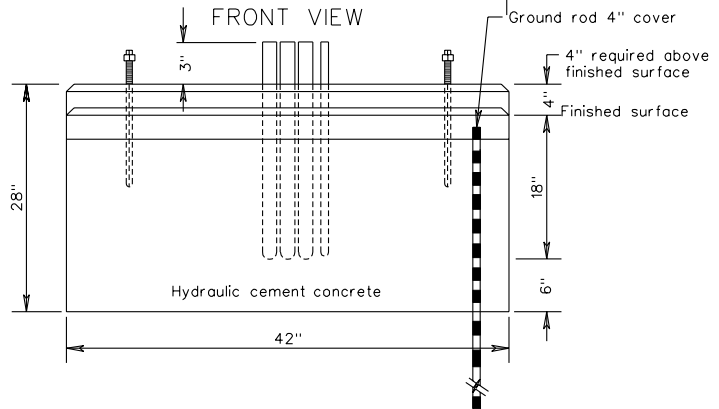
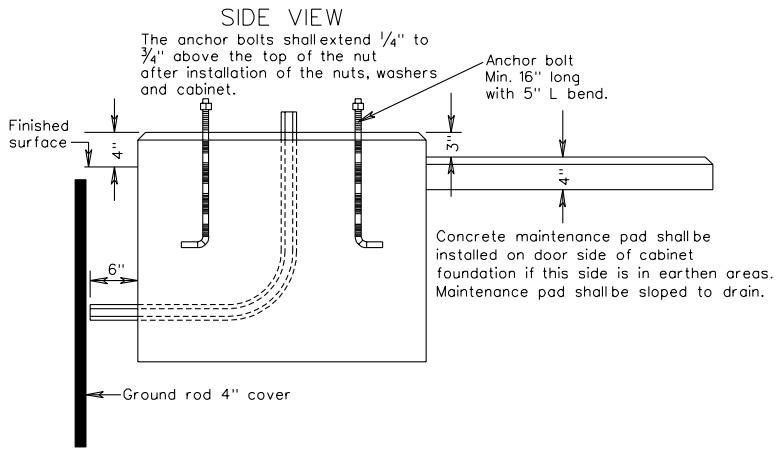
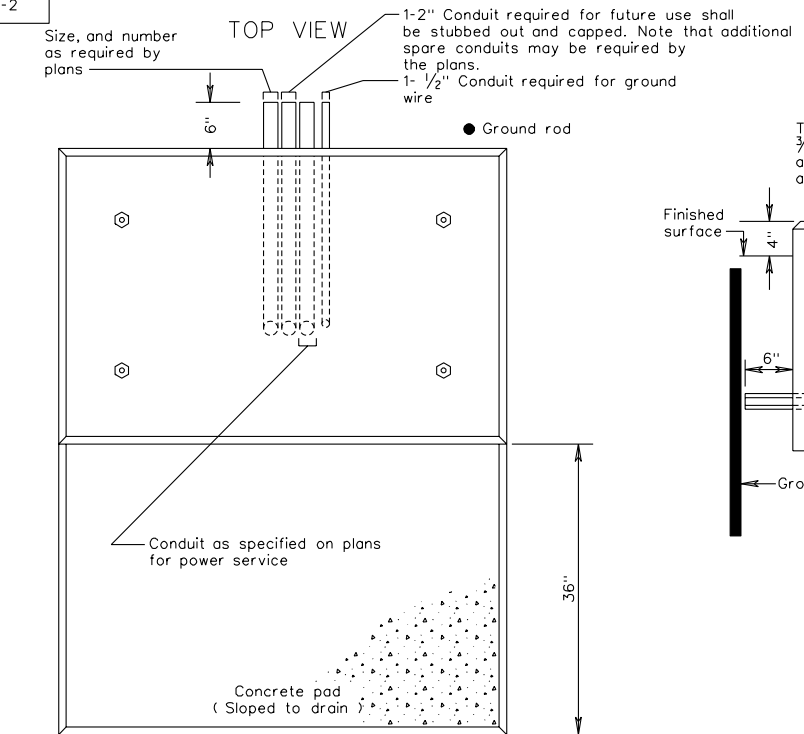


Notes:

- All exposed concrete surface edges shall be chamfered 3/4".
- Anchor bolts and bolt circle template shall be furnished with cabinet. Cabinet shall be centered on foundation.
- Each foundation shall be permanently marked to indicate all sides from which conduits pass. This mark shall be made with a trowel when finishing the concrete and shall be 1/4" deep and 4" to 6" long. Locations of empty conduits shall have an additional 2" long mark made perpendicular to and centered on this marking.
- The controller cabinet at the inside and outside foundation joints shall be sealed with a silicone sealant.
- Bellends shall be installed on each end of PVC conduits. Empty conduits shall be plugged to prevent moisture and rodent entry.
- Grounding bushings shall be installed on each end of metal conduits. Empty conduits shall be plugged to prevent moisture and rodent entry.
- Two - 1/2" diameter weepholes shall be provided in the foundation and located 2" inside of the back or side edges of the controller cabinet. Weepholes shall be sloped to allow outlet to be 3" below top of foundation. Two inches of the outlet end shall be fiber filled.
- VOIDS remaining after conductors exit or enter bellends or bushings of conduits shall be sealed with silicone to prevent moisture or rodent entry.

CONTROLLER CABINET FOUNDATION AND CONDUIT PLACEMENT DETAILS

CF-2



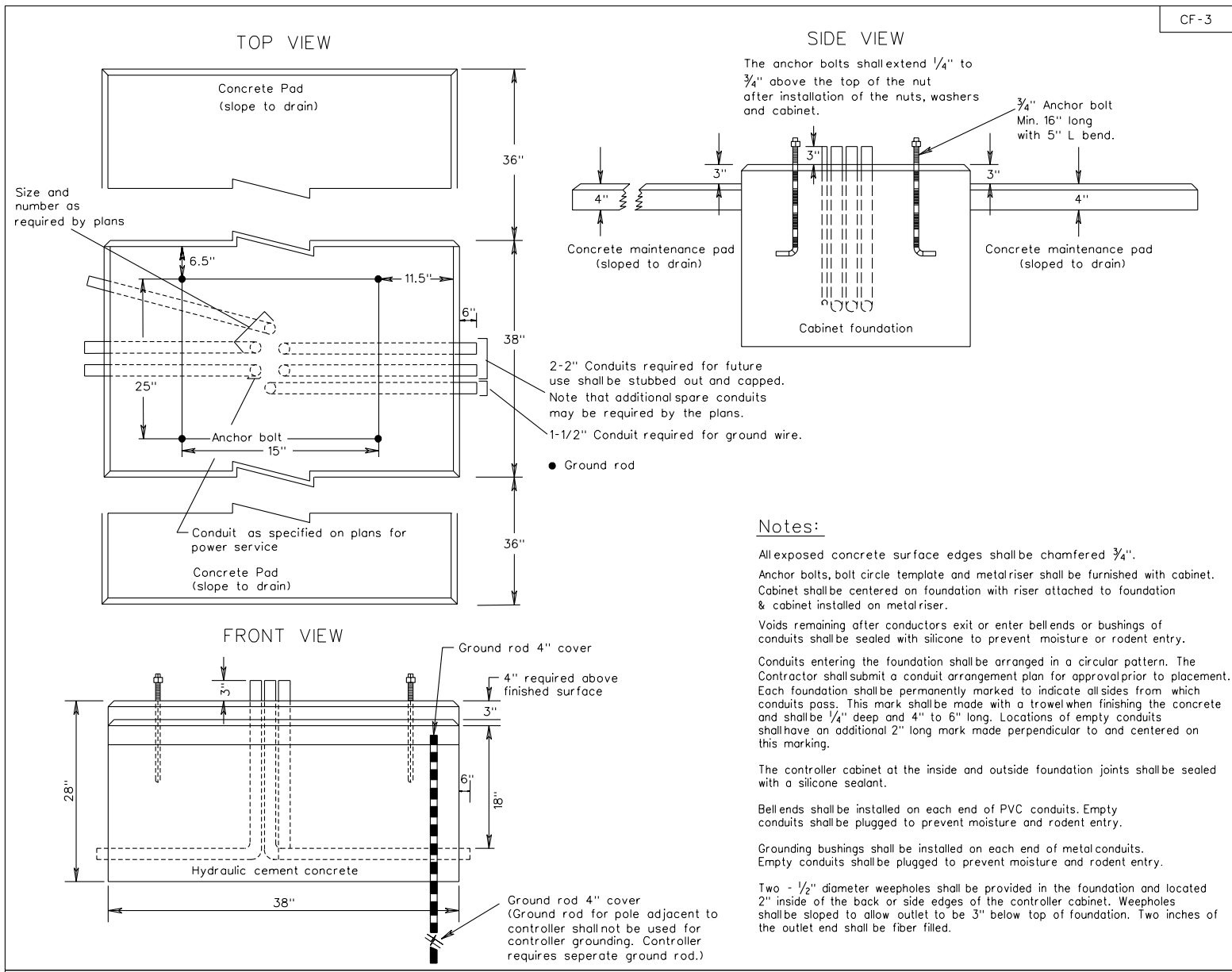
**Notes:**

- All exposed concrete surface edges shall be chamfered 3/4".
- Foundation length and width shall be as required to project no less than a minimum 4" beyond all sides of the cabinet.
- Anchor bolts and bolt circle template shall be furnished with cabinet. Cabinet shall be centered on foundation.
- Each foundation shall be permanently marked to indicate all sides from which conduits pass. This mark shall be made with a trowel when finishing the concrete and shall be 1/4" deep and 4" to 6" long. Locations of empty conduits shall have an additional 2" long mark made perpendicular to and centered on this marking.
- The control center cabinet at the inside and outside foundation joints shall be sealed with a silicone sealant.
- Bellends shall be installed on each end of PVC conduits. Empty conduits shall be plugged to prevent moisture and rodent entry.
- Grounding bushings shall be installed on each end of metal conduits. Empty conduits shall be plugged to prevent moisture and rodent entry.
- Two - 1/2" diameter weepholes shall be provided in the foundation and located 2" inside of the back or side edges of the controller cabinet. Weepholes shall be sloped to allow outlet to be 3" below top of foundation. 2" of the outlet end shall be fiber filled.
- voids remaining after conductors exit or enter bellends or bushings of conduits shall be sealed with silicone to prevent moisture and rodent entry.

CONTROL CENTER CABINET FOUNDATION AND CONDUIT PLACEMENT DETAILS

1301.02

VIRGINIA DEPARTMENT OF TRANSPORTATION

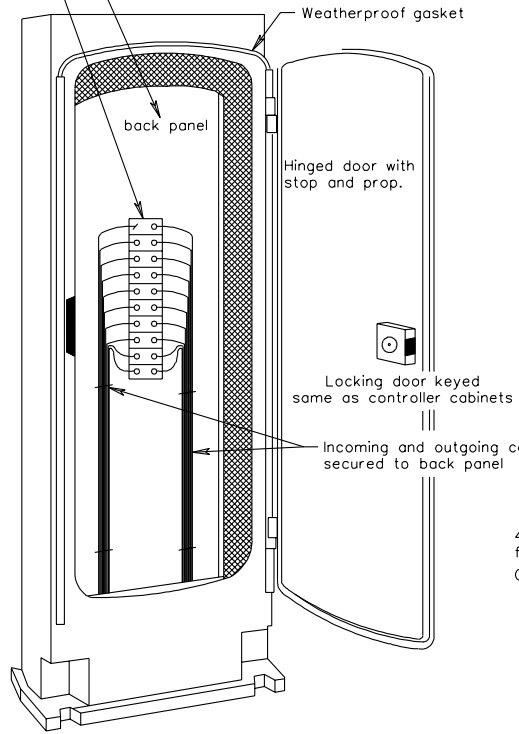


## CONTROLLER CABINET FOUNDATION AND CONDUIT PLACEMENT DETAILS

CTE-1

Two pole terminalstrip with jumpers sized to accommodate wire size and having number of terminal poles required to accommodate cable shown by plans plus 10 spare terminals. Terminal block shall be a non-corrosive material with stainless steel screws, washers and nuts.

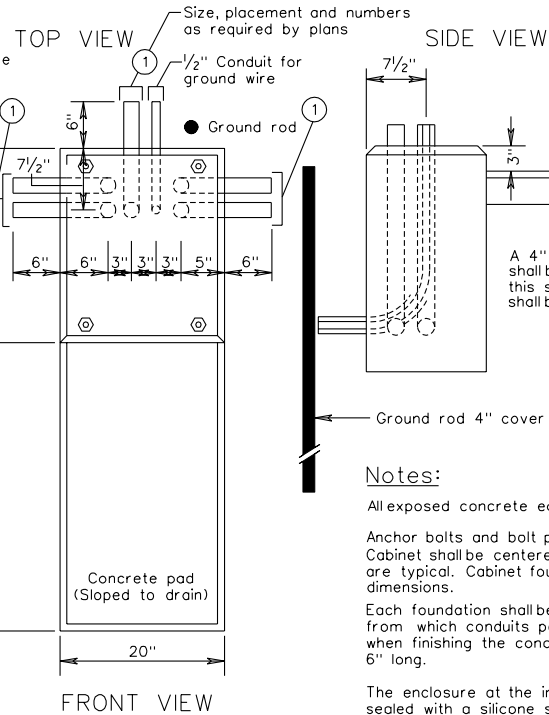
Back panel shall be stainless steel or aluminum.



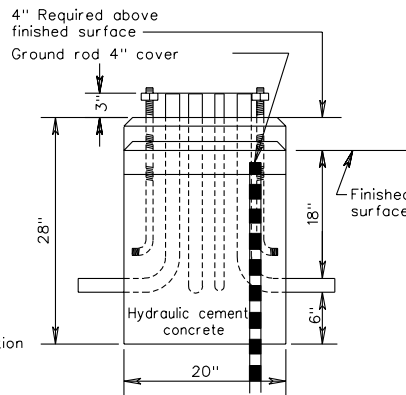
TYPICAL BOX DETAIL

Height 36" minimum  
Width 12" minimum  
Depth 8.5" minimum

Cabinet material, finish and construction as required for controller cabinets.



FRONT VIEW



TYPICAL FOUNDATION DETAIL

A 4" x 36" x 20" concrete maintenance pads shall be installed on door side of foundation if this side is in earthen areas. Maintenance pads shall be sloped to drain.

Notes:

All exposed concrete edges shall be chamfered 3/4"

Anchor bolts and bolt pattern shall be furnished with cabinet. Cabinet shall be centered on foundation. Foundation dimensions are typical. Cabinet foundation shall be adjusted to the cabinet dimensions.

Each foundation shall be permanently marked to indicate all sides from which conduits pass. This mark shall be made with a trowel when finishing the concrete and shall be 1/4" deep and 4" to 6" long.

The enclosure at the inside and outside foundation joints shall be sealed with a silicone sealant.

Bell ends shall be installed on each end of PVC conduits. Empty conduits shall be plugged to prevent moisture and rodent entry.

Grounding bushings shall be installed on each end of metal conduits. Empty conduits shall be plugged to prevent moisture and rodent entry.

Two - 1/2" diameter weepholes shall be provided in the foundation and located 2" inside of the back or side edges of the controller cabinet. Weepholes shall be sloped to allow outlet to be 3" below top of foundation. Two inches of the outlet end shall be fiber filled.

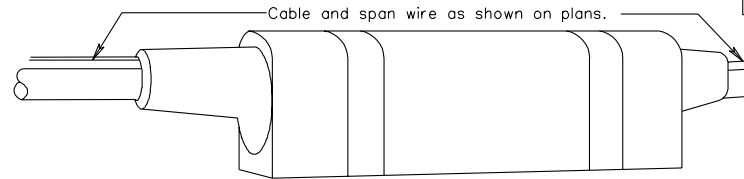
The anchor bolts shall extend 1/4" to 3/4" above the top of the nut after installation of the nuts, washers and cabinet.

Spare conduits, if required by the plans, shall have bell ends or grounding bushings installed on PVC and metal conduits, respectively and shall be plugged to prevent moisture and rodent entry.

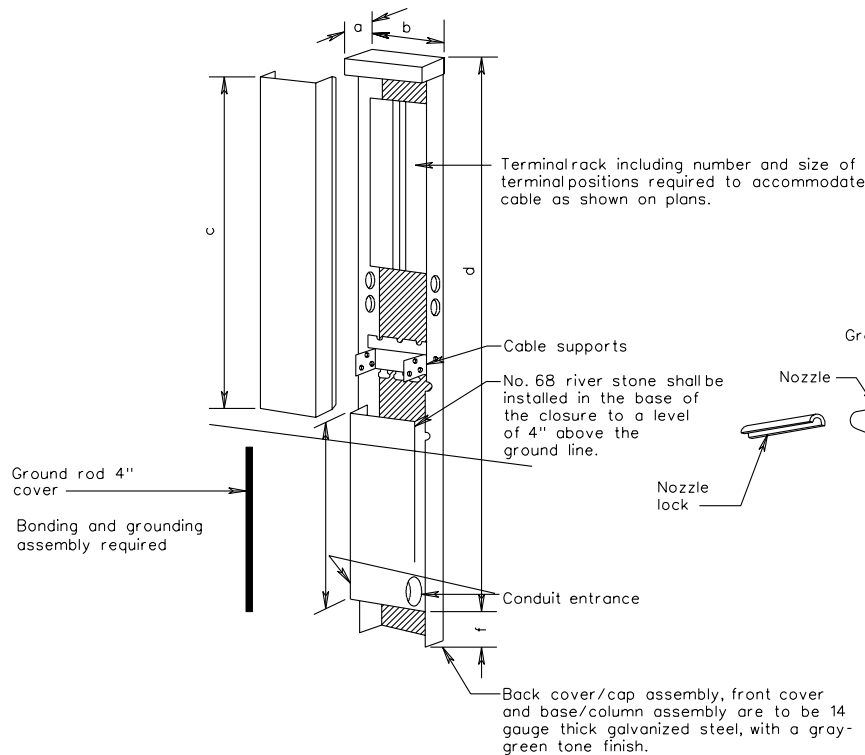
Voids remaining after conductors exit or enter bell ends or bushings of conduits shall be sealed with silicone to prevent moisture and rodent entry.

ABOVE GROUND CABLE TERMINAL ENCLOSURE AND CONDUIT PLACEMENT DETAILS

DIMENSIONS (min.)						
TYPE	a	b	c	d	e	f
A	6 5/8"	6 5/8"	26"	47 5/16"	20 9/16"	3"
B	8 1/4"	8 1/4"	26"	47 5/16"	20 9/16"	3"
C	12 7/8"	12 7/8"	23 5/8"	50 5/16"	25 15/16"	-



TYPICAL COMPLETED ASSEMBLY

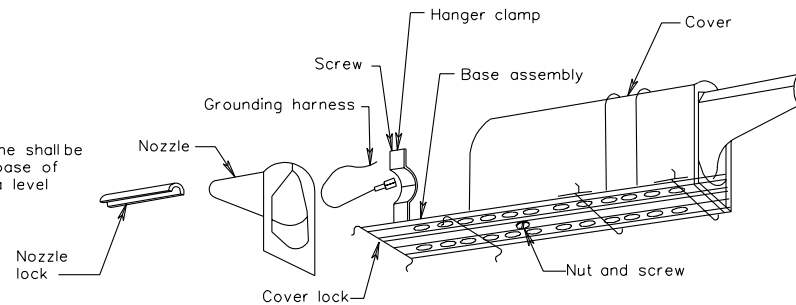


Notes:

This item shall be similar to standard telephone splice enclosures. Terminal block shall be of a non-corrosive material with bright acid tin plated steelscrews, nuts, and washers.

TYPICAL ABOVE GROUND CABLE  
TERMINAL ENCLOSURE

CTE - 2



TYPICAL ASSEMBLY BREAKDOWN

Notes:

This item shall be easily re-enterable.

This item shall be similar to standard telephone splice enclosures, and shall include terminal lugs for size and number of cables used, and shall be weather resistant.

Where necessary this item shall be adapted for a "Y" branch of cable and /or for figure 8 cable.

Terminal block shall be of a non-corrosive material with bright acid tin plated steelscrews, nuts, and washers.

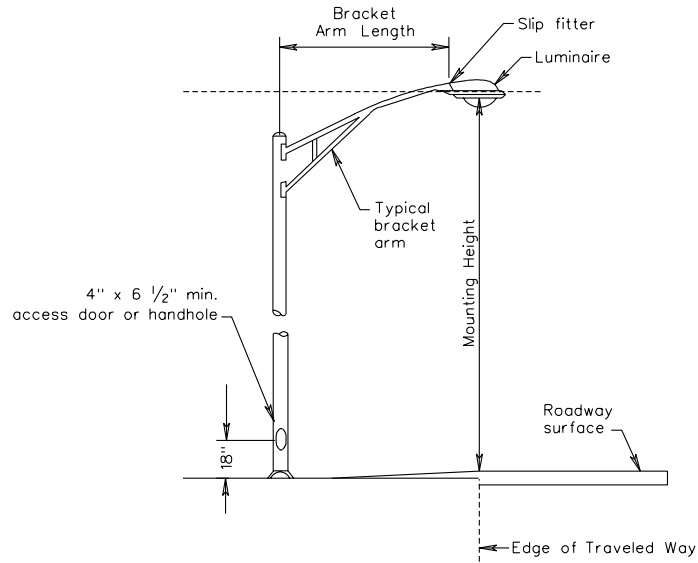
TYPICAL AERIAL CABLE  
TERMINAL ENCLOSURE

CTE - 3

ABOVE GROUND AND AERIAL CABLE  
TERMINAL ENCLOSURE DETAILS

LP-1,2

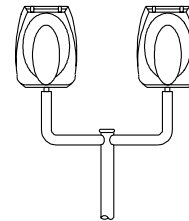
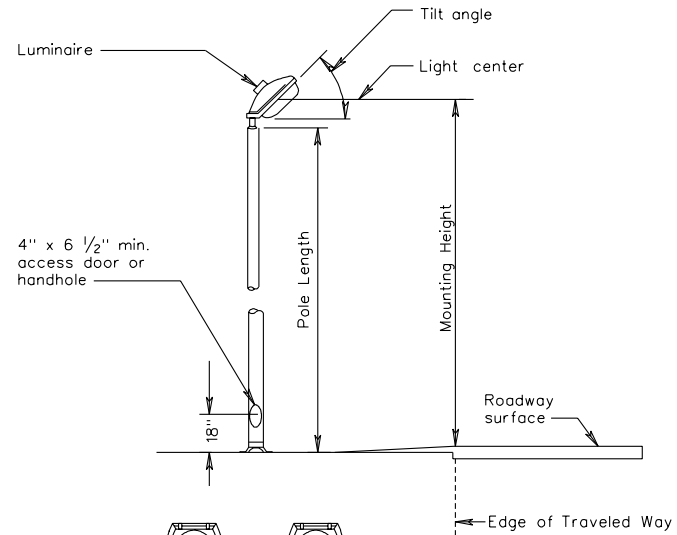
LP-1  
CONVENTIONAL



NOTE:

The mounting height shown on the plans shall be adhered to within a tolerance of 12" and in no case less than the mounting height shown.

LP-2  
OFFSET



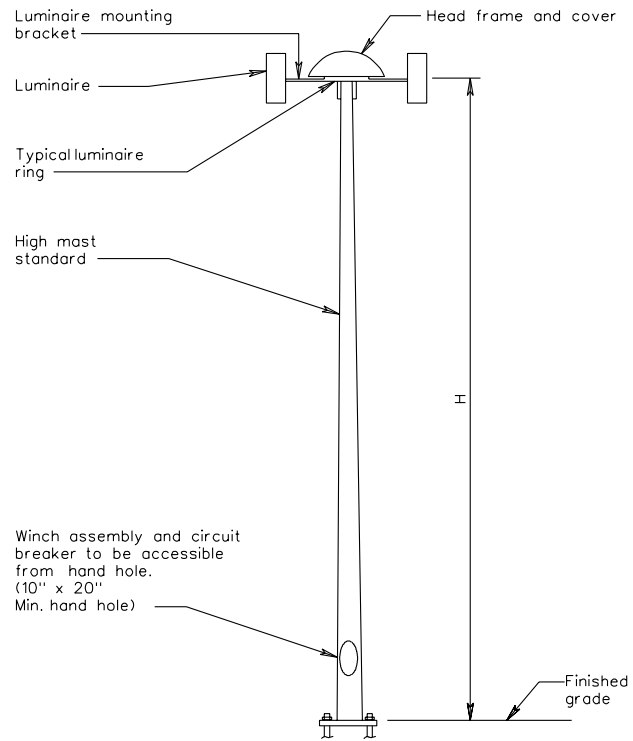
DUAL MOUNT

POLE LENGTH (feet)	BOLT CIRCLE DIAMETER	ANCHOR BOLT DIAMETER
A (5-17)	12"	1"
B (18-22)	12"	1"
C (23-27)	12"	1"
D (28-32)	12"	1"
E (33-37)	15"	1"
F (38-42)	15"	1"
G (43-47)	15"	1"
H (48-52)	16"	1"
I (53-57)	16"	1 1/4"
J (58-62)	16"	1 1/4"

LIGHTING POLE DETAILS  
CONVENTIONAL AND OFFSET

VIRGINIA DEPARTMENT OF TRANSPORTATION

1301.06



TYPE	H
1	70'
2	80'
3	90'
4	100'
5	110'
6	120'
7	130'
8	140'
9	variable

Note:

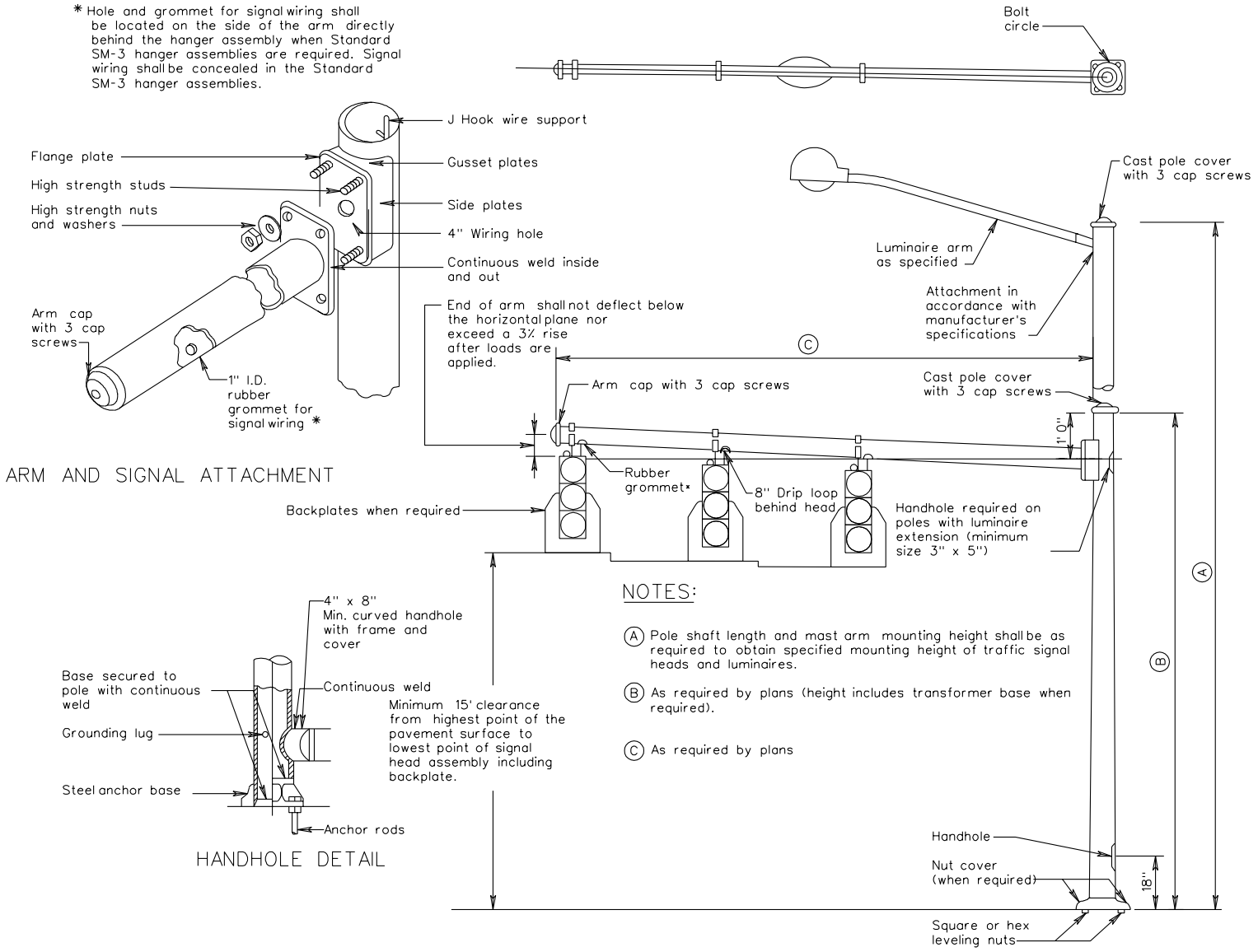
Type 9 poles shall be of sufficient height to provide a luminaire mounting height above the roadway surface as indicated on the plans.

The mounting heights shown on the plans for a type 9 pole shall be adhered to within a tolerance of 3 feet and in no case be less than the mounting height shown.

## LIGHTING POLE DETAILS HIGH MAST

MP-1

\* Hole and grommet for signal wiring shall be located on the side of the arm directly behind the hanger assembly when Standard SM-3 hanger assemblies are required. Signal wiring shall be concealed in the Standard SM-3 hanger assemblies.

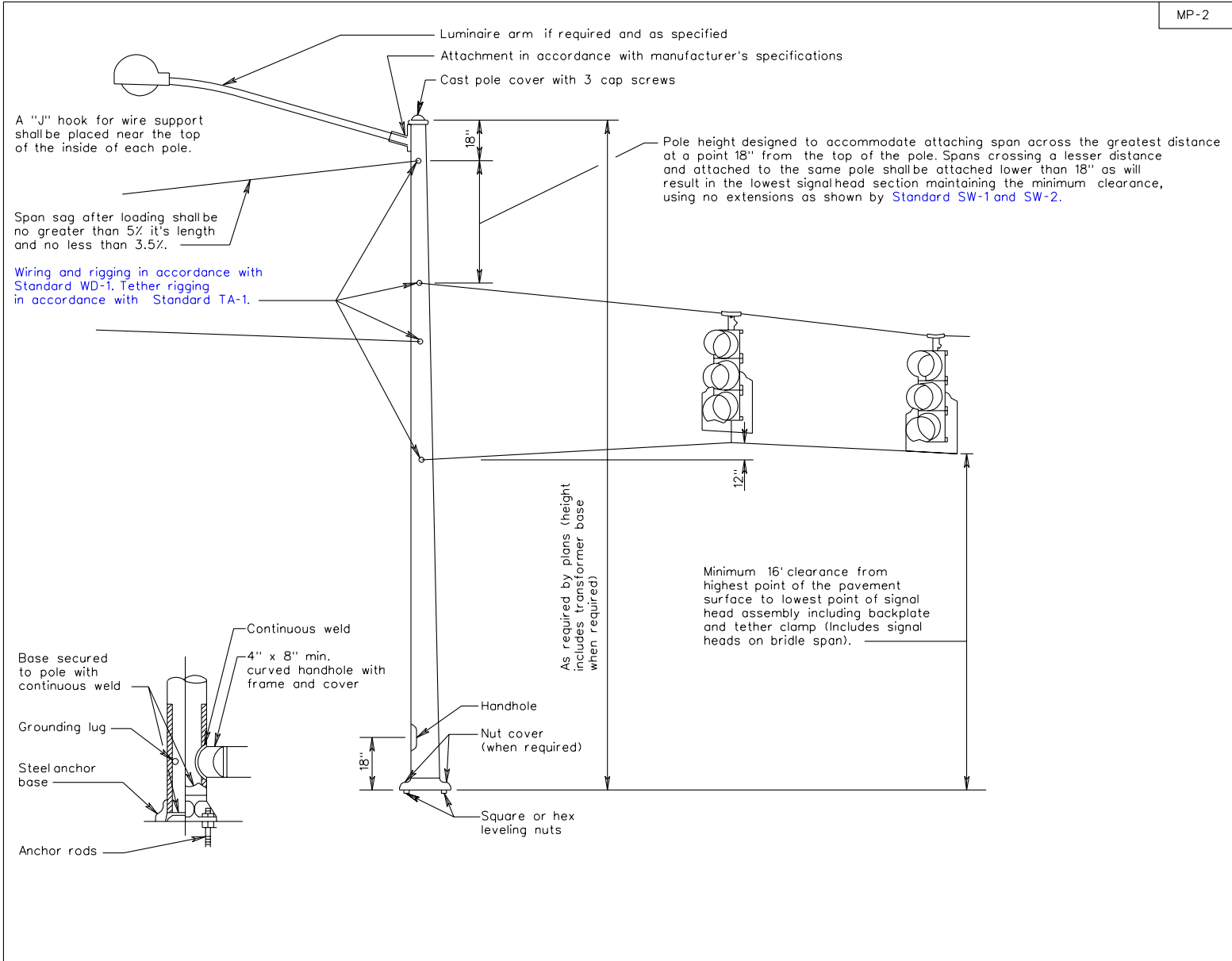


**NOTES:**

- (A) Pole shaft length and mast arm mounting height shall be as required to obtain specified mounting height of traffic signal heads and luminaires.
- (B) As required by plans (height includes transformer base when required).
- (C) As required by plans

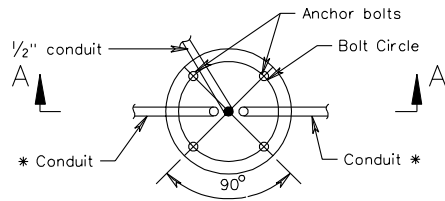
**SIGNAL POLE DETAILS  
(MAST ARM AND COMBINATION LUMINAIRE MAST ARM POLE)**



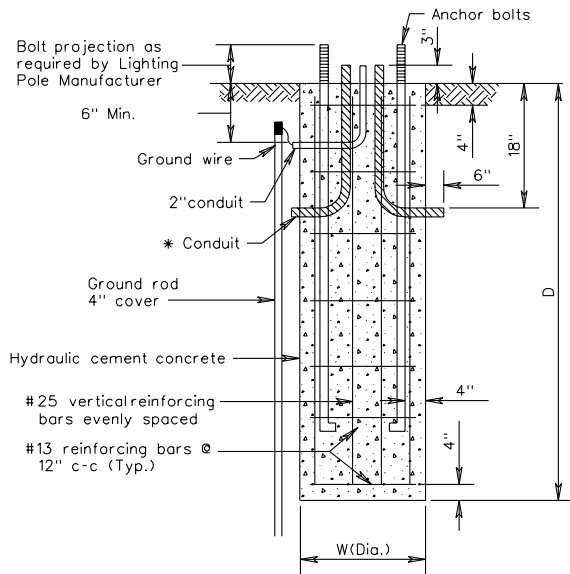


SIGNAL POLE DETAILS  
 (STRAIN AND COMBINATION LUMINAIRE STRAIN POLE)

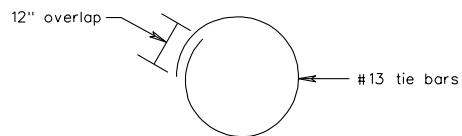
VIRGINIA DEPARTMENT OF TRANSPORTATION



PLAN VIEW  
TYPE A AND B



SECTION A-A



PLAN VIEW

Type	W	D	Vertical Bars
A	2' 6"	8'	8 - #25

Notes:

Conduit elbows shall have a 90° bend. The bend radius shall be in accordance with the N.E.C.

The bolt circle template shall be furnished by the lighting pole manufacturer.

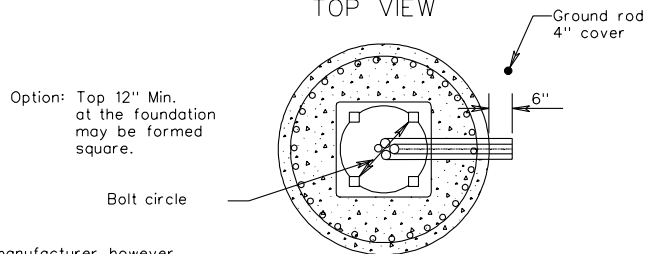
\* The number, orientation and size of conduits entering and exiting foundations shall be as shown on plans.

No mortar, grout, or concrete shall be placed between bottom of base plate and top of pedestal.

LIGHTING POLE FOUNDATION  
INSTALLATION DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

TOP VIEW

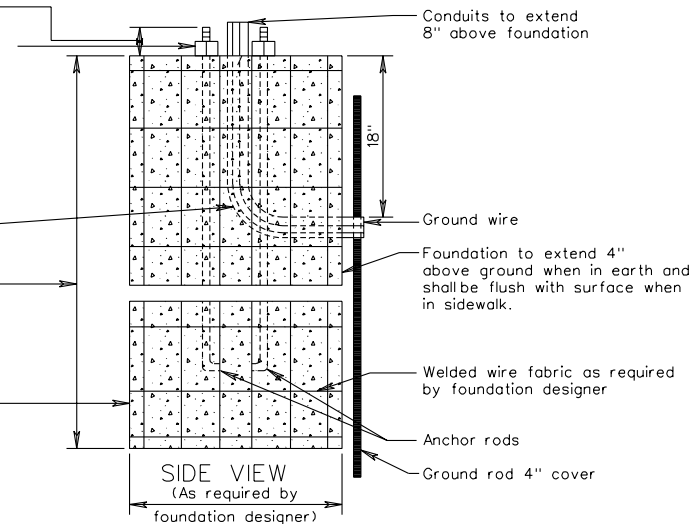


Bolt projection as required by signal pole manufacturer, however distance between bottom of base plate and top of pedestal shall be less than or equal to twice the diameter of anchor bolt but shall not be greater than 3".

Square or hex nuts under base casting serve as a means of leveling or raking pole.

All conduits as specified on plans. In addition 1/2" conduit required for ground wire. 2 - 2" PVC heavy wall conduits required for future use. Note that additional spare conduits may be required by plans

(As required by foundation designer)



CIRCULAR FOUNDATION

Notes:

Anchor bolts and bolt pattern shall be furnished with pole. Pole shall be centered on foundation.

Each foundation shall be permanently marked to indicate all sides from which conduits pass. This mark shall be made with a trowel when finishing the concrete and shall be 1/4" deep and 4" to 6" long. Locations of empty conduits shall have an additional 2" long mark made perpendicular to and centered on this marking.

When foundation extends 4" above finished grade all edges shall be chamfered 3/4".

Grounding bushings shall be installed on each end of metal conduits. Empty conduits shall be plugged to prevent moisture and rodent entry.

Bell ends shall be installed on each end of PVC conduits. Empty conduits shall be plugged to prevent moisture and rodent entry.

Voids remaining after conductors exit or enter bell ends or bushings of conduits shall be sealed with silicone to prevent moisture and rodent entry.

No mortar, grout, or concrete shall be placed between bottom of base plate and top of pedestal.

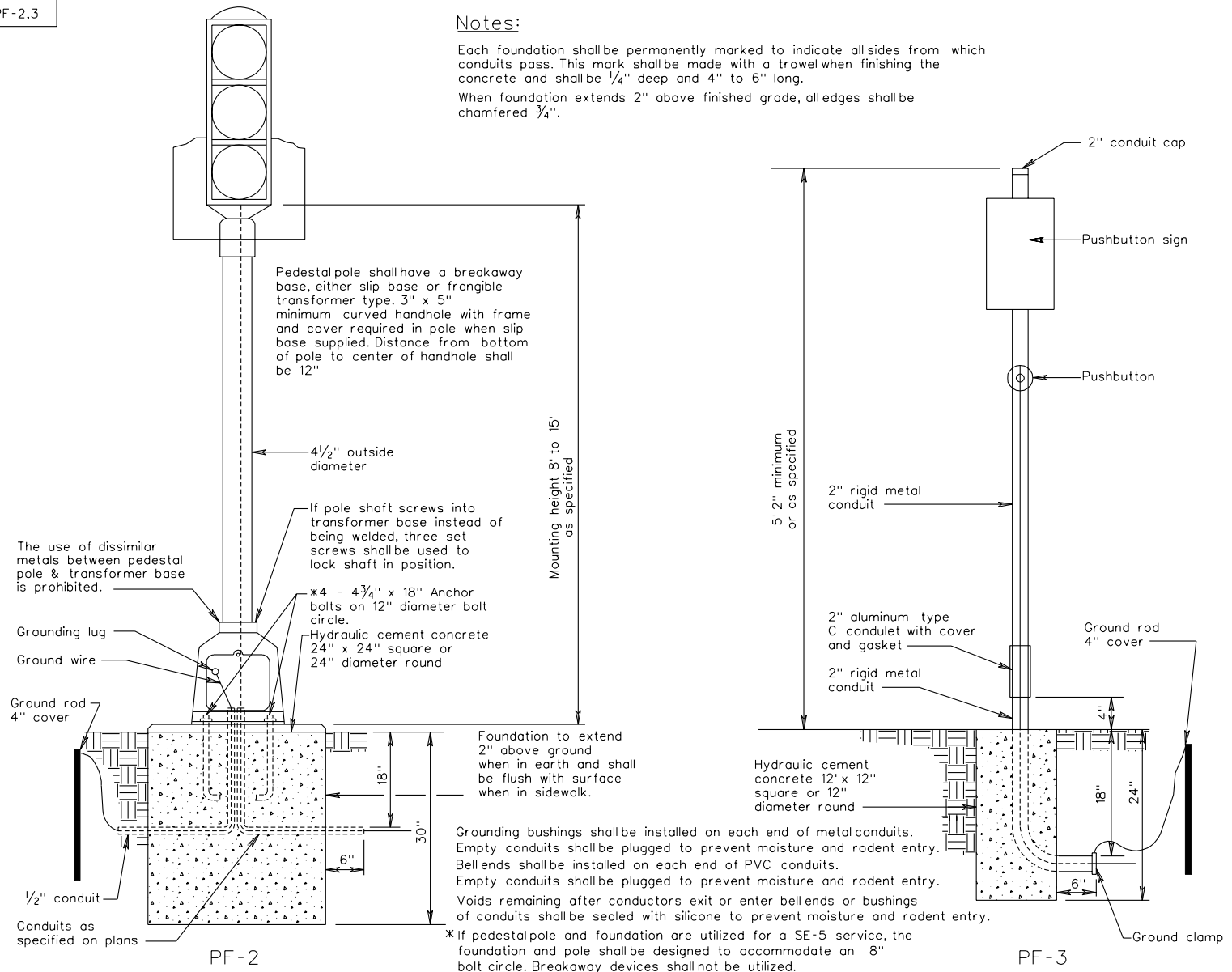
SIGNAL POLE FOUNDATION  
INSTALLATION DETAILS  
VIRGINIA DEPARTMENT OF TRANSPORTATION

PF-2,3

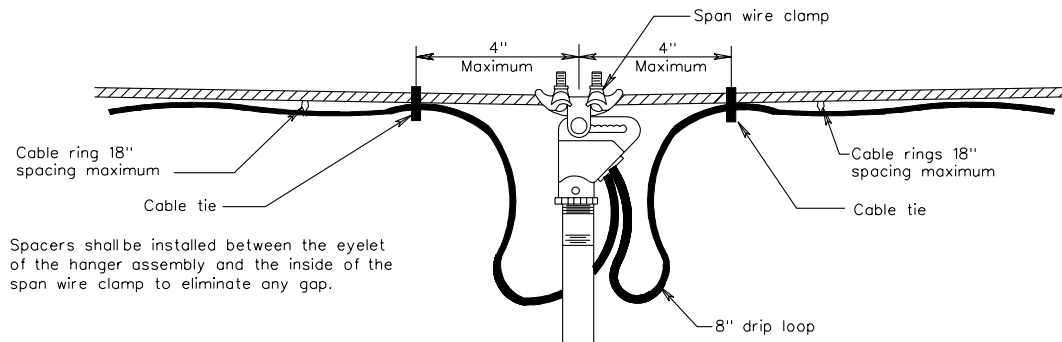
**Notes:**

Each foundation shall be permanently marked to indicate all sides from which conduits pass. This mark shall be made with a trowel when finishing the concrete and shall be 1/4" deep and 4" to 6" long.

When foundation extends 2" above finished grade, all edges shall be chamfered 3/4".



PEDESTAL POLE AND FOUNDATION DETAILS



Spacers shall be installed between the eyelet of the hanger assembly and the inside of the span wire clamp to eliminate any gap.

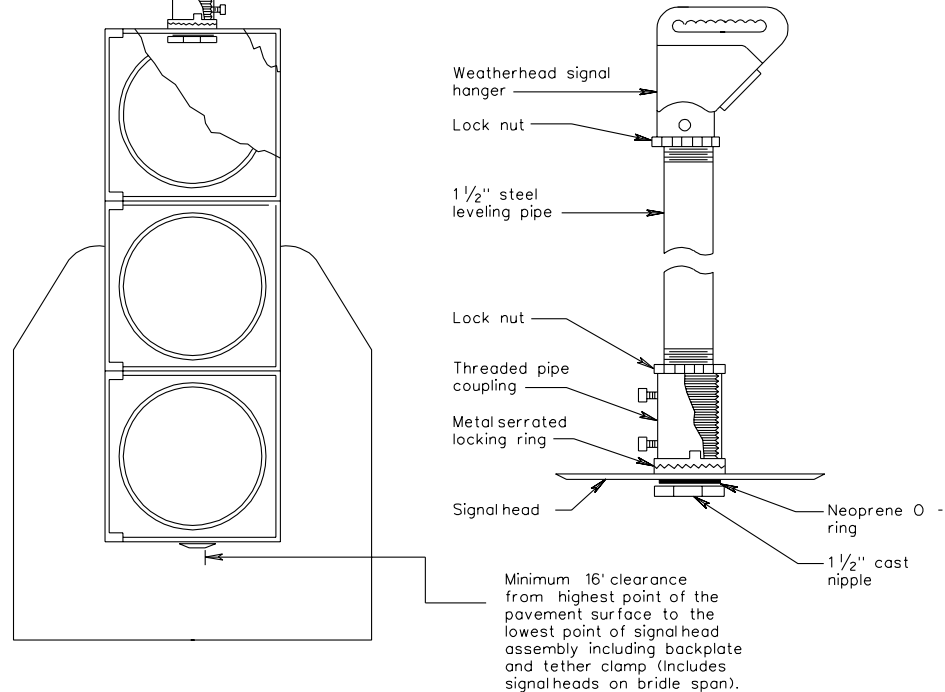
A waterproof sealant shall be applied to the thread area above the pipe coupling before the lock nut is screwed down.

Weatherhead signal hanger, steel leveling pipe and threaded pipe coupling shall be galvanized or painted flat black or yellow.

SIDE VIEW

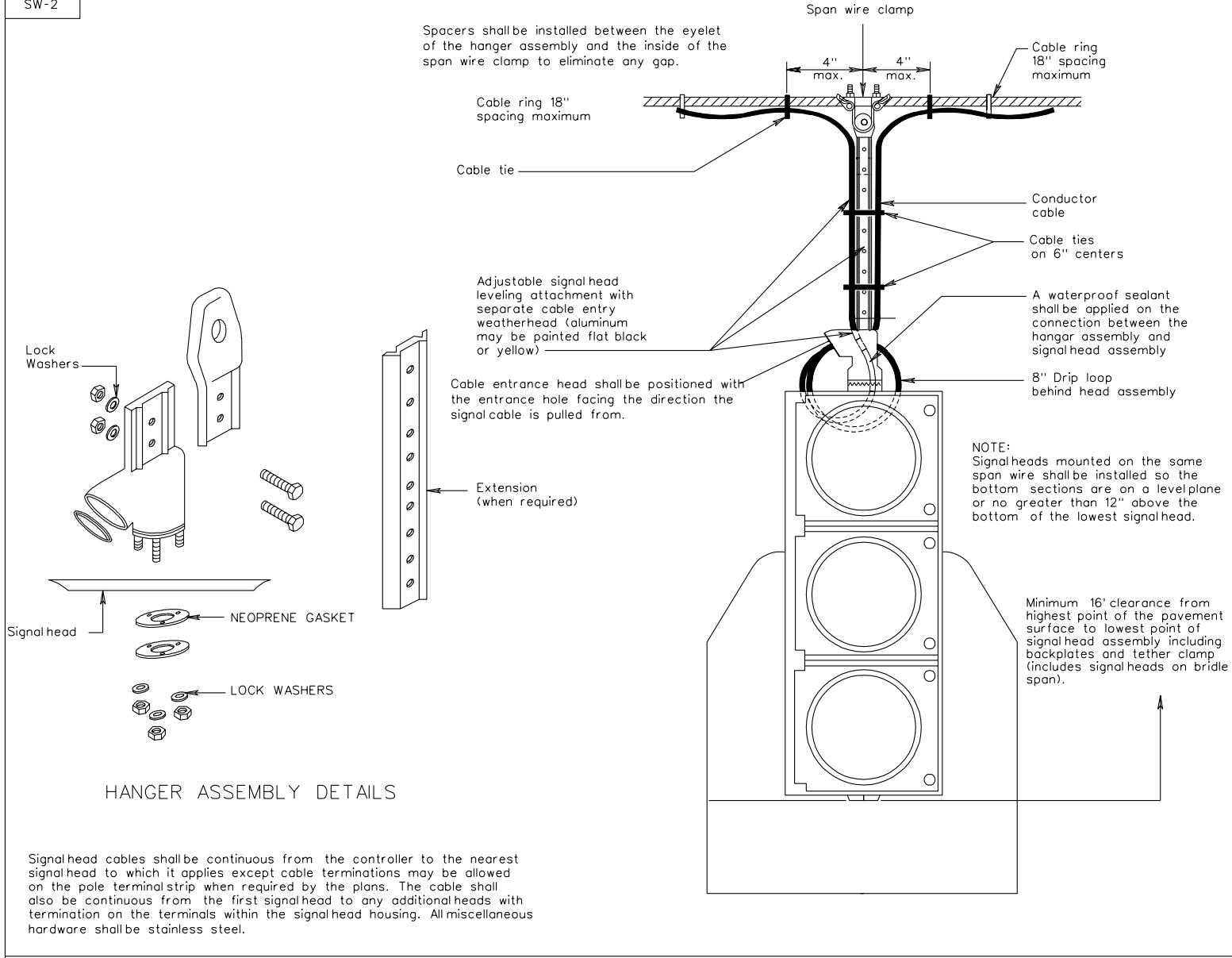
Note:

Signalheads mounted on the same span wire shall be installed so the bottom sections are on a level plane or no greater than 12" above the bottom of the lowest signalhead.

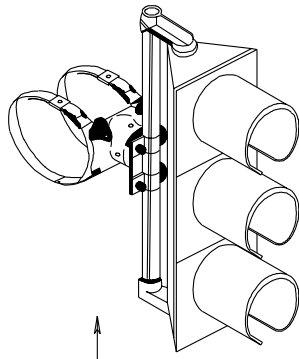


Signal head cables shall be continuous from the controller to the nearest signalhead to which it applies except cable terminations may be allowed on the pole terminal strip when required by the plans. The cable shall also be continuous from the first signal head to any additional heads with termination on the terminals within the signalhead housing.

SIGNAL HEAD MOUNTING DETAILS  
SPAN WIRE



## SIGNAL HEAD MOUNTING DETAILS SPAN WIRE



Minimum 15' clearance from highest point of the pavement surface to lowest point of signal head assembly including backplate.

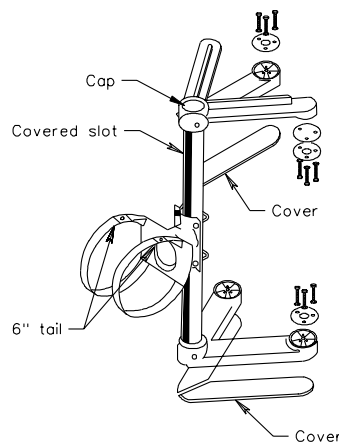
POLE AND HANGER ASSEMBLY  
HARDWARE REQUIREMENTS

IF POLE IS	HARDWARE SHALL BE
Galvanized steel	Aluminum or galvanized iron
Steel painted aluminum	Aluminum, galvanized iron or iron painted aluminum
Steel painted other than aluminum	Aluminum or iron painted to match pole

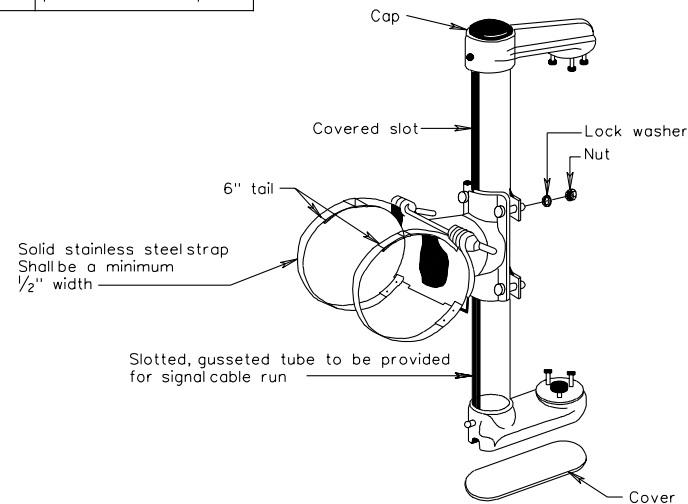
Notes:

Signal head cables shall be continuous from the controller to the nearest signal head to which it applies except cable terminations may be allowed on the pole terminal strip when required by the plans. The cable shall also be continuous from the first signal head to any additional heads with termination on the terminals within the signal head housing.

All bolts, nuts and washers shall be stainless steel.



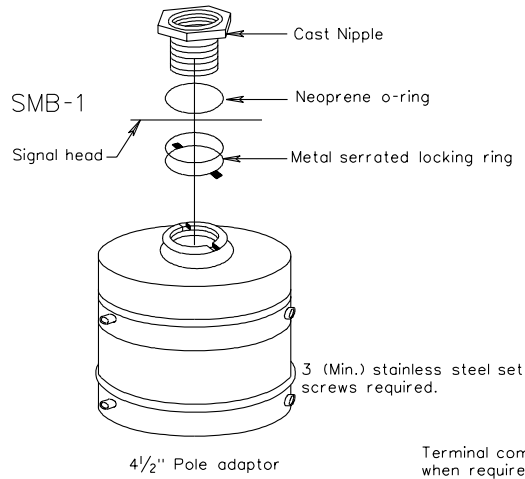
5 SECTION CLUSTER MOUNTING DETAIL



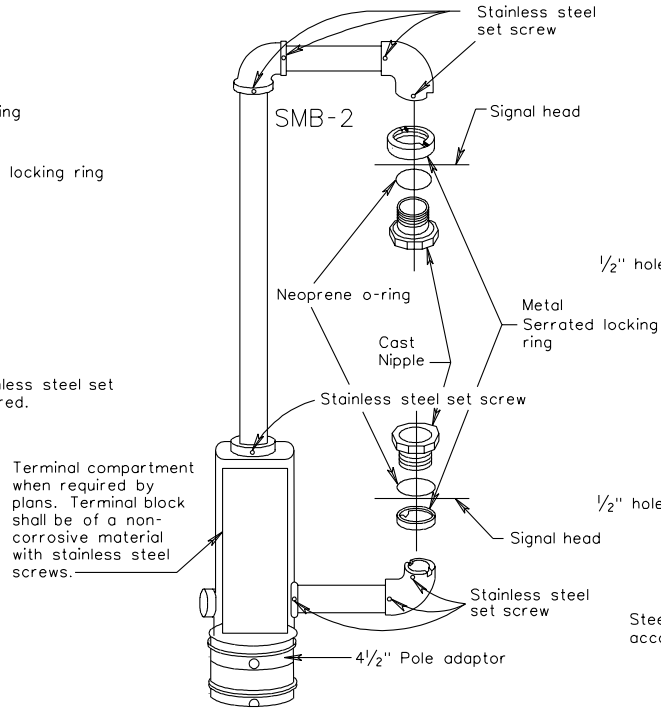
RIGID MAST ARM MOUNTING DETAILS

SIGNAL HEAD MOUNTING DETAILS  
MAST ARM

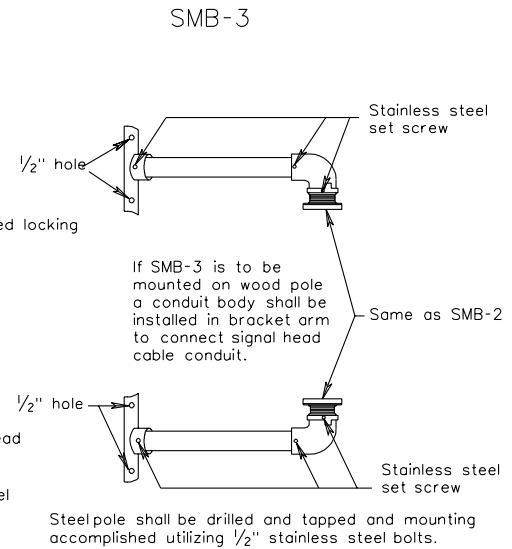
POLE TOP MOUNTING CAST ALUMINUM SIGNAL HEADS ONLY



POLE TOP MOUNTING CAST ALUMINUM OR POLYCARBONATE SIGNAL HEADS



POLE BRACKET MOUNTING CAST ALUMINUM OR POLYCARBONATE SIGNAL HEADS



POLE AND HANGAR ASSEMBLY HARDWARE REQUIREMENTS

IF POLE IS	HARDWARE SHALL BE
Galvanized steel	Aluminum or galvanized iron
Steel painted alum.	Aluminum galvanized iron or iron painted aluminum
Steel painted other than aluminum; Fiberglass tone other than gray	Aluminum or iron painted to match pipe
Wood or fiberglass with gray tone	Aluminum or galvanized iron

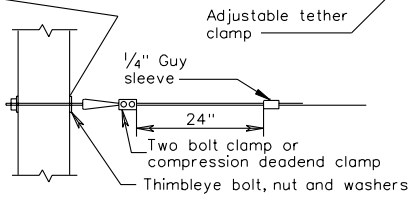
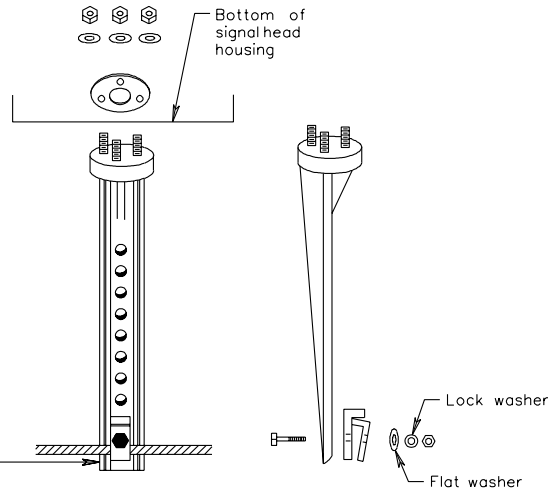
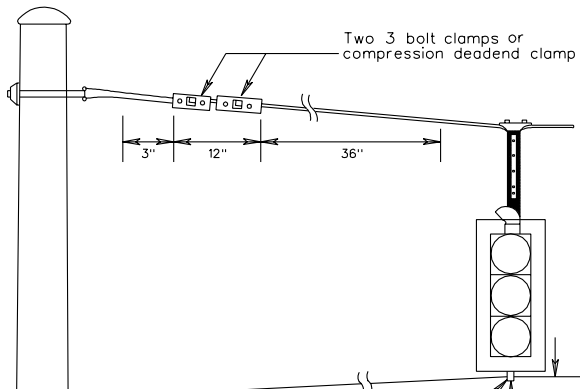
Notes:

If pedestrian signals are being installed, the mounting attachments (SMB-1,2,3) shall be a type specifically manufactured for that purpose.

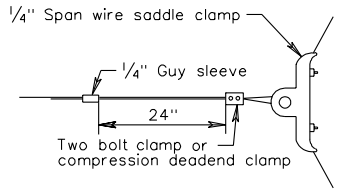
SMB-1, 2 and 3 shown are typical and for one way signal display. Other designs may be submitted for approval by the Engineer. Multi-way assemblies, when required, shall be of similar appropriate design.

SIGNAL HEAD MOUNTING DETAILS  
POLE TOP AND BRACKET





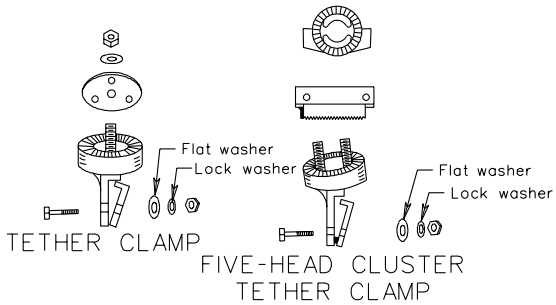
POLE ATTACHMENT



BRIDLE SPAN ATTACHMENT

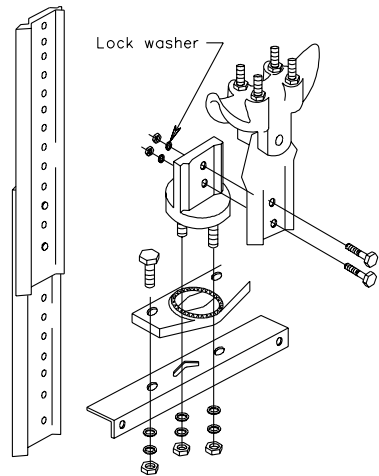
Minimum 16' clearance from highest point of the pavement surface to lowest point of signal head assembly including backplate and tether clamp (Includes signalheads on bridle span).

ADJUSTABLE TETHER CLAMP



TETHER WIRE DETAILS

SPAN WIRE INSTALLATION

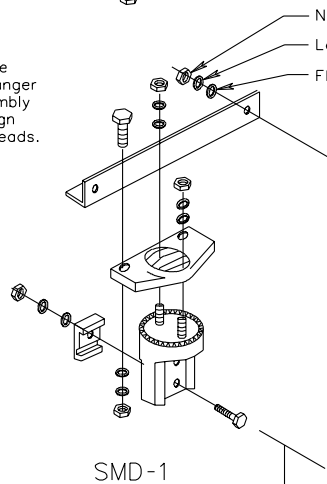


Spacers shall be installed between the eyelet of the sign hanger and the span wire clamp to eliminate any gap.

Note:

All nuts, bolts and washers shall be stainless steel or galvanized steel unless otherwise indicated.

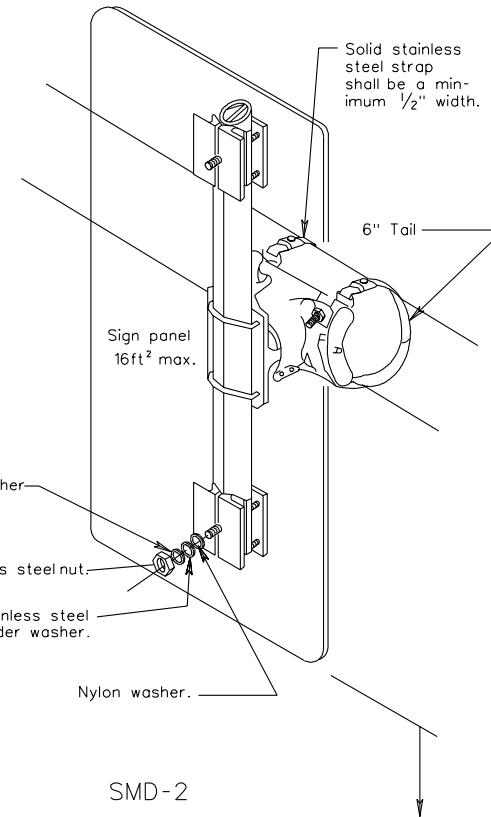
Extension shall be used with the hanger and tether assembly to center the sign with the signal heads.



SMD-1

Minimum 16' clearance from highest point of the pavement surface to bottom of tether clamp.

MAST ARM INSTALLATION



SMD-2

Minimum 15' clearance from highest point of the pavement surface to bottom of sign.

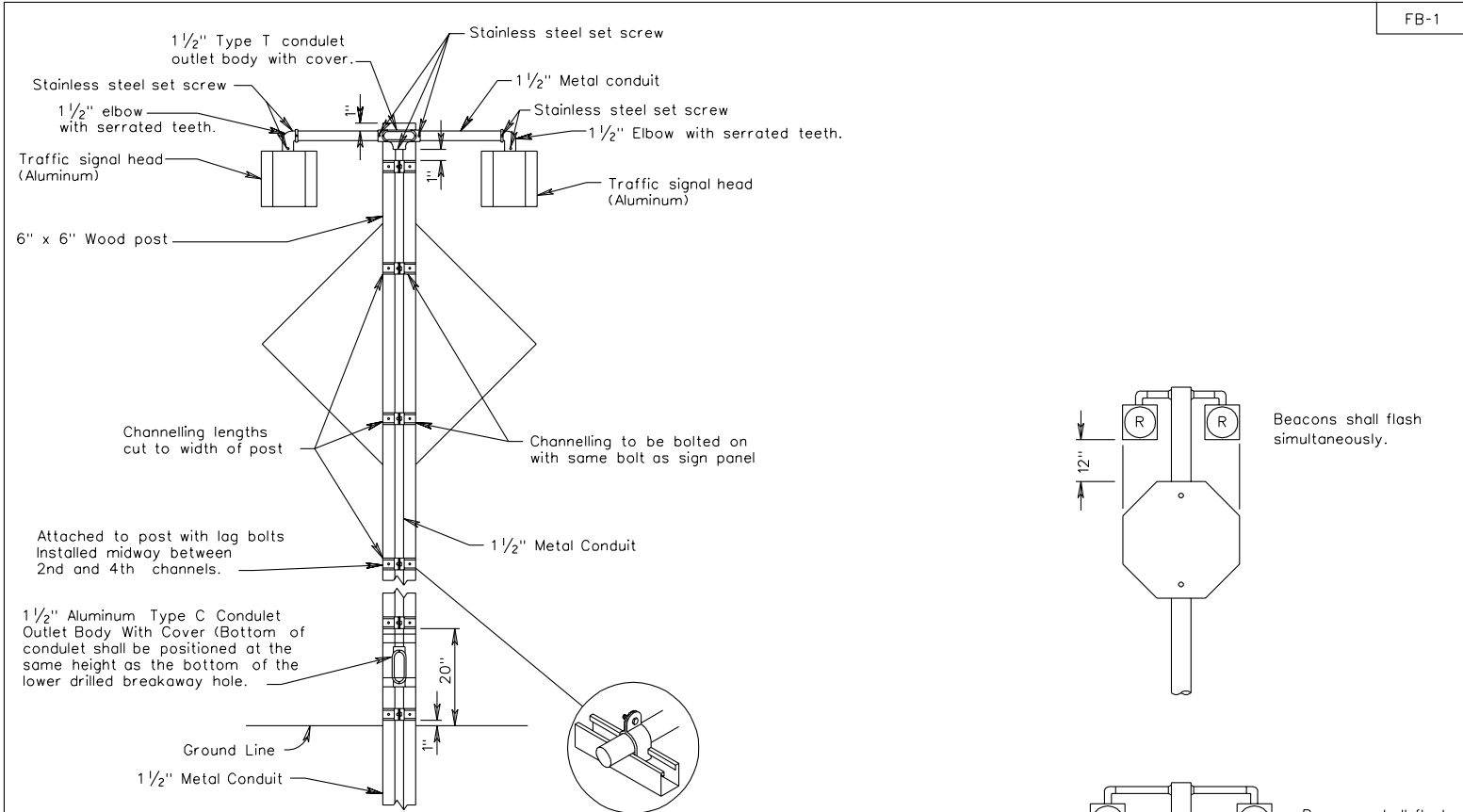
NOTES

Nuts and bolts used for attachment of sign panel shall be stainless steel and 3/4" in diameter.

A 1/4" nylon and stainless steel fender washer shall be used on the front of sign panel where bolt passes through sign panel.

SIGN MOUNTING DETAILS

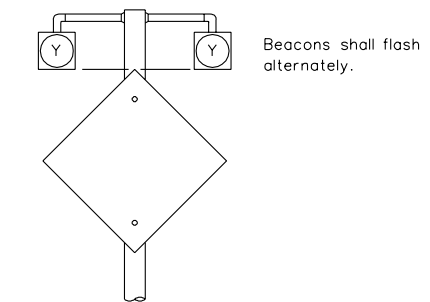
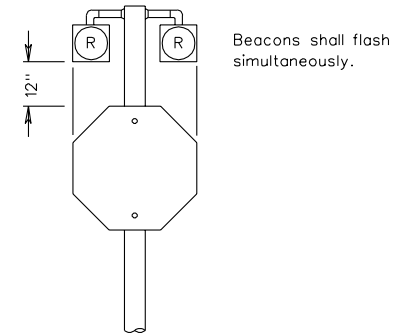
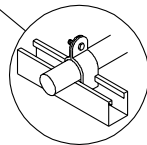
VIRGINIA DEPARTMENT OF TRANSPORTATION



Notes:

- All signal lenses shall be 12".
- [Post to be drilled for breakaway and installed in accordance with WSP-1, pages 1301.57 & 1301.58.](#)
- All elbows and conduits shall have set screws or lock nuts to prevent rotation.
- Miscellaneous hardware shall be stainless steel.
- Channelling shall be galvanized steel.
- A water proof sealant shall be utilized between the elbow & signal head.

CHANNELLING  
DETAIL



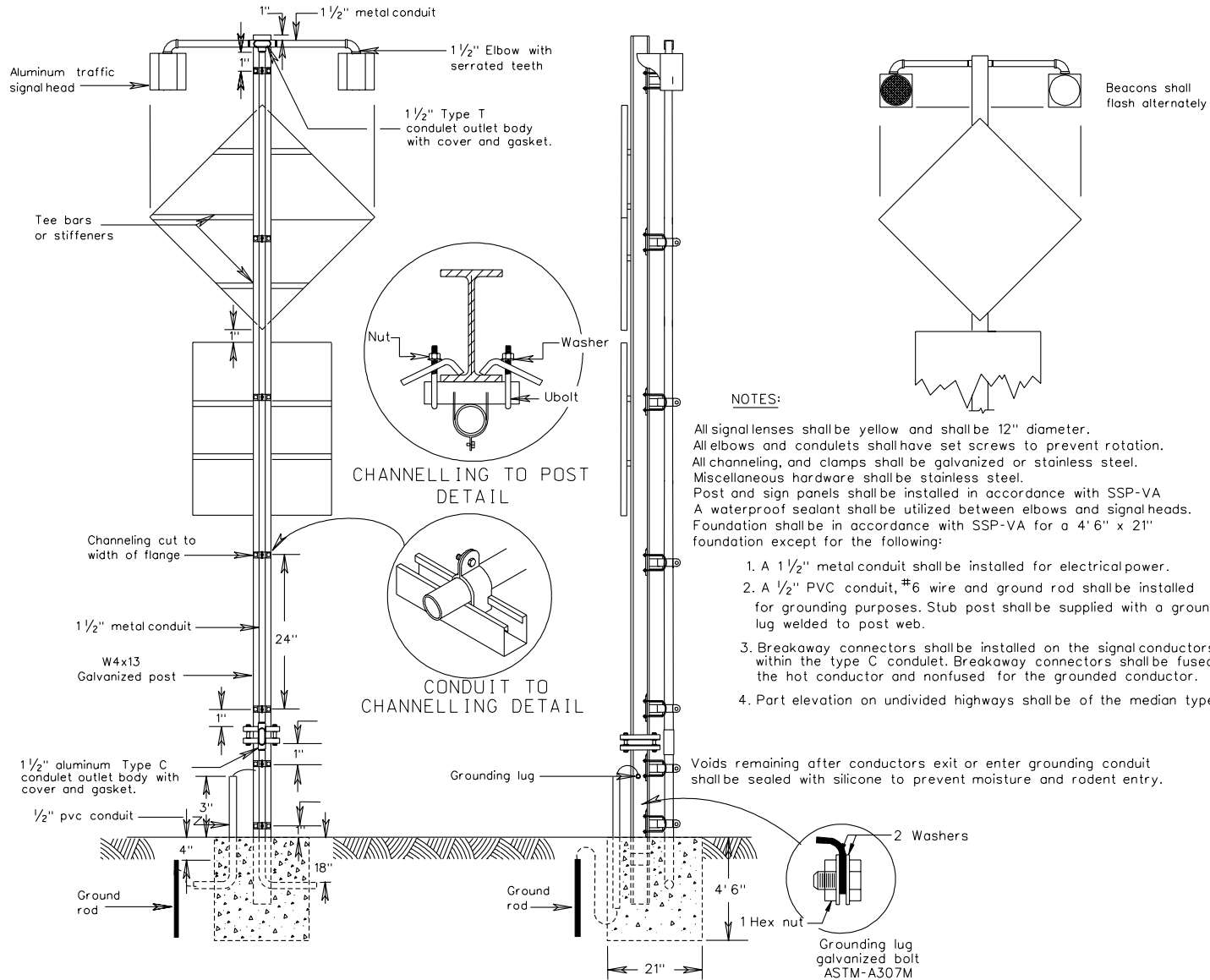
BEACON ALIGNMENT  
DETAIL

# FLASHING BEACON INSTALLATION DETAILS

REAR VIEW

SIDE VIEW

FRONT VIEW

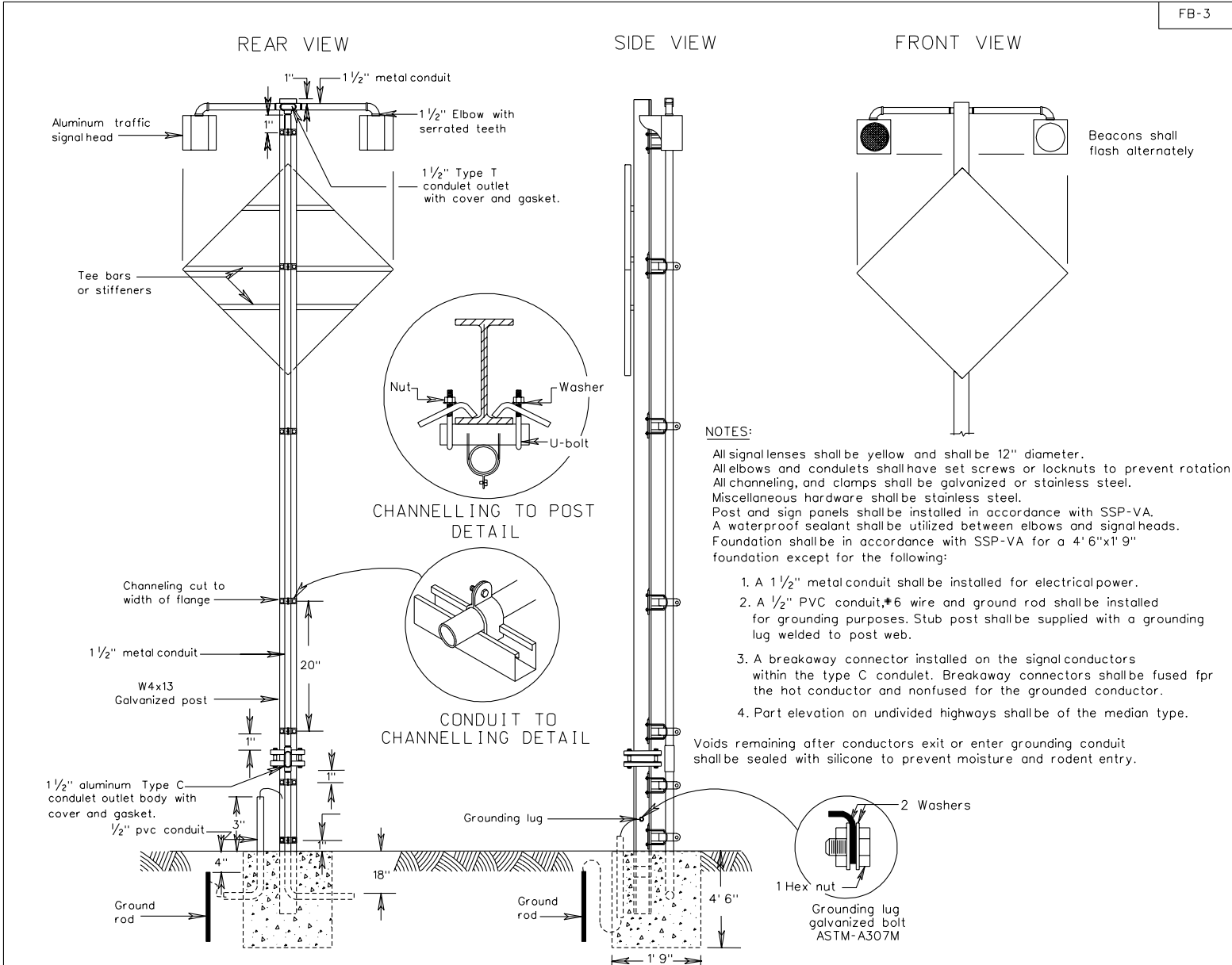


NOTES:

- All signal lenses shall be yellow and shall be 12" diameter.
- All elbows and condulets shall have set screws to prevent rotation.
- All channelling and clamps shall be galvanized or stainless steel.
- Miscellaneous hardware shall be stainless steel.
- Post and sign panels shall be installed in accordance with SSP-VA
- A waterproof sealant shall be utilized between elbows and signal heads.
- Foundation shall be in accordance with SSP-VA for a 4' 6" x 21" foundation except for the following:
  1. A 1 1/2" metal conduit shall be installed for electrical power.
  2. A 1/2" PVC conduit, #6 wire and ground rod shall be installed for grounding purposes. Stub post shall be supplied with a grounding lug welded to post web.
  3. Breakaway connectors shall be installed on the signal conductors within the type C conduit. Breakaway connectors shall be fused for the hot conductor and nonfused for the grounded conductor.
  4. Part elevation on undivided highways shall be of the median type.

Voids remaining after conductors exit or enter grounding conduit shall be sealed with silicone to prevent moisture and rodent entry.

FLASHING BEACON INSTALLATION  
DETAILS



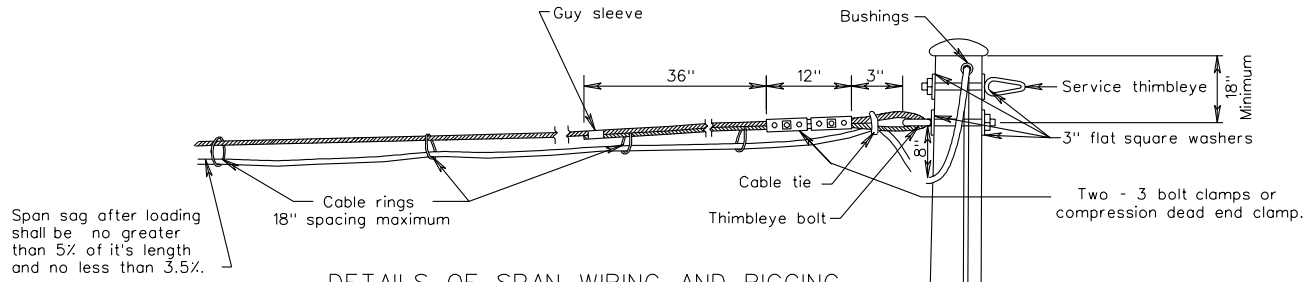
NOTES:

All signal lenses shall be yellow and shall be 12" diameter.  
 All elbows and conduits shall have set screws or locknuts to prevent rotation.  
 All channelling, and clamps shall be galvanized or stainless steel.  
 Miscellaneous hardware shall be stainless steel.  
 Post and sign panels shall be installed in accordance with SSP-VA.  
 A waterproof sealant shall be utilized between elbows and signal heads.  
 Foundation shall be in accordance with SSP-VA for a 4' 6"x1' 9"  
 foundation except for the following:

1. A 1 1/2" metal conduit shall be installed for electrical power.
2. A 1/2" PVC conduit, #6 wire and ground rod shall be installed for grounding purposes. Stub post shall be supplied with a grounding lug welded to post web.
3. A breakaway connector installed on the signal conductors within the type C conduit. Breakaway connectors shall be fused for the hot conductor and nonfused for the grounded conductor.
4. Part elevation on undivided highways shall be of the median type.

VOIDS remaining after conductors exit or enter grounding conduit shall be sealed with silicone to prevent moisture and rodent entry.

FLASHING BEACON INSTALLATION DETAILS



DETAILS OF SPAN WIRING AND RIGGING

Notes:

Concrete pad required when cabinet mounted on pole in earth areas.

See Standard CTE-1 for pad detail.

For methods approved for cable runs, see Standard WD-2.

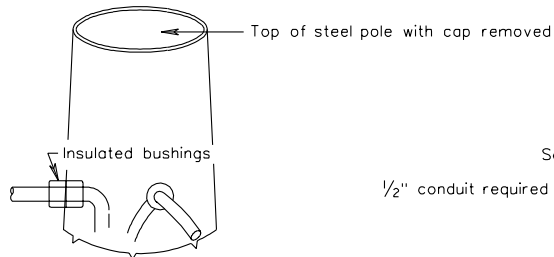
Pole height designed to accommodate attaching span across the greatest distance at a point 18" from the top of the pole. Spans crossing a lesser distance and attached to the same pole shall be attached lower than 18" as will result in the lowest signalhead section maintaining the minimum clearance, using no extensions as shown by Standard SW-1 and SW-2.

A strain insulator(s) may be used to extend the length of existing span wire if a span pull is to be modified.

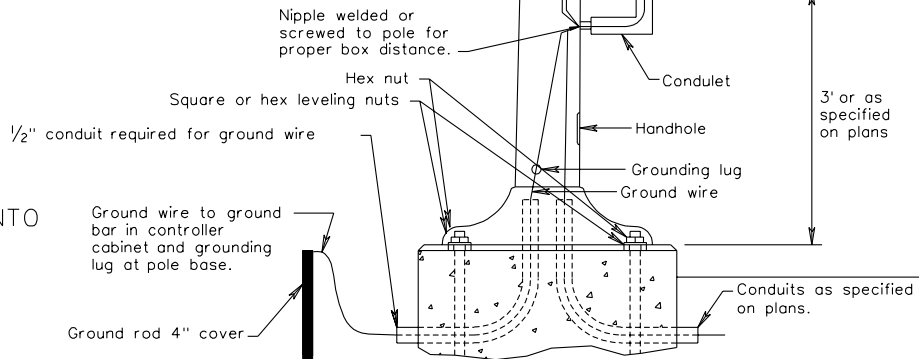
DETAILS OF POLE RIGGING

Signal cable shall be run inside unless otherwise specified

Controller cabinet as specified by plans



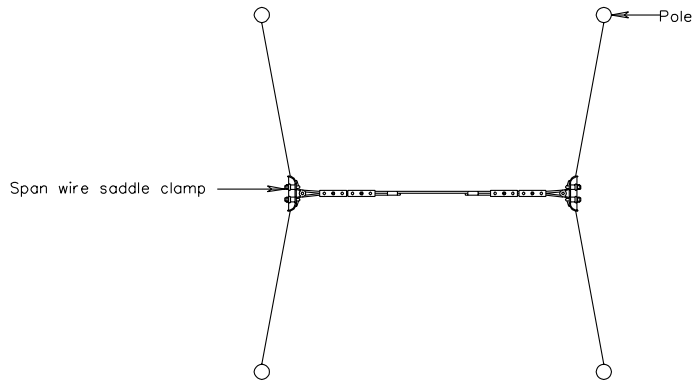
METHODS OF BRINGING CONDUCTORS INTO TOP OF STEEL POLES



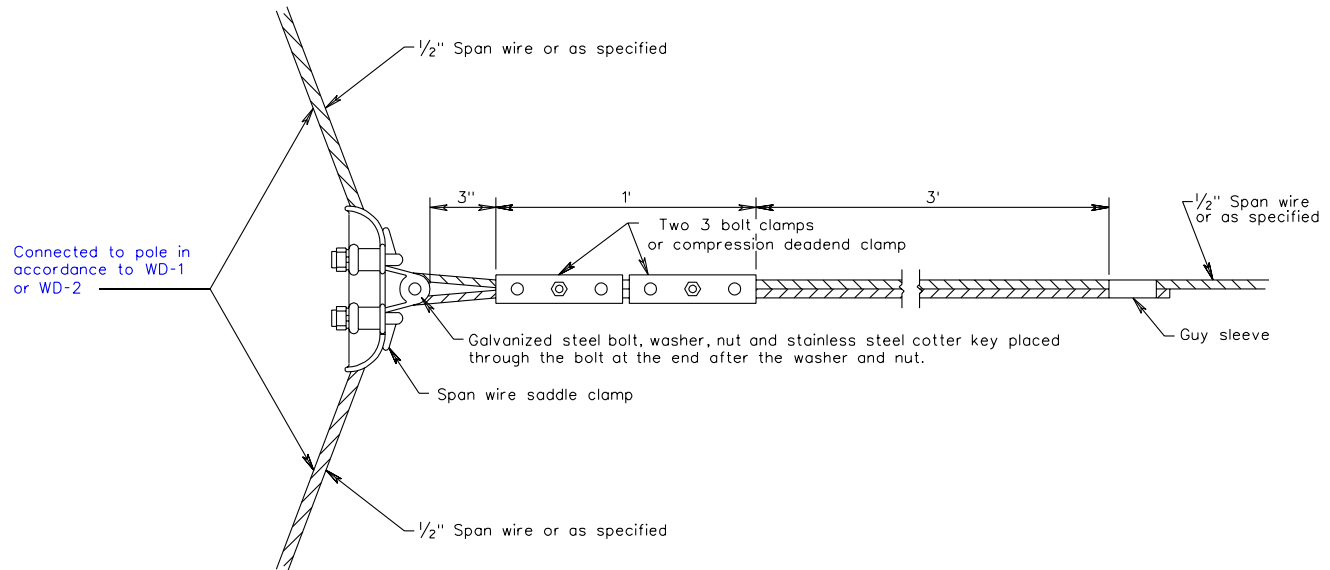
DETAILS OF STEEL POLE BASE WITH CONTROLLER CABINET AND METHODS OF BRINGING IN CONDUCTORS

STEEL POLE WIRING AND RIGGING DETAILS



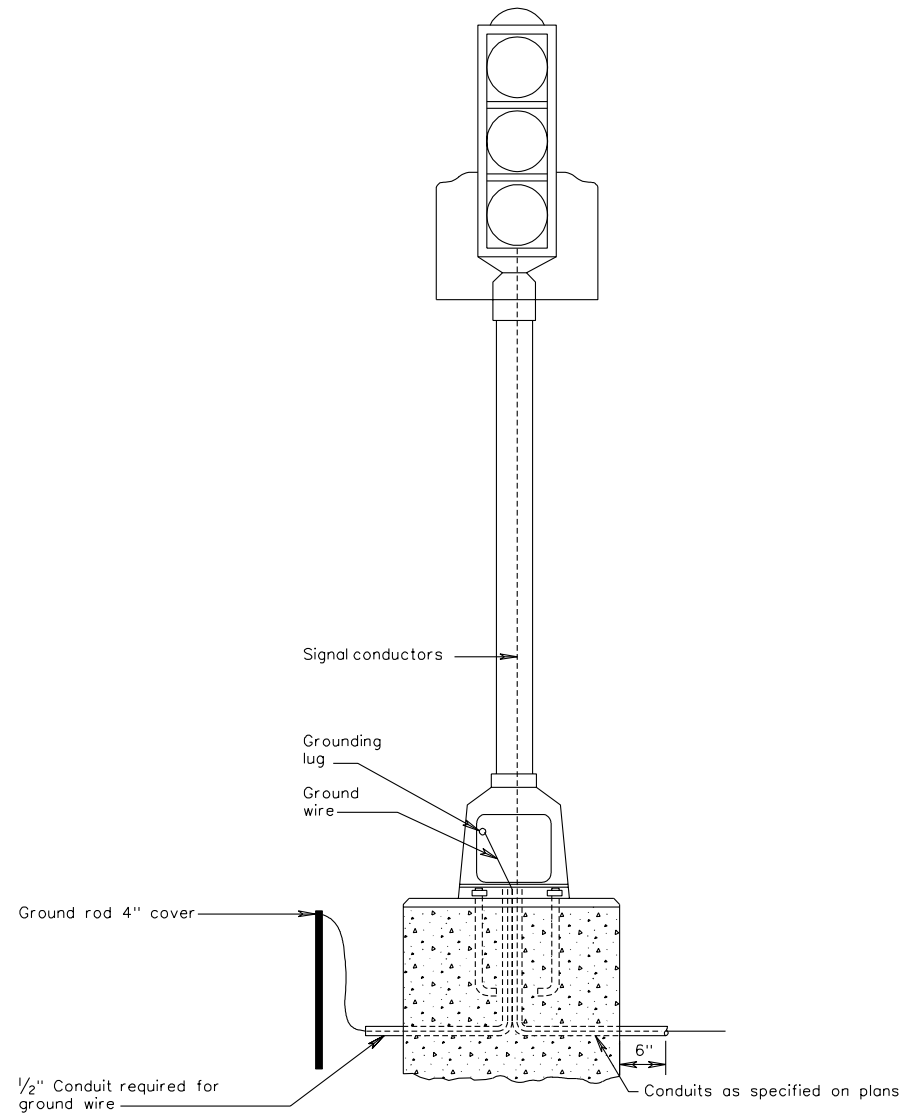


TYPICAL BRIDLE SPAN INSTALLATION



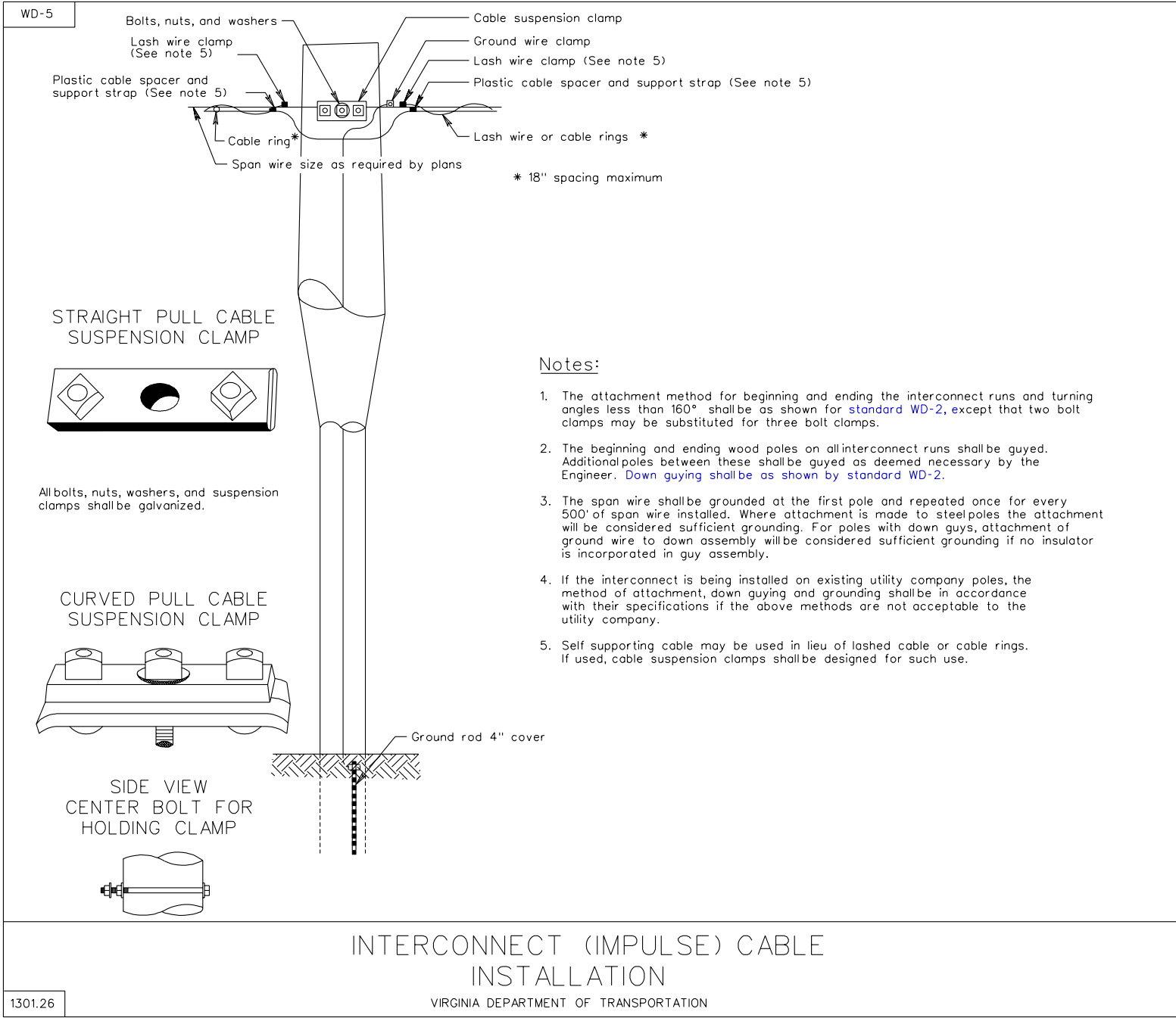
### BRIDLE SPAN WIRING AND RIGGING DETAILS

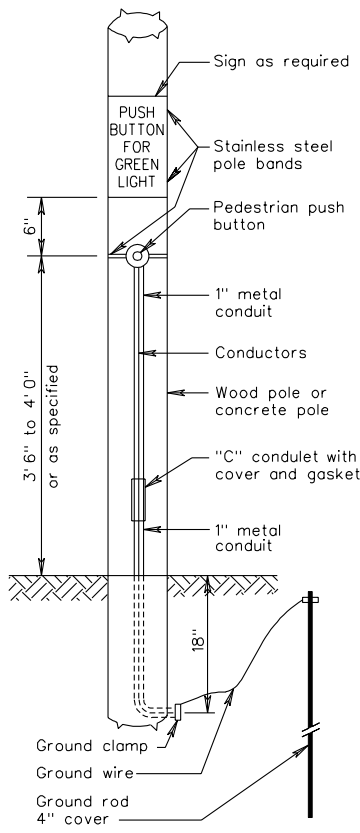




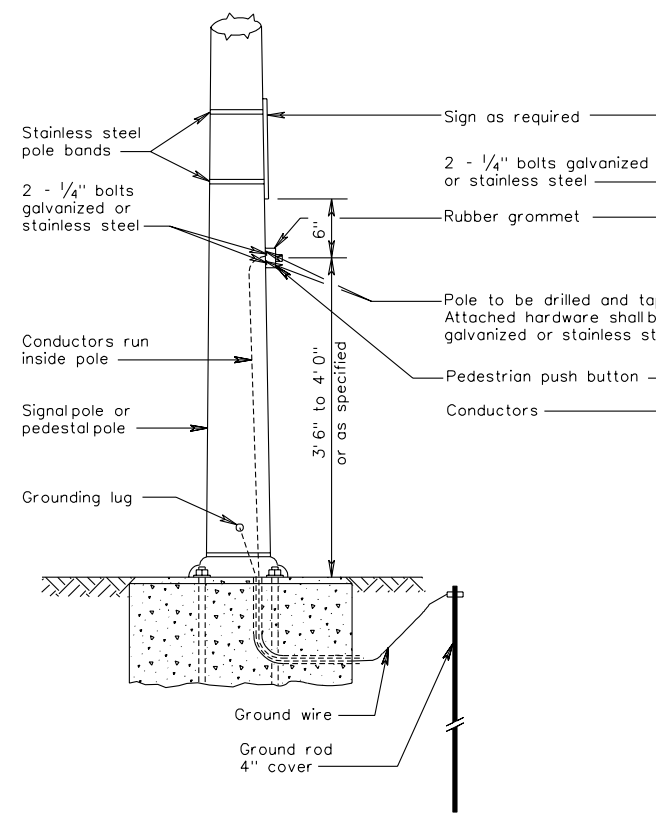
# PEDESTRIAN POLE WIRING DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

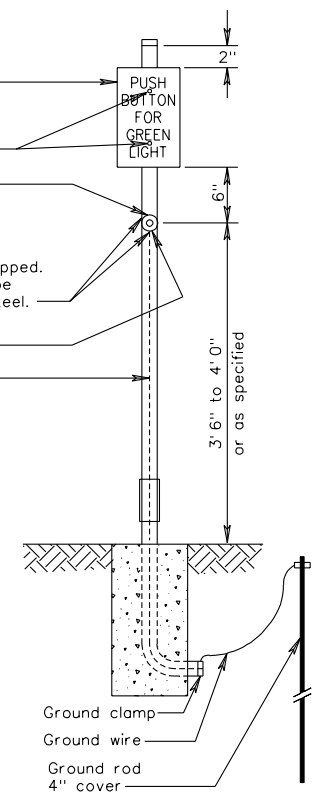




PA-1

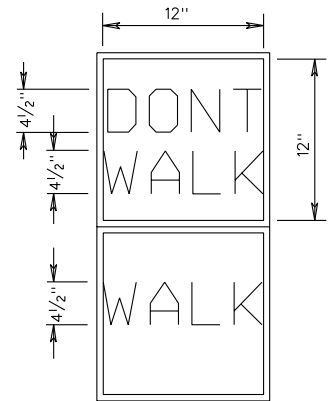


PA-2



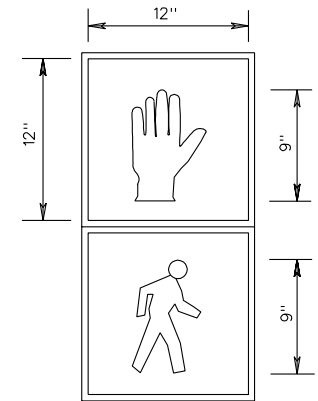
PA-3

# PEDESTRIAN ACTUATION DETAILS

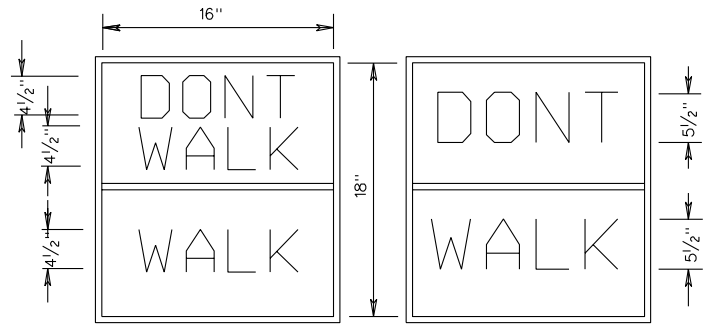


SP-1  
(2-MBS)

COLOR  
The standard colors for pedestrian traffic control signals shall be Portland Orange for the "DONT WALK" and White for the "WALK" indications. The background shall be an opaque material.



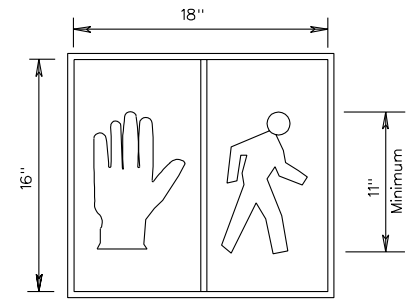
SP-3  
(2-MBS)



TYPE A  
(1-MBS)

TYPE B  
(1-MBS)

SP-2

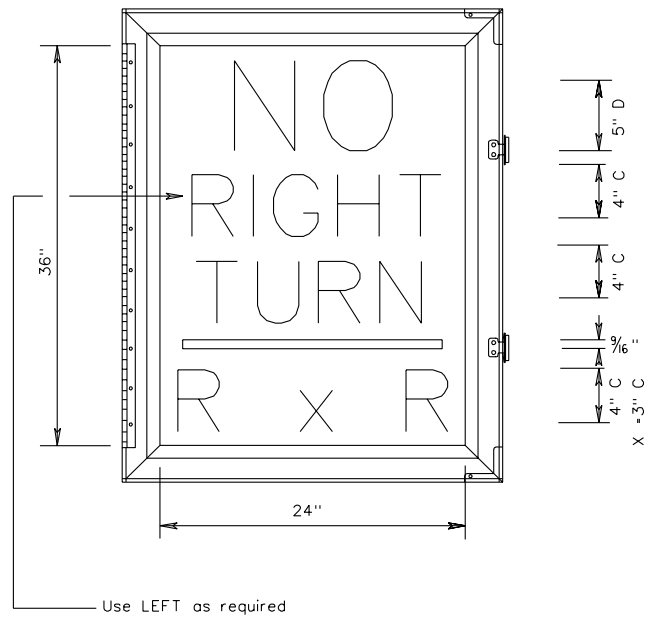


SP-4  
(1-MBS)

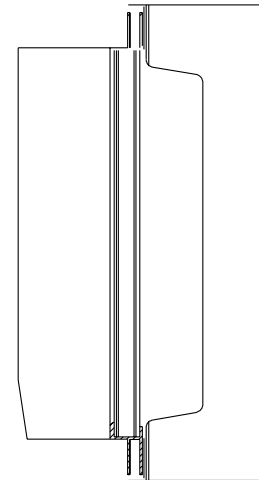
MBS - Message bearing surface

PEDESTRIAN SIGNAL INDICATION DETAILS

FRONT VIEW



SIDE VIEW



ILLUMINATED TRAFFIC CONTROL SIGN

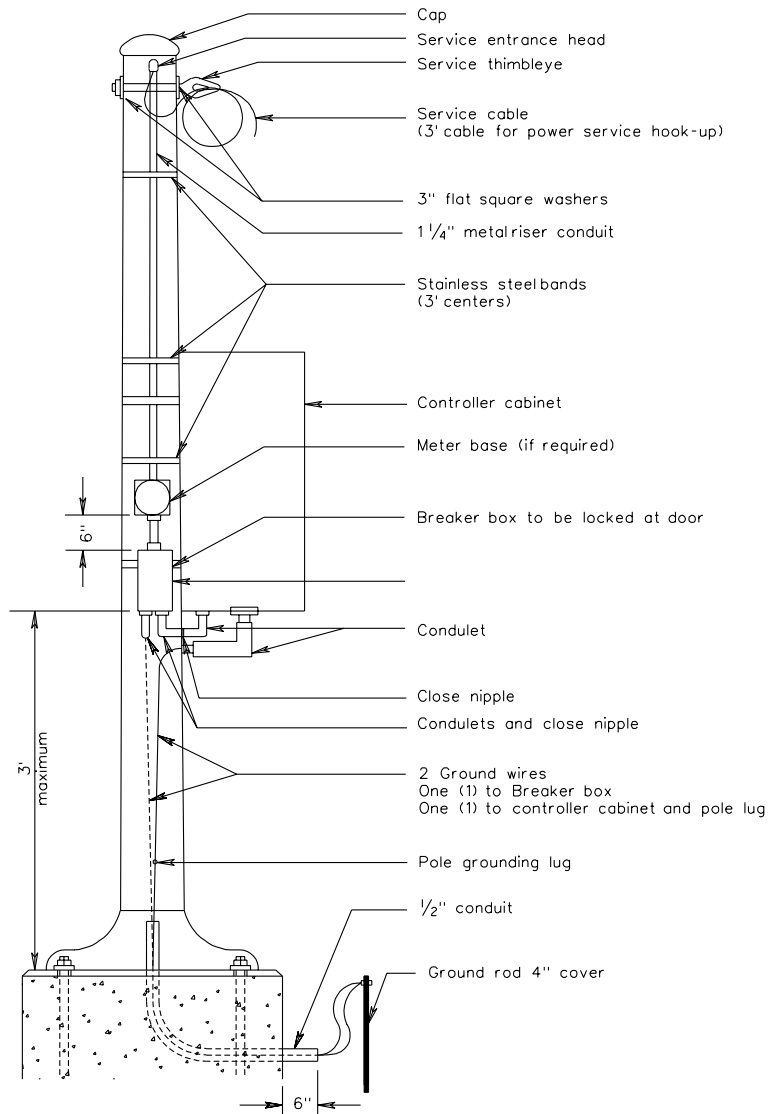
VIRGINIA DEPARTMENT OF TRANSPORTATION

Notes:

No other conductors shall be run in the same conduit with electrical service cable.

Concrete pad required when cabinet mounted on pole in earth areas. (See Standard CTE-1 for pad detail).

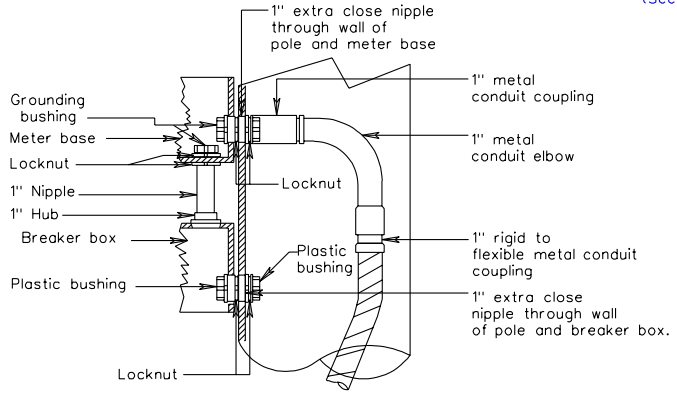
For alternate method of ground wire entering breaker box see Standard SE-5.



TYPE A

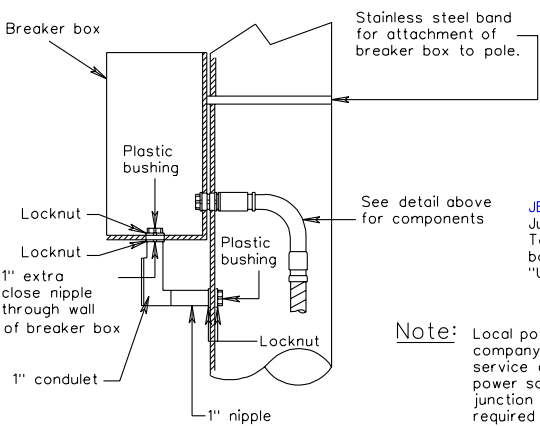
ELECTRICAL SERVICE DETAILS  
SIGNAL INSTALLATIONS

DETAIL



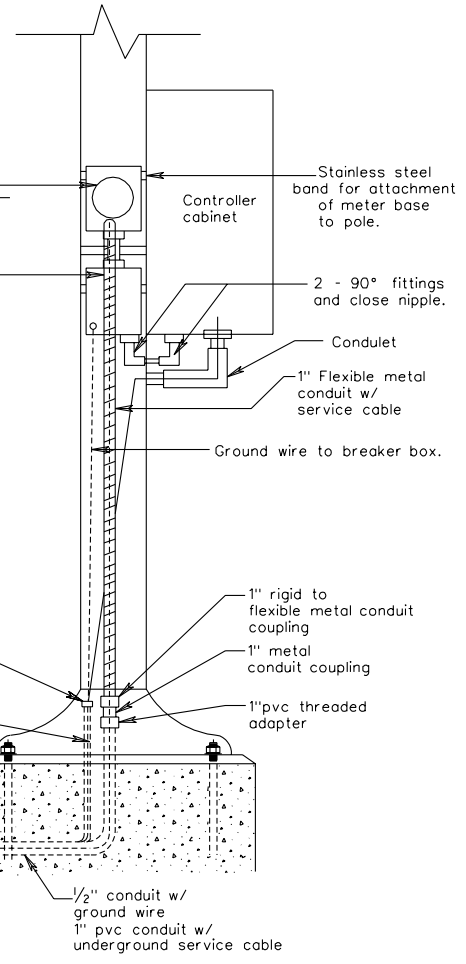
Concrete pad required when mounted on pole in earth areas.  
(See standard CTE-1 for pad detail)

ALTERNATE DETAIL  
(Used when meter base not required)



**Note:** Local power utility company will install service cable from their power source to the junction box and make required splices to the service cable coiled in the junction box.

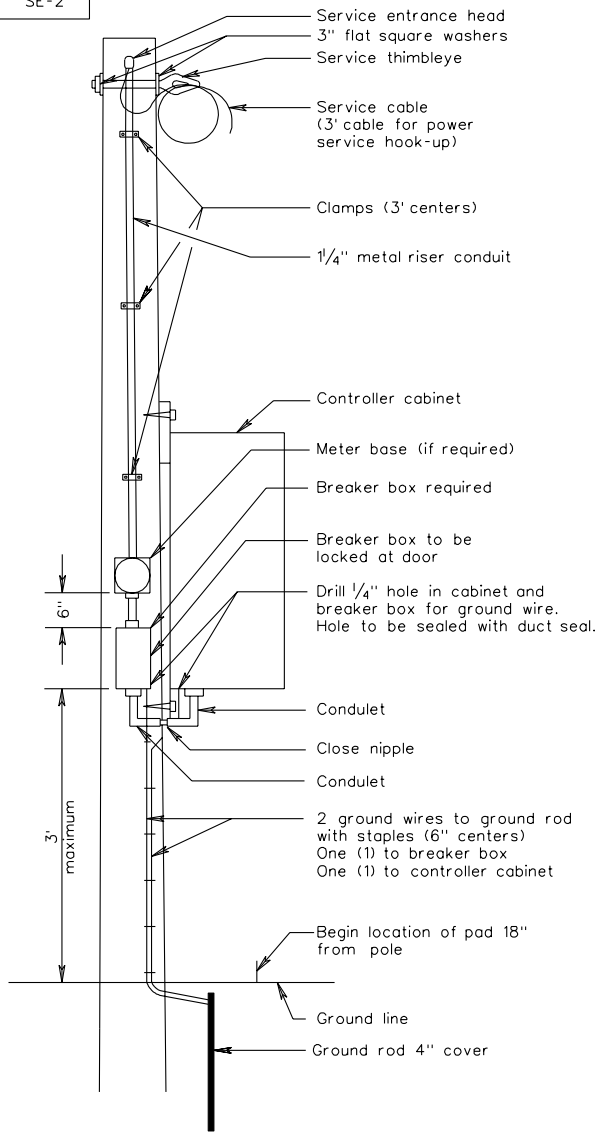
JB-1A, 1B, or 1C  
Junction box  
Top of junction box shall read "UTILITY"



TYPE B

ELECTRICAL SERVICE DETAILS  
SIGNAL INSTALLATION

SE-2



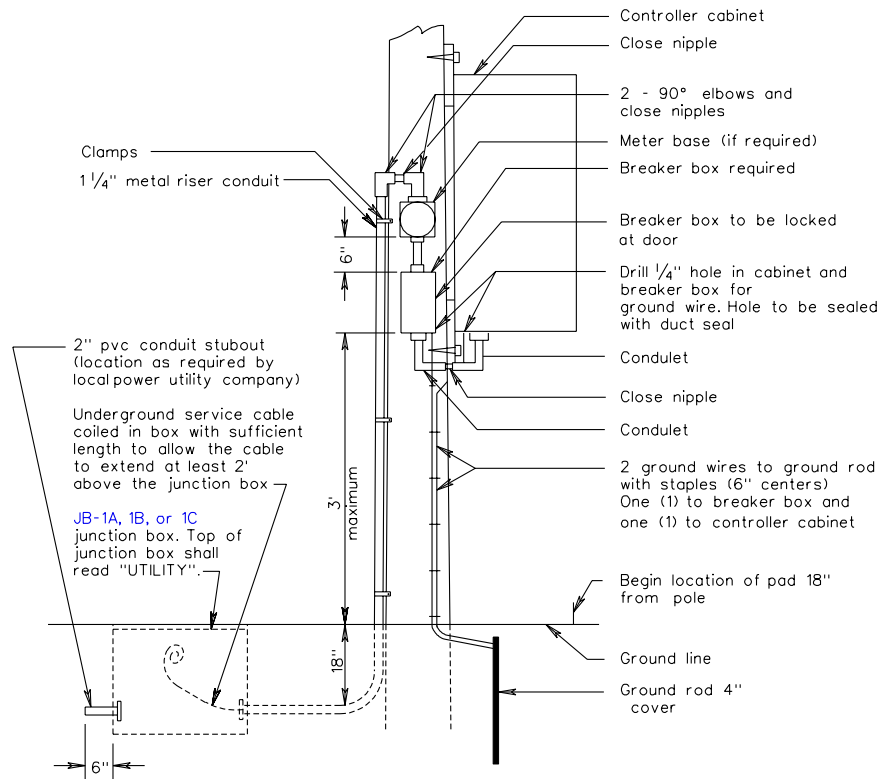
TYPE A

Notes:

No other conductors shall be run in the same conduit with electrical service cable.

Concrete pad required when cabinet mounted on pole in earth areas. (See standard CTE-1 for pad detail).

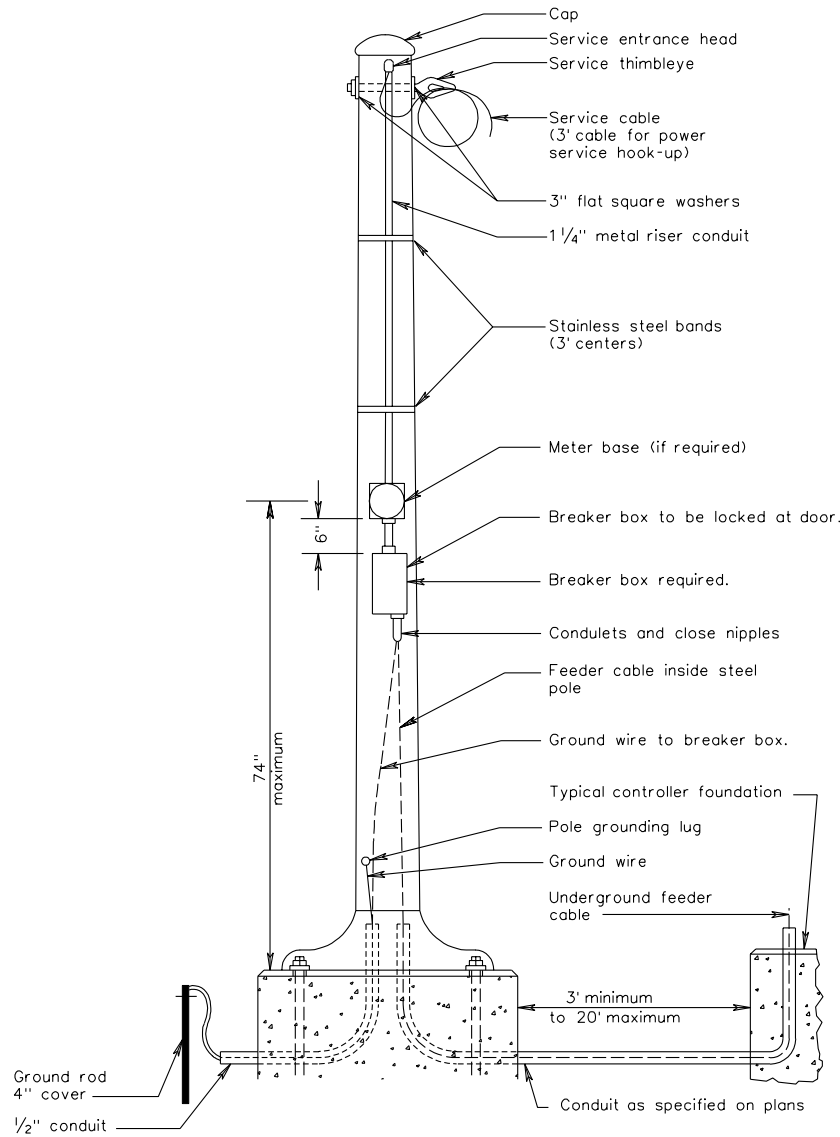
For underground service installations, local power utility company will install service power utility cable from their power source to the junction box and make required splices to the service cable coiled in the junction box.



TYPE B

ELECTRICAL SERVICE DETAILS  
 SIGNAL INSTALLATION





Notes:

No other conductors shall be run in the same conduit with electrical service cable.

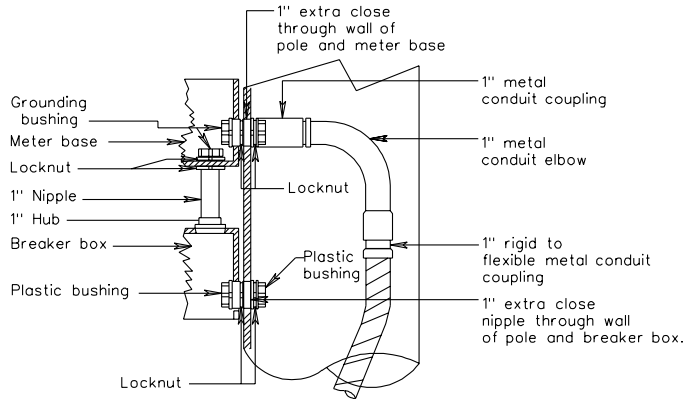
For alternate method of service cable and ground wire entering breaker box, see standard SE-5.

TYPE A

ELECTRICAL SERVICE DETAILS  
SIGNAL INSTALLATION

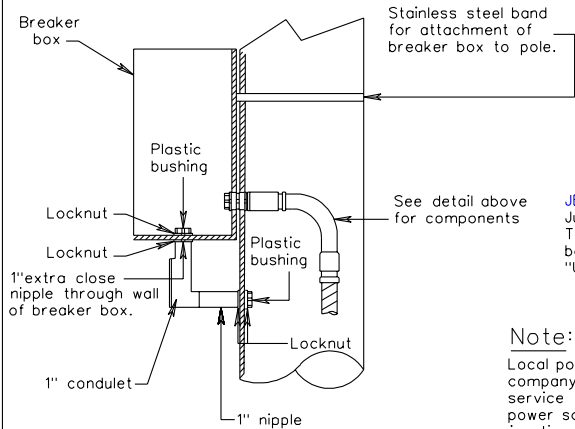
VIRGINIA DEPARTMENT OF TRANSPORTATION

DETAIL



ALTERNATE  
DETAIL

(Used when meter base not required)

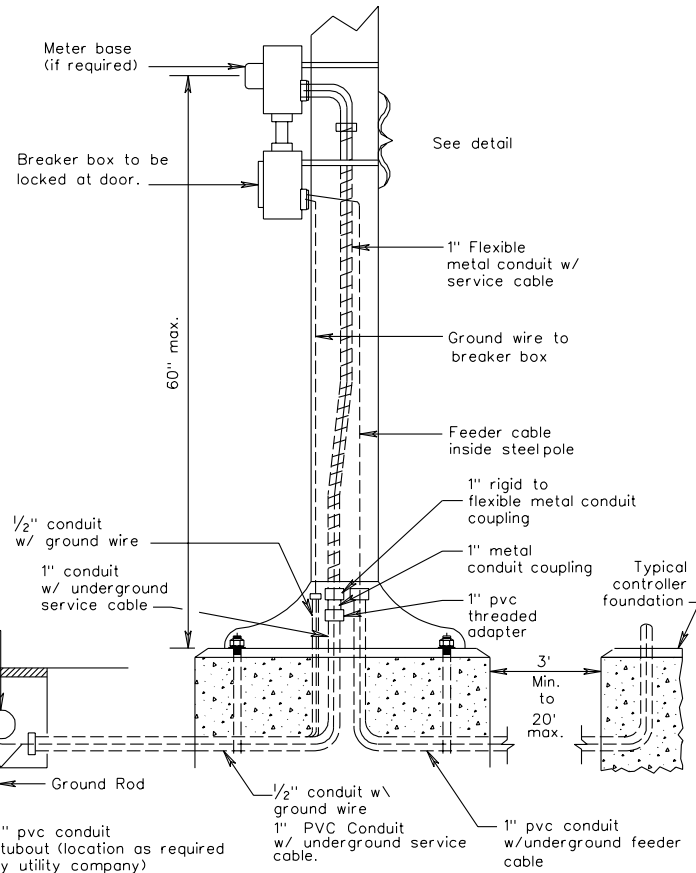


Underground service cable coiled in box with sufficient length to allow the cables to extend at least 2' above the junction box.

JB-1A, 1B, or 1C  
Junction box  
Top of junction box shall read "UTILITY"

Note:

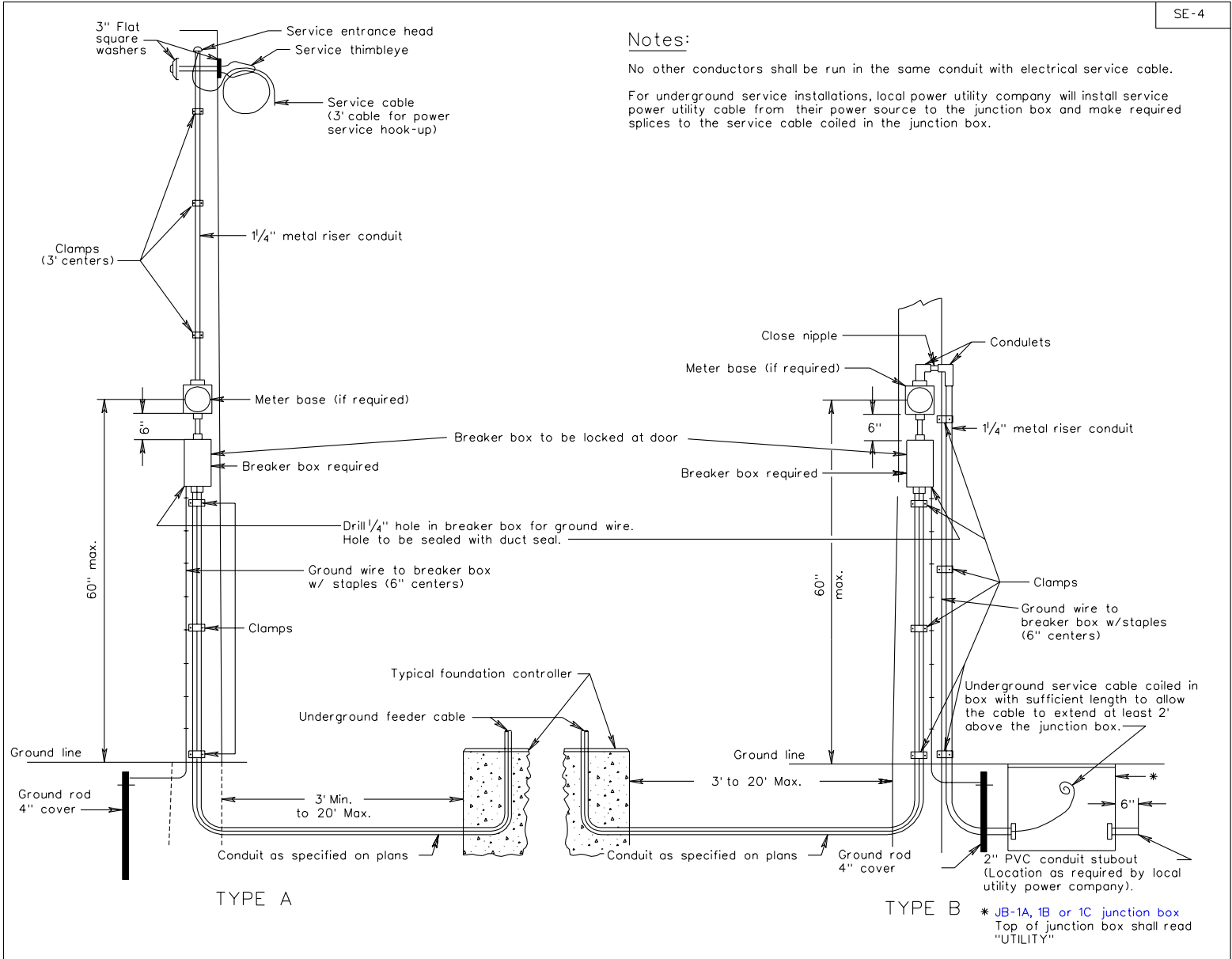
Local power utility company will install service cable from their power source to the junction box and make required splices to the service cable coiled in the junction box.



TYPE B

ELECTRICAL SERVICE DETAILS  
SIGNAL INSTALLATION

VIRGINIA DEPARTMENT OF TRANSPORTATION



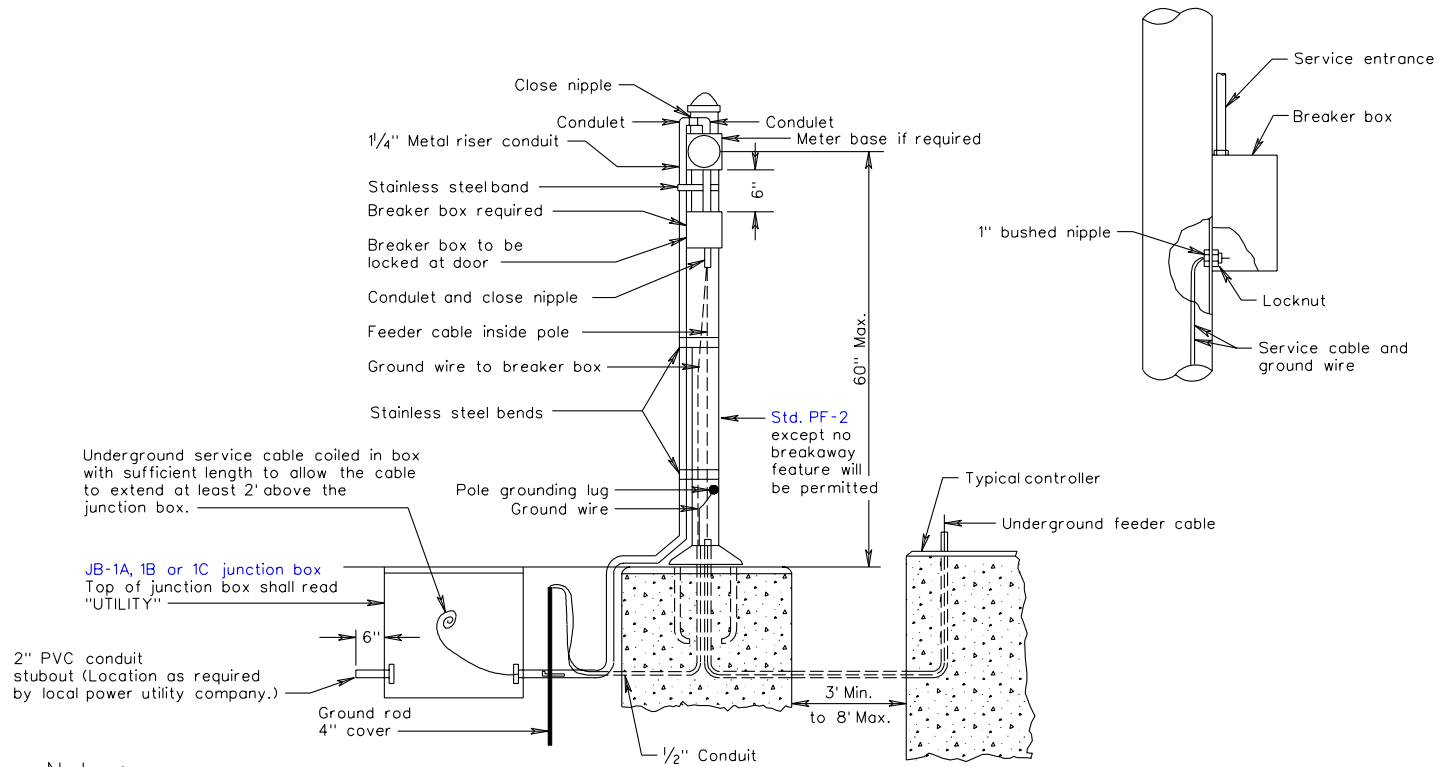
**Notes:**

No other conductors shall be run in the same conduit with electrical service cable.

For underground service installations, local power utility company will install service power utility cable from their power source to the junction box and make required splices to the service cable coiled in the junction box.

ELECTRICAL SERVICE DETAILS  
 SIGNAL INSTALLATION  
 VIRGINIA DEPARTMENT OF TRANSPORTATION

ALTERNATE METHOD OF SERVICE CABLE AND GROUND WIRE ENTERING BREAKER BOX



Notes:

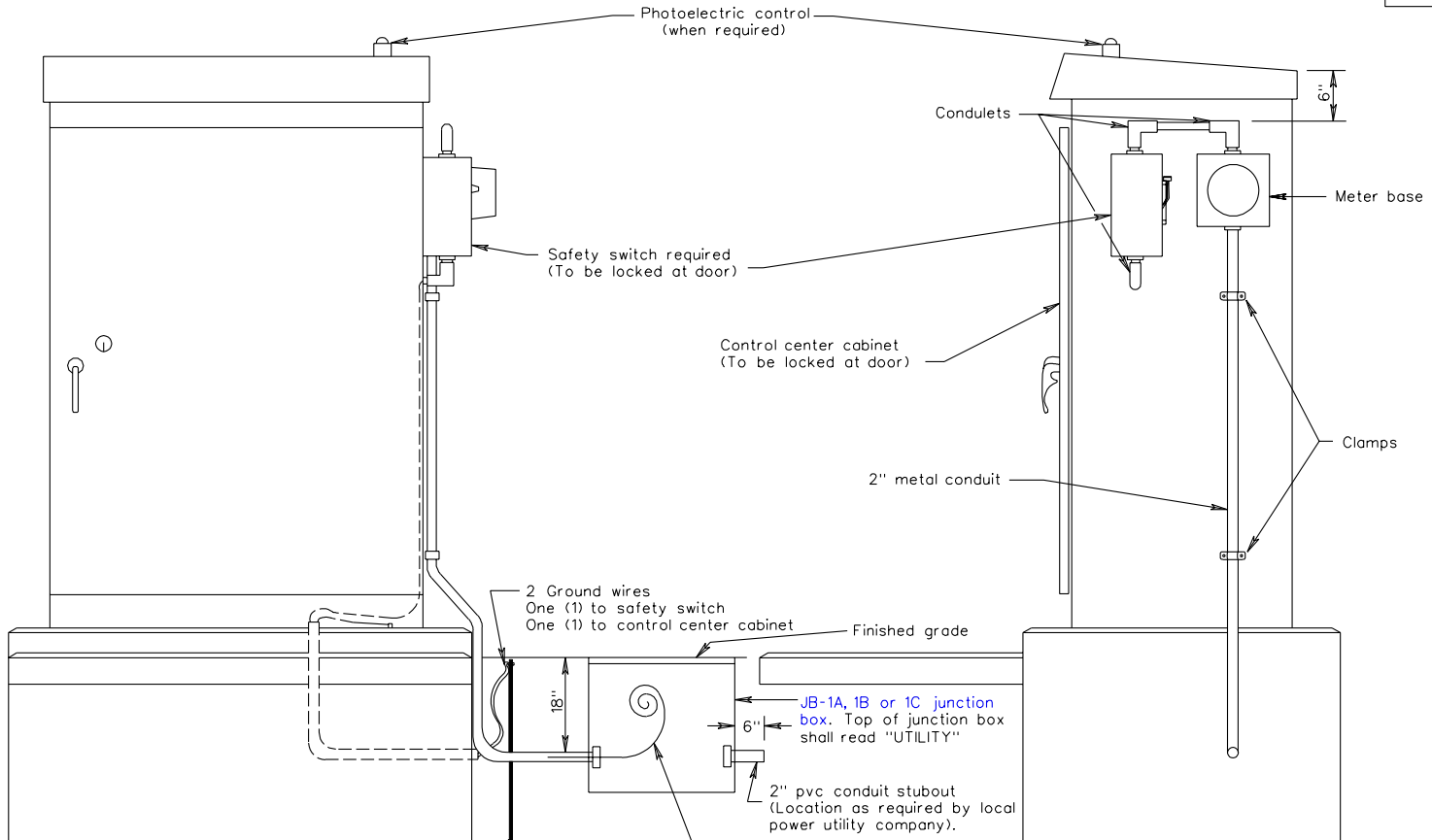
No other conductors shall be run in the same conduit with electrical service cable.

Local power utility company will install service power utility cable from their power source to the junction box and make required splices to the service cable coiled in the junction box.

PEDESTAL POLE WITH GROUND MOUNTED CABINET

ELECTRICAL SERVICE DETAILS  
SIGNAL INSTALLATION

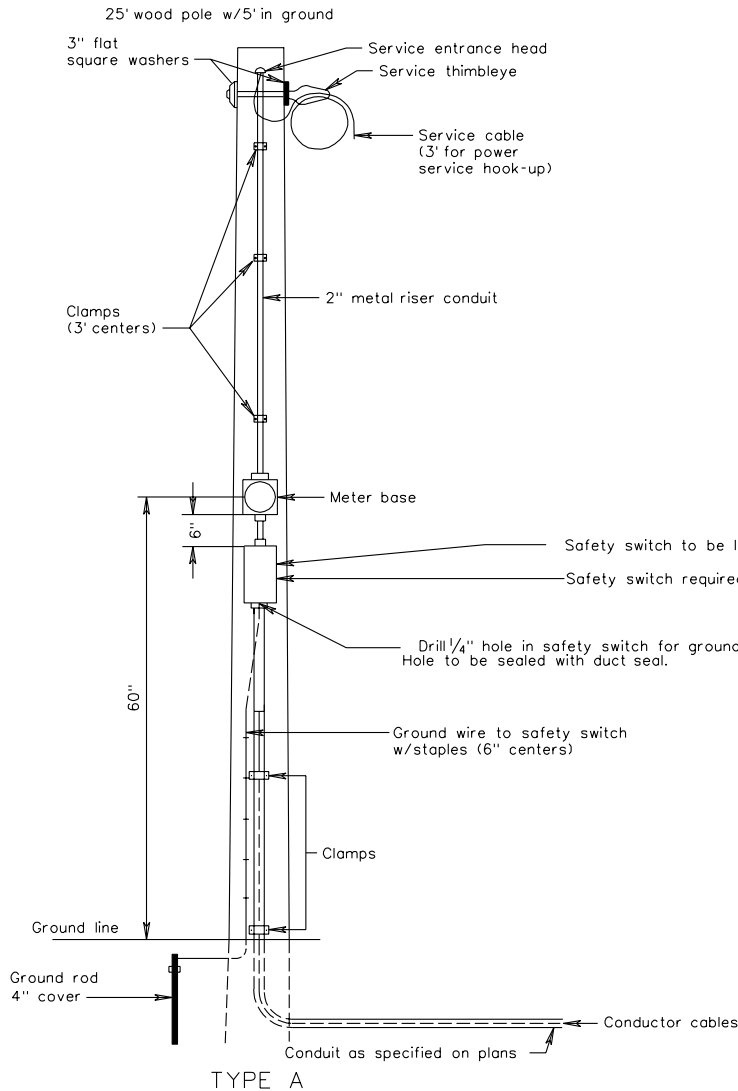
VIRGINIA DEPARTMENT OF TRANSPORTATION



**Notes:**

- The control center cabinet at the inside and outside foundation joints shall be sealed with a silicone sealant
- For alternate method of service cable entering safety switch see Standard SE-5.
- When 200 amp or greater service is required, service shall enter meter base at right bottom.
- No other conductors shall be run in the same conduit with electrical service cable.
- Local power utility company will install service power utility cable from their power source to the junction box and make required splices to the service cable coiled in the junction box.
- This standard is applicable for all electrical services other than 480Y/277. For 480Y/277 service, see Standard SE-9.

ELECTRICAL SERVICE DETAILS  
SIGN AND LIGHTING INSTALLATIONS  
VIRGINIA DEPARTMENT OF TRANSPORTATION



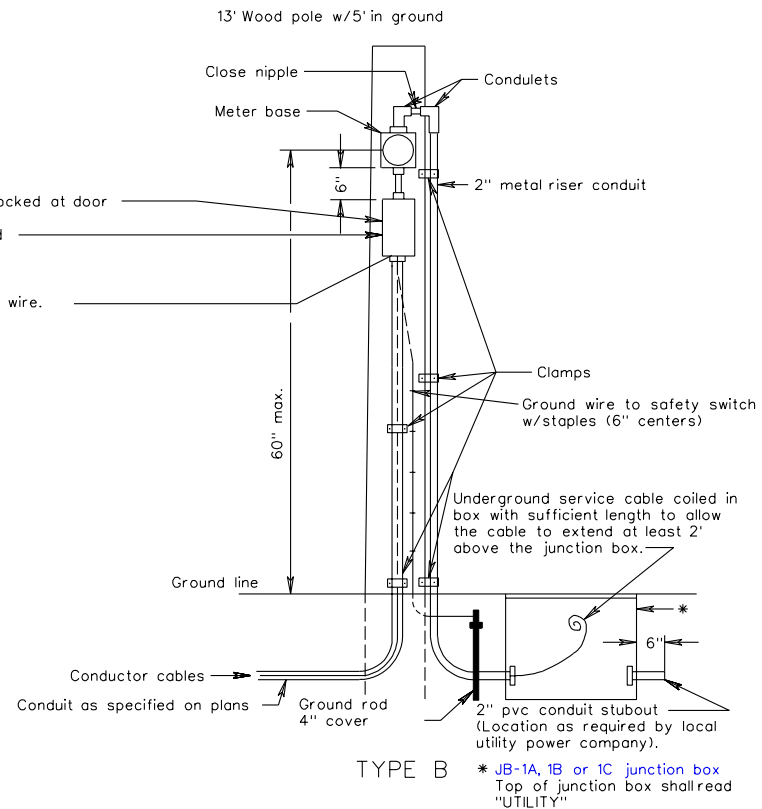
**Notes:**

This standard is applicable for all electrical services other than 480Y/277.

No other conductors shall be run in the same conduit with electrical service cable.

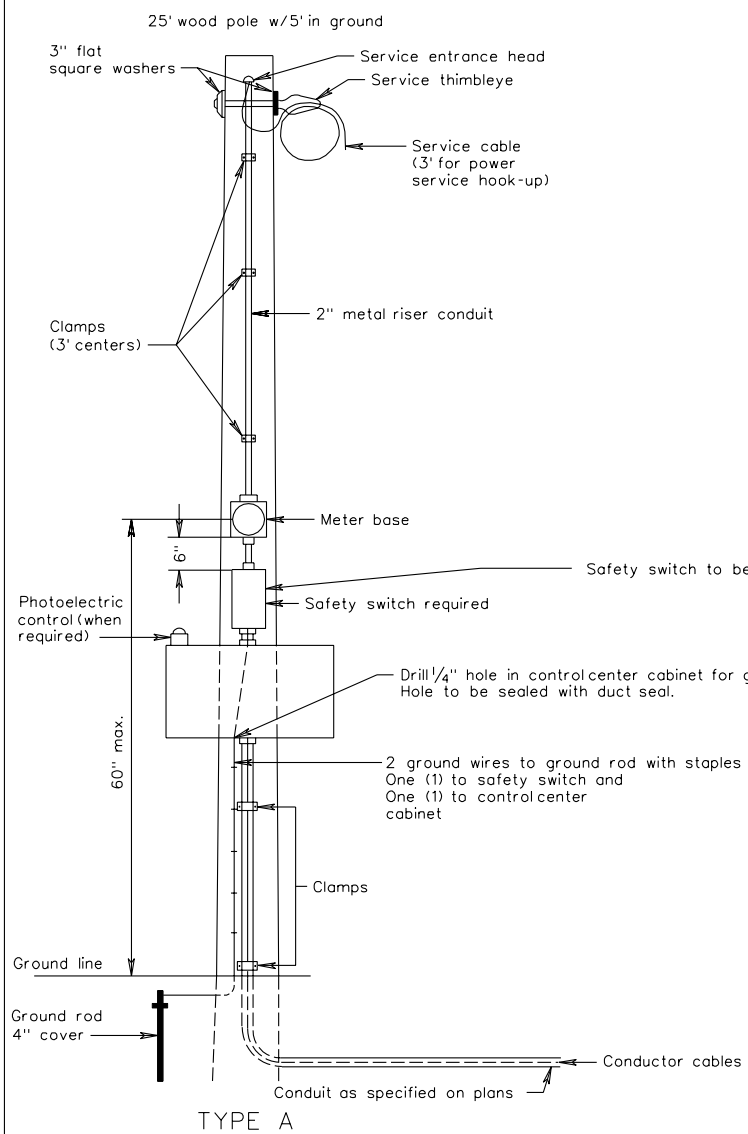
When 200 amp or greater service is required, service shall enter meter base at right bottom.

For underground service installations, local power utility company will install service power utility cable from their power source to the junction box and make required splices to the service cable coiled in the junction box.



ELECTRICAL SERVICE DETAILS  
SIGN AND LIGHTING INSTALLATION

VIRGINIA DEPARTMENT OF TRANSPORTATION



TYPE A

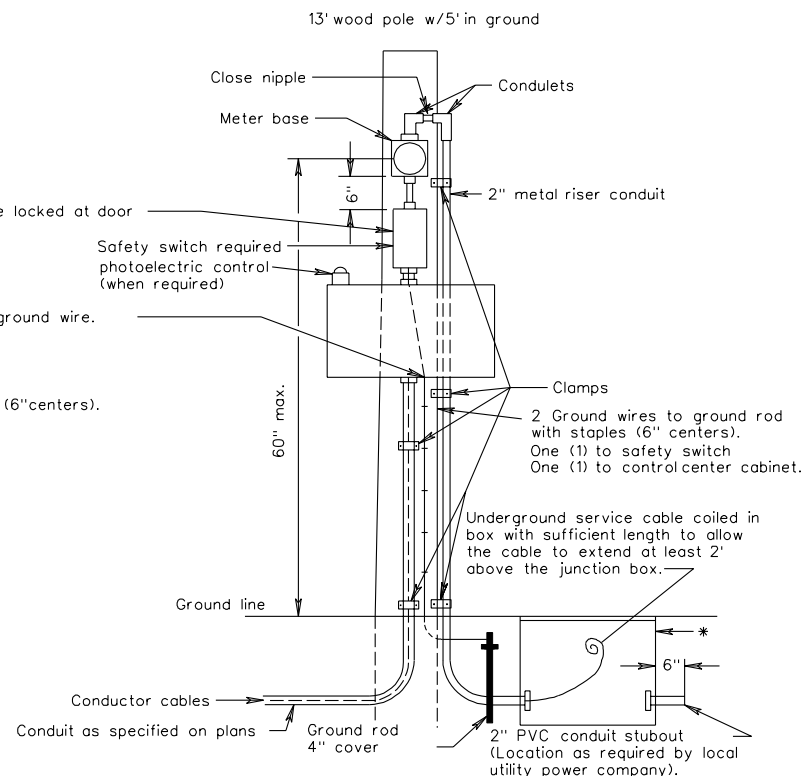
**Notes:**

This standard is applicable for all electrical services other than 480Y/277. For 480Y/277 service, see standard SE-9.

No other conductors shall be run in the same conduit with electrical service cable.

When 200 amp or greater service is required, service shall enter meter base at right bottom.

For underground service installations, local power utility company will install service power utility cable from their power source to the junction box and make required splices to the service cable coiled in the junction box.

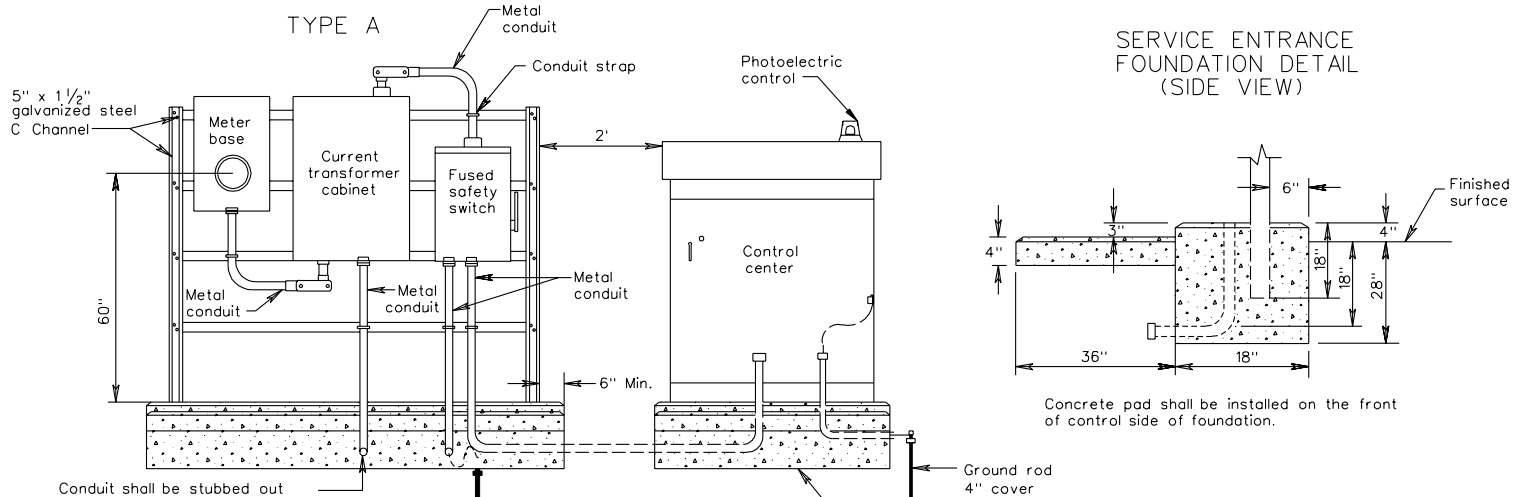


TYPE B

\* JB-1A, 1B or 1C junction box  
Top of junction box shall read "UTILITY"

ELECTRICAL SERVICE DETAILS  
SIGN AND LIGHTING INSTALLATION

VIRGINIA DEPARTMENT OF TRANSPORTATION

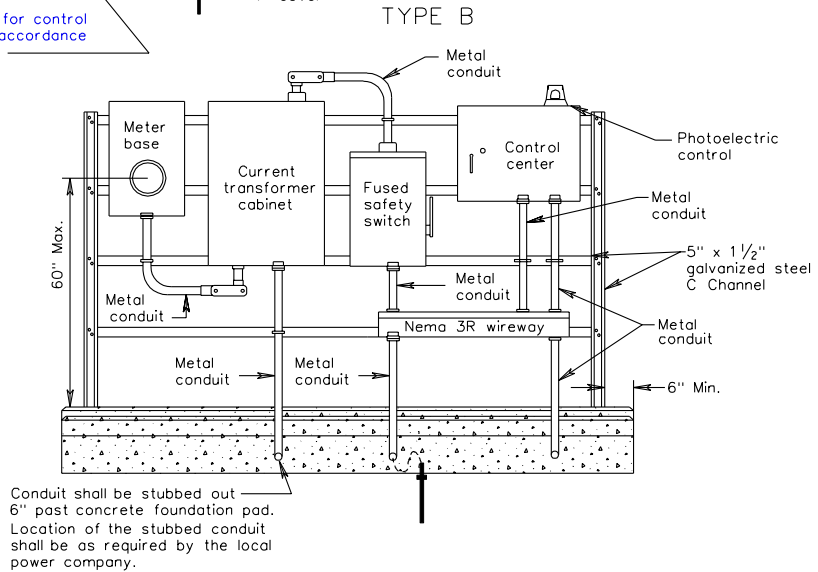


Conduit shall be stubbed out 6" past concrete foundation pad. Location of the stubbed conduit shall be as required by the local power company.

Foundation details for control center shall be in accordance with St'd CF-2.

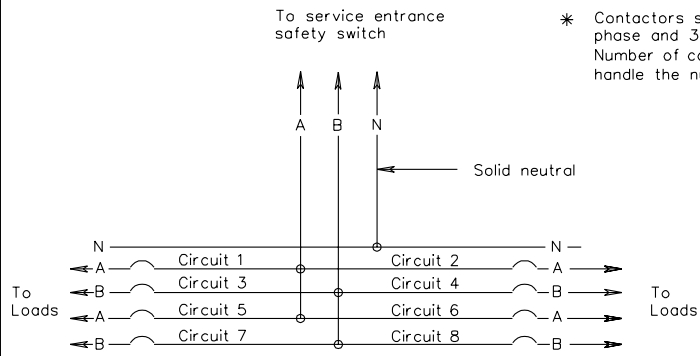
AMP RATING	CONDUIT SIZE	CONDUCTOR SIZE
30 AMP	1"	#8
60 AMP	1 1/4"	#6
100 AMP	1 1/2"	#3
200 AMP	2"	#000

- Notes:** All exposed concrete edges shall be chamfered 3/4".
- Grounding bushings shall be installed on each end of metal conduits.
  - Bell ends shall be installed on the ends of PVC conduits.
  - Local power company will install service cable from their power source to the current transformer cabinet and meter base.
  - Safety switch, meter base, wireway, current transformer cabinet and control center shall be attached to the channeling with 3/8" galvanized bolts, lock washers and nuts. Four cross channels shall be utilized.
  - Each foundation shall be permanently marked to indicate all sides from which conduits pass. This mark shall be made with a trowel when finishing the concrete and shall be 1/4" deep and 4" to 6" long.
  - This standard is applicable for 480Y/277 electrical service only.
  - The contractor shall leave a sufficient amount of conductor cable coiled inside the current transformer cabinet to permit the local power company to make their connection.

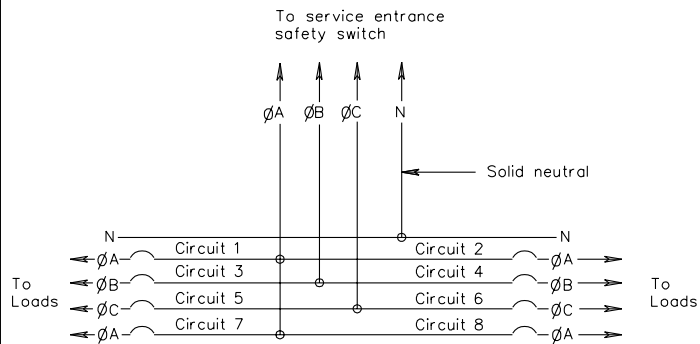


## ELECTRICAL SERVICE DETAILS SIGN AND LIGHTING INSTALLATIONS



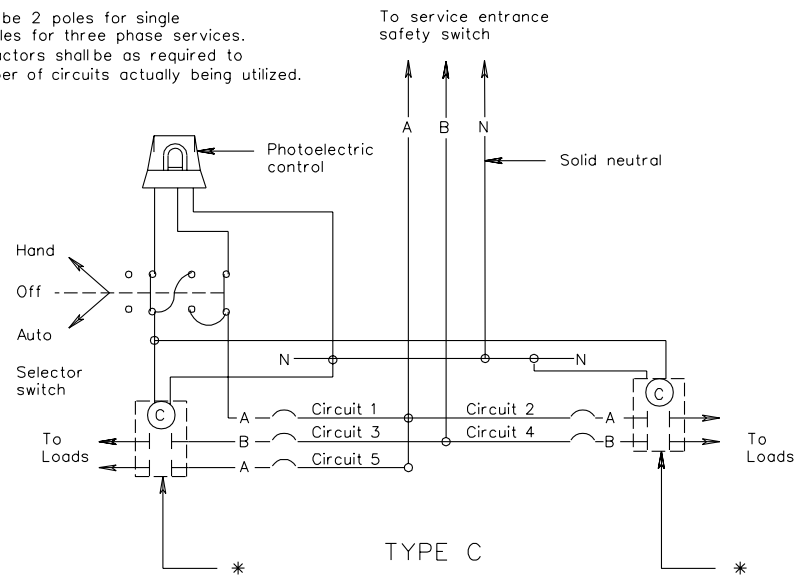


TYPE A

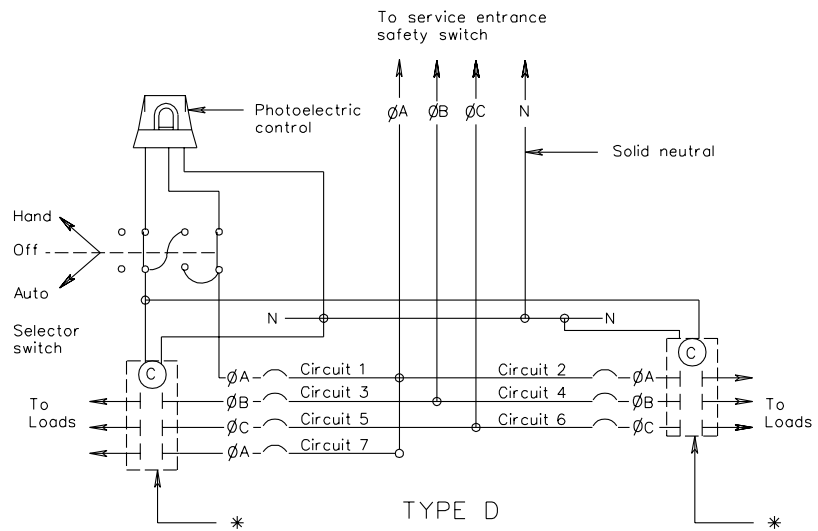


TYPE B

\* Contactors shall be 2 poles for single phase and 3 poles for three phase services. Number of contactors shall be as required to handle the number of circuits actually being utilized.



TYPE C



TYPE D

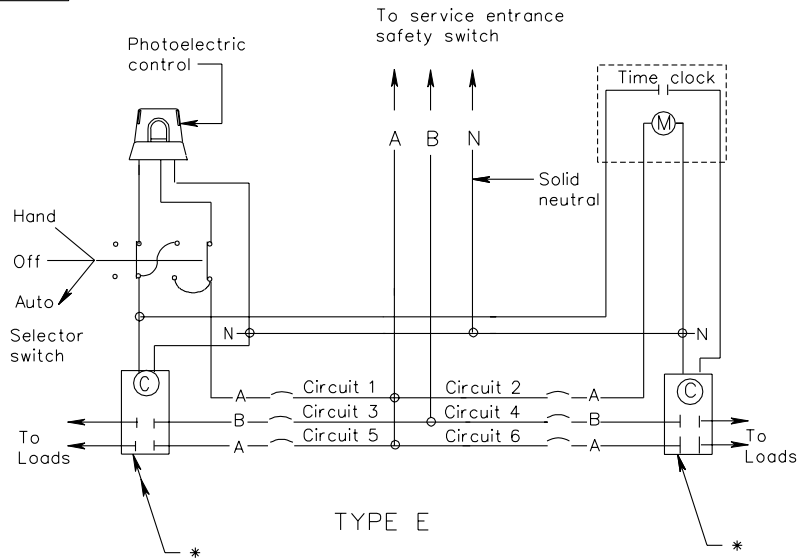
Notes:

All circuit breakers shall be single pole.

Voltage and amperage ratings of contactors and breakers shall be as indicated on the plans.

Number of circuits shown are typical. Exact number required shall be as indicated on the plans.

CONTROL CENTER WIRING DETAILS

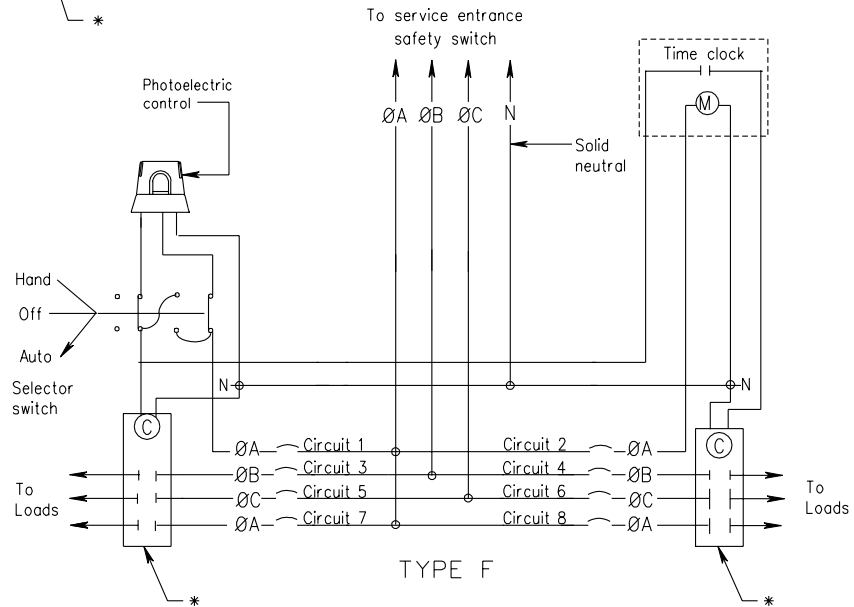


\* Contactors shall be 2 poles for single phase and 3 poles for three phase services. Number of contactors shall be as required to handle the number of circuits actually being utilized.

TYPE E

Notes:

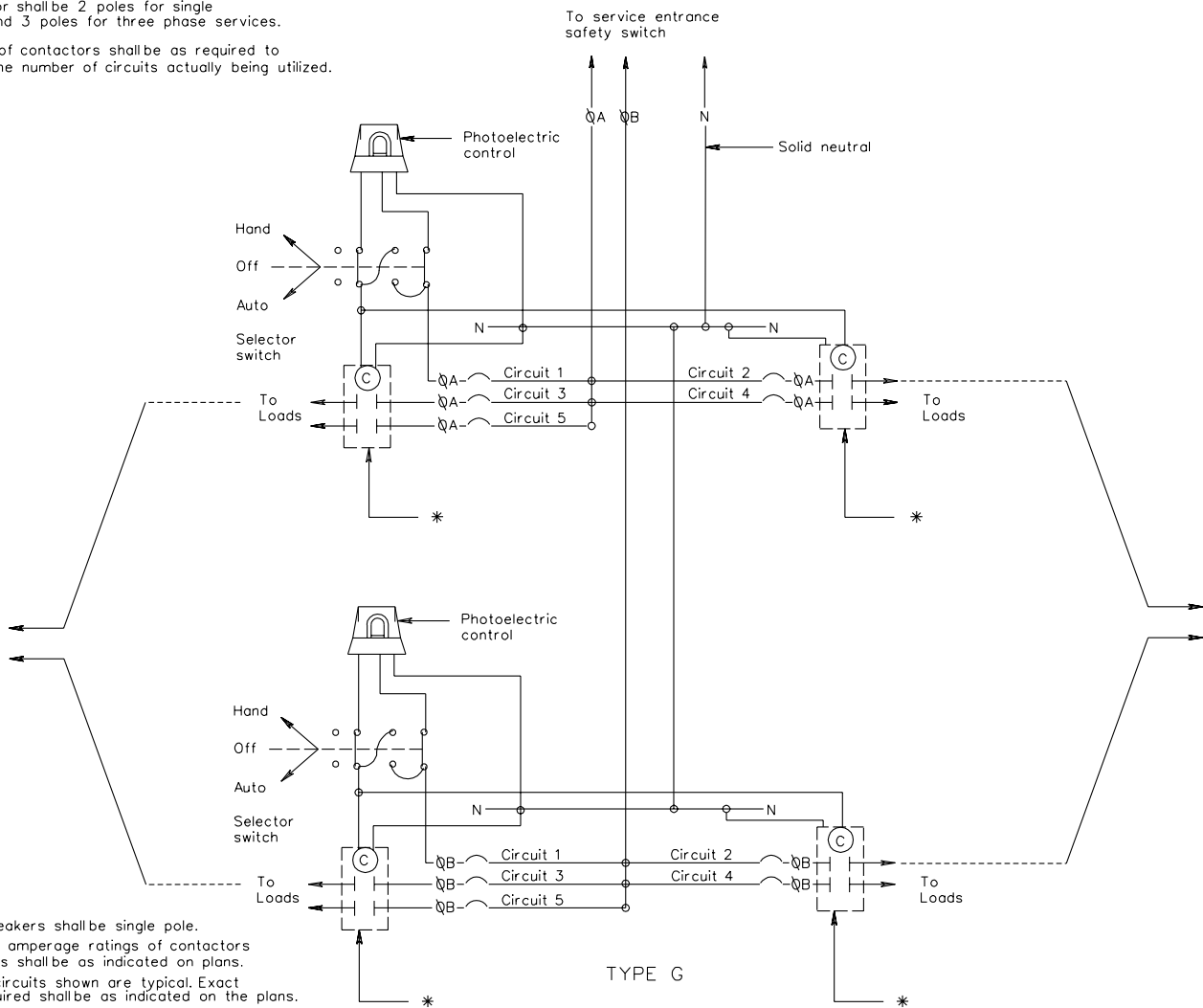
- All circuit breakers shall be single pole.
- Voltage and amperage ratings of contactors and breakers shall be as indicated on the plans.
- Number of circuits shown are typical. Exact number required shall be as indicated on the plans.



TYPE F

CONTROL CENTER WIRING  
DETAILS

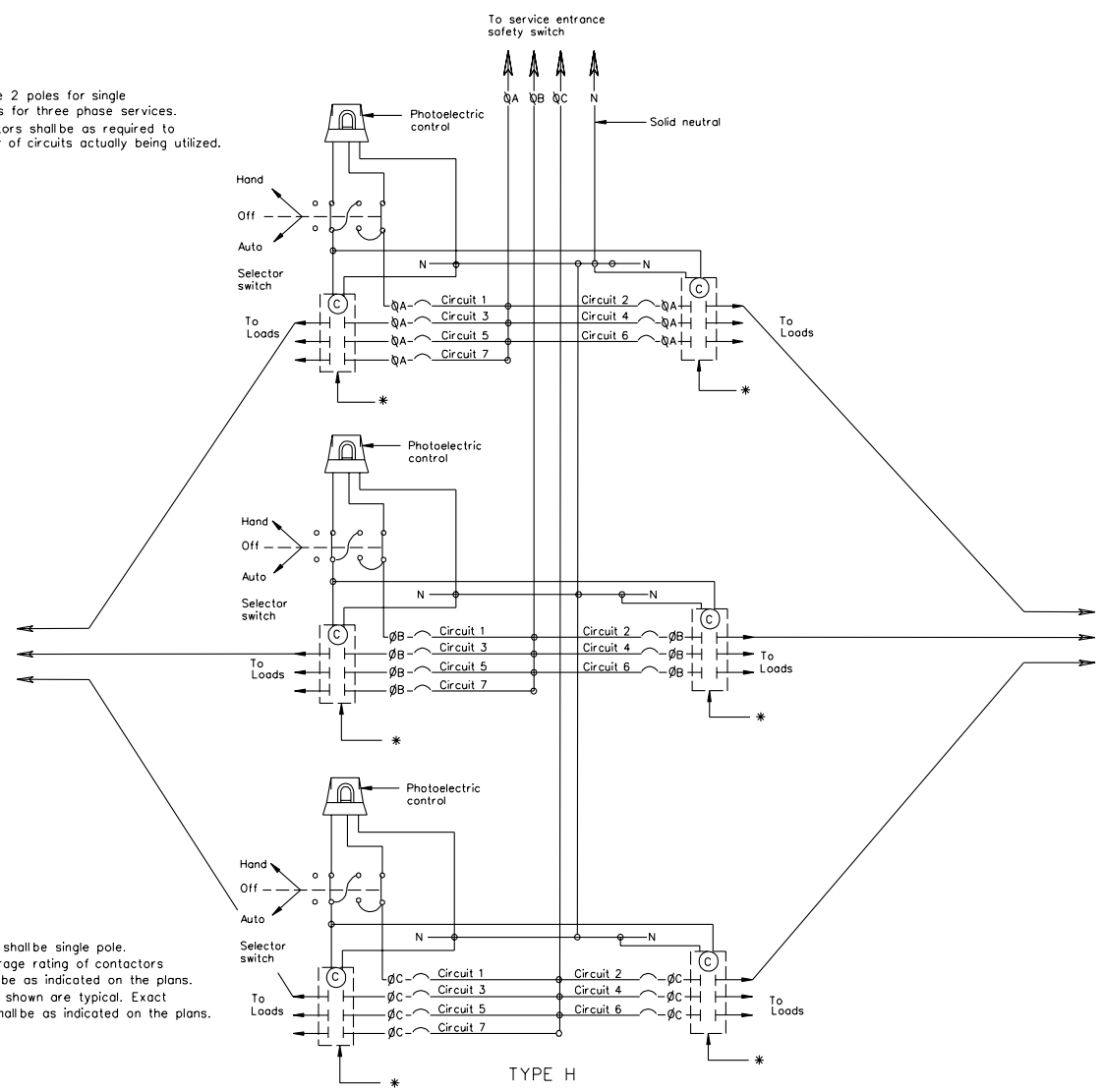
\* Contactor shall be 2 poles for single phase and 3 poles for three phase services.  
 Number of contactors shall be as required to handle the number of circuits actually being utilized.



Notes:  
 All circuit Breakers shall be single pole.  
 Voltage and amperage ratings of contactors and breakers shall be as indicated on plans.  
 Number of circuits shown are typical. Exact number required shall be as indicated on the plans.

## CONTROL CENTER WIRING DETAILS

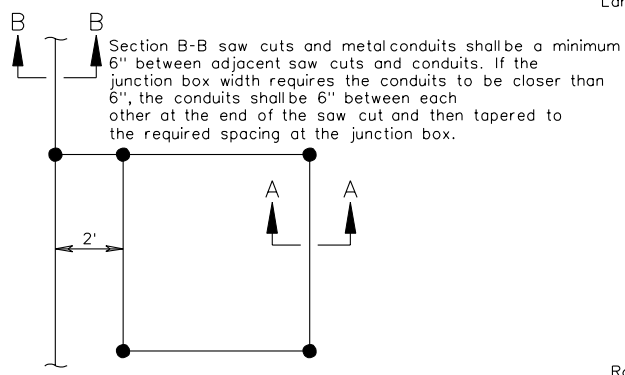
\* Contactors shall be 2 poles for single phase and 3 poles for three phase services. Number of contactors shall be as required to handle the number of circuits actually being utilized.



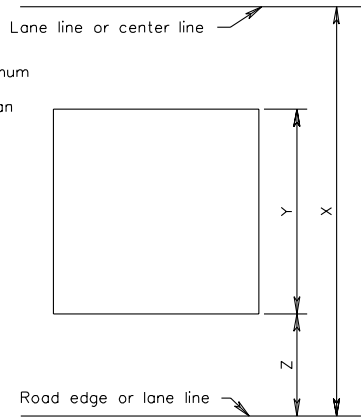
Notes:  
All circuit Breakers shall be single pole.  
Voltage and amperage rating of contactors and breakers shall be as indicated on the plans.  
Number of circuits shown are typical. Exact number required shall be as indicated on the plans.

### CONTROL CENTER WIRING DETAILS

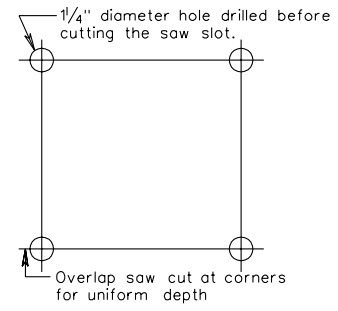
VIRGINIA DEPARTMENT OF TRANSPORTATION



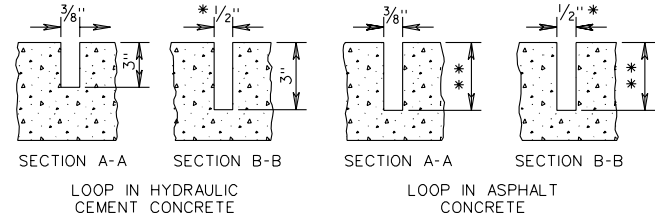
TYPICAL LOOP WIRE PLAN



TYPICAL LANE COVERAGE DIAGRAM

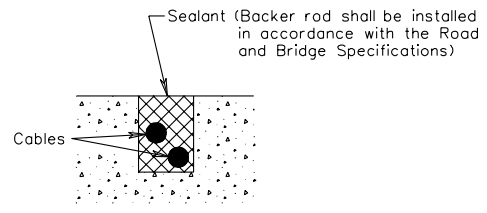


TYPICAL SAW CUT DIAGRAM



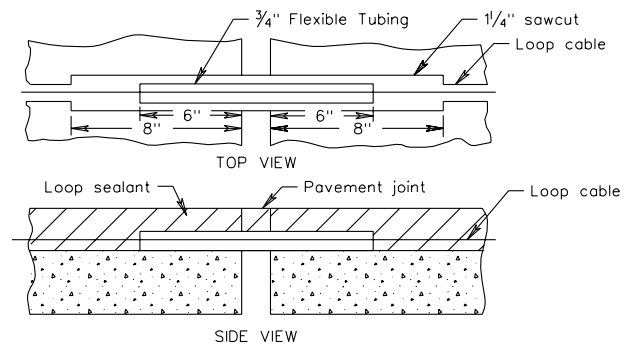
Depth of saw cut shall be measured from pavement surface at time of installation. Not necessarily finished grade.

TYPICAL SAW SLOT DETAIL



CROSS SECTION TYPICAL SEALED SLOT

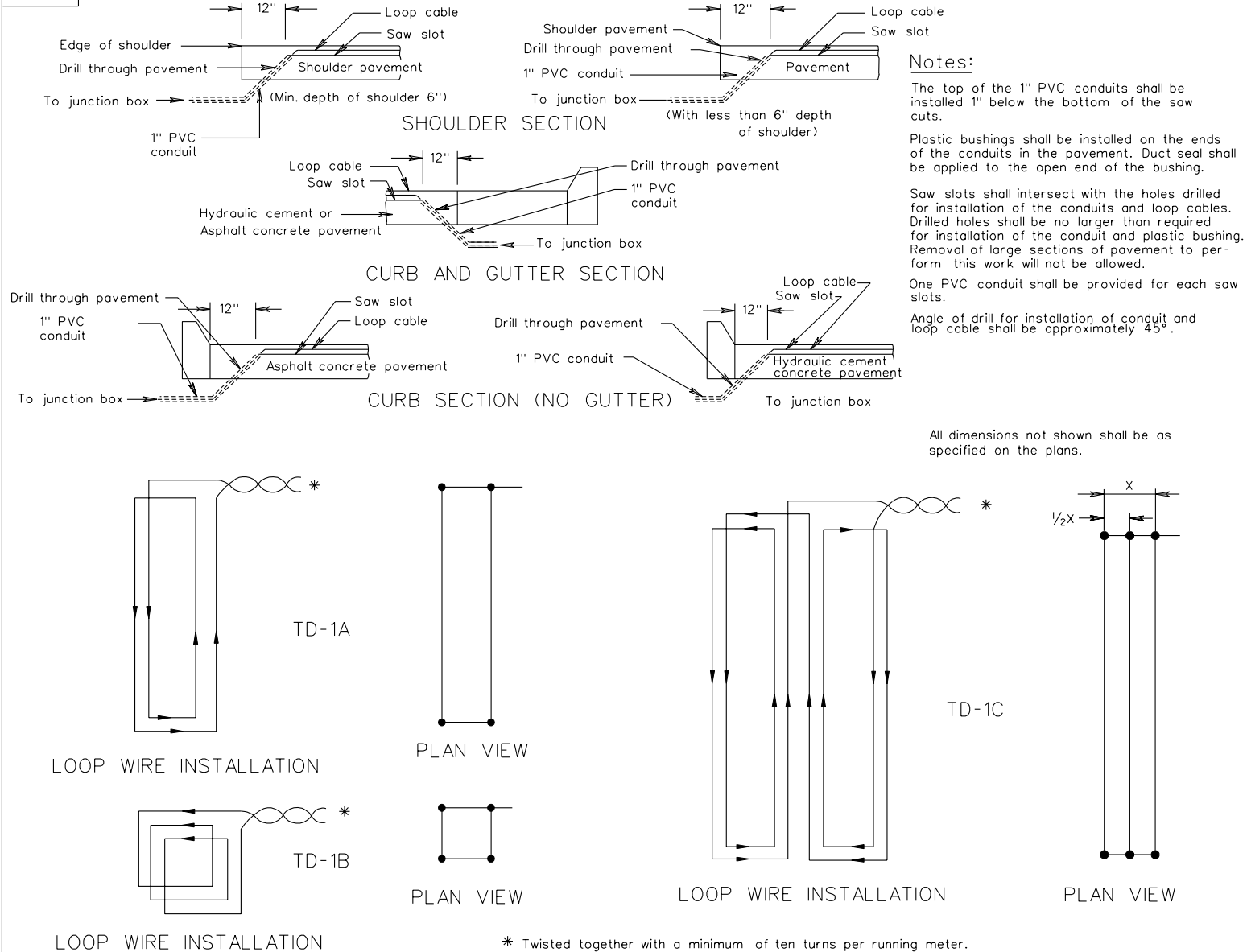
- \* Saw slot shall be 5/8" when loop detector cable enclosed in tubing is installed.
- In new asphalt concrete roadways, saw slots shall be cut into the base course to a depth of 3".
- \*\* In existing asphalt concrete roadways which are to be planned, saw slots shall be cut into the post planned surface to a depth of 3".
- In existing asphalt concrete roadways which are not to be planned, saw slots shall be cut into the existing surface to a depth of 4".



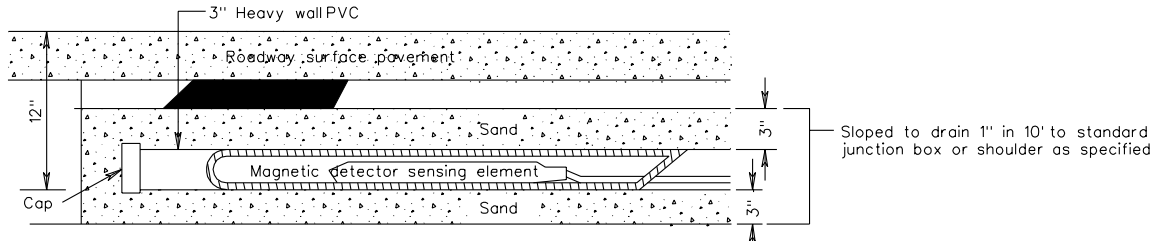
INSTALLATION OF LOOP CABLE ACROSS HYDRAULIC CEMENT CONCRETE PAVEMENT JOINTS

# LOOP DETECTOR INSTALLATION DETAILS

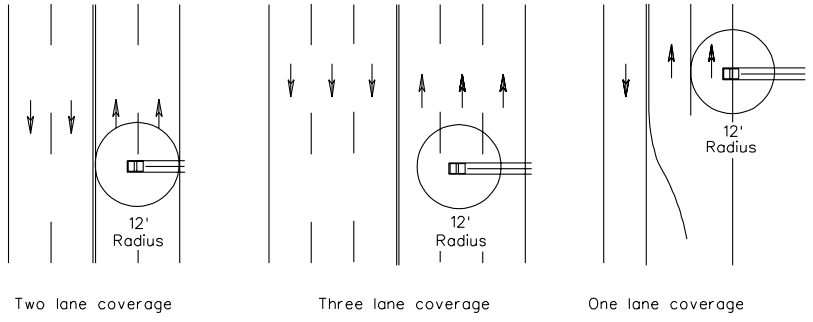
TD-1A,B,C



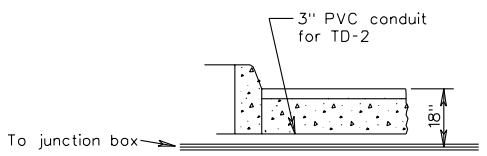
## LOOP DETECTOR INSTALLATION DETAILS



INSTALLATION DETAILS FOR MULTILANE MAGNETIC DETECTORS  
TD-2



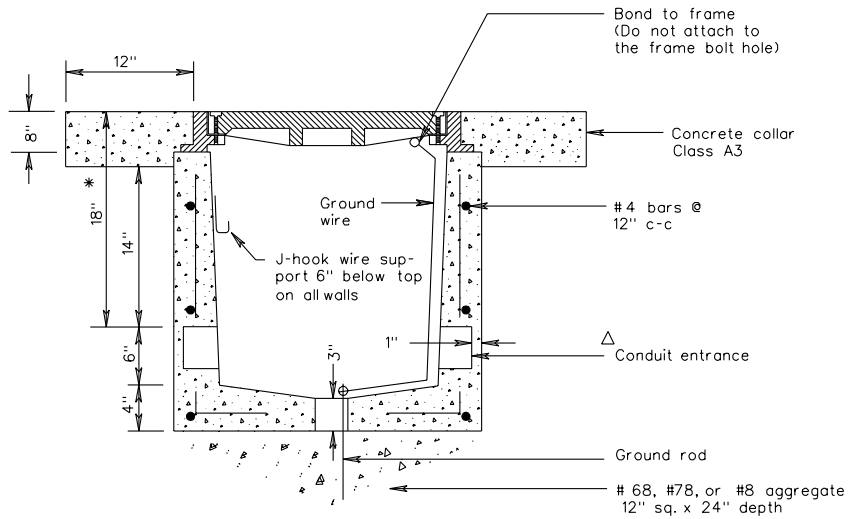
TYPICAL MAGNETIC DETECTOR LOCATIONS



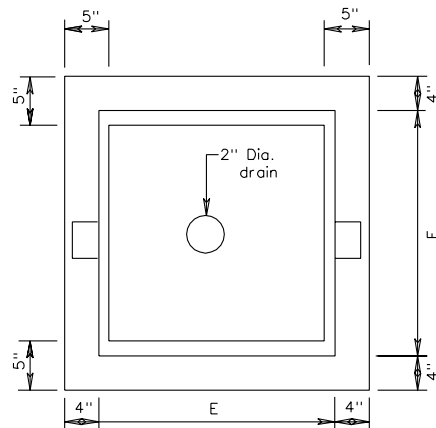
CURB OR CURB AND GUTTER SECTION

# MAGNETIC DETECTOR INSTALLATION DETAILS

JB-1A,2A,3A,4A,&5A



STANDARD	DIMENSIONS	
	E	F
JB-1A	14"	14"
JB-2A	14"	20"
JB-3A	20"	20"
JB-4A	20"	27"
JB-5A	27"	27"



PLAN VIEW  
(FRAME AND COVER REMOVED)

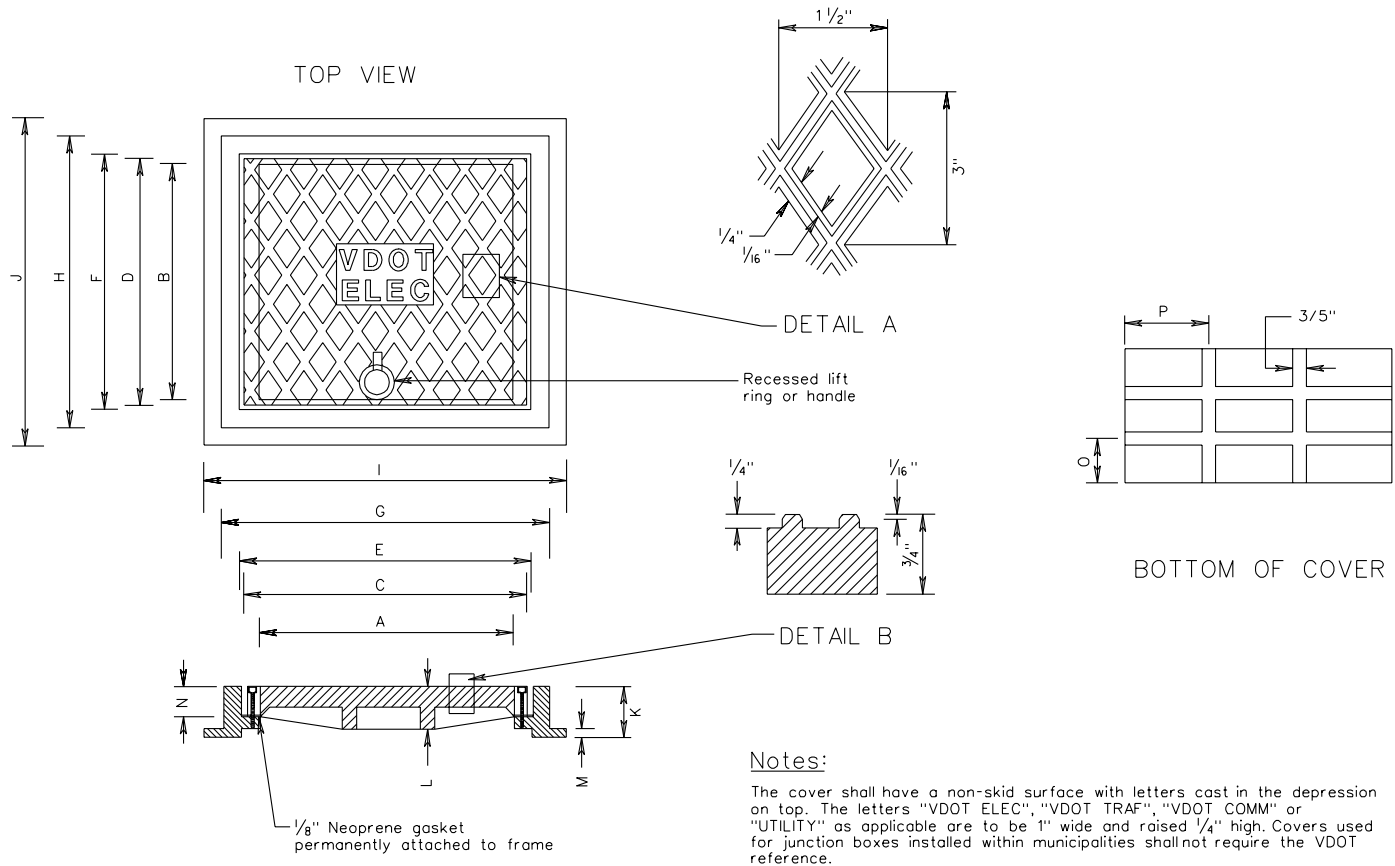
**Notes:**

- Conduit entrances shall be located as shown on the plans. Conduits shall extend 2" min. to 3" max. beyond the inside wall of the junction box.
- Bell ends shall be installed on the ends of PVC conduits. Grounding bushings shall be installed on the ends of metal conduits. Bell ends & bushings shall be plugged to prevent moisture & rodent entry.
- \* Depth of conduit entrances for magnetic detectors shall be in accordance with St'd TD-2.
- All reinforcing steel shall have a minimum 1 1/2" concrete cover. Any reinforcing steel in conflict with conduit shall be cut a minimum of 1 1/2" from conduit.
- The junction box may be precast or cast in place concrete.
- △ A minimum 2" diameter conduit entrance is required unless otherwise specified on plans.
- A concrete collar is required only when junction box is installed in earth areas.
- High strength grout conforming to the Road & Bridge Specifications shall be used to secure the frame to the junction box.
- All junction boxes shall be installed with a ground rod unless box houses only communication/interconnect cable.
- Voids resulting from entrance of conduits into junction box shall be completely filled with hydraulic cement grout conforming to the Road & Bridge Specifications.

JUNCTION BOX

VIRGINIA DEPARTMENT OF TRANSPORTATION





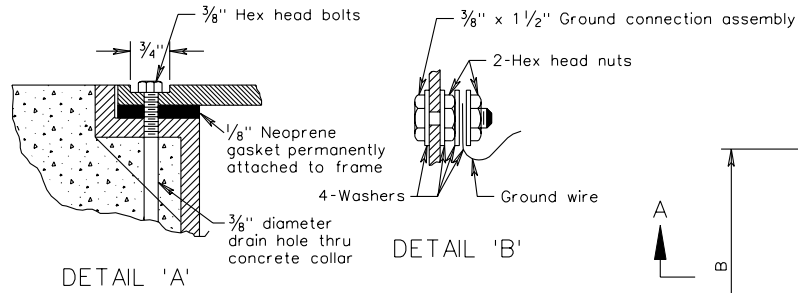
**Notes:**  
 The cover shall have a non-skid surface with letters cast in the depression on top. The letters "VDOT ELEC", "VDOT TRAF", "VDOT COMM" or "UTILITY" as applicable are to be 1" wide and raised 1/4" high. Covers used for junction boxes installed within municipalities shall not require the VDOT reference.  
 Four recessed 3/8" hex head bolts are required for each cover. Bolts shall be located at each corner or center of each side of cover.

STANDARD	DIMENSIONS															
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
JB-1A	12"	12"	13 3/4"	13 3/4"	14"	14"	15"	15"	18"	18"	4"	1 1/2"	1/2"	1 1/2"	4 1/2" ± 1/2"	4 1/2" ± 1/2"
JB-2A	12"	18"	13 3/4"	19 3/4"	14"	20"	15 1/4"	21 1/4"	18"	24"	4"	1 1/2"	5/8"	1 1/2"	6 1/2" ± 1/2"	4 1/2" ± 1/2"
JB-3A	18"	18"	19 3/4"	19 3/4"	20"	20"	21 1/4"	21 1/4"	24"	24"	4"	1 3/4"	5/8"	1 1/2"	6 1/2" ± 1/2"	6 1/2" ± 1/2"
JB-4A	18"	24"	19 3/4"	26 3/4"	20"	27"	21 1/2"	28 1/2"	24"	33 1/2"	4"	1 3/4"	3/4"	1 1/2"	9" ± 1/2"	6 1/2" ± 1/2"
JB-5A	24"	24"	26 3/4"	26 3/4"	27"	27"	28 1/2"	28 1/2"	33 1/2"	33 1/2"	4"	1 3/4"	3/4"	1 1/2"	9" ± 1/2"	9" ± 1/2"

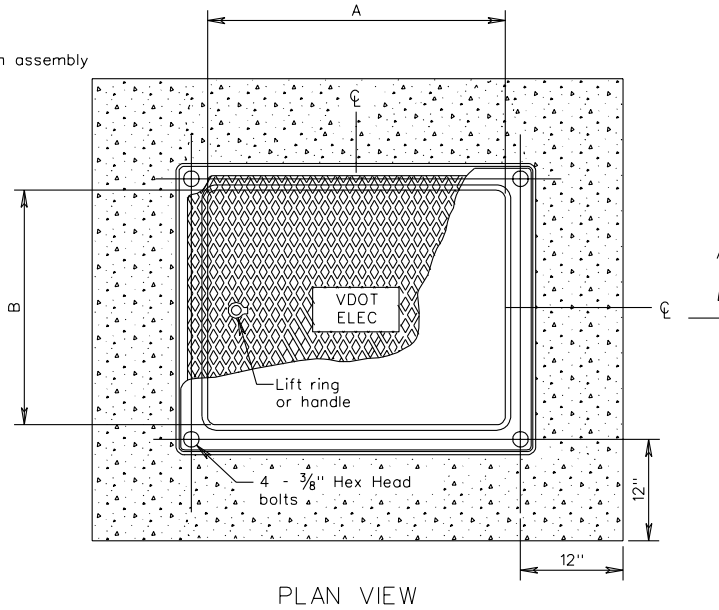
# JUNCTION BOX

REVISED 7/01

JB-1B,2B,3B,4B & 5B



STANDARD	DIMENSIONS	
	A	B
JB-1B	12"	12"
JB-2B	12"	18"
JB-3B	18"	18"
JB-4B	18"	24"
JB-5B	24"	24"



Notes:

Conduit entrances shall be located as shown on the plans. Conduits shall extend 2" min. to 3" max. beyond the inside wall of the junction box.

Bellends shall be installed on the ends of PVC conduits. Grounding bushings shall be installed on the ends of metal conduits. Bellends & bushings shall be plugged to prevent moisture & rodent entry.

\* Depth of conduit entrances for magnetic detectors shall be in accordance with Standard TD-2.

The cover shall have a non-skid surface with letters cast in the depression on top. The letters "VDOT ELEC", "VDOT TRAF", "VDOT COMM" or "UTILITY" as applicable are to be 1" wide and raised 1/4" high. Covers used for junction boxes installed within municipalities shall not require the VDOT reference.

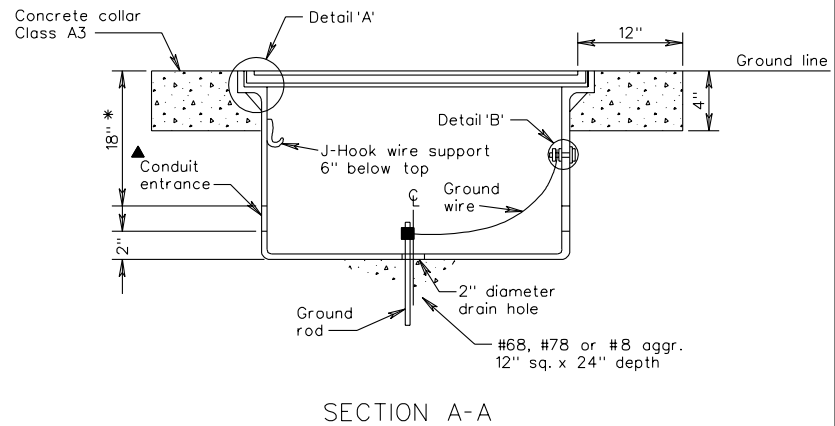
▲ A minimum 2" diameter conduit entrance is required, unless otherwise specified on plans.

A concrete collar is required only when junction box is installed in earth areas.

All junction boxes shall be installed with a ground rod unless box houses only communication/interconnect cable.

Voids resulting from entrance of conduits into junction boxes shall be completely filled with an appropriate material.

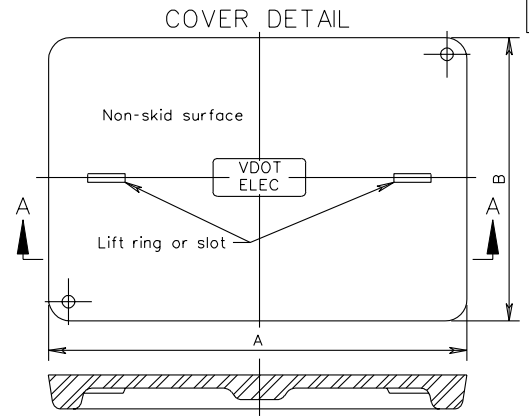
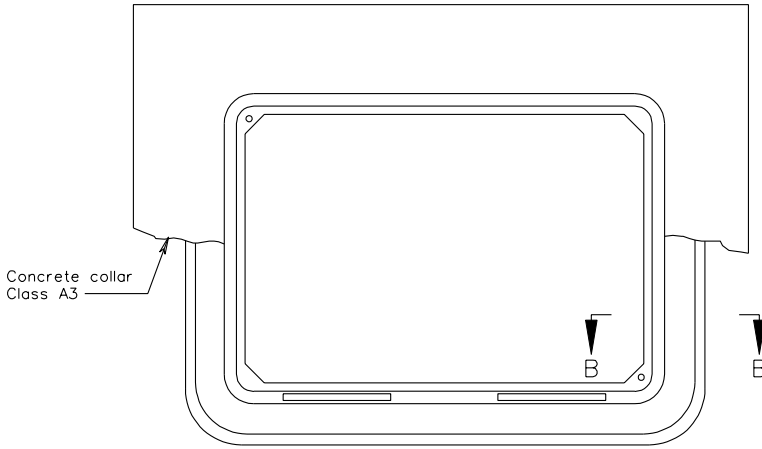
Junction box shall be a gray-iron casting with an asphalt coating on exterior surface except cover.



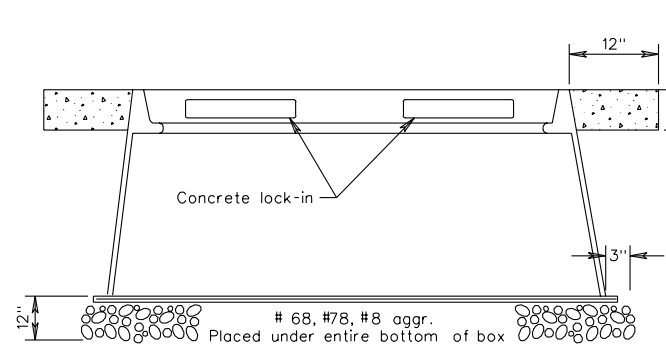
JUNCTION BOX

VIRGINIA DEPARTMENT OF TRANSPORTATION

REVISED 7/01

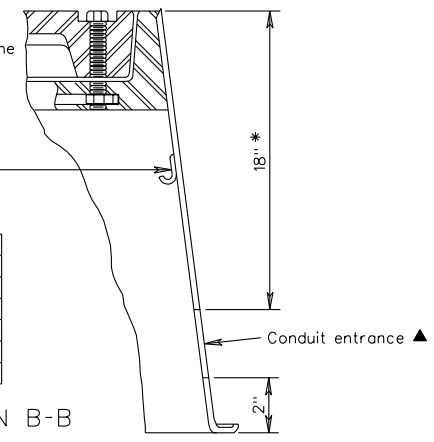


JB-1C, 2C,  
3C, 4C & 5C



1/8" Neoprene gasket  
Permanently attached to frame  
Ground line  
J-Hook wire support  
6" below top

SECTION A-A



STANDARD	DIMENSIONS	
	A	B
JB-1C	12"	12"
JB-2C	12"	18"
JB-3C	18"	18"
JB-4C	18"	24"
JB-5C	24"	24"

SECTION B-B

**Notes:**

- Conduit entrances shall be located as shown on the plans.
- Bellends shall be installed on the ends of PVC conduits.
- Grounding bushings shall be installed on the ends of metal conduits.
- Bellends and bushings shall be plugged to prevent moisture and rodent entry.
- Depth of conduit entrance for use of magnetic detectors shall be in accordance with Standard TD-2.
- The junction box shall be of a polymer concrete with fiberglass sides.
- The cover shall have a non-skid surface with letters cast in the depression on top. The letters "VDOT ELEC", "VDOT TRAF", "VDOT COMM" or "UTILITY" as applicable are to be 1" wide and raised 1/4" high. Covers used for junction boxes installed within municipalities shall not require the VDOT reference.
- All junction boxes shall be installed with a ground rod unless box houses only communication/interconnect cable.

- Two recessed 3/8" Hex head bolts are required for each cover.
- ▲ A minimum 2" diameter conduit entrance is required, unless otherwise specified on the plans.
- A concrete collar is required only when junction box is installed in earth areas.
- Conduits shall extend 2" to 3" max. beyond the inside wall of the junction box.
- The junction box may be a two piece design with the top section no less than 17" in depth.
- Void resulting from entrance of conduits into junction boxes shall be completely filled with an appropriate material.

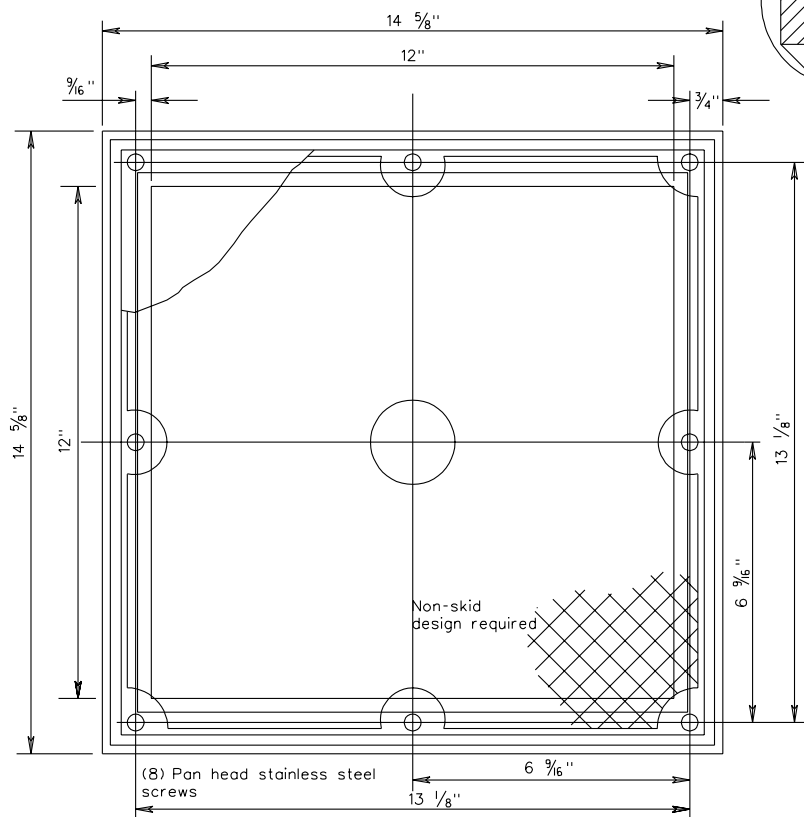
# JUNCTION BOX

VIRGINIA DEPARTMENT OF TRANSPORTATION

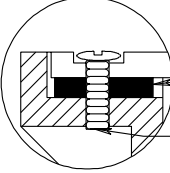
1301.51

JB-1D

### TOP VIEW

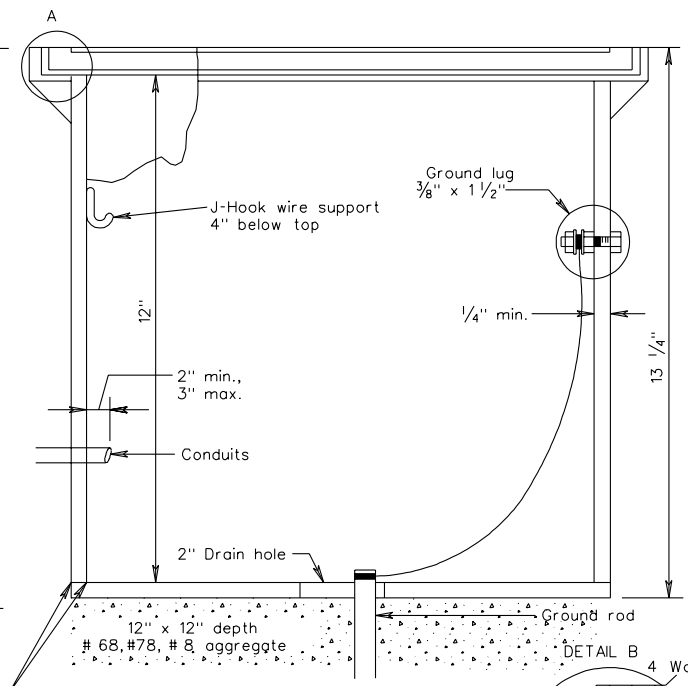


### DETAIL A



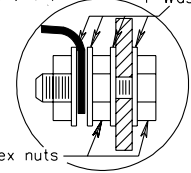
When setting box in concrete, cover with set screws shall be in place.

### SIDE VIEW



All seams shall have two continuous electrical arc-welds.

### DETAIL B



Grounding lug galvanized bolt ASTM-A307

### Notes:

- Finish: Galvanized in accordance with Section 233 and coated (outside) except the cover with an approved mastic.
- Material: Box 1/4" steelplate & cover 1" steelplate ASTM-A36M.
- All junction boxes shall be installed with a ground rod unless box houses only communication/interconnect cable.
- PVC conduits shall have bell ends and metal conduits shall have grounding bushings on all ends.
- Bell ends and bushings shall be plugged to prevent moisture and rodent entry.
- Voids resulting from entrance of conduits into junction boxes shall be completely filled with an appropriate material.

# JUNCTION BOX

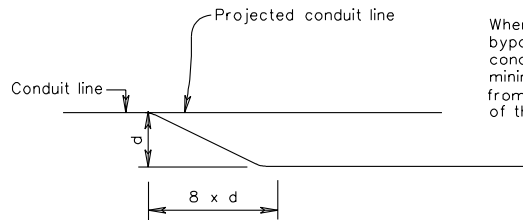
VIRGINIA DEPARTMENT OF TRANSPORTATION

1301.52

Notes:

Offsetting of conduit may be used for tying into existing conduit systems or bypassing obstructions as directed by the Engineer.

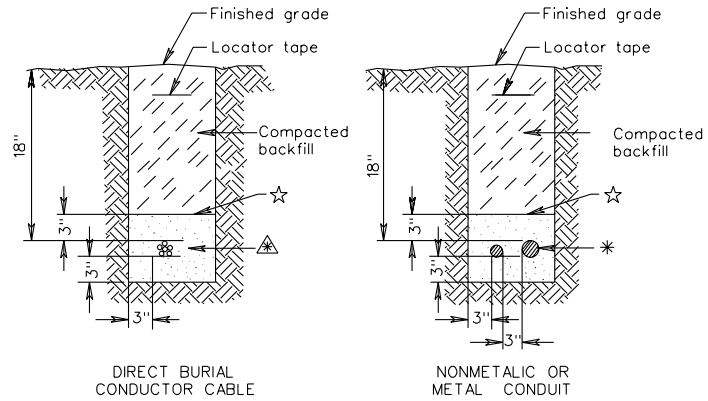
When offsetting conduit to bypass an obstruction, the conduit shall maintain a minimum clearance of 12" from the closest point of the obstruction.



METHOD OF OFFSETTING CONDUIT

d - Width of offset

ECI-1



NON - PAVEMENT AREA INSTALLATION

Notes:

Contractor shall install a 4" minimum to 6" maximum wide red plastic locator tape 2" to 4" below finished grade and directly above buried conduit or conductor cables, except under pavement.

Conduit installed under existing or proposed roadways for direct buried cables shall extend 24" beyond the paved surface and/or sidewalk.

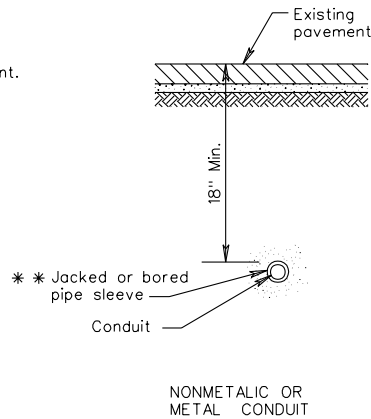
Where conduit for power and conduit for communication are to be installed in close proximity to each other, conduits shall be placed parallel in a common trench with no less than 6" of separation between conduit systems.

☆ Backfill material below this level shall be sandy fill (free of any stones, cinders, wood, roots, debris, etc.).

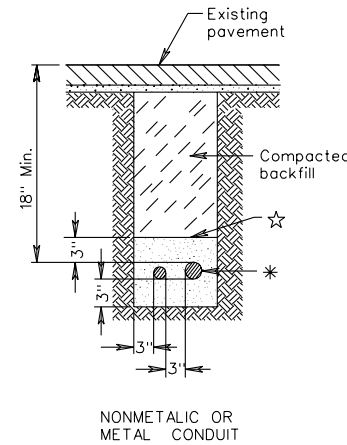
\* One or more conduits as required.

▲ One or more conductor cables as required.

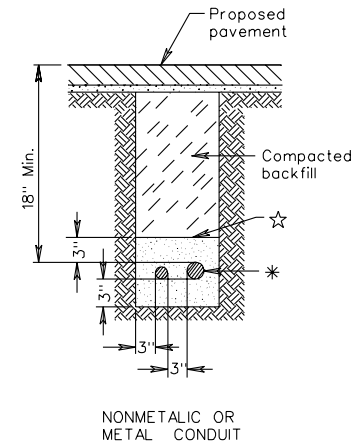
\*\* Only jacking operation requires sleeve.



NONMETALIC OR METAL CONDUIT



NONMETALIC OR METAL CONDUIT

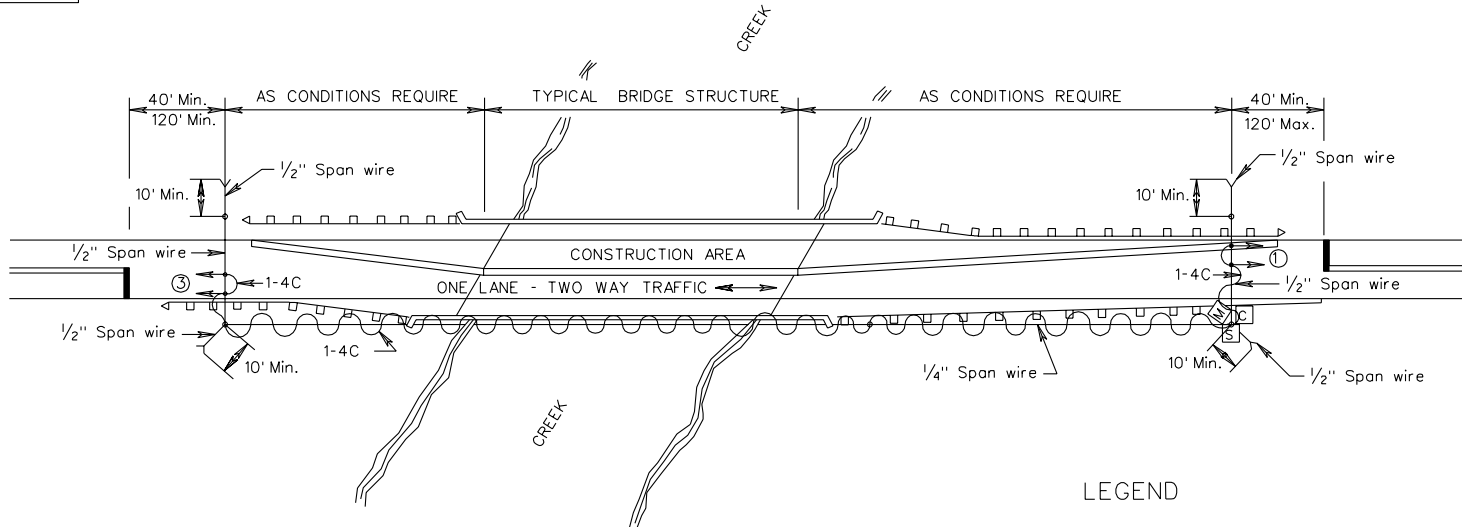


NONMETALIC OR METAL CONDUIT

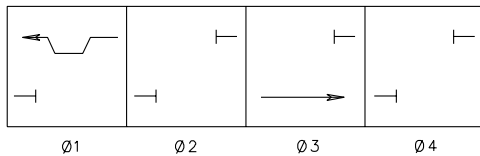
PAVEMENT AREA INSTALLATION

ECI-2

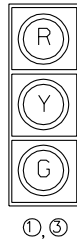
INSTALLATION OF ELECTRICAL CONDUIT AND CONDUCTOR CABLE  
(UNDERGROUND INSTALLATION)



PHASING DIAGRAM



SIGNAL HEAD



COLOR SEQUENCE CHART

Signal	Ø1		Ø2		Ø3		Ø4		Flash
	R <sub>y</sub>	W <sub>#1 #2</sub>	R <sub>y</sub>	W <sub>#1 #2</sub>	R <sub>y</sub>	W <sub>#1 #2</sub>	R <sub>y</sub>	W <sub>#1 #2</sub>	
1	G	Y	R	R	R	R	R	R	R
3	R	R	R	R	R	G	Y	R	R

LEGEND

- [M] METER BASE (IF REQUIRED)
- [C] CONTROLLER
- [S] BREAKER BOX OR SAFETY SWITCH

Notes:

Controller shall be pole mounted or ground mounted next to the wood pole closest to the power source.

Placement of poles are typical. Exact distances for pole placements, stop bar locations, etc shall be determined by the Engineer at the time of installation.

Signal Ahead signs shall be installed when sight distance is limited.

The contractor shall be responsible for furnishing and implementing signal timings unless otherwise specified.

Signal heads shall be installed in accordance with Standards SW-1 or 2 and TA-1.

Wood pole wiring and rigging for 1/2" and 1/4" span wire shall be in accordance with Standards WD-2 and WD-5, respectively.

Electrical service shall be in accordance with Standard SE-2 unless a generator is used.

When an intersection is located between the stop lines for the two approaches, additional phasing and signals shall be provided to accommodate those traffic movements.

If required by plans, entrances located between the stop lines for the two approaches shall be provided with additional phasing and signals to accommodate those traffic movements.

Vehicle detection of each approach shall be accomplished unless otherwise specified.

TYPICAL ONE - WAY BRIDGE  
TEMPORARY SIGNAL INSTALLATION

VIRGINIA DEPARTMENT OF TRANSPORTATION