



**CITY OF AUSTIN
STANDARD PRODUCTS LIST
for
PRE-CAST WATER UTILITY VAULTS**

USING DEPARTMENT: Austin Water **PREPARED BY:** Bill Flynn, P.E. **ISSUED:** 10/01/97
REVISED BY: Jeff A. Kyle, P.E. **REVISED:** 01/01/23

DESCRIPTION: Pre-Cast Water Utility Vaults, rectangular, in the following sizes (inside dimensions): 6'x9', 8'x12', 10'x12', and 10'x15'. Vaults are for dual pressure reducing valve stations or large water meters and shall comply with the following:

1. Vaults shall be precast concrete, designed by a Texas-licensed Professional Engineer in compliance with the design requirements contained herein.
2. Vault pre-casters shall be certified by the National Precast Concrete Association (NPCA).
3. Concrete shall be supplied by an off-site ready-mix plant certified by the National Ready Mixed Concrete Association (NRMCA) or by an on-site plant certified by NPCA.
4. Vaults shall be designed for A-16 Vehicle loads (for installation only in off-street locations such as parking lots and unpaved areas adjacent to roadways).
5. Vaults shall have a removeable top slab fitted with lifting sleeves.
6. The top slab shall be 6" or 8" thick and shall have a single- or double-door access hatch opening.
7. Approval is only for vaults cast at the listed physical locations.
8. Specified concrete compressive strength, f_c' , shall be at least 5,000 psi. Concrete shall conform to TxDOT Item 421, Class H. Any of the Mix Design Options 1–8 in Item 421.4.2.6 are allowed.

LISTING DATE	MANUFACTURER	PRODUCT IDENTIFICATION/COMMENT	APPROVAL
07/01/04	FORTERRA PIPE & PRECAST 11710 Chapel Road Lorena, TX 76655	Approved for all vault sizes See Notes below	R. Lamb
04/01/07	CAPITAL CONCRETE PRODUCTS 5264 Highway 71 East Del Valle, TX 78617	Approved for all vault sizes See Notes below	R. Lamb
04/01/10	CAPITAL PRECAST 6905 South Old Bastrop Highway San Marcos, TX 78666	Approved for all vault sizes See Notes below	R. Lamb
07/01/11	PARK-USA 849 1U.S. Highway 87 East San Antonio, TX 78263	Approved for all vault sizes See Notes below	R. Lamb

NOTES:

1. Access hatches shall be listed on SPL WW-614 or 614A.
2. These vaults were not designed for use in every underground installation of piping and ancillary equipment requiring a vault of the listed plan dimensions. The required wall thickness, top slab thickness, reinforcing steel size and placement, pipe penetration locations, hatch opening location, and vault depth are defined on the following sheets of this SPL. Otherwise, a project-specific design must be prepared. The vault itself must be designed by a Texas-Licensed Professional Engineer (Structural).

LATEST REVISIONS (since 07/01/22):

1. Added dimensions for vertical bar spacing on Sheets 4 and 8.

Design Criteria

Max Earth Fill (H + 6"):	7'-6"	ft, Top of vault (Design fill)
Water table Depth:	None	Vault is assumed above water table
f'c:	5,000	psi, 28 day strength (minimum)
fy:	60,000	psi, ASTM 615 Gr. 60

Design Loads

Vehicle:	16	kip, A-16 Vehicle load ASTM 857 Table 1
Concrete:	150	pcf, Density of concrete
LL Surcharge:	80	psf, ASTM 857 Sec. 4.2.1.2
Depth, LL Surcharge:	8	ft, max depth of applied surcharge load ASTM 857
Soil Classification:	CL	Low plasticity, inorganic, moderately compacted backfill materials assumed
Minimum Soil Pmin:	100	psf per foot of depth, ASCE 7-16 Table 3.2-1

Components

Access Door:	SPL No. WW - 614, & SPL No. WW-614A See Sheet 3 of 9 for location
Lift Lug Requirements:	Applied Factor of Safety per 29 CFR 1926.704 (c) See Sheet 3 of 9 for location

Manufacturing Practices

ASTM:	857-19 Standard Specification for Underground Precast Concrete Structures
Tolerances:	Shall adhere to PCI MNL 116 (latest edition)

Design Summary

	<u>A</u>	<u>B</u>	
Vault Size:			
Interior Width (W2):	6'-0"	8'-0"	ft
Interior Length (L2):	9'-0"	12'-0"	ft
Height (H):	5'-6"/7'-0"	5'-6"/7'-0"	ft, minimum/maximum
Minimum Cover:	3/4"	3/4"	in, Walls ACI 318 Table 20.5.1.3.3
Minimum Cover:	1-1/4"	1-1/4"	in, Lid ACI 318 Table 20.5.1.3.3
Factored Lug Load:	5,300	8,800	lb, load per lug w/ factor of safety applied
Bearing Required:	1600	1700	psf, Un-factored pressure

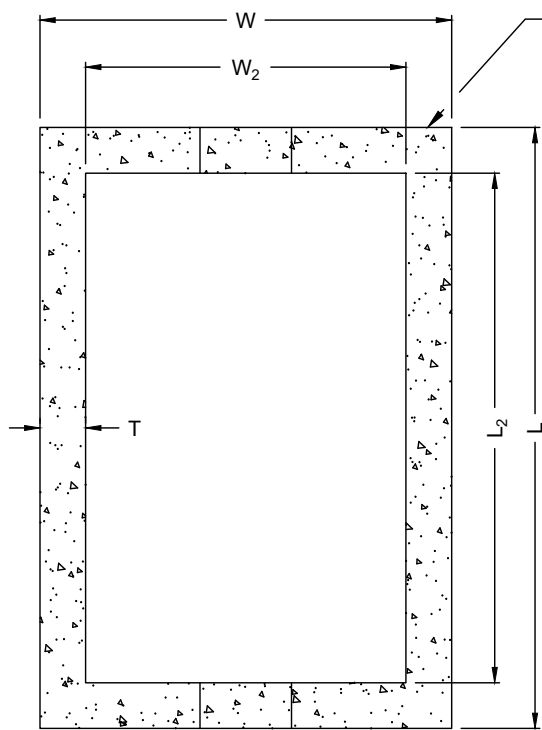
Design Load Factors

Live Load:	1.6	ASCE 7-16 Sec 5.3.1
Dead Load:	1.2	ASCE 7-16 Sec 5.3.1
Earth Pressure:	1.6	ASCE 7-16 Sec 5.3.1
Lift Lugs:	1.0	Un-factored

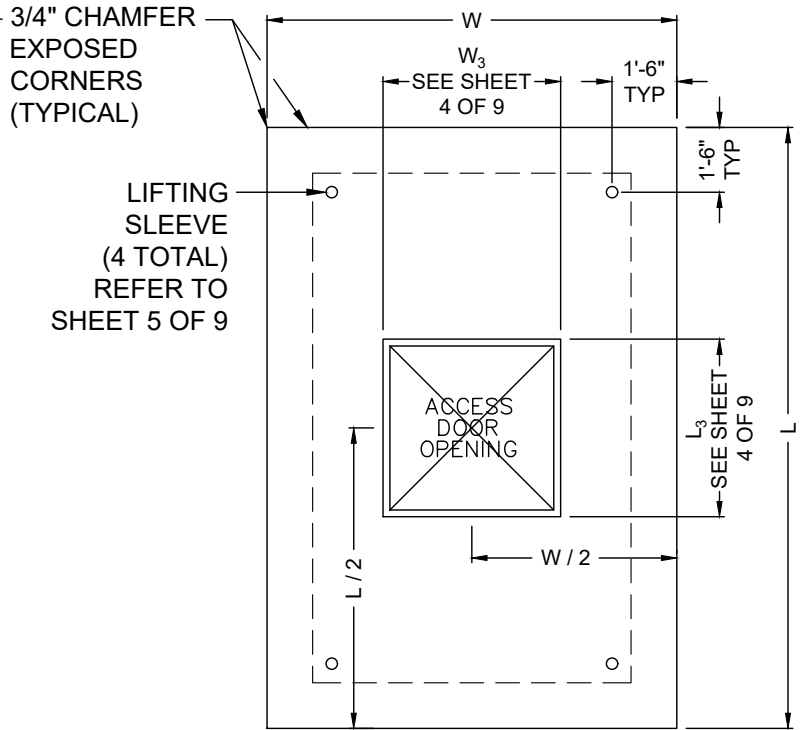
Reduction Factors

Φ:	0.9	Flexure, ACI 318-19
Φ:	0.75	Shear, ACI 318-19

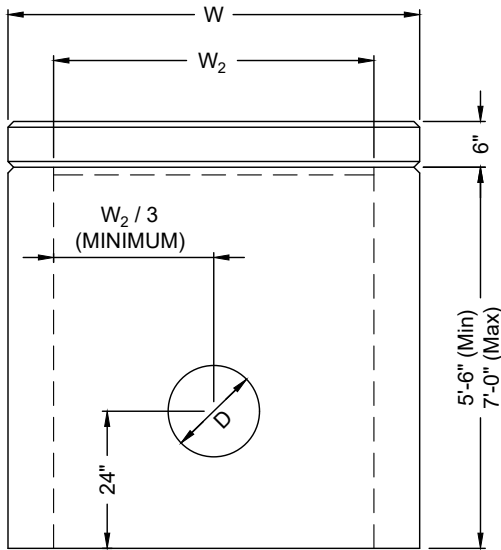
PRE-CAST WATER UTILITY VAULTS
6'x9' AND 8'x12'
STRUCTURAL VAULT DESIGN CRITERIA



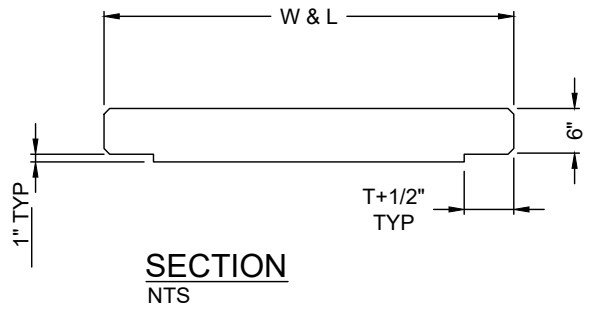
VAULT PLAN VIEW
NTS



LID PLAN VIEW
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SIDE "W" ELEVATION
NTS

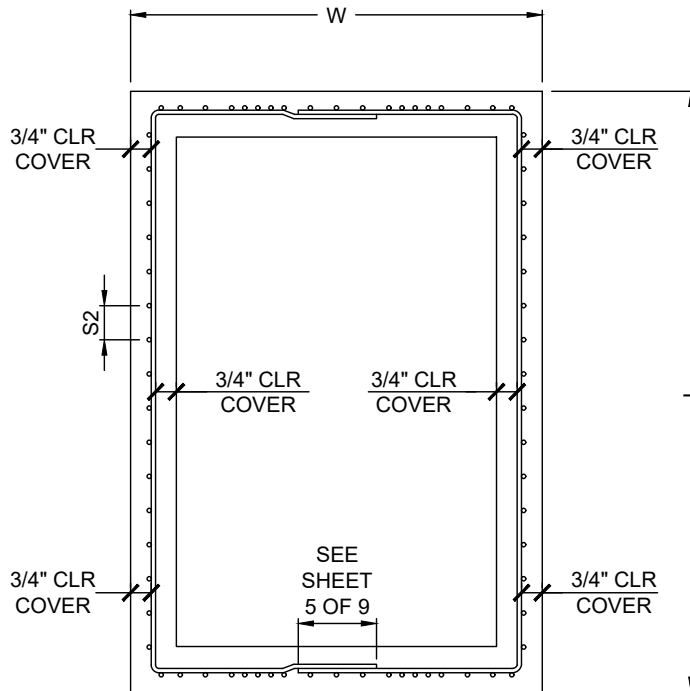


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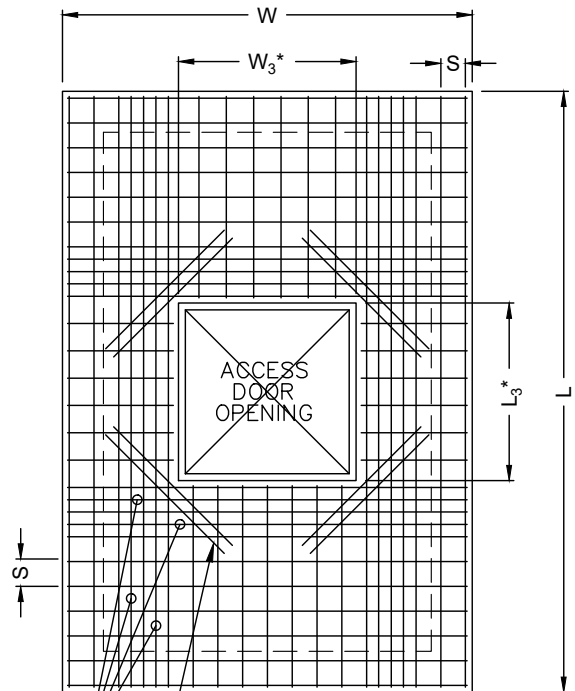
Dimensions						
	L	L ₂	W	W ₂	T	D*
A	10'-0"	9'-0"	7'-0"	6'-0"	6"	1'-8"
B	13'-4"	12'-0"	9'-4"	8'-0"	8"	1'-8"

*D is a maximum

PRE-CAST WATER UTILITY VAULTS
6'x9' AND 8'x12'
STRUCTURAL CONCRETE PLAN AND ELEVATION VIEWS



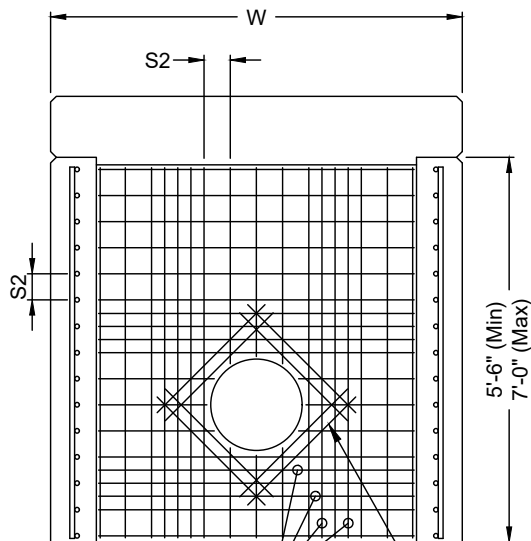
VAULT PLAN VIEW
NTS



2 ADDL. #4 @ MID SPACING EACH SIDE OF OPENING (8 REBARS TOTAL)

2 - #4 x 4'-0" @ 4" OC - CENTERED ON EA. CORNER w/ 1-1/4" CLR COVER AT OPENING (8 REBARS TOTAL)

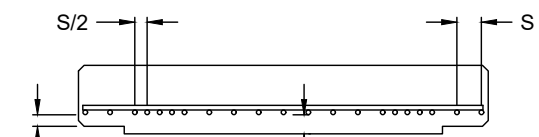
LID PLAN VIEW
NTS



2 ADDL. #5 @ MID SPACING EACH SIDE OF OPENING (8 REBARS TOTAL)

2 - #4 x 5'-0" @ 4" OC - CENTERED ON EA. CORNER w/ 1-1/4" CLR COVER AT OPENING (8 REBARS TOTAL)

SIDE "W" ELEVATION
NTS S = REBAR SPACING

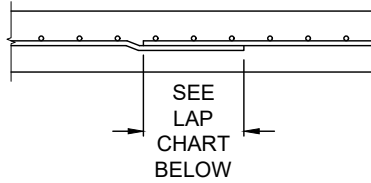


LID SECTION
NTS

REINFORCEMENT DETAILS							ACCESS DOOR SPL No.
	L	W	LID BARS	S	VAULT BAR	S2	L ₃ * & W ₃ *
A	10'-0"	7'-0"	#4	6"	#5	9"	WW-614
B	13'-4"	9'-4"	#4	6"	#5	6"	WW-614A

*See SPL No. listed for Manufacturer & Dimensions

**PRE-CAST WATER UTILITY VAULTS
6'x9' AND 8'x12'
STRUCTURAL REINFORCEMENT PLAN AND ELEVATION VIEWS**



BAR SIZE	MINIMUM LAP
#4	22"
#5	36"

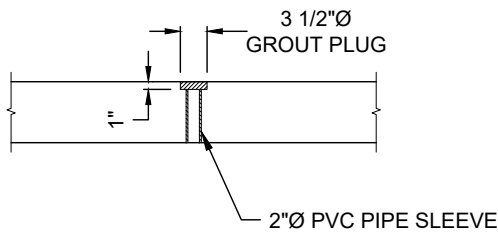
* Lap length shall be adjusted per applicable design standards for higher strengths of concrete.

LAP LENGTH NOTES :

1. See Sheet 4 of 9 drawings for required rebar size and spacing.
2. Lap Splices shall be staggered by Lap/2

LAP LENGTH DETAIL

NTS



LIFTING SLEEVE DETAIL

NTS

ADDITIONAL REINFORCING NOTE :

1. All reinforcement to have 2" clear cover at all openings.

Design Criteria

Max Earth Fill (H + 8"):	7'-8"	ft, Top of vault (Design fill)
Water table Depth:	None	Vault is assumed above water table
f'c:	5,000	psi, 28 day strength (minimum)
fy:	60,000	psi, ASTM 615 Gr. 60

Design Loads

Vehicle:	16	kip, A-16 Vehicle load ASTM 857 Table 1
Concrete:	150	pcf, Density of concrete
LL Surcharge:	80	psf, ASTM 857 Sec. 4.2.1.2
Depth, LL Surcharge:	8	ft, max depth of applied surcharge load ASTM 857
Soil Classification:	CL	Low plasticity, inorganic, moderately compacted backfill materials assumed
Minimum Soil Pmin:	100	psf per foot of depth, ASCE 7-16 Table 3.2-1

Components

Access Door:	SPL No. WW - 614A See Sheet 7 of 9 for location
Lift Lug Requirements:	Applied Factor of Safety per 29 CFR 1926.704 (c) See Sheet 7 of 9 for location

Manufacturing Practices

ASTM:	857-19 Standard Specification for Underground Precast Concrete Structures
Tolerances:	Shall adhere to PCI MNL 116 (latest edition)

Design Summary

	A	B	
Vault Size:			
Interior Width (W2):	10'-0"	10'-0"	ft
Interior Length (L2):	12'-0"	15'-0"	ft
Height (H):	5'-6"/7'-0"	5'-6"/7'-0"	ft, minimum/maximum
Minimum Cover:	3/4"	3/4"	in, Walls ACI 318 Table 20.5.1.3.3
Minimum Cover:	1-1/4"	1-1/4"	in, Lid ACI 318 Table 20.5.1.3.3
Factored Lug Load:	14,300	18,200	lb, load per lug w/ factor of safety applied
Bearing Required:	2000	1700	psf, Un-factored pressure

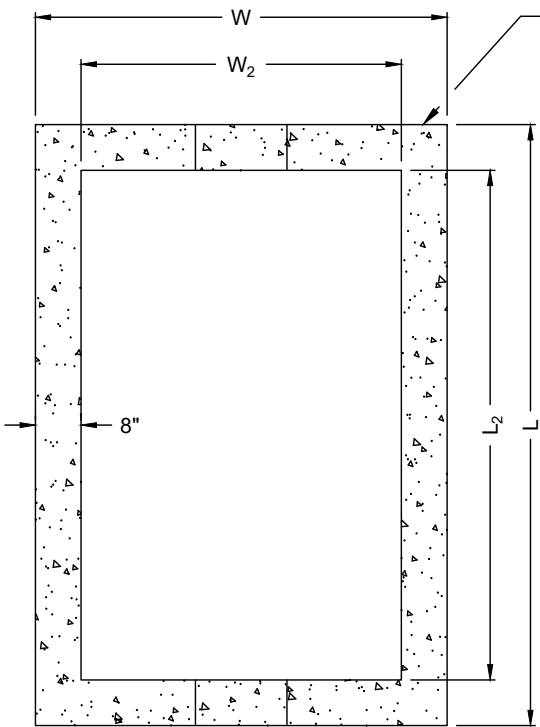
Design Load Factors

Live Load:	1.6	ASCE 7-16 Sec 5.3.1
Dead Load:	1.2	ASCE 7-16 Sec 5.3.1
Earth Pressure:	1.6	ASCE 7-16 Sec 5.3.1
Lift Lugs:	1.0	Un-factored

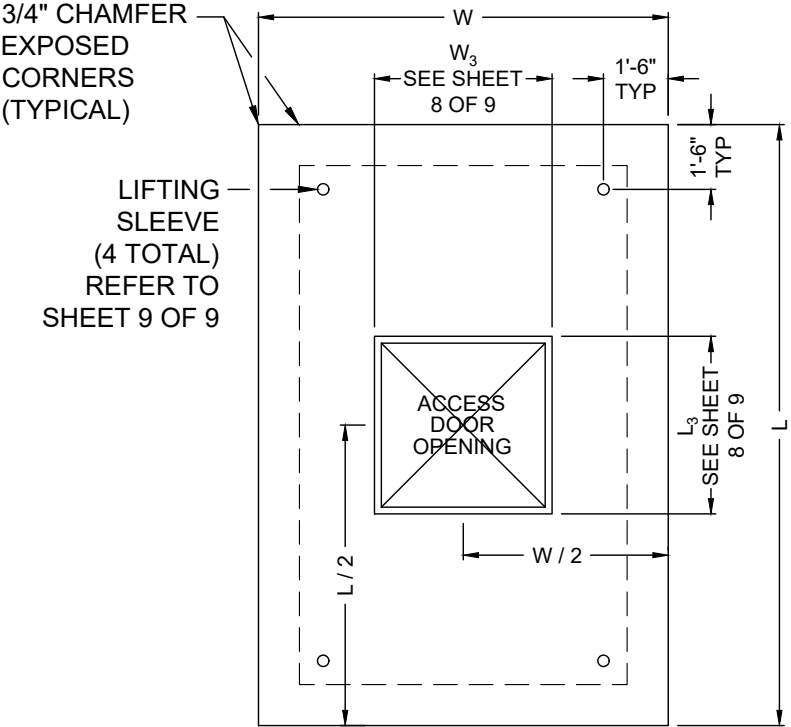
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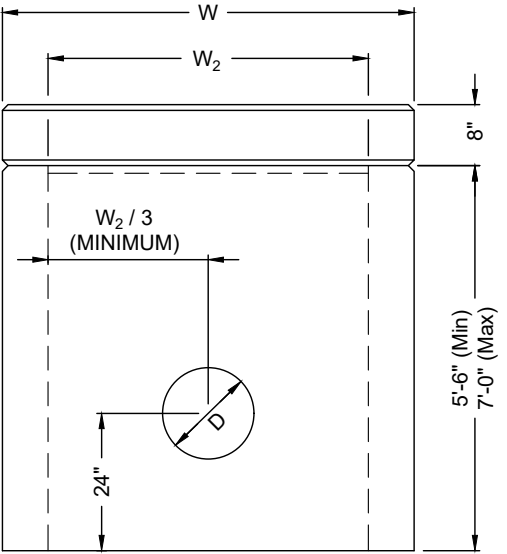
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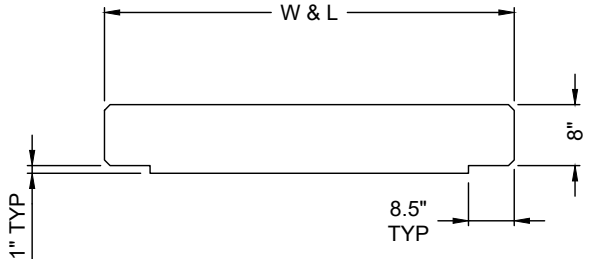
VAULT PLAN VIEW
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LID PLAN VIEW
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SIDE "W" ELEVATION
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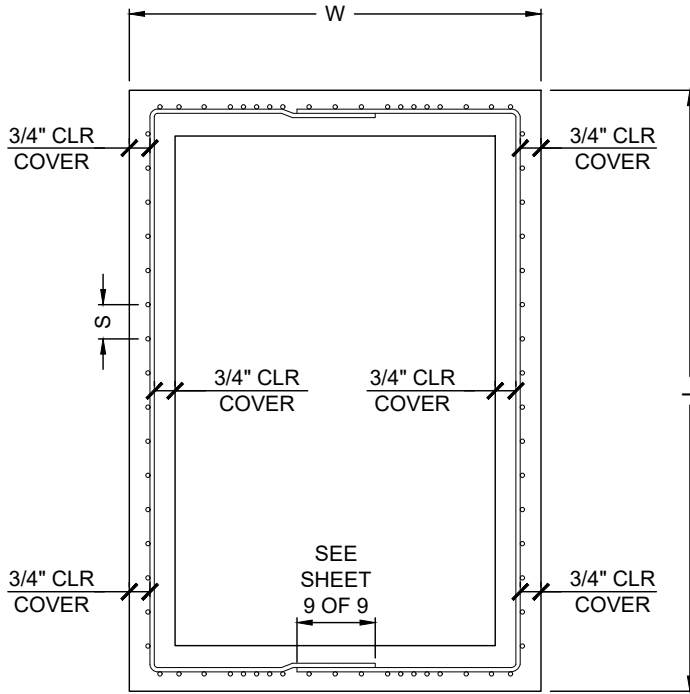


SECTION
 NTS

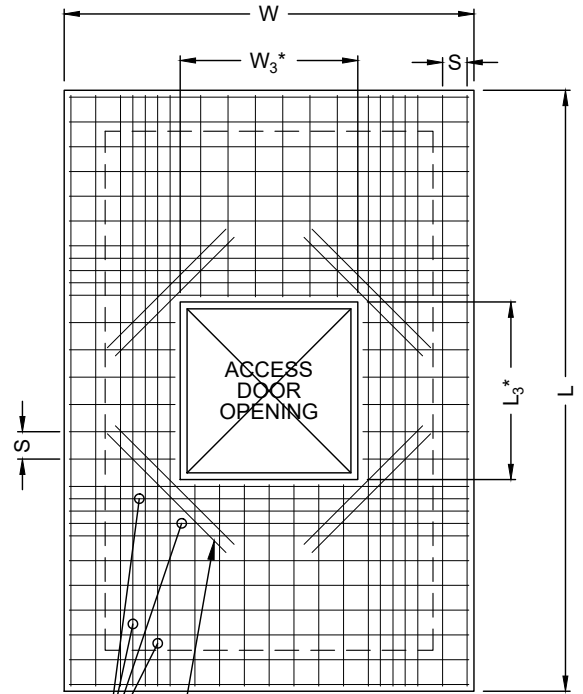
Dimensions					
	L	L ₂	W	W ₂	D*
A	13'-4"	12'-0"	11'-4"	10'-0"	1'-8"
B	16'-4"	15'-0"	11'-4"	10'-0"	1'-8"

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 STRUCTURAL CONCRETE PLAN AND ELEVATION VIEWS**



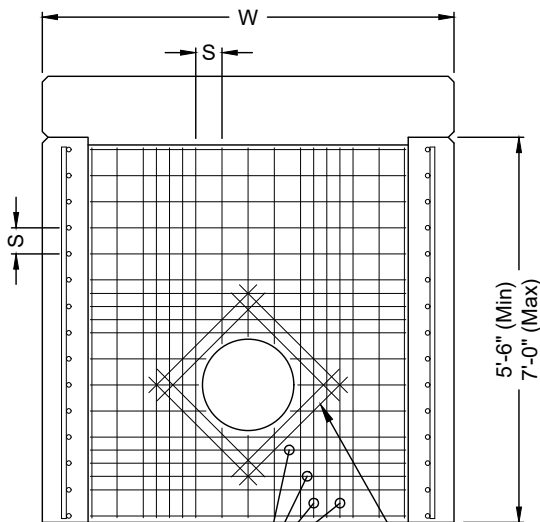
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2 ADDL. #4 @ MID SPACING
EACH SIDE OF OPENING
(8 REBARS TOTAL)

2 - #4 x 4'-0" @ 4" OC - CENTERED ON
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AT OPENING (8 REBARS TOTAL)

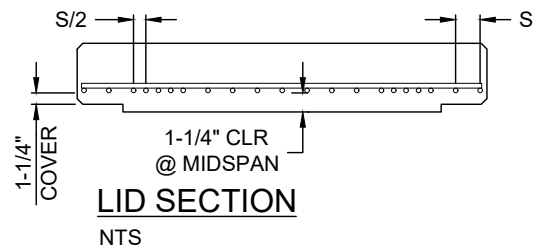
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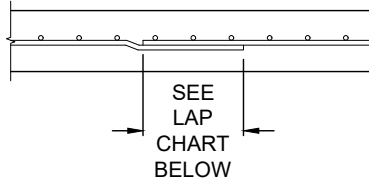


LID SECTION
NTS

REINFORCEMENT DETAILS						ACCESS DOOR SPL No.
	L	W	LID BARS	VAULT BAR	S	L ₃ * & W ₃ *
A	13'-4"	11'-4"	#4	#5	6"	WW-614A
B	16'-8"	11'-8"	#4	#5	6"	WW-614A

*See SPL No. listed for Manufacturer & Dimensions

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BAR SIZE	MINIMUM LAP
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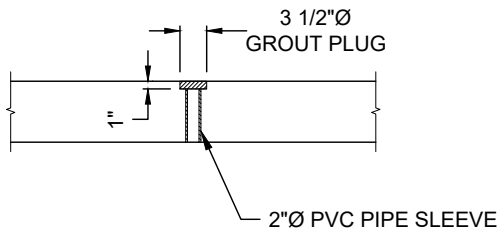
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1. See Sheet 8 of 9 drawings for required rebar size and spacing.
2. Lap Splices shall be staggered by Lap/2

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LIFTING SLEEVE DETATL

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