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**NOTES**

Alcove concrete shall be Class "B" Concrete.

All concrete edges shall have a 3/4" X 45° chamfer. Chamfer on vertical edges shall be continued a minimum of one foot below finished ground line.

When headwalls are placed on the inlet end of corrugated metal pipe or beveled concrete pipe, a bevel shall be used at the inlet opening. The end of the pipe shall be set in from the face of the wall, and the face of the pipe shall be constructed from the end of the pipe to the face of the wall.

When headwalls are placed on the inlet end of concrete pipe, the "back" or "groove" of the pipe shall be placed in the wall in lay of the bevel, except when the slope is to be cut for placing in skewed headwalls. The inside of the "back" or "groove" shall be filled with concrete up to the finish line.

Bevels are not required on outlet headwalls.

Reinforcing shall conform to the requirements of 708.3 and 708.4 of the Specifications.

Reinforcing, as detailed herein, shall be used on walls of headwall structures. The covering for the fabric shall be formed and installed at the time the structure is completed. The face of the wall, unless otherwise specified, shall be cut or mitered to completely enclose the pipe opening in the wall and may be otherwise cut or field bent to fit the structure.

In lieu of the reinforcing described above, as shown reinforcing steelbars meeting the requirements of 708.1 of the Specification, may be used in these structures. Covering for the reinforcing shall be two inches, measured from the surface of the concrete to the face of the headwall, unless otherwise specified. Bars shall be furnished in such lengths, or field bent or cut as necessary to fit the structures and to accommodate the pipe opening in the wall.

Keyed or dovetailed type construction joints, acceptable to the Engineer, may be used during construction.

The pay quantity for straight headwalls, constructed in accordance with the details herein, within the cubic yards of Class B Concrete specified herein.

Cost of all reinforcing and reinforcing bars shall be included in the unit price bid for "Class B Concrete".

---

**BEVEL DETAIL**
(Section Thru Center Of Pipe)

**BEVEL DIMENSIONS**

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**WYO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
STANDARD SHEET ORI**

**PIPE CULVERT HEADWALLS**

**STANDARD SHEET ORI**
Anchor bolts, spaced 1'-6" center to center, measured along the surface of pipe (34% for 60% pipe only).

For Concrete Pipe Only (See Backwall Detail).

Elevation

For Concrete Pipe

Anchor Bolt and Bevel Detail

SECTION X-X

Waterstop Detail

ANCHOR BOLT AND BEVEL DETAIL

NOTES

The "Notes" and the "Construction Detail-Skewed Pipe" on Standard Sheet DR2 (Sheet 1 of 2) shall apply to this sheet.

Anchor bolts shall be used on wingwalls for corrugated metal and structural-plate pipe greater than 48" in diameter. Anchor bolts are not required for concrete pipe.

Anchor bolts and nuts shall conform to the requirements for "Headwall Anchorage" hardware as specified in AASHTO Specification M-167. Anchor bolts and nuts shall be cleaned after galvanizing to provide a free running fit.

Cost of the anchor bolts and nuts shall be included in the unit price bid for the pipe.

Right-of-way fence hardware inserts shall be installed in the sidewalls during the construction of wingwalls for pipes over 48" in diameter.

Dimensions and location of inserts shall conform to the "Drainage Structure Terminology and Installation" detail of the applicable right-of-way fence standard.

Waterstop meeting the requirements of 708.10 shall be placed as shown when concrete gutter is to abut the wingwall.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

STANDARD SHEET DR2

PIPE CULVERT

WINGWALLS

(SHEET 2 OF 4)
### Dimensions of Galvanized Steel End Section for Round Pipes

<table>
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<th>Pipe Diameter (inches)</th>
<th>Metal Thickness (inches)</th>
<th>Dimensions (inches)</th>
<th>Approx. Slope</th>
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### Dimensions of Galvanized Steel End Section for Pipe Arch

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<tr>
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<td>6</td>
<td>72</td>
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**NOTES**

- Typical end sections for pipes and pipe arches are detailed here. Other similar designs may be used if acceptable to the engineer.
- Galvanized steel end sections shall be used on the ends of corrugated steel pipes and/or pipe arches at those locations specified on the plans. End sections shall be measured as the number of units installed at each size and type and shall be paid for in accordance with 60% of the specifications.
- Two-piece and three-piece end sections shall be of lap joint construction, tightly joined with 3/8" diameter galvanized rivets or bolts.
- For 60" thru 84" pipes, the reinforced edges of the end sections shall be supplemented with galvanized stifferener angles fastened by 3/8" diameter galvanized bolts and nuts. This requirement shall also be applicable to the end sections for 77.5" Ø, 77.5" Ø, 36" Ø, and 81" Ø pipe arch sizes. In addition, for those pipe arch sizes, angle reinforcement shall be used under the center panel seams.
- The end section connection details shall be as shown on this plan sheet or of a similar design as recommended by the manufacturer. All similar designs shall provide a secure attachment of the end section to the pipe or pipe arch.
- Although a pipe or pipe arch may have a bituminous coating and/or paved invert, it will not be necessary to bituminous coat or pave the end section, connectors, or connector section.
- The plate extensions shall be the same thickness as the end sections and shall be fastened to the plates with 3/8" diameter galvanized bolts. Lengths of the plate extensions shall be 7" (approx.) for 12" thru 30" diameter pipes and for pipe arches with rise values up to and including 29°. The length shall be 10" (approx.) for larger pipe sizes 36" and 84" (approx.) for larger pipe arches.

---

**END SECTIONS FOR CORRUGATED STEEL PIPES AND PIPE ARCHES**

**STANDARD SHEET D83**
### Inside Pipe Diameter

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**Notes:**
- Concrete to be 3200 PSI minimum compressive strength at 28 days. All reinforcing steel to conform to the requirements of I98.1 and I99.4 of the Specifications.
- The cost of concrete, steel, reinforcing, all other required items, such as gasket, grout, bedding, backfill, material placement, etc. is included in the cost of the concrete fire safety slope end section.
CONCRETE TO BE 3200 PSI MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS. ALL REINFORCING STEEL TO CONFORM TO THE REQUIREMENTS OF T305 AND T306 OF THE SPECIFICATIONS. THE COST OF CONCRETE, STEEL REINFORCING, ALL OTHER INCLUDED ITEMS, SUCH AS, GASKET, GROUT, SCREEDING, BACKFILL MATERIAL, PLACEMENT, ETC. B INCLUDED IN THE COST OF THE CONCRETE PIPE SAFETY SLOPE END SECTION.

### Table: Dimensions

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<th>D</th>
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### Diagrams

- **Plan**
- **Section A-A**
- **End View**
NOTES

THIS INLET SHOULD ONLY BE SPECIFIED WHEN ABLATING CONCRETE PAVEMENT

THE FINAL INSTALLED TOP SURFACE OF INLET AND GRATE SHALL BE FLUSH WITH ADJACENT FINISHED SURFACES SUCH AS PAVEMENT, GUTTERS, CURBS, AND SIDEWALKS. TOP OF GRATE ELEVATION, IF SHOWN ON THE PLANS, IS FOR INFORMATION ONLY.

CONSTRUCTION MAY BE CAST-IN-PLACE, PRECAST IN ONE OR
MULTIPLE SECTIONS, OR ANY COMBINATION OF CAST-IN-PLACE AND PRECAST.

REBARS ARE TO BE INSTALLED AT THE THIRD POINTS TO CONNECT CURB TO INLET, REBARs ARE NOT REQUIRED IF CURB IS POURED IN ANOTHER CYCLE WITH INLET OR IF TYPE V OR VI MEDIAN IS SPECIFIED ON THE PLANS.

FOR DETAILS OF GRATE SUPPORT BAR, SHALLOW FRAME, AND GRATES, SEE INLET CASTINGS STANDARD SHEET DRS-2 & USE OF THE SHALLOW FRAME WILL BE CONCEALED TO ROADWAYS CONSTRUCTED OF CONCRETE PAVEMENT, IF ADJACENT ROADWAY IS BUILT OF HOT MIX ASPHALT PAVEMENT, THE FRAME AS REQUIRED FOR A TYPE F INLET STANDARD SHEET DRS-1 WILL BE REQUIRED.

THE CONTRACTOR MAY, AT HIS OPTION, OMIT USE OF THE FRAME BY FORMING A LEDGE IN THE CONCRETE.

SPECIAL CARE SHALL BE EXERCISED IN FORMING THE 2" WIDE CONCRETE LEDGE TO PROVIDE A SMOOTH EVEN SURFACE FOR SUPPORTING THE GRAVES IF THE SHALLOW FRAME IS NOT USED.

NONE PROJECTIONS SHALL EXIST ON THE LEDGE SURFACES OF THE LEDGE OR THE GRAVES, AND THE GRAVES SHALL BE PLACED ON THE MEDIAN WITHOUT JELLYING.

OPTIONAL CONSTRUCTION JOINTS LABELED "C" MAY BE PROVIDED CONCRETE, NEEDED OR DOWELED AS PER THE TYPICAL DETAILS SHOWN HEREIN OR AS APPROVED BY THE ENGINEER. NON SHRINK CEMENT MORTAR MEETING THE REQUIREMENT OF SUBSECTION 7.5.5 OF THE SPECIFICATIONS MAY BE USED TO A DEPTH OF 1/8" FOR LEVELING BETWEEN PRECAST SECTIONS. THICKER DEPTHS WILL BE ALLOWED AS PER THE MANUFACTURER'S RECOMMENDATIONS.

PC (MINIMUM PIPE COVER) SHALL BE 12" BELOW INLET TOP FOR PIPES PLACED UNDER SIDEWALK OR GRADE AREA OR 24" BELOW INLET TOP FOR PIPES PLACED UNDER PAVEMENT OR SHOULDERS.

CURB, IF SPECIFIED, MAY BE EITHER CONCRETE PLACED ON THE INLET BACKWALL AS DETAILED HEREIN OR AN APPROVED CURB BOX AS MANUFACTURED WITH THE GRATE AND FRAME. DIMENSIONS OF THE CURB REAR WALL SHOULD MEASURE CORRECTLY CONFORM TO THE STANDARDS CURB AS SPECIFIED ON THE PLANS. THE CURB WILL BE 8" MIN. WIDER TO COMPLY WITH THE REQUIREMENTS OF SECTION 810, IN EVERY CASE.

THIS INLET SHALL NOT BE PLACED IN A PEDESTRIAN WALK WAY.

THE MINIMUM DISTANCE FROM THE TOP OF ANY PIPE OPENING TO ANY CONSTRUCTION JOINT ABOVE THE OPENING SHALL BE FOUR INCHES.

THE NUMBER AND LOCATION OF PIPE OPENINGS SHALL BE AS SHOWN ON THE PLANS. THE CONTRACTOR AT NO ADDITIONAL COST SHALL BE RESPONSIBLE FOR ANY TEMPOARY BRACING REQUIRED TO TRANSPORT PRECAST INLET SECTIONS DUE TO MULTIPLE OPENINGS.
NOTES

Optional construction joints labeled "LC" may be roughened concrete, keyed or dripped as per the typical details shown herein or as approved by the Engineer. Non-slip grout meeting the requirements of subsection 775.5 of the specifications may be used to a depth of 1/2" for leveling between precast sections. Thicker depths will be allowed if as per the manufacturer's recommendations.

The covering for reinforcing steel to be two inches, measured from the surface of the concrete to the face of the bar, unless otherwise shown. Steel reinforcement is epoxy coated and meets the requirements of the specifications.

This joint shall not be placed in a pedestrian walkway.

Construction may be cast-in-place, precast in one or multiple sections, or any combination of cast-in-place and precast.

The minimum distance from the top of any pipe opening to any construction joint above the opening shall be 144 inches.

The number and location of pipe openings shall be in accordance with the plans. The contractor is responsible for any temporary bracing required to transport precast inlet sections due to multiple openings.

CONSTRUCTION JOINT DETAILS

BILL OF STEEL

<table>
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-5 refers at 8" C-C around perimeter.

ELEVATION

SECTION A-A
CONCRETE AND REINFORCING STEEL QUANTITIES

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*The quantities shown above are for an "A" of five feet. If deeper wells are required, the quantities must be adjusted accordingly.

The above table is to be used for estimating purposes only.
CONSTRUCTION JOINT DETAILS

The finished top surface of Inlet and grate shall be flush with adjacent finished surfaces such as pavement, gutters, curbs, and sidewalks, top of grate elevation. If shown on the plans it is for information only.

Construction may be cast-in-place, precast in one or multiple sections, or any combination of cast-in-place and precast.

Optional construction joints labeled CJ may be roughened concrete, keyed or dowelled as per the typical details shown herein or as approved by the Engineer. Non-skimming grouts meeting the requirements of subsection 115.5 of the specifications may be used to a depth of 2" for leveling between precast sections. Thicker depths will be allowed if as per the manufacturer's recommendations.

The covering for reinforcing steel shall be two inches measured from the surface of the concrete to the face of the bar, unless otherwise shown.

For details of grates (two required) see Inlet Coatings Standard Sheet DM-312.

PC maximum pipe cover shall be 12" below inlet top for pipes placed under sidewalk or grassed area or 24" below inlet top for pipes placed under pavement or shoulder.

Curb, if specified, may be either concrete placed on the inlet backwall as detailed herein or as approved curb box as manufactured with the grate and frame. Dimensions of the curb box should reasonably conform to the standard curb as specified on the plans. The curb will be placed for per section 810, in either case.

Terra cotta slab shall not be placed in a pedestrian cross walk.

The minimum distance from the top of any pipe opening to any construction joint above the opening shall be four (4) inches.

The number and location of pipe openings shall be as shown in the plans. The contractor at no additional cost shall be responsible for any temporary bracing required to transport precast inlet sections due to multiple openings.
The final installed top surface of inlet and grate shall be flush with adjacent finished surfaces such as pavement, gutters, curbs, and sidewalks.

Top of grate elevation, if shown on the plans, is for information only.

Construction may be cost-in-place, precast in one or multiple sections, or any combination of cost-in-place and precast.

Type 2 Grate shall be used at all locations unless otherwise specified on the Plans. Type 1 Urban Grates shall be used only at specially designated locations as shown on the Plans.

The Contractor, at his option, may omit use of the frame by forming a ledge in the concrete.

Special care shall be exercised in forming the 2" wide concrete ledge to provide a smooth, even surface for supporting the grates if the shallow frame is not used. No projections shall exist on the bearing surfaces of the ledge or the grates; and the grates shall seat on the ledge without rocking.

The Mounding Details shown is not required when an inlet is placed in a sag.

Optional construction joints labeled "C" may be roughened concrete, keyed or dowelled as per the typical details shown herein as approved by the Engineer. Non-shrink grout meeting the requirements of subsection 715.5 of the specifications may be used to a depth of 1/2" for leveling between precast sections. Thicker depths will be allowed as per the manufacturer's recommendations.

This inlet is to be installed in roadside or median ditches only. It is not to be placed adjacent to pavement or in the gutter pan of combination curb and gutter.

The minimum distance from the top of any pipe opening to any construction joint above the opening shall be four (4) inches.

The number and location of pipe openings shall be as shown on the Plans. The contractor at no additional cost shall be responsible for any temporary bracing required to transport precast inlet sections due to multiple openings.

**Notes Table**

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Table Note: Grate and frame weights are for information only and will increase if future straps and bars are used. The following substitutions in dimensions are acceptable for fabricating the grate and frame:

- Strap Thickness: 1/2"
- Strap Depth: 3"
- Bar Depth: 3"

**Construction Joint Details**

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<th>Details</th>
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**Diagram Details**

- Inlet Mounding Table
- Mounding Detail
- Exploded Detail
- Dimensions Table
- Construction Joint Details

**Preservation**

- Standard Sheet: DRA-G
1/2" Expansion Joint Material
(when abutting concrete pavement)

PLAN
(Grate not shown)

SECTION A-A
Pipe size, type, and locations as specified on the plans

SECTION B-B
Pipe size, type, and locations as specified on the plans

SECTION D-D

SECTION E-E
Ribs Optional

NOTES

The final installed top surface of inlet and grate shall be flush with adjacent finished surfaces such as pavement, gutters, curbs, and sidewalks. Top of grate elevation, if shown on the plans, is for information only.

Construction may be cast in place, precast in one or multiple sections, or any combination of cast-in-place and precast.

This inlet is intended for use with Type V and VI medians (concrete barrier medians) as specified on the plans.

Optional construction joints labeled "C" may be roughened concrete, keyed or dowelled as per the typical section shown herein or as approved by the Engineer. Nonshrink grout meeting the requirements of subsection 715.5 of the specifications may be used to a depth of 1/2" for leveling between precast sections. Thicker depths will be allowed as per the manufacturer's recommendations.

Grate as shown on Standard Sheet DRI-K to be used with this inlet.

PC (minimum pipe cover) shall be 12" below inlet top for pipes placed under sidewalk or grassed area or 24" below inlet top for pipes placed under pavement or shoulder.

This inlet shall not be placed in a pedestrian crosswalk.

The minimum distance from the top of any pipe opening to any construction joint above the opening shall be four (4) inches.

The number and location of pipe openings shall be as shown in the plans. The contractor at no additional cost, shall be responsible for any temporary bracing required to transport precast inlet sections due to multiple openings.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

HINTON MUNICIPAL STADIUM

STANDARD SHEET DRI-K

TYPE H INLET

REVISION DATE

DRAWN

STANDARD SHEET DRI-K

AMENDED
NOTES

Type A Manholes, when specified on the Plans, may be constructed in either the precast or cast-in-place option as shown herein.

Steps, frames, and covers shall be as shown on Standard Sheet DRT-A. "Keyed" or "dowled" type construction joints acceptable to the Engineer, may be used in the construction of concrete manholes.

If the cast-in-place manhole is over twelve feet (12') in depth, the sidewalk below that depth will be double thickness.

Pipes at elevations other than shown may be joined to the manhole by cutting a hole the size of the connecting pipe in the manhole. Inserting the pipe with thickness of the manhole shell and closing all openings around the connecting pipe with joint mortar.

Drawing shows pipe entering and leaving manhole in a straight line. However, the pipes may enter or leave at an angle or place as called for or shown on the Plans.

Minimum height of bench wall above flowline of pipe is 25% of the diameter of the pipes.

The use of brick for manhole construction will not be allowed when a manhole is located in the roadway.

The following additional notes are applicable for precast manholes:

Manhole steps shall be placed into plastic concrete well during manufacture or mortared into holes after the concrete has set.

Sidewalk sections may be used in any combination to produce a manhole of desired depth, except the toped top section shall be retained as shown.

The toped section shall be manufactured at the same time as the manhole's sidewalk, but shall conform to the dimensions detailed herein.

Lifting holes in the toped section and the circumferential notches in the manhole cover are for handling purposes only.

The precast sidewalk units shall be set in joint mortar or sealed with O-ring gaskets.
Type B manhole with the fill bar grate shall not be placed in a pedestrian cross walk.

Invert Column or Spilt Pipe Some Size As Better Shown In Inset Of Sidewalks.


Complete Structure

Section Through Footer

Plan Views

NOTES

"Keyed" or "Dowelled" Type Construction Joints, Acceptable To The Engineer, May Be Used In The Construction Of Concrete Manholes.

If Cast-In-Place Manhole Is Over Twelve Feet (12') In Depth.
The Sidewalls Below That Depth Will Be Double Thickness.

Pipe At Elevations Other Than Shown May Be Jelled To The Manhole By Cutting A Hole The Size Of The Connecting Pipe In The Manhole, Inserting The Pipe The Thickness Of The Manhole Shell And Cutting All Openings Around The Connecting Pipe With Joint Mortar.

Either This Manhole Or The Precast Manhole On Standard Sheet DRT-X May Be Furnished When Type B Manhole Is Called For In The Contract. The Frame AND Grate Shall Be As Shown On Standard Sheet DRT-X. All Castings, Steels Shall Be As Shown On Standard Sheet DRT-X.

Minimum Height Of Bench Wall Above Flowline Of Pipe Is 25% Of The Diameter Of The Pipes.
The Use Of Brick For Manhole Construction Will Not Be Allowed When a Manhole Is Located In The Roadway.

Concrete Base
Optional Precast Or Field-cast (For Use With Storm Sewers Only)
**Notes**: Lining on covers shall be STORM SEWER or SANITARY SEWER as applicable. Bottoms of manholes may be cast on manhole cover casting. The 1/2" raised edge to be used as a skid resistant measure. Alternative measures will require approval by the Engineer. Shop drawings shall be submitted if details and dimensions vary.
For Projects Let after June 30, 2019
See revised Standard Detail DR8 Sheet 1 of 4

OBSOLETE

MEDIAN OUTLET IN HIGH FILL
To be used where called for on the plans or as shown on the cross sections.

OUTLET THROUGH BERM
To be used where called for on the plans or as shown on the cross sections.

NOTES
For pipe without corrugations, a one inch layer of fine aggregate for leveling will normally be adequate to achieve a uniform bearing surface. For corrugated pipe, layers shall be 1" minimum for 1/2" depth corrugations, 2" minimum for 1" depth corrugations, and 3" minimum for 2" or 2-1/2" depth corrugations.

TYPICAL PIPE BEDDING

24" O.D. 124" Min.
Compacted Backfill Material
0.15 O.D. Min.
Fine Aggregate for Levelling
0.50" per ft. over pipe, 12" min., 24" max.
Granular Material

24" O.D. 124" Min.
Compacted Backfill Material
0.15 O.D. Min.
Fine Aggregate for Levelling
0.50" per ft. over pipe, 12" min., 24" max.
Granular Material
MEDIAN OUTLET IN HIGH FILL
To be used where called for on the plans or as shown on the cross sections.

FLEXIBLE PIPES TYPICAL (96" OR LESS)

On Rock Foundation

RIGID PIPES TYPICAL (96" OR LESS)

OUTLET THROUGH BERM
To be used where called for on the plans or as shown on the cross sections.

NOTES
Pipe bedding and backfill material in accordance with Section 604. Crushed Aggregate shall be in accordance with 704.6, Class 1 or Class 3. Granular Material shall be in accordance with 7.18.1.2. The bedding material under the middle 1/3 of pipe diameter shall be loosely placed and uncompacted, for clogging of the pipe bottom. Bedding outside of the middle 1/3 shall be compacted.
NOTES

Payment for the outlet pipe includes drop connections in the free draining base trench and slope walls or connections to drainage structures as required. Maximum outlet spacing is to be 250' in embankments. Outlets in cut sections will be made to the nearest drainage structure. Slopewall details will be in accordance with Standard DBB (sheet 3 of 4). All vertical sections, one outlet shall be constructed at the low point and all additional outlets shall be constructed at 25 feet and 50 feet each way from the low point.

Underdrain pipe as detailed to be 6" diameter non-perforated rigid pipe except for the 5' of pipe placed in the free draining base trench unless otherwise specified in the plans.

All outlets are to be equipped with a Slopewall for Underdrain and Varmint Screen as detailed. Slopewalls will not be paid for separately but shall be included in the cost of the underdrain pipe. Underdrain pipe tied to inlets or fastened to culvert pipe by pipe saddles, grouting, cementing, or other means that will provide a secure attachment satisfactory to the engineer. Slopewall shall be included in the cost of the underdrain pipe.

Commercially available galiwaxed hardware screen is to be snugly fitted inside each Slopewall. The screen is to have the capability of being removed and reinstalled for maintenance operations. The screen wires shall be welded to a spacing in each direction of 1/8" to 3/16". The cost of the screen to be included in the cost of the underdrain pipe or edge drain.

Crossdrains shall have outlets coordinated with regular roadway outlets to assure effective slope drainage.

Typical lateral trench sections shown are possible selections. Other configurations may be utilized if depth and width are obtained. Spacing shall be 100' maximum in areas designated as requiring lateral trench.

Lateral trench sections shall be installed at locations as follows:

- Cross Slope ≤ 0.0150: Grade ≤ 4% and above
- Cross Slope ≤ 0.0208: Grade ≤ 5% and above
- Cross Slope ≤ 0.0400: Grade ≤ 8% and above
- Cross Slope ≤ 0.0500: and greater no trench required

**VARMINT SCREEN**
Filter fabric and aggregate for filter fabric underdrain shall conform to the requirements of Section 406.2 of the Specifications. All coats associated with the 5" perforated underdrain pipe required in the Filter Fabric Underdrain Installation to be included in the contract price bid for Filter Fabric Underdrain.

The top of the underdrain pipe shall be placed at the same elevation as the top of the outlet pipe of all inlets or weir boxes unless otherwise noted on the plans.

Spring Control shall be used where noted on the Plans or as directed by the Engineer. Cost of excavation, filter fabric and installation shall be included in the contract price bid for "Crushed Stone, Crushed Gravel, or Silica Sand for Underdrain." Extensions as indicated shall be as shown on the plans or determined on the job.

For pipe cap detail, see Standard Sheet DRB-2 Sheet 3 of 4.

All Underdrain outlets are to be equipped with a Sluice Box for Underdrain and Varmint Screen as detailed on Standard Sheet DRB-3 of 4 or tied to existing inlets or culvert pipes. Sluice Box for Underdrain will not be paid for separately but shall be included in the cost of the Underdrain Pipe or Filter Fabric Underdrain. Underdrain pipe tied to existing outlets or culvert pipes by pipe saddle or grouting, cementing, or other means that will provide a secure attachment satisfactory to Engineer shall be included in the cost of the Underdrain pipe or Filter Fabric Underdrain.
1. The type of backfill and repaving of trenches under existing pavement shall be as specified in the plans. If no type is specified, the applicable detail shall be used.

2. Type A trenches are wider than 7' in existing bituminous pavement, concrete may be deleted if existing asphalt thickness and 18" stone are restored. Concrete shall be constructed in accordance with Section 501 except that testing is waived if from a Certified Supplier.

3. Dowel bars are to be coated in accordance with Section 709.15 of the specifications.

4. Concrete surface to be rough for bonding of asphalt if area is to be resurfaced. Trench to be completed before resurfacing.

5. Concrete shall be constructed in accordance with Section 501 except that testing is waived if from a Certified Supplier.

6. Dowel bars are to be coated in accordance with Section 709.15 of the specifications.
**CONCRETE COLLAR DETAIL**

**Notes:**

- **A and B are minimum dimensions. Forming will not be required if minimum dimensions are obtained. Metal connecting bands may be substituted for a concrete collar to join existing new metal pipes. The cost of metal bands are to be included in the unit bid price for the various pipes.**

- **Concrete for constructing the collar shall be in accordance with section 715.12 of the specifications; however, testing will not be required. The cost of concrete collar is to be included in the unit bid price of proposed pipe.**

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**For Information Only**

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**Type F Drainage Pipe Trench**

- **CLSM - Controlled Low Strength Material**

- **This detail shall be used on proposed pipes / culverts when specified on the plans. The cost of the type F trench is incidental to the pipe / culvert.**

- **If type F trench is used where there is no existing or proposed inlet, the CLSM shall be poured full depth 2' past each edge of pavement. The pipe shall be encased in 4" of CLSM an additional 10' max. Beyond edge of pavement F there is an existing or proposed inlet the CLSM shall be poured full depth to the inlet.**

---

**Standard Specifications**

**Section 604 of Trench Width per Pipe O.D.**

**Notes:**

- **There is no existing or proposed inlet, the CLSM shall be poured if type F trench is used where no pavement / shoulders.**

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**Revised Standard Detail Sheet DR-10**

**For Projects Let After July 1, 2019**
CONCRETE COLLAR DETAIL

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</table>

* For Information Only

NOTES:
A and B are minimum dimensions. Forming will not be required.
If minimum dimensions are obtained, metal connecting bands may be substituted for a concrete collar to join existing new metal pipes. The cost of metal bands are to be included in the unit bid price for the various pipes.

Concrete for constructing the collar shall be in accordance with section 715.12 of the specifications; however, testing will not be required. The cost of concrete collar is to be included in the unit bid price of proposed pipe.

OBSOLETE
For Projects Let After September 15, 2020
See Revised Standard Detail Sheet DR-10

TYPE F DRAINAGE PIPE TRENCH

NOTES:
CLSM - Controlled Low Strength Material
This detail shall be used on proposed pipes/culverts when specified on the Plans. The cost of the Type F Trench is incidental to the pipe/culvert.

If Type F trench is used where there is no existing or proposed inlet, the CLSM shall be poured full depth 2" past each E.P. The pipe shall be encased in 6" of CLSM an additional 10" max. beyond E.P. If there is an existing or proposed inlet the CLSM shall be poured full depth to the inlet.

Under proposed pavement stop CLSM at bottom of pavement typical.

Pavement
4" Max CLSM
Redo full depth CLSM at contractor's option.
CONCRETE COLLAR DETAIL

TYPE F DRAINAGE PIPE TRENCH

**NOTES:**

A and B are minimum dimensions. Forming will not be required if minimum dimensions are obtained. Existing metal pipes shall be carefully inspected and approved by the Engineer before extending the pipe. If the existing pipe is in poor condition, it shall be repaired or replaced. Metal connecting bands shall not be substituted for a concrete collar as they do not meet the standard specification 604.6 requirement for a leak resistant seal.

Concrete for constructing the collar shall be in accordance with section 710.12 of the specifications; however, testing will not be required. The cost of concrete collar is to be included in the unit bid price of proposed pipe.

---

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<tr>
<th>Diam. of Pipe</th>
<th>A</th>
<th>B</th>
<th>Cu. Yd. Conc.</th>
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For information only

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</table>

Trench width may be reduced to outside pipe diameter plus 12" for trenches in rock.

---

**NOTES:**

CLS-M - CONTROLLED LOW STRENGTH MATERIAL, SECTION 219

This detail shall be used on proposed pipes / culverts when specified on the plans. The cost of the Type F Trench is incidental to the pipe / culvert.

Final trench backfill may be completed with CLSM. Class B concrete may be substituted for CLSM.

Low strength CLSM is not a suitable driving surface.
GUARDRAIL HEIGHT

Transitions in guardrail height shall be accomplished at a rate of 1" vertical distance in 12.5" line elements of horizontal distance. Height transitions shall end before end treatments or connectors begin.

Height transitions between 28 1/2" and 31" require moving the spike on/off the post by placing one additional post of half the normal spacing.

Guardrail height shall be as indicated on plans.

Construction tolerances for rail height is plus/minus 1/4".

The Special Tension End Treatment is acceptable for both 28 1/2" and 31" guardrail heights.

Approach Terminal: Separate approved product lists will be maintained for both 28 1/2" and 31" terminal heights.

31" Guardrail that ties to a Cut Slope Terminal (CST) must be transferred down to 28 1/2" height (the height of the CST per the above paragraph). Three Beam transitions shall be per Standard OR-H defect 11-13 for 28 1/2" and defect 11-21 for 31".

Factory punched slots at 3' 1/2" spacing are acceptable for all classes of guardrail.

NOTES

Guardrail systems on NRS routes must meet NCHRP 350 or the most current AASHTO Manual for Assessing Safety Hardware (MASH) crash test criteria and have an eligibility letter to be used on WIDEBOR projects.

Guardrail shall be secured to the blocks, post and other elements by 5/8" bolts and nuts conforming to the details on Spec OR-202 and to the requirements of Table 2 of the Standard Specifications. Nuts shall conform to ASTM A475, Grade A or better.

Approach and Troughing End Treatments shall be as specified on the Plans or directed by the Engineer, shown or described.

The pay quantity of guardrail will be the Linear Feet of guardrail measured along the face of the road from center to center of and posts. Cost of the Terpena Section Buff Er End of anyshall be prorated in the cost of the guardrail.

The approach slope to the face of all guardrail shall be 10% or flatter. The Type, Class and Height of Guardrail shall be as shown on the Plans. Lap Guardrail is No Longer Recommended.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS STANDARD DETAIL

GUARDRAIL ELEMENTS (SHEET 1 OF 2)

STANDARD SHEET GRI
Round Wood Posts shall not be used on WVDOH Projects after 12-31-2017.

GUARDRAIL POSTS AND BLOCKS

REVISED STANDARD DETAIL

**WOOD POSTS:**

Posts and blocks shall be the same type of wood.

WOOD BLOCKS:

The type (species) of wood for blocks is to be one of the types specified by the WVDOH for wood blocks. Wood blocks shall be pressure-treated in accordance with the requirements for wood posts. However, due to the additional requirements for wood blocks beyond the requirements for wood posts, the blocks shall be pressure-treated.

**STEEL POSTS:**

**WOOD BLOCKS:**

The type (species) of wood for blocks is to be one of the types specified by the WVDOH for wood blocks. Wood blocks shall be pressure-treated in accordance with the requirements for wood posts. However, due to the additional requirements for wood blocks beyond the requirements for wood posts, the blocks shall be pressure-treated.

**STEEL POSTS:**

**WOOD BLOCKS:**

The type (species) of wood for blocks is to be one of the types specified by the WVDOH for wood blocks. Wood blocks shall be pressure-treated in accordance with the requirements for wood posts. However, due to the additional requirements for wood blocks beyond the requirements for wood posts, the blocks shall be pressure-treated.

NOTES:

- General:
  - The general requirements for steel posts are found in the WVDOH's Standard Details. Wood posts shall be used in accordance with the specifications for steel posts.

- Steel Guardrail Posts:
  - Steel guardrail posts shall be used in accordance with the specifications for steel guardrail posts.

- Wood Guardrail Posts:
  - Wood guardrail posts shall be used in accordance with the specifications for wood guardrail posts.

- Wood Blocks:
  - Wood blocks shall be used in accordance with the specifications for wood blocks.

- Steel Blocks:
  - Steel blocks shall be used in accordance with the specifications for steel blocks.

- Special Requirements:
  - Special requirements for guardrail posts and blocks shall be met in accordance with the specifications for guardrail posts and blocks.

- Installation:
  - Installation of guardrail posts and blocks shall be in accordance with the specifications for installation.

- Details:
  - Details for guardrail posts and blocks shall be provided in accordance with the specifications for details.

- Materials:
  - Materials for guardrail posts and blocks shall be selected in accordance with the specifications for materials.

- Methods of Connection:
  - Methods of connection for guardrail posts and blocks shall be in accordance with the specifications for methods of connection.

- Specifications:
  - Specifications for guardrail posts and blocks shall be provided in accordance with the specifications for specifications.

- Records:
  - Records for guardrail posts and blocks shall be maintained in accordance with the specifications for records.

- Inspection:
  - Inspection of guardrail posts and blocks shall be conducted in accordance with the specifications for inspection.

- Tests:
  - Tests for guardrail posts and blocks shall be performed in accordance with the specifications for tests.
The block shall be bolted to the tie-plate in the same manner when the beams are at the same elevation as they would when the beams are of different elevations. The standard bolt shall be used for wood guardrail posts when possible.

The applicable details and notes of Standard Sheet GR2 shall apply to this sheet.

When a wood block is used adjacent to a wood post, the block shall be notched to the post with a galvanized steel flat common rail. The rails to be driven in the center of the top or bottom of the block.

Round Wood Posts shall not be used on WVDOT Projects after 12-31-2017.
1. For fill to cut guardrail terminals (trailing end, trailing end, and all approach end where included ends are specified, the details and requirement notes shall be applicable.

2. Prior to placing guardrail, a final check of existing conditions will be made by the engineer and any adjustment necessary to ensure the proper location and functioning of the guardrail for which it is intended will be made accordingly.

3. Posts, blocks and rail elements shall be the same types used in the normal guardrail installation. Guardrail blocks should not be used on any posts completely underground.

4. The final decision as to the type of cut slope terminal installation type shall be made after the installation is complete. The final decision will be based on the actual conditions encountered.

5. Cut slope terminal installation can interfere with normal drainage through a cut section. When this occurs, details for maintaining positive drainage will be shown on the project plans.

6. When installing cut slope terminal, the cut shall be installed at 28-1/2" height. Tapered guardrail shall be vertical to cut installation.

7. The cut guardrail terminal shall be extended only with 2:1 or steeper back slope.

8. The plane rate of the guardrail may be extended to 8:1 after crossing the ditch bottom to shorten the length of the terminal.

9. Rubarail to extend from post 2, through entirety of ditch, to post 22 at a minimum.

10. For the rub rail section use 8' long posts.

11. See GR-4A and GR-4B for details of Type A and Type B terminals.

12. Maximum clearance from bottom of W-beam to ground line normally W-beam 18".

NOTES

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10. For the rub rail section use 8' long posts.

11. See GR-4A and GR-4B for details of Type A and Type B terminals.

12. Maximum clearance from bottom of W-beam to ground line normally W-beam 18".
NOTES:
1. USE CLASS B CONCRETE.
2. USE EPOXY COATED REINFORCING STEEL, PER SECTION 602 OF THE SPECIFICATIONS.
3. USE GALVANIZED THREADED ROD.
4. THREADED RODS CAN BE CAST INTO CONCRETE BLOCK OR HOLES CAN BE DRILLED INTO BLOCK AND RODS ANCHORED WITH EPOXY.
5. DRILL HOLES A MINIMUM 3 INCH DEEP, CLEAN DRILLED HOLES PRIOR TO INSERTING THREADED ROD.

GENERAL NOTES:
TYPE A (SOFT SHALE OR SOIL) CUT SLOPE TERMINAL GUARDRAIL SHALL BE THAT GUARDRAIL WHICH IS TO EXTEND A MINIMUM OF TWO 6'-3" SPANS INTO THE CUT SLOPE, FROM THE FIRST POST BEYOND THE TOE OF THE CUT SLOPE AND IS TO TERMINATE A MINIMUM OF 1'-0" BELOW THE GROUND ELEVATION OF THE BACK SLOPE, EXCEPT IN AREAS OF HEAVY ROCK OUTCROPPING WHERE THE MINIMUM DEPTH MAY BE 6 INCHES.

A TRENCH NO GREATER THAN 18" IN WIDTH SHALL BE EXCAVATED INTO THE CUT SLOPE TO ACCOMMODATE THE TYPE A TERMINAL INSTALLATION. THE CONTRACTOR SHALL ARRANGE AND WORK SEQUENCE SUCH THAT EACH TYPE A CUT SLOPE TERMINAL INSTALLATION BE (EXCAVATED, POSTS DRIVEN, RAIL ELEMENTS AND GUARDRAIL COMPONENTS ASSEMBLED, TRENCH BACKFILLED, AND DISTURBED SLOPE SHAPED SEEDED AND MULCHED ALL IN A CONTINUOUS OPERATION.
Type B (Shale or Rock) Cut Slope Terminals installation shall consist of anchoring the guardrail against the face of the cut slope utilizing guardrail end shoes and rock bolts, as detailed herein.

**GUARDRAIL END SHOE DETAIL**

- Base Metal Nominal Thickness: 0.135" Standard Terminal Hole (Optional)
- 3/4" x 2 1/2" Post Bolt Slot (Optional)
- Bolts and Washers: 1 2  1/4" 3 1/2" 3 1/2" 3" 4'
- 29/32" x 3" Slots Neutral Axis

**TYPE B (SHALE OR ROCK) CUT SLOPE TERMINAL INSTALLATION**

- Edge of Shoulder
- Shale or Rock Cut
- Guardrail End Shoe
- Anchor (Rock)
- 3/4" Holes for Ditch Transition to Grade (Relative 5/8" x 5'L Galvanized)
- Max Slope 10:1 1 50' Grading
- Edge of Shoulder
- Neutral Axis

**CUT SLOPE TERMINAL TYPE B INSTALLATION**

- SHALE OR ROCK
- STANDARD SHEET GR4B

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**WEST VIRGINIA DEPARTMENT OF TRANSPORTATION**

**DIVISION OF HIGHWAYS**

**STANDARD DETAIL**

**P5A1G92-STDBOR a**
PARABOLIC LAYOUT PLAN

NOTES

For details of Flared End Terminals see pre-approved shop drawings.

All materials used shall meet the applicable requirements of Section 607 of the Standard Specifications Road and Bridges.

The post offset dimensions are given to the center of the traffic face of the blockout except at the last post where the dimension is to the center of the traffic face of the post. Offset points are to be located by measurements of the back of rail equal to the nominal post spacing shown on pre-approved shop drawings. Posts are to be set approximately parallel to the rail at each location.

Where a wood block is used adjacent to a wood post, the block shall be nailed to the post with a galvanized steel or common nails. Nails to be driven into the center of the top or bottom of the block.

The cost of furnishing and installing the Flared End Terminal, complete with all miscellaneous hardware and parts as denoted on the pre-approved shop drawings, is to be included in the unit price bid for "Flared End Terminal."

Yellow reflective sheathing shall cover the entire nose of those terminals with a flat impact head. Those terminals with a rounded impact head shall be covered with a 1/16" x 3/16" yellow reflective sheet.

As of 11/15/02 revision date, this detail is obsolete and no longer used for new construction.
FLARED END TERMINAL
STRAIGHT LAYOUT

NOTES

Flared End Terminal (sheet NCMR-P-350 and/or Kosh testing for appropriate height.)
Separate approved product lists will be maintained for both 28 1/2" and 21" terminals heights.
For details of Flared End Terminal see pre-approved shop drawings.
Post and splice locations are per manufacturer.
All materials used shall meet the applicable requirements of Section 607 of the Standard Specifications Road & Bridges.
The post offset dimensions are given in the center of the traffic face of the blockouts, except at the first post, where the dimension is to the center of the traffic face of the post. Offset points are to be located by measurements at the back of the nominally post spacings shown on pre-approved shop drawings. Posts are to be set approximately radial to the railing at each location.

When a wood block is used adjacent to a wood post, the block shall be nailed to the post with a galvanized steel 6d common nail. Nails to be driven into the center of the top or bottom of the black.
The cost of furnishing and installing the Flared End Terminal, complete with all miscellaneous hardware and parts as detailed on the pre-approved shop drawings, is to be included in the unit price bid for "Flared End Terminal".
Yellow reflective sheeting shall cover the entire rear of these terminals with a 1/8" impact head. Terminals with a rounded impact head shall be covered with a 1/8" x 3/4" yellow reflective sheet.
Tangent End Terminal Plan

NOTES:

Tangent End Terminal shall meet NCHRP-350 and/or wash testing for appropriate height. Separate Approved Product Lists will be maintained for both 28 1/2" and 31" terminal heights.

Post and splice locations are per manufacturer.

For details of Tangent End Terminal, see pre-approved shop drawings.

All materials used shall meet the applicable requirements of Section 607 of the Standard Specifications for Roads and Bridges.

The road block shall be painted to the post with a galvanized steel 1/2" common nail. The nails are to be driven into the center of the top or bottom of the block.

The Tangent End Terminal installations shall maintain a 4" minimum offset from the edge of the impact head to the edge of the traveled way. For new or existing shouldered posts or offset of 5" or less from the face of the road shoulder to the edge of the traveled way, the nail and head may be painted to the post and the edge of the post shall be sharp. The painted offset distance shall be 1" or a taper slope length at 25° or a taper rate of 3:1, for a total slope length of 50'-see Flare Detail.

Roll element panel lengths shall be 25'-only. Shorter lengths shall not be used.

The cost of furnishing and installing the Tangent End Terminal, complete with all necessary hardware and parts as detailed on the pre-approved shop drawings, is to be included in the unit price bid for "Tangent End Terminal".

Yellow reflective sheeting shall cover the entire nose of those terminals with a flat impact head. Those terminals with a rounded impact head shall be covered with a 1.0" x 3.0" yellow reflective sheet.

ELEVATION

Flare Detail

meeting the requirements of Section 607 of the Standard Specifications for Roads and Bridges.

The road block shall be painted to the post with a galvanized steel 1/2" common nail. The nails are to be driven into the center of the top or bottom of the block.

The Tangent End Terminal installations shall maintain a 4" minimum offset from the edge of the impact head to the edge of the traveled way. For new or existing shouldered posts or offset of 5" or less from the face of the road shoulder to the edge of the traveled way, the nail and head may be painted to the post and the edge of the post shall be sharp. The painted offset distance shall be 1" or a taper slope length at 25° or a taper rate of 3:1, for a total slope length of 50'-see Flare Detail.

Roll element panel lengths shall be 25'-only. Shorter lengths shall not be used.

The cost of furnishing and installing the Tangent End Terminal, complete with all necessary hardware and parts as detailed on the pre-approved shop drawings, is to be included in the unit price bid for "Tangent End Terminal".

Yellow reflective sheeting shall cover the entire nose of those terminals with a flat impact head. Those terminals with a rounded impact head shall be covered with a 1.0" x 3.0" yellow reflective sheet.
NOTES

1. This guardrail transition is appropriate for connection to a concrete safety shape.

2. Bridge rail ends and bridge parapets must be of adequate strength to accept hit impact loading.

3. Rubrail wood blocks, located on posts 1 through 4 are center drilled and secured with 3/8 carriage bolts.

4. Posts 1 through 5 require additional holes to attach lower blocks and/or lower rubrail.

5. W-beam is not bolted to posts and blocks at posts 2, 3, 4, 6, and 8. Blocks are bolted directly to posts.

6. Steel spacer tube, schedule 40 galvanized pipe, 6" O.D. x 9" L, attached with 3/8 carriage bolt and rectangular plate washer.

7. See Sheet 3 of 3 for detail. Block is attached by a 3/4" x 3" bolt.

8. There is no separate pay item for the connection and all components as detailed herein shall be included in the contract price for guardrail.

GUARDRAIL END SHOE DETAIL
1. Rubrail end must be attached flush with the top of the safety shape. Installation can be greatly simplified by fabricating or shop twisting the rubrail to be consistent with the slope of the safety shape. Rubrails twisted both clockwise and counterclockwise may be required in most situations.

2. The rubrail attachment to the concrete safety shape requires three closely fitted holes. Appropriately spayed ball anchors should be used to reduce the risk of splitting the concrete.

3. There is no separate pay item for this connection and all components are detailed herein shall be included in the contract price for guardrail.

**NOTES**

**BENT PLATE RUBRAIL DETAIL**

**RUBRAIL ATTACHMENT TO SAFETY SHAPE**

**C6X8.2 RUBRAIL DETAIL**

**WOOD BLOCKOUT FOR RUBRAIL DETAIL**

**BEARING PLATE DETAIL**
This guardrail transition is appropriate for connection to a vertical concrete shape and should not be connected directly to a concrete safety shape. Concrete safety shape bridge rails or barriers shall be transitioned to a vertical shape at the guardrail connection in a manner detailed elsewhere in the Project Plans.

The two sections of 12'-6" thrie beam require additional holes in order to mount the beam to the post nearest to the concrete wall.

See Sheet GR 11-C for details not shown on this sheet.

Guardrail systems must have met either the NCHRP 350 or the most current AASHTO Manual for Assessing Safety Hardware (MASH) crash testing criteria and have an FHWA eligibility letter to be used on WVDOH projects. Only FHWA approved guardrail systems utilizing wood or approved block-outs shown on the Division's "Approved Source/Product Listing" shall be used. Steel "W" Shapes shall not be used for block-outs. Only one type of block shall be used for block-out throughout any project, unless otherwise specified.

Concrete transition will as detailed elsewhere.
THIS GUARDRAIL TRANSITION IS APPROPRIATE FOR CONNECTION TO A VERTICAL CONCRETE SHAPE AND SHOULD NOT BE CONNECTED DIRECTLY TO A CONCRETE SAFETY SHAPE. CONCRETE SAFETY SHAPE SIDE BARRIERS SHALL BE TRANSITIONED TO A VERTICAL SHAPE AT THE GUARDRAIL CONNECTION ON A MANNER DETAILED ELSEWHERE IN THE PROJECT PLANS.

THE TWO SECTIONS OF 12'-6" THRIE BEAM REQUIRE ADDITIONAL SLOTTED HOLES IN ORDER TO MOUNT THE BEAM TO THE POST NEAREST TO THE CONCRETE WALL.

ONLY BLOCK-OUTS SHOWN ON THE DIVISION'S "APPROVED SOURCE/PRODUCT LIST" SHALL BE USED. STEEL "W" SHAPES SHALL NOT BE USED FOR BLOCK-OUTS. ONLY ONE TYPE OF BLOCK SHALL BE USED THROUGHOUT ANY PROJECT, UNLESS OTHERWISE SPECIFIED.

SEE SHEET GR 11-B FOR DETAILS NOT SHOWN ON THIS SHEET.
Notes:
Unless otherwise noted no separate measurement or payment shall be made when details on this sheet are used. The cost associated with using these details shall be included in the appropriate guardrail pay item.

PAYING AROUND POSTS

Reduce post spacing to 3'-1 1/2".
Reduce post spacing to 1'-6 3/4".
Double nail rail element.

Any one stiffening method shall not exceed 36" in length.
Any combination of stiffening methods shall not exceed 52" in length.

METHODS OF REDUCING W-BEAM DEFLECTION

Under special circumstances, such as avoiding obstacles that are not relocated, it is acceptable to install additional blockouts to obtain up to 36" depth for one or two consecutive posts in a section of guardrail.

Do not use 16" or 36" blockouts if it causes the post to be driven beyond shoulder hinge point or causes a fixed object to be within the deflection distance of the barrier.
POST DRIVING FOR CONTINUOUS TRANSVERSE UNDERGROUND OBSTRUCTION

PLAN

75' Min. Length Standard Guardrail

25'-0" Max. Span

6'-3"

ELEVATION

OMITTING MULTIPLE POSTS FOR UNDERGROUND OBSTRUCTION

Only those posts conflicting with the obstacle shall be eliminated. A maximum of three posts may be eliminated within 25' span of W-Beam guardrail.

Notes:
Unless otherwise noted, no separate measurement or payment shall be made when details are used. The cost associated with these details shall be included in the appropriate guardrail pay item.

Details on this sheet to be used with Class I Guardrail only.

Methods of obstacle avoidance shown in Guardrail Modifications Sheet GR56 are preferred if applicable.
NOTE:
CAST-IN-PLACE OR SLIP FORMED CONCRETE MEDIAN BARRIERS SHALL BE CONSTRUCTED IN SECTIONS AS SHOWN HEEDING AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF SECTION 601 OF THE SPECIFICATION. HEEDING SHALL BE DISTRIBUTED 6" ON CENTER. MEDIAN BARRIERS CONSTRUCTION JOINTS OVER EXISTING PAVEMENT CONSTRUCTION JOINTS SHALL BE SEPARATED BY 2'-0" ON CENTER. MEDIAN JOINTS SHALL HAVE THE SAME WIDTH AS THE PAVEMENT JOINTS FOR THE FULL EXPOSED WIDTH OF THE MEDIAN.

ALL OTHER MEDIAN BARRIER CONSTRUCTION JOINTS, A GROOVE 1/4" DEEP AND 1" WIDE SHALL BE SHOWN OR FORMED ACROSS THE TOP AND ALONG THE SIDE FOR THE ENTIRE LENGTH OF THE MEDIAN ON A FULL DEPTH MEDIAN BARRIER SHALL BE FORMED. CONSTRUCTION JOINTS SHALL BE FORMED AT EACH INTRODUCTION ALONG THE LENGTH OF THE MEDIAN, THESE GROOVES OR BUTT JOINTS SHALL BE TOLERATED WITHIN A PLUS OR MINUS ONE-TENTH TOLERANCE WITH THE JOINTS IN THE CONCRETE PAVEMENT.

EXPANSION JOINTS SHALL BE PLACED IN THE BARRIERS MEDIAN AT STRUCTURAL EXPANSION JOINTS, EXCEPT WHERE SHOWN. MEDIAN BARRIERS, EXCEPT WHERE SHOWN, MEDIAN BARRIERS, SHALL BE 3'-0" APART AND THE OPENING FILLED FOR THE ENTIRE LENGTH OF THE MEDIAN WITH 2'-0" MEDIAN RECOMMENDED JOINT FILLERS WHICH COMPLIES WITH THE REQUIREMENTS OF SECTION 601 OF THE SPECIFICATION. THE MORTAR JOINTS SHALL BE TOLERATED WITHIN A PLUS OR MINUS ONE-TENTH TOLERANCE WITH THE JOINTS IN THE CONCRETE PAVEMENT. A WATERPROOF SEALER IS RECOMMENDED.

THE FINISHED SURFACE OF THE MEDIAN BARRIER SHALL BE SMOOTH, LEVEL, TIGHT AND FREE FROM Air BUBBLES, HOLEY, DEEP GROOVES, AND HORIZONTALS OR DEVIATIONS AS REQUIRED BY THE ENGINEER. THE ABOVE MENTIONED FINISHED SURFACE WILL BE OBTAINED BY THE USE OF WATER AND A WOOD BLOCK ON CARBONASIL BRICK.


TYPE OF SURFACE ADJACENT TO THE MEDIAN BARRIER SHALL BE SPECIFIED IN THE PLANS AND SHALL BE PAID FOR SEPARATELY.

THE COST OF CONCRETE MEDIAN BARRIER, PREFORMED JOINT FILLER, SECTIONS AND SECTIONS, MOUNTINGS, SHALL BE INCLUDED IN THE COST OF THE ITEM NUMBER GUARD-RAIL MEDIAN TYPE X.
NOTES

For additional details and requirements concerning dowel bars and dowel baskets for Type A & B Joints, see Standard Sheet PM14.

Type B Longitudinal Joint may be used as an alternate to Type E Longitudinal Joint for lanes or shoulders that are full width construction.

For additional details and requirements concerning Types E Joints, see Standard Sheet PM15.

The Contractor shall submit for approval a Joint Layout Plan for all intersections on the project in general accordance with the "Street Jointing Guidelines for Roadways" as suggested by the Portland Cement Association (PCA), Shobe, R. Method, the American Concrete Pavement Association's Joint Layout Guidelines, and the West Virginia Division of Highways' Standard Specifications.
TYPICAL HOOK BOLT DETAILS
TYPE E JOINTS

PAVEMENT SECTION

ALTERNATE HOOK BOLT

45° Countersink
1/16" Deep

See Alternate Hook Bolt for Slab-Form Paving

5/8" Length

1/2" Outside Diameter

8" Min.

Sleeve nut may vary in length from 17/8" to 2" and in Outside Diameter from 27/32" to 1 1/4".

NOTES

Tie bolts shall meet the requirements of Section 709.7 of the Specifications.
Tie bolts shall be placed on 30" centers max. Tie bolts shall be placed 15" from each end of form. Metal channel shall run the full length of form.
5/8" diameter tie bars 30" long, placed longitudinally on 30" centers (max.), and centered across the joint or pavement edge may be used in place of the bolt assemblies.

The longitudinal tie bolt assembly for slab-form paving shall consist of one sleeve nut, one 8" long hook bolt or J bolt, and 18" long alternate hook bolt. As an initial step in installing this assembly, the 12" long alternate hook bolt, with sleeve nut attached, shall be positioned in the proper location in the pavement by depilating slab-form paving equipment.

Typical tie bolt assemblies are shown herein. Minor variations in details and dimensional tolerances are permitted however, minimum values specified herein shall be complied with.

All tie bars and the J Bolt Assemblies shall be epoxy coated in accordance with section 709.1 of the Standard Specifications.

TYPICAL J BOLT DETAILS
TYPE E JOINTS

PAVEMENT SECTION

TRAPEZOIDAL KEY
(J Bolt Shown)

ALTERNATE (HALF-ROUND) KEY
(Alternate Hook Bolt Shown)

Bolt to be used for forming only.

Bolt to be used for forming only.
NOTES

For all Concrete Curb, the face of the curb shall be offset a minimum of two feet from the edge of traffic lane, unless otherwise shown on the Plans.

Construction of Concrete Curb shall be by the "Separate Method" when sawed joints are constructed in the pavement.

All curb joints shall be made acceptable forming methods.

For Combination Concrete Curb and Gutters, the slope of the 2'-0" wide concrete gutter shall conform to the pavement slope or as otherwise specified on the Plans.
NOTES

RAMP CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 603.3 OF THE SPECIFICATIONS. RAMP SURFACE SHALL INCLUDE A "DETECTABLE WARNING SURFACE" SIDE PVT. 3 OF 3 AS SHOWN FOR EACH RAMP TYPE. A CURB IS REQUIRED TO TRANSVERSE TO FLARE SLOPES, OR EQUALLY NURDIND FROM SLOPE BE PROVIDED ON CONCRETE SURFACES.

NORMAL CURB FOR USE AND PROGRAM SHALL BE MAINTAINED THROUGH THE RAMP AREA, UNLESS OTHERWISE SHOWN OR SPECIFIED.

A PREPRINTED EXPANSION JOINT TILES, MEETING THE REQUIREMENTS OF SECTION 603.3 OF THE SPECIFICATIONS, SHALL BE USED IN ALL LOCATIONS WHERE RAMP CONTACTS CURB, GUTTER, OR CONCRETE PAVEMENT. WHEN THE RAMP IS FLARED, THE TILES MAY BE PLACED AT THE CURB TILES. THE EXPANSION MATERIAL SHALL BE PLACED AT ALL LOCATIONS WHERE THE NORMAL GRADE RELATIONSHIP TO THE RAMP MUST BE MAINTAINED.

DRIVEWAY CURB SHALL NOT BE PLACED IN LINE WITH RAMP.

LOCATION OF THE RAMP SHALL BE PRECEDENCE OVER LOCATION OF THE DRIVEWAY CURB. EXCEPT IN TYPICAL STREETS, CURB STRUCTURES ARE REQUIRED TO CONSTRUCT NEW RAPIDS TO A MAXIMUM LENGTH OF 10'-0".

ANY CURB IN PEDESTRIAN AREAS SHALL HAVE OPENINGS NOT GREATER THAN 1/2" AND SHALL BE PLACED WITH CLEAR DEPARTURE OPENING PERPENDICULAR TO THE CURB OR PEDESTRIAN TRAVEL.

A)) THE RAMP SLOPE CAN BE OBTAINED DUE TO CRAB OF THE DRIVEWAY CURB. THE ALLOWED SLOPE OF THE RAMP SHALL BE EXTENDED TO A MAXIMUM LENGTH OF 10'-0".


CURB RAMP FROM SMALL SPACE REQUIREMENT PLUS CURB CLEARANCE. TYPICAL CLEARANCE WITH 3'-6", MINIMUM WIDTH 6'-0".

THE TYPE OF RAMP TO BE USED SHALL BE AS SPECIFIED ON THE PLANS. THE FOLLOWING CAN BE CONSIDERED GUIDELINES IN SELECTING RAMP TYPES, BUT ARE REQUIRED HERE FOR INFORMATION ONLY.

RAMP TYPES

TYPE: Light 0 FOR USE WHERE EXTENDS TO STREET AND WHERE SEVERAL IMPACTS ARE APPROPRIATE FOR RAMP AND PAVEMENT SPACE.

TYPE: Light 1 FOR USE WHERE EXTENDS TO STREET AND WHERE SEVERAL IMPACTS ARE APPROPRIATE FOR RAMP AND PAVEMENT SPACE.

TYPE: Light 2 FOR USE WHERE EXTENDS TO STREET AND WHERE SEVERAL IMPACTS ARE APPROPRIATE FOR RAMP AND PAVEMENT SPACE.

TYPE: Light 3 FOR USE WHERE EXTENDS TO STREET AND WHERE SEVERAL IMPACTS ARE APPROPRIATE FOR RAMP AND PAVEMENT SPACE.

NOTE: SEE SHEET 1 OF 3 FOR DETECTABLE WARNING SURFACE (SEE PVT. 3 OF 3).
**TYPE III Ramps at Intersection**

1. 8.33% 12% MAX RAMP SLOPE, INCLUDING CONSTRUCTION TOLERANCE
2. CROSS SLOPE 2.00% MAX, INCLUDING CONSTRUCTION TOLERANCE
3. CURB Ramps REQUIRE a 4.00% MINIMUM TURNING SPACE with a MAXIMUM CROSS SLOPE and LONGITUDINAL SLOPE OF 3.00%
   WHITE DETECTABLE WARNING MARKERS SEE NOTE RE: 12" INSTRUCTIONS ON SKEW FOR SLOPE TO DRAIN TO CURB

PAY LIMITS FOR CURB Ramps

CURB MAY NOT BE REQUIRED WHEN WALL OR BUILDING IS PRESENT

FOR DETECTABLE WARNING SURFACE NOTES SEE PV7 141.3 OF 3

NOT TO SCALE

**Obsoleted for projects let after December 15, 2020.**

See Revised Sheet PV7

**West Virginia Department of Transportation**

**Sidewalk Ramps**

(SHEET 2 OF 3)

**Standard Sheet PV7**
THE APPROPRIATE DETAILS AND NOTES OF STANDARD SHEET PVT7, SHEETS 1 AND 2 SHALL APPLY TO THIS STANDARD SHEET.

DETECTABLE WARNING SURFACES SHALL EXTEND ACROSS THE FULL WIDTH OF THE CURB RAMP, LANDING OR TRANSITION.

DEVICES SHALL BE ALIGNED IN THE PREDOMINANT DIRECTION OF THE CURB RAMP.

DESIGN AND PLACEMENT OF DETECTABLE WARNING SYSTEMS SHALL BE IN ACCORDANCE WITH SECTION 609 OF THE SPECIFICATIONS AND THE PUBLIC RIGHTS OF WAY ACCESSIBILITY GUIDELINES (PRAWG).

NOTES

PAY LIMITS FOR CURB RAMPS

TYPE IV RAMP

TYPE I RAMP AND TYPE IV RAMP SHOWN AT INTERSECTION

FOR PROJECTS LET AFTER DECEMBER 15, 2020
SEE REVISED SHEET PVT7
TYPE I RAMP

NOTES

THE TYPE OF RAMP TO BE USED SHALL BE AS SPECIFIED ON THE PLANS. THESE STANDARDS CAN BE CONSIDERED GUIDELINES IN SELECTING RAMP TYPES, HOWEVER THEY CAN BE DEVIATED FROM WITH A SPECIAL DETAIL AS NOTED IN PLANS.

RAMP CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 609 OF THE CURRENT IVD, SWT, DDH STANDARD SPECIFICATIONS ROADS AND BRIDGES AND ANY SUBSEQUENT DDH SUPPLEMENTAL SPECIFICATIONS, AND THE PUBLIC RIGHTS OF WAY ACCESSIBILITY GUIDELINES (PROMAGI) DATED JULY 26, 2011. RAMP SURFACE SHALL INCLUDE A "DETECTABLE WARNING SURFACE" (See PV7-SHT. B-6.13) AS SHOWN FOR EACH RAMP TYPE. A COARSE BROOM Finish, TRANSVERSE TO FLAME SLOPES, OR EQUAL NON-SLIP FINISH SHALL BE PROVIDED ON CONCRETE SURFACES.

NORMAL GUTTER FLOW LINE AND PROFILE SHALL BE MAINTAINED THROUGH THE RAMP AREA, UNLESS OTHERWISE SHOWN OR SPECIFIED. POSITIVE DRAINAGE MUST BE MAINTAINED SO THAT NO PONDING OCCURS WITHIN THE RAMP OR CLEAR SPACE AREA.

1/4" MINIMUM, 1/2" MAXIMUM PREFORMED EXPANSION JOINT FILLER, MEETING THE REQUIREMENTS OF SECTION 609 OF THE SPECIFICATIONS, AS NOTED ABOVE, SHALL BE PLACED AT ALL LOCATIONS WHERE RAMP CONTACTS CURB, GUTTER, CONCRETE PAVEMENT, OR OTHER ROC OBJECTS.

WHERE EXISTING SIDEWALK CONNECTS TO PROPOSED SIDEWALK OR RAMPS, EXPANSION JOINTS ALONG WITH DOWEL BARS WILL BE PLACED. DOWEL BARS WILL BE UTILIZED BETWEEN EXISTING AND PROPOSED TO REDUCE VERTICAL CHANGE. SEE SHEET II FOR ADDITIONAL INFORMATION.

SAWCUTS WILL BE UTILIZED DURING DEMOLITION OF EXISTING SIDEWALKS. SIMILAR METHODS MAY BE USED UPON APPROVAL BY FIELD ENGINEER.

RAMPS SHALL NOT BE PLACED IN LINE WITH DRAINAGE STRUCTURES. LOCATION OF THE RAMP SHALL TAKE PRECEDENCE OVER LOCATION OF THE DRAINAGE STRUCTURE, EXCEPT WHERE EXISTING STRUCTURES ARE BEING UTILIZED FOR CONSTRUCTION OF NEW RAMPS.

ANY GRADE IN PEDESTRIAN AREAS SHALL HAVE OPENINGS NOT GREATER THAN 1/2" AND SHALL BE PLACED WITH LONG DIMENSION OPENING PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.

IF THE 8.33/12.0 SLOPE CANNOT BE OBTAINED DUE TO GRADE OF THE ADJACENT ROADWAY, THE SLOPED PORTION OF THE RAMP SHALL BE EXTENDED TO A MINIMUM LENGTH OF 15'-0".

EXISTING CROSSWALK AND STOP BAR MARKINGS TO BE EMAROATED AND RELOCATED AS INDICATED BY PROPOSED RAMP LOCATIONS. COST NOT INCENTIVE TO COST OF PROPOSED RAMP.

CURB RAMP WIDTH MUST MATCH SIDEWALK WIDTH PLUS CLEARANCE. TYPICAL SIDEWALK WIDTH IS 5'-0". RAMP WIDTHS LESS THAN 5'-0" REQUIRE DIVISION/DISTRICT ENGINEER APPROVAL. WIDTHS LESS THAN 4'-0" REQUIRE AN EXCEPTION JUSTIFICATION REPORT, SEE SHEET II FOR INFORMATION REGARDING RAMP THICKNESS.

GRADE BREAKS SHALL BE PERPENDICULAR TO THE DIRECTION OF THE RAMP RUN. SURFACE SLOPES THAT MEET AT GRADE BREAKS SHALL BE FLUSH.

CLEAR SPACE - BELOW THE BOTTOM GRADE BREAK, A CLEAR SPACE THE WIDTH OF THE CURB RAMP AND EXTENDING 4'-0" MINIMUM INTO THE ABUTTING ROADWAY SHALL BE PROVIDED WITH THE WIDTH OF THE PEDESTRIAN STREET CROSSING AND WOOLY OUTSIDE THE PARALLELED TRAVEL LANE. SURFACE TO MEAT EXISTING. ANY CLEAR SPACE WORK TO BE COMPLETED WILL BE INCENTIVE TO THE COST OF THE RAMP.

ALL CURB RAMPS SHALL BE CONSTRUCTED TO PROVIDE ACCESS TO EXISTING OPERABLE PARTS. AN EXAMPLE OF THIS WOULD BE PEDESTRIAN PUSH BUTTONS.
NOTES

THE TYPE OF RAMP TO BE USED SHALL BE AS SPECIFIED ON THE PLANS. THESE STANDARDS CAN BE CONSIDERED GUIDELINES IN SELECTING RAMP TYPES, HOWEVER THEY CAN BE DERIVED FROM WITH A SPECIAL DETAIL AS NOTED IN PLANS.

RAMPS CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 609 OF THE CURRENT WDO, DOC STANDARD SPECIFICATIONS, ROADS AND BRIDGES AND ANY SUBSEQUENT DOC SUPPLEMENTAL SPECIFICATIONS, AND THE PUBLIC RIGHTS OF WAY ACCESSIBILITY GUIDELINES PROMULGATED JULY 28, 2001. RAMPS ARE DEDECTED TO INCLUDE A "DETECTABLE WARNING SURFACE" SEE PVF SH 11 OF 13 AS SHOWN FOR EACH RAMP TYPE. A COARSE BROOM FINISH, TRANSVERSE TO FLARE SLOPES, OR A CONCRETE SURFACE WILL BE PROVIDED ON CONCRETE SURFACES. NORMAL GUTTER FLARE LINE AND PROFILE SHALL BE MAINTAINED THROUGHOUT THE RAMP AREA UNLESS OTHERWISE SHOWN OR SPECIFIED. POSITIVE DRAINAGE MUST BE MAINTAINED SO THAT NO PONDOING OCCURS WITHIN THE RAMP OR CLEAR SPACE AREA.

1/4" MINIMUM, 1/2" MAXIMUM PRECISION EXPANSION JOINT FILLER, MEETING THE REQUIREMENTS OF SECTION 609 OF THE SPECIFICATIONS, AS NOTED ABOVE, SHALL BE PLACED AT ALL LOCATIONS WHERE RAMP CONTACTS CURB, GUTTER, CONCRETE PAVEMENT, OR OTHER RELATED OBJECTS.

WHERE EXISTING SIDEWALK CONNECTS TO PROPOSED SIDEWALK OR RAMPS, EXPANSION JOINTS ALONG WITH DOWEL BARS WILL BE PLACED. DOWEL BARS WILL BE UTILITY BETWEEN EXISTING AND PROPOSED TO REDUCE VERTICAL CHANCE. SEE SHEET II FOR ADDITIONAL INFORMATION. SAFETY MARKERS WILL BE USED DURING MUSEUM OF EXISTING SIDEWALKS. SIMILAR METHODS MAY BE USED UPON APPEARANCE BY FIELD ENGINEER.

RAMPS SHALL NOT BE PLACED IN LINE WITH DRAINAGE STRUCTURES. LOCATION OF THE RAMP SHALL TAKE PRECEDENCE OVER LOCATION OF THE DRAINAGE STRUCTURE, EXCEPT WHERE EXISTING STRUCTURES ARE BEING UTILIZED FOR CONSTRUCTION OF NEW RAMPS.

ANY GRATE IN PEDESTRIAN AREAS SHALL HAVE OPENINGS NOT GREATER THAN 1/2" AND SHALL BE PLACED WITH LONG DIMENSION OPENING PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.

IF THE 8.33% (0.31) SLOPE CANNOT BE OBTAINED DUE TO GRADE OF THE ADJACENT ROADWAY, THE SLOPED PORTION OF THE RAMP SHALL BE EXTENDED TO A MINIMUM LENGTH OF 15'-0".

EXISTING CROSSWALK AND STOP BAR MARKINGS TO BE ERADICATED AND REPLACED AS DICTATED BY PROPOSED RAMP LOCATIONS. COST NOT INDOLENT TO COST OF PROPOSED RAMP.

CURB RAMP MD WIDTH SHALL MEET SIDEWALK WIDTH PLUS CLEARANCE. TYPICAL SIDEWALK WIDTH IS 5'-0" MINIMUM. RAMP WIDTHS LESS THAN 5'-0" REQUIRE DESIGN/ENGINEER APPROVAL. "NOTES LESS THAN 4" REQUIRE AN EXCEPTION JUSTIFICATION REPORT. SEE SHEET II FOR INFORMATION REGARDING RAMP THICKNESS.

GRADE BREAKS SHALL BE PERPENDICULAR TO THE DIRECTION OF THE RAMP RUN. SURFACE SLOPES THAT MEET AT GRADE BREAKS SHALL BE FLUSH.

CLEAR SPACE BEYOND THE BOTTOM GRADE BREAK, CLEAR THE WIDTH OF THE CURB RAMP AND EXTENDING 4'-0" MINIMUM INTO THE ABUTTING ROADWAY SHALL BE PROVIDED WITH THE WIDTH OF THE PEDESTRIAN STREET CROSSING AND WHOLLY OUTSIDE THE PARALLEL TRAVEL LANE. SURFACE TO MATCH EXISTING. ANY CLEAR SPACE WORK TO BE COMPLETED WILL BE INCIDENTAL TO THE COST OF THE RAMP.

ALL CURB RAMPS WILL BE CONSTRUCTED TO PROVIDE ACCESS TO EXISTING OPERABLE PARTS. AN EXAMPLE OF THIS WOULD BE PEDESTRIAN PUSH BUTTONS.
NOTES
THE TYPE OF RAMP TO BE USED SHALL BE AS SPECIFIED ON THE PLANS. THESE STANDARDS CAN BE CONSIDERED GUIDELINES IN SELECTING RAMP TYPES, HOWEVER THEY CAN BE DEVIATED FROM WITH A SPECIAL DETAIL AS NOTED IN PLANS.
RAMP CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 609 OF THE CURRENT CPD. CPD STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES AND ANY SUBSEQUENT CPD SUPPLEMENTAL SPECIFICATIONS, AND THE PUBLIC RIGHTS OF WAY ACCESSIBILITY GUIDELINES (PRWAG) DATED JULY 26, 2011. RAMP SURFACE SHALL INCLUDE A "DETECTABLE WARNING SURFACE" (see PV7 T11 OF 133 AS SHOWN FOR EACH RAMP TYPE). A COARSE BROOM FINISH, TRANSVERSE TO FLARE SLOPES, OR EQUAL NON-SLID FINISH SHALL BE PROVIDED ON CONCRETE SURFACES.
NORMAL GUTTER FLOW LINE AND PROFILE SHALL BE MAINTAINED THROUGH THE RAMP AREA, UNLESS OTHERWISE SHOWN ON SPECIFIED. POSITIVE DRAINAGE MUST BE MAINTAINED SO THAT NO PONDING OCCURS WITHIN THE RAMP OR CLEAR SPACE AREA.
1/4" MINIMUM 1/2" MAXIMUM PREFORMED EXPANSION JOINT FILLER, MEETING THE REQUIREMENTS OF SECTION 606 OF THE SPECIFICATIONS, AS NOTED ABOVE, SHALL BE PLACED AT ALL LOCATIONS WHERE RAMP CONTACTS CURB, GUTTER, CONCRETE PAVEMENT, OR OTHER Rigid OBJECTS.
WHERE EXISTING SIDEWALK CONNECTS TO PROPOSED SIDEWALK OR RAMPs, EXPANSION JOINTS ALONG WITH DOME BARS WILL BE PLACED. DOME BARS WILL BE UTILIZED BETWEEN EXISTING AND PROPOSED TO REDUCE VERTICAL CHANGE. SEE SHEET 11 FOR ADDITIONAL INFORMATION.
SAMED TIES WILL BE UTILIZED DURING DEMOLITION OF EXISTING SIDEWALK. SIMILAR METHODS MAY BE USED UPON APPROVAL BY FIELD ENGINEER.
Ramps shall not be placed in line with existing utilities. Location of the ramp shall take precedence over location of the drainage structure, except where existing structures are being utilized for construction of new ramps.
Any grate in pedestrian areas shall have openings not greater than 1/2" and shall be placed with long dimension of opening perpendicular to the direction of pedestrian travel.
If the 8,333 /2(1) slope cannot be obtained due to grade of the adjacent roadway, the sloped portion of the ramp shall be extended to a minimum length of 15'-0".
Existing crosswalk and stop bar markings are to be eradicated and relocated as dictated by proposed ramp locations. Cost not incidental to cost of proposed ramp.
Curb ramp width shall match sidewalk width plus clearance. Typical sidewalk width is 5'-0". Curb ramp width less than 5'-0" require division/district engineer approval. Widths less than 4'-0" require an exception justification report. See Sheet 11 for information regarding ramp thickness.
Grade breaks shall be perpendicular to the direction of the ramp run. Surface slopes that meet at grade breaks shall be flush.
Clear space beyond the bottom grade break, a clear space the width of the curb ramp and extending 4'-0" minimum into the abutting roadway shall be provided with the width of the Pedestrian Street crossing and wholly outside the parallel travel lane. Surface to match existing. Any clear space work to be completed will be incidental to the cost of the ramp.
All curb ramps shall be constructed to provide access to existing operable parts. An example of this would be pedestrian push buttons.

TYPE IB RAMP
NOTES

THE TYPE OF RAMP TO BE USED SHALL BE AS SPECIFIED ON THE PLANS. THESE STANDARDS CAN CONSIDER GUIDELINES IN SELECTING RAMP TYPES, HOWEVER THEY CAN BE DEVATED FROM WITH A SPECIAL DETAIL AS NOTED ON PLANS.

RAMP CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 609 OF THE CURRENT.Width, DOH STANDARD SPECIFICATIONS ROADS AND BRIDGES AND ANY SUBSEQUENT DOH SUPPLEMENTAL SPECIFICATIONS, AND THE PUBLIC RIGHTS OF WAY ACCESSIBILITY GUIDELINES (PRAW) DATED JULY 26, 2011. RAMP SURFACE SHALL INCLUDE A "DETECTABLE WALKING SURFACE" (SEE PW 17 SHEET II OF 13) AS SHOWN FOR EACH RAMP TYPE. A CORNED BROOM FINISH, TRANSVERSE TO FLARE SLOPES, OR EQUAL NON-SLIP FINISH SHALL BE PROVIDED ON CONCRETE SURFACES.

NORMAL GUTTER FLOW LINE AND PROFILE SHALL BE MAINTAINED THROUGH THE RAMP AREA. UNLESS OTHERWISE SHOWN OR SPECIFIED, POSITIVE DRAINAGE MUST BE MAINTAINED SO THAT NO PONDING OCCURS WITHIN THE RAMP OR CLEAR SPACE AREA.

1/4" MINIMUM 1/2" MAXIMUM PREPARED EXPANSION JOINT FILLER, MEETING THE REQUIREMENTS OF SECTION 609 OF THE SPECIFICATIONS. AS NOTED ABOVE, SHALL BE PLACED AT ALL LOCATIONS WHERE RAMP CONTACTS CURB, GUTTER, CONCRETE PAVEMENT, OR OTHER RELATED OBJECTS.

WHERE EXISTING SIDEWALK CONNECTS TO PROPOSED SIDEWALK OR RAMPS, EXPANSION JOINTS ALONG WITH DOWEL BARS WILL BE PLACED. DOWEL BARS WILL BE UTILIZED BETWEEN EXISTING AND PROPOSED TO REDUCE VERTICAL CHANGE. SEE SHEET II FOR ADDITIONAL INFORMATION.

SARCUTS WILL BE UTILIZED DURING MOWING OF EXISTING SIDEWALKS. SIMILAR METHODS MAY BE CALLED UPON AS PER RAMP DESIGNER."}

"LEAD"".

RAMPs SHALL NOT BE PLACED IN LINE WITH DRAINAGE STRUCTURES. LOCATION OF THE RAMP SHALL TAKE PRECEDENCE OVER LOCATION OF THE DRAINAGE STRUCTURE, EXCEPT WHERE EXISTING STRUCTURES ARE BEING UTILIZED FOR CONSTRUCTION OF NEW RAMPS.

ANY GRADE IN PEDESTRIAN AREAS SHALL HAVE OPENINGS NOT GREATER THAN 1/2" AND SHALL BE PLACED WITH LONG DIMENSION OF OPENING PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.

IF THE 8.33\(\text{\textdegree}\) W2 SLOPE CANNOT BE OBTAINED DUE TO GRADE OF THE ADJACENT ROADSWAY, THE SLOPED PORTION OF THE RAMP SHALL BE EXTENDED TO A MINIMUM LENGTH OF 15.7'. EXISTING CROSSWALK AND STOP BAR MARKINGS TO BE PEGICATED AND RELOCATED AS DICTATED BY PROPOSED RAMP LOCATIONS. COST NOT INCREMENTAL TO COST OF PROPOSED RAMP.

CURB RAMP WIDTHS SHALL MATCH SIDEWALK WIDTH PLUS CLEARANCE. TYPICAL SIDEWALK WIDTH IS 5'. MINIMUM RAMP WIDTHS LESS THAN 5' REQUIRE DISAGREEMENT DRON ENGINEER APPROVAL. WIDTHS LESS THAN 4' REQUIRE AN EXCEPTION JUSTIFICATION REPORT. SEE SHEET II FOR INFORMATION REGARDING RAMP THICKNESS.

GRADE BREAKS SHALL BE PERPENDICULAR TO THE DIRECTION OF THE RAMP RUN. SURFACE SLOPES THAT MEET AT GRADE BREAKS SHALL BE FLUSH.

CLEAR SPACE - BEYOND THE BOTTOM GRADE BREAK, A CLEAR SPACE THE WIDTH OF THE CURB RAMP AND EXTENDING 4' MINIMUM INTO THE ABUTTING ROADWAY SHALL BE PROVIDED WITHIN THE WIDTH OF THE PEDESTRIAN STREET CROSSING AND WHOLLY OUTSIDE THE PARALLEL TRAVEL LANE. SURFACE TO MATCH EXISTING. ANY CLEAR SPACE WORK TO BE COMPLETED WILL BE INCIDENTAL TO THE COST OF THE RAMP.

ALL CURB RAMPS SHALL BE CONSTRUCTED TO PROVIDE ACCESS TO EXISTING OPERABLE PARTS. AN EXAMPLE OF THIS #300D BE PEDESTRIAN PUSH BOUTNS.

"TYPE II RAMPS"

"SIDEWALK RAMPS"

"Sheet 4 of 13"

"Pay Limits for Curb Ramps (Excluding CMW)"

"Type II Ramp"

"NOT TO SCALE"

"Standard Sheet PV 7"
NOTES

THE TYPE OF RAMP TO BE USED SHALL BE AS SPECIFIED ON THE PLANS. THESE STANDARDS CAN BE CONSIDERED GUIDELINES IN SELECTING RAMP TYPES, HOWEVER THEY CAN BE DEVIANED FROM WITH A SPECIAL DETAIL AS NOTED IN PLANS.

RAMP CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 609 OF THE CURRENT WOOD, DOW STANDARD SPECIFICATIONS, AND BRIDGES AND ANY SUBSEQUENT DON SUPPLEMENTAL SPECIFICATIONS, AND THE PUBLIC RIGHTS OF WAY ACCESSIBILITY GUIDELINES PROMULGATED JULY 25, 2001. RAMP SURFACE SHALL Include A "DETECTABLE WARNING SURFACE" SEE PHOTO 11 OF 13 AS SHOWN FOR EACH RAMP TYPE. A COARSE BROOM FINISH, TRANSVERSE TO FLARE SLOPES, OR EQUAL NON-SKID FINISH SHALL BE PROVIDED ON CONCRETE SURFACES.

NORMAL GUTTER FLOW LINE AND PROFILE SHALL BE MAINTAINED THROUGH THE RAMP AREA. UNLESS OTHERWISE SHOWN OR SPECIFIED, POSITIVE DRAINAGE MUST BE MAINTAINED SO THAT NO PONDING OCCURS WITHIN THE RAMP OR CLEAR SPACE AREA.

1/4" MINIMUM, 1/2" MAXIMUM PRE-FORMED EXPANSION J OINT FILLER, MEETING THE REQUIREMENTS OF SECTION 609 OF THE SPECIFICATIONS, AS NOTED ABOVE, SHALL BE PLACED AT ALL LOCATIONS WHERE RAMP CONTACTS Curb, GUTTER, CONCRETE PAVEMENT, OR OTHER HARD OBJECTS.

WHERE EXISTING SIDEWALK CONNECTS TO PROPOSED SIDEWALK OR RAMPS, EXPANSION JOINTS ALONG WITH DOWEL BARS WILL BE PLACED. DOWEL BARS WILL BE UTILIZED TO REDUCE VERTICAL C HANGE. SEE SHEET 11 FOR ADDITIONAL INFORMATION. SAWCUTS WILL BE UTILIZED DURING DEMOLITION OF EXISTING SIDEWALKS. SIMILAR METHODS MAY BE USED UPON APPROVAL BY FIELD ENGINEER.

Ramps shall not be placed in line with drainage structures. Location of the ramp shall take precedence over location of the drainage structure, except where existing structures are being utilized for construction of new ramps.

Any grate in pedestrian areas shall have openings not greater than 1/2" and shall be placed with long dimension of opening perpendicular to the direction of pedestrian travel.

If the existing slope cannot be obtained due to grade of the adjacent roadway, the sloped portion of the ramp shall be extended to a minimum length of 15'-0".

Existing crosswalk and stop bar markings to be eradicated and relocated as dictated by proposed ramp locations. Cost not included to cost of proposed ramp.

Curb ramp width shall match sidewalk width plus clearance. Typical sidewalk width is 5'-0". MINIMUM RAMP WIDTH LESS THAN 5'-0" REQUIRE DIVISION/DISTRICT ENGINEER APPROVAL. WIDTHS 10'-0" TO 11'-0" REQUIRE AN EXPLANATION REPORT TO DIVISION. ALL DEVIATIONS FROM THE HANDICAP CODE MUST BE SHOWN ON THE PLANS.

GRADE BREAKS SHALL BE PERPENDICULAR TO THE DIRECTION OF THE RAMP RUN. SURFACE SLOPES THAT MEET AT GRADE BREAKS SHALL BE FLUSH.

CLEAR SPACE- REGARDING THE BOTTOM GRADE BREAK, A CLEAR SPACE THE WIDTH OF THE CURB RAMP AND EXTENDING 4'-0" MINIMUM INTO THE ABUTTING ROADWAY SHALL BE PROVIDED BEHIND THE WIDTH OF THE PEDESTRIAN STREET CROSSING AND WHOLLY OUTSIDE THE PARALLEL TRAVEL LANE. SURFACE TO MATCH EXISTING. ANY CLEAR SPACE WORK TO BE COMPLETED WILL BE INCIDENTAL TO THE COST OF THE RAMP.

ALL CURB RAMPS SHALL BE CONSTRUCTED TO PROVIDE ACCESS TO EXISTING OPERABLE PARTS. AN EXAMPLE OF THIS WOULD BE PEDESTRIAN PUSH BUTTONS.

LEGEND

1. 8.5/12 Maximum ramp slope inclu ing construction tolerance
   SLOPE OF RAMP SHALL CARRY TO FACE OF CURB
2. Curb ramps require a (5'-0") minimum turning space where pedestrians perform turning maneuverers with a maximum cross slope of 1/2" and longitudinal slope matching roadway
3. Grade break required to be flush (0") and perpendicular to
   pedestrian path of travel
4. If sidewalk is existing and non-compliant see "transition to existing non-compliant sidewalk" detail sheet 12
5. Detectable warning surface see "detectable warning surface (dws)" detail sheet 11
6. Curb wall or check wall as dictated by field
   conditions see "existing adjacent surface transition" detail sheet 13
7. Clear space - width of curb ramp and extending 4'-0"
   minimum
8. 3/4" chamfer edge

PAY LIMITS FOR CURB RAMPS EXCLUDING DWS

NOT TO SCALE

SIDEWALK RAMPS

(Sheet 5 of 13)

TYPE III RAMP

STANDARD SHEET PT 7
THE TYPE OF RAMP TO BE USED SHALL BE AS SPECIFIED ON THE PLANS. THESE STANDARDS CAN BE CONSIDERED GUIDELINES IN SELECTING RAMP TYPES, HOWEVER THEY CAN BE DEViated FROM WITH A SPECIAL DETAIL AS NOTED IN PLANS.

RAMP CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 609 OF THE CURRENT VDOT, DOH STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES AND ANY SUBSEQUENT DOH SUPPLEMENTAL SPECIFICATIONS, AND THE PUBLIC ROADS OF WAY ACCESSIBILITY GUIDELINES (PROPOSED) DATED JULY 26, 2017. RAMP SURFACE SHALL INCLUDE A "DETECTABLE WARNING SURFACE" (SEE PVT7 SHT 11 S/11) AS SHOWN FOR EACH RAMP TYPE, A CORNICE HILO FINISH, TRANSVERSE TO FLARE SLOPES, OR EQUAL NON-SKID FINISH SHALL BE PROVIDED ON CONCRETE SURFACES. NORMAL GUTTER FLOOR LINE AND PROFILE SHALL BE MAINTAINED THROUGH THE RAMP AREA. UNLESS OTHERWISE SHOWN OR SPECIFIED, POSITIVE DRAINAGE MUST BE MAINTAINED so THAT NO PONDING OCCURS WITHIN THE RAMP OR CLEAR SPACE AREA.

1/4" MINIMUM, 1/2" MAXIMUM PREFORMED EXPANSION JOINT FILLER, MEETING THE REQUIREMENTS OF SECTION 609 OF THE SPECIFICATIONS, AS NOTED ABOVE, SHALL BE PLACED AT ALL LOCATIONS WHERE RAMP CONTACTS CURB, GUTTER, CONCRETE PAVEMENT, OR OTHER ROAD OBJECTS.

WHERE EXISTING SIDEWALK CONNECTS TO PROPOSED SIDEWALK OR RAMPS, EXPANSION JOINTS ALONG WITH DOWEL BARS WILL BE PLACED. DOWEL BARS WILL BE UTILIZED BETWEEN EXISTING AND PROPOSED TO REDUCE VERTICAL CHANGE. SEE SHEET 11 FOR ADDITIONAL INFORMATION. SAWCUTS WILL BE UTILIZED DURING DEMOLITION OF EXISTING SIDEWALKS. SIMILAR METHODS MAY BE USED UPON APPROVAL BY FIELD ENGINEER.

RAMPS SHALL NOT BE PLACED IN LINE WITH DRAINAGE STRUCTURES. LOCATION OF THE RAMP SHALL TAKE PRECEDENCE OVER LOCATION OF THE DRAINAGE STRUCTURE, EXCEPT WHERE EXISTING STRUCTURES ARE BEING UTILIZED FOR CONSTRUCTION OF NEW RAMPS.

ANY GRADE IN PEDESTRIAN AREAS SHALL HAVE OPENINGS NOT GREATER THAN 1/2" AND SHALL NOT BE PLACED WITH A LONG DIMENSION OPENING PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.

IF THE B.33.12.01 SLOPE CANNOT BE OBTAINED DUE TO GRADE OF THE ADJACENT ROADSIDE, THE SLOPED PORTION OF THE RAMP SHALL BE EXTENDED TO A MINIMUM LENGTH OF 10'-0". EXISTING CROSSWALK AND STOP BAR MARKINGS TO BE ERASED AND RELOCATED AS DICTATED BY PROPOSED RAMP LOCATIONS. COST NOT INCIDENTAL TO COST OF PROPOSED RAMP. CURB RAMP WASH SHALL MATCH SIDEWALK WASH PLUS CLEARANCE. TYPICAL SIDEWALK WIDTH IS 5'-0" MINIMUM RAMP WIDTH IS 4'-0" MINIMUM. CURB RAMP WASH REQUIRED TO BE APPROVED BY FIELD ENGINEER. APPROVAL WITHIN 5'-0" MINIMUM RAMP WASHPLUS CLEARANCE. TYPICAL SIDEWALK WIDTH IS 5'-0" MINIMUM RAMP WIDTH IS 4'-0" MINIMUM. CURB RAMP WASH REQUIRED TO BE APPROVED BY FIELD ENGINEER. APPROVAL WITHIN 5'-0" MINIMUM RAMP WASHPLUS CLEARANCE. TYPICAL SIDEWALK WIDTH IS 5'-0" MINIMUM RAMP WIDTH IS 4'-0" MINIMUM.

GRADE BREAKS SHALL BE PERPENDICULAR TO THE DIRECTION OF THE RAMP RUN. SURFACE SLOPES THAT MEET AT GRADE BREAKS SHALL BE FLUSH.

CLEAR SPACE - BELOW THE BOTTOM GRADE BREAK, A CLEAR SPACE THE WIDTH OF THE CURB RAMP AND EXTENDING 4'-0" MINIMUM TO THE ADJACENT ROADSIDE SHALL BE PROVIDED WITHIN THE WIDTH OF THE PEDESTRIAN STREET CROSSING AND WHOLLY OUTSIDE THE PARALLEL TRAVEL LANE. SURFACE TO-WATCH EXISTING. ANY CLEAR SPACE ROOM TO BE COMPLETED WILL BE INCIDENTAL TO THE COST OF THE RAMP.

ALL CURB RAMPS SHALL BE CONSTRUCTED TO PROVIDE ACCESS TO EXISTING OPERABLE PARTS. AN EXAMPLE OF THIS WOULD BE PEDESTRIAN PUSH BUTTONS.

NOTES

END OF SIDEWALK

PREVIOUS OPTION

LEGEND

1. 8.33% (12") MAXIMUM RAMP SLOPE INCLUDING CONSTRUCTION TOLERANCE SLOPE OF RAMP SHALL CARRY THROUGH TO FACE OF CURB
2. CROSS SLOPE: 2.00% MAXIMUM INCLUDING CONSTRUCTION TOLERANCE
3. CURB RAMPS REQUIRE A 15'-0" MINIMUM TURNING SPACE WHERE PEDESTRIANS PERFORM TURNING MANEUVERS WITH A MAXIMUM CROSS SLOPE OF 2% AND LONGITUDINAL SLOPE MATCHING ROADWAY
4. GRADE BREAK REQUIRED TO BE FLUSH (0") AND PERPENDICULAR TO PEDESTRIAN PATH OF TRAVEL
5. IF SIDEWALK IS EXISTING AND NON-COMPLIANT SEE "TRANSITION TO EXISTING NON-COMPLIANT SIDEWALK" DETAIL SHEET 12
6. DETECTABLE WARNING SURFACE SEE "DETECTABLE WARNING SURFACE (DWS)" DETAIL SHEET 11
7. CURB WALL OR CHEEK WALL WAS A DICTATED BY FIELD CONDITIONS, SEE "EXISTING ADJACENT SURFACE TRANSITION" DETAIL SHEET 13
8. CLEAR SPACE - WIDTH OF CURB RAMP AND EXTENDING 4'-0" MINIMUM
9. 3/4" CHAMFER EDGE

TYPE IIIA - OPTION 1

END OF SIDEWALK

PREVIOUS OPTION

PAY LIMITS 1/2" CURB RAMPS EXCLUDING DWS

NOT TO SCALE

TYPE IIIA - OPTION 2
THE TYPE OF RAMP TO BE USED SHALL BE AS SPECIFIED ON THE PLANS. THESE STANDARDS CAN BE CONSIDERED GUIDELINES IN SELECTING RAMP TYPES, HOWEVER THEY CAN BE DIVERGED FROM WITH A SPECIAL DETAIL AS NOTED IN PLANS.

RAMP CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 609 OF THE CURRENT VKOOT, DOC STANDARD SPECIFICATIONS, ROADS AND BRIDGES AND ANY SUBSEQUENT DON SUPPLEMENTAL SPECIFICATIONS, AND THE PUBLIC RIGHTS OF WAY ACCESSIBILITY GUIDELINES (PROJ 609) DATED JULY 28, 2001. RAMP SURFACE SHALL INCLUDE A "DETECTABLE WARNING SURFACE" (SEE PVT SH. 13) AS SHOWN FOR EACH RAMP TYPE, A COARSE BROOM FINISH, TRANSITIONS TO FLARE SLOPES, OR EQUAL NON-SLIP FINISH SHALL BE PROVIDED ON CONCRETE SURFACES. NORMAL GUTTER FLOW LINE AND PROFILE SHALL BE MAINTAINED THROUGH THE RAMP AREA, UNLESS OTHERWISE SPECIFIED OR REQUIRED. POSITIVE DRAINAGE MUST BE MAINTAINED SO THAT NO POCKING OCCURS WITHIN THE RAMP OR CLEAR SPACE AREAS.

1/4" MINIMUM, 1/2" MAXIMUM PRE-FORMED EXPANSION JOINT FILLER, MEETING THE REQUIREMENTS OF SECTION 609 OF THE SPECIFICATIONS, AS NOTED ABOVE, SHALL BE PLACED AT ALL LOCATIONS WHERE RAMP CONTACTS CURB, GUTTER, CONCRETE PAVEMENT, OR OTHER ROAD OBJECTS.

WHERE EXISTING SIDEWALK CONNECTS TO PROPOSED SIDEWALK OR RAMPS, EXPANSION JOINTS ALONG WITH DOWEL BARS WILL BE PLACED. DOWEL BARS WILL BE UTILIZED BETWEEN EXISTING AND PROPOSED TO REDUCE VERTICAL CHANGE. SEE SHEET II FOR ADDITIONAL INFORMATION.

SARK CUTS WILL BE UTILIZED DURING DEMOLITION OF EXISTING SIDEWALKS. SIMILAR METHODS MAY BE USED UPON APPROVAL BY FIELD ENGINEER.

RAMPS SHALL NOT BE PLACED IN LINE WITH DRAINAGE STRUCTURES. LOCATION OF THE RAMP SHALL TAKE PRECEDENCE OVER LOCATION OF THE DRAINAGE STRUCTURE. EXCEPT WHERE EXISTING STRUCTURES ARE BEING UTILIZED FOR CONSTRUCTION OF NEW RAMPS.

IF ANY FIRE PUMP AREA SHALL HAVE OPENINGS NOT GREATER THAN 1/2" AND SHALL BE PLACED WITH LONG DIMENSION OPENING PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.

IF THE 8.33% (1/2") SLOPE CANNOT BE OBTAINED DUE TO GRADE OF THE ADJACENT ROADWAY, THE SLOPED PORTION OF THE RAMP SHALL BE EXTENDED TO A MINIMUM LENGTH OF 15'-0". EXISTING CROSSWALK AND STOP BAR WARNINGS TO BE ERADICATED AND REPLACED AS DICTATED BY PROPOSED RAMP LOCATION. COST NOT INCIDENTAL TO COST OF PROPOSED RAMP.

CURB RAMP WITHIN SHALL MATCH SIDEWALK WITH PLUS CLEARANCE. TYPICAL SIDEWALL WIDTH IS 5'-0" MINIMUM RAMP WIDTHS, LESS THAN 5' REQUIRE DESIGN/DISTRICT ENGINEER APPROVAL. WIDTHS LESS THAN 4' REQUIRE AN EXCEPTION JUSTIFICATION REPORT. SEE SHEET III FOR INFORMATION REGARDING RAMP THICKNESS.

GRADE BREAKS SHALL BE PERPENDICULAR TO THE DIRECTION OF THE RAMP RUN. SURFACE SLOPES THAT MEET AT GRADE BREAKS SHALL BE FLUSH.

CLEAR SPACE: BELOW THE BOTTOM GRADE BREAK, A CLEAR SPACE THE WIDTH OF THE CURB RAMP AND EXTENDING 4'-0" MINIMUM INTO THE ABUTTING ROADWAY shall be provided with an additional 4'-0" MINIMUM INTO THE ABUTTING ROADWAY shall be provided with the width of the pedestrian's pedestrian's pathway and minimum 1'-0" outwardly from the parallel travel lane. SURFACE TO MATCH EXISTING ANY CLEAR SPACE WORK TO BE COMPLETED WILL BE INCIDENTAL TO THE COST OF THE RAMP.

ALL CURB RAMPS SHALL BE CONSTRUCTED TO PROVIDE ACCESS TO EXISTING OPERABLE PARTS. AN EXAMPLE OF THIS WOULD BE PEDESTRIAN PUSH BUTTONS.

NOT TO SCALE
NOTES

The type of ramp to be used shall be as specified on the plans. These standards can be considered guidelines in selecting ramp types, however they can be deviated from with a special detail as noted in plans.

Ramp concrete shall meet the requirements of Section 609 of the current MUTCD, DDH standard specifications roads and bridges and any subsequent DDH supplemental specifications, and the public rights of way accessibility guidelines (formal dates: July 26, 2001). Ramp surface shall include a "detectable warning surface" (see DDH SI 11.03) as shown for each ramp type. A coarse broom finish, transverse to flamed slopes, or equal non-skid finish shall be provided on concrete surfaces. Normal gutter flow line and profile shall be maintained throughout the ramp area, unless otherwise shown or specified. Positive drainage must be maintained so that no ponding occurs within the ramp or clear space area. 1/4" minimum, 1/2" maximum preformed expansion joint filler meeting the requirements of Section 609 of the specifications, as noted above, shall be placed at all locations where ramp contacts curb, gutter, concrete pavement, or other road objects.

Where existing sidewalk connects to proposed sidewalk or ramps, expansion joints along with dowel bars will be placed. Dowel bars will be utilized between existing and proposed to reduce vertical change. See sheet II for additional information. Ducts will be utilized during demolition of existing sidewalks, similar methods may be used upon approval by field engineer.

Ramps shall not be placed in line with drainage structures. Location of the ramp shall take precedence over location of the drainage structure except where existing structures are being utilized for construction of new ramps.

Any grate in pedestrian areas shall have openings no greater than 1/2" and shall be placed with long dimension of opening perpendicular to the direction of pedestrian travel.

If the B.350 0.50% grade of the slope cannot be obtained due to grade of the adjacent roadway, the sloped portion of the ramp shall be extended to a minimum length of 15'-0". Existing cross walk and stop bar markings will be eradicated and relocated as dictated by proposed ramp locations. Cost not incidental to cost of proposed ramp.

Ramp width shall match sidewalk width plus clearance. Typical sidewalk width is 5'-0". Minimum ramp width is 5'-0". Minimum ramps shall be 4' minimum. Minimum into the abutting roadway shall be provided within the width of the pedestrian street crossing and wholly outside the parallel travel lane. Surface to match existing. Any clear space work to be completed will be incidental to the cost of the ramp.

All curbs ramps shall be constructed to provide access to existing operable parts. An example of this would be pedestrian push buttons.

**TYPE IIIIB (DESCENDING SIDE ROAD ONLY)**

**LEGEND**

1. B.35% (10%) maximum ramp slope including construction tolerance. Slope of ramp shall carry through to face of curb
2. Cross slope: 2.00% maximum including construction tolerance
3. Curb ramps require a (5'-0") maximum turning space where pedestrians perform turning maneuvers with a maximum cross slope of 2% and longitudinal slope matching roadway
4. Grade breaks required to be flush (10") and perpendicular to pedestrian path of travel
5. If sidewalk is existing and non-compliant see "transition to existing non-compliant sidewalk" detail sheet 12
6. Detectable warning surface see "detectable warning surface (DWS)" detail sheet 11
7. Curb wall or check wall as dictated by field conditions see "existing adjacent surface transition" detail sheet 13
8. Clear space - width of curb ramp and extending 4" minimum
9. 3/4" chamfer edge

**PAY LIMITS FOR CURB RAMPS (EXCLUDING DW5)

**NOT TO SCALE**

**SIDEWALK RAMPS**

**Sheet 8 of 13**

**TYPE IIIIB RAMPS**

**STANDARD SHEET PV 7**
NOTES

The type of ramp to be used shall be as specified on the plans. These standards can be considered guidelines in selecting ramp types, however, they can be deviated from with a special detail as noted in plans.

Ramp concrete shall meet the requirements of Section 609 of the current WDOT Standards Specifications Roads and Bridges and any subsequent additions or supplement to the specifications, and the public rights of way accessibility guidelines (PIOWAG) dated July 26, 2000. Ramp surfaces shall include a "detectable warning surface." See section 777, 11th of 131 as shown for each ramp type. A coarse broom finish, transverse to flake, or equal non-skid finish shall be provided on concrete surfaces.

Minimum gutter fill line and profile shall be maintained throughout the ramp area, unless otherwise shown or specified. Positive drainage must be maintained so that no ponding occurs within the ramp or clear space area.

3/4" minimum, 1/2" maximum preformed expansion joint filler, meeting the requirements of Section 600 of the specifications, as noted above, shall be placed at all locations where ramp contacts curb, gutter, concrete pavement, or other rigid objects.

Where existing sidewalk connects to proposed sidewalk or ramps, expansion joints along with dowel bars will be placed. Dowel bars will be utilized between existing and proposed to reduce vertical change. See Sheet 11 for additional information. Scurcs will be utilized during demolition of existing sidewalk. Similar methods may be used upon approval by field engineer.

Ramps shall not be placed in line with drainage structures. Location of the ramp shall take precedence over location of the drainage structure, except where existing structures are being utilized for construction of new ramps. Any grate in pedestrian areas shall have openings not greater than 1/2" and shall be placed with long dimension of opening perpendicular to the direction of pedestrian travel.

If the &pi;333 (0.12) slope cannot be obtained due to grade of the adjacent roadway, the sloped portion of the ramp shall be extended to a minimum length of 15'-0".

Existing crosswalk and stop bar warnings shall be extended and relocated as dictated by proposed ramp locations. Cost not incidental to cost of proposed ramp.

Curb ramp with shall match sidewalk with flat clear area. Typical sidewalk width is 5'-0" minimum. Ramp widths less than 5' require division district engineer approval. Widths less than 4' require an exception justification report. See Sheet 11 for information regarding ramp thinness.

Grade breaks shall be perpendicular to the direction of the ramp run. Surface slopes that meet at grade breaks shall be flush.

Clear space beyond the bottom grade break, a clear space the width of the curb ramp and extending 4'-0" minimum into the abutting roadway shall be provided within the width of the pedestrian street crossing and wholly outside the parallel travel lane. Surface to match existing. Any clear space work to be completed will be incidental to the cost of the ramp.

All curb ramps shall be constructed to provide access to existing operable parts. An example of this would be pedestrian push buttons.

## TYPE IV RAMP

**Legend**

1. B.511 (125): Maximum ramp slope, including construction tolerance. Slope of ramp shall carry through to face of curb.
2. Cross slope: 2.00% maximum including construction tolerance.
3. Curb ramps require a 15'-0" minimum turning space where pedestrians perform turning maneuvers with a maximum cross slope of 2% and longitudinal slope matching roadway.
4. Grade break required to be flush (0") and perpendicular to pedestrian path of travel.
5. If sidewalk is existing and non-compliant see "transition to existing non-compliant sidewalk" detail sheet 12.
6. ULTRACLEAR WARNING SURFACE (UWWS) detail sheet 11.
7. Curb wall or cheek wall as dictated by field conditions. See "existing adjacent surface transition" detail sheet 13.
8. Clear space - width of curb ramp and extending 4'-0" minimum.
9. 3/4" Chamfer edge.

**Pay Limits for Curb Ramps (Excluding UWWS)**

**Not to Scale**

** sidewalk ramps**

(Sheet 9 of 13)

**Type IV Ramp**

**Standard Sheet Pvt 7**
THE TYPE OF RAMP TO BE USED SHALL BE AS SPECIFIED ON THE PLANS. THESE STANDARDS CAN BE CONSIDERED GUIDELINES IN SELECTING RAMP TYPES, HOWEVER THEY CAN BE REVISED FROM TIME TO TIME AS NOTED IN PLANS.

RAMP CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 609 OF THE CURRENT WSTD. DON STANDARD SPECIFICATIONS, ROADS AND BRIDGES AND ALL SUBSEQUENT DON SUPPLEMENTAL SPECIFICATIONS, AND THE PUBLIC RIGHTS OF WAY ACCESSIBILITY GUIDELINES (PRWAG). DATED JULY 26, 2003. RAMP SURFACE SHALL INCLUDE A "DETECTABLE WARNING SURFACE" (See PWT SHT. II of 13) AS SHOWN FOR EACH RAMP TYPE. A COARSE BROOM FINISH, TRANSVERSE TO FLARE SLOPES, OR EQUAL NON-SLIP FINISH SHALL BE PROVIDED ON CONCRETE SURFACES. NORMAL CUTTER FOR LINE AND PROFILE SHALL BE MAINTAINED THROUGH THE RAMP AREA, UNLESS OTHERWISE SHOWN OR SPECIFIED. POSITIVE DRAINAGE MUST BE MAINTAINED SO THAT NO PONDING OCCURS WITHIN THE RAMP OR CLEAR SPACE AREA.

1/4" MINIMUM, 1/2" MAXIMUM PROFILMED EXPANSION JOINT FILLER, MEETING THE REQUIREMENTS OF SECTION 609 OF THE SPECIFICATIONS. AS NOTED ABOVE, SHALL BE PLACED AT ALL LOCATIONS WHERE RAMP CONTACTS CURB, GUTTER, CONCRETE PAVEMENT, OR OTHER RIGID OBJECTS.

WHERE EXISTING SIDEWALK CONNECTS TO PROPOSED SIDEWALK OR RAMPS, EXPANSION JOINTS ALONG WITH DOWEL BARS WILL BE PLACED. DOWEL BARS WILL BE UTILIZED BETWEEN EXISTING AND PROPOSED TO REDUCE VERTICAL CHANGE. SEE SHEET II FOR ADDITIONAL INFORMATION.

GARDS WILL BE UTILIZED DURING DEMOLITION OF EXISTING SIDEWALKS. SIMILAR METHODS MAY BE USED UPON APPROVAL BY FIELD ENGINEER.

RAMPS SHALL NOT BE PLACED IN LIEU WITH DRAINAGE STRUCTURES. LOCATION OF THE RAMP SHALL TAKE PRECEDENCE OVER LOCATION OF THE DRAINAGE STRUCTURE, EXCEPT WHERE EXISTING STRUCTURES ARE BEING UTILIZED FOR CONSTRUCTION OF NEW RAMPS.

ANY GRADE IN PEDESTRIAN AREAS SHALL HAVE OPENINGS NOT GREATER THAN 1/2" AND SHALL BE PLACED WITH LONG DIMENSION OPENING PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.

IF THE 8.33% (0.15) SLOPE CANNOT BE OBTAINED DUE TO GRADE OF THE ADJACENT ROADWAY, THE SLOPED PORTION OF THE RAMP SHALL BE EXTENDED TO A MINIMUM LENGTH OF 15' - 0". EXISTING CROSS WALLS AND STOP BAR MARKINGS TO BE ERADICATED AND REPLACED AS DIRECTED BY PROPOSED RAMPS LOCATIONS. COST NOT INCIDENTAL TO COST OF PROPOSED RAMP. CURB RAMPS WITH MINIMUM RAMP WIDTHS PLUS CLEARANCE. TYPICAL SIDEWALK WIDTH IS 5 FT. MINIMUM. RAMP WIDTHS LESS THAN 5 FT. REQUIRE DOWEL OR FIELD ENGINEER APPROVAL. WIDTHS LESS THAN 4 FT. REQUIRE AN EXCEPTION JUSTIFICATION REPORT. SEE SHEET III FOR INFORMATION REGARDING RAMPS TOWARDS.

GRADE BREAKS SHALL BE PERPENDICULAR TO THE DIRECTION OF THE RAMP RUN. SURFACE SLOPES THAT MEET AT GRADE BREAKS SHALL BE FLUSH. CLEAR SPACE - BEYOND THE BOTTOM GRADE BREAK, A CLEAR SPACE THE WIDTH OF THE CURB RAMP AND EXTENDING 4" MINIMUM INTO THE ADJACENT ROADWAY SHALL BE PROVIDED WITHIN THE WIDTH OF THE PEDESTRIAN STREET CROSSING AND WOOLY OUTSIDE THE PARALLEL TRAVEL LANE. SURFACE TO MATCH EXISTING. ANY CLEAR SPACE WORK TO BE COMPLETED WILL BE INCIDENTAL TO THE COST OF THE RAMP.

ALL CURB RAMPS SHALL BE CONSTRUCTED TO PROVIDE ACCESS TO EXISTING OPERABLE PARTS. AN EXAMPLE OF THIS WOULD BE PEDESTRIAN PUSH BUTTONS.

NOTES
DETECTABLE WARNING SURFACE (DWS)

NOTES:
- DETECTABLE WARNING SURFACES (DWS)'S SHALL ONLY BE PURCHASED FROM VENDORS ON THE WEST VIRGINIA DIVISION OF HIGHWAYS APPROVED VENDOR LIST 609-2 - DETECTABLE WARNING SURFACES.
- DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH ADJACENT CURB, STREET, OR HIGHWAY. EITHER LIGHT OR DARK ON DARK OR DARK ON LIGHT.
- A MEAL OR PLASTIC SET-IN-PLACE DETECTABLE WARNING SURFACE (DWS) SHALL BE INSTALLED AT THE TIME OF THE PLACEMENT OF THE CURB RAMP, WHILE THE CONCRETE IS STILL PLASTIC.
- BUILD-IN-PLACE CONCRETE DOMES, BRICK PAVERS, OR IRON OR STEEL WARNING SYSTEMS SHALL NOT BE USED.
- SET-IN-PLACE DWS SHALL BE USED IN NEW CONSTRUCTION. SURFACE MOUNTED DWS ARE NOT PERMITTED.
- CONCRETE SHALL BE EDGED AROUND THE DWS AT THE TIME OF PLACEMENT.
- A SINGLE DWS PANEL SHALL BE USED WITH CURB RAMP WIDTHS OF 5" OR LESS. ANY CUTTING OF DWS DURING INSTALLATION SHALL BE APPROVED BY PROJECT ENGINEER.
- IF DWS IS CUT TO CONFORM TO A SPECIFIC SHAPE ON RAMP AND ANCHORING DEVICES BECOME PART OF THE RAMP, THEN ANCHOR WILL BE REMOVED AND REATTACHED INTO THE DWS AT THE ORIGINAL EDGE OFFSET AS PER MANUFACTURER.
- ALL DOWEL BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH SECTION 709.1 OF THE CURRENT WVDOT STANDARD SPECIFICATIONS ROADS AND BRIDGES.

CURB RAMP TYPICAL

NOTES:
- CURB RAMP AND BED COURSE MATERIAL TO BE PAID BY ITEM 609005-001 CURB RAMP.
- THICKNESS OF CONCRETE SHALL BE INCREASED TO 6" MINIMUM IN AREAS EXPOSED TO TRAFFIC.

CURB RAMP TYPICAL

NOTE: 1/2" DOWEL TO BE EVENLY SPACED, MINIMUM LENGTH 6". COST OF DOWEL INSTALLATION INCIDENT TO COST OF RAMP.
SIDEWALK TRANSITION
FROM NON-COMPLIANT EXISTING TO PROPOSED

EXISTING NON-COMPLIANT SIDEWALK
NEW TRANSITIONAL SIDEWALK
NEW CURB RAMP OR SIDEWALK

EXISTING CROSS SLOPE = 3% MAX NON-COMPLIANT
EXPANSION JOINT

EXPANSION JOINT

SIDESLOPE 2% MAX
EXPANSION JOINT

NOTE: CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 609 OF THE CURRENT
WWD, DOM STANDARD SPECIFICATIONS, ROADS AND BRIDGES AND ANY SUBSEQUENT DOH
SUPPLEMENTAL SPECIFICATIONS, AND THE PUBLIC RIGHTS OF WAY ACCESSIBILITY GUIDELINES
PROPOSED DATED JULY 26, 2011. A COARSE BROOM FINISH, TRANSVERSE TO FLARE SLOPES, OR
EQUAL. NON-SKD FINISH SHALL BE PROVIDED ON CONCRETE SURFACES.

NORMAL CUTTER FLOW LINE AND PROFILE SHALL BE MAINTAINED THROUGH THE TRANSITION AREA.
UNLESS OTHERWISE SHOWN ON SPECIFIED. POSITIVE DRAINAGE MUST BE MAINTAINED SO THAT NO
PONDING OCCURS.

SURFACE SLOPES THAT MIGE AT GRADE BREAKS SHALL BE FLUSH.
ANY GRADE IN PEDESTRIAN AREAS SHALL HAVE OPENINGS NOT GREATER THAN 1/2" AND SHALL
BE PLACED WITH LONG DIMENSION OPENING PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN
TRAVEL.

ENSURE THAT THE TRANSITION AREA IS FULLY TAPERED FROM THE EXISTING NON-COMPLIANT
SIDEWALK TO THE NEW SIDEWALK IN ORDER TO AVOID CREATING SADDLE DROP OFFS ALONG THE
PEDESTRIAN PATH OF TRAVEL.

MIX CONCRETE PLACED IN THE PROPOSED TRANSITION AREA TO MATCH THE EXISTING
NON-COMPLIANT SIDEWALK CROSS SLOPE AND WIDTH.

THE LENGTH OF THE PROPOSED TRANSITION AREA IS BASED ON THE TRANSITION REQUIRED TO
MEET CROSS SLOPE AND GRADE STANDARDS. SEE THE CHART ON THIS SHEET FOR CROSS
SLOPE RANGES AND ASSOCIATED PROPOSED TRANSITION SIDEWALK LENGTH. SHOULD
EXISTING CROSS SLOPE EXCEED 1%, USE THE TREND LINE IN THE CHART TO DETERMINE
APPROPRIATE PROPOSED TRANSITION SIDEWALK LENGTH.

SIDEWALK TRANSITION TO BE PAID AS 606002 - CONCRETE SIDEWALK AND 606002 - BID COURSE
MATERIAL.

TAPER LENGTHS TO BE DETERMINED BY SIDEWALK TRANSITION LENGTH. TAPER TO RUN
CONSISTENTLY ALONG THE FULL LENGTH OF NEW TRANSITIONAL SIDEWALK AS SHOWN.
TRANSITION PIECE TO BE Poured BEYOND RAMP SLOPE WHEN TYING RAMP INTO NON-COMPLIANT
EXISTING SIDEWALK.

ALL RAMP SLOPES TO BE BROUGHT TO FULL HEIGHT OF CURB BEFORE TRANSITION AREA
STARTS.

X SIDEWALK CROSS SLOPE TO BE ADJUSTED TO TRANSITION
FROM EXISTING SIDEWALK TO PROPOSED RAMP.

CROSS SLOPE

LEGEND

EXISTING SIDEWALK
SIDEWALK TRANSITIONAL LENGTH
SIDEWALK CROSS SLOPE
EXISTING SIDEWALK CROSS SLOPE
CROSS SLOPE TRANSITIONAL LENGTH
0.00 - 2.00% NOT REQUIRED
2.01 - 3.00% 1" 0"0'
3.01 - 4.00% 2" 0"0'
4.01 - 5.00% 3" 0"0'
5.01 - 6.00% 4" 0"0'
6.01 - 7.00% 5" 0"0'
7.01 - 8.00% 6" 0"0'
8.01 - 9.00% 7" 0"0'

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REVIEWED 11:20:13
APPROVED 11:20:13

Sheet 12 of 13
SIDEWALK TRANSITION AREA
STANDARD SHEET PVT 7
EXISTING ADJACENT SURFACE TRANSITION DETAIL

NOTES

DETAILS ON THIS SHEET USED TO SHOW OPTIONAL METHODS TO TRANSITION FROM EXISTING ROLLABLE AND NON-ROLLABLE SURFACES TO ADJACENT PROPOSED CURB RAMPS AND SIDEWALKS ONLY. ROLLABLE SURFACES INCLUDE, BUT ARE NOT LIMITED TO COMMERCIAL AREAS ADJACENT TO PROPOSED RAMPS.

CHEEK WALLS AND CURB WALLS SHALL MEET THE REQUIREMENTS OF SECTION 609 OF THE CURRENT HDOT, DOH STANDARD SPECIFICATIONS ROADS AND BRIDGES AND ANY SUBSEQUENT DOH SUPPLEMENTAL SPECIFICATIONS.

1/4" MINIMUM, 1/2" MAXIMUM PRE-FORMED EXPANSION JOINT FILLER, MEETING THE REQUIREMENTS OF SECTION 628 OF THE SPECIFICATIONS, AS NOTED ABOVE, SHALL BE PLACED AT ALL LOCATIONS WHERE RAMP CONTACTS CURB, GUTTER, CONCRETE PAVEMENT, OR OTHER NON-ROLLABLE OBJECTS.

WHERE PROPOSED CURB RAMP CONNECTS TO PROPOSED CURB/ CHEEK WALL, EXPANSION JOINTS ALONG WITH DOWEL BARS WILL BE PLACED. DOWEL BARS WILL BE UTILIZED BETWEEN EXISTING AND PROPOSED TO REDUCE VERTICAL CHANGE. SEE SHEET II FOR ADDITIONAL INFORMATION.

SANCTIONS WILL BE UTILIZED DURING DEMOLITION OF EXISTING SIDEWALKS. SIMILAR METHODS MAY BE USED UPON APPROVAL BY FIELD ENGINEER.

AS A MINIMUM, TOP AND BACK OF VISIBLE CURB WALL J UNTING ADJUSTING ROLLABLE SURFACE SHALL BE PAINTED WITH HIGH DEFINITION YELLOW PAINT.

CHEEK AND CURB WALLS MAY NOT BE REQUIRED WHEN WALL OR BUILDING PRESENT.

AS PREVIOUSLY NOTED, THE COST OF CHEEK WALL OF CURB WALL IS INCIDENTAL TO COST OF CURB RAMP.

1/2" DOWEL, TO BE EQUALLY SPACED, MINIMUM LENGTH TO BE 8". COST OF DOWEL INSTALLATION TO BE INCIDENTAL TO COST OF RAMP.

SEE STANDARD SHEET PVT3 FOR DETAIL OF TIE BAR AND CHANNEL TO BE USED FOR FORMING LONGITUDINAL JOINT.

ALL DOWEL BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH SECTION 709.1 OF THE CURRENT HDOH STANDARD SPECIFICATIONS ROADS AND BRIDGES.
REPAIRS PERFORMED AT AN EXISTING TRANSVERSE JOINT EVEN THOUGH ONLY ONE SIDE NEEDS REPAIR. THE TOTAL REPAIR LENGTH SHALL BE 6 FOOT.

CONCRETE REPAIR DETAIL METHOD A 6'

SECTION A-A

REPAIRS PERFORMED AT AN EXISTING TRANSVERSE JOINT EVEN THOUGH ONLY ONE SIDE NEEDS REPAIR. THE TOTAL REPAIR LENGTH SHALL BE 4 FOOT.

CONCRETE REPAIR DETAIL METHOD A 4'

SECTION A-A

REPAIRS PERFORMED AT AN EXISTING TRANSVERSE JOINT EVEN THOUGH ONLY ONE SIDE NEEDS REPAIR. THE TOTAL REPAIR LENGTH SHALL BE 4 FOOT.

CONCRETE REPAIR DETAIL METHOD A 4'

SECTION A-A

CONCRETE REPAIR DETAIL METHOD A 4'

GENERAL NOTES:

REPAIRS SHALL BE MADE IN CONCRETE MEETING THE REQUIREMENTS OF SECTION 501 OF THE SPECIFICATIONS. CONCRETE REPAIRS SHALL BE IN ACCORDANCE WITH SUBSECTION 501.32 OF THE SPECIFICATIONS AND MAY REQUIRE ADDITIONAL MATERIALS OR WORK PROCEDURES AS SPECIFIED IN THE STANDARD DETAILS. COST TO BE INCLUDED IN VARIOUS ITEMS IN THE CONTRACT.

HOLES FOR THE DOWELS AND LOAD TRANSFER UNITS SHALL BE DRILLED IN THE項目 DIRECTION. DOWEL BARS SHALL BE IN A SHORTLY PARALLEL POSITION. HOLE DIAMETER SHALL BE ±1/8" LARGER FOR CEMENT GROUTS AND ±1/16" FOR EPOXIES. HOLE DIAMETER AMOUNTS TO BE ADJUSTED TO SUIT THE CONTRACTOR'S EXHIBITED STANDARDS. FOR EPOXY BONDING COMPOUNDS APPROVED BY THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION MATERIALS CONTROL, SOILS AND TESTING DIVISION, THE HOLE DIAMETER SHALL BE ±1/8" LARGER THAN THE BAR DIAMETER. AN EPOXY BONDING COMPOUND AS APPROVED BY THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION MATERIALS CONTROL, SOILS AND TESTING DIVISION SHALL BE USED ON THE BAR DIAMETER. AN EPOXY BONDING COMPOUND AS APPROVED BY THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION MATERIALS CONTROL, SOILS AND TESTING DIVISION SHALL BE USED TO ENSURE THAT THE CONTRACTOR'S EXHIBITED STANDARDS ARE MET.

CONSTRUCTION OF HOLES FOR THE DOWELS AND LOAD TRANSFER UNITS SHALL BE DRILLED SIMULTANEOUSLY TO THE REQUIRED DEPTH USING FRAME MOUNTED DRILLS WHICH WILL MAINTAIN THE DRILLS IN A SHORTLY PARALLEL POSITION. HOLE DIAMETER SHALL BE ±1/8" LARGER FOR CEMENT GROUTS AND ±1/16" FOR EPOXIES. HOLE DIAMETER AMOUNTS TO BE ADJUSTED TO SUIT THE CONTRACTOR'S EXHIBITED STANDARDS. FOR EPOXY BONDING COMPOUNDS APPROVED BY THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION MATERIALS CONTROL, SOILS AND TESTING DIVISION, THE HOLE DIAMETER SHALL BE ±1/8" LARGER THAN THE BAR DIAMETER. AN EPOXY BONDING COMPOUND AS APPROVED BY THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION MATERIALS CONTROL, SOILS AND TESTING DIVISION SHALL BE USED ON THE BAR DIAMETER. AN EPOXY BONDING COMPOUND AS APPROVED BY THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION MATERIALS CONTROL, SOILS AND TESTING DIVISION SHALL BE USED TO ENSURE THAT THE CONTRACTOR'S EXHIBITED STANDARDS ARE MET.

PAYOUT SHALL INCLUDE ALL CONSTRUCTION WORK PERFORMED UNDER THIS CONTRACT, TO INCLUDE MATERIALS AND LABOR REQUIRED TO COMPLETE THE REPAIRS. PAYMENT SHALL BE MADE IN ACCORDANCE WITH SECTION 501 OF THE SPECIFICATIONS. CONCRETE REPAIRS MAY REQUIRE ADDITIONAL MATERIALS OR WORK PROCEDURES AS SPECIFIED IN THE STANDARD DETAILS. COST TO BE INCLUDED IN VARIOUS ITEMS IN THE CONTRACT.

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CONCRETE REPAIR DETAILS

SECTION A-A

CONCRETE REPAIR DETAIL METHOD B

REPAIRS PERFORMED AT AN EXISTING TRANSVERSE JOINT. THE SERRATION OR CLEAT CUTS OF THE JOINT SHALL NOT BE MORE THAN (5") IN LENGTH AND MUST BE PERFORMANCE OF THE JOINT. EXISTING DOWELS AND GROUT ASSEMBLIES SHALL BE COMPLETELY REMOVED WHEN A REPAIR IS PERFORMED AT A TRANSVERSE JOINT.

CONCRETE REPAIR DETAIL METHOD C

REPAIRS PERFORMED AT AN EXISTING TRANSVERSE JOINT. DETAIL METHODS A, B, C AND D SHALL APPLY.

CONCRETE REPAIR DETAIL METHOD D

REPAIRS PERFORMED IS COMPLETELY REPLACE SLABS BETWEEN TWO JOINTS. CONCRETE REPAIR DETAIL METHOD C

CONCRETE REPAIR DETAIL METHOD E

REPAIRS PERFORMED AT THE SLAB SHALL BE A MINIMUM OF 6" FROM AN EXISTING TRANSVERSE JOINT. DETAIL METHODS A, B, C AND D SHALL APPLY.
PEDESTRIAN GATE DETAIL

VEHICULAR GATE DETAIL

NOTES

The applicable details and notes of Standard Sheet 11 (Sheet 1 of 2) shall apply to this Standard Sheet.

Except for "normal length" line posts, all other posts and braces shall be galvanized steel pipe members or galvanized steel roll-formed members as shown in the "Fence Members Table" herein. When galvanized pipe posts are used, galvanized post bracing shall be used.

When roll formed posts are used, roll formed post bracing shall be employed.

Roll formed posts and braces shall meet the requirements of 12.8 of the Specifications.

Strengtheners, rods, and accompanying post bands shall not be used with roll-formed posts. Instead, the fence fabric shall be integrally woven into the lock loops of the posts.

Post caps shall not be used on roll-formed posts.

Gate frames and gate vertical braces shall be galvanized pipe members. Gate fabric shall have the same coating as the fence fabric. All other metal components of gates shall be galvanized, with the exception of die-cast aluminum corner fittings, or pressed steel corner fittings.

Table:

<table>
<thead>
<tr>
<th>Description</th>
<th>Galvanized Plain</th>
<th>Galvanized Coated</th>
<th>Steel Sheet</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-Grated Center</td>
<td>3.50</td>
<td>3.50</td>
<td>3.50</td>
<td></td>
</tr>
</tbody>
</table>
Notes

Chain link fence shall be in accordance with Section 608 of the Specifications.
Filter fabric shall be in accordance with Section 715.3.5 of the Specifications.
Super silt fence shall be in accordance with Section 642.6.8 of the Specifications.
Square filter fabric to chain link fabric with ties spaced at 24" centers.
Posts shall be driven.

ELEVATION

SECTION A-A
PROJECT MARKER

NOTES

Signs shall be fabricated from 0.08" thick aluminum sheets or #16 gauge galvanized steel sheets. Reflectors are not required. Signs shall have black legends and borders on white backgrounds. The letters and numerals are to be of the size and style shown herein.

U-channel posts shall meet the requirements of Section 607.2 of the Specifications. Steel signs and posts shall be galvanized in accordance with ASTM A-123.

Steel hardware shall conform with Subsection 709.23 of the Specifications. Cast aluminum hardware with Subsections 709.36 and 709.37. Steel hardware shall be galvanized in accordance with ASTM A-153.

Top of posts shall extend to the top of signs.

All posts and signs shall be punched with 3/8-inch holes on 1" centers in vertical locations. Signs shall be so located that the signs can be attached to the posts at three inches below the top of the sign and three inches above the bottom of the sign.

U CHANNEL SIGN POST DETAIL

ELEVATION

Mounting Detail

1/8" pilots.
2/16" pilot
2 1-1/4" x 2-1/2" x 6' with 1-1/4" and 3/4" holes.

Example Project Signs
I-79
APD
I-279
STANDARD SURVEY MARKER

NOTES
Survey markers shall conform to the requirements of the Standard Specifications. Sufficient reinforcement shall be included in precast survey markers to resist handling stresses.

ALTERNATE SURVEY MARKER

PLAN VIEW
Deep hex socket that won't "wobble" when tapped on to the rebar
Mark for alignment reference Center punch & cross

SECTION E-E

NOTES
Survey markers shall conform to the requirements of the Standard Specifications.