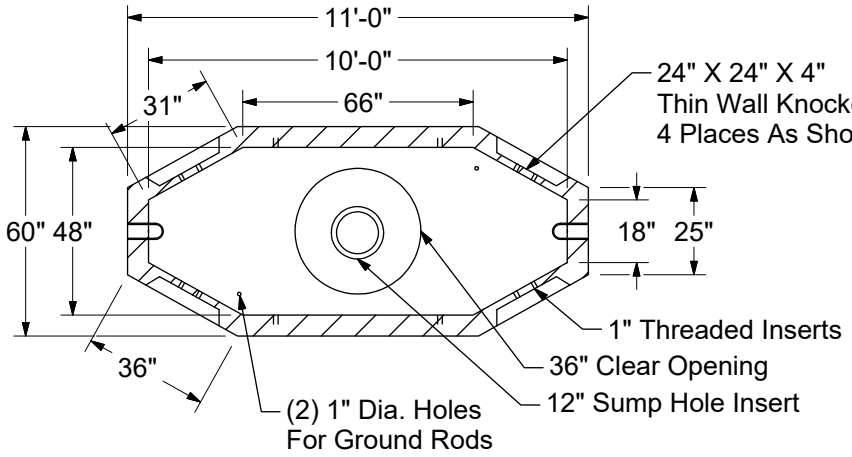
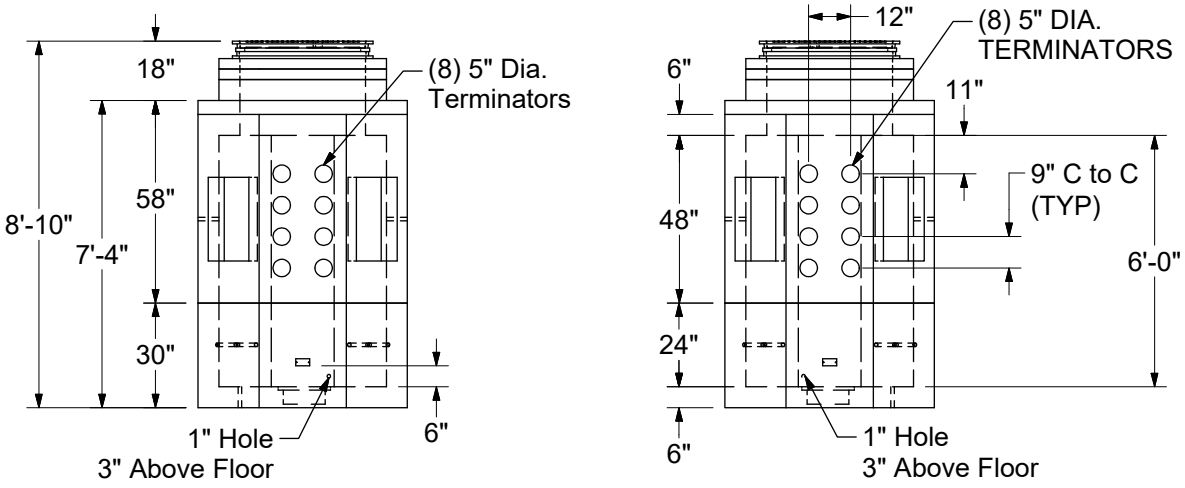
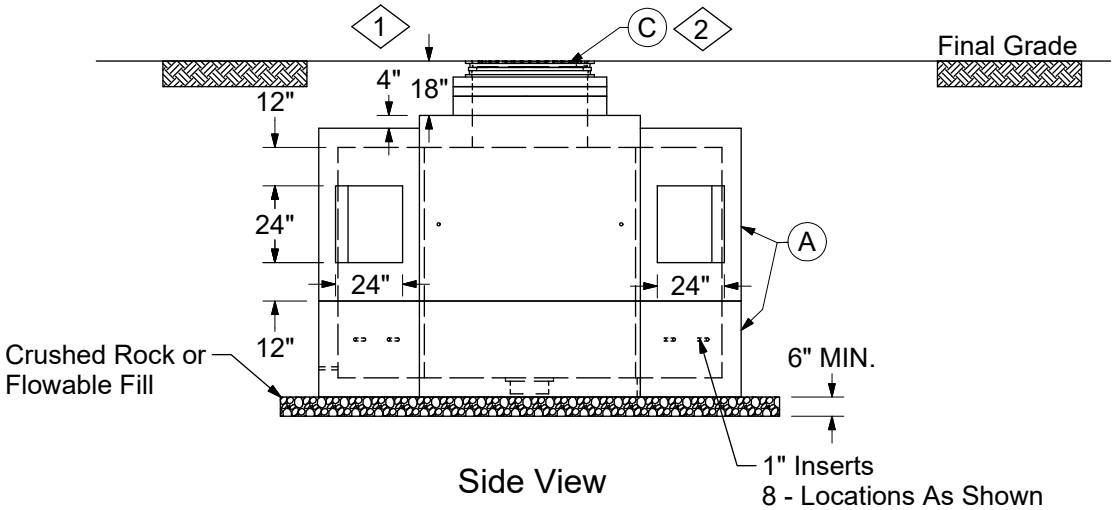
MANHOLES AND VAULTS 32



Top View



End Views



Side View

REV	DATE	ENG	DESCRIPTION
9	04/01/25	EJB	Correct Item L
8	01/01/24	JMW	Converted to new format

CONSTRUCTION NOTE(s):

1. Preferred setting depth is 18" as shown. Minimum setting depth is 12" and maximum is 60".

2. Preferred collar configuration is one 6" and two 3" for 12" thickness. The 3" necks are required on all manholes and shall be the top two collars. Add the required necks so that frame and cover are at final grade. 3" thick collar is Stock #12 06 062 and 6" thick collar is Stock #12 06 063.

3. Weights are as follows: Top Section - 13,200 lbs., Base Section - 7,350 lbs., Total - 20,550 lbs.

DCS #	DESCRIPTION
32 21 02 01	18" Setting Depth
32 21 02 02	60" Setting Depth

	ITEM	STK / DCS #	DESCRIPTION 32 21 02 **	01	02
	A	12 06 231	Manhole - Top, Precast Concrete	1	1
		12 06 232	Manhole - Bottom, Precast Concrete	1	1
	B	98 00 006	Concrete - 2 Sack (c.y.)	4	4
	C	**33 12 01 01**	Frame and Cover 36" Dia. x 18" Deep	1	-
		33 12 01 02	Frame and Cover 36" Dia. x 60" Deep	-	1
	D	19 04 327	Grate - 14"	1	1
	E	**33 11 ** ****	Wingwall Bays	#	#
	F	98 00 014	Crushed Rock (c.y.)	2/3	2/3
	G	12 53 017	Shield, Duct, 3" thru 6"	4	4
6	H	12 56 113	Cable Mounting Arm - 14"	#	#
6	I	12 56 112	Cable Mounting Arm - 18"	#	#
6	J	12 56 114	Cable Mounting Arm - 7-1/2"	#	#
6	K	12 56 125	J Hook - 5"	#	#
	L	**33 20 02 01**	Grounding System, 4' x 10' Manhole	1	1
@			Op Code, Excavation (Mach.) (c.y.)	18	27
@			Op Code, Backfilling (Mach.) (c.y.)	4	11
@			Op Code, Tamping (s.f.)	70	70
@			Op Code, Surface Removal (s.f.)	70	70
@			Op Code, Surface Replacement (s.f.)	70	70
@			Op Code, Loading Out (c.y.)	#	#

DESIGN NOTE(s):

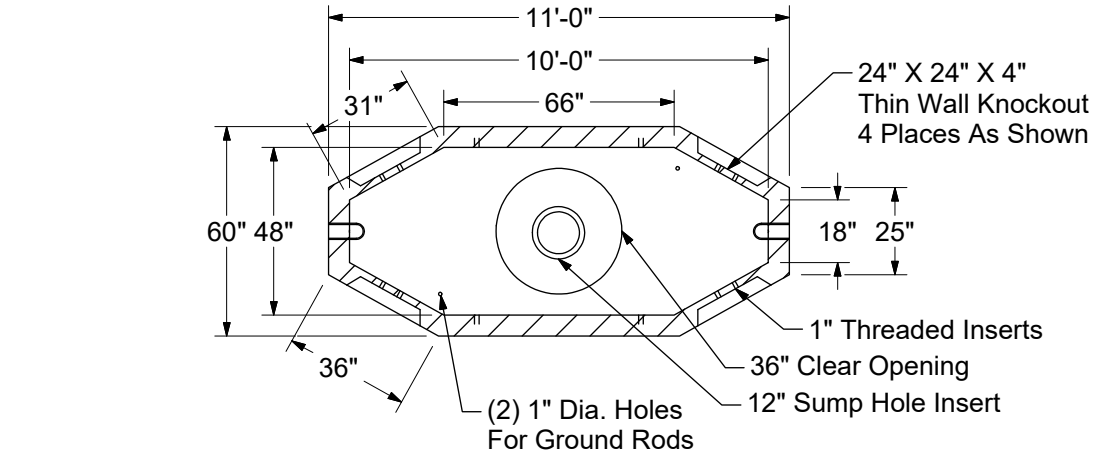
4. 2.45 Cubic yards of dirt removed per foot of excavation.

5. Add the required number of 6" concrete (Stock #12 06 063) and 3" concrete (Stock #12 06 062) necks so that the frame and cover are at final grade.

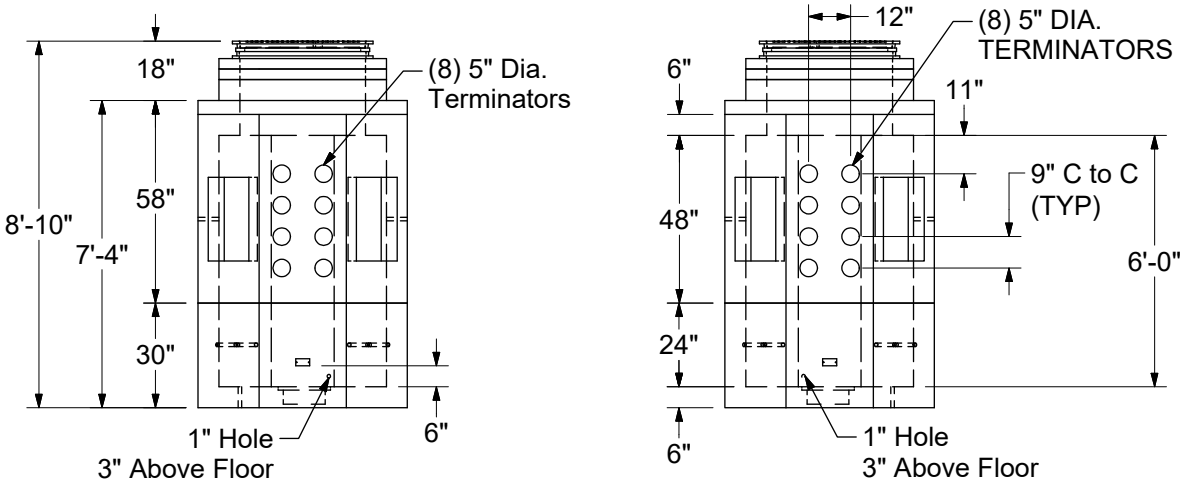
6. Manholes are equipped with the cable mounting racks. Add the required number of cable mounting arms to suspend the installed cables.

7. Traffic Rated Design - H-20 16,000 pounds wheel load.

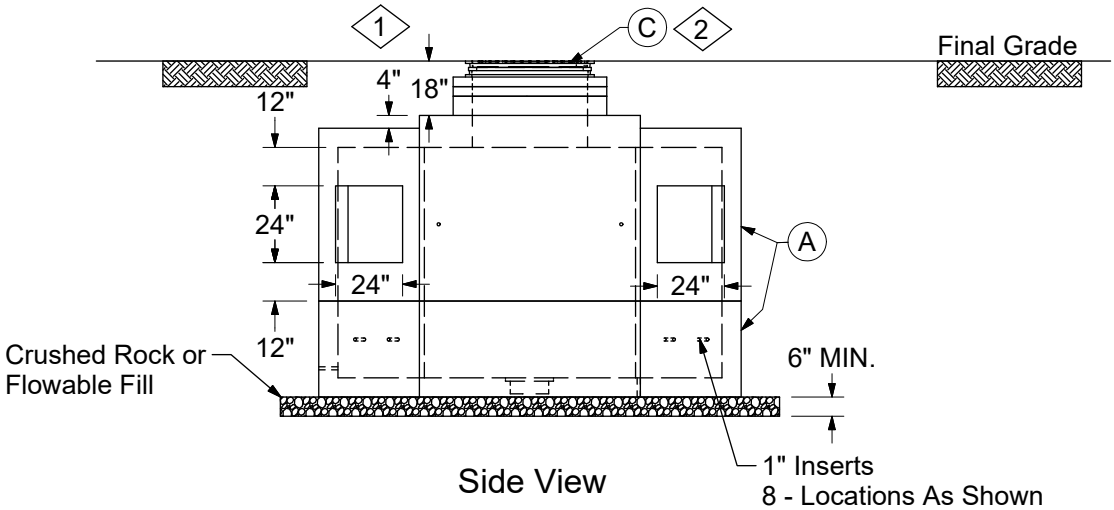
REV	DATE	ENG	DESCRIPTION
9	04/01/25	EJB	Correct Item L
8	01/01/24	JMW	Converted to new format



Top View



End Views



Side View

REV	DATE	ENG	DESCRIPTION
8	01/01/24	JMW	Converted to new format
7	12/12/12	DDG	

CONSTRUCTION NOTE(s):

1. Preferred setting depth is 18" as shown. Minimum setting depth is 12" and maximum is 60".

2. Preferred collar configuration is one 6" and two 3" for 12" thickness. The 3" necks are required on all manholes and shall be the top two collars. Add the required necks so that frame and cover are at final grade. 3" thick collar is Stock #12 06 062 and 6" thick collar is Stock #12 06 063.

3. Weights are as follows: Top Section - 13,200 lbs., Base Section - 7,350 lbs., Total - 20,550 lbs.

DCS #	DESCRIPTION
32 21 02 01	18" Setting Depth
32 21 02 02	60" Setting Depth

	ITEM	STK / DCS #	DESCRIPTION 32 21 02 **	01	02
	A	12 06 231	Manhole - Top, Precast Concrete	1	1
		12 06 232	Manhole - Bottom, Precast Concrete	1	1
	B	98 00 006	Concrete - 2 Sack (c.y.)	4	4
	C	**33 12 01 01**	Frame and Cover 36" Dia. x 18" Deep	1	-
		33 12 01 02	Frame and Cover 36" Dia. x 60" Deep	-	1
	D	19 04 327	Grate - 14"	1	1
	E	**33 11 ** ****	Wingwall Bays	#	#
	F	98 00 014	Crushed Rock (c.y.)	2/3	2/3
	G	12 53 017	Shield, Duct, 3" thru 6"	4	4
6	H	12 56 113	Cable Mounting Arm - 14"	#	#
6	I	12 56 112	Cable Mounting Arm - 18"	#	#
6	J	12 56 114	Cable Mounting Arm - 7-1/2"	#	#
6	K	12 56 125	J Hook - 5"	#	#
	L	**32 20 02 01**	Grounding System, 4' x 10' Manhole	1	1
@			Op Code, Excavation (Mach.) (c.y.)	18	27
@			Op Code, Backfilling (Mach.) (c.y.)	4	11
@			Op Code, Tamping (s.f.)	70	70
@			Op Code, Surface Removal (s.f.)	70	70
@			Op Code, Surface Replacement (s.f.)	70	70
@			Op Code, Loading Out (c.y.)	#	#

DESIGN NOTE(s):

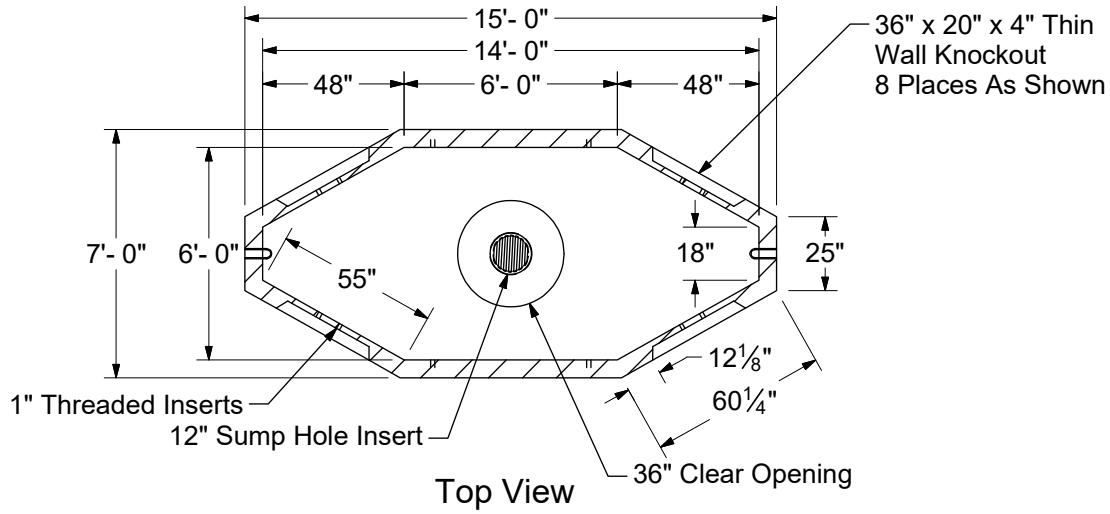
4. 2.45 Cubic yards of dirt removed per foot of excavation.

5. Add the required number of 6" concrete (Stock #12 06 063) and 3" concrete (Stock #12 06 062) necks so that the frame and cover are at final grade.

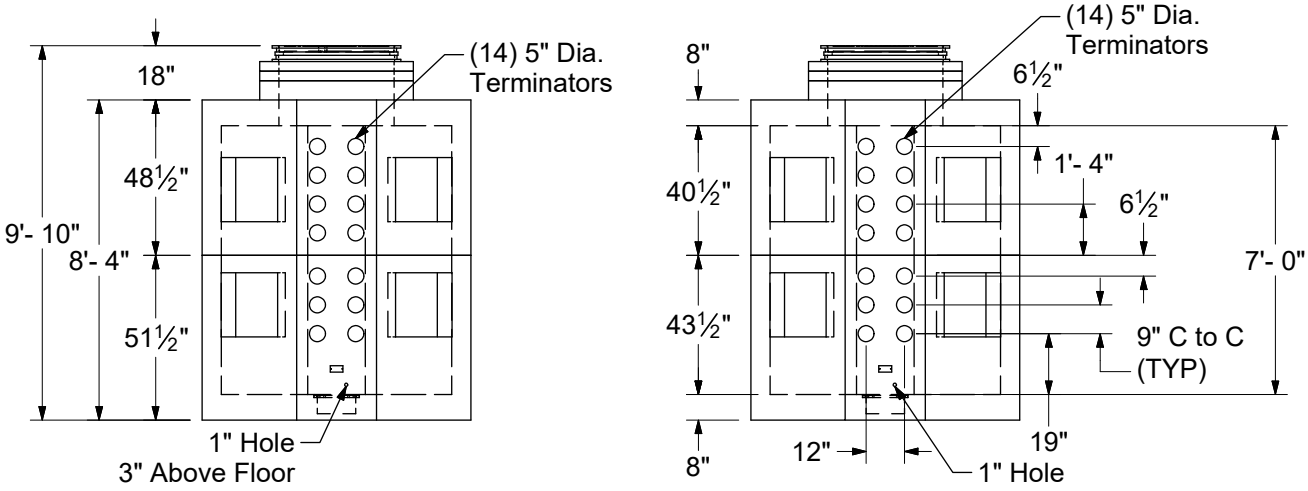
6. Manholes are equipped with the cable mounting racks. Add the required number of cable mounting arms to suspend the installed cables.

7. Traffic Rated Design - H-20 16,000 pounds wheel load.

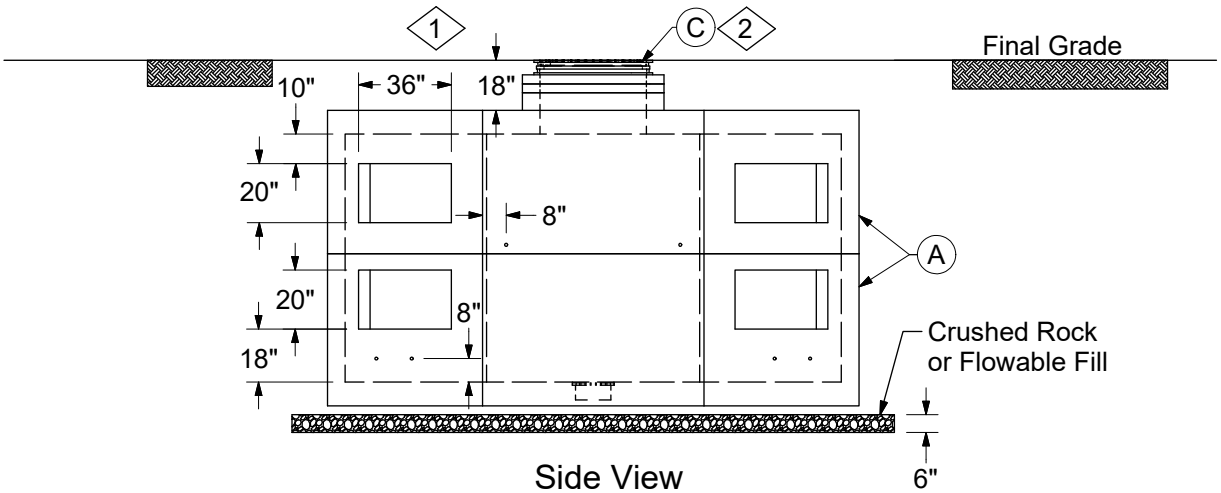
REV	DATE	ENG	DESCRIPTION
8	01/01/24	JMW	Converted to new format
7	12/12/12	DDG	



Top View



End Views



Side View

REV	DATE	ENG	DESCRIPTION
11	01/01/24	JMW	Converted to new format
10	04/23/14	EJB	

CONSTRUCTION NOTE(s):

1. Preferred setting depth is 18" as shown. Minimum setting depth is 12" and maximum is 60".

2. Preferred collar configuration is one 6" and two 3" for 12" thickness. The 3" necks are required on all manholes and shall be the top two collars. Add the required necks so that frame and cover are at final grade. 3" thick collar is Stock #12 06 062 and 6" thick collar is Stock #12 06 063.

3. Weights are as follows: Top Section - 19,798 lbs., Base Section - 20,526 lbs., Total - 40,324 lbs.

DCS #	DESCRIPTION
32 21 03 01	18" Setting Depth
32 21 03 02	60" Setting Depth

	ITEM	STK / DCS #	DESCRIPTION 32 21 03 **	01	02
	A	12 06 233	Manhole - Top, Precast Concrete	1	1
		12 06 234	Manhole - Bottom, Precast Concrete	1	1
	B	98 00 006	Concrete - 2 Sack (c.y.)	8	8
	C	**33 12 01 01**	Frame and Cover 36" Dia. x 18" Deep	1	-
		33 12 01 02	Frame and Cover 36" Dia. x 60" Deep	-	1
	D	19 04 327	Grate - 14"	1	1
	E	**33 11 ** ****	Wingwall Bays	#	#
	F	98 00 014	Crushed Rock (c.y.)	1	1
	G	12 53 017	Shield, Duct, Cable	12	12
6	H	12 56 112	Cable Mounting Arm - 18"	#	#
6	I	12 56 113	Cable Mounting Arm - 14"	#	#
6	J	12 56 114	Cable Mounting Arm - 7-1/2"	#	#
6	K	12 56 125	J Hook - 5"	#	#
	L	**33 20 02 02**	Grounding System, 6' x 14'	1	1
@			Op Code, Excavation (Mach.) (c.y.)	40	53
@			Op Code, Backfilling (Mach.) (c.y.)	9	24
@			Op Code, Tamping (s.f.)	99	99
@			Op Code, Surface Removal (s.f.)	99	99
@			Op Code, Surface Replacement (s.f.)	99	99
@			Op Code, Loading Out (c.y.)	#	#

DESIGN NOTE(s):

4. 5.32 Cubic yards of dirt removed per foot of excavation.

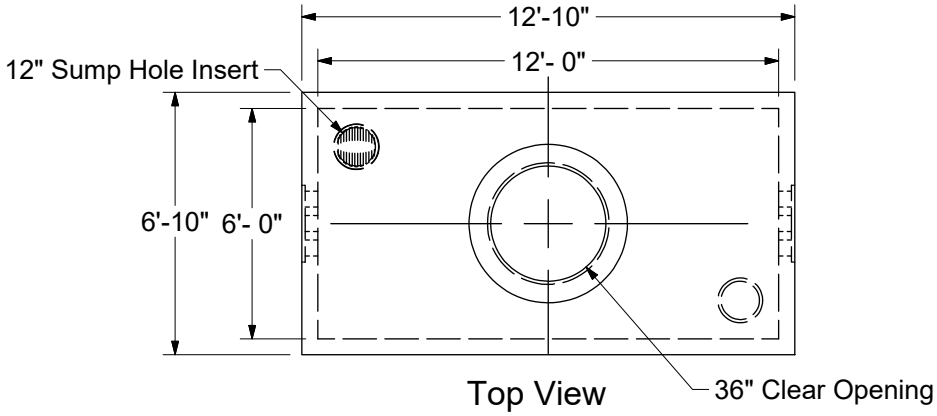
5. Add the required number of 6" concrete (Stock #12 06 063) and 3" concrete (Stock #12 06 062) necks so that the frame and cover are at final grade.

6. Manhole are equipped with the cable mounting racks. Add the required number of cable mounting arms to suspend the installed cables.

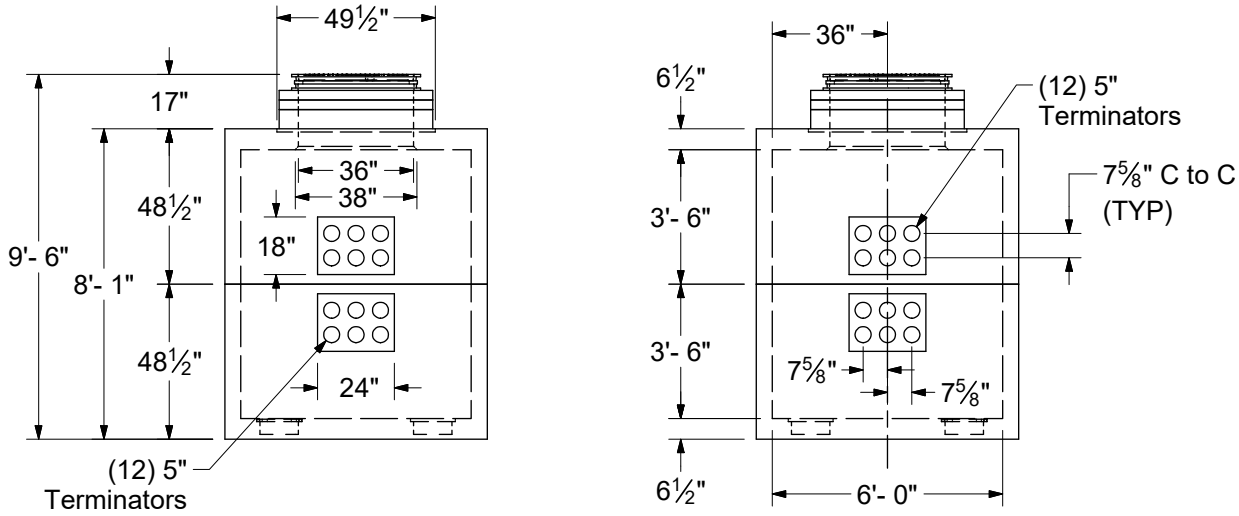
7. Traffic Rated Design - H-20 16,000 pounds wheel load.

REV	DATE	ENG	DESCRIPTION
11	01/01/24	JMW	Converted to new format
10	04/23/14	EJB	

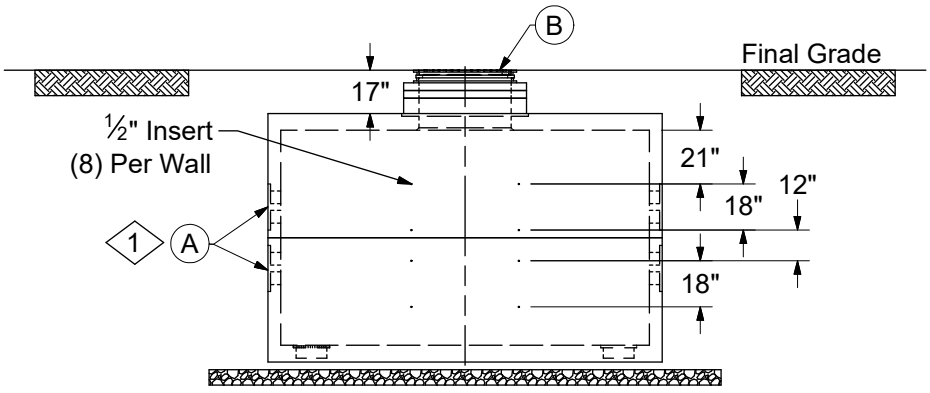
ILLINOIS ONLY



Top View



End Views



Side View

REV	DATE	ENG	DESCRIPTION
3	01/01/24	JMW	Converted to new format
2	12/12/12	DDG	

CONSTRUCTION NOTE(s):

1. Weights are as follows: Top Section - 14,375 lbs., Bottom Section - 15,075 lbs., Total 29,450 lbs.

DCS #	DESCRIPTION
32 21 04 01	5-5/8" Setting Depth
32 21 04 02	10" Setting Depth

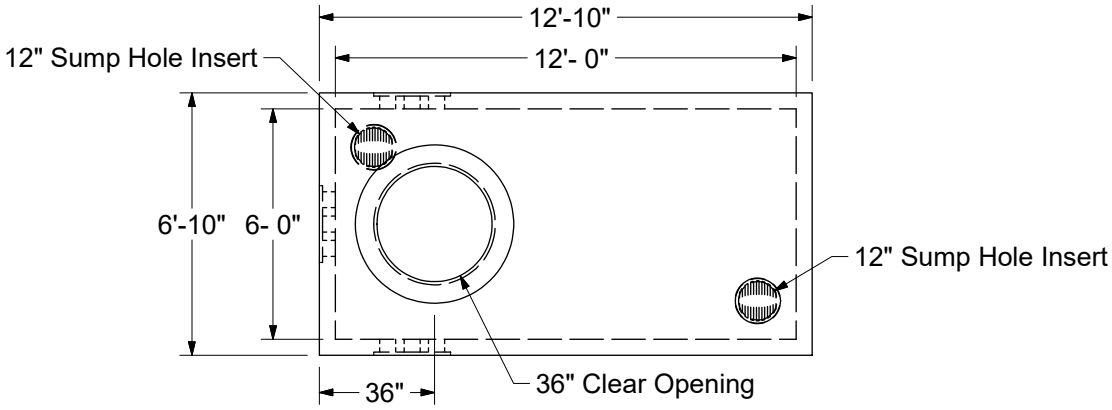
	ITEM	STK / DCS #	DESCRIPTION 32 21 04 **	01	02
1	A	12 06 223	Manhole - Top, Precast Concrete (Type 38Y- Roof A)	1	1
		12 06 224	Manhole - Bottom, Precast Concrete (Type 38Y- Roof A)	1	1
	B	**33 12 02 01**	Manhole Frame and Cover - 32" Dia. x 5-5/8" Deep	1	-
		33 12 02 02	Manhole Frame and Cover - 32" Dia. x 10" Deep	-	1

DESIGN NOTE(s):

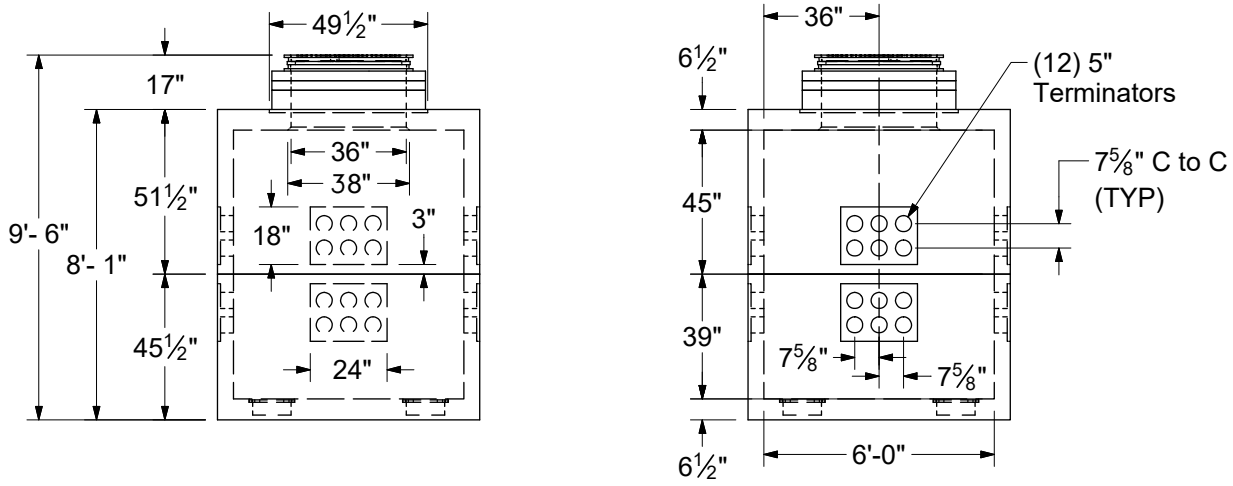
2. Traffic Rated Design - H-20 16,000 pounds wheel load.

REV	DATE	ENG	DESCRIPTION
3	01/01/24	JMW	Converted to new format
2	12/12/12	DDG	

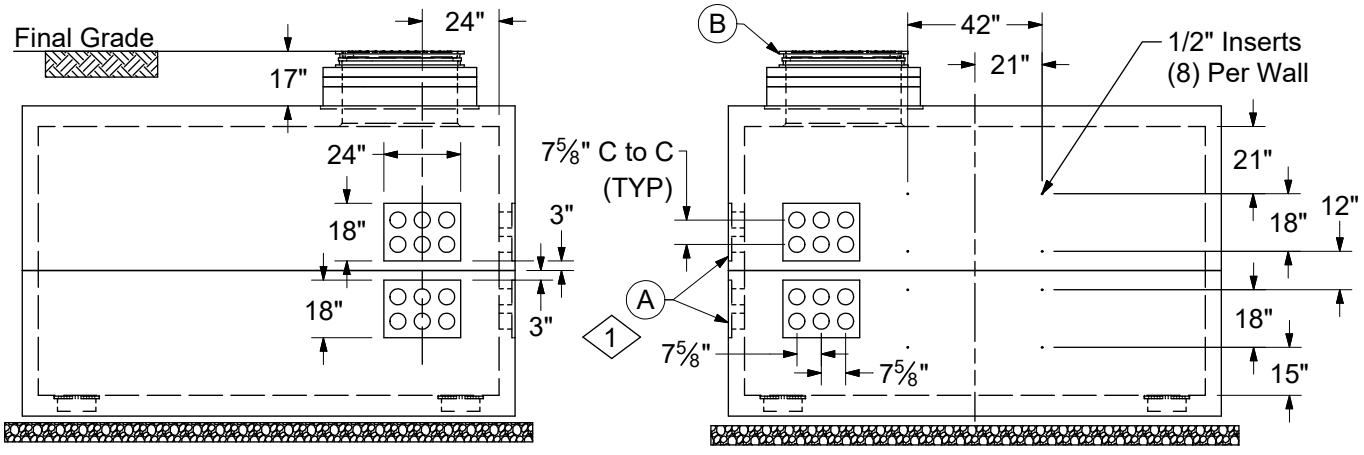
ILLINOIS ONLY



Top View



End Views



Side Views

REV	DATE	ENG	DESCRIPTION
3	01/01/24	JMW	Converted to new format
2	12/12/12	DDG	

CONSTRUCTION NOTE(s):

1. Weights are as follows: Top Section - 14,375 lbs., Bottom Section - 15,075 lbs., Total - 29,450 lbs.

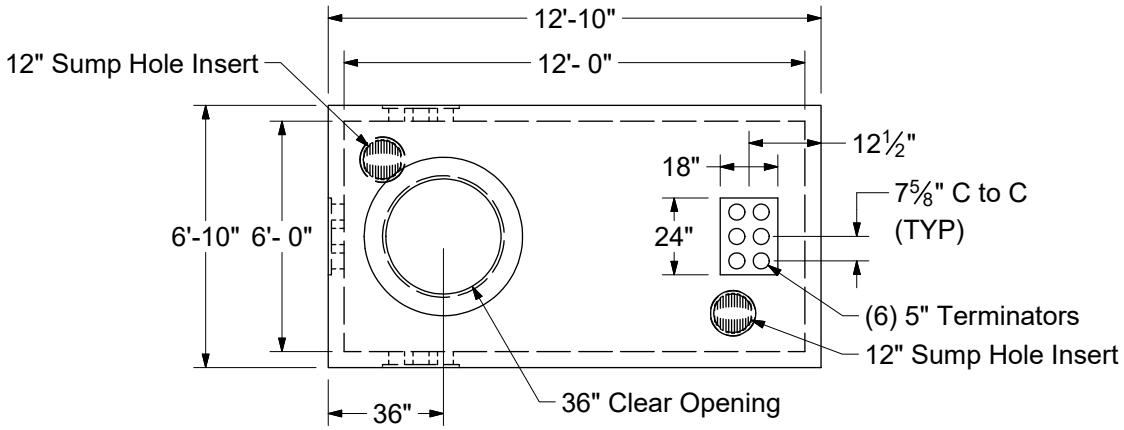
DCS #	DESCRIPTION
32 21 05 01	5-5/8" Setting Depth
32 21 05 02	10" Setting Depth

	ITEM	STK / DCS #	DESCRIPTION 32 21 05 **	01	02
1	A	12 06 225	Manhole - Top, Precast Concrete (Type 38Y- J4 Roof A)	1	1
		12 06 226	Manhole - Bottom, Precast Concrete (Type 38Y- J4 Roof A)	1	1
	B	**33 12 02 01**	Manhole Frame and Cover - 32" Dia. x 5-5/8" Deep	1	-
		33 12 02 02	Manhole Frame and Cover - 32" Dia. x 10" Deep	-	1

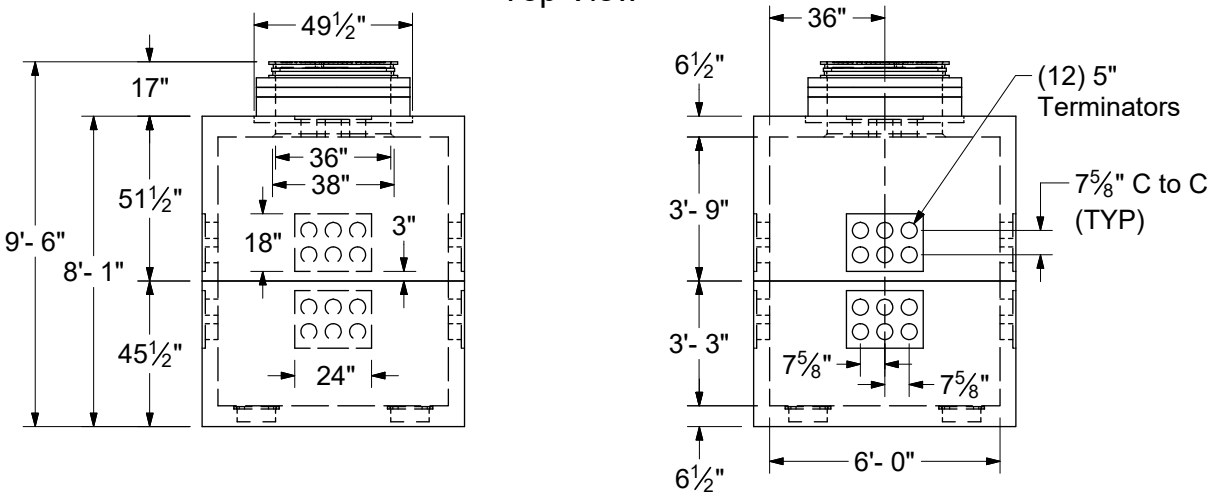
DESIGN NOTE(s):

2. Traffic Rated Design - H-20 16,000 pounds wheel load.

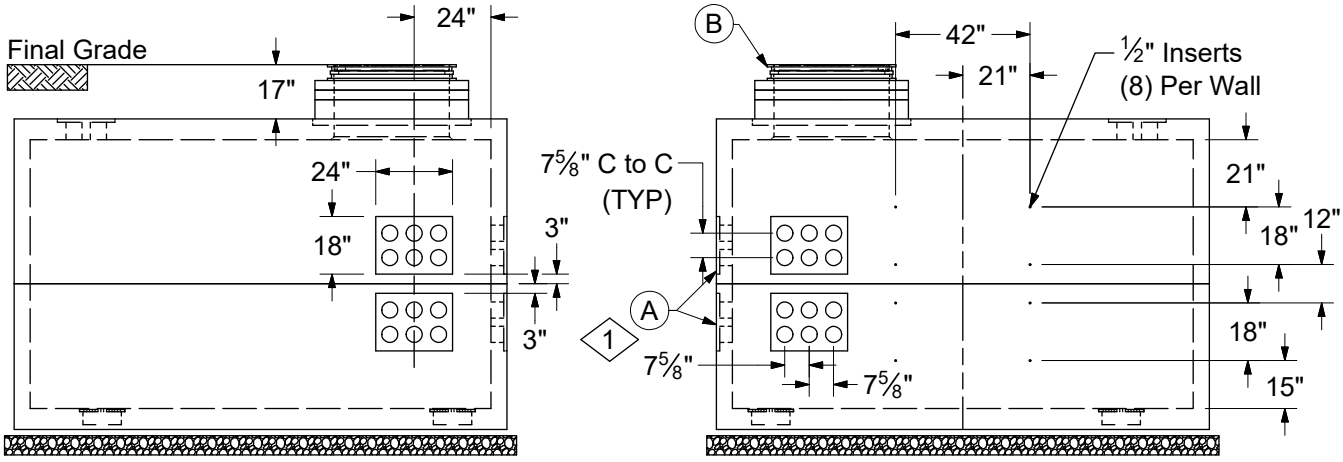
ILLINOIS ONLY



Top View



End Views



Side Views

REV	DATE	ENG	DESCRIPTION
3	01/01/24	JMW	Converted to new format
2	12/12/12	DDG	

CONSTRUCTION NOTE(s):

1. Weights are as follows: Top Section - 14,375 lbs., Bottom Section - 15,075 lbs., Total - 29,450 lbs.

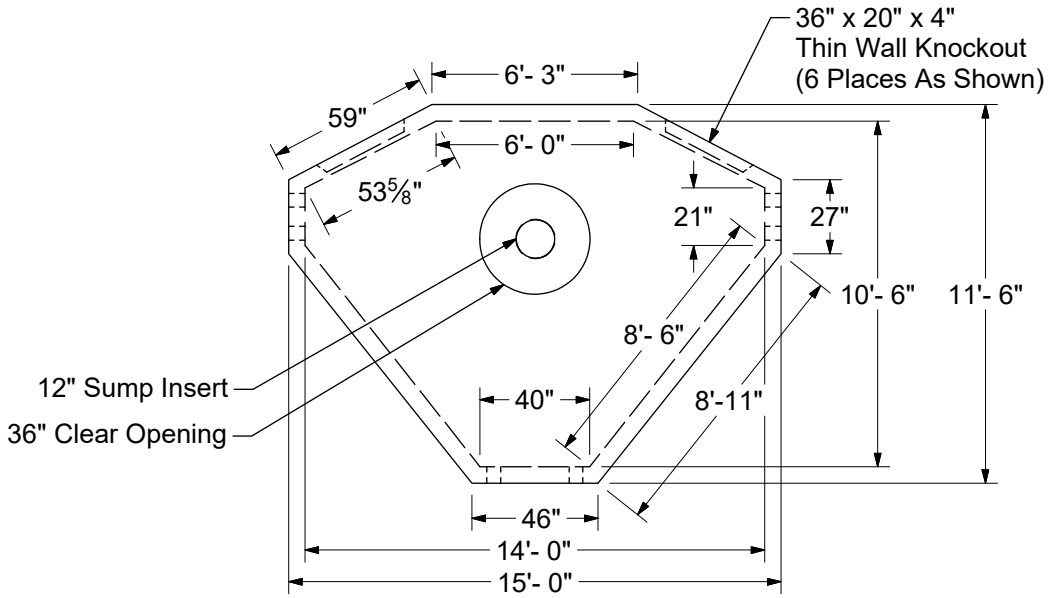
DCS #	DESCRIPTION
32 21 06 01	5-5/8" Setting Depth
32 21 06 02	10" Setting Depth

	ITEM	STK / DCS #	DESCRIPTION 32 21 06 **	01	02
1	A	12 06 227	Manhole - Top, Precast Concrete (Type 38Y- J4 Roof D)	1	1
		12 06 228	Manhole - Bottom, Precast Concrete (Type 38Y- J4 Roof D)	1	1
	B	**33 12 02 01**	Manhole Frame and Cover - 32" Dia. x 5-5/8" Deep	1	-
		33 12 02 02	Manhole Frame and Cover - 32" Dia. x 10" Deep	-	1

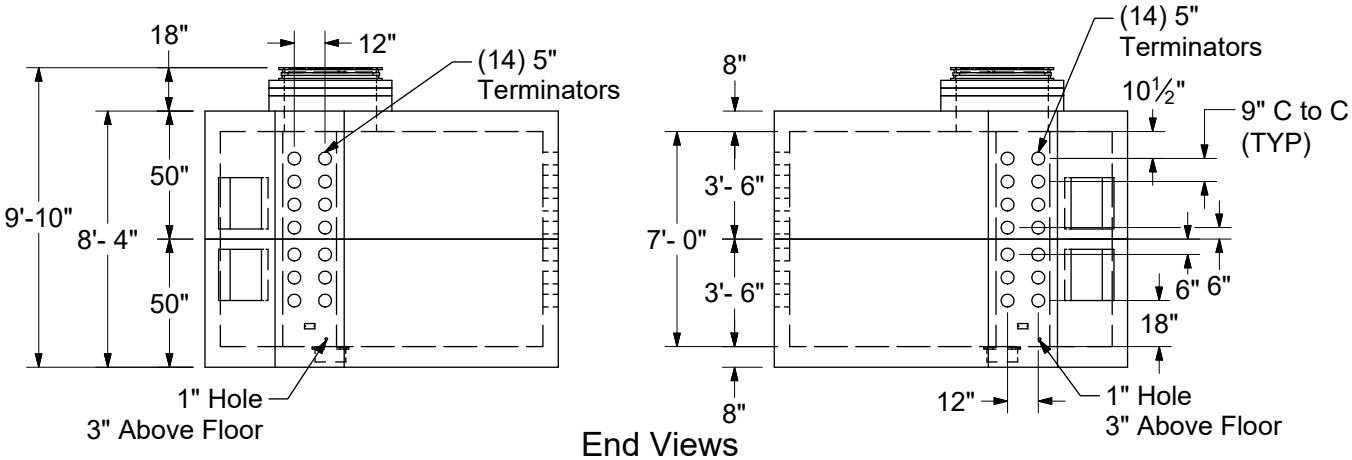
DESIGN NOTE(s):

2. Traffic Rated Design - H-20 16,000 pounds wheel load.

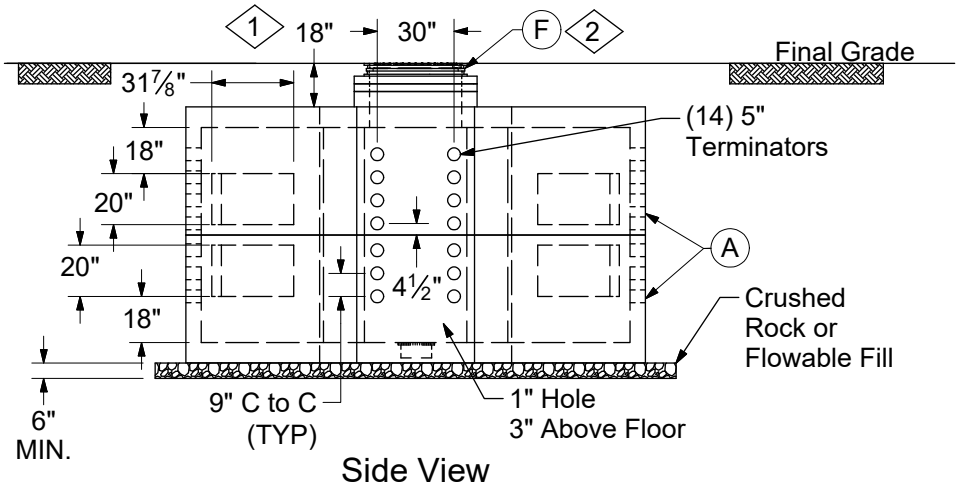
REV	DATE	ENG	DESCRIPTION
3	01/01/24	JMW	Converted to new format
2	12/12/12	DDG	



Top View



End Views



Side View

DISTRIBUTION
CONSTRUCTION STANDARDS

REV	DATE	ENG	DESCRIPTION
10	01/01/24	JMW	Converted to new format
9	04/23/14	EJB	

CONSTRUCTION NOTE(s):

1. Preferred setting depth is 18" as shown. Minimum setting depth is 12" and maximum is 60".

2. Preferred collar configuration is one 6" and two 3" for 12" thickness. The 3" necks are required on all manholes and shall be the top two collars. Add the required necks so that frame and cover are at final grade. 3" thick collar is Stock #12 06 062 and 6" thick collar is Stock #12 06 063.

3. Weights are as follows: Top Section - 21,609 lbs., Bottom Section - 22,305 lbs., Total - 43,914 lbs.

DCS #	DESCRIPTION
32 22 01 01	18" Setting Depth
32 22 01 02	60" Setting Depth

	ITEM	STK / DCS #	DESCRIPTION 32 22 01 **	01	02
	A	12 06 237	Manhole - Top, Precast Concrete	1	1
		12 06 238	Manhole - Bottom, Precast Concrete	1	1
	B	98 00 006	Concrete - 2 Sack (C.Y.)	14	14
	C	12 51 156	Coupling - Conduit, 5" Plastic (AVG.)	26	26
	D	19 04 327	Grate - 14"	1	1
	E	**33 11 ** ****	Wingwall Bays	1	1
	F	**33 12 01 01**	Frame and Cover 36" Dia. x 18" Deep	1	-
		33 12 01 02	Frame and Cover 36" Dia. x 60" Deep	-	1
	G	98 00 014	Crushed Rock (C.Y.)	2	2
	H	12 53 017	Shield - Duct, 3" thru 6"	1	1
6	I	12 56 113	Cable Mounting Arm - 14"	#	#
6	J	12 56 112	Cable Mounting Arm - 18"	#	#
6	K	12 56 114	Cable Mounting Arm - 7-1/2"	#	#
@	L	12 56 125	J Hook - 5"	#	#
@	M	**33 20 03 01**	Grounding System, 3-Way Manhole	1	1
@			Op Code, Excavation (Mach.) (C.Y.)	46	65
@			Op Code, Backfilling (Mach.) (C.Y.)	12	28
@			Op Code, Tamping (S.F.)	124	124
@			Op Code, Surface Removal (S.F.)	124	124
@			Op Code, Surface Replacement (S.F.)	124	124
@			Op Code, Loading Out (C.Y.)	#	#

DESIGN NOTE(s):

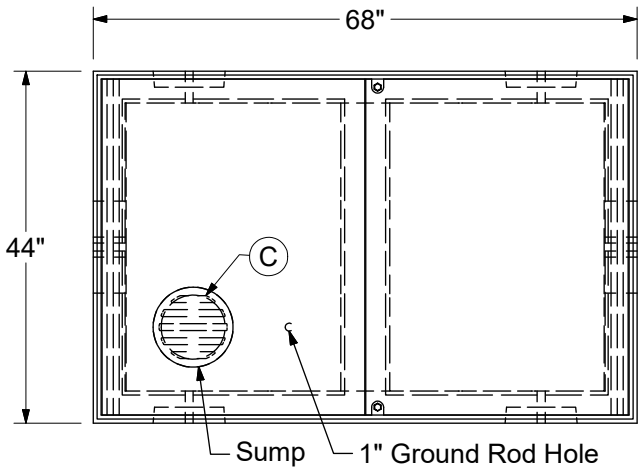
4. 4.586 Cubic yards of dirt removed per foot of excavation.

5. Add the required number of 6" concrete (Stock #12 06 063) and 3" concrete (Stock #12 06 062) necks so that the frame and cover are at final grade.

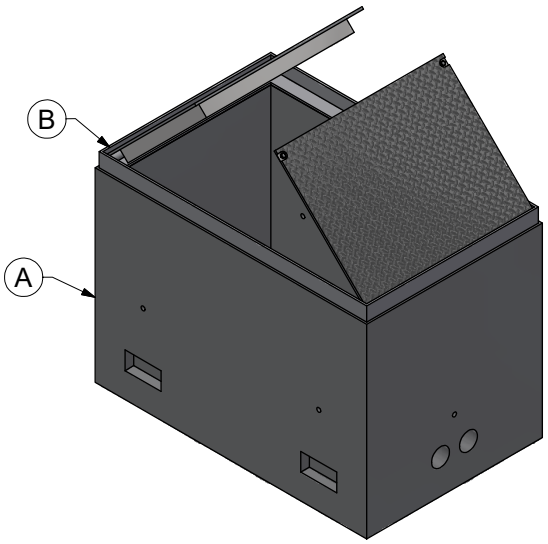
6. Manhole are equipped with the cable mounting racks. Add the required number of cable mounting arms to suspend the installed cables.

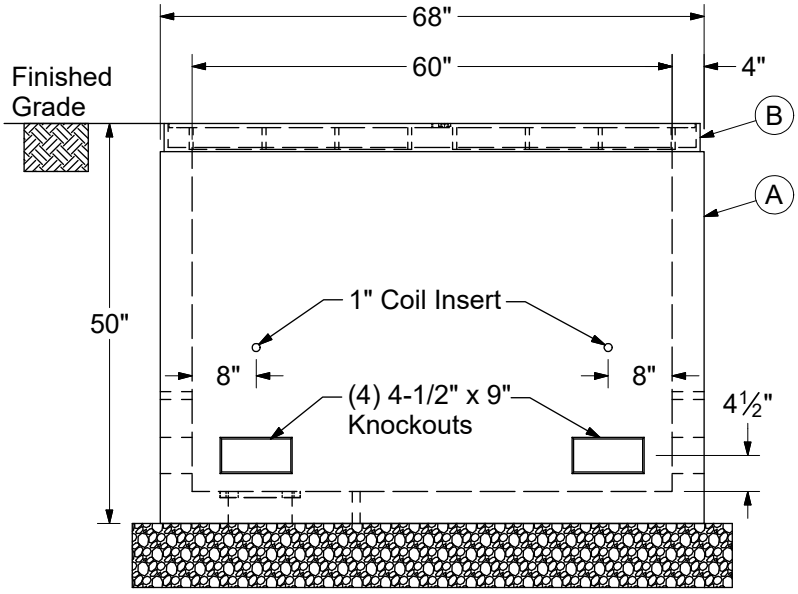
7. Traffic Rated Design - H-20 16,000 pounds wheel load.

REV	DATE	ENG	DESCRIPTION
10	01/01/24	JMW	Converted to new format
9	04/23/14	EJB	

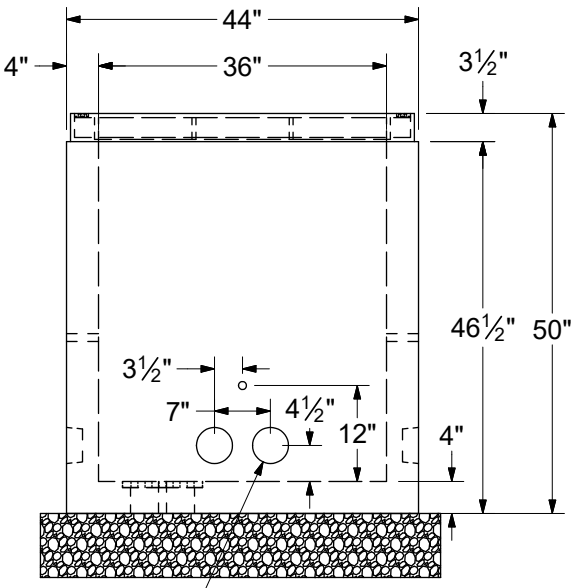


Top View





Side View



End View

CONSTRUCTION NOTE(S):

1. Grade adjustments shall be made using the riser to meet the existing slope. The vault floor shall always be installed level.

2. Excavate a pit approximately 5' W x 7' L and 4-½' D.
   Note: 6" riser (Stock #12 06 192) may be use if vault is set deeper.

3. Fill with crushed rock leveling the rock and tamping to firm wherever the earth has been distrubed.

4. Use swivel plates mounted to the threaded inserts with lag bolts to firmly fasten the plate against the wall.

REV	DATE	ENG	DESCRIPTION
11	01/01/24	JMW	Converted to new format
10	01/12/16	EJB	

CONSTRUCTION NOTE(S): (CONT.)

5. Place conduits into ducts or knockouts as required. Grout or mortar around ducts entering thru knockouts.

6. Replace and stabilize the earth around the vault and riser tamping to compaction.

7. Brick and mortar between riser and keyway in manhole to accommodate the grade slope. Seal the cover frame to riser with aquaseal. Install pulling eyes firmly into wall above conduits.

8. Weights are as follows: vault - 4,200 lbs., riser - 665 lbs., cover - 500 lbs.

9. Sod or resurface grade as necessary.

10. In Missouri residential developments, the contractor will install the vault conduit, See DCS **32 24 01 03**.

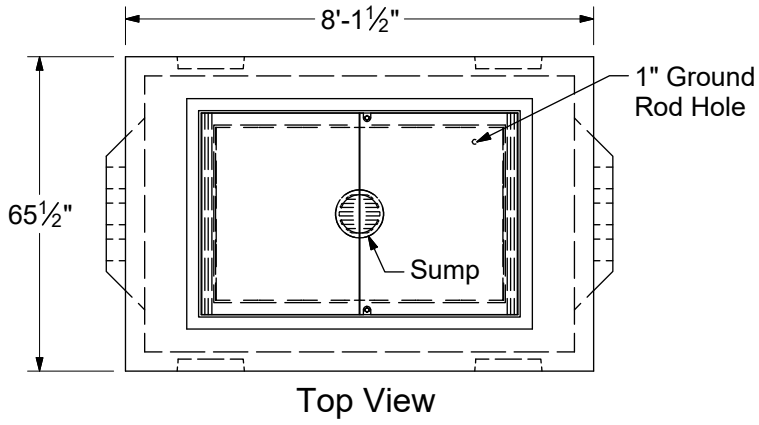
	ITEM	STK / DCS #	DESCRIPTION 32 24 01 **	01	03
	A	12 06 097	Vault - Precast 3' x 5'	1	-
	B	12 02 100	Cover - Vault Galv. Stl. 42" x 66"	1	-
	C	19 04 352	Grate - Sewer 10" Round	1	1
	D	98 00 014	Rock - Crushed (c.y.)	1	-
	E	23 59 076	Eye - Pulling (ea.)	2	2
	F	25 54 053	Compound - Sealer Aqua	1	-
	G	12 53 017	Shield - Duct, 3" thru 6"	#	#
@			Op Code, Mechanical Excavation (c.y.)	11	-
@			Op Code, Mechanical Backfill (c.y.)	2	-
@			Op Code, Air Tamping (s.f.)	32	-
@			Op Code, Install Conduit (m.h.)	50	-
@			Op Code, Knockout - Conduit Preparation	#	#
@			Op Code, Resurfacing	#	#

DESIGN NOTE(s):

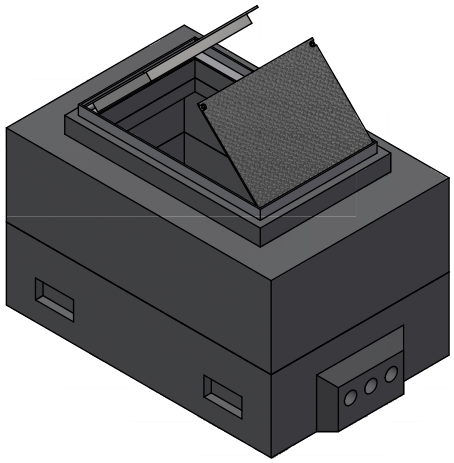
11. Vault has (2) 4" PVC couplings at each end. Use with #2 and 4/0 cable. Vault can accommodate up to 6 splices.

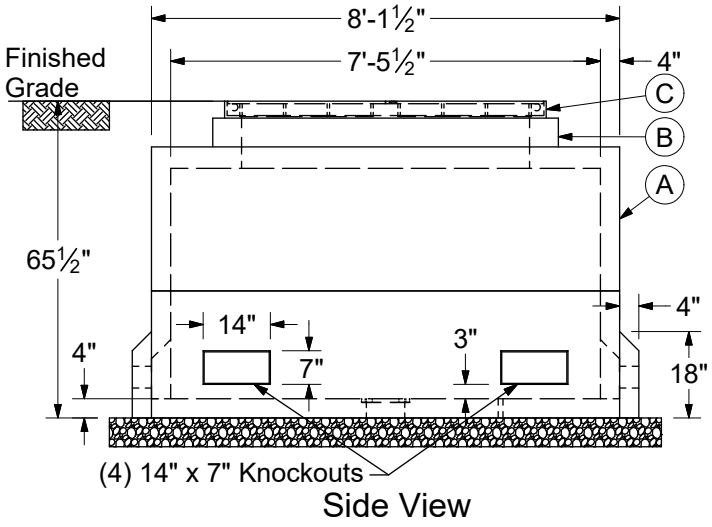
12. This vault can withstand occasional vehicular traffic loading and can be placed in between the street and sidewalk, in parking lots, and driveways. Rated H-15 12,000 pounds wheel load.

REV	DATE	ENG	DESCRIPTION
11	01/01/24	JMW	Converted to new format
10	01/12/16	EJB	

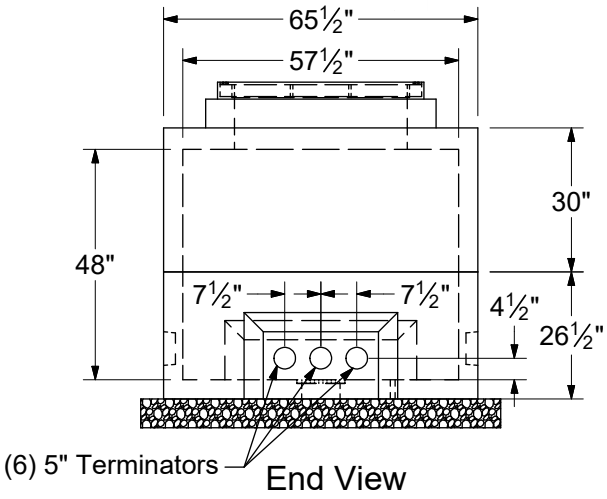


Top View





Side View



End View

CONSTRUCTION NOTE(s):

1. Grade adjustments shall be made using the riser to meet the existing slope. The vault floor shall always be installed level.
2. Excavate a pit approximately 6' W x 11' L and 6' D.
   Note: The 6" riser must be used on this vault.
3. Fill any overdig with crushed rock leveling the rock and tamping to firm whatever the earth has been distrubed.
4. Use swivel plates mounted to the threaded inserts with lag bolts to firmly fasten the plate against the wall.
5. Place conduits into ducts or knockouts as required. Grout or motar around ducts entering thru knockouts.
6. Replace and stabilize the earth around the vault and riser tamping to compaction.
7. Brick and motar between riser and keyway in manhole to accommodate the grade slope. Seal the cover frame to the riser with aquaseal. Install pulling eyes firmly into wall above conduits.
8. Weights are as follows: bottom - 4,560 lbs., top - 4,420 lbs., riser - 365 lbs., cover - 500 lbs.
9. Sod or resurface grade as neccessary.
10. In Missouri residential developments, the contractor will install the vault and conduits. See DSC # **32 24 02 03**.

	ITEM	STK / DCS #	DESCRIPTION 32 24 02 **	01	03
	A	12 06 096	Vault - Precast 4' x 8'	1	-
	B	12 06 192	Riser - Neck 6" Extension	1	-
	C	12 02 100	Cover - Vault Galv. Stl. 42" x 66"	1	-
	D	19 04 352	Grate - Sewer 10" Round	1	-
	E	98 00 014	Rock - Crushed (c.y.)	2	-
	F	23 59 076	Eye - Pulling	2	2
	G	25 54 053	Compound - Sealer Aqua	1	-
	H	12 53 017	Shield - Duct, 3: thru 6"	#	#
@			Op Code, Mechanical Excavation (c.y.)	20	-
@			Op Code, Mechanical Backfill (s.f.)	1	-
@			Op Code, Air Tamping (m.h.)	50	-
@			Op Code, Install Conduit	50	-
@			Op Code, Knockout - Conduit Preparation	#	#
@			Op Code, Resurfacing	#	#

DESIGN NOTE(s):

11. Vault has (3) 5" PVC couplings at each end. Use with 350 through 750 cable.

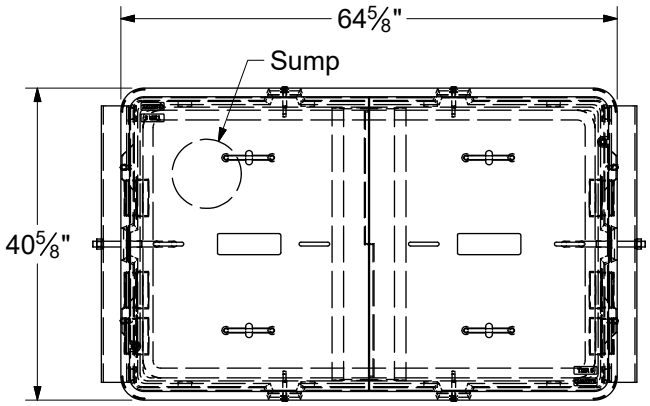
12. This vault can withstand occasional vehicular loading and can be placed in between the street and sidewalk, in parking lots, and driveways. Rated H-15 12,000 pounds wheel load.

REV	DATE	ENG	DESCRIPTION
10	01/01/24	JMW	Converted to new format
9	01/26/11	DDG	

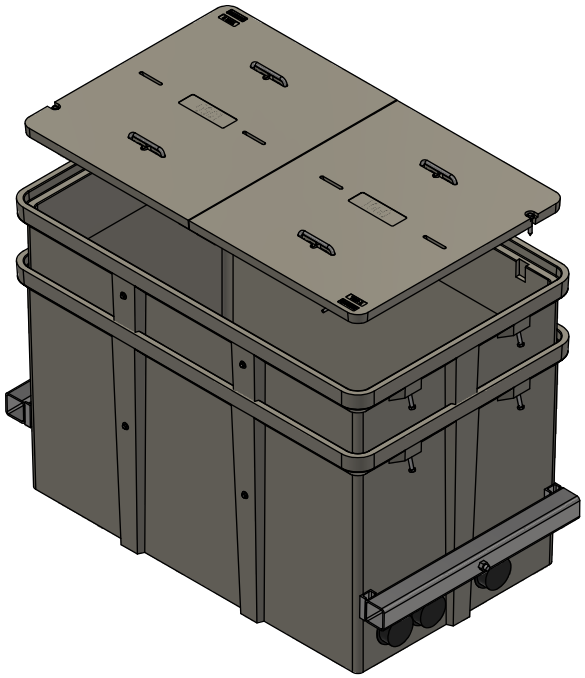
UNDERGROUND STRUCTURES

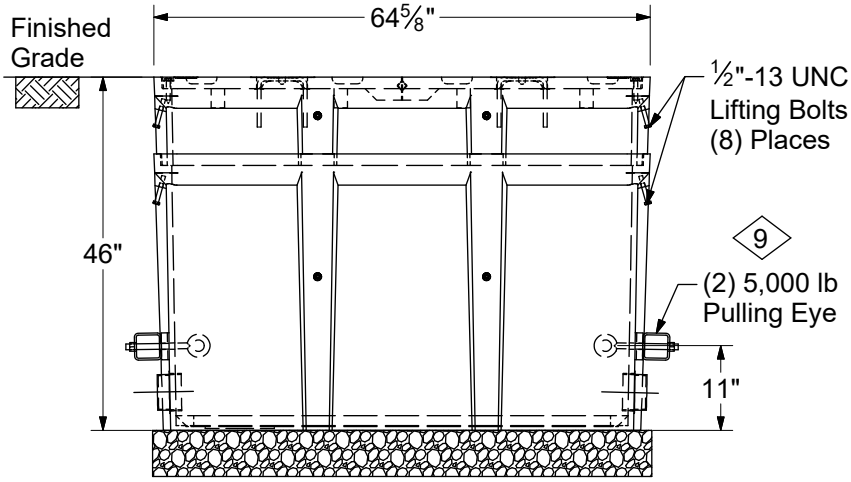
Fibercrete or Polyethylene Vault
3' x 5' x 3.5' Depth

32 24 03 **
15kV
1 of 2

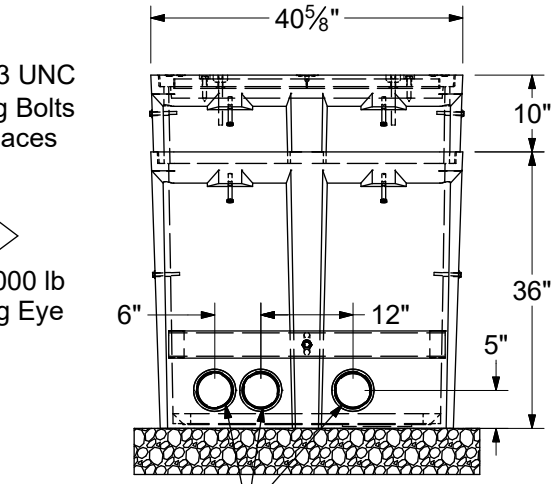


Top View





Side View



End View

DISTRIBUTION CONSTRUCTION STANDARDS

REV	DATE	ENG	DESCRIPTION
5	01/01/24	JMW	Converted to new format
4	06/26/18	JMW	

CONSTRUCTION NOTE(s):

1. Drawing illustrates Fibercrete vault. Polyethylene vault dimensions vary slightly.
2. Excavate and install vault at standard conduit depths on 10" base of 1" gravel.
3. Fill any overdig with crushed rock leveling the rock and tamping firm.
4. Install conduits in couplings or drill holes in desired conduit locations.
5. Replace and stabilize the earth around the vault tamping to compaction
6. Sod or resurface grade as necessary.

	ITEM	STK / DCS #	DESCRIPTION 32 24 03 **	01	02
	A	12 06 122	Vault - 3' x 5' - Fibercrete	1	-
9	B	12 06 259	Vault - 3' x 5' - Polyethylene	-	1
	C	98 00 14	Rock - Crushed (cy.)	1	1
	D	19 04 352	Grate - Sewer 10" Round	1	1
	E	12 53 017	Shield - Duct, 3" thru 6"	#	#
@			Op Code, Mechanical Excavation (cy.)	11	11
@			Op Code, Mechanical Backfill (cy.)	2	2
@			Op Code, Air Tamping (s.f.)	32	32
@			Op Code, Install Conduit (MH/10)	50	50
@		701	Op Code, Drill Hole in Vault	#	#
@			Op Code, Resurfacing	#	#

DESIGN NOTE(s):

7. Vault has (3) 4" couplings at each end. Use with #2 and 4/0 cable. Vault can accommodate up to 9 splices.

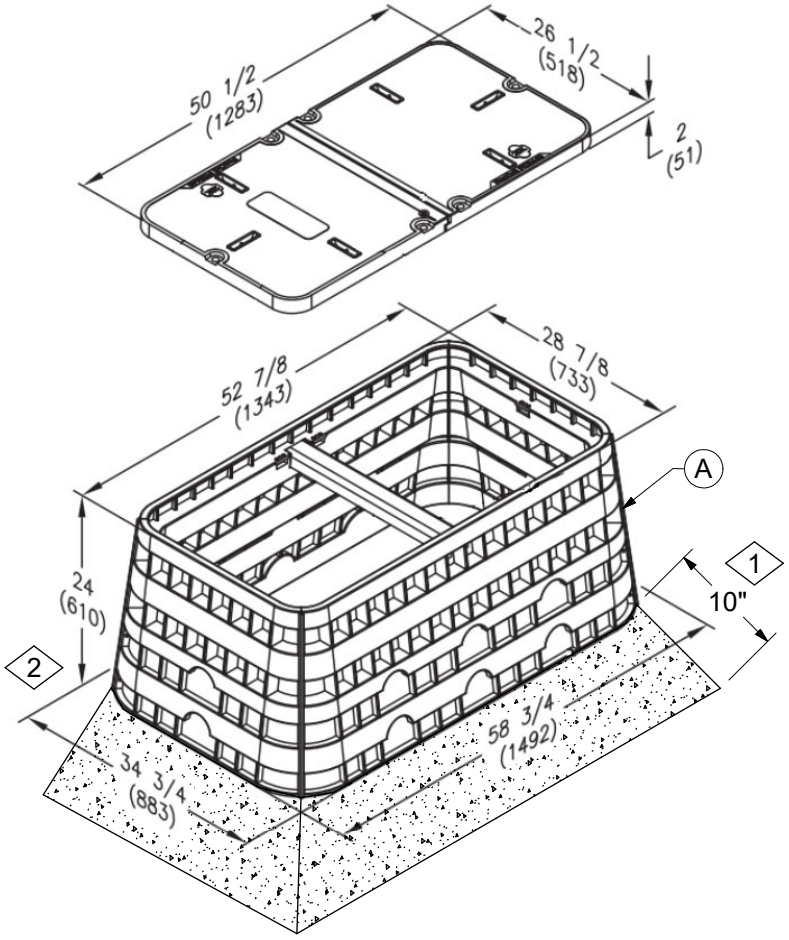
8. These vaults are intended for yards, terraces sidewalks, and other areas not subject to vehicular traffic. Non-Traffic Rated 5,000 pounds over 10" x 10" area.

◇9◇ Weight of Fibercrete vault is 1,136 lbs. Weight of polyethylene vault is 420 lbs. Use Polyethylene vault only when Fibercrete is too heavy to transport - such as on private property.

UNDERGROUND STRUCTURES

Polyethylene Splice Box
2' x 4' x 2' Depth

32 24 04 **
15kV
1 of 1



CONSTRUCTION NOTES(s):

1. Excavate and install box at standard conduit depths on 10 inch base of 1 inch gravel. Box lid located approx. 18" below grade.

2. Install conduits thru knockouts, or bore holes in the box. Seal conduits at box interface.

3. After installing cable, place lid on box, partially backfill and tamp soil.

4. Place electronic marker at the center inside of the box and complete backfill. IMPORTANT: Marker must be laid flat.

5. In Missouri residential developments, the contractor will install the splice box and conduit.

6. Conduit end to end inside box 45" min.

	ITEM	STK / DCS #	DESCRIPTION 32 24 04 **	01
	A	12 06 105	Box, Cable, 2' x 4' x 2' Deep	1
	B	49 05 519	Marker, Electronic	1
	C	98 00 014	Rock Crushed	-
@		701	Op Code, Drill Hole In Box	#

DESIGN NOTES(s):

7. Splice box is intended to be buried. It can be installed at grade. Non-traffic Rated 5,000 lbs.

8. Splice box has (2) 4" cutouts in each end and (6) in each side. Use with single phase #2 and 4/0 cable. Splice box can accommodate up to 2 splices.

DISTRIBUTION CONSTRUCTION STANDARDS

REV	DATE	ENG	DESCRIPTION
1	01/01/24	JMW	Converted to new format
0	01/11/13	DDG	

NOTES