This is the July 2021 release of the 2021 Oregon Standard Drawings.

For ODOT Projects the details in the standard drawings will be effective on the December 1, 2021 bid opening where these drawings are called for in the project plans.

These drawings are for use with projects using the 2021 Oregon Standard Specifications.

You will notice an “effective date” on the lower right bottom of each Standard Drawing. The bid opening date of a project should be in the effective date window of the drawings. This will ensure the correct drawings are being used on the projects.

Electronic PDF files with the effective date for each drawing are on the Web site at:

http://www.oregon.gov/ODOT/Engineering/Pages/Standards.aspx

The Standard Drawing Baseline Reports for the drawings contain useful information for the designer as well as updates that occur on the drawing. The link to the report is the title of the specific drawing on the webpage.

These Standard Drawings are the ones that have updates:

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GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. See Std. Dwg. RD364, RD365, and RD366 for inlet details not shown.
2. See appropriate standard drawings or special project details for other similar structures.
3. Location, elevation, diameter, slope, and number of pipe(s) varies, see project plans.
4. Maximum pipe diameter varies with pipe material.
5. All connecting pipes shall have a tracer wire, or approved alternate.
6. When rigid pipe is used, the connecting pipe shall have a flexible, gasketed and unrestrained joint within 18" of structure wall. Joint type varies with manufacturer.
7. When flexible pipe is used, install resilient connectors conforming to requirements of ASTM C923.
8. Pipe zone varies, see Std. Dwg. RD300.
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

**OREGON STANDARD DRAWINGS**

DATE: 2021

RD398

**CULVERT ID MARKER**

Effective Date: December 1, 2021 - May 31, 2022

- **SINGLE DRAINAGE FACILITY - SINGLE PIPE**
  - (See Note 8)
  - Type 2 marker paddle mounted on steel post parallel to travel lane, numbers facing edge of pavement.

- **SINGLE DRAINAGE FACILITY - MULTIPLE PIPES**
  - (See Note 8)
  - Type 1 marker, Type B Green preformed fused thermoplastic tape. Place in line with inlet side of first culvert.

- **MULTIPLE DRAINAGE FACILITY**
  - (See Note 9)
  - Type 2 marker paddle mounted on steel post parallel to travel lane, numbers facing edge of pavement.

**NOTES:**

1. See Standard Drawing TM571 for 'Type 1U Steel Post Dimensions' details.
2. Place Type 1 marker on inlet edge of the pavement directly in line with the inlet.
3. Install Type 2 culvert markers parallel to travel lane and inconspicuous to traffic.
4. On non-divided highways place markers only at the culvert inlet side of highway.
5. On divided highways placing markers on the outlet side is optional.
6. Drainage Facility ID: Place the assigned DFI number on the Type 2 marker when the culvert span is less than 6 feet. (Example D10123).
7. Bridge Structure ID: Place the assigned ID number on the Type 2 marker when the culvert has a span equal to or greater than 6 feet. (Example D10123).
8. For more information on Single and Multiple Drainage Facilities, contact the Senior Culvert Hydraulic Engineer or the Senior Culvert Maintenance Hydraulic Engineer in the Hydraulic Unit of the Engineering Technical Services Branch.
9. Steep slopes where guardrail or concrete barrier are present, install Type 2 marker on slope side of barrier.
10. Install only a Type 1 marker or a Type 2 marker on concrete barrier.
W-BEAM GUARDRAIL ASSEMBLY

NORML RAIL ELEMENT DATA

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GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. See appropriate guardrail standard drawing(s) for details not shown.
2. When required by the plans, drainage curb alignment same as face of guardrail.
3. Orient post bolts with the button head located on the side nearest the traffic lane.
4. Lap guardrail in direction of adjacent traffic.
5. Final paved surfacing to extend to face of block. Rail height measured from final paved surface at face of rail (typical all types). 1/16" tolerance.
6. Wood block shall be toe-nailed to the post with 2 - 16d galvanized nails in top of block to prevent block rotation.
7. Wood blocks shown. Blocks of an approved alternate material may be used. (See ODOT's QPL).
8. Existing posts shall not be raised. Replace posts as necessary to achieve required guardrail height.
9. Replace posts as necessary to achieve required guardrail height.

THE SELECTION AND USE OF THIS STANDARD DRAWING, WHILE DESIGNED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING PRINCIPLES AND PRACTICES, IS THE SOLE RESPONSIBILITY OF THE USER AND SHOULD NOT BE USED WITHOUT CONSULTING A REGISTERED PROFESSIONAL ENGINEER.
GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:
1. See appropriate guardrail standard drawing(s) for details not shown.
2. See bridge dwgs. for bridge transition guardrail post and block requirements.
3. Lowest hole(s) required only when channel rail is to be installed. Drill 12" below top 1/8" or 1/4" hole(s) used.
4. Dimensions shown are for nominal posts and blocks.
5. Wood blocks shown. Blocks of an approved alternate material may be used. See ODOT's QPL.
6. When required by the plans, nested thrie beam wood post shall be 8" x 8".
7. Wood block shall be toe-nail to the post with 2 - 16d galvanized nails in top of block to prevent block rotation.

GUARDRAIL WOOD POST TABLE

<table>
<thead>
<tr>
<th>GUARDRAIL TYPE</th>
<th>POST SIZE</th>
<th>POST LENGTH</th>
<th>POST SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>W BEAM</td>
<td>6&quot;x8&quot; or 8&quot;x8&quot;</td>
<td>8'-0&quot;</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>Metal median barrier</td>
<td>6&quot;x8&quot;</td>
<td>8'-0&quot;</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>THRIE BEAM</td>
<td>6&quot;x8&quot; or 8&quot;x8&quot;</td>
<td>8'-0&quot;</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>FRP standard</td>
<td>6&quot;x8&quot;</td>
<td>8'-0&quot;</td>
<td>3'-0&quot;</td>
</tr>
</tbody>
</table>

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.
PLACEMENT OF GUARDRAILS ON SLOPES

**NOTE:** Cases shown do not apply to terminals, transition sections or anchors.

**CASE 1**
- Use when there is less than a 2'-0" shoulder widening from face of guardrail to the slope breakpoint.
- Shoulder 2'-0" minimum.
- Blockout 6'-0" minimum PNL.
- Slope breakpoint 310/2 minimum.

**CASE 2**
- Use when there is a 4'-0" or greater shoulder widening from face of guardrail to the slope breakpoint.
- Shoulder 4'-0" minimum.
- Blockout 6'-0" minimum PNL.
- Slope breakpoint 310/1 minimum.

**CASE 3**
- Use when there is a 2'-6" or greater shoulder widening from face of guardrail to the slope breakpoint.
- Shoulder 2'-6" minimum.
- Blockout 6'-0" minimum PNL.
- Slope breakpoint 310/1 minimum.

**CASE 4**
- Use when there is less than a 2'-0" shoulder widening from face of guardrail to the slope breakpoint.
- Shoulder 2'-0" minimum.
- Blockout 6'-0" minimum PNL.
- Slope breakpoint 310/1 minimum.

---

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

PLACEMENT OF GUARDRAILS ON SLOPES

2021

Effective Date: December 1, 2021 – May 31, 2022
Mid span splice

Ground line

3'-1" x 4" post bolt slot (Typ.)

16d galv. anti-rotation nail

Steel post (W6x8.5 or W6x9)

Wood post (6x8 or 8x8)

C-4

W-Beam rail element

Rail splice lap

W-Beam assembly details

W-Beam rail element

Splice bolt

Ground line

Block

Rail splice lap

Section thru rail element

3'-1"

Typical section

Steel post

Mid span splice

Wood post

Drainage curb

Paved shop:

W-Beam rail element

6x8 block

(Post)

(See gen. note 7)

(Normal rail element data)

1/4" recessed hex nut & washer

2A, 3

5/8"

2B.8 x 1/4" post bolt slot each end

8 reqd. per splice

Typical W-Beam rail element

Typical Elevation

MIDWEST GUARDRAIL SYSTEM

OREGON STANDARD DRAWINGS

W-Beam

Effective Date: December 1, 2021 – May 31, 2022

5/8"

2B.8 x 1/4"

16d galv. anti-rotation rail

Typ. 5/8"

recessed

hex nut

wood post

(See gen. note 7)

Splice bolt

1/4"

recessed hex nut \\

& washer

6x8 or 8x8

rail element

16d galv.

anti-rotation rail

(See gen. note 5)

1/4"

recessed

hex nut

& washer

Wood post

(6x8 or 8x8)

W-Beam rail element

1/4"

recessed

hex nut

& washer

Rail splice lap

at mid-span

1/4"

recessed

hex nut

& washer

6x8 or 8x8

wood post

(See gen. note 7)

W-Beam rail element

Typical W-Beam rail element

General notes for all details on this sheet:

1. See appropriate guardrail standard drawings for details not shown.

2. When required by the plans, drainage curb alignment same as face of guardrail.

3. Lap guardrail in direction of adjacent traffic.

4. Final paved surfacing to extend to face of post. Rail height measured from final
curved or flat surface at face of rail to top of rail (typ. all types). 1" ± tolerance.

5. Blocks shall be toe-nailed to prevent rotation when wood posts are used. See
Std. Dwg. RD404). Blocks shall be morticed or toe-nailed when steel posts
are used to prevent rotation (see Std. Dwg. RD406).

6. Wood blocks shown. Blocks of an approved alternate material may be used. See
OOGI's QPL.

7. All posts for guardrail run shall be of the same type: wood or steel.

8. For guardrail installed on radii of 150' or less (5' min. radius) use rail elements
pre-curved to industry standard. Install "Radius Identification Plate".

The selection and use of this Standard Drawing, while de-
signed in accordance with generally accepted engineer-
ning principles and practices, is the sole responsibility of
the user and should not be used without consulting a
Registered Professional Engineer.

CALC. BOOK NO. N/A

SDR DATE 19-RU-2021

NOTE: All material and workmanship shall be in accordance with
the current Oregon Standard Specifications

OREGON STANDARD DRAWINGS

2021

INSTRUMENT DESCRIPTION

MIDWEST GUARDRAIL SYSTEM

W-Beam

The selection and use of this Standard Drawing, while de-
signed in accordance with generally accepted engineer-
ning principles and practices, is the sole responsibility of

1. Use details shown as a general guide since manufacturer's details may vary. Install a guardrail terminal system that meets MASH requirements per manufacturer's recommendations. Ensure that guardrail terminal meets appropriate test level for the project.

2. See appropriate guardrail standard drawings for details not shown. See project plans for details not shown. See Std. Dwg. RD791 for drainage curbs, where required.

3. Guardrail Non-flared terminal shall be installed with a minimum 1 foot offset ensuring that the end piece is entirely off normal shoulder.

4. Cross slope to match adjacent roadway cross slope (preferred). If required, maximum shoulder slope 10% for guardrail widening. If required, maximum grade break at normal edge of shoulder 3%.

5. On two way two lane highways, both ends of guardrail runs shall be provided with a terminal flared or non-flared. Paving of widened shoulder to the face of posts on both ends of guardrail runs is required.

6. Provide guardrail terminal from ODOT's QPL. Install according to manufacturer's recommendations (post count varies). Provide shop drawings to Engineer.

7. Install a reflectorized object marker on head of every guardrail terminal with "W" 4 feet or less according to manufacturer's recommendations. Ensure that guardrail terminal meets appropriate test level for the project.

8. "W" distance is measured to face of guardrail at end post, exclusive of end piece.

9. Length of need post location varies by manufacturer. "W" distance is measured to face of guardrail at end post, exclusive of end piece.

10. 1:4 slope or flatter preferable, 1:3 maximum.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.
1. Use details shown as a general guide since manufacturer's details may vary. Install a guardrail terminal system that meets MASH requirements per manufacturer's recommendations. Ensure that guardrail terminal meets appropriate test level for the project.

2. See appropriate guardrail standard drawing(s) for details not shown. See project plans for details not shown. See Std. Dwg. RD701 for drainage curbs, where required. E=Z+2 or as shown on project plans.

3. Guardrail Non-flared terminal shall be installed with a min. 1 foot offset ensuring that the end piece is entirely off normal shldr.

4. Cross slope to match adjacent roadway cross slope (preferred).
   - If required, maximum shoulder slope 10% for guardrail widening.
   - If required, maximum grade break at normal edge of shoulder 8%.

5. On two way two lane highways, both ends of guardrail runs shall be provided with a terminal flared or non-flared. Paving of widened shldr. to the face of posts on both ends of guardrail runs is required.

6. Provide guardrail terminal from ODOT's QPL. Install according to manufacturer's recommendations (post count varies). Provide shop drawings to Engineer.

7. Install a reflectorized object marker on head of every guardrail terminal with recommendations (post count varies). Provide shop drawings to Engineer.

8. "W" distance is measured to face of guardrail at end post, exclusive of end piece.

9. Length of post need location varies by manufacturer.

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Use details shown as a general guide since manufacturer's details may vary. Install a guardrail terminal system that meets MASH requirements per manufacturer's recommendations. Ensure that guardrail terminal meets appropriate test level for the project.

2. See appropriate guardrail standard drawing(s) for details not shown. See project plans for details not shown. See Std. Dwg. RD701 for drainage curbs, where required. E=Z+2 or as shown on project plans.

3. Guardrail Non-flared terminal shall be installed with a min. 1 foot offset ensuring that the end piece is entirely off normal shldr.

4. Cross slope to match adjacent roadway cross slope (preferred).
   - If required, maximum shoulder slope 10% for guardrail widening.
   - If required, maximum grade break at normal edge of shoulder 8%.

5. On two way two lane highways, both ends of guardrail runs shall be provided with a terminal flared or non-flared. Paving of widened shldr. to the face of posts on both ends of guardrail runs is required.

6. Provide guardrail terminal from ODOT's QPL. Install according to manufacturer's recommendations (post count varies). Provide shop drawings to Engineer.

7. Install a reflectorized object marker on head of every guardrail terminal with recommendations (post count varies). Provide shop drawings to Engineer.

8. "W" distance is measured to face of guardrail at end post, exclusive of end piece.

9. Length of post need location varies by manufacturer.
SAFETY EDGE FOR ASPHALT CONCRETE (NEW CONSTRUCTION)

---

SAFETY EDGE PLACED WITH LIFTS

SAFETY EDGE PLACED ONLY WITH FINAL LIFT

MULTI-LAYER PAVEMENT CONSTRUCTION

SAFETY EDGE FOR PORTLAND CEMENT CONCRETE PAVEMENT OVERLAY

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Slope of individual layer may be placed steeper.
2. Slope of individual layer to be 1:1.
3. Overall slope of successive layers to be 1:1.
4. Slope varies, see project plans.

SLOPE VARIATION:

- Slope of individual layer to be 1:1.
- Overall slope of successive layers to be 1:1.
- Slope varies, see project plans.
- Additional pavement.
- Base material.

SAFETY EDGE PLACED WITH LIFTS

SAFETY EDGE PLACED ONLY WITH FINAL LIFT

MULTI-LAYER PAVEMENT CONSTRUCTION

SAFETY EDGE FOR PORTLAND CEMENT CONCRETE PAVEMENT OVERLAY

SAFETY EDGE FOR ASPHALT CONCRETE RECONSTRUCTION (INCLUDING MILL, INLAY AND OVERLAY)

PAVEMENT THICKNESS (T) 5" OR LESS

PAVEMENT THICKNESS (T) GREATER THAN 5"

NOTE:

1. Safety edges are required at the outside edges of the paved roadway (edge of travel lane or edge of paved shoulders), where the wearing surface thickness is 2" or greater, except where indicated in the plans.
2. Construct the safety edge at a slope of 1:1 to 1:2 measured from the pavement surface.
3. Do not construct safety edge at intersections, paved driveways, or other obstructions.
4. For total new asphalt depth of "T" ≥ 5", construct the safety edge to a depth of 5" approximately with a 1:1 sloped face below the safety edge.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

Effective Date: December 1, 2021 – May 31, 2022

OREGON STANDARD DRAWINGS

SURFACE EDGE DETAILS

2021

NOTE: All materials and workmanship shall be in accordance with the current Oregon Standard Specifications

CALC. BOOK NO. N/A

RD615
GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Accessible route islands are based on applicable ODOT Standards.
2. Place detectable warning surface at the back of curb for a minimum depth of 2 feet at curb ramp that is adjacent to traffic. For details not shown, see Std. Dwg. RD902 through RD906.
3. The minimum area of islands that contain signal poles, pedestrian, etc., shall be 75 square feet. Square feet to be measured to outer perimeter of entire island.
4. For cut through islands, dowel each island segment to the pavement with a minimum of two ½ diameter dowels. Place dowels as directed. See Std. Dwg. RD705.
5. Align curb ramps for lowered or partially lowered island and cut through island with the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks shall be flush.
6. Curb type and island width as shown on plans or as directed. Type A or Type CA islands are acceptable alternates, see Std. Dwg. RD705.
7. See project plans for details not shown.
8. Curb ramp run that is parallel to traffic run shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks shall be flush.
9. Type A or Type CA islands are acceptable alternates, see Std. Dwg. RD705.
10. Details intended for pedestrian route only. For multi-use path, see project plans for specific details.
11. When crossing surface grade is ≤ 5%, a level area is not required.
12. On or along state highways, curb and gutter is required at curb ramps.
13. Raised islands in crossings shall have accessible ramps at both sides or be cut through with the street.
1. Accessible route islands are based on applicable ODOT Standards.
2. Place detectable warning surface at the back of curb for a minimum depth of 2” at curb ramp that is adjacent to traffic. For details not shown, see Std. Dwgs. RD905 through RD908.
3. The min. area of islands that contain signal poles, pedestals, etc., shall be 75 sq. ft. Square feet to be measured to outer perimeter of entire island.
4. For cut through islands dowel each island segment to the pvmt. with a min. of 2, 3#4” dia. dowels. Dowel the nose section of the raised median island with a minimum of 2, 3#4” dia. dowels. Place dowels as directed. See Std. Dwg RD705.
5. Align curb ramps for lowered or partially lowered island and cut through island with the crosswalk.
6. Detectable warning surfaces shall be separated by a 2.0 ft. minimum length of walkway without detectable warnings. Where no curb, the detectable warning surface shall be placed at the edge of roadway.
7. Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks shall be flush.
8. Curb type and island width as shown on plans or as directed.
9. See project plans for details not shown.
10. Details intended for pedestrian route only. For multi-use path, see project plans for specific details.
11. When crossing surface grade is ≤ 5%, a level area is not required.
12. On or along state highways, curb and gutter is required at curb ramps.
13. Type A or Type CA islands are acceptable alternates, see Std. Dwg. RD705.

SECTION A-A
PARTIALLY LOWERED ISLAND DETAIL
(Use perpendicular curb ramp inspection form)

SECTION B-B
CUT THROUGH ISLAND DETAIL
RAISED RIGHT TURN CHANNELIZATION ISLAND

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Accessible route islands are based on applicable ODOT Standards.
2. Place detectable warning surface at the back of curb for a minimum depth of 2” at curb ramp that is adjacent to traffic. For details not shown, see Std. Dwgs. RD905 through RD908.
3. The min. area of islands that contain signal poles, pedestals, etc., shall be 75 sq. ft. Square feet to be measured to outer perimeter of entire island.
4. For cut through islands dowel each island segment to the pvmt. with a min. of 2, 3#4” dia. dowels. Dowel the nose section of the raised median island with a minimum of 2, 3#4” dia. dowels. Place dowels as directed. See Std. Dwg RD705.
5. Align curb ramps for lowered or partially lowered island and cut through island with the crosswalk.
6. Detectable warning surfaces shall be separated by a 2.0 ft. minimum length of walkway without detectable warnings. Where no curb, the detectable warning surface shall be placed at the edge of roadway.
7. Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks shall be flush.
8. Curb type and island width as shown on plans or as directed.
9. See project plans for details not shown.
10. Details intended for pedestrian route only. For multi-use path, see project plans for specific details.
11. When crossing surface grade is ≤ 5%, a level area is not required.
12. On or along state highways, curb and gutter is required at curb ramps.
13. Type A or Type CA islands are acceptable alternates, see Std. Dwg. RD705.

SECTION A-A
PARTIALLY LOWERED ISLAND DETAIL
(Use perpendicular curb ramp inspection form)

SECTION B-B
CUT THROUGH ISLAND DETAIL
RAISED RIGHT TURN CHANNELIZATION ISLAND

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Accessible route islands are based on applicable ODOT Standards.
2. Place detectable warning surface at the back of curb for a minimum depth of 2” at curb ramp that is adjacent to traffic. For details not shown, see Std. Dwgs. RD905 through RD908.
3. The min. area of islands that contain signal poles, pedestals, etc., shall be 75 sq. ft. Square feet to be measured to outer perimeter of entire island.
4. For cut through islands dowel each island segment to the pvmt. with a min. of 2, 3#4” dia. dowels. Dowel the nose section of the raised median island with a minimum of 2, 3#4” dia. dowels. Place dowels as directed. See Std. Dwg RD705.
5. Align curb ramps for lowered or partially lowered island and cut through island with the crosswalk.
6. Detectable warning surfaces shall be separated by a 2.0 ft. minimum length of walkway without detectable warnings. Where no curb, the detectable warning surface shall be placed at the edge of roadway.
7. Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks shall be flush.
8. Curb type and island width as shown on plans or as directed.
9. See project plans for details not shown.
10. Details intended for pedestrian route only. For multi-use path, see project plans for specific details.
11. When crossing surface grade is ≤ 5%, a level area is not required.
12. On or along state highways, curb and gutter is required at curb ramps.
13. Type A or Type CA islands are acceptable alternates, see Std. Dwg. RD705.

SECTION A-A
PARTIALLY LOWERED ISLAND DETAIL
(Use perpendicular curb ramp inspection form)

SECTION B-B
CUT THROUGH ISLAND DETAIL
RAISED RIGHT TURN CHANNELIZATION ISLAND

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Accessible route islands are based on applicable ODOT Standards.
2. Place detectable warning surface at the back of curb for a minimum depth of 2” at curb ramp that is adjacent to traffic. For details not shown, see Std. Dwgs. RD905 through RD908.
3. The min. area of islands that contain signal poles, pedestals, etc., shall be 75 sq. ft. Square feet to be measured to outer perimeter of entire island.
4. For cut through islands dowel each island segment to the pvmt. with a min. of 2, 3#4” dia. dowels. Dowel the nose section of the raised median island with a minimum of 2, 3#4” dia. dowels. Place dowels as directed. See Std. Dwg RD705.
5. Align curb ramps for lowered or partially lowered island and cut through island with the crosswalk.
6. Detectable warning surfaces shall be separated by a 2.0 ft. minimum length of walkway without detectable warnings. Where no curb, the detectable warning surface shall be placed at the edge of roadway.
7. Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks shall be flush.
8. Curb type and island width as shown on plans or as directed.
9. See project plans for details not shown.
10. Details intended for pedestrian route only. For multi-use path, see project plans for specific details.
11. When crossing surface grade is ≤ 5%, a level area is not required.
12. On or along state highways, curb and gutter is required at curb ramps.
13. Type A or Type CA islands are acceptable alternates, see Std. Dwg. RD705.

SECTION A-A
PARTIALLY LOWERED ISLAND DETAIL
(Use perpendicular curb ramp inspection form)

SECTION B-B
CUT THROUGH ISLAND DETAIL
RAISED RIGHT TURN CHANNELIZATION ISLAND

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Accessible route islands are based on applicable ODOT Standards.
2. Place detectable warning surface at the back of curb for a minimum depth of 2” at curb ramp that is adjacent to traffic. For details not shown, see Std. Dwgs. RD905 through RD908.
3. The min. area of islands that contain signal poles, pedestals, etc., shall be 75 sq. ft. Square feet to be measured to outer perimeter of entire island.
4. For cut through islands dowel each island segment to the pvmt. with a min. of 2, 3#4” dia. dowels. Dowel the nose section of the raised median island with a minimum of 2, 3#4” dia. dowels. Place dowels as directed. See Std. Dwg RD705.
5. Align curb ramps for lowered or partially lowered island and cut through island with the crosswalk.
6. Detectable warning surfaces shall be separated by a 2.0 ft. minimum length of walkway without detectable warnings. Where no curb, the detectable warning surface shall be placed at the edge of roadway.
7. Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks shall be flush.
8. Curb type and island width as shown on plans or as directed.
9. See project plans for details not shown.
10. Details intended for pedestrian route only. For multi-use path, see project plans for specific details.
11. When crossing surface grade is ≤ 5%, a level area is not required.
12. On or along state highways, curb and gutter is required at curb ramps.
13. Type A or Type CA islands are acceptable alternates, see Std. Dwg. RD705.
OPTION K
DRIVEWAY IN WIDE (8' OR GREATER) SIDEWALK

OPTION L
SIDEWALK WRAPPED AROUND DRIVEWAY

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Details are based on applicable ODOT Standards.
2. Only use details allowed by jurisdiction.
3. The following dimensions are as shown on plans, or as directed: driveway width, sidewalk width, curb exposure, driveway lip exposure, landing area length and width. See project plans for details not shown.
5. A greater than or equal 4' unobstructed clear passage with cross slope 1.5% max. (Max. 2.0% finished surface slope) is required behind driveway apron.
6. Where existing driveway is in good condition, and meets slope requirements, construct only as much landing area as required for satisfactory connection with new work.
7. Check the gutter flow depth at driveway locations to assure that the design flood does not overtop the back of sidewalk at driveway.
8. Construct a full depth expansion joints with ½" preformed joint filler at ends of each driveway. Tool joint fillers are required at all driveway slope break lines.
9. 15' min. of the driveway behind the sidewalk should be surfaced to prevent tracking of gravel onto the sidewalk.
10. Monolithic curb & sidewalk shall retain thickened edge through lowered profile, to accommodate driveway use. See Std. Dwg. RD720 for details.
11. Any dimensions except those of general note 5 may be amended by local agencies for their use.

LEGEND:

- Sidewalk
- Drive way pay limit (of monolithic, include adjacent curb)
  - Cross slope 1.5% max. (Max. 2.0% finished surface slope)
    - Normal sidewalk cross slope
  - Width of driveway
  - Curb exposure

NOTE:
This drawing is to be used by local agencies to assist them in the design of driveways on their facilities.
1. See Std. Dwg. RD781 & RD782 for details not shown.
2. Structure varies, see project plans.
3. All concrete shall be commercial grade concrete.
4. See project plans for details not shown.

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

Adjacent sidewalk

PLAN

ELEVATION

ALUMINUM PEDESTRIAN FENCE

POST BASE PLATE BOLT DOWN ANCHOR

WHEN PEDESTRIAN FENCE IS REQUIRED FOR WALKING SURFACES

OREGON STANDARD DRAWINGS

ALUMINUM PEDESTRIAN FENCE (MASH, TL-2)

CALC. BOOK NO. N/A

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

Effective Date: December 1, 2021 – May 31, 2022
4. Structure varies, see project plans for details not shown.

3. All concrete shall be commercial grade concrete.

5356 filler material.

2. All aluminum welds should follow the aluminum design standard manual 2010 by using

1. See Std. Dwg. RD780 for details not shown.

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. See Std. Dwg. RD780 for details not shown.

2. All aluminum welds should follow the aluminum design standard manual 2010 by using 5356 filler material.

3. All concrete shall be commercial grade concrete.

4. Structure varies, see project plans for details not shown.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

ALUMINUM PEDESTRIAN FENCE COMPONENT DETAILS

OREGON STANDARD DRAWINGS

ALUMINUM POST

SIDE

THREADED ROD

(3/4" X 3/8" SQUARE - 12' LONG)

ALUMINUM POST BASE PLATE

TOP

PLAN

ALUMINUM POST

(2" X 4" X 8" - 43" LONG)

ELEVATION

ALUMINUM SPINDLE

(3/4" X 3/8" SQUARE - 12' LONG)

ALUMINUM POST CAP

NYLON WASHER

STEEL NUT

STEEL FLAT WASHER

ALUMINUM SHIM

BOTTOM RAIL

ALUMINUM RAIL ELEVATION

SECTION A-A

ELEVATION

DETAIL "A"

Effective Date: December 1, 2021 – May 31, 2022
## Curb Ramp Index

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<td>RD930, RD912, &amp; RD916</td>
<td>Combination Curb Ramp</td>
</tr>
<tr>
<td>RD938</td>
<td>Combination Curb Ramp Single Ramp</td>
</tr>
<tr>
<td>RD940</td>
<td>Blended Transition Curb Ramp Single Ramp</td>
</tr>
<tr>
<td>RD950 &amp; RD952</td>
<td>End of Walk Curb Ramp</td>
</tr>
<tr>
<td>RD960</td>
<td>Unique Curb Ramp</td>
</tr>
</tbody>
</table>

### Legend:
- Sidewalk or other traversable surface
- Detectable warning surface (DWS)
- Level area (Turning space/landing)
- Cross slope 1.3% max. (Max. 2.0% finished surface slope)
- Normal sidewalk cross slope
- Running slope 4.0% max. (Max. 4.0% finished surface slope)
- Running slope 7.5% max. (Max. 8.3% finished surface slope)
- Counter slope 4.0% max. ascending or descending (Max. 5.0% finished surface slope)
- Slope as required for drainage
- Flare slope (Max. 10.0% finished surface slope)
- 4°×4' clear space

### Typical Curb Ramp System Components

**Perpendicular Type Shown**

- **Level area (Turning space/landing)**
- **Buffer strip (non-walkable)**
- **Detectable warning surface**
- **Curb and gutter (typ.) flush with pavement**
- **Curb running slope**
- **Intended crosswalk**

---

**OREGON STANDARD DRAWINGS CURB RAMP COMPONENTS AND LEGEND**

2021

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

Effective Date: December 1, 2021 – May 31, 2022
1. Detectable warning surface details & locations are based on applicable ODOT Standards.

2. See project plans for details not shown.

3. The detectable warning surface shall extend the full width of the curb ramp opening, shared use path, blended transition, turning space, or other roadway entrance as applicable. A gap of up to 2 inches on each side of the detectable warning surface is permitted measured at the leading edge of the detectable warning surface panel as shown in detail "A".

4. Detectable warning surface shall be placed at the back of curb for a minimum depth of 2 ft. in the direction of pedestrian travel at curb ramps that are adjacent to traffic. Detectable warning surface may be radial or rectangular, but must comply with the truncated dome size and spacing standards. Detectable warning surface may be cut to meet necessary shape as shown in plans. Detectable warning surface across a grade break is prohibited. Place abutting panels within 1/8 inch of each other and install anchors, as specified by manufacturers, along cut edge.

5. Color to be safety yellow if no color specified in construction note. Alternative colors require a design exception on or along state highways.

6. Detectable warning surface shall be used in the following locations:
   a) Curb ramps at street crossings.
   b) Crossings islands (Accessible Route Islands).
   c) Rail crossings.

7. Where public transportation stations (rail, bus, etc.) use platform boarding, detectable warning surface shall be placed along the full edge length of the station, when not protected by platform screens or guards, (see Std. Dwgs. RD908).

8. Detectable warning surface shall not be used in the following locations:
   a) End of sidewalk transitions that are not at a crosswalk, (see Std. Dwgs. RD950, RD952 and RD960).
   b) Driveways, unless constructed with curb return or are signalized.
   c) Parking lots, access aisles and passenger loading zones where curb ramp does not lead to vehicular way.

9. Where no curb is present, the detectable warning surface shall be placed at the edge of the roadway.

10. On or along state highways, curb and gutter is required at curb ramps.

**DETAIL "A"**

- Width of curb ramp
  - 2” max.
  - 2” max.

- Detectable warning surface
  - 2” max.
  - (Typ. of all applications) (See general notes 3, 4 & 5)

- Detectable warning surface details & locations are based on applicable ODOT Standards.

- Color to be safety yellow if no color specified in construction note. Alternative colors require a design exception on or along state highways.

- Detectable warning surface shall be used in the following locations:
  - Truck ramps at street crossings.
  - Crossings islands (Accessible Route Islands).
  - Rail crossings.

- Detectable warning surface shall not be used in the following locations:
  - End of sidewalk transitions that are not at a crosswalk, (see Std. Dwgs. RD950, RD952 and RD960).
  - Driveways, unless constructed with curb return or are signalized.
  - Parking lots, access aisles and passenger loading zones where curb ramp does not lead to vehicular way.

- Where no curb is present, the detectable warning surface shall be placed at the edge of the roadway.

- On or along state highways, curb and gutter is required at curb ramps.
**With Landscaped Buffer Strip**

**Option "PR-1"**

- Curb and gutter (See general note 7)
- Return curb should not reduce width of approaching sidewalk
- Return curbs 6' rad.
- Grade break (See general note 6)
- Buffer strip (non-walkable) (Typ.)

**For Wide Sidewalks**

**Option "PR-2"**

- Grade break (See general note 6)
- Grade break (See general note 7)
- 12' min. (See general note 5)

**For Narrow Sidewalks**

**Option "PR-3"**

- Grade break (See general note 6)
- 12' min. (See general note 5)
- Curb and gutter (See general note 7)
- PAR ≥ 4.5'
- Sidewalk widening

**Option "PR-4"**

- Grade break (See general note 6)
- 12' min. (See general note 5)
- Curb and gutter (See general note 7)
- PAR ≥ 4.5'
- 20' min. (Typ.)

**Legend:**

- Marked or intended crossing location
- Sidewalk
- Detectable warning surface
- Level area (Turning space/landing) Unobstructed 4.5' x 4.5'
- With obstruction 4.5' x 5.5' (longer dimension in direction of pedestrian crossing)

**General Notes for All Details on This Sheet:**

1. Curb ramp details are based on applicable ODOT Standards.
3. Tooled dummy joints are required at all curb ramp grade break lines. See Std. Dwg. RD723.
4. Curb ramp slopes shown are relative to the true level horizon (zero bubble).
5. When 2 curb ramps are immediately adjacent, the curb exposure (E) between the adjacent side 

---

**Notes:**

- The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

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**OREGON STANDARD DRAWINGS**

**PERPENDICULAR CURB RAMP**

**2021**

**DATE:** [N/A]  **SDR DATE:** [19-JUL-2021]

**NOTE:** All material and workmanship shall be in accordance with the current Oregon Standard Specifications.
1. Curb ramp details are based on applicable ODOT Standards.
2. See Std. Dwg. RD700 & RD701 for curbs.
3. Site conditions normally require a project specific design. See project plans for details not shown.
4. Tooled dummy joints are required at all curb ramp grade break lines, (see Std. Dwg. RD722).
5. Curb ramp slopes shown are relative to the true level horizon (zero bubble).
6. Place detectable warning surface at the back of curb for a minimum depth of 2’ in the direction of pedestrian travel full width of curb ramp opening that is adjacent to traffic.
7. Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks shall be flush.
8. When 2 ramp runs are immediately adjacent, the curb exposure (E) between the adjacent side may range between 3” and full design exposure.
9. Curb ramps for shared use paths intersecting a roadway shall be full width of path, excluding flares. When a curb ramp is used to provide bicycle access from a roadway to a sidewalk, the curb ramp opening will be ≥ 8’ wide.
10. Place an inlet at upstream side of curb ramp or perform other approved design mitigation. Check the gutter flow depth at curb ramp locations to assure that the design flood does not overwhelm the back of sidewalk.
11. On or along state highways, curb and gutter is required at curb ramps.

**GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:**

**SECTION A-A**

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

**OREGON STANDARD DRAWINGS**

**PARALLEL CURB RAMP**

**OPTION "PL-1"**

**OPTION "PL-2"**

**NOTES:**

- All material and workmanship shall be in accordance with the current Oregon Standard Specifications.
SECTION A-A

Max. flare slopes 10.0% (Typ.)

Detectable warning surface full width of curb opening: Curb ramp width ≥ 4.5' (see general note 6)

Curb and gutter

Const. 6" wide (nom.) curb at back of curb ramp unless otherwise directed

Const. 6" wide (nom.) curb at back of curb ramp unless otherwise directed

Free from vertical obstructions

Curb and gutter (Typ.)

Max. flare slopes 10.0% (Typ.)

Detectable warning surface full width of curb opening: Curb ramp width ≥ 4.5' (see general note 6)

Curb and gutter

SECTION A-A

COMBINATION CURB RAMP DETAIL

Max. flare slopes 10.0% (Typ.)

Detectable warning surface full width of curb opening: Curb ramp width ≥ 4.5' (see general note 6)

Curb and gutter

Const. 6" wide (nom.) curb at back of curb ramp unless otherwise directed

Const. 6" wide (nom.) curb at back of curb ramp unless otherwise directed

Free from vertical obstructions

Curb and gutter (Typ.)

Max. flare slopes 10.0% (Typ.)

Detectable warning surface full width of curb opening: Curb ramp width ≥ 4.5' (see general note 6)

Curb and gutter

LEGEND:

Marked or intended crossing location

Sidewalk

Detectable warning surface

Level area (Turning space/landing)

Detectable warning surface

Max. edge tolerance on skid resistance testing

Curb and gutter (Typ.)

Level area (Turning space/landing)

 Detectable warning surface

COMBINATION CURB RAMP DETAIL

Max. flare slopes 10.0% (Typ.)

Detectable warning surface full width of curb opening: Curb ramp width ≥ 4.5' (see general note 6)

Curb and gutter

SECTION A-A

Const. 6" wide (nom.) curb at back of curb ramp unless otherwise directed

Const. 6" wide (nom.) curb at back of curb ramp unless otherwise directed

Free from vertical obstructions

Curb and gutter (Typ.)

Max. flare slopes 10.0% (Typ.)

Detectable warning surface full width of curb opening: Curb ramp width ≥ 4.5' (see general note 6)

Curb and gutter

LEGEND:

Marked or intended crossing location

Sidewalk

Detectable warning surface

Level area (Turning space/landing)

Detectable warning surface

Max. edge tolerance on skid resistance testing

Curb and gutter (Typ.)

Level area (Turning space/landing)

 Detectable warning surface

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

COMBINATION CURB RAMP

2021

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

07-2020

The Oregon Department of Transportation reserves the right to make changes or modifications as necessary to meet changing conditions on the project.

Effective Date: December 1, 2021 – May 31, 2022

RD930
PARALLEL COMBINATION WITH LANDSCAPE BUFFER STRIP
OPTION "CC-3"

FOR NARROW SIDEWALKS
OPTION "CC-4"
GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Curb ramp details are based on applicable ODOT Standards.
2. See project plans for details not shown.
   - See Std. Dwgs. RD902 through RD908 for detectable warning surface installation details.
3. Sidewalk options normally require a project special design. See project plans for details not shown.
4. Tooled dummy joints are required at all curb ramp grade break lines, (see Std. Dwg. RD722).
5. Curb ramp slopes shown are relative to the true level horizon (zero bubble).
6. Place detectable warning surface at the back of curb for a minimum depth of 2' at curb ramp that is adjacent to traffic. When there is no curb, the detectable warning surface shall be placed at the edge of roadway.
7. Place an inlet at upstream side of curb ramp or perform other approved design mitigation. Check the gutter flow depth at curb ramp locations to assure that the design flood does not overtop the back of sidewalk.
8. When a shared use path terminates, the curb ramp shall be the full width of the path, the turning space Y-dimension should be minimum 8' wide to enable bicycles to ride from ramp to shoulder.
9. Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks shall be flush.
10. All end of sidewalk options can be used for curved or tangent roadway sections. Superelated roadways require site specific details.

LEGEND:
- Sidewalk
- Transition panel
- Detectable warning surface
- Cross slope 1.5% max. (Max. 2.0% finished surface slope)
- Running slope 4.0% max. (Max. 4.9% finished surface slope)
- New construction sidewalk width. See contract plans for dimension.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

END OF WALK CURB RAMP

Effective Date: December 1, 2021 – May 31, 2022
GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. Curb ramp details are based on applicable ODOT applicable Standards.

2. See project plans for details not shown.

3. Site conditions normally require a project special design. See project plans for details not shown.

4. Tooled dummy joints are required at all curb ramp grade break lines, (See Std. Dwg. RD722).

5. Curb ramp slopes shown are relative to the true level horizon (zero bubble).

6. Place detectable warning surface at the back of curb for a minimum depth of 2' in the direction of pedestrian travel full width of curb ramp opening that is adjacent to traffic.

7. Place an inlet at upstream side of curb ramp or perform other approved design mitigation.

8. When a shared use path terminates, the curb ramp shall be the full length of the path, the turning space Y-dimension should be minimum 6' wide to enable bicycles to ride from ramp to shoulder.

9. Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks shall be flush.

10. On or along state highways, curb and gutter is required at curb ramps.

11. Unique curb ramp option can be used for curved or tangent roadway sections. Superelevated roadways require a site specific detail.

 protection must be provided for a pedestrian to access the roadway or otherwise cross the roadway.

b. At grade, new construction curb ramp width shall be measured at A.

c. See project plans for details not shown.

2. See project plans for details not shown.

3. Site conditions normally require a project special design. See project plans for details not shown.

4. Tooled dummy joints are required at all curb ramp grade break lines, (See Std. Dwg. RD722).

5. Curb ramp slopes shown are relative to the true level horizon (zero bubble).

6. Place detectable warning surface at the back of curb for a minimum depth of 2' in the direction of pedestrian travel full width of curb ramp opening that is adjacent to traffic.

7. Place an inlet at upstream side of curb ramp or perform other approved design mitigation.

8. When a shared use path terminates, the curb ramp shall be the full length of the path, the turning space Y-dimension should be minimum 6' wide to enable bicycles to ride from ramp to shoulder.

9. Grade breaks at the top and bottom of curb ramp runs shall be perpendicular to the direction of the ramp run. Grade breaks shall not be permitted on the surface of ramp runs and turning spaces. Surface slopes that meet at grade breaks shall be flush.

10. On or along state highways, curb and gutter is required at curb ramps.

11. Unique curb ramp option can be used for curved or tangent roadway sections. Superelevated roadways require a site specific detail.

 protection must be provided for a pedestrian to access the roadway or otherwise cross the roadway.

b. At grade, new construction curb ramp width shall be measured at A.

c. See project plans for details not shown.
Vertical concrete parapet, 42 inch Pay Limit

See bridge plans for joint locations.

Expansion joint, see std. dwg. BR231:
- 4 - #5 (each side) stop 2" clear at joints and ends.

Add 1 extra bar each side of scoring joints.

Add 5 additional Bar "B" and Bar "C" each side of open or expansion joints and at rails end.

#5 Bar ‘B’ @ 12”, Bar ‘C’ @ 12”

Type ‘B’ joint, see std. dwg. BR222. Place at every bent with continuous deck.

- #5 x cont. (each side) thru scoring joints, stop 2" clear at ends and all other joints.

- #5 x cont. (each side) thru scoring joints, stop 2" clear at ends and all other joints.

- 8 - #5 U-bars at ends and all other joints.

- 4 - #5 x cont. (each side) thru scoring joints, stop 2" clear at ends and all other joints.

- 2 - #5 cont. thru scoring joints. Stop 2" clear at ends and other joints.

- 8 - #5 cont. thru scoring joints, stop 2" clear at ends and all other joints.

- 6 - #8 dia. bolts (ASTM F3125), with std. steel washers and lock nuts or jam nuts, snug tight.

NOTE:
- Drill horizontal bolt holes (bolt dia. + 1/2") in hardened concrete with low-impact rotary drill. Cut bolts after installation so they extend 1/4" max. beyond nut. Grind smooth and cold galvanize.

GENERAL NOTES:
- Rail evaluated to meet MASH TL-4 requirements. This rail can be used for speeds of 45 mph and greater when a TL-3 rated guardrail transition is used.

- Provide reinforcing steel conforming to AASHTO M31 (ASTM A615), Grade 60 or ASTM A706.

- Provide all reinforcing steel conforming to AASHTO M31 (ASTM A615), Grade 60 or ASTM A706.

- Provide Class 3300 - 1-1/4" or 1-1/4" concrete.

- Provide steel cover plates conforming to AASHTO M183 (ASTM A36). Hot dip galvanize after fabrication.

- At skewed bents up to 20° make joints parallel to the bent center line.

- For skew greater than 20° make joints normal to rail.

- See project plans for spacing, joint locations and details not shown.

Bridge deck, see project plans.

Type ‘B’ joint, see std. dwg. BR222. Place at every bent with continuous deck.

- 8" Recess

- 2" Recess

- 3'-0"

- 0'-10"

- 0'-0"

- 0'-0"

- 0'-0"

- 0'-0"

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**CONSTRUCTION NOTES:**
All structural drawing, in accordance with Oregon Standard Specification 00530.70. Provide corrosion measures to prevent adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

Panel length of rail section members must be attached continuously to a minimum of three mounting plates. One shop splice per panel is permitted with minimum 8% penetration. The weld may be square groove, double vee groove, or single groove. Grind smooth.

Round or chamfer all exposed edges of steel components by grinding prior to galvanizing.

Cap all open ends of tubular steel sections.

Field verify rail heights prior to fabrication.

**MATERIAL NOTES:**
Provide structural tubing according to Oregon Standard Specification 02810.20.

Provide steel mounting plates conforming to ASTM A572 Gr 50 unless otherwise noted.

Anchor rods must be 1/2" dia. ASTM F1554 Grade 105 threaded rods with heavy hex nuts, one hardened steel washer, and one (2" O.D.) steel washer each.

Anchor installation, include hole size, drilling, and close out, must be in accordance with Oregon Standard Specification 00530.70. Anchor adhesive chosen must be able to achieve a minimum pullout force of 75 kl. Use Hilti HIT-200 A, or Hilti HIT-BC 500 k, or Red Head C6+ or Ultrabond NE-106 epoxy adhesive from the QPL. Minimum adhesive anchor embedment depth is 10".

Hot-dip galvanized structural steel including fasteners after fabrication, except as noted. Provide Galvanize-Control Silicon according to Oregon Standard Specification 00530.70.

**GENERAL NOTES:**
Rail evaluated to meet MASH TL-4 requirements. This rail retrofit can be used for speeds of 45 mph and greater when a TL-3 rated guardrail transition is used.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

Submit erection drawings showing panel lengths, mounting plate spacing, and anchor rod setting to the Engineer for approval.

**NOTE TO DESIGNER:**
Check structural capacity of the existing bridge deck overhang and strengthen as required.

**FIELD NOTES:**
Cap all open ends of tubular steel sections.

**INTERIM NOTES:**
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

**OREGON STANDARD DRAWINGS**
**TYPE "F" CONCRETE RAIL RETROFIT SHEET 1 OF 2**

<table>
<thead>
<tr>
<th>RADIUS TO</th>
<th>MAX. CHORD LENGTH</th>
<th>CONSTRUCT OR FABRICATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FACE OF RAIL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over 8500'</td>
<td>25'-6&quot; Straight rail sections</td>
<td></td>
</tr>
<tr>
<td>Over 1400'</td>
<td>14'-6&quot; To required radius</td>
<td></td>
</tr>
<tr>
<td>Over 1000'</td>
<td>7&quot; or to choose shown</td>
<td></td>
</tr>
<tr>
<td>Max 1000'</td>
<td>0' To required radius</td>
<td></td>
</tr>
</tbody>
</table>

**DETAIL A**

Effective Date: December 1, 2021 - May 31, 2022
The Federal Highway Administration's standard rounded capital letter alphabets and letter sizing shall be used. The sizes for the numeral and the size and series for the letter suffix of the route number shall be as shown herein. The letter shall be placed beside the numerals.

US Route Markers shall have non-reflectorized black letters, symbols and borders on a white ASTM Type III or Type IV retroreflective sheeting background. Use white ASTM Type IX or XI retroreflective sheeting background for overhead installations.

The Interstate Route Marker shall have silver-white ASTM Type III or Type IV retroreflective sheeting overlaid with Standard Interstate red and blue transparent past background with white ASTM Type III or Type IV retroreflective sheeting letters and symbols. Use white Type IX or XI sheeting background and white Type IX or XI letters and symbols for overhead installations.

* In a few cases numerals cannot be accommodated within the space available. For these situations, the Standard Series 'D' numeral may be reduced to Series 'C', or as a second choice to the next smaller height commonly available. Where the numerals are reduced in height the reduction shall be divided equally and added to the dimensions 'D' & 'C'.

** If at least 2 of the 3 digits are '1', then use shield size corresponding to a 2 digit number.

NOTE: Use sheet aluminum overlay with rivet holes for mounting on extruded aluminum panel signs.

Mounting holes for 0.125 in. blind rivets

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and shall not be used without consulting a Registered Professional Engineer.

Effective Date: December 1, 2021 - May 31, 2022
The current Oregon Standard Specifications

All material and workmanship shall be in accordance with

NOTE:

DATE

REVISION DESCRIPTION

OREGON STANDARD DRAWINGS

2021

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON ROUTE SIGNS

SIGNING DETAILS

OREGON ROUTE SIGNS

ROUTE SHIELDS
(for use as legend on Regulatory and Guide signs)

Mounting holes to be filled

NOTE: Use sheet aluminum overlay with rivet holes for mounting on extruded aluminum panel signs.

ROUTE SHIELD SIGNS
(for use in Junction, Directional, & Confirmation Marker Assemblies)

Notes:
- The Federal Highway Administration’s standard rounded capital letter alphabets and letter spacing shall be used. The series for the numeral and the size and series for the letter suffix of the route number shall be as shown hereon. The letter shall be placed between the numerals.

Oregon Route Signs and Shields shall have non-reflective black letters, symbols, and borders on a white ASTM Type III or Type IV retroreflective sheeting background. Use white ASTM Type IX or XI retroreflective sheeting for overhead installations.

ROUTE SHIELD SIGNS
(for use as legend on Regulatory and Guide signs)

- If at least 2 of the 3 digits are "1", then use shield size corresponding to a 2 digit number.

BASIC DESIGN

For 1 or 2 Digit Routes

For 3 Digit Routes

THEME/NO. OF DIGITS A B C D E F G

18 18 1 or 2 8-C

18 22 2 8-D

24 24 1 or 2 12-C

24 30 3 11-C

36 36 1 or 2 16-C

36 45 3 16-C

* If at least 2 of the 3 digits are "1", then use shield size corresponding to a 2 digit number.
The current Oregon Standard Specifications

All material and workmanship shall be in accordance with the current Oregon Standard Specifications for Construction.

General Notes:

1. Signs shall be fabricated from sheet aluminum with a nominal thickness of 0.063".
2. Signs shall have white ASTM Type III or Type IV retroreflective sheeting permanent legend and border on a green ASTM Type III or Type IV retroreflective sheeting background.
3. The Federal Highway Administration's standard rounded capital letter alphabet shall be used.
4. The corners of signs shall be rounded to match the border.
5. Signs shall conform to sections 940 and 2910 of the current Oregon Standard Specifications for Construction.
6. The rivet hole pattern is unique for each sign and corresponds to a specific post length on ODOT Standard Drawing TM222.
7. Border for all signs is ¼" wide. This dimension supersedes ODOT Standard specification 09940.45(c).

Effective Date: December 1, 2021 - May 31, 2022
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

General Notes:
1. The Bottom Of Signal Heads Shall Be At The Same Vertical Elevation Above The Roadway. Eyebolts For Span Need Not Be At The Same Elevation.
2. All Screws, Bolts, Nuts And Washers shall be Type 304 Or 316 Stainless Steel Unless Noted Otherwise.

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**Temporary Wood Strain Pole Details**

**Legend**
- **1. Luminance Arm** (See TM453 For Details)
- **2. Eyebolt**
- **3. Strandwise**
- **4. Bonding Lug** (See TM452 For Details)
- **5. Messenger cable**
- **6. Cable Ties**
- **7. Bond Wire** (See TM452 For Details)
- **8. Terminal Cabinet** (See TM452 For Details)
- **9. Control Cable**
- **10. Watertight Compression Entrance Fitting**
- **11. Guy Wire** (See TM453 For Details)
- **12. Turnbuckle**
- **13. 'S' Hook (State Supplied)**
- **14. Tether Cable**
- **15. Strandwire Hanger** (See TM452 For Details)
- **16. Tether Clamp** (See TM452 For Details)

---

**Temporary Wood Strain Pole**

- Wood Strain Pole
- Lock/Jam Nut
- Takeup Min.
- 1/2"
- 1/2"
- 4"

---

**Pedestrian Signal** (See TM467 For Details)

- Pedestrian Pushbutton

---

**Pedestrian Signal Mounting** (See TM456 For Details)

- As Shown On Plans

---

**Sign And Vehicle Signal Mounting** (See TM456 For Details)

- Lag (5% Of Span Length)

---

**As Shown On Plans**

- Chord Line Between Eyebolts

---

**Vehicle Signal Heads Mounted On Adjustable Brackets.** (See TM452 For Details)

- 16'-0" To Top Of Sign
- 3'-6" To 4'-0"
- 14'-0" To Bottom Of Signal
- 17'-0" To Bottom Of Signal When Sign Is Mounted Below

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**Effective Date:** December 1, 2021 - May 31, 2022
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

**NOTE:**

**DATE**

**REVISION**

**DESCRIPTION**

OREGON STANDARD DRAWINGS

TM453

CALC. BOOK NO.     N/A

LUMINAIRE ARM DETAILS

GUY WIRE/ANCHOR, & PEDESTRIAN WOOD POST, TEMPORARY

OVERHEAD CONDUCTORS

GENERAL NOTES:

1. All Screws, Bolts And Washers Shall Be Type 304 or 316 Stainless Steel Unless Noted Otherwise.

2. Bolts And Screws Shall Have Hex Or Square Heads. Allen Head Fasteners Not Allowed.

3. Conduit Mounted On Wood Poles/Posts May Be Liquid Tight Flex Conduit.

LUMINAIRE ARM INSTALLATION ON WOOD POLE

- 1/2" Thru Bolts W/Flat Washers And Locknuts
- Crossbar Mounting Plate
- 2" Sched. 40 Galv. Steel
- 1/2" X 4" Lag Screws
- Curved Pole Plate (3/8" x 10" x 10")
- 1 1/4" Holes
- 1 1/4" Threaded Pipe With Bushing For Wire Or Conduit Entrance
- Smooth Inside Edges For Wire Protection
- 3/4" Diameter

SIDEWALK GUY ANCHOR ASSEMBLY

- Bright Yellow Guy Marker
- Half Round Shape Or Equivalent
- 2" Or 1 1/2" Galv. Steel Pipe
- 1/3 Of Attachment Height Min.

GUY ANCHOR ASSEMBLY

- Strap Conduit As Per N.E.C.
- Messenger Attachment
- (See TM452 For Details)

PEDESTRIAN WOOD POST INSTALLATION

- 4" x 4" x 10'-0" Treated Wood Post
- 1" PVC Conduit
- Min. 6" x 6" x 6" Weatherproof Box
- Clam Shell Mount
- Pedestrian Pushbutton (See TM 467 For Details)
- Pedestrian Signal Head
- Ground Lug & Wire
- 1 1/2" X" Conduit Body
- Weatherhead Conductor Entrance
- Messenger Attachment
- (See TM452 For Details)

NOTE:

Install Guy Anchors In Line With Messenger Cables
General Notes:
1. All Bolts, Nuts and Washers Shall Conform To 02560.20 and Be Galvanized Steel According To 02560.40 Unless Noted Otherwise.
2. All Anchor Rods Shall Be Galvanized Steel Conforming To 02560.30.
3. All Anchor Rods Shall Be Galvanized Steel Conforming To 02560.30.
4. Install 1/4" Thick Preformed Expansion Joint Filler Around Footing In Sidewalk Area As Per TM653.
5. Top Of Foundation Shall Not Be Below Finish Grade, Island Surface, Or Sidewalk. Top Of Foundation Shall Have Less Than 1/4" Vertical Exposure Above Finish Grade, Island Surface, Or Sidewalk.

VEHICLE SIGNAL PEDESTAL

- 2 ø 1 1/4" Anchor Rods (ASTM F 1554 Grade 36) 12" Rod Circle (RC)
- (4) 2" Square Washers At Top Connection.
- PEDESTRIAN SIGNAL PEDESTAL

- 4" Dia. Std. Galvanized Steel Pipe (ASTM A53 or ASTM A500 with ASTM A123 galvanization, Sch. 40, 4 1/2" O.D.)
- Frangible Base Mounted Flush With Sidewalk Or Island
- 30 Lb. Building Paper Gasket
- Concrete Foundation, (Place In One Pour) (Top 4" Shall Be Square, Remaining Depth May Be Round Or Square)
- Ground Line
- Conduit (Size As Shown On Plans. See TM471 For Details)
- PEDESTRIAN OR BICYCLE PUSHBUTTON POST

- 4" Dia. Std. Galvanized Steel Pipe (ASTM A53 or ASTM A500 with ASTM A123 galvanization, Sch. 40, 4 1/2" O.D.)
- Frangible Base Mounted Flush With Sidewalk Or Island
- 30 Lb. Building Paper Gasket
- Concrete Foundation, (Place In One Pour) (Top 4" Shall Be Square, Remaining Depth May Be Round Or Square)
- Conduit (Size As Shown On Plans. See TM471 For Details)
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

**VEHICLE SIGNAL HEAD DESIGNATIONS AND LENS ARRANGEMENT**

- **TYPE 1**
  - Red Flashing Beacon
  - Yellow Flashing Beacon
  - Standard
  - Left Turn
  - Protected / Permitted Left Turn
  - Right Turn
  - Protected / Permitted Right Turn
  - Split Phase Only

- **TYPE 2**
  - Green Circular Ball
  - Yellow Arrow
  - Red Arrow
  - Green Arrow
  - Yellow Circular Ball
  - Red Circular Ball

- **TYPE 3**
  - Fully Exposed Threads
  - Length as req'd.
  - Carriage Bolts: 1/4" x Length as req'd. For three fully exposed threads
  - Nylon Insert

- **TYPE 4**
  - All Indications Are 12" Diameter
  - FLB
  - FYA
  - FR
  - FYA
  - R
  - Y
  - G

**General Notes:**
1. All Screws, Bolts, Nuts And Washers Shall Be Type 304 Or 316 Stainless Steel Unless Noted Otherwise.
2. Bolts And Screws Shall Have Square Or Hex Heads Unless Noted Otherwise. Allen Head Fasteners Not Allowed.
3. Assemble The Heavy Duty Polycarbonate Vehicle Signal, Visor, And Backboard With Bolted Connections, Stainless Steel Reinforcing Strips And Stainless Steel Plates.

**Date:**
- Effective Date: December 1, 2021 - May 31, 2022
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NOTE:
This Detail Can Be Applied To Any Signal Head Configuration. If The Extension Between The Center Line Of The Mast Arm And The Top Bracket Exceeds 18" Consult Engineer For Guidance.

MOUNTING VEHICLE SIGNAL ABOVE BRACKET ARMS

General Notes:
1. All Screws, Bolts, Nuts And Washers Shall Be Type 304 Or 316 Stainless Steel Unless Noted Otherwise.
2. Bolts And Screws Shall Have Square Or Hex Heads. Allen Head Fasteners Not Allowed.
3. Follow Manufacturers Recommendations For Installation.

MOUNTING VEHICLE SIGNAL BETWEEN BRACKET ARMS

NOTE: Drill And Tap Pole For 3/8" Forged Eye Bolt

POLE SHAFT INSTALLATION

General Notes:
1. All material and workmanship shall be in accordance with the current Oregon Standard Specifications

OREGON STANDARD DRAWINGS

Vehicle Signal Bracket & Sign Bracket (Type B) Details

TM462

Effective Date: December 1, 2021 - May 31, 2022
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

Effective Date: December 1, 2021 - May 31, 2022
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

NOTES:
1. Where Two Heads Are Side Mounted On 4" Conduit, Proper Clearance Shall Be Maintained To Allow Legend To Be Fully Visible.
2. Clam Shells To Be Orientated So That The Heads Can Be Viewed For Maintenance. (Verify Hinge Placement Of Clamshell).

General Notes:
1. All Screws, Bolts, Nuts And Washers Shall Be Type 304 Or 316 Stainless Steel Unless Noted Otherwise.
2. Bolts And Screws Shall Have Square Or Hex Heads. Allen Head Fasteners Not Allowed.
3. Drill And Tap Pole As Per Orientation Shown On Plans.
4. Horizontal Reach To The Pushbutton Shall Be 10 Inches Maximum. See Plans Or Consult Engineer To Ensure Compliance.
**DIN Rail, Terminal Blocks, & Wiring in Pole Recessed Terminal Cabinet**

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<th>Pedestrian Phases</th>
<th>Vehicle Phase</th>
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**Color Code Chart Control Cable**

- **Wire**
  - Out
  - In

- **Terminal Block**
  - Type "B" PEDESTAL/POST Ramped Poles

**Wire & Cable in Conduits**

- Use electrical lubricants when inserting wires and cables in conduit.
- Pull all wires and cables by hand only.
- Pull in a straight line with the conduit opening.
- Temporarily bundling cables or wire (tapes, straps, ties, or other binding material) allowed only at the terminating end points for pulling only.
- *Use a pulley device to achieve a straight line if pulls are made with poles or controller cabinets in place.*

**Wire & Cable in Poles**

- Install individual No. 14 AWG THHN wires to pedestrian signals and pushbuttons shown mounted on the pole.
- Install separate 7 conductor control cable for each signal head or PTR sign.
- Drill and tap for 2-10/32 screws.
- Install individual No. 14 AWG THHN wires to pedestrian signals and pushbuttons shown mounted on the pole.

**Wire & Cable in Ramp Meter**

- Type 2 signal head
- Type 8 signal head

**Pedestals**

- PEDESTAL/POST Ramped Poles

**Wire & Cable Installation**

- All material and workmanship shall be in accordance with the current Oregon Standard Specifications.

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**Effective Date:** December 1, 2021 - May 31, 2022
REVISION DESCRIPTION

TM471

Fiberglass Riser (In Foundations)
PVC Riser (In Junction Boxes) Or
Manipulation, Or Cutting In The Field)
(No Crimping, Flattening, Field
Standard Factory Fiberglass Bend
Conduit Ends Fit Together For Their
Maximum Diameter

When Excavating, Cut Sharp And Well Defined
Pavement Edges With An Approved Pavement
Cutting Saw 2" Minimum Depth Along
The Boundaries Of The Area To Be Removed

Match Existing Surface Material: PCC Or ACP
Compact Material According To 00744,
00745, 00755, And 00756, As Applicable.
Finish To A Smooth Riding Surface.

CLSM

EXISTING PAVED AREAS

CONDUIT ELBOWS

CONDUIT OPEN TRENCH EXCAVATION & BACKFILL

CONDUIT END BUSHINGS

Standard Factory Fiberglass Bend
(No Crimping, Flattening, Field
Manipulation, Or Cutting In The Field)

Make Cuts Square And True So
Conduit Ends Fit Together For Their
Full Circumference. Use Solvent
Weld To Connect Conduit As Per
Manufacturer's Recommendation.

Notes:
1.) Slip joints, Running Threads Or Reducing Couplings Not Allowed. Use The Same
Size Conduit For The Entire Length, Outlet To Outlet.

CONDUIT COUPLINGS

3/4" Min. To 3/4" Max.

3/4" Min. To 3/4" Max.

2" Min. To 3" Max.

Sand Blanket (May Be Omitted
When Using Rigid
Metallic Conduit)

Center Underground Marking Tape
Over Conduit For The Entire Length
Of The Conduit Run

Top Of Trench,
Bottom Of Subgrade,
Surrounding Ground, Or
Upper Limit Of Excavation

Top Of Finished
Surface

Minimum Cover (See
Minimum Cover Table)

Minimum Cover From
Top Of Finished Surface
(Use Permit Depth
If Greater Than These)

Maximum Cover From Finished Surface

1" Larger Than Riser Diameter

R (min.)

R

Diameter

Conduit

1 1/2" 10" 2"

2 1/2" 12"

3" 15" 18"

Notes:
1.) Ream Conduit Ends To Remove Rough Edges And Burrs
2.) Temporarily Plug Or Cap Conduit Ends At All Times To Keep Debris Out

CONDUIT INSTALLATION IN FOUNDATIONS

(Applicable for Pole, Pedestal, Post, Service Cabinet
And Controller Cabinet Foundations)

3. Do Not Backfill Trenches Until Inspected By The Engineer.

4. Furnish Backfill Materials According To 00960.10

3. Do Not Backfill Trenches Until Inspected By The Engineer.

4. Furnish Backfill Materials According To 00960.10

1. Install Non-Metallic Conduit Unless Otherwise Shown. Conduit Runs Shall Be Continuous
Between Any Pole, Junction Box, Or Cabinets.

2. Install Conduit By Open Trench Method, Horizontal Directional Drilling, Or As Shown
Between Any Pole, Junction Box, Or Cabinet Foundations.

General Notes:
1. Install Non-Metallic Conduit Unless Otherwise Shown. Conduit Runs Shall Be Continuous Between Any Pole, Junction Box, Or Cabinets.
2. Install Conduit By Open Trench Method, Horizontal Directional Drilling, Or As Shown Between Any Pole, Junction Box, Or Cabinet Foundations.
3. Conduit Runs Shown On Plans Are For Bidding Purposes Only. Locations may be Changed To Avoid Obstructions.
4. Larger Conduit Than Specified May Be Used At The Option And Cost Of The Contractor. If Max. Sum Of Conduit Diameters In Junction Box Is Not Exceeded.

EXHIBIT NO. 1

The selection and use of this Standard Drawing, while de-
signed in accordance with generally accepted engineer-
ning principles and practices, is the sole responsibility
of the user and should not be used without consulting a
Registered Professional En-

OREGON STANDARD DRAWINGS

TRENCHING & CONDUIT INSTALLATION

CALC. BOOK NO. - 58 } SDR REPORT DATE 1-Jul-2021

NOTE: All material and workmanship shall be in accordance with
the current Oregon Standard Specifications

DATE 9/21

WORKER DESCRIPTION 2021

CONDUIT INSTALLATION

Effective Date: December 1, 2021 - May 31, 2022

TM471
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

General:

1. Install top of junction box and hand hole flush with the sidewalk, surrounding grade, or top of curb. For hand holes installed in the roadway or shoulder, leave the top of the hand hole 1 1/2" below the pavement surface.

2. Install junction boxes and hand holes at the approximate locations shown, or if not shown, no more than 300 feet apart for junction boxes and no more than 1000 feet apart for hand holes.

3. More junction boxes and hand holes than specified may be installed to facilitate the work at the option and cost of the contractor.

4. Use materials according to 00640.10 and 00640.16. Use compaction equipment suitable for area and compact each six-inch layer with sufficient coverages to produce a firm unyielding surface. Do not install conductors until surface has been constructed.

**JUNCTION BOX INSTALLATION IN PCC SIDEWALK**

This detail only applicable for junction boxes located in flat areas of sidewalks. Do not install in slopes of ramps or driveways.

**TANDEM JB/3A JUNCTION BOX DETAILS**

1. Install top of junction box and hand hole flush with the sidewalk, surrounding grade, or top of curb. For hand holes installed in the roadway or shoulder, leave the top of the hand hole 1/2" below the pavement surface.

2. Install junction boxes and hand holes at the approximate locations shown, or if not shown, no more than 300 feet apart for junction boxes and no more than 1000 feet apart for hand holes.

3. More junction boxes and hand holes than specified may be installed to facilitate the work at the option and cost of the contractor.

4. Use materials according to 00640.10 and 00640.16. Use compaction equipment suitable for area and compact each six-inch layer with sufficient coverages to produce a firm unyielding surface. Do not install conductors until surface has been constructed.

**FIBER OPTIC CABLE HAND HOLE INSTALLATION**

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

**NOTE:** The exact location and width of the fiber optic cable must be determined by the contractor. The fiber optic cable may be installed in existing voids, slits, or handholes in sidewalks or curbs. When installed in handholes, take care not to pinch the fiber optic cable when installing handhole lid.

The fiber optic cable shall be coiled and installed in handholes. Take care not to pinch the fiber optic cable when installing handhole lid.

**GENERAL NOTES:**

1. Install top of junction box and hand hole flush with the sidewalk, surrounding grade, or top of curb. For hand holes installed in the roadway or shoulder, leave the top of the hand hole 1 1/2" below the pavement surface.

2. Install junction boxes and hand holes at the approximate locations shown, or if not shown, no more than 300 feet apart for junction boxes and no more than 1000 feet apart for hand holes.

3. More junction boxes and hand holes than specified may be installed to facilitate the work at the option and cost of the contractor.

4. Use materials according to 00640.10 and 00640.16. Use compaction equipment suitable for area and compact each six-inch layer with sufficient coverages to produce a firm unyielding surface. Do not install conductors until surface has been constructed.
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

General Notes:
1. All Screws, Bolts, Nuts And Washers Shall Be Galvanized Steel Unless Noted Otherwise.
3. Type 304 Or 316 Stainless Steel Or Galvanized Steel May Be Used For Mounting Cabinet To Riser Frame.

BASE MOUNTED SERVICE CABINET FOUNDATION

GENERAL NOTES:

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

General Notes:
1. All Screws, Bolts, Nuts And Washers Shall Be Galvanized Steel Unless Noted Otherwise.
3. Type 304 Or 316 Stainless Steel Or Galvanized Steel May Be Used For Mounting Cabinet To Riser Frame.

BASE MOUNTED SERVICE CABINET FOUNDATION

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General Notes:
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3. Type 304 Or 316 Stainless Steel Or Galvanized Steel May Be Used For Mounting Cabinet To Riser Frame.

BASE MOUNTED SERVICE CABINET FOUNDATION

GENERAL NOTES:

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General Notes:
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3. Type 304 Or 316 Stainless Steel Or Galvanized Steel May Be Used For Mounting Cabinet To Riser Frame.

BASE MOUNTED SERVICE CABINET FOUNDATION

GENERAL NOTES:

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General Notes:
1. All Screws, Bolts, Nuts And Washers Shall Be Galvanized Steel Unless Noted Otherwise.
3. Type 304 Or 316 Stainless Steel Or Galvanized Steel May Be Used For Mounting Cabinet To Riser Frame.

BASE MOUNTED SERVICE CABINET FOUNDATION

GENERAL NOTES:

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General Notes:
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BASE MOUNTED SERVICE CABINET FOUNDATION

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General Notes:
1. All Screws, Bolts, Nuts And Washers Shall Be Galvanized Steel Unless Noted Otherwise.
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BASE MOUNTED SERVICE CABINET FOUNDATION

GENERAL NOTES:

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

General Notes:
1. All Screws, Bolts, Nuts And Washers Shall Be Galvanized Steel Unless Noted Otherwise.
3. Type 304 Or 316 Stainless Steel Or Galvanized Steel May Be Used For Mounting Cabinet To Riser Frame.
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

Utility Provider Details

2. Service Cabinet Shall Have A Solid Copper Neutral Bus And The Number And Size Of Switches Or Circuit Breakers As Shown. Service Cabinet Can Accommodate A Maximum Of 10 Circuit Breakers.
3. Wiring Connections To The Terminal Screws On The Circuit Breakers And Contactors Shall Make Full Contact Under The Screw Head.
4. Circuit Breakers Shall Be UL489 Listed, Unenclosed, Molded Case Bolt-On Type With End Conductor Terminals Suitable For Surface Mounting In The Cabinet On A False Back Or Bracket.
5. Label Circuit Breakers And Equipment With An Engraved Permanent Label On The Dead Front Panel To Indicate The Circuit Controlled.

Effective Date: December 1, 2021 - May 31, 2022
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General Notes:
1. Do NOT install Signal Poles Within Paved Gore Area.
2. Locate Ramp Meter Pedestal 25'-0" Beyond Stop Line Or As Shown.
3. Field Verify Pole Lengths To Maintain Clearances.

Ramp Meter Advance Warning Sign Assembly

(See TM457 For Details)

Foundation Depth

Anchor Rods

Ramp Meter Pedestal

Sloped Ground

Detail A: SLOPED CONCRETE SLAB

FOR PEDESTRIAN SIGNAL PEDESTAL

(See TM457 (Pedestrian Signal Pedestal) For Additional Details)

Anchor Rods

Foundation Depth

4" Dia. Std. Galvanized Steel Pipe

Transformer Base

Type 1Y Vehicle Signal

With Three Set Screws

Slip Fit Metallic Pole Cap

For Three Set Screws

Side Pole Mount

Clamp And Bracket

Stainless Steel

(Side Pole Mount

See TM462 For Details)

"RAMP METERED WHEN FLASHING"

W3-8 ASTM Type IX Aluminum Sign

(36" x 36"

Top Of Foundation

Pedestrian Pedestal

(See TM457 For Details)

Foundation On Level Ground

(See TM457 For Details. See

Foundation On Level Ground

(See TM457 For Details)

Additional Details

RAMP METER PEDESTAL ASSEMBLY

(See TM457 (Vehicle Signal Pedestal) For Additional Details)

Ramp Meter Pedestal

Sloped Ground

Detail B: SLOPED CONCRETE SLAB

FOR PEDESTRIAN SIGNAL PEDESTAL

(See TM457 (Pedestrian Signal Pedestal) For Additional Details)

Anchor Rods

Foundation Depth

4" Dia. Std. Galvanized Steel Pipe

Transformer Base

Type 1Y Vehicle Signal

With Three Set Screws

Slip Fit Metallic Pole Cap

For Three Set Screws

Side Pole Mount

Clamp And Bracket

Stainless Steel

(Side Pole Mount

See TM462 For Details)

"RAMP METERED WHEN FLASHING"

W3-8 ASTM Type IX Aluminum Sign

(36" x 36"

Top Of Foundation

Pedestrian Pedestal

(See TM457 For Details)

Foundation On Level Ground

(See TM457 For Details. See

Foundation On Level Ground

(See TM457 For Details)

Additional Details

RAMP METER PEDESTAL ASSEMBLY

(See TM457 (Vehicle Signal Pedestal) For Additional Details)

Ramp Meter Pedestal

Sloped Ground

Detail A: SLOPED CONCRETE SLAB

FOR PEDESTRIAN SIGNAL PEDESTAL

(See TM457 (Pedestrian Signal Pedestal) For Additional Details)

Anchor Rods

Foundation Depth

4" Dia. Std. Galvanized Steel Pipe

Transformer Base

Type 1Y Vehicle Signal

With Three Set Screws

Slip Fit Metallic Pole Cap

For Three Set Screws

Side Pole Mount

Clamp And Bracket

Stainless Steel

(Side Pole Mount

See TM462 For Details)

"RAMP METERED WHEN FLASHING"

W3-8 ASTM Type IX Aluminum Sign

(36" x 36"

Top Of Foundation

Pedestrian Pedestal

(See TM457 For Details)

Foundation On Level Ground

(See TM457 For Details. See

Foundation On Level Ground

(See TM457 For Details)

Additional Details

RAMP METER PEDESTAL ASSEMBLY

(See TM457 (Vehicle Signal Pedestal) For Additional Details)

Ramp Meter Pedestal

Sloped Ground

Detail B: SLOPED CONCRETE SLAB

FOR PEDESTRIAN SIGNAL PEDESTAL

(See TM457 (Pedestrian Signal Pedestal) For Additional Details)

Anchor Rods

Foundation Depth

4" Dia. Std. Galvanized Steel Pipe

Transformer Base

Type 1Y Vehicle Signal

With Three Set Screws

Slip Fit Metallic Pole Cap

For Three Set Screws

Side Pole Mount

Clamp And Bracket

Stainless Steel

(Side Pole Mount

See TM462 For Details)

"RAMP METERED WHEN FLASHING"

W3-8 ASTM Type IX Aluminum Sign

(36" x 36"

Top Of Foundation

Pedestrian Pedestal

(See TM457 For Details)

Foundation On Level Ground

(See TM457 For Details. See

Foundation On Level Ground

(See TM457 For Details)

Additional Details

RAMP METER PEDESTAL ASSEMBLY

(See TM457 (Vehicle Signal Pedestal) For Additional Details)

Ramp Meter Pedestal

Sloped Ground

Detail A: SLOPED CONCRETE SLAB

FOR PEDESTRIAN SIGNAL PEDESTAL

(See TM457 (Pedestrian Signal Pedestal) For Additional Details)

Anchor Rods

Foundation Depth

4" Dia. Std. Galvanized Steel Pipe

Transformer Base

Type 1Y Vehicle Signal

With Three Set Screws

Slip Fit Metallic Pole Cap

For Three Set Screws

Side Pole Mount

Clamp And Bracket

Stainless Steel

(Side Pole Mount

See TM462 For Details)

"RAMP METERED WHEN FLASHING"

W3-8 ASTM Type IX Aluminum Sign

(36" x 36"

Top Of Foundation

Pedestrian Pedestal

(See TM457 For Details)

Foundation On Level Ground

(See TM457 For Details. See

Foundation On Level Ground

(See TM457 For Details)

Additional Details

RAMP METER PEDESTAL ASSEMBLY

(See TM457 (Vehicle Signal Pedestal) For Additional Details)

Ramp Meter Pedestal

Sloped Ground

Detail B: SLOPED CONCRETE SLAB

FOR PEDESTRIAN SIGNAL PEDESTAL

(See TM457 (Pedestrian Signal Pedestal) For Additional Details)

Anchor Rods

Foundation Depth

4" Dia. Std. Galvanized Steel Pipe

Transformer Base

Type 1Y Vehicle Signal

With Three Set Screws

Slip Fit Metallic Pole Cap

For Three Set Screws

Side Pole Mount

Clamp And Bracket

Stainless Steel

(Side Pole Mount

See TM462 For Details)

"RAMP METERED WHEN FLASHING"

W3-8 ASTM Type IX Aluminum Sign

(36" x 36"

Top Of Foundation

Pedestrian Pedestal

(See TM457 For Details)

Foundation On Level Ground

(See TM457 For Details. See

Foundation On Level Ground

(See TM457 For Details)

Additional Details

RAMP METER PEDESTAL ASSEMBLY

(See TM457 (Vehicle Signal Pedestal) For Additional Details)

Ramp Meter Pedestal

Sloped Ground

Detail A: SLOPED CONCRETE SLAB

FOR PEDESTRIAN SIGNAL PEDESTAL

(See TM457 (Pedestrian Signal Pedestal) For Additional Details)

Anchor Rods

Foundation Depth

4" Dia. Std. Galvanized Steel Pipe

Transformer Base

Type 1Y Vehicle Signal

With Three Set Screws

Slip Fit Metallic Pole Cap

For Three Set Screws

Side Pole Mount

Clamp And Bracket

Stainless Steel

(Side Pole Mount

See TM462 For Details)

"RAMP METERED WHEN FLASHING"

W3-8 ASTM Type IX Aluminum Sign

(36" x 36"

Top Of Foundation

Pedestrian Pedestal

(See TM457 For Details)

Foundation On Level Ground

(See TM457 For Details. See

Foundation On Level Ground

(See TM457 For Details)

Additional Details

RAMP METER PEDESTAL ASSEMBLY

(See TM457 (Vehicle Signal Pedestal) For Additional Details)

Ramp Meter Pedestal

Sloped Ground

Detail B: SLOPED CONCRETE SLAB

FOR PEDESTRIAN SIGNAL PEDESTAL

(See TM457 (Pedestrian Signal Pedestal) For Additional Details)

Anchor Rods

Foundation Depth

4" Dia. Std. Galvanized Steel Pipe

Transformer Base

Type 1Y Vehicle Signal

With Three Set Screws

Slip Fit Metallic Pole Cap

For Three Set Screws

Side Pole Mount

Clamp And Bracket

Stainless Steel

(Side Pole Mount

See TM462 For Details)

"RAMP METERED WHEN FLASHING"

W3-8 ASTM Type IX Aluminum Sign

(36" x 36"

Top Of Foundation

Pedestrian Pedestal

(See TM457 For Details)

Foundation On Level Ground

(See TM457 For Details. See

Foundation On Level Ground

(See TM457 For Details)

Additional Details

RAMP METER PEDESTAL ASSEMBLY

(See TM457 (Vehicle Signal Pedestal) For Additional Details)

Ramp Meter Pedestal

Sloped Ground

Detail A: SLOPED CONCRETE SLAB

FOR PEDESTRIAN SIGNAL PEDESTAL

(See TM457 (Pedestrian Signal Pedestal) For Additional Details)

Anchor Rods

Foundation Depth

4" Dia. Std. Galvanized Steel Pipe

Transformer Base

Type 1Y Vehicle Signal

With Three Set Screws

Slip Fit Metallic Pole Cap

For Three Set Screws

Side Pole Mount

Clamp And Bracket

Stainless Steel

(Side Pole Mount

See TM462 For Details)

"RAMP METERED WHEN FLASHING"

W3-8 ASTM Type IX Aluminum Sign

(36" x 36"

Top Of Foundation

Pedestrian Pedestal

(See TM457 For Details)

Foundation On Level Ground

(See TM457 For Details. See

Foundation On Level Ground

(See TM457 For Details)

Additional Details

RAMP METER PEDESTAL ASSEMBLY

(See TM457 (Vehicle Signal Pedestal) For Additional Details)
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

To be accompanied by Standard Dwg. Nos. TM502 and TM515
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

General Notes:
1) See Standard Drawing TM500 and/or project plans for marking length and width dimensions.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.
**GENERAL NOTES:**

Luminaire supports shall be designed in accordance with ASSTED/KDE Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals (2015).

The design wind velocity shall be 145 mph.

The design snow and wind velocity shall be 87 mph.

Load on a 60" (3.0% for round cross section luminaire supports) with arms.

For further information, please refer to TM630, TM631, TM653.

**LUMINAIRE ARM CONNECTION DETAILS**

No Scale

**LUMINAIRE TENON DETAILS**

No Scale

**POLE AND ARM SPLICE**

Weld Details

**HUB WELD DETAIL**

No Scale

**TYPICAL LUMINAIRE SUPPORT**

No Scale

**LUMINAIRE ARM DESIGN DATA**

Arms

<table>
<thead>
<tr>
<th>Arm length</th>
<th>Width &amp; Dia.</th>
<th>Arm Circum.</th>
<th>Bolt dia.</th>
<th>Arm washers</th>
</tr>
</thead>
<tbody>
<tr>
<td>4'-0&quot;</td>
<td>3-3/16&quot;</td>
<td>10.5&quot;</td>
<td>7/32&quot;</td>
<td>7/32&quot;</td>
</tr>
<tr>
<td>5'-0&quot;</td>
<td>4-1/4&quot;</td>
<td>15.7&quot;</td>
<td>7/32&quot;</td>
<td>7/32&quot;</td>
</tr>
<tr>
<td>5'-10&quot;</td>
<td>4-3/4&quot;</td>
<td>18.3&quot;</td>
<td>7/32&quot;</td>
<td>7/32&quot;</td>
</tr>
</tbody>
</table>

**Note:**

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

**OREGON STANDARD DRAWINGS**

SLIP BASE AND FIXED BASE LUMINAIRE SUPPORTS GENERAL DETAILS AND DESIGN CRITERIA

2021

**OREGON STANDARD SPECIFICATIONS**

Slip Base and Fixed Base Luminaire Supports are to be designed in accordance with the current Oregon Standard Specifications.

**Effective Date:** December 1, 2021 — May 31, 2022

**TM629**
Adjust anchor rod leveling nuts as required to rake pole.

8'-6" 6" "BL" ≤ 40'

8" 2 "T"

1" 6" sq. x 1" thick plate

"BD" ≥ 850

ANCHOR PLATE ASSEMBLY - SLIP BASE POLE

PLAN - POLE SLIP PLATE - SLIP BASE POLE

ANCHOR PLATE RECESS - SLIP BASE POLE

BOLT ASSEMBLY DETAIL

SLIP BASE DETAILS

SLIP BASE CHART

Bolt or Anchor rod

No. of Luminaire arm

Torque - P-lbs

Footings Depth

1' "BL" < 10" 600 90 8'-0"

1'-6" "BL" < 10" 900 105 8'-0"

1'-6" "BL" > 50'

Notes:

1. "BL" shall not exceed 55' for single luminaire arm poles. "BL" shall not exceed 45' for double luminaire arm poles. Top of anchor rod "BD" shall not exceed 50' for single luminaire arm poles. "BD" shall not exceed 40' for double luminaire arm poles.

2. The assumed non-cohesive soil friction angle is 25°, the bulk weight is 100 pcf, and fully saturated.

3. The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

4. The the selection and use of this Standard Drawing, while desin in accordance with generally accepted engineerin principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

These notes should be reviewed and understood by all users of the slip base bolted details. These notes are intended to provide guidance on the proper use of the slip base bolted details. They should not be construed as a substitute for professional engineering judgment or as a requirement for the use of the slip base bolted details.
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

Effective Date: December 1, 2021 – May 31, 2022
**TEMPORARY BARRIERS FLARE RATE TABLE**

<table>
<thead>
<tr>
<th>SPEED (mph)</th>
<th>MINIMUM FLARE RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 - 15</td>
<td>0.7</td>
</tr>
<tr>
<td>16 - 20</td>
<td>1.15</td>
</tr>
<tr>
<td>20 - 25</td>
<td>2.0</td>
</tr>
<tr>
<td>25 - 30</td>
<td>3.6</td>
</tr>
<tr>
<td>30 - 35</td>
<td>5.4</td>
</tr>
<tr>
<td>35 - 40</td>
<td>7.2</td>
</tr>
<tr>
<td>40 - 45</td>
<td>9.2</td>
</tr>
<tr>
<td>45 - 50</td>
<td>11.4</td>
</tr>
<tr>
<td>50 - 55</td>
<td>13.8</td>
</tr>
<tr>
<td>55 - 60</td>
<td>16.8</td>
</tr>
<tr>
<td>60 - 65</td>
<td>19.6</td>
</tr>
<tr>
<td>65 - 70</td>
<td>24.0</td>
</tr>
<tr>
<td>70 - 75</td>
<td>30.0</td>
</tr>
</tbody>
</table>

**TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE**

<table>
<thead>
<tr>
<th>SPEED (mph)</th>
<th>Sign Spacing (ft)</th>
<th>Max. Channelizing Device Spacing (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 - 30</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>30 - 40</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>40 - 50</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>50 - 60</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>60 - 70</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>70 - 80</td>
<td>350</td>
<td>350</td>
</tr>
<tr>
<td>80 - 90</td>
<td>400</td>
<td>400</td>
</tr>
</tbody>
</table>

**EXCAVATION ABRUPT EDGE**

- Abrupt edges may be created by paving, operations, excavations or other roadway work. Abrupt edge signing may be created by using the "L" formula, for speeds = 30: \( \frac{W}{60} \times S \), for speeds = 40: \( \frac{W}{70} \times S \), for speeds = 50: \( \frac{W}{80} \times S \), for speeds = 60: \( \frac{W}{90} \times S \), for speeds = 70: \( \frac{W}{100} \times S \).

**PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) INSTALLATION**

- Place portable changeable message signs (PCMS) in advance of excavations.

**FLAGGER STATION LIGHTING DELINEATION**

- Install flagger station lighting beyond the outside shoulder, where practical.
- Use tubular markers in shoulder taper on 10' spacing.
- Place sign generator / power supply off of the shoulder, as far as practical.

**MINIMUM LENGTHS TABLE**

<table>
<thead>
<tr>
<th>L VALUE FOR TAPERS (ft)</th>
<th>BUFFER &quot;B&quot; (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W - 10</td>
<td>1.0</td>
</tr>
<tr>
<td>W - 40</td>
<td>1.0</td>
</tr>
<tr>
<td>W - 60</td>
<td>1.0</td>
</tr>
<tr>
<td>W - 80</td>
<td>1.0</td>
</tr>
<tr>
<td>W - 100</td>
<td>1.0</td>
</tr>
<tr>
<td>W - 120</td>
<td>1.0</td>
</tr>
<tr>
<td>W - 140</td>
<td>1.0</td>
</tr>
<tr>
<td>W - 160</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**TYPICAL ABRUPT EDGE DELINEATION**

- Place sign generation / generator / power supply of the shoulder, as far as practical.

**OBSERVATIONS**

- For lane closures where \( W < 10' \), use "L" value for \( W = 10' \).
- For shoulder closures where \( W < 10' \), use "L" value for \( W = 10' \) or calculate "L" using formula, for speeds = 30: \( \frac{W}{60} \times S \), for speeds = 40: \( \frac{W}{70} \times S \), for speeds = 50: \( \frac{W}{80} \times S \), for speeds = 60: \( \frac{W}{90} \times S \), for speeds = 70: \( \frac{W}{100} \times S \).

**NOTES**

- Use Pre-Construction Speed to select the Speed From the Tables below.

**SPORTS CONTROL DEVICES (TCD) SPACING TABLE**

- Place traffic control devices on 10 ft. spacing for intersection and access radii.
- When necessary, sign spacing may be adjusted to fit site conditions. Limit spacing adjustments to 30% of the "A" dimension for all speeds.

**OBSERVATIONS**

- The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.
NOTES:

- DO NOT USE ON BRIDGE DECKS. Restrain barrier on bridge decks according to Bridge Design Manual. See Chapter 1.3.2.1.10
- Predrill pin holes for PCC pavement placement.
- Excavation height greater than 3 feet requires proper backslope based on angle of repose, or shoring as directed.

- CPPR and inlay existing rumble strips prior to staging traffic across the area. Common application is staging for freeway crossovers and lane shifts.
- Remove and replace existing striping as required.

CPPR and Inlay Area with Level 2, ½ inch ACP, or as directed

Existing Rumble Strip

Grinding Width

24" Typical - Shoulder Rumble Strips
18" Typical - Centerline Rumble Strips

OR

Existing Rumble Strip

2" Nom.

SECTION A-A

THE SELECTION AND USE OF THIS STANDARD DRAWING, WHILE DESIGNED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING PRINCIPLES AND PRACTICES, IS THE SOLE RESPONSIBILITY OF THE USER AND SHOULD NOT BE USED WITHOUT CONSULTING A REGISTERED PROFESSIONAL ENGINEER.

OREGON STANDARD DRAWINGS

TEMPORARY CONCRETE BARRIER AND RUMBLE STRIP DETAILS

CALC. BOOK NO. --- JUA ---

DATE --- 01-JUL-2021 ---

NOTES:

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications.
DOUBLE AHEAD (W 20-5) signs and the appropriate "LEFT LANE ENDS" (W 4-2) signs.

Speed Zone Order from the State Traffic Engineer.

Do not delineate Radar Speed Trailers. Locate trailer as shown, or as directed.

Using Radar Sensors, place the "Radar Speed Trailer," 2 and other signs and TCD, as shown.

Move "Radar Speed Trailer 2" as work progresses. Maintain "Radar Speed Trailer 2" within 1/4 mile of the paving machine.

** Once the Paving Machine is approximately 1/2 mile from the start of the paving operations, place the "Radar Speed Trailer," 2 and other signs and TCD, as shown.

Move "Radar Speed Trailer 2" as work progresses. Maintain "Radar Speed Trailer 2" within 1/4 mile of the paving machine.

GREY NOTES FOR ALL DETAILS:
- Drawing intended for continuous or intermittently moving paving or pavement preservation activities on freeways or high-speed divided highways.

Flaggers are not permitted to stop or hold freeway traffic.

If the inside shoulder in either direction is less than 100', use 36x36 signs, as shown on Dwg. Nos. "TM202" and "TM222.

Unless otherwise shown, use the "MINIMUM LENGTHS TABLE" on Dwg. No. "TM800 to determine Taper Length "L" and Buffer Length "B."

Make a Type II barricade in closed lane on 3/4 mile spacing, as shown, after rollers have completed compaction.

Decrease Tumbler Marker spacing to 40 ft. behind the paving machine as work progresses.

To control traffic, place "TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE" on Dwg. "TM800,"

For work in the left lane, place TCD to close the left lane... Use "LEFT LANE CLOSED AHEAD" (W 20-5) signs and the appropriate "LEFT LANE ENDS" (W 4-2) signs.

Speed Limit of "YY" shown on signs to be determined by an approved speed zone engineer.

Speed Zone Order from the State Traffic Engineer.

Do not delineate Radar Speed Trailers. Locate trailer as shown, or as directed.

To be accompanied by Dwg Nos. "TM202" & "TM222."

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

Effective Date: December 1, 2021 – May 31, 2022