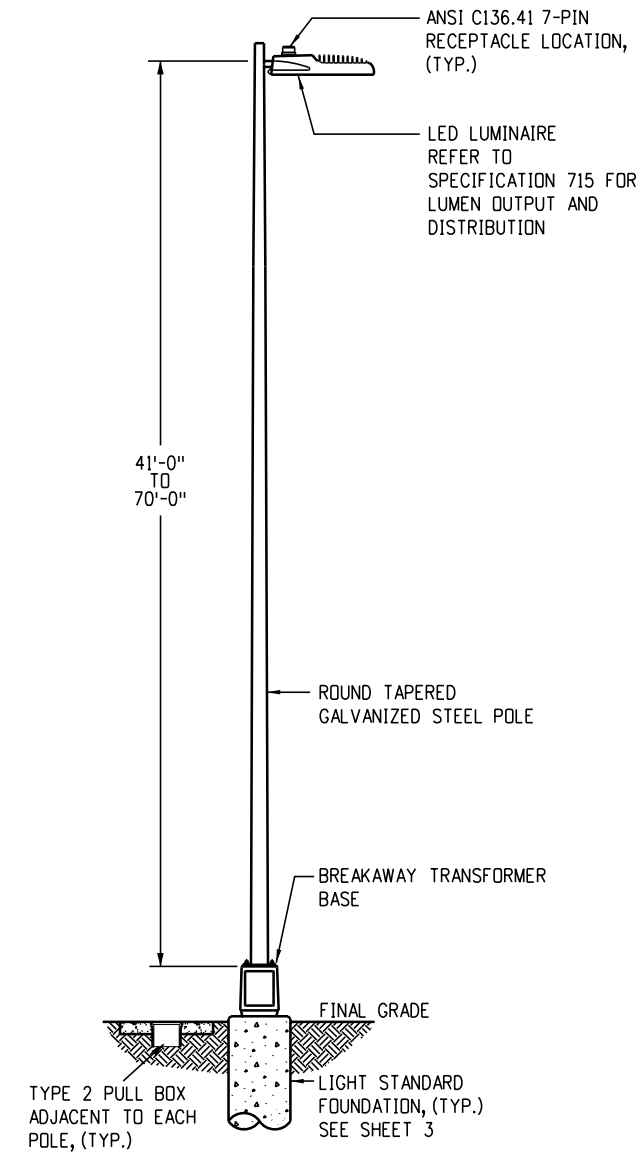
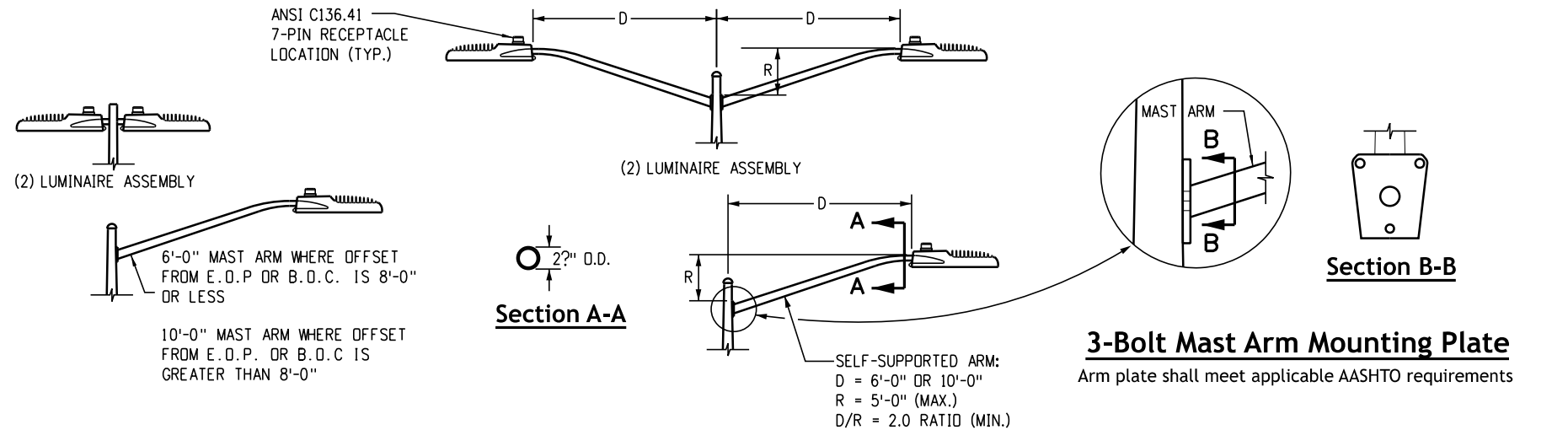
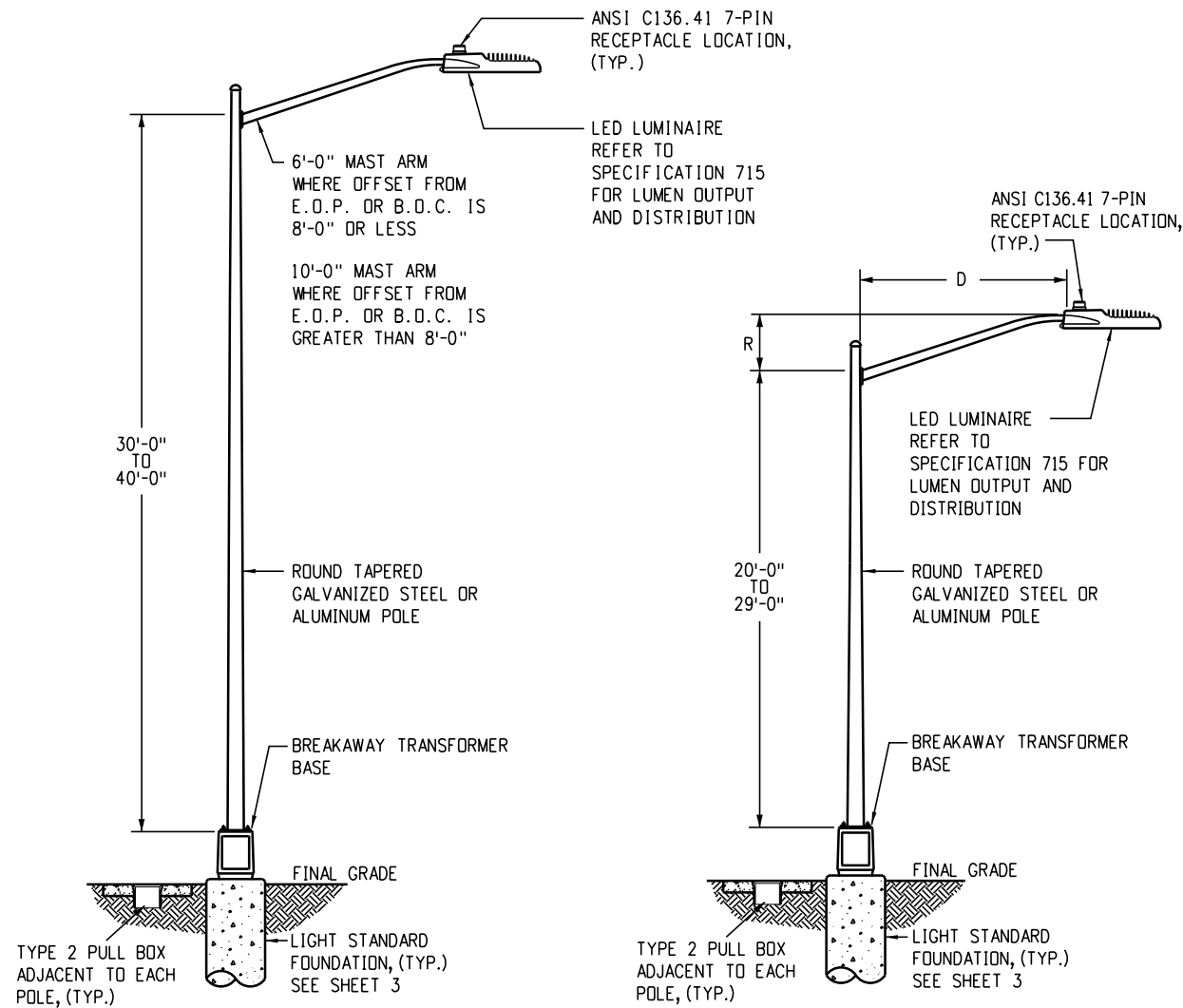
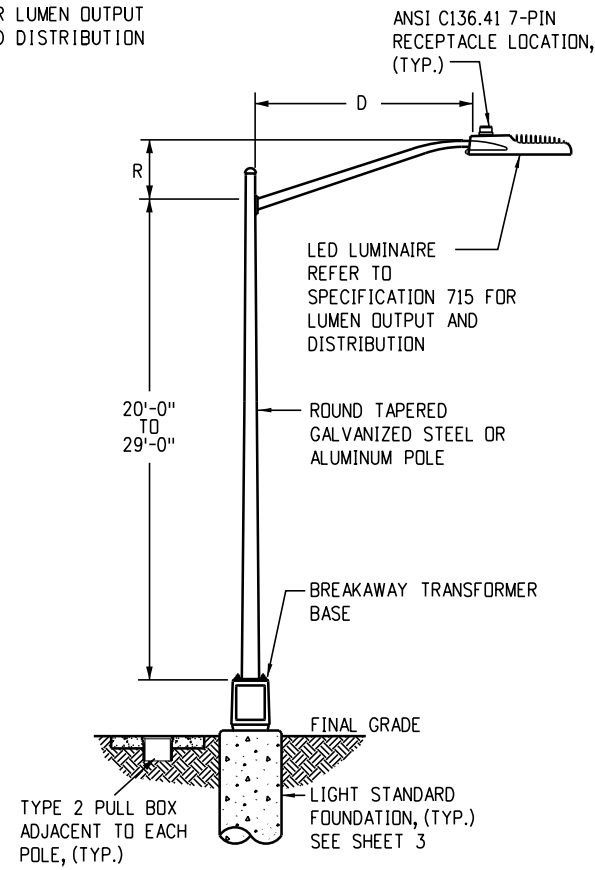




41 Feet to 70 Feet Standard



30 Feet to 40 Feet Standard



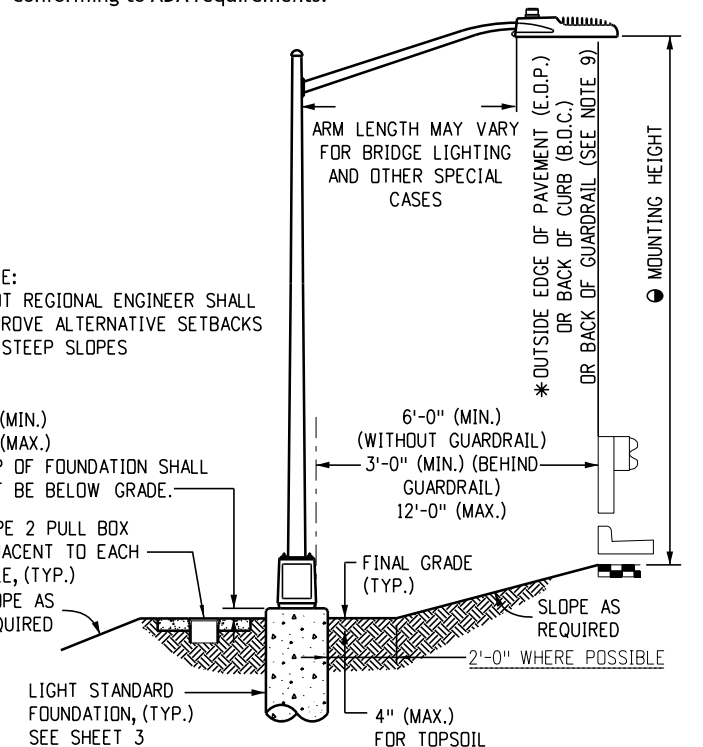
20 Feet to 29 Feet Standard

NOTE:
CDOT REGIONAL ENGINEER SHALL APPROVE ALTERNATIVE SETBACKS ON STEEP SLOPES

◆ 2" (MIN.)
4" (MAX.)
TOP OF FOUNDATION SHALL NOT BE BELOW GRADE.

TYPE 2 PULL BOX ADJACENT TO EACH POLE, (TYP.)
SLOPE AS REQUIRED

LIGHT STANDARD FOUNDATION, (TYP.)
SEE SHEET 3

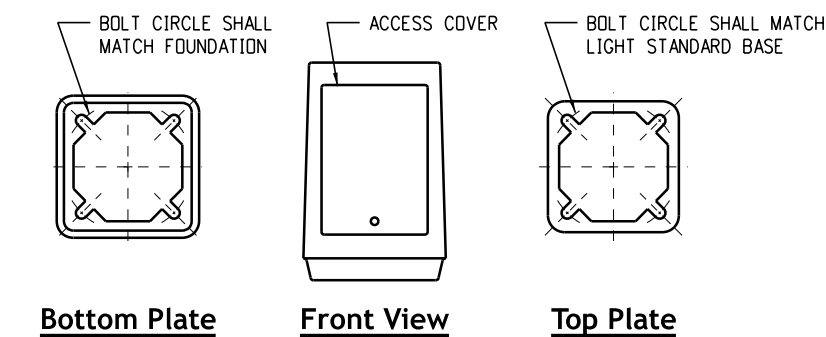


Light Standard Location

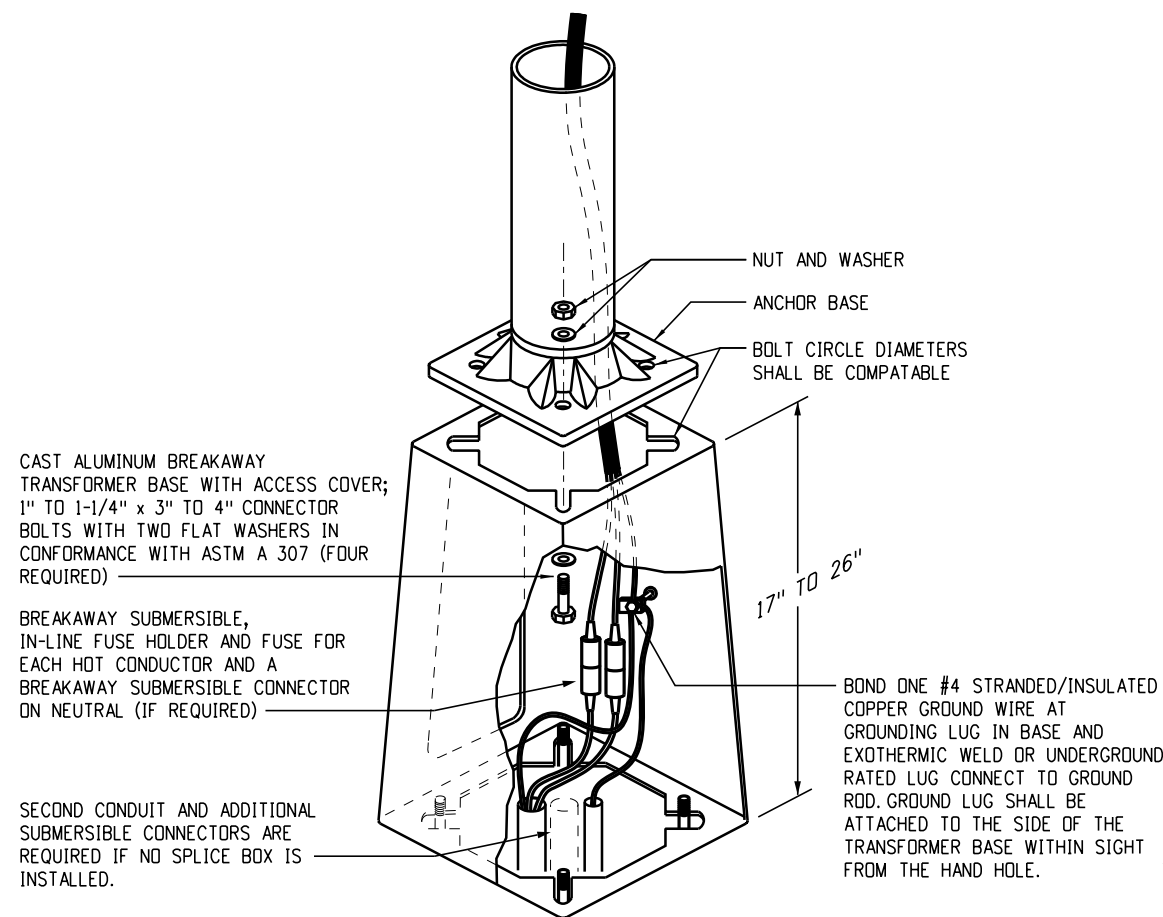
Luminaire and Light Standard Notes:

1. Luminaires with light sources rated more than 3200 lumens shall have no uplight (U0 rating) per IES TM-15-20 and mounted level and plumb.
 2. All luminaires shall be equipped with an ANSI C136.41 7-pin receptacle and shorting cap for wireless control node.
 3. All LED luminaires shall be 3000K nominal or less, per ANSI C78.377-2011 Standard and equipped with a surge suppression device with an immunity level of 10kV (minimum). All LED luminaires shall be equipped with a 0-10V or DALI dimming driver.
 4. Light standards shall not be placed in ditches or other low areas unless an alternative location is not possible.
 5. Backfill shall be compacted in accordance with Section 203.
 6. Pole caps and base plate covers are required.
 7. All electrical components shall be UL listed per the appropriate UL requirements. Including but not limited to 508A industrial control panels.
 8. Electrical splices may be made within the pole base or transformer base at each region's discretion. The CDOT Project Manager shall confirm whether splice boxes shall be installed for the project or whether splices shall be made in the pole.
 9. Guardrail placement shall be per M-606-1.
- Pole assembly shall be supplied in sufficient length to accommodate luminaire mounting height.
 - * Final location of the luminaires shall be approved by the Engineer.
 - ◆ Where foundation is located in sidewalk, pavers or other hardscape, the top of foundation shall be flush with the top of the sidewalk conforming to ADA requirements.

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CAD Ver.: ORD 10.12 Scale: Not to Scale Units: English					2829 West Howard Place Denver, CO 80204 EB	Issued by the Traffic Safety & Engineering Services: July 01, 2026	



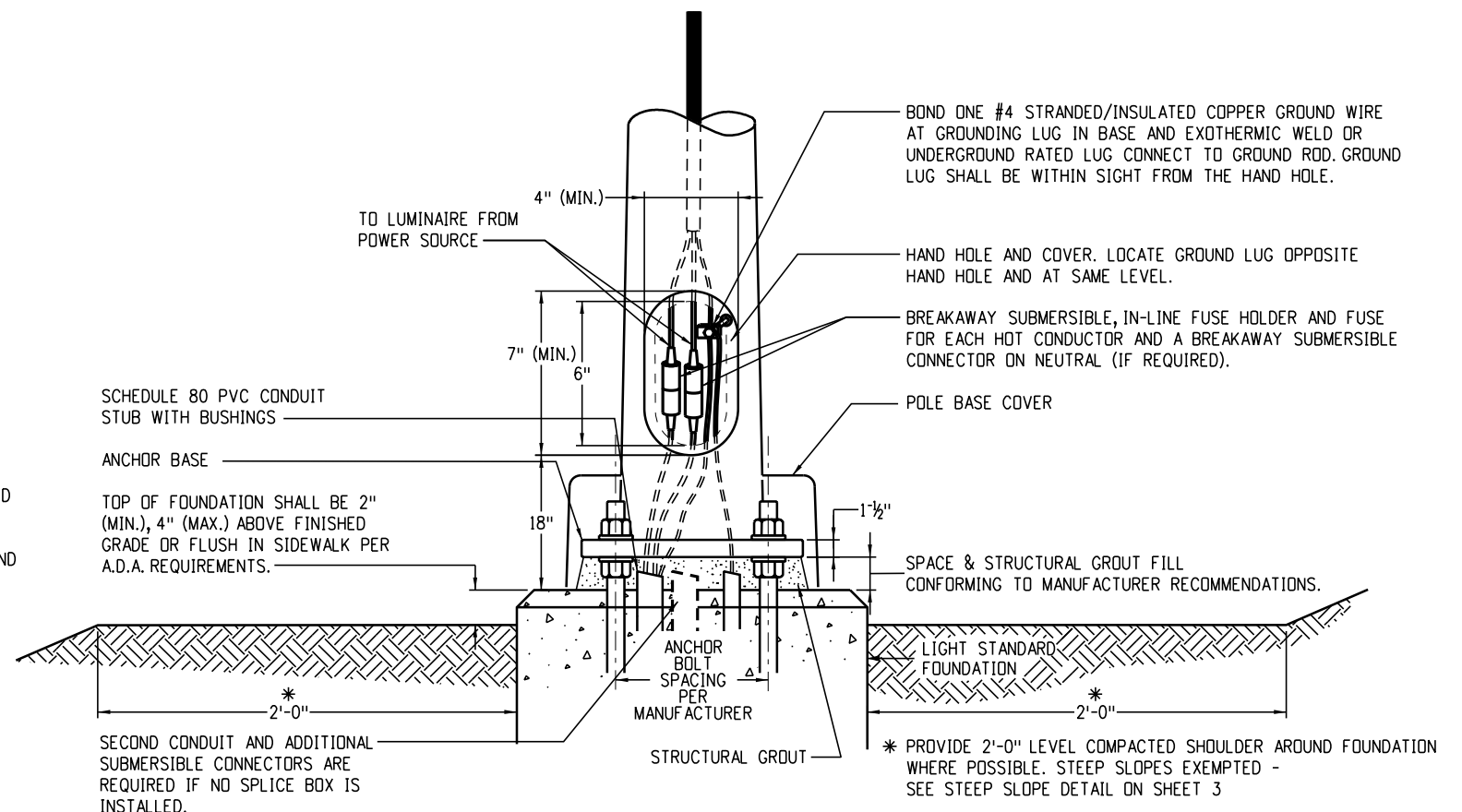
Note: match existing breakaway transformer base as closely as possible.



Typical Breakaway Type Transformer Base Detail

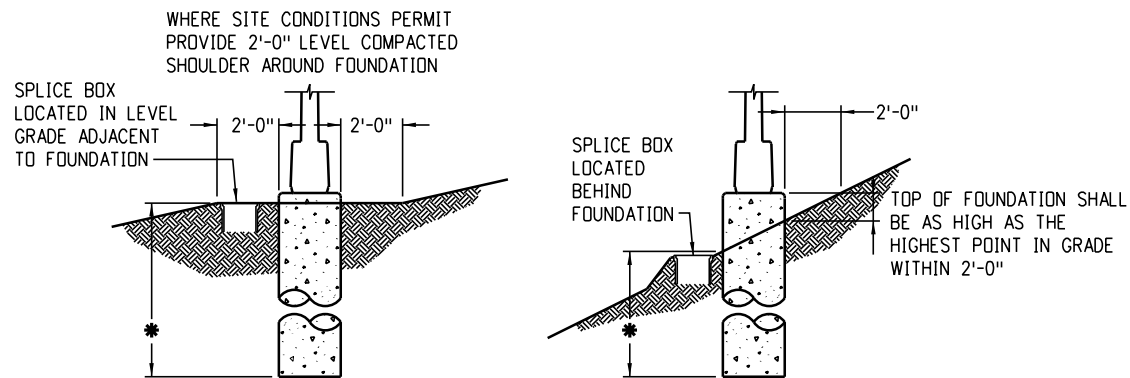
Detail Notes:

1. All breakaway transformer bases shall conform to AASHTO "LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals".
2. Anchor bolt spacing, hardware and torque conforming to manufacturer recommendations.
3. Breakaway bases of any type are for use inside clear zones. Breakaway bases should not be used when the light standard is located at least one and a half times (1.5x) mounting height away from pedestrian occupied areas. Refer to current Utility Accommodation Code Section 3.3.3 for clear zone requirements.
4. Breakaway bases shall not be used when the light standard is mounted on top of a median barrier. Poles without breakaway transformer bases must have hand hole.
5. All conductors shall be sized in conformance with N.E.C. requirements S.O.O.W. 12/3 stranded copper conductor or #12 AWG minimum color code black, white, green.
6. Light standards shall be grounded in accordance with N.E.C. Article 250 "Grounding and Bonding".
7. Lock washers, jam nuts, thread locker adhesive or other solutions as approved by the manufacturer are required to prevent nuts from loosening on the breakaway base.

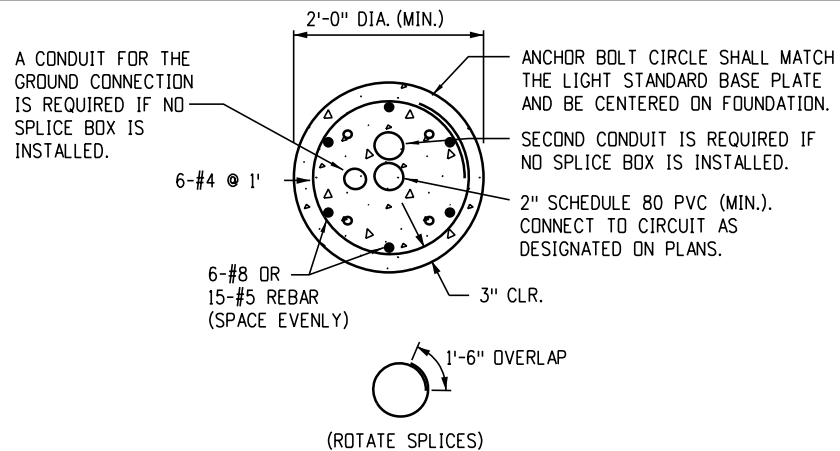


Typical Non-Breakaway Base Detail

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CAD Ver.: ORD 10.12 Scale: Not to Scale Units: English										



Foundation Requirements for Steep Slopes



Typical Foundation Section

Notes:

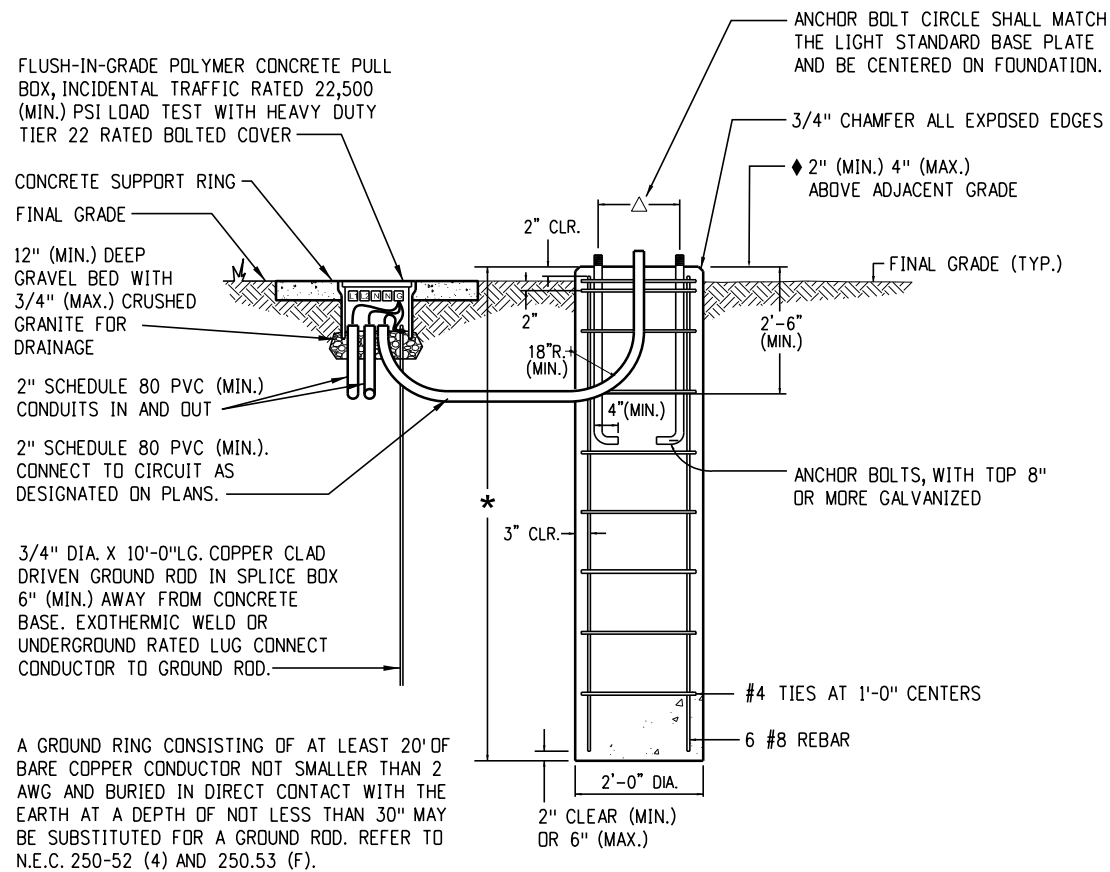
1. Dimensions for the transformer base, anchor base and anchor bolts are variable for the height of the light standard and the mast arm configuration. All components shall fit and accommodate the requirements of the light standard supplied.
2. Concrete shall be air entrained Class BZ and shall conform to Section 601 for concrete and Section 602 for reinforcing steel.
3. Where light standard foundation occur in hardscape areas, where an exposed foundation could create a tripping hazard, the top of foundation shall be flush to the finished surface to meet A.D.A. requirements. Where exposed light standard foundation complies with A.D.A. requirements, foundation shall be installed 2 inches above hardscape with CDOT approval.
4. Bond (1) #4 stranded/insulated copper to ground rod in pull box / splice box and grounding lug in pole base hand hole.
5. Provide 4-terminal submersible underground rated lug connections to fit #12 AWG - #350 AWG copper wire. Electrical splices may be made within the pole base or transformer base at each regions discretion. Submersible underground rated lug connections are not required when splices are made in the pole.
6. All PVC conduit ends shall have end bells or male adaptor, threaded terminal ends with screw on bushing.
7. Foundation dimensions per foundation schedule below and as noted. Light standards higher than 50 feet or with banners, precast foundation, varying soil, or wind conditions shall be designed by a Structural Engineer licensed in the State of Colorado. For design wind speeds greater than v=155mph add an additional 1 foot to the foundation depth shown in the foundation schedule below.

Foundation Schedule

Pole Height	Foundation Depth	Foundation Diameter
< 20'	8'-0"	24"
20' - < 30'	9'-0"	24"
30' - 50'	12'-0"	24"
> 50'	P.S.E.	P.S.E.

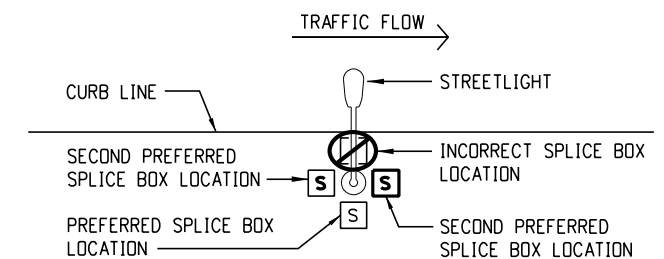
P.S.E. (Per Structural Engineer)
Foundation design data:
Broms' method using AASHTO LFRD LTS 1st, 2015 with 2018 interims.

The design assumes following soil parameters:
Soil density = 110 lb/cf
Soil cohesion = 750 lb/sqft for medium stiff cohesive soil
Soil angle = 30° for medium dense cohesionless soil
Resistance factor = 0.4 for flexure.



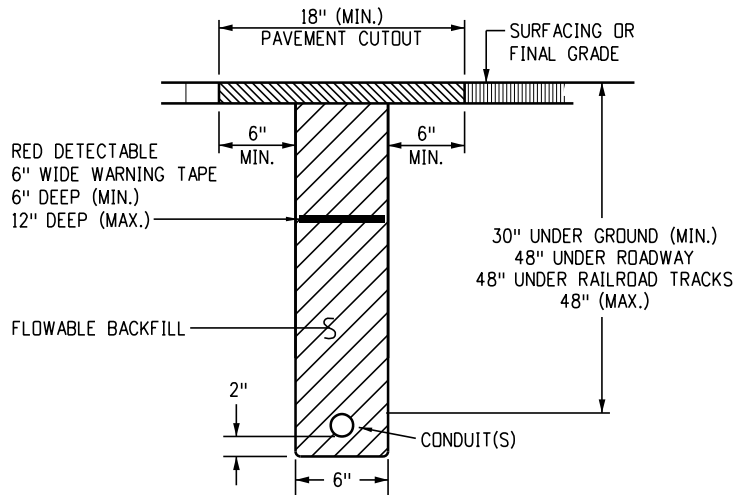
Typical Concrete Light Standard Foundation

Light standard foundation shall be cast-in-place concrete. A complete foundation includes the Class BZ concrete, reinforcing steel, PVC stub out(s), grounding electrode(s), anchor bolts and connector bolts (for breakaway type transformer bases).



Typical Street Light Splice Box Placement

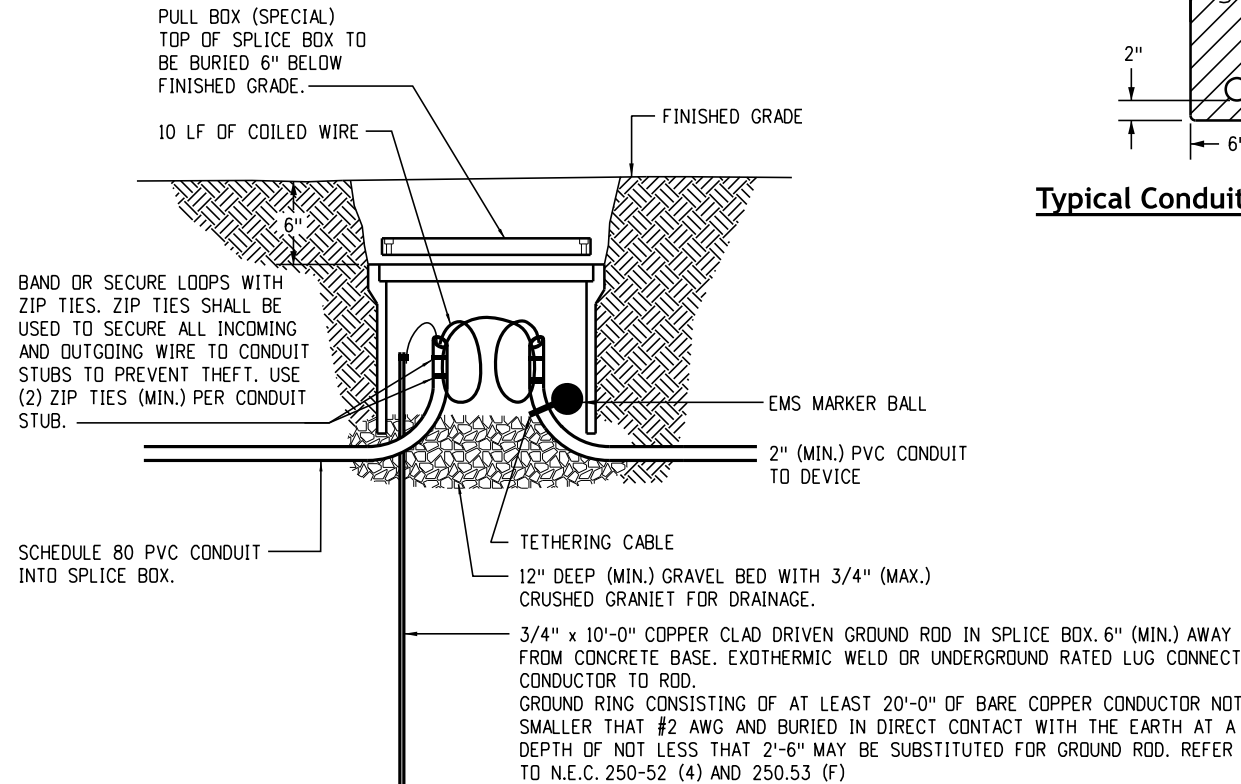
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Typical Conduit Burial - Section

Conduit Burial Notes

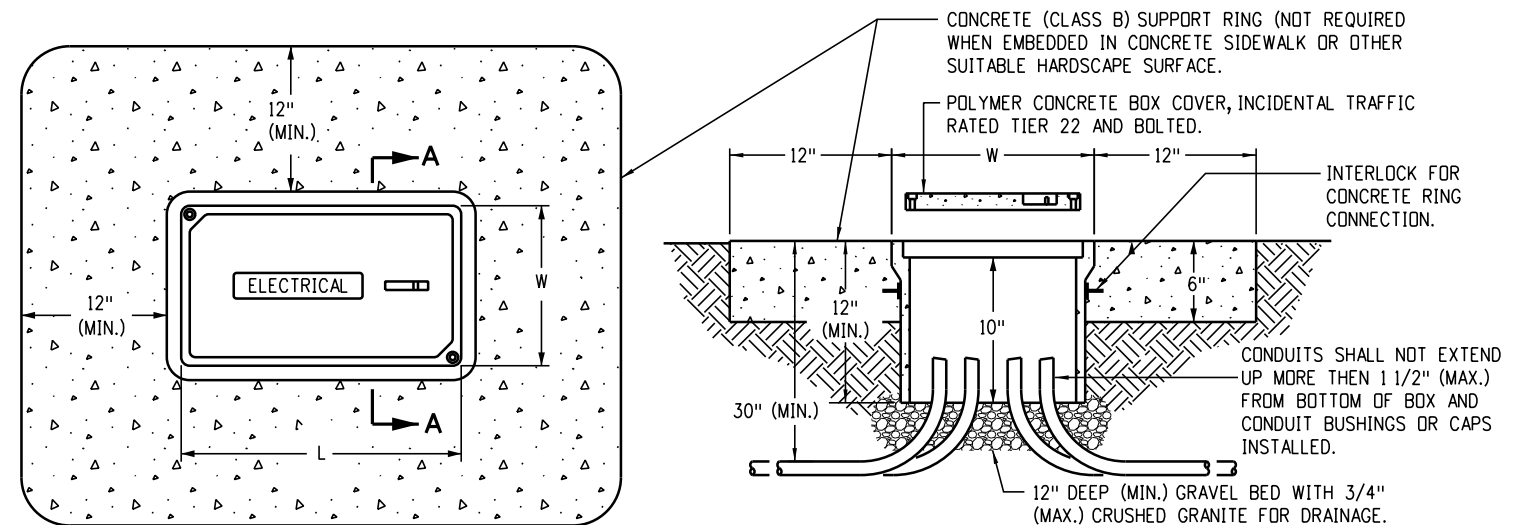
- Contractor shall coordinate trenching with other underground utilities, ramp metering and irrigation. Contractor shall use common trenches at all road crossings where possible.
- One conduit per bundle shall have one #12 AWG locate wire and a nylon or polyester pull tape with 1,250 pounds test strength and footage markings in all empty conduits. Locate wires shall not be installed in fiber optic conduits.
- Electrical conduit (bored) shall be UL listed HDPE and installed using trenchless technology or either jacked conduit or directional boring. If trenched conduit is specified on plans, bored conduit of equal or greater size may be substituted for trenched conduit if paid for under the originally designed trenched conduit pay item and at no additional cost to the project. Electrical conduit (bored) shall conform to the same minimum depth requirements.
- Installing conduit in any method other than trenching or directional bore, that may cause damage to the embankment or highway area, or be hazardous to the traveling public will not be permitted. When jacking is specified, disruption of highway traffic will not be permitted.
- For all Schedule 80 PVC conduit, provide slip fit expansion fittings at 100 foot intervals and 6 feet (maximum) from each elbow. Expansion fittings will be installed per N.E.C. requirements for 65 degree Fahrenheit temperature change.
- For all trenched conduit, elbows shall be wide sweeps (36 inches minimum) with PVC coated GRC on the outside and threaded couplings.
- All PCV conduit ends in pull boxes shall have end bells or male adaptor, threaded terminal ends with screw on bushing.



Buried Splice Box with EMS Marker Ball

Buried Splice Box Notes

- All pull boxes shall be incidental traffic rated 22,500 psi load test (minimum) with heavy duty Tier 22 rated covers.
- All pull boxes shall be Type 2. 13 inches x 24 inches x 12 inches deep (minimum) unless noted otherwise on plans. Refer to N.E.C. Section 314.28A for box size requirements. Refer to CDOT Standard Plan No. S-613-3 for typical pull box sizes.
- All pull boxes shall be buried 6 inches below final grade and covered with embankment and topsoil. Buried pull boxes shall not be covered with concrete, asphalt, rock or any other hardscaping. Concrete support ring is not required for these special buried anti-theft pull boxes.
- Connect copper ground wire to helical foundation.
- Buried splice boxes shall only be used where approved by CDOT Engineer.
- The wire terminations in pull boxes shall be made using UGR, submersible insulated pedestal lug connections. Provide one multi-lug connector for each phase, neutral and ground conductor to be spliced in the in-grade pull box.



Plan View

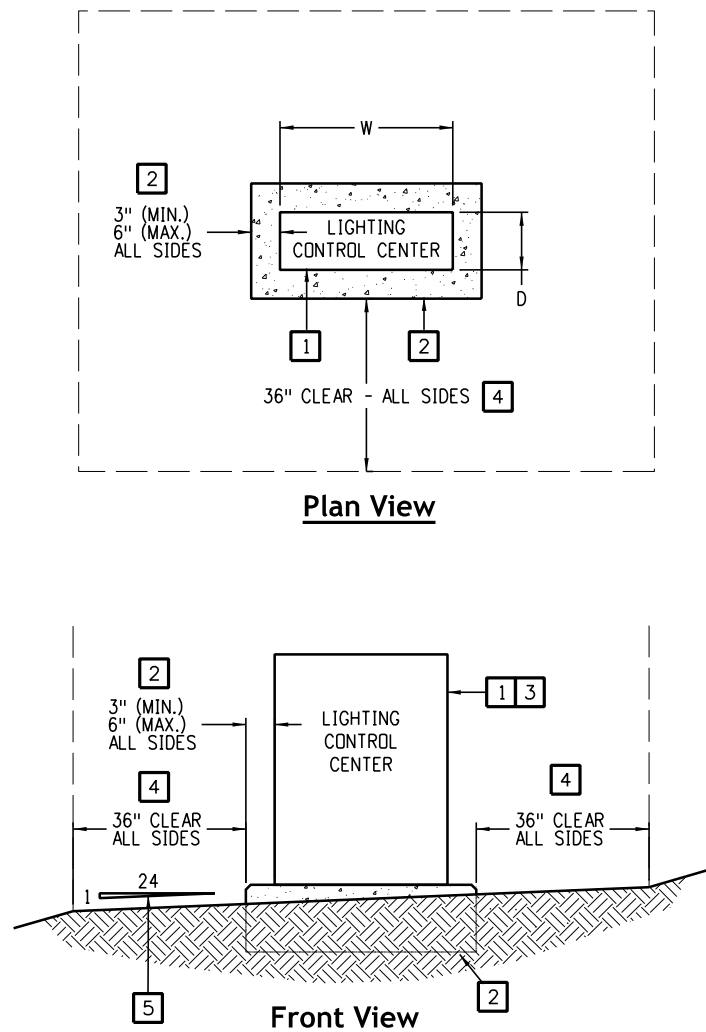
Section A-A

Typical Pull or Splice Box

Splice Box Notes

- Box covers must be polymer concrete with fiberglass reinforcement, incidental traffic rated to Tier 22 and bolted with an HS load rating of 22,500 psi (minimum).
- Box covers shall be labeled as follows:
"ELECTRIC" or "STREET LIGHTING" on all pull boxes containing CDOT owned electrical service.
"UTILITY ELECTRIC" on all pull boxes containing utility owned electrical service.
Labeling must be cast into the cover and not as a separate independent tag.
- Refer to CDOT Standard Plan No. S-613-3 for typical pull box sizes.
- Refer to N.E.C. Article 314 "Pull and Junction boxes and Conduit Bodies Minimum Size" for box size requirements. Refer to CDOT Specification 601 for cast-in-place concrete specification.
- The wire terminations in pull boxes shall be made using UGR, submersible insulated pedestal lug connections. Provide one multi-lug connector for each phase, neutral and ground conductor to be spliced in the in-grade pull box.

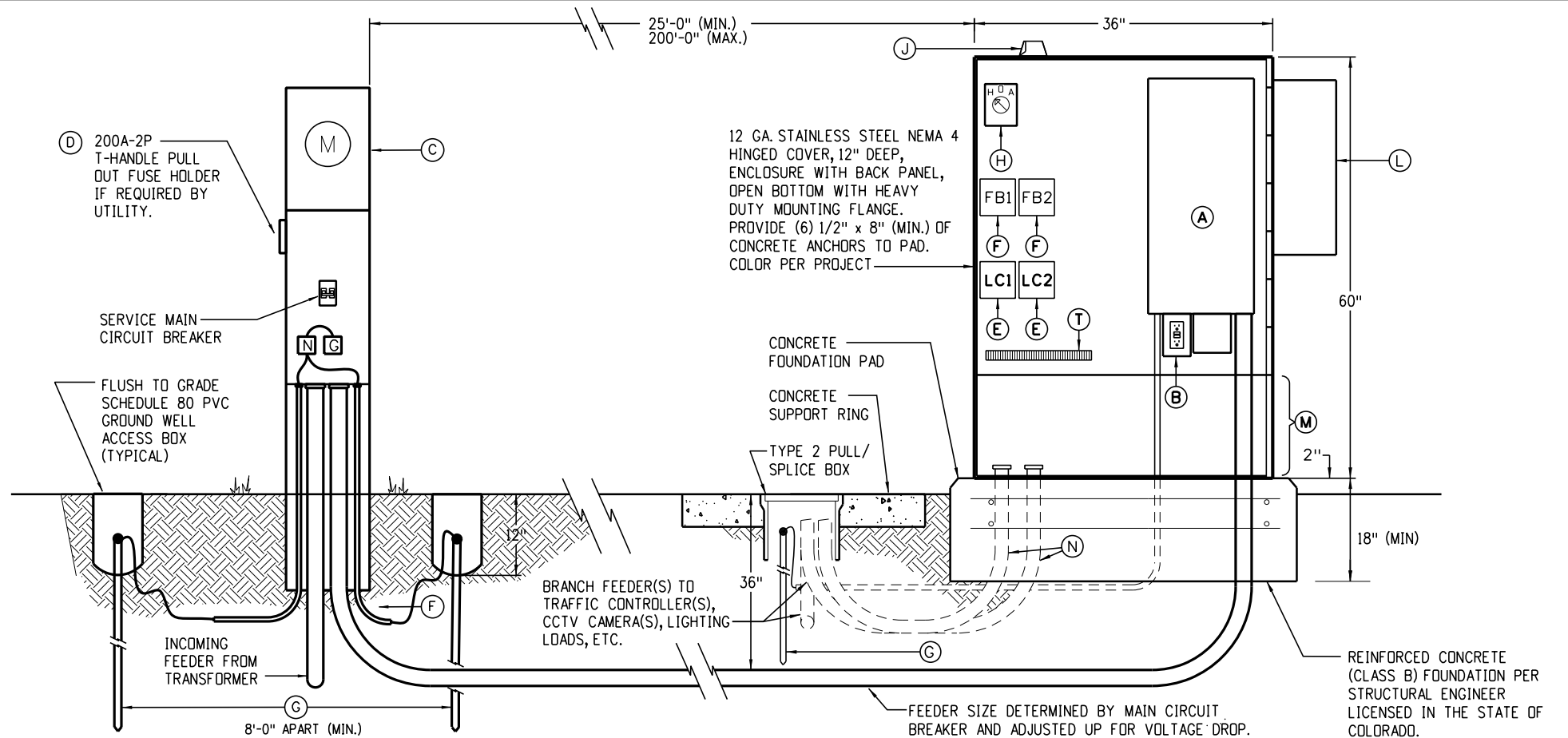
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Lighting Control Center Placement

Detail Notes

- 1 Prebuilt NEMA 3R lighting control center cabinet (LCC). Refer to lighting control center details for more information.
- 2 Reinforced concrete (Class B) foundation pad, per Structural Engineer licensed in the State of Colorado, with 1 inch chamfer on all exposed edges. Edge of concrete to extend 3 inches (minimum) or 6 inches (maximum) beyond edge of cabinet.
- 3 The LCC shall not be located in any intersection sight triangles. Placement shall conform to allowable encroachments in the public row.
- 4 36 inch clear zone (minimum) on all sides of concrete pad when located in softscape. 48 inches of clear zone (minimum) on all sides of concrete pad when located within the sidewalk.
- 5 1:24 slope (maximum) in clear zone area.



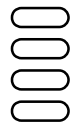
Component List

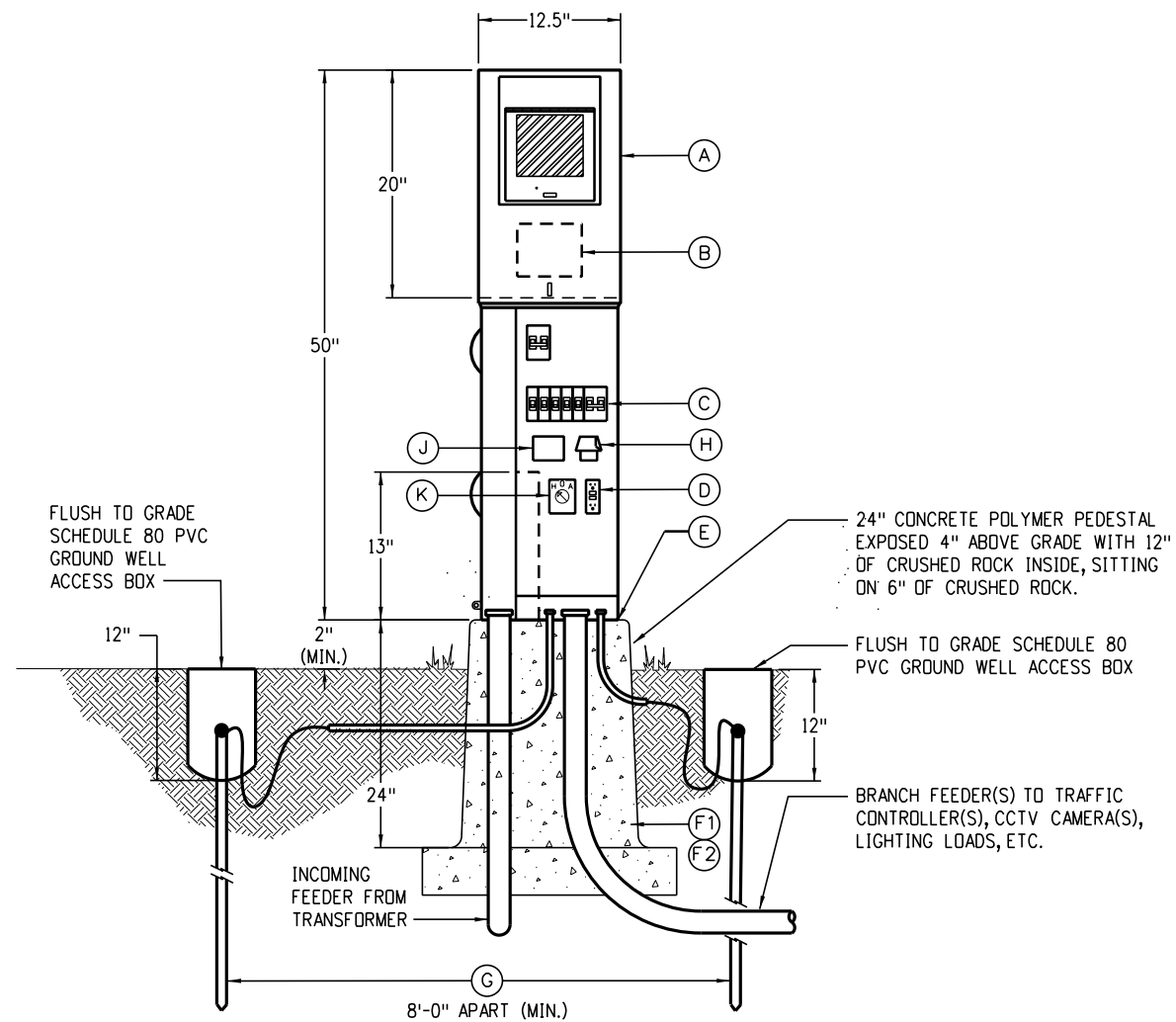
- (A) NEMA 1, service entrance rated, single phase load centers. (See panel schedule for quantity and size of main and branch breakers). Mounted inside NEMA 4 enclosure.
- (B) GFCI maintenance receptacle in a 1-gang back box with cover.
- (C) 200A, 1 ph., NEMA 3R, direct bury meter pedestal service entrance rated with lever bypass to utility company specifications. Provide service MCB size as indicated on one-line diagram with neutral & ground bars.
- (D) 200A, 2 pole, 250V, heavy duty, NEMA 3R, T-handle pull-out meter disconnect, UL listed for service equipment and type and size fuses as shown on one-line diagram. May be omitted by utility company specifications hot sequence requirements.
- * (E) 4 pole, 30A, 250V electrically held lighting contactors with 120V coils. Two (2) required.
- * (F) 4 pole, 30A, fuse blocks with 30A, FRNR fuses to the lighting contactors as required by UL 508A (2001 Standard for Industrial Control Panels). Two (2) required.
- (G) 3/4 inch x 10 feet long, copper-clad driven ground rod with ground conductor exothermic weld or underground rated lug connect ground conductor to ground rod. Provide schedule 80 PVC ground wells.
- * (H) H.O.A. switch - hand-off-auto with 15A 120V contacts, back box, cover, knob & legend and the photocell control wired in the auto position.
- * (J) NEMA 3R 120V photoelectric control with 3-prong twist-lock receptacle base wired through the H.O.A. switch. The photoelectric control shall be mounted on the north side on enclosure or window facing north or down to minimize the sun's interference.
- (L) Optional cabinet HVAC per Engineering request. Paint to match NEMA 4 enclosure.
- (M) Optional 18 inch high skirt per Engineer request.
- (N) Branch raceways - provide branch circuit raceway to all lighting fed from this LCC. See plan and feeder schedule for size and quantity.
- (T) Terminal strip - 600V rated, lugs to accept #1 - 10 AWG copper with all marking strip, end caps and mounting hardware. Provide the number of terminal points as required, minimum of 36 points.

Note: All components listed shall be included in the Lighting Control Center pay item. All electrical components shall be UL listed per the appropriate UL requirements. Including but not limited to 508A industrial control panels.

* Only required for loads not controlled by local nodes.

Recommended Cabinet Type Lighting Control Center Detail

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Lighting Control Center (Pedestal Only) Detail

Component List

- (A) Stainless steel, 200A, 120/240V, NEMA 3R combination, service entrance rated, cold sequence, meter/power pedestal with lever bypass, load center, MCB and fused tee-handle pull out disconnect ahead of meter to local utility specifications. See panel schedule for size of main and number and size of branch breakers required. Set enclosure on concrete pad plumb and level.
- (B) T-handle, pull-out fuse type meter, disconnect flush mounted into the back side of the enclosure for meter protection per utility specification, cold sequence meter with weatherproof cover and tab for seal. This item may be omitted by utility company specifications hot sequence requirements.
- (C) Service entrance panel breaker section, for customer loads. See panel schedules for size of breakers and number of poles required.
- (D) Optional built-in GFCI NEMA 5-20R, duplex, GFCI maintenance receptacle flush mounted in panel dead-front.
- (E) Provide recessed concrete pad mounting plate with L-bolts to match the enclosure base bolt pattern.
- (F1) Option 1: Polymer concrete pedestal foundation with fiberglass reinforcement. The pad shall be continuous cloth reinforcement on the inside and outside perimeter. Weight of the foundations shall be stenciled on the sidewall of the foundation.
- (F2) Option 2: Provide 4500 psi, re-bar reinforced, concrete with a direct earth bury depth of 18 inches (minimum), 2 inches overlap of the enclosure on all sides front and back and 2 inches exposure above grade. Provide 3/4 inch chamfered edges. Provide Structural Engineering stamped drawing for pad.
- (G) 3/4 inch x 10 feet long, copper-clad driven ground rods. Exothermic weld or underground lug connect conductor to rod. Two (2) ground rods required. Ground rod to be located in Schedule 80 PVC ground well access with bolt down cover and "ground" cast into lid.
- (H) Optional photocell - NEMA 3R 120V photoelectric control with 3-prong twist-lock receptacle base. The photocell shall be mounted inside the enclosure with a glass lens covered hole in the exterior of the enclosure to allow the photocell to receive daylight.
- (J) Optional lighting contactor - controlled by optional photocell item 'H' above when more than one circuit is to be controlled by the photocell.
- (K) Optional hand-off-auto switch when items 'H' and 'J' above are used. Provide this HOA switch with the photocell control wired in the auto position.

Note: All components listed shall be included in the Lighting Control Center pay item. All electrical components shall be UL listed per the appropriate UL requirements. Including but not limited to 508A industrial control center.

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