PADS AND TRANSFORMER ACCESSORIES 34

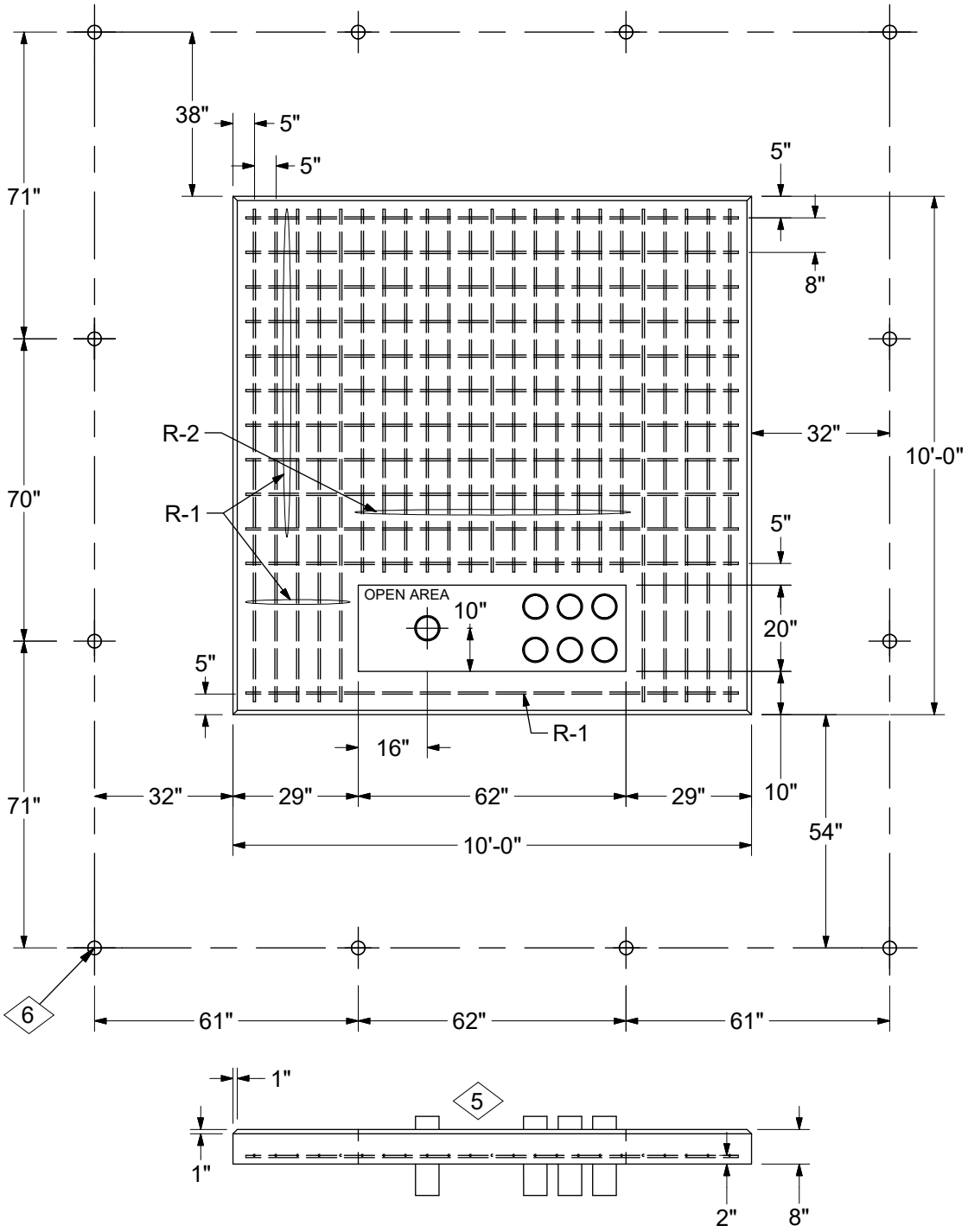

Table 1 - Radial-Feed Pad Reinforcing Schedule			
Rebar	NO Req'd	Size	Length
R-1	22	#4	114"
R-2	13	#4	84"

Radial-Feed Pad
1500 kVA Thru 3000 kVA

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4	01/01/22	DG	Converted to new format

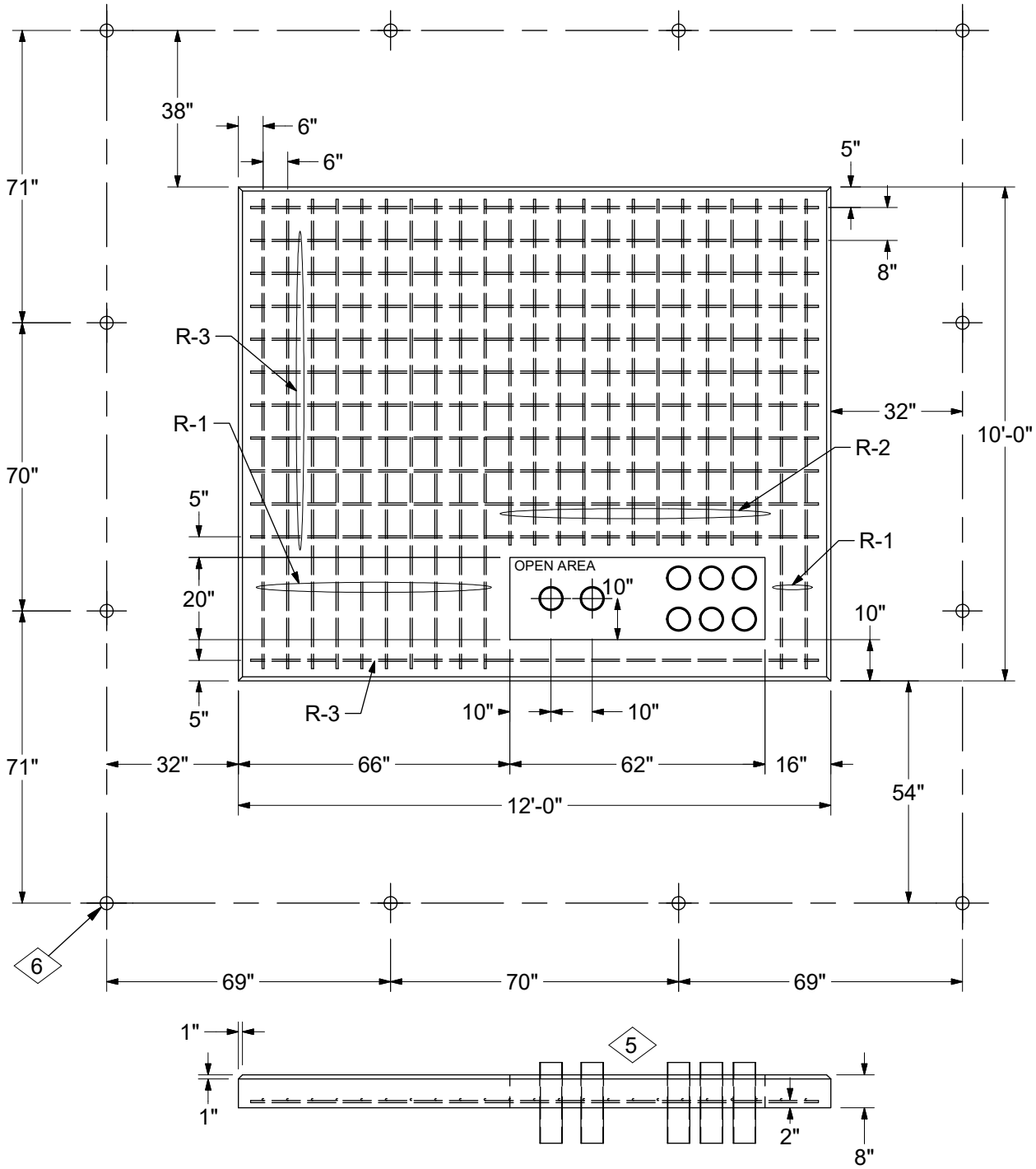

Table 2 - Loop-Feed Pad Reinforcing Schedule			
Rebar	NO Req'd	Size	Length
R-1	12	#4	114"
R-2	11	#4	84"
R-3	12	#4	138"

LOOP-FEED PAD
500 kVA THRU 2500 kVA

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4	01/01/22	DG	Converted to new format

CONSTRUCTION NOTE(s):

1. Concrete mix shall be either Type I or Type III portland. Mix concrete in accordance with ASTM C94. Water shall be clear and drinkable. Ultimate strength at 28 days shall be 4,000 psi, 6 sacks minimum of cement per cubic yard. Maximum slump 4”. Water to cement ratio shall not exceed 5.0 by weight, including free moisture on aggregate. Aggregate shall be white limestone rock, maximum size 3/4”. Use air entraining admixture (3% to 6% air by volume.) **The use of calcium chloride is prohibited.**

2. All concrete shall be well vibrated, dense and smooth. No honeycombs, fins or cold joints shall be present. Placement and vibration of concrete shall not disturb the reinforcement.

3. Reinforcement shall consist of #4 reinforcing bars meeting the requirements of ASTM A615, minimum grade 40. All reinforcing bars shall be tied to prevent displacement during concrete placement.

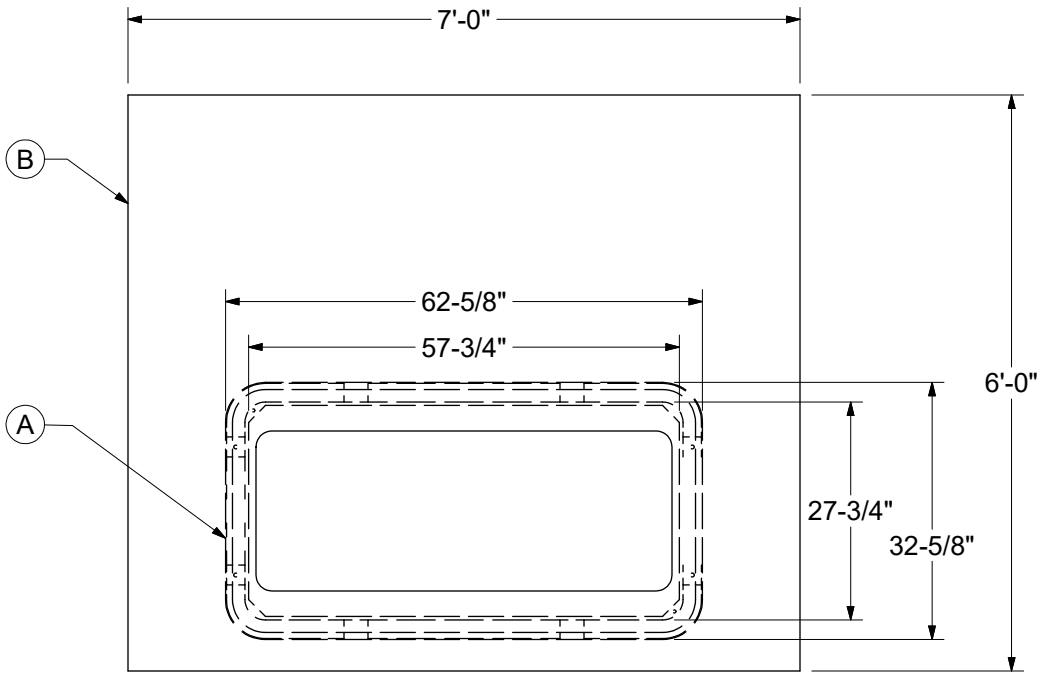
4. Dimensions shall be in accordance with the drawings shown in this standard. The top surface shall be true and free of mounds or depressions. A four foot level shall be placed at any location on the top surface and at no location may a #14 (American Wire Gauge) bare wire fit between the level and the surface. The finished pad shall be free of voids and crumbling edges. No protrusion or flashing shall exceed 1/4” in length from the finished surface. **Pads not conforming to any dimension or specification contained herein will not be accepted.**

◇5. Secondary conduits shall be symmetrically located within a 20" x 24" area. Primary conduit shall be positioned as shown.

◇6. All materials and labor for protective barrier posts shall be provided by the customer.
a. Barrier posts on sides not accessible to vehicles may be omitted.
b. Installation of barrier posts must be coordinated with the conduit installation to avoid mutual interference.
c. Barrier posts to be 4" steel pipe, 8'-6" long, buried 56" deep.
d. Drill holes for barrier posts with 8" auger.
e. Fill the holes around the barrier posts with concrete to the top of grade.
f. Fill the barrier posts with concrete.
g. Paint barrier posts with yellow laquer.

This transformer box vault (Stock #12 06 241) is for use with composite pad Stock #12 06 124 (or equivalent sized poured in place concrete pad) for the following applications:

1. If primary cable is larger than 1/0,
2. If secondary output requirement from the transformer is greater than 2000 Amps:
   A. Loop-feed 750 kVA and larger transformer at 208Y/120 Volts
   B. Radial-feed 1500 kVA and larger transformer at 480Y/277 Volts



Top View

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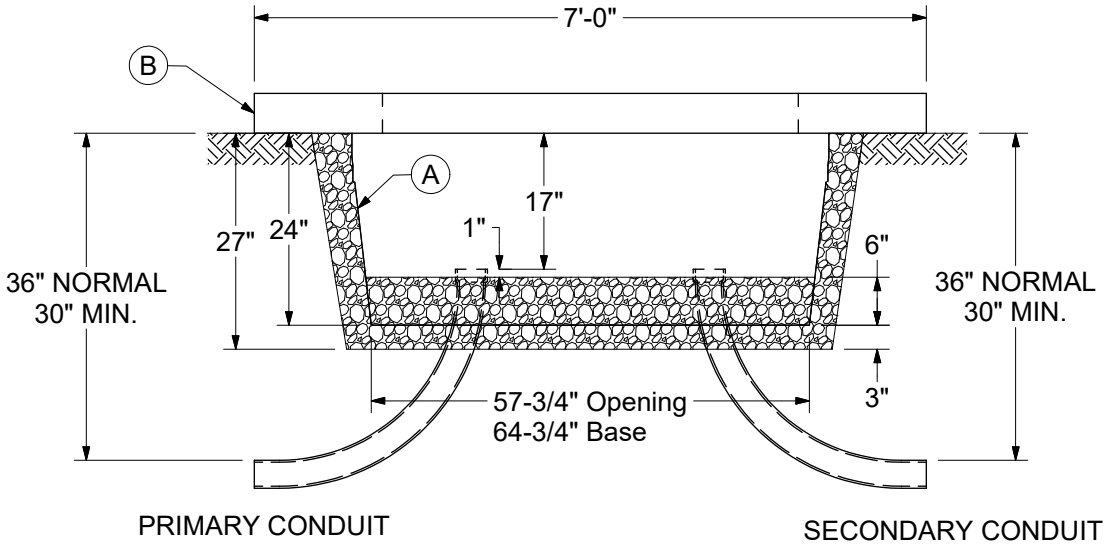
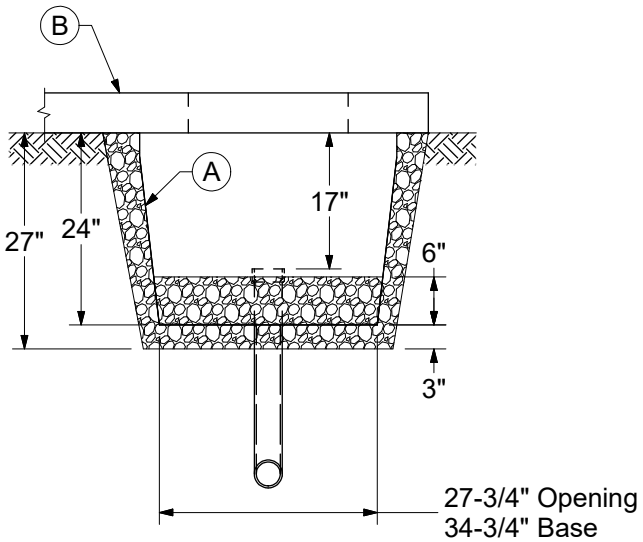
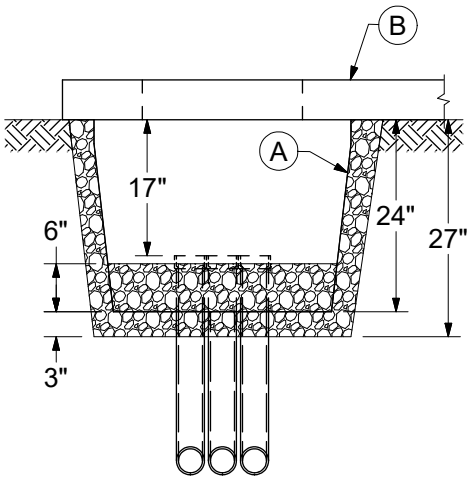


Front View



Primary Conduit
Side View



Secondary Conduit
Side View

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CONSTRUCTION NOTE(s):

1. The areas of excavation that bear the box vault and the flat pad shall be tamped and leveled. Proper compaction prior to setting the box vault and the flat pad is important to prevent settling. See DCS **34 21 05 **** for pad backfill requirements.

2. An initial depth of 27” shall be excavated for the box vault.

3. To install the 36” radius bends, an increase in the initial excavation depth is required. After the bends have been installed, crushed stone screenings shall be placed and tamped to the level shown in the drawings.

4. The primary and secondary conduits may enter the box vault from the sides (as shown in drawings), from the front, or from the back.

5. All conduits shall be rigid PVC Schedule 40 or approved PVC flexible conduit. If bends are cut off, apply a bell end coupling over the end of each conduit.

6. See DCS **34 21 05 ****, sheet 4 of 4, for conduit layout in the primary and secondary compartment areas of the pad vault.

7. Stabilize the box vault over the conduits before backfilling so that there will be no shifting. To further stabilize the conduit bends, place additional screenings inside the pad vault and hand tamp in place. Conduit openings should be 17” below the load bearing surface (top) of the box vault. See drawings.

8. The opening of the flat pad should be centered over the box vault. Note that the box vault opening is 57-3/4” x 27-3/4” and the flat pad opening is slightly smaller at 52” x 20”.

9. If pulling tension through the conduit elbows will exceed 400 lbs., restrain the bends as per DCS **31 47 01 ****.

10. Box vault cover Stock #12 06 245 can be used on this vault box to temporarily cover the opening. Note however, this cover cannot be installed or removed with the flat pad in place over the box vault.

ITEM	STK / DCS #	DESCRIPTION 34 21 04 **	05
A	12 06 241	Box Vault - Composite 60" x 30" x 24"	1
B	12 06 124	Pad - Transformer, Composite 3 Phase 84" x 72"	1

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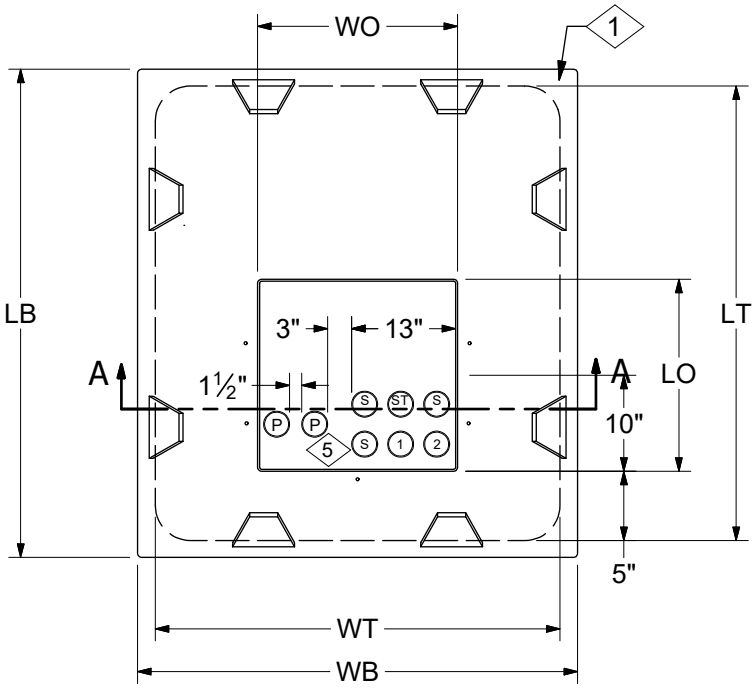
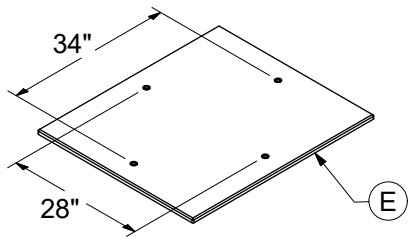
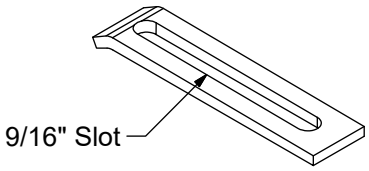
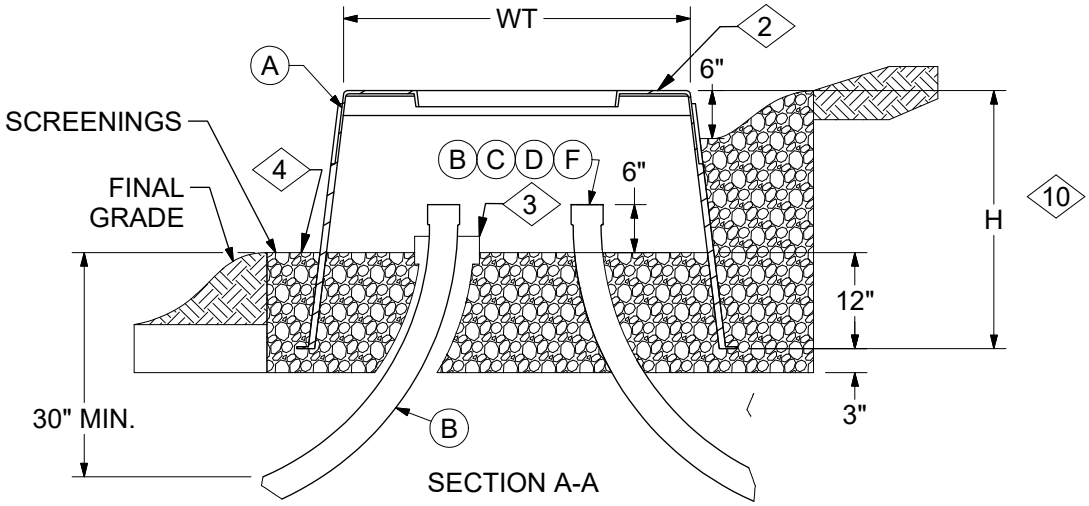




OPTIONAL BOX VAULT COVER
W/Four 3/8" SS Penta Head Bolts



HOLD DOWN BRACKET DETAIL
2 Brackets Provided w/Pad



CONSTRUCTION NOTE(s):

1. Base of vault.
2. Load bearing surface of vault.
3. Restrain conduit bends per DCS **31 47 01 ****** for pulling long cable lengths.
4. 12" minimum cover over flange of box on downhill side of box.
5. P=Primary, S=Secondary, ST=Streetlight, 1&2=Services
6. In Missouri residential developments, the contractor will install the vault and bends.
7. Secondary conduit shall be symmetrically located within a 13” x 10” area as shown above.

8. For Missouri residential contractor jobs, 3” conduits shall be installed on the primary side. Otherwise 2” conduit may be installed on the primary side.

9. Conduit ends to be sealed with duct tape and the tape marked with permanent marker as follows: S=Secondary, ST=Streetlight, and service conduits marked with lot number.

Box Vault Dimensions & Weight										
	STK #	Description	Dimensions (Inches)							Approx. Weight (lbs.)
			Top		Height	Opening		Base		
			WT	LT	H	WO	LO	WB	LB	
10	12 06 215	42"Wx48"Lx32"H	42	48	32	25	24	54	60	144
11	12 06 163	42"Wx48"Lx18"H	42	48	18	25	24	50.5	56.5	90
12	12 06 218	37"Wx48"Lx18"H	37	43	18	22	23.5	47.5	54.5	80

	ITEM	STK / DCS #	DESCRIPTION 34 21 04 **	01	02	03
	A	12 06 215	Vault - Transformer 42" x 48" x 32" Fiberglass	1	-	-
		12 06 163	Vault - Transformer 42" x 48" x 18" Fiberglass	-	1	-
		12 06 218	Vault - Transformer 37" x 43" x 18" Fiberglass	-	-	1
@	B	12 51 173	Conduit - Bend 3" , 36" Rad	#	#	#
@	C	12 51 331	Conduit - Bend 1-1/2", 24" Rad	#	#	#
@	D	12 51 264	Conduit - Bend 2-1/2", 24" Rad	#	#	#
@	E	12 06 085	Cover - Vault, Fiberglass	1	1	1
	F	40 83 492	Conduit - Coupling 1-1/2" Bell End	#	#	#
@		12 51 398	Conduit - Coupling 2-1/2" Bell End	#	#	#
		12 51 008	Conduit - Coupling 3", Bell End	2	2	2

DESIGN NOTE(s):

10. The 32” tall box vault pad stock #12 06 215 is for use on slopped grades.

11. The 18” tall box vault pad stock #12 06 163 is intended for use on flat grades for commercial applications with two or more runs of 750 kcmil secondary/service cables or where primary cable is larger than #2, and transformer is 167 or 250kVA. It is also used for 34.5kV Grdy/19.92kV singlephase padmount transformers.

12. The 18" tall box vault pad stock #12 06 218 is intended for use on flat grades for commercial applications with two or more runs of 750 kcmil secondary/service cables or where primary cable is larger than #2, and transformer is 100kVA or smaller.

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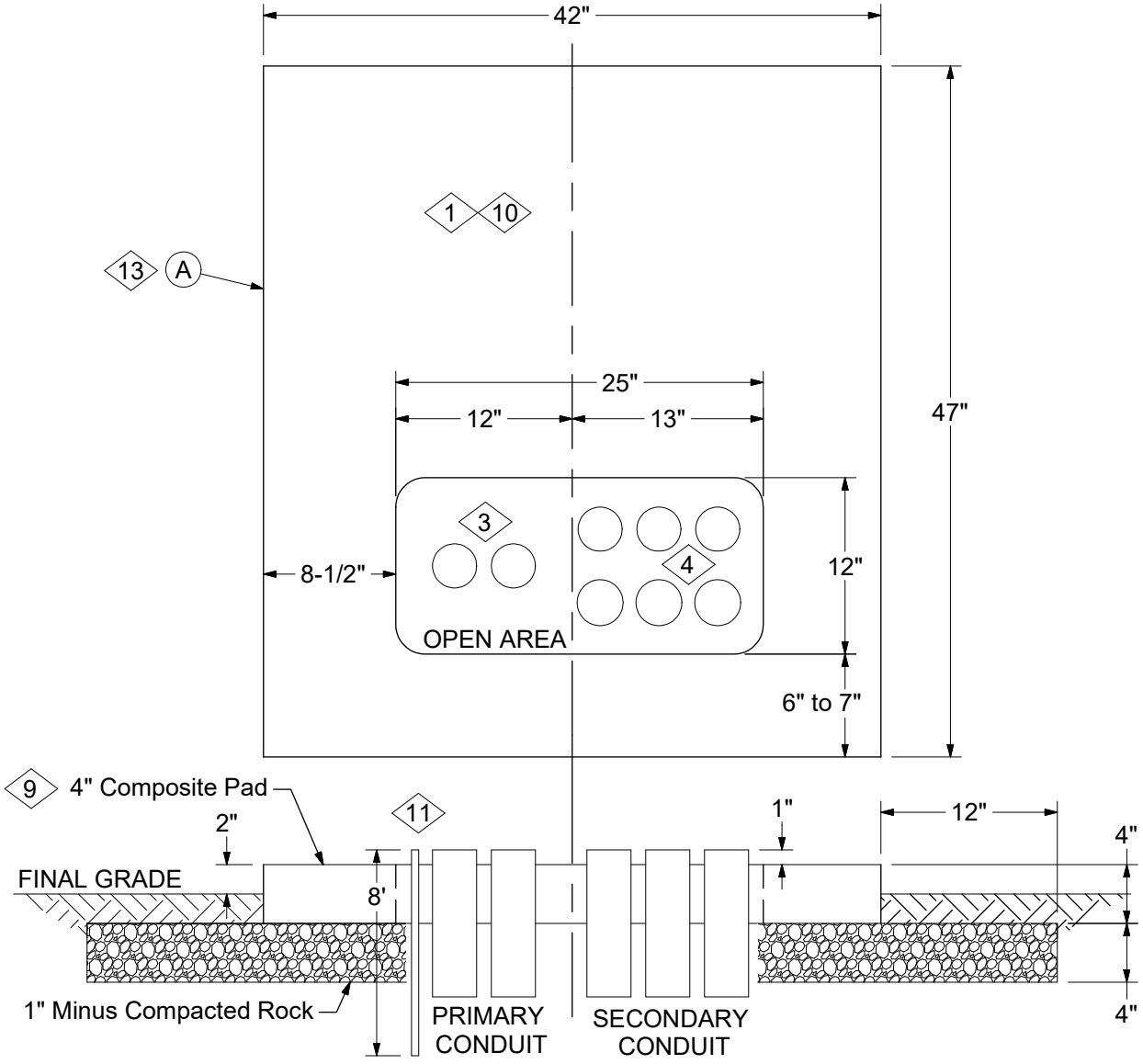

34 21 05 01 - Lightweight Pad

34 21 05 02 - Heavy Pad 13

25 kVA thru 250 kVA Single Phase Loop Feed

CONSTRUCTION NOTE(s):

1. Approximate weight of single-phase pads: Lightweight - 50 lbs., Heavy - 300 lbs.
2. In Missouri residential developments, the contractor will install the pad and conduits.
3. Two conduits shall be installed on the primary side - minimum size 2".
4. Secondary conduit shall be symmetrically located within 12" x 13" area. The maximum number of conduits is 6 - 3" for the secondary. The number of secondary cables shall not exceed 8 per phase.

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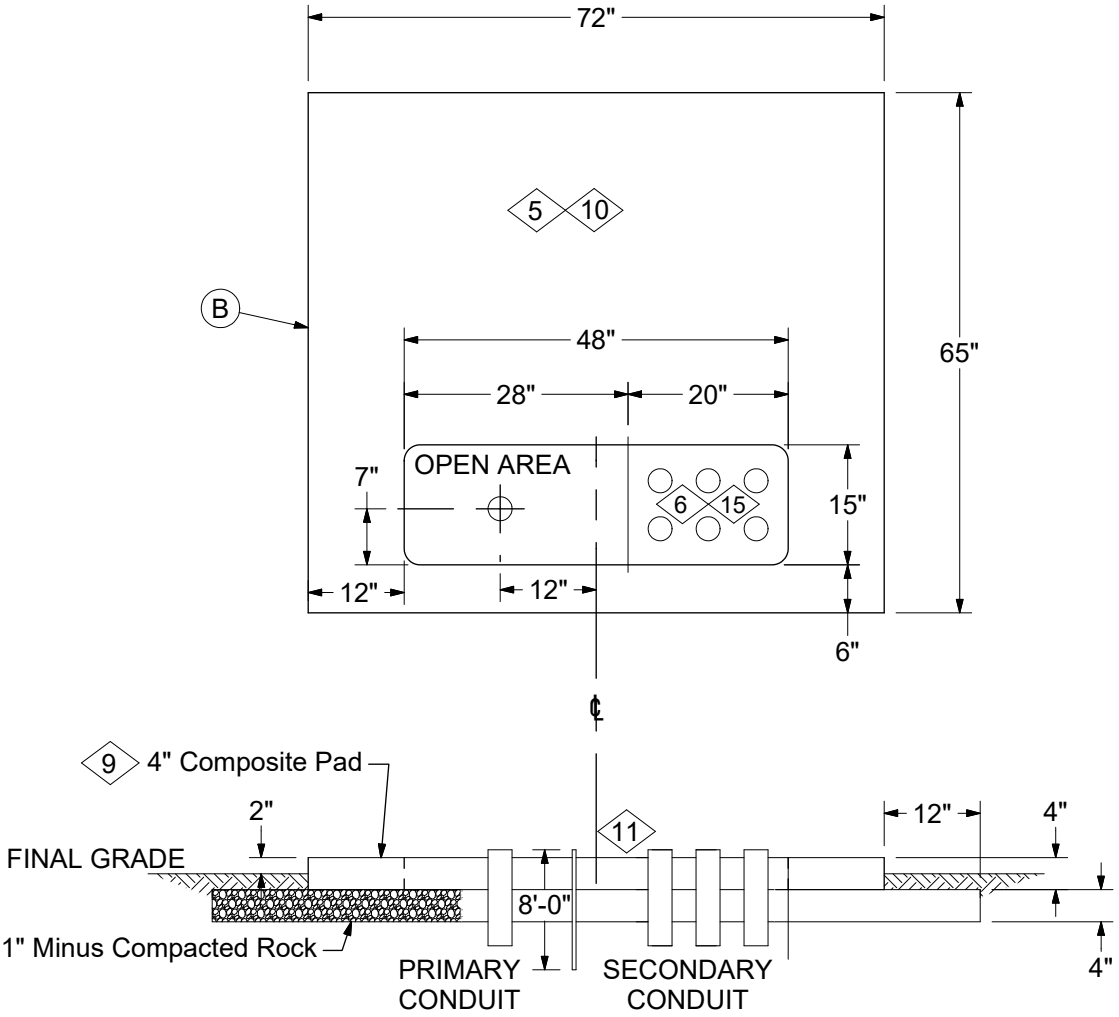
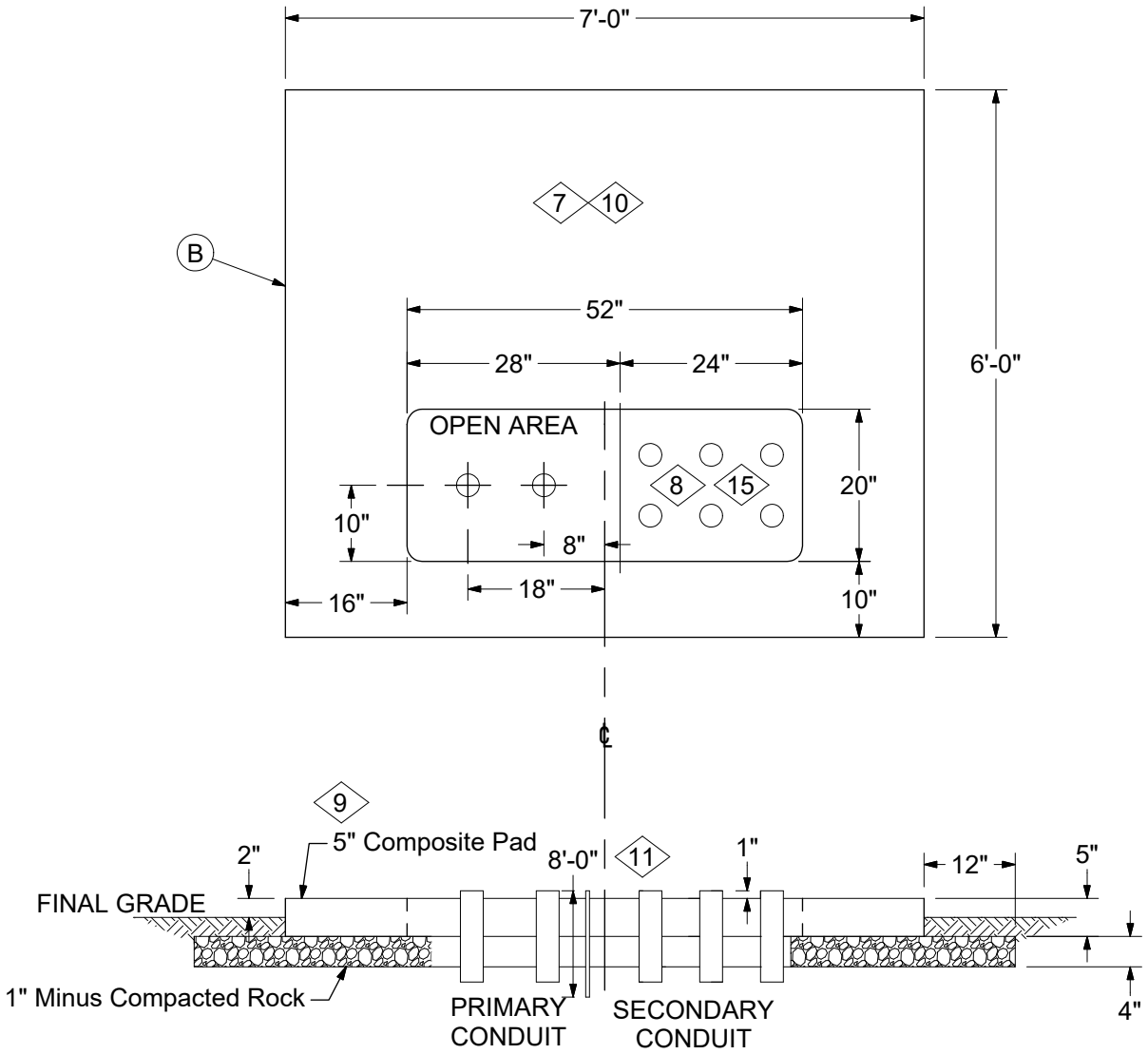


34 21 05 04

750 kVA and Smaller Three Phase Radial Feed

CONSTRUCTION NOTE(s):

5. Approximate weight of this three-phase pad is 600 lbs.
6. Secondary conduit shall be symmetrically located within a 15" x 20" area as shown above.



34 21 05 05

75 kVA thru 1000 kVA Three Phase Loop Feed

1000 kVA thru 2500 kVA Three Phase Radial Feed

CONSTRUCTION NOTE(s):

7. Approximate weight of this three-phase pad is 800 lbs.

8. Secondary conduits shall be symmetrically located within a 20" x 24" area as shown above.

CONSTRUCTION NOTE(s):

9. Pad shall be installed on 4" level, well compacted, 1" minus rock extending 12" outside the pad. Dirt under rock must first be compacted. Avoid filling opening before cable or conduit is installed. Unless situated in a paved area, the rest of the exterior shall be backfilled with the excavated material and foot tamped.

10. When possible, do not install cable under this portion of the pad.

11. The 5/8" x 8' ground rod can be located where most convenient in the pad opening to avoid the incoming and outgoing conduit elbows.

	ITEM	STK / DCS #	DESCRIPTION 34 21 05 **	01	02	04	05
13	A	12 06 164	Pad - Transformer, Composite 1 Phase Lightweight	1	-	-	-
		12 06 198	Pad - Transformer, Composite 1 Phase Heavy	-	1	-	-
	B	12 06 123	Pad - Transformer, Composite 3 Phase 72" x 65"	-	-	1	-
		12 06 124	Pad - Transformer, Composite 3 Phase 84" x 72"	-	-	-	1

DESIGN NOTE(s):

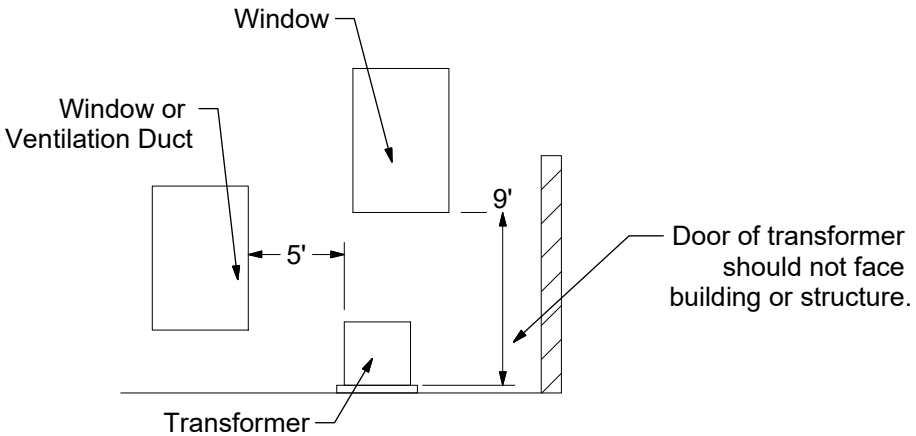
12. Ameren Engineering to determine final location and orientation of transformer pad.

13. Heavy single-phase pad is for conduit systems where pad is installed by customer contractor and for “dummy” transformers (DCS **51 11 02 ****). Lightweight single-phase pad is for installations where pad is installed by Ameren personnel.

14. All conduit shall be rigid PVC Schedule 40 or approved PVC flexible conduit.

15. The number of primary and secondary conduits may vary. The number of secondary cables shall not exceed 12 per phase. Ameren Engineering will determine if the number of conduits is acceptable or if a vault will be required.

16. Typical Minimum Clearances -



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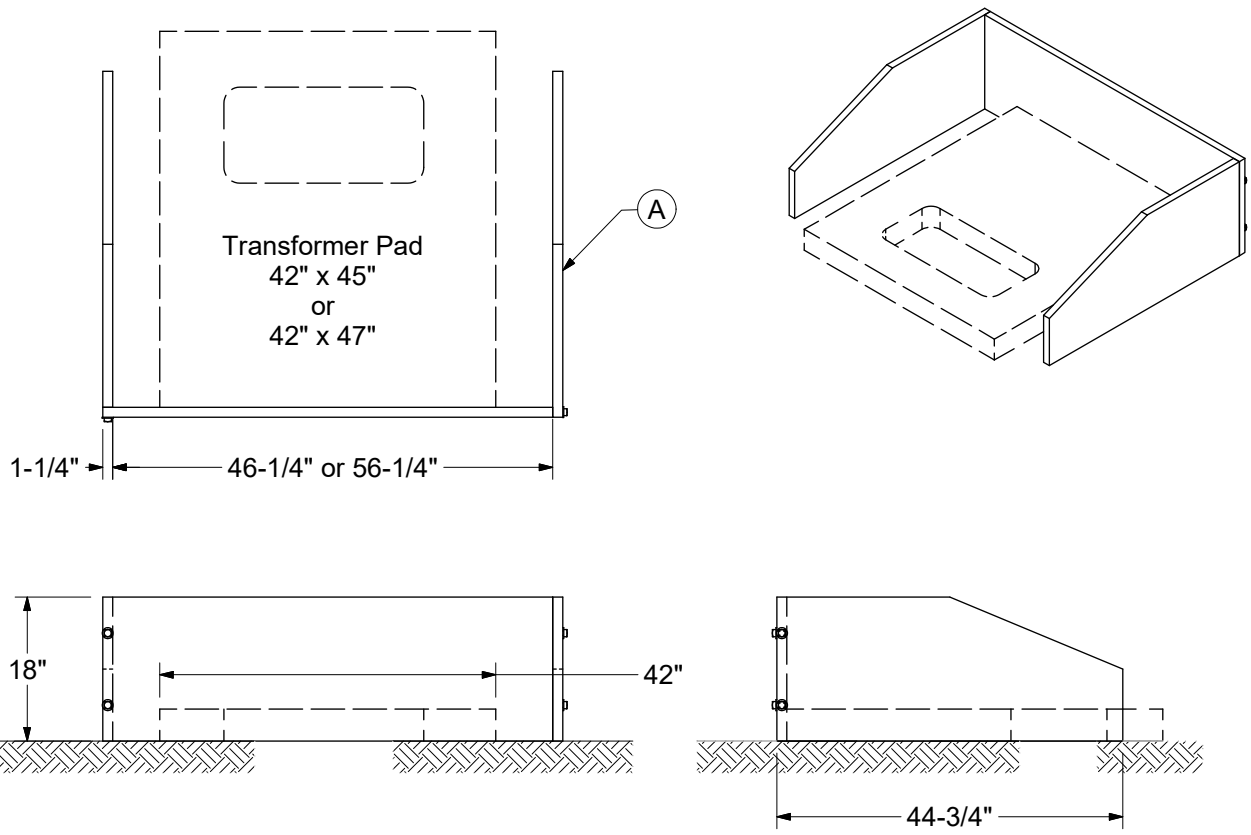

DESIGN NOTE(s):

1. Use where grade has changed and transformer or pedestal has been partially buried. Can also be used in new installations where slight grade exists and erosion or landscaping is reasonably expected.

2. Retaining wall set includes 1 - Back Wall, 1 - Right (short) Wall, 1 - Left (long) Wall, and 4 - galvanized steel bolts with washers and nuts.

ITEM	STK / DCS #	DESCRIPTION 34 21 06 **	01	02
A	12 06 208	Retaining Wall - 44-3/4" x 58-3/4" x 18" x 1-1/4"	1	-
	12 06 209	Retaining Wall - 44-3/4" x 48-3/4" x 18" x 1-1/4"	-	1

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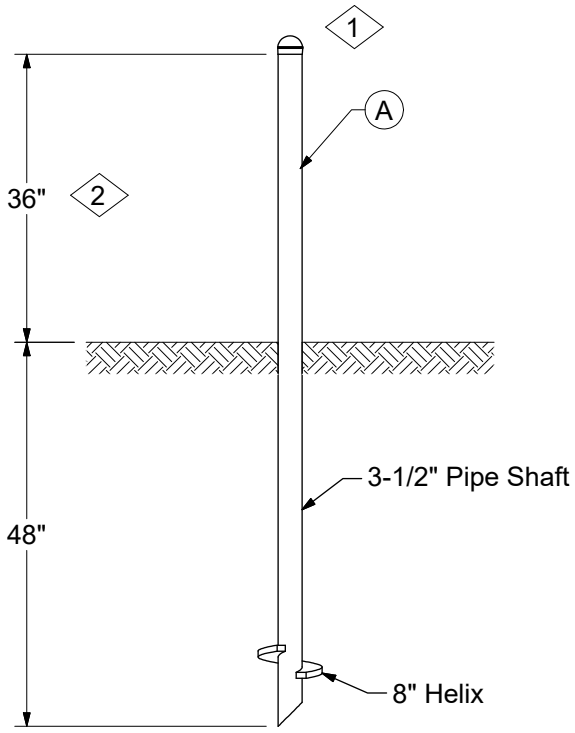

CONSTRUCTION NOTE(s):

1. Cap should be driven on after bumper post is installed.

2. Install the base 48" into the ground in order to leave 36" projecting above the ground line.

3. See DCS **59 81 51 10** for placement positions of bumper posts around padmounted transformers and switchgear.

ITEM	STK / DCS #	DESCRIPTION 34 22 01 00	QTY
A	21 51 127	Bumper - Screw Type 3-1/2" x 84"	1
	203	Operation Code - Inst Bumper Post	1

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