

Vault Design Loading

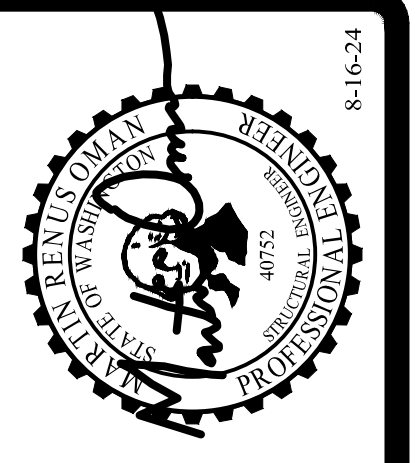
Revisions to this sheet:

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

PRRWF20250237

Solutions 4 Structures
 A Structural Engineering Corporation

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



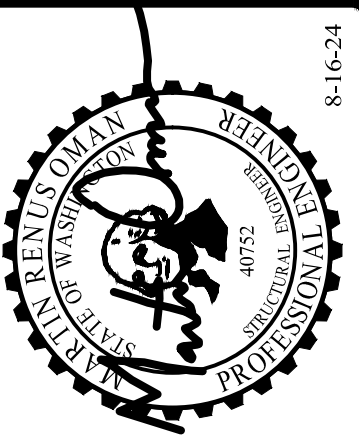
THOMAS L. CHASE, PE
 MARTIN R. OMAN, PE, SE
 OLEG G. KONDRATYUK, PE

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.

S1.1

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



8-16-24
THOMAS L. CHASE, PE
MARTIN R. OMAN, PE, SE
OLEG G. KONDRATYUK, PE

Revisions to this sheet:

Bradley Heights Apartments
Detention Vaults 2, 3, & 4
202 27th Ave SE
Puyallup, Washington
PRRWF20250237
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.

S2.2

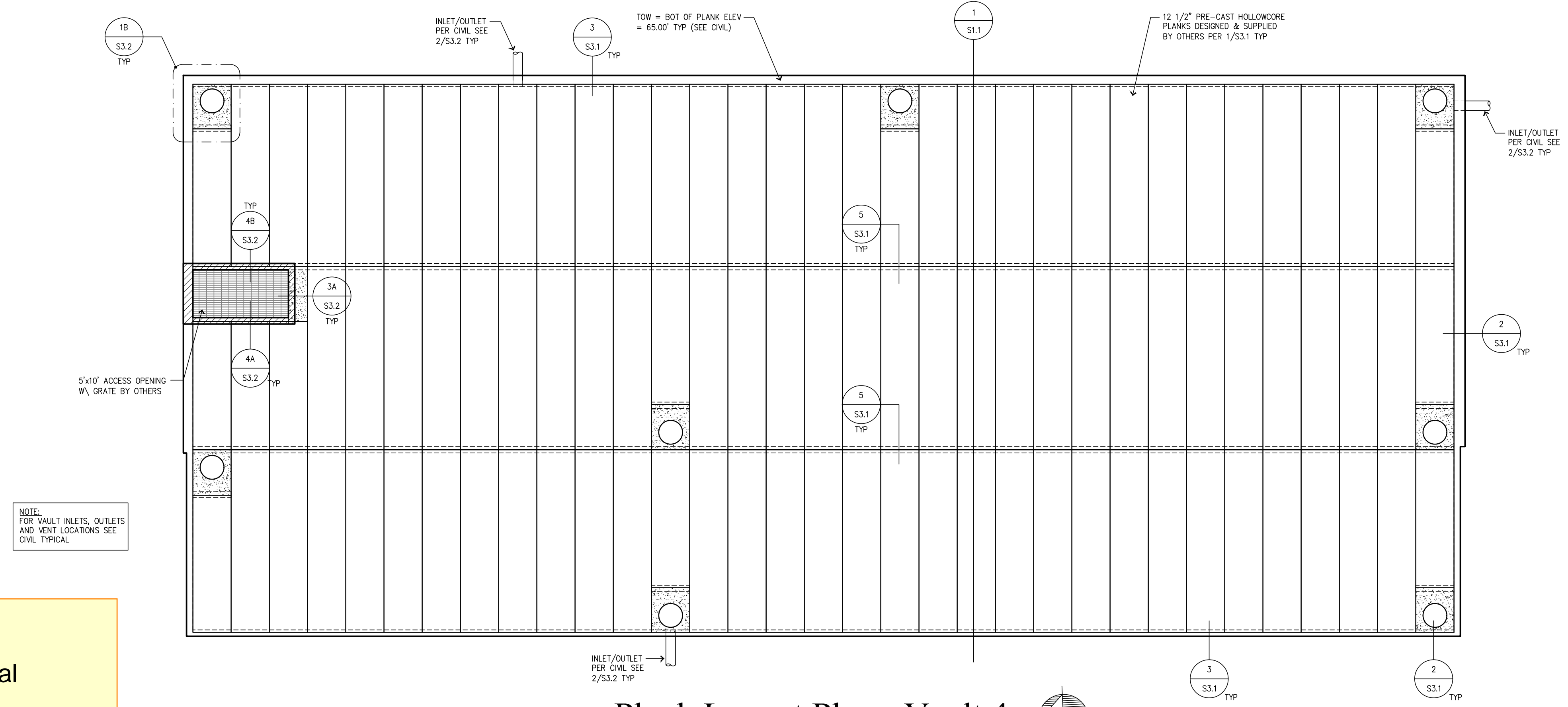
- ### Plank Framing Notes - Vault 4
- TOW = TOP OF WALL ELEVATION (ALSO BOTTOM OF PLANKS) = 398.50'
 - TOF = VARIES SEE CIVIL
 - TOP OF VAULT FRAMING TYPICALLY CONSISTS OF SIMPLE SPAN 12-1/2" PRECAST PRE-STRESSED HOLLOW CORE PLANKS TO BE DESIGNED BY OTHERS TO CARRY ALL DESIGN LOADS AS SHOWN ON SHEET S1.1
 - 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.
 - REFER TO SHEET S3.1 FOR TYPICAL PLANK CONNECTION DETAILS
 - CONTRACTOR SHALL VERIFY AND COORDINATE ALL OPENINGS THROUGH THE PLANK FRAMING ASSEMBLY. SEE SHEET S3.2 FOR RELATED DETAILS.
 - 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.
 - SEE THE GENERAL STRUCTURAL NOTES ON SHEET S1.0 FOR ADDITIONAL INFORMATION.

CONTRACTOR NOTE

Engineer shall review and approve plank shop drawings prior to install. Engineer will provide a letter of approval of shop drawing prior to install. Engineer's letter will be present at time of inspection.

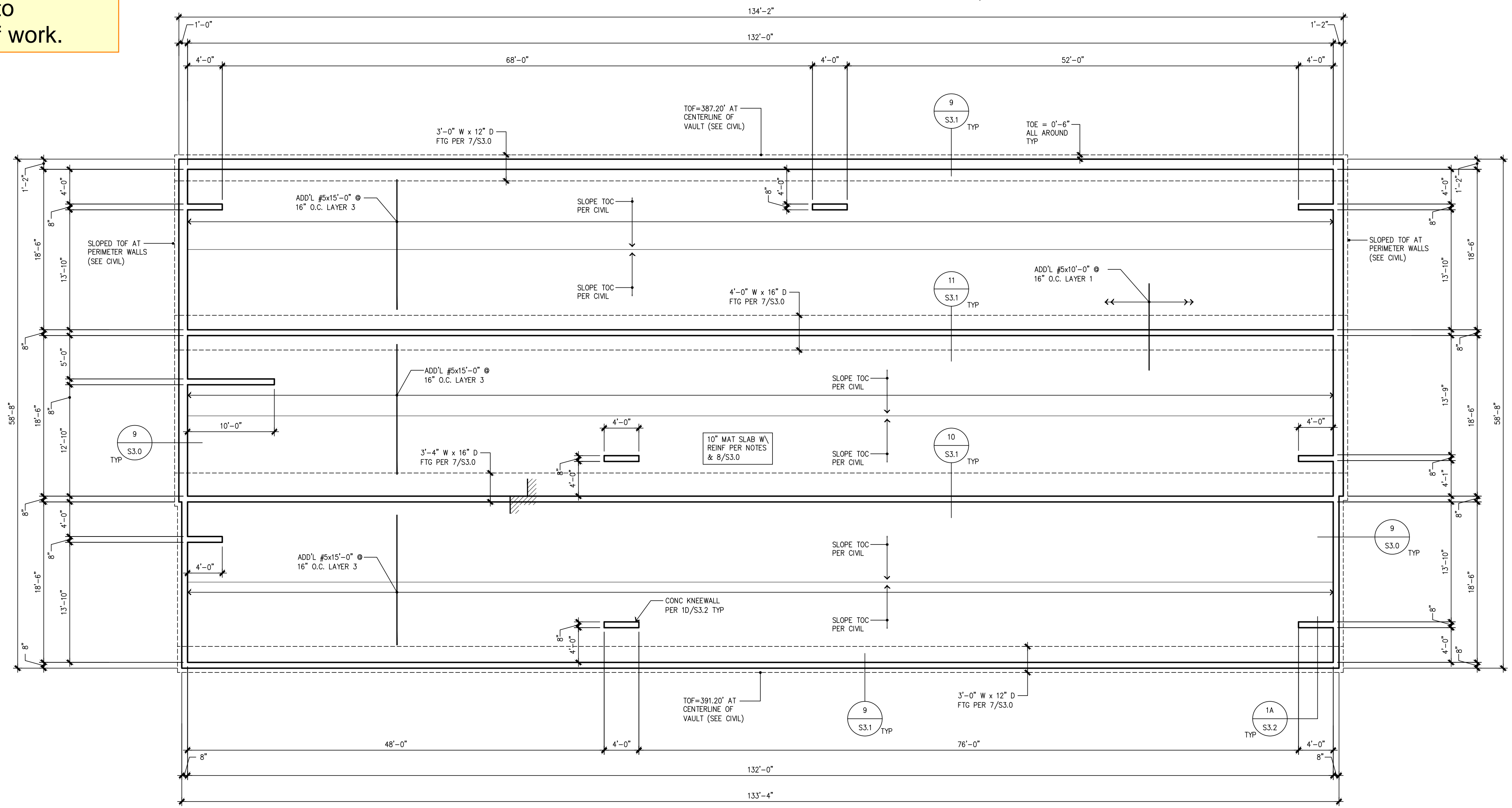
NOTE:

Review Geotechnical Engineering Report regarding Temporary Excavations prior to commencement of work.



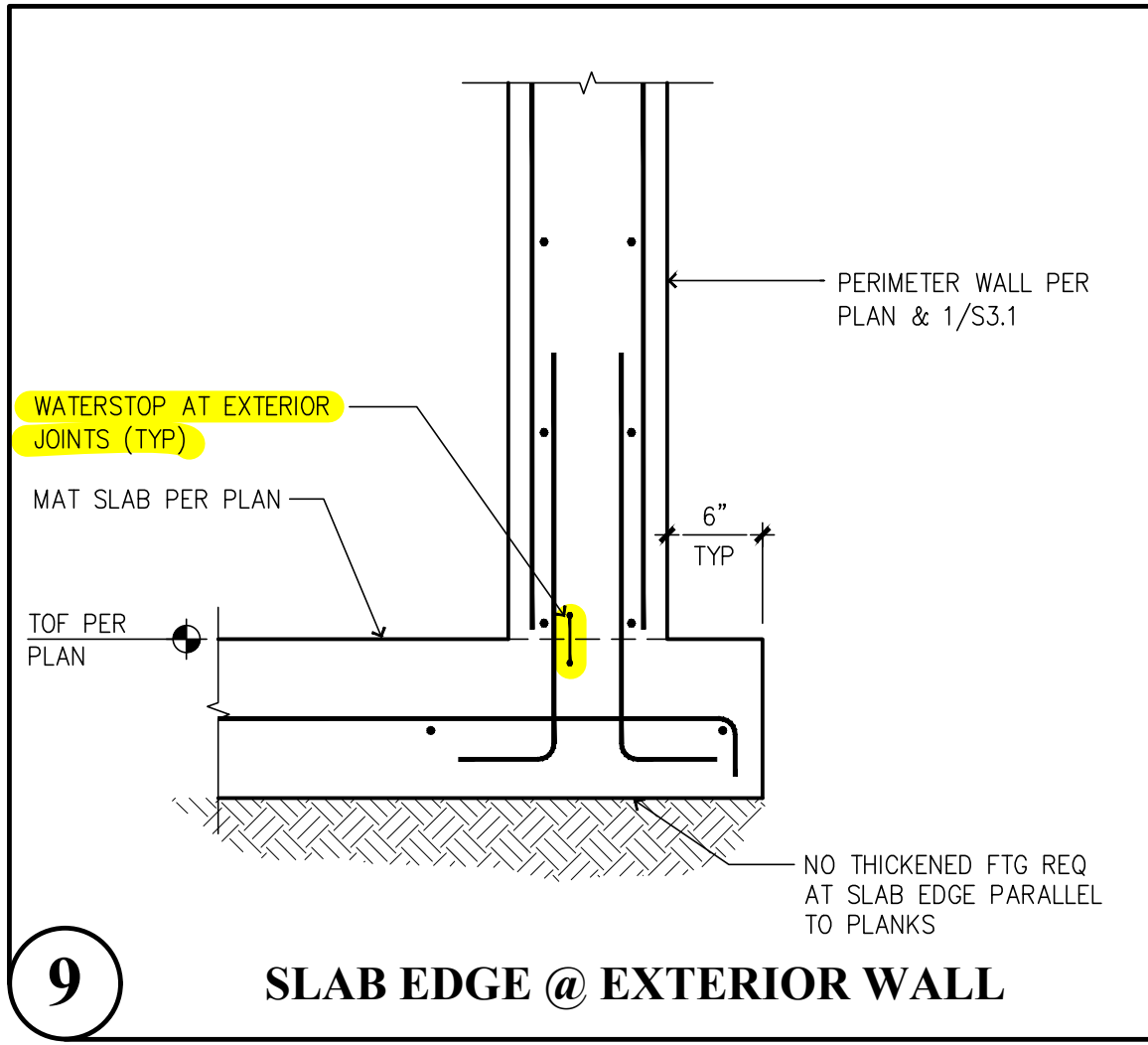
Plank Layout Plan - Vault 4
SCALE 1/8"=1'-0"

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

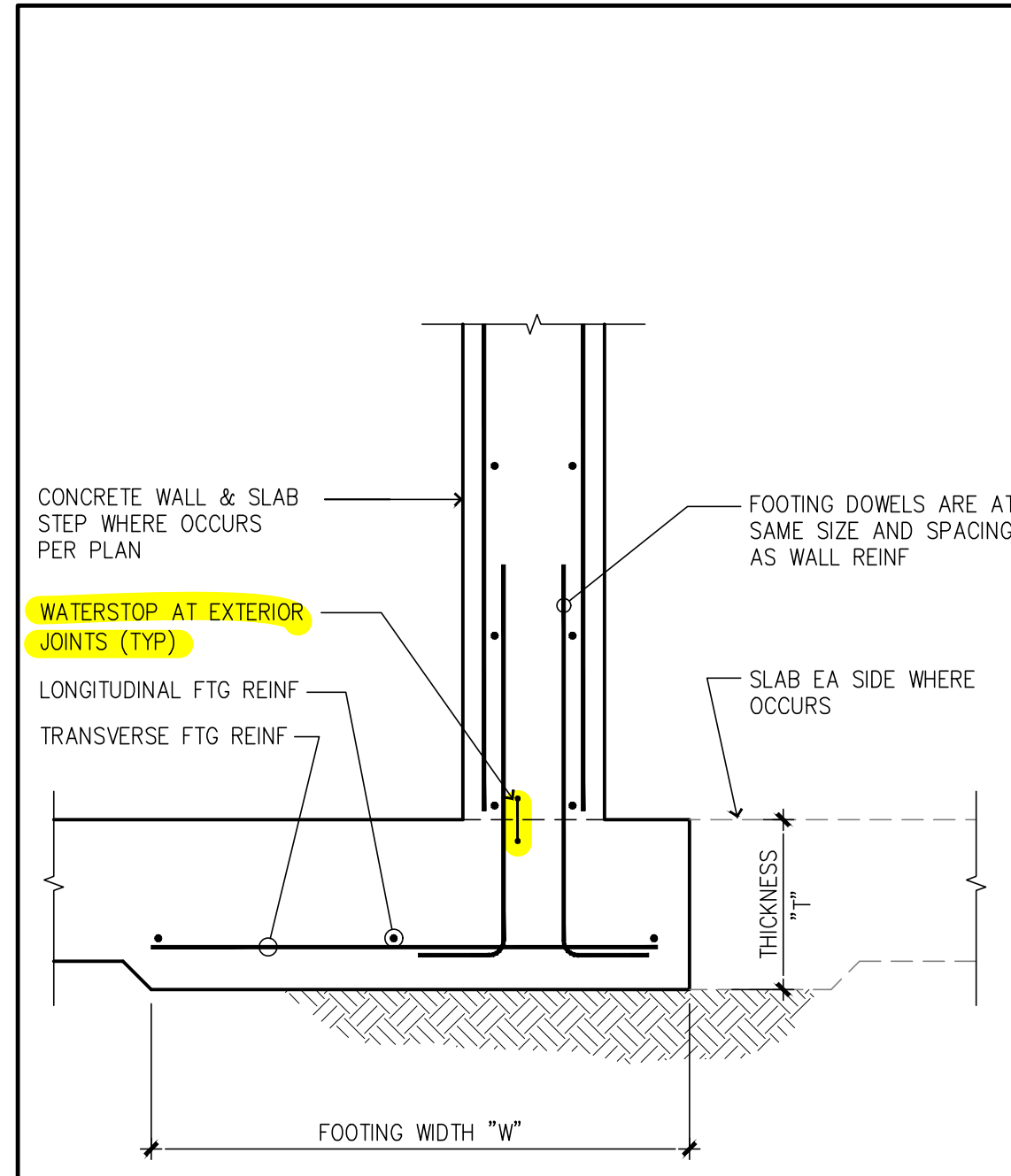


Foundation Plan - Vault 4
SCALE 1/8"=1'-0"

CAD FILE: F:\Projects\2023 Projects\Drawings\Detention_Vault\S3.0.dwg PLOT DATE/TIME: 10/30/2024 - 3:55pm THANK YOU FOR USING SOLUTIONS 4 STRUCTURES



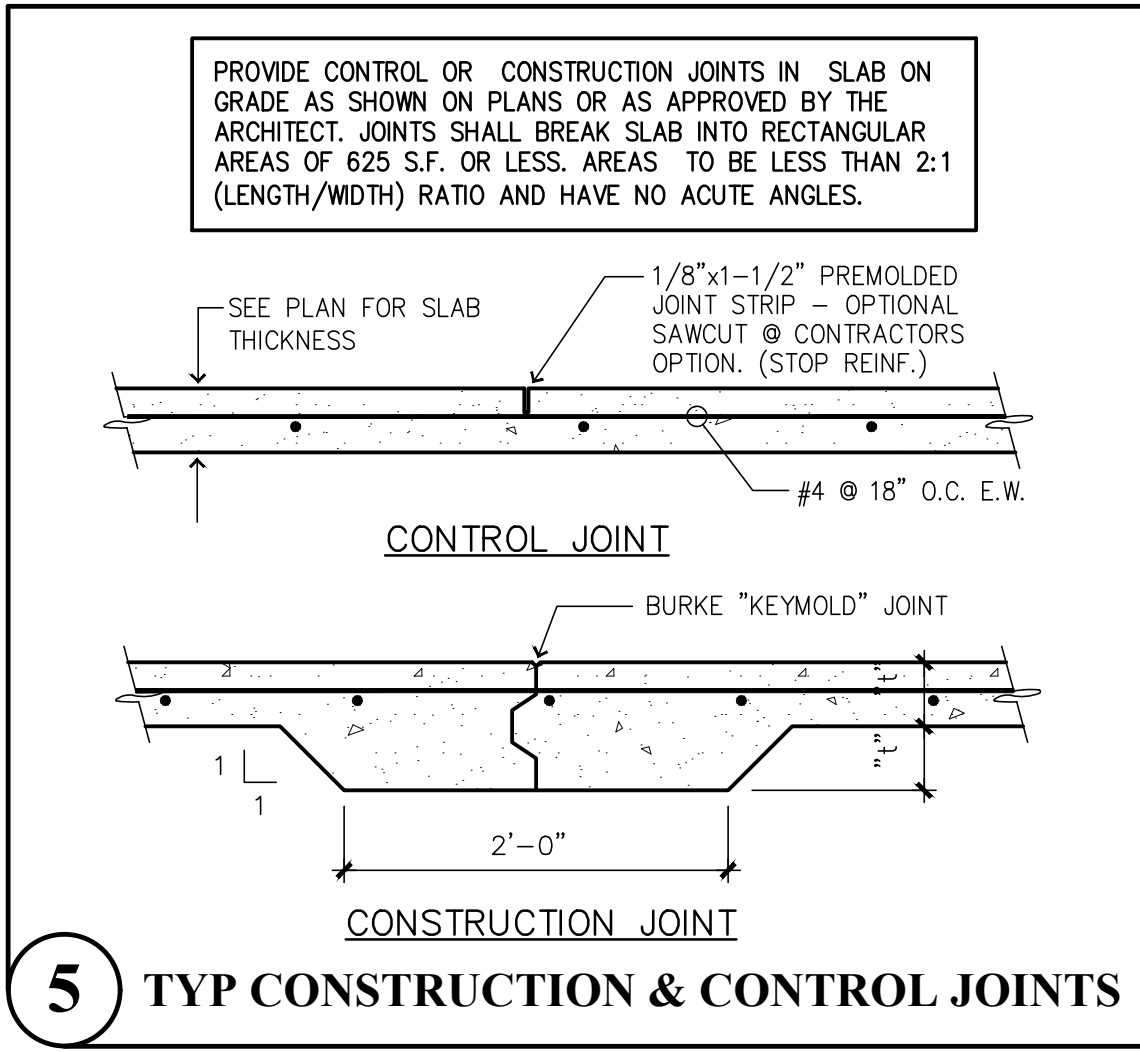
9 SLAB EDGE @ EXTERIOR WALL



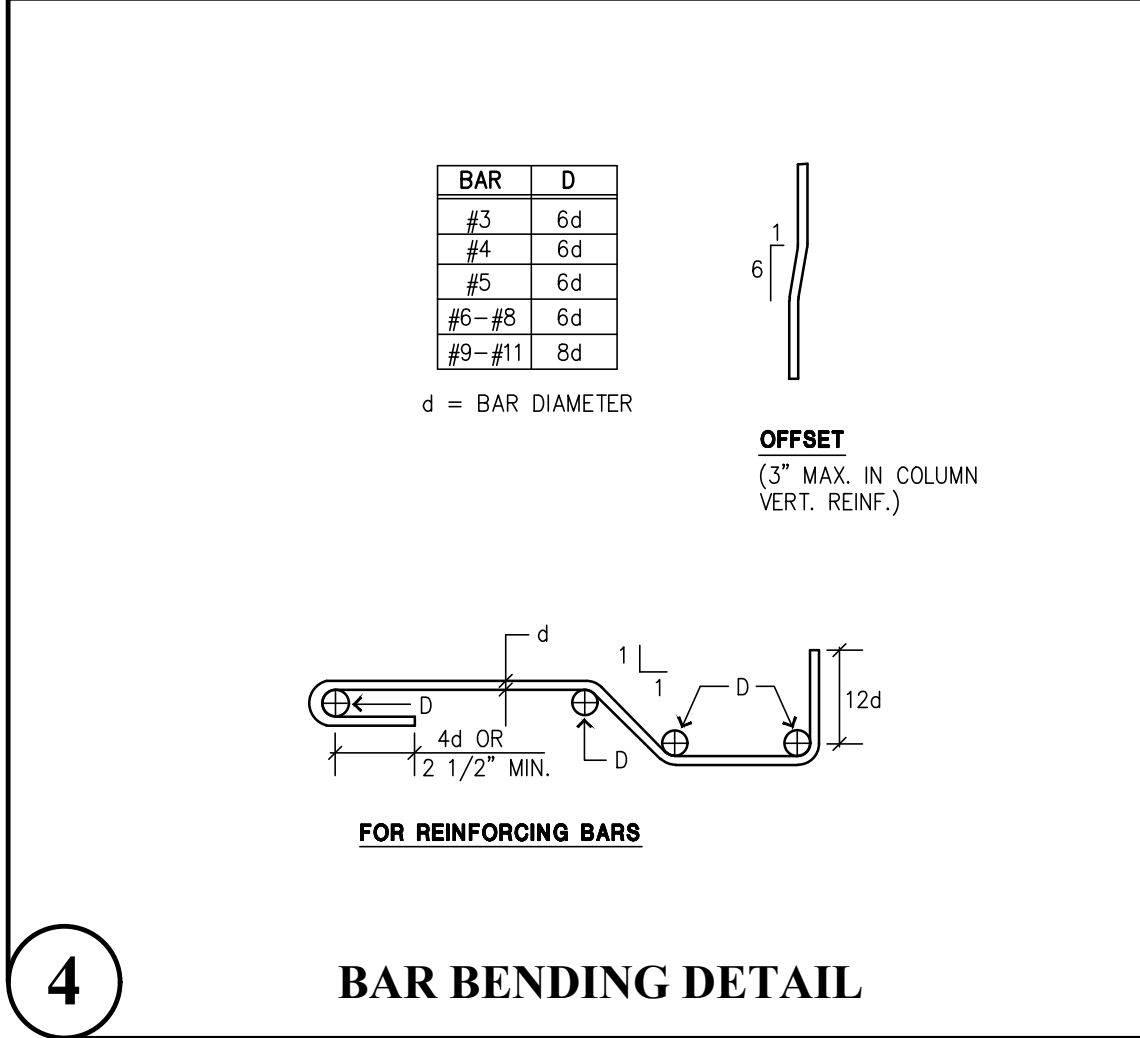
Wall Footing Schedule				
"W"	"T"	REINFORCEMENT		DETAIL
		LONGITUDINAL	TRANSVERSE	
3'-0"	12"	(3)-#5 BOT	#4 @ 12" O.C. BOT	9/S3.1
3'-4"	16"	(4)-#5 BOT	#5 @ 12" O.C. BOT	10/S3.1
4'-0"	16"	(5)-#5 BOT	#5 @ 16" O.C. BOT	11/S3.1

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

7 FOOTING SCHEDULE



5 TYP CONSTRUCTION & CONTROL JOINTS



4 BAR BENDING DETAIL

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

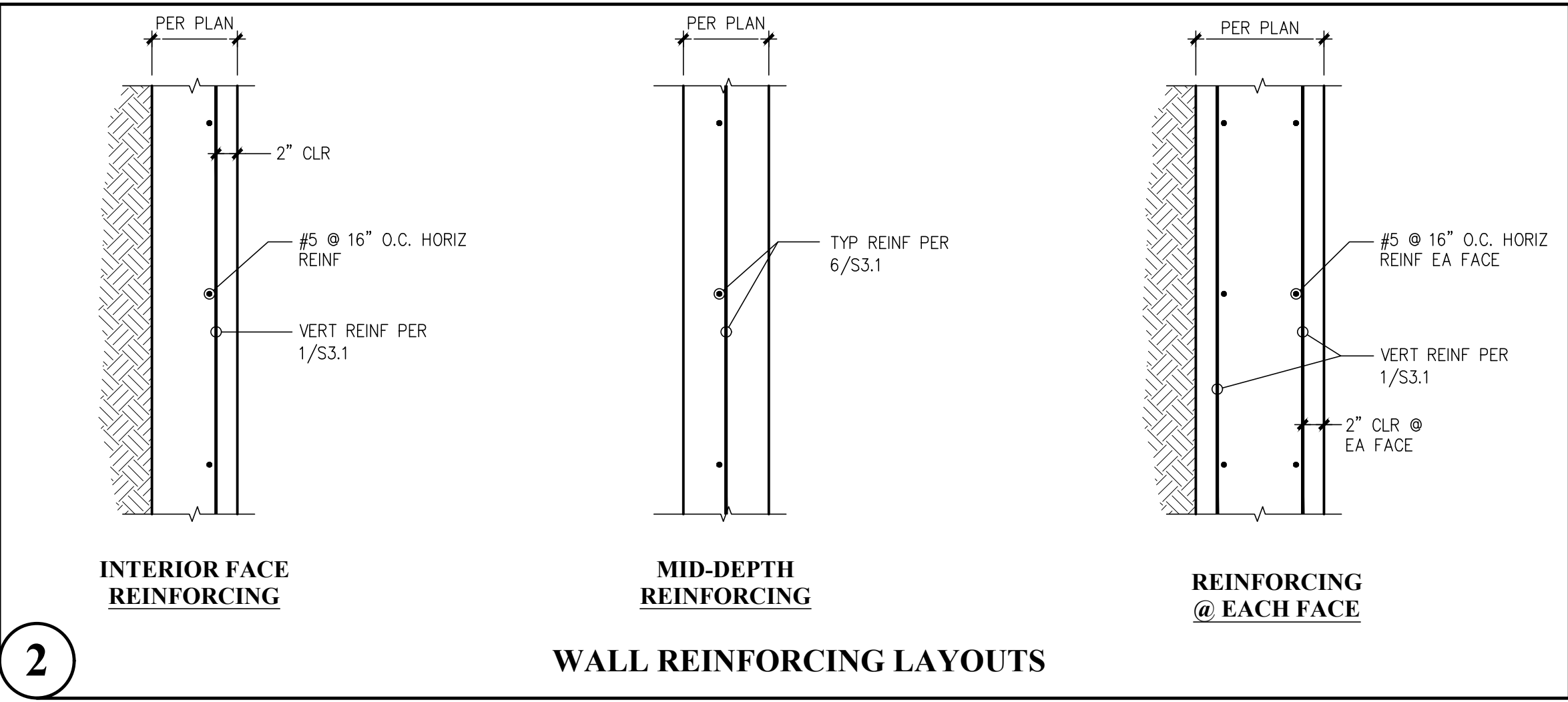
3000 psi conc, Fy=60 ksi Rebar				
BAR SIZE	Ld (inches)	Lt (inches)	Lsb (inches)	Lsbt (inches)
#3	17	22	22	28
#4	22	29	29	38
#5	28	36	36	47
#6	33	43	43	56
#7	48	63	63	81
#8	55	72	72	93
#9	62	81	81	105
#10	70	91	91	118
#11	78	101	101	131
#14	94	121		COUPLER REQ.

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.

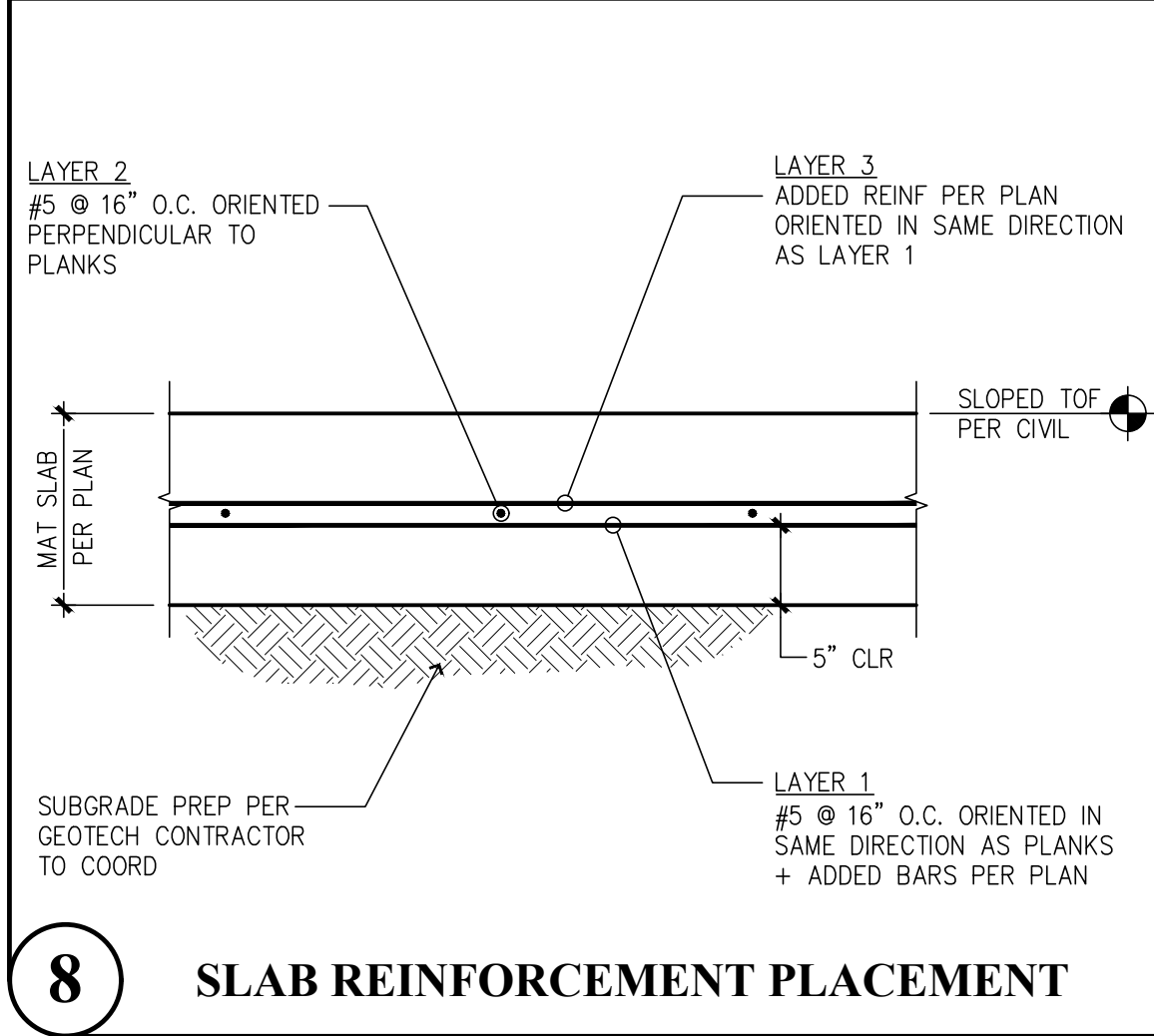
HORIZONTAL REINF. SHALL BE PROVIDED WITH Lsbt LAP SPLICES AT THE FOLLOWING LOCATIONS U.N.O:
 A) AT ALL CONCRETE WALLS
 B) BEAMS OR WALLS IN GENERAL WITH MORE THAN 12" OF FRESH CONCRETE CAST IN THE MEMBER BELOW THE HORIZONTAL REINF. BEING SPLICED.

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

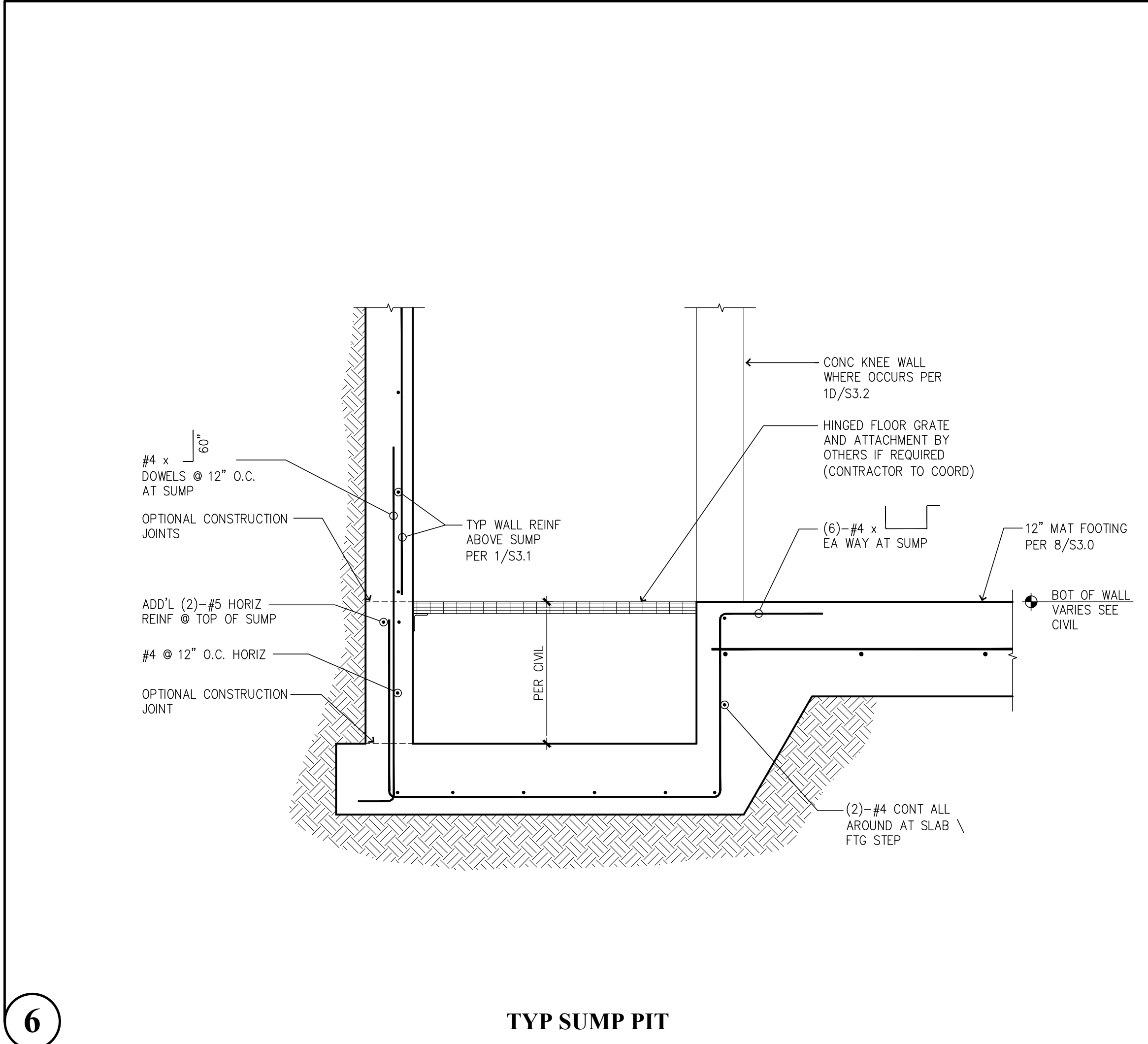
3 REINFORCING SPLICE & DEVELOPMENT LENGTH SCHEDULE



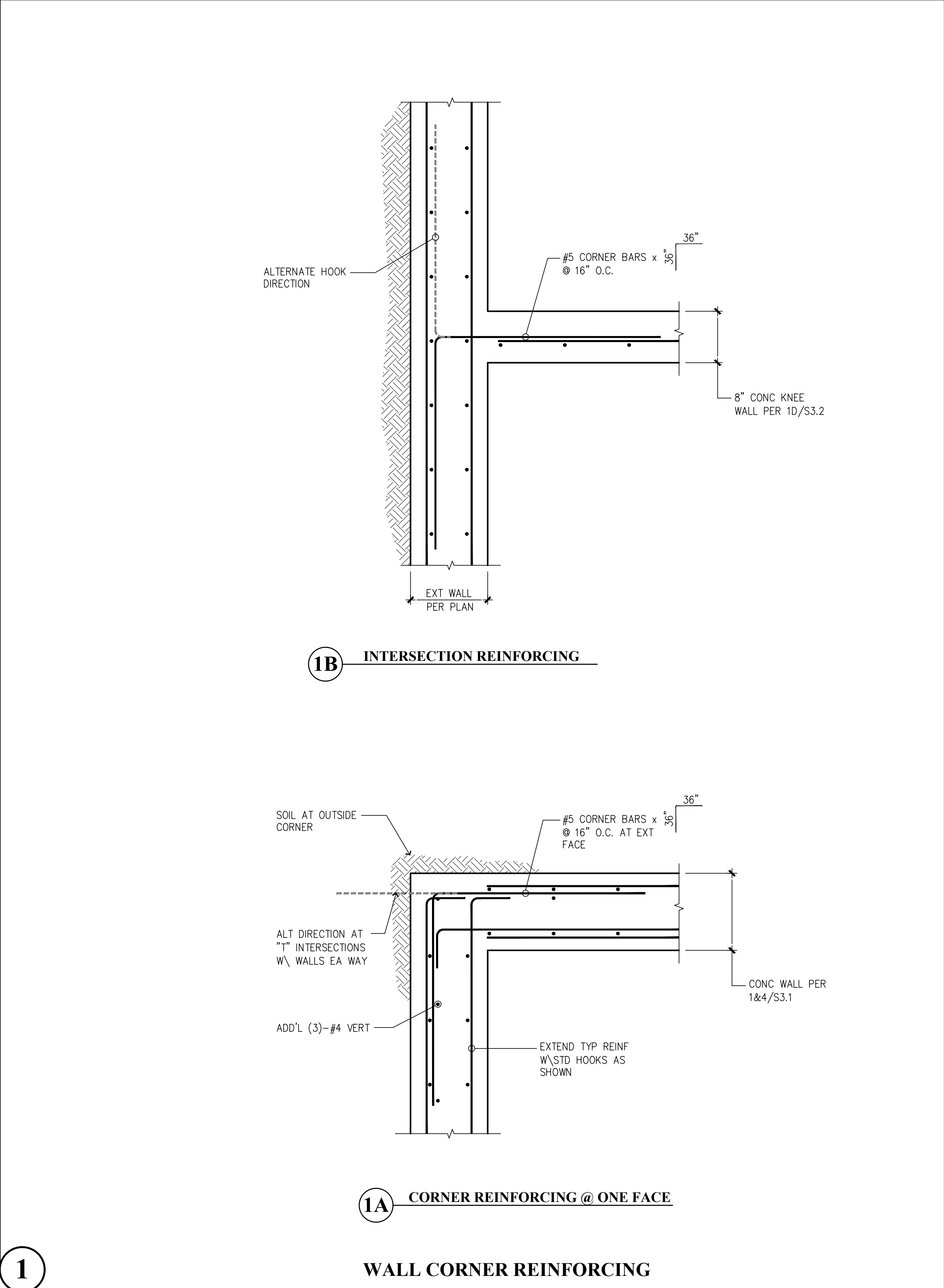
2 WALL REINFORCING LAYOUTS



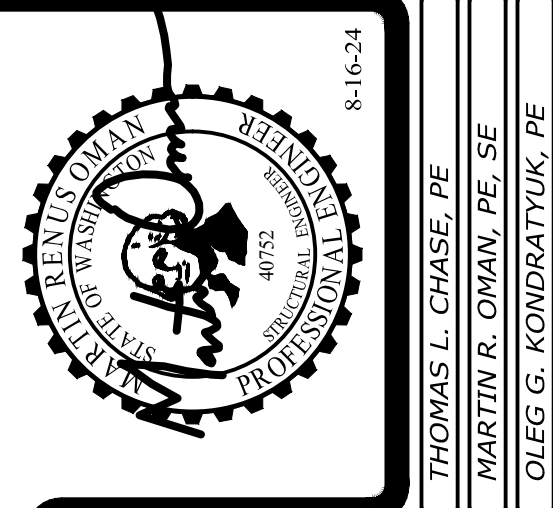
8 SLAB REINFORCEMENT PLACEMENT



6 TYP SUMP PIT



1 WALL CORNER REINFORCING



Revisions to this sheet:

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

PRRWF20250237

Solutions 4 Structures
 A Structural Engineering Corporation

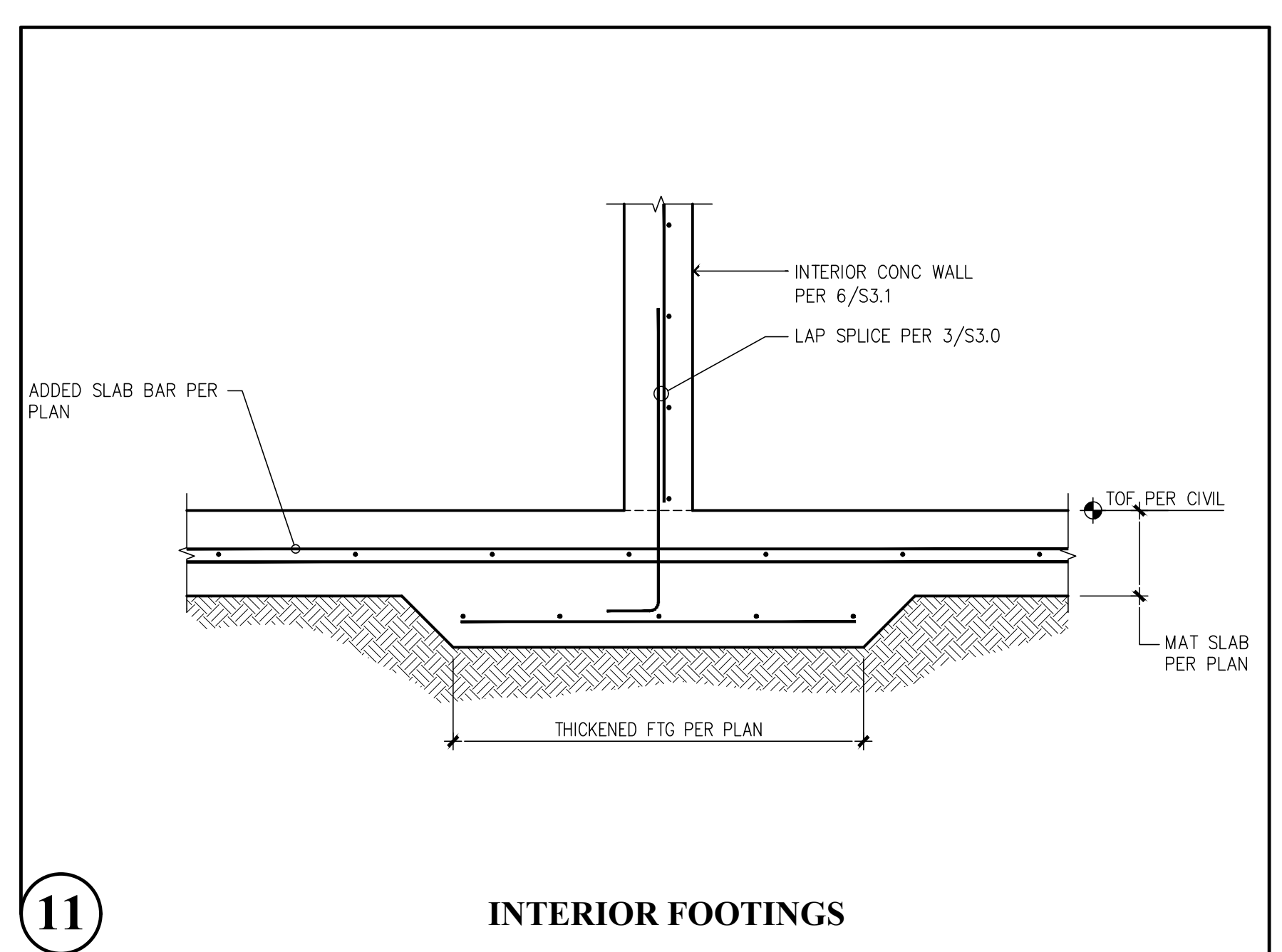
Puyallup, Washington 98374
 Ph 253-314-9822
 www.solutions4structures.com

PROJECT NO. : 23-007
 DESIGNED BY : MRO
 DRAWN BY : RSO
 ISSUE DATE : 8-16-24
 LATEST REV. OF DWG. SET :

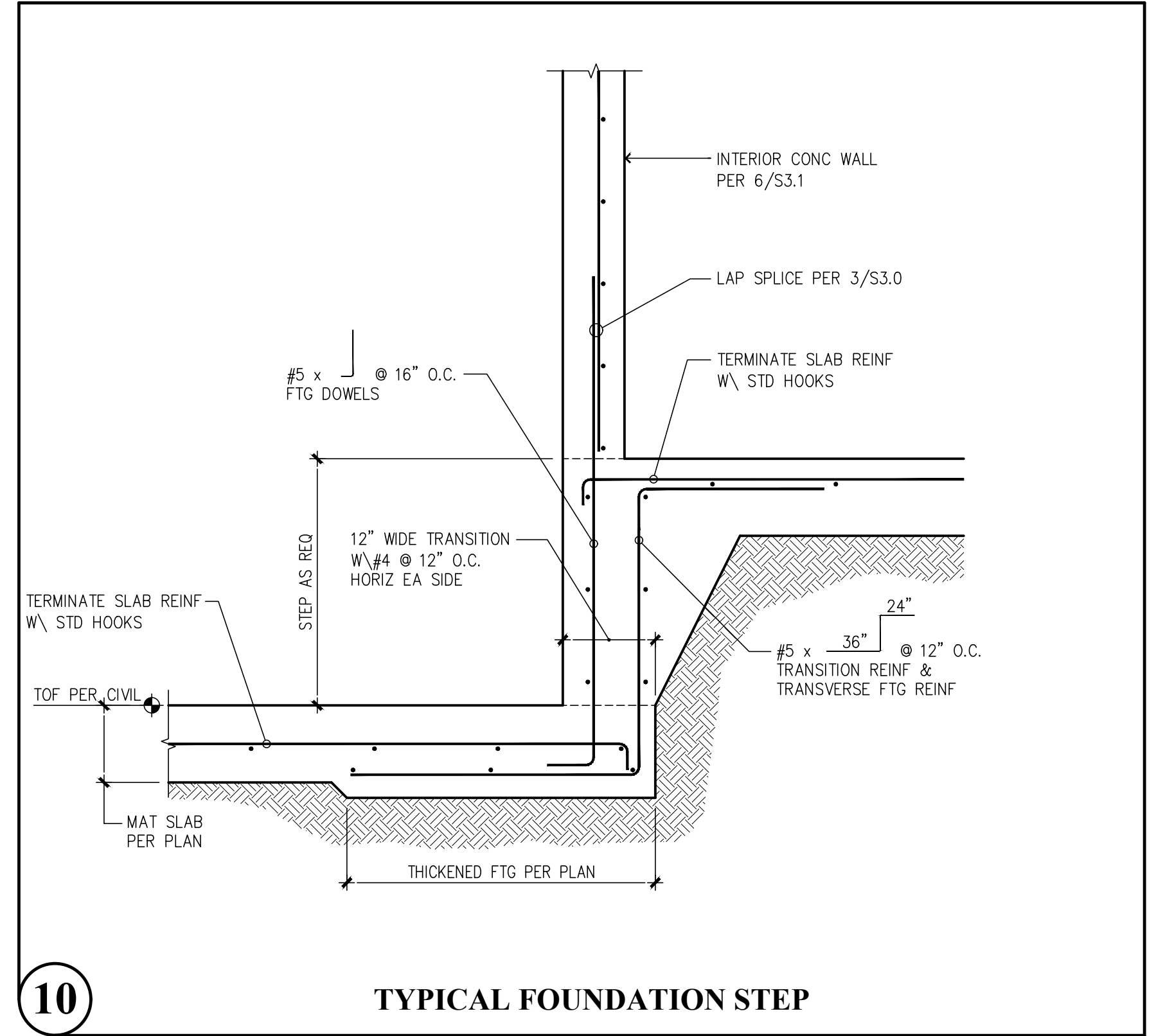
SUBMITTAL SET ONLY NOT FOR CONSTRUCTION
 THESE DRAWINGS ARE SUBJECT TO REVISIONS
 PENDING LOCAL JURISDICTIONAL REVIEW.

PLOT DATE/TIME: 10/30/2024 10:23:46pm THANK YOU FOR USING SOLUTIONS 4 STRUCTURES

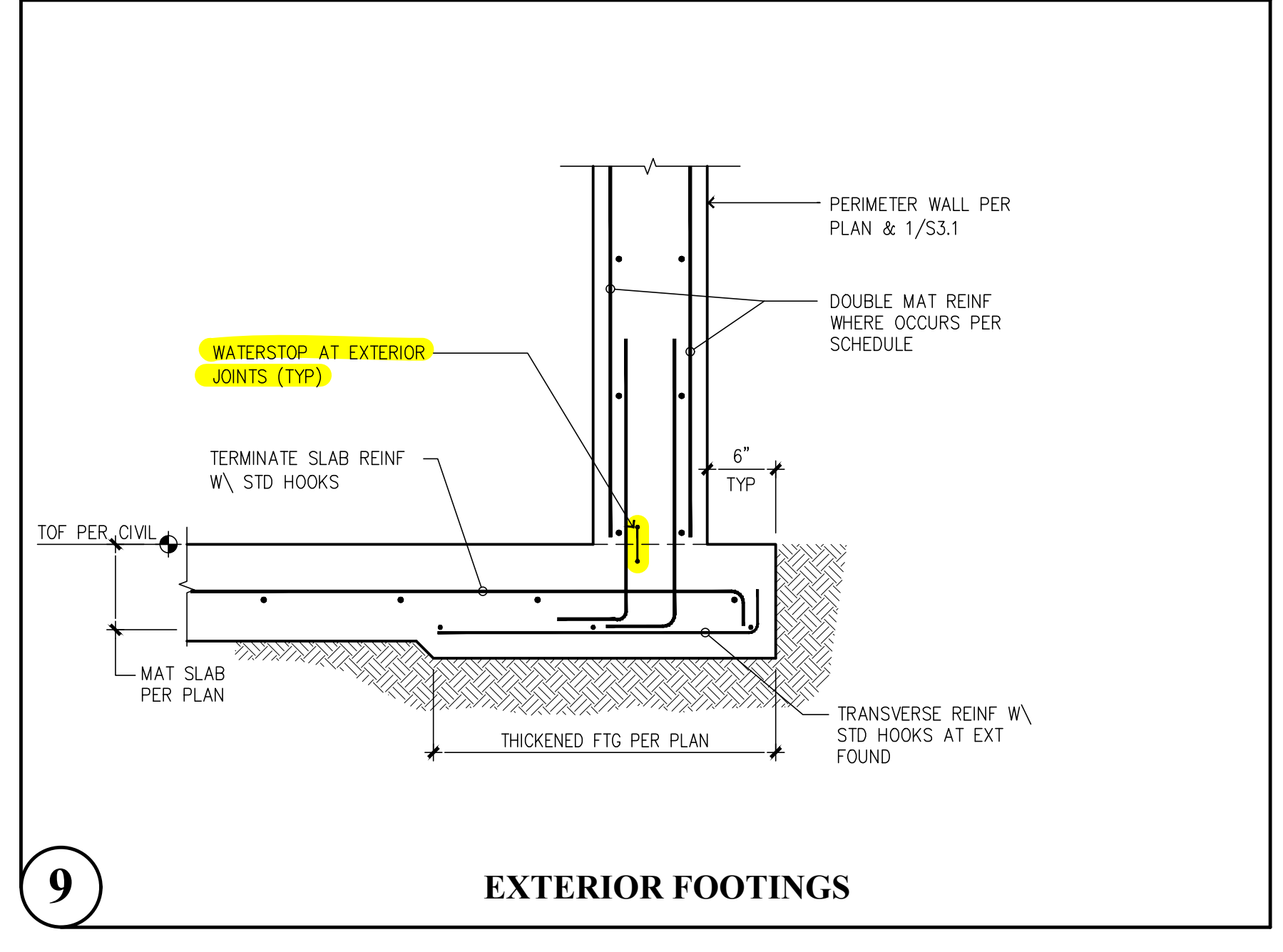
CAD FILE: F:\Projects\2023 Projects\23.007 Bradley Heights\Drawings\Detention_Vault\S3.1.dwg



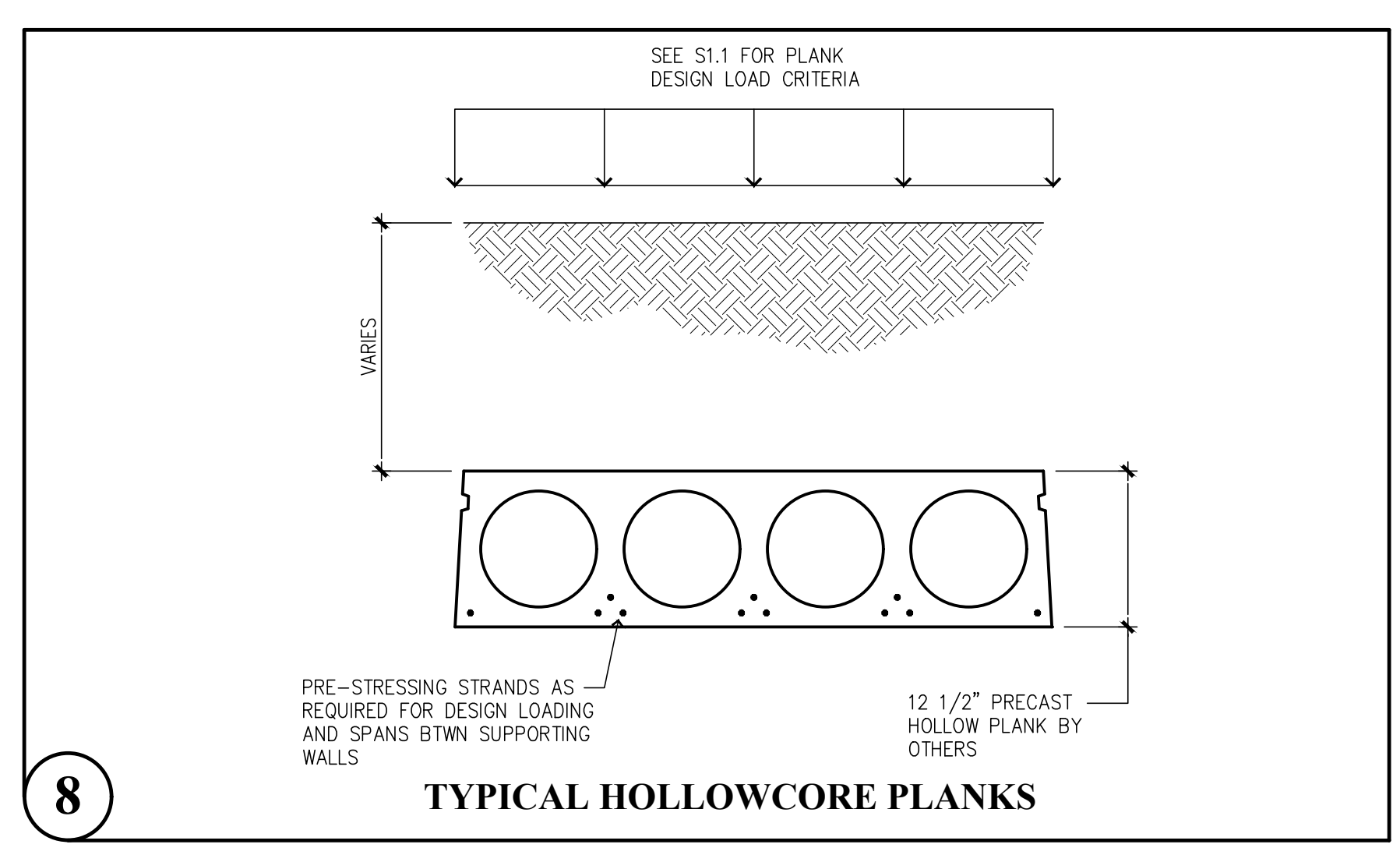
11 INTERIOR FOOTINGS



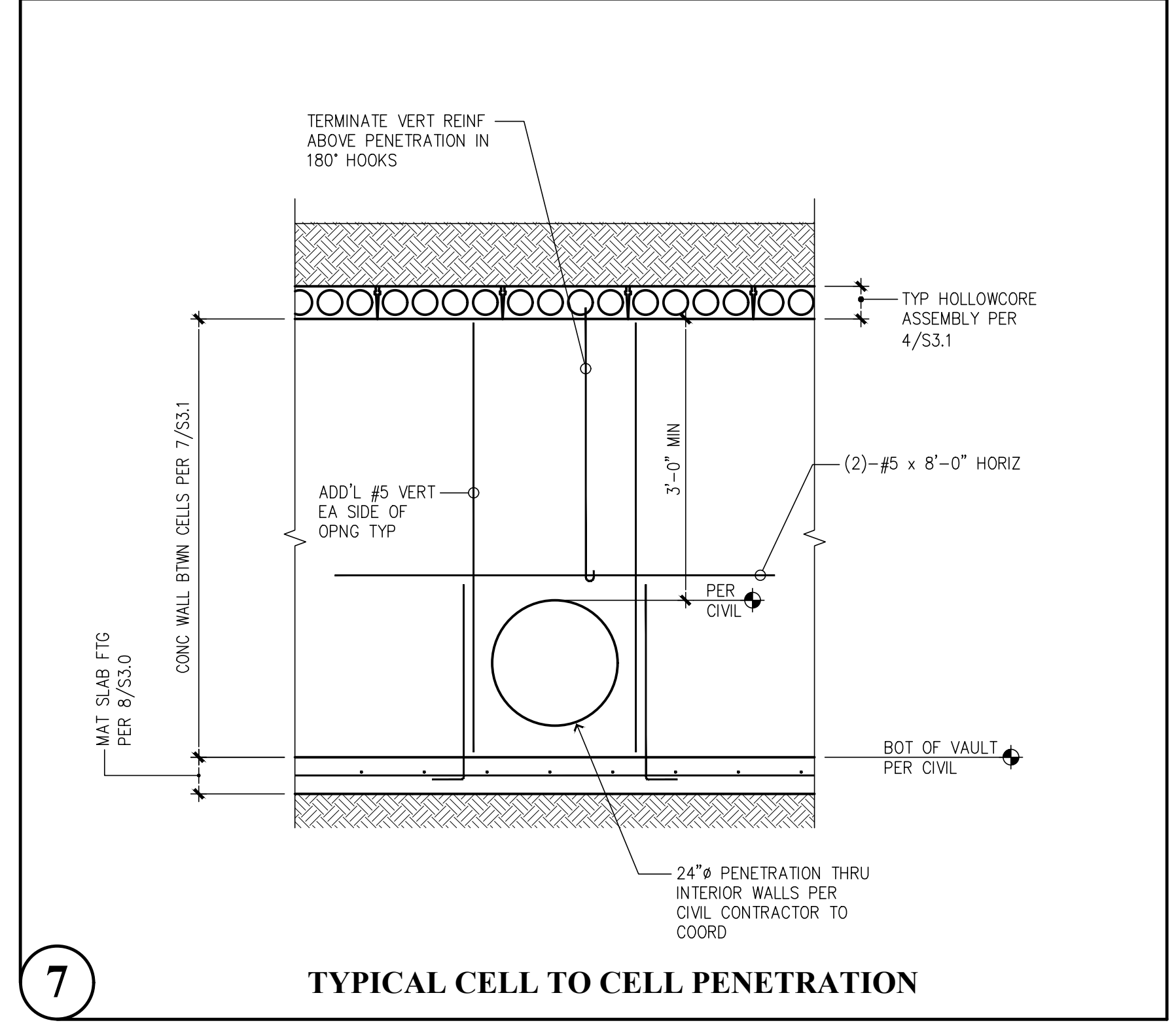
10 TYPICAL FOUNDATION STEP



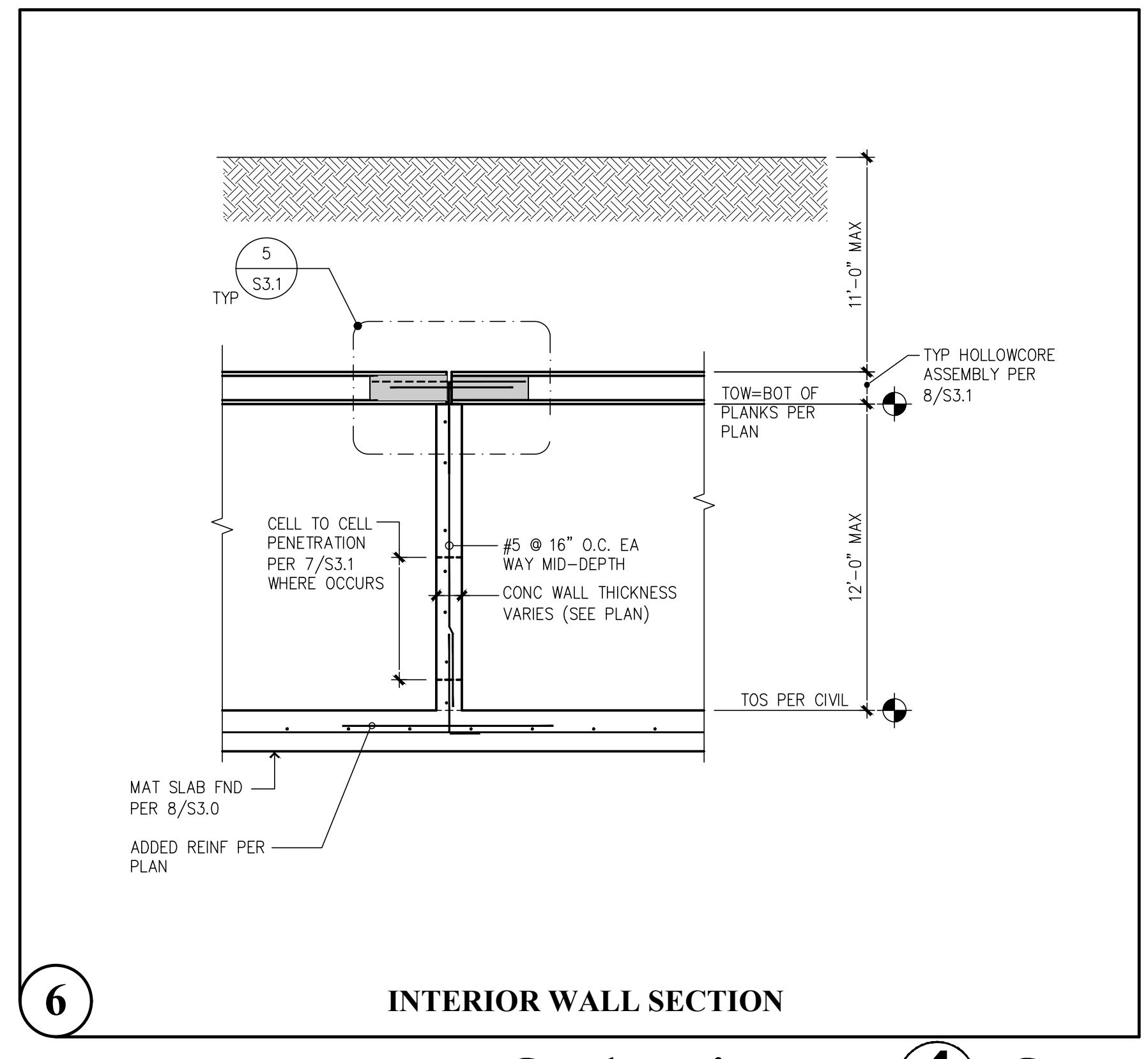
9 EXTERIOR FOOTINGS



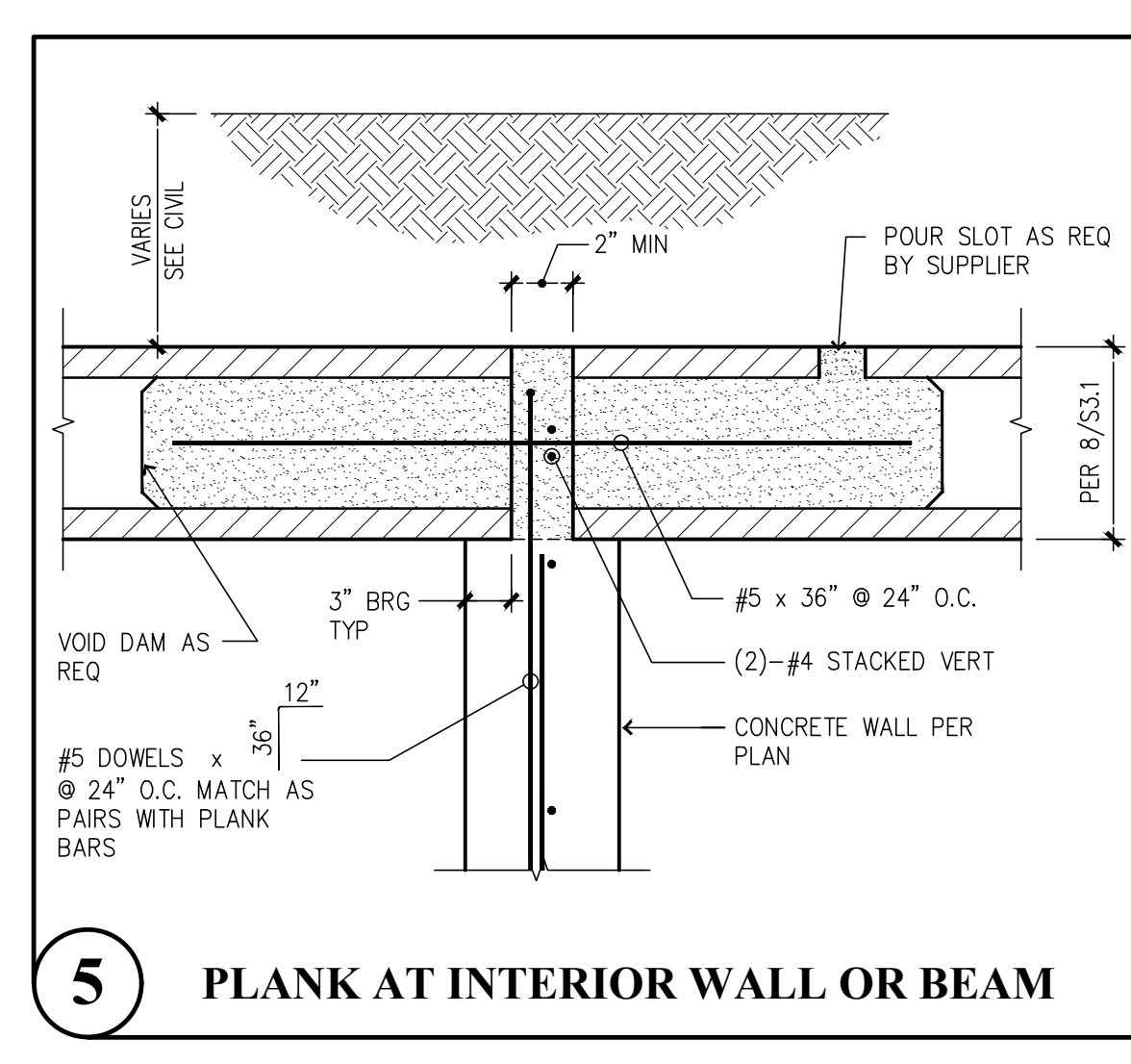
8 TYPICAL HOLLOWCORE PLANKS



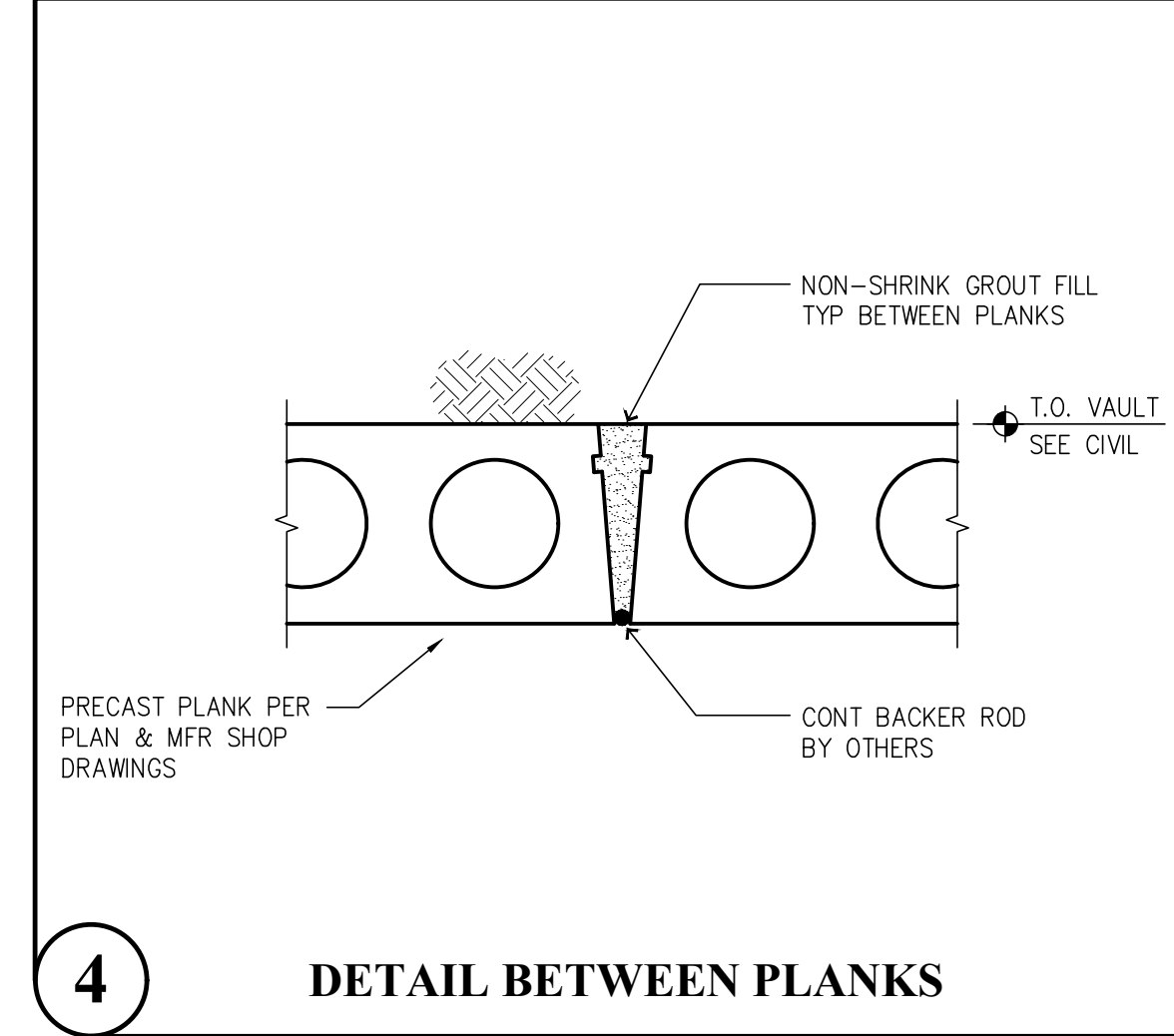
7 TYPICAL CELL TO CELL PENETRATION



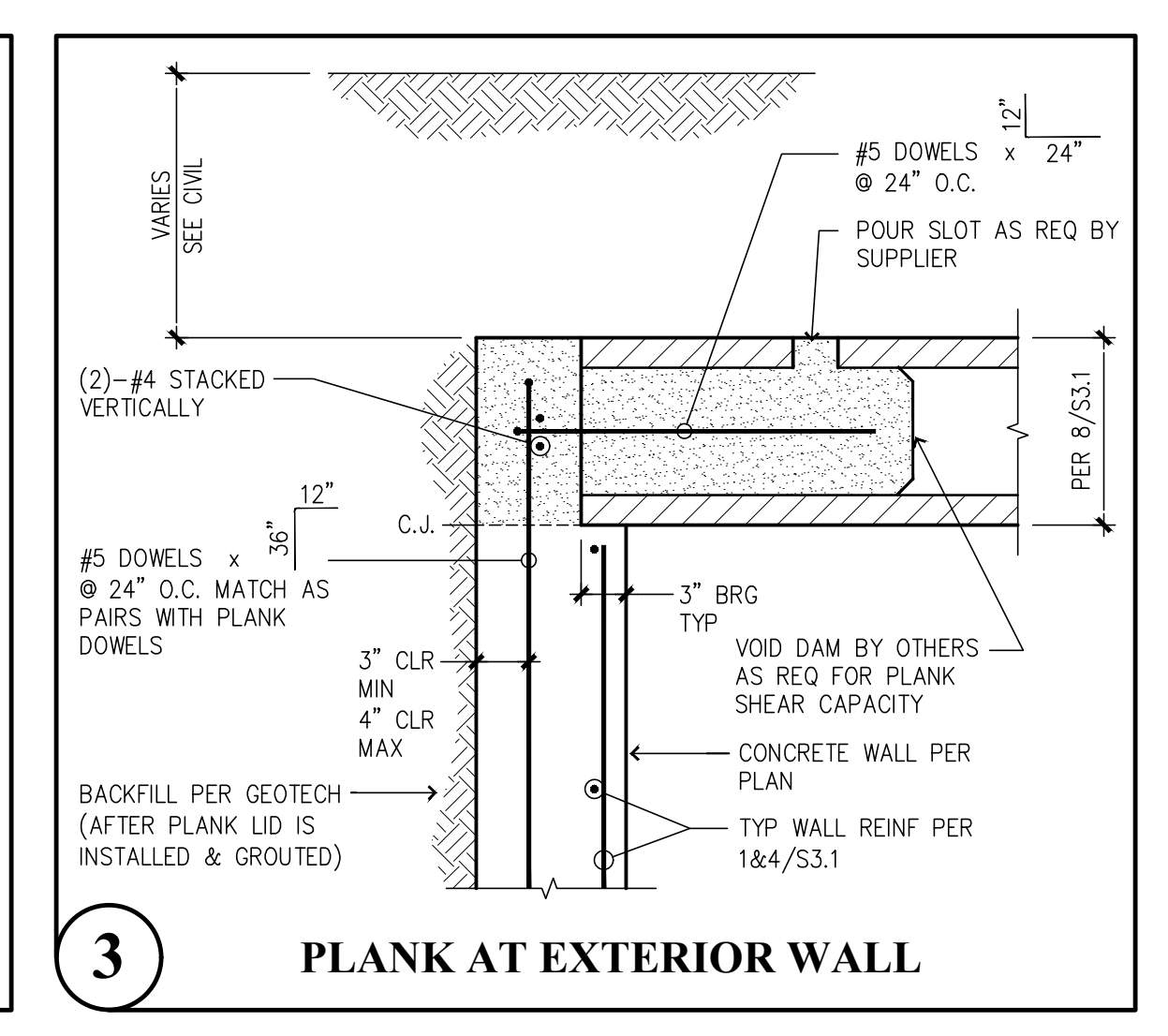
6 INTERIOR WALL SECTION



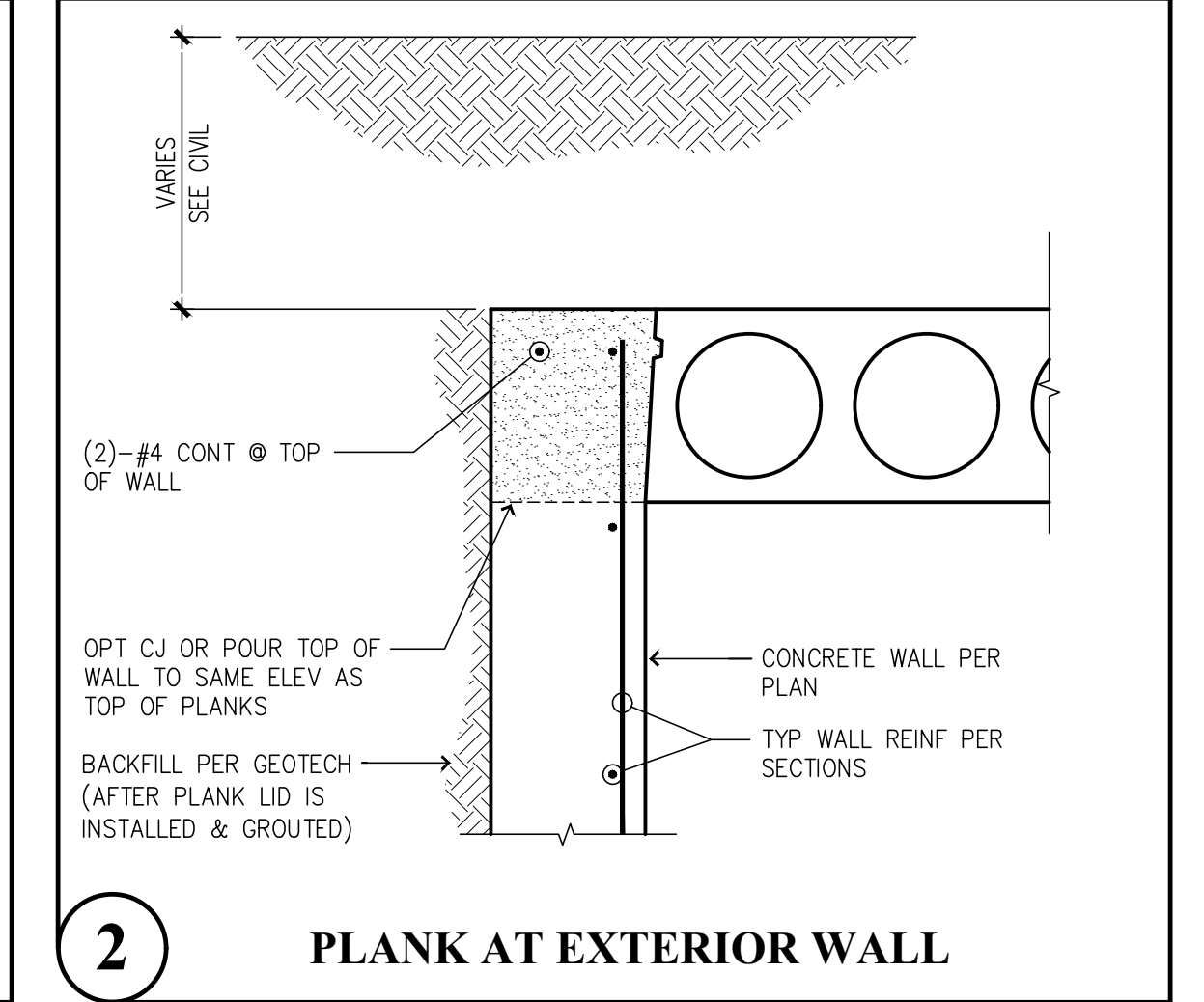
5 PLANK AT INTERIOR WALL OR BEAM



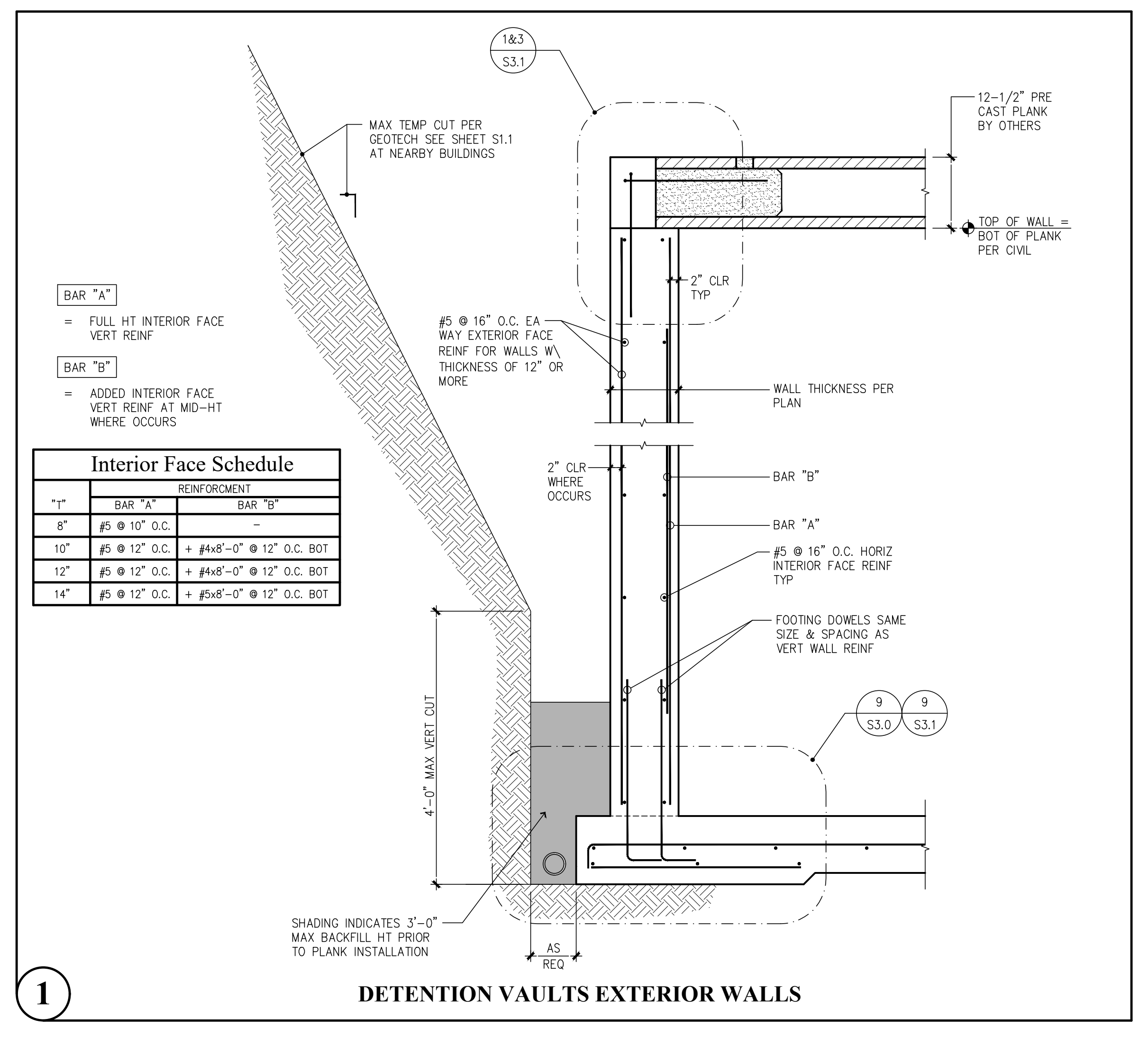
4 DETAIL BETWEEN PLANKS



3 PLANK AT EXTERIOR WALL



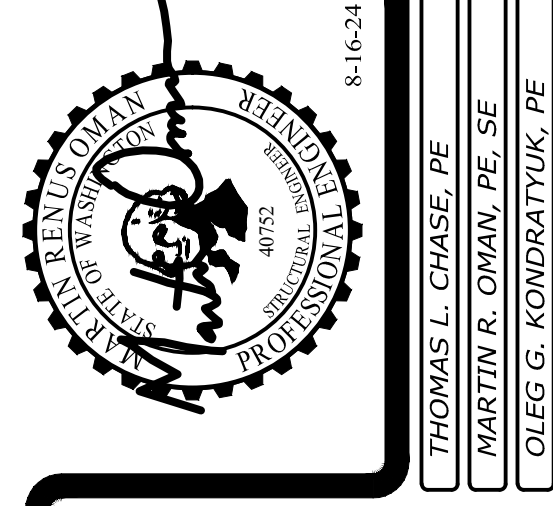
2 PLANK AT EXTERIOR WALL



1 DETENTION VAULTS EXTERIOR WALLS

- BAR "A" = FULL HT INTERIOR FACE VERT REIN
- BAR "B" = ADDED INTERIOR FACE VERT REIN AT MID-HT WHERE OCCURS

TYP	REINFORCEMENT	
	BAR "A"	BAR "B"
8"	#5 @ 10" O.C.	-
10"	#5 @ 12" O.C.	+ #4x8'-0" @ 12" O.C. BOT
12"	#5 @ 12" O.C.	+ #4x8'-0" @ 12" O.C. BOT
14"	#5 @ 12" O.C.	+ #5x8'-0" @ 12" O.C. BOT



Revisions to this sheet:

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

PRRWF20250237

Solutions 4 Structures
 A Structural Engineering Corporation

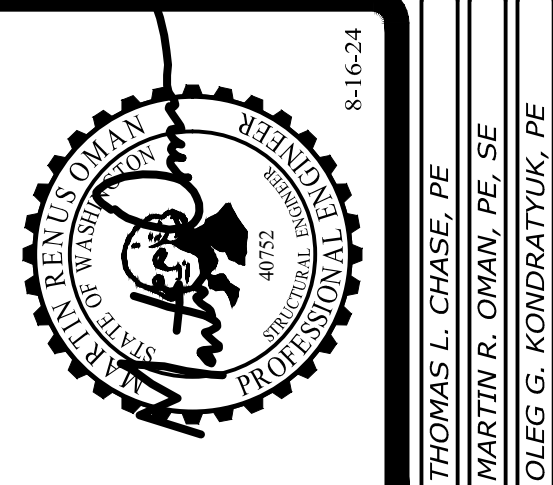
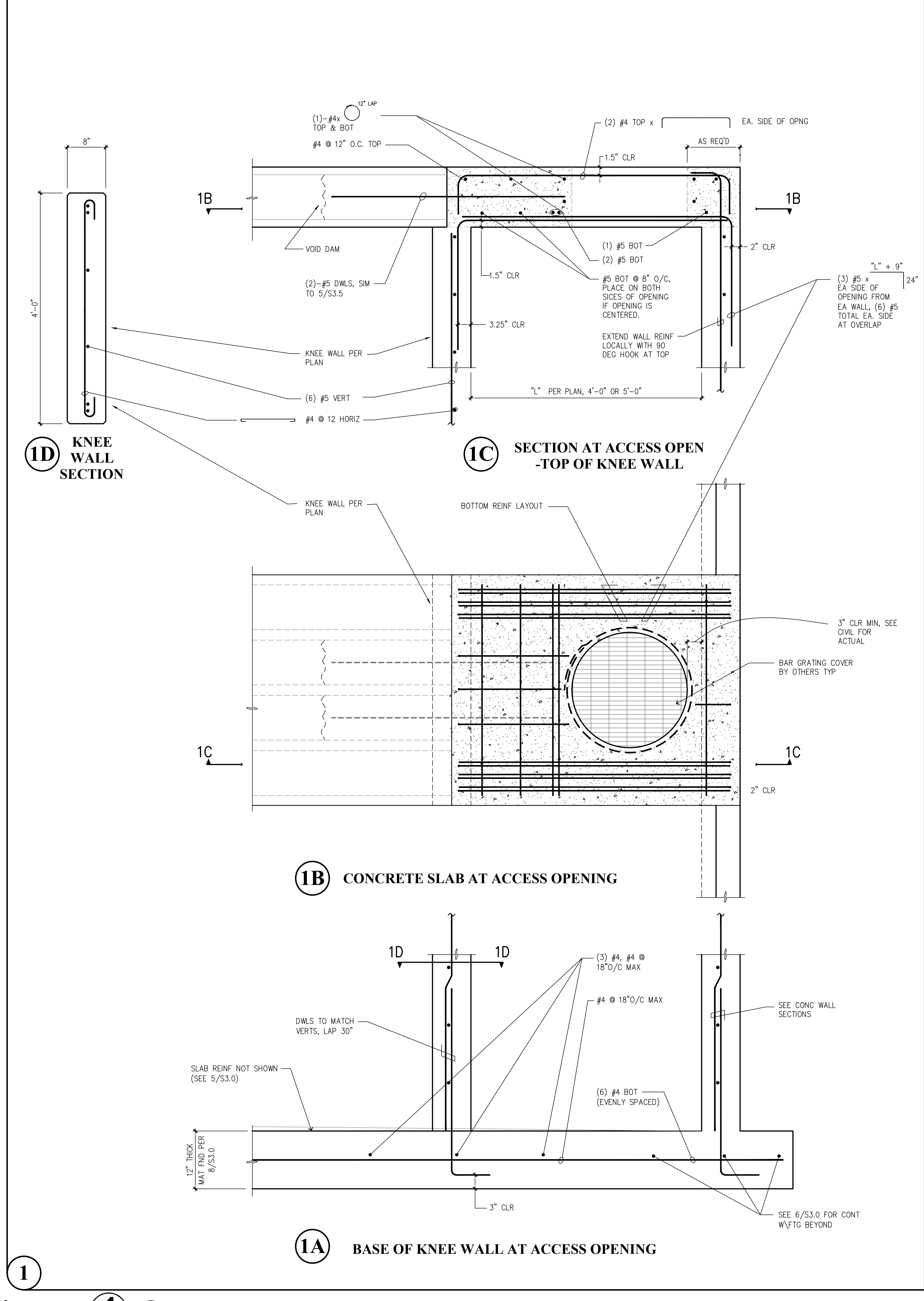
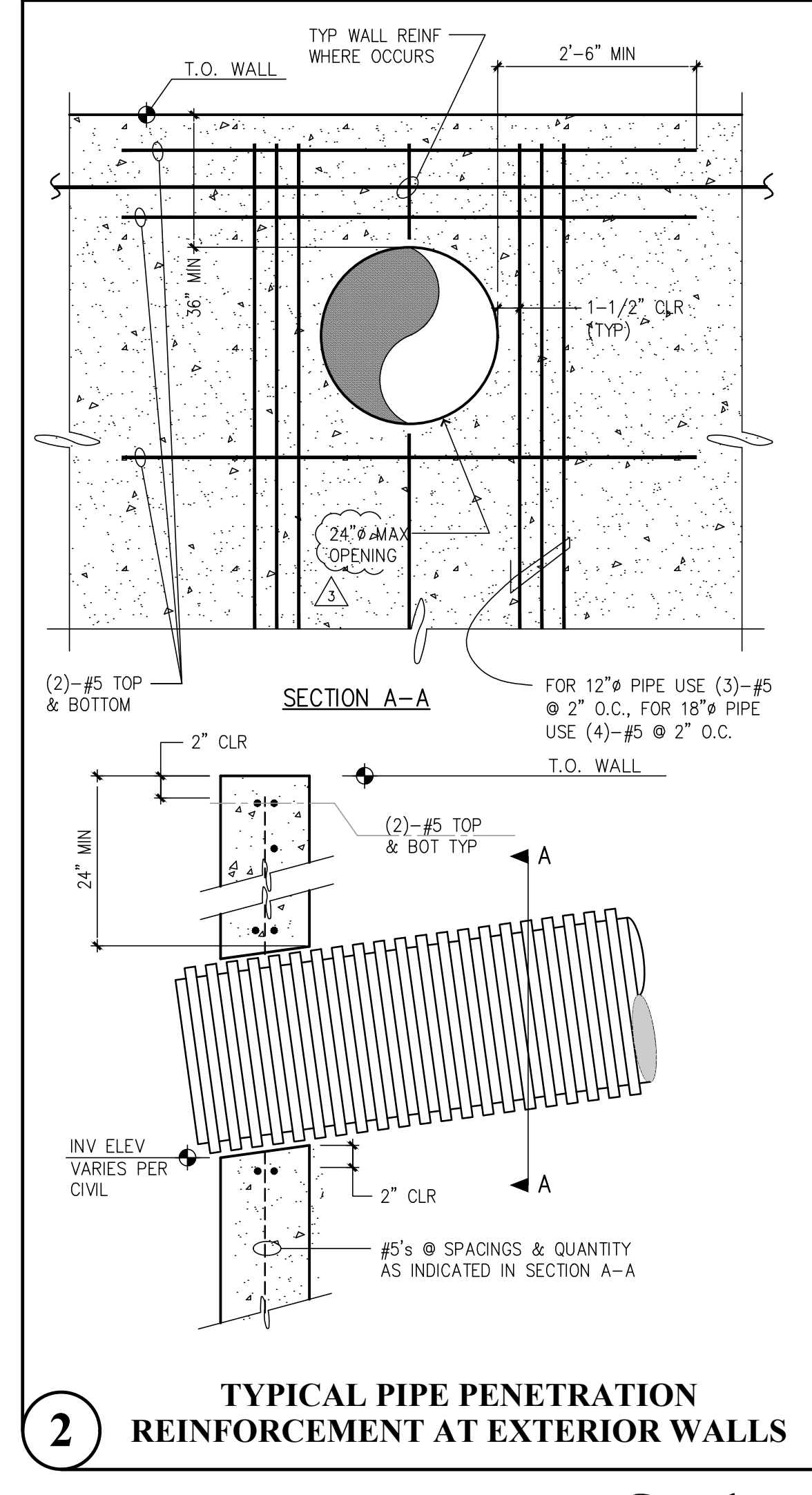
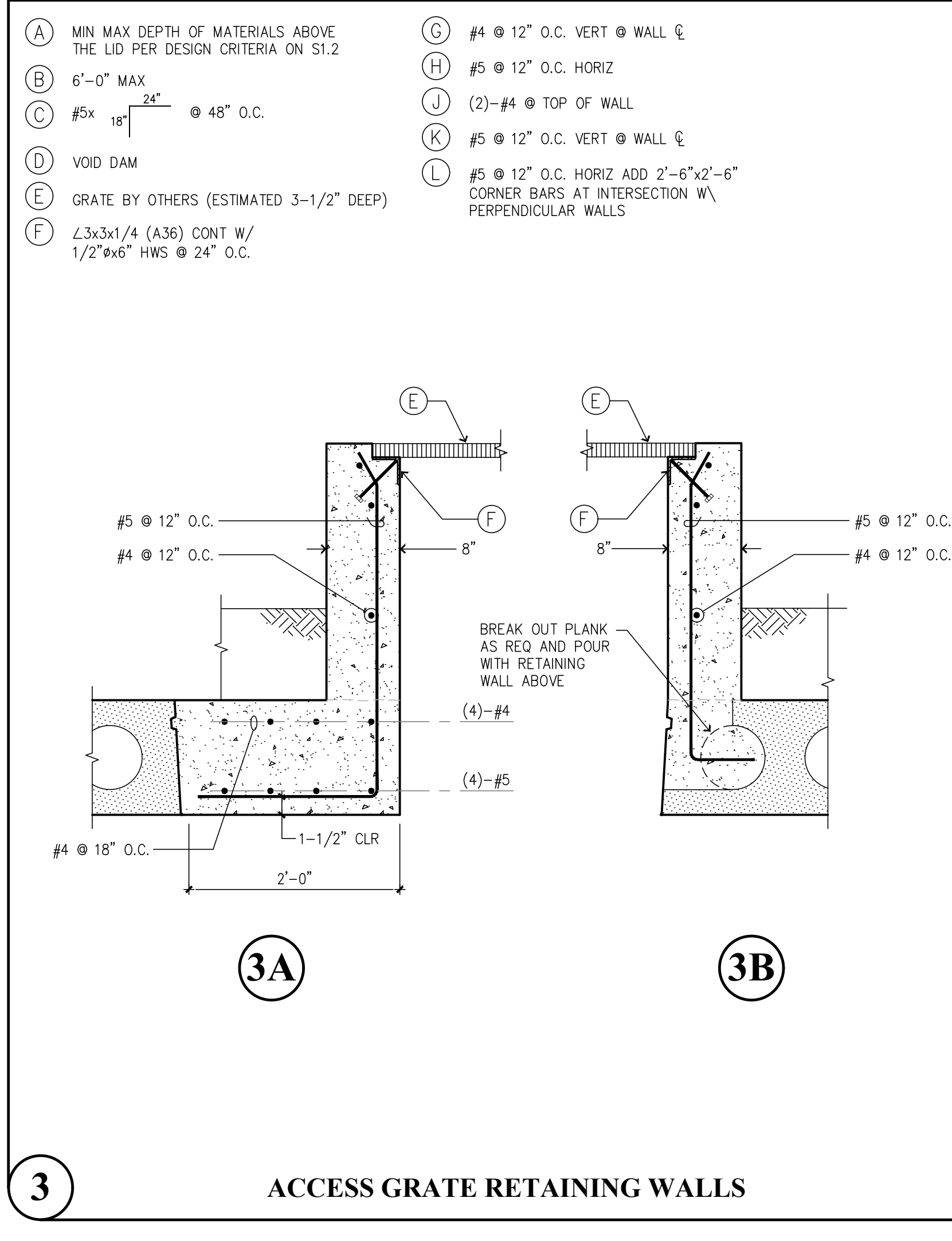
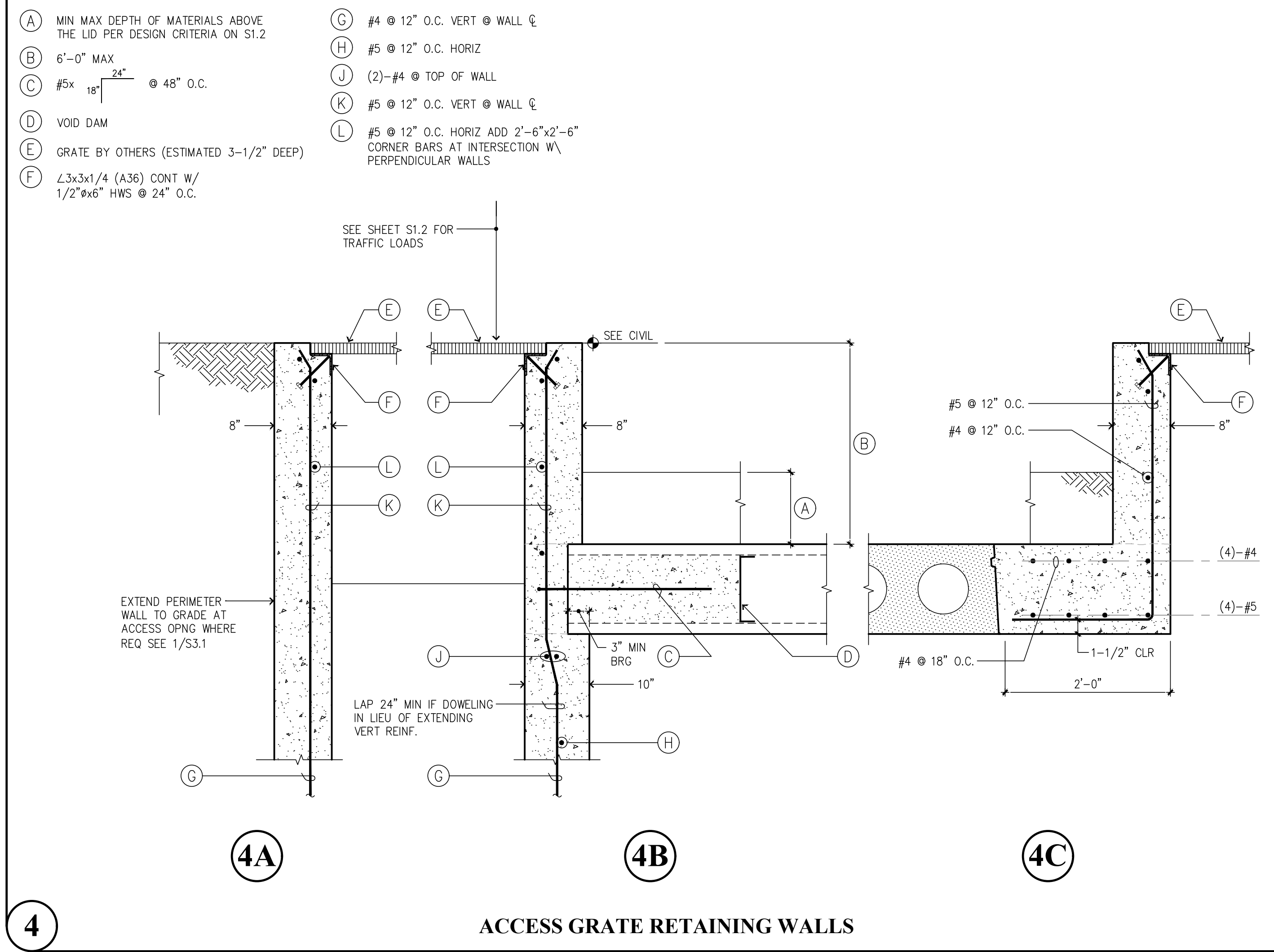
Puyallup, Washington 98374
 Ph 253-314-9822
 www.solutions4structures.com

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.

S3.1

CAD FILE: F:\Projects\2023 Projects\23.007 Bradley Heights\Drawings\Detention_Vault\S3.2.dwg
 PLOT DATE/TIME: 10/31/2024 - 8:35am THANK YOU FOR USING SOLUTIONS 4 STRUCTURES



Revisions to this sheet:

Bradley Heights Apartments
 Detention Vaults 2, 3, & 4
 202 27th Ave SE
 Puyallup, Washington
PRRWF20250237
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.

S3.2