MANHOLES ACCESSORIES 33

12” RECESS CONSTRUCTION - FOR CAST IN PLACE MANHOLES..... 33 11 01 **

BAY CONSTRUCTION - FOR PRECAST OR CAST IN PLACE MANHOLES..... 33 11 03 **

24” RECESS CONSTRUCTION - FOR CAST IN PLACE MANHOLES..... 33 11 04 **

36” RECESS CONSTRUCTION - FOR CAST IN PLACE MANHOLES..... 33 11 05 **

MANHOLE NECK - WITH SWIVELOCK FRAME AND COVER.....33 12 01 **

MANHOLE NECK - WITH FRAME AND COVER - ILLINOIS ONLY..... 33 12 02 **

UNISTRUT CABLE RACK - ILLINOIS ONLY..... 33 20 01 **

GROUNDING SYSTEM - FOR PRECAST MANHOLE - STRAIGHT..... 33 20 02 **

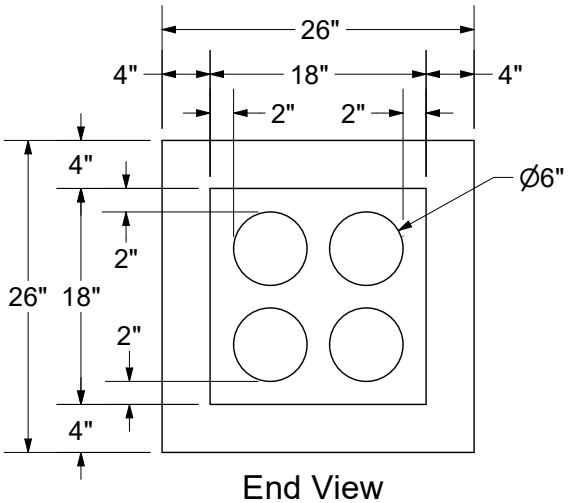
GROUNDING SYSTEM - FOR PRECAST MANHOLE - 3 WAY..... 33 20 03 01

CABLE TRAINING - FOR PRECAST MANHOLE - STRAIGHT..... 33 20 04 01

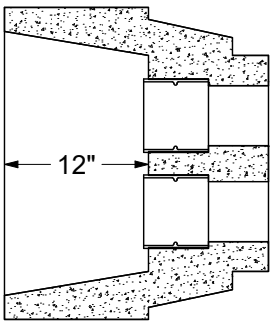
CABLE TRAINING - FOR PRECAST MANHOLE - 3 WAY 33 20 04 02

CABLE RACKING - FOR PRECAST MANHOLE - STRAIGHT..... 33 20 05 **

GROUNDING SYSTEM - FOR CAST IN PLACE NETWORK VAULT..... 33 20 06 01

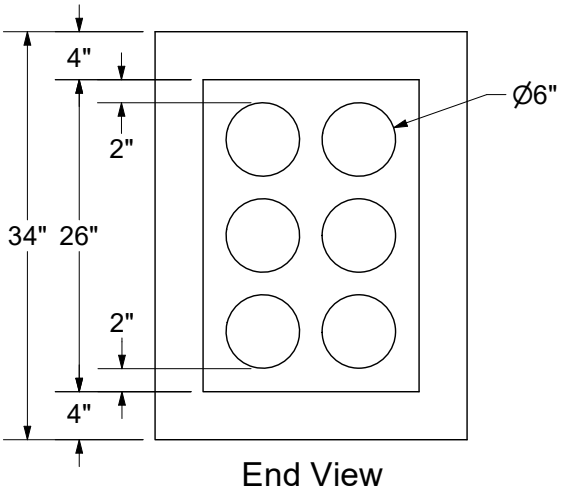


End View



Side View

33 11 01 01



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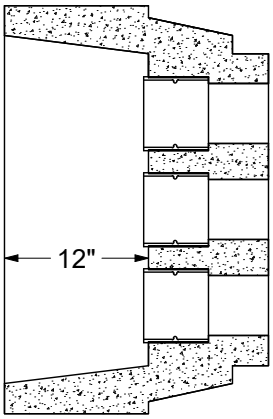
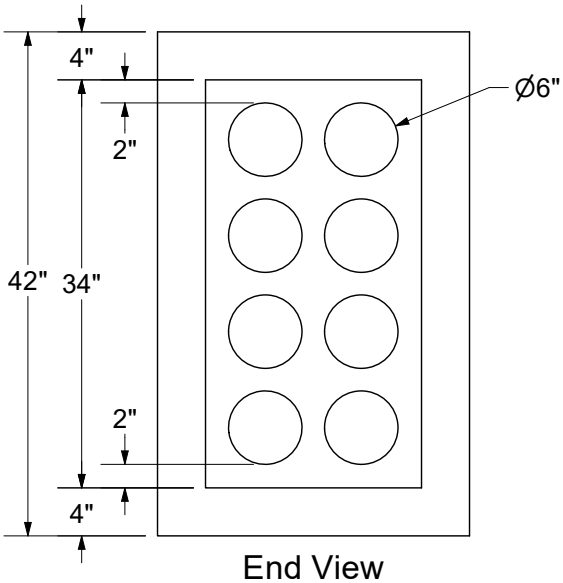
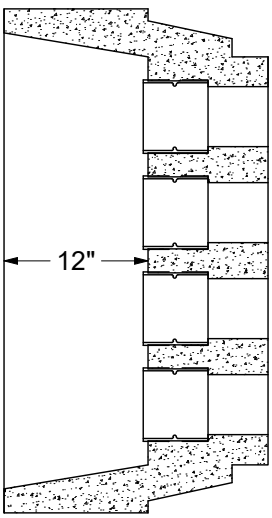


Side View

33 11 01 02



End View



Side View

33 11 01 03

REV	DATE	ENG	DESCRIPTION
4	01/01/24	JMW	Converted to new format
3	03/16/09	DDG	

DCS #	DESCRIPTION
33 11 01 01	4 Duct Recess
33 11 01 02	6 Duct Recess
33 11 01 03	8 Duct Recess

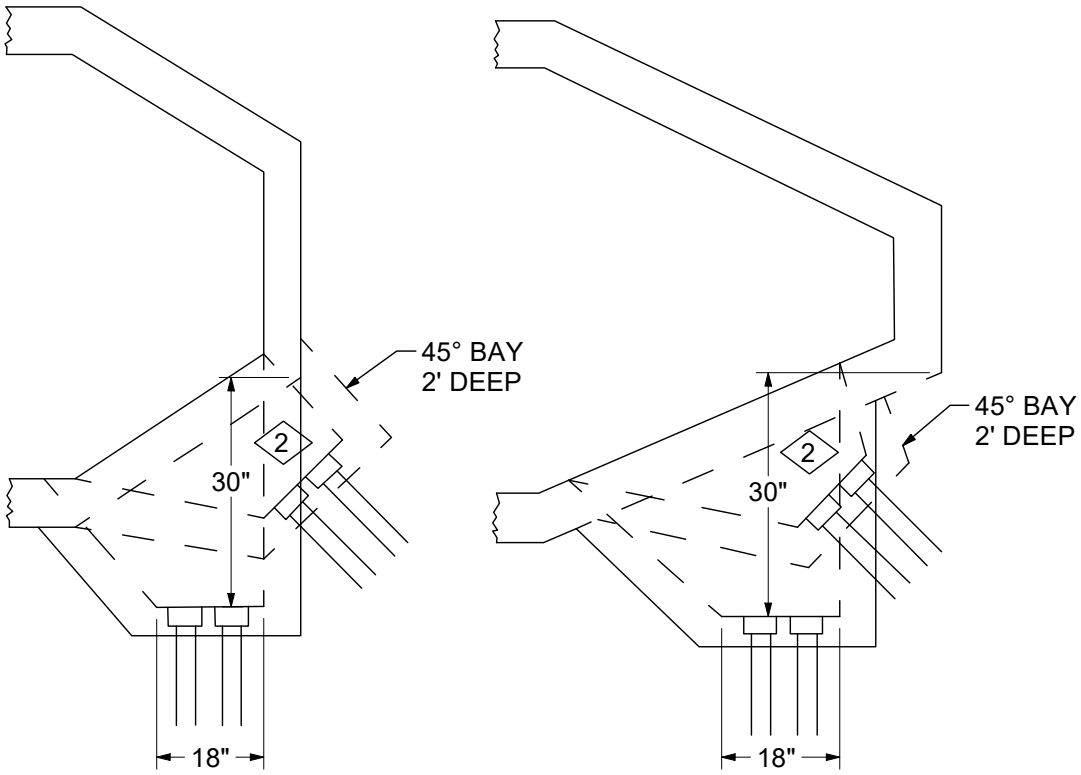
CONSTRUCTION NOTE(s):

1. Two or more ducts may be omitted if not required.

2. May use 3 hole duct terminator (Stock #12 56 126) in place of couplings when appropriate.

	ITEM	STOCK #	DESCRIPTION 33 11 01 **	01	02	03
	A	98 00 005	Concrete - M.H. (c.y.)	1	1	1
2	B	12 51 156	Coupling, PVC, 5" SCH 40	4	6	8
@			Op Code, Excavation (Mach.) (c.y.)	3	3	3
@			Op Code, Installing and Removing Forms (s.f.)	11	13	14
@			Op Code, Backfilling (Mach.) (c.y.)	1	1	1
@			Op Code, Tamping (s.f.)	7	7	8
@			Op Code, Surface Removal (s.f.)	7	7	8
@			Op Code, Surface Replacement (s.f.)	7	7	8

REV	DATE	ENG	DESCRIPTION
4	01/01/24	JMW	Converted to new format
3	03/16/09	DDG	



DCS #	DESCRIPTION
33 11 03 01	45° - 90° Wingwall Bay for 10'-0" & 14'-0" Long Manholes
33 11 03 02	45° - 90° Wingwall Bay for 17'-6" Long Manholes

CONSTRUCTION NOTE(s):

1. Use plywood to frame walls approximately 6" thick.

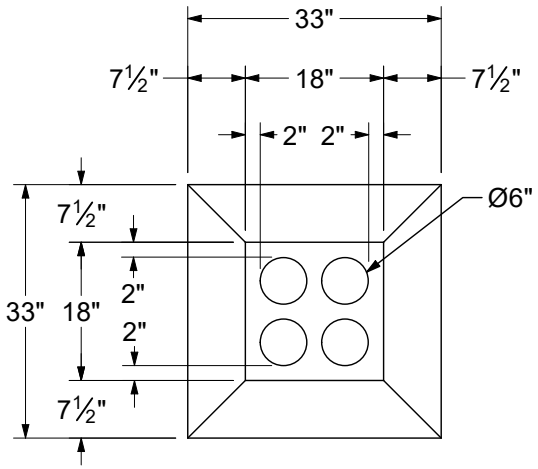
<2.> 30" may be reduced to 24" if necessary.

	ITEM	STK / DCS #	DESCRIPTION 33 11 03 **	01	02
	A	98 00 005	Concrete - M.H. (c.y)	1	1
@			Op Code, Excavation (Mach.) (c.y.)	8	8
@			Op Code, Installing and Removing Forms (S.F.)	43	43
@			Op Code, Backfilling (Mach.) (c.y.)	1	1
@			Op Code, Tamping (s.f)	22	22
@			Op Code, Surface Removal (s.f.)	22	22
@			Op Code, Surface Replacement (s.f.)	22	22

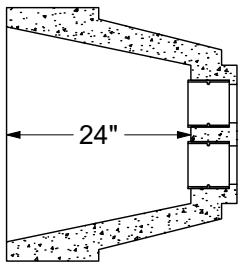
DESIGN NOTE(s):

3. Bay to be used on pre-cast manholes when conduit run direction requires this or when end openings are all used.

REV	DATE	ENG	DESCRIPTION
5	01/01/24	JMW	Converted to new format
4	03/16/09	DDG	

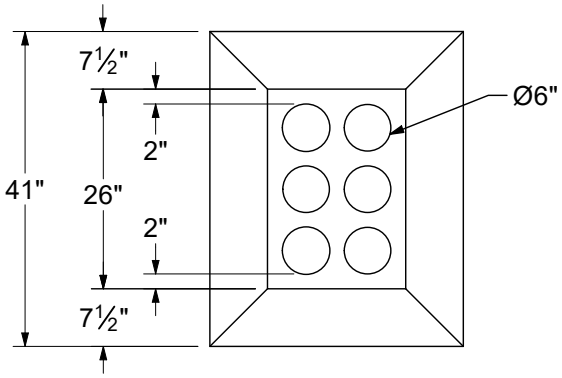


End View

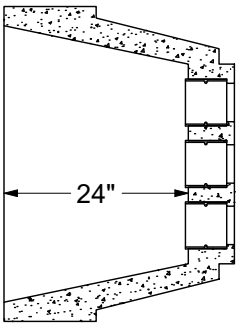


Side View

33 11 04 01

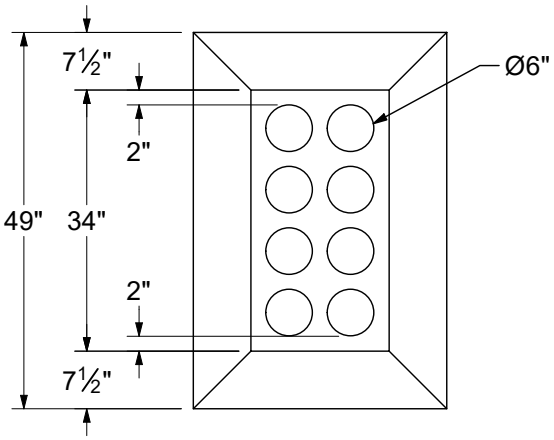


End View

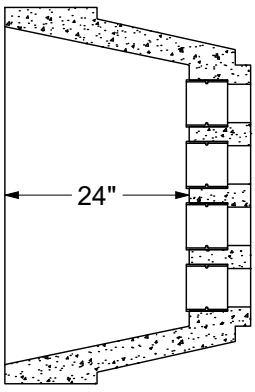


Side View

33 11 04 02



End View



Side View

33 11 04 03

REV	DATE	ENG	DESCRIPTION
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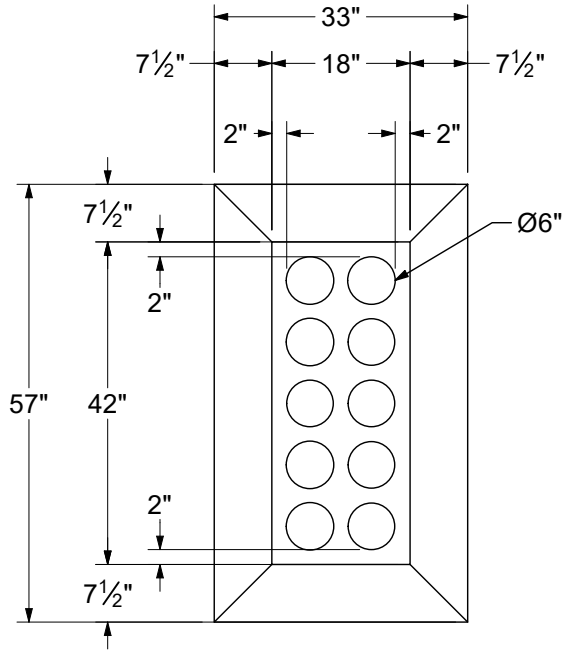
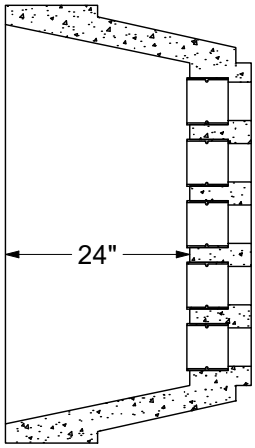
3	01/16/03	DDG	



End View



Side View

33 11 04 04

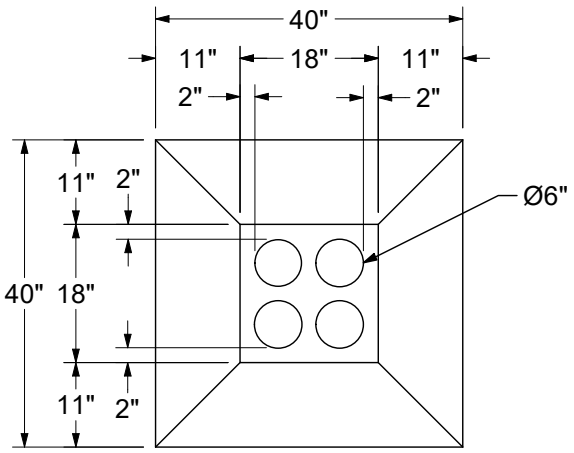
DCS #	DESCRIPTION
33 11 04 01	4 Duct Recess
33 11 04 02	6 Duct Recess
33 11 04 03	8 Duct Recess
33 11 04 04	10 Duct Recess

CONSTRUCTION NOTE(s):

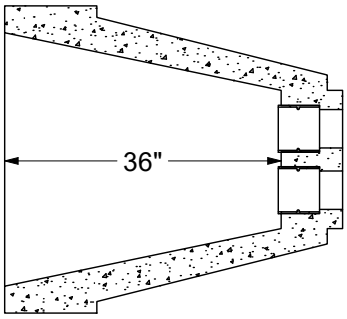
1. May use 3 hole duct terminator (Stock #12 56 126) in place of couplings when appropriate.

	ITEM	STK / DCS #	DESCRIPTION 33 11 04 **	01	02	03	04
	A	98 00 005	Concrete - M.H. (c.y.)	1	1	2	2
1	B	12 51 156	Coupling, PVC, 5" SCH 40	4	6	8	10
@			Op Code, Excavation (Mach.) (c.y.)	4	4	4	14
@			Op Code, Installing and Removing Forms (s.f.)	20	23	26	29
@			Op Code, Backfilling (c.y.)	1	1	1	1
@			Op Code, Tamping (s.f.)	12	12	12	12
@			Op Code, Surface Removal (s.f.)	12	12	12	12
@			Op Code, Surface Replacement (s.f.)	12	12	12	12
@			Op Code, Demolition (s.f.)	7	8	10	11

REV	DATE	ENG	DESCRIPTION
4	01/01/24	JMW	Converted to new format
3	01/16/03	DDG	

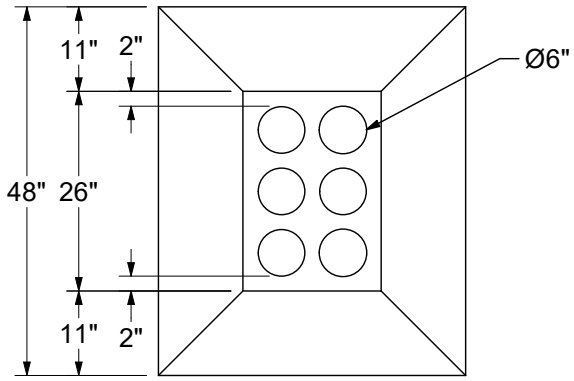


End View

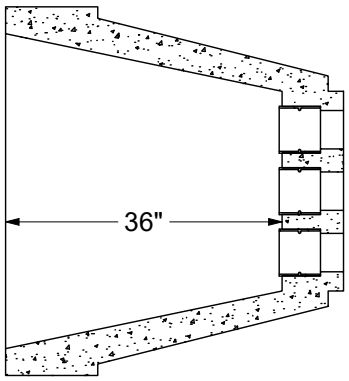


Side View

33 11 05 01

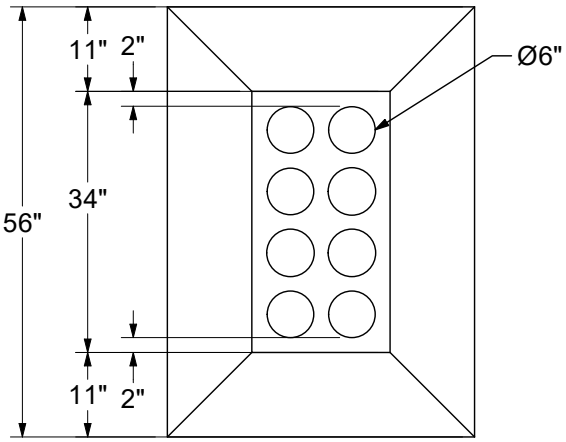


End View

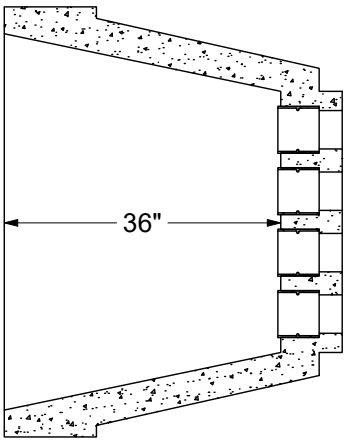


Side View

33 11 05 02



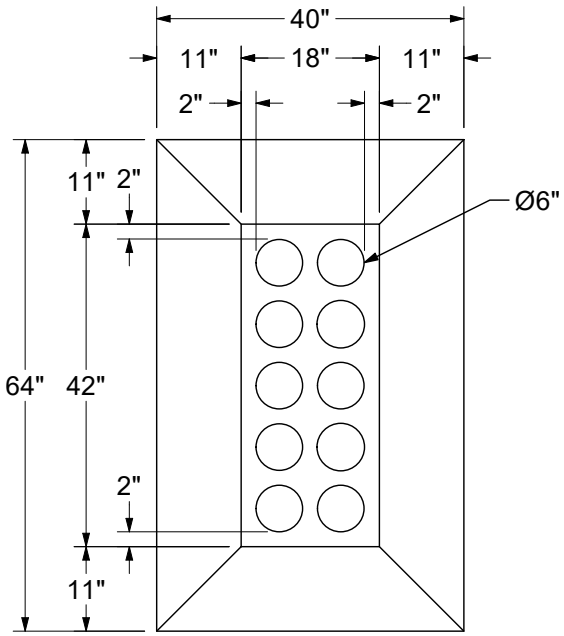
End View



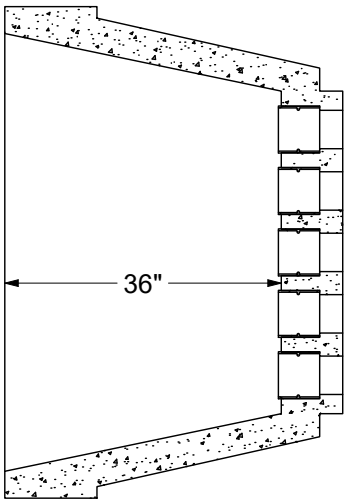
Side View

33 11 05 03

REV	DATE	ENG	DESCRIPTION
4	01/01/24	JMW	Converted to new format
3	03/16/03	DDG	



End View



Side View

33 11 05 04

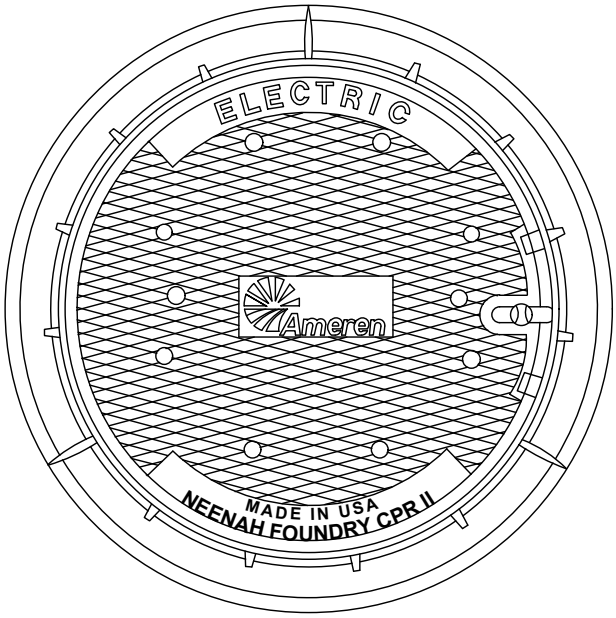
DCS #	Description
33 11 05 01	4 Duct Recess
33 11 05 02	6 Duct Recess
33 11 05 03	8 Duct Recess
33 11 05 04	10 Duct Recess

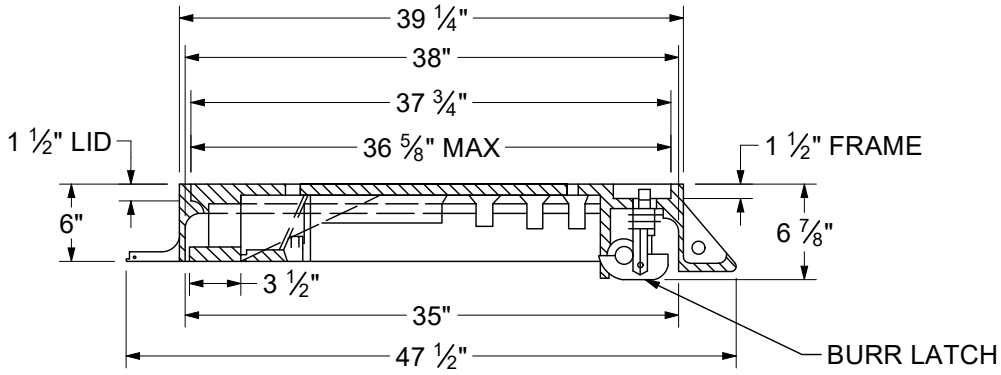
CONSTRUCTION NOTE(s):

1. May use 3 hole duct terminator (Stock #12 56 126) in place of couplings when appropriate.

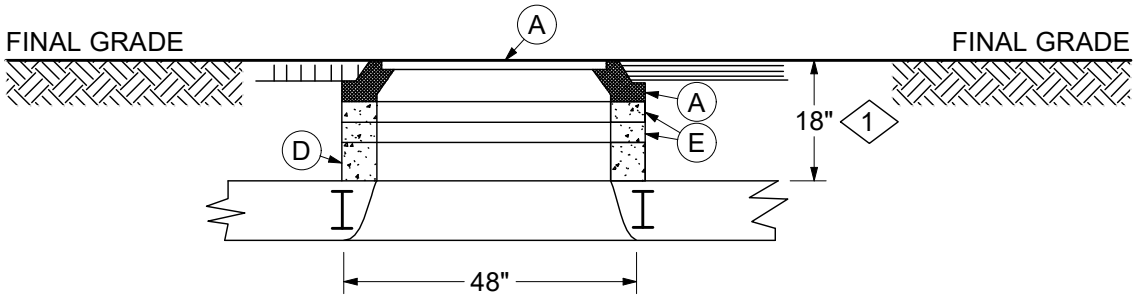
	ITEM	STK / DCS #	DESCRIPTION 33 11 05 **	01	02	03	04
	A	98 00 005	Concrete - M.H. (c.y.)	2	2	3	3
	B	12 51 156	Coupling, PVC, 5" SCH 40	4	6	8	10
@			Op Code, Excavation (Mach.) (c.y.)	5	5	5	5
@			Op Code, Installing and Removing Forms	36	39	42	45
@			Op Code, Backfilling (c.y.)	2	2	2	2
@			Op Code, Tamping (s.f.)	18	18	18	18
@			Op Code, Surface Removal (s.f.)	18	18	18	18
@			Op Code, Surface Replacement (s.f.)	18	18	18	18
@			Op Code, Demolition (s.f.)	8	10	11	12

REV	DATE	ENG	DESCRIPTION
4	01/01/24	JMW	Converted to new format
3	03/16/03	DDG	





Frame and Cover
Swiveloc Type 3



33 12 01 01
Normal Depth

REV	DATE	ENG	DESCRIPTION
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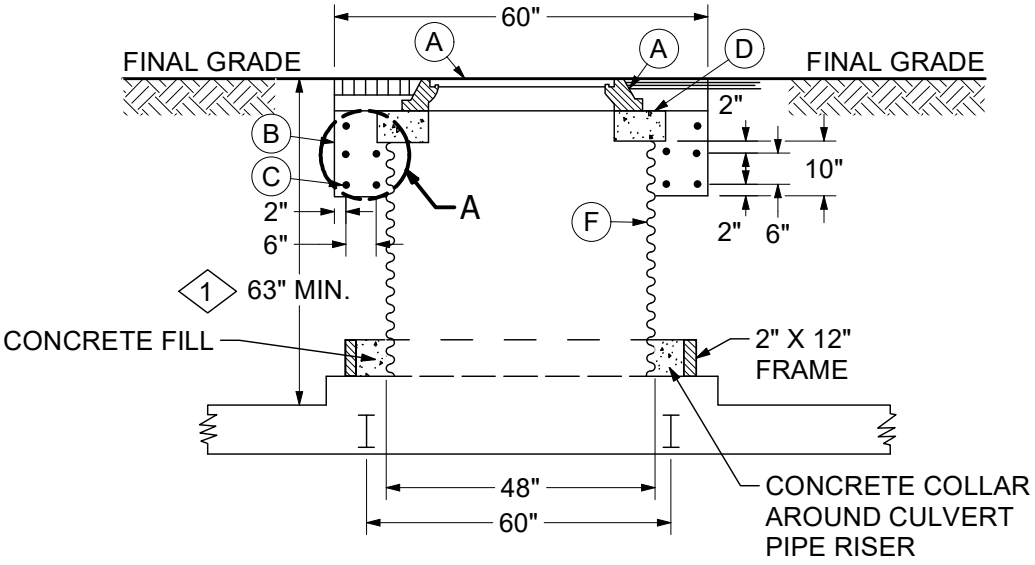
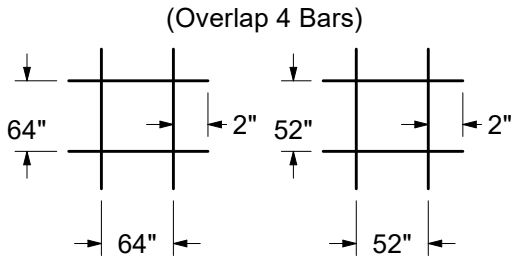
5	12/05/17	EJB	



33 12 01 02
Extra Deep



Detail A
#3 Reinforcing Bars

CONSTRUCTION NOTE(s):

1. Normal depth is 18" with 2 - 3" collars on top of 1 - 6" collar. Extra deep is 63" minimum.

2. Extension rings can be used to raise the non-locking style cover. 1.75" rise - Stock #12 52 003 and 2.25" rise - Stock #12 52 004.

	ITEM	STK / DCS #	DESCRIPTION 33 12 01 **	01	02
3	A	12 02 108	Frame and Cover - SwiveLoc Type, 36" Dia.	1	1
	B	98 00 005	Concrete, 4000 PSI Cu Yards	-	1
	C	27 02 062	Bar, Reinforcing, #3, 16 ft	-	6
	D	12 06 063	Neck - Section, 6" Thick Concrete	1	1
	E	12 06 062	Neck - Section, 3" Thick Concrete	2	-
@	F	12 02 076	Culvert Pipe - 48" x 5'-0"	-	1
		12 02 077	Culvert Pipe - 48" x 4'-0"	-	-
@	G	12 02 107	Cover Only - Explosion Mitigation Type	-	-

DESIGN NOTE(s):

3. Non-locking manhole frame and cover (Stock #12 02 085) is available for restricted use only.

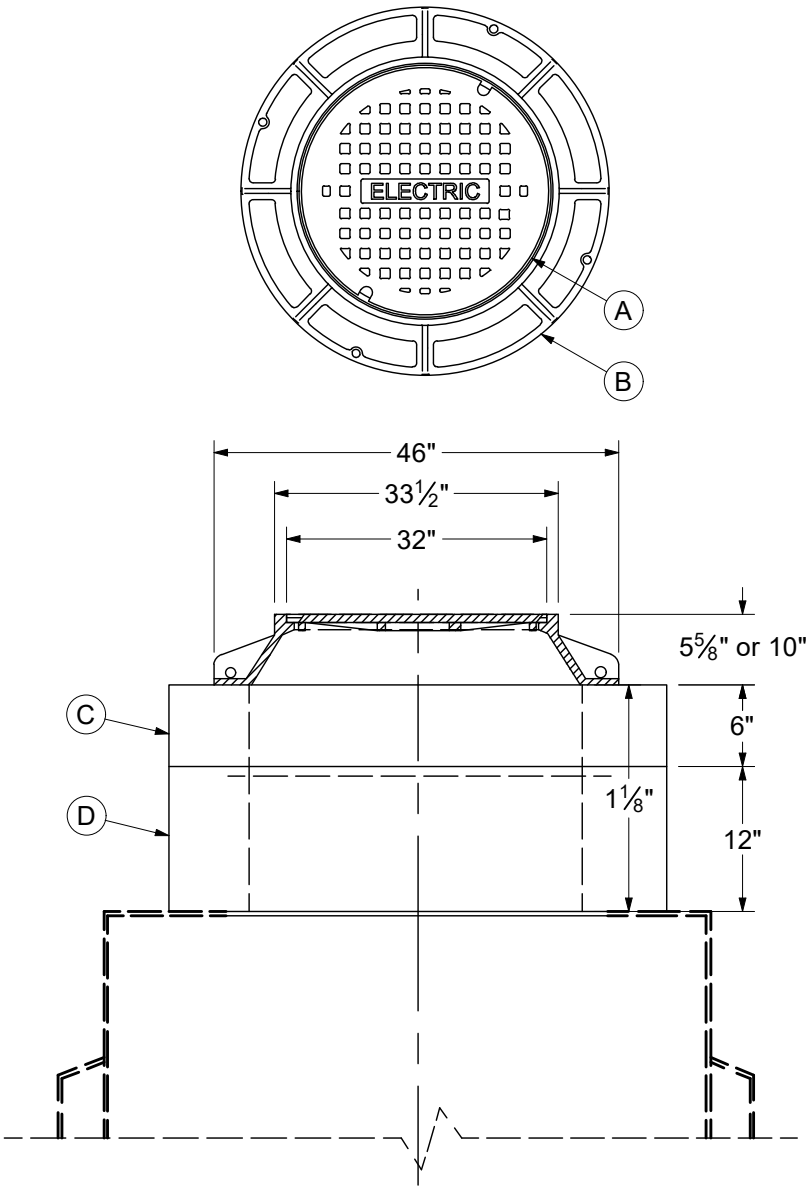
REV	DATE	ENG	DESCRIPTION
6	01/01/24	JMW	Converted to new format
5	12/05/17	EJB	

MANHOLE ACCESSORIES

Manhole Neck
with Frame and Cover

33 12 02 **
1 of 1

ILLINOIS ONLY



DCS #	DESCRIPTION
33 12 02 01	5-5/8" Frame Depth - Alternate
33 12 02 02	10" Frame Depth - Preferred

CONSTRUCTION NOTE(s):

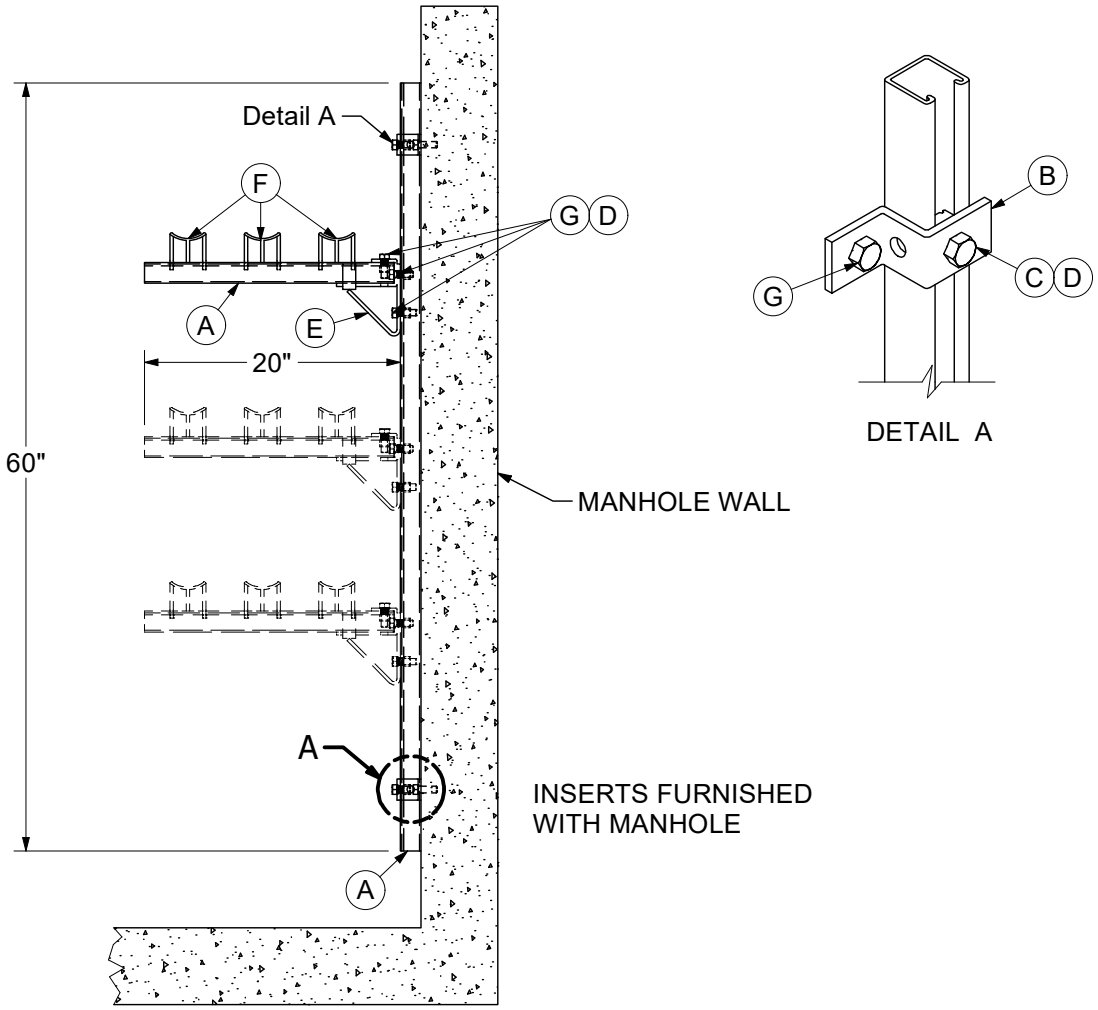
1. Extension rings can be used to raise the cover. 2" rise - Stock #12 52 089 and 3" rise - Stock #12 52 091.

	ITEM	STK / DCS #	DESCRIPTION 33 12 02 **	01	02
	A	12 02 088	Cover - Manhole, 32" Dia.	1	1
	B	12 06 143	Frame - Manhole, 5-5/8" Deep	1	-
		12 06 144	Frame - Manhole, 10" Deep	-	1
@	C	12 56 085	Collar - 6" Precast Concrete	-	-
@	D	12 56 086	Collar - 12" Precast Concrete	-	-

DISTRIBUTION CONSTRUCTION STANDARDS

REV	DATE	ENG	DESCRIPTION
2	01/01/24	JMW	Converted to new format
1	03/25/09	DDG	

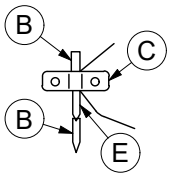
ILLINOIS ONLY



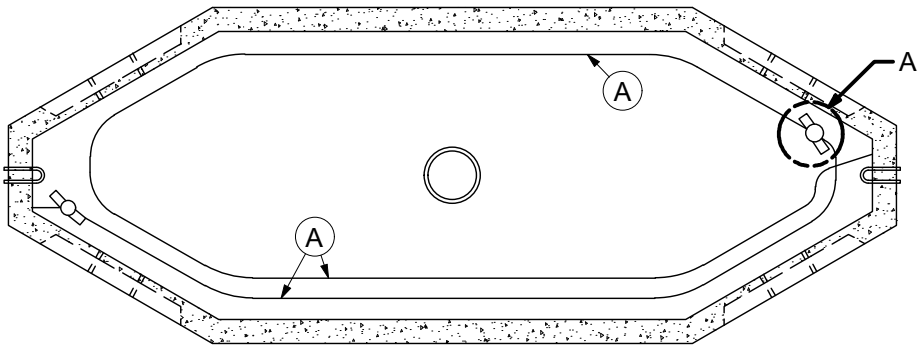
DCS #	DESCRIPTION
33 20 01 01	Cable Rack - 1 Circuit
33 20 01 02	Cable Rack - 2 Circuits
33 20 01 03	Cable Rack - 3 Circuits
33 20 01 04	Cable Rack - Add (1) Circuit

	ITEM	STK / DCS #	DESCRIPTION 33 20 01 **	01	02	03	04
	A	40 79 781	Channel - Single, Galv, 1-5/8" x 1-5/8" x 10', (Ft.)	7	9	10	2
	B	40 79 764	Support - Zee Unistrut	2	2	2	-
	C	23 52 436	Screw - 1/2" x 1" Hex	2	2	2	-
	D	40 09 231	Nut - Channel, 1/2"	5	8	11	3
	E	40 79 759	Brace - Bracket, Unistrut	1	2	3	1
	F	40 79 761	Insulator - Cable Rack	3	6	9	3
	G	40 79 763	Screw - Cap, 1/2" x 1-1/2" Hex	5	8	11	3

REV	DATE	ENG	DESCRIPTION
2	01/01/24	JMW	Converted to new format
1	03/25/09	DDG	



DETAIL A



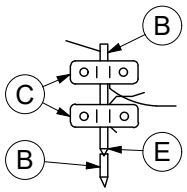
DCS #	DESCRIPTION
33 20 02 01	4' x 10' Manhole
33 20 02 02	6' x 14' Manhole
33 20 02 03	6' x 17' Manhole

CONSTRUCTION NOTE(s):

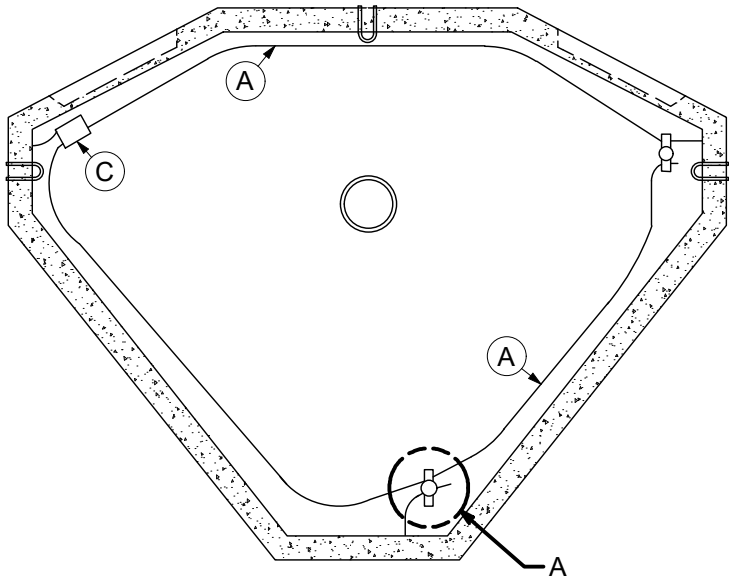
1. All splice ground and drain wires are connected to the grounding system using a two bolt connector.
2. The bond wire is to be fastened 6 inches above the manhole floor using plastic hooks (D) attached to the cable mounting brackets.
3. If the manhole is the first one in the substation do not drive the ground rods. Connect the end of the bond wire at two points to the substation ground grid.
4. When making grounding attachments to the bond wire, clean the bond wire at the attachment point.
5. Join two ground rods together with a coupling.

	ITEM	STK / DCS #	DESCRIPTION 33 20 02 **	01	02	03
	A	18 52 024	Wire-4/0 AWG, Copper, Bare, Soft Drawn	43	54	65
3	B	23 63 143	5/8" Ground Rod 4ft	4	4	4
	C	17 54 132	Connector-Wire, 8-350 kcmil, CU	2	2	2
2	D	12 56 123	Cable Hook - Bond Wire Support	10	10	10
5	E	23 12 070	Coupling - CU Alloy, 5/8", Threaded	2	2	2
			Op Code, Install ground system	1	1	1

REV	DATE	ENG	DESCRIPTION
3	01/01/24	JMW	Converted to new format
2	04/05/17	EJB	



DETAIL A

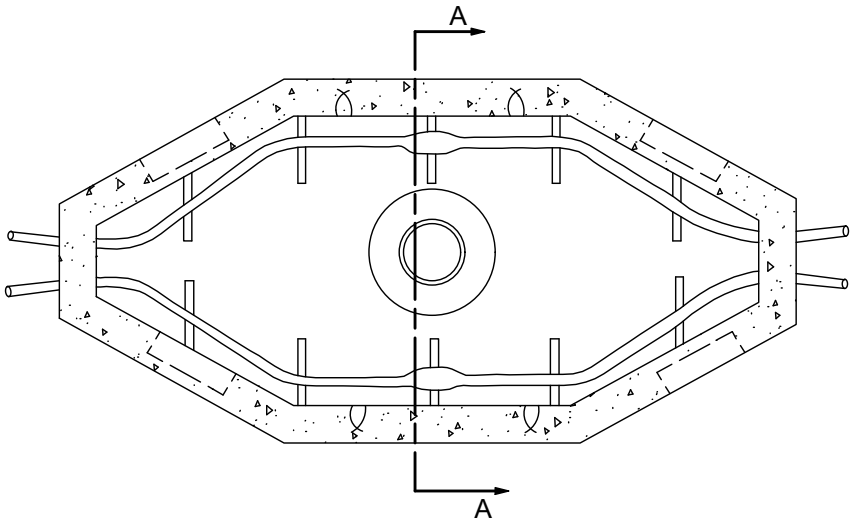


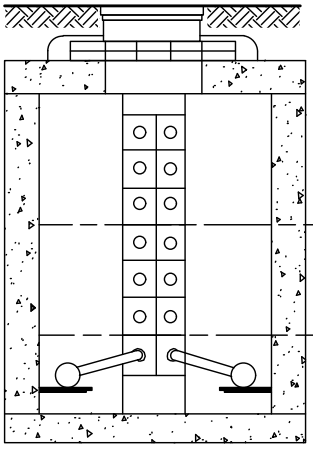
CONSTRUCTION NOTE(s):

1. All splice ground and drain wires are connected to the grounding system using a two bolt connector.
2. The bond wire is to be fastened 6 inches above the manhole floor using plastic hooks (D) attached to the cable mounting brackets.
3. If the manhole is the first one in the substation do not drive the ground rods. Connect the end of the bond wire at two points to the substation ground grid.
4. When making rounding attachments to the bond wire, clean the bond wire at the attachment point.
5. Join two ground rods together with a coupling.

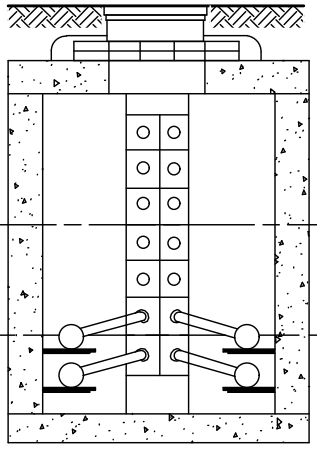
	ITEM	STK / DCS #	DESCRIPTION 33 20 03 **	01
	A	18 52 024	Wire - 4/0 AWG, Copper, Bare, Soft Drawn	50
3	B	23 63 143	5/8" Ground Rod 4ft	4
	C	17 54 132	Connector - Wire, 8-350 kcmil, CU	5
2	D	12 56 123	Cable Hook - Bond Wire Support	8
5	E	23 13 070	Coupling - CU Alloy, 5/8", Threaded	2
			Op Code, Install Ground System	1

REV	DATE	ENG	DESCRIPTION
3	01/01/24	JMW	Converted to new format
2	04/05/17	EJB	

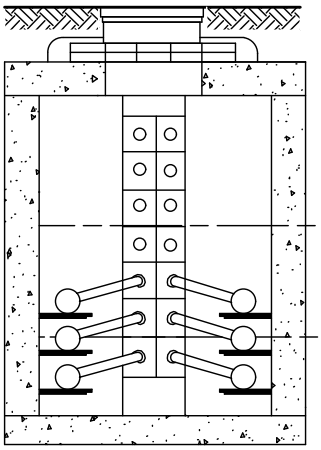




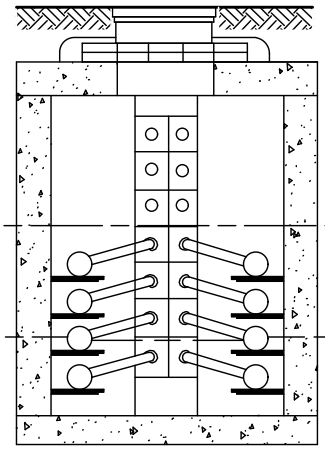
Section A-A
Two Ducts



Section A-A
Four Ducts



Section A-A
Six Ducts



Section A-A
Eight Ducts

REV	DATE	ENG	DESCRIPTION
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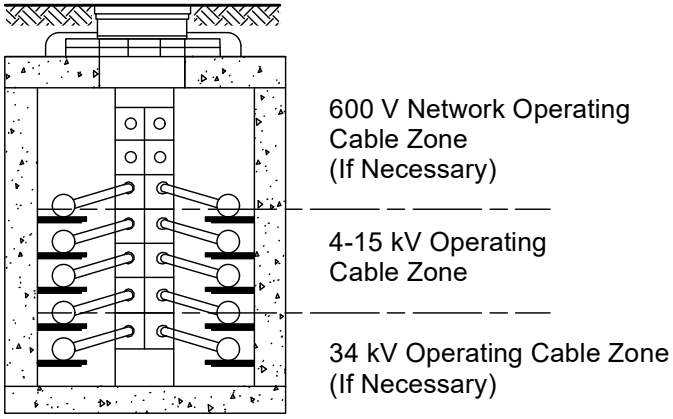
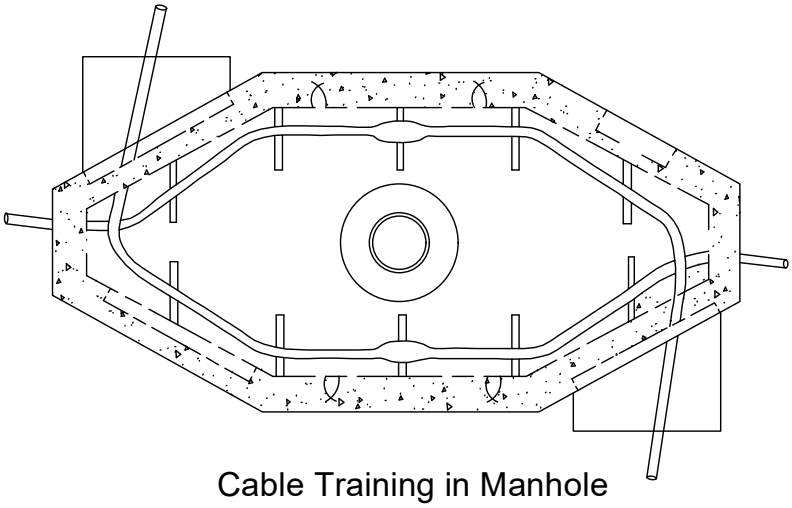
1	10/03/16	EJB	



Section A-A
Ten Ducts

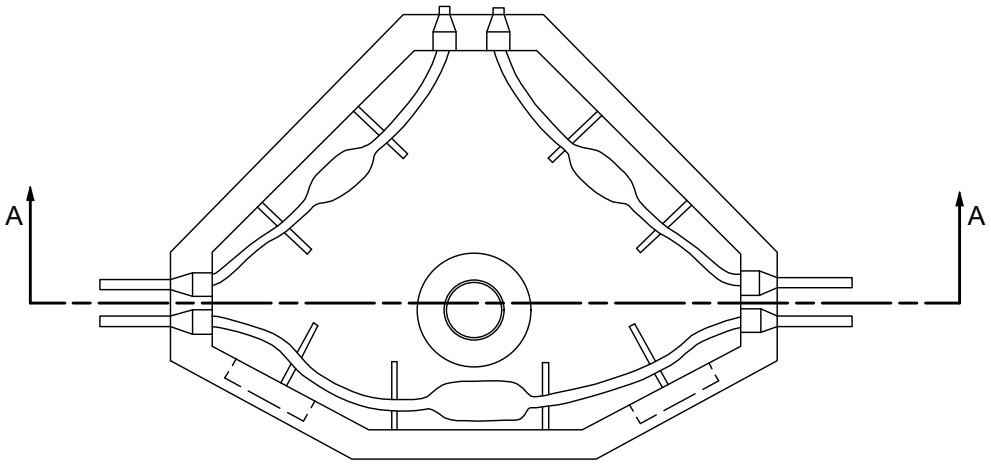


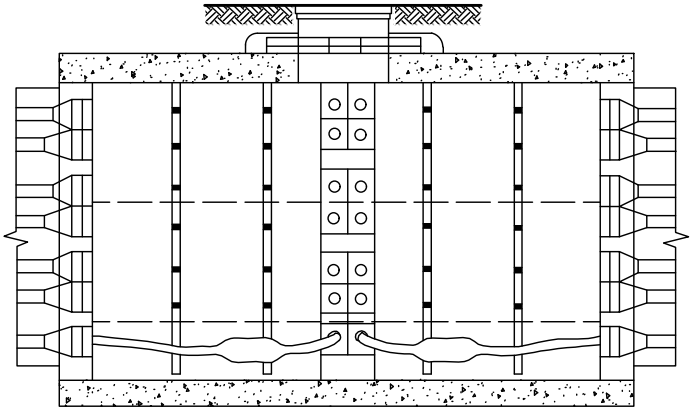
Cable Training in Manhole
With Wingwall

CONSTRUCTION NOTE(s):

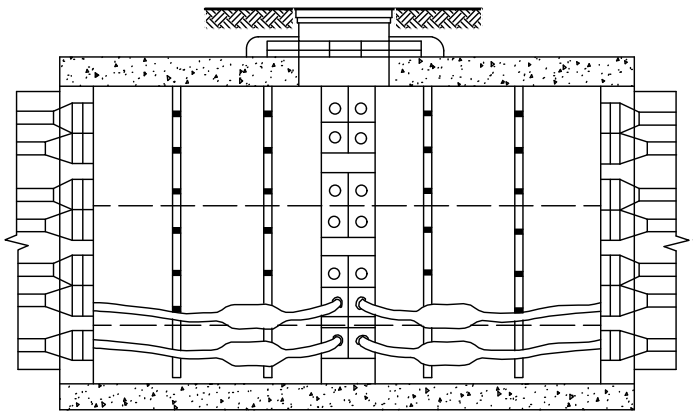
1. Cable and splice positions reflect three single solid dielectric cable splices or one three conductor PILC cable joint.

2. The maximum number of ducts occupied by energized power cables shall be ten.

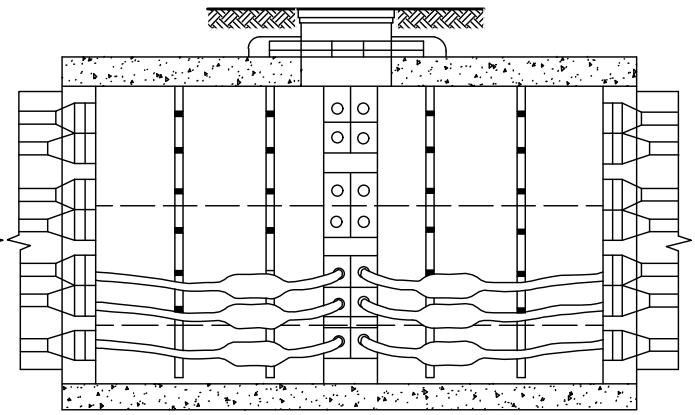




Section A-A
Two Ducts



Section A-A
Four Ducts



Section A-A
Six Ducts

REV	DATE	ENG	DESCRIPTION
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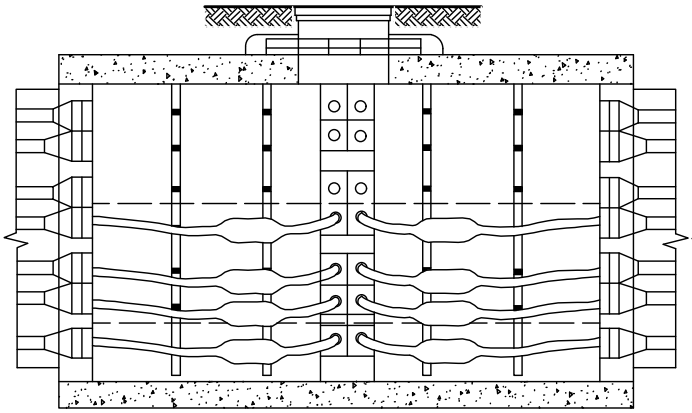
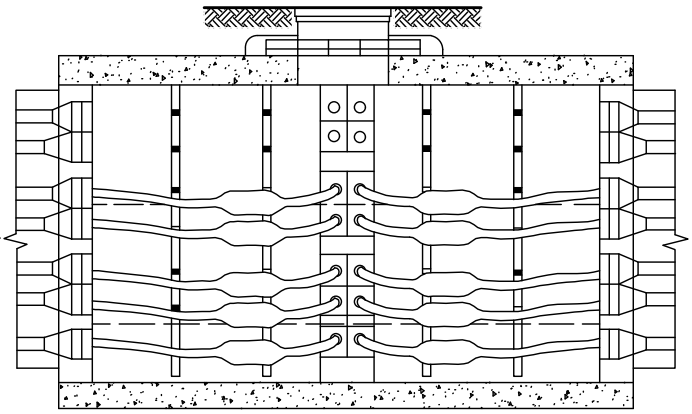
0	07/03/13	EJB	



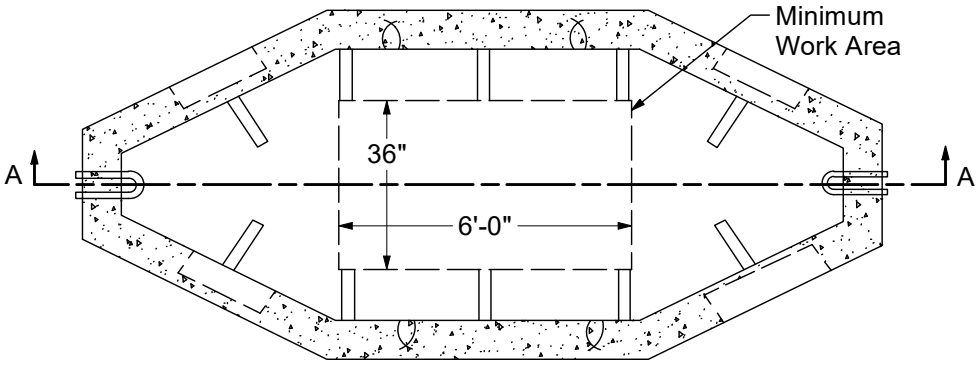
Section A-A
Eight Ducts



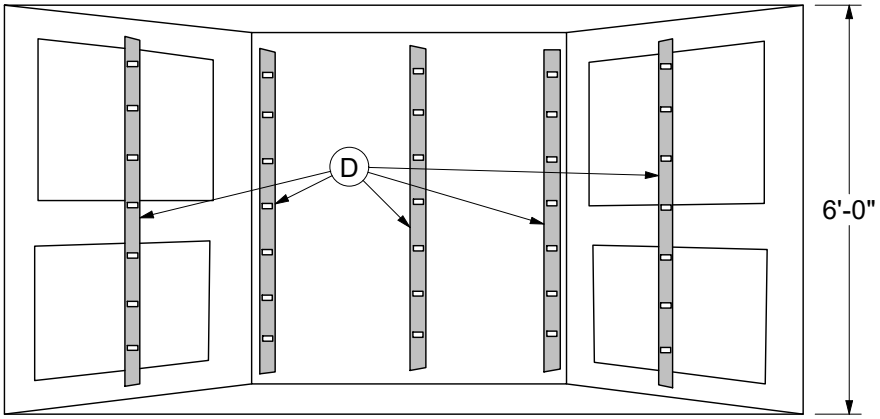
Section A-A
Ten Ducts

CONSTRUCTION NOTE(s):

1. Cable and splice positions reflect three single dielectric cable splices or one three conductor PILC cable joint.
2. The maximum number of ducts occupied by energized power cables shall be ten.



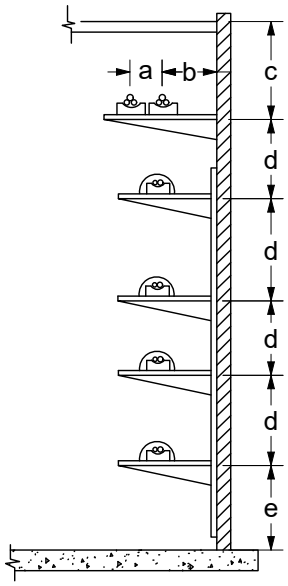
Cable Rack Spacing in Manhole



SECTION A-A

Side View of Cable Racks in Manhole

Cable Bracket Spacing



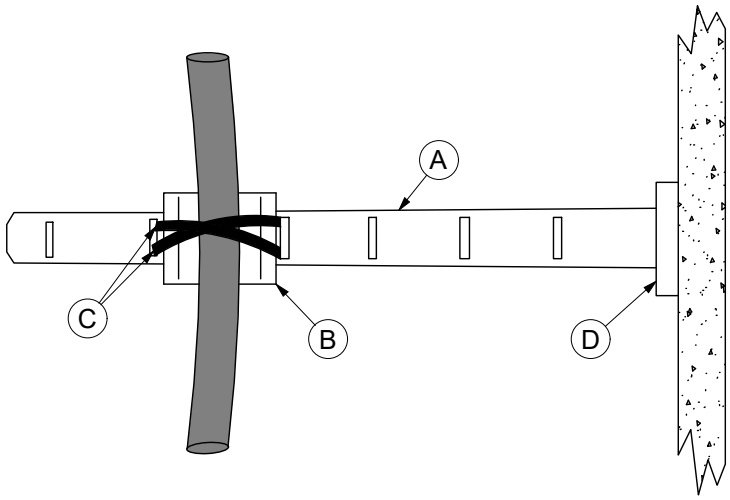
Dimension in Table

Standard Manhole (1 to 10 Ducts Used)
Maximum of 10 Network Cables on One Side
Maximum of 5 Primary Cables on Each Side
7 Brackets Maximum on Each Cable Rack

SPACING REQUIREMENTS FOR CABLE BRACKETS
Standard Precast Manhole

	a	b	c	d	e
Network & 600V	6"	6"	12"	12"	12"
5 & 15 kV	-	6"	12"	12"	12"
35 kV	-	6"	12"	12"	15"

REV	DATE	ENG	DESCRIPTION
1	01/01/24	JMW	Converted to new format
0	03/14/13	EJB	



Cable / Splice Cross Tie Down Detail

CONSTRUCTION NOTE(s):

1. In combined Network & Primary manholes the Network cables should be located on the top 1-4 brackets and the Primary cables should be located on the next 1-3 brackets below the Network cables. The Sub-transmission cables (if needed) should be located below the Primary cables on the bottom bracket(s).

2. Use the Cable Training DCS 33 20 04 01 to determine the duct position of new cable installations. When training and racking cables avoid situations whenever possible where cables will cross each other.

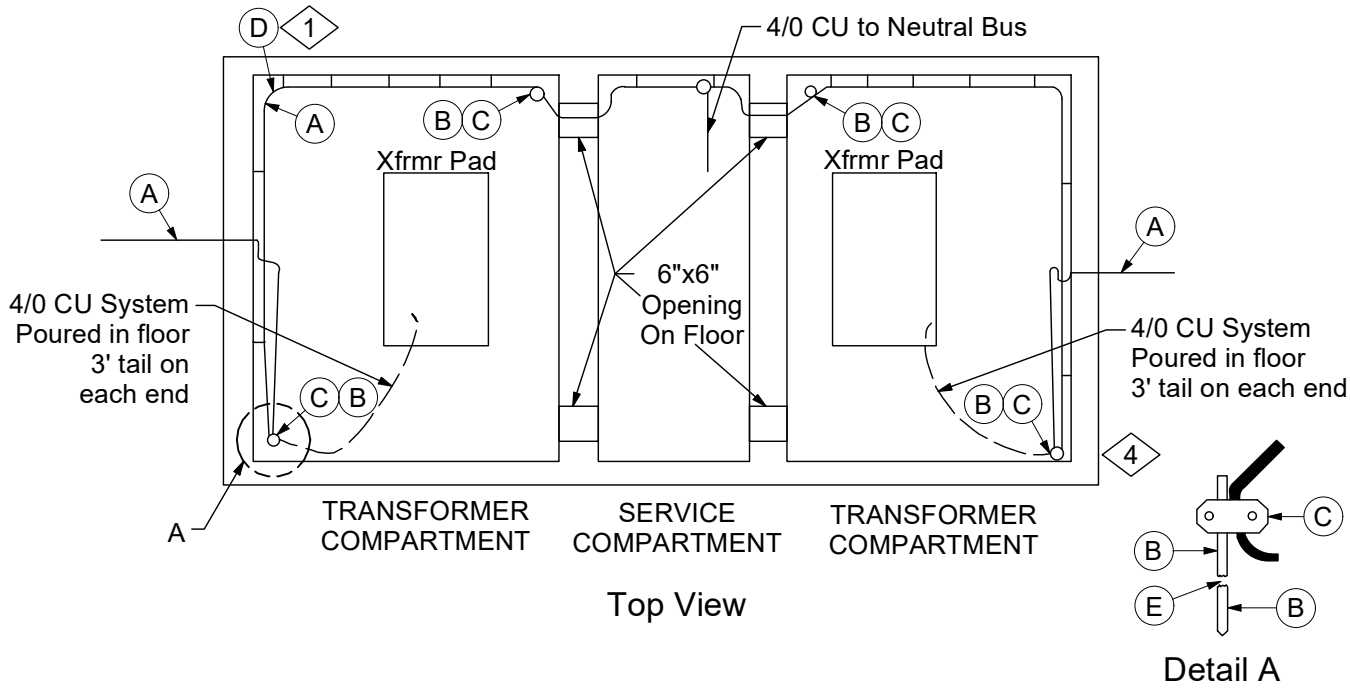
3. At each cable mounting arm, tie the cable/splice down to the porcelain insulator pad and mounting arm using two cable ties in a cross pattern (see Detail above).

4. New precast manholes will be supplied with the cable racks already installed in them.

DCS #	DESCRIPTION
33 20 05 01	Single Installation of 5 kV or 15 kV Primary Cable and Splice or a 35 kV Sub−transmission Cable and a Splice
33 20 05 02	Installation of One or Two 600 V Network Cables and Straight Splices or 2−3 Network Cables and a 3−way Crab Connector
33 20 05 03	4−7 600 V Network Cables and Either a 5 or 7 way Crab Connector

	ITEM	STK / DCS #	DESCRIPTION 33 20 05 **	01	02	03
	A	12 56 121	Arm − Cable Mounting 10”	5	-	-
		12 56 113	Arm − Cable Mounting 14”	-	20	-
		12 56 112	Arm − Cable Mounting 18”	-	-	20
	B	12 56 122	Insulator − Porcelain Pad	#	#	#
3	C	40 59 196	Tie − Cable, Black, 13 ½” Dia.	10	40	200
4@	D	12 56 115	Rack − Cable, Galv. Steel, 30” Long, 18 Holes	#	#	#
		12 56 116	Rack − Cable, Galv. Steel, 55” Long, 37 Holes	#	#	#

REV	DATE	ENG	DESCRIPTION
1	01/01/24	JMW	Converted to new format
0	03/14/13	EJB	



CONSTRUCTION NOTE(s):

1. The Bond Wire (A) is to be fastened with cable ties (D) 6 inches above the manhole floor after the vault is poured. The Bond wire will be tied to 1/2" minimum diameter mounting eyes which are to be cast into the vault walls at intervals of 3 ft. maximum. The 4/0 AWG bond wire will run from the primary duct banks in to the vaults.

2. Each transformer component will have a 4/0 AWG copper wire extension from the wall to the transformer pad. The extension is to be poured into the vault floor and have two 3 foot tails exposed at each end. One end will connect to the bond wire system while the other end connects to the transformer ground. Connect the extension with two bolt connections (C).

3. The service compartment will have a 4/0 AWG bond wire, clean the bond wire extension from the bond wire system to the neutral bus bar. Connect the extension with two bolt connectors (C).

4. Ground rods (B) are to be driven in 6 feet prior to pouring the floor of the vault. Rods shall be placed 6" from corners and walls.

5. When making grounding attachments to the bond wire, clean the bond wire at the attachment point.

6. Join two ground rods together with a coupling.

7. All access ladders are to be individually connected to the grounding system.

	ITEM	STK / DCS #	DESCRIPTION 33 20 06 **	01
1	A	18 52 024	Wire - 4/0 AWG, Copper, Bare, Soft Drawn	95
4	B	23 63 143	5/8" Ground Rod 4ft	8
	C	17 54 132	Connector - Wire, 8-350 kcmil, CU	11
1	D	40 59 196	Tie - Cable, Black, 13-1/2" Dia.	20
6	E	23 13 070	Coupling - CU Alloy, 5/8", Threaded	4

REV	DATE	ENG	DESCRIPTION
2	01/01/24	JMW	Converted to new format
1	04/05/17	EJB	