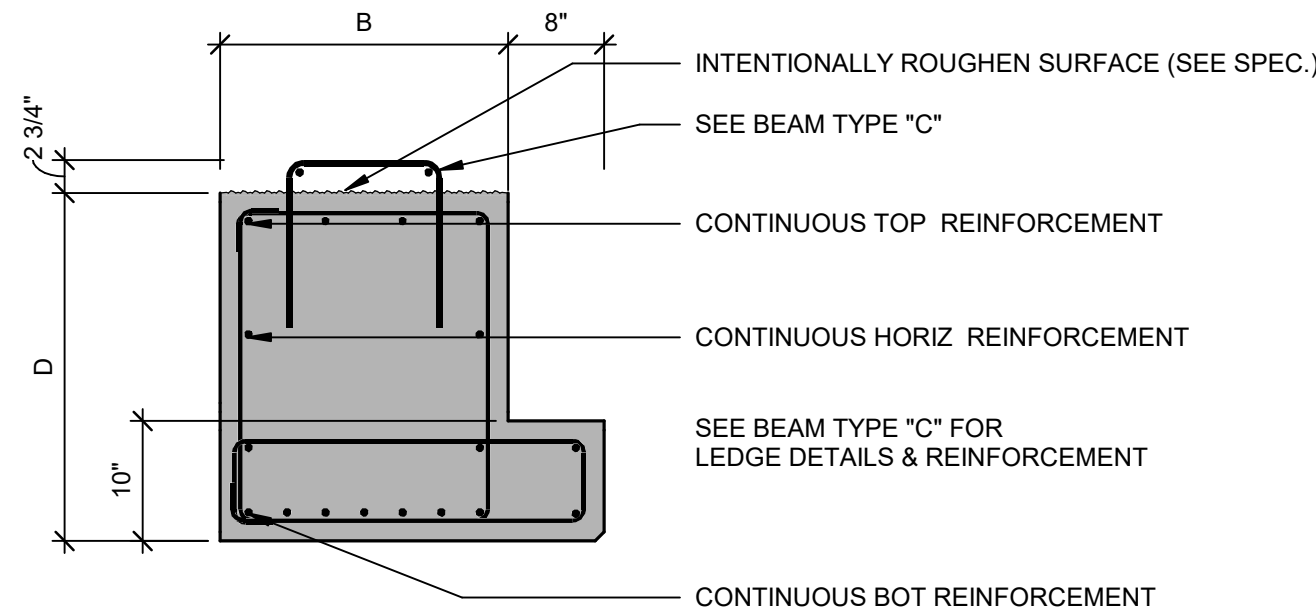
NTS



- NOTES:
1. SEE PRECAST EMBED SCHEDULE FOR MATERIALS.
  2. EQUIVALENT PREFABRICATED WWF ACCEPTABLE.

## END OF BEAM REINFORCEMENT (UNDAPPED TEE) DETAIL

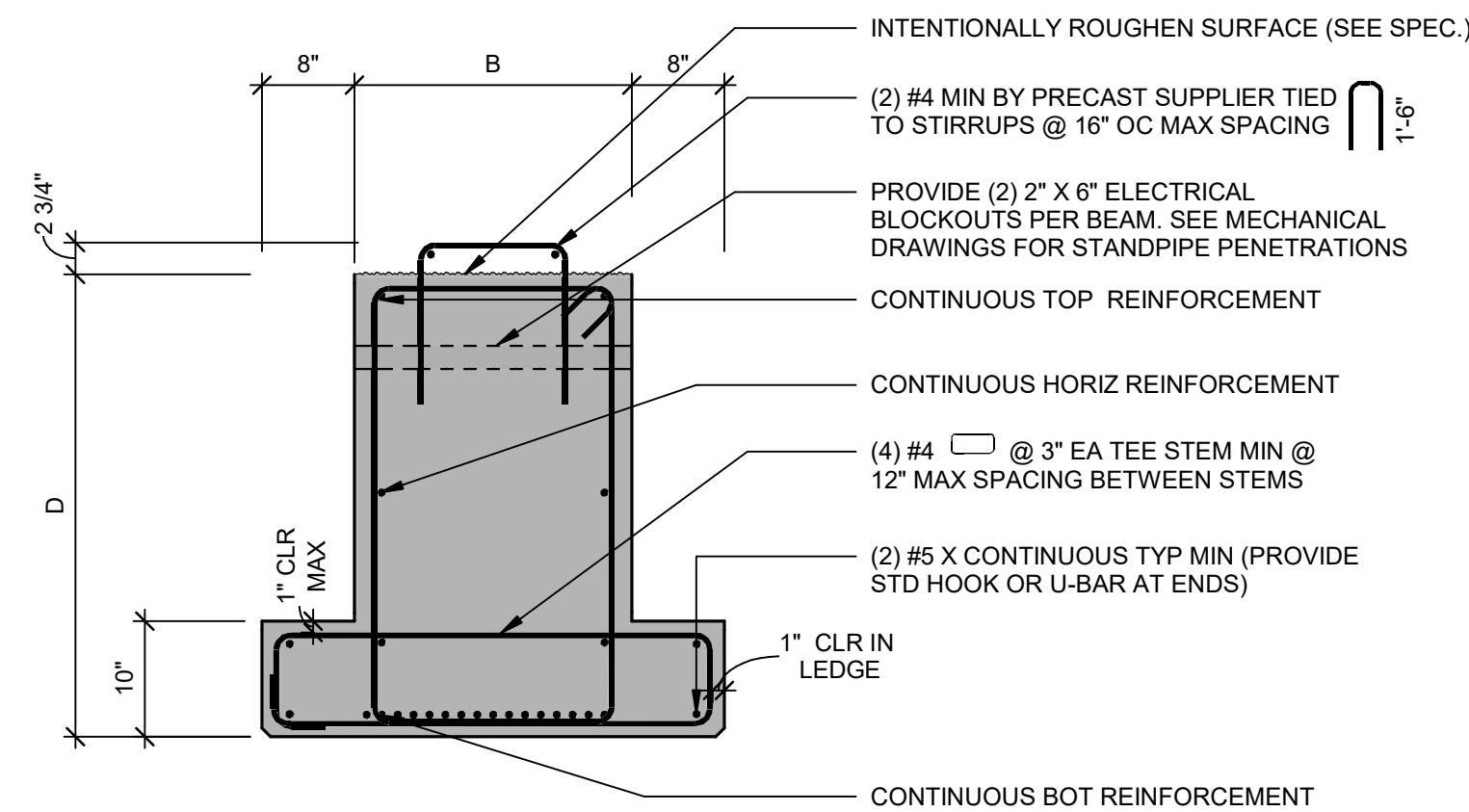
NTS



NOTE:  
EQUIVALENT PREFABRICATED WWF ACCEPTABLE

## BEAM TYPE "D"

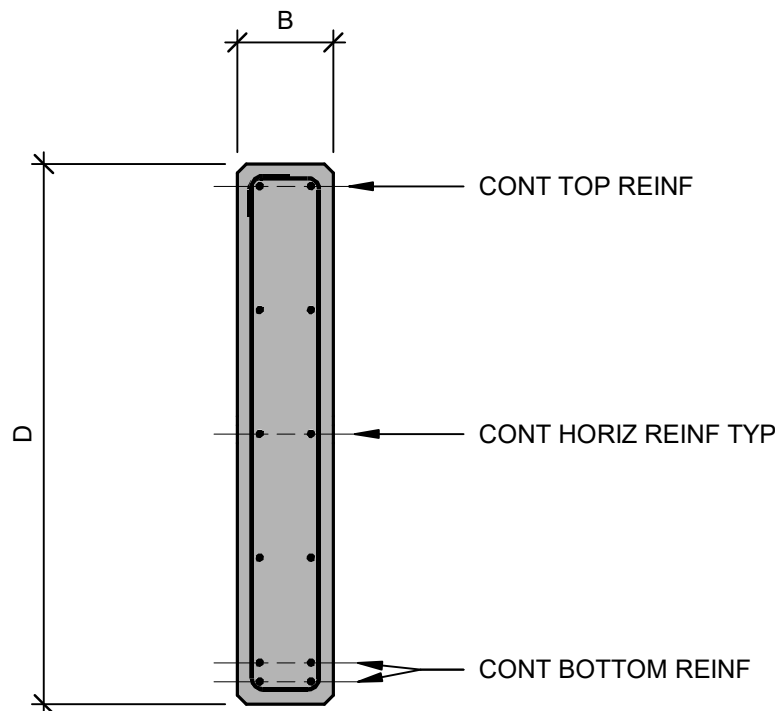
NTS



NOTE:  
EQUIVALENT PREFABRICATED WWF ACCEPTABLE

## BEAM TYPE "C"

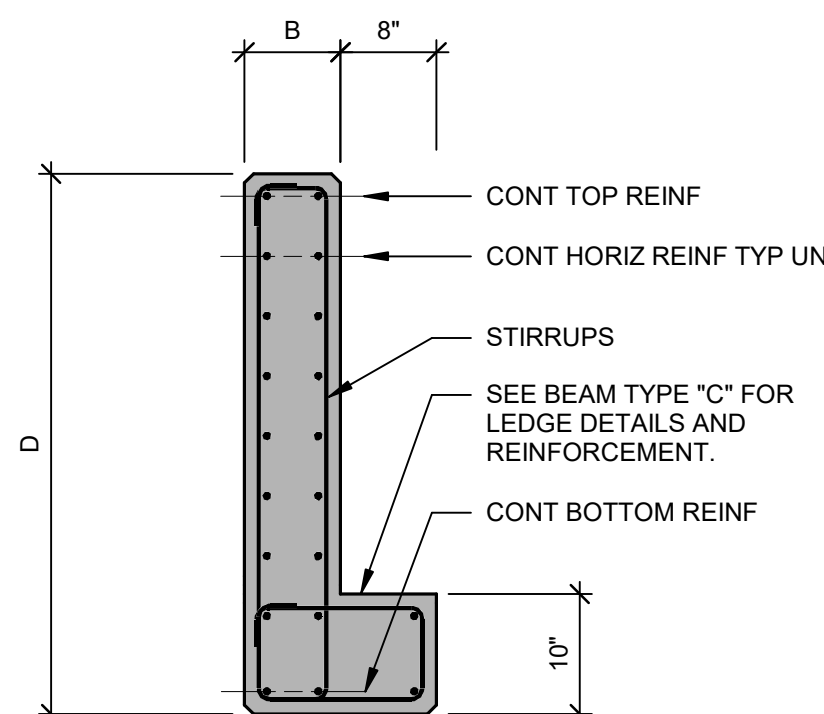
NTS



NOTE:  
EQUIVALENT PREFABRICATED WWF ACCEPTABLE

## BEAM TYPE "B"

NTS



NOTE:  
EQUIVALENT PREFABRICATED WWF ACCEPTABLE

## BEAM TYPE "A"

NTS

PRECAST EMBEDMENT SCHEDULE			EXCEPTIONS
PROD.	CONNECTION HARDWARE		
TEE	BEARING PLATE	HDG	
	EMBED AT TOP CONNECTION	HDG	
	FLANGE WELDER EMBED	SS	
	EMBED AT EXPANSION JOINT	HDG	
BEAM	BEARING PLATE	HDG	
	EMBED TO TOP CONNECTION	HDG	
INT. SPA.	BEARING PLATE	HDG	
	EMBED AT CONNECTION w/COL	HDG	
	EMBED AT CONNECTION w/WALL	HDG	
	EMBED AT CONNECTION w/TEE	HDG	
EXT. SPA.	BEARING PLATE	HDG	
	EMBED AT CONNECTION w/COL	HDG	
	EMBED AT CONNECTION w/WALL	HDG	
	EMBED AT CONNECTION w/TEE	HDG	
COL.	BASE PLATE	PS	
	TOP PLATE/HAUNCH	HDG	
	HAUNCH ASSEMBLY	HDG	
	EMBED AT CONNECTION w/TEE	HDG	
	EMBED AT CONNECTION w/EXT. SPA.	HDG	
	EMBED AT CONNECTION w/INT. SPA.	HDG	
	EMBED AT CONNECTION w/WALL	HDG	
	EMBED AT CONNECTION w/BM.	HDG	
STRUC. WALL	EMBED AT CONNECTION w/TEE	HDG	
	EMBED AT CONNECTION w/BEAM	HDG	
	EMBED AT CONNECTION w/WALL	HDG	
	EMBED AT CONNECTION w/COL	HDG	
	EMBED AT CONNECTION w/FOUNDATION	HDG	
ARCH. WALL	EMBED AT CONNECTION w/TEE	HDG	
	EMBED AT CONNECTION w/BEAM	HDG	
	EMBED AT CONNECTION w/WALL	HDG	
	EMBED AT CONNECTION w/COL	HDG	
	EMBED AT CONNECTION w/FOUNDATION	HDG	
FLAT SLABS (RISER)	EMBED AT CONNECTION w/BEAM	HDG	
	EMBED AT CONNECTION w/COL	HDG	
	EMBED AT CONNECTION w/SLAB	HDG	
	BEARING PLATES	HDG	
LOOSE MTL.	TEE TO TEE WELDER	SS	
	TEE TO BEAM	HDG	
	TEE TO SPANDREL	HDG	
	TEE TO COLUMN	HDG	
	TEE TO WALL	HDG	
	BEAM TOP	HDG	
	BEAM BOTTOM (CUBE)	HDG	
	SPANDREL TOP	HDG	
	SPANDREL BOTTOM	HDG	
	ANCHOR BOLTS	PS	
	OTHER FOUNDATION EMBEDS	HDG	
SPL. INFO.			
ABBREVIATIONS:	PS = PLAIN STEEL	SS = STAINLESS STEEL	
	HDG = HOT DIP GALVANIZED	ZRC = ZINC RICH COATING	

PRECAST BEAM SCHEDULE			
MARK	WIDTH (W)	DEPTH (D)	REMARKS
24IT36	2' - 0"	3' - 0"	







**PRECAST LITEWALL NOTES:**

2. FOR GENERAL NOTES, SEE S-001.
3. LITWAL DESIGN IS PERFORMANCE DESIGN AND SHALL BE BASED ON THE FOLLOWING: (1) DESIGN OF VERTICAL AND HORIZONTAL REINFORCING, INCLUDING TIES AND STIRRUPS, SHALL BE BASED ON THE FOLLOWING: (A) DESIGN OF VERTICAL REINFORCEMENT, AND SIZE, NUMBER, AND SPACING OF INSERTION ROD (OR OTHER SHEAR TRANSFER); (B) DESIGN OF HORIZONTAL REINFORCEMENT TO RESIST TRANSFER OF LATERAL LOADS. (SEE SPECIFICATION 03410 FOR PRECAST CONCRETE).
4. FOR LITWALL SIZES, SEE DETAILS THIS SHEET.
5. FOR LITWALL BASE CONNECTION, SEE S25-S24.
6. FOR TOP OF LITWALLS, SEE 15-120.
7. PROVIDE REINFORCING AND TOP OF LITWALLS AS REQUIRED FOR LIGHT POLE SUPPORT. COORDINATE LOCATION OF REINFORCING ELEMENTS WITH ELECTRICAL DRAWINGS AND LIGHT POLE SUPPLIER.
8. FOR EMBEDDED PLATES TO RECEIVE WELDS AS PART OF THE CONNECTION TO THE LIGHT POLE SUPPLIER.
9. FOR LATERAL LOADS DUE TO SEISMIC, SEE 15-120.
10. PRECAST MANUFACTURER TO CONDUCT THEIR OWN LATERAL LOAD ANALYSIS AND PROVIDE DESIGN.



UNIVERSITY of NORTH CAROLINA WILMINGTON  
601 S COLLEGE ROAD  
WILMINGTON, NORTH CAROLINA 28403  
PARKING DECK II AND SURFACE  
PARKING (DESIGN-BUILD)  
SOUTH CAMPUS - 4965 RIEGEL ROAD

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty**  
Construction

DESIGNER

CLARK NEXSEN

1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028

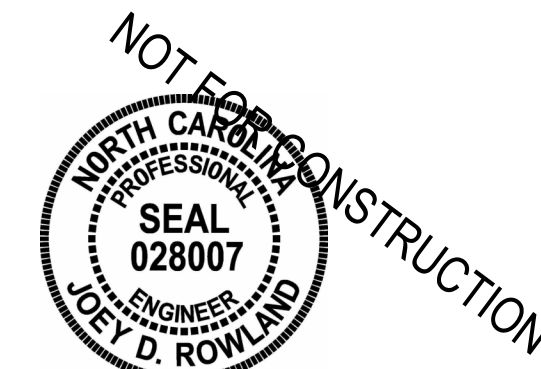


13860 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518



CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEA



SUBMITTAL

04/15/2019

CONSTRUCTION DOCUMENT  
SUBMITTAL 01

## REVISIONS

### KEY PLAN

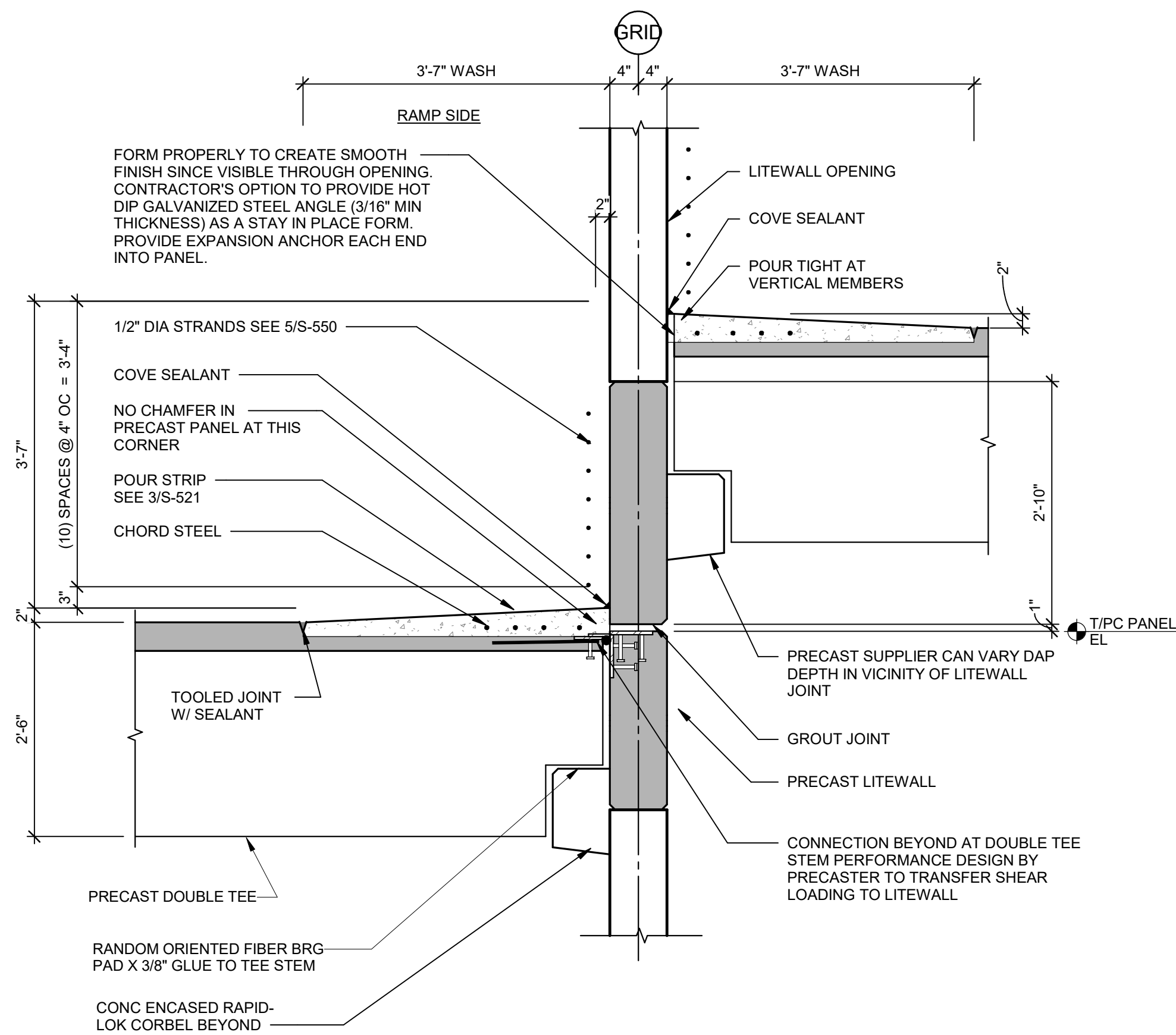
SHEET

## P/C LITEWALL DETAILS

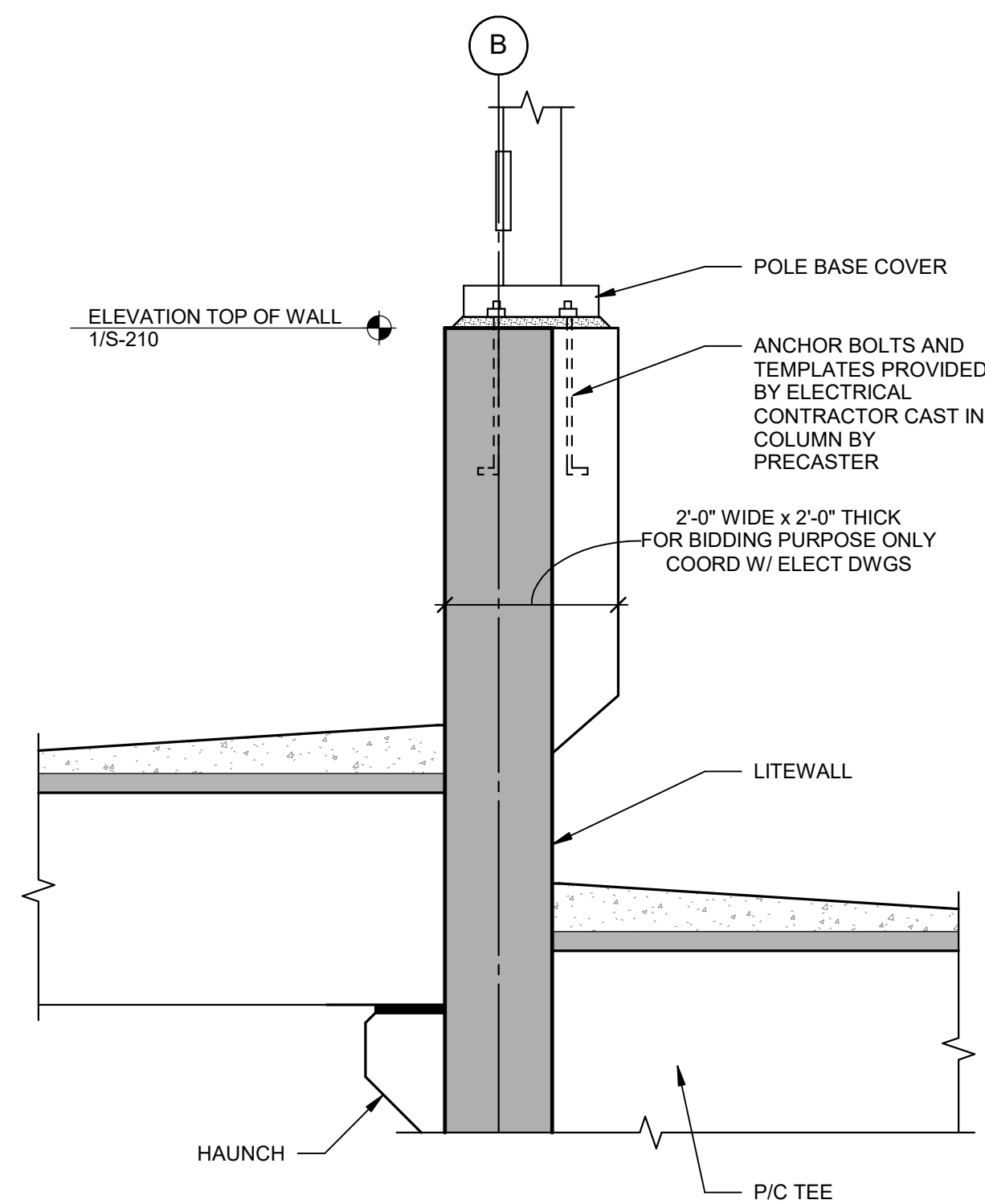
# S-522

DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

CN PROJECT  
NUMBER

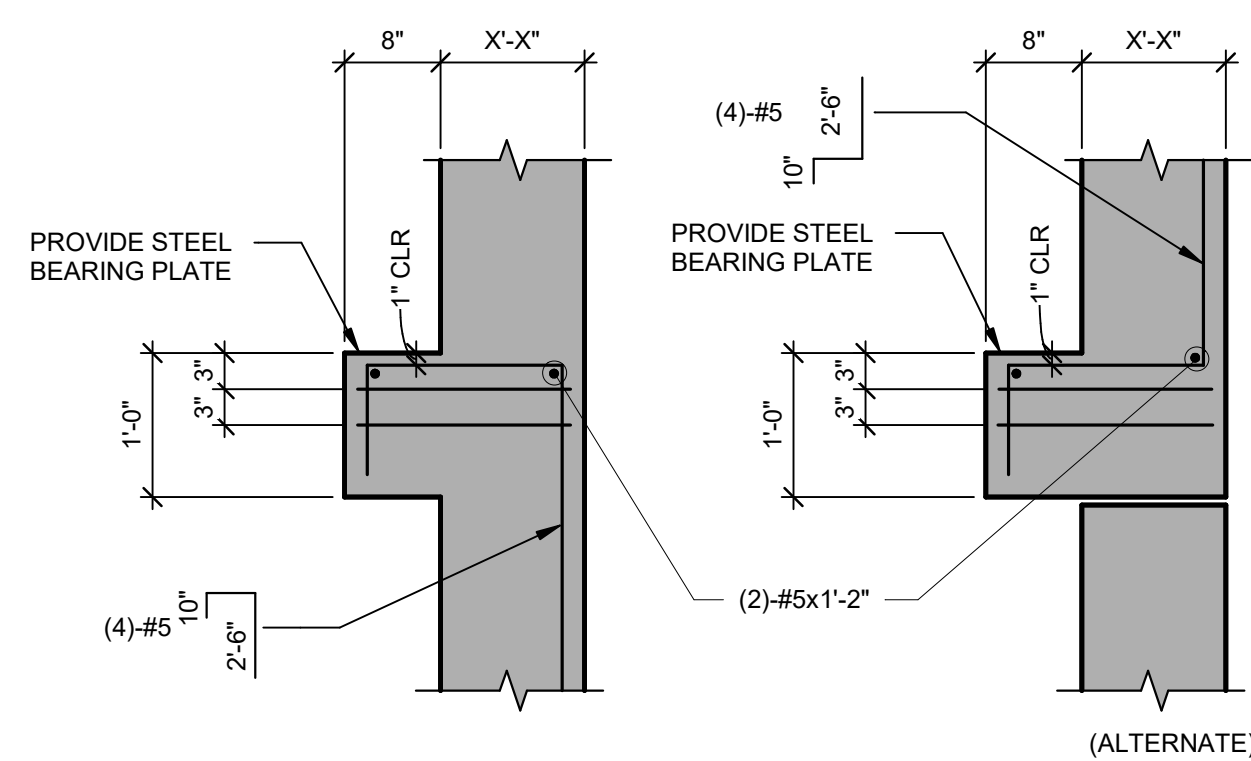


### 3 LIGHT WALL SECTION DETAIL

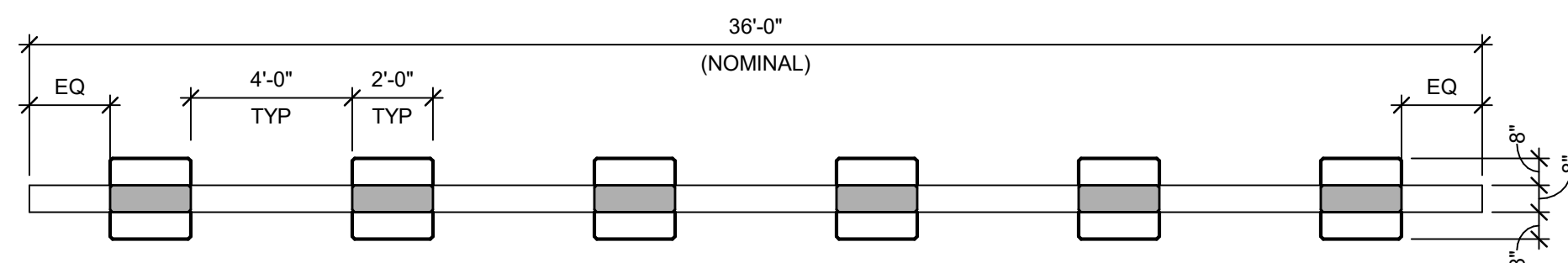
$$3/4" = 1'-0"$$


## LITEWALL/POLE BASE CONNECTION DETAIL

3/4" = 1'-0"

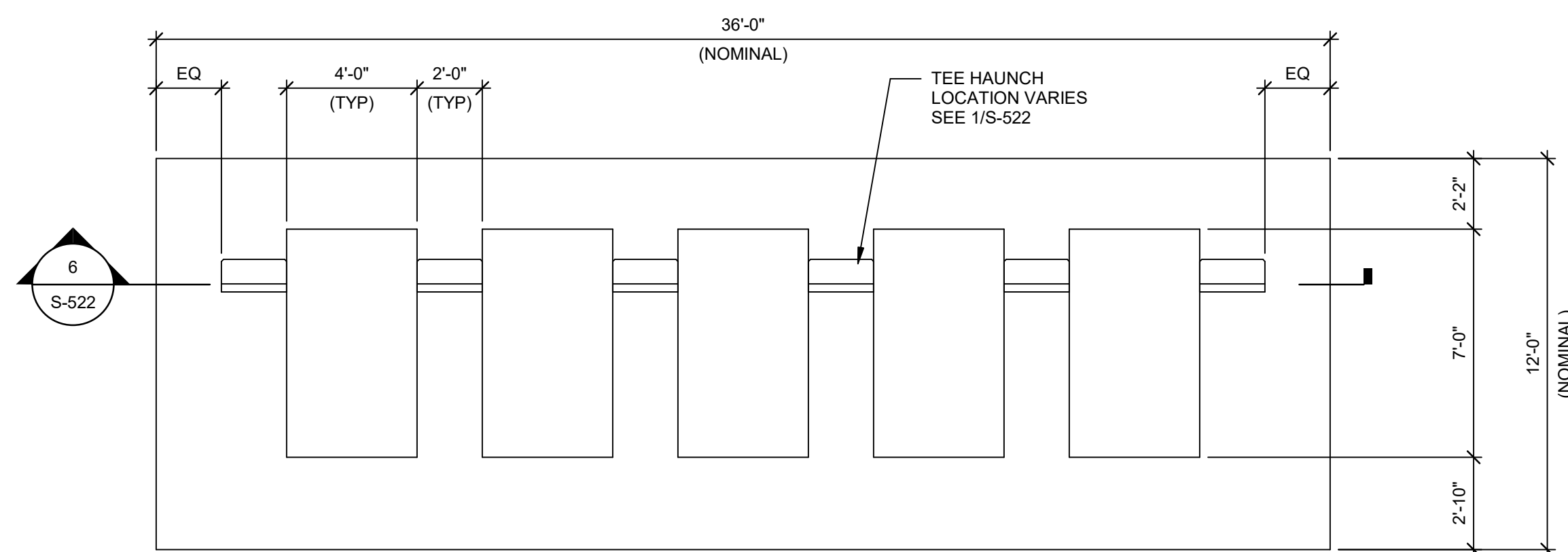


### ④ LITEWALL HAUNCH DETAIL

 $3/4" = 1'-0"$ 

⑥ LITEWALL PLAN DETAIL

1/4" = 1'-0"



⑤ LITEWALL ELEVATION DETAIL

 $1/4'' = 1'-0''$







1

2

3

4

5

6

SHEET NOTES

PRECAST COLUMN NOTES:

- FOR GENERAL NOTES, SEE SHEET S-001.
- COLUMN DESIGN IS PERFORMANCE DESIGN AND SHALL INCLUDE TYPE, NUMBER AND LOCATION OF VERTICAL REINFORCEMENT AND TIES. DESIGN SHALL ALSO INCLUDE BASE, POCKET, AND HAUNCH REINFORCEMENT. SEE SPECIFICATION SECTION 034100 FOR PRECAST CONCRETE.
- PERFORMANCE DESIGN SHALL INCLUDE EFFECTS DUE TO VOLUME CHANGE OF THE STRUCTURE. COLUMNS SHALL BE DESIGNED ASSUMING PINNED BASE CONDITIONS.
- FOR COLUMN SIZES, SEE PLANS AND DETAILS ON SHEET S-525.
- FOR COLUMN BASE, POCKET, AND HAUNCH DETAILS, SEE DETAILS ON SHEET S-525.
- PROVIDE #5 MIN VERTICAL AT EACH CORNER BETWEEN POCKETS TYP.
- MINIMUM COLUMN TIES SHALL BE #4 GRADE 60 CLOSED TIES AS FOLLOWS:
  - AT 16" OC (MAX SPACING) TYP AND FOR ADDED TIES AT REINFORCEMENT BELOW AND BETWEEN POCKETS.
  - ADD (4) TIES @ 3" OC BELOW EACH POCKET
  - ADD (2) TIES @ 3" OC ABOVE EACH POCKET
  - ADD (4) TIES @ 3" OC @ TOP & BOTTOM OF COLUMN
  - ADD (3) TIES @ 3" OC ABOVE & BELOW HAUNCHES
  - ADD (1) TIE ABOVE & BELOW COIL ROD INSERTS.
- FOR EMBED PLATES TO RECEIVE WELDS AS PART OF WELDED CONNECTIONS, SEE 715-S24
- TORSION STABILITY CONNECTIONS TOP & BOTTOM EACH END OF BEAM BY PRECASTER. SEE DETAILS 8/S-520 & 3/S-525 FOR EXAMPLES.



UNIVERSITY of NORTH CAROLINA WILMINGTON  
601 S COLLEGE ROAD  
WILMINGTON, NORTH CAROLINA 28403  
PARKING DECK II AND SURFACE  
PARKING (DESIGN-BUILD)  
SOUTH CAMPUS - 4965 RIEGEL ROAD

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty**  
Construction

DESIGNER



**CLARK NEXSEN**

1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028



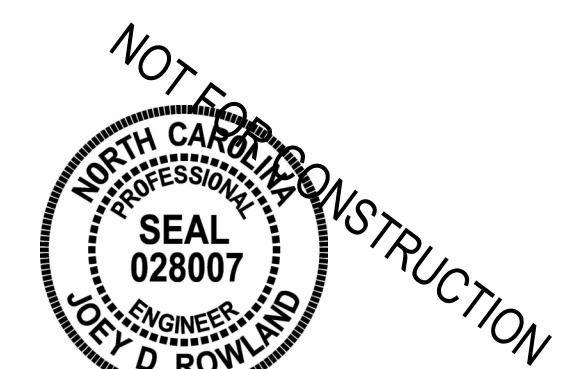
**WALKER**  
CONSULTANTS

13860 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518

**MCKIM&CREED**

CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEAL



SUBMITTAL

04/15/2019

CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS


KEY PLAN

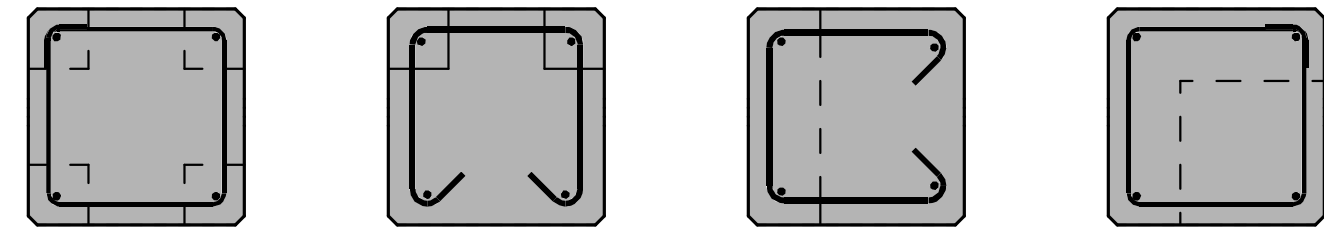
SHEET

P/C COLUMN DETAILS

**S-525**

DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

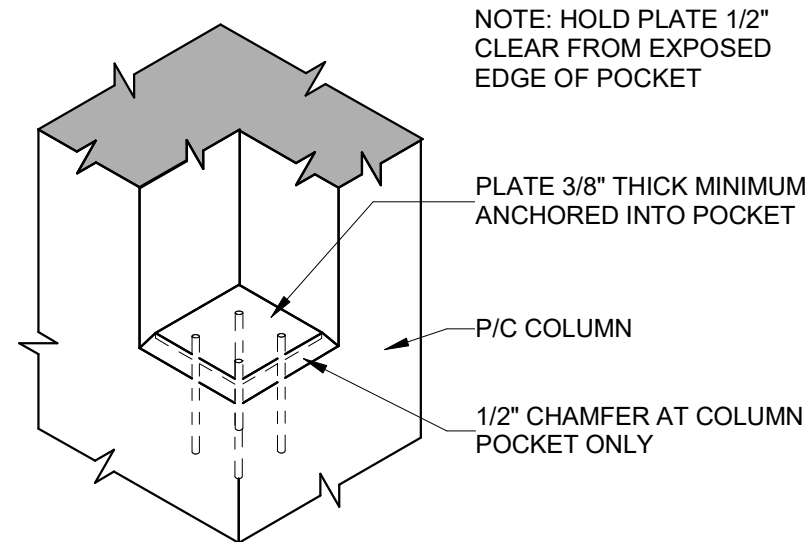
ON PROJECT  
NUMBER



NOTE:  
MAIN REINFORCING NOT SHOWN FOR CLARITY

DIAGRAM FOR ADDED TIES BETWEEN  
POCKETS

7  
NTS



NOTE: HOLD PLATE 1/2"  
CLEAR FROM EXPOSED  
EDGE OF POCKET

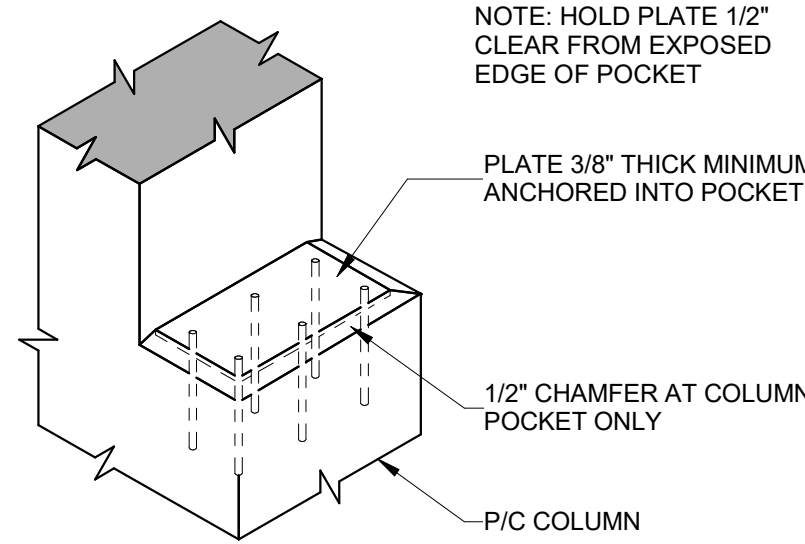
PLATE 3/8" THICK MINIMUM  
ANCHORED INTO POCKET

1/2" CHAMFER AT COLUMN  
POCKET ONLY

NOTE:  
SEE PRECAST EMBEDMENT  
SCHEDULE FOR MATERIALS

PRECAST COLUMN POCKET

6  
NTS



NOTE: HOLD PLATE 1/2"  
CLEAR FROM EXPOSED  
EDGE OF POCKET

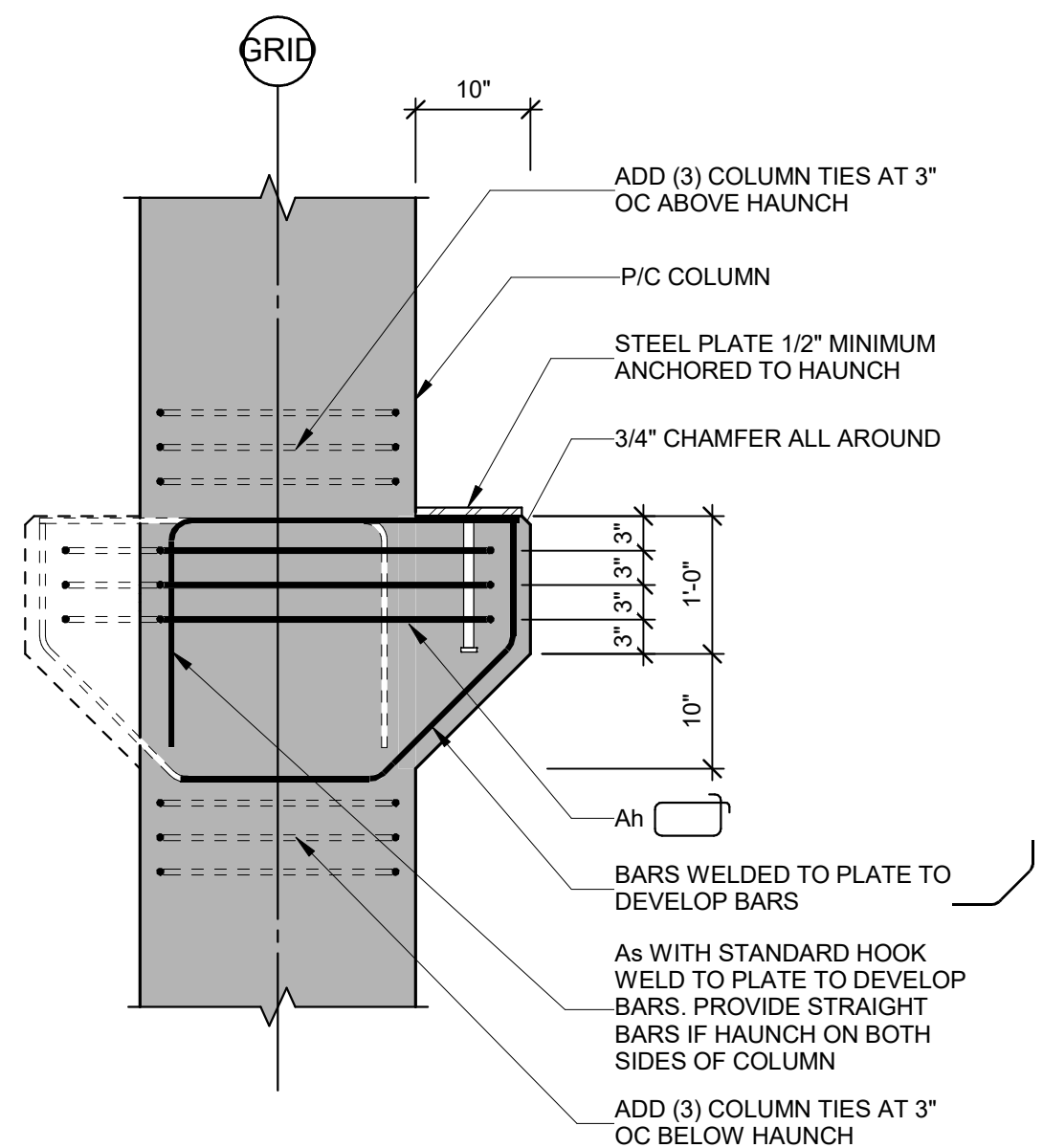
PLATE 3/8" THICK MINIMUM  
ANCHORED INTO POCKET

1/2" CHAMFER AT COLUMN  
POCKET ONLY

NOTE:  
SEE PRECAST EMBEDMENT  
SCHEDULE FOR MATERIALS

PRECAST COLUMN POCKET

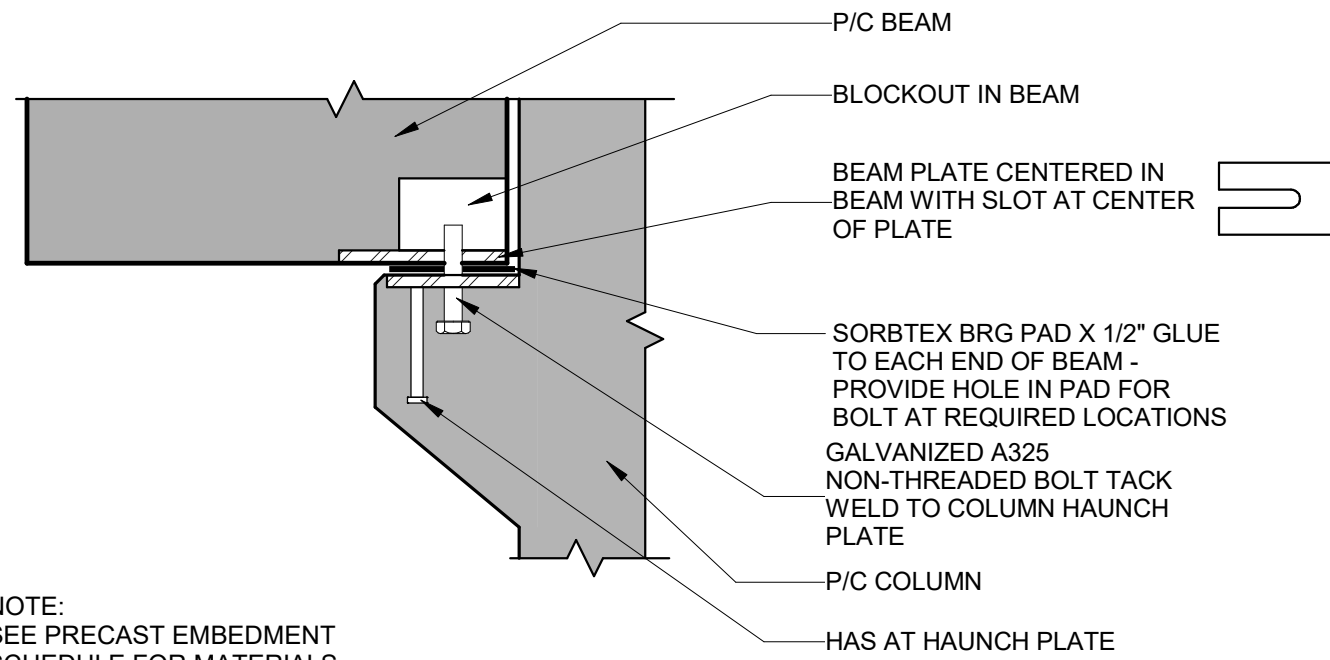
5  
NTS



NOTE:  
SEE PRECAST EMBEDMENT  
SCHEDULE FOR MATERIALS

PRECAST HAUNCH DETAIL

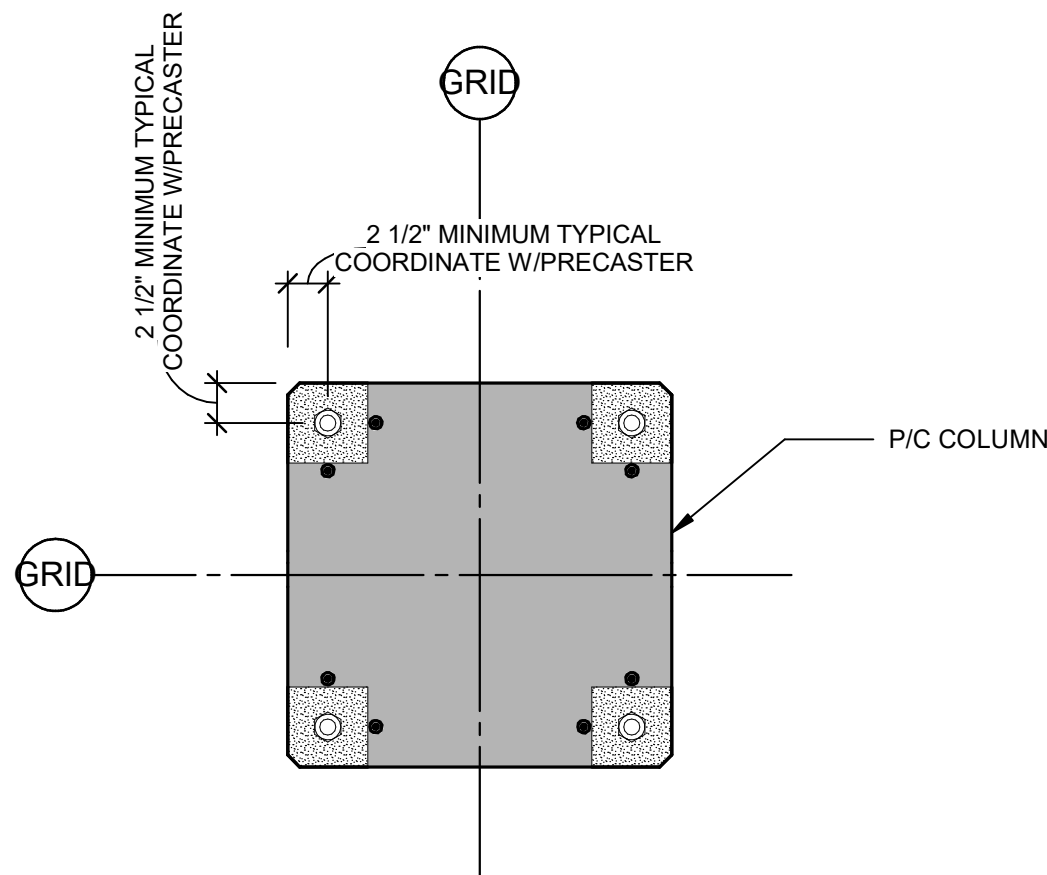
4  
NTS



NOTE:  
SEE PRECAST EMBEDMENT  
SCHEDULE FOR MATERIALS

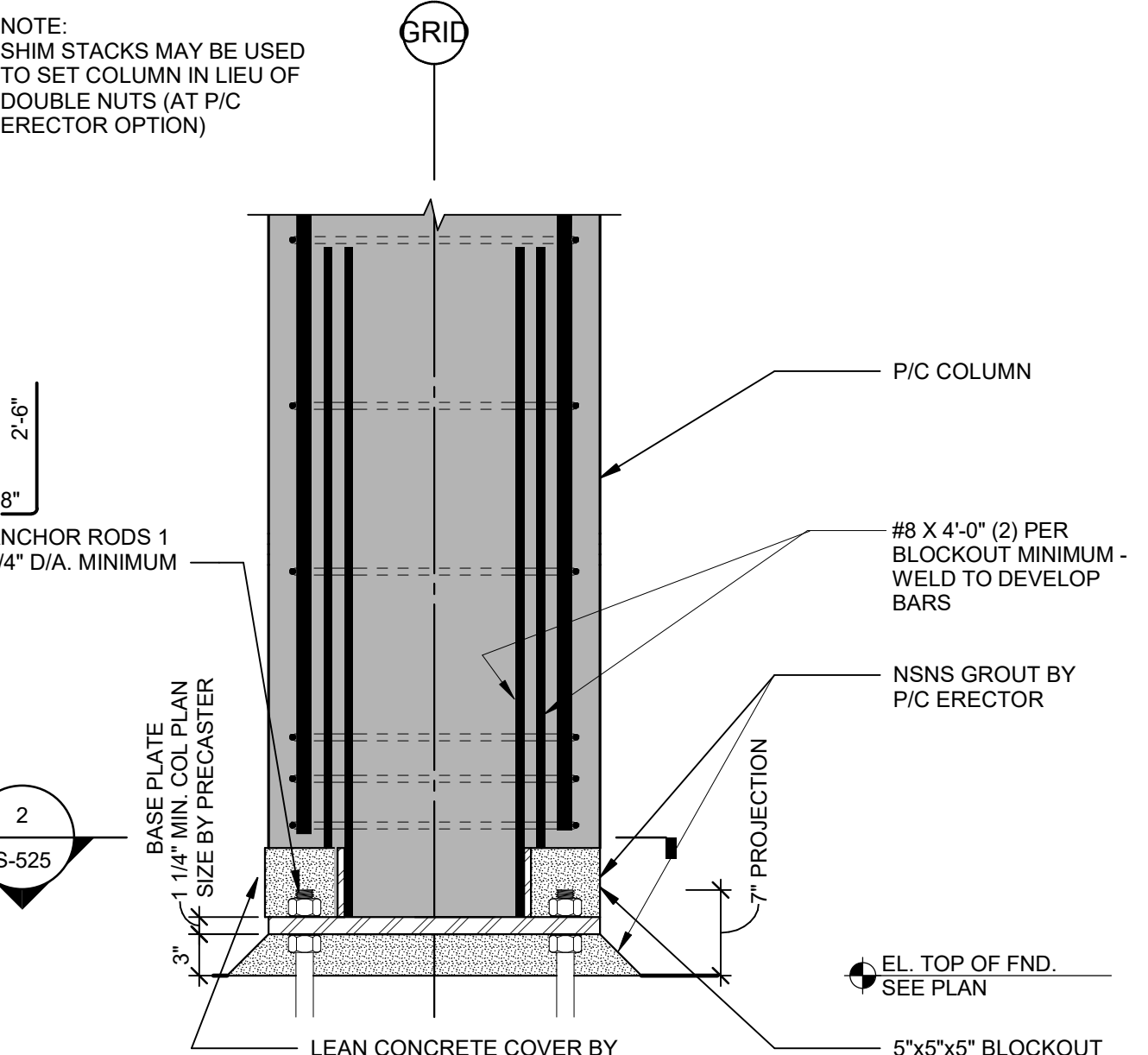
PRECAST CONNECTION DETAIL

3  
NTS



PRECAST COLUMN PLAN DETAIL

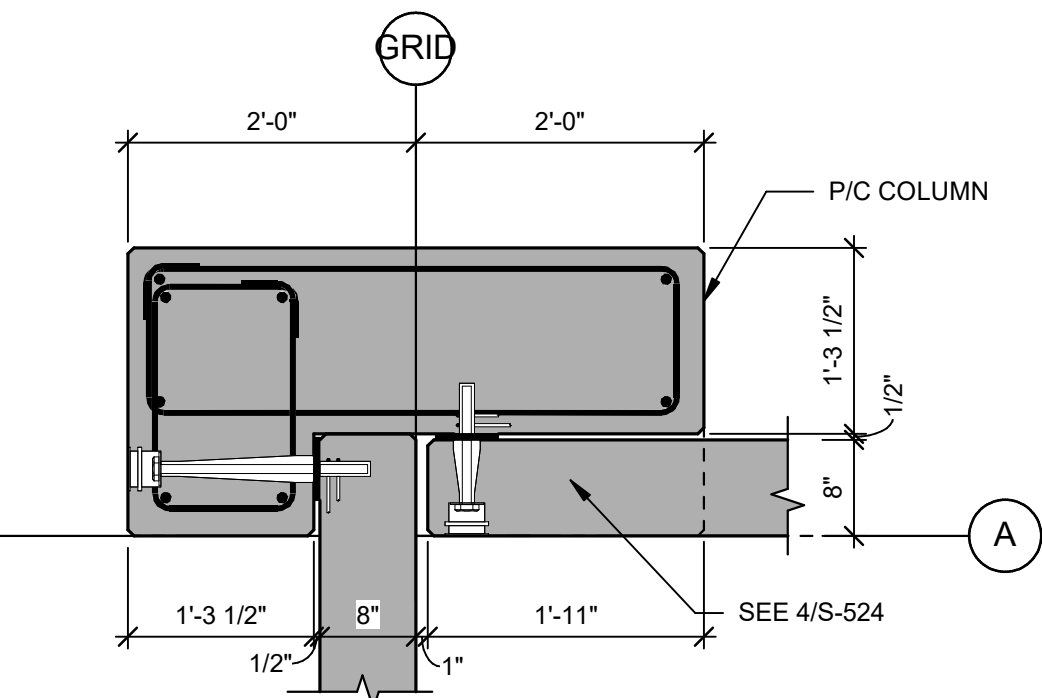
2  
NTS



NOTE:  
SEE PRECAST EMBED  
SCHEDULE FOR MATERIALS

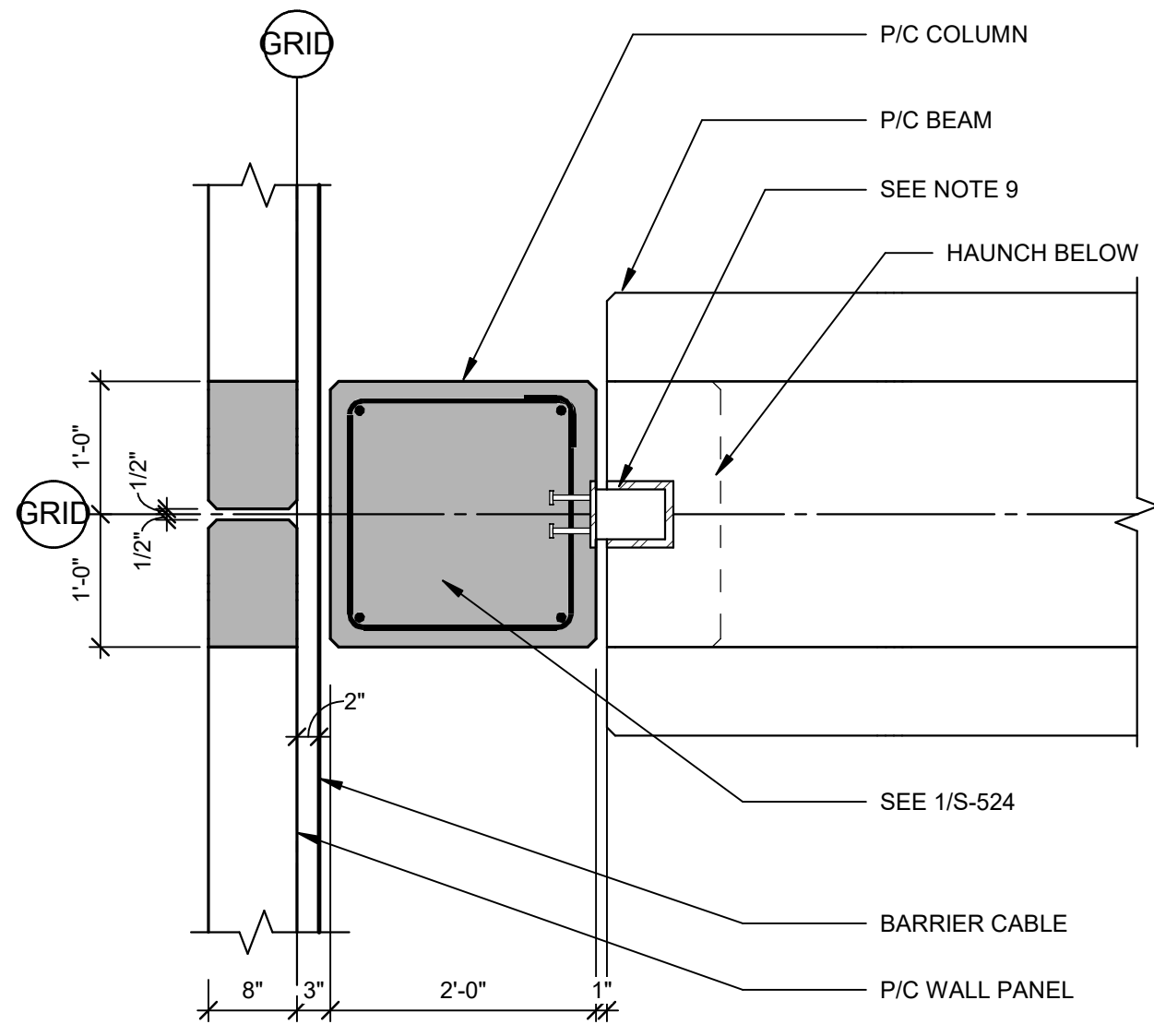
PRECAST COLUMN BASE DETAIL

1  
NTS



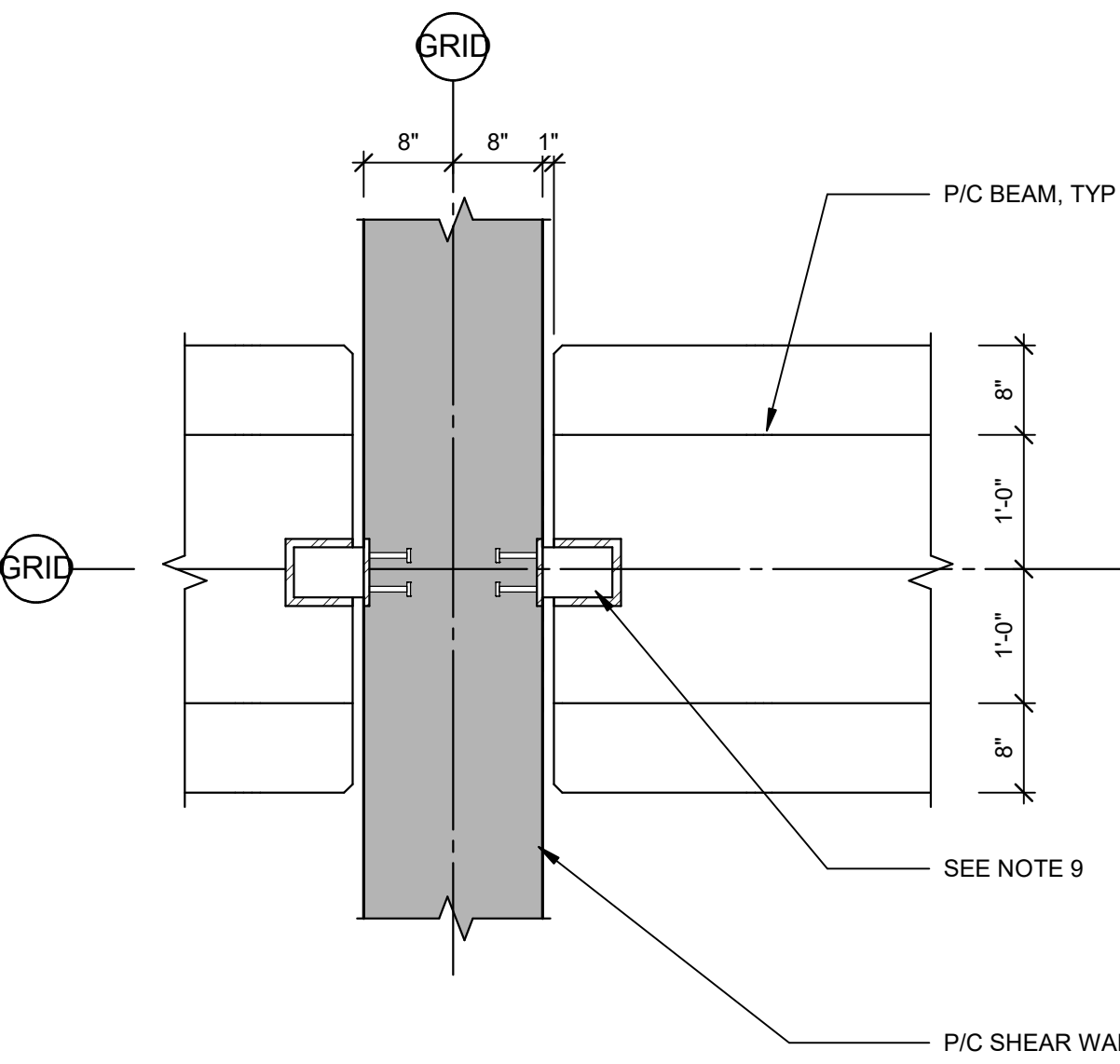
P/C CLOSURE SPANDREL PLAN DETAIL

14  
3/4" = 1'-0"



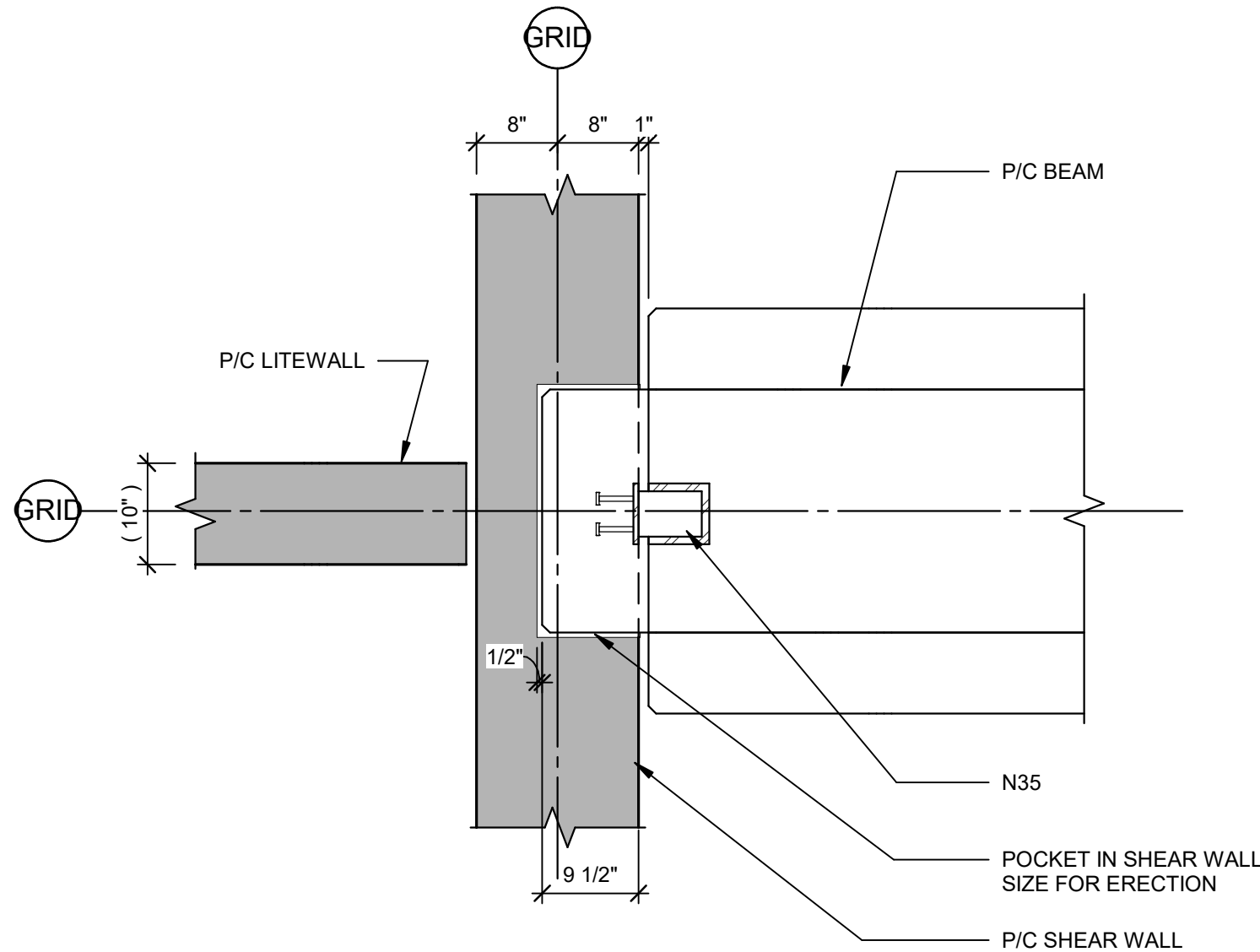
PRECAST COLUMN PLAN DETAIL

10  
3/4" = 1'-0"



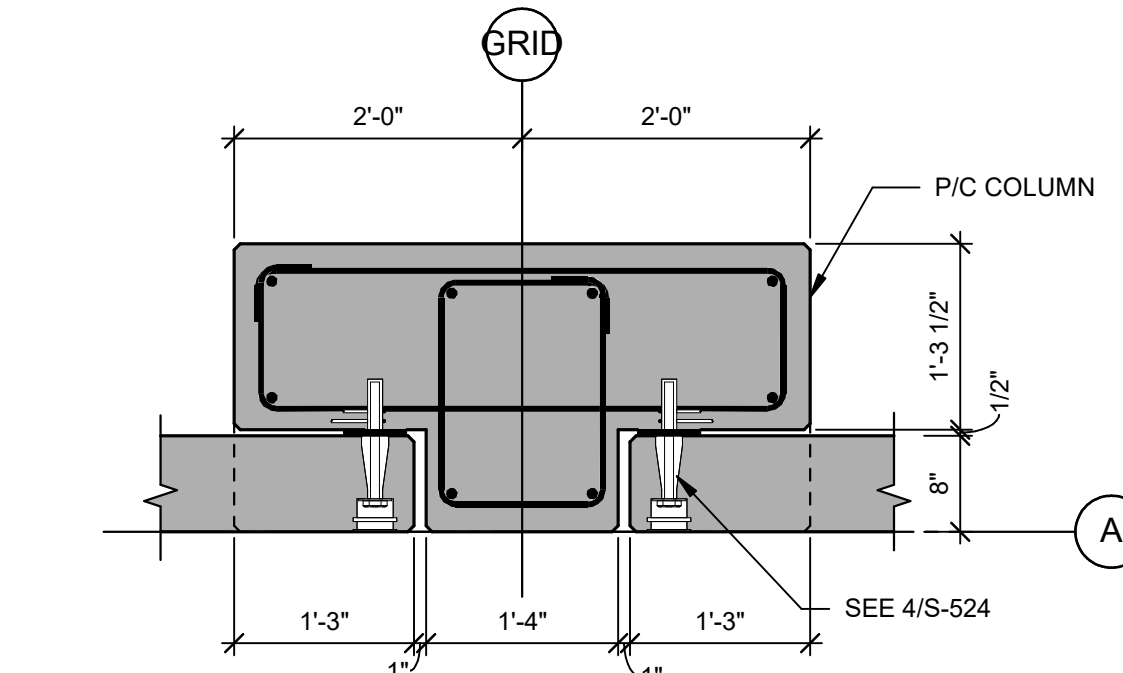
PRECAST WALL/BEAM PLAN DETAIL

13  
3/4" = 1'-0"



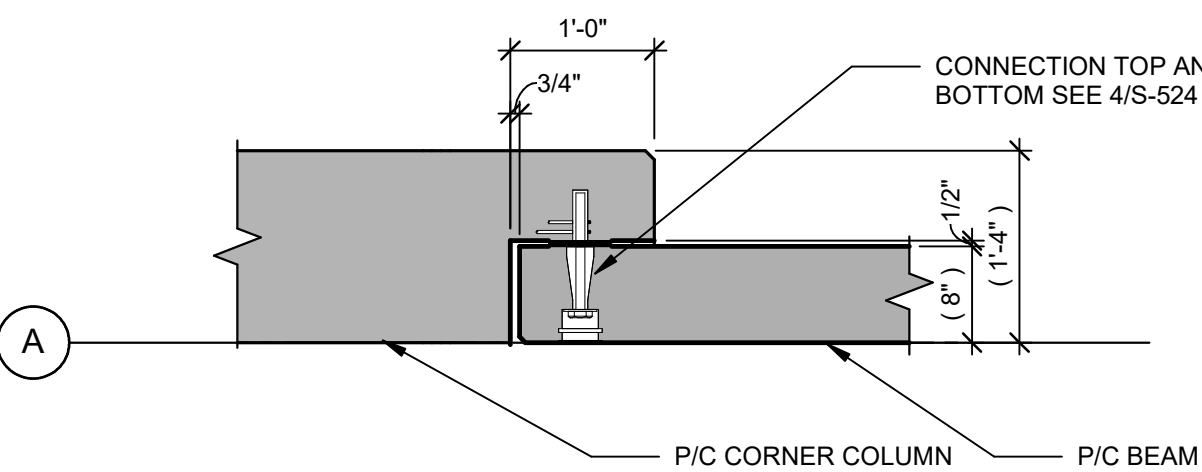
PRECAST WALL/BEAM PLAN DETAIL

9  
3/4" = 1'-0"



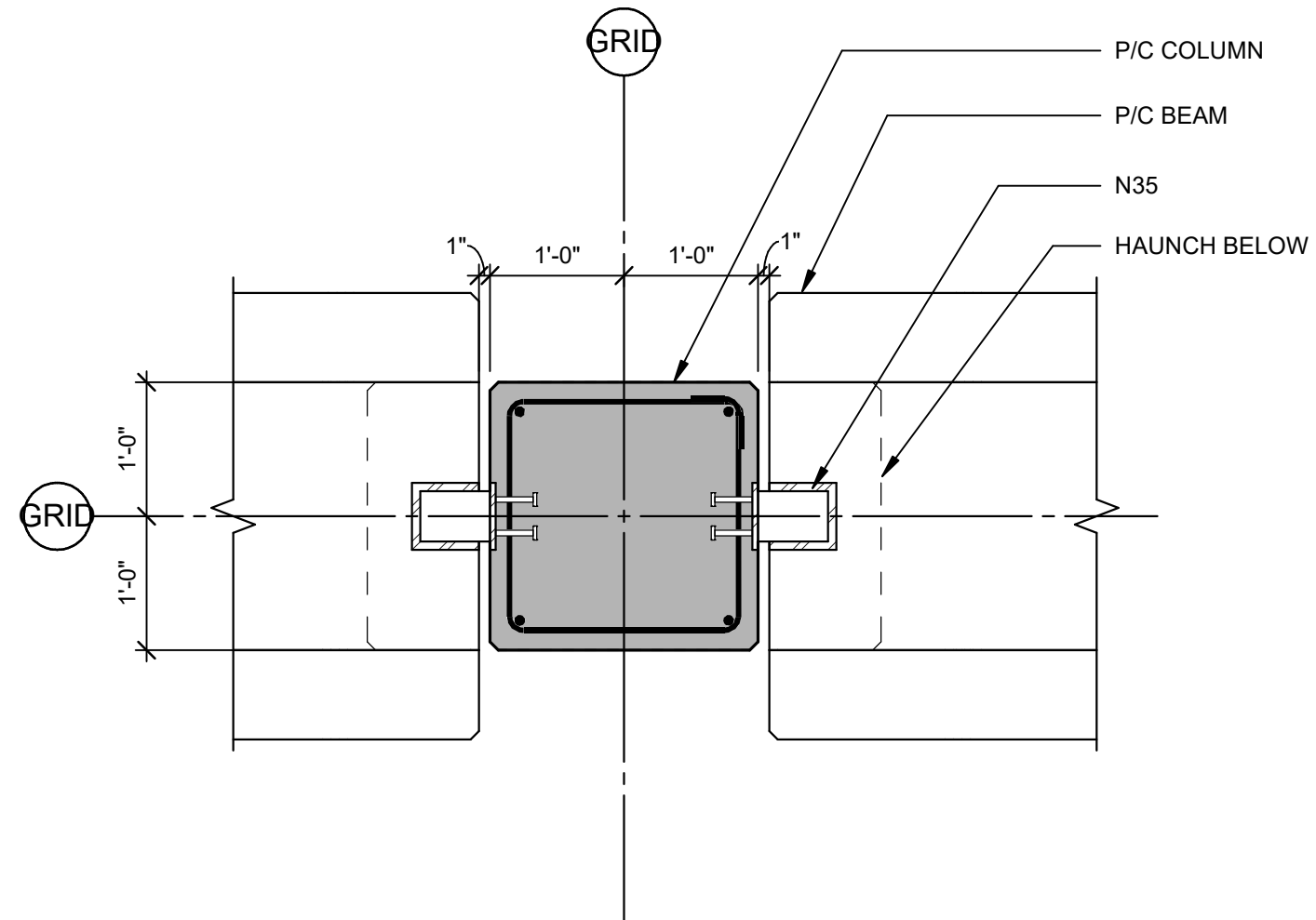
PLAN DETAIL

12  
3/4" = 1'-0"



PRECAST COL/SPANDREL PLAN DETAIL

11  
3/4" = 1'-0"



PRECAST COLUMN PLAN DETAIL

8  
3/4" = 1'-0"



4/15/2019 5:35:35 PM  
C:\revit\Projects\UNC\Wilmington Deck II.rvt\_roy.granham.rvt

A

B

C

D

E

1

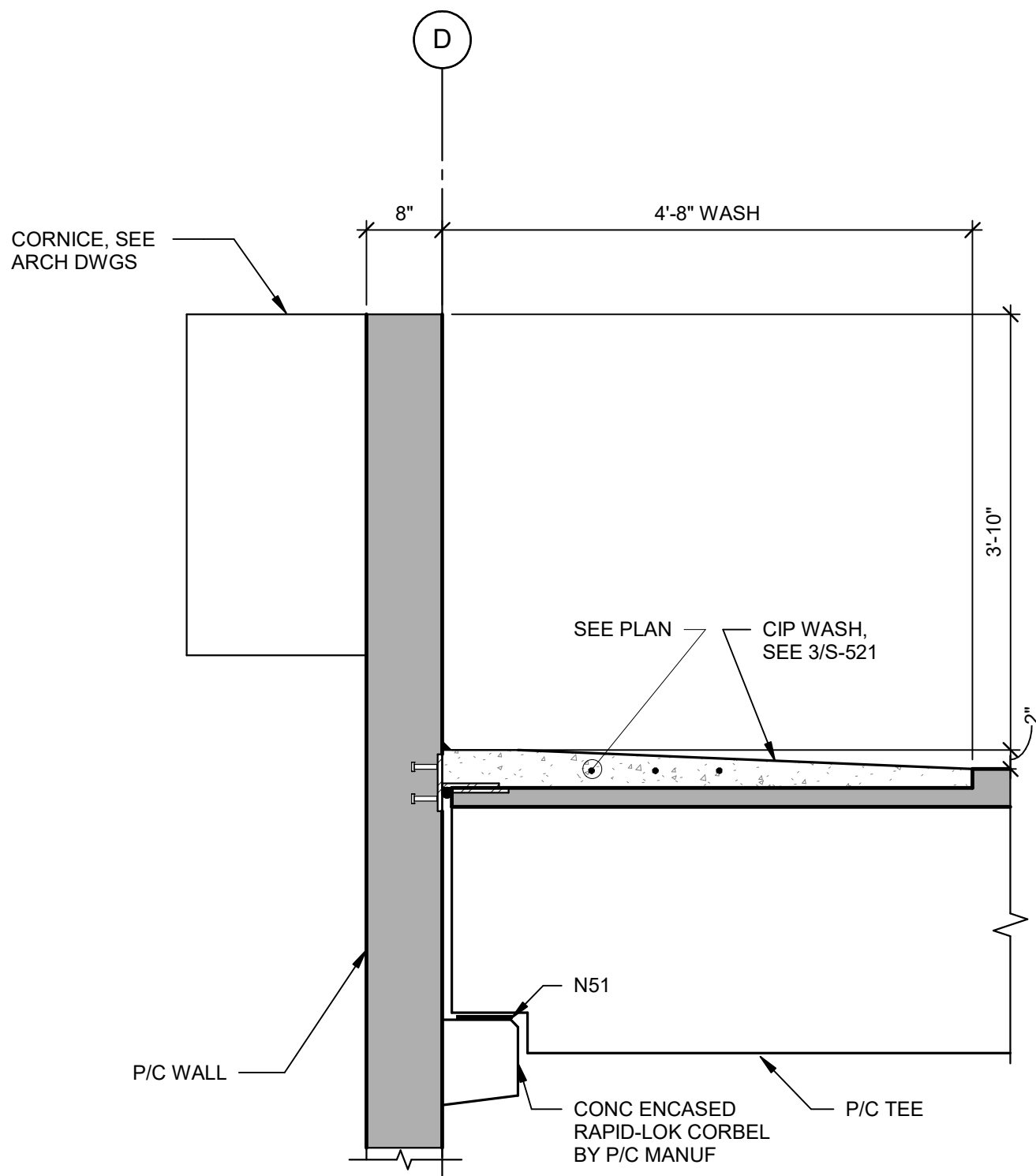
2

3

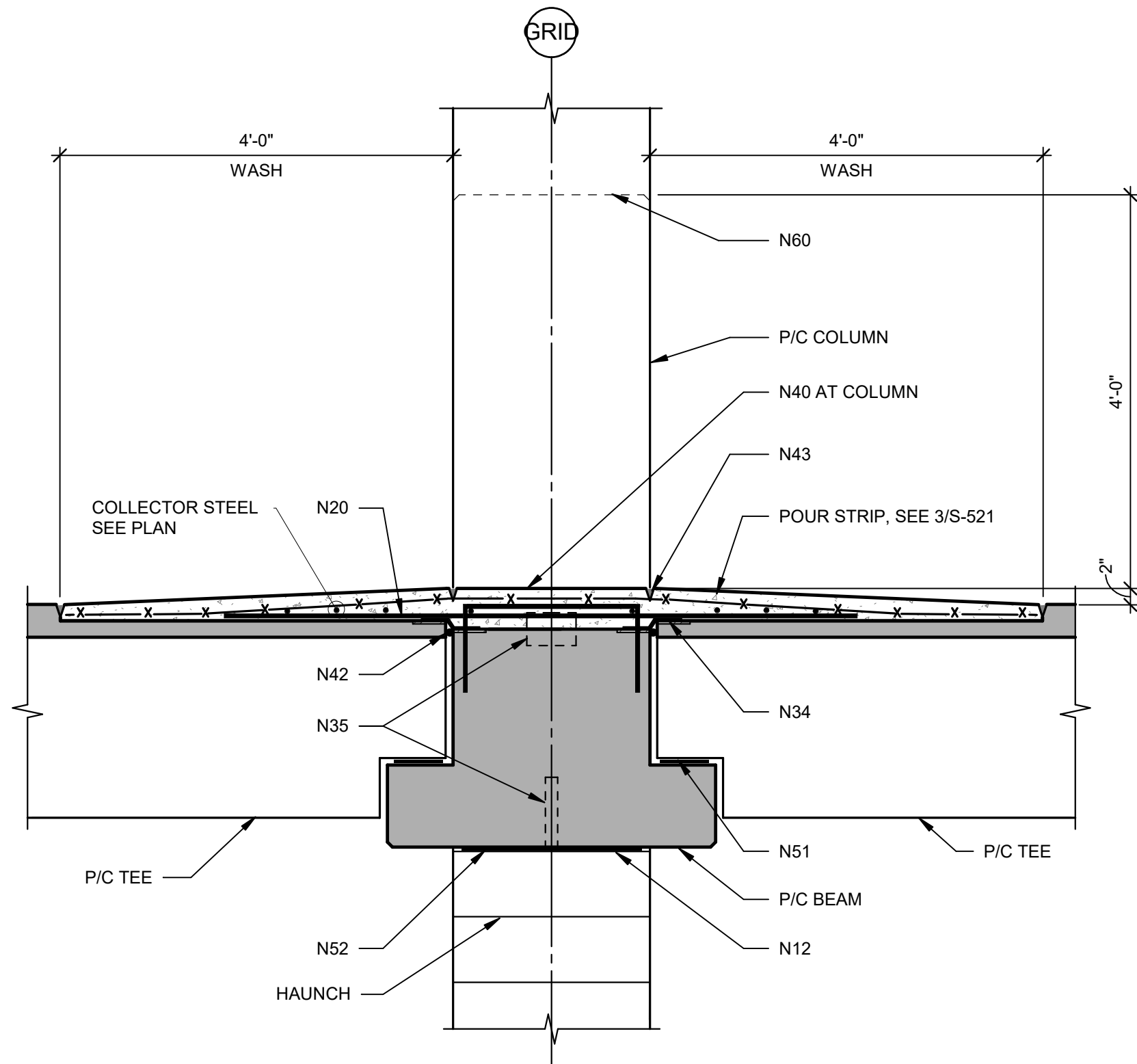
4

5

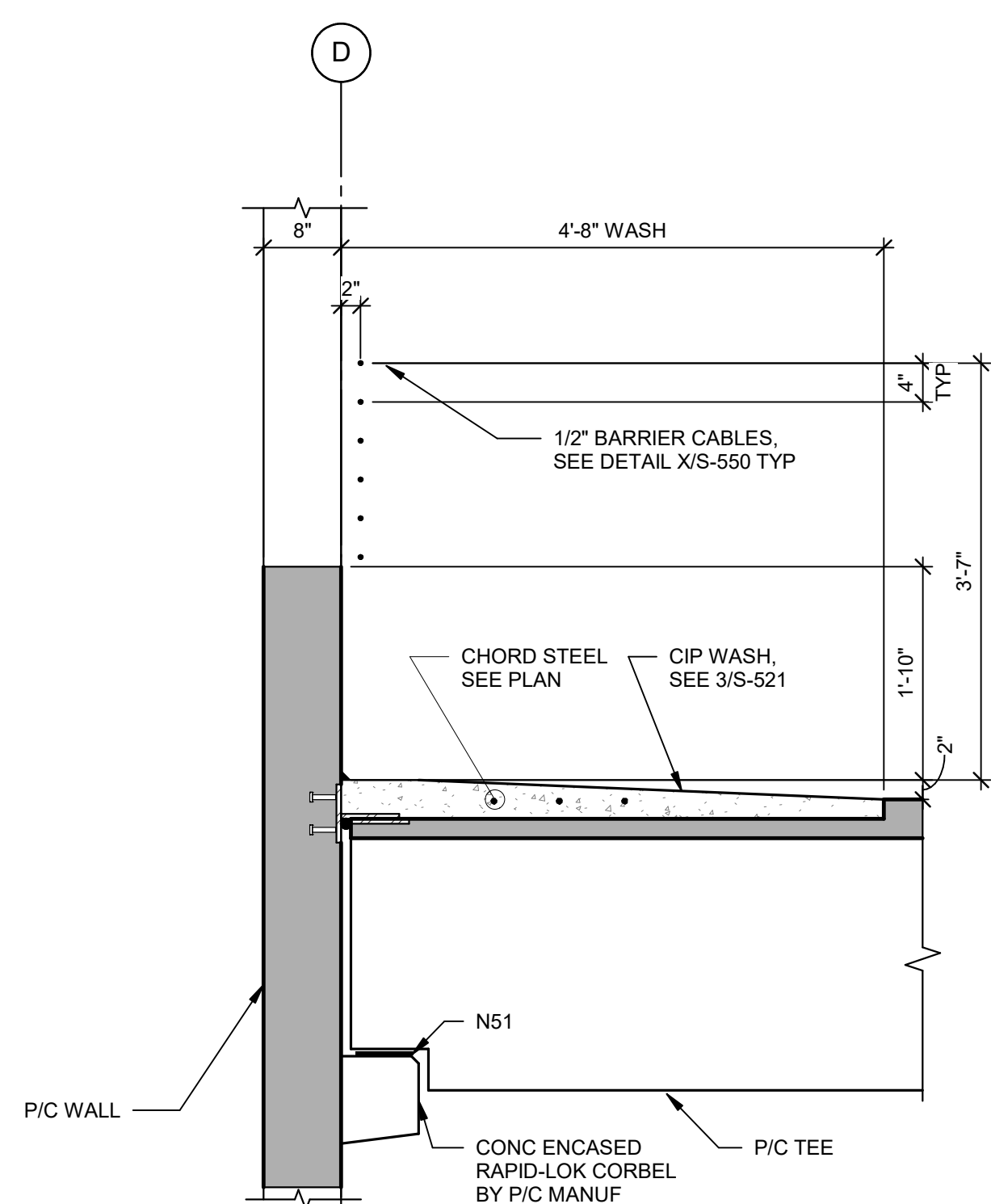
6



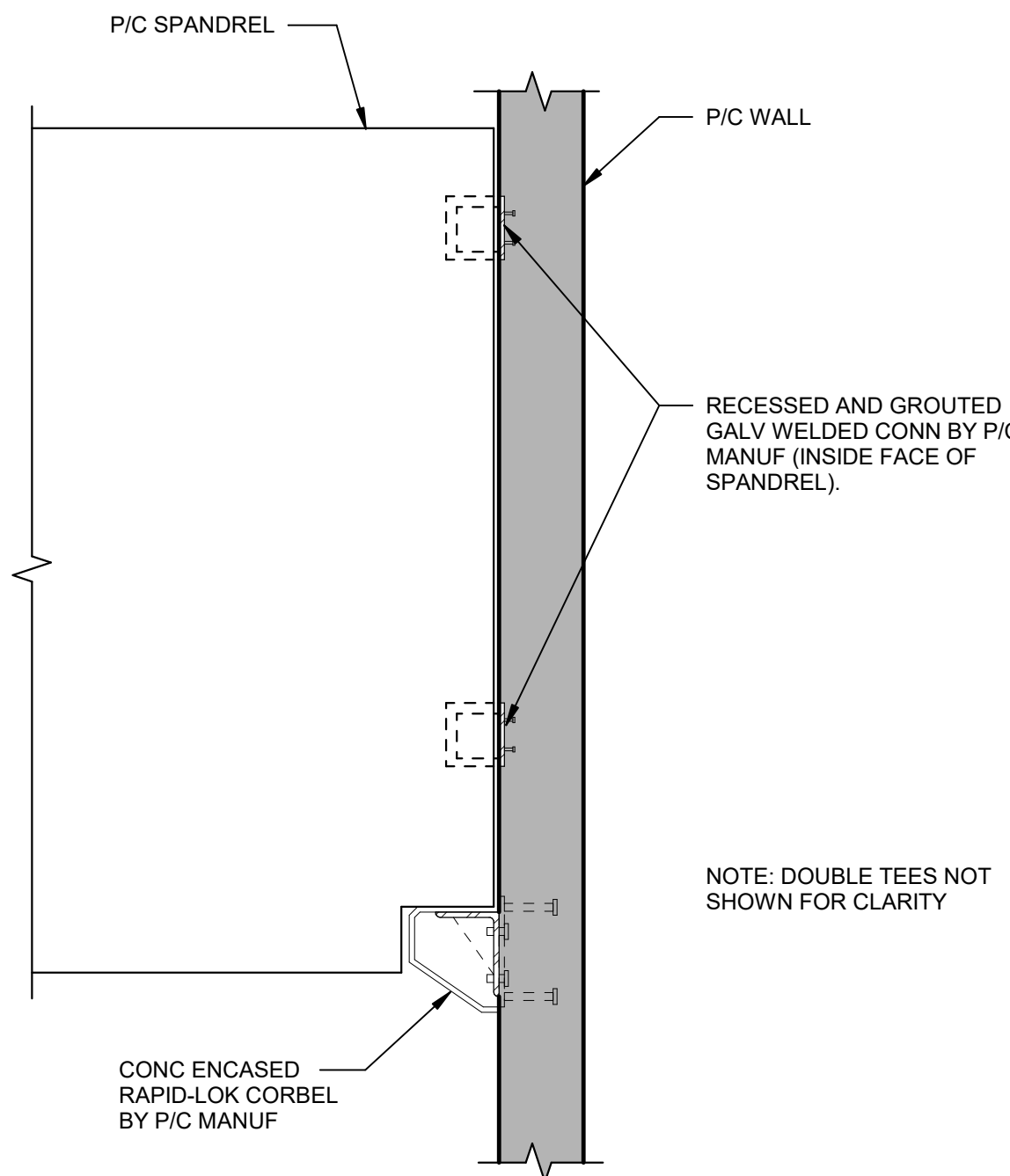
9 SECTION  
3/4" = 1'-0"



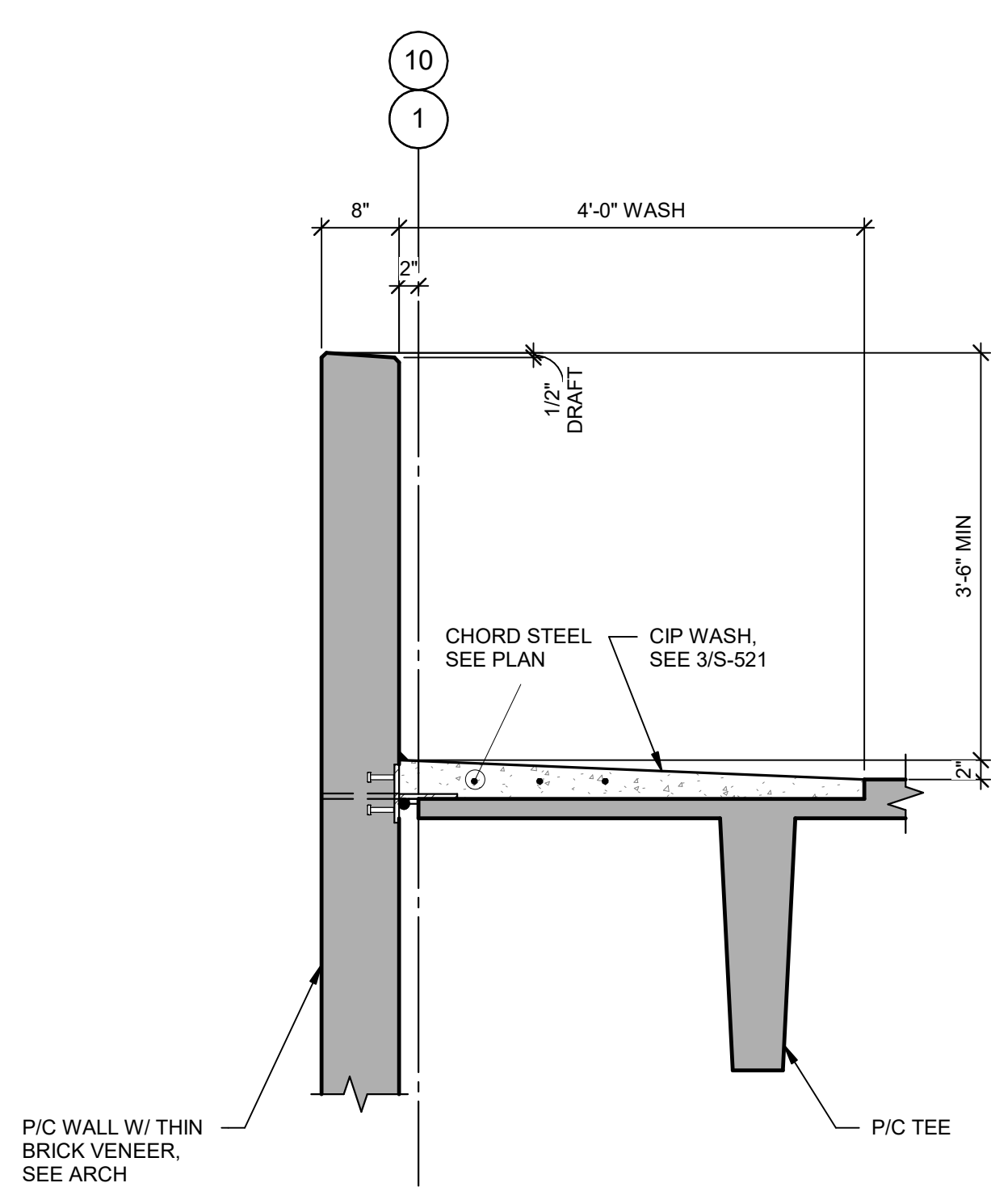
7 SECTION  
3/4" = 1'-0"



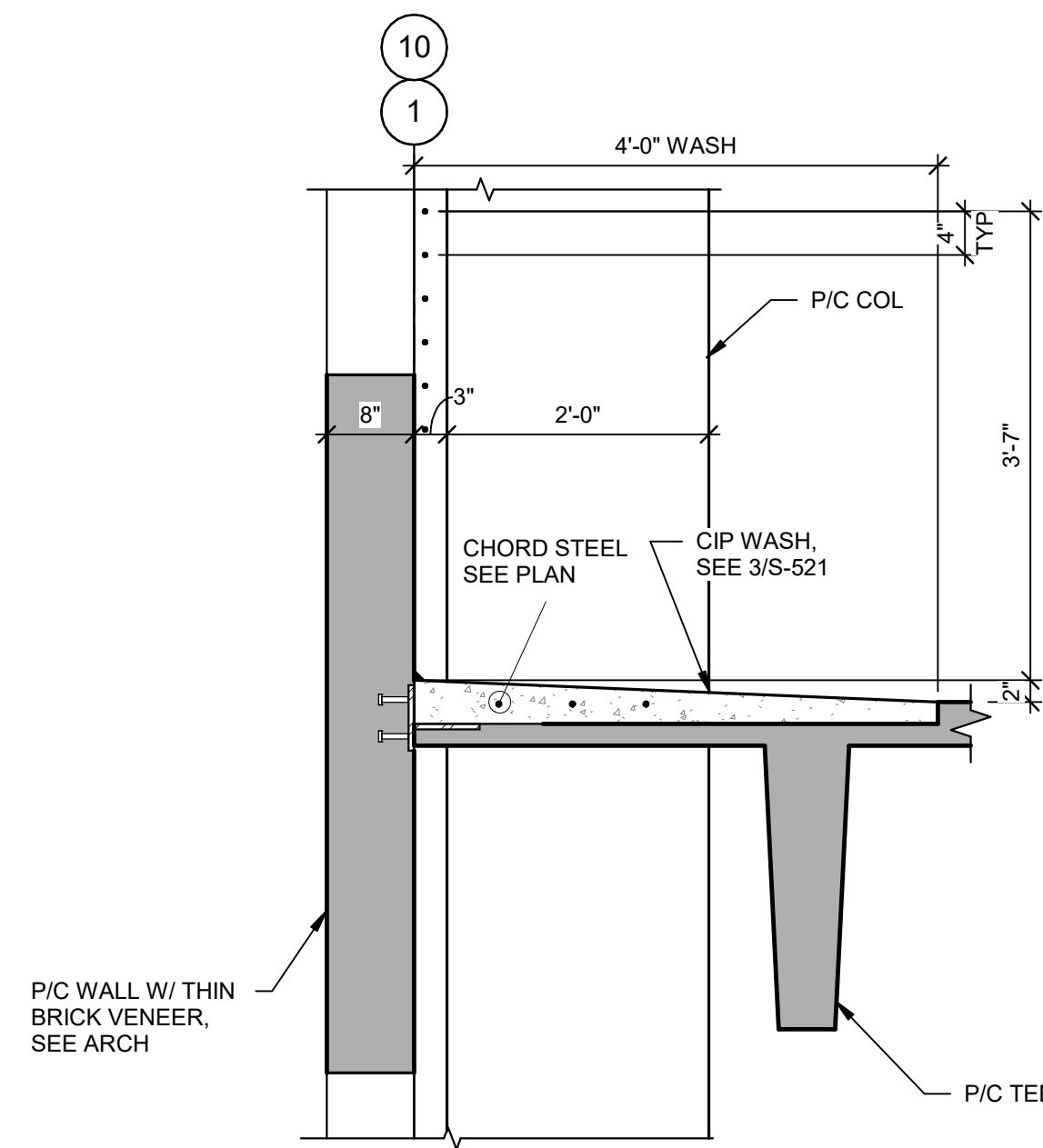
6 SECTION  
3/4" = 1'-0"



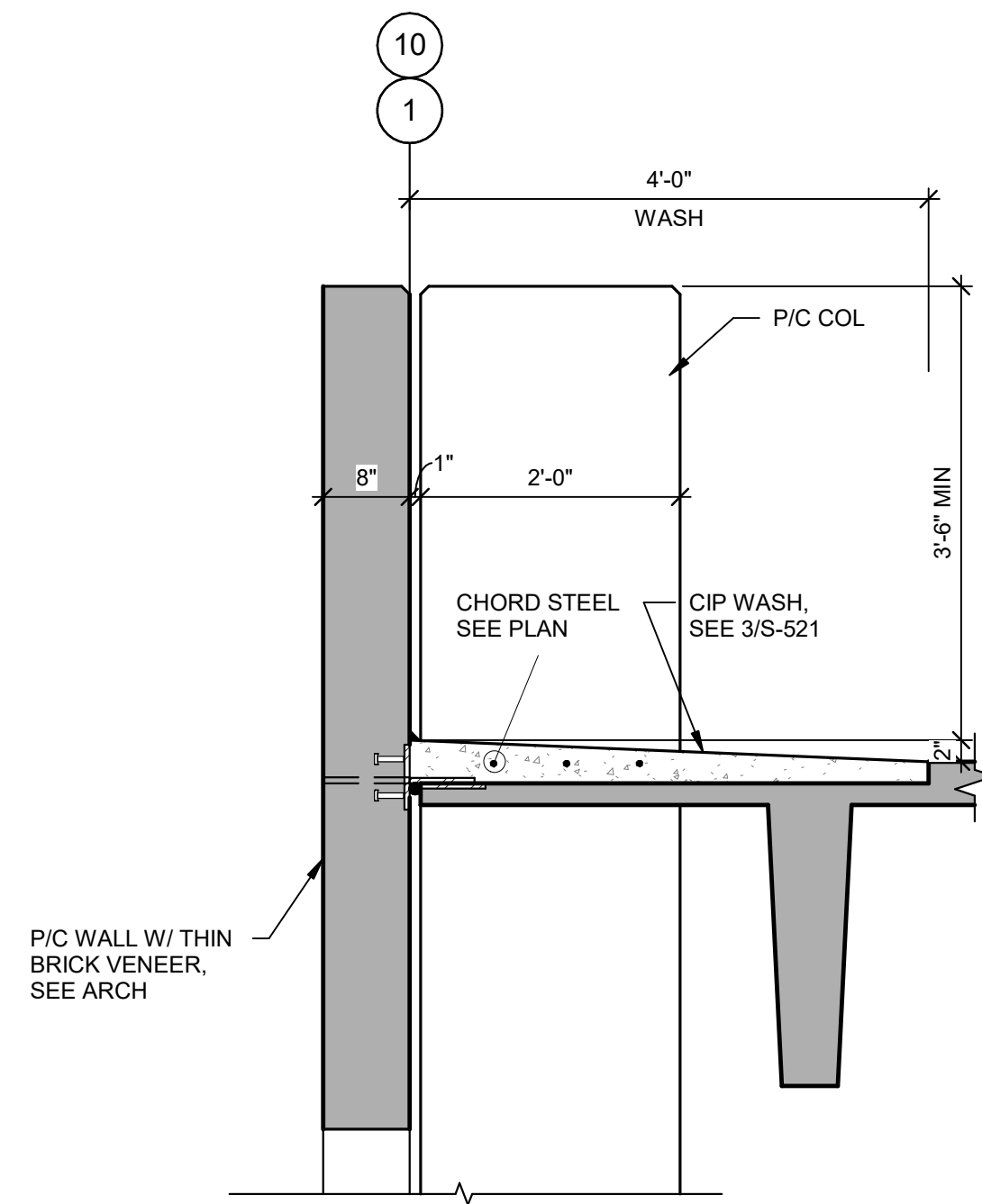
8 SPANDREL/WALL DETAIL  
3/4" = 1'-0"



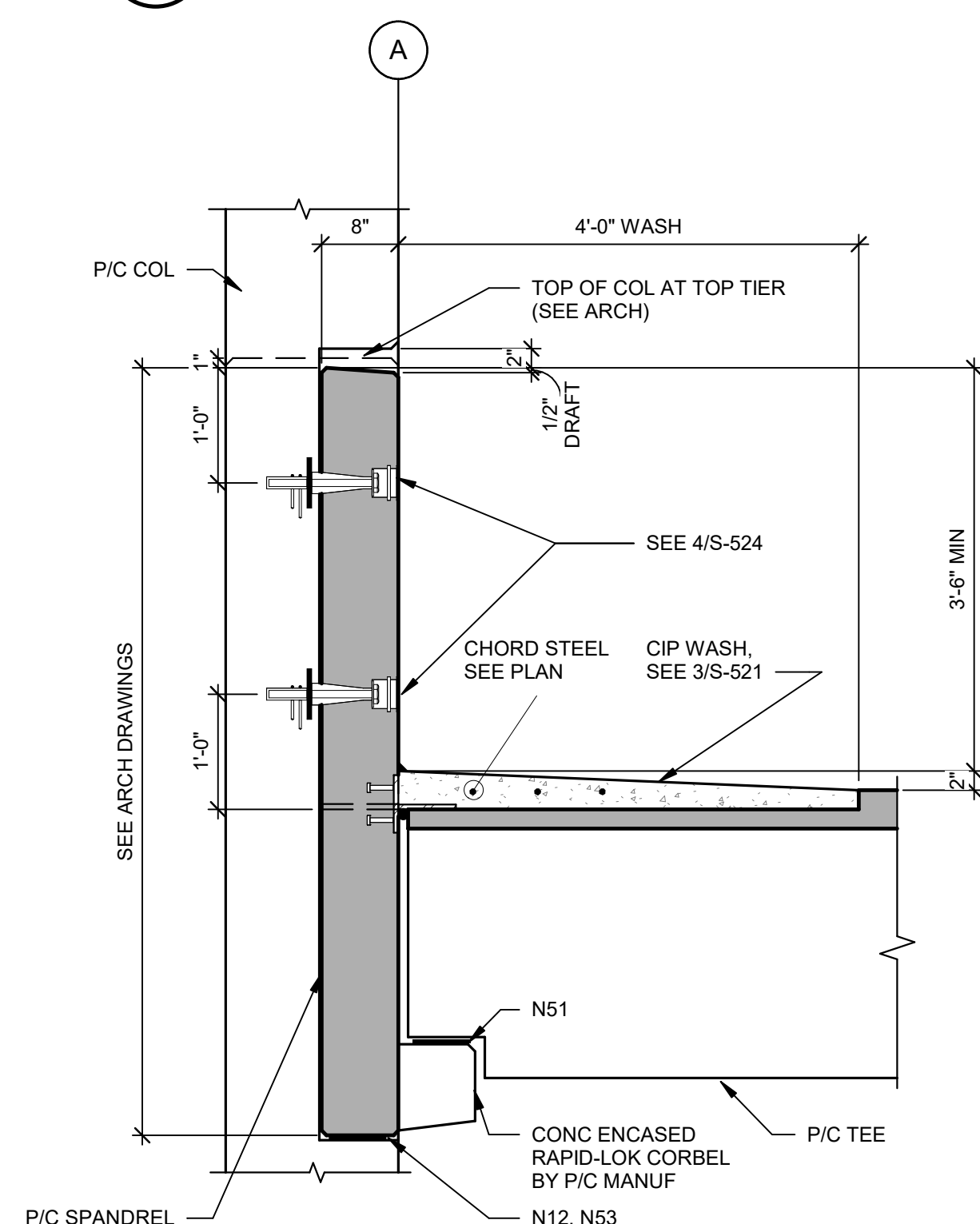
3 SECTION  
3/4" = 1'-0"



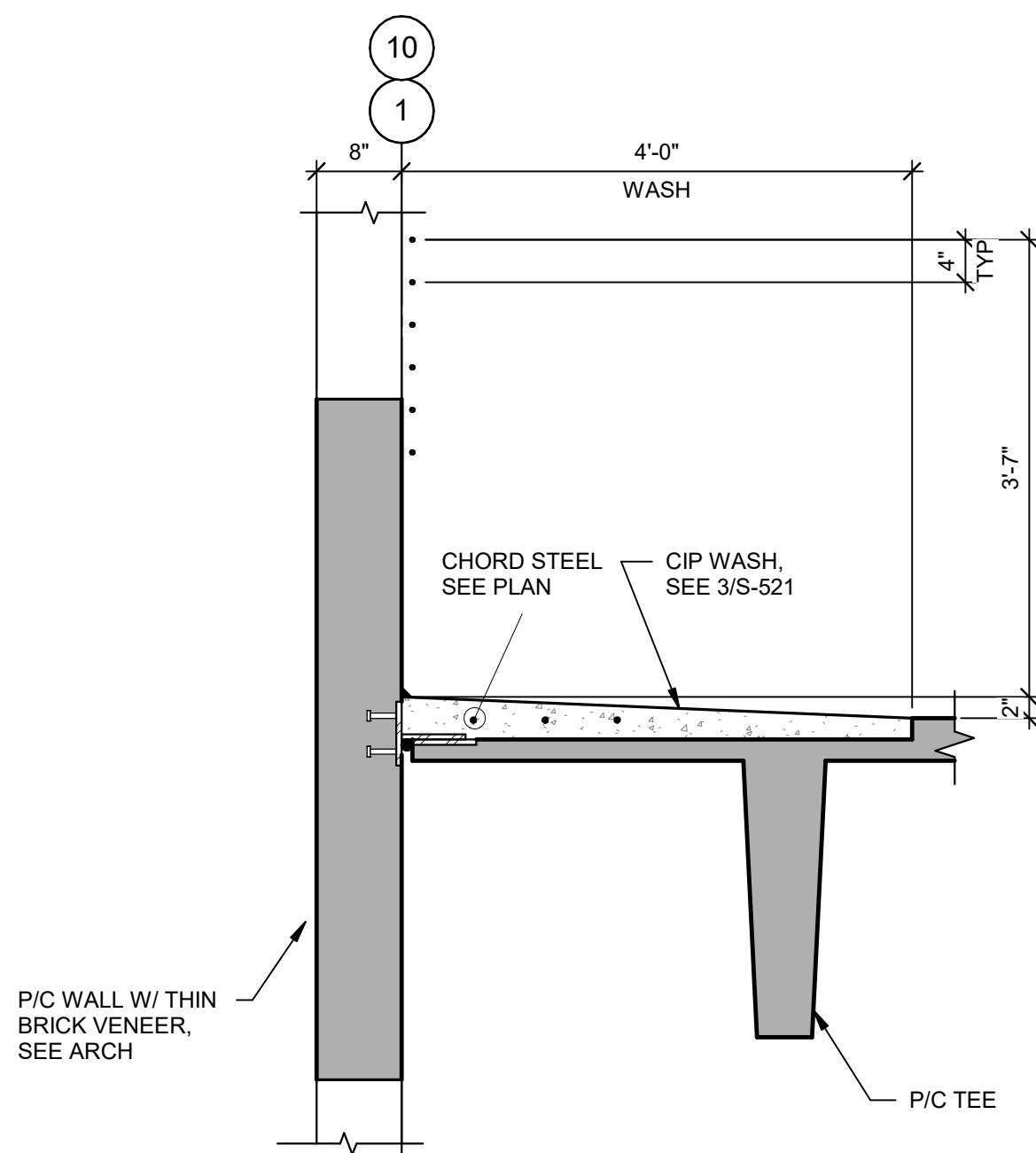
4 SECTION  
3/4" = 1'-0"



5 SECTION  
3/4" = 1'-0"



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



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

- KEY NOTES
- N12. SLOPE BEARING PLATES IN BEAMS AND SUPPORT PLATES IN COLUMNS, AS REQ'D, TO PROVIDE UNIFORM BEARING ON PADS (TYPICAL).
  - N20. #6 (MIN) X 7'-0" @ EACH TEE STEM.
  - N21. #4 L-BAR W/ 2'-0" LEGS, SPACE TO MATCH COIL, ROD SPACING.
  - N22. #4 X 3'-0" W/ 180° STD HOOK @ 4'-0" OC AND 1-#4 X CONTINUOUS.
  - N23. CHORD STEEL, SEE PLAN.
  - N27. 6" X 6" W/ 2.9 X W/ 2.9 ADDED WWF.
  - N28. #6 (MIN) X 4'-6" @ EACH TEE STEM.
  - N30. WELDED COLUMN BRACING CONNECTION BY PRECASTER.
  - N31. 3/4" DIA INSERT AND COIL ROD X 2'-6" (6" FROM EDGE OF EACH POCKET) W/ #4 HAIRPIN W/ 2'-0" LEGS AROUND INSERT AND 1-#4 CONTINUOUS.
  - N32. 3/4" DIA INSERT/COIL ROD (GALV) X 2'-6" @ 4" OC W/ 2-#4 CONTINUOUS ADJUST INSERT ELEV FOR TEE CAMBER.
  - N33. 3/4" DIA INSERT/COIL ROD (GALV) X 2'-6" @ EACH TEE STEM W/ 2-#4 CONTINUOUS.
  - N34. ERECTION CONNECTION BY PRECASTER.
  - N35. TORSION/STABILITY CONNECTIONS TOP & BOT EA EACH END OF BEAM BY PRECASTER. SEE DETAILS ON SHEET S-525 FOR EXAMPLES.
  - N36. CONNECTION REQUIRED TO RESIST BUMPER LOAD FORCES.
  - N40. COVE SEALANT, SEE DETAIL 1/S-570.
  - N42. CONTINUOUS ETHAFOAM CONC DAM AS REQ'D.
  - N43. TOOLED JOINT W/ SEALANT.
  - N50. SORTEX BRG PAD X 1/2", GLUE TO BEAM.
  - N51. RANDOM ORIENTED FIBER REINFORCED BRG. PAD X 3/8", GLUE TO TEE STEM.
  - N52. SORTEX BRG PAD X 1/2", GLUE TO BEAM, AT EACH END OF BEAM. PROVIDE HOLE IN PAD FOR BOLT AT REQUIRED LOCATIONS.
  - N53. SORTEX BRG PAD X 1/2", GLUE TO COLUMN POCKET.
  - N60. TOP OF COLUMN AT TOP TIER.
  - N63. USE FORM WHERE BOTTOM OF TEE FLANGE RISES ABOVE TOP OF BEAM.

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty**  
Construction

DESIGNER



**CLARK NEXSEN**  
1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028



13660 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518



CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEAL



SUBMITTAL

04/15/2019

CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS

NO.	DESCRIPTION	DATE

KEY PLAN

SHEET  
**STRUCTURAL DETAILS**

**S-540**

DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

ON PROJECT  
NUMBER



4/15/2019 5:35:38 PM  
C:\revit\Projects\UNC\Wilmington\Desk II\_r7\_09garbam.rvt

1  
E  
D  
C  
B  
A

2

3

4

5

6

## SHEET NOTES

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty**  
Construction

DESIGNER

**CLARK NEXSEN**  
1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028

**WALKER**  
CONSULTANTS

13860 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518

**MCKIM&CREED**

CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEAL



SUBMITTAL  
04/15/2019  
CONSTRUCTION DOCUMENT  
SUBMITTAL 01

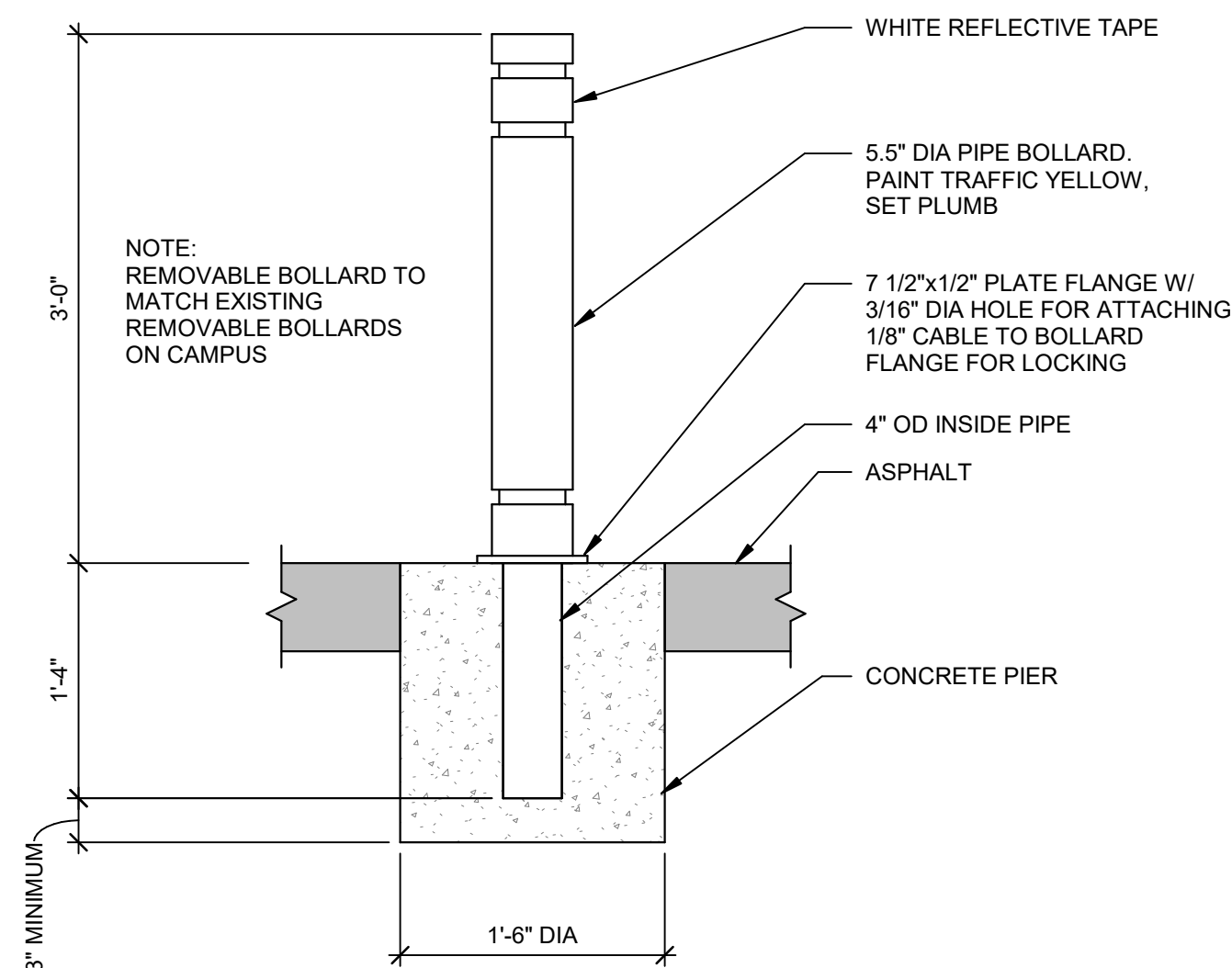
REVISIONS


KEY PLAN

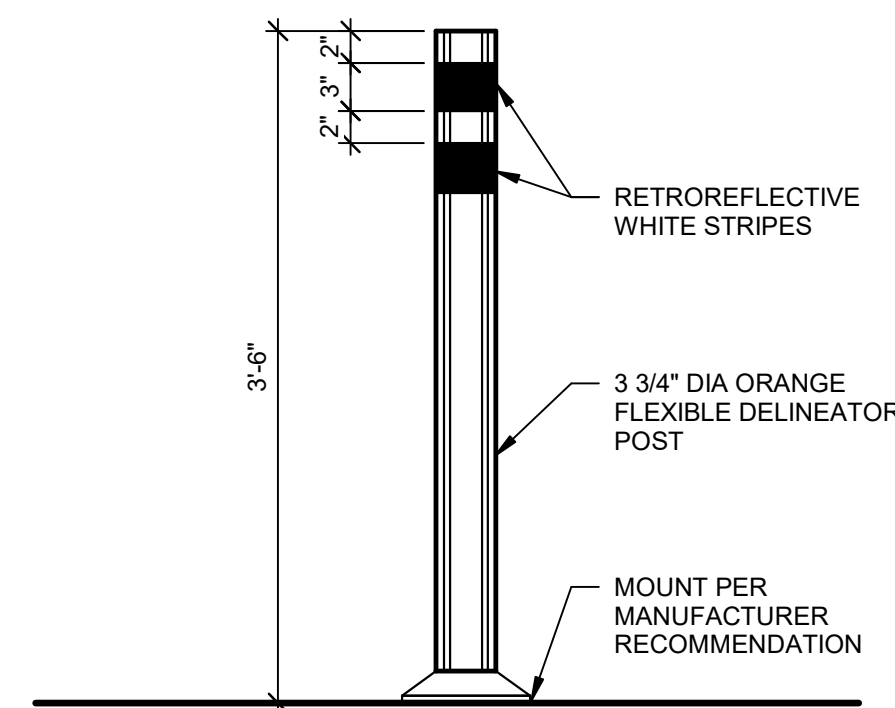
SHEET  
**MISC METALS DETAILS**

**S-550**

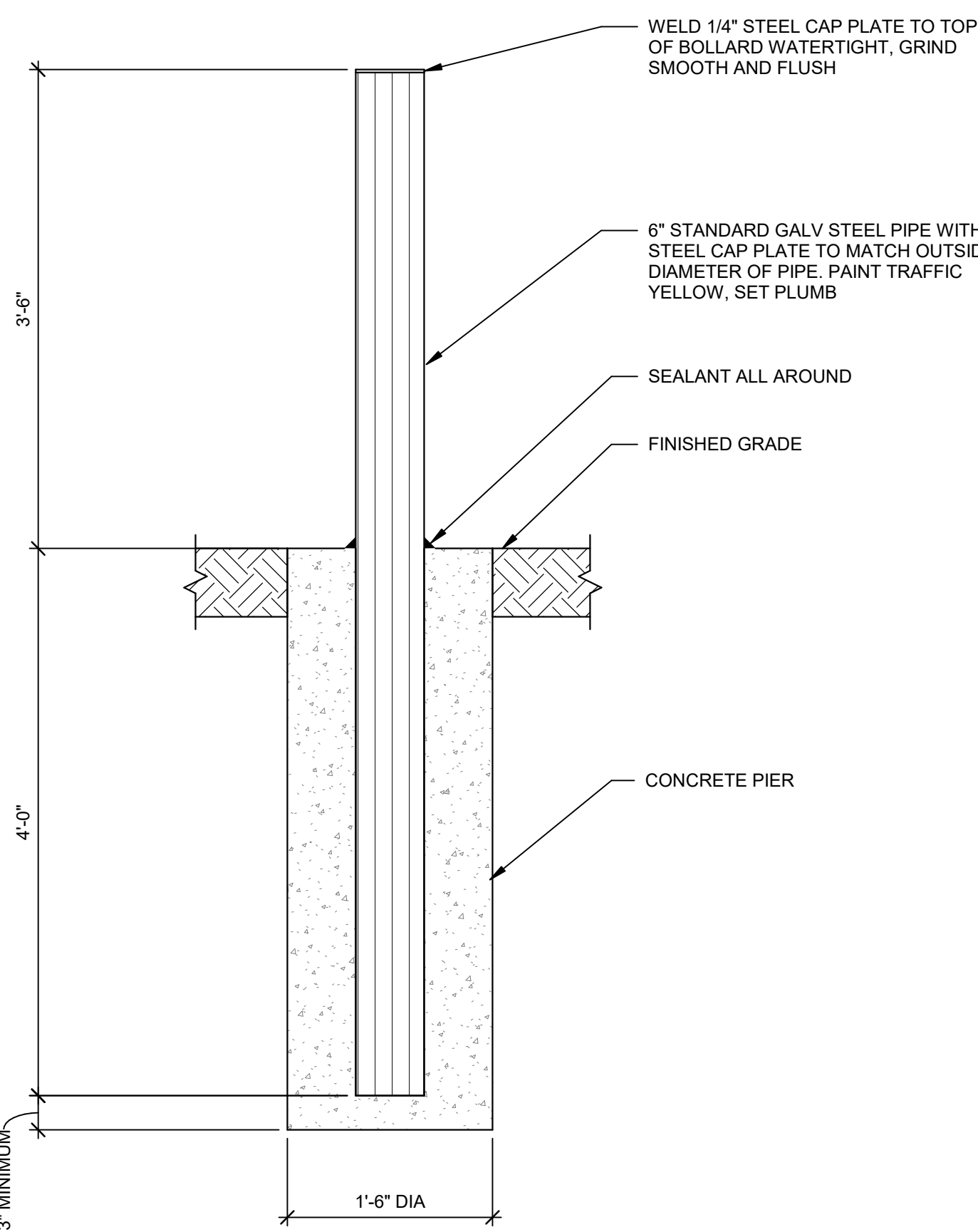
DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker  
ON PROJECT  
NUMBER



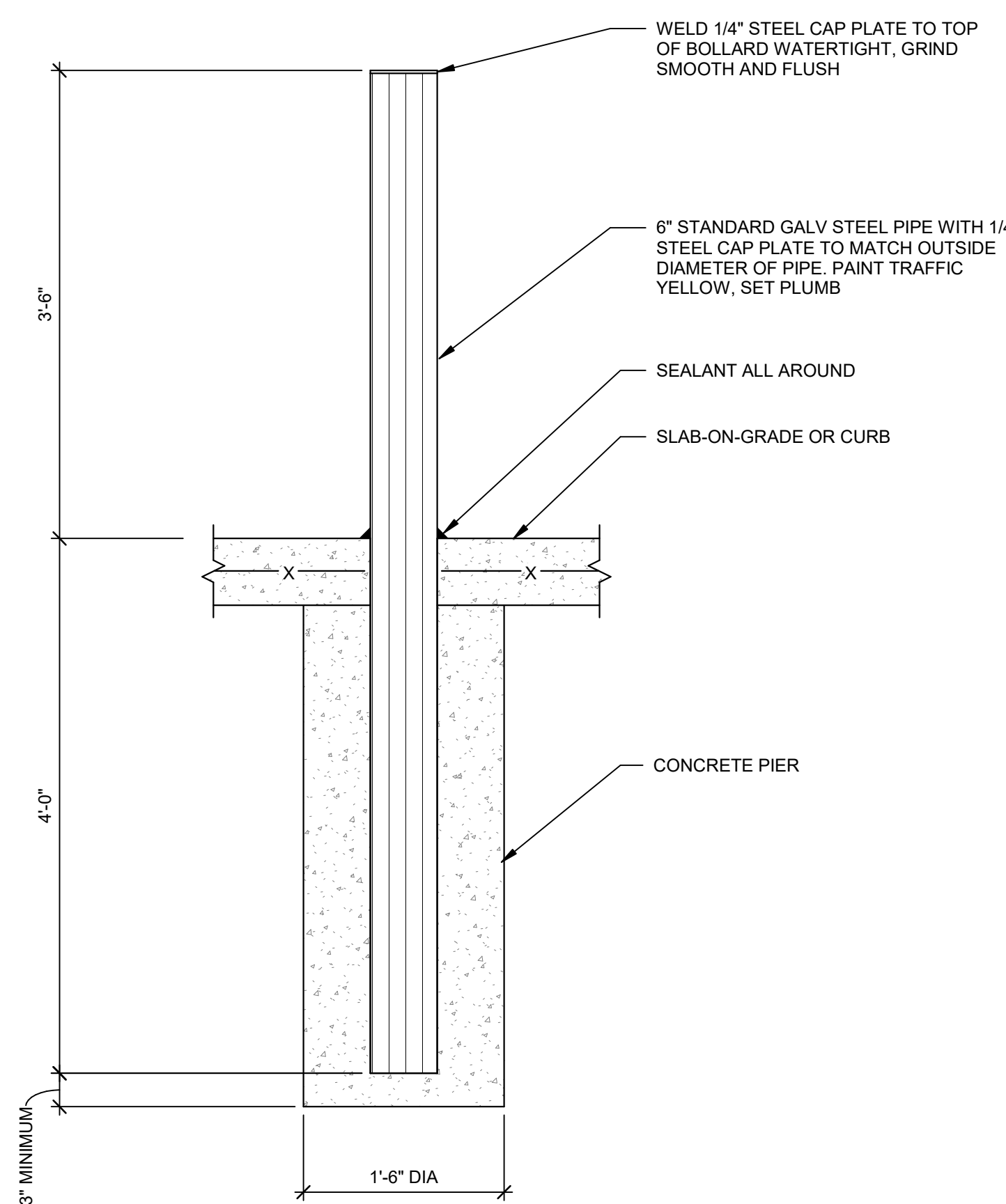
9 REMOVABLE PIPE BOLLARD DETAIL  
1" = 1'-0"



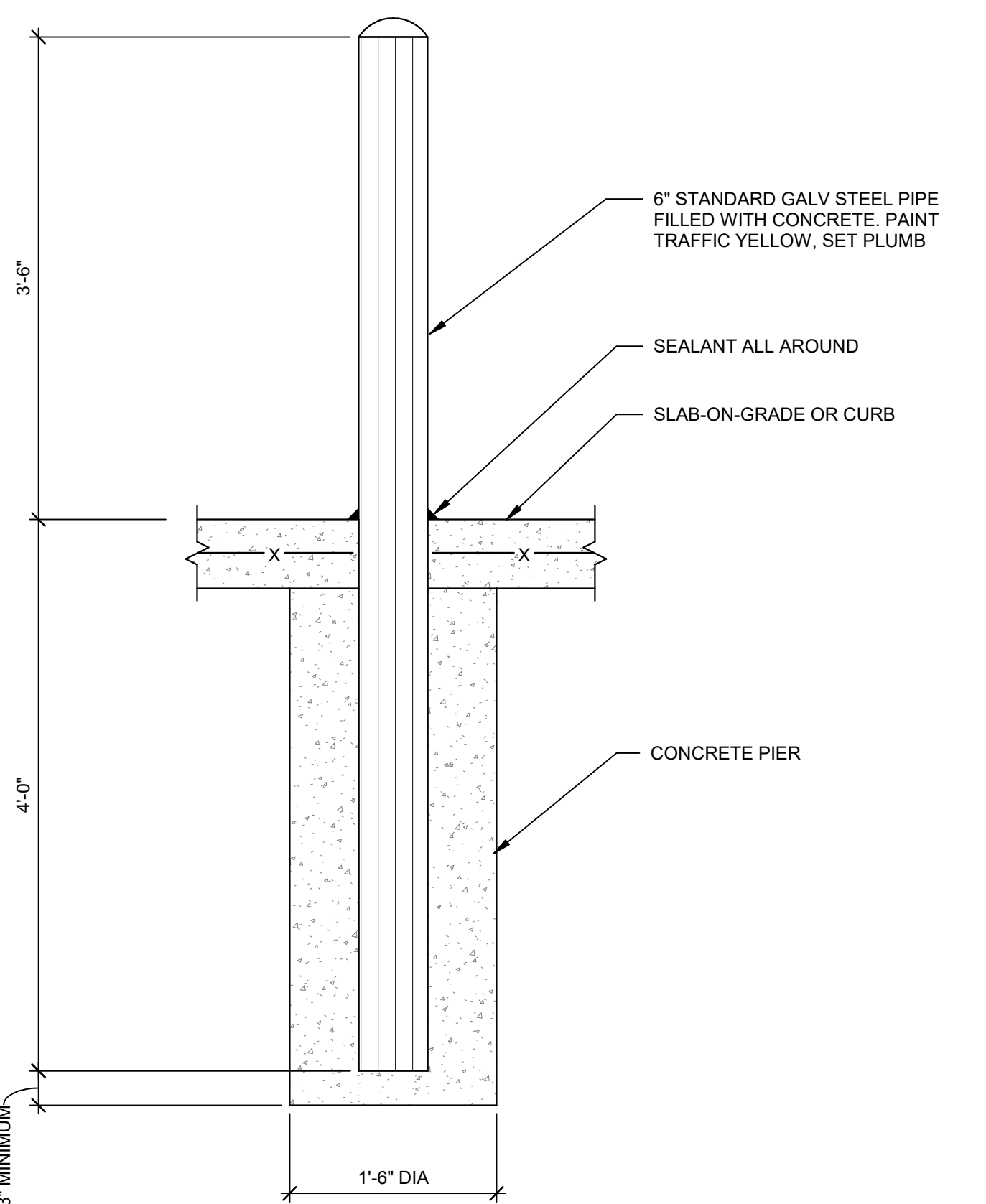
6 DELINEATOR POST  
1" = 1'-0"



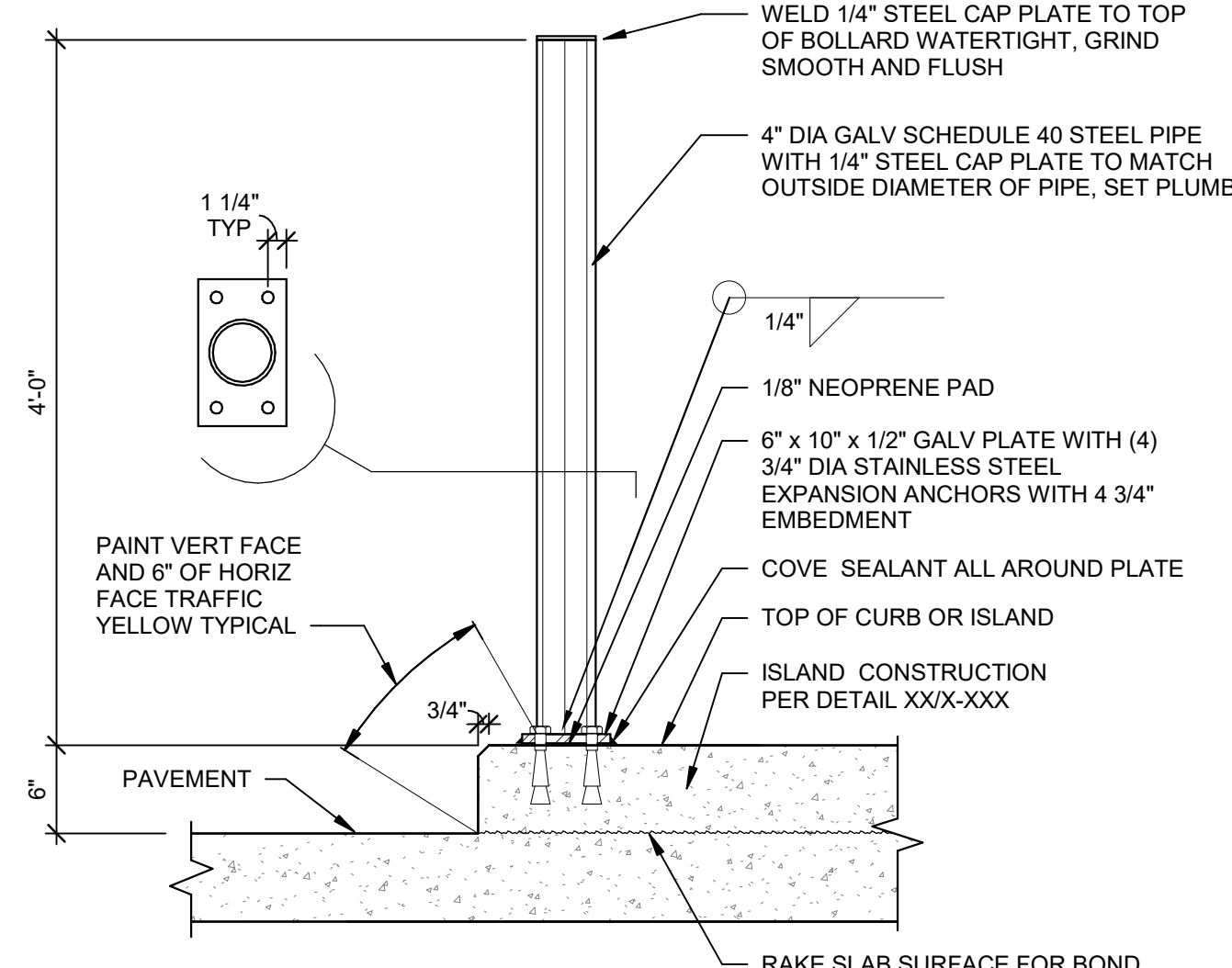
11 PIPE BOLLARD DETAIL  
1" = 1'-0"



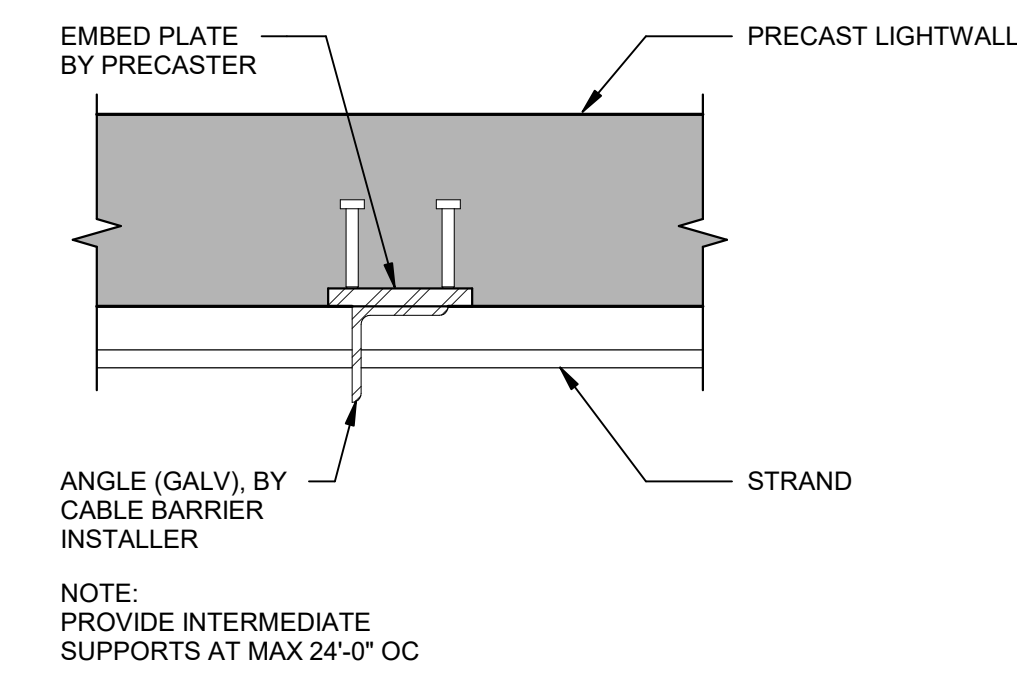
8 PIPE BOLLARD DETAIL  
1" = 1'-0"



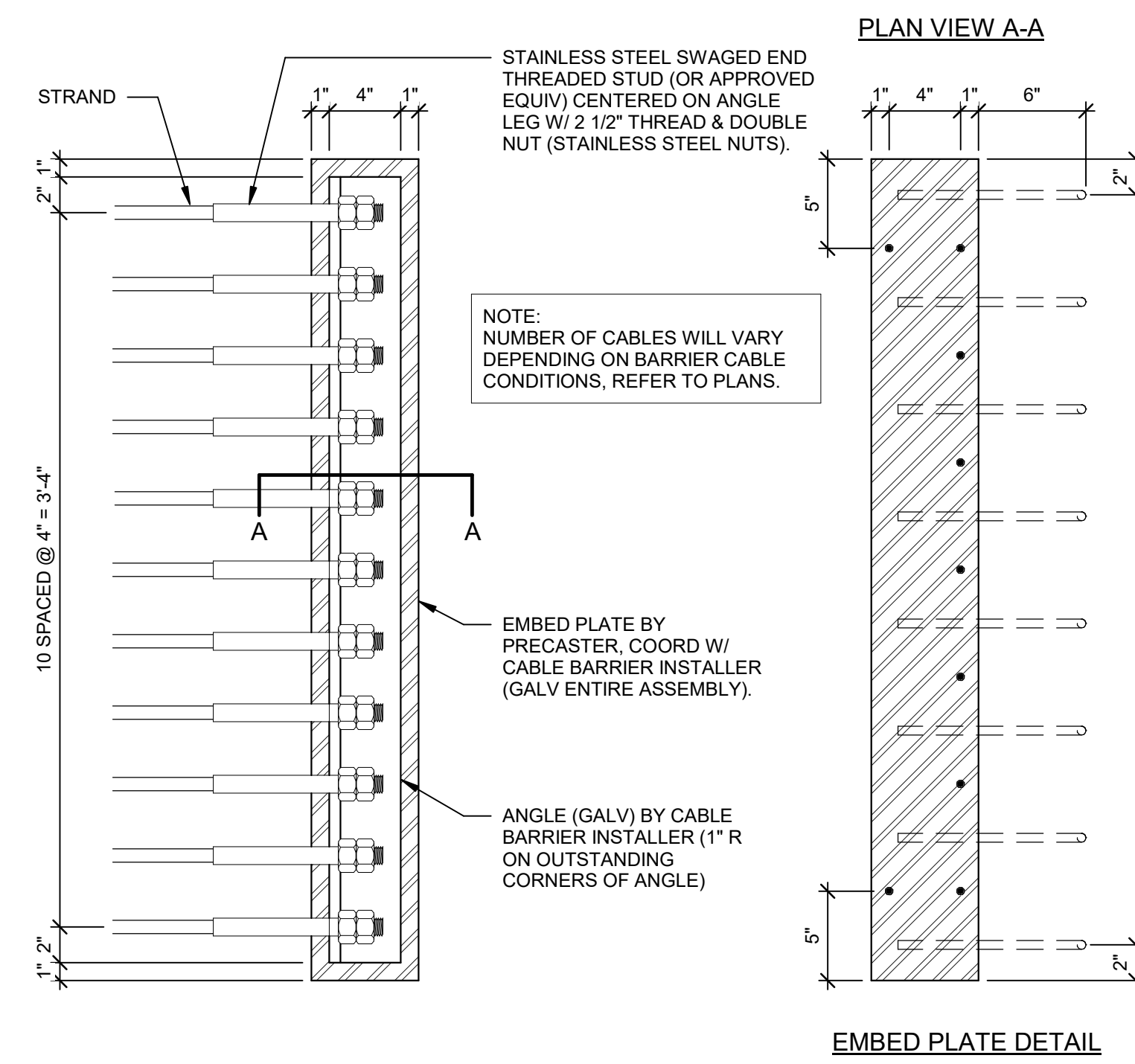
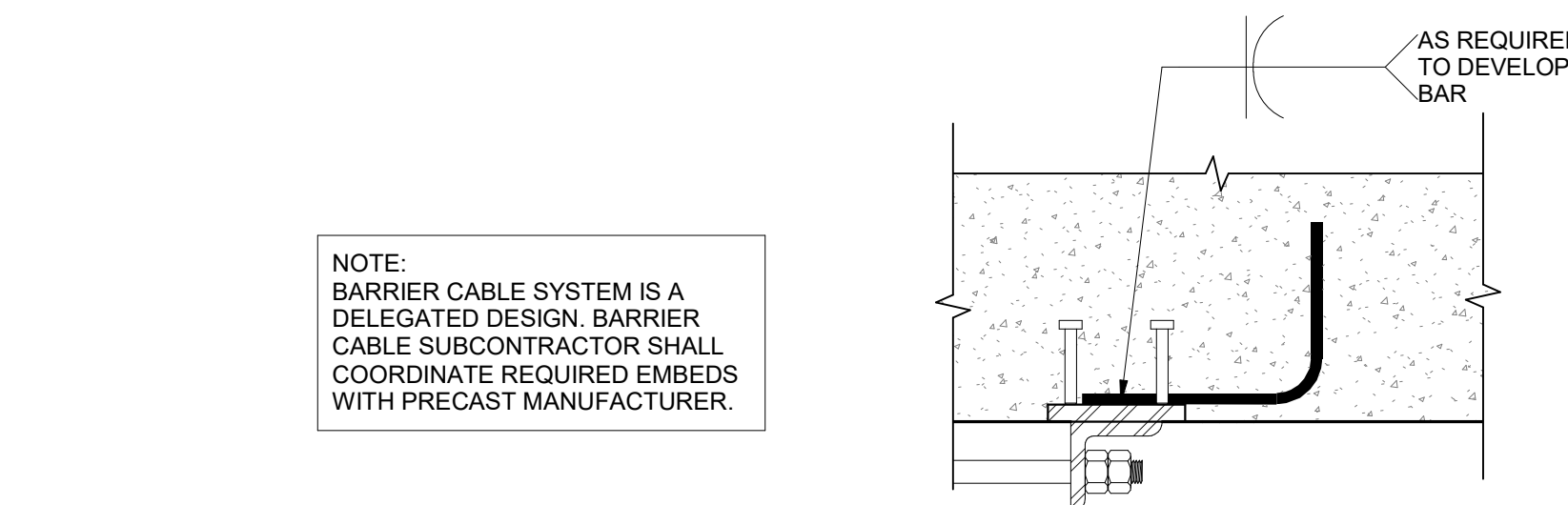
10 PIPE BOLLARD DETAIL  
1" = 1'-0"



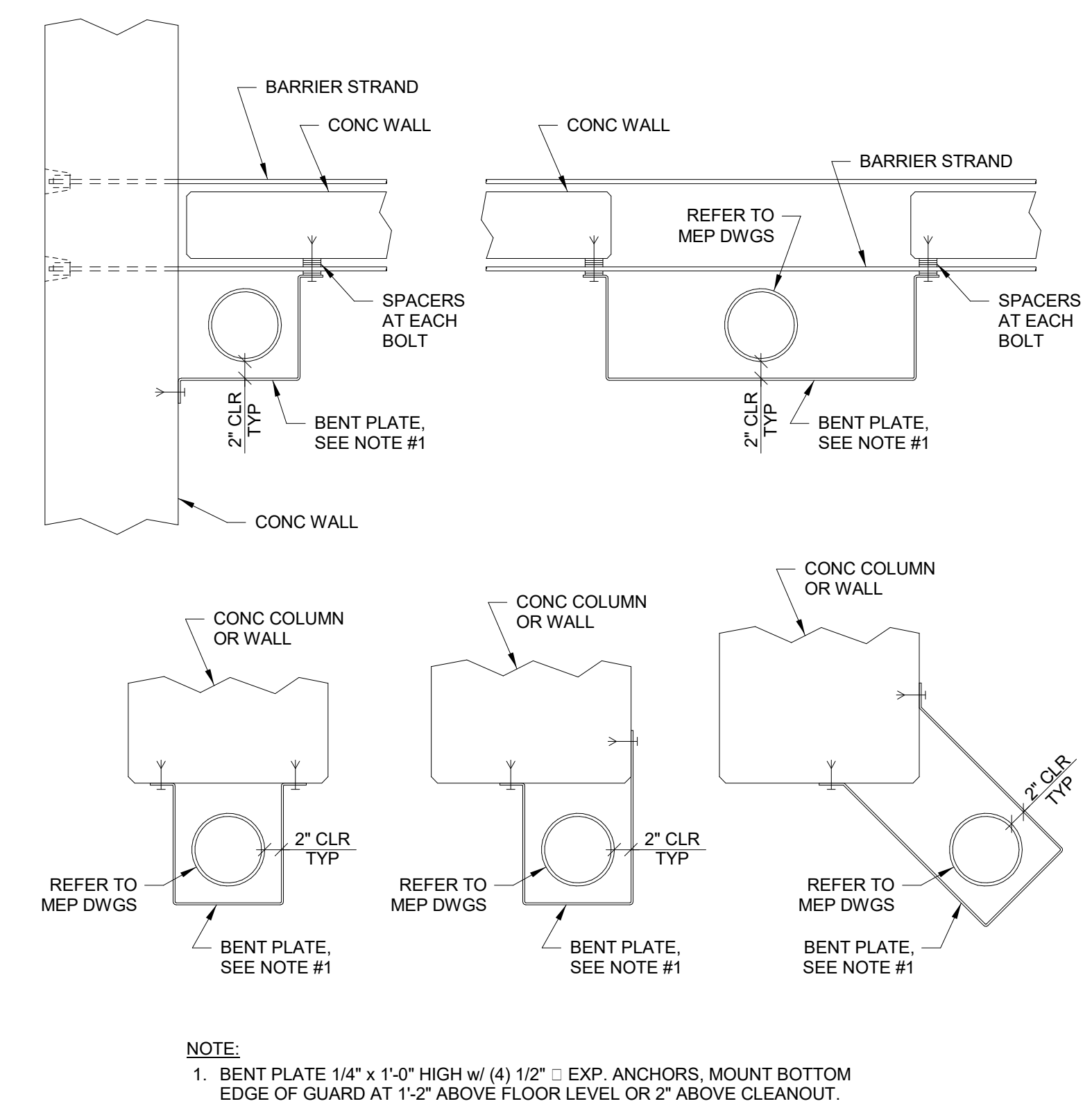
7 PACS - PIPE BOLLARD  
1" = 1'-0"



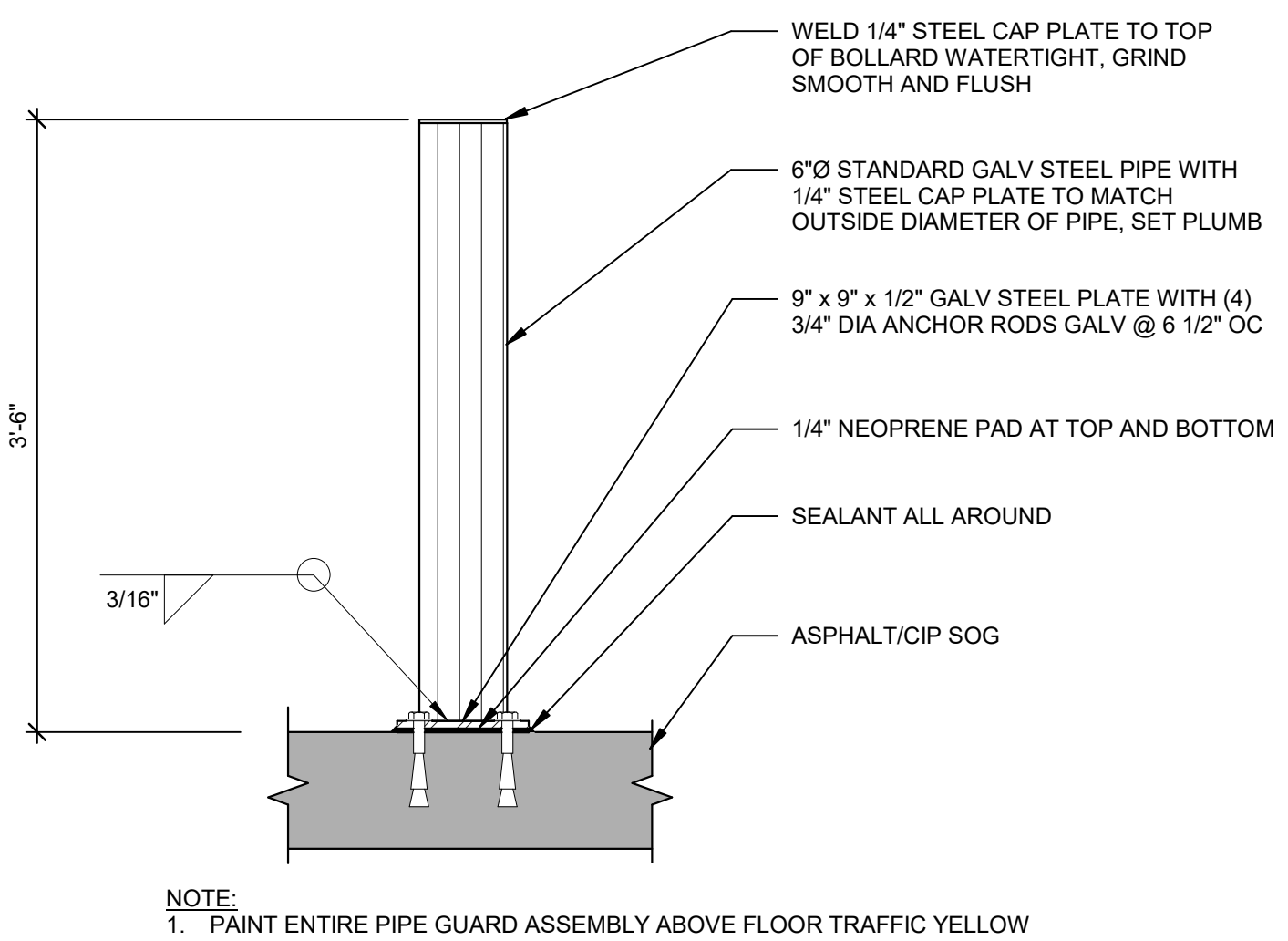
5 STRAND INTERMEDIATE SUPPORT DETAIL  
1 1/2" = 1'-0"



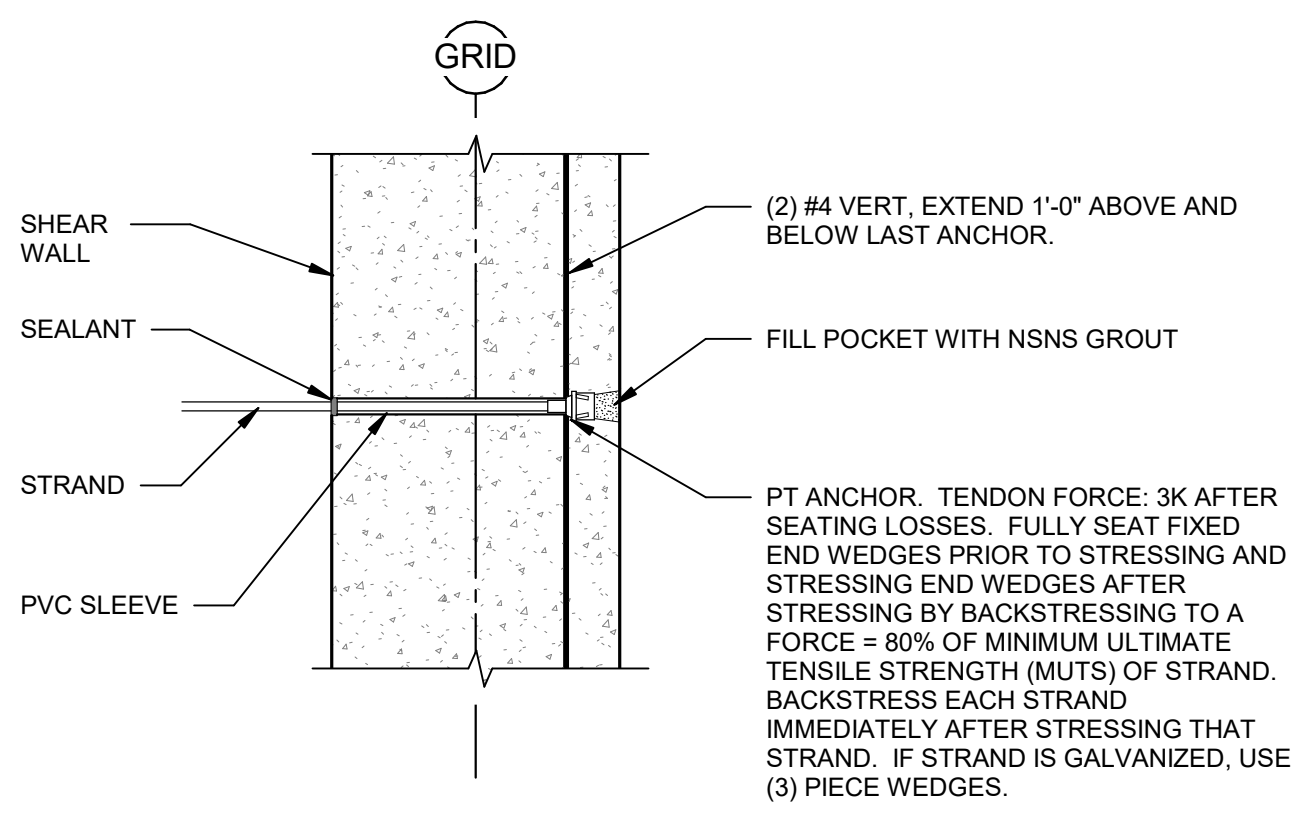
4 STRAND END ANCHOR  
1 1/2" = 1'-0"



3 PIPE GUARD DETAILS  
3/4" = 1'-0"



2 PIPE BOLLARD DETAIL  
1" = 1'-0"



1 STRAND END ANCHOR DETAIL  
3/4" = 1'-0"



4/15/2019 5:35:40 PM  
C:\revit\Projects\UNC\Wilmington\Desk II\_r7\_01.dwg\Bentham.rvt

A

B

C

D

E

1

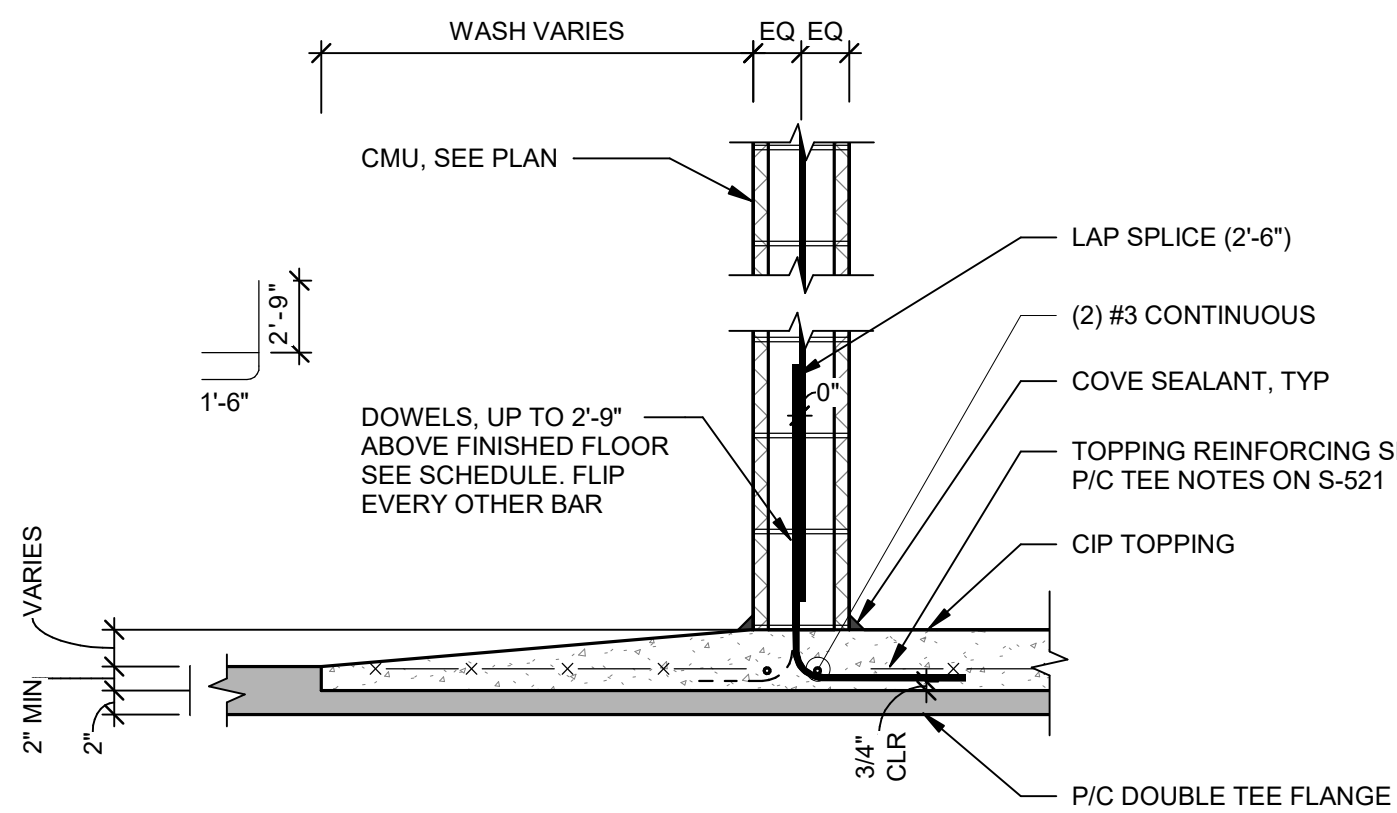
2

3

4

5

6



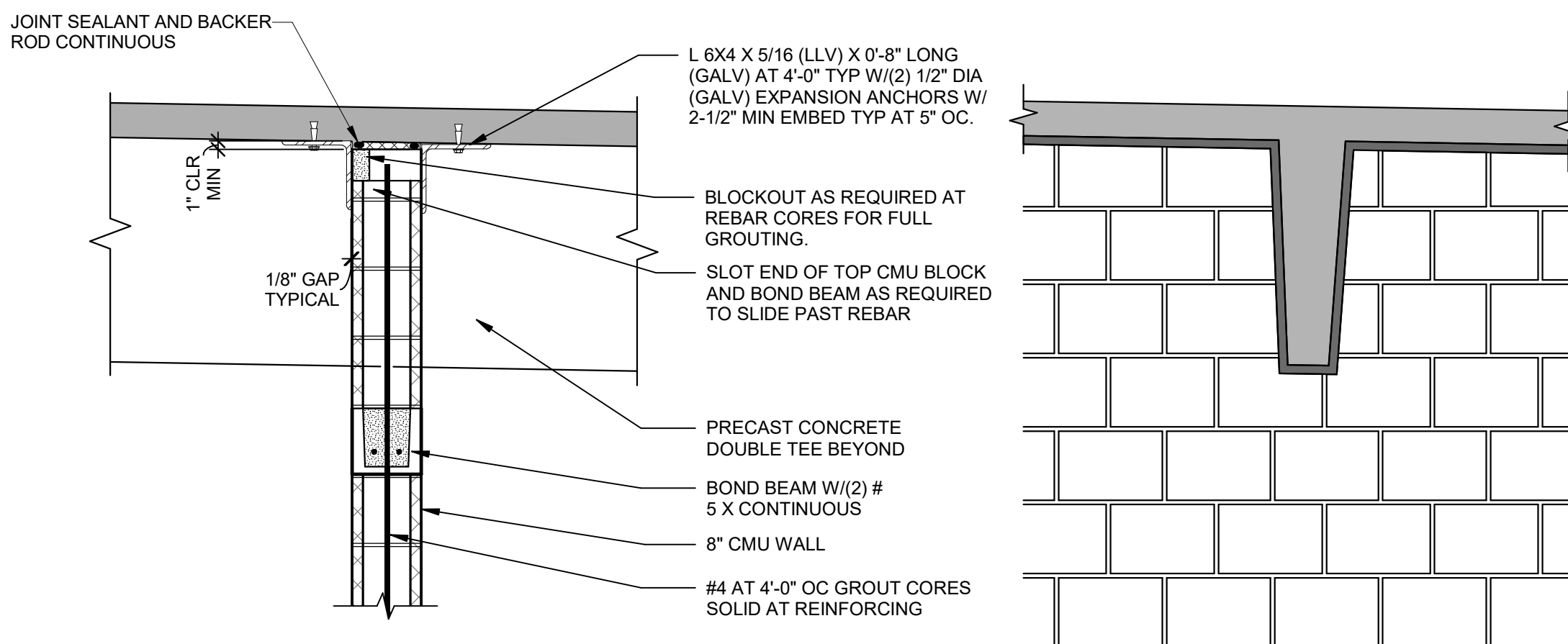
## 11 MASONRY DETAIL

3/4" = 1'-0"

CMU WALL SCHEDULE					#
WALL MARK	SIZE	VERT. REINF.	HORIZ. REINF.	DOWELS	NOTES
1	8"	#5 @ 4'-0"	9GA. TRUSS TYPE @ 16" O.C.	AT ALL VERTICAL REINFORCING	WHERE WALL SEGMENT IS 2'-8" OR LESS PROVIDE VERTICAL BAR AT EACH CORNER OR END AND ONE IN THE MIDDLE (3 BARS)
2	8"	#5 @ 8" TO 2'-5" AFF., #5 @ 4'-0" TO TOP (PROVIDE LAP SPLICE)	9GA. TRUSS TYPE @ 16" O.C.	AT ALL VERTICAL REINFORCING	WHERE WALL SEGMENT IS 4'-0" OR LESS PROVIDE VERTICAL BAR AT EACH CORNER OR END AND ONE IN THE MIDDLE (3 BARS)

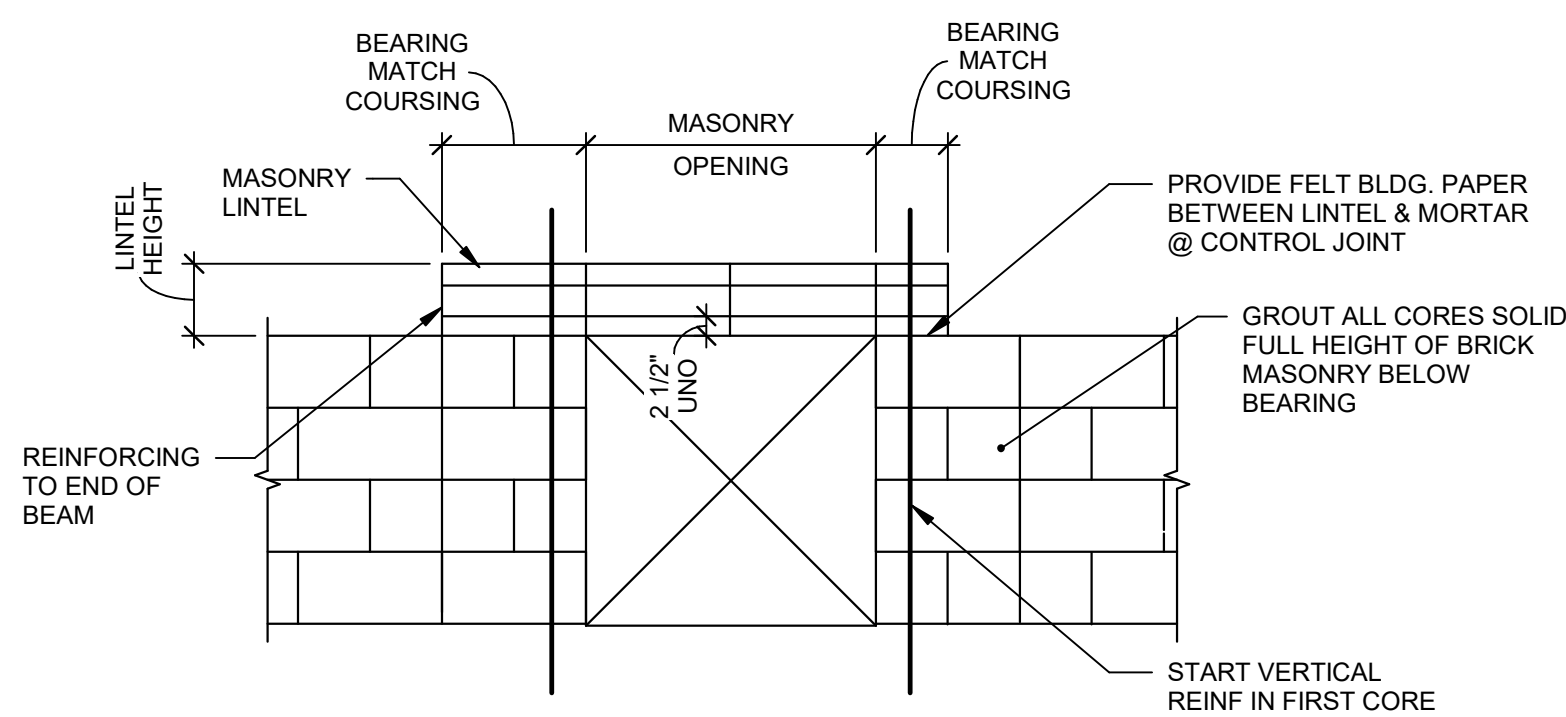
## 10 MASONRY REBAR SCHEDULE

1" = 1'-0"



## 9 MASONRY WALL DETAIL

3/4" = 1'-0"



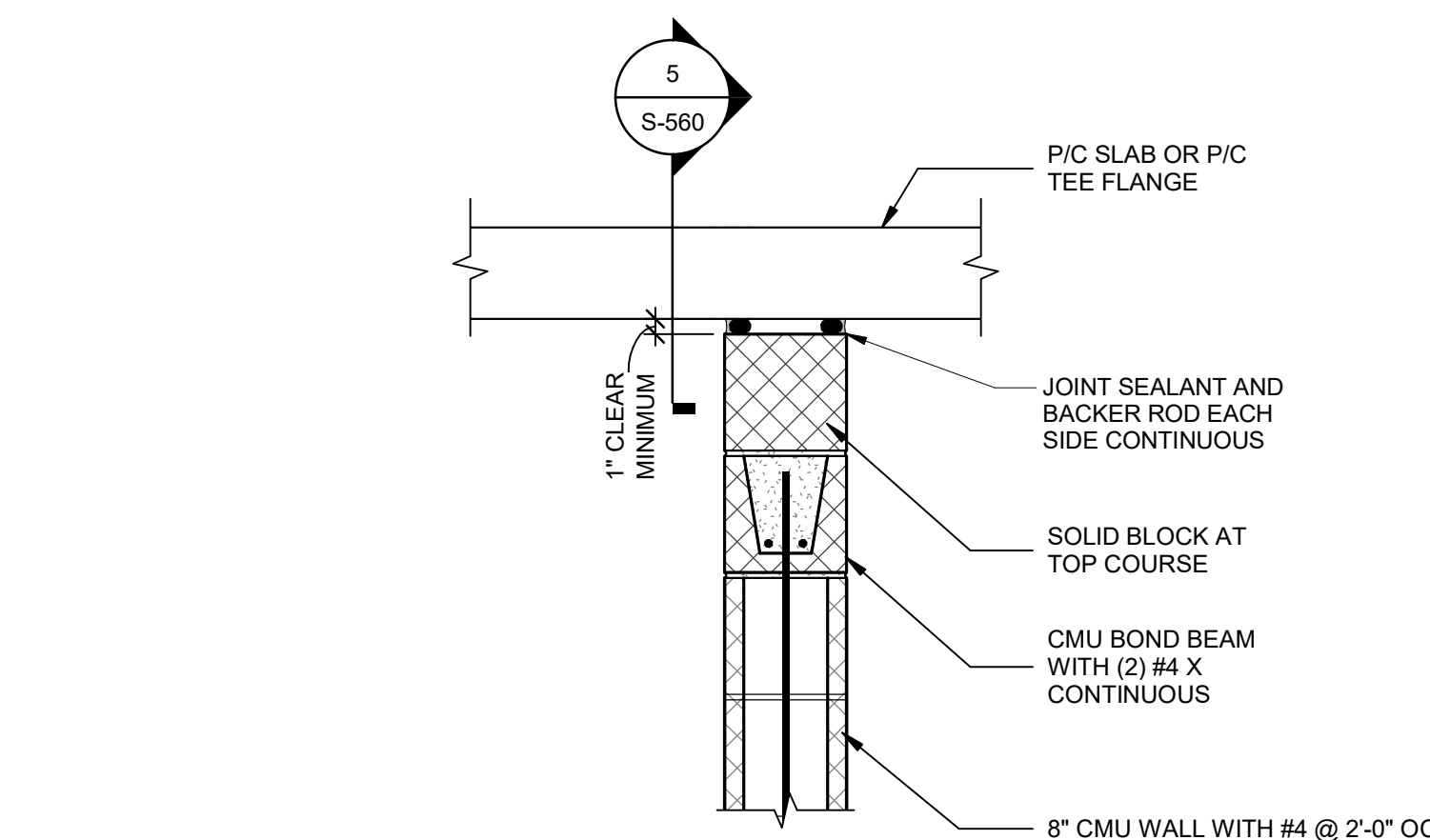
LINTEL SCHEDULE					
MARK	BLOCK WIDTH	MAX MASONRY OPENING	LINTEL BLOCK HEIGHT	REINFORCING	BEARING
L1	8"	4'-0"	8"	(2)-#5	8" MIN
L2	8"	12'-0"	2'-0"	(2)-#6 T&B	12" MIN

## 8 MASONRY LINTEL SCHEDULE

3/4" = 1'-0"

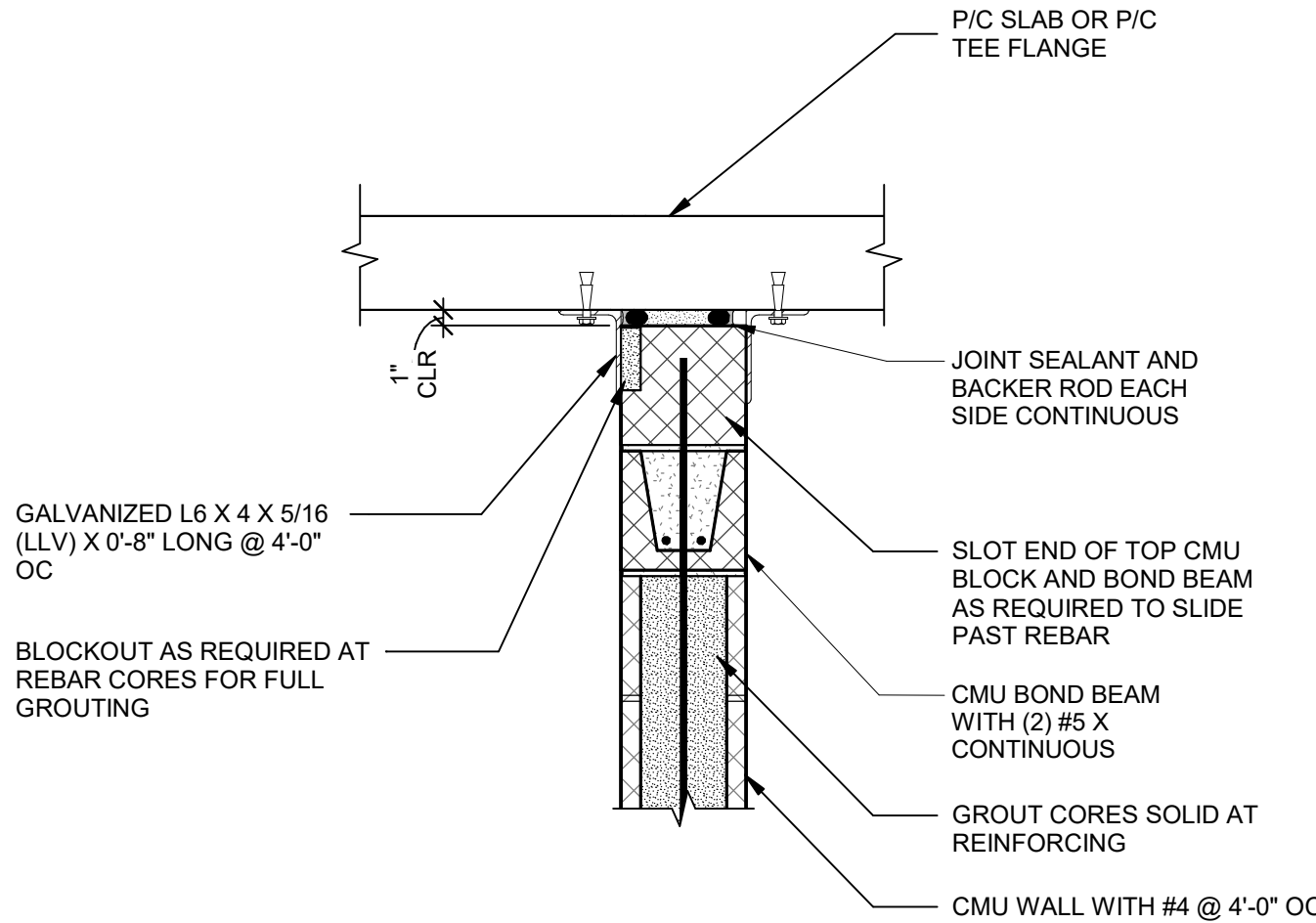
## 7 SLAB/WALL DETAIL

1" = 1'-0"



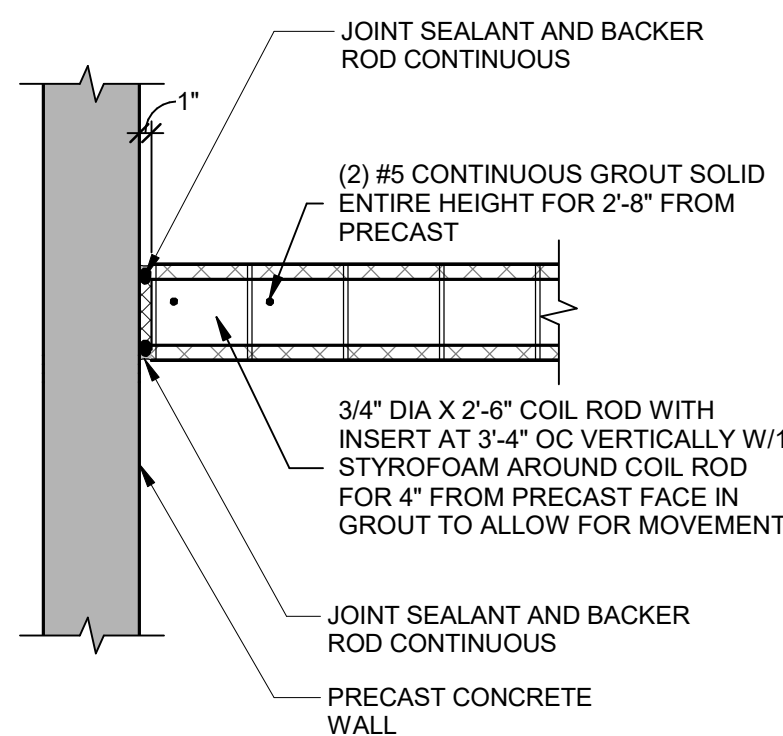
## 6 SLAB/WALL DETAIL

1" = 1'-0"



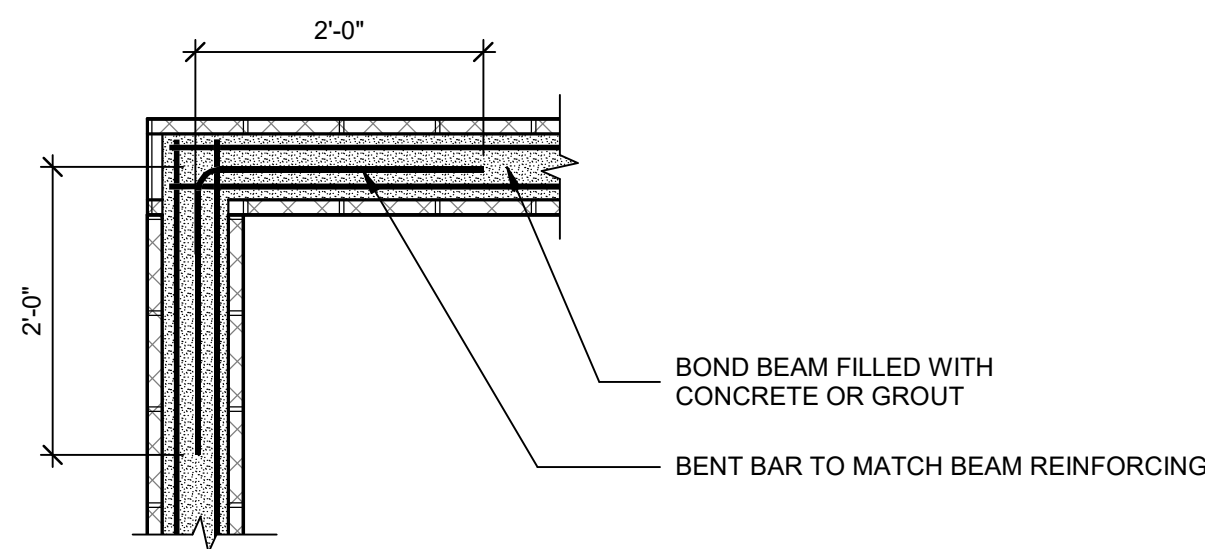
## 5 MASONRY DETAIL

3/4" = 1'-0"



## 4 CORNER REINFORCEMENT

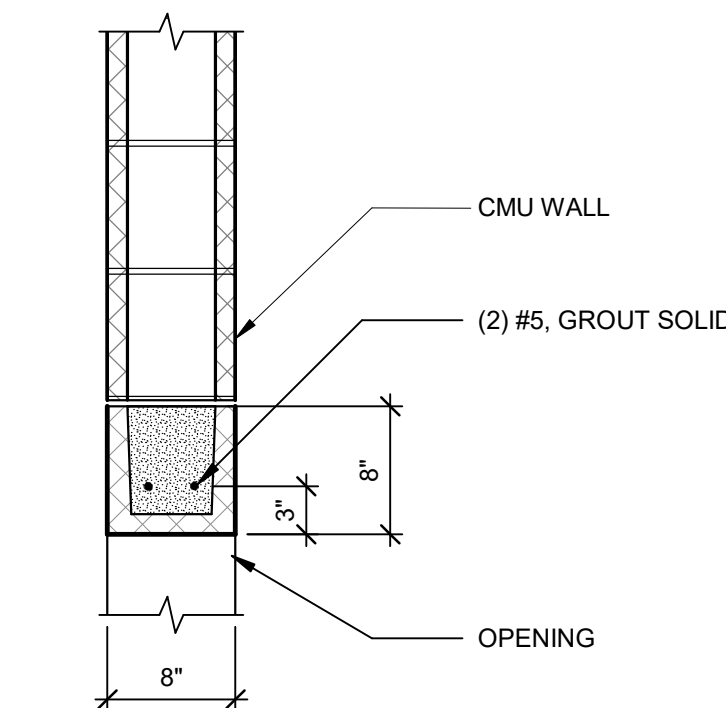
3/4" = 1'-0"



- NOTES:
- BOND BEAMS AT TOP OF WALL SHALL BE CONTINUOUS THROUGH MASONRY CONTROL JOINTS. INTERMEDIATE BOND BEAMS SHALL BE DISCONTINUOUS AT MASONRY CONTROL JOINTS.
  - MINIMUM BOND BEAM REINFORCING SHALL BE 2-#5 IN ALL BOND BEAMS.

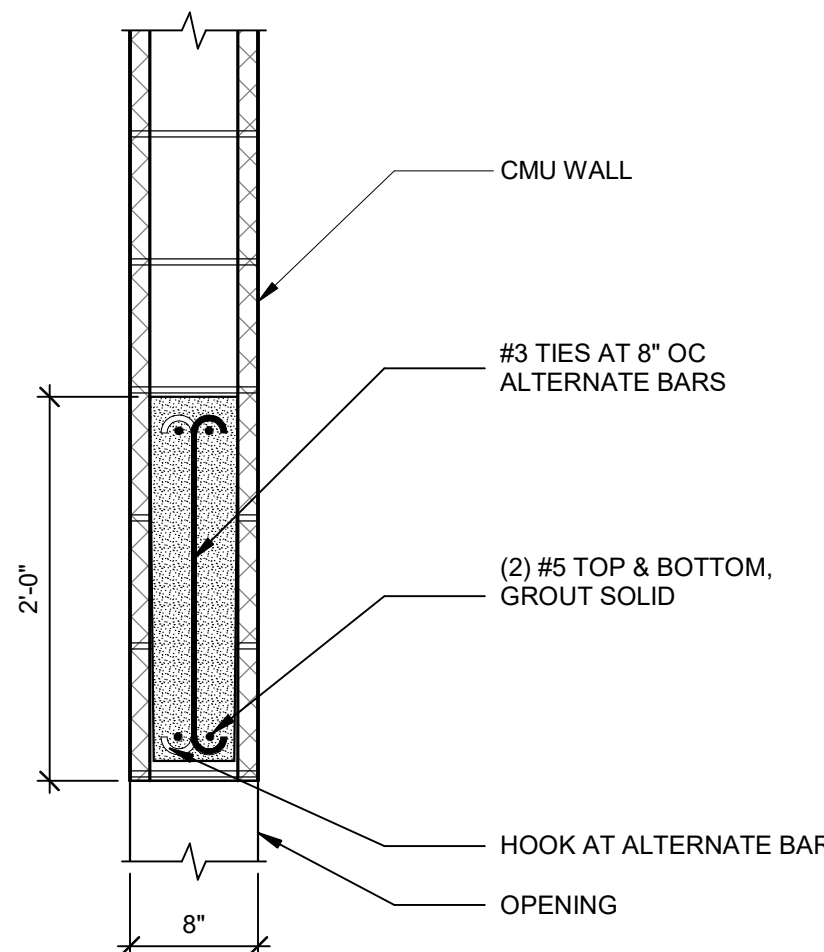
## 3 MASONRY LINTEL DETAIL

1" = 1'-0"

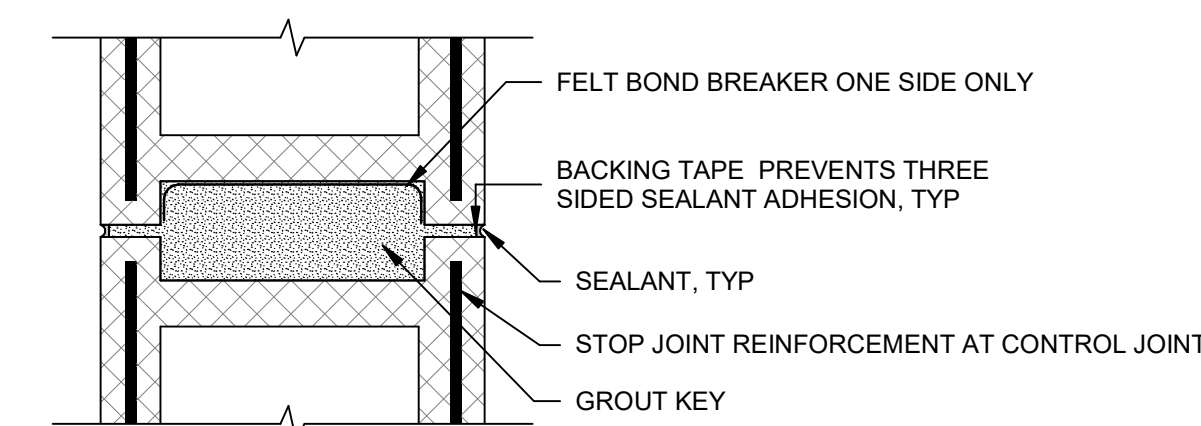


## 2 MASONRY LINTEL DETAIL

1" = 1'-0"



NOTE:  
ENGINEER MUST VERIFY LOADS AND SPANS FOR THIS DETAIL



- NOTES:
- CONTROL JOINTS ARE REQUIRED IN MASONRY WALL AT 20'-0" MAX.
  - LOCATE NEAR CENTER OF WALL.

## 1 MASONRY CONTROL JOINT DETAIL

3" = 1'-0"

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR  
**Balfour Beatty**  
Construction

DESIGNER

**CLARK NEXSEN**

1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028

**WALKER**  
CONSULTANTS

13660 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518

**MCKIM&CREED**

CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEAL



SUBMITTAL

04/15/2019

CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS

KEY PLAN

SHEET

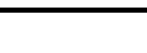
MASONRY DETAILS

**S-560**

DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

ON PROJECT  
NUMBER





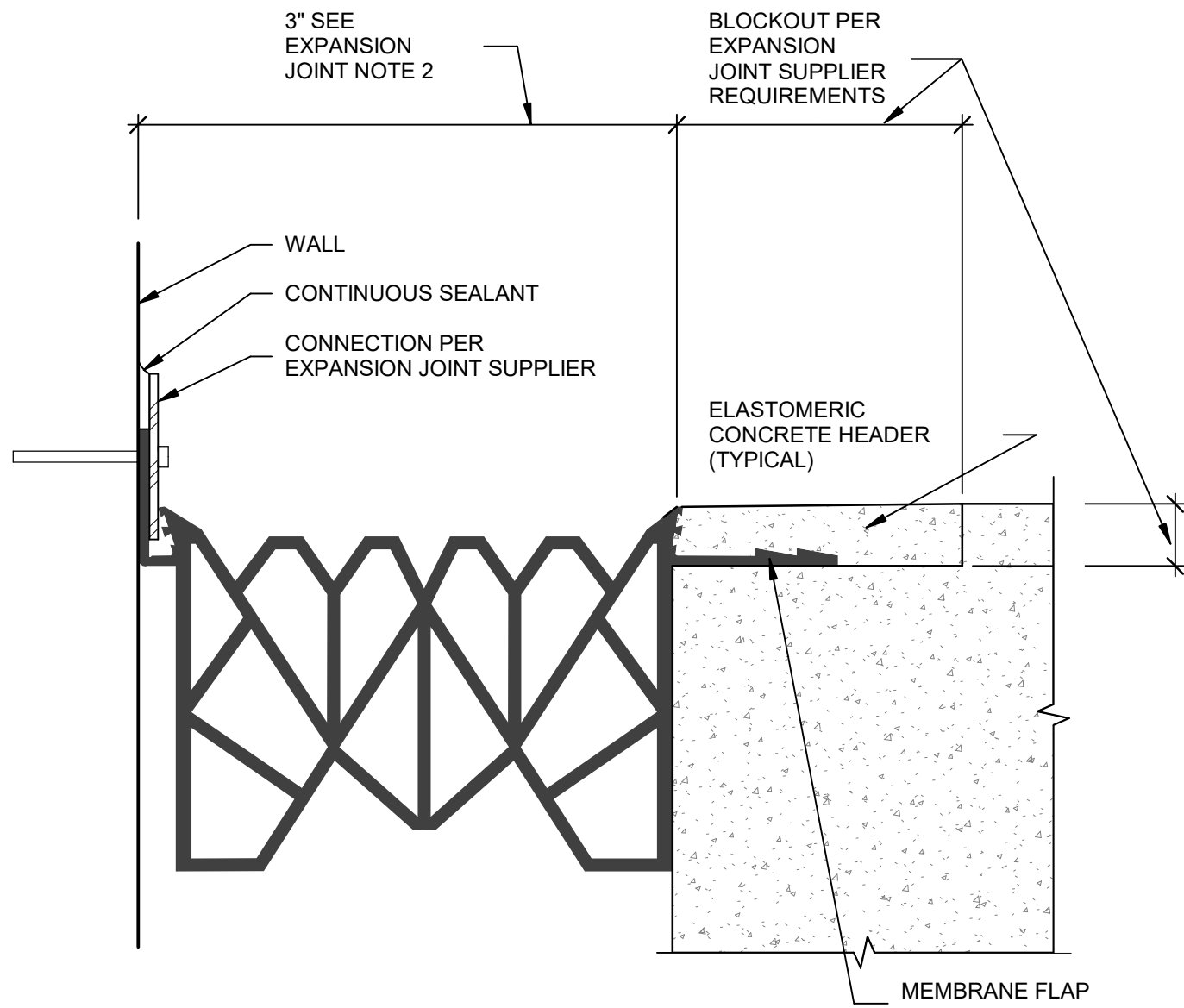


4/15/2019 5:35:42 PM C:\revit Projects\UNC\Wilmington Deck II.rvt\_roy.granham.rvt

## SHEET NOTES

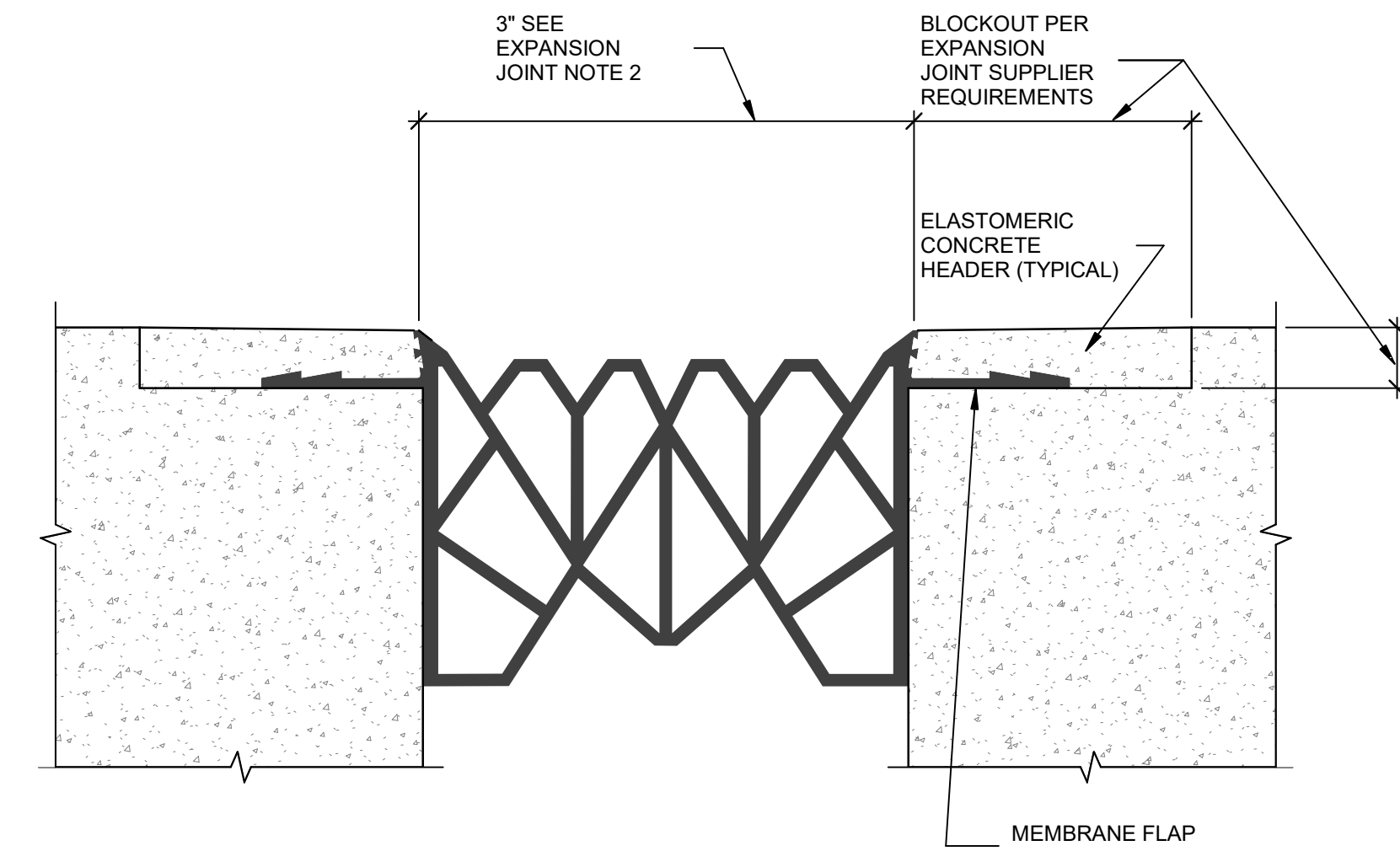
### EXPANSION JOINT NOTES:

- EXPANSION JOINTS ARE PERFORMANCE DESIGN. EXPANSION JOINT SYSTEM SHALL BE DETERMINED BY EXPANSION JOINT SUPPLIER AS REQUIRED TO MEET MOVEMENT AND OTHER CRITERIA DEFINED ON DRAWINGS AND IN SPECIFICATIONS.
- FORM WIDTH SHOWN IN DETAILS IS A NOMINAL FORM WIDTH. INITIAL FORM WIDTH AT TIME OF CONCRETE PLACEMENT IS ADJUSTABLE AND IS PART OF PERFORMANCE DESIGN. INITIAL FORM WIDTH SHALL BE DETERMINED BY EXPANSION JOINT SUPPLIER AND COORDINATED WITH GENERAL CONTRACTOR. WIDTH DETERMINATION SHALL TAKE INTO CONSIDERATION TEMPERATURE PREVAILING AT TIME OF CONCRETE PLACEMENT, VOLUME CHANGE MOVEMENT THAT OCCURS BETWEEN TIME OF CONCRETE PLACEMENT AND TIME OF JOINT INSTALLATION, REQUIRED INSTALLATION WIDTH, FINAL MAXIMUM AND MINIMUM OPENING WIDTH, SEISMIC MOVEMENT, ETC. REFER TO EXPANSION JOINT MOVEMENT TABLE.
- EXPANSION JOINT SYSTEM SHALL BE CAPABLE OF HANDLING DIFFERENTIAL VERTICAL MOVEMENT OF 1/2" INCH.
- ONCE FORMED, JOINTS AND BLOCKOUTS SHALL BE PROTECTED FROM DAMAGE DUE TO CONSTRUCTION TRAFFIC.
- IN SERVICE GAP WIDTH MUST ACCOMMODATE SEISMIC MOVEMENT WITHOUT ALLOWING CONCRETE EDGES OR ANY ELEMENTS OF EXPANSION JOINT ASSEMBLY TO "POUND" TOGETHER.
- TOP PLATES MUST BE SIZED AND DESIGNED TO REMAIN IN SERVICE DURING AND AFTER DESIGN SEISMIC EVENT.



ELASTOMERIC CONC EDGED,  
EXTRUDED RUBBER EJ DETAIL

6" = 1'-0"



ELASTOMERIC CONC EDGED,  
EXTRUDED RUBBER EJ DETAIL

6" = 1'-0"



UNIVERSITY of NORTH CAROLINA WILMINGTON  
601 S COLLEGE ROAD  
WILMINGTON, NORTH CAROLINA 28403  
PARKING DECK II AND SURFACE  
PARKING (DESIGN-BUILD)  
SOUTH CAMPUS - 4965 RIEGEL ROAD

SCO ID NUMBER: 18-19226-01A  
CODE: 41828  
ITEM: 301

CONTRACTOR

**Balfour Beatty**  
Construction

DESIGNER



**CLARK NEXSEN**

1523 ELIZABETH AVENUE, SUITE 300  
CHARLOTTE, NORTH CAROLINA 28204  
704-377-8800

CLARK NEXSEN LICENSE NUMBER: C-1028



**WALKER**  
CONSULTANTS

13660 Ballantyne Corporate Place  
Suite 140  
Charlotte, NC 28277  
T: 704.247.6230  
[www.walkerconsultants.com](http://www.walkerconsultants.com)  
NC License No. F-0518



**MCKIM & CREED**

CIVIL ENGINEER  
243 NORTH FRONT STREET  
WILMINGTON, NORTH CAROLINA  
28401  
910.343.1048

PROFESSIONAL SEAL



SUBMITTAL

04/15/2019

CONSTRUCTION DOCUMENT  
SUBMITTAL 01

REVISIONS


KEY PLAN

SHEET

WATERPROOFING &  
EXPANSION JOINT DETAILS

**S-571**

DESIGN: Designer  
DRAWN: Author  
REVIEW: Checker

ON PROJECT  
NUMBER



E

D

C

B

A

UNCOATED		TABLE 1 - TENSION DEVELOPMENT AND LAP SPICE LENGTHS FOR UNCOATED BARS WITH CENTER TO CENTER SPACING NOT LESS THAN 5*d <sub>b</sub> AND CLEAR COVER AT LEAST 2*d <sub>b</sub>																MIN CLEAR COVER (IN)	MIN CENTER TO CENTER SPACING (IN)												
SEE GENERAL SHEET NOTES FOR FURTHER INFORMATION		LENGTHS (IN) PER CONCRETE STRENGTH																													
		f' <sub>c</sub> = 4000 PSI				f' <sub>c</sub> = 5000 PSI				f' <sub>c</sub> = 6000 PSI				f' <sub>c</sub> = 7000 PSI						f' <sub>c</sub> = 8000 PSI				f' <sub>c</sub> = 9000 PSI				f' <sub>c</sub> = 10000 PSI OR GREATER			
		12"CASTING POSITION		OTHER BARS		12"CASTING POSITION		OTHER BARS		12"CASTING POSITION		OTHER BARS		12"CASTING POSITION		OTHER BARS				12"CASTING POSITION		OTHER BARS		12"CASTING POSITION		OTHER BARS		12"CASTING POSITION		OTHER BARS	
		BAR SIZE	LAP CLASS																												
#3 (#10)	A	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	3/4	1 7/8		
	B	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16				
#4 (#13)	A	15	12	14	12	14	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	1	2 1/2		
	B	20	16	18	16	18	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16				
#5 (#16)	A	19	15	17	13	15	12	14	12	13	12	13	12	13	12	12	12	12	12	12	12	12	12	12	12	12	12	1 1/4	3 1/8		
	B	24	19	22	17	20	16	18	16	17	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16				
#6 (#19)	A	22	17	20	16	18	14	17	13	16	12	15	12	14	12	14	12	14	12	14	12	14	12	14	12	14	12	1 1/2	3 3/4		
	B	29	22	26	20	24	18	22	17	21	16	20	16	19	16	20	16	19	16	20	16	19	16	20	16	19	16				
#7 (#22)	A	33	25	29	23	27	21	25	19	23	18	22	17	21	16	22	17	21	16	22	17	21	16	22	17	21	16	1 3/4	4 3/8		
	B	43	33	38	29	35	27	32	25	30	23	28	22	27	21	30	23	28	22	27	21	30	23	28	22	27	21				
#8 (#25)	A	37	29	33	26	30	24	28	22	26	20	25	19	24	18	25	19	24	18	25	19	24	18	25	19	24	18	2	5		
	B	49	37	43	33	40	31	37	28	34	27	32	25	31	24	34	27	32	25	31	24	34	27	32	25	31	24				
#9 (#29)	A	42	33	38	29	34	27	32	25	30	23	28	22	27	21	32	25	30	23	28	22	27	21	32	25	30	23	2 1/4	5 3/4		
	B	55	42	49	38	45	34	41	32	39	30	36	28	35	27	40	31	37	28	34	27	32	25	30	23	28	22				
#10 (#32)	A	47	37	42	33	39	30	36	28	34	26	32	24	30	23	38	29	34	27	32	25	30	23	38	29	34	27	2 5/8	6 3/8		
	B	62	47	55	42	50	39	47	36	44	34	41	32	39	30	48	37	46	35	43	33	40	31	37	29	35	27				
#11 (#36)	A	53	41	47	36	43	33	40	31	37	29	35	27	33	26	44	33	40	31	37	29	35	27	33	26	44	33	2 7/8	7 1/8		
	B	68	53	61	47	56	43	52	40	48	37	46	35	43	33	58	45	53	41	47	36	43	33	40	31	37	29				
#14 (#43)	N/A	63	49	56	43	51	40	48	37	45	34	42	32	40	31	60	47	55	42	50	39	47	36	44	34	41	32	39	30	31/2	8 1/2
#18 (#57)	N/A	84	65	75	58	68	53	63	49	59	46	56	43	53	41	80	63	73	57	67	52	62	49	59	46	56	43	53	41	4 1/2	11 3/8

UNCOATED		TABLE 2 - TENSION DEVELOPMENT AND LAP SPICED LENGTHS FOR UNCOATED BARS (SEE QUALIFYING CASES BELOW)																											
SEE GENERAL SHEET NOTES FOR FURTHER INFORMATION		LENGTHS (IN) PER CONCRETE STRENGTH																											
		f' <sub>c</sub> = 4000 PSI								f' <sub>c</sub> = 5000 PSI								f' <sub>c</sub> = 6000 PSI								f' <sub>c</sub> = 7000 PSI			
		12" CASTING POSITION		OTHER BARS		12" CASTING POSITION		OTHER BARS		12" CASTING POSITION		OTHER BARS		12" CASTING POSITION		OTHER BARS		12" CASTING POSITION		OTHER BARS		12" CASTING POSITION		OTHER BARS		12" CASTING POSITION		OTHER BARS	
BAR SIZE	LAP CLASS	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2	CASE 1	CASE 2
		OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS	OTHER BARS
#3 (#10)	A	19	28	15	22	17	25	13	19	15	23	12	18	14	21	12	16	13	20	12	15	13	19	12	15	12	18	12	14
	B	24	36	19	28	22	33	17	25	20	30	16	23	18	28	16	21	17	26	16	20	16	24	16	19	16	23	16	18
#4 (#13)	A	25	37	19	29	22	33	17	26	20	31	16	24	19	28	15	22	18	26	14	20	17	25	13	19	16	24	12	18
	B	32	48	25	37	29	43	22	33	26	40	20	31	25	37	19	28	23	34	18	26	22	32	17	25	21	31	16	24
#5 (#16)	A	31	47	24	36	28	42	22	32	25	38	20	29	24	35	18	27	22	33	17	25	21	31	16	24	20	30	15	23
	B	40	60	31	47	36	54	28	42	33	46	24	35	29	43	22	33	27	40	21	31	26	38	20	30	26	38	20	30
#6 (#19)	A	37	56	29	43	33	50	26	38	31	46	24	35	28	42	22	33	26	40	20	30	25	37	19	29	24	36	18	27
	B	48	72	37	56	43	65	33	50	40	59	31	46	37	55	28	42	34	51	26	40	32	48	25	37	31	46	24	35
#7 (#22)	A	54	81	42	63	49	73	37	56	44	66	34	51	41	62	32	47	38	58	30	44	36	54	28	42	35	52	27	40
	B	70	106	54	81	63	94	49	73	58	86	44	66	53	80	41	62	50	75	38	58	47	70	36	54	45	67	34	52
#8 (#25)	A	62	93	48	71	55	83	43	64	51	76	39	58	47	70	36	54	44	66	34	51	41	62	32	48	39	59	30	45
	B	80	121	62	93	72	108	55	83	66	98	51	76	61	91	47	70	57	85	44	66	54	80	41	62	51	76	39	59
#9 (#29)	A	70	105	54	81	63	94	48	72	57	86	44	66	53	79	41	61	49	74	38	57	47	70	36	54	44	66	34	51
	B	91	136	70	105	81	122	63	94	74	111	57	86	69	103	53	79	64	96	49	74	61	91	47	70	57	86	44	66
#10 (#32)	A	79	118	61	91	70	105	54	81	64	96	49	74	59	89	46	69	56	83	43	64	53	79	41	61	50	75	39	58
	B	102	153	79	118	91	137	70	105	83	125	64	96	77	116	59	89	72	108	56	83	68	102	53	79	65	97	50	75
#11 (#36)	A	87	131	67	101	78	117	60	90	71	107	55	82	66	99	51	76	62	93	48	71	58	87	45	67	55	83	43	64
	B	113	170	87	131	101	152	78	117	93	139	71	107	86	128	66	99	80	120	62	93	76	113	58	87	72	108	55	83
#14 (#43)	N/A	105	157	81	121	94	140	72	108	86	128	66	99	79	119	61	91	74	111	57	85	70	105	54	81	66	99	51	77
#18 (#57)	N/A	139	209	107	161	125	187	96	144	114	171	88	131	106	158	81	122	99	148	76	114	93	139	72	107	88	132	68	102
TABLE 2 QUALIFIERS	CASE 1	CENTER TO CENTER SPACING OF BARS BEING DEVELOPED OR LAP SPICED NOT LESS THAN 2*d <sub>b</sub> , CLEAR COVER AT LEAST d <sub>b</sub> , AND OCCURS WITHIN THE STIRRUPS OR TIES OF A BEAM OR COLUMN.																OR CENTER TO CENTER SPACING OF BARS OF BEING DEVELOPED OR LAP SPICED AT LEAST 3*d <sub>b</sub> AND CLEAR COVER AT LEAST d <sub>b</sub> .											
	CASE 2	CENTER TO CENTER SPACING OF BARS BEING DEVELOPED OR LAP SPICED NOT LESS THAN 2*d <sub>b</sub> , AND NO LESS THAN MINIMUM CLEAR SPACING SPECIFIED IN GENERAL SHEET NOTES.																AND CENTER TO CENTER SPACING OF BARS OF BEING DEVELOPED OR LAP SPICED AT LEAST 3*d <sub>b</sub> AND CLEAR COVER NOT LESS THAN 0.5*d <sub>b</sub> AND NO LESS THAN CLEAR COVER SPECIFIED IN GENERAL STRUCTURAL NOTES.											

f <sub>c</sub> = 4000 PSI		TABLE 3 (f <sub>c</sub> = 4000 PSI) - TENSION DEVELOPMENT AND LAP SPICE LENGTHS FOR BARS IN WALLS AND SLABS (IN)																															
SEE GENERAL SHEET NOTES FOR FURTHER INFORMATION		MINIMUM CONCRETE COVER = 0.75"								MINIMUM CONCRETE COVER = 1.00"								MINIMUM CONCRETE COVER = 1.50"								MINIMUM CONCRETE COVER = 2.00"							
		12" CASTING POSITION				OTHER BARS				12" CASTING POSITION				OTHER BARS				12" CASTING POSITION				OTHER BARS				12" CASTING POSITION				OTHER BARS			
		UNCOATED		EPOXY COATED		UNCOATED		EPOXY COATED		UNCOATED		EPOXY COATED		UNCOATED		EPOXY COATED		UNCOATED		EPOXY COATED		UNCOATED		EPOXY COATED		UNCOATED		EPOXY COATED					
#3	A	12	12	15	13	1 7/8	12	12	15	13	1 7/8	12	12	14	12	1 7/8 UNC	12	12	14	12	2 5/8 EPOXY	16	16	18	16	2 1/2 UNC	15	12	18	14	2 1/2 UNC		
#10	B	16	16	19	17		16	16	19	17		16	16	18	16		2 5/8 EPOXY	16	16	18		16	2 5/8 EPOXY										
#4	A	19	15	24	22	2	15	12	20	17	2 1/2	15	12	18	14	2 1/2 UNC	15	12	18	14	3 1/2 EPOXY	20	16	23	18	3 1/2 UNC	20	16	23	18	3 1/2 UNC		
#13	B	24	19	32	28		20	16	25	22		20	16	23	18		3 1/2 EPOXY	20	16	23		18	3 1/2 EPOXY										
#5	A	28	21	36	32	2 1/8	22	17	29	26	2 5/8	19	15	24	22	3 1/8	19	15	22	17	3 1/8 UNC	24	19	29	22	4 3/8 EPOXY	24	19	29	22	4 3/8 EPOXY		
#16	B	36	28	47	41		29	22	38	33		24	19	32	28		3 1/8	24	19	29		22	4 3/8 EPOXY										
#6	A	37	29	49	43	2 1/4	31	24	40	35	2 3/4	22	17	29	26	3 3/4	22	17	29	26	3 3/4	29	22	38	34	3 3/4	29	22	38	34	3 3/4		
#19	B	48	37	63	56		40	31	52	46		29	22	38	34		3 3/4	29	22	38		34	3 3/4										
#7	A	60	46	78	69	2 3/8	50	38	65	57	2 7/8	37	28	48	43	3 7/8	33	25	43	38	4	37	29	49	43	4 3/8	33	25	43	38	4 3/8		
#22	B	78	60	102	90		64	50	84	74		48	37	62	55		3 7/8	42	33	55		49	4 3/8										
#8	A	74	57	97	86	2 1/2	62	48	81	72	3	47	36	61	54	4	37	29	49	43	4	48	37	63	56	5	48	37	63	56	5		
#25	B	96	74	126	111		80	62	105	93		60	47	79	70		4	48	37	63		56	5										
#9	A	90	69	117	104	2 5/8	76	58	99	87	3 1/8	57	44	75	66	4 1/8	46	36	60	53	4 1/8	60	46	78	69	5 1/8	60	46	78	69	5 1/8		
#29	B	117	90	153	135		98	76	128	113		74	57	97	86		4 1/8	60	46	78		69	5 1/8										
#10	A	108	83	141	125	2 7/8	92	70	120	106	3 3/8	70	54	92	81	4 1/4	57	44	74	66	4 1/4	74	57	97	85	5 1/4	74	57	97	85	5 1/4		
#32	B	140	108	183	162		119	92	155	137		91	70	119	105		4 1/4	74	57	97		85	5 1/4										
#11	A	127	98	166	146	3	108	83	141	125	3 1/2	84	65	110	97	4 1/2	67	53	89	79	4 1/2	89	68	116	102	5 1/2	89	68	116	102	5 1/2		
#36	B	165	127	215	190		141	108	184	162		109	84	142	125		4 1/2	89	68	116		102	5 1/2										