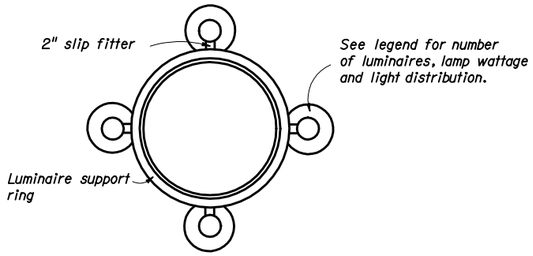
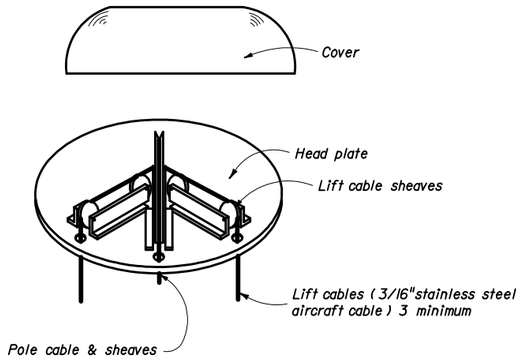
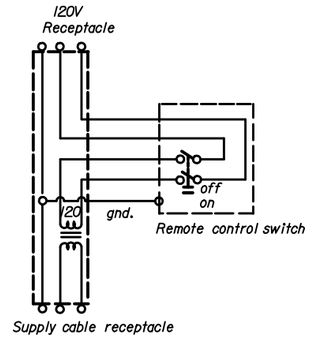
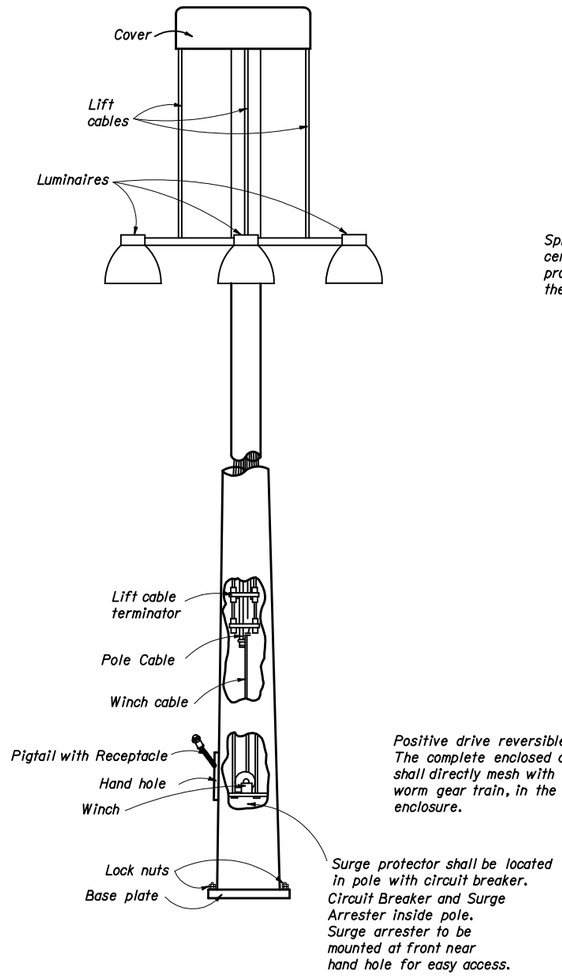
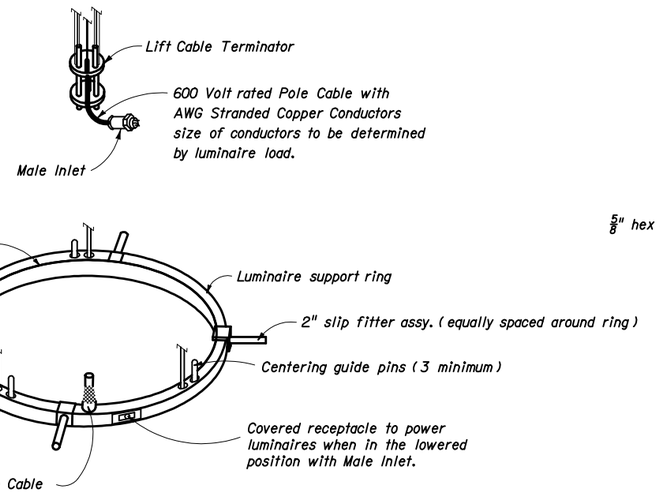


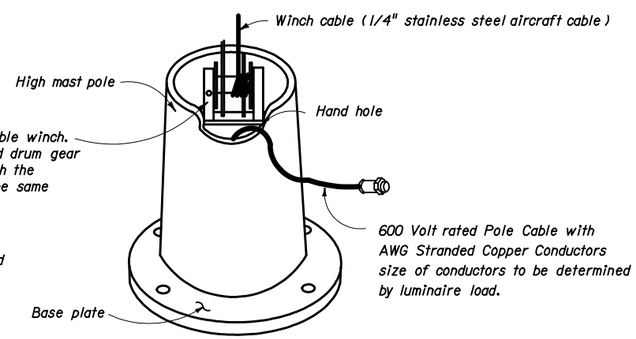


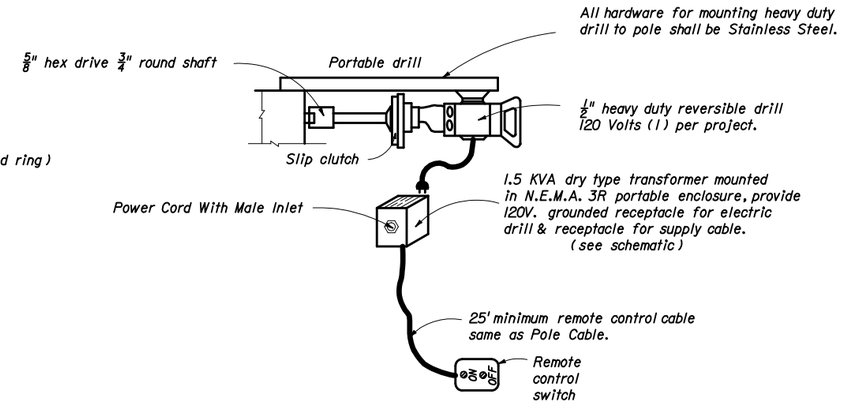


SCHEMATIC OF REMOTE AUXILIARY POWER UNIT









STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	2006 FDOT Design Standards	Last Revision 07/01/05	Sheet No. 1of 4
	HIGHMAST LIGHTING		Index No. 17502

LUMINAIRE SPECIFICATIONS

The reflector with its aluminum cover shall be firmly attached to a cast ring. This ring shall have keyhole slots in its upper surface such that the reflector/refractor assembly may be readily attached to, or detached from, the luminaire bracket entry and lamp support assembly without completely removing the support bolts.

Each luminaire shall contain an integral auto-regulator type ballast connected for 480 volts input ± 10% and a power factor of more than 90%. The luminaire ballast shall be enclosed within an aluminum housing which intregally attaches to the luminaire bracket entry and lamp support assembly. It shall be readily removable without removing the luminaire from the bracket arm.

The luminaire shall be attached to the bracket arm by means of a bracket entry and lamp support assembly. The assembly shall include a side entry slipfitter designed for 2" pipe with provision for 3° adjustment for leveling the luminaire. An enclosed terminal block shall be included such that all electrical connections shall be protected from exposure to weather.

All electrical connections shall be made waterproof or be made inside a weather resistant enclosure. All luminaires shall be ANSI/IES light distribution as indicated in plans. Each luminaire shall be labeled with a permanent label which states the type of lamp, voltage input, power input, power factor, ballast type, socket position, ANSI/IES light distribution, and such other catalog information that a complete replacement can be readily ordered.

The contractors attention is directed to those plan sheets detailing the mounting of luminaires at the pole top. Particular attention is directed to alignment of luminaire light distributions. Special attention must be exercised in the physical alignment of these luminaires to ensure that the approved photometric layout is physically produced at each lighting standard in the field. A marking shall be placed on the external face of the refractor to allow visual inspection of alignment. The marking shall correspond to the 0° axis of the refractor.

FOOTING

The high mast foundations shall be constructed in accordance with the details shown in the plans.

Anchor bolts per manufacturer's Specifications. Submittals shall be supplied to the engineer of record prior to purchase.

One leveling nut, one hold-down nut, and one locking/jam nut shall be supplied per anchor bolt. The standoff distance (the distance between the bottom of the leveling nut and the top of the foundation) shall not exceed one anchor bolt diameter. All small metal parts, (nuts, screws, washers, etc.) shall be rustproofed either by galvanizing per ASTM A153 or by the nature of material used in their fabrication.

If a grout pad is not installed, baseplates shall be secured with double nuts both above and below the baseplate. The locking nuts shall be half-height nuts. The standoff distance (the distance between the bottom of the full-height leveling nut and the top of the foundation) shall not exceed one anchor bolt diameter. In rural areas, the top of the foundation should be greater than 12" above finished grade. A vertically placed wire cloth screen between the baseplate and the top of the foundation shall be wrapped horizontally around the baseplate with a 3" min. lap. The wire cloth shall be galvanized steel standard grade plain weave 2x2 mesh 0.063" dia. wire. The screen shall be attached to the baseplate with stainless steel self-tapping $\frac{1}{4}$" screws with stainless steel washers spaced at 9" centers.

LOWERING SYSTEM SPECIFICATIONS

The lowering system shall consist of the following:

A. Head frame and cover
B. Luminaire ring
C. Cables
D. Winch
E. Portable power unit (1 per project)

The head frame unit shall rigidly mate the top of the pole to the head frame platform. The platform with its associated sheaves, etc. shall be covered and raintight. The head frame structure shall be zinc coated steel, attached to the pole by means of a steel slipfitter. Head frame shall encompass six 5" nominal steel cable sheaves grooved to the exact cable diameter, for 180° cable bearing surface. The sheave shall be zinc electroplated to ASTM 164 and dipped in yellow chromate for corrosion resistance. Bearings and cable keepers shall have permanent lubrication. Three (3) stainless steel 7 x 19 aircraft cables of $\frac{3}{16}$" or greater diameter shall be provided.

The pole cable shall be attached to the luminaire ring with a waterproof connector capable of withstanding the pull of the weight of the pole cable. Where the wire ropes are required to bend over sheaves or over the winch drum, the maximum working stress in the outer fibers of wire rope shall not exceed 20% of the wire rope manufacturer's rated ultimate stress.

Drum design shall cause level wind of wire rope. The power cord shall travel on sheave (s) or a combination of rollers providing a radius for the cord of 6" or larger. Each end of the sheave (s) or rollers shall have a keeper to prevent the cable from jumping out of the roller track.

The head frame shall also include three (3) latching devices to support the luminaire ring assembly when the lowering device is not in operation. The latches shall be actuated by alternate raising and lowering of the hoisting cables. Locking of luminaire ring shall be signaled by indicators visible from ground. All moving parts of the latch mechanism shall be serviceable from the ground. Each of the three latches shall be strong enough, by itself, to support twice the weight of the ring and all the luminaires. Latching mechanisms which depend primarily upon spring operation or contain dissimilar metals are not acceptable. The latching mechanism shall not require adjustment after the original installation.

The luminaire ring shall be constructed of a minimum of 6" x 2" x 7 guage steel channel galvanized in accordance with ASTM A123 Class "B" steel channel with the appropriate number of 2" steel pipe mounting arms. The luminaire ring shall be prewired with Type "W" or specially reinforced Type "SO" power cable with suitable conductor quantity and size for proper operation and Type "ST" distribution wiring with insulation suitable for at least 105°C. All power cables should be attached to the aluminum weathertight wiring chamber with weathertight cable connectors. A 600 volt terminal block, completely prewired shall be included in the weathertight wiring chamber. A weather-tight twistlock power inlet shall be provided on the luminaire ring to allow testing of the luminaire while in the lowered position. The power inlet shall face away from the pole for easy access. Raising speed of the luminaire ring shall be a minimum of 12' per minute.

The ultimate support of the luminaire ring shall not be dependent upon the lowering and raising cables.

The system shall be provided with a circuit breaker assembly with a lightning arrestor on the circuit breaker enclosure. A pigtail cord and receptacle shall be supplied from the circuit breaker assembly. The receptacle on the pigtail cord shall be of dead front construction. The receptacle shall have a push button pawl which secures the plug to the receptacle and when secured shall provide a NEMA 3R rating. The plug and receptacle shall be UL/CSA switch rated.

The winch shall be a reversible worm gear self locking type with an integral friction drag brake to prevent freespooling. The winch shall be designated for hand operation or for operation by means of a $\frac{1}{2}$" heavy duty reversing electric drill motor, remote controlled to enable the operator to stand 25' from the pole, Stainless Steel 7 x 19 aircraft cables of $\frac{1}{4}$" or greater diameter equal to MIL-W-5424 shall be supplied on the winch. The winch shall be provided with keepers above the drum to force the cable away from the ends of the drum for spooling. The drum shall have a wire guard to prevent the cable from coming off.

The winch shall be mounted in such a way that the cable terminator and the riser cable connector may be reached and worked on by a person with his arm through the handhole.

Roller contact spring-loaded centering arms shall be provided to center the luminaire ring while ascending or descending the pole. The rollers for the centering arm shall be made of a water resistant non-marking composition material. All shafts and washers shall be #304 stainless steel. The spring-loading mechanism shall consist of an oil-tempered steel compression spring over an aluminum rod. The rollers shall be in contact with the pole at all times.

POLE SPECIFICATIONS

The pole shaft may be joined or single piece, polygon or round, high strength steel having a minimum yield strength of 50 ksi. All material shall be single thickness steel plate with no laminations. Steel shall be as specified.

All poles shall be equipped with a reinforced handhole approximately 1' above the base plate. The handhole shall be 10" wide by 20" high minimum. The handhole shall have a hinged cover that is removable and lockable with a waterproof seal. Drilling through the handhole reinforcement or the pole for the attachment of the handhole cover is not allowed. A cover clip to the handhole frame shall be provided.

All poles and hardware will be adequately packed to assure protection to the finish during shipping and handling, poles shall not be shipped pre-assembled.

Drawings shall be provided with the equipment which show assembly sequence, lift point, and recommended erection procedure. A permanent decal or card shall be fixed on the inside of the handhole cover which describes the sequence for lowering the luminaires and the cautions.

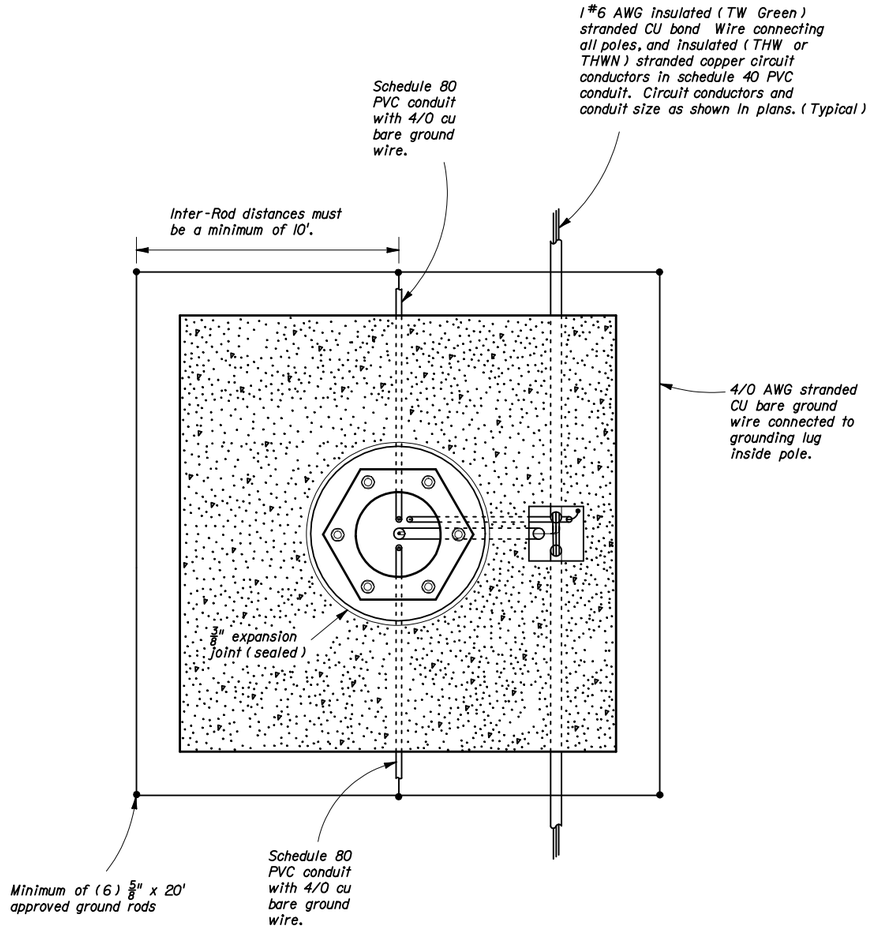
The proportioning of weld details and the operation of welding shall be in accordance with the current edition of the AASHTO Standard Specifications for Welding of Structural Steel Highway Bridges, and The Referenced American Welding Society Structural Welding Code.

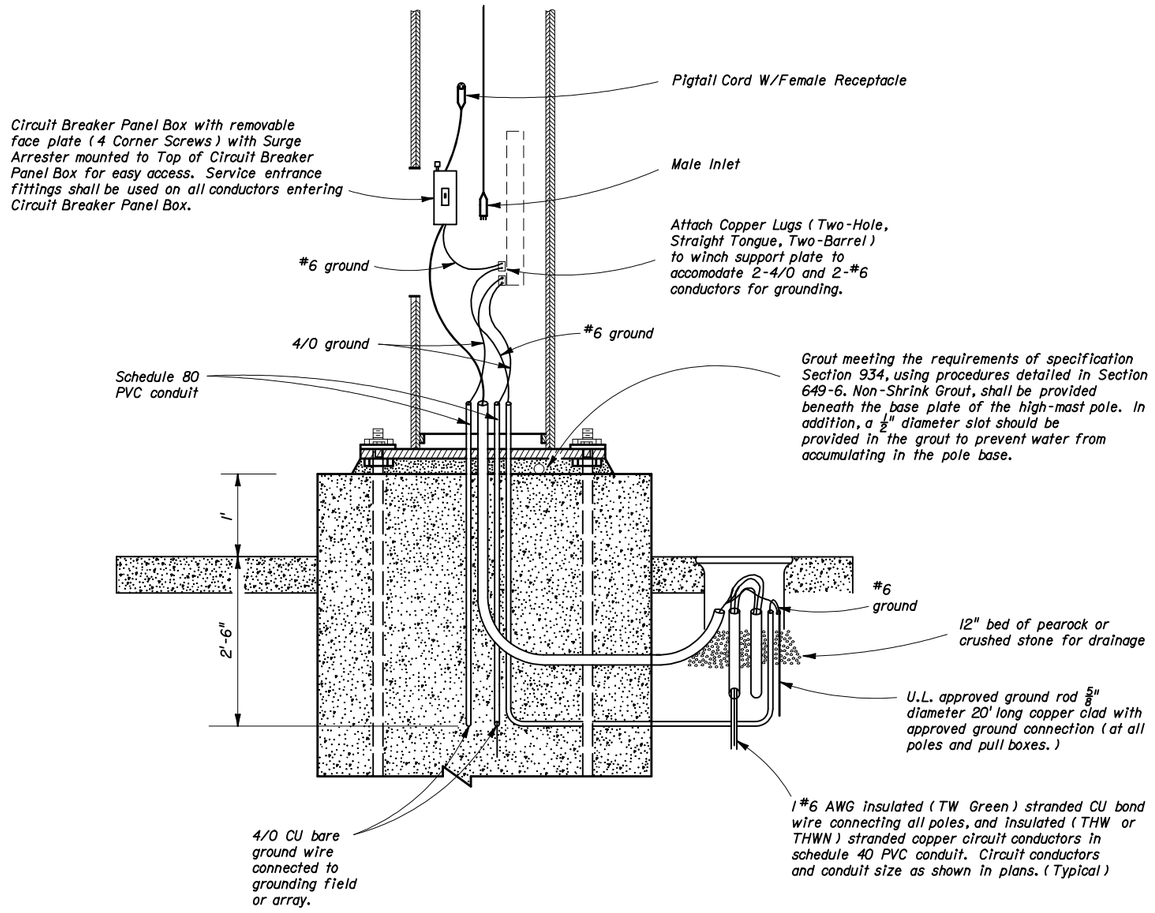
Finished poles shall have a protective coating of hot galvanizing applied in accordance with ASTM A123.

Note: It is the responsibility of the contractor to coordinate the anchor bolt design with foundation design.

ALTERNATE POLE

A spun high mast prestressed concrete pole listed on the Qualified Products List may be substituted for a steel pole with approved shop drawings and calculations. If the concrete pole is provided as a substitute for the steel pole, payment will be made under the items bid for steel poles and associated foundations and plan quantities of these items will be the basis for payment.

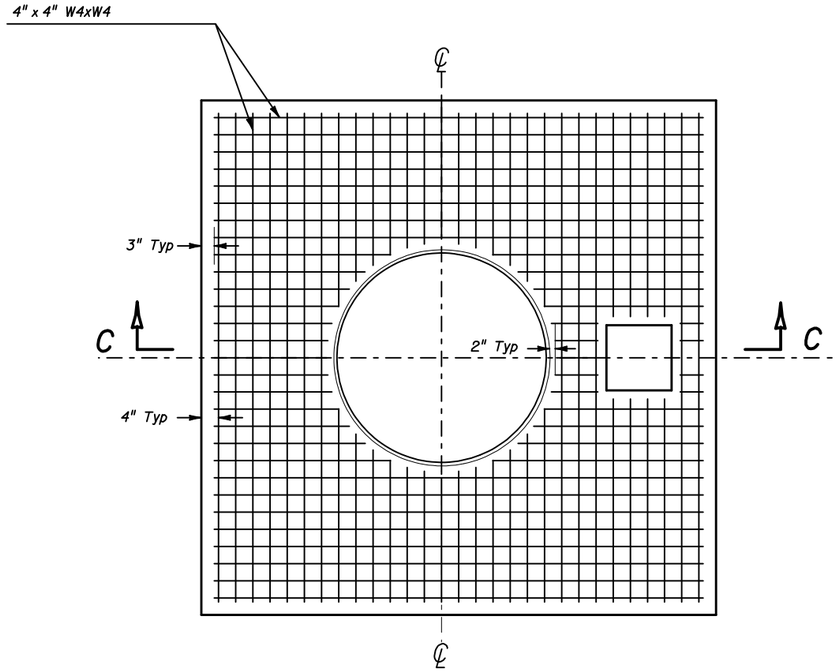




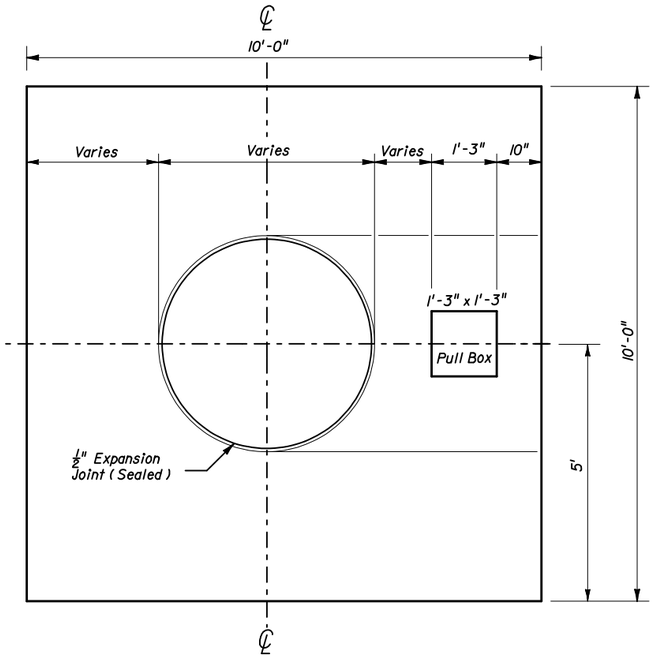
NOTES:

1. At all pull boxes and pole bases, ends of conduit shall be sealed in accordance with Section 630 of the Standard Specifications For Road And Bridge Construction.
2. Slabs to be placed around all Poles and Pull Boxes.
3. For Pull Boxes between Poles refer to Index 17500.

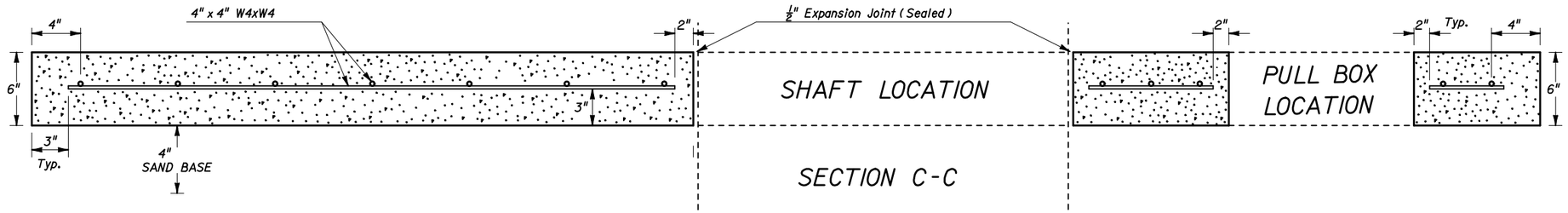
WIRING DETAILS



REINFORCEMENT LAYOUT



SLAB DIMENSIONS



NOTES:

1. Use clean free draining sand < 5% passing No. 200 sieve for base (4").
2. Welded wire fabric shall meet the requirements of ASTM A185.
3. Concrete strength at 28 days shall be f'c = 3 ksi.
4. Outside edges of slab shall be cast against formwork.
5. The 1/2" thick expansion joint between shaft and slab shall be sealed with a hot poured elastic joint sealer.
6. Concrete slabs around poles and pull boxes shall be paid for under the contract unit price for Class I Concrete (Miscellaneous); the cost for reinforcing steel fabric shall be included in the price for Class I Concrete (Miscellaneous).
7. The pull box shown is 1'-3" x 1'-3"; others approved under Section 635 of the Standard Specifications may be used.

SLAB DETAILS