Douglas County Traffic Signal Installation Guidelines

(January 2013)

The following guidelines are minimum requirements for equipment installation.

Section A. Poles and Foundations (Wood, Concrete, Mast Arm, Or Steel Pole)

1. Poles are to be staked by the prime contractors surveyor on the same day that the prime or sub contractor intend to install foundations. If you intend on coming back the following day to install a foundation, the surveyor must come back out and restake the remaining pole locations as well OR you may drive metal fence post 12" into the ground and only leave 3" above ground and paint it orange. This method will not allow a person to remove your staking device. **(If the contractor does not adhere to this method the contractor may face pulling and reinstalling a pole at a later date if the pole does not meet design criteria or falls off of right away).**

2. All Mast Arm / steel pole foundations are to be poured continuously until each foundation is complete. A concrete test sample may be taken by Douglas County or GDOT personnel. NO partial pour foundations are accepted. All concrete foundation work is to be vibrated as it is being poured.

Splices Inside of Poles

1. Splices are not permitted inside Mast Arm Poles unless directed to do so by Douglas County Traffic Signal Unit.

Placement of Signal Equipment on Poles and Spanwire

1. Contractors must schedule a time with Douglas County Signal Unit to be onsite and designate all signal head/equipment locations on both Mast Arm and Spanwire signal installations. This includes any video detection equipment, signage, signal heads, and antennae**.**

Wiring of Signal Heads and Equipment

1. Signal wire must run continuously from the cabinet to the furthest left head for any phase intended to be used. It shall then be placed onto a terminal block and then a jumper wire is used to go to the subsequent signal head. If (2) wires go under the same screw terminal they must be crimped into the same fork connector and then screwed under the same terminal location.

Section B Spanwire Installations

1. Spanwire intersections are to have bullring placements along with signal head placement designated by Douglas County Personnel. Contractors must schedule a time for Douglas County personnel to be onsite and site in this equipment.
2. Currently there is only one approved method for attaching signal wire to spanwire. Contractors must use Black UV resistant Heavy gauge tiewraps placed every 8" apart from each other.Wiring must be kept straight and neat throughout the installation.
3. 7/8" x 5 ½" round weldless galvanized powder coated bullrings are required for ALL spanwire installations. (no oval bullrings permitted)

Section C. Pullboxes

1. Pullboxes are to be flush with surrounding grade and have 1" gravel inside as well as under the box for drainage purposes. **Examples A. and B. below**

A. 

B. 

Section D. Conduit

1 Conduit in pullboxes is to come into pullboxes (excluding fiber runs) completely vertical and be gray conduit.The Distance between any conduit riser in a pull box and the lid is not to be closer than 6" at any time. All couplings are to be glued thoroughly. Refer to examples **A.and B.** above.

2. Directional bore conduit is **NOT** allowed to come directly into a pullbox unless the conduit is specifically for Fiber Optic Cable. The conduit must first terminate and a 90 degree turn must come up into a pullbox using gray conduit. When terminating a directional bore conduit and connecting a PVC conduit or elbow the only approved method to connect these different types of conduit is a solid aluminum serrated coupling that bites into both types of conduit. **See example photo D 2 a)**

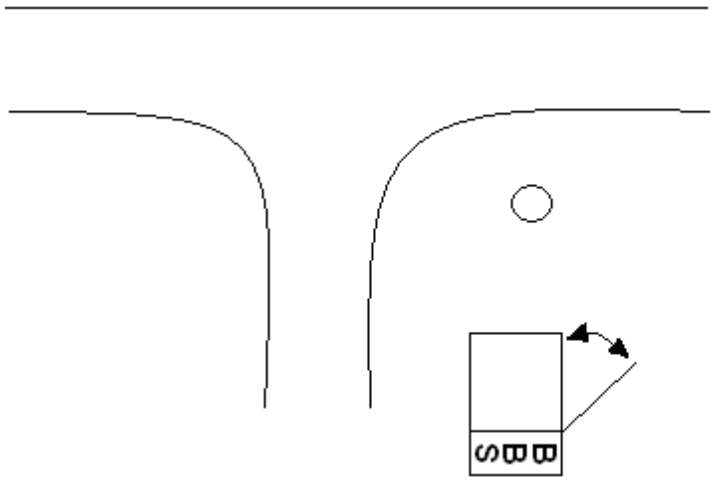
1" and 2" sizes are available

Section E. Signal Heads

1. Signal heads are sighted in only by Douglas County Traffic Signal Personnel. Contractor personnel MUST use terminal blocks inside all signal heads to wire up signal heads. All connections that are to be jumpered to additional signal heads of the same phase,SHALL be from the furthest left head of the phase first, crimped together in the same terminal fork and then attached to a terminal block.
2. Signal heads are to be NO lower than 18' unless special conditions exist. Signal heads are to be NO higher than 20'.

Section F. Cabinet Bases

1. Cabinet bases SHALL be buried to a depth of no more than 8". The cabinet base shall be 90 degrees to the main street at all times. Battery Backup Equipment SHALL always face away from the roadway.Cabinet doors shall always swing away from the roadway and NOT block the vision of a signal technician.

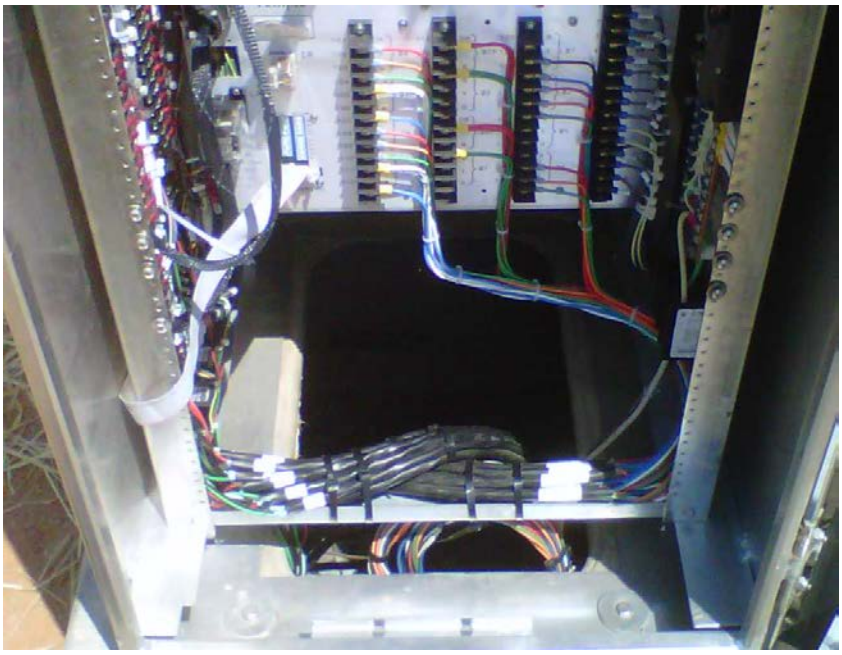


2. Locating a cabinet base at a 45 degree angle is NOT permitted

3. All cabinet bases Shall be BBS ready, one piece units that provide a mounting platform for BBS/UPS systems.

Section G. Cabinet Wiring

1. Cabinets shall be wired so that all wiring comes up to the access hole in the base and is still covered with black outer jacket on the wires. Each phase, ped, and loop wire shall be clearly and neatly marked as well as the neutral wire for each phase, any ped indication terminating on the on the neutral bus bar should have a number that corresponds to which phase it belongs to. **See example C. below**.



Example C. Notice that the wiring is cut to length and neatly terminates on each terminal. This is the only accepted method for wiring the cabinet.

Section H. Loops

1. All loops are to be marked on the asphalt by temporary means. Temporary means can be temporary marking paint or chalk or other temporary means. **Example D.Below**
2. Loops are to be wet sawcuts.
3. Loops are to be cut at a precise depth of 3" into the asphalt or concrete.
4. Loops are to be perfectly straight lines. **Example E. Below**
5. Loops are to be sealed using Chemque sealant or approved equivalent and are NOT to exceed the sawcut. It is recommended to stop sealant at 1/8" from the top of any sawcut to prevent excessive sealant on the asphalt. **Example F Below.**
6. Each loop is to have its on lead in individually cut to the edge of the curd and drilled through the curb. **Example G Below**.
7. The nose of a loop should exceed the stop bar by only 24" at a maximum. Unless directed to by DCDOT staff. **Example H. Below**
8. Loops shall have precise cuts in all corners that are equal and a consistent depth for loop turns to be made. Typically the distance for a minimum cut is ½ of the sawblade at any corner of the loop. This keeps loop wires at a consistent depth through turns. **Example I** is a correct corner cut. Example J. is a poor cut example. **Example J**. will result in recutting the entire loop.

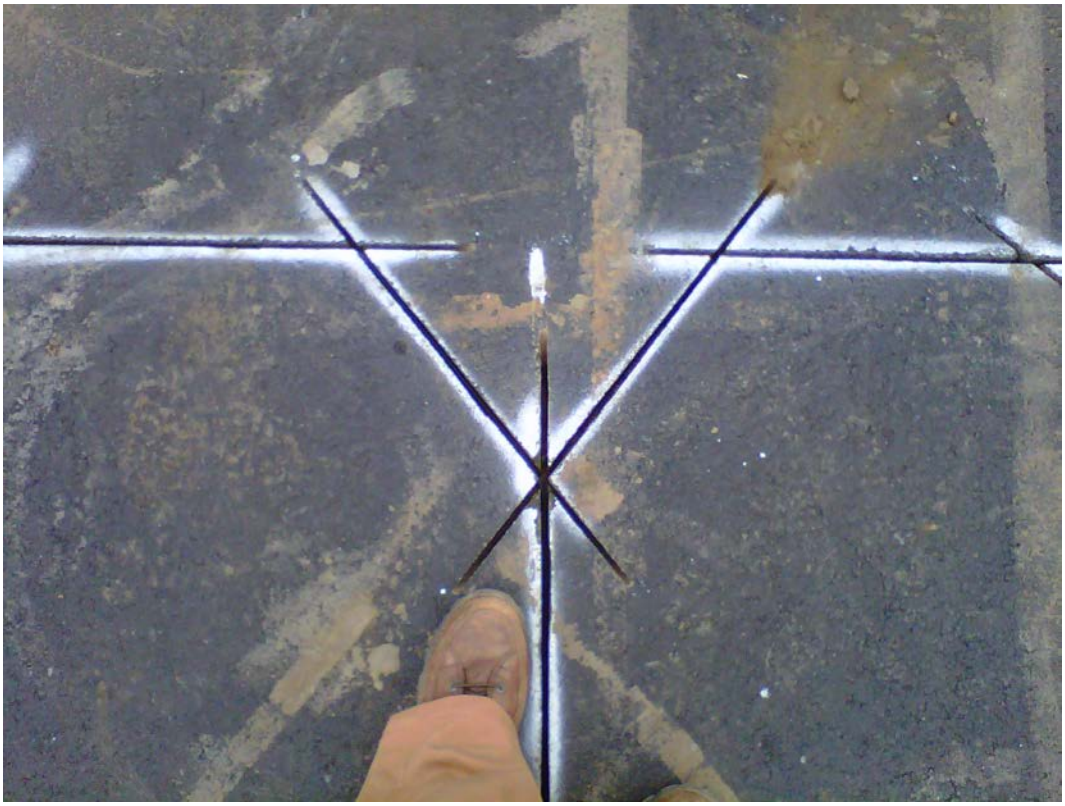
Example D.. loops properly marked and straight cuts

Example E. Perfectly straight sawcuts at 3” depth

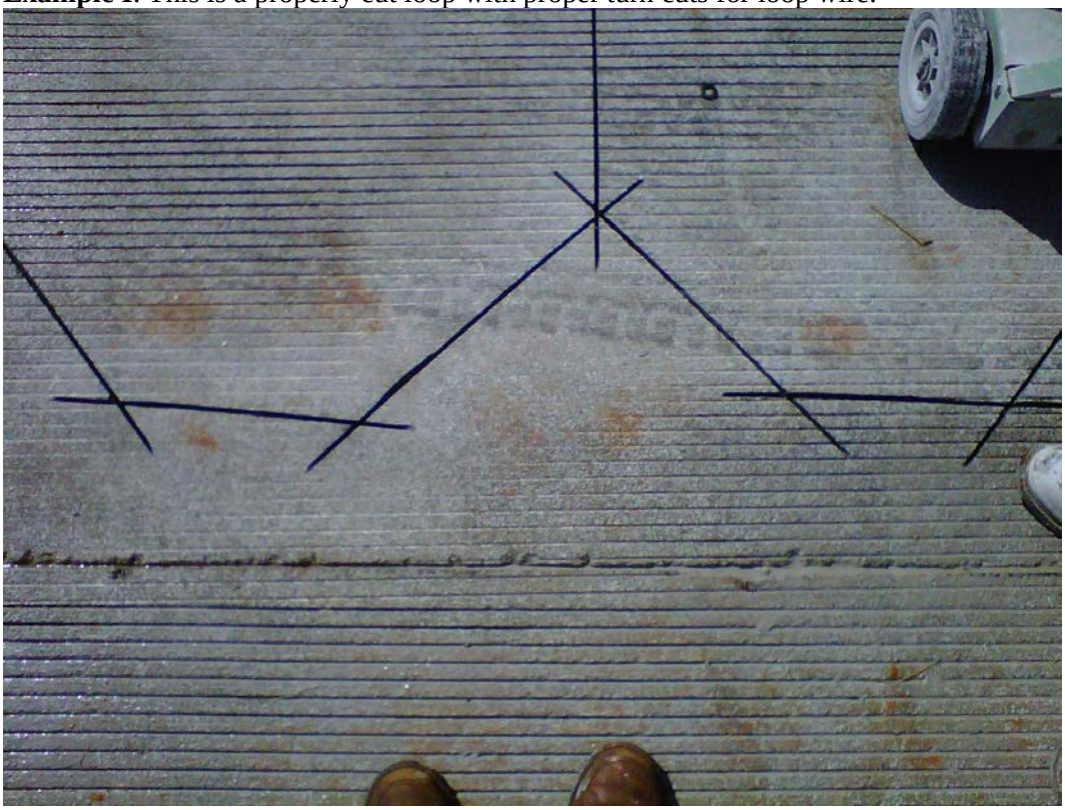
Example F. Sealant being installed without spillage.

Example G. Each lead in has a separate cut out to the curb and are drilled through the curb.

Example H. The nose of a loop passing the stop bar by only 24”.



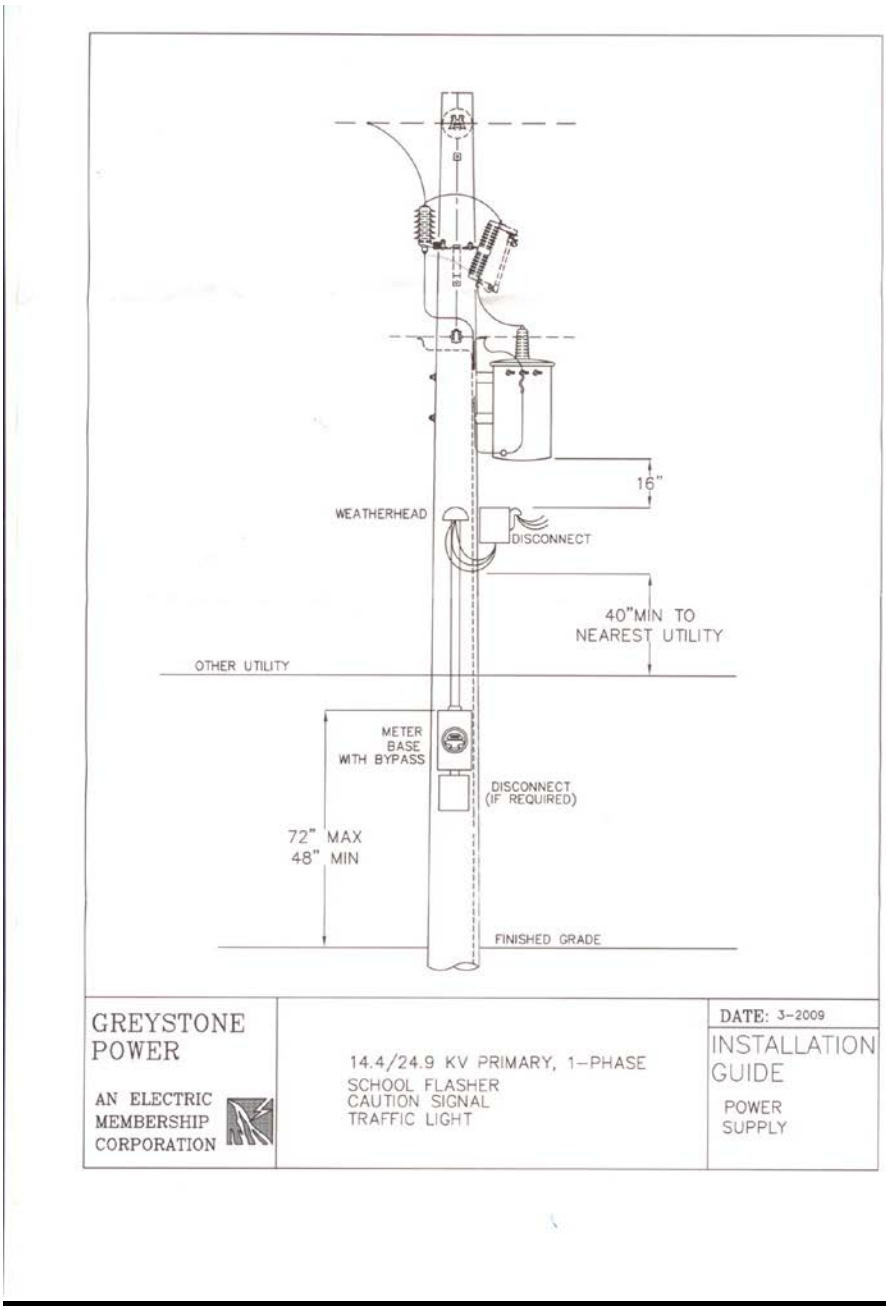
Example I. This is a properly cut loop with proper turn cuts for loop wire.



Example J. This is an example of a poorly cut loop at turn points. This will result in re cutting the entire loop.

Section I. Installation of Metering equipment and disconnecting equipment.

Below is a diagram from the local EMC power company clearly showing the route that power must go through to enter the signal cabinet and all appropriate measurements. Power must first be routed to the service disconnect. Next, the power must enter the meterbase. Finally the power should route into the traffic signal cabinet. **The use of a disconnect after the meterbase is NOT allowed**. A 60amp fuseable service disconnect shall be mounted no less than 16" below a transformer on a utility owned pole. If mounted on the signal pole then ask signal superintendent for proper mounting height to attach the disconnect. The meterbase shall be mounted so that the meter socket does not exceed 50" from ground level.



Example A. Utility power diagram sheet.

The meterbase shall be a 200amp meterbase with built in bypass switch. Wiring inside the meterbase shall be ran so that all wiring is clearly visible and NOT twisted around each other.**Example B**. **below demonstrates proper wiring of the meterbase. BLACK 6awg stranded copper wire is used for HOT wire and WHITE 6awg stranded copper wire is used for neutral wire runs.**

_Example. B. proper wiring of a meterbase

Section I. School Flasher Equipment

School Flasher / Pedestrian Foundations

1. Foundations shall be Class A concrete poured into a round 24” diameter x 24” depth Sonotube form.
2. The Sonotube form shall be fastened to a square wood frame and wooden stakes securely fastened to the wood form to prohibit **ANY** movement of the Sonotube.
3. The concrete shall be electrically vibrated so all air pockets are removed.
4. 18”deep x ¾” anchor bolts shall be used to secure the ped base to the concrete and installed in the concrete **PRIOR** to the cement being poured. The cement shall be smooth across the top.
5. 1, 2” conduit and 1, 1” conduit shall be installed inside the ped foundation and run continuously to the nearest Type 1 Pullbox where a ground rod shall be installed.
6. All conduit are to be located at the center of the foundation and come out of the cement at 90 degrees to the ground. (no crooked pipes).

School Flasher construction

1.Place octagonal ped base on cement foundation.
2. Place aluminum ped pole into base and COMPLETELY tighten and secure the pole into the base with the use of a CHAIN STRAP until the pole no longer rotates.
3. Locate a point 50” off of the ground and drill out the pole and install a 1” rubber grommet so that the rubber grommet faces opposite of oncoming traffic. This is the point at which the School Flasher cabinet wiring will be fed through.
4. Locate a point approximately 10’ above ground and mark the pole. This point represents the bottom of the lowest signal indication.
5. Near the top of the pole drill out the pole and install a 1” rubber grommet for necessary wiring to pass through.
6. Route wiring from the flasher assembly down the pole and out of the previously drilled hole in the pole.
7. Pull wire out of the pole and into the cabinet. Mount and secure the cabinet to the pole.
8. Attach the school flasher assembly to the pole by use of the provided clamping pipe assemblies.

9. Near the top of the pole drill out a 1” hole and install a 2nd 1” rubber grommet. This grommet is to be used for routing RTC antennae wire through later.
10. On the nearest wooden utility pole mount the 200 amp meterbase w/bypass switch as indicated in the attached document provided by the Utility company. Wire the meterbase as indicated earlier in this document in SECTION I.

The completed installation should resemble the assembly below.