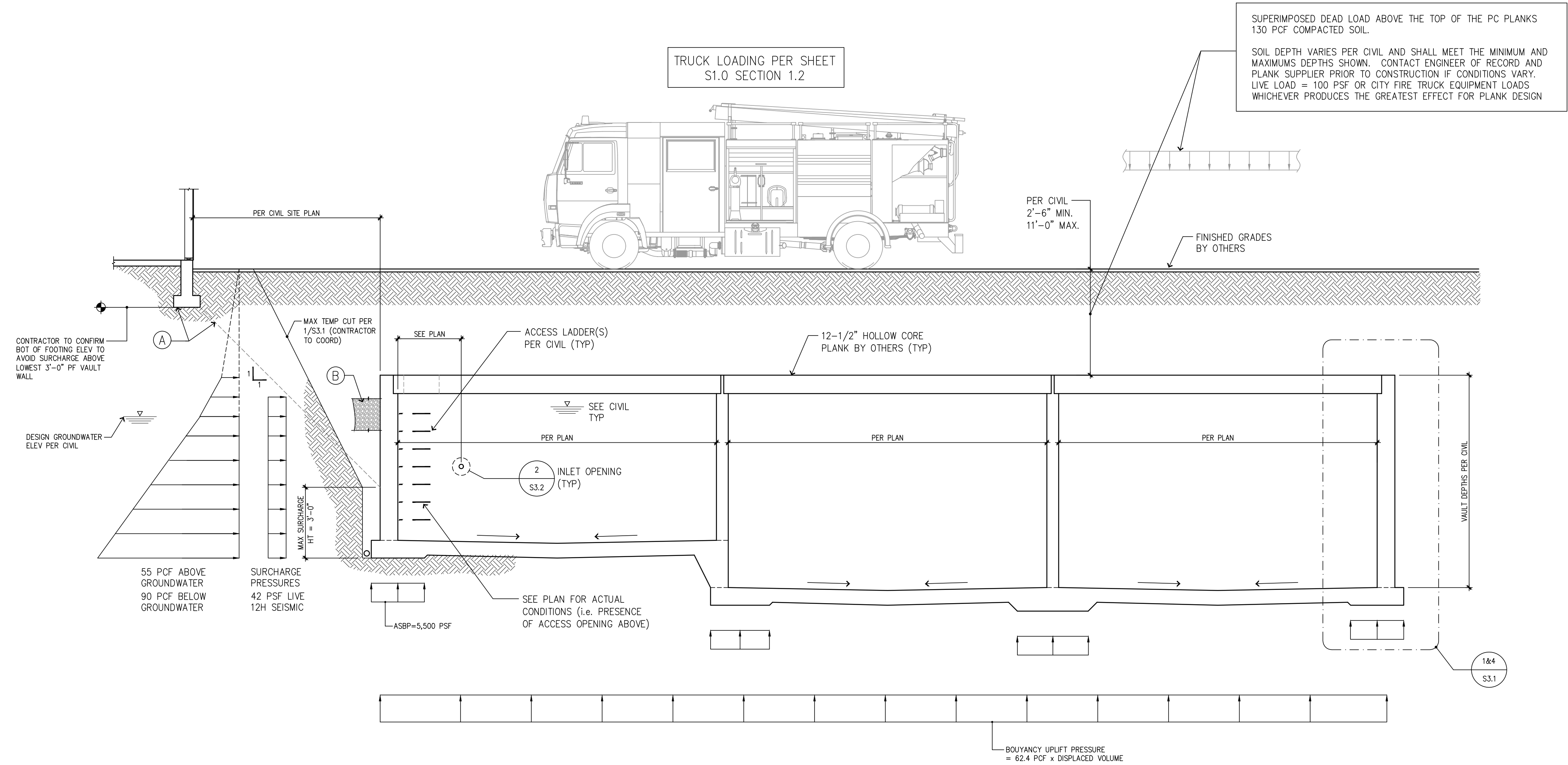




- (A) TEMPORARY SLOPES PER SOILS ENGINEER. SEE DETAIL 10/S3.1 FOR EXCAVATION NOTES AND MINIMUM BUILDING OFFSETS.
- (B) COMPLETION OF BACKFILL SHALL NOT BEGIN UNTIL AFTER PLANKS ARE PLACED AND GROUTED PER SECTION 1/S3.1 METHODS AND MATERIALS SHALL BE COORDINATED BETWEEN THE SOILS ENGINEER AND THE CONTRACTOR AND SHALL NOT RESULT IN OUT OF PLANE PRESSURES EXCEEDING THE LIMITS NOTED.
- (C) DE-WATERING REQUIRED DURING CONSTRUCTION SHALL REMAIN UNTIL FINAL GRADE MATERIAL HAS BEEN PLACED ABOVE THE PLANKS.



### Vault Design Loading

NTS

Revisions to this sheet:

**Bradley Heights Apartments**  
Detention Vaults 2, 3, & 4  
202 27th Ave SE  
Puyallup, Washington

**Solutions 4 Structures**  
A Structural Engineering Corporation

Puyallup, Washington 98374  
Ph 253-314-9822  
www.solutions4structures.com

PROJECT NO. : 23.007  
DESIGNED BY : MRO  
DRAWN BY : RSO  
ISSUE DATE : 8-16-24  
LATEST REV. OF DWG. SET :

SUBMITTAL SET ONLY NOT FOR CONSTRUCTION  
THESE DRAWINGS ARE SUBJECT TO REVISIONS  
PENDING LOCAL JURISDICTIONAL REVIEW.

THOMAS L. CHASE, PE  
MARTIN R. OMAN, PE, SE  
OLEG G. KONDRATYUK, PE

# S1.1

CAD FILE: F:\Projects\2023 Projects\Drawings\Bradley Heights\Detention Vault\S2.0.dwg PLOT DATE/TIME: 10/31/2024 - 10:14am THANK YOU FOR USING SOLUTIONS 4 STRUCTURES

Plank Framing Notes - Vault 2

1. TOW = TOP OF WALL ELEVATION (ALSO BOTTOM OF PLANKS)  
= 381.07'

2. TOF = VARIES SEE CIVIL

3. TOP OF VAULT FRAMING TYPICALLY CONSISTS OF SIMPLE SPAN 12-1/2" PRECAST PRE-STRESSED HOLLOW CORE PLANKS TO BE DESIGNED BY OTHERS TO CARRY ALL DESIGN LOADS AS SHOWN ON SHEET S1.1

4. FLOOR PLANK LOCATIONS ARE SCHEMATICALLY SHOWN ON THE PLANS. IT IS NOT THE INTENT OF THE STRUCTURAL PLANS TO GRAPHICALLY LOCATE ALL FRAMING MEMBERS. THE CONTRACTOR IS RESPONSIBLE FOR SPACING FRAMING MEMBERS AS NOTED ON THE PLANS AND GENERATING MEMBER LAYOUTS FOR SHOP DRAWINGS AND QUANTITY TAKEOFFS.

5. REFER TO SHEET S3.1 FOR TYPICAL PLANK CONNECTION DETAILS

6. CONTRACTOR SHALL VERIFY AND COORDINATE ALL OPENINGS THROUGH THE PLANK FRAMING ASSEMBLY. SEE SHEET S3.2 FOR RELATED DETAILS.

7. ALL BACKFILL SHALL NOT BEGIN UNTIL AFTER PLANKS ARE PLACED AND GROUTED. METHODS AND MATERIALS SHALL BE COORDINATED BETWEEN THE SOILS ENGINEER AND THE CONTRACTOR AND SHALL NOT RESULT IN OUT OF PLANE PRESSURES EXCEEDING THE LIMITS NOTED.

8. SEE THE GENERAL STRUCTURAL NOTES ON SHEET S1.0 FOR ADDITIONAL INFORMATION.

Foundation Notes - Vault 2

1. TOF ELEVATIONS VARY (SEE PLAN)

2. TYPICAL DIMENSIONS ARE TO FACE OF WALL OR TO CENTERLINE OF COLUMN OR FOOTING. VERIFY ALL DIMENSIONS AND ELEVATIONS WITH THE ARCHITECT.

3. PROVIDE MAT FOOTING SUBSTRATE PREPARATION PER THE SOILS REPORT.

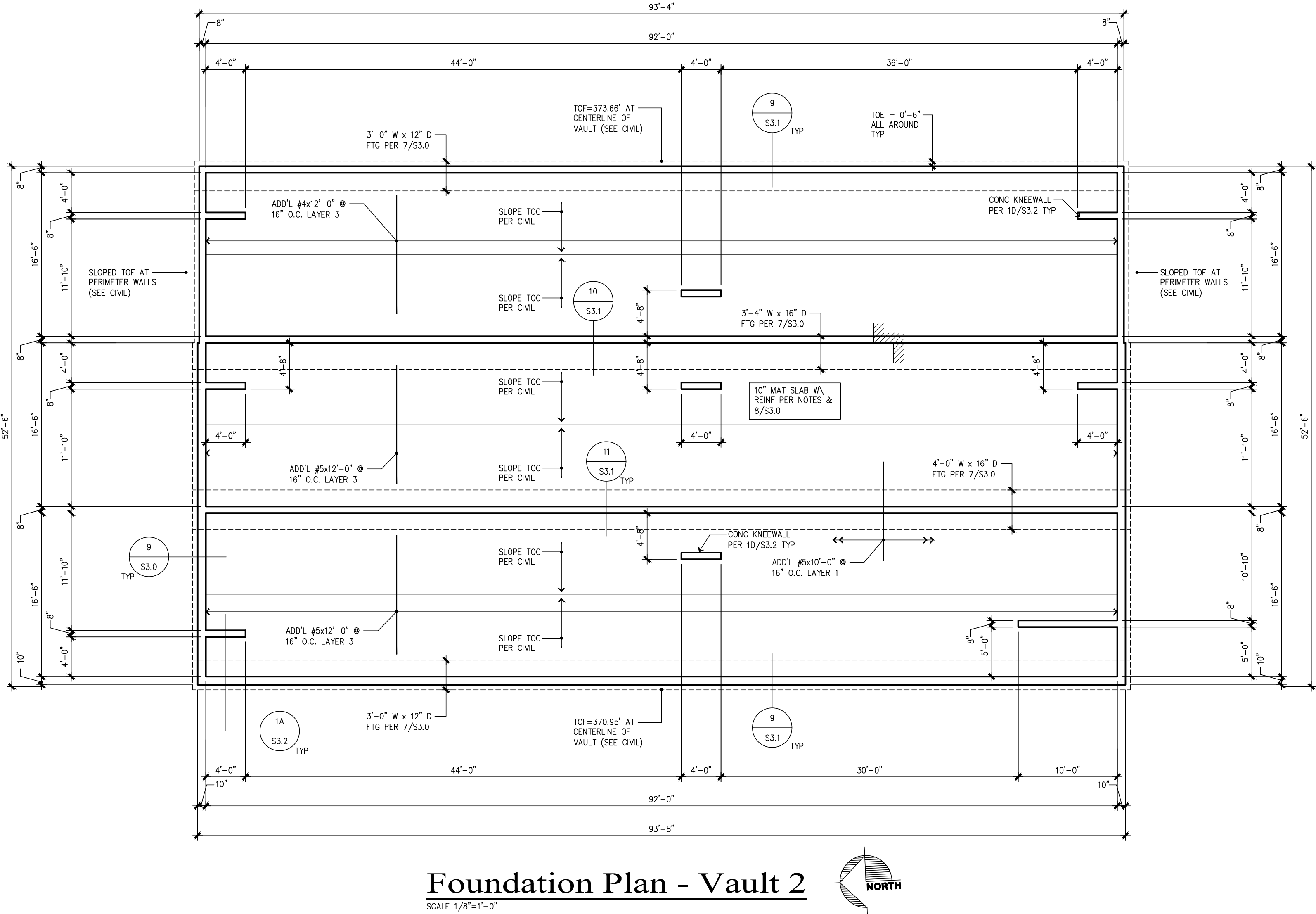
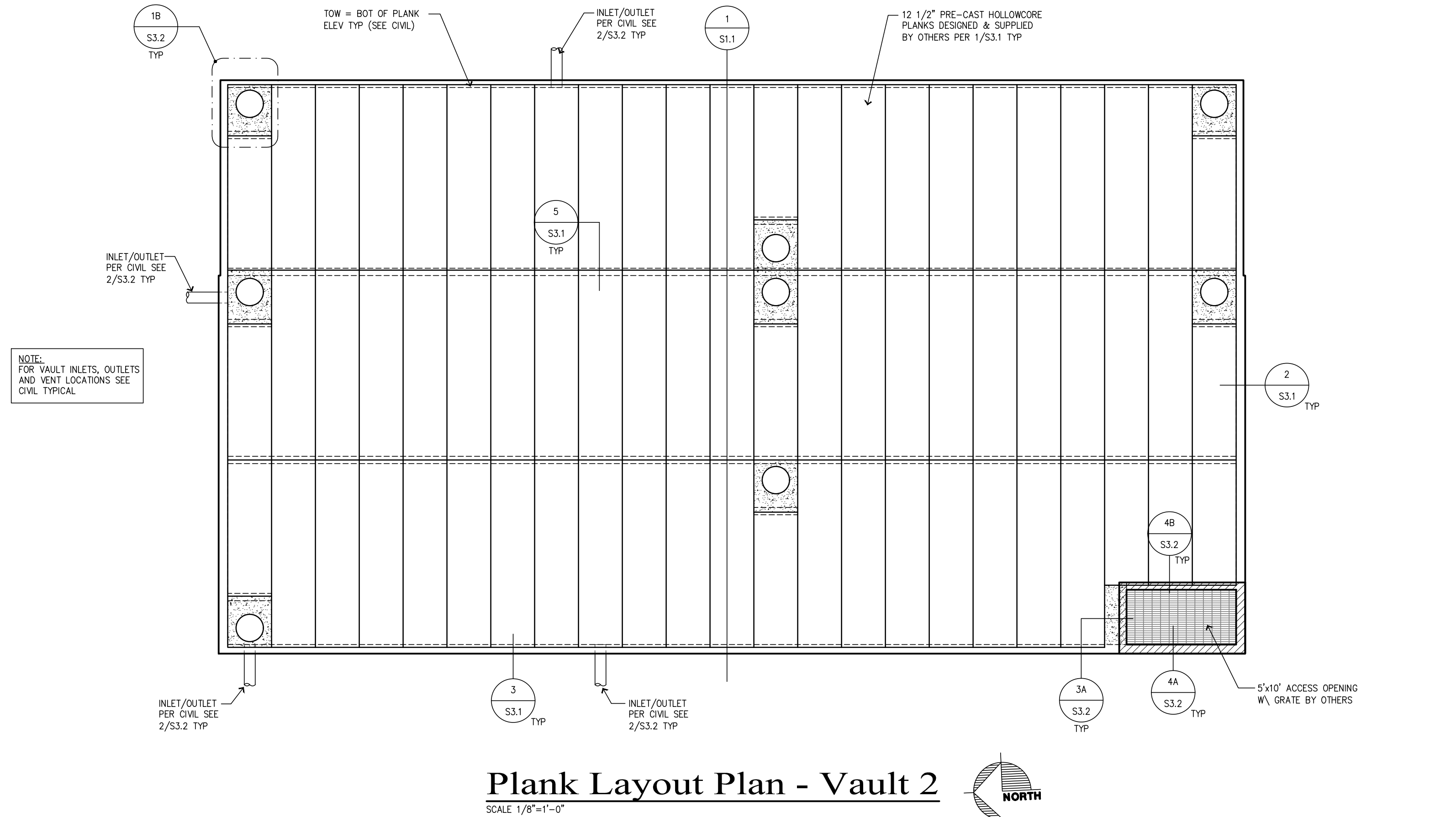
4. ALL FOOTING DOWELS = SAME SIZE AND SPACING AS VERT WALL REINF TYPICAL

5. 10" THICK MAT SLAB W/ #5 @ 16" O.C. EA WAY PER 8/S3.0 & ADD'L REINFORCEMENT PER PLAN TYP.

6. PROVIDE 36"x36" CORNER BARS AT ALL WALL/FOOTING INTERSECTIONS AND CORNERS TO MATCH ALL HORIZONTAL REINFORCEMENT.

7. DO NOT BACKFILL PERIMETER CONC WALLS UNTIL PLANK ASSEMBLY HAS BEEN PLACED AND GROUTED.

8. SEE THE GENERAL STRUCTURAL NOTES ON SHEET S1.0 FOR ADDITIONAL INFORMATION.



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S2.0

PROFESSIONAL SEAL

THOMAS L. CHASE, PE

MARTIN R. OMAN, PE, SE

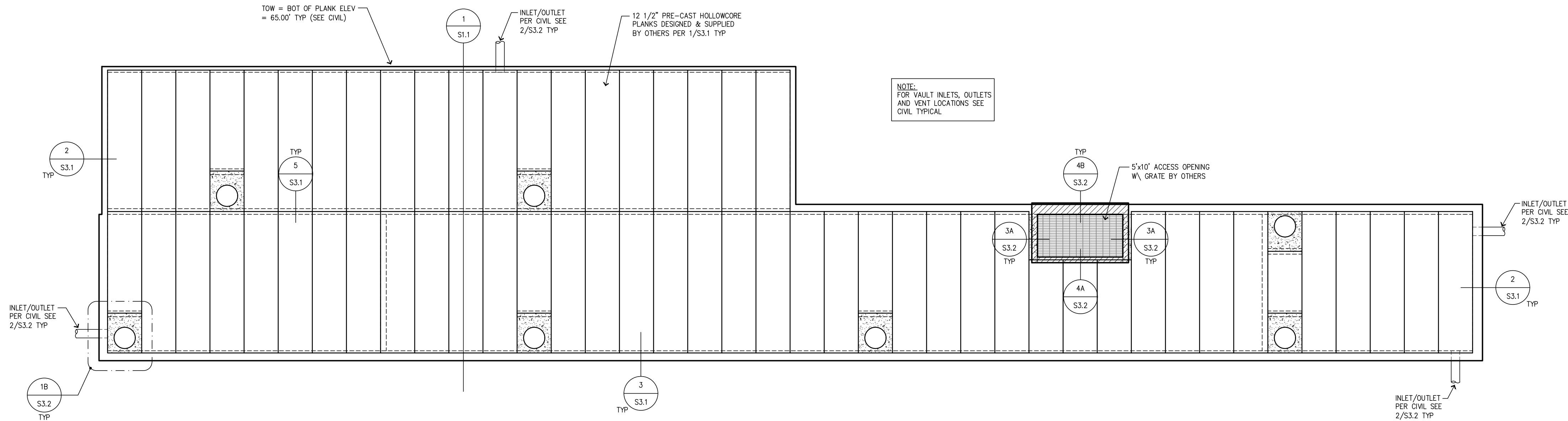
OLEG G. KONDRATYUK, PE

8-16-24

CAD FILE: F:\Projects\2023 Projects\Drawings\Bradley Heights\Detention Vault\S2.1.dwg PLOT DATE/TIME: 10/31/2024 10:16am THANK YOU FOR USING SOLUTIONS 4 STRUCTURES

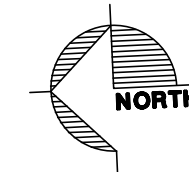
### Plank Framing Notes - Vault 3

1. TOW = TOP OF WALL ELEVATION (ALSO BOTTOM OF PLANKS)  
= 384.30'
2. TOF = VARIES SEE CIVIL
3. TOP OF VAULT FRAMING TYPICALLY CONSISTS OF SIMPLE SPAN 12-1/2" PRECAST PRE-STRESSED HOLLOW CORE PLANKS TO BE DESIGNED BY OTHERS TO CARRY ALL DESIGN LOADS AS SHOWN ON SHEET S1.1
4. FLOOR PLANK LOCATIONS ARE SCHEMATICALLY SHOWN ON THE PLANS. IT IS NOT THE INTENT OF THE STRUCTURAL PLANS TO GRAPHICALLY LOCATE ALL FRAMING MEMBERS. THE CONTRACTOR IS RESPONSIBLE FOR SPACING FRAMING MEMBERS AS NOTED ON THE PLANS AND GENERATING MEMBER LAYOUTS FOR SHOP DRAWINGS AND QUANTITY TAKEOFFS.
5. REFER TO SHEET S3.1 FOR TYPICAL PLANK CONNECTION DETAILS
6. CONTRACTOR SHALL VERIFY AND COORDINATE ALL OPENINGS THROUGH THE PLANK FRAMING ASSEMBLY. SEE SHEET S3.2 FOR RELATED DETAILS.
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8. SEE THE GENERAL STRUCTURAL NOTES ON SHEET S1.0 FOR ADDITIONAL INFORMATION.



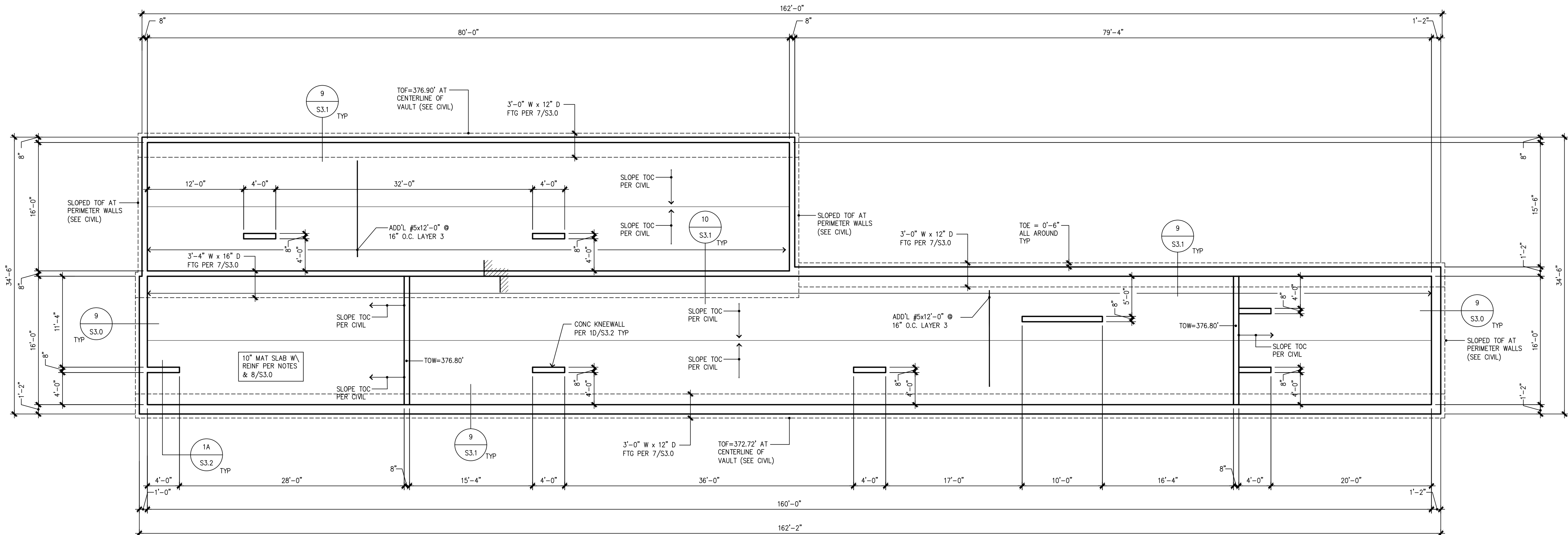
### Plank Layout Plan - Vault 3

SCALE 1/8"=1'-0"



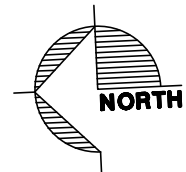
### Foundation Notes - Vault 3

1. TOF ELEVATIONS VARY (SEE PLAN)
2. TYPICAL DIMENSIONS ARE TO FACE OF WALL OR TO CENTERLINE OF COLUMN OR FOOTING. VERIFY ALL DIMENSIONS AND ELEVATIONS WITH THE ARCHITECT.
3. PROVIDE MAT FOOTING SUBSTRATE PREPARATION PER THE SOILS REPORT.
4. ALL FOOTING DOWELS = SAME SIZE AND SPACING AS VERT WALL REINF TYPICAL
5. 10" THICK MAT SLAB W/ #5 @ 16" O.C. EA WAY PER 8/S3.0 & ADD'L REINFORCEMENT PER PLAN TYP.
6. PROVIDE 36"x36" CORNER BARS AT ALL WALL/FOOTING INTERSECTIONS AND CORNERS TO MATCH ALL HORIZONTAL REINFORCEMENT.
7. DO NOT BACKFILL PERIMETER CONC WALLS UNTIL PLANK ASSEMBLY HAS BEEN PLACED AND GROUTED.
8. SEE THE GENERAL STRUCTURAL NOTES ON SHEET S1.0 FOR ADDITIONAL INFORMATION.



### Foundation Plan - Vault 3

SCALE 1/8"=1'-0"



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Puyallup, Washington

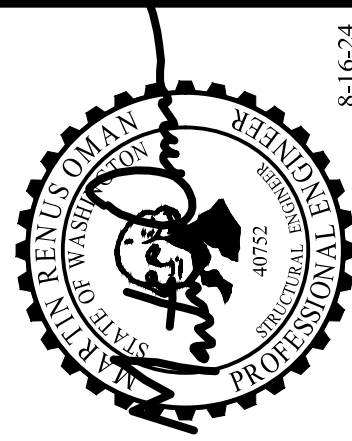
**Solutions 4 Structures**  
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**S2.1**



THOMAS L. CHASE, PE  
MARTIN R. OMAN, PE, SE  
OLEG G. KONDRATYUK, PE

8-16-24



CAD FILE: F:\Projects\2023 Projects\23.007 Bradley Heights\Drawings\Detention Vault\S2.2.dwg PLOT DATE/TIME: 10/31/2024 - 10:19am THANK YOU FOR USING SOLUTIONS 4 STRUCTURES

Plank Framing Notes - Vault 4

1. TOW = TOP OF WALL ELEVATION (ALSO BOTTOM OF PLANKS)  
= 398.50'

2. TOF = VARIES SEE CIVIL

3. TOP OF VAULT FRAMING TYPICALLY CONSISTS OF SIMPLE SPAN 12-1/2" PRECAST PRE-STRESSED HOLLOW CORE PLANKS TO BE DESIGNED BY OTHERS TO CARRY ALL DESIGN LOADS AS SHOWN ON SHEET S1.1

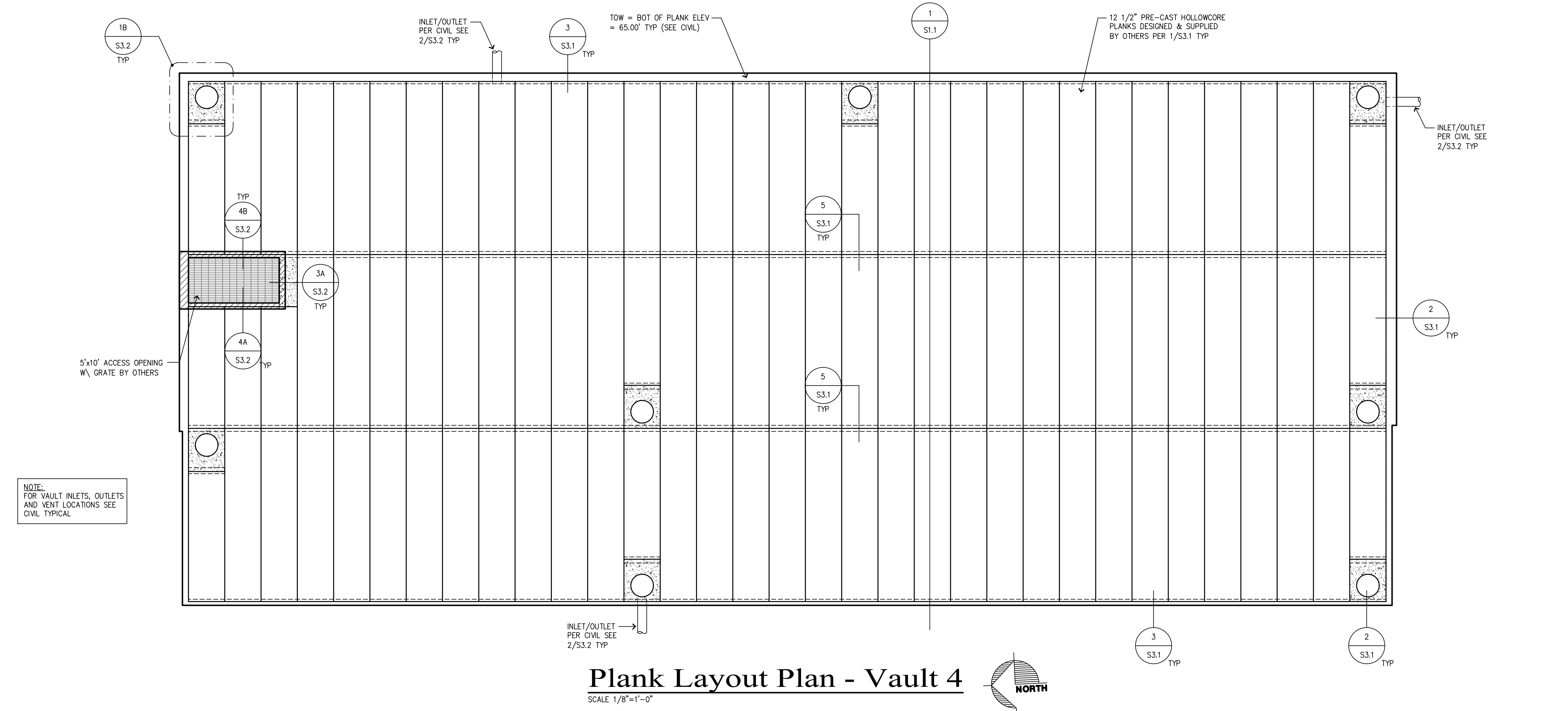
4. FLOOR PLANK LOCATIONS ARE SCHEMATICALLY SHOWN ON THE PLANS. IT IS NOT THE INTENT OF THE STRUCTURAL PLANS TO GRAPHICALLY LOCATE ALL FRAMING MEMBERS. THE CONTRACTOR IS RESPONSIBLE FOR SPACING FRAMING MEMBERS AS NOTED ON THE PLANS AND GENERATING MEMBER LAYOUTS FOR SHOP DRAWINGS AND QUANTITY TAKEOFFS.

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8. SEE THE GENERAL STRUCTURAL NOTES ON SHEET S1.0 FOR ADDITIONAL INFORMATION.



Foundation Notes - Vault 4

1. TOF ELEVATIONS VARY (SEE PLAN)

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3. PROVIDE MAT FOOTING SUBSTRATE PREPARATION PER THE SOILS REPORT.

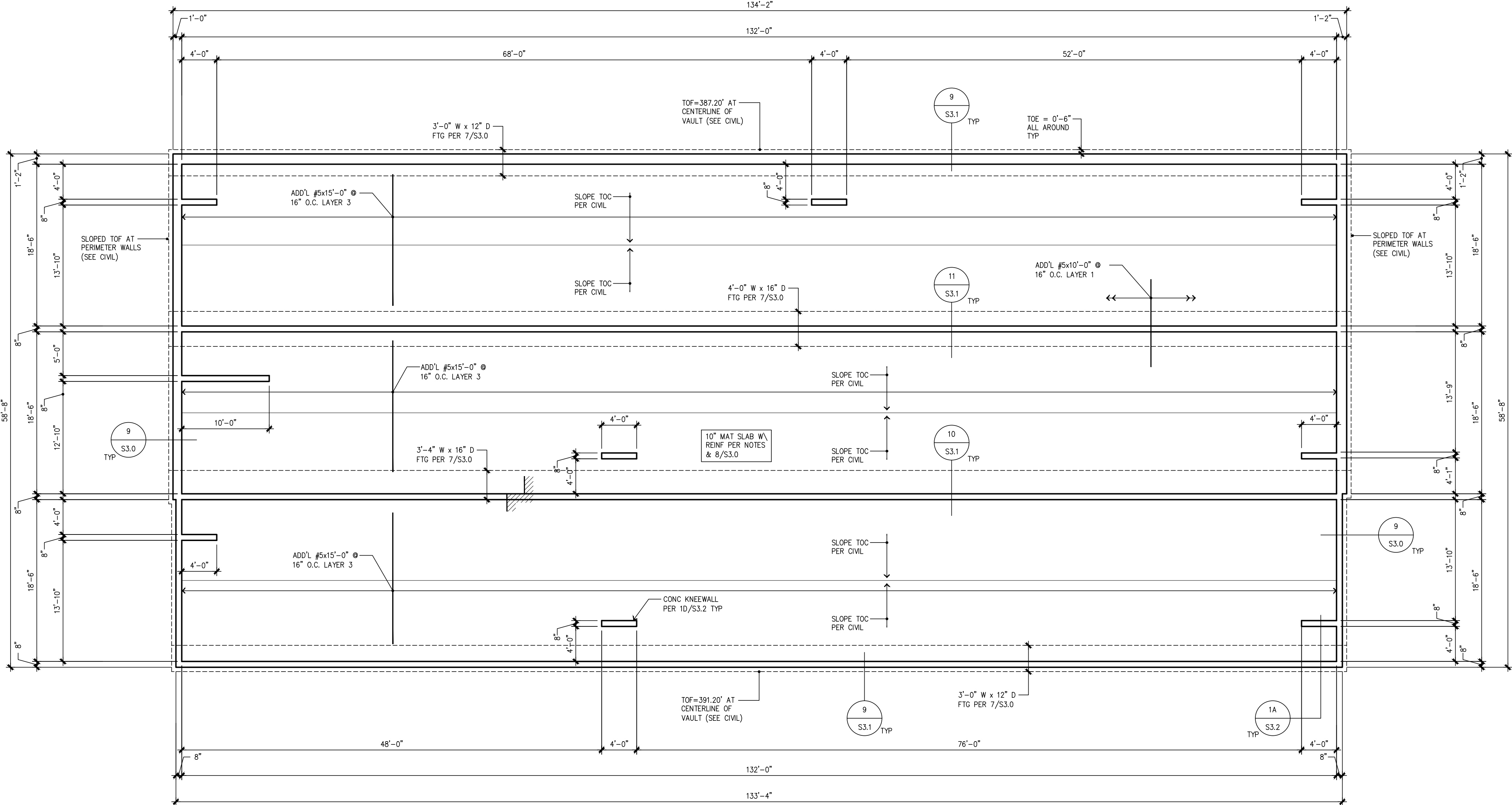
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5. 10" THICK MAT SLAB W/ #5 @ 16" O.C. EA WAY PER 8/S3.0 & ADD'L REINFORCEMENT PER PLAN TYP.

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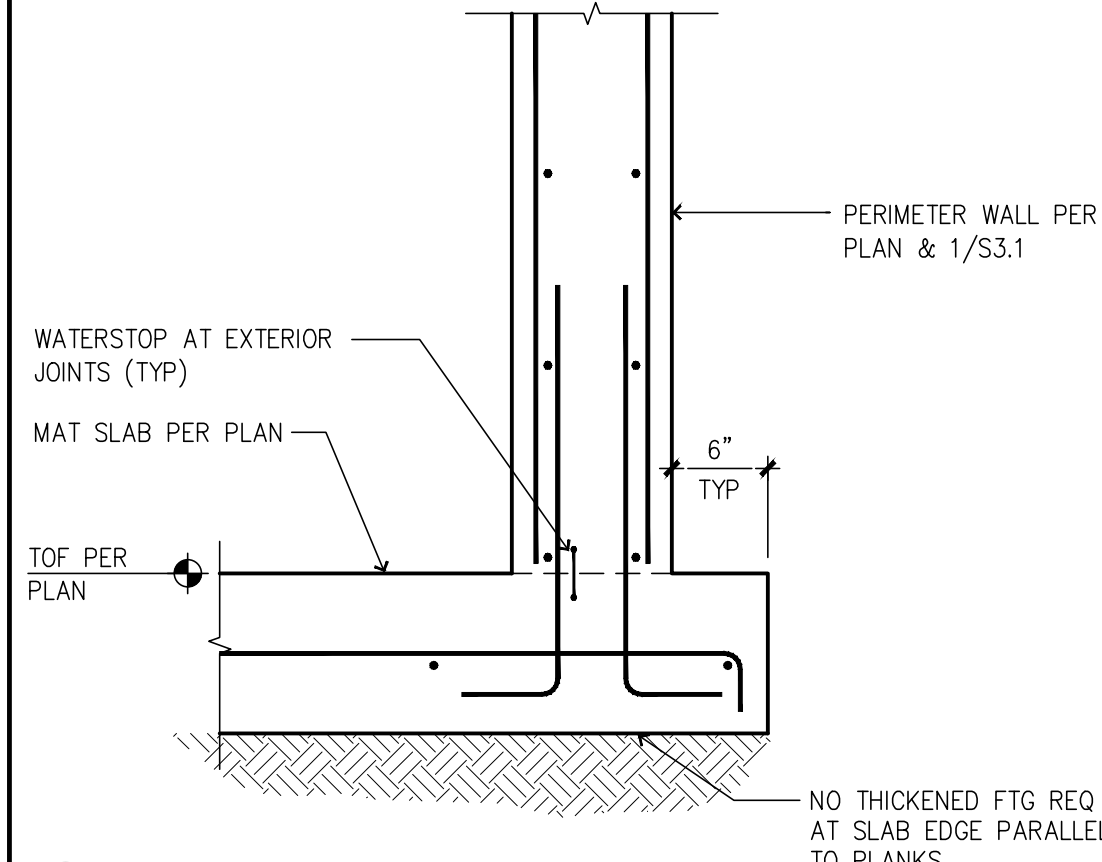
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S2.2

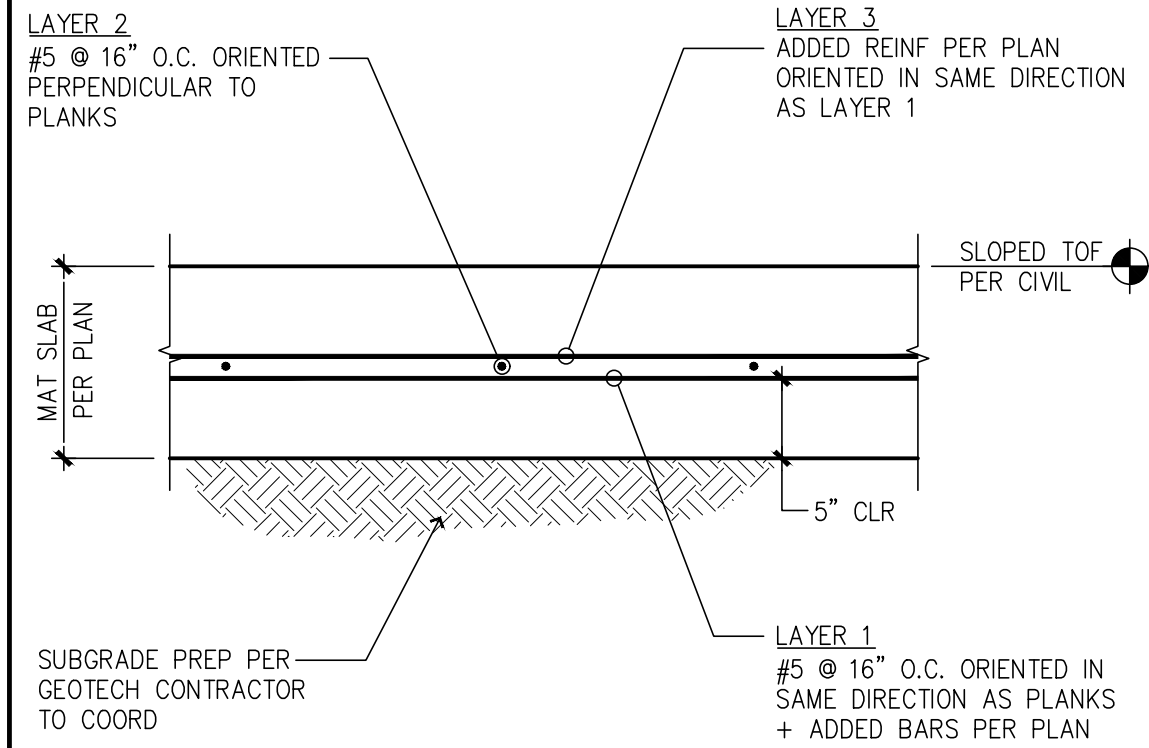
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SLAB EDGE @ EXTERIOR WALL



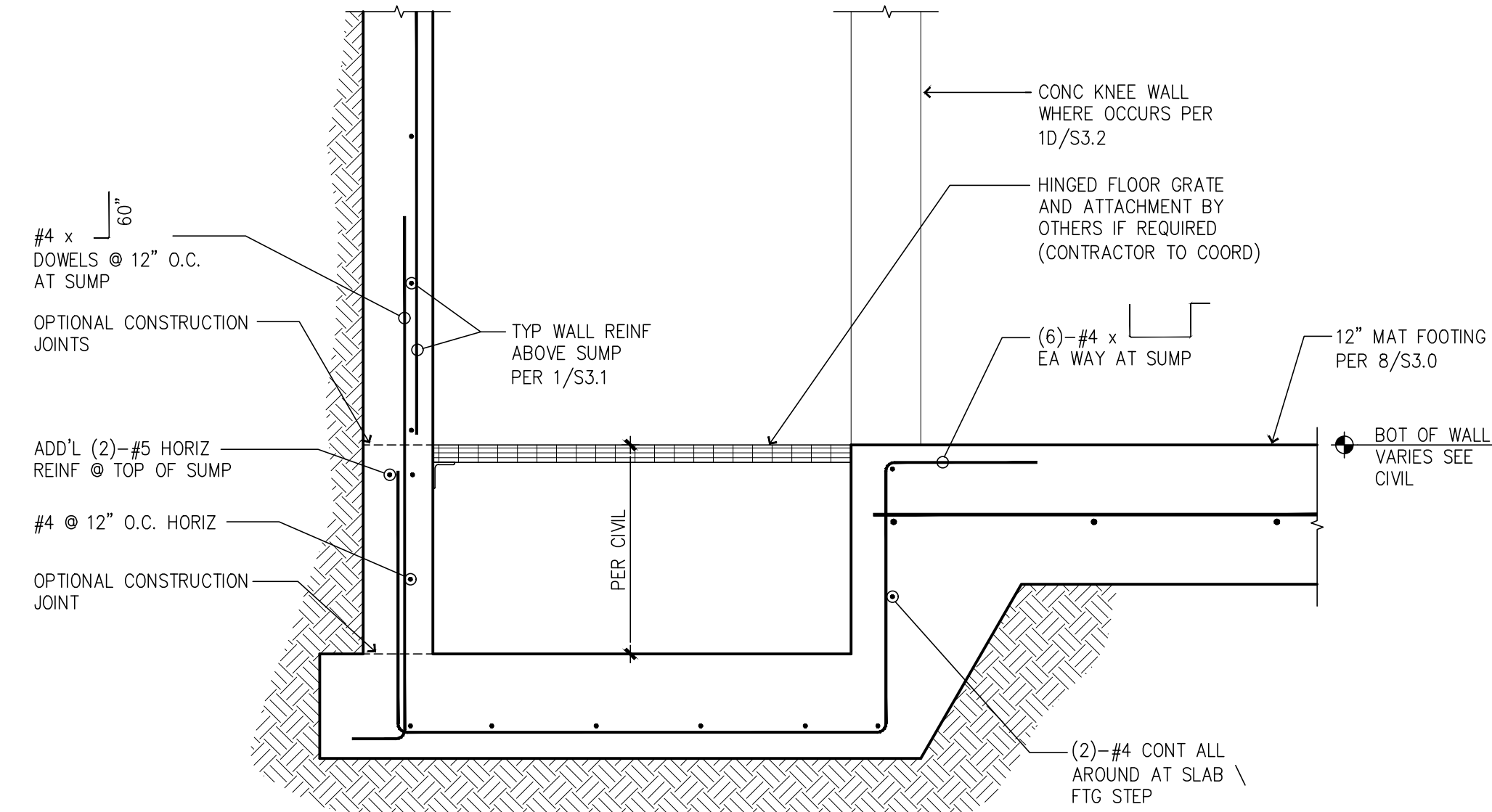
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SLAB REINFORCEMENT PLACEMENT



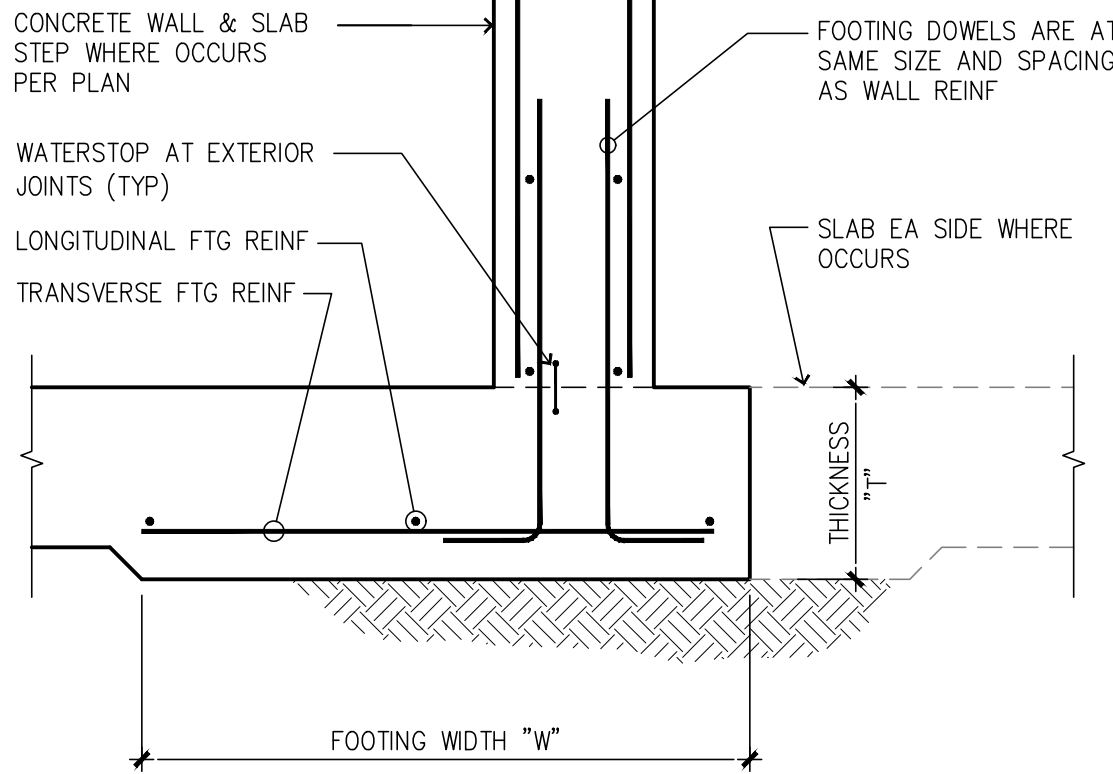
6

TYP SUMP PIT



7

FOOTING SCHEDULE



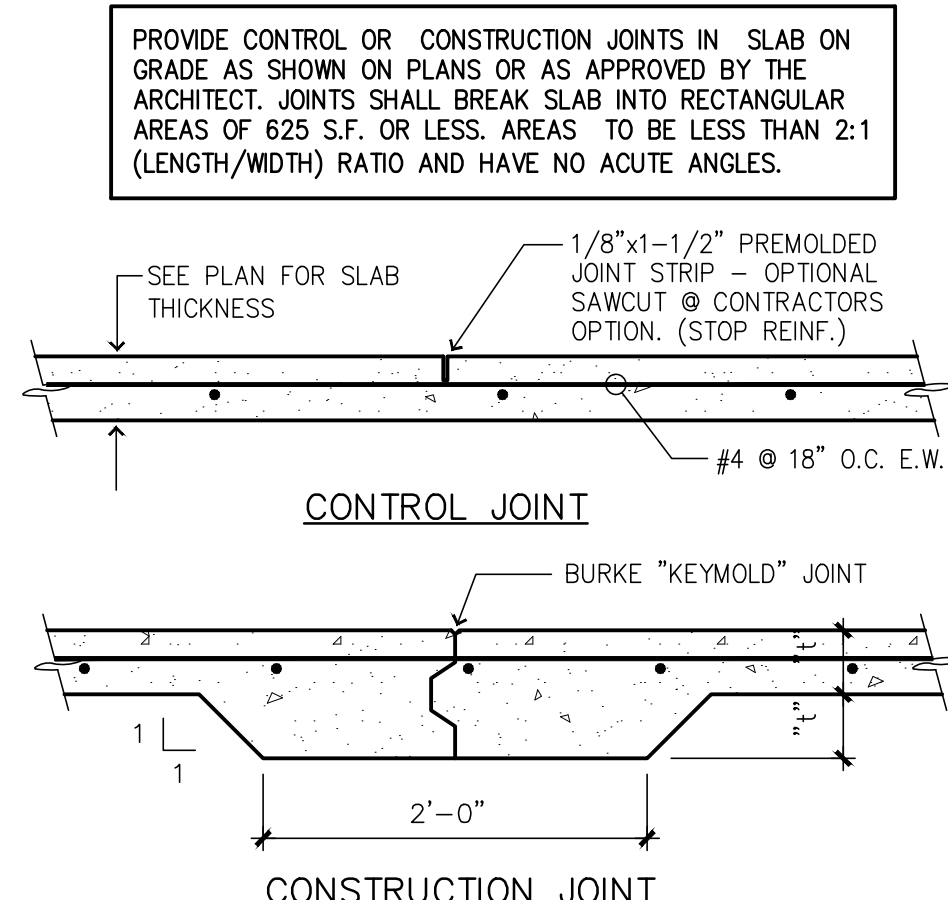
"W"		REINFORCEMENT		DETAIL
		LONGITUDINAL	TRANSVERSE	
3'-0"	12"	(3)-#5 BOT	#4 @ 12" O.C. BOT	9/S3.1
3'-4"	16"	(4)-#5 BOT	#5 @ 12" O.C. BOT	10/S3.1
4'-0"	16"	(5)-#5 BOT	#5 @ 16" O.C. BOT	11/S3.1

NOTES:

- FOOTING SHALL BEAR ON UNDISTURBED OR COMPACTED MATERIAL.
- WALL FOOTING DESIGN BEARING CAPACITY = 5,000 ALLOWABLE SOIL BEARING PRESSURE.
- CENTER FOOTINGS UNDER COLUMNS OR WALLS U.N.O.
- PROVIDE 36"x36" CORNER BARS WHERE CONT. REINF CANNOT PASS THRU PERPENDICULAR FOOTINGS

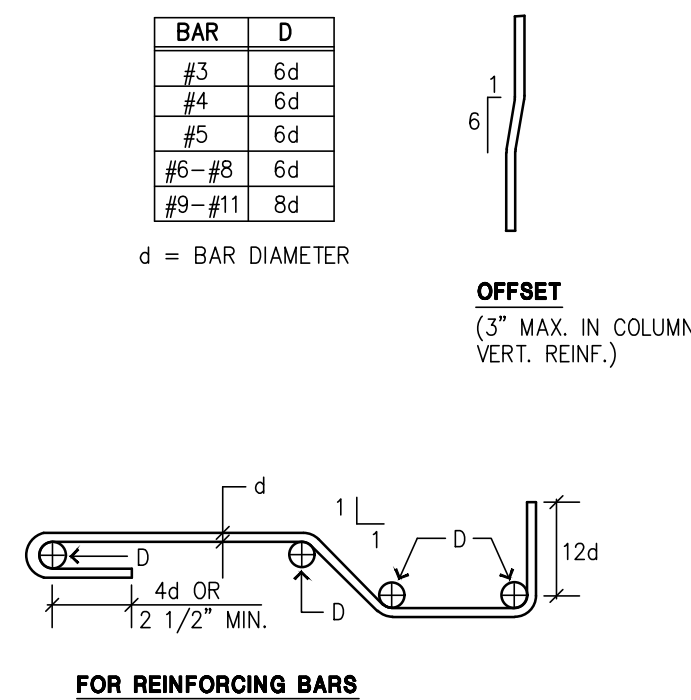
5

TYP CONSTRUCTION & CONTROL JOINTS



4

BAR BENDING DETAIL



3

REINFORCING SPLICE & DEVELOPMENT LENGTH SCHEDULE

REINFORCEMENT DEVELOPMENT AND SPLICE LENGTHS IN ACCORDANCE WITH ACI 318-11

Ld = TENSION DEVELOPMENT LENGTH  
Lt = DEVELOPMENT LENGTH OF TOP BARS IN TENSION  
Lsb = TENSION LAP SPLICE LENGTH FOR BARS OTHER THAN TOP BARS  
Lsbt = TENSION LAP SPLICE LENGTH FOR TOP BARS

3000 psi conc, Fy=60 ksi Rebar				
BAR SIZE	Ld (inches)	Lt (inches)	Lsb (inches)	Lsbt (inches)
#3	17	22	22	28
#4	22	29	29	38
#5	28	36	36	47
#6	33	43	43	56
#7	48	63	63	81
#8	55	72	72	93
#9	62	81	81	105
#10	70	91	91	118
#11	78	101	101	131
#14	94	121	COUPLER REQ.	

4000 psi conc, Fy=60 ksi Rebar				
BAR SIZE	Ld (inches)	Lt (inches)	Lsb (inches)	Lsbt (inches)
#3	15	19	19	25
#4	19	25	25	33
#5	24	31	31	41
#6	29	37	37	49
#7	42	54	54	71
#8	48	62	62	81
#9	54	70	70	91
#10	61	79	79	102
#11	67	87	87	114
#14	80	104	COUPLER REQ.	

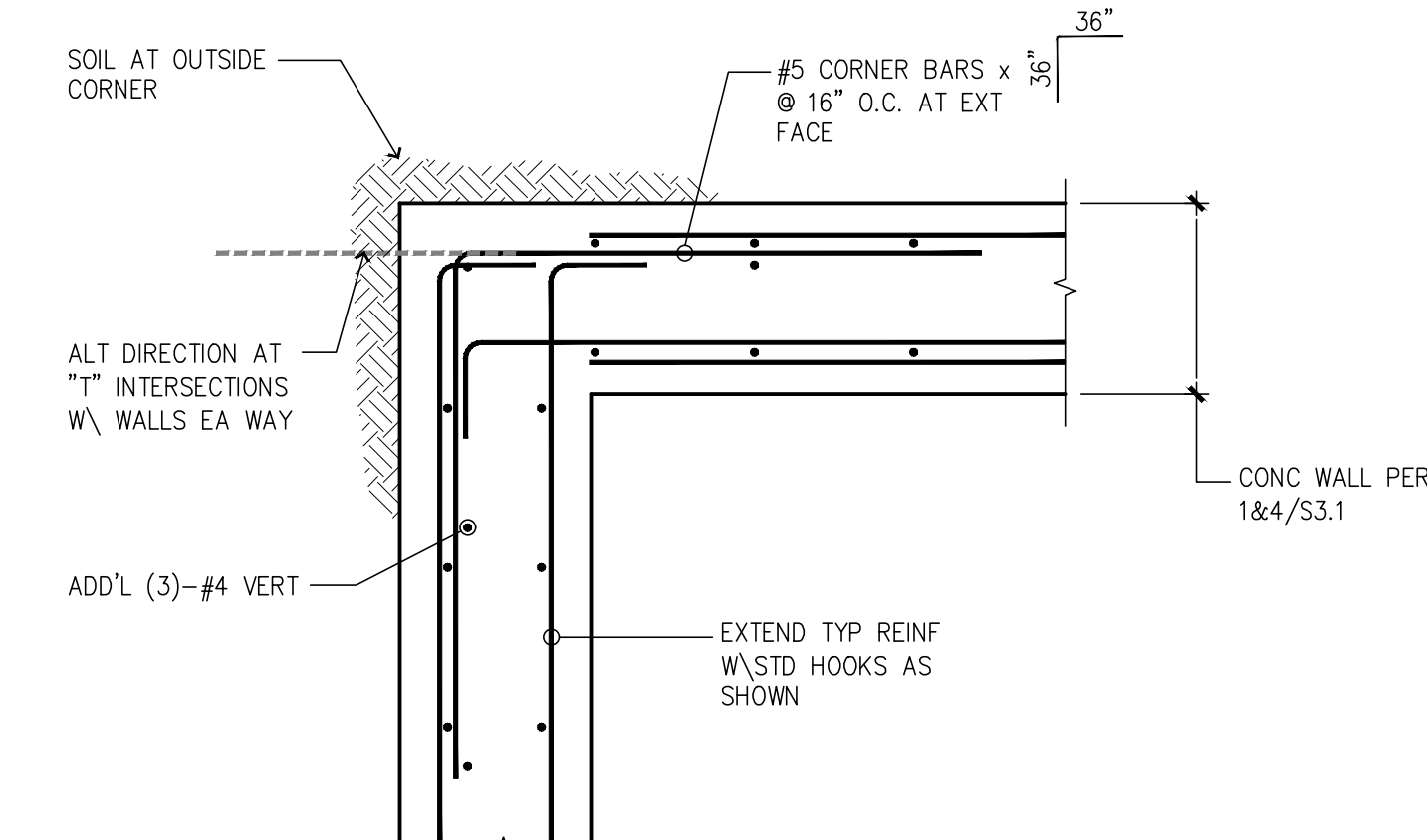
HORIZONTAL REINF. SHALL BE PROVIDED WITH Lsbt LAP SPLICES AT THE FOLLOWING LOCATIONS U.N.O:

A) AT ALL CONCRETE WALLS  
B) BEAMS OR WALLS IN GENERAL WITH MORE THAN 12" OF FRESH CONCRETE CAST IN THE MEMBER BELOW THE HORIZONTAL REINF. BEING SPLICED.

VERTICAL REINF. SHALL BE PROVIDED WITH Lsb LAP SPLICES U.N.O.  
MECHANICAL COUPLER SPLICES REQUIRED FOR #14 REINFORCING BARS

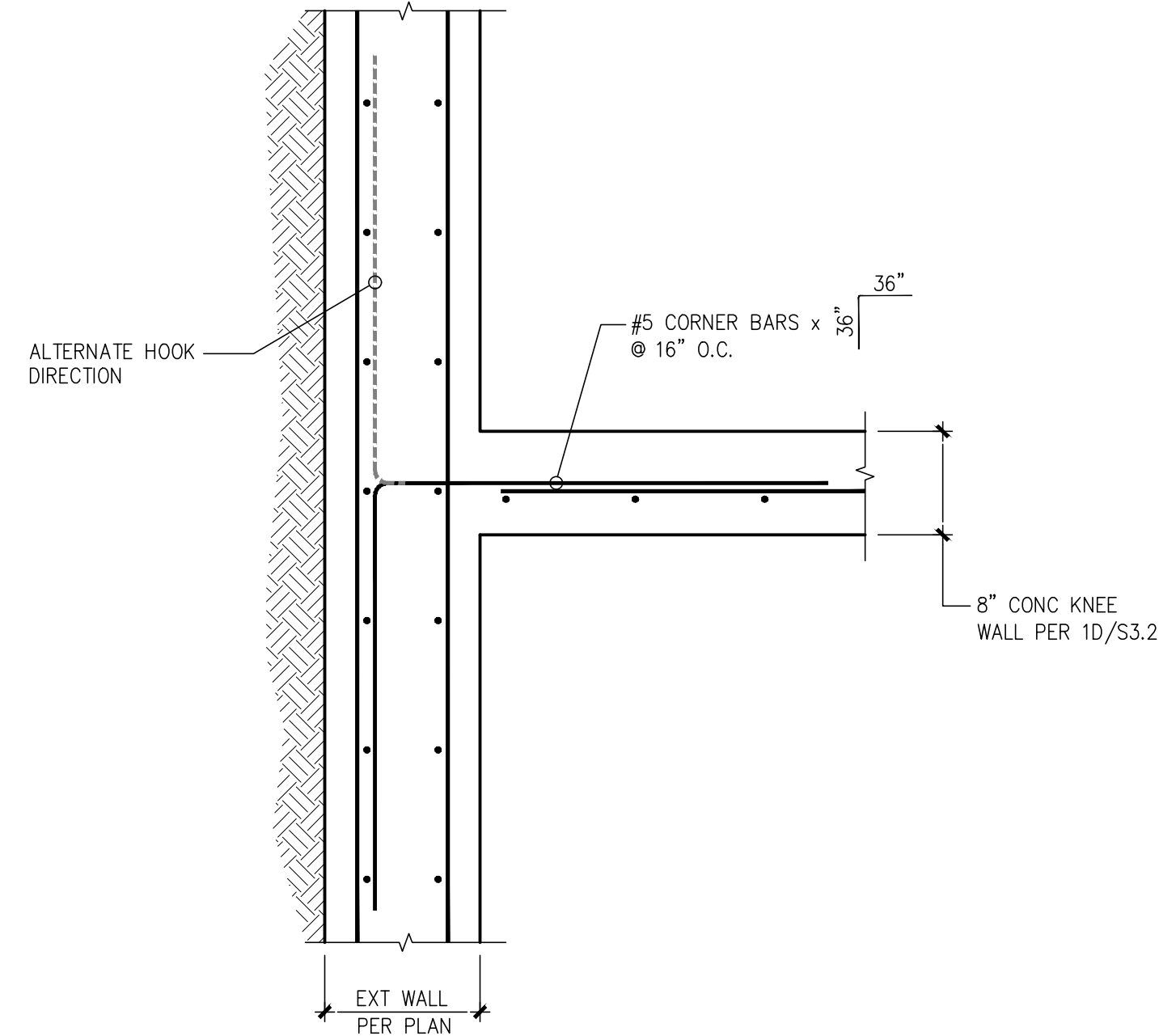
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WALL CORNER REINFORCING



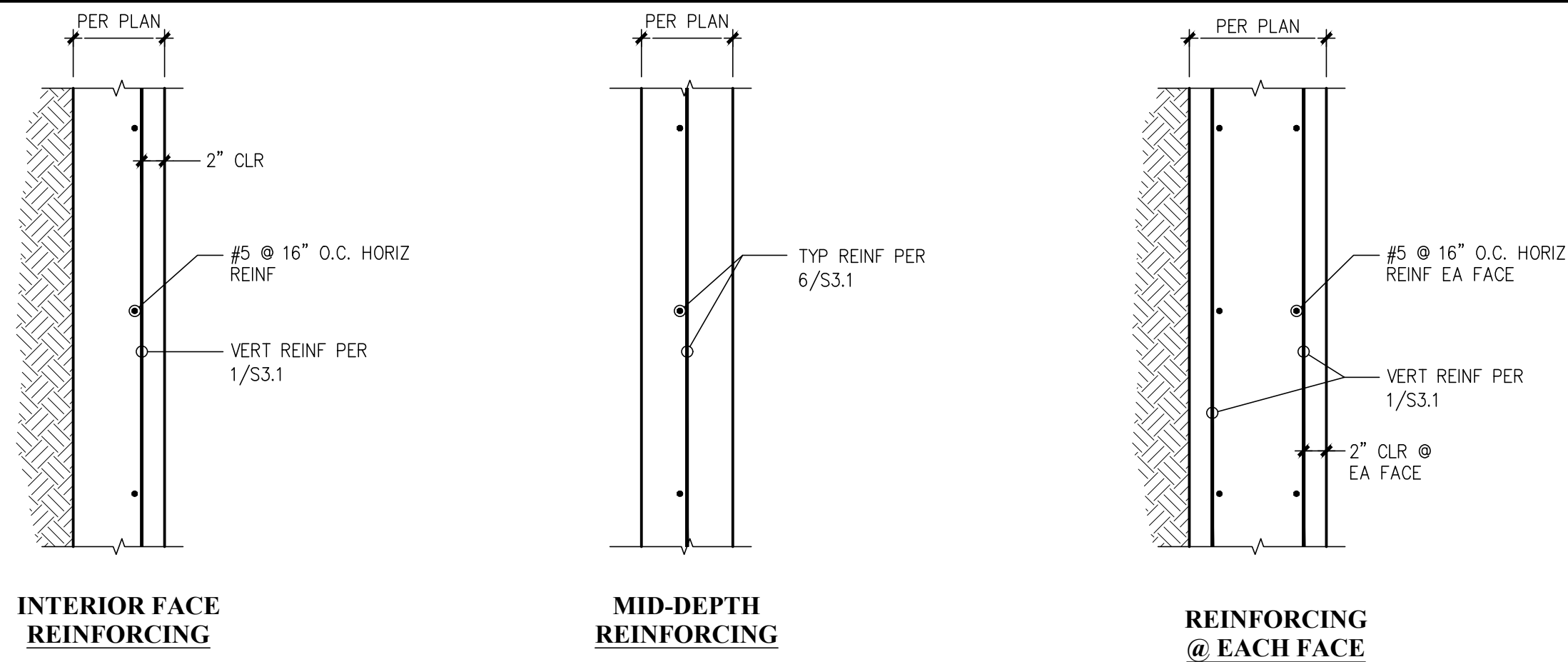
1B

INTERSECTION REINFORCING



2

WALL REINFORCING LAYOUTS



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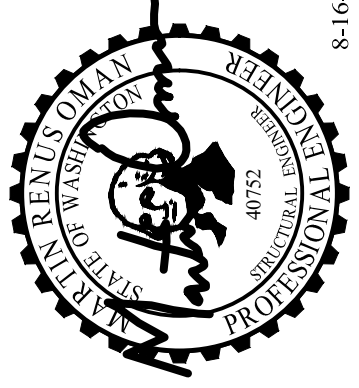
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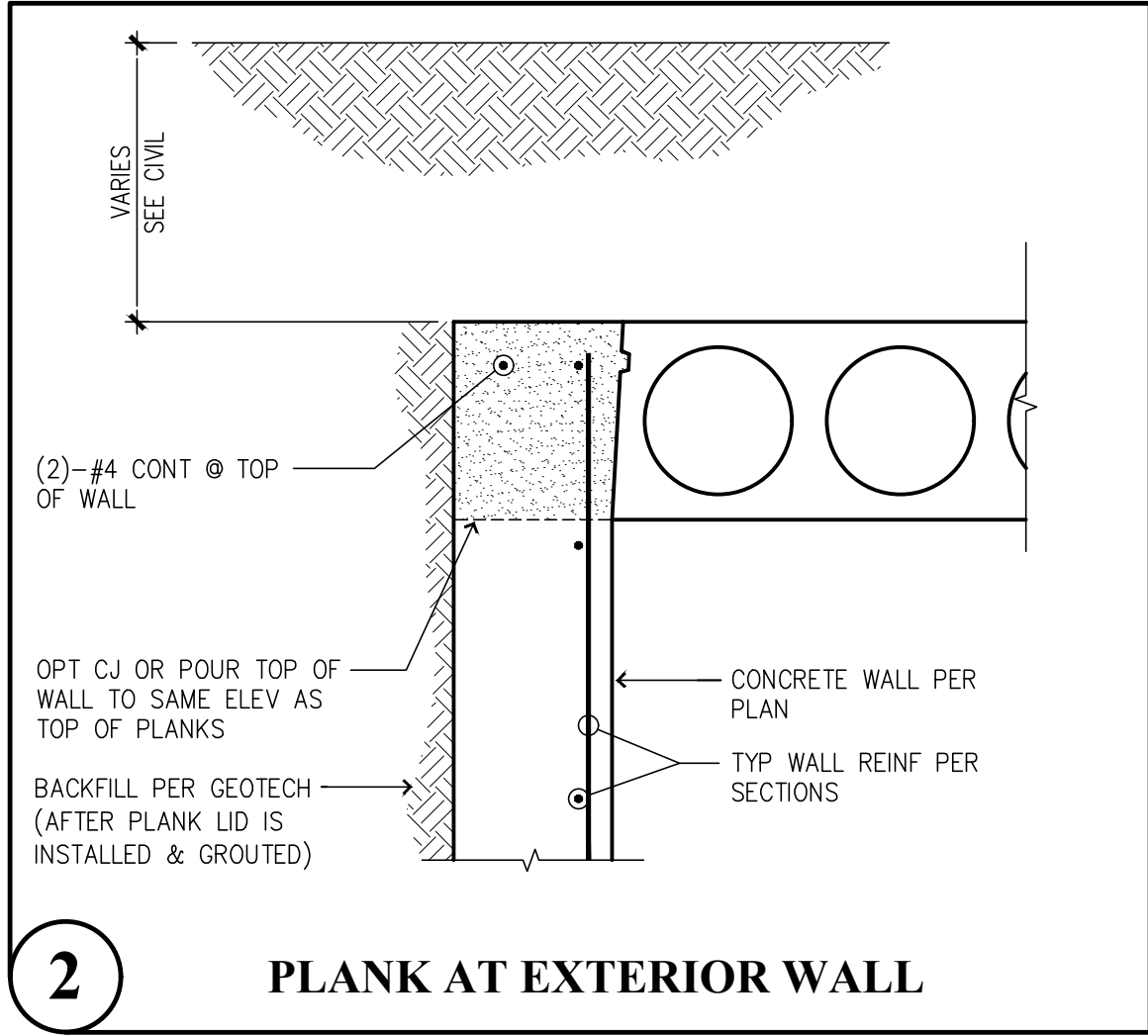
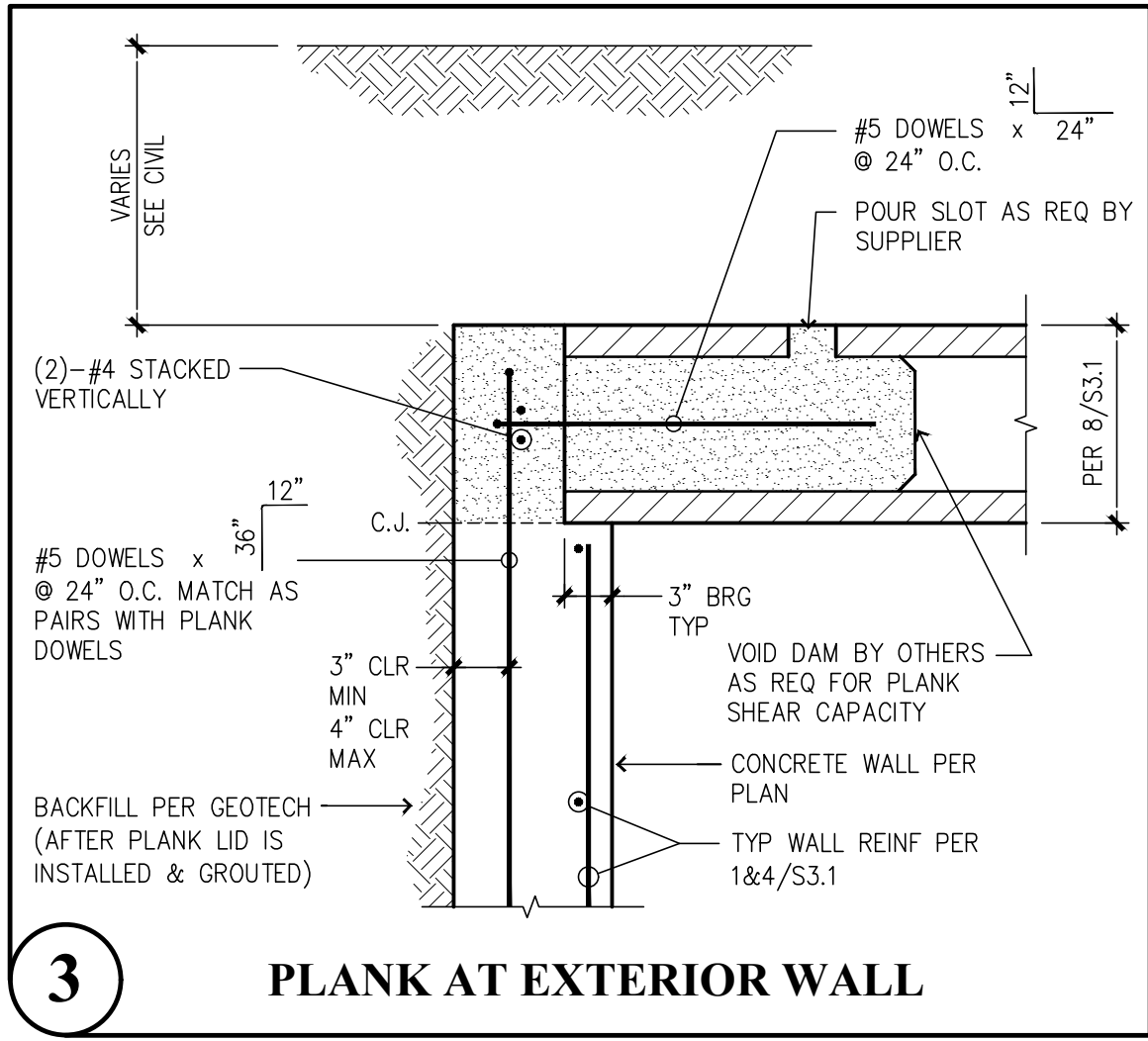
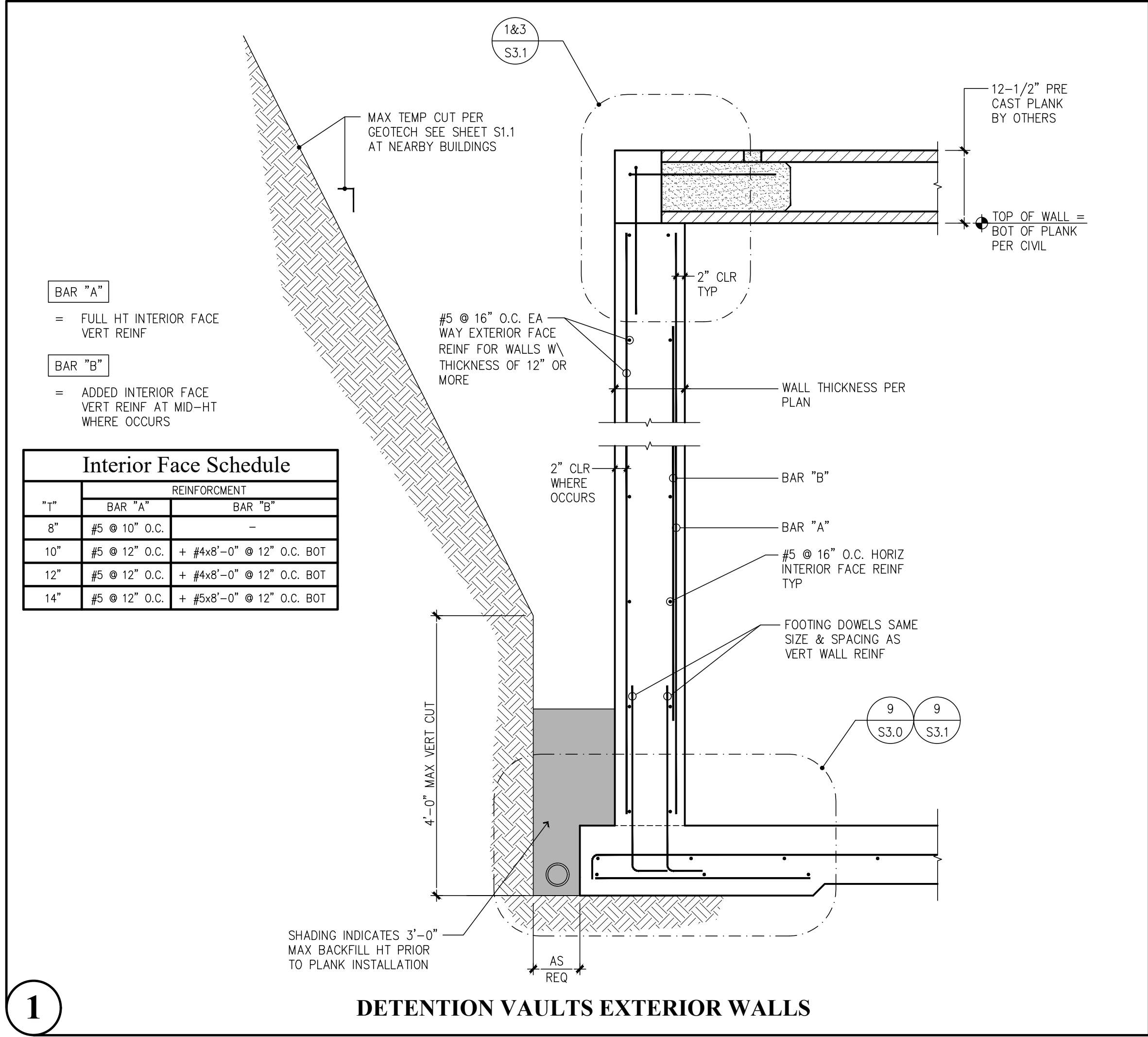
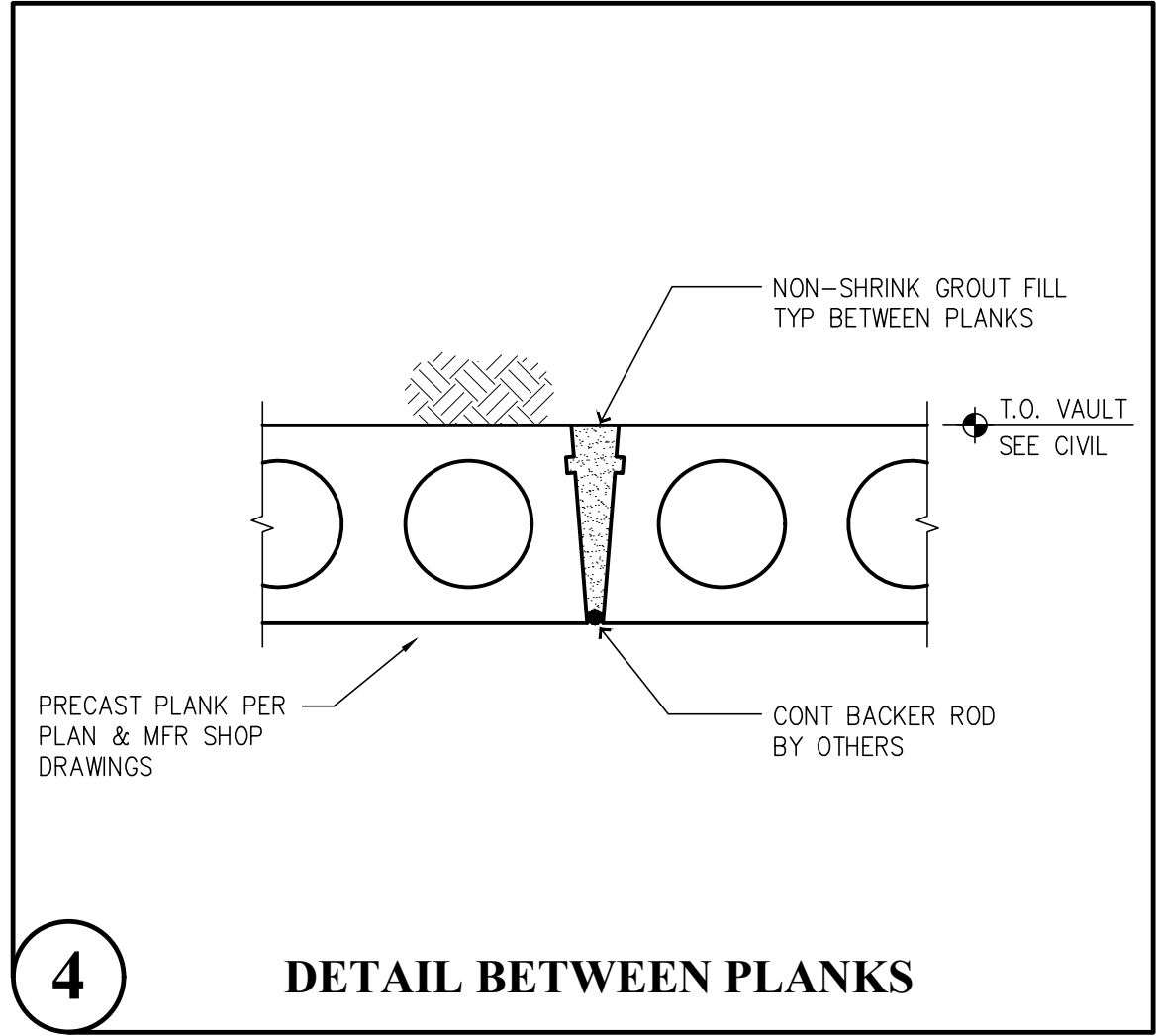
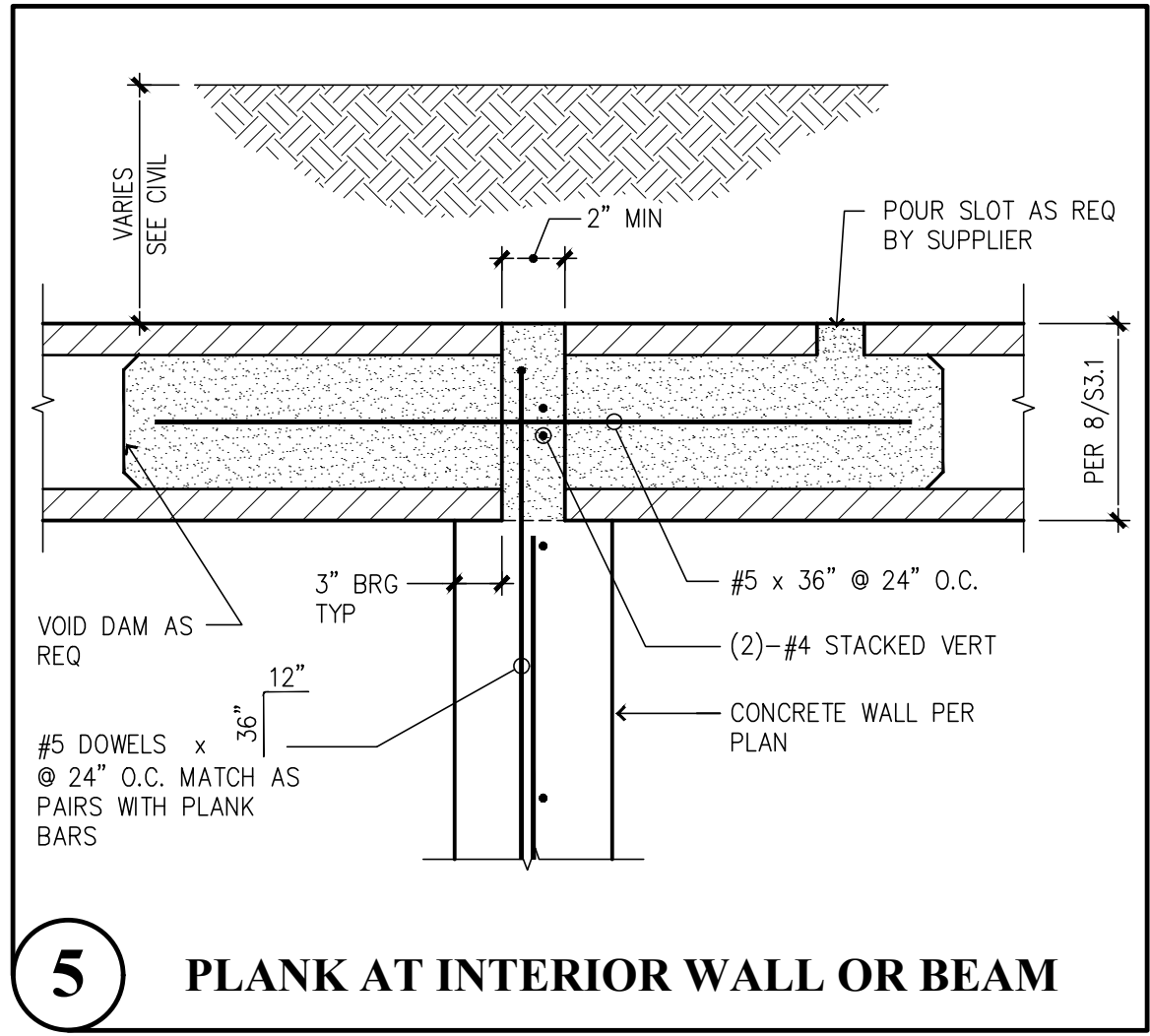
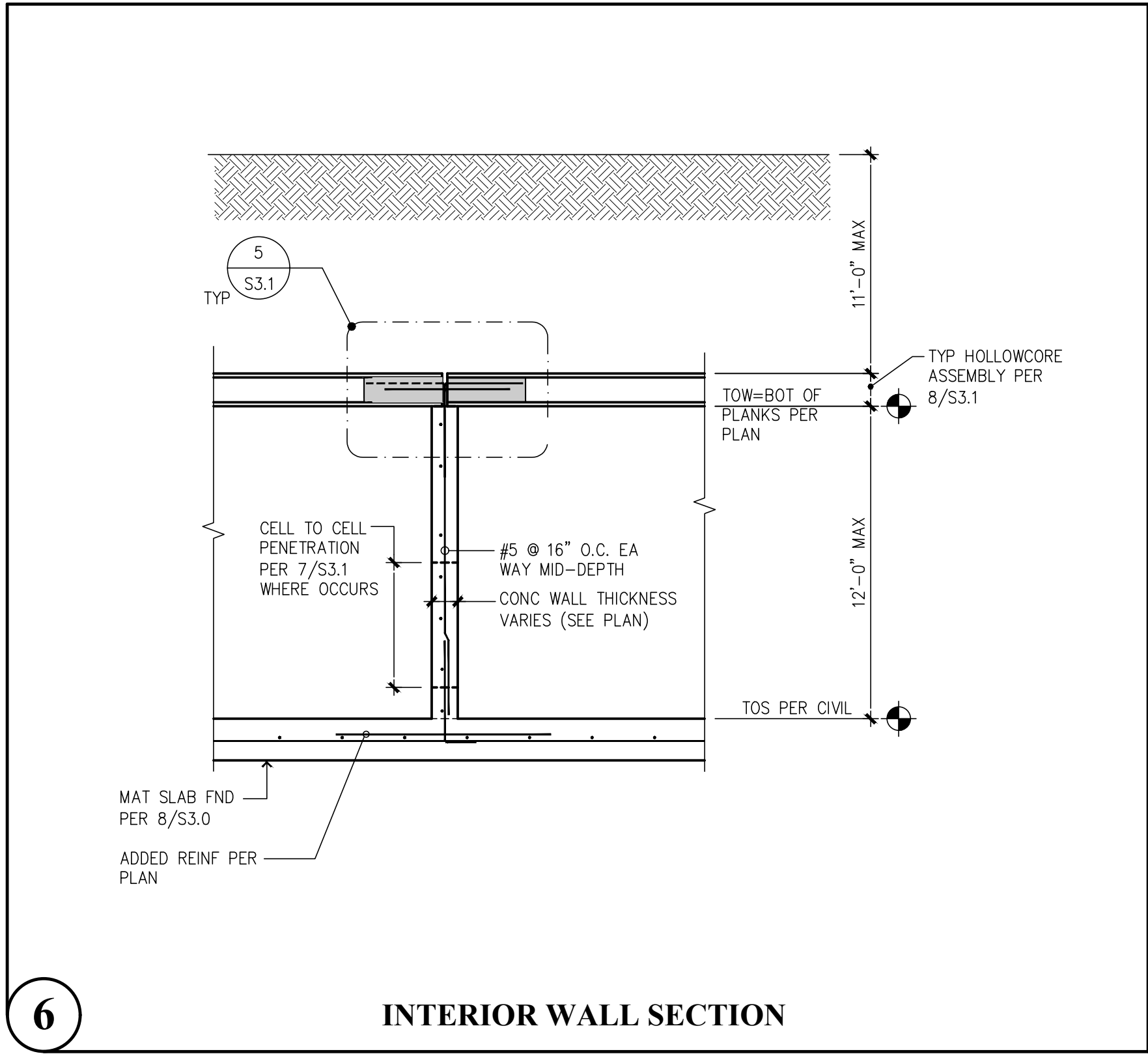
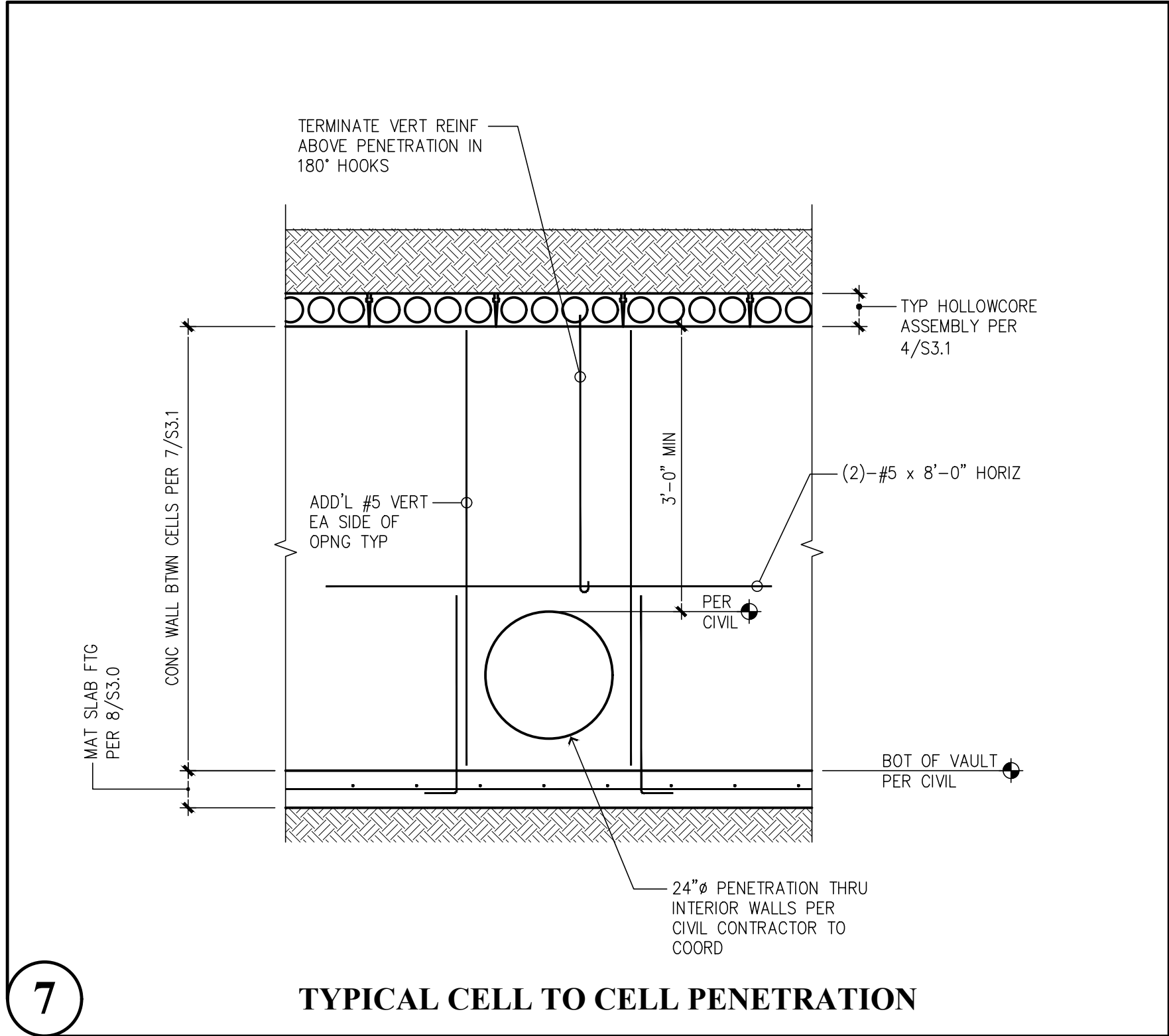
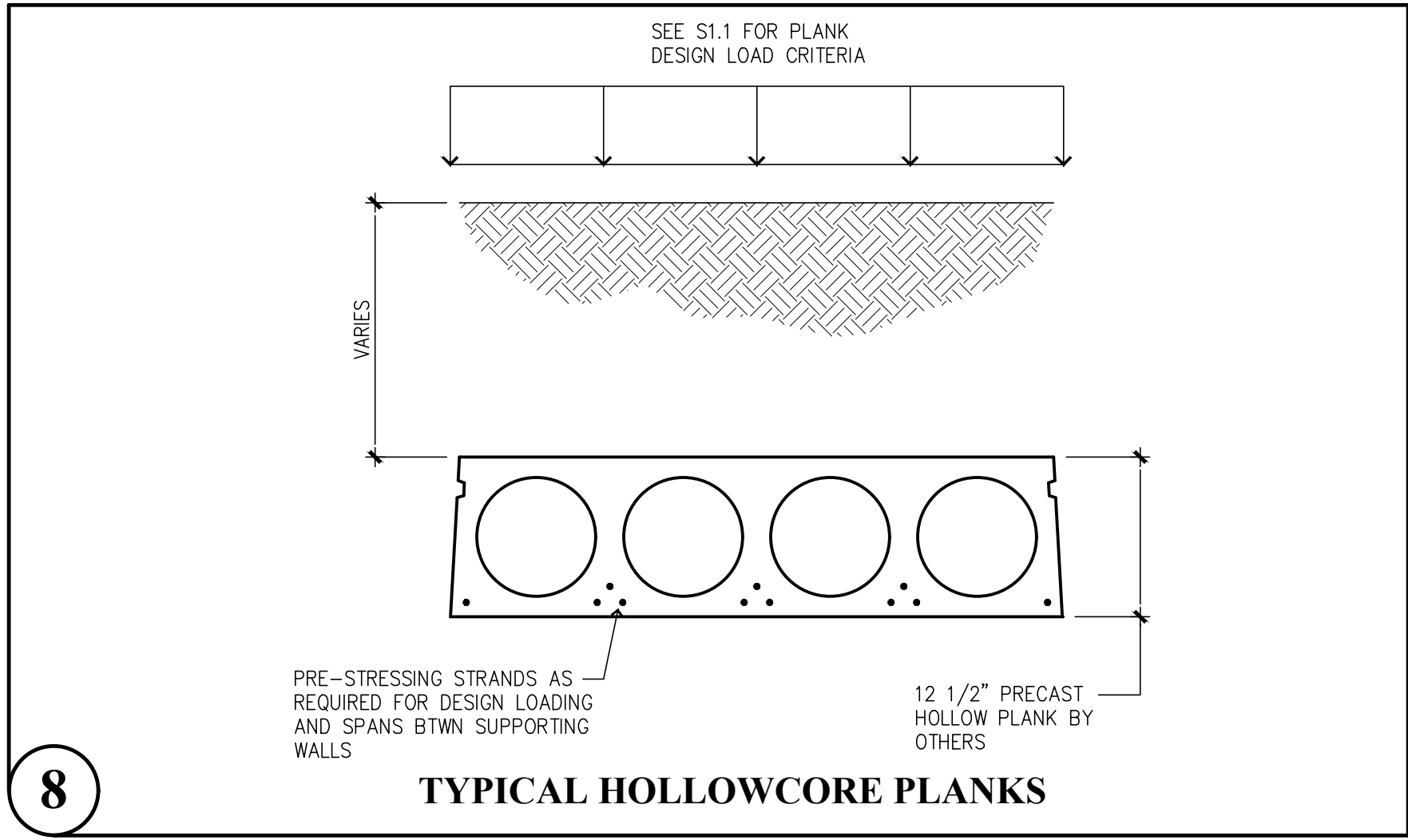
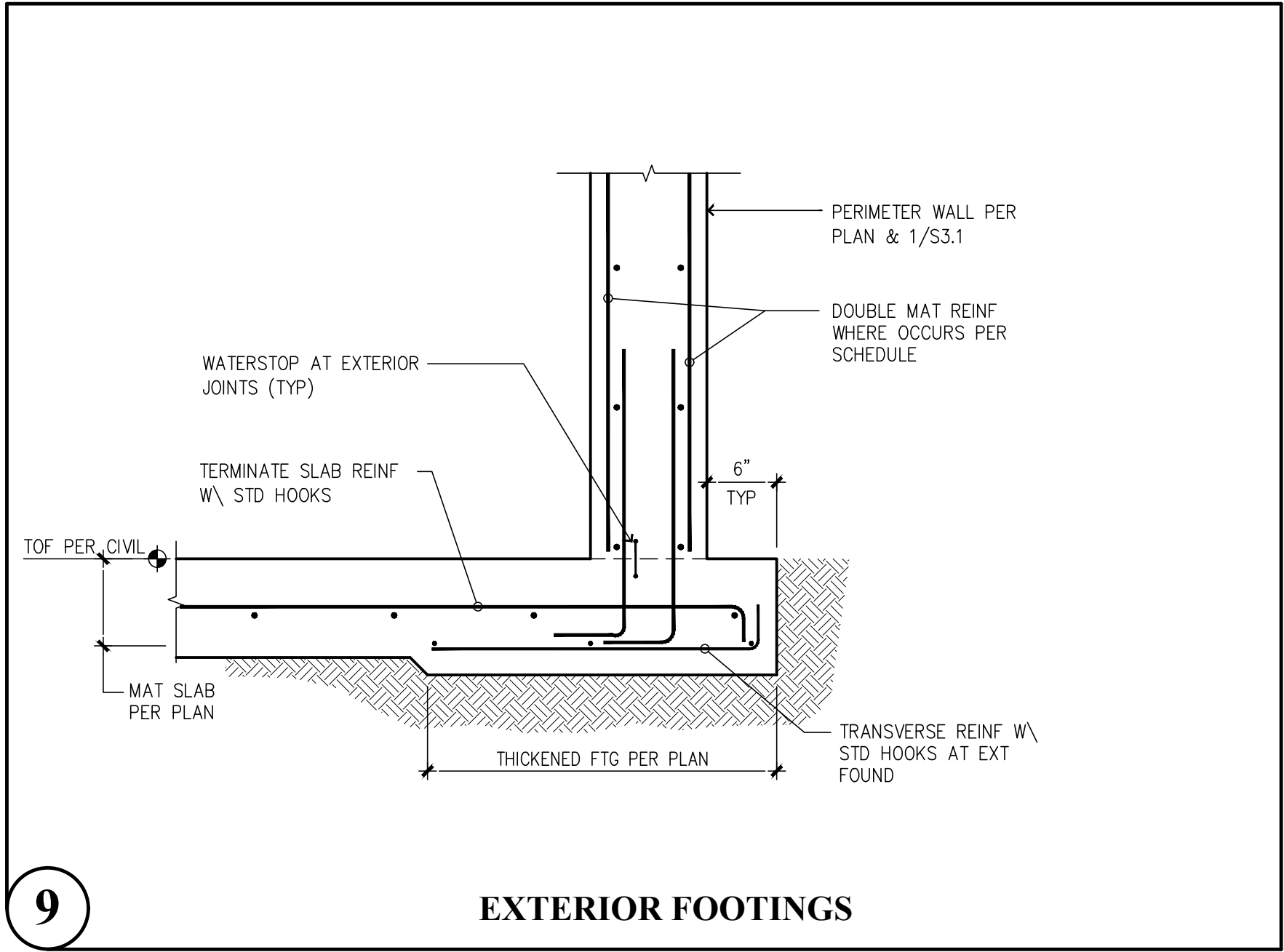
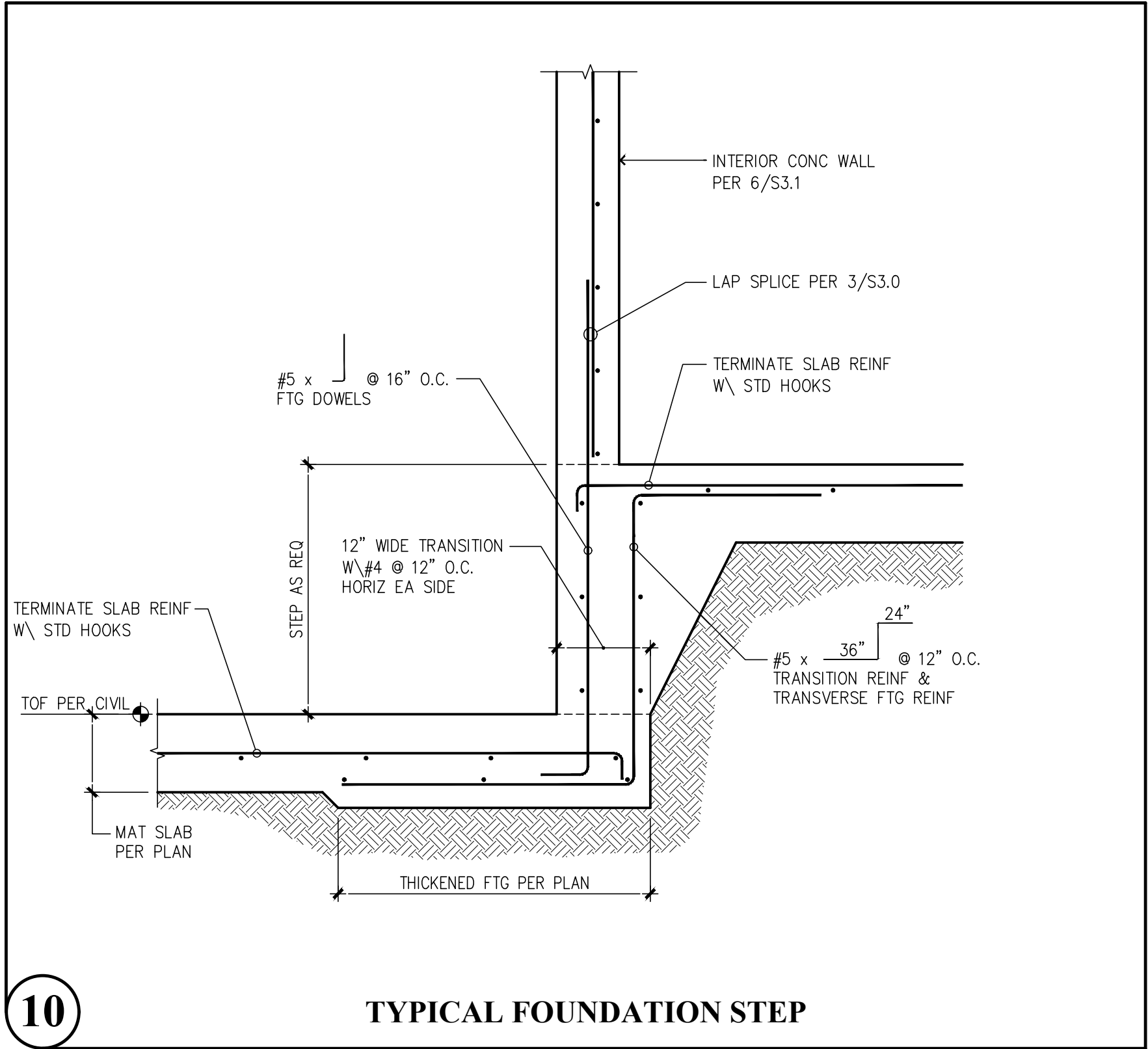
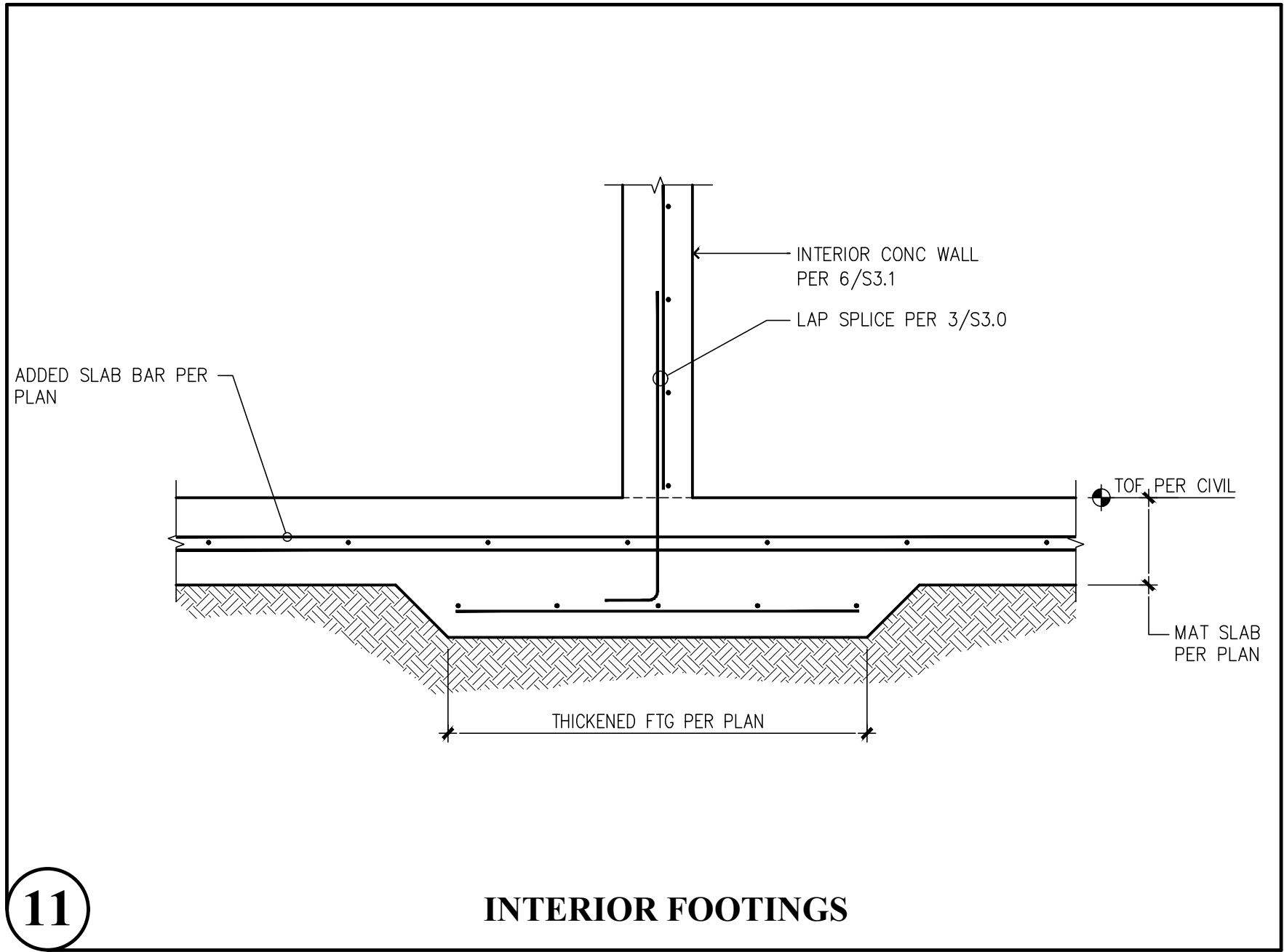


THOMAS L. CHASE, PE  
MARTIN R. OMAN, PE, SE  
OLEG G. KONDRATYUK, PE

**S3.0**

PLOT DATE/TIME: 10/30/2024 - 2:34pm THANK YOU FOR USING SOLUTIONS 4 STRUCTURES

CAD FILE: F:\Projects\2023 Projects\03.007 Bradley Heights\Drawings\Detention Vault\S3.1.dwg



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S3.1



