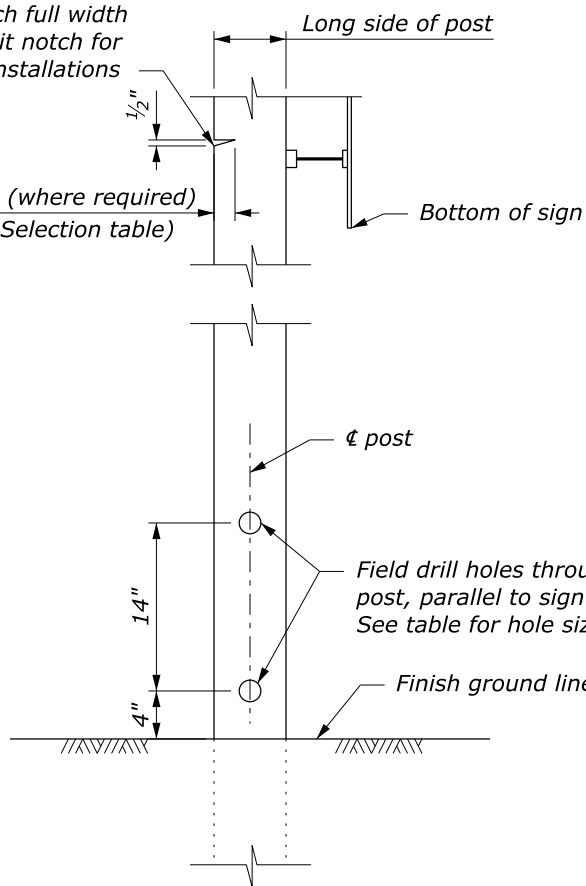
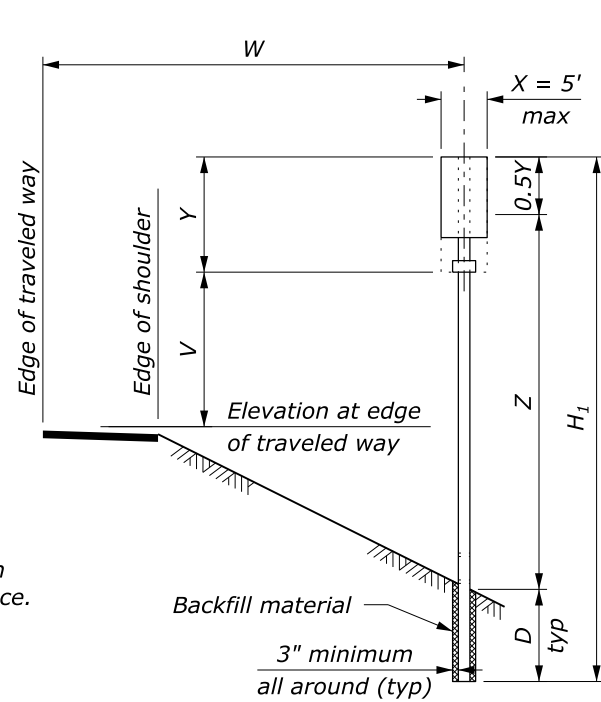


Saw cut notch full width of post. Omit notch for single post installations

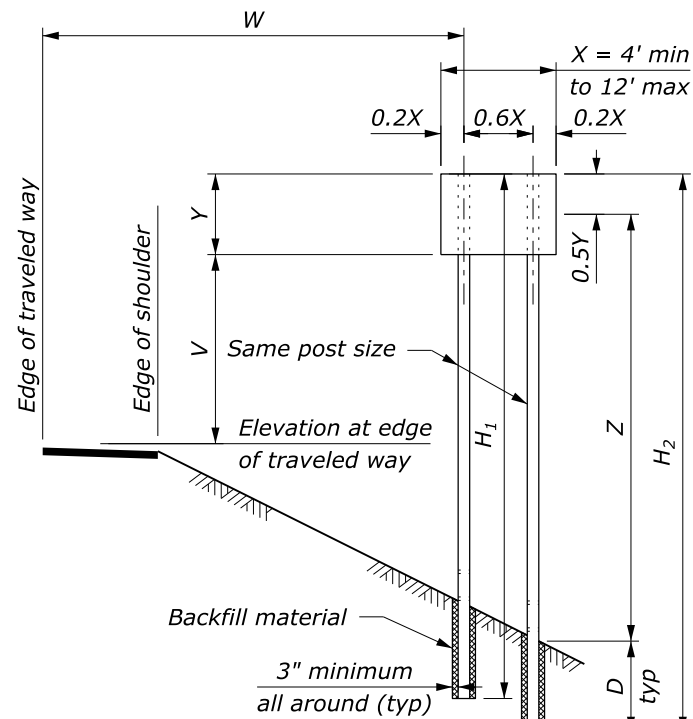
Notch depth (where required)
(See Post Selection table)



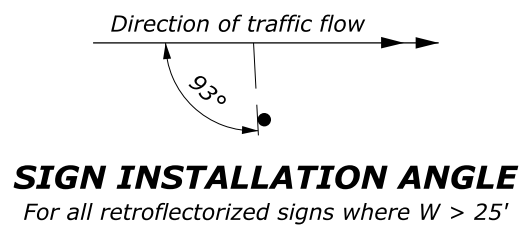
POST DETAIL



SINGLE POST SIGNS



TWO POST SIGNS

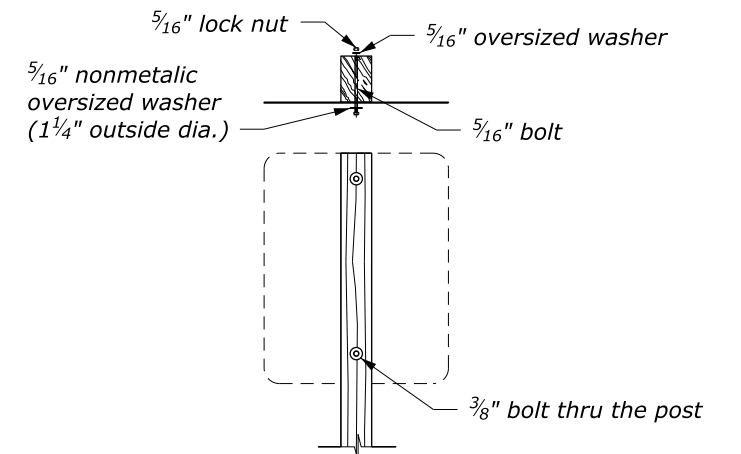


| MINIMUM DISTANCE TO SIGN | | |
|---------------------------------|--------------------|---------------------|
| Location | Lateral Offset (W) | Mounting Height (V) |
| Rural Districts | 6 ft | 5 ft |
| Business or Residence Districts | 2 ft from curb | 7 ft |

V may be reduced by 1 foot in rural districts for a secondary sign mounted below another sign.

NOTE:

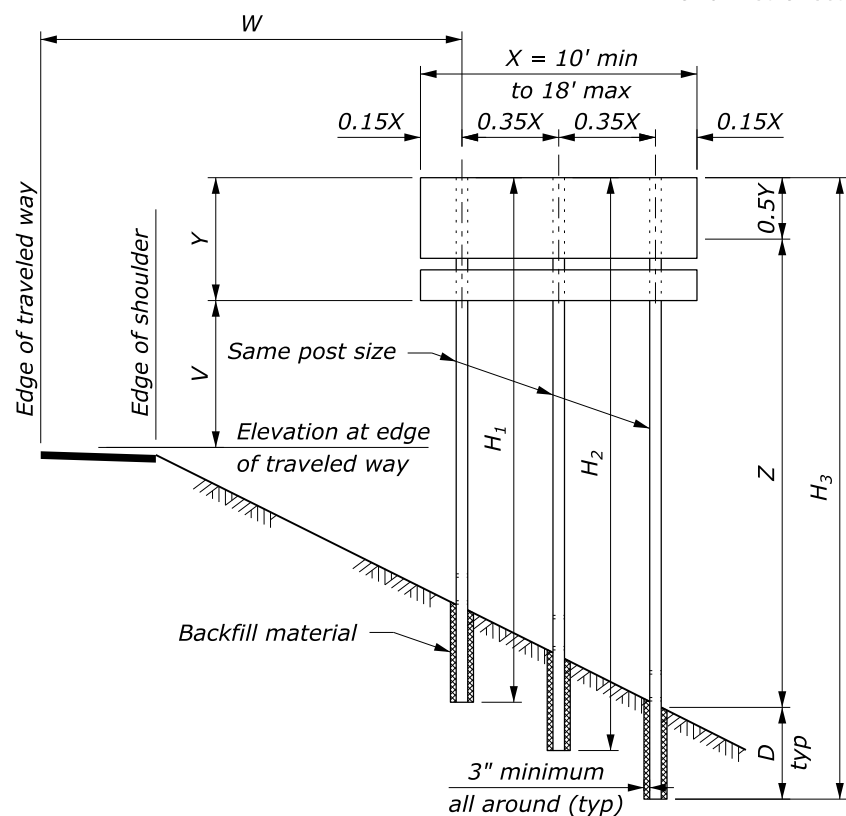
1. Provide traffic barrier protection for all posts larger than 6 x 8 inches when located within the clear zone or if the post is vulnerable to being struck when placed outside the clear zone.
2. H₁ thru H₄ indicate overall post length. Select post lengths to fit field conditions.
3. D is the minimum post embedment depth for average soil conditions. See Wood Post Selection Table below.
4. Z is the height from ground line to mid-height of sign at the longest post.
5. For the purpose of post selection X and Y are as follows:
 - Overall dimensions of the sign for a single sign, or back to back signs
 - Dimensions of a rectangle enclosing all the signs for multiple sign installations.



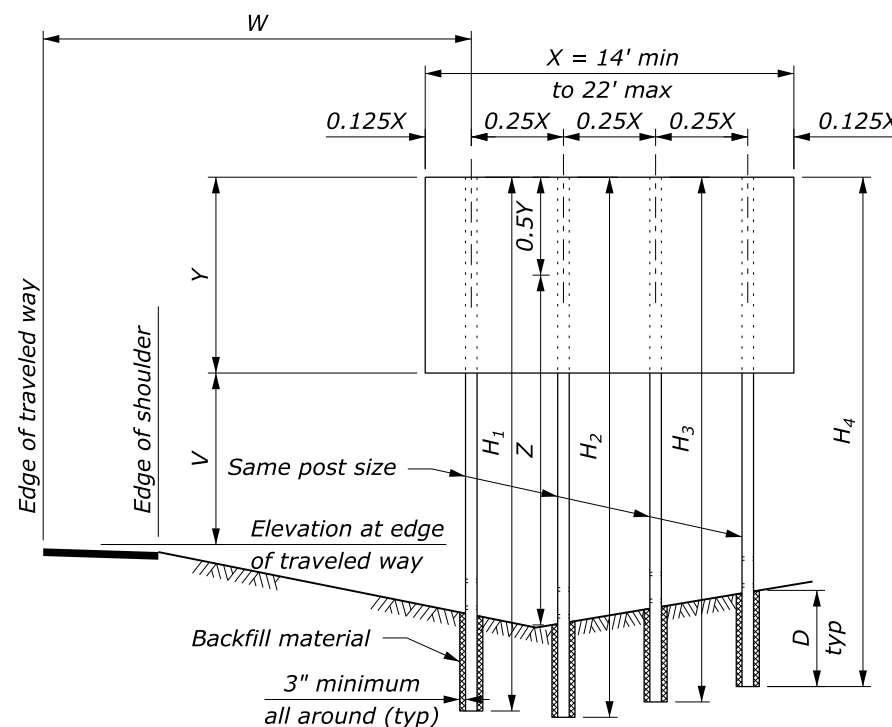
TYPICAL MOUNTING FOR SIGNS WITHOUT ANGLES

| POST SIZE (inch) | NUMBER OF POSTS | | | | D | Notch depth and hole diameter |
|------------------|--------------------------|------|------|------|-------|-------------------------------|
| | 1 | 2 | 3 | 4 | | |
| | Product of X-Y-Z in CUFT | | | | | |
| 4 x 4 | 80 | 155 | 235 | 310 | 3'-0" | - |
| 4 x 6 | 180 | 385 | 545 | 725 | 4'-0" | 1 3/4" |
| 6 x 6 | 235 | 475 | 710 | 950 | 4'-0" | 1 3/4" |
| 6 x 8 | 300 | 850 | 1280 | 1700 | 4'-0" | 2 1/2" |
| 6 x 10 | 385 | 1180 | 1170 | 2360 | 5'-0" | - |
| 8 x 10 | 575 | 1610 | 2410 | 3215 | 5'-0" | - |
| 8 x 12 | 775 | 2310 | 3465 | 4620 | 6'-0" | - |

Values shown are the maximum permitted. If the product of XYZ exceeds the limit for the largest post, use steel post installation.



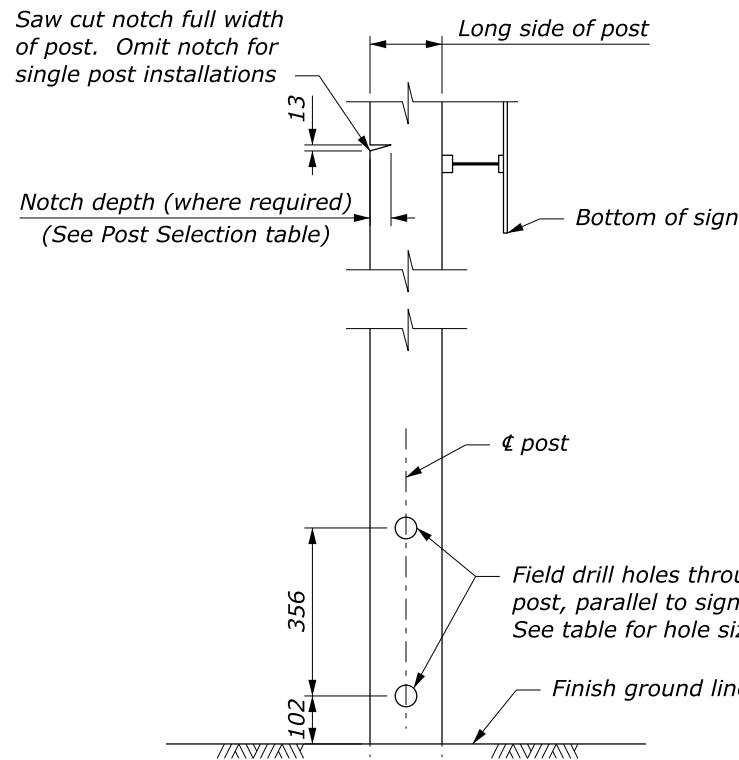
THREE POST SIGNS



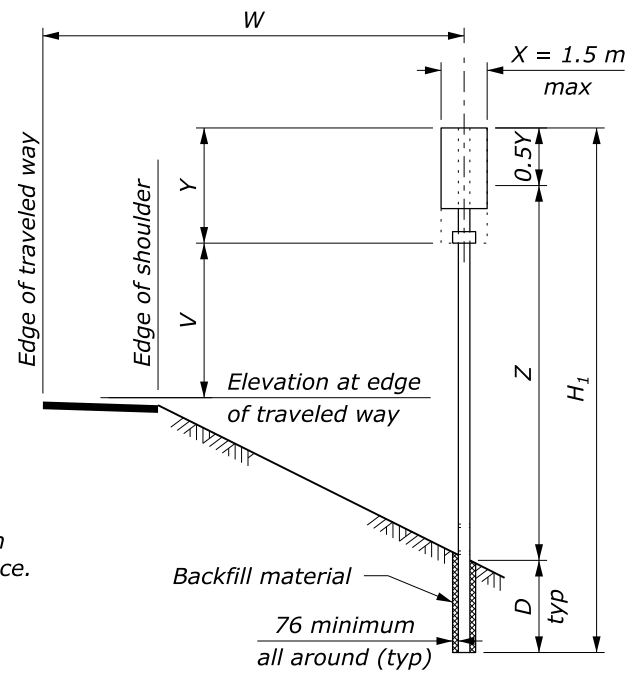
FOUR POST SIGNS

NO SCALE

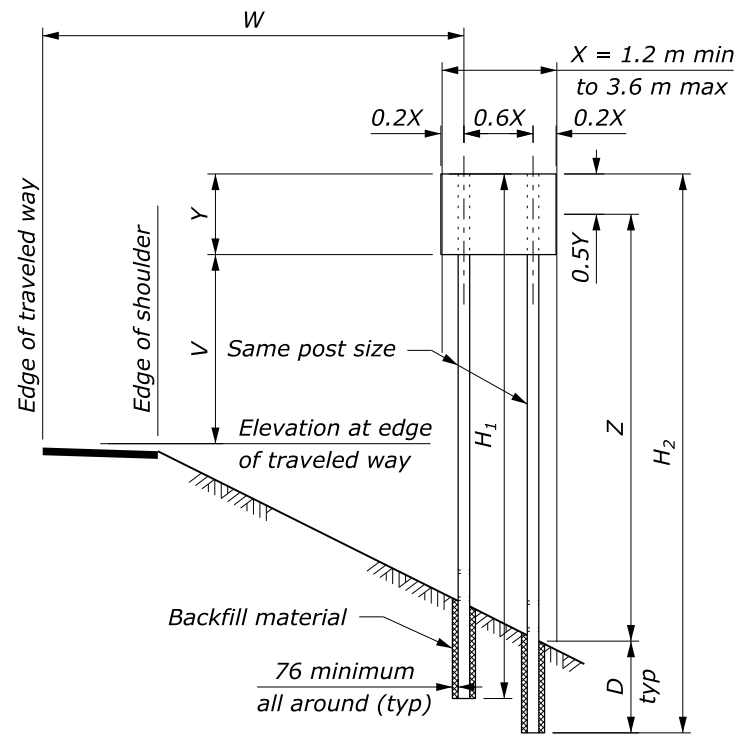
| | |
|--|-------------------------------|
| U.S. DEPARTMENT OF TRANSPORTATION, FHWA OFFICE OF FEDERAL LANDS HIGHWAY | WFL STANDARD W633-7 |
| PERMANENT SIGN INSTALLATION WOOD POSTS | SPECIFICATION FP-24, FP-14 |
| | APPROVED FOR USE 9/2024 |



POST DETAIL



SINGLE POST SIGNS



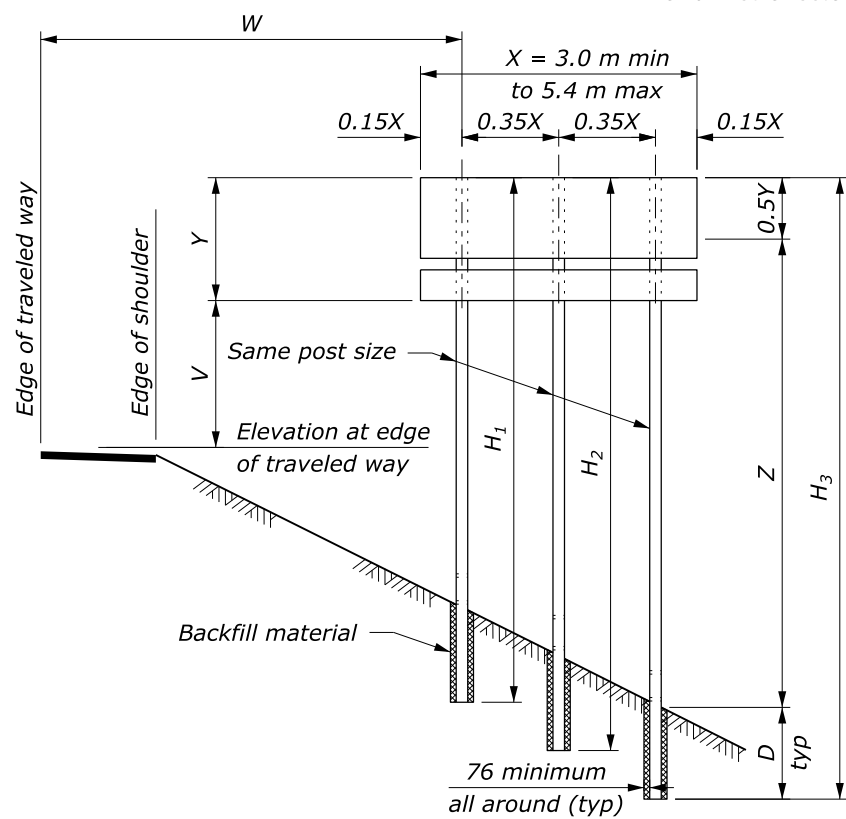
TWO POST SIGNS

SIGN INSTALLATION ANGLE

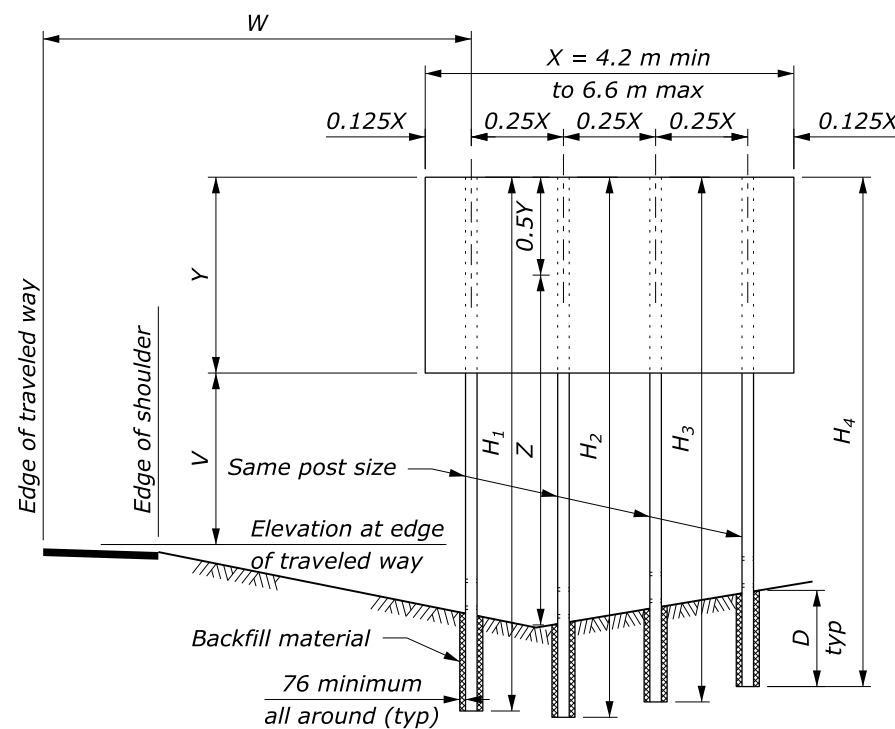
For all retroreflectorized signs where $W > 7.6$ m

| MINIMUM DISTANCE TO SIGN | | |
|---------------------------------|--------------------|---------------------|
| Location | Lateral Offset (W) | Mounting Height (V) |
| Rural Districts | 1.8 m | 1.5 m |
| Business or Residence Districts | 0.6 m from curb | 2.1 m |

V may be reduced by 0.3 m in rural districts for a secondary sign mounted below another sign.



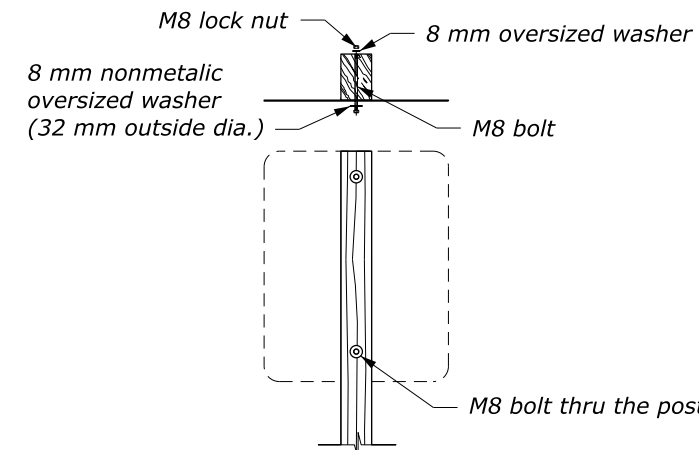
THREE POST SIGNS



FOUR POST SIGNS

NOTE:

1. Provide traffic barrier protection for all posts larger than 150 x 200 mm when located within the clear zone or if the post is vulnerable to being struck when placed outside the clear zone.
2. H_1 thru H_4 indicate overall post length. Select post lengths to fit field conditions.
3. D is the minimum post embedment depth for average soil conditions. See Wood Post Selection Table below.
4. Z is the height from ground line to mid-height of sign at the longest post.
5. For the purpose of post selection X and Y are as follows:
 - Overall dimensions of the sign for a single sign, or back to back signs
 - Dimensions of a rectangle enclosing all the signs for multiple sign installations.



TYPICAL MOUNTING FOR SIGNS WITHOUT ANGLES

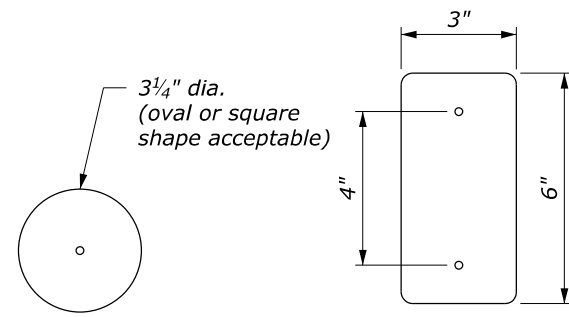
| POST SIZE (mm) | NUMBER OF POSTS | | | | D (m) | Notch depth and hole diameter |
|----------------|-----------------------|------|------|-------|-------|-------------------------------|
| | 1 | 2 | 3 | 4 | | |
| | Product of X-Y-Z (m3) | | | | | |
| 100 x 100 | 2.2 | 4.3 | 6.6 | 18.7 | 0.9 | - |
| 100 x 150 | 5.0 | 10.8 | 15.3 | 20.3 | 1.2 | 45 mm |
| 150 x 150 | 6.6 | 13.3 | 19.9 | 26.6 | 1.2 | 45 mm |
| 150 x 200 | 8.4 | 23.8 | 35.8 | 47.6 | 1.2 | 65 mm |
| 150 x 250 | 10.8 | 33.0 | 49.6 | 66.1 | 1.5 | - |
| 200 x 250 | 16.1 | 45.1 | 67.5 | 90.0 | 1.5 | - |
| 200 x 300 | 21.7 | 64.7 | 97.0 | 129.4 | 1.8 | - |

Values shown are the maximum permitted. If the product of XYZ exceeds the limit for the largest post, use steel post installation.

This drawing contains **Metric** units of measure. Dimensions without units are millimeters.

| | |
|--|-------------------------------|
| U.S. DEPARTMENT OF TRANSPORTATION, FHWA OFFICE OF FEDERAL LANDS HIGHWAY | WFL STANDARD WM633-7 |
| PERMANENT SIGN INSTALLATION WOOD POSTS | SPECIFICATION FP-24, FP-14 |
| | APPROVED FOR USE 9/2024 |

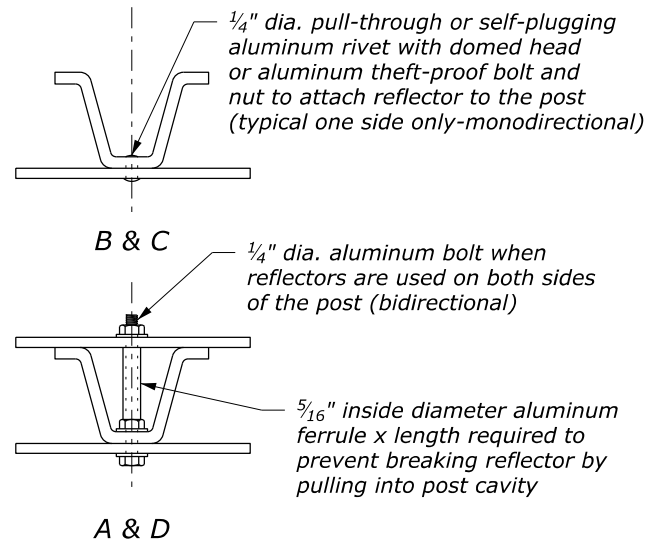
NO SCALE



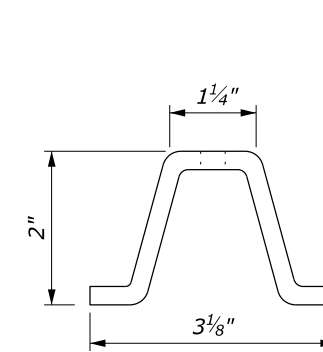
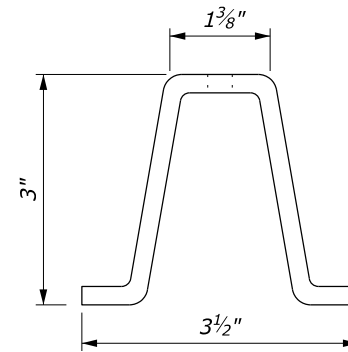
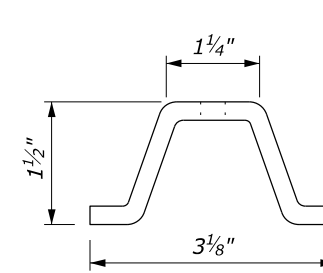
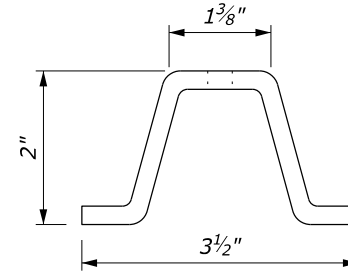
REFLECTOR DETAILS

DELINEATION MARKER REFLECTOR

| TYPE | COLOR OF REFLECTOR | REFLECTORIZED |
|------|--------------------|---------------|
| A | White | Front & Rear |
| B | White | Front |
| C | Yellow | Front |
| D | Yellow | Front & Rear |

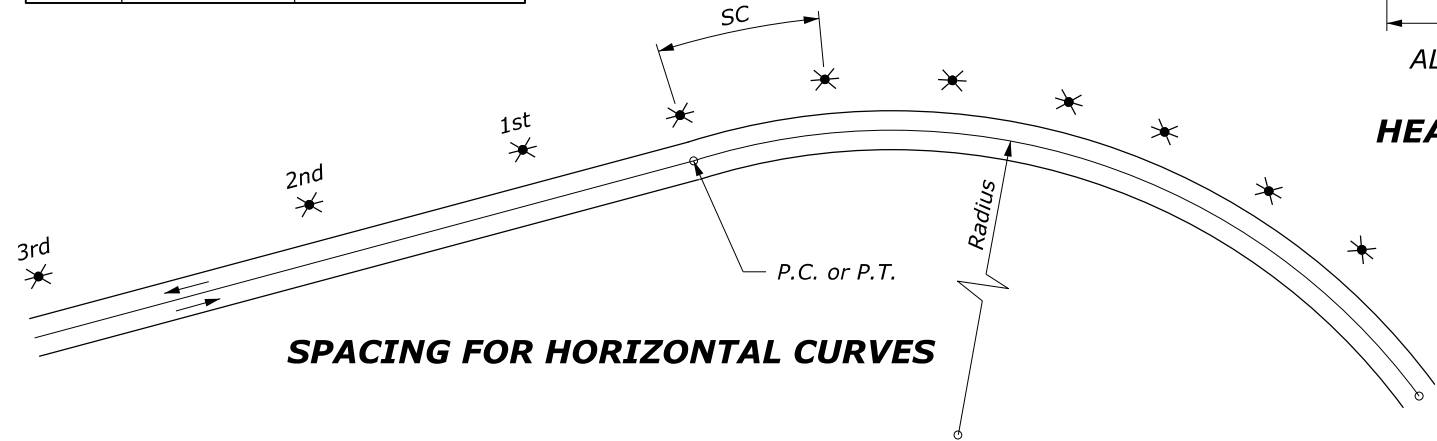


ATTACHMENT DETAIL



HEAVY CHANNEL POSTS

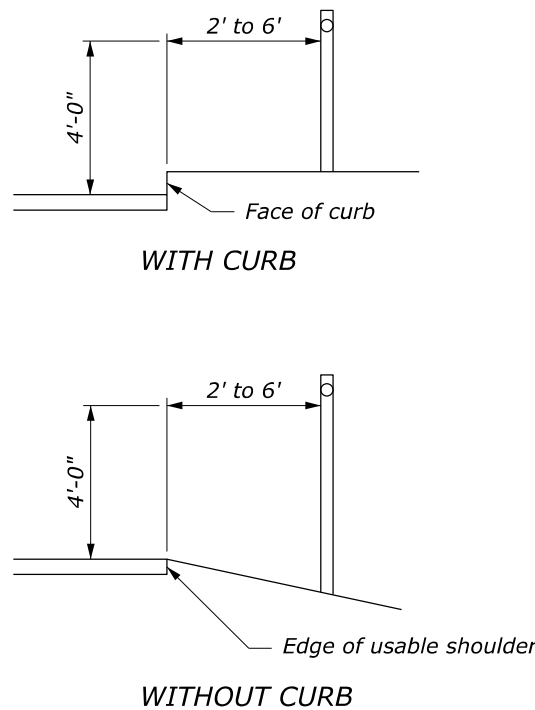
LIGHT CHANNEL POSTS



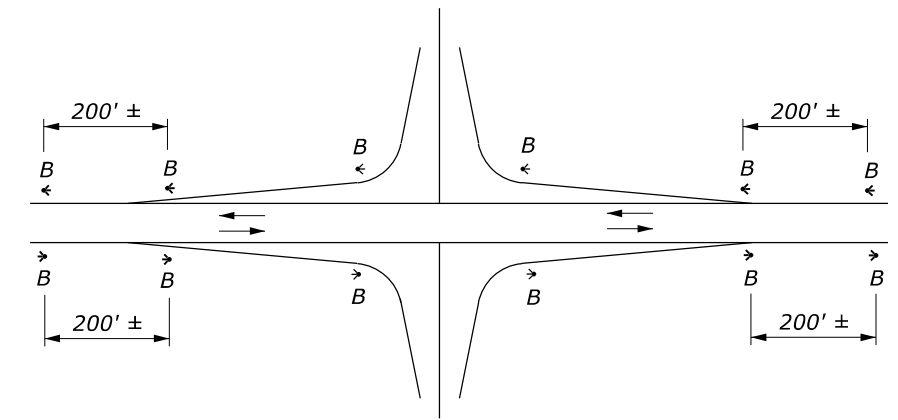
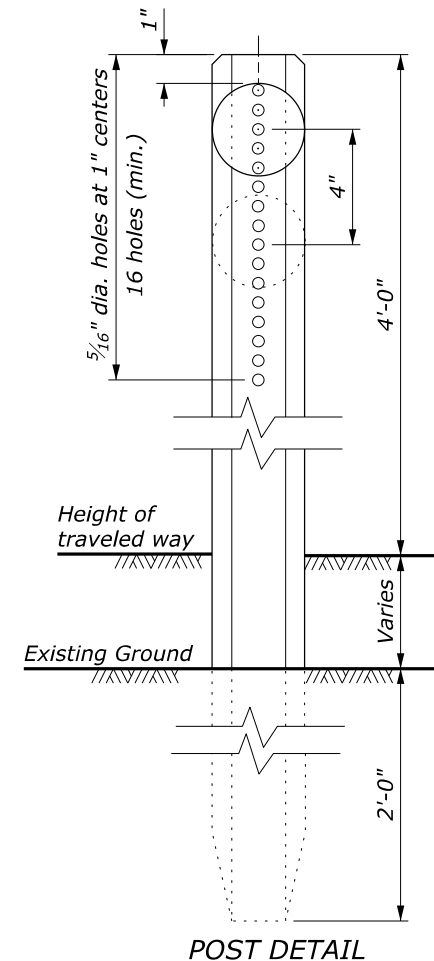
SPACING FOR HORIZONTAL CURVES

| CURVE RADIUS (FEET) | SPACING ON EACH SIDE OF ROADWAY (FEET) | | | |
|---------------------|--|------------------------------|-----------|-----------|
| | ON CURVE * | IN ADVANCE OF & BEYOND CURVE | | |
| | | 1st SPACE | 2nd SPACE | 3rd SPACE |
| 10,000 | 300 | 300 | 300 | 300 |
| 5,000 | 200 | 300 | 300 | 300 |
| 4,000 | 190 | 300 | 300 | 300 |
| 3,000 | 165 | 300 | 300 | 300 |
| 2,000 | 130 | 235 | 300 | 300 |
| 1,000 | 90 | 160 | 270 | 300 |
| 900 | 85 | 155 | 250 | 300 |
| 800 | 80 | 145 | 240 | 300 |
| 700 | 75 | 135 | 225 | 300 |
| 600 | 70 | 125 | 210 | 300 |
| 500 | 65 | 115 | 195 | 300 |
| 400 | 55 | 100 | 165 | 300 |
| 300 | 50 | 90 | 150 | 300 |
| 250 | 40 | 70 | 120 | 240 |
| 200 | 35 | 65 | 105 | 210 |
| 150 | 30 | 55 | 90 | 180 |
| 100 | 20 | 35 | 60 | 120 |
| 75 | 20 | 25 | 45 | 90 |

* Spacing for specific radii not shown may be interpolated from the formula: $Spacing = 3 \sqrt{R-50}$
(Minimum spacing: 20 feet; Maximum spacing: 300 feet)



TYPICAL INSTALLATION



Two Way Road ROAD INTERSECTIONS

NOTE:

1. Vary the post spacing up to 1/8 of the spacing shown to clear driveways, cross roads, intersections or ramps. Eliminate the post in cases where the variation is exceeded.
2. Dimensions of channel posts shown indicate general design only and may vary slightly among manufacturers.
3. When specified, rectangular 3" x 6" reflectors may be used in lieu of double disk reflector.
4. Offset delineators 2 feet unless otherwise shown.
5. See plans for delineator reflector colors.
6. Use tangent spacing of 500 feet ± (525 feet maximum).
7. When the contract does not include the final pavement, allow for the ultimate base and pavement thickness when establishing the traffic delineator elevation.
8. On two way roads, stagger markers on opposite sides of the road.

NO SCALE

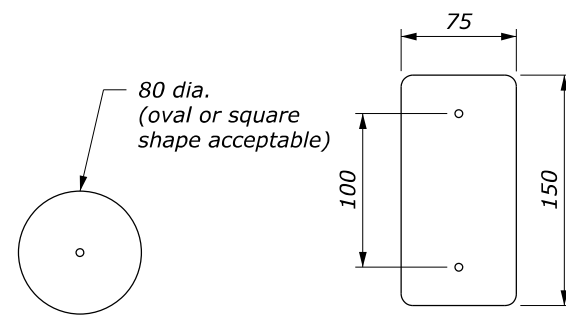
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

WFLHD DETAIL

ALASKA DELINEATORS

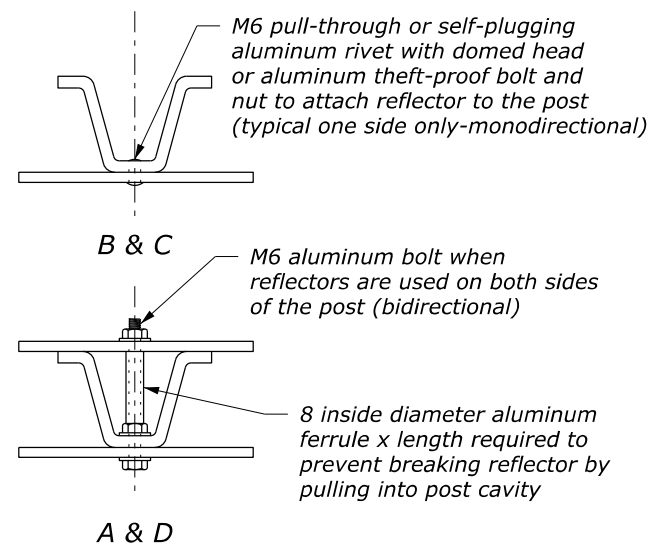
DETAIL APPROVED FOR USE 7/2016
REVISED:

DETAIL
W633-40

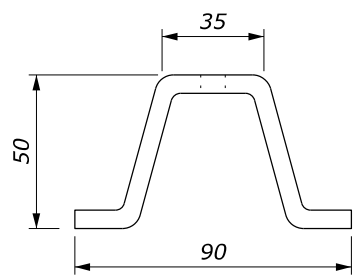


REFLECTOR DETAILS

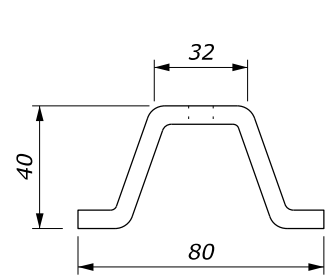
| DELINEATION MARKER REFLECTOR | | |
|------------------------------|--------------------|---------------|
| TYPE | COLOR OF REFLECTOR | REFLECTORIZED |
| A | White | Front & Rear |
| B | White | Front |
| C | Yellow | Front |
| D | Yellow | Front & Rear |



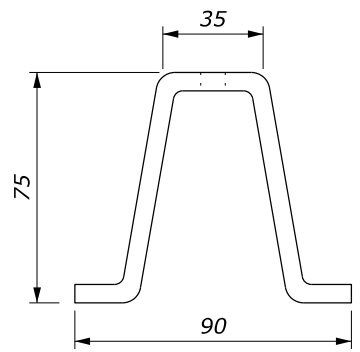
ATTACHMENT DETAIL



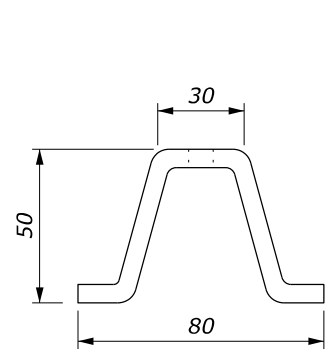
STEEL POST
3.95 kg/m



STEEL POST
2.97 kg/m



ALUMINUM POST
2.68 kg/m



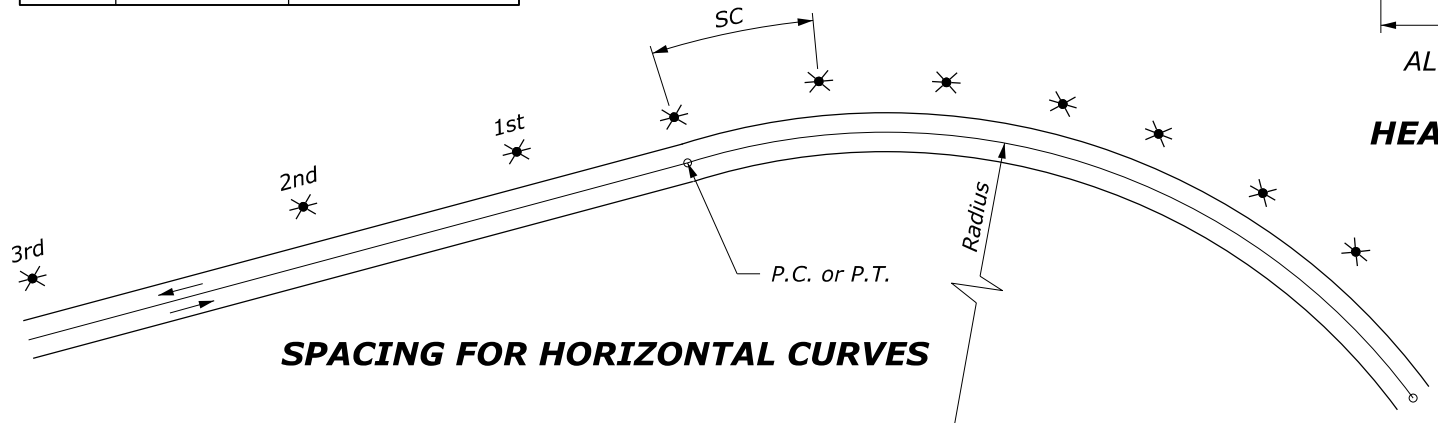
ALUMINUM POST
1.33 kg/m

HEAVY CHANNEL POSTS

LIGHT CHANNEL POSTS

NOTE:

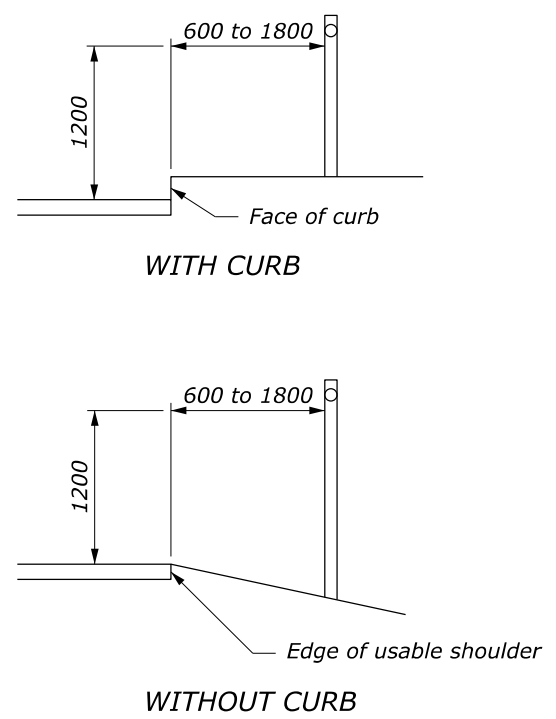
1. Vary the post spacing up to 1/8 of the spacing shown to clear driveways, cross roads, intersections or ramps. Eliminate the post in cases where the variation is exceeded.
2. Dimensions of channel posts shown indicate general design only and may vary slightly among manufacturers.
3. When specified rectangular 75 x 150 mm reflectors may be used in lieu of double disk reflector.
4. Offset delineators 600 mm unless otherwise shown.
5. See plans for delineator reflector colors.
6. Use tangent spacing of 150 m ± (160 m maximum).
7. When the contract does not include the final pavement, allow for the ultimate base and pavement thickness when establishing the traffic delineator elevation.
8. On two way roads, stagger markers on opposite sides of the road.
9. Furnish hardware in the metric sizes shown. Equivalent US Customary sizes may be used when metric sizes are unavailable.
10. Dimensions without units are millimeters.



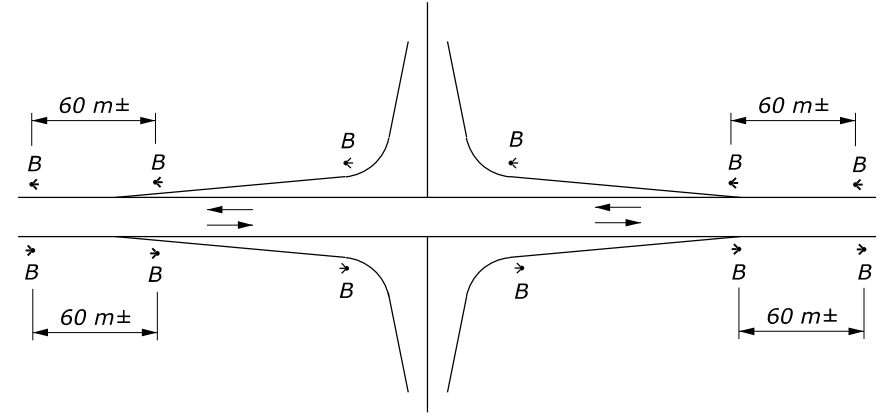
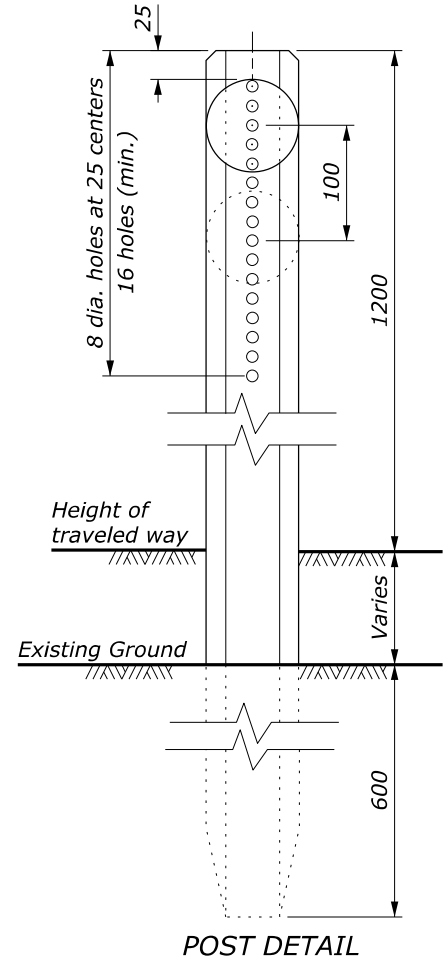
SPACING FOR HORIZONTAL CURVES

| CURVE RADIUS (METERS) | HORIZONTAL CURVES | | | |
|-----------------------|--|------------------------------|-----------|-----------|
| | SPACING ON EACH SIDE OF ROADWAY (METERS) | | | |
| | ON CURVE * | IN ADVANCE OF & BEYOND CURVE | | |
| | | 1st SPACE | 2nd SPACE | 3rd SPACE |
| 3000 | 90 | 90 | 90 | 90 |
| 1500 | 64 | 90 | 90 | 90 |
| 1200 | 57 | 90 | 90 | 90 |
| 900 | 49 | 90 | 90 | 90 |
| 600 | 40 | 80 | 90 | 90 |
| 300 | 28 | 56 | 84 | 90 |
| 270 | 26 | 52 | 78 | 90 |
| 240 | 25 | 50 | 75 | 90 |
| 210 | 23 | 46 | 69 | 90 |
| 180 | 22 | 44 | 66 | 90 |
| 150 | 19 | 38 | 57 | 90 |
| 120 | 17 | 34 | 51 | 90 |
| 90 | 14 | 28 | 42 | 84 |
| 75 | 13 | 26 | 39 | 78 |
| 60 | 11 | 22 | 33 | 66 |
| 45 | 9 | 18 | 27 | 54 |
| 30 | 6 | 12 | 18 | 36 |
| 25 | 6 | 12 | 18 | 36 |

* Spacing for specific radii not shown may be interpolated from the formula: $Spacing = 1.65 \sqrt{R-15}$
(Minimum spacing: 6 m; Maximum spacing: 90 m)



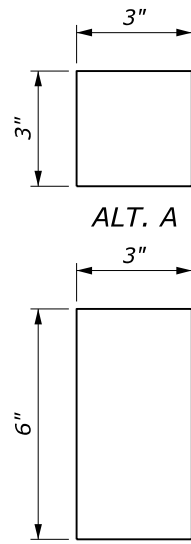
TYPICAL INSTALLATION



Two Way Road ROAD INTERSECTIONS

| | |
|--|----------|
| U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION OFFICE OF FEDERAL LANDS HIGHWAY | |
| WFLHD METRIC DETAIL | |
| ALASKA DELINEATORS | |
| DETAIL APPROVED FOR USE 7/2016 | DETAIL |
| REVISED: | WM633-40 |

NO SCALE

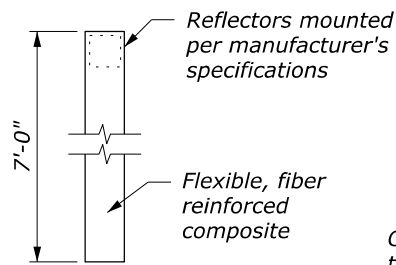


ALT. A

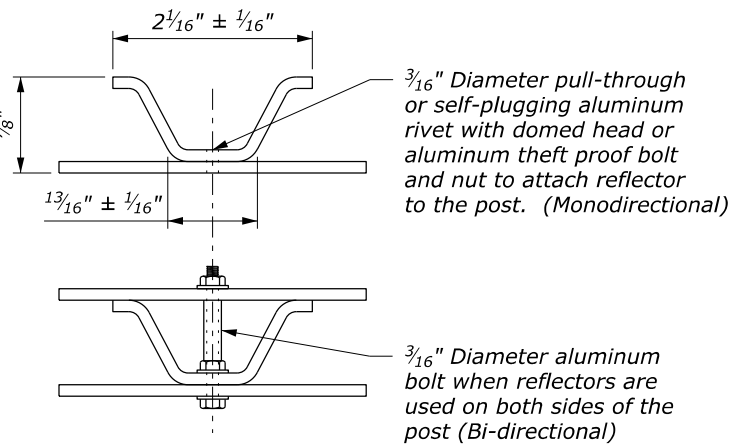
ALT. B

Mount reflectors on aluminum or apply directly to flexible post

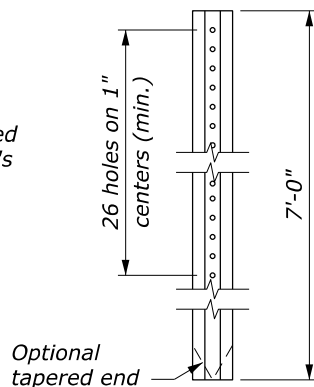
REFLECTIVE SHEETING



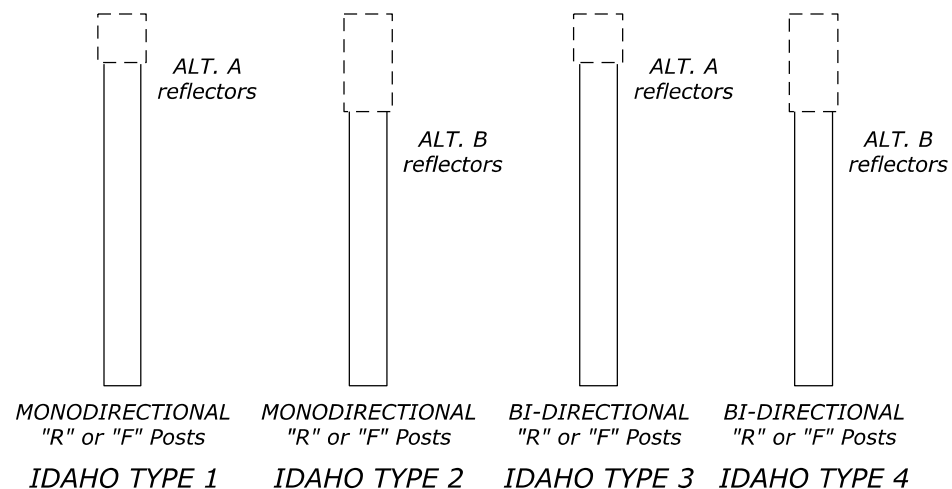
FLEXIBLE, SELF ERECTING OR YIELDING; WHITE UNLESS OTHERWISE NOTED
POST "F" DETAIL



ATTACHMENT DETAIL For "R" Post



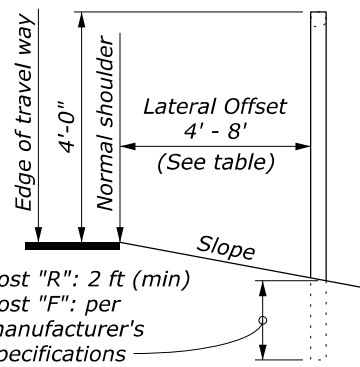
RIGID STEEL OR ALUMINUM (ALL HOLES 1/4" DIAMETER)
POST "R" DETAIL



DELINEATORS

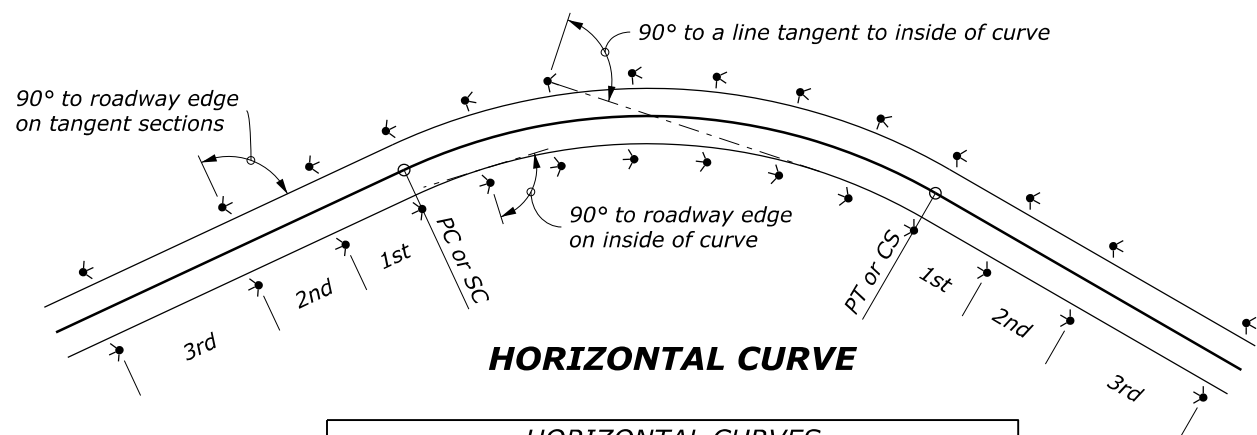
NOTE:

- Where delineators are used only on curves, place three delineators outside the curve limits.
- Place Type 3 delineators on the left side of two-way roadways at extreme curves with radii less than 984 feet to the right. They may also be installed where it is not possible or practical to install and maintain right-hand delineation on both sides.
- If horizontal and vertical curves are combined, use the more restrictive spacing.
- Where delineators are used on tangents, space the delineators at 528 feet. Begin the tangent spacing beyond the spacing requirements for horizontal and vertical curves.
- Delineator reflector colors are shown in the plans. Delineator type includes the post type, for example: Type 1R or Type 3F, etc.
- When the contract does not provide for the construction of the ultimate pavement, allow for the thickness of base and pavement to be placed later when establishing the elevation of the traffic delineators.
- Vary the post spacing up to 1/8 of the spacing shown to clear driveways, cross roads, intersections or ramps. Eliminate the post if the variation is exceeded.



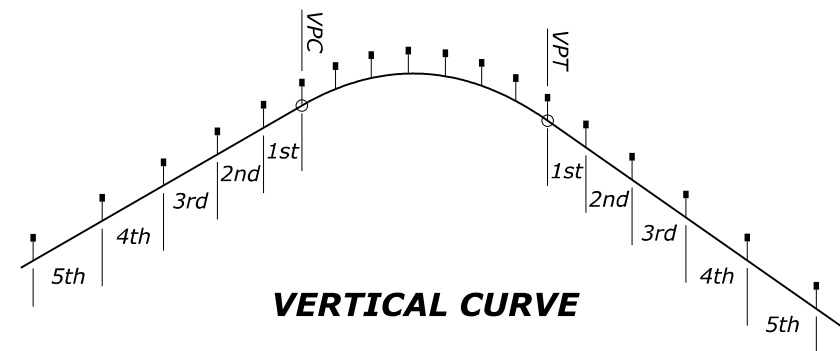
TYPICAL INSTALLATION

| LATERAL PLACEMENT TABLE | |
|-------------------------|----------------|
| SLOPE | OFFSET |
| 1V:4H | 4'-0" to 6'-0" |
| 1V:6H or flatter | 6'-0" to 8'-0" |
| Curb Section | 6'-0" |



HORIZONTAL CURVE

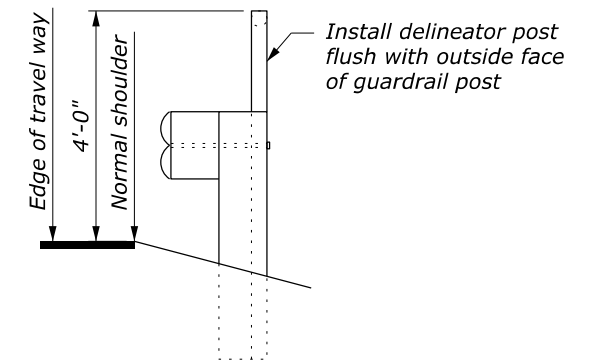
| HORIZONTAL CURVES | | | | |
|---------------------|--|-------------------------|-----------|-----------|
| CURVE RADIUS (FEET) | SPACING ON EACH SIDE OF ROADWAY (FEET) | | | |
| | ON CURVE | BEYOND SC, CS, PC or PT | | |
| | | 1st SPACE | 2nd SPACE | 3rd SPACE |
| ≥ 6000 | 300 | 528 | 528 | 528 |
| 1450 - 5999 | 150 | 300 | 528 | 528 |
| 480 - 1449 | 100 | 200 | 300 | 528 |
| 240 - 479 | 75 | 150 | 225 | 528 |
| < 240 | 50 | 100 | 150 | 300 |



VERTICAL CURVE

| CREST VERTICAL CURVES | | | | | | |
|-----------------------|---|-------------------|-----------|-----------|-----------|-----------|
| K | SPACING ON EACH SIDE OF ROADWAY IN FEET | | | | | |
| | ON CURVE | BEYOND VPC or VPT | | | | |
| | | 1st SPACE | 2nd SPACE | 3rd SPACE | 4th SPACE | 5th SPACE |
| ≥ 550 | 528 | 528 | 528 | 528 | 528 | 528 |
| 400 - 549 | 300 | 528 | 528 | 528 | 528 | 528 |
| 200 - 399 | 200 | 300 | 528 | 528 | 528 | 528 |
| 100 - 199 | 100 | 150 | 200 | 300 | 528 | 528 |
| 50 - 99 | 75 | 100 | 150 | 200 | 300 | 528 |
| < 50 | 50 | 75 | 100 | 150 | 200 | 300 |

$K = L/A$ where L = Length of vertical curve in feet
 A = Algebraic grade change in %



TYPICAL INSTALLATION WITH BEAM TYPE GUARD RAIL

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

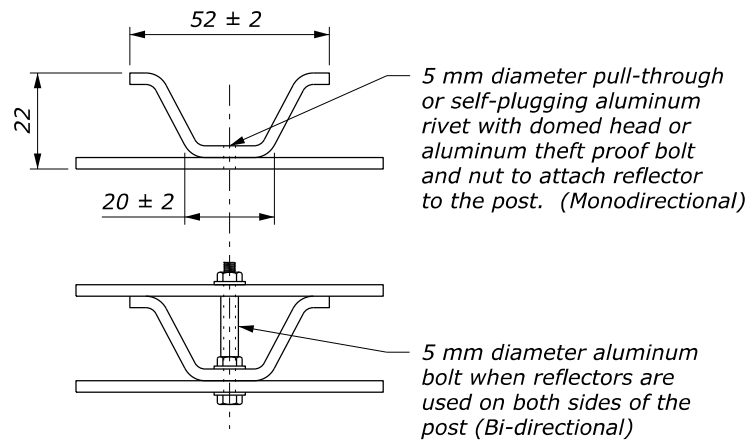
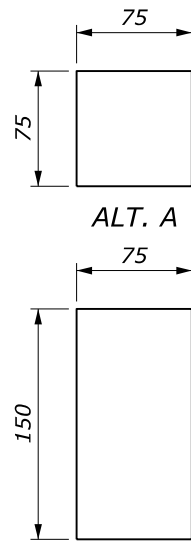
WFLHD DETAIL

IDAHO DELINEATORS

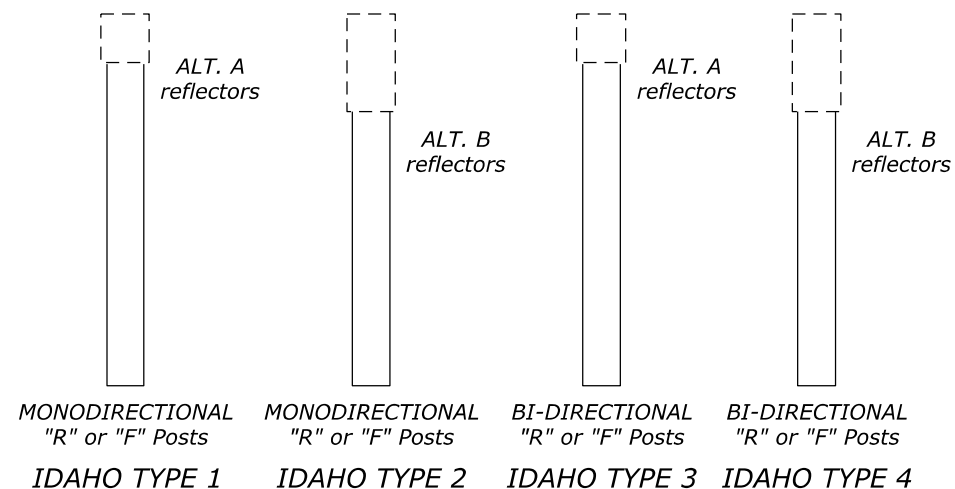
DETAIL APPROVED FOR USE 9/2009
REVISID:

DETAIL
W633-50

NO SCALE



ATTACHMENT DETAIL For "R" Post

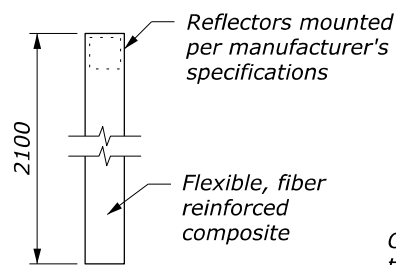


DELINEATORS

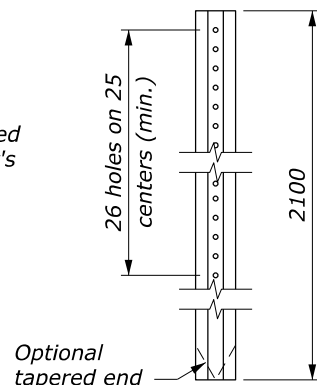
NOTE:

- Where delineators are used only on curves, place three delineators outside the curve limits.
- Place Type 3 delineators on the left side of two-way roadways at extreme curves with radii less than 300 m to the right. They may also be installed where it is not possible or practical to install and maintain right-hand delineation on both sides.
- If horizontal and vertical curves are combined, use the more restrictive spacing.
- Where delineators are used on tangents, space the delineators at 160 meters. Begin the tangent spacing beyond the spacing requirements for horizontal and vertical curves.
- Delineator reflector colors are shown in the plans. Delineator type includes the post type, for example: Type 1R or Type 3F, etc.
- When the contract does not provide for the construction of the ultimate pavement, allow for the thickness of base and pavement to be placed later when establishing the elevation of the traffic delineators.
- Vary the post spacing up to 1/8 of the spacing shown to clear driveways, cross roads, intersections or ramps. Eliminate the post if the variation is exceeded.
- Furnish hardware in the metric sizes shown. Equivalent US Customary sizes may be used when metric sizes are unavailable.
- Dimensions without units are millimeters.

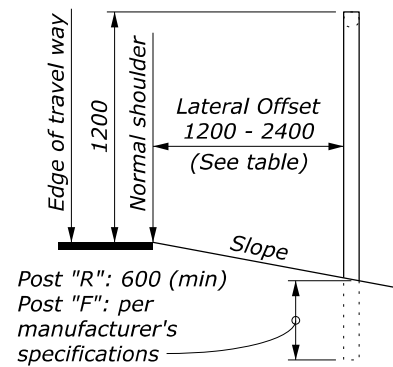
REFLECTIVE SHEETING



FLEXIBLE, SELF ERECTING OR YIELDING; WHITE UNLESS OTHERWISE NOTED
POST "F" DETAIL

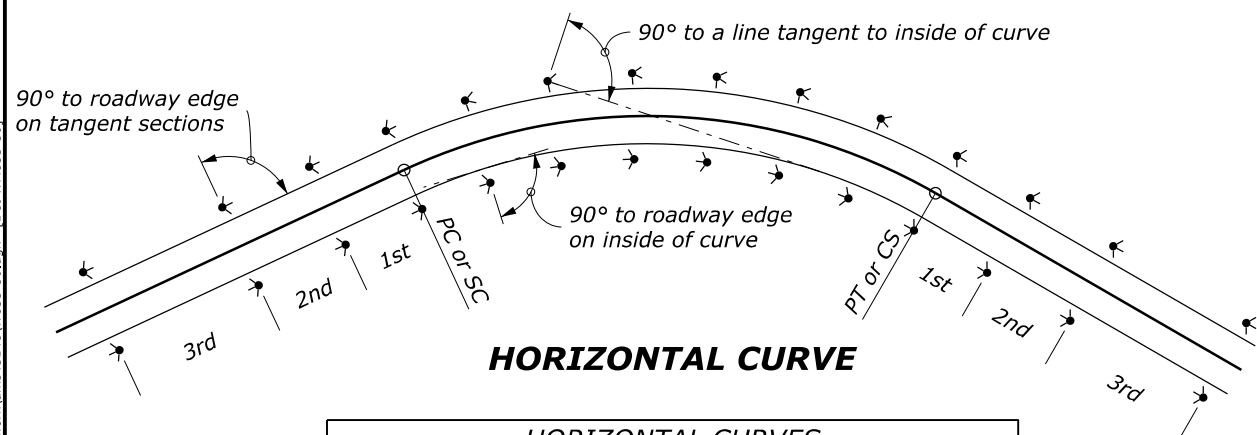


RIGID STEEL OR ALUMINUM (ALL HOLES 6.5 mm DIAMETER)
POST "R" DETAIL



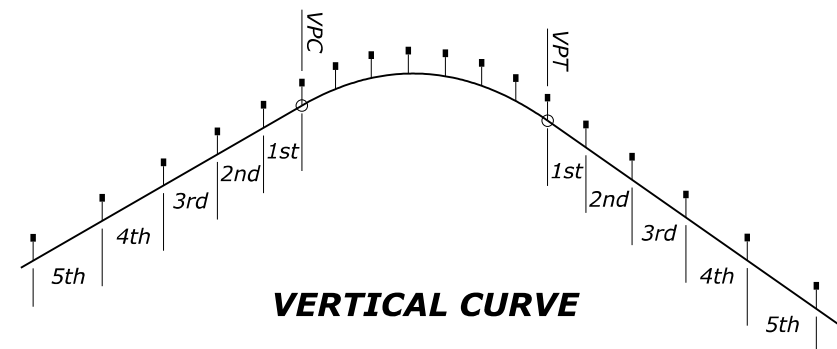
| LATERAL PLACEMENT TABLE | |
|-------------------------|--------------|
| SLOPE | OFFSET |
| 1V:4H | 1200 to 1800 |
| 1V:6H or flatter | 1800 to 2400 |
| Curb Section | 1800 |

TYPICAL INSTALLATION



HORIZONTAL CURVE

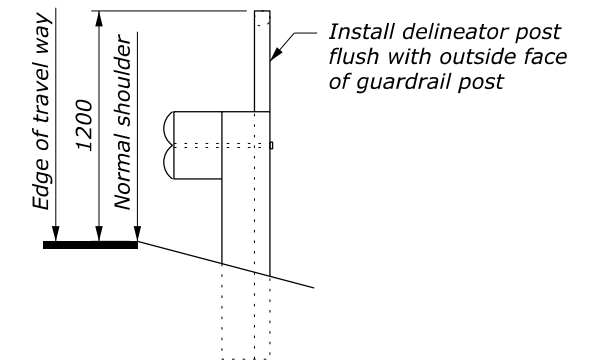
| HORIZONTAL CURVES | | | | |
|-----------------------|-------------------------------------|-------------------------|-----------|-----------|
| CURVE RADIUS (METERS) | SPACING ON EACH SIDE OF ROADWAY (m) | | | |
| | ON CURVE | BEYOND SC, CS, PC or PT | | |
| | | 1st SPACE | 2nd SPACE | 3rd SPACE |
| ≥ 1900 | 90 | 160 | 160 | 160 |
| 450 - 1899 | 45 | 90 | 160 | 160 |
| 150 - 449 | 30 | 60 | 90 | 160 |
| 75 - 149 | 25 | 45 | 70 | 160 |
| < 75 | 15 | 30 | 45 | 90 |



VERTICAL CURVE

| CREST VERTICAL CURVES | | | | | | |
|-----------------------|---|-------------------|-----------|-----------|-----------|-----------|
| K | SPACING ON EACH SIDE OF ROADWAY IN METERS | | | | | |
| | ON CURVE | BEYOND VPC or VPT | | | | |
| | | 1st SPACE | 2nd SPACE | 3rd SPACE | 4th SPACE | 5th SPACE |
| ≥ 165 | 160 | 160 | 160 | 160 | 160 | 160 |
| 120 - 164 | 90 | 160 | 160 | 160 | 160 | 160 |
| 60 - 119 | 60 | 90 | 160 | 160 | 160 | 160 |
| 30 - 59 | 30 | 45 | 60 | 90 | 160 | 160 |
| 15 - 29 | 25 | 30 | 45 | 60 | 90 | 160 |
| < 15 | 15 | 25 | 30 | 45 | 60 | 90 |

$K = L/A$ where L = Length of vertical curve in meters
 A = Algebraic grade change in %



TYPICAL INSTALLATION WITH BEAM TYPE GUARD RAIL

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

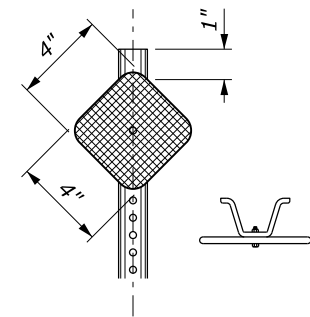
WFLHD METRIC DETAIL

IDAHO DELINEATORS

DETAIL APPROVED FOR USE 9/2009
REVISED:

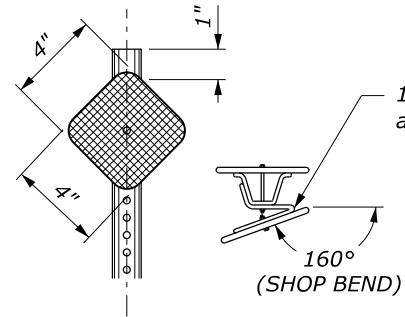
DETAIL WM633-50

NO SCALE



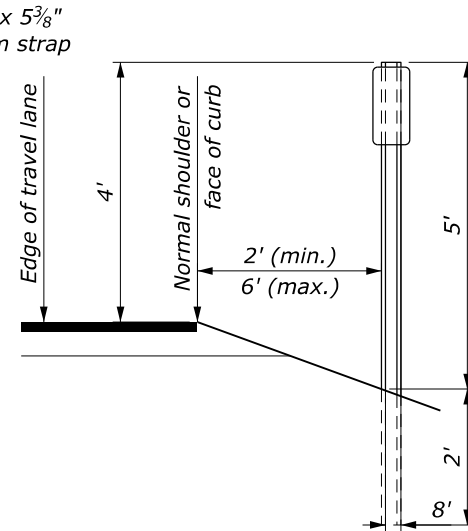
DESIGN A
(WHITE)

Use for delineation on tangents and on curves with $R > 1500'$.

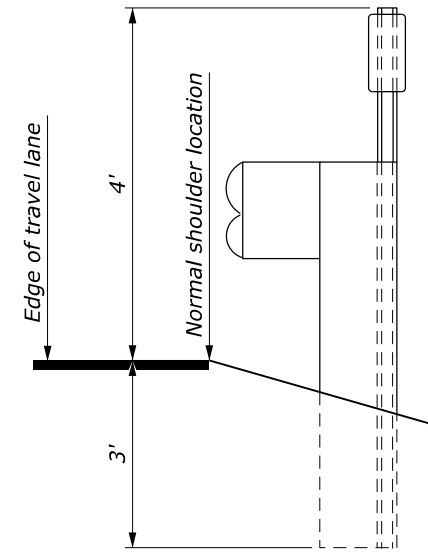


DESIGN C
(WHITE)

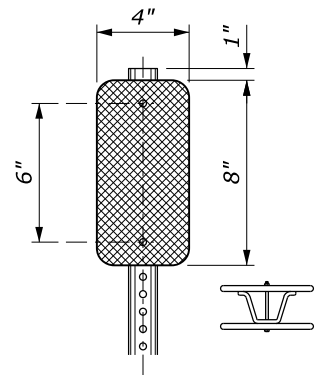
Use on curves with $R \leq 575'$



TYPICAL INSTALLATION

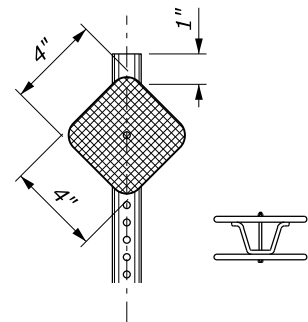


TYPICAL INSTALLATION WITH BEAM TYPE GUARD RAIL



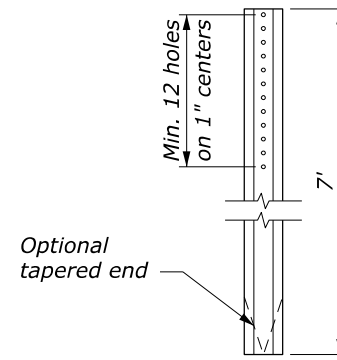
DESIGN D
(YELLOW)

Use at approaches with Stop or Yield signs.

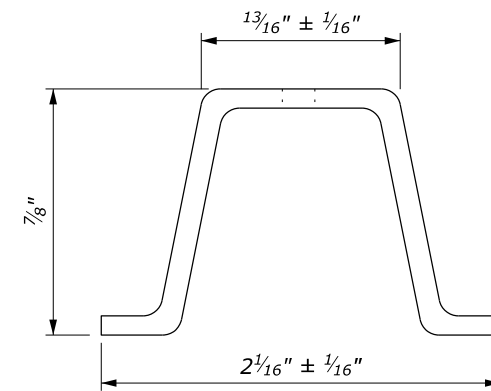


DESIGN F
(WHITE)

Use for curves with $R > 575'$ and $R \leq 1500'$.

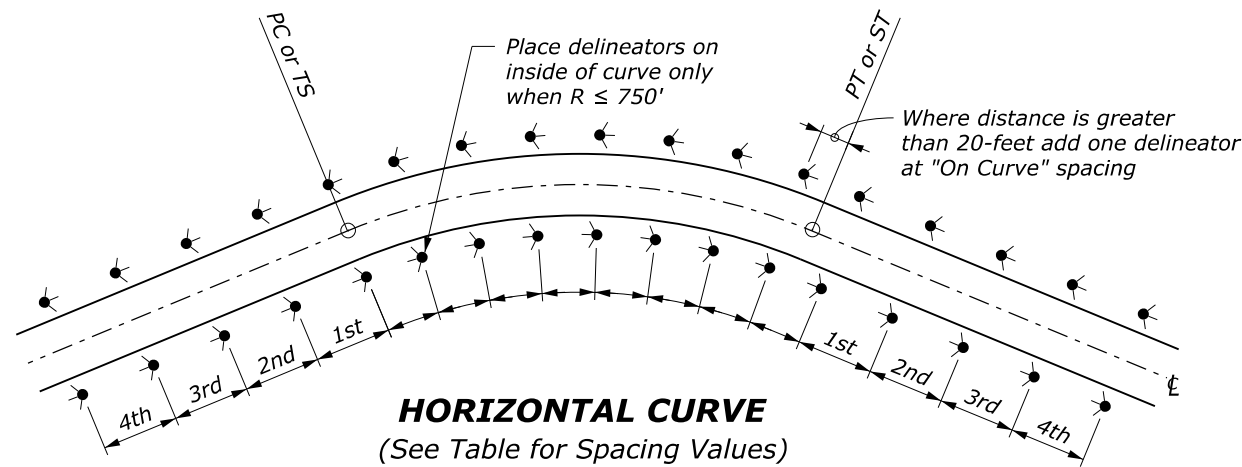


Optional tapered end

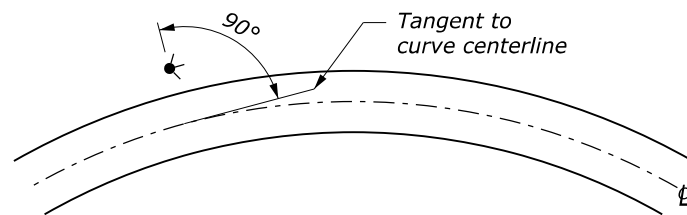


DELINEATOR POST DETAILS

Rigid Steel or Aluminum



HORIZONTAL CURVE
(See Table for Spacing Values)



SIGN INSTALLATION ANGLE

| HORIZONTAL CURVES | | | | | |
|-------------------|-----------------------|---|-----------|-----------|-----------|
| RADIUS (ft) | SPACING ON CURVE (ft) | SPACING IN ADVANCE OF & BEYOND CURVE (ft) | | | |
| | | 1st SPACE | 2nd SPACE | 3rd SPACE | 4th SPACE |
| ≥ 5700 | 300 | 400 | 400 | 400 | 400 |
| 3000 to < 5700 | 225 | 400 | 400 | 400 | 400 |
| 2000 to < 3000 | 160 | 320 | 400 | 400 | 400 |
| 1500 to < 2000 | 130 | 260 | 400 | 400 | 400 |
| 1000 to < 1500 | 110 | 220 | 330 | 400 | 400 |
| 700 to < 1000 | 90 | 185 | 275 | 400 | 400 |
| 500 to < 700 | 75 | 150 | 230 | 300 | 400 |
| 300 to < 500 | 60 | 125 | 185 | 300 | 400 |
| < 300 | 45 | 90 | 140 | 275 | 400 |

NOTE:

- When the contract does not include the final surfacing, allow for the thickness of the final pavement structure when establishing the elevation of the traffic delineators.
- Place delineators at a constant clearance distance from the edge of pavement except where guardrail or other obstructions interfere. Align delineators with the inside edge of obstruction. Install delineators located behind beam guardrail so that the delineator post is adjacent to the trailing edge of the nearest guardrail post. (See typical installation with beam type guardrail).
- When a delineator falls within a cross road or approach, the delineator may be moved in either direction a distance not to exceed one quarter of the normal spacing. Eliminate the post if this allowance is exceeded.
- Mount delineators on metal posts with $\frac{3}{16}$ " cadmium plated bolt(s). Drill or punch a minimum of twelve $\frac{3}{8}$ " diameter holes on 1-inch centers from the top of the post. $\frac{3}{8}$ " square holes may be used with large-headed bolt or an appropriate washer. Jam threads after tightening the nut to prevent removal.
- All delineator reflectors have $\frac{3}{4}$ " corner radii.
- Manufacture posts from flanged U-channel sections of steel meeting the requirements of ASTM A 36 and weighing not less than 1.25 pounds per foot or aluminum meeting the requirements of ASTM B 221, Alloy 6061-T6, with a minimum thickness of 0.125 inches. After fabrication galvanize steel posts in accordance with ASTM A 123.
- When a route has a current ADT of 900 or greater, continuously delineate the roadway along the shoulder by means of post mounted reflectors. Spacing on tangent sections is 400 feet.

NO SCALE

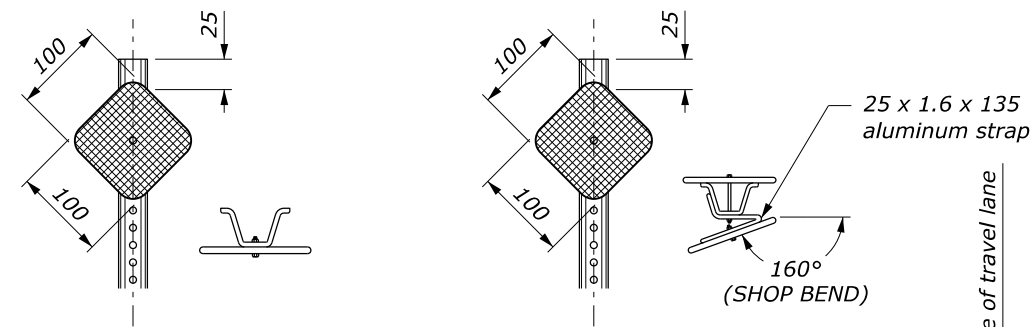
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

WFLHD DETAIL

MONTANA
DELINEATORS

DETAIL APPROVED FOR USE 11/2006
REVISED: 1/2008

DETAIL
W633-60

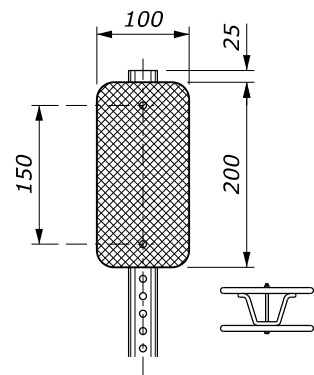


DESIGN A
(WHITE)

Use for delineation on tangents and on curves with $R > 450$ m.

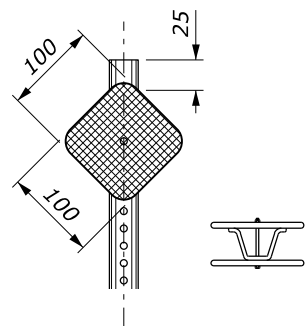
DESIGN C
(WHITE)

Use on curves with $R \leq 170$ m



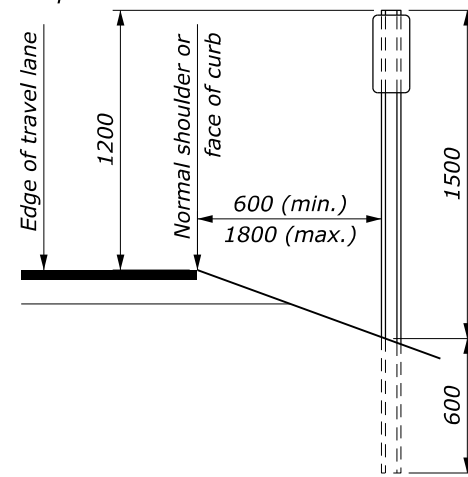
DESIGN D
(YELLOW)

Use at approaches with Stop or Yield signs.

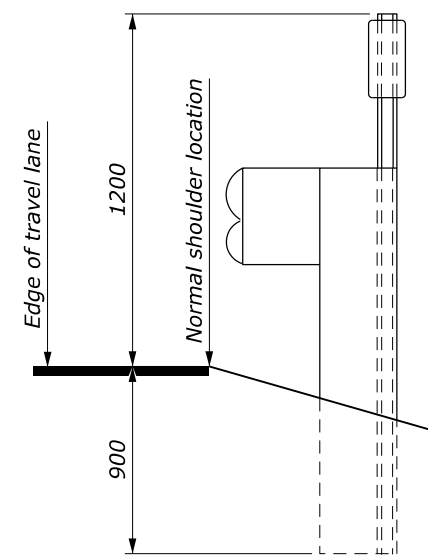


DESIGN F
(WHITE)

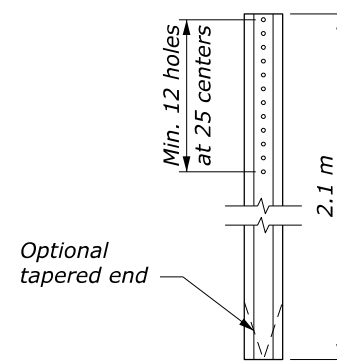
Use for curves with $R > 170$ m and $R \leq 450$ m.



TYPICAL INSTALLATION

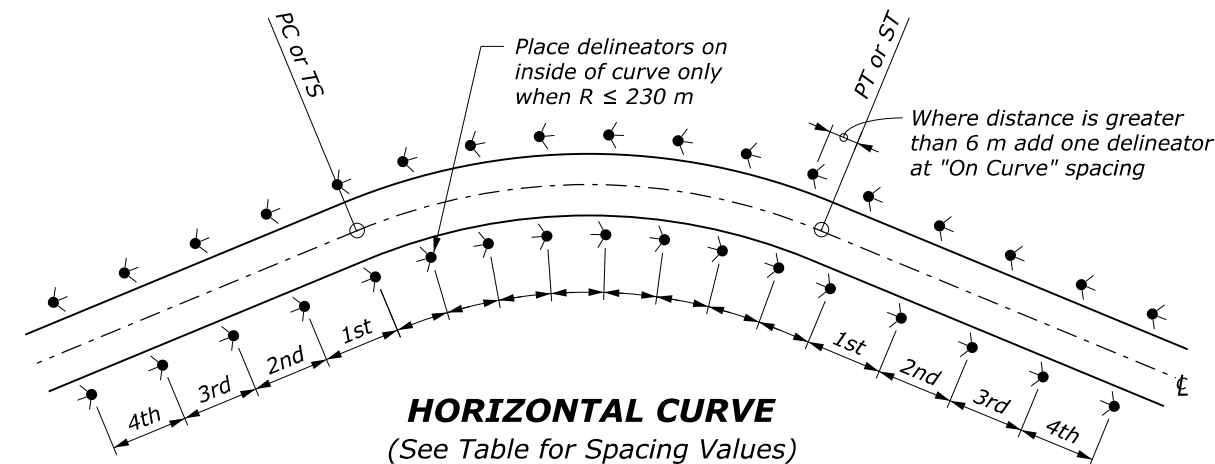
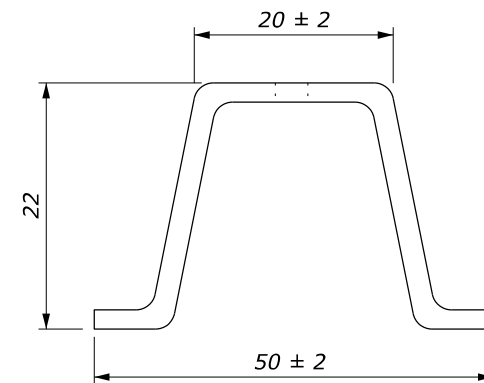


TYPICAL INSTALLATION WITH BEAM TYPE GUARD RAIL

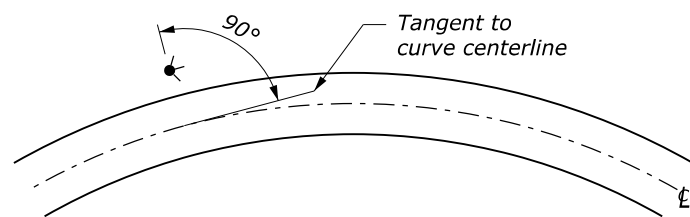


DELINEATOR POST DETAILS

Rigid Steel or Aluminum



HORIZONTAL CURVE
(See Table for Spacing Values)



SIGN INSTALLATION ANGLE

| HORIZONTAL CURVES | | | | | |
|-------------------|----------------------|--|-----------|-----------|-----------|
| RADIUS (m) | SPACING ON CURVE (m) | SPACING IN ADVANCE OF & BEYOND CURVE (m) | | | |
| | | 1st SPACE | 2nd SPACE | 3rd SPACE | 4th SPACE |
| ≥ 1750 | 90 | 120 | 120 | 120 | 120 |
| 900 to < 1750 | 65 | 120 | 120 | 120 | 120 |
| 600 to < 900 | 50 | 95 | 120 | 120 | 120 |
| 450 to < 600 | 40 | 75 | 120 | 120 | 120 |
| 300 to < 450 | 35 | 65 | 100 | 120 | 120 |
| 200 to < 300 | 25 | 55 | 80 | 120 | 120 |
| 150 to < 200 | 20 | 45 | 70 | 90 | 120 |
| 100 to < 150 | 20 | 35 | 55 | 90 | 120 |
| < 100 | 15 | 25 | 40 | 80 | 120 |

NOTE:

- When the contract does not include the final surfacing, allow for the thickness of the final pavement structure when establishing the elevation of the traffic delineators.
- Place delineators at a constant clearance distance from the edge of pavement except where guardrail or other obstructions interfere. Align delineators with the inside edge of obstruction. Install delineators located behind beam guardrail so that the delineator post is adjacent to the trailing edge of the nearest guardrail post. (See typical installation with beam type guardrail).
- When a delineator falls within a cross road or approach, the delineator may be moved in either direction a distance not to exceed one quarter of the normal spacing. Eliminate the post if this allowance is exceeded.
- Mount delineators on metal posts with M5 cadmium plated bolt(s). Drill or punch a minimum of twelve 9.5 mm diameter holes on 25 mm centers from the top of the post. 9.5 mm square holes may be used with large-headed bolt or an appropriate washer. Jam threads after tightening the nut to prevent removal.
- All delineator reflectors have 20 mm corner radii.
- Manufacture posts from flanged U-channel sections of steel meeting the requirements of ASTM A 36 and weighing not less than 1.86 kilograms per meter or aluminum meeting the requirements of ASTM B 221, Alloy 6061-T6, with a minimum thickness of 3.2 mm. After fabrication galvanize steel posts in accordance with ASTM A 123.
- When a route has a current ADT of 900 or greater, continuously delineate the roadway along the shoulder by means of post mounted reflectors. Spacing on tangent sections is 120 meters.
- Furnish hardware in the metric sizes shown. Equivalent US Customary sizes may be used when metric sizes are not available.
- Dimensions without units are millimeters.

NO SCALE

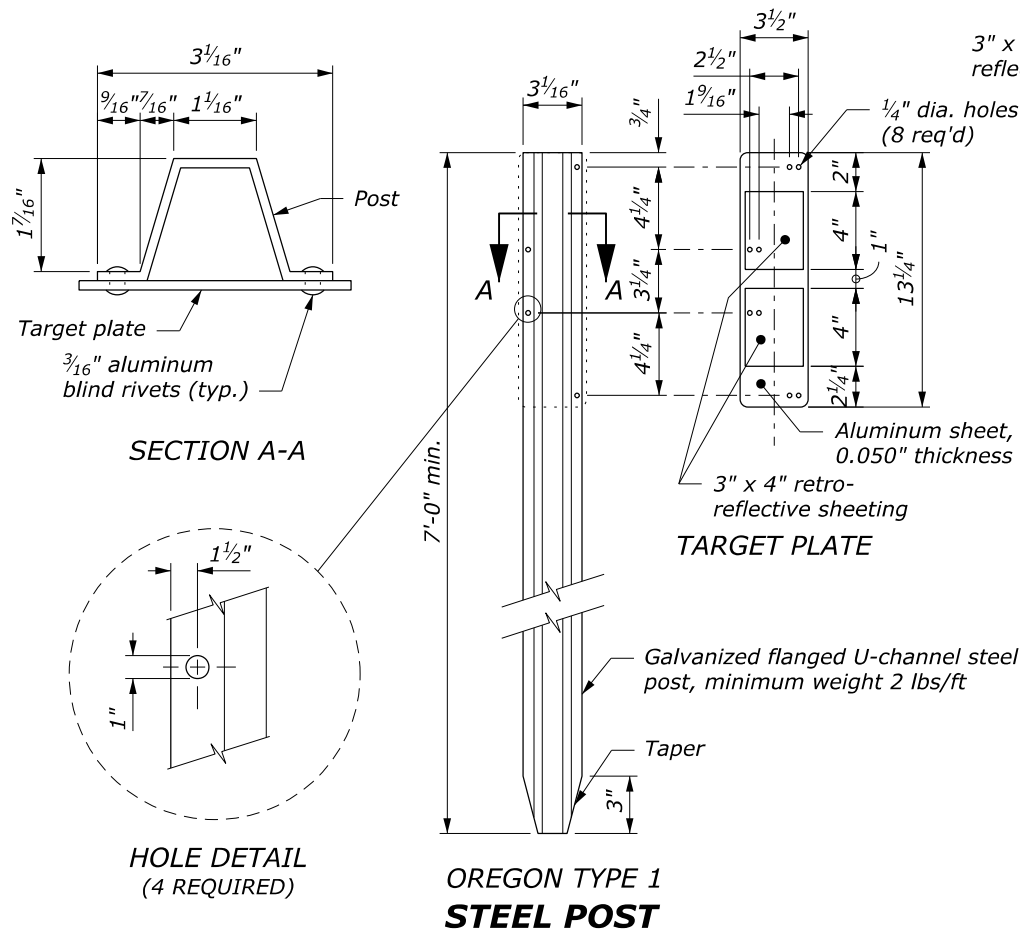
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

WFLHD METRIC DETAIL

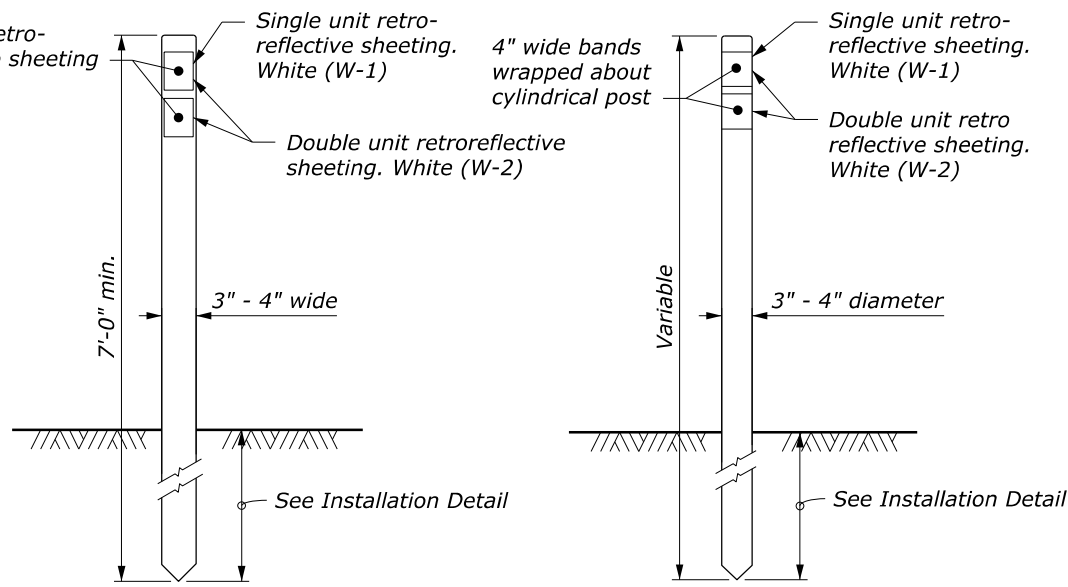
MONTANA
DELINEATORS

DETAIL APPROVED FOR USE 11/2006
REVISED: 1/2008

DETAIL
WM633-60



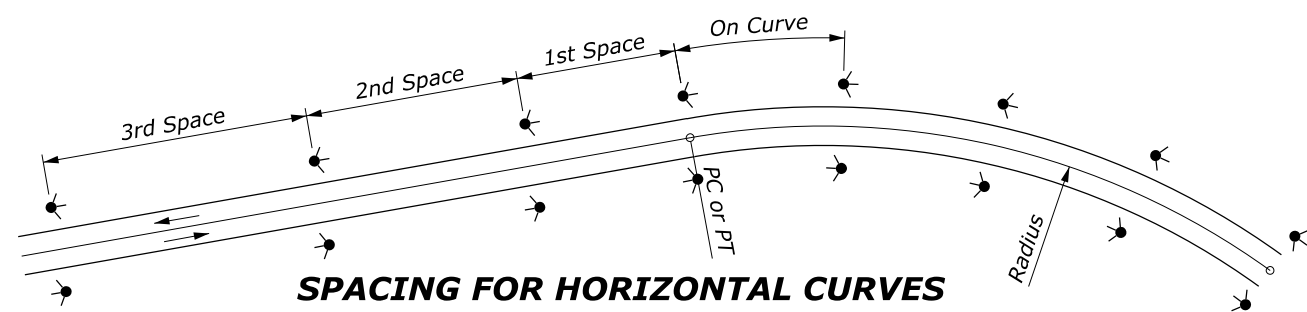
OREGON TYPE 1 STEEL POST



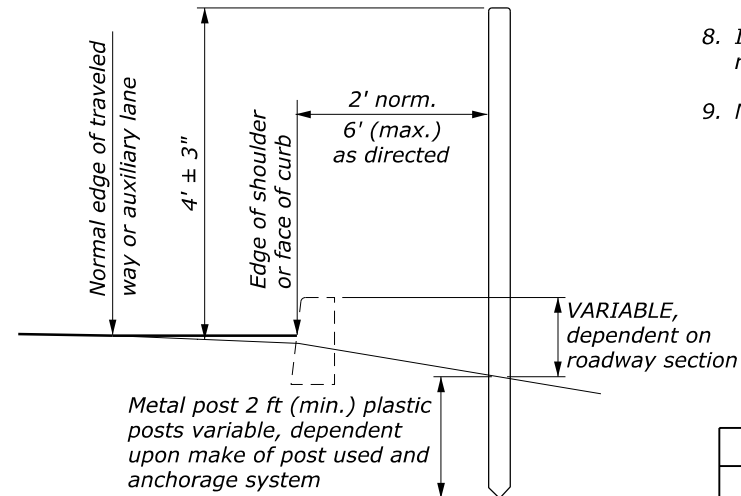
OREGON TYPE 2 OREGON TYPE 3 FLEXIBLE PLASTIC POSTS

NOTE:

1. Place delineators nearly opposite each other on horizontal curves.
2. Install all delineators with reflectors facing adjacent on-coming traffic.
3. Install delineators behind the rail at guardrail locations.
4. Offset delineators a minimum distance of 4 feet in areas of heavy snow removal operations.
5. On roads with less than 500 ADT, use delineators only for situations such as sharp vertical or horizontal curves, or other undesirable geometrics exist.
6. Vary the post spacing up to 1/4 of the spacing shown to clear driveways, cross roads, intersections or ramps. Eliminate the post if the variation is exceeded.
7. When the contract does not provide for the construction of the ultimate pavement, allow for the thickness of base and pavement to be placed later when establishing the elevation of the traffic delineators.
8. If horizontal and vertical curves are combined, use the more restrictive spacing.
9. Measure spacing along the shoulder or face of curb.



SPACING FOR HORIZONTAL CURVES



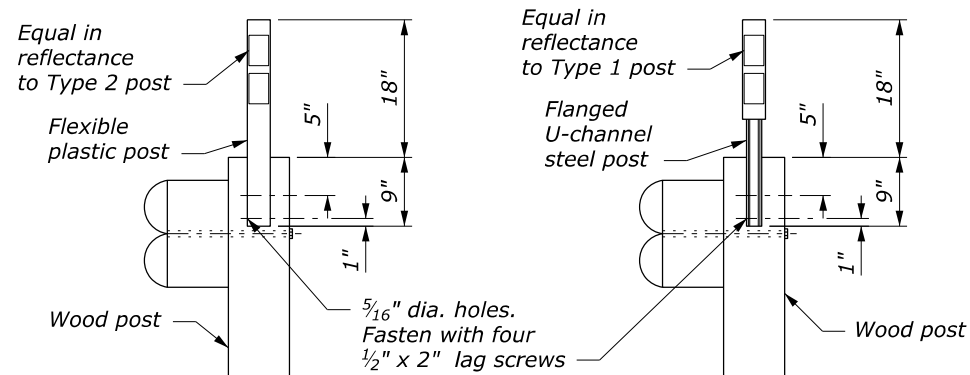
TYPICAL INSTALLATION

REFLECTOR DETAILS

| TYPE | REFLECTOR & TARGET/POST COLOR | NUMBER OF REFLECTORS | USAGE AND SPACING |
|------|-------------------------------|----------------------|---|
| W-1 | White | 1 | Max. tangent spacing: 400' each side Intersections (tapers and widening): 100' See Horizontal Curves table for variations |
| W-2 | White | 2 | Intersection Radius: 3 min. @ 50' Lane Reduction: 3 min @ 100' |

HORIZONTAL CURVES

| RADIUS OF CURVE | SPACING ON EACH SIDE OF ROADWAY IN FEET | | | |
|-----------------|---|------------------------------|-----------|-----------|
| | ON CURVE | IN ADVANCE OF & BEYOND CURVE | | |
| | | 1st SPACE | 2nd SPACE | 3rd SPACE |
| ≥ 5800 | 300 | 300 | 300 | 300 |
| 2900 to < 5800 | 230 | 300 | 300 | 300 |
| 2000 to < 2900 | 160 | 300 | 300 | 300 |
| 1500 to < 2000 | 130 | 260 | 300 | 300 |
| 1200 to < 1500 | 110 | 220 | 300 | 300 |
| 960 to < 1200 | 100 | 200 | 300 | 300 |
| 820 to < 960 | 90 | 180 | 270 | 300 |
| 640 to < 820 | 80 | 160 | 240 | 300 |
| 480 to < 640 | 70 | 140 | 210 | 300 |
| 340 to < 480 | 60 | 120 | 180 | 300 |
| 250 to < 340 | 50 | 100 | 150 | 300 |
| 170 to < 250 | 40 | 80 | 120 | 240 |
| 110 to < 170 | 30 | 60 | 90 | 180 |
| ≤ 110 | 20 | 40 | 60 | 120 |



ALTERNATE 1 ALTERNATE 2 OREGON TYPE 4 PLASTIC OR STEEL POST INSTALLATION WITH BEAM TYPE GUARDRAIL

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

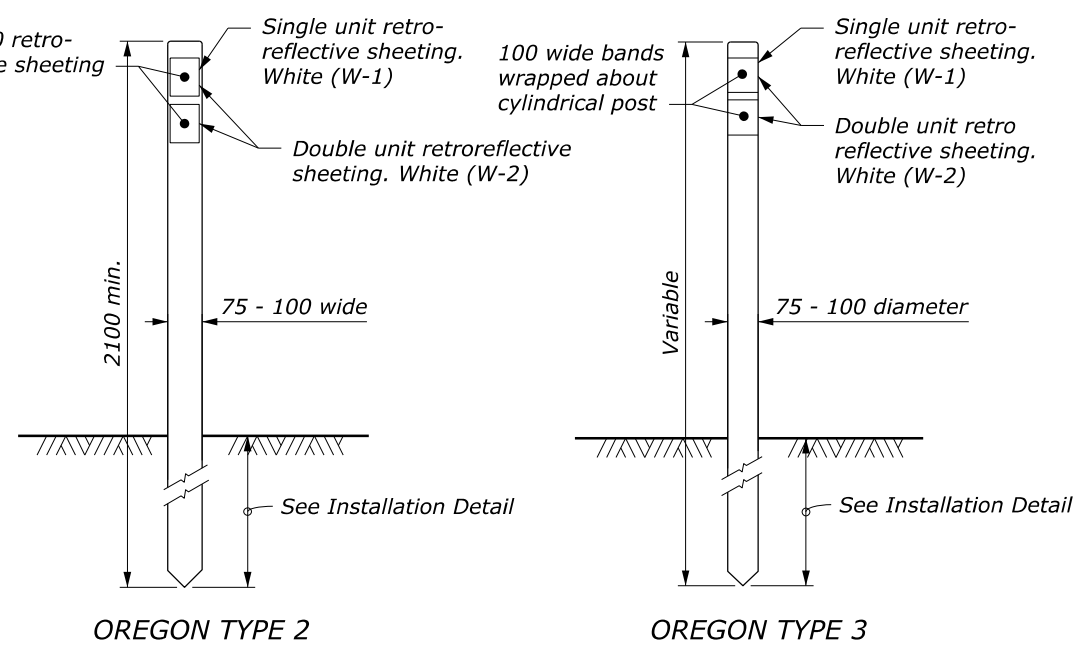
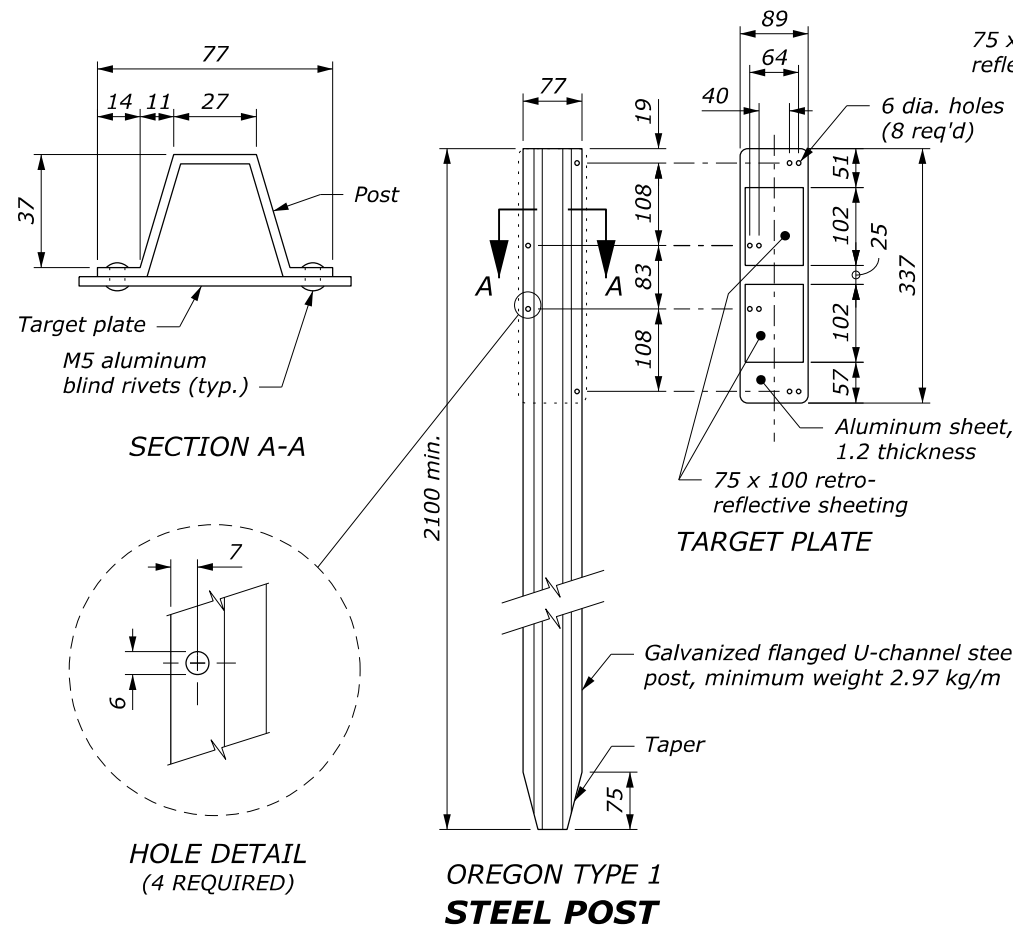
WFLHD DETAIL

OREGON DELINEATORS

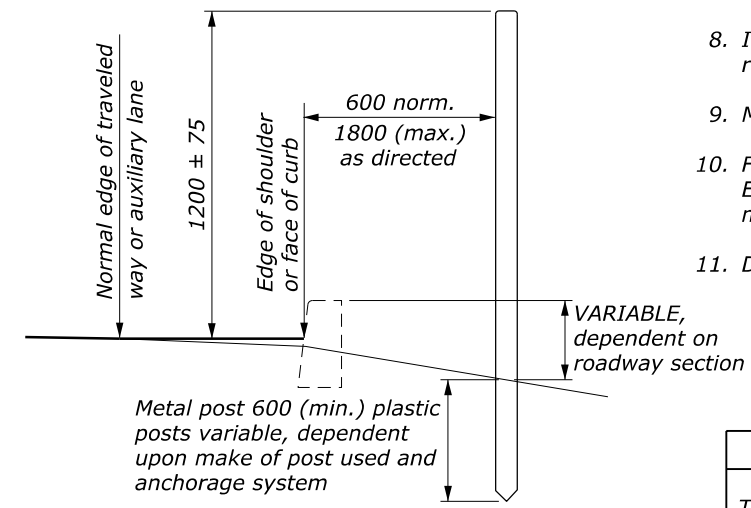
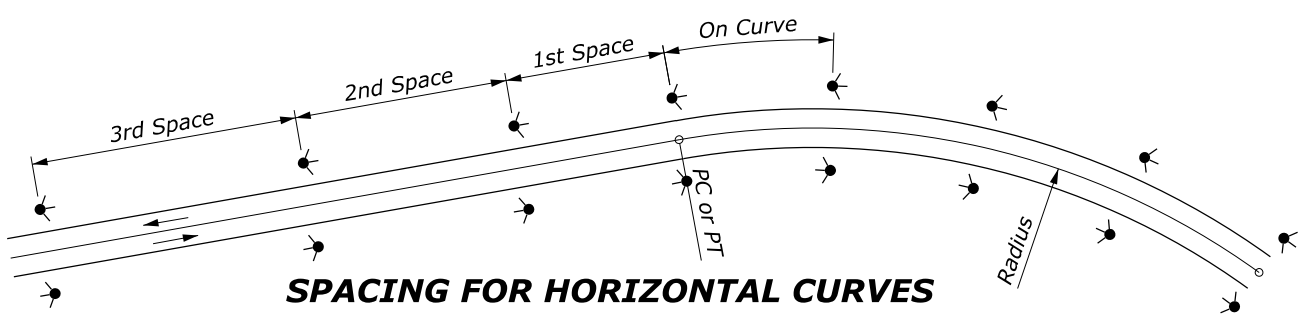
NO SCALE

DETAIL APPROVED FOR USE 11/2014
REVISED:

DETAIL
W633-70



FLEXIBLE PLASTIC POSTS

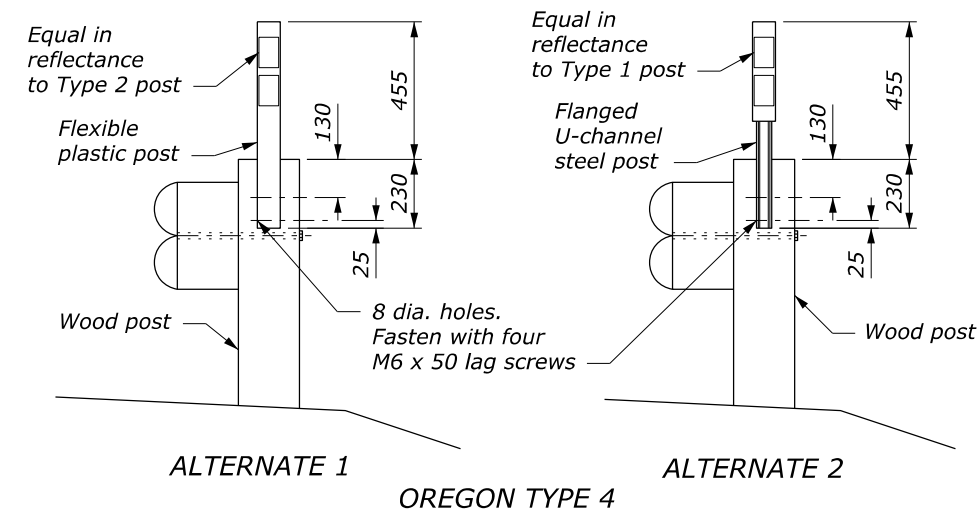


NOTE:

1. Place delineators nearly opposite each other on horizontal curves.
2. Install all delineators with reflectors facing adjacent on-coming traffic.
3. Install delineators behind the rail at guardrail locations.
4. Offset delineators a minimum distance of 1.2 m in areas of heavy snow removal operations.
5. On roads with less than 500 ADT, use delineators only for situations such as sharp vertical or horizontal curves, or other undesirable geometrics exist.
6. Vary the post spacing up to 1/4 of the spacing shown to clear driveways, cross roads, intersections or ramps. Eliminate the post if the variation is exceeded.
7. When the contract does not provide for the construction of the ultimate pavement, allow for the thickness of base and pavement to be placed later when establishing the elevation of the traffic delineators.
8. If horizontal and vertical curves are combined, use the more restrictive spacing.
9. Measure spacing along the shoulder or face of curb.
10. Furnish hardware in the metric sizes shown. Equivalent US Customary sizes may be used when metric sizes are unavailable.
11. Dimensions without units are millimeters.

| REFLECTOR DETAILS | | | |
|-------------------|-------------------------------|----------------------|--|
| TYPE | REFLECTOR & TARGET/POST COLOR | NUMBER OF REFLECTORS | USAGE AND SPACING |
| W-1 | White | 1 | Max. tangent spacing: 120 m each side |
| | | | Intersections (tapers and widening): 30 m |
| | | | See Horizontal Curves table for variations |
| W-2 | White | 2 | Intersection Radius: 3 min. @ 15 m |
| | | | Lane Reduction: 3 min @ 30 m |

| HORIZONTAL CURVES | | | | |
|-------------------|---|------------------------------|-----------|-----------|
| RADIUS OF CURVE | SPACING ON EACH SIDE OF ROADWAY IN METERS | | | |
| | ON CURVE | IN ADVANCE OF & BEYOND CURVE | | |
| | | 1st SPACE | 2nd SPACE | 3rd SPACE |
| ≥ 1750 | 90 | 90 | 90 | 90 |
| 875 to < 1750 | 70 | 90 | 90 | 90 |
| 585 to < 875 | 50 | 90 | 90 | 90 |
| 440 to < 585 | 40 | 80 | 90 | 90 |
| 350 to < 440 | 35 | 70 | 90 | 90 |
| 295 to < 350 | 30 | 60 | 90 | 90 |
| 250 to < 295 | 30 | 55 | 85 | 90 |
| 195 to < 250 | 25 | 50 | 75 | 90 |
| 145 to < 195 | 20 | 45 | 65 | 90 |
| 105 to < 145 | 20 | 35 | 55 | 90 |
| 75 to < 105 | 15 | 30 | 45 | 90 |
| 50 to < 75 | 10 | 25 | 35 | 75 |
| 32 to < 50 | 10 | 20 | 30 | 55 |
| ≤ 32 | 5 | 15 | 20 | 40 |



ALTERNATE 1 ALTERNATE 2 OREGON TYPE 4 PLASTIC OR STEEL POST INSTALLATION WITH BEAM TYPE GUARDRAIL

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
OFFICE OF FEDERAL LANDS HIGHWAY

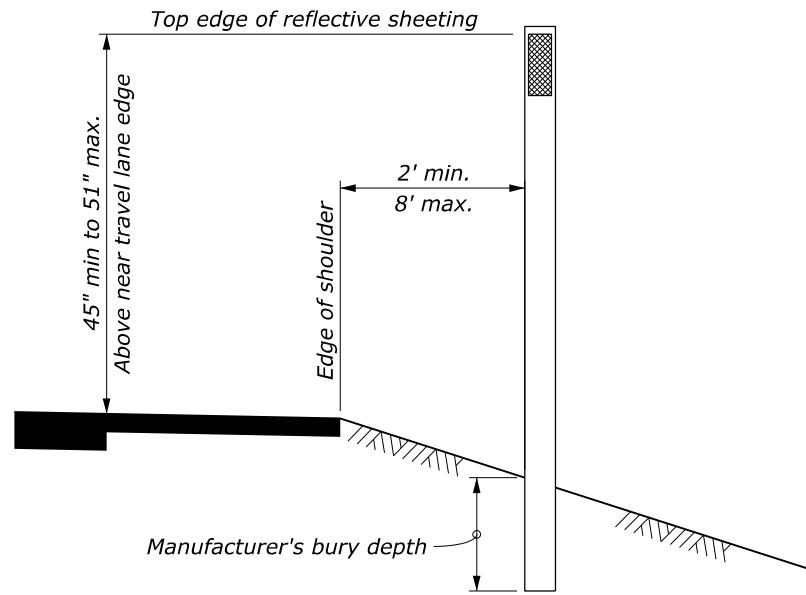
WFLHD METRIC DETAIL

OREGON DELINEATORS

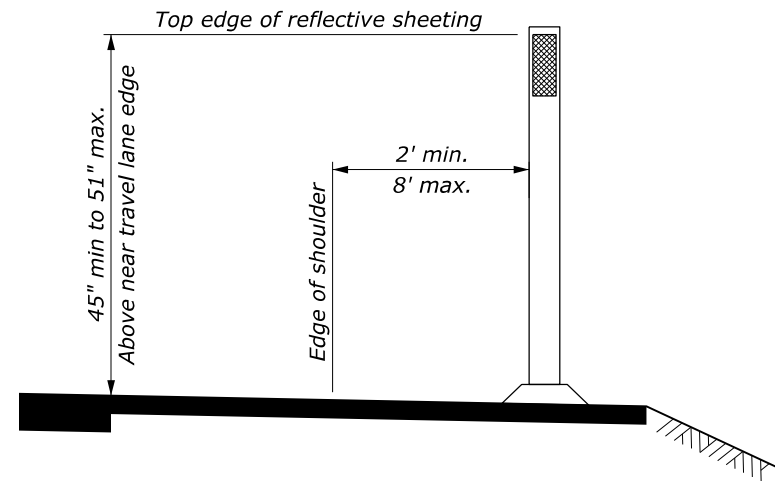
DETAIL APPROVED FOR USE 11/2014
REVISED:

DETAIL WM633-70

NO SCALE



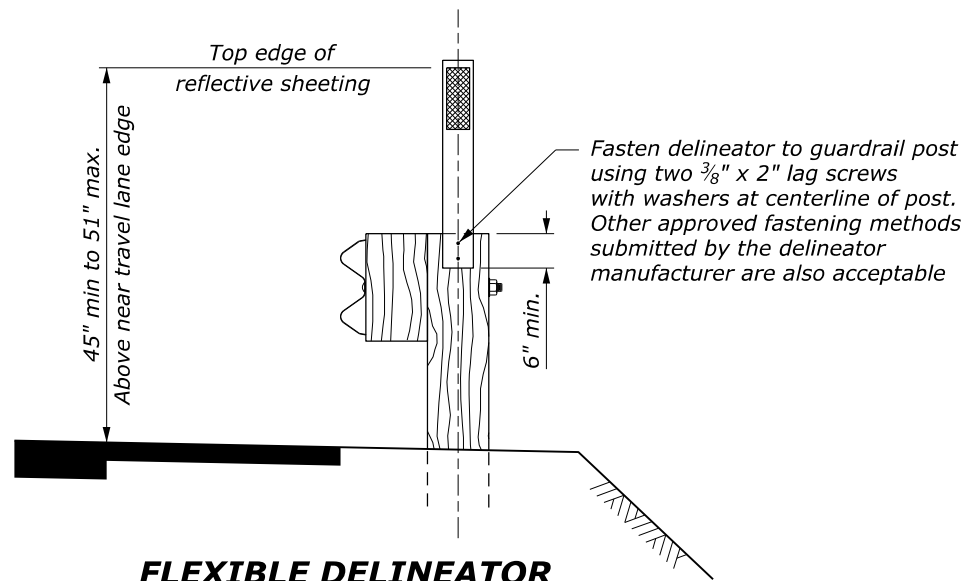
FLEXIBLE DELINEATOR
GROUND MOUNTED



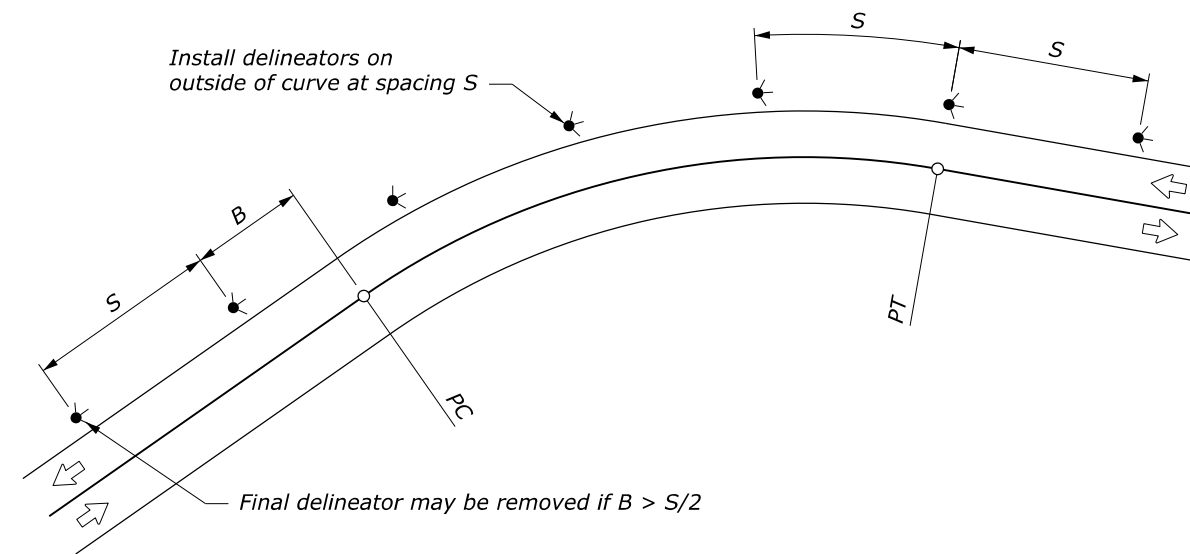
FLEXIBLE DELINEATOR
SURFACE MOUNTED

NOTE:

1. When a delineator falls within a cross road or approach, the delineator may be moved in either direction a distance not to exceed one quarter of the normal spacing. Eliminate the delineator if this allowance is exceeded.
2. Place delineators 2 feet from the edge of design shoulder unless otherwise specified.
3. Install delineators behind the rail at guardrail locations. Either drive the delineator in line with the guardrail posts or mount a shorter delineator onto the guardrail post as shown on this sheet.
4. When the contract does not provide for the construction of the ultimate pavement, allow for the thickness of base and pavement to be placed later when establishing the elevation of the traffic delineators.
5. Use the current edition of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) as a guide for delineation layout.



FLEXIBLE DELINEATOR
GUARDRAIL MOUNTED OPTION
(Use only with wood guardrail posts)



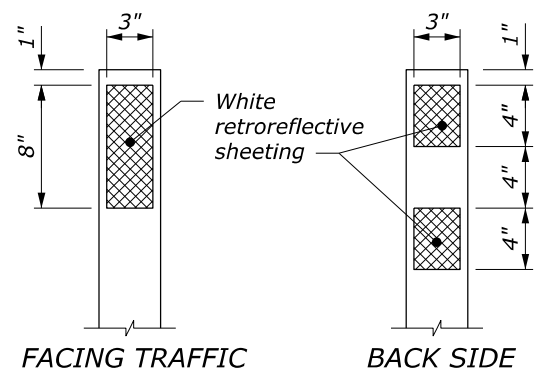
PLACEMENT ON HORIZONTAL CURVES

| DELINEATOR SPACING ON HORIZONTAL CURVES | |
|---|--------------------|
| CURVE RADIUS (FEET) | SPACING (S) (FEET) |
| 50 | 20 |
| 115 | 25 |
| 180 | 35 |
| 250 | 40 |
| 300 | 50 |
| 400 | 55 |
| 500 | 65 |
| 600 | 70 |
| 700 | 75 |
| 800 | 80 |
| 900 | 85 |
| 1,000 | 90 |

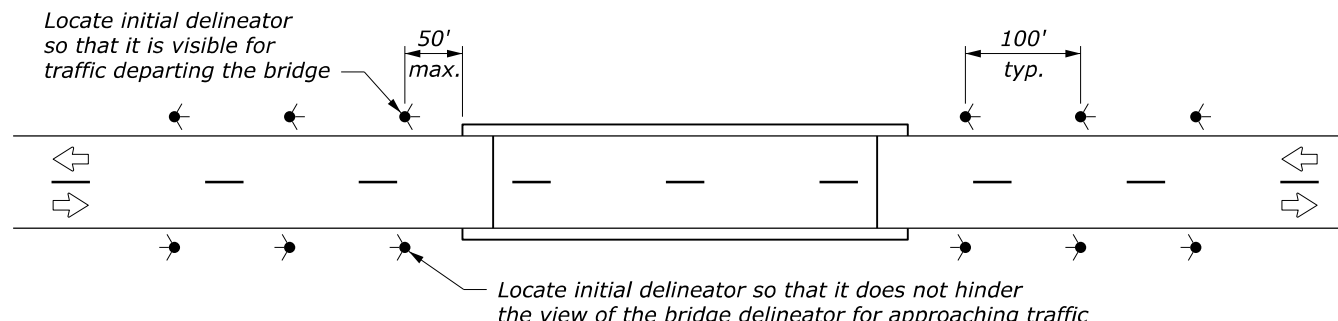
Spacing for a specific curve may be interpolated from the table, or calculated using the formula:

$$\text{Spacing} = 3 \sqrt{R-50}$$

The minimum spacing should be 20 feet.
 Curve spacing should not exceed 300 feet.



REFLECTIVE SHEETING DETAIL



PLACEMENT AT BRIDGE APPROACHES

NO SCALE

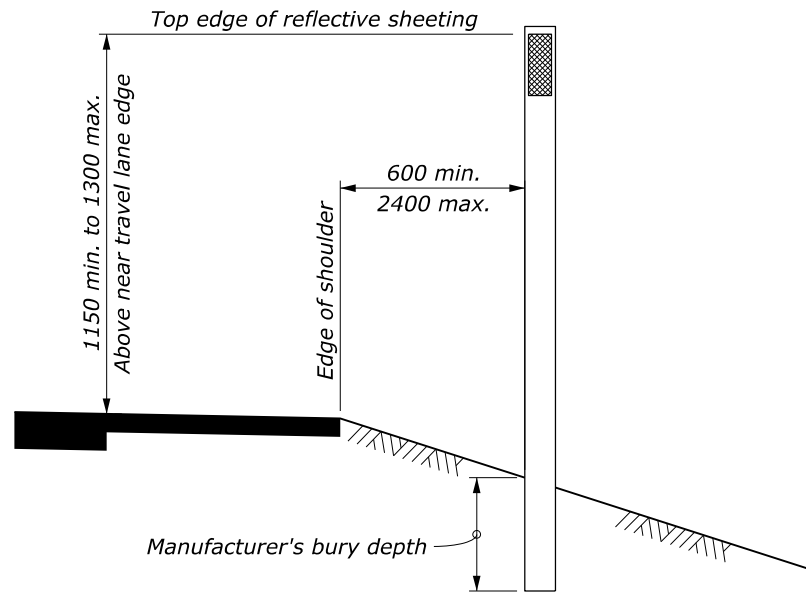
U.S. DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION
 OFFICE OF FEDERAL LANDS HIGHWAY

WFLHD DETAIL

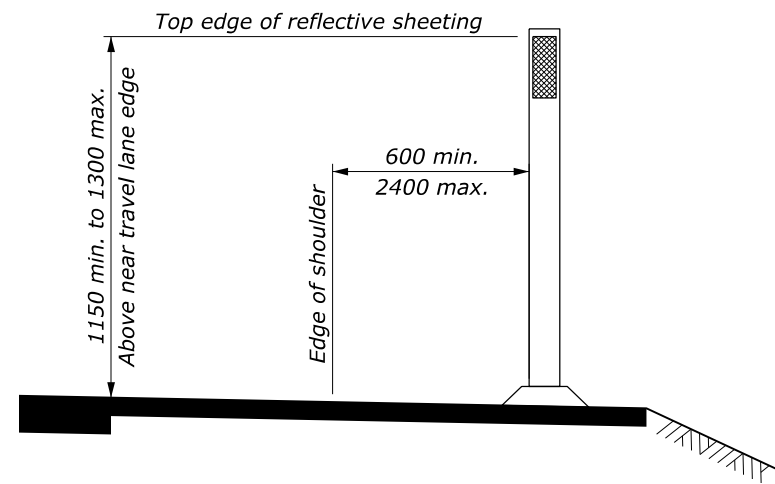
**WASHINGTON
 DELINEATORS**

DETAIL APPROVED FOR USE 1/2008
 REVISID:

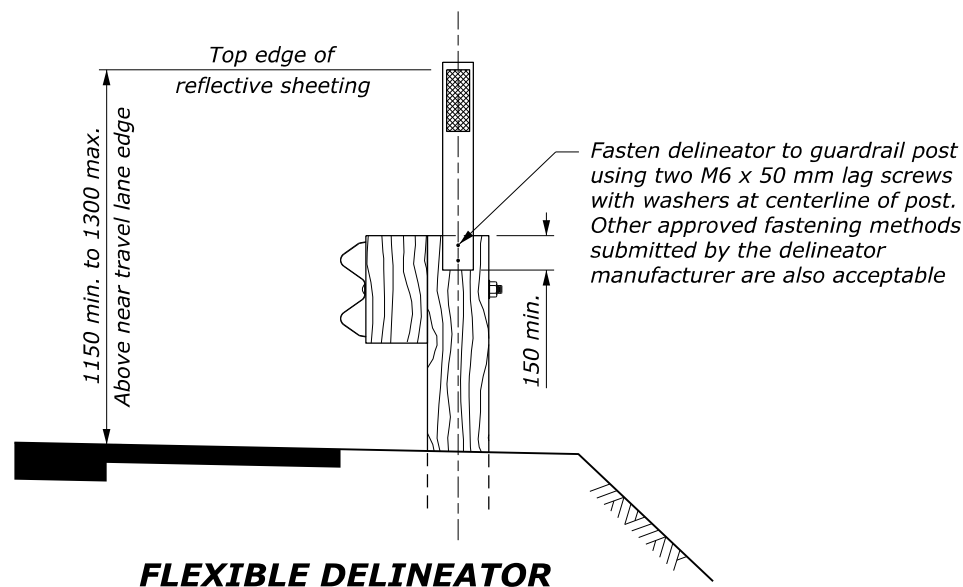
DETAIL
 W633-80



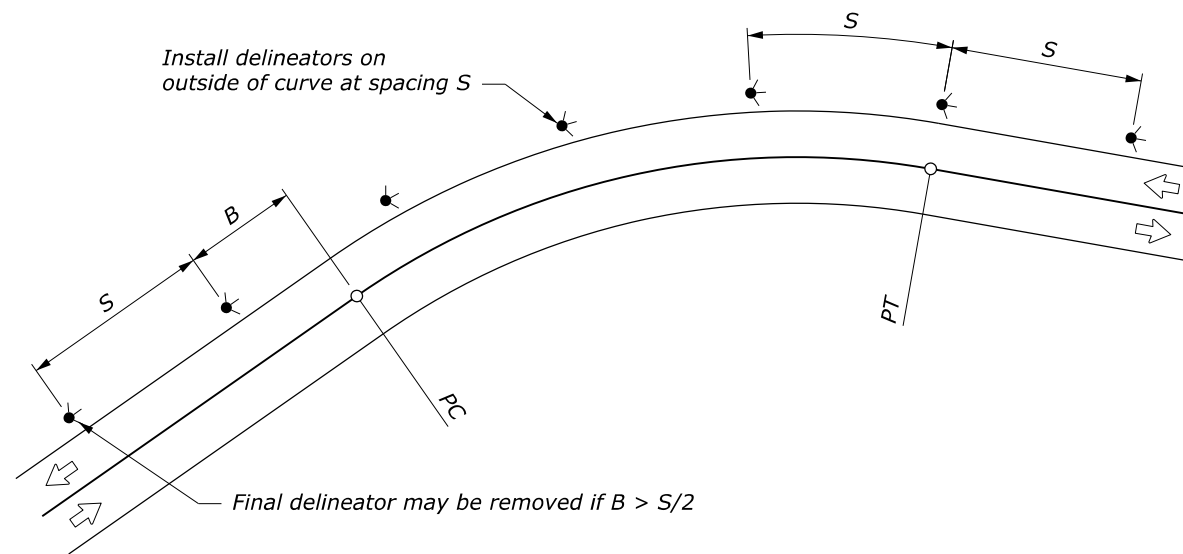
FLEXIBLE DELINEATOR
GROUND MOUNTED



FLEXIBLE DELINEATOR
SURFACE MOUNTED



FLEXIBLE DELINEATOR
GUARDRAIL MOUNTED OPTION
(Use only with wood guardrail posts)



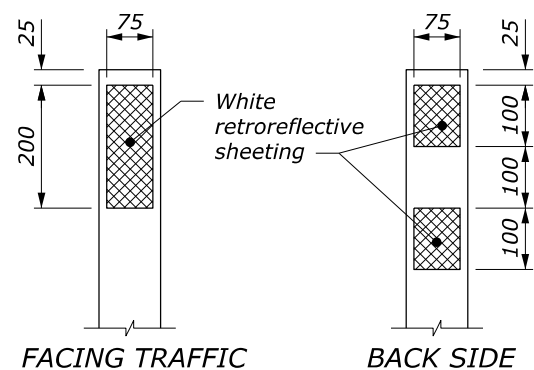
PLACEMENT ON HORIZONTAL CURVES

| DELINEATOR SPACING ON HORIZONTAL CURVES | |
|---|-----------------|
| CURVE RADIUS (m) | SPACING (S) (m) |
| 15 | 6 |
| 35 | 8 |
| 55 | 11 |
| 75 | 13 |
| 95 | 15 |
| 125 | 18 |
| 155 | 20 |
| 185 | 22 |
| 215 | 24 |
| 245 | 26 |
| 275 | 27 |
| 305 | 29 |

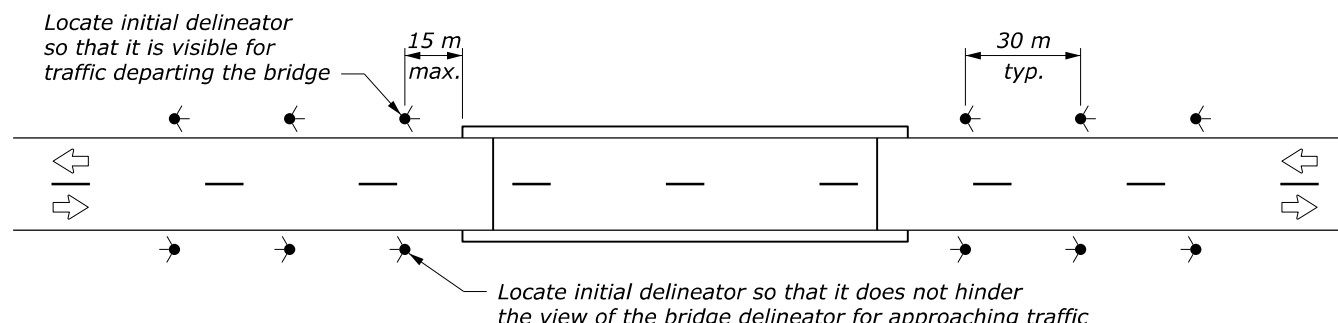
Spacing for a specific curve may be interpolated from the table, or calculated using the formula:

$$\text{Spacing} = 1.7 \sqrt{R-15}$$

The minimum spacing should be 6 meters.
 Curve spacing should not exceed 90 meters.



REFLECTIVE SHEETING DETAIL



PLACEMENT AT BRIDGE APPROACHES

NOTE:

1. When a delineator falls within a cross road or approach, the delineator may be moved in either direction a distance not to exceed one quarter of the normal spacing. Eliminate the delineator if this allowance is exceeded.
2. Place delineators 600 mm from the edge of design shoulder unless otherwise specified.
3. Install delineators behind the rail at guardrail locations. Either drive the delineator in line with the guardrail posts or mount a shorter delineator onto the guardrail post as shown on this sheet.
4. When the contract does not provide for the construction of the ultimate pavement, allow for the thickness of base and pavement to be placed later when establishing the elevation of the traffic delineators.
5. Use the current edition of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) as a guide for delineation layout.
6. Furnish hardware in the metric sizes shown. Equivalent US Customary sizes may be used when metric sizes are unavailable.
7. Dimensions without units are millimeters.

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION
 OFFICE OF FEDERAL LANDS HIGHWAY

WFLHD METRIC DETAIL

WASHINGTON
DELINEATORS

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 REVISED:

DETAIL
 WM633-80