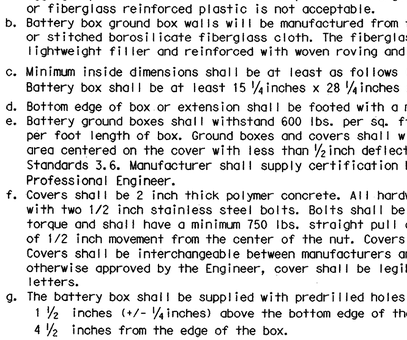
GROUND BOX - Type - Battery Box

A. MATERIALS

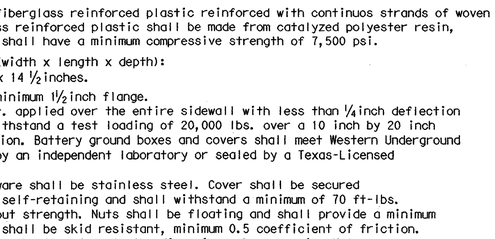
1. Battery box ground boxes shall be constructed such that it will be possible to install and accomodate up to 4 batteries measuring 8" x 13.5" x 10" (W x L x D).
2. All battery box ground boxes and covers shall be permanently marked either by impress or by permanent ink, with manufacturer's model number and manufacturer's name or logo.
3. Covers shall be bolted down, and bolt holes in the box shall be arranged to drain dirt.
4. Battery box ground boxes shall meet the following requirements:
   a. Battery box cover and cover ring will be manufactured from polymer concrete reinforced with continuous strands of woven or stitched borosilicate fiberglass cloth. The polymer concrete shall be made from catalyzed polyester resin, sand and aggregate, and shall have a minimum compressive strength of 11,000 psi. Polymer concrete containing chopped fiberglass or fiberglass reinforced plastic is not acceptable.
   b. Battery box ground box walls will be manufactured from fiberglass reinforced plastic reinforced with continuos strands of woven or stitched borosilicate fiberglass cloth. The fiberglass reinforced plastic shall be made from catalyzed polyester resin, lightweight filler and reinforced with woven roving and shall have a minimum compressive strength of 7,500 psi.
   c. Minimum inside dimensions shall be at least as follows (width x length x depth):
      Battery box shall be at least 15 1/4 inches x 28 1/4 inches x 14 1/2 inches.
   d. Bottom edge of box or extension shall be footed with a minimum 1 1/2 inch flange.
   e. Battery ground boxes shall withstand 600 lbs. per sq. ft. applied over the entire sidewall with less than 1/4 inch deflection per foot length of box. Ground boxes and covers shall withstand a test loading of 20,000 lbs. over a 10 inch by 20 inch area centered on the cover with less than 1/2 inch deflection. Battery ground boxes and covers shall meet Western Underground Standards 3.6. Manufacturer shall supply certification by an independent laboratory or sealed by a Texas-Licensed Professional Engineer.
   f. Covers shall be 2 inch thick polymer concrete. All hardware shall be stainless steel. Cover shall be secured with two 1/2 inch stainless steel bolts. Bolts shall be self-retaining and shall withstand a minimum of 70 ft-lbs. torque and shall have a minimum 750 lbs. straight pull out strength. Nuts shall be floating and shall provide a minimum of 1/2 inch movement from the center of the nut. Covers shall be skid resistant, minimum 0.5 coefficient of friction. Covers shall be interchangeable between manufacturers and shall conform to the dimensions shown herein. Unless otherwise approved by the Engineer, cover shall be legibly labeled, "Traffic Signals Danger High Voltage" in minimum 1 inch letters.
   g. The battery box shall be supplied with predrilled holes to accept 3/8 inch stainless steel rods. The holes shall be installed 1 1/2 inches (+/- 1/4 inches) above the bottom edge of the box along the length of the box at 3 1/2 inch centers beginning 4 1/2 inches from the edge of the box.
   h. A minimum of seven 3/8 inch stainless steel rods threaded on both ends shall come equipped to be inserted in the predrilled holes to serve as a rack sufficient to accommodate up to four batteries. The rods shall be secured in place utilizing 3/8" stainless steel (s.s.) nuts and 3/8" X 1" s.s. flat washers.
   i. Ground boxes of the type specified above shall meet the requirements shown above. The Contractor will be permitted to furnish like materials of any manufacturer provided they are of equal quality and comply with the specifications.
   j. Two 3/16" plastic sheets measuring a nominal 6" x 24" shall be supplied which are to be placed on the secured rods upon which the batteries (supplied by others) are to be set.
   k. A minimum of four battery "bell jars" and respective tie down straps are to be supplied. These bell jars are inverted over the batteries and strapped to the batteries.

B. CONSTRUCTION METHODS

1. Battery box ground boxes shall be set on a 9 inch (minimum) bed of coarse No. 1 aggregate as defined by Item 421. Gravel shall be in place prior to setting box and conduits shall be capped. Any gravel or dirt in conduit shall be removed.
2. Construction of an apron encasing the battery box ground box including concrete and reinforcing steel is required and shall not be paid for directly but shall be subsidiary to the ground box. Reinforcing steel may be field bent. Concrete for aprons shall be considered miscellaneous concrete for testing purposes. Aprons shall be cast in place.
3. Any holes cut into the sidewall of battery box ground boxes shall be accomplished using a round hole saw or other method approved by the Engineer.



PLAN VIEW

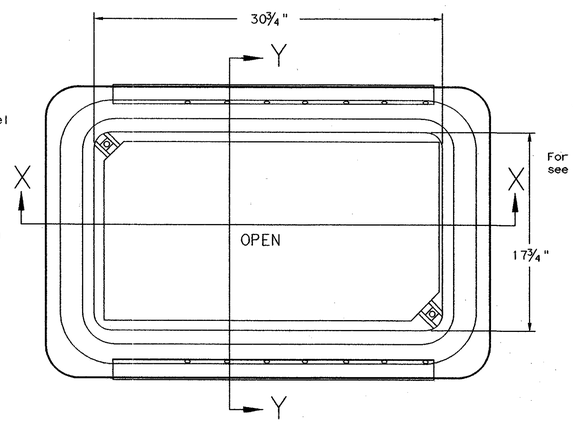


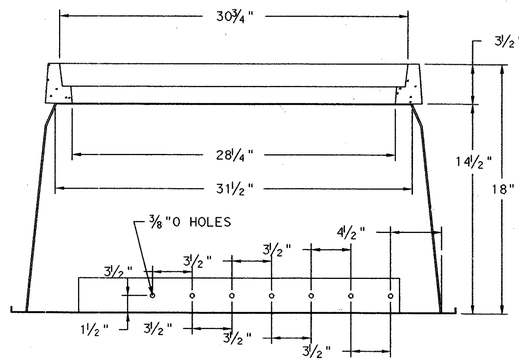
SECTION A - A

APRON FOR GROUND BOXES

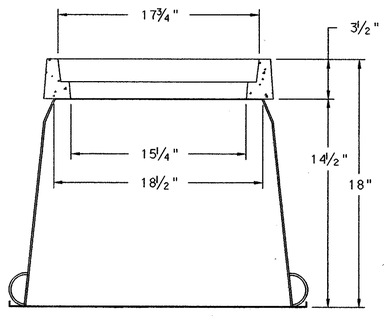
(Where required)

(1) Place gravel "under" the box. not "in" the box. Gravel should not encroach on the interior volume of the box.
(2) Install bushing on the upper end of all ells.
(3) All conduits shall be installed in a neat and workmanlike manner.

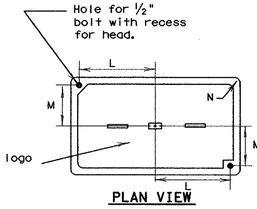




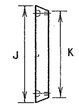
SECTION X-X



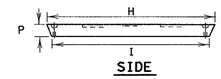
SECTION Y-Y



PLAN VIEW



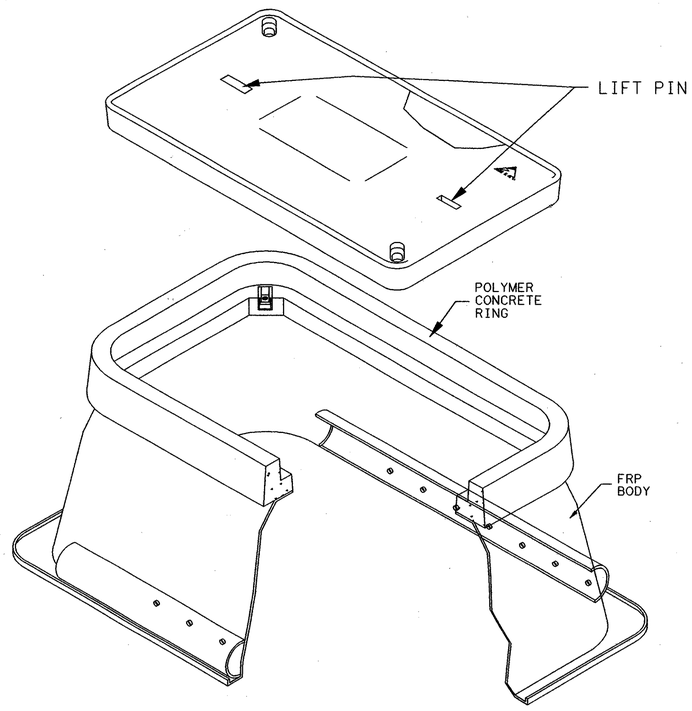
END



SIDE

GROUND BOX COVER

GROUND BOX COVER DIMENSIONS								
BOX	DIMENSIONS (INCHES)							
SIZE	H	I	J	K	L	M	N	P
Battery box	30 ½	30 ¼	17 ½	17 ¼	13 ¼	6 ¾	1 ⅜	2



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STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

ELECTRICAL DETAILS GROUND BOXES/ BATTERY BOX

ED(13)-03

DN: HW	CK: BV	DW: HW	CK: CAL
REVISIONS	STATE DISTRICT: 6	FEDERAL REGION	FEDERAL AID PROJECT	SHEET: BLS-9
COUNTY	CONTROL	SECTION	JOB	HIGHWAY

71N

LEVELS DISPLAYED ACC:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	