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

A 4" x 36" x 55" concrete maintenance pad shall be installed on door side of cabinet foundation if this side is in earthen areas. Maintenance pad shall be sloped to drain.

Notes:
- All exposed concrete surface edges shall be chamfered 1/4".
- 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 aisles 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.
- Valves 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

VIRGINIA DEPARTMENT OF TRANSPORTATION

1301.01
Control Center Cabinet Foundation and Conduit Placement Details

1301.02

Virginia Department of Transportation

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 tracer when finishing the concrete and shall be 1/4" deep and 4" to 8" long. Locations of empty conduits shall have additional 2" long marks 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.

Bends 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 shall be fiber filled.

voids remaining after conductors exit or enter bends or bushings of conduits shall be sealed with silicone to prevent moisture and rodent entry.
CONTROLLER CABINET FOUNDATION AND CONDUIT PLACEMENT DETAILS

Notes:

All exposed concrete surface edges shall be chamfered 1/4".
Anchor bolts, bolt circle template and metal riser shall be furnished with cabinet. Cabinet shall be centered on foundation with riser attached to foundation & cabinet installed on metal riser.
Voids remaining after conduits exit or enter bellends or bushings of conduits shall be sealed with silicone to prevent moisture or radon entry.
Conduits entering the foundation shall be arranged in a circular pattern. The Contractor shall submit a conduit arrangement plan for approval prior to placement. Each foundation shall be permanently marked to indicate aisles 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 radon entry.
Grounding bushings shall be installed on each end of metal conduits. Empty conduits shall be plugged to prevent moisture and radon 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.
Two pole terminal strip 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.

Weatherproof gasket

Hinged door with stop and prop.

Locking door keyed same as controller cabinets

Incoming and outgoing cables secured to back panel

Ground rod 4" cover

Concrete pad (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 sealtant.

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.

TYPICAL FOUNDATION DETAIL

ABOVE GROUND CABLE TERMINAL ENCLOSURE AND CONDUIT PLACEMENT DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
<table>
<thead>
<tr>
<th>TYPE</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>6 1/4&quot;</td>
<td>6 1/4&quot;</td>
<td>26&quot;</td>
<td>47 3/8&quot;</td>
<td>20 3/8&quot;</td>
<td>3&quot;</td>
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<tr>
<td>B</td>
<td>8 1/4&quot;</td>
<td>8 1/4&quot;</td>
<td>26&quot;</td>
<td>47 3/8&quot;</td>
<td>20 3/8&quot;</td>
<td>3&quot;</td>
</tr>
<tr>
<td>C</td>
<td>12 1/2&quot;</td>
<td>12 1/2&quot;</td>
<td>23 3/8&quot;</td>
<td>50 3/8&quot;</td>
<td>25 3/8&quot;</td>
<td>-</td>
</tr>
</tbody>
</table>

Terminal rock including number and size of terminal positions required to accommodate cable as shown on plans.

No. 68 river stone shall be installed in the base of the closure to a level of 4" above the ground line.

Cable supports

Grounding harness

Hanger clamp

Cover

Base assembly

Cover lock

Screw

Nut and screw

Conduit entrance

Back cover/cap assembly, front cover and base/column assembly are to be 1/4 gauge thick galvanized steel, with a gray-green tone finish.

Notes:

This item shall be easily re-entrantable.

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 steel screws, nuts, and washers.

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 steel screws, nuts, and washers.

Typical Above Ground Cable Terminal Enclosure

Typical Aerial Cable Terminal Enclosure
LP-1 CONVENTIONAL

LP-2 OFFSET

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.

<table>
<thead>
<tr>
<th>POLE LENGTH (feet)</th>
<th>BOLT CIRCLE DIAMETER</th>
<th>ANCHOR BOLT DIAMETER</th>
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<tbody>
<tr>
<td>A (5-12)</td>
<td>12&quot;</td>
<td>1&quot;</td>
</tr>
<tr>
<td>B (18-22)</td>
<td>12&quot;</td>
<td>1&quot;</td>
</tr>
<tr>
<td>C (23-27)</td>
<td>12&quot;</td>
<td>1&quot;</td>
</tr>
<tr>
<td>D (28-32)</td>
<td>12&quot;</td>
<td>1&quot;</td>
</tr>
<tr>
<td>E (33-37)</td>
<td>15&quot;</td>
<td>1&quot;</td>
</tr>
<tr>
<td>F (38-42)</td>
<td>15&quot;</td>
<td>1&quot;</td>
</tr>
<tr>
<td>G (43-47)</td>
<td>15&quot;</td>
<td>1&quot;</td>
</tr>
<tr>
<td>H (48-52)</td>
<td>16&quot;</td>
<td>1&quot;</td>
</tr>
<tr>
<td>I (53-57)</td>
<td>16&quot;</td>
<td>1 1/4&quot;</td>
</tr>
<tr>
<td>J (58-62)</td>
<td>16&quot;</td>
<td>1 1/4&quot;</td>
</tr>
</tbody>
</table>

LIGHTING POLE DETAILS
CONVENTIONAL AND OFFSET

VIRGINIA DEPARTMENT OF TRANSPORTATION
Luminaire mounting bracket

Head frame and cover

Luminaire

Typical luminaire ring

High mast standard

Winch assembly and circuit breaker to be accessible from hand hole.
(10" x 20"
Min. hand hole)

Finished grade

<table>
<thead>
<tr>
<th>TYPE</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>70'</td>
</tr>
<tr>
<td>2</td>
<td>80'</td>
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<tr>
<td>3</td>
<td>90'</td>
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<td>4</td>
<td>100'</td>
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<td>6</td>
<td>120'</td>
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<tr>
<td>7</td>
<td>130'</td>
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<tr>
<td>8</td>
<td>140'</td>
</tr>
<tr>
<td>9</td>
<td>variable</td>
</tr>
</tbody>
</table>

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

VIRGINIA DEPARTMENT OF TRANSPORTATION
A "U" hook for wire support shall be placed near the top of the inside of each pole.

Span sag after loading shall be no greater than 5X it's length and no less than 3.5X.

Wiring and rigging in accordance with Standard WD-1. Tether rigging in accordance with Standard TA-1.

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 signal head section maintaining the minimum clearance, using no extensions as shown by Standard SW-1 and SW-2.

Base secured to pole with continuous weld

Grounding lug

Steel anchor base

Anchor rods

Continuous weld 1" x 8" min. curved handhole with frame and cover

Handhole

Nut cover (when required)

Square or hex leveling nuts

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

SIGNAL POLE DETAILS
(STRAIN AND COMBINATION LUMINAIRE STRAIN POLE)

VIRGINIA DEPARTMENT OF TRANSPORTATION

1301.09
**PLAN VIEW**

Bolt projection as required by Lighting Pole Manufacturer

6" Min.

Grounding conductor

1" conduit

Conduit

Grounding electrode

4" cover

Hydraulic cement concrete

#8 vertical reinforcing bars evenly spaced

#4 reinforcing bars @ 12" c-c (Typ.)

W (O.C.)

SECTION A-A

#4 tie bars

12" overlap

**PLAN VIEW**

**LIGHTING POLE FOUNDATION INSTALLATION DETAILS**

**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.
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 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.

Open ends of conduits with conductors installed shall be sealed with an approved soft, pliable, and easily removable waterproof sealant. The sealant shall not have a deleterious effect on cable coverings.

No mortar, grout, or concrete shall be placed between bottom of base plate and top of pedestal.
Notes:
Each foundation shall be permanently marked to indicate all sides from which conduits pass. This mark shall be made with a chisel 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 shall have a breakaway base, either slip base or fragrable transformer type. 3" x 5" minimum curved handhole with frame and cover required in pole when slip base supplied. Distance from bottom of pole to center of handhole shall be 2".

4 1/8" outside diameter

If pole shall be EMT, three set screws shall be used to lock shaft in position.

4 - 4 1/2" x 18" Anchor bolts on 12" diameter bolt circle.
Hydraulic cement concrete 24" x 24" square or 24" diameter round

Foundation to extend 2" above ground when in earth and shall be flush with surface when in sidewalk.

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.

If pedestal pole and foundation are utilized for a SL-5 service, the foundation and pole shall be designed to accommodate an 8" bolt circle. Breakaway devices shall not be utilized.
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.

**Note:**
Signal heads 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 signal head.

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.

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

Minimum 18" clearance from highest point of the pavement surface to the lowest point of signal head assembly including backplate and bollard clamp (includes signal head on bridge span).
Spacers shall be installed between the eyelet of the hanger assembly and the inside of the span wire clamp to eliminate any gap.

Cable ring 18" spacing maximum

Cable tie

Adjustable signal head leveling attachment with separate cable entry weatherhead (aluminum may be painted flat black or yellow)

Cable entrance head shall be positioned with the entrance hole facing the direction the signal cable is pulled from.

Extension (when required)

Span wire clamp

Cable ring 18" spacing maximum

Conductor Cable

Cable ties on 6" centers

A waterproof sealant shall be applied on the connection between the hanger assembly and signal head assembly

8" Drip loop behind head assembly

NOTE:
Signal heads 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 signal head.

Minimum 6" clearance from highest point of the pavement surface to lowest point of signal heads assembly including backplates and tether clamp (includes signal heads on bridge span).

Signal heads 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 terminators 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 miscellaneous hardware shall be stainless steel.
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.

POLE AND HANGER ASSEMBLY HARDWARE REQUIREMENTS

<table>
<thead>
<tr>
<th>IF POLE IS</th>
<th>HARDWARE SHALL BE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galvanized steel</td>
<td>Aluminum or galvanized iron</td>
</tr>
<tr>
<td>Steel painted aluminum</td>
<td>Aluminum, galvanized iron or iron painted aluminum</td>
</tr>
<tr>
<td>Steel painted other than aluminum</td>
<td>Aluminum or iron painted to match pole</td>
</tr>
</tbody>
</table>

5 SECTION CLUSTER MOUNTING DETAIL

RIGID MAST ARM MOUNTING DETAILS

SIGNAL HEAD MOUNTING DETAILS

MAST ARM

VIRGINIA DEPARTMENT OF TRANSPORTATION
POLE TOP MOUNTING CAST ALUMINUM POLE TOP MOUNTING CAST ALUMINUM POLE BRACKET MOUNTING CAST ALUMINUM OR POLYCARBONATE SIGNAL HEADS OR POLYCARBONATE SIGNAL HEADS

SMB-1

- Cast Nipple
- Neoprene o-ring
- Metal serrated locking ring

3 (Min.) stainless steel set screws required.

$4\frac{1}{2}''$ Pole adaptor

SMB-2

- Stainless steel set screw
- Signal head
- Neoprene o-ring
- Metal serrated locking ring
- Stainless steel set screw

Terminal compartment when required by plans. Terminal block shall be of non-corrosive material with stainless steel screws.

$4\frac{1}{2}''$ Pole adaptor

SMB-3

- Stainless steel set screw
- $\frac{1}{2}''$ hole
- Neoprene o-ring
- Metal serrated locking ring
- Stainless steel set screw

$\frac{1}{2}''$ hole

If SMB-3 is to be mounted on wood pole a conduit body shall be installed in bracket arm to connect signal head cable conduit.

Same as SMB-2

Steel pole shall be drilled and tapped and mounting accomplished utilizing $\frac{1}{2}''$ stainless steel bolts.

POLE AND HANGAR ASSEMBLY HARDWARE REQUIREMENTS

<table>
<thead>
<tr>
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<tr>
<td>Galvanized steel</td>
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<tr>
<td>Steel painted alum.</td>
<td>Aluminum galvanized iron or iron painted</td>
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<tr>
<td>Steel painted other than</td>
<td>aluminum</td>
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<tr>
<td>than aluminum: Fiberglass</td>
<td>painted to match alpae</td>
</tr>
<tr>
<td>Wood or fiberglass</td>
<td>Aluminum or galvanized iron</td>
</tr>
<tr>
<td>with gray tone</td>
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</tr>
</tbody>
</table>

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.
**Tether Wire Details**

Virginia Department of Transportation

---

**Pole Attachment**

- 1/4" Spun wire saddle clamp
- 1/4" Guy sleeve

**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 signal heads on bridge span).
- 24" Two bolt clamp or compression deadend clamp

**Adjustable Tether Clamp**

- Cut off excess tether stem 3/4" below clamp.
- Lock washer
- Flat washer

**Tether Clamp**

- Flat washer
- Lock washer

---

**Two 3 bolt clamps or compression deadend clamp**

- Bottom of signal head housing

---

**Details**

- 1/4" Guy sleeve
- 24" Two bolt clamp or compression deadend clamp
- Thimble eye bolt, nut and washers
- Lock washer
- Flat washer
SPAN WIRE INSTALLATION

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

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.

MAST ARM INSTALLATION

Solid stainless steel strap shall be a minimum 1/2" width.

5" Tall

Sign panel 16 ft² max.

Stainless steel lock washer

Stainless steel nut

Stainless steel fender washer

Nylon washer

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 1/4" 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.
Channeling shall be galvanized steel.
A waterproof sealant shall be utilized between the elbow & signal head.

Beacons shall flash simultaneously.
Beacons shall flash alternately.
FLAShING BEACoN INSTALLATION DETAILS

1. A 1 1/2" metal conduit shall be installed for electrical power.

2. A 3/4" 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.

NOTES:

- All signal lenses shall be yellow and shall be 12" diameter.
- All bays and conduits shall have set screws to prevent rotation.
- All channeling 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:

- Grounding lug
- 2 washers
- Ground rod galvanized bolt ASTM A307M
- Hex nut

- Grounding lug shall be sealed with silicone to prevent moisture and rodent entry.
FLAShING BEACON INSTALLATION DETAILS
VIRGINIA DEPARTMENT OF TRANSPORTATION

REAR VIEW

1 1/2" metal conduit
1 1/2" elbow with serrated teeth
1 1/2" Type T conduit outlet with cover and gasket.

Tee bars or stiffeners

Aluminum traffic signal head

SIDE VIEW

1 1/2" metal conduit

CHANNELLING TO POST DETAIL

Nut
Washer
U-bolt

CHANNELING OUT TO WIDTH OF FLANGE

1 1/2" metal conduit

W4x13 Galvanized post

1 1/2" aluminum Type C conduit outlet body with cover and gasket.

Front View

Beacons shall flash alternately

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 channeling, 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. Port 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
VIRGINIA DEPARTMENT OF TRANSPORTATION

1301.21
Details of span wiring and rigging

Notes:
Concrete pad required when cabinet mounted on pole in earth areas.
See Standard CTF-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 signal/hood 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.

Methods of bringing conductors into top of steel poles

Steel pole wiring and rigging details

Virginia Department of Transportation
METHODS APPROVED FOR CABLE RUNS

- Thimbleye bolts
- Conduit size as specified on plans for signal conductors or service use.
- A 6" minimum vertical separation shall be provided between thimbleye bolts

ANGLES LESS THAN 160°

- Thimbleye bolt
- 5" square washer
- Thimbleye nut
- Two 3 bolt clamps or compression deadend clamp.

ANGLES GREATER THAN 160°

- Thimbleye bolt
- 5" square washer
- Thimbleye nut
- Two 3 bolt clamps or compression deadend clamp.

WOOD POLE WIRING AND RIGGING DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
TYPICAL BRIDLE SPAN INSTALLATION

½" Span wire or as specified

Connected to pole in accordance to WD 1 or WD 2

2 bolt clamps or compression deadend clamp

Galvanized steel bolt, washer, nut and stainless steel cotter key placed through the bolt at the end after the washer and nut.

Span wire saddle clamp

½" Span wire or as specified

½" Span wire or as specified

Guy sleeve

BRIDLE SPAN WIRING AND RIGGING
DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
PEDESTAL POLE WIRING DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
Notes:

1. The attachment method for beginning and ending the interconnect runs and turning angles less than 180° shall be as shown for standard WD-2, except that two bolt clamps may be substituted for three bolt clamps.

2. The beginning and ending wood poles on all interconnect runs shall be guyed. Additional poles between these shall be guyed as deemed necessary by the Engineer. Down guying shall be as shown by standard WD-2.

3. The span wire shall be grounded at the first pole and repeated once for every 500’ of span wire installed. Where attachment is made to steel poles the attachment will be considered sufficient grounding. For poles with down guys, attachment of ground wire to down assembly will be considered sufficient grounding if no insulator is incorporated in guy assembly.

4. If the interconnect is being installed on existing utility company poles, the method of attachment, down guying and grounding shall be in accordance with their specifications if the above methods are not acceptable to the utility company.

5. Self-supporting cable may be used in lieu of lashed cable or cable rings. If used, cable suspension clamps shall be designed for such use.
PEDESTRIAN ACTUATION DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
FRONT VIEW

Use LEFT as required.

RIGHT TURN

R X R

SIDE VIEW

24"
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 grounding conductor entering breaker box see Standard SC-5.
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. The pad shall be 18" from pole. (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 called in the junction box.
Notes:

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

For alternate method of service cable and grounding conductor entering breaker box, see Standard SE-5
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.

1" Liquid tight flexible metal conduit w/service cable

Grounding conductor to breaker box

Feeder cable inside steel pole

1" rigid to liquid tight flexible metal conduit coupling

1" metal conduit coupling

1" metal conduit elbow

1" metal conduit coupling

1" conduit w/grounding conductor

1" conduit w/grounding conductor

1" conduit w/grounding conductor

1" conduit stubout (location as required by utility company)

2" PVC conduit stubout (location as required by utility company)

1" PVC Conduit

Electrical service grounding electrode

Augmented grounding electrode 4" cover

10'-0" Separation Minimum

Foundation (separate pay item)

JBI-2C Junction box
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.

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

** Underground service cable coiled in box with sufficient length to allow the cable to extend at least two feet above the junction box.

*** 2" PVC conduit stubout (location as required by local utility company).

---

**ELECTRICAL SERVICE DETAILS**

**SIGNAL INSTALLATION**

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 2/06

1301.35
ALTERNATE METHOD OF SERVICE CABLE AND GROUNDING CONDUCTOR ENTERING BREAKER BOX

Standard PF-2 Pedestal Pole and Foundation (cost to be included with Electrical Service Pay Item)

Close nipple

Conduit

Conduit Meter base if required

9/16" Metal riser conduit

Stainless steel band

Breaker box required

Breaker box to be locked at door

Conduit and close nipple

Feeder cable inside pole

Grounding conductor to breaker box

Stainless steel bends

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

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

2" PVC conduit stubout (Location as required by local power utility company.)

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

REV. 2/06
1301.36
Notes:

- The conduit and service cable shall extend from the cabinet to the utility junction box.
- 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 cooled in the junction box.
- This standard is applicable for all electrical services other than 480Y/277. For 480Y/277 service, see Standard SE-9.
Notes:

This standard is applicable for all electrical services other than 480V/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 called in the junction box.

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

** Conductor cables and conduit as specified on plans.

13' Wood pole w/5' in ground (included in the Electrical Service pay item)

10'-0" Separation Minimum

Underground service cable coiled in box with sufficient length to allow the cable to extend at least 2' above the junction box.
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
diesel-electric 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 should read "UTILITY."

** The conduit and conductor cable shall be as specified on the plans.

---

ELECTRICAL SERVICE DETAILS
SIGN AND LIGHTING INSTALLATION

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV 2/06
1301.39
Notes:

- Conduit shall be stubbed out 6" past concrete foundation pad. Location of the stubbed conduit shall be as required by the local power company.
- All exposed concrete edges shall be chamfered 1/4".
- Grounding bushings shall be installed on each end of metal conduits.
- Bills of lading 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 3/16" 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.
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.
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.

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.
* 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
VIRGINIA DEPARTMENT OF TRANSPORTATION
* 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.
- Exact number required shall be as indicated on the plans.

CONTROL CENTER WIRING DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
Section B-B saw cuts and metal conduits shall be a minimum 6" between adjacent saw cuts and conduits. If the junction box width requires the conduits to be closer than 6", the conduits shall be 6" between each other at the end of the saw cut and then tapered to the required spacing at the junction box.

TYPICAL LOOP WIRE PLAN

TYPICAL LANE COVERAGE DIAGRAM

TYPICAL SAW CUT DIAGRAM

SECTION A-A
LOOP IN HYDRAULIC CEMENT CONCRETE

SECTION B-B
LOOP IN ASPHALT CONCRETE

Saw slot shall be ¾" 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".

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

TYPICAL SAW SLOT DETAIL

Sealant (Backer rod shall be installed in accordance with the Road and Bridge Specifications)

Cables

CROSS SECTION
TYPICAL SEALED SLOT

INSTALLATION OF LOOP CABLE ACROSS HYDRAULIC CEMENT CONCRETE PAVEMENT JOINTS

LOOP DETECTOR INSTALLATION DETAILS
VIRGINIA DEPARTMENT OF TRANSPORTATION

1301-45
Notes:
The top of the 1" PVC conduits shall be installed 1" below the bottom of the saw cuts.
Plastic bushings shall be installed on the ends of the conduits in the pavement. Duct seal shall be applied to the open end of the bushing.
Saw slots shall intersect with the holes drilled for installation of the conduits and loop cables. Drilled holes shall be no larger than required for installation of the conduit and plastic bushing. Removal of large sections of pavement to perform this work will not be allowed.
One PVC conduit shall be provided for each saw slots.
Angle of drill for installation of conduit and loop cable shall be approximately 45°.

All dimensions not shown shall be as specified on the plans.

* Twisted together with a minimum of ten turns per running meter.
INSTALLATION DETAILS FOR MULTILANE MAGNETIC DETECTORS

TD-2

TYPICAL MAGNETIC DETECTOR LOCATIONS

CURB OR CURB AND GUTTER SECTION

MAGNETIC DETECTOR INSTALLATION DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
PLAN VIEW
(FRAME AND COVER REMOVED)

JUNCTION BOX

VIRGINIA DEPARTMENT OF TRANSPORTATION

Notes:

- J-hook wire supports shall be securely attached to the junction box with a bolt and nut with a neoprene washer or an expansion fitting.
- 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 grounding electrode 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.

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>DIMENSIONS</th>
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<tbody>
<tr>
<td></td>
<td>E</td>
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<tr>
<td>JB-1A</td>
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<td>JB-2A</td>
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<td>JB-3A</td>
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<td>JB-4A</td>
<td>20&quot;</td>
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<tr>
<td>JB-5A</td>
<td>27&quot;</td>
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</tbody>
</table>

#4 bars @ 12" c-c

#6B, #7B, #8 aggregate or crushed glass meeting #7B or #8 gradation requirements. 12" sq. x 24" depth (dimension vary according to detail "A").

Concrete collar
Class A3

Grounding conductor

J-hook wire support 6" below top on all walls

Grounding electrode

2" Dia. drain

Bond to frame
(Do not attach to the frame bolt hole)
Notes:
The cover shall have a non-skid surface with letters cast in the depression on top. The letters "VDOT ELECT", "VDOT RAIL", "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 3/4" hex head bolts are required for each cover. Bolts shall be located at each corner or center of each side of cover.

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<td>9 1/2&quot;</td>
<td>1/2&quot;</td>
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</tbody>
</table>
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.
**Notes:**

Conduit entrances shall be located as shown on the plans.
Bell ends shall be installed on the ends of PVC conduits.
Grounding bushings shall be installed on the ends of metal conduits.
Bell ends 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 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 TRAFF", "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.

---

**JUNCTION BOX**

**VIRGINIA DEPARTMENT OF TRANSPORTATION**
Notes:

Finish: Galvanized in accordance with Section 233 and coated (outside) except the cover with an approved mastic.

Material: Box 1/4" steel plate & cover 1" steel plate 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
METHOD OF OFFSETTING CONDUIT

d = Width of offset

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.

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.

PAVEMENT AREA INSTALLATION

INSTALLATION OF ELECTRICAL CONDUIT AND CONDUCTOR CABLE (UNDERGROUND INSTALLATION)

VIRGINIA DEPARTMENT OF TRANSPORTATION

1301.53
PHASING DIAGRAM

SIGNAL HEAD

COLOR SEQUENCE CHART

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 in accordance with Standard SE-2 and WS-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.

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 WO-2 and WO-5, respectively.

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

TYPICAL ONE-WAY BRIDGE
TEMPORARY SIGNAL INSTALLATION

VIRGINIA DEPARTMENT OF TRANSPORTATION
TYPICAL DETAILS FOR STANDARD WOOD POST STRUCTURE TYPES

Virginia Department of Transportation
SIDE VIEW

Bore holes shall be thoroughly saturated with a water-borne preservative conforming to Section 236 of the Road and Bridge Specifications.

6" x 6" wood post requires two 2" bare holes.

6" x 8" wood post requires two 3" bare holes. Posts less than 6" x 6" do not require bare holes.

FRONT VIEW

WOOD POSTS

Nylon Washer
3/8" x 3"
lag bolt
Sign Face

Wood post

Nylon Washer
3/8" - 2024-T351
Aluminum Bolt
Sign Face

Notes:
Nylon washer shall be 1/8" thick minimum with an outside diameter of 1" cnc on inside diameter of 3/8".
To obtain a flush mounting surface for signs, all wood shall be mortised where necessary, to receive flange of aluminum angle.

ALUMINUM FRAMING

2024-T4 Aluminum Washer and 6262-T9 Aluminum Hex Nut

2" x 2" x 1/4"
Aluminum Angle Aluminum 6061-T6

FLAT CUT

4" x 4" or

All other size posts

PYRAMIDAL CUT

4" x 4"

Other size posts of equal dimensions

SIGN PANEL ATTACHMENT DETAILS

(For Sign Panel Attachment To Z Bars, See Standard SPD 1)

TYPICAL DETAILS FOR STANDARD WOOD POST STRUCTURE TYPES

VIRGINIA DEPARTMENT OF TRANSPORTATION
**INSTALLATION DETAILS**

**SINGLE POST INSTALLATIONS**

- Wood Post
- Ground Line
- Concrete
- Wood Post
- Standard Illuminous Mix Type S-4

**Notes:**
Minimum spacing between two 4" x 4" wood posts shall be 3'. Minimum spacing between any other two size posts shall be 8'.

**MULTI-POST INSTALLATIONS**

**PERMANENT SIGN INSTALLATIONS**

**MINIMUM MOUNTING HEIGHT (in) (See Note 1)**

<table>
<thead>
<tr>
<th>Sign Types</th>
<th>Limited Access Highways</th>
<th>Non-Limited Access Highways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directional Signs</td>
<td>7'</td>
<td>5'</td>
</tr>
<tr>
<td>Route Markers, Warning and Regulatory Signs</td>
<td>6'</td>
<td>5'</td>
</tr>
<tr>
<td>Secondary Signs (See Note 2)</td>
<td>5' (See Note 3)</td>
<td>5' (See Note 3)</td>
</tr>
</tbody>
</table>

1. Mounting height may need to be greater than indicated in chart to provide the minimum height to the top of the sign for single post installations and the minimum height to the bottom of the sign for multi-post installations.

2. A secondary sign is considered to be a sign mounted below another sign except a route marking assembly consisting of a route marker with an auxiliary plate is considered to be a single sign.

3. Mounting height (in) of the major sign above the secondary sign shall be 8' minimum.

**CONSTRUCTION SIGN INSTALLATIONS**

**MINIMUM MOUNTING HEIGHT (in) (See Note 1)**

<table>
<thead>
<tr>
<th>Sign Types</th>
<th>Limited Access Highways</th>
<th>Non-Limited Access Highways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Signs (See Note 2)</td>
<td>6' (See Note 3)</td>
<td>6' (See Note 3)</td>
</tr>
</tbody>
</table>

1. Mounting height may need to be greater than indicated in chart to provide the minimum height to the top of the sign for single post installations and the minimum height to the bottom of the sign for multi-post installations.

2. A secondary sign is considered to be a sign mounted below another sign.

3. Mounting height (in) of the major sign above the secondary sign shall be 8' minimum.

**TYPICAL DETAILS FOR STANDARD WOOD POST STRUCTURE TYPES**

**1301.58**

**VIRGINIA DEPARTMENT OF TRANSPORTATION**
See Sheet '301.61 for Section C-C

See Sheet '301.58

** See sheet '301.62

** Signs shall be located to provide optimum viewing and safety within the indicated limits for later placement.

*** In cut slopes, the minimum distance between the top of the sign and the ground shall be 9' for any top mast sign within the clear zone. This requirement will not apply to signs located more than 10' up a slope greater than 3:1.

TYPICAL DETAILS FOR TYPE VA
SIGN STRUCTURES

VIRGINIA DEPARTMENT OF TRANSPORTATION
# Type VA-F

![Diagram of Type VA-F](image1)

# Type VA-G

![Diagram of Type VA-G](image2)

# Type VA-K

![Diagram of Type VA-K](image3)

## SUPPORT DETAILS

<table>
<thead>
<tr>
<th>STRUCTURE TYPE</th>
<th>SIGN PANEL DIMENSIONS</th>
<th>POST LENGTH DIMENSIONS</th>
<th>TEE 6061-T6 2.5 x 3.0 @ 1.75 lb/ft.</th>
<th>FOUNDATION DIMENSIONS</th>
<th>WELDED WIRE MESH</th>
<th>STEEL BASE PLATE</th>
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<tbody>
<tr>
<td>VA-B</td>
<td>4'</td>
<td>4'</td>
<td>1'-2'</td>
<td>1'-8'</td>
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<td>2'-6'</td>
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<td>2</td>
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<td>5'</td>
<td>3'</td>
<td>0'-8'</td>
<td>1'-8'</td>
<td>2</td>
<td>4</td>
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<tr>
<td>VA-E</td>
<td>6'</td>
<td>5'</td>
<td>1'-3'</td>
<td>2'-6'</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>VA-F</td>
<td>5'</td>
<td>1'-8'</td>
<td>13'-0'</td>
<td>4</td>
<td>1 each</td>
<td>2'-10&quot; &amp; 1'-4&quot;</td>
</tr>
<tr>
<td>VA-G</td>
<td>5'</td>
<td>5'</td>
<td>1'-3'</td>
<td>2'-6*</td>
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<td>VA-K</td>
<td>4'</td>
<td>2'</td>
<td>1'-2*</td>
<td>1'-8**</td>
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<td>VA-M</td>
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<td>4</td>
<td>2</td>
</tr>
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<td>VA-A, VA-AI</td>
<td>6'</td>
<td>3'</td>
<td>1'-3&quot;</td>
<td>5/8&quot;</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

*All post lengths shall be field checked by contractor prior to fabrication.

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## TYPICAL DETAILS FOR TYPE VA SIGN STRUCTURES

**Virginia Department of Transportation**

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**1301.60**
For Type VA-A, use \( \frac{1}{8} \)" Diameter High Strength Bolts with Hex Head, Hex Nut and 3 Washers each Stainless Steel or ASTM A325. Bolts to be installed with a torque of 155 inch lbs. for typical assembly, see Project Plans.

TYPICAL DETAILS FOR TYPE VA
SIGN STRUCTURES
VIRGINIA DEPARTMENT OF TRANSPORTATION
FOUNDATIONS

Section D-D

Maximum Projection of Sign Stub Post

1. Welded wire mesh lapped 90° minimum.
2. 4" maximum projection when measured above a 60" chord aligned radially to the centerline of the highway and connecting any point, within the length of the chord, on the ground surface on one side of the support to a point on the ground surface on the other side.
3. Requires two layers offset in both directions resulting in 3' square openings.

6 x 6 - MW 5.5 x MW 5.5

* 6 x 6 - 2/2 Welded Wire Mesh

Forms not required below ground.

Diameter

Ground Line

D

D

60°

Diagonal

3' Clear

Foundation Stab Post

Diameter
SHIM DETAIL

Furnish 2 @ 0.63” thick and 2 @ .032” thick shims per post. Shims shall be fabricated from brass conforming to ASTM B36M or from stainless steel with a minimum chromium content of 11.50%. No more than 2 shims shall be used per bolt with a maximum of 4 shims per post.

POST CLAMP DETAIL

Gavanized Gray - Iron or Aluminum Casting
Centerline Hole for 3/8” diameter Square Head Stainless Steel Bolt x 2 1/4” long with Self-locking Nut and one Flat Washer.
Serrate 3/8” Deep at 5/6” Centers
3/8” or 5/6” Leg of Clamp is for adjustment to Post Flange

TYPICAL DETAILS FOR TYPE VA
SIGN STRUCTURES

Virginia Department of Transportation

REV. 7/05
REV. 4/04
TYPE VA-A2

NOTES:
There is to be a maximum space of 1" between signs.
Cardinal directions are to be centered above shields.
For details of shims, tee bars, clamps, and other notes, see standard 1301.63.

TYPICAL DETAILS FOR TYPE VA
SIGN STRUCTURES
VIRGINIA DEPARTMENT OF TRANSPORTATION
BOLT KEEPER PLATE

BOLT KEEPER PLATE DATA

<table>
<thead>
<tr>
<th>POST SHAFT</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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<td>S3 x 5.7</td>
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<td>7 1/4&quot;</td>
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<td>3/4&quot;</td>
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<td>3 1/2&quot;</td>
</tr>
<tr>
<td>W6 x 12</td>
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<td>7&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>3 1/2&quot;</td>
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</tbody>
</table>

ALTERNATE BOLT KEEPER PLATE

Hole Dia = Bolt Dia + 1/16"
TYPES VA-B, VA-C, VA-D, VA-L AND VA-M

STIFFENER TO POST ATTACHMENT DETAIL

STIFFENERS TO POST ATTACHMENT DETAIL

TYPES VA-E

TYPES VA-F

TYPES VA-G

TYPES VA-K

MEDIAN STIFFENER DETAIL

See Standard SSP-VIA for post clamp and bolt details. See sheets 1301.59 thru 1301.63 for further details.

Note:
Rivets shall be used for securing the stiffeners to the sign unless otherwise specified or approved, and shall be 3/4" minimum diameter by 1/2" long aluminum and capable of withstanding a minimum shear force of 480lbs. Rivet spacing for attaching the stiffeners to the sign panel shall be 6" maximum beginning 1/2" from the ends of the sign panel.
The spacing between sign posts shall be a minimum of 8' center to center. *Signs shall be located to provide optimum viewing and safety within the indicated view limits for lateral placement.

In cut slopes, the minimum clearance between the bottom of the sign and the ground shall be 7" for any portion of the sign within the clear zone. This requirement will not apply to signs or portions of signs located more than 10' up a slope greater than 3:1.

For Sign Panel Designs see Standard SPD-1

Max Slope 2:1

For Sign foundation details see standard 1301.70

---

**ISO METRIC VIEW**

- Zee Bar
- Backing Strip
- Tee Bar
- Sign Post
- Rivet
- Post clamp

**SHIM DETAIL**

Furnish 2 each .063" and 2 each .032" mm thick shims per pole. Shims shall be fabricated from brass conforming to ASTM B36 or from stainless steel with a minimum chromium content of 1150%. No more than 2 shims shall be used per bolt with a maximum of 4 shims per pole.

**STIFFENER PLATE DETAIL**

Plate thickness t₂

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**TYPICAL DETAILS FOR TYPE VIA INTERSTATE SIGN STRUCTURE**

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 7/05
REV. 4/04

1301.67
SIGN POST AND FOUNDATION STUB POST ELEVATION

Furnish 2 each 3/8" galvanized bolt with hex head, hex nut and 2 washers for each bolt.

Type B Zee bar
Top of sign
Field Drill Zee and Post for 3/8" bolts.
Post clamp typical
For details see SSP-VA.

Extruded Aluminum Tee
For details see SSP-VA.

Bottom of sign panel shall be at least 1" + 3/4" above top of friction fuse plate.

Payment limit for Sign post
Remove all galvanized runs or beads in washer area.

H. S. Bolt with Hex. head, Hex. nut and 3 washers with each bolt.
See Plans for bolt diameter and Torque.

Post lengths shown on plans are typical for a 2:1 slope. All post lengths shall be field checked by contractor prior to fabrication.

SECTION A-A

SECTION B-B

DETAIL A

H. S. Bolts conforming to Section 226.02(1). Tighten bolts according to Section 407.06(1) of the Road and Bridge Specifications.

Friction Fuse Plate install with notches toward base.

Direction of Traffic
**ZEE BARS**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>SIZE</th>
<th>WEIGHT</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>2 3/4&quot; x 1/4&quot; x 1/4&quot;</td>
<td>1.00 lbs/ft.</td>
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<tr>
<td>B</td>
<td>3&quot; x 2 3/4&quot; x 1/4&quot;</td>
<td>2.40 lbs/ft.</td>
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<tr>
<td>C</td>
<td>4&quot; x 3/8&quot; x 1/4&quot;</td>
<td>2.93 lbs/ft.</td>
</tr>
<tr>
<td>D</td>
<td>5&quot; x 3/4&quot; x 1/4&quot;</td>
<td>4.13 lbs/ft.</td>
</tr>
<tr>
<td>E</td>
<td>6&quot; x 3/2&quot; x 1/4&quot;</td>
<td>5.58 lbs/ft.</td>
</tr>
</tbody>
</table>

**NOTES:**

Use H.S. bolts with hexagon head and hexagon nut, one flat washer under each bolt head and beveled flat washer, where required, under nut. Tighten in accordance with section 407.66 of the Road and Bridge Specifications.

**BOLT KEEPER PLATE**

**ALTERNATE BOLT KEEPER PLATE**

**TYPICAL DETAILS FOR TYPE VI A**

**INTERSTATE SIGN STRUCTURES**

VIRGINIA DEPARTMENT OF TRANSPORTATION
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**TYPICAL VIA FOUNDATION DETAILS**

*Virginia Department of Transportation*
See Standard SPD-1 for sign panel design. See sheets 1301.67 thru 1301.70 for other details.
SPAN STRUCTURE

HAND HOLE AND COVER 4" x 8" MINIMUM.

COPE TOP OF PEDASTAL

WIRE INLET (TYPICAL). SEE NOTE 1.

VERTICAL CLEARANCE (SEE NOTE 6)

GUARDRAIL

HIGHEST POINT IN ROADWAY

EDGE OF SHOULD

CANTILEVER STRUCTURE

POLE ARM CONNECTION

1/2" DIAMETER WIRE INLET INSTALL ON SIDE OPPOSITE TRAFFIC.

1/2" DIAMETER WIRE INLET AT CENTERLINE OF SIGN PANEL, BEHIND FIRST SIGN ONLY.

HAND HOLE AND COVER 4" x 8" MINIMUM.

VARIABLE

GUARDRAIL

HIGHEST POINT IN ROADWAY

END ELEVATION

NOTES:

1. 1/2" diameter wire inlets shall be provided at the following locations:
   A. On span structures on the front leg of end pole 12" below bottom chord.
   B. On cantilever structures on pole 12" below bottom chord.
   C. On span structures below bottom chord at centerline behind first sign panel from each end pole.
   D. On cantilever structures below bottom chord at centerline behind first sign panel from pole.

2. All unused wire inlets shall be capped water tight.

3. Distance shall be no less than the minimum indicated in Standard OR-INS.

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

5. The maximum space between the bottom of the base plate and the top of the foundation shall be no more than the diameter of the anchor bolt plus one inch.

6. Vertical clearance for overhead and bridge mounted sign structures shall be no less than 5.8 meters and no more than 6.4 meters from the bottom of the lowest mounted sign panel to the crown of the roadway, unless otherwise specified on the plans. Luminaire assemblies shall have a vertical clearance of no less than 3.5 meters from the bottom of the assembly to the crown of the roadway.

7. All poles/urplights of overhead sign structures including "butterfly" structures shall have a minimum of six anchor bolts, each having a minimum diameter of 1/2". Anchor bolts shall be cast in place. Adhesive anchors with epoxy or non-shrink grout shall not be allowed.
ELECTRIC DETAILS FOR SIGN LIGHTING

SPAN SIGN STRUCTURE

FRONT VIEW

SECTION A-A

Photoelectric Control
Service Entrance Head
Rigid Metal Conduit
Safety Switch
Contactor
Liquid Tight Flexible Metal Conduit

CANTILEVER SIGN STRUCTURE

FRONT VIEW

SECTION B-B

Photoelectric Control
Service Entrance Head
Rigid Metal Conduit
Safety Switch
Contactor
Rigid Metal Conduit

Note:

A safety switch shall be installed on all sign structures requiring electrical power. Electrical service for sign structures not controlled by a control center shall have a photocell and a photocell-controlled contactor to control the electrical power to luminaires. The contactor shall be in a NEMA 3R enclosure within 24 inches of the safety switch.

All conduit located in or on an overhead sign structure shall be 3/4" minimum.
SIGN HANGER ERECTION DETAIL WITH LUMINAIRE RETRIEVAL SYSTEM

Aluminum sign hanger W4 x 3.06 placed no greater than 2' 3" from the left and right edges of sign panel and then spaced 4' 6" o.c. maximum.

Top of sign shall be tilted towards traffic so that the sign face is 3" from vertical.

Aluminum Z bar

1/4" Gusset

6"

SECTION A-A

1/8" diameter Aluminum bolts, nuts and flatwashers

Z Bar

Chord

2 1/4"

Sign hanger

1/8" S. S. U-Bolts, nuts and flatwashers

SECTION B-B

For Sign Panel Details, See Standard SPD-1

1/8" Aluminum bolt, nut and flatwasher.

Sign Hanger

TYPICAL DETAILS FOR OVERHEAD SIGN STRUCTURES

VIRGINIA DEPARTMENT OF TRANSPORTATION

Note:
Luminaire Retrieval System including electrical system shall be equal to "LUM-TRAK" and designed for the number of luminaires indicated on the plans. Spacing of hangers used to support the retrieval system shall be in accordance with manufacturer's recommendations. Turntable and shall be of sufficient length to align with the vertical edge of the outside paved shoulder (48") or shall be extended 5 feet beyond the vertical edge (46") of the outermost sign luminaire whichever is greater. The opposite end of retrieval system shall extend a minimum of 6 inches past the outermost vertical edge of the sign hanger arm.

Luminaires and Luminaire Retrieval System required only where indicated on the plans.
SIGN HANGER ERECTION DETAIL WITH LUMINARE

(When no Luminare Retrieval System is Required)

Aluminum sign hanger W4 x 3.06 placed no greater than 2' 3" from the left and right edges of sign panel and then spaced 4' 6" o.c. maximum.

Top of Sign shall be tilted towards traffic so that the sign face is 3° from vertical.

SIGN ATTACHMENT TO TRUSS-TYPE STRUCTURES

SECTION A-A

3/8" diameter Aluminum bolts, nuts and flatwashers.

Z Bar

Chord

2 1/4"

Sign hanger

1/2" S.S. U-Bolts, nuts and flatwashers

SECTION B-B

For Sign Panel Details, See Standard SPD-1

3/8" Aluminum bolt, nut and flatwasher

SECTION D-D

Luminare Mounting Bracket (1/8" thick, sized to fit luminare)

Luminare

3/4" Gusset

Section

TYPICAL DETAILS FOR OVERHEAD SIGN STRUCTURES

VIRGINIA DEPARTMENT OF TRANSPORTATION
TYPICAL SIGN FOOTING DETAIL WITH CONDUIT

NOTES:

The type, size, number and orientation of conduits entering and exiting footings may vary per sign location.

In addition to the conduits specified on the plans, one - 1" conduit required for ground wire and two - 2" PVC heavy wall conduits required for future use. Future use conduits shall be stubbed out and capped. Future use conduits shall be oriented to run parallel to the roadway. For location of future use conduits in foundations for double end pole structures, see drawing at right.

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 1/8" deep and 4" to 6" long. Locations of empty conduits shall have an additional 2" long mark made perpendicular to and centered on this mark.

Foundations above finished grade shall be chamfered 3/4" on all edges.

Grounding bushings shall be installed on each end of metal conduits.

Bellends shall be installed on each end of PVC conduits.

Bellends & bushings of empty conduits shall be plugged to prevent moisture and rodent entry.

Voids remaining after conductors exit or enter bellends 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.

LOCATION OF FUTURE USE CONDUITS FOR DOUBLE END POLE STRUCTURES

* Future use conduits placed parallel to the roadway

** Future use conduits placed at an angle to miss the back foundation or anchor bolts in a spread footing foundation.

The maximum space between the bottom of the base plate and the top of the foundation shall be no greater than the diameter of the anchor bolt plus one inch.

Overhead sign structures including "butterfly" structures shall have a minimum of six anchor bolts, each having a minimum diameter of 1/2".
NOTES:

The vertical and horizontal conduit runs shall be supported at 10’ intervals for metal conduits and 5’ intervals for PVC conduits all bends shall be supported within a minimum of 12” on each side of bend.

Conduit clamps shall be designed for the size and type of conduit indicated. The expansion anchor bolt shall be galvanized or stainless steel, 1/4” diameter embedded a minimum length of 2” with a minimum tensile pullout strength of 500 Lbs. Conduit clamps shall be located 4” minimum from the drip bead.
TYPICAL FOR PRESTRESSED CONCRETE BEAM

For details see standard SPD-1

H.S. Bolts
Neoprene Gasket
Anchors

See Note 1.

1/8"
8" Min. Clearance
H.S. Bolts

Bar

Luminare Support Channel

6" Min.
Clearance

41'-0"

2'

4'

This parapet is not typical for bridges with a sidewalk. Bridge plans shall be reviewed for project specific parapet/rail.

NOTES:

1. The size of members and weld sizes shall be designed by the contractor for the sign to be supported. Minimum size fillet weld shall be 1/4".

2. Minimum clearances are as specified by AASHTO or approved by the Virginia Department of Transportation.

3. For attachment to concrete superstructures or to painted or galvanized steel superstructures, supporting frame may be either aluminum or galvanized steel. For attachment to unlined weathering steel superstructures, the supporting frames shall be with weathering steel.

4. The spacing of zees and supports shall be as shown on the plans.

5. Sign supports shall be braced for lateral forces.

6. Bolts shall be High-Strength ASTM A325, galvanized except when attachment is made to unlined weathering steel in which case bolts shall be ASTM A325 Type 3. Anchors shall be cast-in-place. Thru-bolting may also be used for attachments to parapets. When cast-in-place anchors are used, they shall develop the strength of the bolts. When thru-bolting is used, anchorage on the traffic side of the parapet shall be flush with the parapet face. Anchors shall be placed no higher than 3" above top of deck slab. Adhesive anchors (with epoxy or non-shrink grout) shall not be allowed.

7. When required by the plans bridge mounted sign structure luminaires shall be installed on a luminaire retrieval system with supports and electrical system designed for track mounted luminaires. Retrieval system including the electrical system shall be equal to "LUMI-TRAK" and designed for the number of luminaires as indicated on the plans. Spacing of hangers used to support the retrieval system shall be increased to a maximum 7-foot distance only where hangers do not support sign panels. Turntable end of retrieval system shall be of sufficient length to align with the vertical edge of the outside paved shoulder (16") or shall extend five feet beyond the vertical edge (16") of outermost sign luminaire whichever is greater. The opposite end of retrieval system shall extend a minimum of 6 inches past the outermost vertical edge of the sign hanger arm. Luminare support channels and associated equipment will not be required with the luminare retrieval system.

TYPICAL FOR STEEL BEAM/GIRDER

For details see Standard SPD-1

H.S. Bolts
Neoprene Gasket
Anchors

See Note 1.

Bridge plans shall be reviewed for project specific parapet/rail.

TYPICAL BRIDGE PARAPET SIGN MOUNTING DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
Signs having a height greater than 10' may have one horizontal joint. Horizontal joint shall be between lines of message.

**SECTION A-A**

**ALL INSTALLATIONS EXCEPT TOP AND BOTTOM ZEE BARS ON OVERHEAD SIGNS**

3/8" diameter rivet - Rivets shall be dome head, blind mandrel, blind rivets conforming to Industrial Fasteners Institute Standard IFI-M14, Style 1. Grades 10 or 11 except that the minimum ultimate tensile strength shall be 360 pounds. Rivets shall have a grip range accommodating the combined thickness of the sign panel and zee bar and shall be installed in accordance with the manufacturer's recommendations.

**SIGN FACE**

Zee bar 6061-T6 aluminum alloy

**SECTION B-B**

**TOP AND BOTTOM ZEE BAR INSTALLATION ON OVERHEAD SIGNS**

ASTM, F593, Alloy 304 stainless steel 3/16" diameter - 1/8" x 1" length carriage bolt with stainless steel nut and flat washer

**SIGN FACE**

Zee bar 6061-T6 aluminum alloy

**0.100" Thick aluminum backing strip (Material same as sign panel)**

**Rivet** (same as used for connecting sign to zee bar). In lieu of using rivets, tape equal to 3M's VHB Double Coated Acrylic Foam Tape may be used except on horizontal backing strip. Tape shall be installed in accordance with the manufacturer's recommendations.
TYPE ONE PANEL CLIP DETAIL

* Use 380 for Type D and E Zee Bars

BACKING STRIP DETAIL

* Use 380 for Type D and E Zee Bars
Rivets used for securing the stiffeners and splice plate to the sign, and the large stiffener splice bar to the large stiffener, shall be \( \frac{3}{4}'' \) minimum diameter by \( \frac{1}{2}'' \) long aluminum and capable of withstanding a minimum shear force of 460 lbs. Rivet spacing for attaching the stiffeners to the sign shall be 6'' maximum beginning 1 1/2'' from the ends of the sign panel. Rivet spacing for attaching the large stiffener splice bar to the large stiffener shall be 3'' beginning 1 1/2'' from the ends of the splice bar. Rivet spacing for attaching the splice plate shall be based on stiffener spacing in accordance with the following:

<table>
<thead>
<tr>
<th>Stiffener spacing</th>
<th>Splice plate rivet spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>6''</td>
<td>3''</td>
</tr>
<tr>
<td>7''</td>
<td>4''</td>
</tr>
<tr>
<td>8''</td>
<td>5''</td>
</tr>
<tr>
<td>9'' or greater</td>
<td>6''</td>
</tr>
</tbody>
</table>

Use the above sign panel detail for "c" and "d" spacing when the "c" dimension for alternate sign panel attachment details is "0" or 1/2".

**VERTICAL SPLICING DETAIL**
The maximum number of splices in a stiffener shall be one per stiffener location.

Splices shall not be in a vertical alignment but shall be offset 2" from each other.
Notes:

Driving cap to be used when driving post.

Panel to be fabricated of ASTM B209 alloy 6061-T6 or 5052-T138, 0.080 thick.

Top of panel to be flush with top of post.

Erection

Milepost markers to be located in line with delineator posts, edge of shoulder or back of guardrail, if present.

<table>
<thead>
<tr>
<th>D10-4</th>
<th>D10-5</th>
<th>D10-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
</tr>
</tbody>
</table>

Curb face to sign edge:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>4&quot;</td>
<td>4&quot;</td>
</tr>
</tbody>
</table>

Pavement top to sign bottom:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>4&quot;</td>
<td>4&quot;</td>
</tr>
</tbody>
</table>

Curb top to sign bottom:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>93&quot;</td>
<td>93&quot;</td>
<td>93&quot;</td>
</tr>
</tbody>
</table>

Sign face to pavement edge:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>93&quot;</td>
<td>93&quot;</td>
<td>93&quot;</td>
</tr>
</tbody>
</table>
**NOTES:**

Standard ED-1 delineators consist of reflectorized sheathing, cut to a 3" by 8" vertical rectangle, mounted on a backing of aluminum alloy, not less than 0.063 thick conforming to ASTM B209, alloy 6061-T6 or 5052-H38. The color of the reflective sheathing shall, in all cases, conform to the color of the edgelines.

The reflectors are attached to wood posts with a minimum of two nails or screws produced from alloy 2024-T4 or 6061-T6.

The posts above the ground are painted white with number 11 white paint.

Posts are treated with a water-borne preservative in accordance with Section 236 of the Road and Bridge Specifications.

The top of the posts may have a flat, shed, or pyramidal cut; however, they shall be uniform throughout a project. Cuts shall be in accordance with Standard WSIP-1.

---

**NOTES:**

Special delineators are made from aluminum alloy, not less than 0.080 thick conforming to ASTM B209, alloy 6061-T6 or 5052-H38.

Delineators extend 1" above the top of the post.

Delineators are reflectorized, and in all cases, the color shall conform to the color of the edgelines, alternating with a black stripe.

The stripes shall slope down toward the center of roadway.

Delineators are mounted on U-Type posts fabricated from rolled-steel 1.33 lb./ft. minimum.

The bottom of the delineator panel is 12" above the pavement edge elevation.
NOTES:

Road edge delineators are to be erected two feet beyond the outer edge of the shoulder or the face of unmountable curbs.

D-1 delineators shall be placed on the right of through roadways at 528 foot spacing with the following exceptions:

- Tangent roadways where pavement markers are installed will not require the installation of delineators.
- Locations where delineators are installed on guardrails, parapets or barriers on the right of the roadway will not require the installation of road edge delineators.

D-1 delineators shall be placed on at least one side and on the outside curve of interchange ramps except where delineators are installed on guardrails, parapets or barriers. The spacing along the ramps shall be at 100' intervals except in horizontal curves where the spacing shall conform to the chart on SPACING FOR HIGHWAY DELINEATORS.

D-2 delineators shall be placed on acceleration and deceleration lanes at 100' spacing.

The color of delineators shall conform to the color of the edgelines.

**SPACING FOR HIGHWAY DELINEATORS ON HORIZONTAL CURVES**

Distance in feet rounded to the nearest 5'.

<table>
<thead>
<tr>
<th>RADIUS OF CURVE IN FEET</th>
<th>SPACING ON CURVE IN FEET</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>150</td>
<td>30</td>
</tr>
<tr>
<td>200</td>
<td>35</td>
</tr>
<tr>
<td>250</td>
<td>40</td>
</tr>
<tr>
<td>300</td>
<td>50</td>
</tr>
<tr>
<td>400</td>
<td>55</td>
</tr>
<tr>
<td>500</td>
<td>65</td>
</tr>
<tr>
<td>600</td>
<td>70</td>
</tr>
<tr>
<td>700</td>
<td>75</td>
</tr>
<tr>
<td>800</td>
<td>80</td>
</tr>
<tr>
<td>900</td>
<td>85</td>
</tr>
<tr>
<td>1000</td>
<td>90</td>
</tr>
</tbody>
</table>

Spacing for specific radius not shown may be interpolated from table. The minimum spacing should be 20'. The spacing on curves should not exceed 300'. In advance of or beyond a curve, and proceeding away from the end of the curve, the spacing of the first delineator is 25', the second 35' and the third 65' but not to exceed 300'. 5 refers to the delineator spacing for specific radii computed from the formula S = 3√R - 50.'
LIMITED ACCESS LANE DROP EXIT RAMPS
BESIDE CHOICE LANE THRU / EXIT

* Standard skip stripe

Elephant tracks 8" white

8" white

Yellow

Variable

Theoretical gore

Physical gore

4" white

4" yellow

Exit Ramp

Elephant tracks should be placed a minimum of 1/2 mi, up to a maximum distance to begin at the point where the first notice of the lane drop is signed.

200' - 8" solid white line should be installed in advance of the theoretical gore

LIMITED ACCESS LANE DROP EXIT RAMPS

* Standard skip stripe

Elephant tracks 8" white

8" white

Yellow

Variable

Theoretical gore

Physical gore

4" white

4" yellow

Exit Ramp

Elephant tracks should be placed a minimum of 1/2 mi, up to a maximum distance to begin at the point where the first notice of the lane drop is signed.

200' - 8" solid white line should be installed in advance of the theoretical gore

* The pavement marking for the mainline of Interstate Highways shall be 6" wide; all other highways the pavement marking shall be 4" wide unless otherwise noted on the plans.

STANDARD ELEPHANT TRACKS

0.5 12' 0.5 12' 0.5 6'

300' optional solid white line

TYPICAL PAVEMENT MARKING DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 2/06

1301.87
TURN LANE ARROWS

Turn arrows required in accordance with the following, unless otherwise directed by the Engineer.

TURN LANE LENGTH

30' or longer: 3 arrows

1 Arrow located at beginning of full width turn lane.
1 Arrow located at midpoint of full width turn lane.
1 Arrow located 50' back from stopbar or end of lane line.

300' or less: 2 arrows

1 Arrow located at beginning of full width turn lane.
1 Arrow located 50' back from stopbar or end of lane line.

10' White Skip line

Solid white line at the beginning of the radius.

30' Spacing

2' White skip line

4' Spacing

No edge line required where curb and gutters present unless indicated by the Engineer.

Notes:

Stop bars, if required by the Engineer, shall be a minimum of 4' in advance of the crosswalk. In the absence of a marked crosswalk, the stop bar shall be a minimum of 4' and a maximum of 30' in advance of the nearest edge of the intersecting roadway. Stopbars shall be 2" in width. Arrows shall be in accordance with the Federal MUTCD. Spacing between double solid yellow lines shall be 4".

SKIPS

Thru lanes: use 10' skips / 30' spacing. Transitions more than 100' use miniskips (2' skips / 4' spacing). Transitions 100' or less: do not use skips.

DETAIL FOR LOCATION OF EDGE LINES ON CURB SECTIONS OF ROADWAY (NO GUTTER)

4" Marking

No edge line required where curb and gutters present unless indicated by the Engineer.
TURN LANE ARROWS

Turn arrows required in accordance with the following, unless otherwise directed by the Engineer.

TURN LANE LENGTH

30' or longer: 3 arrows
1. Arrow located at beginning of full width turn lane.
1. Arrow located at midpoint of full width turn lane.
1. Arrow located 50' back from stopbar.

300' or less: 2 arrows
1. Arrow located at beginning of full width turn lane.
1. Arrow located 50' back from stopbar.

SKIPS

Thru lanes: use 10' skips / 30' spacing.
Transitions more than 100': use mini-skips (2' skips / 4' spacing).
Transitions 100' or less do not use skips.

10' White Skip line
30' Spacing

2' White Skip line
4' Spacing

4' Marking

No edge line required where curb and gutters present unless indicated by the Engineer.

DETAIL FOR LOCATION OF EDGE LINES ON CURB SECTIONS OF ROADWAY (NO CUTTER)

No edge line required where curb and gutters present unless indicated by the Engineer.

TYPICAL PAVEMENT MARKING FOR SIGNALIZED INTERSECTIONS

VIRGINIA DEPARTMENT OF TRANSPORTATION

Notes:

Stop bars shall be 2" in width and shall be located as shown on the traffic signal plans.
Arrows shall be in accordance with the Federal MUTCD.
Spacing between double solid yellow lines shall be 4".
Note:
Method used shall be as directed by the Engineer.

- 2' wide Yellow Diagonal Line @ 45°
- 2' White skip line
- 4' Spacing

Solid yellow line to be 3' width followed with 12' space and one 2' solid yellow diagonal line.

Additional 2' solid yellow diagonal lines at 45° shall be used with 12' spaces if required by the Engineer.

TYPICAL PAVEMENT MARKING
LEFT TURN PAVEMENT MARKED MEDIAN

VIRGINIA DEPARTMENT OF TRANSPORTATION
TYPICAL PAVEMENT MARKINGS FOR
BIKE LANE

VIRGINIA DEPARTMENT OF TRANSPORTATION

NOTES:

- Pavement markings consisting of arrow and bicycle lane symbols shall be placed at the beginning of the bicycle lane at right turn lanes. They shall also be placed at the end of the bicycle lane at right turn lanes if the solid white line separating the bicycle lane from the right turn lane is greater than 300 in length.

- Bicycle lane symbols shall be placed a minimum of 500 apart.

- The bicycle lane stripe shall be 4" from the edge of pavement on curb & gutter roadways unless otherwise noted on the plans or existing markings indicate otherwise. (Contact Mobility Management Division if additional guidance is required.)

- The bicycle lane stripe shall be 5" from the face of curb on roadways without curb & gutter unless otherwise noted on the plans or existing markings indicate otherwise. (Contact Mobility Management Division if additional guidance is required.)

- On asphalt roadways where the bicycle lane is beside curb and gutter and the asphalt portion of the bicycle lane is of insufficient width to allow placement of the bicycle symbol entirely on the asphalt, the symbol shall be reduced in size to fit entirely on the asphalt. The bicycle symbol shall be reduced to no less than 4" in height at these locations.
Width may vary according to lane width.

A portion of the pavement marking symbol should be directly opposite the advance warning sign (W10-1). If needed, supplemental pavement marking symbol(s) may be placed between the advance warning sign and the crossing, but should be at least 50' from the stop line.

Markings shall be installed at grade crossing which conform to the requirements of the MUTCD and as directed by the Engineer.

A three lane roadway should be marked with a centerline for two - lane approach operation on the approach to a crossing.

On multi-lane roads the transverse bands should extend across all approach lanes, and individual RR symbol should be used in each approach lane.

Refer to standard alphabet for highway signs and markings for RR symbol details.
FIVE LANE - CENTER LANE LEFT TURN ONLY

DIVIDED ROADWAYS

NOT TO SCALE

GENERAL PLACEMENT:

Markers adjacent to solid line

Markers in a skip line

Pavement Marking

Notes:

Exact locations of the markers shall be approved by the Engineer prior to installation.

Typical spacing is 40' c-c when used adjacent to a solid line and 80' when used in conjunction with a skip line except that on horizontal curves at 4° or more, the spacing along skip lines and channelizing lines adjacent to turn lanes can be reduced by 1/2 as shown on the plans or as directed by the Engineer.

KEY:

Φ Two way

< One way

TYPICAL PAVEMENT MARKER LOCATION DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
EXIT RAMP

See Note
20" c to c spacing

Note:
Markers to be installed a minimum of 80" beyond physical gore.

NO PASSING

NOT TO SCALE

ENTRANCE RAMP

See Note
20" c to c spacing

Note:
Markers to be installed a minimum of 80" beyond physical gore.

PASSING TWO DIRECTIONS

NOT TO SCALE

PASSING ONE DIRECTION

40" c to c

80" c to c

TYPICAL PAVEMENT MARKER
LOCATION DETAILS

VIRGINIA DEPARTMENT OF TRANSPORTATION
PROCEDURE FOR USING TABLES:

1. Select minimum mounting height to be used (5'-0" or 7'-0").
2. Determine slope of ground line (level, 1/2: 1 or 2:1).
3. Decide on number of posts to be used (single, two or three).
4. Calculate the area of each sign panel \( A_1, A_2, A_3, \ldots, A_n \).
5. Calculate the centroidal distance for each sign panel \( H_1, H_2, H_3, \ldots, H_n \).
   - The centroidal distance is the vertical distance from the reference point on the ground line to the center of each sign panel.
6. Calculate the centroidal distance \( H \) for the entire sign panel group:
   \[
   H = \frac{(A_1 \times H_1 + A_2 \times H_2 + A_3 \times H_3 + \ldots + A_n \times H_n)}{(A_1 + A_2 + A_3 + \ldots + A_n)}
   \]
7. Enter the appropriate table based on:
   - the minimum mounting height selected in step 1
   - the ground slope select in step 2
   Pick the post sizes to be reviewed, and entering with the "H" value calculated in step 6, read the maximum area under the size of posts selected in step 3.
   - If the total area of sign panel(s) to be supported is less than or equal to that shown in the table(s), the size of the post(s) will be satisfactory.

Notes:
Reference point for calculating centroidal distance(s):
   - For single post: on ground line at intersection of post
   - For two-posts: on ground line, half-way between posts
   - For three posts: on ground line at intersection of center post

PROCEDURES FOR CALCULATING SIZE OF WOOD POSTS FOR PERMANENT & CONSTRUCTION SIGNS
VIRGINIA DEPARTMENT OF TRANSPORTATION
SAMPLE PROBLEM:

Given sign panels: 10'-0" X 5'-0", 6'-0" X 2'-0" (see layout)

Find: Size of post(s) that will be acceptable

1. Minimum mounting height: 7'-0"
2. Slope of ground line: 2:1
3. Area of sign panels: \( A_1 = 10.0 \times 5.0 = 50 \text{ sq. ft.} \)
\[ A_2 = 6.0 \times 2.0 = 12 \text{ sq. ft.} \]

4. \( H_1 = 11.5 \text{ ft} \)
\( H_2 = 15.0 \text{ ft} \)

\[
H = \frac{(A_1 \times H_1 + A_2 \times H_2)}{(A_1 \times A_2)} = \frac{(50 \times 11.5 + 12 \times 15.0)}{(50 + 12)} = \frac{755}{62} = 12.2 \text{ (ft)}
\]

Round up \( H \) to 12.5 (ft) (Tables are in 0.5 foot increments)

6. Using Table with 7'-0" min. mounting height and 2:1 ground slope, enter with \( H = 12.5 \) and use column for 2-posts:

The following maximum area (Total of sign panel(s) (ft\(^2\))) is indicated in the tables for the following post sizes:

<table>
<thead>
<tr>
<th>Post size</th>
<th>Maximum area (Total of sign panel(s) (ft(^2)))</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 x 4</td>
<td>---</td>
</tr>
<tr>
<td>5 x 5</td>
<td>18</td>
</tr>
<tr>
<td>4 x 6</td>
<td>22</td>
</tr>
<tr>
<td>6 x 6</td>
<td>35</td>
</tr>
<tr>
<td>6 x 8</td>
<td>64</td>
</tr>
</tbody>
</table>

The total area of sign panels is 62 sq. ft. The only post size that satisfies this requirement is the 6 x 8 post which has a maximum area of 64 sq. ft.
### DESIGN TABLE FOR WOODEN SUPPORTS

<table>
<thead>
<tr>
<th>Size of post</th>
<th>H (ft)</th>
<th>Maximum area (Total of sign panels) (ft²)</th>
<th>Single-post</th>
<th>Two-posts</th>
<th>Three-posts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Single-post</td>
<td>Two-posts</td>
<td>Three-posts</td>
</tr>
<tr>
<td>4” x 4”</td>
<td>8.0</td>
<td>7</td>
<td>13</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.5</td>
<td>6</td>
<td>13</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.0</td>
<td>6</td>
<td>12</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.5</td>
<td>6</td>
<td>11</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.0</td>
<td>5</td>
<td>11</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.5</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11.0</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11.5</td>
<td>5</td>
<td>9</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12.0</td>
<td>4</td>
<td>9</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

**For a single 4x4 post (construction sign installation only) the maximum total sign panel area can be increased to 16 square feet provided:**

1. The maximum clearance between the ground level and bottom of the sign panel does not exceed 7'-6" while maintaining a 7'-0" minimum mounting height between the bottom of the sign and the top of the pavement.
2. Contractor supplies Department with materials certification for wood posts to ensure conformance with Section 235.02(a) of the Road & Bridge Specifications.

### DESIGN TABLE FOR WOODEN SUPPORTS

<table>
<thead>
<tr>
<th>Size of post</th>
<th>H (ft)</th>
<th>Maximum area (Total of sign panels) (ft²)</th>
<th>Single-post</th>
<th>Two-posts</th>
<th>Three-posts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Single-post</td>
<td>Two-posts</td>
<td>Three-posts</td>
</tr>
<tr>
<td>4” x 6” (**)</td>
<td>8.0</td>
<td>18</td>
<td>37</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.5</td>
<td>17</td>
<td>35</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.0</td>
<td>16</td>
<td>33</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9.5</td>
<td>15</td>
<td>31</td>
<td>46</td>
<td></td>
</tr>
<tr>
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<td>10.0</td>
<td>15</td>
<td>29</td>
<td>44</td>
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</tr>
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</tr>
<tr>
<td></td>
<td>11.0</td>
<td>13</td>
<td>27</td>
<td>40</td>
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</tr>
<tr>
<td></td>
<td>11.5</td>
<td>13</td>
<td>26</td>
<td>38</td>
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</tr>
<tr>
<td></td>
<td>12.0</td>
<td>12</td>
<td>25</td>
<td>37</td>
<td></td>
</tr>
</tbody>
</table>

### DESIGN TABLE FOR WOODEN SUPPORTS

<table>
<thead>
<tr>
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<th>H (ft)</th>
<th>Maximum area (Total of sign panels) (ft²)</th>
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<th>Three-posts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Single-post</td>
<td>Two-posts</td>
<td>Three-posts</td>
</tr>
<tr>
<td>5” x 5”</td>
<td>8.0</td>
<td>18</td>
<td>37</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td></td>
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(*) Larger dimension in direction of (parallel) to traffic.
### DESIGN TABLE FOR WOODEN SUPPORTS

<table>
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<tr>
<th>Size of post</th>
<th>H (ft)</th>
<th>Maximum area (Total of sign panels) (ft(^2))</th>
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<tr>
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**For a single 4x4 post (construction sign installation only) the maximum total sign panel can be increased to 16 square feet provided:**

1. The maximum clearance between the ground level and bottom of the sign panel does not exceed 7'-0" while maintaining a 7'-0" minimum mounting height between the bottom of the sign and the top of the pavement at the edge of the pavement.

2. Contractor supplies Department with materials certification for wood posts to ensure conformance with Section 236.02(a) of the Road & Bridge Specifications.

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<thead>
<tr>
<th>Size of post</th>
<th>H (ft)</th>
<th>Maximum area (Total of sign panels) (ft(^2))</th>
</tr>
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<tbody>
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(*) Larger dimension in direction of (parallel to) traffic.

### DETAILS FOR CALCULATING SIZE OF WOOD POSTS FOR CONSTRUCTION & PERMANENT SIGNS INSTALLED AT 7'-0" MINIMUM MOUNTING HEIGHTS ON 1/2 : 1 SLOPE

1301.98

VIRGINIA DEPARTMENT OF TRANSPORTATION
## Design Table for Wooden Supports

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<th>6&quot; x 8&quot;</th>
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</table>

<p>| Maximum area (Total of sign panels) (ft²) |</p>
<table>
<thead>
<tr>
<th>Single-post</th>
<th>Two-posts</th>
<th>Three-posts</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
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<tr>
<td>8.5</td>
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</tbody>
</table>

(*) Larger dimension in direction of (parallel to) traffic.

Details for calculating size of wood posts for construction & permanent signs installed at 7'-0" minimum mounting heights on 1½ : 1 slope

Virginia Department of Transportation
### DESIGN TABLE FOR WOODEN SUPPORTS

**4" x 4"**

<table>
<thead>
<tr>
<th>Size of post</th>
<th>H (ft)</th>
<th>Maximum area (Total of sign panels) (ft²)²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single-post</td>
<td>Two-posts</td>
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<tr>
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</tbody>
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**For a single 4x4 post (construction sign installation only) the maximum total sign panel area is increased to 16 square feet provided:**

1. The maximum clearance between the ground level and bottom of the sign panel does not exceed 7'6" while maintaining a 7'10" minimum mounting height between the bottom of the sign and the top of the pavement at the edge of the pavement.

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---

**5" x 5"**

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<tr>
<td></td>
<td>Single-post</td>
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<tr>
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</tbody>
</table>

(*) Larger dimension in direction of (parallel to) traffic

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**DETAILS FOR CALCULATING SIZE OF WOOD POSTS FOR CONSTRUCTION & PERMANENT SIGNS INSTALLED AT 7'-0" MINIMUM MOUNTING HEIGHTS ON 2:1 SLOPE**

* Virginia Department of Transportation*
### DESIGN TABLE FOR WOODEN SUPPORTS

<table>
<thead>
<tr>
<th>Size of post</th>
<th>H (ft)</th>
<th>Maximum area (Total of sign panels) (ft²)</th>
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<tbody>
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<tr>
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<td>15.0</td>
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</tbody>
</table>

|              | 8.0   | 52          | ---       | ---         |
|              | 8.5   | 49          | ---       | ---         |
|              | 9.0   | 46          | ---       | ---         |
|              | 9.5   | 44          | ---       | ---         |
|              | 10.0  | 41          | 81        | ---         |
|              | 10.5  | 39          | 77        | ---         |
|              | 11.0  | 38          | 73        | ---         |
|              | 11.5  | 36          | 70        | ---         |
|              | 12.0  | 34          | 67        | 98          |
|              | 12.5  | 33          | 64        | 94          |
|              | 13.0  | 32          | 62        | 90          |
|              | 13.5  | 31          | 60        | 87          |
|              | 14.0  | ---         | 42        | 61          |
|              | 14.5  | ---         | 41        | 59          |
|              | 15.0  | ---         | 39        | 57          |

(*) Larger dimension in direction of (parallel to) traffic.

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**DETAILS FOR CALCULATING SIZE OF WOOD POSTS FOR CONSTRUCTION & PERMANENT SIGNS INSTALLED AT 7'-0" MINIMUM MOUNTING HEIGHTS ON 2:1 SLOPE**

VIRGINIA DEPARTMENT OF TRANSPORTATION
## DESIGN TABLE FOR WOODEN SUPPORTS

### 4" x 4"

<table>
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<tr>
<th>Size of post</th>
<th>H (FT)</th>
<th>Maximum area (Total of sign panels) (ft)^2</th>
<th>Single-post</th>
<th>Two-posts</th>
<th>Three-posts</th>
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### 4" x 6" (X)

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### 5" x 5"

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<th>Single-post</th>
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<th>Three-posts</th>
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### 5" x 8" (X)

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<th>Three-posts</th>
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(‡) Larger dimension in direction of (paralleto) traffic.

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DETAILS FOR CALCULATING SIZE OF WOOD POSTS FOR PERMANENT SIGNS INSTALLED AT 5'-0" MINIMUM MOUNTING HEIGHTS ON LEVEL GROUND

VIRGINIA DEPARTMENT OF TRANSPORTATION

1301.102
## DESIGN TABLE FOR WOODEN SUPPORTS

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<th>Size of post</th>
<th>H (ft)</th>
<th>Maximum area (Total of sign panels) (ft²)</th>
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| 4" x 6" (*)  |        |             |          |             |
| 6.0          | 25     | ---         | ---       | ---         |
| 6.5          | 23     | ---         | ---       | ---         |
| 7.0          | 22     | ---         | ---       | ---         |
| 7.5          | 20     | ---         | ---       | ---         |
| 8.0          | 19     | ---         | ---       | ---         |
| 8.5          | 18     | 34          | ---       |             |
| 9.0          | 17     | 32          | ---       |             |
| 9.5          | 16     | 31          | ---       |             |
| 10.0         | 15     | 29          | ---       |             |
| 10.5         | 14     | 28          | ---       |             |
| 11.0         | 14     | 26          | ---       |             |
| 11.5         | 13     | 25          | 35        |             |
| 12.0         | 13     | 24          | 34        |             |
| 12.5         | ---    | 23          | 32        |             |
| 13.0         | ---    | 22          | 31        |             |

| 5" x 5"      |        |             |          |             |
| 6.0          | 21     | ---         | ---       | ---         |
| 6.5          | 20     | ---         | ---       | ---         |
| 7.0          | 18     | ---         | ---       | ---         |
| 7.5          | 17     | ---         | ---       | ---         |
| 8.0          | 16     | ---         | ---       | ---         |
| 8.5          | 15     | 28          | ---       |             |
| 9.0          | 14     | 27          | ---       |             |
| 9.5          | 14     | 25          | ---       |             |
| 10.0         | 13     | 24          | ---       |             |
| 10.5         | 12     | 23          | 31        |             |
| 11.0         | 12     | 22          | 29        |             |
| 11.5         | 11     | 21          | 28        |             |
| 12.0         | 11     | 20          | 27        |             |
| 12.5         | ---    | 19          | 26        |             |
| 13.0         | ---    | 18          | 25        |             |

(*) Larger dimension in direction of (parallel to) traffic.

---

DETAILS FOR CALCULATING SIZE OF WOOD POSTS FOR PERMANENT SIGNS INSTALLED AT 5'- 0" MINIMUM MOUNTING HEIGHTS ON 1/2 : 1 SLOPE

VIRGINIA DEPARTMENT OF TRANSPORTATION
## Design Table for Wooden Supports

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<th>H (ft)</th>
<th>Maximum area (Total of sign panels) (ft)²</th>
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(**) Larger dimension in direction of (parallel to) traffic.

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**Details for Calculating Size of Wood Posts for Permanent Signs Installed at 5'-0'' Minimum Mounting Heights on 1/2 : 1 Slope**

Virginia Department of Transportation
## DESIGN TABLE FOR WOODEN SUPPORTS

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<thead>
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<th>Size of post</th>
<th>H (ft)</th>
<th>Maximum area (Total of sign panels) (ft²)</th>
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*(Maximum area (Total of sign panels) (ft²))

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*(Maximum area (Total of sign panels) (ft²))

| Note: Larger dimension in direction of (parallel to) traffic |

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**DETAILS FOR CALCULATING SIZE OF WOOD POSTS FOR PERMANENT SIGNS INSTALLED AT 5'-0" MINIMUM MOUNTING HEIGHTS ON 2:1 SLOPE**

**Virginia Department of Transportation**

[1301.105]
## Design Table for Wooden Supports

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<th>Size of Post</th>
<th>H (ft)</th>
<th>Maximum Area (Total of Sign Panels) (ft²)</th>
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(※) Larger dimension in direction of (parallel to) traffic.

## Details for Calculating Size of Wood Posts for Permanent Signs Installed at 5'-0" Minimum Mounting Heights on 2:1 Slope

Virginia Department of Transportation