

CITY OF AUSTIN ELECTRIC UTILITY DEPARTMENT



PURCHASE SPECIFICATION

FOR

MANHOLE, CONCRETE, PRE-CAST, 36INCH, 48INCH

DATE	PREPARED BY	ISSUANCE/REVISION	APPROVAL
			PROCESS SUPV. / MATERIALS SUPV.
9/2/11	Arthur Gonzalez	Revision	
7/21/20	Julius Heslop	Revision	
7/29/20	Julius Heslop	Revision	
12/29/21	Julius Heslop	Revision	

<i>REASON FOR REVISION</i>	<i>AFFECTED PARAGRAPHS</i>
9/2/11- Added burial depth criteria and reference to new drawings. Also added applicable standards.	3.0, 4.0, and Attachment 1
7/21/20-Added to applicable standards, design loading, vendor physical requirements.	3.0, 4.0, and 5.0
7/29/20- Added drawings	Attachment 1
12/29/21 Updated drawings	Attachment 1

This specification, until rescinded, shall apply to each future purchase and contract for the commodity described herein.
Retain for future reference.

**AUSTIN ENERGY
PURCHASE SPECIFICATION
FOR
MANHOLE, CONCRETE, PRE-CAST, 36INCH, 48INCH**

1.0 SCOPE

- 1.1 The Electric Utility Department of the City of Austin hereinafter referred to as Austin Energy or AE. AE requires a qualified Vendor to supply precast concrete manholes. The precast concrete manholes shall be engineered and fabricated to provide a structurally safe design.

2.0 CLASSIFICATION

- 2.1 The precast concrete manholes will be used by AE for the underground transmission, distribution, and communication systems.

3.0 APPLICABLE STANDARDS

The Manholes shall conform to or exceed applicable requirements of the following standards and codes:

- 3.1 ASTM A-615 Grade 60 for Rebar
- 3.2 ASTM A-185 Grade 65 for Mesh
- 3.3 ASTM C-857 Minimum Structural Design Loading for Underground Precast Concrete Utility Structures
- 3.4 AASHTO HS 20 Loading
- 3.5 ACI 318 for Structural Concrete
- 3.6 ASTM C150 for Portland Cement
- 3.7 ASTM C478 for Standard Specification for Precast Reinforced Concrete Manhole Sections
- 3.8 ASTM C858 Standard Specification for Underground Precast Concrete Utility Structures

4.0 DESIGN LOADS

- 4.1 The precast concrete manholes (Attachment I) shall be rated for AASHTO HS-20 loading. Traffic (live load= 16,000lbs) shall approach the structure from any direction.
- 4.2 The precast concrete manholes shall be designed to be installed with the top of the vault to have a burial depth 3 feet or 5 feet below grade, whichever is specified.
- 4.3 Manholes designed for a burial depth of 3 feet require access openings of 36" in diameter.
- 4.4 Manholes designed for a burial depth of 5 feet require access openings of 48" in diameter.

5.0 PHYSICAL REQUIREMENTS

- 5.1 The Vendor shall fabricate precast concrete manholes in accordance with Attachment I.
- 5.2 The precast concrete manhole windows shall be a non-reinforced concrete membrane. The dimensions of the windows and thickness of the non-reinforced concrete membrane shall be as shown on the attached drawings (Attachment I).
- 5.3 Minimum compressive strength of concrete shall not be less than 4,000 psi in 28 days
- 5.4 The concrete cover for reinforcement shall be provided as shown in the attached drawings (Attachment I). If not noted on drawings, the concrete cover for reinforcement shall be 1.5 inches minimum for main reinforcing bars and $\frac{3}{4}$ inch for stirrups and ties.
- 5.5 The concrete finish shall be free of rock pockets and honeycombed areas.
- 5.6 The interior walls, ceiling and exterior surfaces exposed shall be smooth.
- 5.7 Knockout and duct openings shall be beveled on the exterior surface.
- 5.8 Inserts shall be provided as shown in the attached drawings (Attachment 1)

6.0 VENDOR REQUIREMENTS

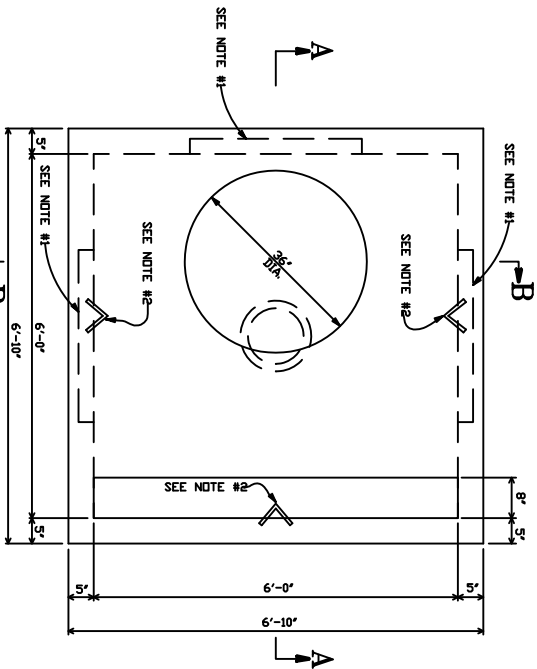
- 6.1 The Vendor shall supply all vehicles, equipment and accessories required to safely lift and place the manhole in the excavation for the manhole at the AE job site.
- 6.2 The Vendor shall present AE with the engineering data for the manholes, certified by the Vendor's registered professional engineer. The certified engineering data shall state the structural integrity for the manhole configurations listed in Attachment I.

ATTACHMENT I

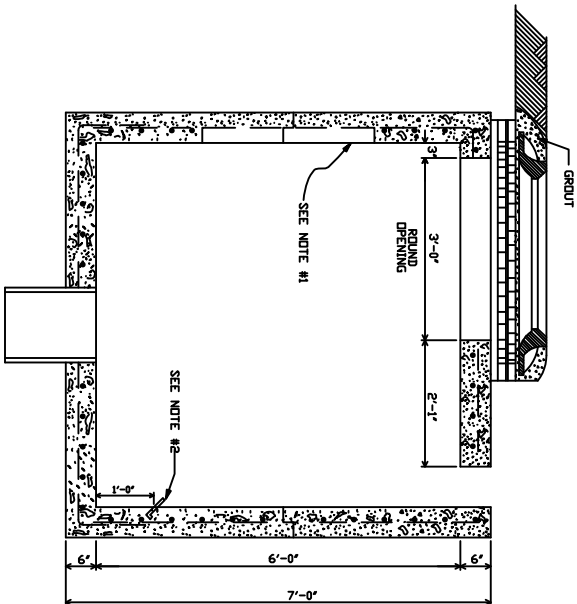
AUSTIN ENERGY PRECAST CONCRETE MANHOLE DRAWINGS

DRAWING NUMBERS:

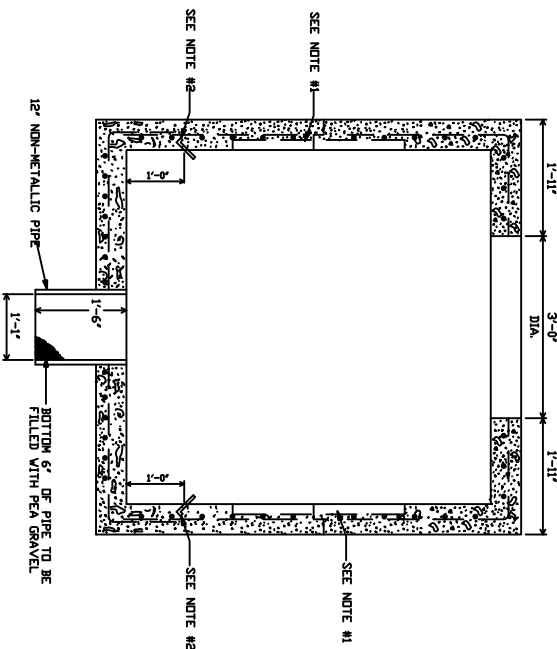
7B 1098 1, 5 X 5, designed for 3 ft burial depth
7B 1098 2, 6 X 6, designed for 3 ft burial depth
7B 1098 3, 12 X 12, designed for 3 ft burial depth
7B 1098 4, 6 X 12 X 7, designed for 3 ft burial depth
7B 1098 5, 6 X 12 Center Section, designed for 3 ft burial depth
7B 1098 6, 4 X 4, designed for 3 ft burial depth
7B 1098 7, 6 X 8, designed for 3 ft burial depth
7B 1098 8, 5 X 5, designed for 5 ft burial depth
7B 1098 9, 6 X 6, designed for 5 ft burial depth
7B 1098 10, 12 X 12, designed for 5 ft burial depth
7B 1098 11, 6 X 12 X 7, designed for 5 ft burial depth
7B 1098 12, 6 X 12 Center Section 2 ft Height, designed for 5 ft burial depth
7B 1098 13, 6 X 12 Center Section 2.5 Ft Height, designed for 5 ft burial depth
7B 1098 14, STD 6X12 Manhole
7B 1098 15, STD 12X12 Manhole
7B 1098 16, STD 6X8X5H Cable Vault



PLAN



SECTION A-A



SECTION B-B

NOTES:

1. INSTALL 34" X 34" WINDOW CENTERED IN WALL.
2. PULLING IRONS (3) REQUIRED.
3. SHALL BE DESIGNED FOR A BURIAL DEPTH OF 3 FEET BELOW GRADE OF TOP OF VAULT.
4. SHALL BE RATED FOR AASHTO HS 20 LOADING.

REV.		DATE	DESCRIPTION	DESIGNED	CHECKED	BRANN	CHECKED	CLAY	VIA	NO	ENGR.	APPROV.	CONSTR.	APPROV.
A			ORIGINAL DRAWING											
7B		1098	2	A										

CITY OF AUSTIN, TEXAS
ELECTRIC DEPARTMENT
SUBSTATION ENGINEERING & DESIGN



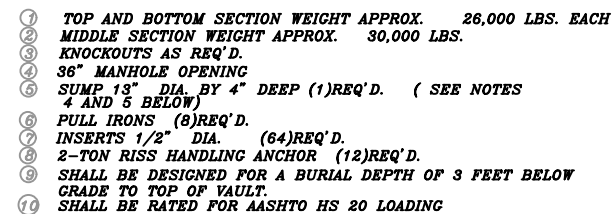
CITY OF AUSTIN
PRECAST & BOX TULLBOX

TITLE

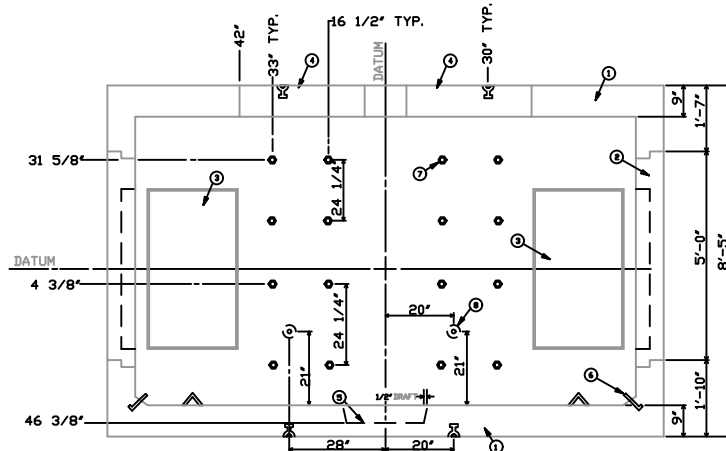
DATE: JULY 1993

SCALE: INT'S

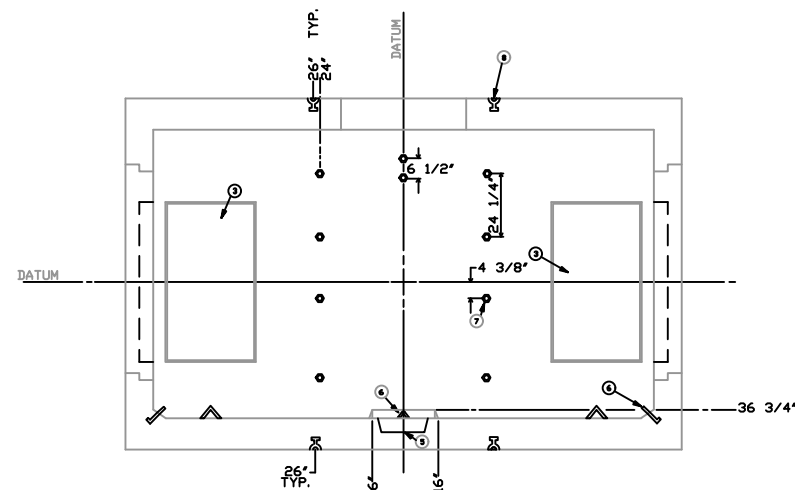
DRAWING NUMBER: 7B 1098 2 A



- FOR INFORMATION ONLY -



SECTION "A-A"



SECTION "B-B"

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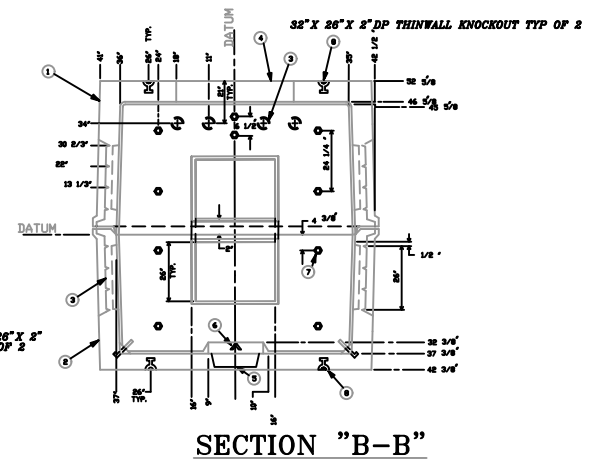
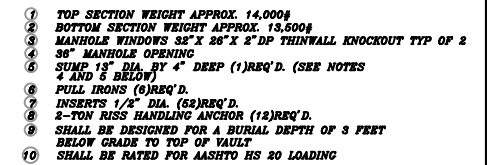


ELECTRIC SERVICE DELIVERY SUBSTATION ENGINEERING

TITLE :

CITY OF AUSTIN
12' X 12'
PRECAST MANHOLE

MASTER NO.	SCA
	NT
FILE NAME	
7B-1098-3B	
DRAWING NUMBER	
7B 1098 3	

[illegible]

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ELECTRIC SERVICE DELIVERY
SUBSTATION ENGINEERING

TITLE : CITY OF AUSTIN
CITY OF AUSTIN STANDARD
6' X 12' X 7' PRECAST MANHOLE

MASTER NO.	SCALE
	N.T.S.
FILE NAME	
DRAWING NUMBER	
7B 1098 4	



– FOR INFORMATION ONLY –



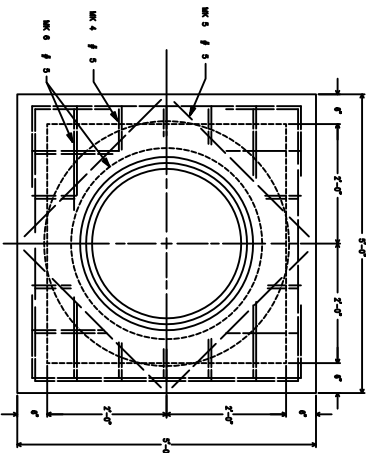
DETAILS

SECTION "B-B"

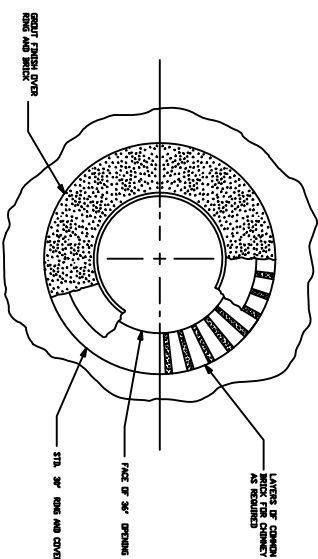
[illegible]

The diagram shows a circular cross-section of a cable. It consists of a central conductor (a small circle) surrounded by a dielectric layer (a ring). This is followed by a braided shield (a ring with diagonal lines) and an outer jacket (a thick outer ring). A vertical line passes through the center, with a dashed line segment in the middle. Arrows labeled 'A' point outwards from the top and bottom of the central conductor.

SCALE: 1"=1'-0"

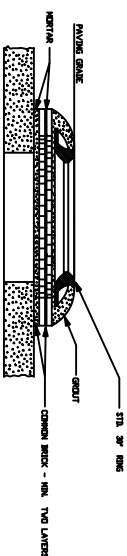


SCALE: 1"=1'-0"



SCALE 3/4"=1'-0"

RING AND COVER TO BE DUCTILE STEEL.



SCALE 3/4"=1'-0"

1. USE 30" TRAFFIC TYPE MA. ROAD AND COVER.
2. CUT AND ADJUST REINFORCING STEEL AS REQUIRED TO CLEAR CABLE ENTRANCE AND HANDLE OPENING.
3. INSTALL 2 TURNS OF #10 DIA. OF #4 BARE COPPER WIRE IN BOTTOM OF EXCAVATION AND COVER WITH 6 MIL. POLY. BEFORE PLACING CONCRETE.
4. SHALL BE DESIGNED FOR MIN. DEPTH OF 3 FEET BELOW GRADE TO TOP OF WALL.
5. SHALL BE RATED FOR MINSTO 15 TO 20 LADING.

SECTION A-A

SCALE: 1"=1'-0"

SCALE: 1"=1'-0"

ESTIMATED CONCRETE REQUIRED - 2.7 CU. YDS.

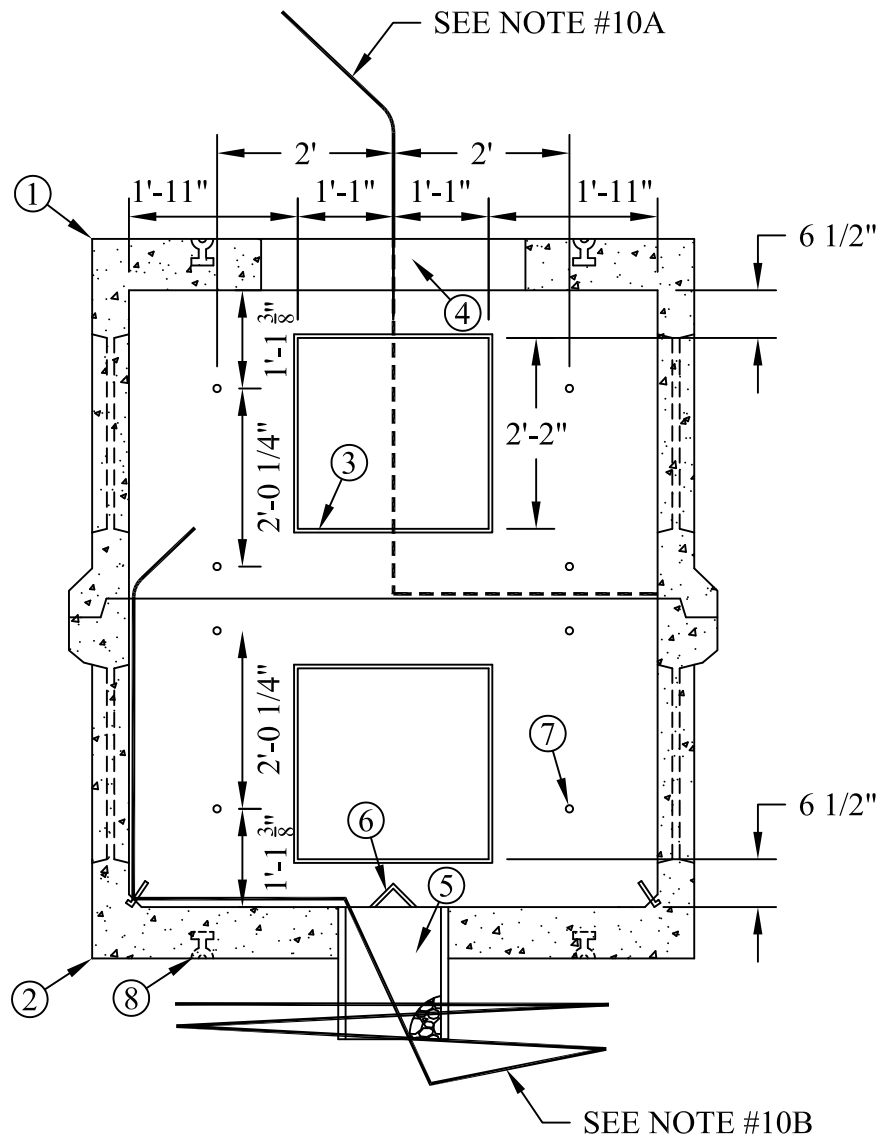
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POWER DELIVERY DIVISION
TRANSMISSION ENGINEERING

III

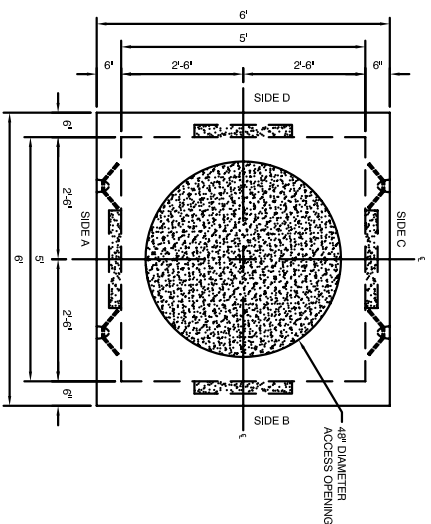
CITY OF AUSTIN
PRECAST 4' X 4' PULLBOX

ORDER NO.	SCALE
	AS SHOWN
FOR INFO	
7B 1098 6.DWG	
DRAWING NUMBER	
7B 1098 6	

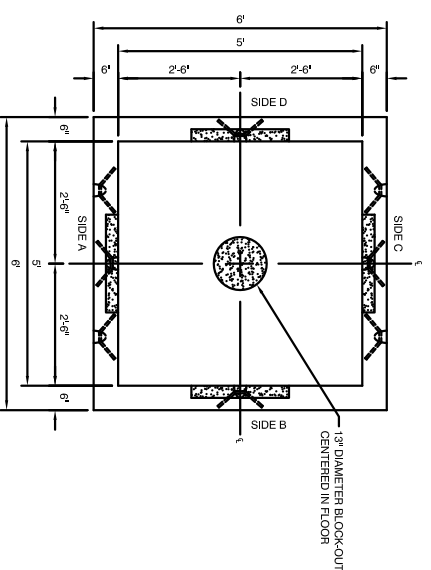


SEC B-B

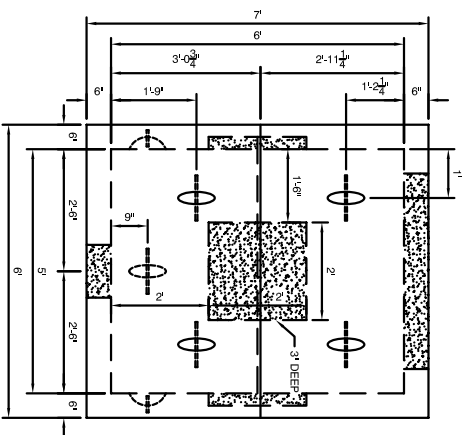
- ① TOP SECTION WEIGHT 16,400 LBS. (SEE NOTE 2)
- ② BOTTOM SECTION WEIGHT 16,175 LBS. (SEE NOTE 2)
- ③ KNOCKOUT (12) REQUIRED
- ④ 36" MANHOLE OPENING
- ⑤ 13" DIAMETER OPENING FOR SUMP. (SEE NOTE 4 & 5)
- ⑥ PULL IRONS (6) REQUIRED
- ⑦ INSERTS 1/2" DIAMETER (48) REQUIRED
- ⑧ 2 TON RISS HANDLING ANCHOR (12) REQUIRED
- ⑨ SHALL BE DESIGNED FOR A BURIAL DEPTH OF 3 FEET BELOW GRADE TO TOP OF VAULT
- ⑩ SHALL BE RATED FOR AASHTO HS 20 LOADING



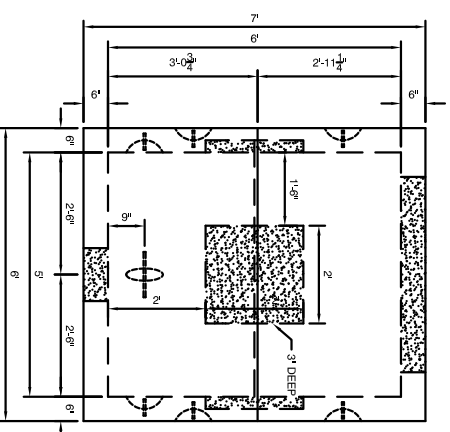
TOP VIEW



BOTTOM VIEW



SIDE A & C

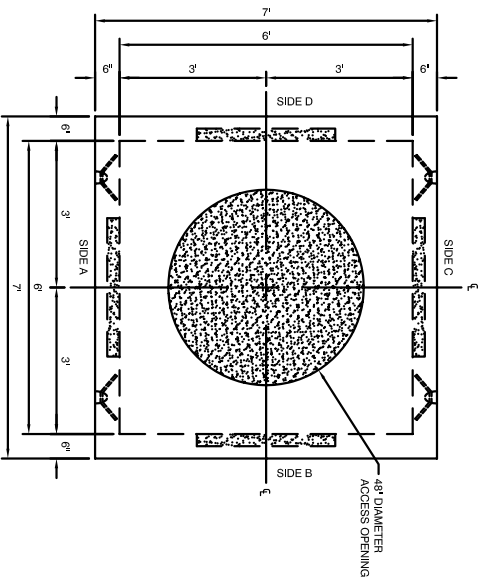


SIDE B & D

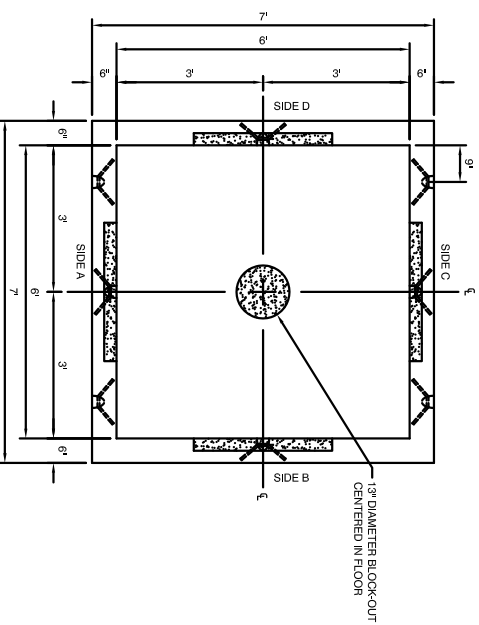
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 2. SHALL BE RATED FOR AASHTO HS 20 LOADING.



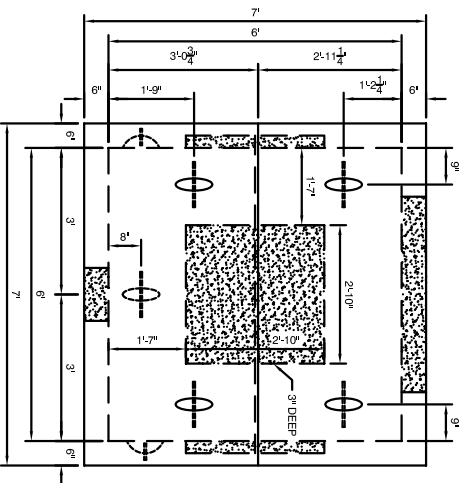
SCALE: 3/8"=1'-0"
5'-0" X 5'-0" X 6'-0"
MANHOLE



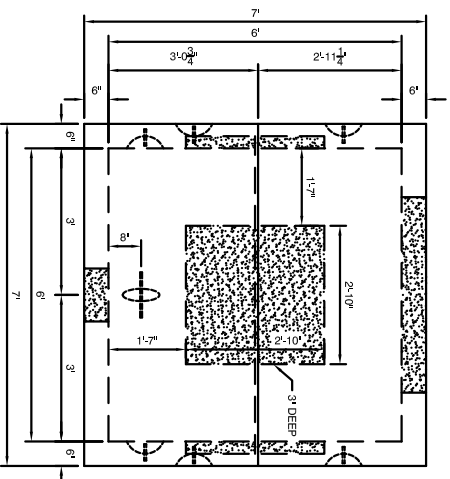
TOP VIEW



BOTTOM VIEW



SIDE A & C

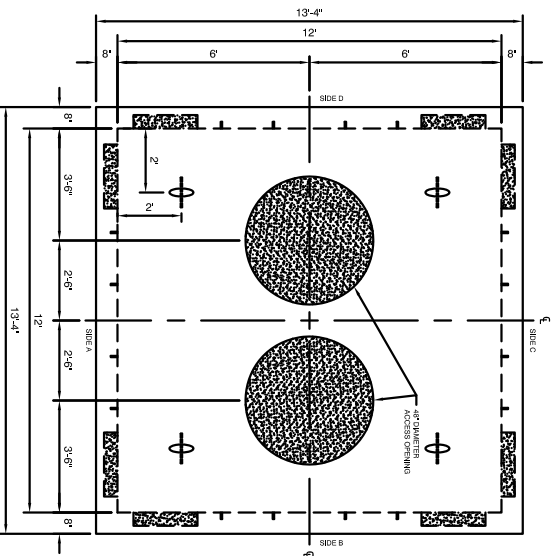


SIDE B & D

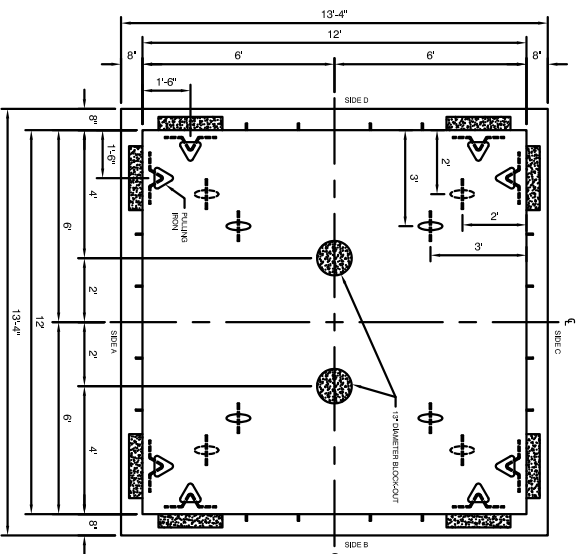
- NOTES:
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 2. SHALL BE RATED FOR AASHTO HS 20 LOADING.



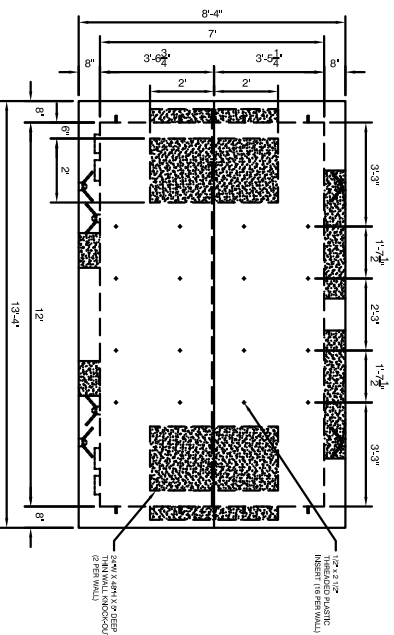
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6'-0" X 6'-0" X 6'-0"
MANHOLE



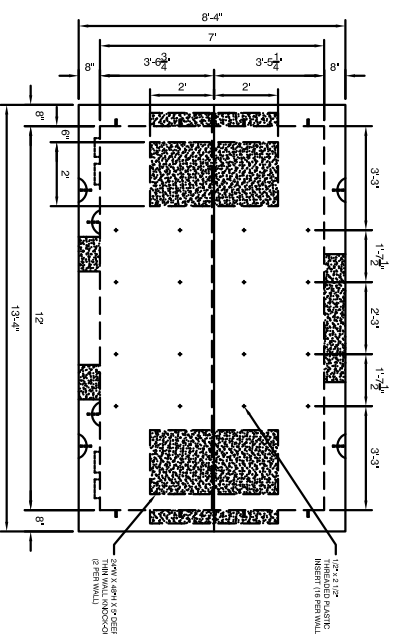
TOP VIEW



BOTTOM VIEW



SIDE A & C

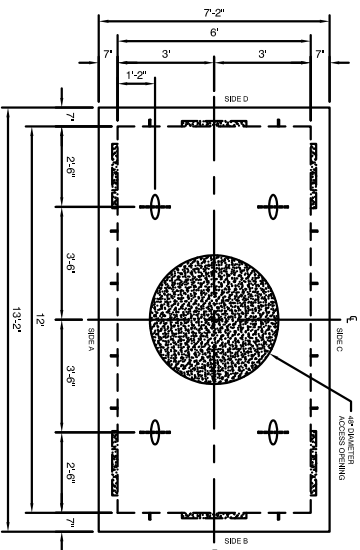


SIDE B & D

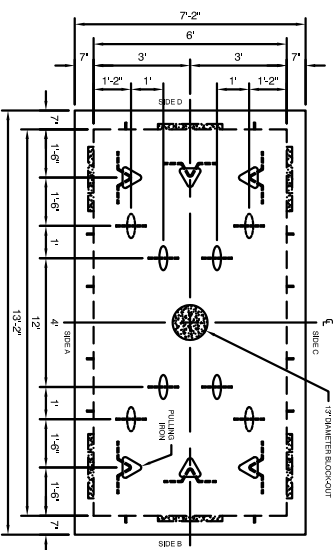
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 2. SHALL BE RATED FOR AASHTO HS 20 LOADING.



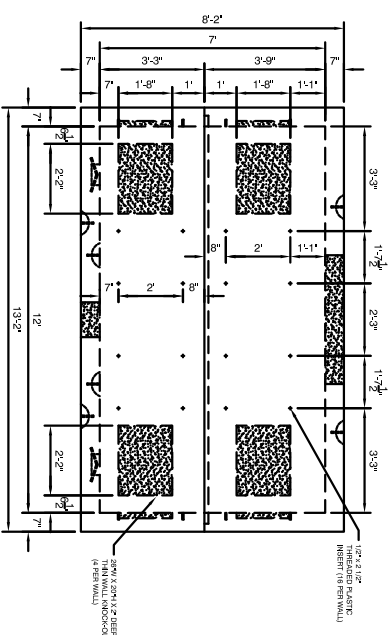
SCALE: 1/4"=1'-0"
12'-0" X 12'-0" X 7'-0"
MANHOLE



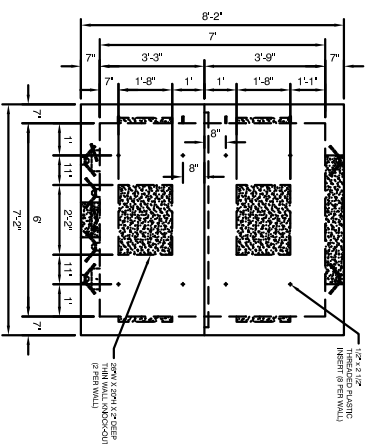
TOP VIEW



BOTTOM VIEW



SIDE A & C

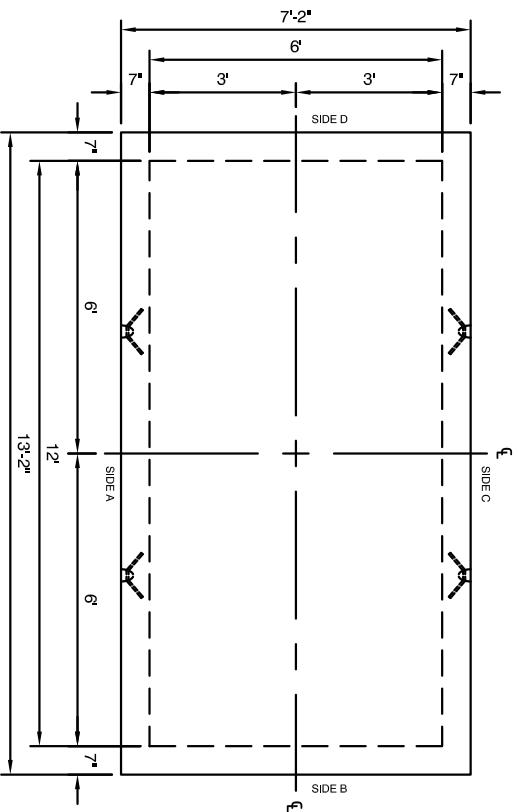


SIDE B & D

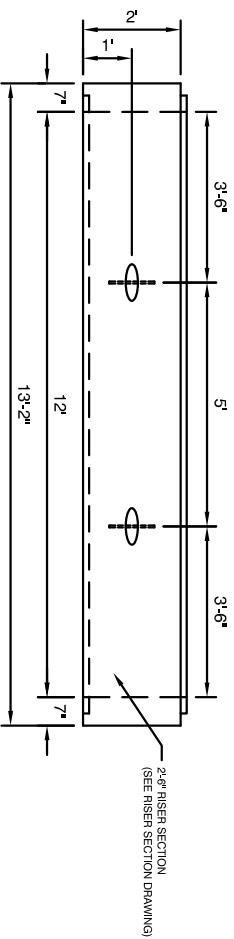
- NOTES:
1. SHALL BE DESIGNED FOR BURIAL DEPTH OF 5 FEET BELOW GRADE TO TOP OF VAULT.
 2. SHALL BE RATED FOR AASHTO HS 20 LOADING.



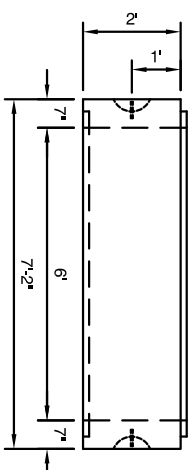
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MANHOLE



TOP VIEW



SIDE A & C

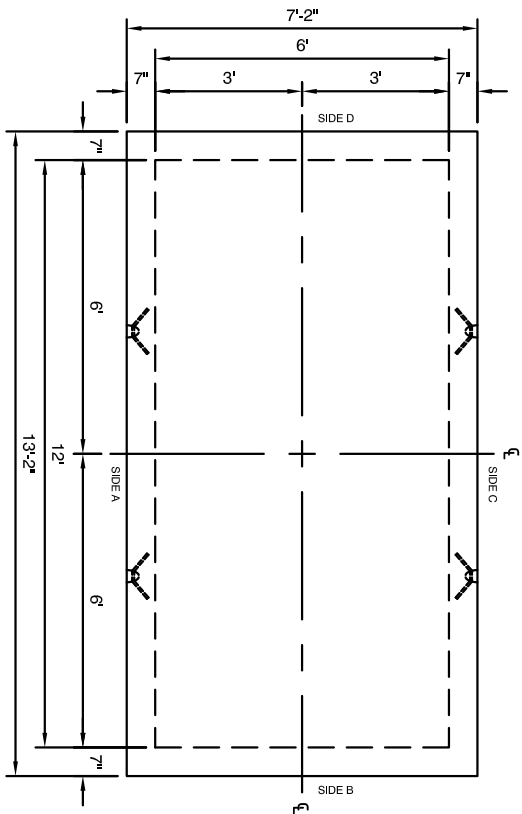


SIDE B & D

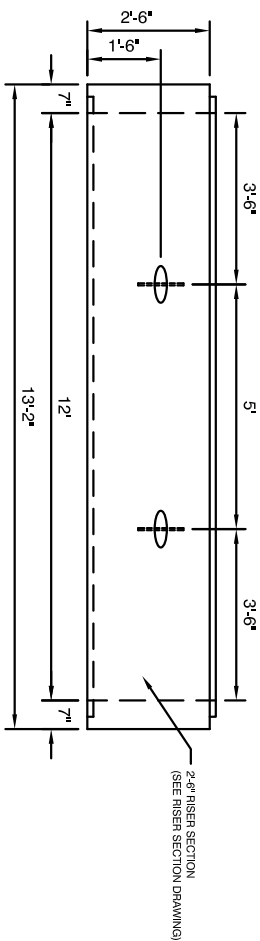
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 2. SHALL BE RATED FOR AASHTO HS 20 LOADING.



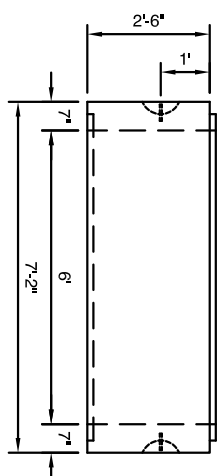
SCALE: 3/8"=1'-0"
6'-0" X 12'-0" X 2'-0"
RISER SECTION



TOP VIEW



SIDE A & C



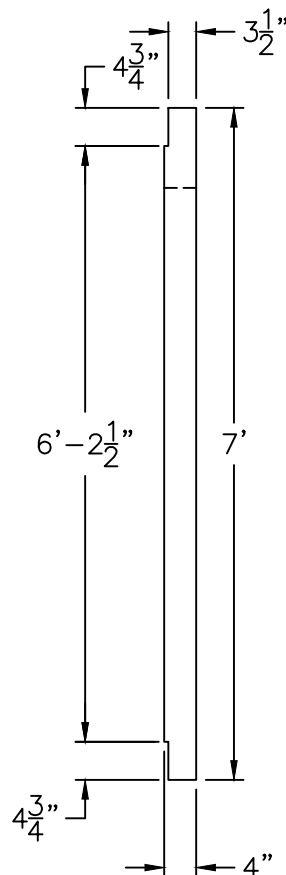
SIDE B & D

- NOTES:
1. FOR USE ON VAULTS THAT ARE DESIGNED FOR A BURIAL DEPTH OF 5 FEET BELOW GRADE TO TOP OF VAULT.
 2. SHALL BE RATED FOR AASHTO HS 20 LOADING.

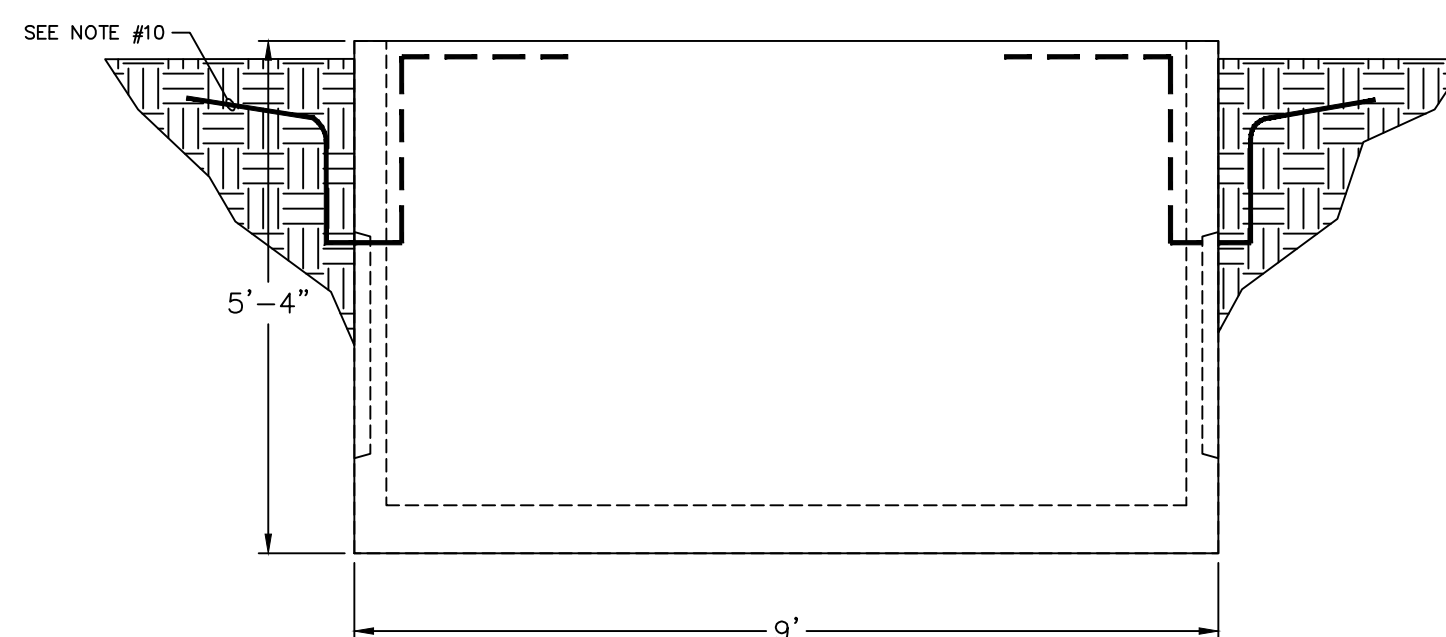
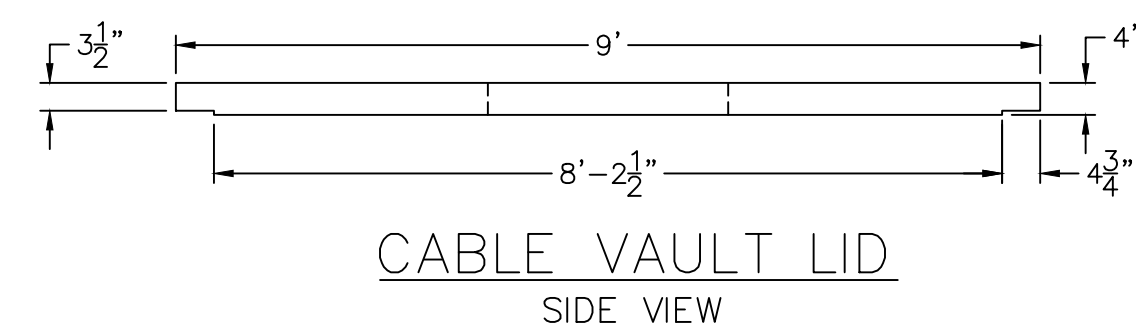


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RISER SECTION

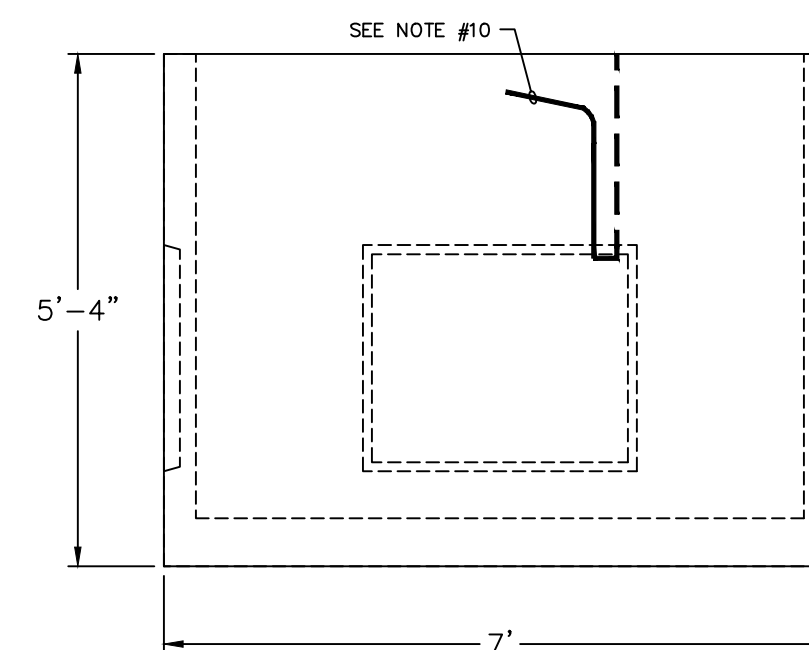
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	FILE NAME		
	7B_1098_15.DWG		
	DRAWING NUMBER		
			7B 1098 15



CABLE VAULT LID
SIDE VIEW

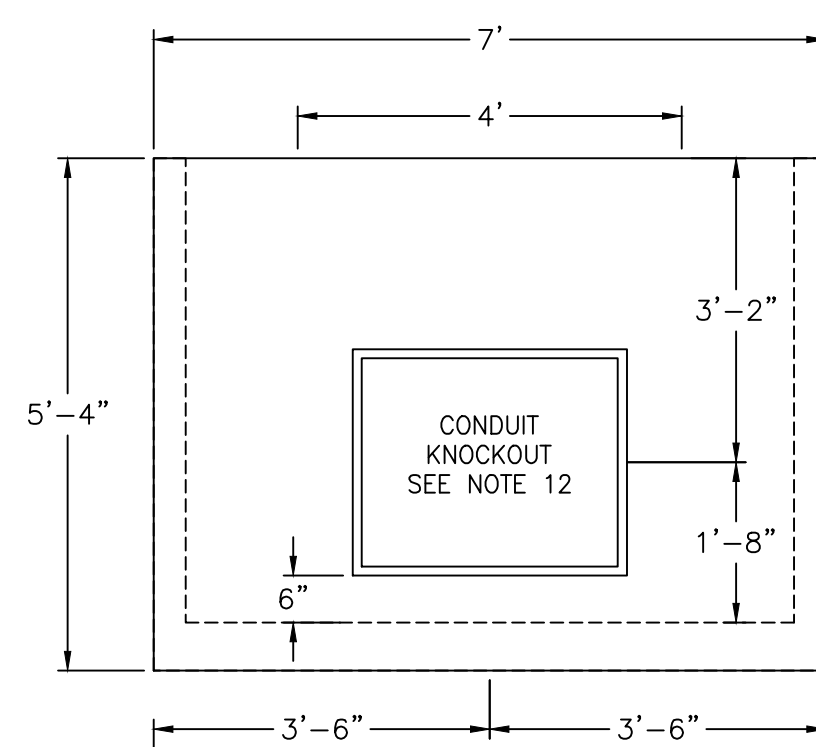


SECTION A-A

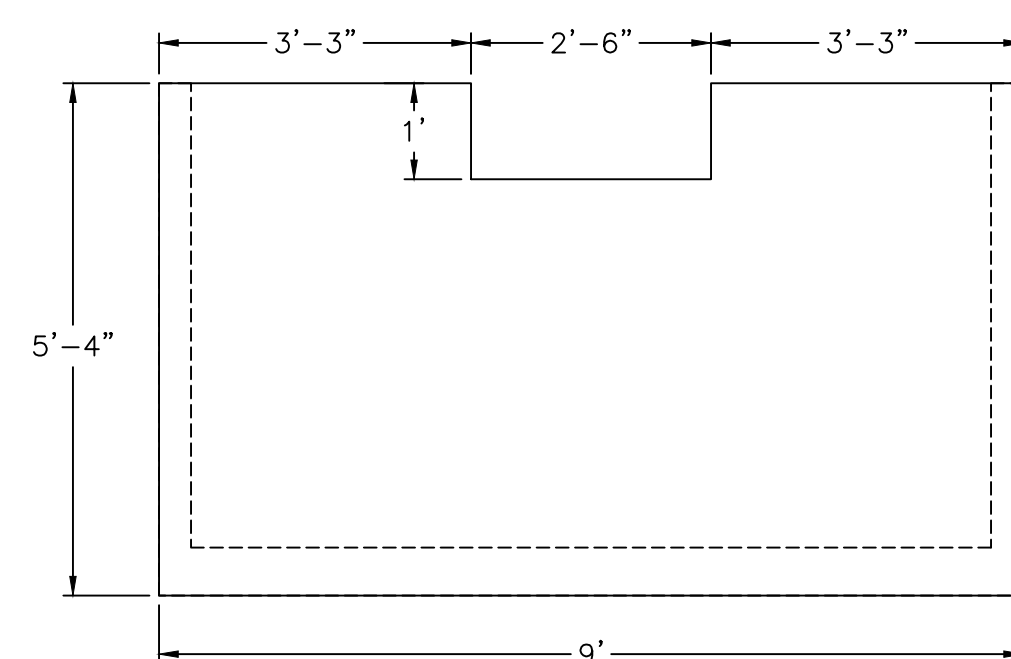


SECTION B-B

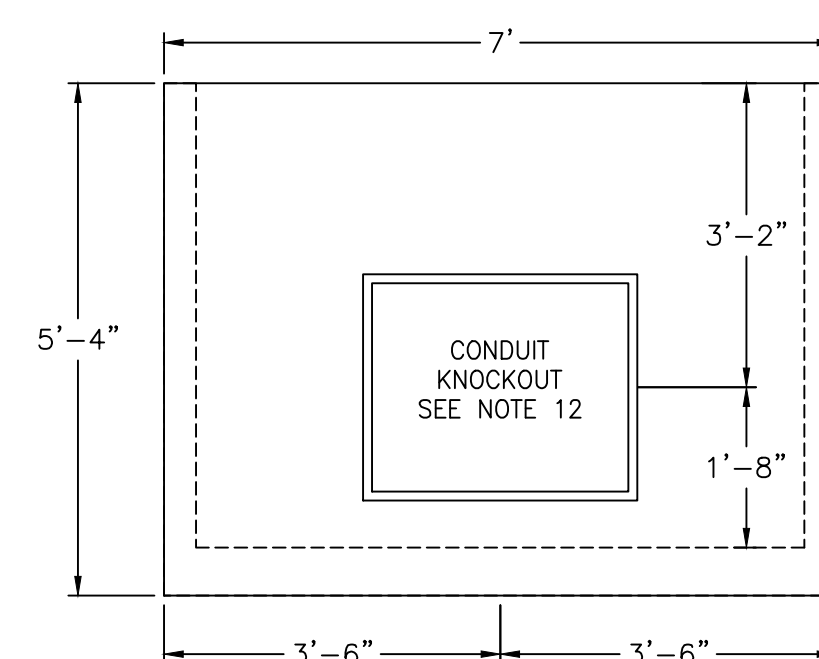
CABLE VAULT
PLAN VIEW



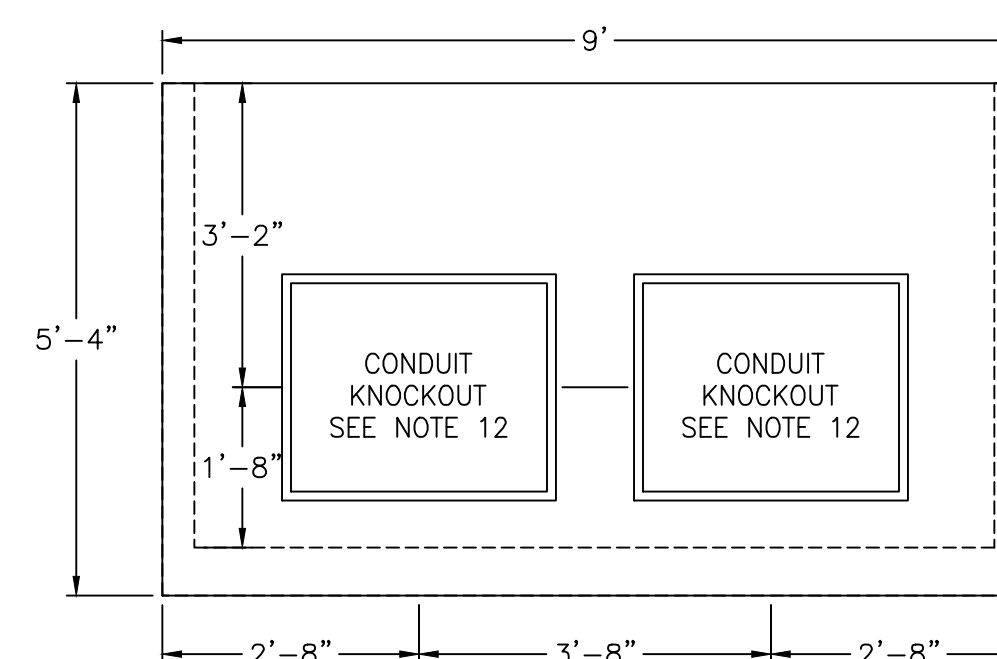
SIDE A



SIDE B



SIDE C



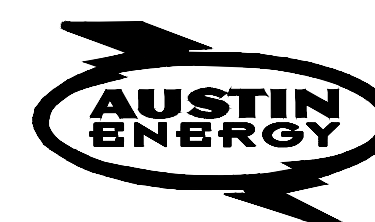
SIDE D

1. THE CABLE VAULT SHALL BE A "ONE-PIECE" DESIGN OR ENGINEER APPROVED EQUAL.
2. THE CABLE VAULT SHALL CONSIST OF A PRECAST CONCRETE BASE AND COVER WITH TORSION ASSISTED LIDS. IT SHALL BE INSTALLED WITH LID EXTENDING ABOVE THE SURROUNDING CRUSHED ROCK SURFACE. THE COVER & LID SHALL BE MANUFACTURED AS HEAVY DUTY VEHICULAR TRAFFIC RATINGS OR ENGINEER APPROVED EQUAL.
3. THE TORSION ASSIST LIDS SHALL OPEN A MINIMUM OF 90° AND REQUIRE NO MORE THAN 55 LBS OF LIFT TO OPEN OR CLOSE A SINGLE LID FROM ANY POSITION. LIDS SHALL HAVE PROVISIONS FOR LOCKING IN THE OPEN POSITION.
4. THE CABLE VAULT AND LID SHALL BE DESIGNED TO SUPPORT AT LEAST 200 POUNDS PER SQUARE FOOT LIVE LOAD FOR PEDESTRIAN TRAFFIC.
5. THE CABLE VAULT SHALL HAVE A MINIMUM INTERIOR CLEAR CROSS SECTIONAL AREA OF 76" WIDE X 100" LONG X 58" DEEP. THE OVERALL DIMENSIONS SHALL BE APPROXIMATELY 84" WIDE X 108" LONG X 64" DEEP, OVERALL INCLUDING COVER.
6. THE VAULT WALLS SHALL HAVE KNOCKOUTS IN THE WALLS. SEE THE CABLE VAULT PLAN & SECTION VIEWS FOR THE SIZE AND PLACEMENT OF THE OPENINGS.
7. PROVIDE WINDOW IN THE BACK OF THE BASE. THIS WINDOW SHALL BE 30" WIDE AND 12" HIGH. SEE SIDE B FOR DETAILS. PROVIDE WINDOW IN THE BACK OF THE LID. THIS WINDOW SHALL BE 30" WIDE AND 10" HIGH. SEE CABLE VAULT DRAWING FOR DETAILS.
8. THE CABLE VAULT SHALL BE DESIGNED AND CONSTRUCTED SO THAT NEITHER THE LIDS, NOR TEMPORARY SIDE-TO-SIDE BRACES NEED TO BE INSTALLED TO FACILITATE INSTALLATION OR SUBSEQUENT MACHINE BACKFILLING AND TAMPING.
9. THE CABLE VAULT SHALL HAVE TWO TORSION ASSISTED LIDS. THEY SHALL BE EASILY ACCESSIBLE FOR MAINTENANCE. LIDS SHALL HAVE A PROVISION FOR LOCKING WITH A HEX-HEAD BOLT. SPRING STEEL RODS SHALL BE USED TO MAKE OPENING THE LIDS EASIER. LIDS SHALL BE DIAMOND PLATED AND HAVE HANDLES THAT ARE FLUSH TO PREVENT TRIPPING HAZARDS. LIDS SHALL HAVE A GROUNDING PAD FOR ATTACHMENT TO THE SITE GROUND GRID. THE LIDS SHALL BE RATED FOR PEDESTRIAN TRAFFIC. THE LIDS SHALL BE HOT DIP GALVANIZED PER ASTM A-123. OTHER LID SYSTEMS MAY BE BID FOR EVALUATION BY THE AUSTIN ENERGY ENGINEER.
10. PROVIDE A NEMA GROUND PAD ON EACH LID FOR CONNECTING A 19#9 COPPER GROUND WIRE TO THE SUBSTATION GROUNDING GRID. GROUND WIRE SHALL BE RUN INSIDE VAULT AND OUT NEAREST WINDOW TO GROUND GRID.
11. FURNISH AND INSTALL FOUR LIFTING ANCHORS IN THE CABLE VAULT. THESE ANCHORS WILL BE USED TO LIFT THE CABLE VAULT DURING INSTALLATION. THESE ANCHORS SHALL PROVIDE A MEANS TO LIFT THE VAULT WITHOUT DAMAGE.
12. ALL CONDUIT KNOCKOUT WINDOWS SHALL BE 32"x26". THERE SHALL BE TWO (2) CONDUIT KNOCKOUT WINDOWS CENTERED IN SIDE D SIZED 32"x26".
13. CUT AND ADJUST REINFORCING STEEL AS REQUIRED TO CLEAR KNOCKOUTS.

[illegible]

FOR CONSTRUCTION / DATE:

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ELECTRIC SERVICE DELIVERY SUBSTATION ENGINEERING

TITLE :

STANDARD SUBSTATION
CONTROL HOUSE
6'X8'X5'H CABLE VAULT

MASTER NO.	SCALE
EV_C10_8.DWG	1/2"=1'
FILE NAME	
7B_1098_16.DWG	
DRAWING NUMBER	
7B 1098 16	