FORWARD TO METRIC STANDARD PLANS

Welcome to the metric world! By now you have probably heard that NDOT has gone metric except for the speed limits and distances on the roadway signs. A few game rules have changed.

One noticeable change will be the slope ratio. We used to say 4:1, 1 1/2:1, 1:1, 1/2:1 (H:V); now it will be 1:4, 1:1.5, 1:1, 2:1 (V:H). Fractions are not allowed in metrics. Another change is in the rebar. The soft conversion suggested by the Concrete Reinforcing Steel Institute (CRSI) will be used. For example a NO. 4 rebar becomes NO. 13 and a NO. 5 becomes NO. 16.

A lot of manufactured products will just undergo a name change and not a physical change. For example a 24" CMP becomes a 600 mm CMP. Gauges for CMP, wires and plates have been eliminated and replaced with actual thickness to nearest 0.1 mm. Pipe sizes, excluding culvert pipes, will be nominal pipe sizes (NPS). For example, 2" pipe becomes NPS 2 per ASTM A53.

We strongly encourage the use of metric products. However, if a metric product is not economically available then the English equivalent may be substituted.

ASTM, AASHTO, AGC, ARTBA, APWA and other organization's documents are available to provide their metric information. MUTCD had not yet put out their metric version at the time this document was being published.

There are several new sheets in the standard plans, several sheets were eliminated and several sheets split into two sheets for clarity.

A metric conversion manual is being published by Operational Analysis Division. The metric design manual is scheduled for mid 1997.

If you find an error or want to make a comment, make a copy of that sheet with your comments and forward them to Gene Bails, Standards and Manuals, 1263 S. Stewart Street, Carson City, Nevada 89712.
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**GENERAL NOTES**

1. Trenches more than 12 m deep shall be shored. Soil back to at least the edge of the drain for existing site conditions, or other means of protection shall be provided.

2. If hazardous field conditions indicate gravel support may be expected, trenching less than 12 m deep shall also be protected as excised.

3. For the purpose of payment, structure excavation and backfill quantities are based on these standards.

4. The above quantities are based on inside dimension drawings and no additional payment will be made for shearing.

5. Trench excavation shall conform to OSHA regulations.

6. The quantity of structure excavation and backfill measured for payment shall be the number of cubic meters calculated above any excavation of limits.

7. Granular backfill to be placed for a depth of 150 mm above the bottom of the walls for the width of the trench.

8. The limits of structure excavation and backfill shown herein shall be subject to the methods of measurement, the payment quantities, and the standards for any additional excavation or backfill required for excavations to meet OSHA regulations.

9. Trench shearing conform to OSHA regulations.

**LEGEND**

- Structure Excavation
- Granular Backfill
- Roadway Embankment

---

**STATE OF NEVADA**

**DEPARTMENT OF TRANSPORTATION**

**STRUCTURE EXCAVATION AND BACKFILL**

**METHOD OF MEASUREMENT**
### Corrugated Aluminum Alloy Pipe

#### 68 mm x 13 mm

<table>
<thead>
<tr>
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<th>MINIMUM PLATE THICKNESS</th>
<th>MAX TELL HEIGHTS ABOVE TOP OF PIPE IN MM</th>
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</tr>
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<td>4.6</td>
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<tr>
<td>1050</td>
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<td>3.7</td>
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<tr>
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#### 75 mm x 25 mm

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### Covering Dimensions

#### 68 mm x 13 mm

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### Covering Dimensions

#### 75 mm x 25 mm

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### Maximum Height Cover for Structural Plate Pipe

#### 68 mm x 13 mm

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### Maximum Height Cover for Structural Plate Pipe

#### 75 mm x 25 mm

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**Note:** To determine proper metal thickness (mm), select the span in the left-hand column that is next larger to size structure. Required Example—If you need a 3251 mm span x 2261 mm rise structure, use the line for span 3.4 m.

**Contact Hydrostatics Engineer for Materials or sizes not listed.**
**GENERAL NOTES**

1.パイプの取付け長さは図面と構造上の要件に基づいて計算されたものであり、図面に示されている長さで指示される。パイプの間隔は通常、パイプの取付け長さを計画するための目安を提供するものである。

2.パイプの取付け長さは、通常、パイプの間隔を計画するための目安を提供するものである。

3.パイプの取付け長さは、通常、パイプの間隔を計画するための目安を提供するものである。

4.パイプの取付け長さは、通常、パイプの間隔を計画するための目安を提供するものである。

5.パイプの取付け長さは、通常、パイプの間隔を計画するための目安を提供するものである。

6.パイプの取付け長さは、通常、パイプの間隔を計画するための目安を提供するものである。

7.パイプの取付け長さは、通常、パイプの間隔を計画するための目安を提供するものである。

8.パイプの取付け長さは、通常、パイプの間隔を計画するための目安を提供するものである。

9.パイプの取付け長さは、通常、パイプの間隔を計画するための目安を提供するものである。

10.パイプの取付け長さは、通常、パイプの間隔を計画するための目安を提供するものである。

**STANDARD CONNECTIONS**

1. TYPE 1 FOR 300 mm CMP THROUGH 600 mm CMP ONLY

2. TYPE 2 FOR 750 mm CMP THROUGH 2000 mm CMP AND FOR 425 mm X 925 mm CMP AND 500 mm CMP (MIN)

3. TYPE 3 FOR 630 mm CMP THROUGH 2475 mm CMP OR FOR 300 mm CMP THROUGH 2000 mm CMP (OPTIMIZED)

**ELEVATION**

ANCHOR BLOCK DETAIL

1. LENGTH OF THE PLATE TO BE W = 250 mm MAX FOR 500 mm TO 750 mm DIAMETER PIPE EXCLUSIVE & W = 550 mm MAX FOR 500 mm DIAMETER PIPE LARGER.

2. LENGTH OF THE PLATE TO BE W = 250 mm MAX FOR PIPE ARCHES WITH ROSE OF 325 mm AND 750 mm DIAMETER PIPE LARGER.

**PLAN**

1. PIPE DIAMETER

2. CONNECTOR SECTION

3. BOLTS OR RIVETS

4. STANDARD STRAP CONNECTOR

5. ROD HANGER

6. ELEVATION ANCHOR BLOCK DETAIL

**SECTION**

1. TYPE 1 OR 2 CONNECTION

2. TYPE 3 CONNECTION

**DETAIL B**

1. PIPE CONNECTIONS

2. PIPE ANCHOR DIMENSIONS

3. CONCRETE MIXTURES
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<td>575</td>
<td>3800</td>
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**GENERAL NOTES**

1. Class and type of concrete shall be as specified for reinforced concrete pipe.
2. Structural design of end section shall conform to that of standard reinforced concrete culvert pipe.
3. Length of pipe shown on the plans does not include connector section (length C).
4. Contact hydrologic engineer for sizes not listed.

---

**PLAN**

**END VIEW**

**SECTION A-A**

**CROSS SECTION VIEW**

450 mm RCP TO 1350 mm RCP
### LENGTH OF REINFORCING BARS

#### SINGLE CMP

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**Quantities Shown Above Are for One Headwall.**

- For 1200 mm & 1500 mm Dia.
- For 1500 mm & 1800 mm Dia.

---

**TYPICAL SECTION 1200 mm**

**GENERAL NOTES**

1. CONCRETE SHALL BE CLASS A OR B.
2. REINFORCING STEEL SHALL BE DEFERRTED BARS WITH MAXIMUM SPACING OF 500 MM SET 65 MM CLEAR OF SURFACE OF CONCRETE EXCEPT AS NOTED. BAR END SHALL BE KEPT 60 MM CLEAR OF SURFACE OF CONCRETE. REINFORCING BARS MAY BE CUT AND BENT ON FIELD.
3. FOUNDATION HOE ARE OF MINIMUM DEPTH AND SHALL BE EXHAUSTED IF SOIL IS UNSTABLE OR LIKELY TO SPOUR.
4. WELDING OF CHAINAGES, HEADWALLS AND CONNECTORS, WHEN RECOMMENDED ARE TO BE WELDED BY EXACT PROPERTIES OF PIPE SHALL NOT BE WELDED EXCEPT IN CONDITIONS WHERE IT IS NECESSARY.
5. FOR ESTIMATING HEADWALL QUANTITIES ON SHEER PIPE, USE QUANTITIES ON SHEER PIPE.
6. USE QUANTITIES ON SHEER PIPE.
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10. OVER 50' - CALCULATE QUANTITIES FOR SHEER PIPE.
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100. USE QUANTITIES ON SHEER PIPE.

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**STATE OF NEVADA**

**DEPARTMENT OF TRANSPORTATION**

**CULVERT HEADWALLS**

1200 mm CMP TO 1800 mm CMP

---

**NOTE:**

Anchor Bolts To Be Installed On Inlet End Only.

(Saw Nuts # G)
### GENERAL NOTES

1. All coupling band connection hardware shall be galvanized or electroplated in accordance with standard specifications.
2. For WYAN ARCHEL use same AS for round pipe of equal ferrule.
3. Two piece band is required for pipe greater than 100 mm diameters.
4. Design strap may be connected to band on sheet with either spot welded or fillet welds that develop minimum required strength of strap.
5. Use 10 mm gauge steel dimension on attached angle leg for rivets and spot welds.
6. Band thickness shall not be less than 2 standard thicknesses lighter than the thickness of the pipe.
7. Dimensions and thickness shown are maximum.
8. Angle 50 mm long with 16 mm x 50 mm strap.
9. Fillet welds of equivalent strength may be substituting for spot welds on rivets.

### CHANNEL COUPLING BAND

*FOR USE ON FLANGED END CMP*  
(Channel coupling band shall be two piece)

#### NOMINAL DIMENSIONS

<table>
<thead>
<tr>
<th>Thickness</th>
<th>A/&quot;</th>
<th>FOR USE WITH CPR</th>
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<tbody>
<tr>
<td>2.0</td>
<td>16</td>
<td>1.0 mm THICK OR LIGHTER</td>
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<tr>
<td>2.8</td>
<td>20</td>
<td>3.5 mm THICK OR HEAVIER</td>
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</table>

#### SECTION A-A

![Diagram of channel coupling band](image_url)
GENERAL NOTES
1. All concrete shall be class A or AA.
2. Forming of the base will not be required.

PLAN VIEW
Non-Skid Pattern on Frame & Cover
Extend Curb under Frame to Fit.

VIEW C-C
Flow Line of Curb
Expansion Joint

SECTION A-A
Grout or Concrete
Grout or Concrete

SECTION B-B
Wedge Lock Hold Down

FLOW

Elev. Top Of Curb

25 mm Dia. Hole

Cover

Frame

31

150

125

300 Min.

40

75 Min.

900 Min.

75 Min.

600

T

T

200 Min.

600

75 Min.
**General Notes**

1. FOR CAST IN PLACE CONCRETE BASE ALL REINFORCING STEEL TO BE NO. 13 BARS AT 450 mm CENTERS. TIGHTLY WOUND AT ALL INTERSECTIONS AND WEAKENED IN CONCRETE AT LEAST 50 mm AND BAR ENDS MUST CLEAR CONCRETE SURFACES BY 40 mm.

2. ALL CONCRETE SHALL BE CLASS A OR AA.

3. MANHOLE WITH MORE THAN ONE PIPE-INFLOW PIPE INVERT ELEVATIONS SHALL BE 30 mm ABOVE OUTFLOW PIPE ELEVATION.

4. FOR VALUES OF "H" SEE STORM DRAIN SCHEDULE OR STRUCTURE LIST. "H" IS THE DIFFERENCE IN ELEVATION BETWEEN THE OUTFLOW PIPE INVERT ELEVATION AND THE TOP OF MANHOLE ELEVATION AT STREET GRADE.

5. DO NOT PLACE PIPES IN TAPERED SECTION.

6. MANHOLE COVER SHALL BEAR ENTITY IDENTIFICATION AND SYSTEM FUNCTION (IF APPLICABLE).

7. MANHOLE STEPS SHALL CONFORM TO AASHTO STANDARD SPECIFICATION C-478 WITH MAXIMUM SPACING OF 400 mm AND 100 mm CLEAR DISTANCE FROM THE WALL OF RISER OR CONE SECTION. THE STEPS MUST HAVE A 250 mm MINIMUM WIDTH.

8. SHAPE FLOWLINE IN MANHOLE TO OUTLET PIPE, AND PROVIDE A 1:10 MINIMUM SLOPE FROM ALL DIRECTIONS TOWARD FLOWLINE.

**Typical Method of Adjusting Manholes & Valves**

(Illustrations and details are provided for adjusting collars to be poured square or round.)

**Typical Traffic-Strength Manhole Frame & Cover**

(Area under frame is 54.4 sq. ft. or 5.1 sq. m.)

**Approx. Mass Frame 84.4 Lbs. Cover 55.3 Lbs. Min. Material Cast Iron.**

**Cover for Manholes, manholes & covers (used for Type 1 & 2 Manholes)**

(Area under frame is 54.4 sq. ft. or 5.1 sq. m.)

**Concrete Collar Placement**

(Commercial Prefabricated Adjustment Rings For Manholes May Be Used When Approved By The Engineer.)
**GENERAL NOTES:**
1. ALL CONCRETE SHALL BE CLASS A OR CLASS AA.
2. MANHOLES WITH MORE THAN ONE PIPE; THE INFLOW PIPE INVERT ELEVATION SHALL BE GREATER THAN OR EQUAL TO 30 mm ABOVE THE OUTFLOW PIPE INVERT ELEVATION.
3. FOR VALUES OF "H", SEE STORM DRAIN SCHEDULE OR STRUCTURE LIST IN CONTRACT PLANS. "H" IS THE DIFFERENCE IN ELEVATION BETWEEN THE OUTFLOW PIPE INVERT ELEVATION AND THE TOP OF MANHOLE ELEVATION AT STREET GRAGE.
4. MANHOLE STEPS SHALL CONFORM TO ASME STANDARD SPECIFICATION C-479 WITH MINIMUM SPACING OF 600 mm AND 100 mm CLEAR DISTANCE FROM THE MANHOLE WALL. THE STEP MUST BE A 250 mm MINIMUM WIDTH.
5. MANHOLE COVER SHALL BEAR ENTITY IDENTIFICATION AND SYSTEM FUNCTION (IF APPLICABLE).
6. SHAPE FLOWSIDE IN MANHOLE TO OUTLET PIPE, AND PROVIDE A 1 IN 10 MINIMUM SLOPE FROM ALL DIRECTIONS TOWARD FLOWSIDE.
GLUE DOWN CURBS

SECTION TYPE A
- Only Rounding When Curb Is Back To Back
- P.C.C. or Dense Graded

SECTION TYPE B
- Only Rounding When Curb Is Back To Back
- P.C.C. or Dense Graded

CURB
- Only Rounding When Curb Is Back To Back
- P.C.C. or Dense Graded

CANAL GUTTER

SECTION TYPE 2
- Only Rounding When Curb Is Back To Back
- P.C.C. or Dense Graded

SECTION TYPE 3
- Only Rounding When Curb Is Back To Back
- P.C.C. or Dense Graded

SECTION TYPE 4
- Only Rounding When Curb Is Back To Back
- P.C.C. or Dense Graded

SECTION TYPE 5
- Only Rounding When Curb Is Back To Back
- P.C.C. or Dense Graded

SECTION TYPE 6
- Only Rounding When Curb Is Back To Back
- P.C.C. or Dense Graded

SECTION TYPE 7
- Only Rounding When Curb Is Back To Back
- P.C.C. or Dense Graded

Curb and Gutter

General Notes:
1. This Line Should Be Used To Dimension Offsets.
2. When Distance Between Curb On Islands Is 1.2 m or Less, Use Class A or A4 Concrete (Island Paving)

Typical Transition From Rolled Curb to Vertical Face

Typical Expansion Joint Detail

State of New York
Department of Transportation
Curb & Gutters

All Elevations are in Millimeters
Unless Otherwise Noted

Metric
NDOT

Chief Road Design Engineer

Asphalt

Advisory Permits

Prepared

Presentation
**General Notes:**

1. Spacing of No. 13 bars less than 450 mm to meet local codes, shall be noted in the structure list.
2. When constructing driveways where curb and gutter exists, completely remove existing sections. Driveway shall be poured monolithic to A.C. line, in which case the bars shall be continuous if optional sectional pour is used. Expansion joints and redar end clearance shall apply as shown.
3. Concrete shall be class A or AA concrete.
4. Curb ramps shall be constructed in accordance with standard drawings R-5.1.1 to R-5.1.3.
5. For grade changes greater than 3%, vertical curves of at least 3.0 m must be used.
6. Driveway geometrics shall go to the P.C.
GENERAL NOTES
1. ALL CURB RAMPS SHALL BE 11:12 OR FLATTER.
2. SEE PLAN SHEETS FOR 6).
3. GRATING OR SIMILAR ACCESSORIES SHALL NOT BE LOCATED IN AREA AT THE BASE OF THE CURB RAMP OR LANDSCAPE AREA.
4. NO LIFT SHALL BE PERMITTED AT THE CURB RAMP SLOPE TO GUTTER PAN.
5. PLAINSTONE BITUMINOUS ASPHALT SURFACE SHALL BE FRESH WITH THE EDGE OF THE GUTTER PAN IN THE AREA OF THE CURB RAMP.
6. ROUGH SURFACES TEXTURE ON CURB RAMPS AND WINDOWS, TEXTURE SHALL PROVIDE A VISUAL CONTRAST TO THE MEDIAN ISLAND.
1. MINIMUM 300 mm COVER OVER TOP OF CONDUIT AT SHOULDER LINE.
2. 2.5 mm BARE COPPER DETECTION WIRE TO LAY IN TRENCH ADJACENT TO CONDUIT AND ATTACH TO LOCATION MARKER AT EACH END.
3. LOCATION MARKER SHALL BE 50 mm P.V.C. OR 1.5 m STEEL FENCE POSTS.
GENERAL NOTES
1. Spacing between wires on Missouri gate shall be the same as wires on adjacent fence.
2. Gate latch shall be lag-bolted firmly to the gate post.
3. Wire post, latch posts, and cattle guard wing attachment posts shall be 2.4 m in length and shall be buried 1 m in ground.
4. For end panel details, see Sheet R 6.12.
5. Wire may be used in lieu of metal strap for connection of cattle guard wing to fence post.
TYPICAL CATTLE GUARD INSTALLATION ON CROWNED ROADSWAYS

NOTE: All cattle guard installations on crowned roadways shall be installed using an even number of units as shown above, and as indicated in the table below.

Units for Roadway Crowned at

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ALTERNATE ARMOR DETAIL

NOTE: The above alternate armor detail may be substituted for the 50 mm x 50 mm x 6 mm armor angles at the contractor's option.

LIMITS OF EXCAVATION & GRANULAR BACKFILL

METHOD OF PATCHING AT PRECAST CATTLE GUARDS
GENERAL NOTES

1. THESE DETAILS ARE TO BE USED ONLY WHEN GUARDRAIL POST CANNOT BE INSTALLED TO AVOID UNDERGROUND OBSTRUCTIONS WITH GUARDRAIL POSTS.

2. SEE SHEET R-8.17 FOR DETAILS ON GALVANIZED GUARDRAIL (TRIPLE CORRUGATION NOT SHOWN).

3. GUARDRAIL LENGTHS OF NEED SHALL BE BASED ON DESIGN YEAR TRAFFIC VOLUMES. SEE ASSIST ROADSIDE DESIGN GUIDE FOR DETAILS.

4. CHECK FEASIBILITY OF REMOVING HAZARDS OR EXTENDING DRAINAGE OUTSIDE CLEAR ZONE VERSUS COST OF GUARDRAIL.

5. IF GUARDRAIL SPACE OCCURS ON THE POSTS WHICH ARE ADJACENT TO THE MISSING POST THEN THREE CONSECUTIVE SECTIONS 11.43 m OF HORIZONTAL GUARDRAIL ARE REQUIRED WITH THE MIDDLE SECTION BEING CENTERED AT THE LOCATION OF THE MISSING POST.
PLAN VIEW

Transition to
Any Slope

Tangent Line Projected from the Face of the Last Two Post Blocks in the Standard Post Section.

SECTION "A"-"A"

For Location of Holes, See Assembly and Steel Tube Footing Details. See M.E.T. 2.

NOTE:

THE POST OFFSET DIMENSIONS ARE GIVEN TO THE CENTER OF THE EYELET HOLE IN THE DISC OF THE EYELET POST. THE DISTANCE IS MEASURED FROM THE CENTERLINE OF THE RAIL TO THE EYELET POST, EXCEPT AT THE FIRST POST WHERE THE DISTANCE IS TO THE CENTERLINE. SUITABLE EYELETS ARE TO BE USED. THE POST OFFSET DIMENSIONS ARE TO BE SET APPROXIMATELY PARALLEL TO THE RAILING AT EACH POST LOCATION.
*20 mm Drilled Holes For 16 mm Button Head Bolts
With Hex Nuts & Flat Plate Washer

A - For This Length The Tri-Beam Are To Be Nested. (See Detail "C")

**150 mm x 200 mm Post & Block (Wood)
150 x 13.5 Post & Block (Steel)

** 28 mm Dia. Core Drilled Holes For 22 mm Dia. Galvanized High Strength Hex Bolts & Nuts With 75 mm x 6.4 mm G. Galvanized Steel Washer With 25 mm Dia. Hole

PLAN

846 466 816 466

SECTION A-A
SECTION B-B
SECTION C-C

RESPER BLOCK DETAIL

ELEVATION

Top of Bridge Deck
or Approach Slab

Top of Bridge Deck
or Approach Slab

Top of Approach Slab
or Bridge Deck

NOTE:
1. Use Spacer Blocks (If The Proper Dimensional May Be Substituted For The Anchored Steel Blocks.
2. WPS = Highway Poly Styrene Designator. See KST #33
GENERAL NOTES:
1. STRAIGHT HOLES .38 in. Ø OF THE DEPTH SHOWN MAY BE USED IN LIEU OF THE TAPERED HOLES.
2. RESIN CAPSULE-TYPE ANCHORAGE DEVICES MAY BE SUBSTITUTED FOR MULTI-ROD RODS.
3. PLACE SCREEN ON WORK AREA SIDE OF TEMPORARY RAILING WHERE TRAFFIC WILL ONLY BE ON ONE SIDE OF THE TEMPORARY RAILING. WHERE TRAFFIC WILL BE ON BOTH SIDES OF THE TEMPORARY RAILING THE SCREEN MAY BE PLACED ON EITHER SIDE OF THE PIPE SUPPORT.
4. CLINCHED 8D BOX NAILS MAY BE SUBSTITUTED FOR SCREWS THE NAILS SHALL BE CLINCHED ON THE WORK AREA SIDE OF THE SCREEN WHERE TRAFFIC WILL ONLY BE ON ONE SIDE OF THE TEMPORARY RAILING.
5. 48 in. U-BOLTS MAY BE SUBSTITUTED FOR 6 in. Ø BOLTS.
6. OPENINGS IN THE SCREEN AREA OF 1 in. 2- SHALL BE PROVIDED AT 6 ft. 0 in. INTERVALS.
7. IPS = NORMAL PIPE SIZE DESIGNATION; SEE ASTM A53

SECTION A-A

ELEVATION

6 mm Ø BOLT 50 mm WASHER AND SELFLOCKING NUT
TAPPED HOLE 41 mm Ø AT TOP TO 34 mm Ø AT BOTTOM (SEE NOTE 2)

ANCHOR P/L

SCREEN ANCHORAGE DETAIL

ALTERNATIVE 'A'

PLAN

14 mm Ø HOLES FOR THREADED RODS

SCREEN ANCHORAGE DETAIL

ALTERNATIVE 'B'

ELEVATION

25 mm Ø HOLES IN PRECAST BARRIER RAIL

WORK AREA

(SEE NOTE 3)

APPROVED REFLECTOR

SEE SHEET R-6.3.3.1

SECTION B-B

ELEVATION

13 mm MAX EXPOSED THREAD

SCREEN ANCHORAGE DETAIL

ALTERNATIVE 'B'

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

METRIC
NDOT

TEMPORARY TRAFFIC
SCREEN

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED

Sheet Size 24 in. X 36 in.
Revision 7/1921
SECTION A-A

BARRIER RAIL REFLECTOR INSTALLATION

TYPICAL GUARDRAIL REFLECTOR
(GUIDE POST INSTALLATION)

REFLECTOR PLACEMENT SPACING ON GUARDRAIL/BARRIER RAIL

SPACING SHALL BE

1. 15 METER ON TANGETE AND ON CURVES OF 90 METER
   CURVATURE OR GREATER; IF LESS THAN 90 METER CURVATURE
   SEE TABLE "A".

2. REFLECTORS SHALL BE OMITTED ON THE FLATTED SECTIONS
   OF GUARDRAIL.

3. NO DIRECT PATHWAY FOR REFLECTORS REGARDLESS OF TYPE OR INSTALLATION.

<table>
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<tr>
<th>Radius of Curve (in Meters)</th>
<th>Reflector Spacing (in Meters)</th>
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<td>45 - 60</td>
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<td>60 - 75</td>
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<td>&gt; 75</td>
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NOTES:

1. ALL REFLECTORS SHALL BE SELECTED & INSTALLED PURSUANT TO
   THE PROJECT PLAN & SPECIFICATIONS OR AT THE DIRECTION OF
   THE ENGINEER. THE DEPENDED REFLECTORS ARE FOR WARNING
   LOCATION INFORMATION ONLY.

2. SPACING SEE "REFLECTOR PLACEMENT ON GUARDRAIL" NOTES A
   TABLE "A" OF THIS SHEET.

3. REFLECTORS SHALL BE PLACED AS SPECIFIED BY THE
   MANUFACTURER OR AS DIRECTED BY THE ENGINEER.

4. COLORS SHALL SIMPLY WITH THE GUIDELINES ESTABLISHED
   BY THE M.A.T.C.O.D. 1988 EDITION AND REVISIONS THEREAFTER.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

REFLECTORS

CHIEF ROAD DESIGNEER
ADAPTED: 08/26
REVISED:

METRIC
NDOT
RUMBLE STRIPS ON CONCRETE SHOULDERS
(RUMBLE STRIPS SHALL NOT BE USED IN URBAN AREAS)

RUMBLE STRIPS ON CONCRETE SHOULDERS
(RUMBLE STRIPS SHALL NOT BE USED IN URBAN AREAS)

GENERAL NOTES:
1. DO NOT USE IN DECELERATION AND ACCELERATION AREAS OF FUMPS AND TIMED ENTRANCES DO NOT USE ACROSS TURN APPROACHES.
2. SHOULDER TRANSVERSE JOINTS SHALL BE THE SAME PATTERN AS TURN ROADS.
3. 1.8 m RUMBLE STRIPS SHALL BE SUNK BETWEEN THE 4.5 m MARKER LINES SHOWN FOR TRANSVERSE JOINTS.
4. SEE TYPICAL SECTION FOR WIDTH OF SHOULDER AND LOCATION OF PLANE JOINT LOCATION.

METRIC
NDOT

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

RUMBLE STRIPS
CONCRETE AND ASPHALT

R-10.13
(12/01/2020)

DESIGNATED PLAN DATE MODIFIED 07/08
MAILBOX TURNOUT

SUGGESTED GUIDELINES FOR LATERAL PLACEMENT OF MAILBOXES

TABLE 1

<table>
<thead>
<tr>
<th>HIGHWAY TYPE AND TRAFFIC CONDITIONS</th>
<th>WIDTH (m) OF ALL-WEATHER SURFACE OF TURNOUT OR AVAILABLE SHOULDER AT MAILBOX</th>
<th>DISTANCE (m) ROADSIDE FACE OF MAILBOX TO BE OFFSET BEHIND EDGE OF TURN OUT OR ON USABLE SHOULDER</th>
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<td>PREFERRED</td>
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<td>1.0</td>
<td>2.4</td>
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<tr>
<td>RURAL ROAD ADT &lt; 100 vpd</td>
<td>2.4</td>
<td>1.8</td>
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<tr>
<td>RESIDENT STREET WITHOUT CURB OR ALL WEATHER SHOULDER</td>
<td>1.8</td>
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<tr>
<td>CURVED RESIDENTIAL STREET</td>
<td>N/A</td>
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<tr>
<th>D1 (meters)</th>
<th>Preferred</th>
<th>Minimum</th>
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</thead>
<tbody>
<tr>
<td>45</td>
<td>30</td>
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</tbody>
</table>

GENERAL NOTES:
2. Mailboxes within the Clearzone Shall Be The Types Shown In Sheets R-12.1.2 And R-12.1.3 Or An Approved Equal.

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION

MAILBOX TURNOUTS

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED

R-12.1.2 - 12/84
REVISION 1-1986
<table>
<thead>
<tr>
<th>NEW DESCRIPTION</th>
<th>EXISTING DESCRIPTION</th>
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<tbody>
<tr>
<td>Luminaire</td>
<td></td>
</tr>
<tr>
<td>Detector</td>
<td></td>
</tr>
<tr>
<td>Underpass Luminaire</td>
<td></td>
</tr>
<tr>
<td>Traffic Signal Head: 3 Section</td>
<td>300 mm Red, Yellow and Green Sections unless indicated otherwise</td>
</tr>
<tr>
<td>Traffic Signal Head With Back Plate</td>
<td></td>
</tr>
<tr>
<td>Traffic Signal Head: Programmed Intensity: 000 mm Green Arrow Sections, with Back Plate</td>
<td></td>
</tr>
<tr>
<td>Traffic Signal Head With 300 mm Green, Yellow and Red Arrow Sections, with Back Plate</td>
<td></td>
</tr>
<tr>
<td>Mast Arm Signal With Back Plate</td>
<td></td>
</tr>
<tr>
<td>Combination Traffic Signal Standard with Luminaire and Signage, Right-Hand Push Button and Sign</td>
<td></td>
</tr>
<tr>
<td>Traffic Signal With OPTICAL DETECTOR UNIT</td>
<td></td>
</tr>
<tr>
<td>M-5 (Cluster Type Head) 200 mm Green, Yellow and Red Balls With 500 mm Green and Yellow Arrows</td>
<td></td>
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<tr>
<td>Pedestrian Signal</td>
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<tr>
<td>Pull Box</td>
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<td>Controller Cabinet</td>
<td></td>
</tr>
<tr>
<td>Electrical Cabinet</td>
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<tr>
<td>Service (100-240 V.A.C. Unless Otherwise Specified)</td>
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</tr>
<tr>
<td>Transformer Pad</td>
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<tr>
<td>Power Source</td>
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<td>Conduit</td>
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<td>Conduit Jacket</td>
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<tr>
<td>Pole Designation</td>
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<tr>
<td>Conduit Run</td>
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<tr>
<td>Junction Box</td>
<td></td>
</tr>
<tr>
<td>Wood Power Pole</td>
<td></td>
</tr>
<tr>
<td>Special Junction Cabinet (For Interconnect Cable)</td>
<td></td>
</tr>
</tbody>
</table>

**STATE OF NEVADA**
DEPARTMENT OF TRANSPORTATION

**SIGNAL AND LIGHTING SYMBOLS**

ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED

**T-30.1.1 (923)**
**TYPE 1-A SIGNAL STANDARDS TYPE 1B**

1. For Pedestrian Push Button and Sign See Sheet T-36.1.2
2. For Foundation Details See Sheet T-30.1.13

**FRONT VIEW SIDE VIEW MOUNTING DETAIL OPTICAL DETECTOR**

**TRENCHING DETAIL**

1. Remove and Replace Existing Surface. New Surface Material Shall Be of Approved Commercial Source.
2. Seal and Sand New Surface. (See Directed By The Engineer).
3. Two 16" Sack Sturdy Mix Cement.
4. Recompact Existing Base.
5. All New Surface and Concrete Material Shall Be Approved By Engineer.
6. New Waterline and Trenching Shall Not Be Paid For Directly But Included In The Price For The Conduit.
7. Sand Bedding.
8. 2 Conduit Diameters Min.

**SECTION B-B WITH PIPE**

**DETAIL "F"**

**POST TOP MOUNTED SIDE BRACKET MOUNTED TERMINAL COMPARTMENTS**

STATE OF NEVADA DEPARTMENT OF TRANSPORTATION TYPE 1A AND 1B POLES, OPTICAL MOUNT AND TERMINAL COMPARTMENTS
See Contract Plans for Position of leading Edges Loop 1

CONDUIT INSTALLATION

NOTES:
1. All Talon Copper and PVC Conduit shall be listed and labeled for use in the location indicated.

COND. 150 mm Min.

Splices to Lead-in Conductors For Run To Controller

COND. 150 mm Min.

As Shown On Plans

As Shown On Plans

WINDING DETAIL SAWSLIT DETAIL (TWO TURNS)

QUADRAPOLE LOOP DETECTOR

LOOP INSTALLATION PROCEDURE:
1. Cut slots in pavement for loop CONDUIT 150 mm Min. in details.
2. INSTALL TERMINATION PLUGS BOLTS CABLES and PLUGS.
3. INSTALL CONDUIT with 2.2 mm to 3.6 mm space using Copper Conduit with 2.2 mm to 3.6 mm space using Copper Conduit.
4.當地 CONDUIT IN CONCRETE.
5. INSTALL LOOP CONDUCTORS TO LEAD IN CONDUIT 150 mm Min. In Details.
6. INSTALL LOOP CONDUCTORS IN CONCRETE.
7. INSTALL LOOP CONDUCTORS IN CONCRETE.
8. INSTALL LOOP CONDUCTORS IN CONCRETE.
9. INSTALL LOOP CONDUCTORS IN CONCRETE.
10. INSTALL LOOP CONDUCTORS IN CONCRETE.
11. INSTALL LOOP CONDUCTORS IN CONCRETE.
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97. INSTALL LOOP CONDUCTORS IN CONCRETE.
98. INSTALL LOOP CONDUCTORS IN CONCRETE.
99. INSTALL LOOP CONDUCTORS IN CONCRETE.
100. INSTALL LOOP CONDUCTORS IN CONCRETE.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

LOOP DETECTORS

METRIC

NDOT

PLAN VIEW OF DIAGONAL SLOT AT CORNERS
PLAN VIEW

FRONT VIEW

SIDE VIEW

LIGHTING CABINET FOUNDATION PLAN

NOTES:
1. The ultimate concrete compressive
   strength shall be 28 MPa.
2. All architectural steel shall be:
   A36 Grade 36 Steel.
3. Anchor bolts shall be:
   A307 Grade C.

All dimensions are in millimeters unless otherwise noted.
7.5 m AND SMALLER RADIUS CURB RETURN AND MEDIAN LOCATION

>7.5 m AND LARGER RADIUS CURB RETURN AND MEDIAN LOCATION

NOTES:
1. ISLANDS SHALL BE PLACED ONLY ON SLOPES GREATER THAN 1:10.
2. WHEN USING SAFETY BARS THE TOP OF THE FOUNDATION SHALL BE PLACED FLUSH WITH THE TOP OF THE FOUNDATION ISLAND.
**SECTION A-A**

- **No. 3 1/2 Pull Box**
  - **Note:** When concrete pull box is furnished, extensions shall be 300 mm in. When plastic pull boxes are furnished, extension shall be 200 mm high.

**SECTION B-B**

- **No. 5 Pull Box**
  - **Note:** Boxes shall be sealed with mortar around conduit openings.

- **No. 7 Pull Box**
  - **Note:** Use steel cover when pull box is subject to vehicular traffic limits. When pull box is located in the travel way, an electrical manhole frame and cover shall be installed.

**SECTION C-C**

- **Electrical Manhole Frame & Cover**
  - **Note:** 1. A compacted base and a concrete footing shall be constructed prior to placement of the cast iron frame as directed by the Engineer.
  - **Note:** 2. Adjustments to elevations shall be made with collar risers as required. (Units: depth 450 mm)

- **Collar Riser**
  - **Note:** Typical detail

**Special No. 5 Pull Box**

- **Base**
- **Extension**
- **Cover**
- **Body**
- **Drain Backfill Type II**
- **50 mm Drain Hole**

**Special No. 7 Pull Box**

- **Base**
- **Extension**
- **Cover**
- **Body**
- **Drain Backfill Type II**
- **50 mm Drain Hole**

**Traffic Light**

- **Street Lighting**

**Street Lighting**

- **300 mm**
- **500 mm**

**Traffic Sign**

- **500 mm**

**Cover Must Fit Over Entire Box**

**Drain Backfill Type II**
NEMA 3 BRIDGE JUNCTION BOX

Notes:
1. SCREW WELD CONSTRUCTION w/ 5 DA FALLET WELD + GROOVE FILLER WELD
2. SCREW WELD CONSTRUCTION FOR BARS FRAME AND
   20 mm x 10 mm + 42 mm CENTERS.
3. GASKET: WATFIL 2 mm x 56 mm NEOPRENE CEMENT
   2 GASKET SPONGES WITH EPOXY.

Material: 3.5 mm Steel

VIEW A-A
2 STRINGER MOUNTING

3 STRINGER MOUNTING

4 STRINGER MOUNTING

NOTE: To obtain Duplicated Footing, Max. of 1 Panel may be Cut Less Than 1600 mm, 400 mm Max. Each

STRINGER AND PANEL ARRANGEMENT

CLAMP PLATE

GENERAL NOTES:
1. See Standard Details 1-31-1-1 Through 1-31-1-14 For Details Not Shown.
2. NPS = Numbers, Pipe Size See ASNH A 53.

DETAIL A

DETAIL B

DETAIL C

METRIC

GROUND MOUNTED
SIGN SUPPORTS
(GROUND METAL POSTS)
STEEL PIPE POST SUPPORTS

6 mm Dia. x 64 mm Round Head Bolts
Ø 150 mm o.c. with Fiber Insert Hex Nuts and Flat Washers.

See Detail "A"

W

WOOD POST SUPPORTS

6 mm Dia. x 64 mm Round Head Bolts
Ø 150 mm o.c. with Fiber Insert Hex Nuts and Flat Washers.

See Detail "B"

Panel Joint (See Detail T-31.16)

DETAIl "A"
ALTERNATE MOUNTING (STEEL POSTS)

6 mm Dia. x 64 mm Round Head Bolts
Ø 150 mm o.c. with Fiber Insert Hex Nuts and Flat Washers.

Detail "B"
WOOD POST MOUNTING

75 mm x 50 mm x 4.6 mm Steel Tubing

10 mm Dia. Round Head Bolts
With Fiber Inserts and Flat Washers (See Table 3)

TABLE 1
(Clampt stock)

<table>
<thead>
<tr>
<th>PIPE DIA</th>
<th>O.D.</th>
<th>A</th>
<th>B</th>
<th>CLAMPSTOCK</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPS 2</td>
<td>60</td>
<td>103</td>
<td>144</td>
<td>6 x 38</td>
</tr>
<tr>
<td>HPS 3</td>
<td>69</td>
<td>132</td>
<td>173</td>
<td>6 x 38</td>
</tr>
</tbody>
</table>

TABLE 2
(Tubing Size)

<table>
<thead>
<tr>
<th>SIGN WIDTH</th>
<th>TUBING SIZE (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.2 m or Less</td>
<td>75 x 50 x 4.8</td>
</tr>
<tr>
<td>7.2 m to 8.4 m</td>
<td>100 x 50 x 4.8</td>
</tr>
</tbody>
</table>

TABLE 3

<table>
<thead>
<tr>
<th>POST SIZE</th>
<th>&quot;D&quot;</th>
<th>BOLT SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 x 100</td>
<td>90</td>
<td>10 Dia. x 160</td>
</tr>
<tr>
<td>100 x 150</td>
<td>140</td>
<td>10 Dia. x 150</td>
</tr>
<tr>
<td>150 x 150</td>
<td>140</td>
<td>10 Dia. x 210</td>
</tr>
<tr>
<td>150 x 200</td>
<td>180</td>
<td>10 Dia. x 260</td>
</tr>
</tbody>
</table>

GENERAL NOTES

1. FOR MOUNTING DETAILS NOT SHOWN, SEE SHEETS T-31.11 THROUGH T-31.14 FOR ROUND METAL SUPPORTS AND SHEETS T-31.15 AND T-31.16 FOR TIMBER SUPPORTS.

2. NPS - Nominal Pipe Size Designator
   See ASTM A 53.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

METRIC

NDOT

ALTERNATE MOUNTING DETAIL

T-31.1.9 (621)

NOTE: TRAFFIC ENGINEERS ADAPTED 7/91 REVISIONS

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.
LEGEND

- WORK ZONE
- PORTABLE PRECAST CONC BARRIER RAIL
- CHANNELIZING DEVICES
- FLAGGER LOCATIONS (TO BE DETERMINED BY THE FIELD ENGINEER)
- TYPE B WARNING LIGHTS
- TEMPORARY IMPACT ATTENUATORS
- ARROW BOARD

TABLE FOR SPACING OF ADVANCE WARNING SIGNS

<table>
<thead>
<tr>
<th>SPEED LIMIT (MPH)</th>
<th>DISTANCE BETWEEN A &amp; B (FT)</th>
</tr>
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<tbody>
<tr>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>35 &amp; 40</td>
<td>50</td>
</tr>
<tr>
<td>45</td>
<td>60</td>
</tr>
<tr>
<td>50</td>
<td>70</td>
</tr>
<tr>
<td>55 &amp; 60</td>
<td>80</td>
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<tr>
<td>65 &amp; 70</td>
<td>90</td>
</tr>
<tr>
<td>75</td>
<td>100</td>
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SPEED CONVERSION TABLE

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<td>80</td>
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<tr>
<td>55</td>
<td>90</td>
</tr>
<tr>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

TYPICAL PORTABLE PRECAST BARRIER RAIL (TWO LANE - TWO WAY)

TYPICAL PORTABLE PRECAST BARRIER RAIL (MULTI LANE)
TYPICAL PLACEMENT OF SHOULDER DROP OFF SIGNS
(PLACED WHEN SHOULD DROP-OFF EXIST DURING NON-WORKING HOURS)

TYPICAL PLACEMENT OF LOOSE GRAVEL/DUST HAZARD (ALTERNATING) SIGNS

TYPICAL PLACEMENT OF UNEVEN LANES SIGNS
(PLACED WHEN UNEVEN LANES EXIST DURING NON-WORKING HOURS)
NOTE: TYPE II B BARRICADES USED FOR TEMPORARY SIGN SUPPORTS, SIGNS SHALL BE MOUNTED 300 mm MIN. FROM GROUND.

BARRICADE CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>TYPE I BARRICADE</th>
<th>TYPE II BARRICADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>W - Width of Rail</td>
<td>200 mm Min. - 275 mm Max.</td>
<td>200 mm Min. - 300 mm Max.</td>
</tr>
<tr>
<td>L - Length of Rail</td>
<td>0.6 m Min.</td>
<td>0.6 m Min.</td>
</tr>
<tr>
<td>Width of Stripes</td>
<td>Roll Length &lt;0.9 m = 100 mm</td>
<td>Roll Length &lt;0.9 m = 100 mm</td>
</tr>
<tr>
<td></td>
<td>Roll Length ≥0.9 m = 150 mm</td>
<td>Roll Length ≥0.9 m = 150 mm</td>
</tr>
<tr>
<td>H - Height</td>
<td>0.9 m Min.</td>
<td>0.9 m Min.</td>
</tr>
<tr>
<td>Number of Reflected Rollbars</td>
<td>2 (One each Direction)</td>
<td>4 (Two each Direction)</td>
</tr>
</tbody>
</table>

MARKINGS FOR BARRIER RAILS AND VERTICAL PANELS SHALL BE ALTERNATE REFLECTORIZED ORANGE AND REFLECTORIZED WHITE STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION OF TRAFFIC.
**Section "C"-"C"**

**Section "D"-"D"**

**Alternative Connections at Top Chord**

**Notes:**
1. For Steel Removable Sign Panel Frames, see Standard Plan T-36 L.B.
2. Minimum Fillet Weld is 7 mm. For Clip Angles, Weld to Chord Member of Truss.
3. Minimum Spacing of Bottom Clip Angle is 1075 mm.
4. Top Clip Required For Each Vertical Member of Removable Sign Panel Frame.
WALKWAY PLAN

DETAIL 15
TYPE CONNECTION

DETAIL 14
CONNECTION AT SPICE

SECTION V-V

NOTES:
1. Welded-Type Grating Shall Have 32 mm. x 3 mm. Spacing Bars @ 50 mm Centers. See Detail 12. If Welded-Plastic Grating Is Used It Shall Be Equally Strengthen to the Welded-Type Alternate.
   Hardened Clips May Be Submitted for Approval.
2. Fine Spacing of Lighting Fixtures See Table of Spacings on "Fluorescent Sign Lighting Equipment" Sheet.
3. Walkway Grating and Light Fixtures Mounting Channels to Be Continuous Over As Many Walkway Brackets As Practically Consistent with Fabrication, Ease of Handling

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
OVERHEAD SIGNS
WALKWAY DETAILS NO. 1

METRIC NDOT
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

T-36.1-9 (6237)

DESIGN TRAFFIC ENGINEER ADOPTED 11/2/77.
Note:
1. Special Care Shall Be Taken to Ensure That The Complete Hinge and Brace Assembly, Will Be In The Safety Railing In A Steady Manner. Free of Wobble, Will Be Insured Maximum Allowable Displacement From Vertical at Top of Railing When Latched Shall Be 25 mm.
2. Details For Rolling Hinge Base R. To Walkway Bracket may Be Submitted For Approval.
3. Alternative Details Approved By The Engineer May Be Substituted For The Safety Chain Connections Shown.
4. NPS - Nominal Pipe Size Designator, See M 453.

END VIEW - TWO POST HINGE

PLAN VIEW - END POST HINGE

PLAN VIEW - CENTER POST HINGE

SECTION A-A

CHAIN ASSEMBLY

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

OVERHEAD SIGNS
WALKWAY SAFETY RAILING DETAILS

METRIC NDOT

1-35-1-11 15223

NOTE: TRAFFIC CONTROL DEVICES 1/89 REVISED
LIGHT FIXTURE MOUNTING DETAIL

NPS = Nominal Pipe Size Designator. See ASTM A53.
CENTER LANE TWO WAY TRAFFIC

DOUBLE YELLOW CENTER LINE

LANE LINE

EXIT RAMP GORE STRIPING

ONE WAY PASSING ZONE

NON-REFLECTIVE & REFLECTIVE MARKERS

TWO WAY LEFT TURN LANE

See Plan Sheets for Location
For Exposed Top, Provide No.13 Bars @ 450 mm Each Way (600 mm Lap With "c" Bars) and Adjust Quantities

**FOR BOXES WITH SPAN OR WEIGHT LESS THAN ANY OF THOSE SHOWN IN TABLE, USE NEXT GREATER SIZE BOX CONCRETE DIMENSIONS AND REINFORCEMENT. MAKE NECESSARY CHANGES IN BAR LENGTHS AND QUANTITIES.**

1. For Boxes with span or height or cover greater than those shown in Tables, a special design is required.
2. Quantities are approximate and for design purposes only.
3. It is permissible to eliminate the 160° hooks on every other bar.
4. "a" bars are at half spacing; "b" bars are at 3 m, 3.7 m, 4.3 m only.
5. "c" bars are at half spacing; "d" bars are at 3 m, 3.7 m, 4.3 m only.
6. Provide paving notch when top is exposed and where P.C.C. pavement or approach slab is used; adjust the quantities.
7. When top is exposed, the top slab concrete shall be "c" or "d" type or "a" type, as determined by the engineer. If "c" type concrete is to be used, all reinforcement steel within the top slab shall have an epoxy coating.

All dimensions are in millimeters unless otherwise shown.
NOTE: FOR GENERAL NOTES SEE SHEET B-20.1.1
FOR QUANTITIES SEE SHEET B-20.1.4.1

ELEVATION

PLAN

SECTION A-A

SECTION B-B

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
RCD CULVERTS
TYPE II HEADWALLS

F. J. MEMAIL
CHIEF BRIDGE DESIGNER
## Cubic Meters of Concrete and Kilograms of Reinforcing for Two Type II Headwalls

### Table: Cubic Meters and Kilograms

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<th>Span (ft)</th>
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### Quantities for Additional Cells

- Concrete for two Type II headwalls for each additional cell (cu. meter)
- Reinforcing for two Type II headwalls for each additional cell (kilograms)

### Additional Notes

- All dimensions are in millimeters unless otherwise shown.
- State of Nevada Department of Transportation
- RCB Culverts Type II Headwalls

---

**Metric Note:**

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**Revision:**

Rev 1 12/14/2000

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**Sheet 2 of 2**

**E.I. Mansfield**

**Technical Design Lead**

**Date: 12/14/2000**
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NOTES:
1. FOR GENERAL NOTES SEE SHEET B-20.1.
2. DOWELLING: DOWEL HOLES SHALL BE DRILLED 300 mm INTO EXISTING CONCRETE. DIAMETER OF HOLE SHALL BE 6 mm LARGER THAN DIAMETER OF BAR. HOLE MAY BE INCLINED NO MORE THAN 5° OFF THE HORIZONTAL. DOWELS SHALL BE EPOXI,ED INTO CLEAN HOLES. EPOXY SHALL CONFORM TO THE REQUIREMENT OF SECTION 728 OF THE STANDARD SPECIFICATIONS.

* - Place Bars in Center of Walls and Slabs

NOTE:
Old Headwalls To Remain In Place, Unless Otherwise Noted.

PART LONGITUDINAL SECTION

ELEVATION

PLAN

R.C.B. CULVERT EXTENSION

* - Place Bars in Center of Walls and Slabs

SECTION

METHOD OF PLUGGING R.C.B.
NOTES: Width and Height Varies.
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

METRIC
NDOT

METHOD OF EXTENDING R.C.B. CULVERTS

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION

E.20.1.7-150.21
00-00-00
00-00-00
GENERAL NOTES

1. CONCRETE: ALL CONCRETE IN PRECAST PRESTRESSED PILES SHALL BE DESIGNATED AS CONCRETE, EXCEPT THE MEL SIAM AND RANCH STAFF SHALL CONTAIN NOT LESS THAN 500 LBS. CEMENT PER CUBIC YARD. AIR CONTENT SHALL BE 0% TO 0.5%. MINIMUM ULTIMATE COMpressive STRENGTH SHALL BE:

   * 5,000 psi at 28 days
   * 7,000 psi at 56 days

2. FINAL FORCE: THE FORCE REMAINING IN THE PILES AFTER ALL LOADED IN THE PRESTRESSING STEEL SHALL BE 43 KSI (300 MPa). CONCRETE STRESS: TOTAL LOADS IN PRESTRESSING STEEL SHALL BE TAKEN AS 1.76 KSI.

3. PRESTRESSING STEEL: PRESTRESSING STEEL SHALL BE HIGH-TECHNIQUE STRENGTH SEVERE WIRE STRAND CONFORMING TO THE REQUIREMENTS OF ASTM A416.

4. REINFORCEMENT: ALL REINFORCING STEEL SHALL BE ASPIRE AT A MINIMUM OF 600 KSI. STAINLESS STEEL WIRE FOR SPIRAL REINFORCEMENT SHALL COMPLY TO ASTM A416.

CONSTRUCTION NOTES

1. LAPPED SPLICES: IN SPIRAL REINFORCEMENT SHALL BE 60 DIAMETERS MINIMUM. ALL SPIRAL REINFORCEMENT AT SPLICES AND AT ENDS OF THE PILE SHALL BE TERMINATED BY A 125-TONG WITH A 150-MIL TAIL RIVED REDDING A LONGITUDINAL BAR OR STRAND.

2. LOCATION AND TYPE OF LIFTING DEVICES SHALL BE APPROVED BY THE ENGINEER.

3. MAXIMUM CUT-OFF LENGTH AT THE TOP OF PILE IS 3600 mm.

4. PRECAST PRESTRESSED CONCRETE PILES SHALL BE SUPPLIED FULL LENGTH. SPLICES SHALL NOT BE ALLOWED.

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

PRECAST PRESTRESSED CONCRETE PILE DETAILS

E. J. Maguire
CHIEF ENGINEER

ACCEPTED 7/30
REVISION
600 mm DIAMETER PILES

NOTES:
1. SPLICES IN LONGITUDINAL REINFORCEMENT NOT ALLOWED WITHIN UPPER 1500 mm OF PILE. MINIMUM LIP SPACING 25 mm or 1500 mm.
2. LONGITUDINAL PILE REINFORCEMENT EXCEEDING 2500 mm MUST BE SPLICED AT 1500 mm INTERVALS.
3. LAPPED SPLICES IN SPIRAL REINFORCEMENT SHALL BE APPLIED WITH A DIA. 25 mm TWISTED TIE AT THE LIP END. STEEL SHALL BE TREATED WITH A DIA. 25 mm TWISTED TIE AT THE LIP END. STEEL SHALL BE TREATED WITH A DIA. 25 mm TWISTED TIE AT THE LIP END. STEEL SHALL BE TREATED WITH A DIA. 25 mm TWISTED TIE AT THE LIP END. STEEL SHALL BE TREATED WITH A DIA. 25 mm TWISTED TIE AT THE LIP END. STEEL SHALL BE TREATED WITH A DIA. 25 mm TWISTED TIE AT THE LIP END. STEEL SHALL BE TREATED WITH A DIA. 25 mm TWISTED TIE AT THE LIP END. STEEL SHALL BE TREATED WITH A DIA. 25 mm TWISTED TIE AT THE LIP END. STEEL SHALL BE TREATED WITH A DIA. 25 mm TWISTED TIE AT THE LIP END. STEEL SHALL BE TREATED WITH A DIA. 25 mm TWISTED TIE AT THE LIP END. STEEL SHALL BE TREATED WITH A DIA. 25 mm TWISTED TIE AT THE LIP END. STEEL SHALL BE TREATED WITH A DIA. 25 mm TWISTED TIE AT THE LIP END. STEEL SHALL BE TREATED WITH A DIA. 25 mm TWISTED TIE AT THE LIP END. 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HP PILE POINT ATTACHMENT NOTES
1. HP PILE POINT ATTACHMENTS ARE REQUIRED ONLY WHEN SHOWN ON THE PLANS OR IN THE SPECIAL PROVISIONS.
2. THE PILE POINT CONFIGURATION SHALL BE AS SHOWN ON PLANS.
3. PILE POINT ATTACHMENTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A24M GRADE 450-240 UNLESS NOTED OTHERWISE.
4. WELDS FOR ATTACHMENTS SHALL BE AS RECOMMENDED BY THE MANUFACTURER.

TYPICAL HP PILE POINT DETAIL

HP PILE SPlice DETAIL

HP PILE ANCHORAGE DETAIL

SINGLE VEE-GROOVE BUTT WELD
PERMITTED FOR ALL POSITIONS

COMPLETE APTT PENETRATION WELD USE WELDING DETAILS FOR APPROVED WELDS

PILE SPLICE NOTES
1. PILE SPLICE WELDS SHALL CONFORM TO AWS D1.1.
2. PILE MUST BE STOPPED AT LEAST 1000 mm ABOVE GROUND POINT TO SPLICEING.

SINGLE BEVEL-GROOVE BUTT WELD
PERMITTED IN HORIZONTAL POSITION ONLY

PILE SPLICE WELDING DETAILS
**GENERAL NOTES**

1. RAILING TO CONFORM TO VERTICAL AND HORIZONTAL ALIGNMENT.
2. JOINTS TO BE SPACED 12000 mm CENTER TO CENTER, MAXIMUM.
3. SLIP JOINTS TO BE PLACED IN PANELS TO MATCH EXPANSION JOINTS IN DECK. THE 6 IN. FOR MOVEMENT WILL BE CHARGED TO MATCH ALLOWANCE FOR MOVEMENT IN THE DECK AND CURB.
4. DESIGN WEIGHT: 25.3 kg PER METER.
5. RAILING ASSEMBLY SHALL BE GALVANIZED AFTER FABRICATION.
6. ALL EXPOSED SURFACES OF RAILING ASSEMBLY SHALL BE PAINTED WHITE.

**METRIC**

**STEEL BRIDGE RAIL TYPE "H"**

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
END REDWOOD STRIPS AT TOP OF RADIAL SECTION WHEN THEIR INTERMEDIATE DISTANCE FROM EACH OTHER REACHES 1000 mm

NOTE:
1. SLOPE PAVING IS TO BE DIVIDED INTO EQUALLY SPACED PANELS. THE WIDTH OF EACH PANEL IS TO BE AS NEARLY 3000 mm AS SITE DIMENSIONS WILL PERMIT.
2. THESE DETAILS WILL NOT APPLY IN TOTAL TO ANY ONE SITE, BUT ARE INTENDED TO BE GENERAL ENOUGH TO COVER ALL POSSIBILITIES. TO OBTAIN LIMITS OF SLOPE PAVING FOR A SPECIFIC SITE, CONSULT THE PLAN SHEETS.

38x89 Redwood Saw As Shown & Reassemble Remove Upper Portion After Concrete Cures.

25 mm Screws

100 Galvanized

60 mm Concrete

Edger Finish

Rough Finish (Typ.)

Concrete Slope Paving

SECTION F-F

SECTION E-E

EDGE OF SLOPE

SECTION D-D

AT WINGWALL

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

METRIC
CONCRETE SLOPE PAVING DETAILS

10 Galvanized 0.200 O.C. (Stopper)

Concrete Joint

150

80

150

60 mm Concrete Slop Paving

90° Concrete Paving

SECTION C-C

AT ABUTMENT

SECTION B-B

AT PIER

SECTION A-A

WITH SIDEWALK

SECTION A-A

WITH DITCH

SECTION A-A

TOE OF SLOPE

3F-95

8-81-15

REV.

5/8/81

B.L.

7-3-81

REV.

5/8/81

B.L.

7-3-81

REV.

5/8/81

B.L.

7-3-81

REV.

5/8/81

B.L.

7-3-81

REV.

5/8/81

B.L.

7-3-81

REV.

5/8/81

B.L.