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<td>1111-5-E-00</td>
<td>Obliteration of Existing Maintenance Turnaround</td>
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<td>1380-5-E-01</td>
<td>Curb Removal Detail</td>
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<td>Grading for Box Culvert Extensions</td>
<td>July 2020 - Revision</td>
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<td>July 2020 - Revision</td>
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<td>Surfacing Around Guardrail - 31&quot;</td>
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<td>Details of Maintenance Turnaround with 40'-Median</td>
<td>OBSOLETE PLAN REMOVE FROM BOOK (RENUMBERED TO 1910-2-E-00)</td>
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<td>Roadside Sediment Trap and Outlet</td>
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<td>Details of Rock Riprap Scour Hole</td>
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<td>OBSOLETE PLAN REMOVE FROM BOOK</td>
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<td>Metal Diaphragm Detail</td>
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<td>Inlet Liner Details</td>
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<td>31&quot; Transition to 27 5/8&quot; Guardrail - 31&quot;</td>
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<td>7046-5-E-02</td>
<td>Curved Beam Design Guide - 31&quot;</td>
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<td>7049-5-E-00</td>
<td>MGS For Long Span - 31&quot;</td>
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<td>7390-5-E-00</td>
<td>25 Ft. Transition Section 31&quot; to Existing 27 5/8&quot;</td>
<td>July 2020 - New Plan</td>
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<td>8350-5-E-01</td>
<td>Sections of Timber Plank and Rubberized Crossing</td>
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OBLITERATION OF EXISTING MAINTENANCE TURNAROUND
CURB REMOVAL DETAIL

VIEW 1

THIS SKETCH IS TO BE USED WHEN SURFACE WILL NOT BE OVERLAYERED.

CURB REMOVAL DETAIL

VIEW 2

THIS SKETCH IS TO BE USED WHEN CURB IS TO BE REMOVED MORE THAN 1 WAY ON A PROJECT EACH SHOULD HAVE A SKETCH AND IDENTIFY WHERE IT IS APPLICABLE.

CURB REMOVAL DETAIL

VIEW 4

NOTE:

THIS SKETCH IS NORMALLY NOT REQUIRED AS IT IS COVERED IN THE SPECS. HOWEVER IF THE CURB IS TO BE REMOVED MORE THAN 1 WAY ON A PROJECT EACH SHOULD HAVE A SKETCH AND IDENTIFY WHERE IT IS APPLICABLE.

CURB REMOVAL DETAIL

VIEW 3

THIS CAN ALSO BE REMOVED AS PAVEMENT.
NOTE: FOR ADDITIONAL DETAILS SEE DRAINAGE CROSS-SECTIONS.

L = LENGTH FROM SHOULDER TO END OF EXTENSION
NOTE: FOR ADDITIONAL DETAILS SEE DRAINAGE CROSS-SECTIONS.

STeeper Slope

Limits of Construction

Grading for Culvert Extensions

$L = \text{Length from Shoulder to End of Extension}$
VIEW 7

NON-SURFACED SHOULDER AT CABLE GUARDRAIL LOCATIONS
SURFACE UNDER GUARDRAIL

VIEW 8

NON-SURFACED SHOULDER WITH CABLE AT CABLE GUARDRAIL LOCATIONS
SURFACE UNDER GUARDRAIL
Design of Interception Dikes

- Elevation of Intercepting Dikes
- Plan View of Intercepting Dikes
- Section A-A of Intercepting Dike
- Section B-B of Intercepting Dike
NOTE: TRANSVERSE JOINT SPACING AT 16'-6"

DEFORMED BAR SPACING
(Steel Reinforced Concrete Pavement)

8 BARS ON 18" CTRS.

NOTE: SKEWED TRANSVERSE JOINT SPACING AT 16'-6"

DEFORMED BAR SPACING
(Plain Concrete Pavement)

8 BARS ON 18" CTRS.

SECTION A-A

SECTION B-B

1½" X 18" EPOXY
COATED DEFORMED BARS

REPAIR MATERIAL

SANDBLAST & VACUUM CLEAN SLOT

CAULKING FILLER

DIAMOND SAW BLADE CUT

PLAN VIEW DEFORMED BAR SLOT MATERIAL REMOVAL
TRANSVERSE JOINT
THAN 30 LBS) HAMMER LIGHTWEIGHT (NOT LARGER
REMOVE MATERIAL WITH DIAMOND SAW BLADE CUT
PLAN VIEW DOWEL BAR RETROFIT SLOT MATERIAL REMOVAL
NOTE: SHOWN TRANSVERSE JOINT SPACING AT 15'-6"

RETOFIT DOWEL BAR SPACING

NOTE: THE 10'-6" DRIVING LANE WHERE THE DOWEL BAR RETROFIT IS PLACED SHALL BE SAWED AND SEALED ACCORDING TO THE TRANSVERSE JOINT DETAIL.

PLAN VIEW DOWEL BAR RETROFIT SLOT MATERIAL REMOVAL

SECTION A-A

SECTION B-B

EXPANSION CAP

DOWEL BAR SUPPORT (CHAIR)

FOAM BOARD FILLER DETAIL

EXPANSION CAP

DOWEL BAR SUPPORT TO REST ONE IN LEVEL SURFACE CREATED BY SAW BLADE

DIAMOND SAW BLADE CUT

SURFACE PAVEMENT

2'-0" 1'-0" 1'-0" 2'-6"

1'-0" 1'-0" 3'-0" 10'-0" 12'-0" 15'-0"

DIAMOND SAW BLADE CUT

EXPANSION CAP

CAULKING FILLER

SAND BLAST & VACUUM CLEAN SLOT

REPAIR MATERIAL

FOAM BOARD FILLER DETAIL

+ --- + --- +

- --- - --- -

…" " " THICK FOAM BOARD FILLER,
FLUSH TO SLIGHTLY RECESSED

DOWEL BAR SUPPORT (CHAIR)

SECTION A-A

DOWEL BAR

DOWEL BAR SUPPORT TO REST ONE IN LEVEL SURFACE CREATED BY SAW BLADE

DIAMOND SAW BLADE CUT

SURFACE PAVEMENT

2'-0" 1'-0" 1'-0" 2'-6"

1'-0" 1'-0" 3'-0" 10'-0" 12'-0" 15'-0"

DIAMOND SAW BLADE CUT

EXPANSION CAP

CAULKING FILLER

SAND BLAST & VACUUM CLEAN SLOT

REPAIR MATERIAL

FOAM BOARD FILLER DETAIL

+ --- + --- +

- --- - --- -

…" " " THICK FOAM BOARD FILLER,
FLUSH TO SLIGHTLY RECESSED

DOWEL BAR SUPPORT (CHAIR)
NOTE: PRECAST CONCRETE CURB STOP SHALL BE ANCHORED WITH NO. 7 BARS 18" IN LENGTH
PLAN VIEW

15'' DIA. SDR-35 PVC SEWER PIPE

EDGE OF SHOULDER

SLOTTED VANE DRAIN

CURB INLET

FLOW

FLOW

15"

21"

3'' TYPE

1'-9"

GRANULAR FILL

UNDERDRAIN W/PERFORATIONS

VARYING WIDTH

18'' CONCRETE PIPE

CONCRETE TRENCH

18'' CONCRETE PIPE

VARIES

6'' MIN.

VARIES

4'' CORR. POLYETHYLENE PIPE

18'' CONCRETE PIPE

[ISOMETRIC VIEW OF DRAINAGE STRUCTURE DETAILS
STA. ****]
CABLE LOOPS WILL BE PROVIDED, WHERE NECESSARY, FOR HANDLING PURPOSES. APPROVED DRAWINGS. THE DRAWINGS WILL SHOW THE SHAPE, PLACEMENT AND SIZE OF STEEL.

THE STATE WILL BE FURNISHED, PRIOR TO FABRICATION, FIVE SETS OF ENGINEER APPROVED DRAWINGS. THE DRAWINGS WILL SHOW THE SHAPES, PLACEMENT AND SIZE OF STEEL.

CABLE LOOPS WILL BE PROVIDED, WHERE NECESSARY, FOR HANDLING PURPOSES.

THE NUMBER OF INDIVIDUAL SECTIONS USED TO MAKE UP A COMPLETE END SECTION MAY VARY, HOWEVER, NO ONE INDIVIDUAL SECTION WILL BE LESS THAN 4'-6" IN LENGTH.

S = 2.5 FOR BOX RISES UP TO 8', AND S = 2 FOR RISES IN EXCESS OF 8'.

X = 2'-0" FOR BOX RISES UP TO 8', AND X = 3'-0" FOR RISES IN EXCESS OF 8'.

THE STATE WILL BE FURNISHED, PRIOR TO FABRICATION, FIVE SETS OF ENGINEER APPROVED DRAWINGS. THE DRAWINGS WILL SHOW THE SHAPES, PLACEMENT AND SIZE OF STEEL.

CABLE LOOPS WILL BE PROVIDED, WHERE NECESSARY, FOR HANDLING PURPOSES.
Note: All Dowel Bars are No. 6 Bars x 2'-6" Placed at 18" Centers and Perpendicular to the Surface to be Extended. Place Dowels in 1½" Holes and Grout Full.

PREPARATION OF EXISTING BOX CULVERT FOR EXTENTION
**View 1**

- **SECTION C-C**
  - 6" x 6" x 42° WIRE MESH

- **SECTION A-A**

**View 2**

- **DETAILS OF DROP CURB FOR DRAINAGE**
  - 4" DEPTH
  - 2% MIN.

- **SECTION B-B**

**Errosion Control**

- **EROSION CONTROL**
  - 3'-0" MIN.
  - 4'-0" MIN.
CURB INLET DEPRESSION

Limits of Transition Area

Gutter Depression Template

Work paid for as concrete pavement

Limits of Transition Area

Y + 10'

5'-0" 5'-0" 3'-3"
MSE WALL V-DITCH DRAIN

CONCRETE FLUME SECTION A-A

10" PVC PIPE
6" LAP AT SPLICES

6 - #8 x 2'-0"

EDGE OF DITCH

A

A

MODIFY SECTION TO MEET DRAINAGE NEEDS

FOOTING

3'-0"

4"

90° ELBOW

18" PVC PIPE

6" LAP AT SPLICES

6 - #8 x 2'-0"

5/8 EXPANSION JOINT

INSIDE FACE OF COPING

FACE OF MSE WALL

OUTSIDE FACE OF COPING

COPING

3'-0"

18"

18"

OUT TO MATCH SLOPE

SLOPE = 0.5%

SLIP = 0.5%

CUTTING

CONCRETE FLUME AT END OF MSE WALL DETAIL

MSE WALL V-DITCH DRAIN

CONCRETE FLUME AT END OF MSE WALL DETAIL
PROJECT NO.

SHEET NO.

C.N.

ROADWAY DESIGN DIVISION

Computer: NDOT DESIGN 134

Date: 13 - APR - 2020 14:56

File: 45005 e01.dgn

DETAILS OF ROCK RIPRAP

SHEET 1 OF 1

STA. * TO STA.*

STA. * TO STA.*

STA. * TO STA.*

STA. * TO STA.*
**Sheet 1 of 2**

**Section B-B**
- 10'-0" Width
- 4'-0"
- 1'-0" Weir Depth
- 3:1
- Type A Rock Riprap

**Section C-C**
- Embankment
- Earthen
- Berm Depth
- 2:1
- Type A Rock Riprap
- 1'-6" Apron Depth

**Section D-D**
- 1'-6" Apron Depth
- Total Depth
- Wet Storage (67 CY/ACRE)
- Basin Length (See Table 2)
- Dry Storage (67 CY/ACRE)
- 3:1

**Table 2**

<table>
<thead>
<tr>
<th>Contributing Drainage Area</th>
<th>Basin Length (FT.)</th>
<th>Basin Width (FT.)</th>
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<td>1 ACRE</td>
<td>22</td>
<td>15</td>
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<tr>
<td>2 ACRE</td>
<td>40</td>
<td>25</td>
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<tr>
<td>3 ACRE</td>
<td>56</td>
<td>29</td>
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<td>4 ACRE</td>
<td>73</td>
<td>34</td>
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<td>5 ACRE</td>
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**Table 1**

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<td>2 ACRE</td>
<td>5</td>
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<td>3 ACRE</td>
<td>6</td>
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<tr>
<td>4 ACRE</td>
<td>8</td>
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<tr>
<td>5 ACRE</td>
<td>12</td>
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**Section E-E**
- 3'-0" Width
- 3:1
- 2:1
- 1'-0"
- Sediment Trap Outlet
- 2'-0"
- 3'-4"
- 2:1
- 3:1
- 2'-0"
- 5'-0"

**Plan View**
- Earthen Embankment
- Flow

**Roadside Sediment Trap and Outlet**

**Typical Roadside Ditch Sediment Trap Basin**
- Rock Riprap Outlet
- Ditch Dike with Cutout for Outlet
TYPICAL ROADSIDE DITCH APPLICATION

TYPICAL OUTLET SWALE APPLICATION

ROADSIDE SEDIMENT TRAP AND OUTLET
DETAIL OF ROCK RIPRAP SCOUR HOLE

BUILD ROCK RIPRAP SCOUR HOLE

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<tr>
<th>STATION</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>W_B</th>
<th>L_B</th>
<th>TONS</th>
<th>RIPRAP TYPE</th>
<th>FILTER FABRIC</th>
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</table>
NOTES:
WHEN MULTIPLE PIPES W/FLARED END SECTIONS ARE USED, WIDTH OF BASIN (W_B) MUST BE AT LEAST EQUAL TO THE DISTANCE BETWEEN THE OUTSIDE EDGES OF THE FLARED END SECTIONS.

DETAIL OF ROCK RIPRAP SCOUR HOLE

<table>
<thead>
<tr>
<th>STATION</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>W_B</th>
<th>L_B</th>
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<th>FILTER FABRIC SQ. YDS.</th>
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### NOTES:

When placing riprap basin at outlet of box culvert, pave the apron between the wingwalls w/ 3-5 foot cutoff wall/footing.

### DETAILS OF ROCK RIPRAP SCOUR HOLE

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<thead>
<tr>
<th>STATION</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>WB</th>
<th>LB</th>
<th>TONS</th>
<th>RIPRAP TYPE</th>
<th>FILTER FABRIC SQ. YDS.</th>
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BRIDGE DRAINAGE BASIN

PLAN VIEW

SECTION A-A
CONCRETE DITCH LINER

SECTION B-B
DETAIL OF BROKEN CONCRETE RIPRAP

SECTION C-C

*AT SLOPES STEEPER THAN 2%, THE DITCH LINER WILL EXTEND TO THE SLOPE IN THE GRADE.

QUANTITIES PER DRAINAGE BASIN
BROKEN CONCRETE RIPRAP = 9.6 TON

RIP RAP
PIPE BEDDING DETAIL
FOR PIPES LARGER THAN 15" DIAMETER

CRUSHED ROCK BEDDING

CENTERLINE PIPE

PIPE DIA. + 3'-0" MAX.

6" MIN.
METAL DIAPHRAGM DETAILS

STANDARD TANK LUG DETAILS

ELEVATION OF ASSEMBLED DIAPHRAGM

SECTION

ELEVATION

END VIEW

STANDARD TANK LUG DETAILS

METAL DIAPHRAGM DETAILS
INLET LINER DETAILS
REFERENCE A PLAN VIEW OF YOUR MSE WALL
(LIKE THIS SAMPLE)
BOX WILL BE ERASED

REFERENCE A CROSS SECTION VIEW
OF YOUR MSE WALL
(LIKE THIS SAMPLE)
BOX WILL BE ERASED

SUMMARY OF QUANTITIES

LOCATION

<table>
<thead>
<tr>
<th>COMPOUND</th>
<th>SELECT GRANULAR BACKFILL</th>
<th>LEVELING PAD</th>
<th>MSE WALL EXT.</th>
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</table>

* MEASURED FROM CONCRETE LEVELING PAD TO TOP OF COPING
** SEE BRIDGE PLANS FOR CORRUGATED METAL PIPE LAYOUT

MECHANICALLY STABILIZED EARTH WALL
SHEET 1 OF 2
SPECIAL PLAN C
REFERENCE A PLAN VIEW OF YOUR MSE WALL (LIKE THIS SAMPLE) BOX WILL BE ERASED

REFERENCE A CROSS SECTION VIEW OF YOUR MSE WALL (LIKE THIS SAMPLE) BOX WILL BE ERASED

ELEVATION AT ABUTMENT NO. 1
VIEW A-A

SUMMARY OF QUANTITIES

LOCATION | CUMMEN FACE PANELS | SELECT GRANULAR BACKFILL | COPING | LEVELING PAD | MSE WALL
|----------|--------------------|--------------------------|--------|--------------|--------
| ABUT. #1 | 600 | 30 | 100 | 50 | 20 |

MECHANICALLY STABILIZED EARTH WALL

SPECIAL PLAN C

TYPICAL SECTION OF BACKFILL AT ABUTMENT (NOT TO SCALE)

WARP Fill SLOPE AROUND BLUNT ENDS OF WALL.
GRANULAR BACKFILL SHALL BE CAPPED WITH 1 FOOT OF CONCRETE TOE.
MSE WALL TEXTURE:
THE FRONT FACE OF THE MSE WALL SHALL BE TEXTURED USING SYMCO FORM LINERS FRACOURED GRANITE PATTERN (NOT TO SCALE) OR SYMONS FORM LINERS PATTERN NO. 1006 ON AN APPROVED EQUAL.

MEASURED FROM CONCRETE LEVELING PAD TO TOP OF COPING
** SEE BRIDGE PLANS FOR CORRUGATED METAL PIPE LAYOUT

MEASURES FROM CONCRETE LEVELING PAD TO TOP OF COPING
** SEE BRIDGE PLANS FOR CORRUGATED METAL PIPE LAYOUT
REFERENCE A PLAN VIEW OF YOUR MSE WALL (LIKE THIS SAMPLE). BOX WILL BE ERASED.

REFERENCE A CROSS SECTION VIEW OF YOUR MSE WALL (LIKE THIS SAMPLE). BOX WILL BE ERASED.

SUMMARY OF QUANTITIES

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>GRANULAR BACKFILL (CU. YD.)</th>
<th>COPING PANELS (LIN. FT.)</th>
<th>CONCRETE LEVELING PAD (CU. YD.)</th>
<th>MSE WALL PANELS (SQ. FT.)</th>
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<tbody>
<tr>
<td>ABUT. #1</td>
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* MEASURED FROM CONCRETE LEVELING PAD TO TOPE OF COPING

** SEE OTHER PLANS FOR CORRUGATED METAL PIPE LAYOUT
REFERENCE A PLAN VIEW OF YOUR MSE WALL (LIKE THIS SAMPLE) BOX WILL BE ERASED

REFERENCE A CROSS SECTION VIEW OF YOUR MSE WALL (LIKE THIS SAMPLE) BOX WILL BE ERASED

SUMMARY OF QUANTITIES

LOCATION               | CONCRETE PANELS (LIN. FT.) | SELECT GRAIN BACKFILL (LIN. FT.) | COPING (LIN. FT.) | LEVELING PAD (LIN. FT.) | MSE WALL PANELS (LIN. FT.)
---                     |----------------------------|---------------------------------|-------------------|------------------------|------------------------
ABUT. #1               |                            |                                |                   |                        |                        

* MEASURED FROM CONCRETE LEVELING PAD TO TOP OF COPING
** SEE BRIDGE PLANS FOR CORRUGATED METAL PIPE LAYOUT

MECHANICALLY STABILIZED EARTH WALL
SPECIAL PLAN C

TYPICAL SECTION OF BACKFILL (NOT TO SCALE)

LEVEL PAD EL=1167.00

MEASURED ALONG WALL.

0.7' HGRANULAR BACKFILL

VOLUME OF SELECT GRANULAR BACKFILL =

SUMMARY OF QUANTITIES

LOCATION | CONCRETE PANELS (LIN. FT.) | SELECT GRAIN BACKFILL (LIN. FT.) | COPING (LIN. FT.) | LEVELING PAD (LIN. FT.) | MSE WALL PANELS (LIN. FT.)
---       |----------------------------|---------------------------------|-------------------|------------------------|------------------------
ABUT. #1  |                            |                                |                   |                        |                        

* MEASURED FROM CONCRETE LEVELING PAD TO TOP OF COPING
** SEE BRIDGE PLANS FOR CORRUGATED METAL PIPE LAYOUT
VIEW 1 - 31" BAS FOR MGS TRANSITION TO W-BEAM

VIEW 2 - MGS TRANSITION TO W-BEAM
FOR PDU INFORMATION PLACE DETAILS INSIDE BLUE BOX ON GUARDRAIL LAYOUT SPECIAL PLAN SHEETS.

DETAIL OF CURVED BEAM

NOTE: SHOWN GUARDRAIL WHEN RADIUS IS SHARPER THAN 150'.

END TREATMENT TABLE

<table>
<thead>
<tr>
<th>TYPE OF INT.</th>
<th>END TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRIVEWAY</td>
<td>END ANCHORAGE ASSEMBLY</td>
</tr>
<tr>
<td>COUNTY ROAD</td>
<td>TYPE I OR II</td>
</tr>
<tr>
<td>STATE HIGHWAY</td>
<td>TYPE I OR II</td>
</tr>
</tbody>
</table>

EXAMPLE OF CURVED BEAM INSTALLATION

CURVED BEAM DESIGN GUIDE
MGS FOR LONG SPAN

FOR PDU INFORMATION: PLACE DETAILS INSIDE BLUE BOX ON GUARDRAIL LAYOUT SPECIAL PLAN SHEETS.
POST 9

DISTANCE TO SECOND EXISTING POST:
- WHEN 6'-3" TO 9'-0" USE POST ONE IN PLACE.
- WHEN 6'-3" TO 10'-1" USE POST ONE IN PLACE AND ADD ANOTHER POST AT 3'-1".
- WHEN 8'-1" TO 10'-0" USE POST ONE IN PLACE.

W-BEAM TRANSITION 31" TO 27½"
SECTION OF TIMBER PLANK CROSSING (TYPICAL)

WIDER TREATED TIMBER PLANK MAY BE SUBSTITUTED FOR THE OPTIONAL 4" X 10" HEADER AND ADJACENT PLANK WHEN 9'-0" TIES ARE USED IN CROSSING CONSTRUCTION.

SECTION OF RUBBERIZED CROSSING

NOTE: DROP INTEGRAL CURB 6'-0" FROM RAILROAD CROSSING