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B-7 (2000) - GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 1

B-8 (2000) - GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 2

B-9 (2002) - GUARDRAIL TO BARRIER CONNECTION, EXIT TYPE

B-10 (2002) - BRIDGE RAIL RETROFIT, TYPE 1

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B-12 (2002) - BRIDGE RAIL RETROFIT, TYPE 3

B-13 (2000) - HARDWARE

B-14 (2000) - CONCRETE SAFETY BARRIER (F SHAPE)

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B-15 PORTABLE CONCRETE SAFETY BARRIER (F SHAPE)

D-1 PLAN, ELEVATION, AND SECTION VIEW DELETED - SEE SPECIFICATIONS.
D-2 CURVE SECTION DETAIL DELETED - SEE SPECIFICATIONS.
D-3 TAPERED END DETAIL DELETED - SEE SPECIFICATIONS.
D-4 TYPICAL REINFORCEMENT DETAILS DETAIL DELETED - SEE SPECIFICATIONS.
D-5 JOINT CONNECTION DETAILS DETAIL DELETED - SEE SPECIFICATIONS.

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SHEET NO. NAME
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C-2 CURB RAMPS

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D-1 GD SAFETY END STRUCTURE

D-2 GD SAFETY END STRUCTURE

D-3 GD SAFETY GRATES

D-4 GD INLET BOX DETAILS

D-5 INLET DETAILS

SECTION III - DRAINAGE

SHEET NO. NAME
D-1 GD SAFETY END STRUCTURE

D-2 GD SAFETY END STRUCTURE

D-3 GD SAFETY GRATES

D-4 GD INLET BOX DETAILS

D-5 INLET DETAILS

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<td>- MANHOLE DETAILS</td>
</tr>
<tr>
<td>0200 - 1</td>
<td>BOX MANHOLE ASSEMBLY</td>
</tr>
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<td>0200 - 2</td>
<td>ROUND MANHOLE ASSEMBLY</td>
</tr>
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<td>0200 - 3</td>
<td>MANHOLE FRAME AND COVER</td>
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<td>0200 - 4</td>
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<td>D-7</td>
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<td>E-2 (2006)</td>
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<td>E-5 (2006)</td>
<td>- STONE CHECK DAM</td>
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<td>E-6 (2005)</td>
<td>- SEDIMENT TRAP</td>
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<td>E-7 (2005)</td>
<td>- SEDIMENT TRAP USING DRAINAGE INLET AS OUTLET</td>
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<tr>
<td>0200 - 2</td>
<td>TRASH HOOK DETAILS</td>
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<td>- EROSION CONTROL BLANKET APPLICATIONS</td>
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<td>E-10 (2005)</td>
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<td>- TEMPORARY SWALE</td>
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<td>E-13 (2005)</td>
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<td>E-21 (2005)</td>
<td>- STABILIZED CONSTRUCTION ENTRANCE</td>
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<tr>
<td>0200 - 1</td>
<td>FLOATING TURBIDITY CURTAIN</td>
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<tr>
<td>0200 - 2</td>
<td>STAGED TURBIDITY CURTAIN</td>
</tr>
<tr>
<td>E-24 (2005)</td>
<td>- PORTABLE SEDIMENT TANK</td>
</tr>
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<td>E-25 (2005)</td>
<td>- TURF REINFORCEMENT MAT APPLICATIONS</td>
</tr>
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<td>E-26 (2006)</td>
<td>- RPRAP ENERGY DISSIPATOR DETAIL</td>
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  - 2006-2: TREE PLANTING DETAILS
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M-2 (2001): CONCRETE MONUMENT
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M-4 (2004): BIKE RACK
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  - 2000-3: # BOLT, HOOK BOLT, DOWEL & TIE BAR
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  - 2004-1: FULL DEPTH PATCH PLAN VIEW
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  - 2004-3: FULL DEPTH PATCH SEALANT DETAILS, CIRCUIT RETENTION DISK, AND DOWEL BAR
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<td>CONDUCT JUNCTION WELL, TYPE 4</td>
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<tr>
<td>T-3 (2005)</td>
<td>CONDUCT JUNCTION WELL, TYPE 5</td>
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<tr>
<td>T-4 (2005)</td>
<td>CABINET BASES (TYPES &quot;A&quot; AND &quot;B&quot;)</td>
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<td>T-5</td>
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<td>T-6 (2005)</td>
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<td>T-8 (2005)</td>
<td>LOOP DETECTOR TO CONDUCT JUNCTION WELL CONNECTION</td>
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<td>TYPE &quot;A&quot; LOOP DETECTOR</td>
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<td>T-10 (2005)</td>
<td>TYPE &quot;B&quot; LOOP DETECTOR</td>
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<td>T-11</td>
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<tr>
<td>T-12</td>
<td>MESSENGER WIRE ATTACHMENT</td>
</tr>
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<td>T-13</td>
<td>CONDUCT JUNCTION WELLS</td>
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<td>T-14</td>
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<tr>
<th>ITEM NO.</th>
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<tbody>
<tr>
<td>1</td>
<td>W-BEAM</td>
</tr>
<tr>
<td>2</td>
<td>W6 X 9 (W150 x 13.5) STEEL POST</td>
</tr>
<tr>
<td>3</td>
<td>WOOD OFFSET BLOCK</td>
</tr>
<tr>
<td>4</td>
<td>SPILCE - REQUIRES EIGHT (8) 1/2&quot; (16) GUARDRAIL BOLTS (L=1/4&quot; (35)) WITH RECESS NUTS, AND ONE (1) 5/8&quot; (16) GUARDRAIL BOLT (L=10&quot; (255)) WITH RECESS NUT.</td>
</tr>
<tr>
<td>5</td>
<td>W-BEAM TERMINAL CONNECTOR</td>
</tr>
<tr>
<td>6</td>
<td>5/8&quot; (16) GUARDRAIL BOLT (L=1/4&quot; (35)) AND RECESS NUT</td>
</tr>
<tr>
<td>7</td>
<td>5/8&quot; (16) GUARDRAIL BOLT (L=10&quot; (255)) AND RECESS NUT</td>
</tr>
<tr>
<td>8</td>
<td>5/8&quot; (16) GUARDRAIL BOLT (L=10&quot; (255)), STEEL WASHER, AND RECESS NUT</td>
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<tr>
<td>9</td>
<td>3/4&quot; (22) HIGH STRENGTH STRUCTURAL HEX BOLT (L=VARYS) AND HEX NUT</td>
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<tr>
<td>10</td>
<td>5/8&quot; (16) CARRIAGE BOLT (L=VARYS), STEEL WASHER, AND HEX NUT</td>
</tr>
<tr>
<td>11</td>
<td>BEARING PLATE</td>
</tr>
</tbody>
</table>
DELTA WARE
DEPARTMENT OF TRANSPORTATION

GUARDRAIL APPLICATIONS
STANDARD NO. B-1 (2004)  SHT. 1 OF 6

APPROVED

RECOMMENDED

NOTES:
1. THE DISTANCE FROM THE EDGE OF THE TRAVEL LANE OR SHOULDER TO THE FACE OF GUARDRAIL SHOULD BE MAXIMIZED. THIS AREA SHALL BE GRADED 1:10 OR FLATTER.
2. PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.

TYPE 1 GUARDRAIL
TYPICAL GUARDRAIL TREATMENT
WHEN THE REQUIRED 4' (1200) CLEARANCE TO OBSTRUCTION IS AVAILABLE

TYPE 2 GUARDRAIL
TYPICAL GUARDRAIL TREATMENT WHEN A MINIMUM OF 2' (600) TO 4' (1200) OF CLEARANCE TO OBSTRUCTION IS AVAILABLE

TYPE 3 GUARDRAIL
TYPICAL GUARDRAIL TREATMENT WHEN A MINIMUM OF 4' (1200) IS AVAILABLE FOR MEDIAN

FLARE RATES

<table>
<thead>
<tr>
<th>DESIGN SPEED</th>
<th>FLARE RATE</th>
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<tbody>
<tr>
<td>70 MPH (110 km/h)</td>
<td>6d</td>
</tr>
<tr>
<td>60 MPH (100 km/h)</td>
<td>6d</td>
</tr>
<tr>
<td>55 MPH (90 km/h)</td>
<td>6d</td>
</tr>
<tr>
<td>50 MPH (80 km/h)</td>
<td>6d</td>
</tr>
<tr>
<td>45 MPH (70 km/h)</td>
<td>6d</td>
</tr>
<tr>
<td>40 MPH (60 km/h)</td>
<td>6t</td>
</tr>
<tr>
<td>30 MPH (50 km/h)</td>
<td>6t</td>
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</tbody>
</table>
NOTE: OVERLAP W-BEAMS IN DIRECTION OF TRAVEL.
GUARDRAIL SECTION
(RURAL SHOULDER APPLICATION)

CURB SHALL BE USED ONLY WHEN INDICATED ON THE PLANS
NO FIXED OBJECTS OR OBSTRUCTIONS (SEE TABLE BELOW)

HINGE POINT

GUARDRAIL SECTION
(MEDIAN APPLICATION)

CURB TO BE USED ONLY WHEN INDICATED ON THE PLANS

GUARDRAIL SECTION
(URBAN SHOULDER APPLICATION)

OFFSET DISTANCE

PAVEMENT OR SIDEWALK SHALL BE USED ONLY WHEN INDICATED ON PLANS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>POST SPACING</th>
<th>CLEAR AREA BEHIND POST</th>
<th>DESIGN SPEED</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6' (1.8m)</td>
<td>4' (1200 mm)</td>
<td>&lt; 50 MPH (80 km/h)</td>
<td>6' (1800)</td>
</tr>
<tr>
<td>2</td>
<td>3' 1/2 (952.5)</td>
<td>2' (600 mm)</td>
<td>&gt; 50 MPH (80 km/h)</td>
<td>10' (3000)</td>
</tr>
</tbody>
</table>

DELAWARE
DEPARTMENT OF TRANSPORTATION

GUARDRAIL APPLICATIONS

STANDARD NO. B-1 (2002) SHT. 3 OF 6

APPROVED

01/31/2002

RECOMMENDED
NOTES:
1. FLARE THE END TREATMENT AT 25' BEGINNING 50' O.S. FROM THE END OF THE IMPACT HEAD, UNLESS THE CONSTRUCTION PLANS OR SPECIFICATIONS SPECIFY A SMALLER FLARE.
2. THIS DETAIL WAS SOLELY CREATED TO SHOW THE GRADING REQUIRED FOR THIS TYPE OF ATTENUATOR.
3. THE GUARDRAIL END TREATMENT ATTENUATOR SHALL BE INSTALLED AS PER THE MANUFACTURER'S AND THE DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS.

GRADING FOR GUARDRAIL END TREATMENT ATTENUATOR, TYPE I
NOTES:
1. Flare shall be 4' (1200) unless the construction plans or specifications specify a smaller flare. Flare may be parabolic or straight based on manufacturer's specifications.
2. This detail was solely created to show the grading required for this type of attenuator. The guardrail end treatment attenuator shall be installed as per the manufacturer's and the Department of Transportation's specifications.

SECTION A-A

GRADING FOR GUARDRAIL END TREATMENT ATTENUATOR, TYPE 2
NORMAL DOUBLE FACE W-BEAM BARRIER
ON TRANSITION TO CONCRETE BARRIER
50' 05" mLIM OF PAYMENT

SHOULDER

10' (3000 MM)
TRANSITION GRADING
SHOWN ON PLANS
OF REQUIRED

MIDIAN DITCH

SHOULDER

DIRECTION OF TRAFFIC

BEGINNING OF TRANSITION

PLAN VIEW

SECTION B-B
GRADING FOR END TREATMENT ATTENUATOR, TYPE 3

NOTES:
1. THIS DETAIL WAS SOLELY CREATED TO SHOW THE GRADING REQUIRED FOR THIS TYPE OF ATTENUATOR.
2. W/B OR FLATTER GRADING IS ALLOWABLE WHEN THE BARRIER IS LOCATED 0' (0MM) OR MORE FROM THE OUTSIDE EDGE OF THE SHOULDER.
3. THIS END TREATMENT CAN ALSO BE USED IN RAMP CORSES OR OTHER AREAS WHERE 2 RAILS OF W-BEAM COME TOGETHER AND TERMINATE WITH ONE END TREATMENT.
4. WHEN OPPOSING ROADWAYS HAVE EQUAL ELEVATIONS THE TRAFFIC BARRIER SYSTEM SHOULD BE PLACED ON THE OPPOSITE SIDE OF THE DITCH LINE FROM APPROACHING TRAFFIC.
5. THE GUARDRAIL END TREATMENT ATTENUATOR SHALL BE INSTALLED AS PER THE MANUFACTURER'S AND THE DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS.
NOTES:
1. ALL W-BEAMS ARE 12'-6" (3810) IN LENGTH.
2. PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.
DELAWARE
DEPARTMENT OF TRANSPORTATION

GUARDRAIL OVER CULVERTS, TYPE 2

APPROVED

STANDARD NO. B-5 (2000) SHT. 1 OF 1

RECOMMENDED

NOTES:
1. ALL W-BEAMS ARE 18'-9" (5715) IN LENGTH.
2. PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.
NOTES:
1. NO WASHERS ARE USED ON THE RAIL SIDE OF THE LONG WOOD BREAKAWAY POSTS.
2. THE CURVED GUARDRAIL SECTION SHALL BE SHOP BUILT.
3. PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.

AREA BEHIND GUARDRAIL TO BE MAINTAINED FREE OF FIXED OBJECTS OR OTHER HAZARDS.

TYPE I GUARDRAIL PLACEMENT OR APPROPRIATE END TREATMENT OR GUARDRAIL TO BARRIER CONNECTION

CURVED GUARDRAIL SECTION

PLAN

SECCTN A-A

LONG WOOD BREAKAWAY POST

SLOPE = 15:1 OR FLATTER

4' (1200) ROUNDING

RAIL NOT BOLTED TO THE POST AT THE CENTER OF THE CURVED SECTION

AREA BEHIND GUARDRAIL TO BE MAINTAINED FREE OF FIXED OBJECTS OR OTHER HAZARDS.
NOTES:
1. ADDITIONAL HOLES FOR ANCHOR PLATE SHALL BE DRILLED PRIOR TO GALVANIZING. SEE STANDARD HARDWARE SHEET FOR HOLE SPACING INFORMATION.
2. CONTRACTOR HAS THE OPTION OF USING A 4" (100) STEEL TUBE WITHOUT A SOIL PLATE OR A 5" (125) STEEL TUBE WITH A SOIL PLATE.

END ANCHORAGE

DEPARTMENT OF TRANSPORTATION

STANDARD NO. B-5 (2002) SHT. 1 OF 1

APPROVED

RECOMMENDED

01/31/2002
FLARE RATES

<table>
<thead>
<tr>
<th>Design Speed</th>
<th>Flare Rate</th>
</tr>
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<tbody>
<tr>
<td>40 MPH (0.65 km/h)</td>
<td>5ft</td>
</tr>
<tr>
<td>45 MPH (0.75 km/h)</td>
<td>10ft</td>
</tr>
<tr>
<td>50 MPH (0.80 km/h)</td>
<td>15ft</td>
</tr>
<tr>
<td>55 MPH (0.90 km/h)</td>
<td>15ft</td>
</tr>
<tr>
<td>60 MPH (1.00 km/h)</td>
<td>15ft</td>
</tr>
<tr>
<td>65 MPH (1.05 km/h)</td>
<td>15ft</td>
</tr>
<tr>
<td>70 MPH (1.12 km/h)</td>
<td>15ft</td>
</tr>
</tbody>
</table>

NOTES:

1. BURIED END SECTION PAYMENT INCLUDES THE CONCRETE OR POST ANCHORAGE, EXCAVATION, BACKFILL, AND ALL APPROPRIATE ITEMS, INCLUDING LABOR NECESSARY TO COMPLETE END ANCHORAGE.

2. THE CONTRACTOR HAS THE OPTION OF USING EITHER A CONCRETE BLOCK ANCHOR OR A POST ANCHOR TO TERMINATE THE BURIED END SECTION.


4. WHEN USING A SECOND RAIL, IF 12" (30 cm) LONG POSTS ARE REQUIRED, BEHIND THE DITCHLINE, POSTS MUST PROVIDE 4" (10 cm) MINIMUM EMBEDMENT (20°) (50) WHEN ROCK IS ENCOUNTERED, POSTS FOR THE POST ANCHOR SHALL BE 4" (100 cm) LONG.


6. MAINTAIN THE FLARE OF THE GUARDRAIL UNTIL THE 12" (30 cm) COVER HAS BEEN ATTAINED. IF THE 12" (30 cm) COVER CANNOT BE ATTAINED BEFORE THE RAIL IS 7' (2100 mm) BEHIND THE BOTTOM OF THE DITCH, THEN SLOPE THE GUARDRAIL FROM THE POINT WHERE IT CROSS THE DITCH TO WHERE IT IS 7' (2100 mm) BEHIND THE DITCH, SO THAT IT HAS 2' (600 mm) OF COVER.

DELAWARE
DEPARTMENT OF TRANSPORTATION

STANDARD NO. B-6 (2002)
SHT. 2 OF 3

APPROVED

RECOMMENDED

01/31/2002
NOTES:
1. W BEAM IS NOT BOLTED TO POSTS AT POSTS 2 THROUGH 4.
2. RUB RAIL IS NOT BOLTED AT POSTS 2 AND 4.
3. POSTS 1 THROUGH 6 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER WOOD BLOCKS AND/OR RUBRAIL AND WOOD BLOCK.
4. USE APPROPRIATE EPOXY BOLT ANCHORS TO REDUCE THE CHANCE OF SPLITTING THE CONCRETE.
5. PLACE STEEL WASHERS FOR \( \frac{3}{4}" \) DIA BOLT BETWEEN BOLT HEADS AND RUB RAIL.
6. ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.
7. PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.
8. APPROVED CONCRETE INSERTS MAY BE USED IN NEW CONSTRUCTION TO ATTACH TERMINAL CONNECTOR TO PARAPET.
ELEVATION
WOOD BLOCKOUT DETAIL

WIDTH VARIES (SEE TABLE)

ELEVATION
RIGHT SIDE

RUB RAIL WOOD BLOCKS

RUB RAIL WOOD BLOCKS
(7" (175) x 4" (100))

POST NO. | WIDTH | BOLT LENGTH
---------|--------|-------------
1        | 4\(\frac{3}{4}\) (108) | 6" (150)
2        | 3\(\frac{3}{4}\) (83)    | 4" (100)
3        | 2\(\frac{3}{4}\) (50)    | 4" (100)
4        | 1\(\frac{3}{4}\) (25)    | 2" (50)

ELEVATION
RIGHT SIDE

RUB RAIL TO BARRIER CONNECTION

NOTES:
1. THE RUB RAIL TO BARRIER CONNECTION END MUST BE ATTACHED FLUSH WITH THE SLOPED TOP OF THE SAFETY BARRER INSTALLATION CAN BE SIMPLIFIED BY FABRICATING OR SHOP TWISTING THE RUB RAIL END TO BE CONSISTENT WITH THE SLOPE OF THE BARRIER, HOWEVER, FIELD BENDING USING HEAT IS PERMITTED.

2. STEEL SPACER TUBE IS SCHEDULE 40 GALVANIZED PIPING 6" (150) O.D. X 3" (229)

DELWARE
DEPARTMENT OF TRANSPORTATION

GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 1

STANDARD NO. B-7 (2001) SHT. 2 OF 3

APPROVED
RECOMMENDED

04/01/2001
LIMITS OF PAYMENT FOR GUARDRAIL TO BARRIER CONNECTION APPROACH TYPE 2

NOTES:
1. CURB SHALL NOT BE USED AT THE FACE OF RAIL WITHIN THE LIMITS OF THIS INSTALLATION.
2. POSTS 1, 2, 3, 4, AND 6 REQUIRE AN ADDITIONAL HOLE TO ATTACH WOOD BLOCKS AND/OR BENT RAIL.
3. DO NOT ATTACH RAILS TO POSTS 1, 2, 3, 5, OR 7.
4. ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.
5. GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 2
6. GUARDRAIL OR APPROPRIATE END TREATMENT
7. APPROVED CONCRETE INSERTS MAY BE USED IN NEW CONSTRUCTION TO ATTACH TERMINAL CONNECTORS TO PARAPET.
8. PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.
9. WHEN PLACED OVER CURB MIN 8" (200) HIGH, BOTTOM RAIL CAN BE ELIMINATED.
BENT RAIL WOOD BLOCKS

BENT RAIL WOOD BLOCKS

1'-2"(360) x 4 1/2"(115)

<table>
<thead>
<tr>
<th>BLOCK</th>
<th>WIDTH</th>
<th>BOLT LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5&quot;(125)</td>
<td>8&quot;(200)</td>
</tr>
<tr>
<td>2</td>
<td>4&quot;(100)</td>
<td>6&quot;(150)</td>
</tr>
<tr>
<td>3</td>
<td>3&quot;(75)</td>
<td>6&quot;(150)</td>
</tr>
<tr>
<td>4</td>
<td>2&quot;(50)</td>
<td>4&quot;(100)</td>
</tr>
</tbody>
</table>

NOTE: BOTTOM WOOD BLOCKS LOCATED ON POSTS 1-4 ARE OFFSET DRILLED TO SIT SQUARELY ON THE POST FLANGE AND SECURED WITH 3/8"(9.53) CARRIAGE BOLTS OR VARIES, SEE BENT RAIL WOOD BLOCKS TABLE.
NOTES:
1. CONCRETE INSERTS MAY BE USED IN NEW CONSTRUCTION TO ATTACH TERMINAL CONNECTOR TO PARAPET.
2. GUARDRAIL SECTION AND TERMINAL CONNECTORS SHALL BE OVERLAPPED IN THE DIRECTION OF TRAVEL.
3. INSTALLATION SHOWN ABOVE WITH AN 'T'-TYPE BARRIER FACE. GUARDRAIL SECTION OF BARRIER CONNECTION SHALL BE ADJUSTED HORIZONTALLY IN ORDER TO MEET FLUSH AGAINST VARIOUS TYPES OF WALLS AND BARRIERS.
1). The installation shall be used when the existing sidewalk is 6'-3" (1905) or less.

2). Use a Thrie beam expansion section at bridge expansion joints.

3). Place guardrail reflector in the upper valley of the Thrie beam every fifth post.

4). Timber block thickness shall be adjusted to allow face of the Thrie beam to be flush with bottom of curb. Minimum thickness shall be 4" (100).

5). The exit end application shall be used only on divided highways. For all other situations, the entrance end application shall be used on both ends of the bridge parapet.

6). Spacing of wood posts may need to be reduced to accommodate lining up posts at the end of the parapet.
EXISTING RAIL

1) THIS INSTALLATION SHALL BE USED WHEN THE EXISTING SIDEWALK IS 18" (450) OR WIDER, AND DEAD LOAD CONSIDERATIONS ARE A CONCERN WHEN USING BRIDGE RAIL RETROFIT, TYPE 3.

2) ADHESIVE ANCHORS SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS AND SHALL BE GALVANIZED.

3) USE A THREE BEAM EXPANSION SECTION AT BRIDGE EXPANSION JOINTS.

4) PLACE GUARDRAIL REFLECTOR IN THE UPPER VALLEY OF THE THRIE BEAM EVERY FIFTH POST.

5) THE EXIT END APPLICATION SHALL BE USED ONLY ON DIVIDED HIGHWAYS. FOR ALL OTHER SITUATIONS, THE ENTRANCE END APPLICATION SHALL BE USED ON BOTH ENDS OF THE BRIDGE PARAPET.

6) SPACING OF STEEL POSTS MAY NEED TO BE REDUCED TO ACCOMMODATE LINING UP POSTS AT THE END OF THE PARAPET.

NOTES:

W6 x 15 (W50 x 22) STEEL GUARDRAIL POST

W 1/2 (20) GROUT PAD-FILL WITH WASHERS AS NECESSARY TO LEVEL PLATE

CHIP OUT 1/2" DEEP RECESS FOR GROUT

DRILL FOR 2 - 5/16 x 12" SCREW BOLTS (AASHTO M-840)

ADHESIVE ANCHORS 65,000 lbs (25,000 kg) ULTIMATE
ADHESIVE BOND STRENGTH, 1" (25) MIN. EMBEDMENT

DRILL FOR 2 - 5/8 x 12" SCREW BOLTS (AASHTO M-840)

ADHESIVE ANCHORS 80,000 lbs (35,000 kg) ULTIMATE
ADHESIVE BOND STRENGTH, 1.5" (38) MIN. EMBEDMENT

SECTION A-A

THREE BEAM GUARDRAIL WITH STEEL POSTS SPACED AT 6'-3" (1905) CENTER TO CENTER

SEE NOTE

EXISTING CURB LINE (BOTTOM OF CURB)

SEE NOTE

END OF SIDEWALK

POINT OF STANDARD NO.

18" (450) MIN.

A

DIRECTION OF TRAVEL

END OF SIDEWALK

A

ENTRANCE END APPLICATION

SEE NOTE

EXIT END APPLICATION

SEE NOTE

1/2 x 120 x 1/2 x 250 x 1" x 2" (150) x 200 (125) MIN. EMBEDMENT

1/2 (20) GUARDRAIL BOLT (L=1"

31/2"

3"

3"

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TYPE I GUARDRAIL PLACEMENT OR APPROPRIATE END TREATMENT
GUARDRAIL TO BARRIER CONNECTION
LIMIT OF PAYMENT

END OF SIDEWALK

TAPER END OF WALL TO TOP OF GUARDRAIL AT A SLOPE OF 4:1 OR FLATTER

CONTRACTION JOINTS

BRIDGE BARRIER

DIRECTION OF TRAVEL

EXISTING BRIDGE RAIL

2"(50)

1000.0

4" (100)

2.500.0

3/4" (20)

2-1/8"

2.250.0

2-7/8" (75)

VARS

NOTE: STANDARD GUARDRAIL TO BARRIER CONNECTIONS SHALL BE CONNECTED TO THE ENDS OF THE NEW BRIDGE BARRIER AND TRANSITIONED TO THE EXISTING GUARDRAIL.

SECTION A-A

EXISTING RAIL - DO NOT DISTURB

(N12.5)

N

$(#5) B4/25 (4)

DRILL 2.250 DIA. HOLE, FILL WITH HIGH STRENGTH NON-SHRINK CEMENT

*6 (#5) BARS SPACED 18"(457)

LATERALLY, FRONT AND BACK ROWS SHALL BE STAGGERED
W-BEAM ELEVATION

- W-BEAM SECTION

NOTES: B. TWO ADDITIONAL 3/8" x 2 1/2" BOLT SLOTS SHALL BE PROVIDED AT 6'-3" (1905) SPACING FOR BEAM LENGTH OF 26'-1/2" (7940).

DELAWARE
DEPARTMENT OF TRANSPORTATION

HARDWARE
STANDARD NO. B-13 (2004) SHT. 1 OF 13

APPROVED

RECOMMENDED

DATE: 1/4/05

09/31/2004
W-BEAM STEEL POST AND WOOD OFFSET BLOCK

**NOTES:**
- Where conditions require, alternate lengths in increments of 6" (150) may be used.
- Lower holes only required where hub rail is used.
- **Note:** all holes shall be 9/32" (0.08), bolt hole pattern is symmetrical with respect to the vertical axis of the post.
W-BEAM TERMINAL CONNECTOR

ELEVATION

3/4" (20) x 2 1/8" (55) SLOT (OPTIONAL)

1/2" (13) x 1/8" (30) SLOTS

5/16" (8) HOLE

2" (51)

12" (300)

30" (750)

PLAN

2'-6" (760)

DELWARE
DEPARTMENT OF TRANSPORTATION

HARDWARE


APPROVED

RECOMMENDED

DATE: 1/14/05

DATE: 1/15/05

DATE: 01/27/2004
THREE BEAM ELEVATION

THREE BEAM EXPANSION ELEMENT

THREE BEAM SECTION

DELWARE
DEPARTMENT OF TRANSPORTATION

HARDWARE

APPROVED


RECOMMENDED

DATE: 11/4/05

HARDWARE

B-13 (2004)
NOTE: WHERE CONDITIONS REQUIRE, USE ALTERNATE LENGTHS IN INCREMENTS OF 6" (150)

THREE BEAM STEEL POST AND WOOD OFFSET BLOCK

POST

NOTE:

ALL HOLES SHALL BE 5/8" (16) C/D BOLT HOLE PATTERN IS SYMMETRICAL WITH RESPECT TO THE VERTICAL AXES OF THE POST.
Standard W-Beam Section

- 3' 6½" (922.9) long
- 4½" (114)
- 12" (305) high

Post Bolt Slots:
- 4" (100) max.
- 2" (508) min.

W-Beam Transition Section

- 3' 6½" (922.9) long
- 4½" (114)
- 12" (305) high

Splice Bolt Slots:
- 4½" (114)
- 12" (305) high

Hardware:
- 13

Delaware Department of Transportation

Recommended

Date: 11/1/05

Hardware

NOTES:
1. All holes shall be drilled prior to galvanizing.
2. All wood sizes are nominal dimensions.

1/4" (6) THICK GALVANIZED STEEL PLATE
1/4" (12) DIA. HOLES

STEEL PLATE
7/8" (180) x 3/4" (75) GALVANIZED STEEL TUBING

WOOD BLOCK
3/4" (180) DIA. HOLE

SOIL PLATE

STEEL TUBE

SHORT WOOD BREAKAWAY POST
3/4" (180) x 3/4" (75) SLOT
3/4" (12) DIA. HOLES

LONG WOOD BREAKAWAY POST
2 3/4" (70) DIA. HOLES
2 3/4" (70) DIA. HOLES
2 3/4" (70) DIA. HOLES
ANCHOR PLATE TO W-BEAM CONNECTION DETAIL

SWAGED CABLE ASSEMBLY AND RELATED HARDWARE ASSEMBLY

NOTES:
1. TO ENSURE THAT THE TIMBER BEARING PLATE REMAINS IN POSITION.
2. 2 - 10d GALVANIZED STEEL NAILS SHALL BE DRIVEN IN THE SHORT TIMBER BREAKAWAY Post, AND BENT OVER BEARING PLATE.
3. ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.

STEEL POST SLEEVE

SECTION A-A

ANCHOR PLATE TO W-BEAM CONNECTION DETAIL

NOTES:
1. TO ENSURE THAT THE TIMBER BEARING PLATE REMAINS IN POSITION.
2. 2 - 10d GALVANIZED STEEL NAILS SHALL BE DRIVEN IN THE SHORT TIMBER BREAKAWAY POST, AND BENT OVER BEARING PLATE.
3. ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.

SHORT TIMBER BREAKAWAY POST

SWAGED CABLE ASSEMBLY AND RELATED HARDWARE ASSEMBLY

NOTES:
1. TO ENSURE THAT THE TIMBER BEARING PLATE REMAINS IN POSITION.
2. 2 - 10d GALVANIZED STEEL NAILS SHALL BE DRIVEN IN THE SHORT TIMBER BREAKAWAY POST, AND BENT OVER BEARING PLATE.
3. ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.
GUARDRAIL REFLECTOR

MOUNTING POSITION

BEARING PLATE DETAIL

DELWARE
DEPARTMENT OF TRANSPORTATION

HARDWARE

APPROVED

DATE


RECOMMENDED

DATE

DATE

DATE

DATE

DATE

DATE
RECESSED NUT
(FOR 5/8" (16) GUARDRAIL BOLT)

STEEL WASHER (FOR 5/8" (16) GUARDRAIL BOLT)

Note: Dimension for washer thickness is approximate based on metal thickness.

GUARDRAIL BOLT

Notes:
1. All fillets shall have a minimum radius of 1/4" (6).
2. If the bolt extends more than 1/8" (3) beyond the nut, the bolt shall be trimmed back as per the department's specifications.

HARDWARE

<table>
<thead>
<tr>
<th>L</th>
<th>T (MIN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot; (6)</td>
<td>FULL THREAD LENGTH</td>
</tr>
<tr>
<td>1/2&quot; (12)</td>
<td>FULL THREAD LENGTH</td>
</tr>
<tr>
<td>3/4&quot; (16)</td>
<td>FULL THREAD LENGTH</td>
</tr>
<tr>
<td>1&quot; (20)</td>
<td>4&quot; X 100 THREAD LENGTH</td>
</tr>
<tr>
<td>1.125&quot; (25)</td>
<td>4&quot; X 100 THREAD LENGTH</td>
</tr>
</tbody>
</table>

NOTES:
- 1. ALL FILLETS SHALL HAVE A MINIMUM RADIUS OF 1/4" (6).
- 2. IF THE BOLT EXTENDS MORE THAN 1/8" (3) BEYOND THE NUT, THE BOLT SHALL BE TRIMMED BACK AS PER THE DEPARTMENT'S SPECIFICATIONS.
NOTE: DIMENSION FOR WASHER THICKNESS IS APPROXIMATE BASE METAL THICKNESS.
STEEL WASHER

NOTES:
1. FOR USE WITH SWAGED CABLE ASSEMBLAGE.
2. DIMENSION FOR WASHER THICKNESS IS APPROXIMATE BASE METAL THICKNESS.

1/4" (6.35)
1/2" (12.7)
3/4" (19.05)
1" (25.4)
2" (50.8)

1/8" (3.175)
3/32" (2.381)
1/32" (0.8125)

5/8" (16) CARRIAGE BOLT

5/16" (8.9)

1/4" (6.35)
3/8" (9.525)
1/2" (12.7)
13/32" (10.16)
5/32" (4.7625)
TYPICAL CAST-IN-PLACE OR SLIP-FORM CONSTRUCTION

* BAR SHALL BE CUT AT EVERY JOINT IF MADE CONTINUOUS FOR SLIP-FORM CONSTRUCTION
DELaware  
DEPARTMENT OF TRANSPORTATION

CONCRETE SAFETY BARRIER (OR SHAPED)

STANDARD NO.  B-14 (2001)  
SHT.  2  OF  3

APPROVED:  
RECOMMENDED:  
04/17/2001

TYPICAL PRE-CAST REINFORCEMENT DETAILS

ELEVATION

BAR LIST

<table>
<thead>
<tr>
<th>MARK</th>
<th>SIZE</th>
<th>NUMBER IN EACH SECTION</th>
<th>LENGTH</th>
<th>TYPE</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>68I</td>
<td>4 (2)</td>
<td>6</td>
<td>4&quot; 7/8&quot;</td>
<td>4000</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>682</td>
<td>6 (2)</td>
<td>6</td>
<td>4&quot; 7/8&quot;</td>
<td>4000</td>
<td>2</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

**NOTES:**  
1. CONCRETE CLEAR COVER FOR REINFORCING BARS SHALL BE 6" (150MM) MIN.

**BAR OFFSETS** CHART THIS SHEET

**BAR OFFSETS** FOR EACH BARBER UNIT

<table>
<thead>
<tr>
<th>NOMINAL LENGTH OF BARRIER UNIT</th>
<th>&quot;A&quot;</th>
<th>NO. BARS FOR EACH BARRIER UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>20' (6000)</td>
<td>6&quot;</td>
<td>2</td>
</tr>
<tr>
<td>16' (4800)</td>
<td>6&quot;</td>
<td>2</td>
</tr>
<tr>
<td>12' (3600)</td>
<td>6&quot;</td>
<td>2</td>
</tr>
<tr>
<td>10' (3000)</td>
<td>6&quot;</td>
<td>2</td>
</tr>
</tbody>
</table>

**THE LENGTH OF BARS 68I AND 682 SHALL BE 6" (150MM) SHORTER IN LENGTH THAN THE NOMINAL SIZE OF THE BARRIER IN WHICH IT IS USED.**

**SEE "BAR OFFSETS" CHART ON THIS SHEET FOR MORE INFORMATION."
STEEL CONNECTOR PLATE

SECTION A-A

SECTION B-B

STANDARD NO. B-14 (2001) SH. 3 OF 3

APPROVED

DEPARTMENT OF TRANSPORTATION

SLOTTED PLATE CONNECTION DETAILS

CONCRETE SAFETY BARRIER, PRECAST CONSTRUCTION
9" SHAPE BARRIER SECTION
1. WHEN INTEGRAL P.C.C. CURB AND GUTTER IS PLACED ADJACENT TO PORTLAND CEMENT CONCRETE PAVEMENT, CONSTRUCT THE JOINT AS PER THE LONGITUDINAL JOINT SEALANT DETAIL ON STANDARD P-2, SHEET 3 OF 5. USE APPROVED JOINT FILLER TO SEAL WORK TO BE PAID UNDER RESPECTIVE CURB AND GUTTER ITEM.
2. DEPRESS CURB AT DRIVEWAYS AS DETAILED.
3. DEPRESS CURB FLUSH WITH PAVEMENT AT CURB RAMPS. MAXIMUM SLOPE OF DEPRESSED CURB IS 12:1.
DETECTABLE WARNING TRUNCATED DOME DETAILS

NOTES:

A. The area of detectable warning truncated domes shall be 24" x 600" long and the full width of the ramp or depressed curb.
B. See specification for additional information.

ELEVATION A-A

SECTION B-B

MAXIMUM DIFFERENCE IN GRADE

FOR EXAMPLE: IF THE CURB RAMP AND DEPRESSED CURB SLOPE 0% IS 8% AND THE PAVEMENT SLOPE 1% IS 4%, THEN TO DETERMINE THE DIFFERENCE IN GRADE, ADD X + Y TO GET 12%, WHICH IS GREATER THAN THE 9% PERMITTED BUT LESS THAN THE 1% MAXIMUM.

CURB RAMP, TYPE I AND SECTIONS

DETECTABLE WARNING TRUNCATED DOMES ALONG A CURB RADIUS

DELWARE DEPARTMENT OF TRANSPORTATION

CURB RAMP, TYPE I AND SECTIONS

STANDARD NO. C-2 (2006)  SHT. 1 OF 4

APPROVED

08/03/2006
NOTES:
1. WHERE A (MAXIMUM) SLOPE RAMP WILL NOT MEET THE SIDEWALK GRADE WITHIN A LENGTH OF 6' (1.8M) DUE TO STEEP ADJACENT ROADWAY, THE RAMP LENGTH MAY BE LIMITED TO 5' (1.5M), AND THE RAMP SLOPE ALLOWED TO EXCEED 6%.
2. TRANSITION TO EXISTING SIDEWALK WIDTH OVER THE LENGTH OF THE RAMP.
3. RAMP OR LANDING WIDTH SHALL BE 4' (120CM) MINIMUM, HOWEVER, 5' (152CM) IS PREFERRED.
4. RAMP AND SIDEWALK CROSS SLOPE SHALL BE 5% OR 2% MAXIMUM.
5. IF GRADE WILL BE STEEPER THAN 6% ADJACENT TO THE CURB RAMP OR SIDEWALK, THEN A TYPE I (CURB) OR RETAINING WALL SHOULD BE USED TO ELIMINATE THE NEED FOR THE STEEP SLOPE.
TYPE D
INTEGRAL P.C.C. CURB AND GUTTER, TYPE 1

TYPE E
INTEGRAL P.C.C. CURB AND GUTTER, TYPE 2

DELWARE DEPARTMENT OF TRANSPORTATION
CURB OPENINGS

STANDARD NO. C-4 (2001) SHT. 2 OF 3 RECOMMENDED

APPROVED
PLAN VIEW
SHOWN WITHOUT GRATE

NOTE: 101 SAFETY END STRUCTURE TO BE PRECAST

SECTION A-A
* REQUIRED ONLY FOR PPE SIZE OF 24" (625) OR 24" (600)

FRONT VIEW

DELTA
DEPARTMENT OF TRANSPORTATION

101 SAFETY END STRUCTURE
STANDARD NO. D-2 (2001) SHT. 1 OF 2 RECOMMENDED

APPROVED

04/17/2001
NOTES:
1) STEPS SHALL BE INSTALLED IN BACK WALL AS PER SPECIFICATIONS.
2) NO PIPE WITH AN OUTSIDE DIAMETER LARGER THAN 8" (1275) WILL BE PERMITTED TO ENTER THE BACK WALL OF A DRAINAGE INLET, IF IT IMPHES THE INSTALLATION OF STEPS IN THE BACK WALL.
3) IF NECESSARY, A LARGER BOX MAY BE USED IN ORDER TO FIT THE STEPS AND A LARGER PIPE IN THE BACK WALL.

DELWARE DEPARTMENT OF TRANSPORTATION

DRAINAGE INLET DETAILS

STANDARD NO. D-5 (2002) SHT. 1 OF 8

APPROVED

RECOMMENDED

05/02/2002
**INLET TOP UNIT APPLICATIONS**

<table>
<thead>
<tr>
<th>TOP UNIT</th>
<th>CURB</th>
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<tbody>
<tr>
<td>TYPE A</td>
<td>USE IN DRAINAGE SWALE</td>
</tr>
<tr>
<td>TYPE B</td>
<td>INTERNAL PCC CURB &amp; GUTTER, TYPE I &amp; 3, PCC CURB TYPE 1</td>
</tr>
<tr>
<td>TYPE C</td>
<td>INTERNAL PCC CURB &amp; GUTTER, TYPE 4, PCC CURB TYPE 3</td>
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<tr>
<td>TYPE D</td>
<td>PCC CURB TYPE 2</td>
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</table>

**DRAINAGE INLET TOP UNITS**

NOTE: TOP UNIT IS TO BE CAST-IN-PLACE TO GRADE AS SPECIFIED ON PLAN SHEETS OR AS DIRECTED BY ENGINEER.

**ISOMETRIC VIEW**

**NOTE:** TOP UNIT IS TO BE CAST-IN-PLACE TO GRADE AS SPECIFIED ON PLAN SHEETS OR AS DIRECTED BY ENGINEER.
NOTE:
1. 4"x100" throat is for types B and C top units only.
2. Relocate end connectors reinforcing bars when using types B & C top units.
3. Cover slabs are to be pre-cast and must be sized to fit inlet box dimensions.
4. All bars are to be M5 (6) spaced @ 6"(150) unless noted otherwise.
5. Minimum bar cover = 6"(150).

5502 is not required to be one continuous bar. If more than one bar is used, there must be a 3"(750) overlap between bars.

DELTA CREEK WETLANDS

DEPARTMENT OF TRANSPORTATION

DOUBLE INLET COVER SLAB DETAILS

STANDARD NO. D-5 (3000D)  SHT. 5  OP 8  RECOMMENDED

06/1/98

PROJECT ENGINEER
34" (865) x 24" (610) DRAINAGE INLET DETAILS

NOTE: REFER TO PREVIOUS SHEETS FOR REINFORCING REQUIREMENTS
34" (865) x 18" (455) DRAINAGE INLET DETAILS

NOTES:
1. REFER TO PREVIOUS SHEETS FOR REINFORCEMENT REQUIREMENTS
2. THE HEIGHT OF THIS INLET IS LIMITED TO 4'-0" (1200) MAXIMAL. THEREFORE
   STEPS WILL NOT BE REQUIRED AND SHOULD NOT BE INSTALLED ON THIS
   INLET.

DELTAWARE
DEPARTMENT OF TRANSPORTATION
NOTE:
1. REINFORCEMENT SHALL BE 4" (102) X 4" (102) #4 X #4 (626 X 626)
2. INLET BOXES ARE TO BE PRE-CAST OR CAST-IN-PLACE.
ROUND MANHOLE ASSEMBLY

NOTE: ROUND MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M 199.

STANDARD NO.     MANHOLE DETAILS
D-6 (2001)        SHT. 2 OF 4

DELWARE DEPARTMENT OF TRANSPORTATION

APPROVED

RECOMMENDED

06/06/2001
NOTE: TOP UNIT IS TO BE CAST IN PLACE TO GRADE AS SPECIFIED ON PLAN SHEETS OR AS DIRECTED BY ENGINEER.
48" (1220) X 30" (760) MANHOLE

48" (1220) X 48" (1220) MANHOLE

66" (1675) X 30" (760) MANHOLE

66" (1675) X 48" (1220) MANHOLE

SECTION A-A

SECTION B-B

BOX MANHOLE COVER SLAB DETAILS

NOTES:
1. COVER SLABS SHALL BE PRE-CAST.
2. ALL BARS SHALL BE <5 (6G) SPACED AT 6" (150) UNLESS NOTED OTHERWISE.
3. MINIMUM BAR COVER = 1/2" (13).
4. DIMENSIONS TO MATCH OUTSIDE TO OUTSIDE DIMENSIONS ON BOX.

DELTAER
DEPARTMENT OF TRANSPORTATION

MANHOLE DETAILS

STANDARD NO. D-6 (2002)  
SHT. 4 OF 4  
APPROVED

06/1/2002
48" (1220) x 30" (760) JUNCTION BOX

48" (1220) x 48" (1220) JUNCTION BOX

66" (1675) x 30" (760) JUNCTION BOX

66" (1675) x 48" (1220) JUNCTION BOX

SECTION A-A

SECTION B-B

JUNCTION BOX COVER SLAB DETAILS

NOTES:
1. COVER SLABS ARE TO BE PRE-CAST.
2. ALL BARS ARE TO BE #5 (#6) SPACED @ 2'-0" (605) UNLESS NOTED OTHERWISE.
3. MINIMUM BAR COVER = ½" CBL.

DIMENSIONS TO OUTSIDE TO OUTSIDE DIMENSIONS OF BOX
LIMIT OF PAY FOR EXCAVATION OF PIPE TRENCHES = O.D. + 24" (60)

CLASS A BEDDING

LIMIT OF PAY ITEMS 206 AND/ORE 208

CLASS C BEDDING

NOTE: USE CLASS C BEDDING UNLESS OTHERWISE INDICATED
NOTES:
1. THE PERFORATED PIPE UNDERDRAIN SHALL BE LOCATED AS SHOWN ON THE TYPICAL SECTIONS OF THE CONSTRUCTION PLANS.
2. GEOTEXTILE FILTER FABRIC SHALL BE PLACED ENTIRELY OVER THE TOP OF UNDERDRAIN TRENCH AND LAPPED AS SHOWN.
3. SLOPE OF UNDERDRAINS SHALL MATCH ROADWAY GRADE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
4. OUTLET PIPE CONFIGURATIONS SHALL USE 45 DEGREE ELBOWS OR SHALL USE STRAIGHT PIPE WITH A MINIMUM RADIUS OF 3' TO DIRECT UNDERDRAIN PIPE INTO SIDE OF DRAINAGE INLET OR TO POSITIVE GRADE. PIPE SHALL ALSO BE NON-PERFORATED AND HAVE A SMOOTH INTERIOR.
5. RODENT SCREEN SHALL SNUGLY FIT THE PROVIDED SLOT WITH THE SCREEN UP FITTING TIGHT TO THE BOTTOM FLOW LINE.
6. A 4" OD X 3" ID FLEXIBLE DELINATOR SHALL BE FURNISHED AND INSTALLED AT THE DIRECTION OF THE ENGINEER TO MARK THE LOCATION OF THE CONCRETE HEADWALL. COST INCIDENTAL TO DOWNSPOUT SPLASH APRONS NOT INCLUDED.
7. WHEN TWO LINES OF PIPE UNDERDRAIN DRAIN TO A COMMON POINT, EACH PIPE MUST HAVE ITS OWN OUTLET.
8. PERFORATED PIPE UNDERDRAIN SHALL NOT BE PLACED UNDER GUARDRAILS IN ORDER TO AVOID PUNCTURING.
NOTES:
1) EDGE BERM AND TEMPORARY SLOPE DRAINS SHALL BE CONSTRUCTED ALONG THE TOP OF ALL SLOPES TO INTERCEPT RUNOFF AND CONVEY IT DOWN THE SLOPE FACES WITHOUT CREATING GULLIES OR WASHOUTS.

2) SLOPE FACES SHALL BE TRACED WITH CLEATED EQUIPMENT SUCH THAT THE CLEAT MARKS ARE ORIENTED HORIZONTALLY.

3) ALL CUT AND FILL SLOPES OF THE HIGHWAY EMBANKMENT SHALL BE PERMANENTLY STABILIZED AS THE WORK PROGRESSES IN INCREMENTS NOT TO EXCEED 10' (3000) MEASURED ALONG THE SLOPE.

4) CROSS SLOPES SHALL BE 2% MINIMUM, 6% MAXIMUM.
NOTES:
1. THIS DEVICE IS INTENDED TO CONTROL SHEET FLOW ONLY. IT SHALL NOT BE USED IN AREAS OF CONCENTRATED FLOW.
2. SILT FENCE ENDS SHALL BE TURNED UPSLOPE TO CONTAIN RUNOFF.
3. REINFORCING STRIP IS TO BE ONE COMPLETE STRIP COVERING ALL GEOTEXTILE FABRIC AT POST.

DELTA WIRE MESH DETAIL
(REINFORCED SILT FENCE ONLY)

UNREINFORCED SILT FENCE CONNECTION DETAIL

REINFORCED SILT FENCE CONNECTION DETAIL
NOTE: IF THE INLET IS NOT AT A LOW POINT, INSTALL SEDIMENT CONTROL EARTH DIKE DOWNSREAM FROM INLET.
NOTES:
1. FOR DITCHES LESS THAN 30" (750) IN DEPTH, PLACE DAM AS DIRECTED BY THE ENGINEER.
2. THE CHECK DAM Height MUST NOT EXCEED 2' (600) AT THE CENTER OF THE WEIR.
3. THE CHECK DAM IS TO BE CONSTRUCTED SO THAT THE CENTER IS 6'-0" (1800) MIN.
   LOWER THAN THE OUTER EDGES, FORMING A WEIR THAT WATER CAN FLOW ACROSS.
4. GEO-TEXTILE FABRIC IS TO BE INSTALLED UNDERNEATH RIPRAP ON PERMANENT CHECK
   DAMS ONLY.
5. THE MAXIMUM SPACING BETWEEN DAMS SHALL BE THE DISTANCE IN THE DITCH WHERE
   THE Toe OF THE UPSTREAM DAM IS AT THE SAME ELEVATION AS THE TOP OF THE
   DOWNSTREAM DAM AT THE CENTER OF THE WEIR.
NOTES:
1. SEDIMENT TRAPS ARE INTENDED FOR USE IN EXISTING, PROPOSED, AND
   TEMPORARY DITCHES OF ALL TYPES WITH A MAXIMUM DRAINAGE AREA OF
   5 ACRES (20 HECTARES) AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.
2. SIDE SLOPES SHALL BE STABILIZED WITH "TEMPORARY GRASS SEEDING, DRY GROUND"
   AND STRAW MULCH.
3. AN OUTLET STRUCTURE IS REQUIRED. STONE CHECK DAMS, PERFORATED RISER
   PIPES, SWABBER (DEWATERING DEVICES), OR DRAINAGE PLETS MAY BE USED. SEE
   APPROPRIATE STANDARD SHEET FOR ADDITIONAL INFORMATION.
4. FOR SIZE, LOCATION, ETC. OF SEDIMENT TRAP, SEE CONSTRUCTION PHASING,
   M.O.T., AND EROSION CONTROL PLANS.
5. ALL FIL SLOPES SHALL BE 2:1.
6. A 2:1 LENGTH TO WIDTH RATIO SHOULD BE ACHIEVED WHERE POSSIBLE IF THIS IS
   NOT POSSIBLE, THE USE OF BAFFLES OR OTHER SPECIAL DESIGNS SHOULD BE
   INCORPORATED TO INCREASE FLOW TIME.

PLAN SYMBOL

S.T.
NOTES:
1. The work shall consist of the construction of a sediment trap around a drainage inlet to allow sedimentation to occur before runoff enters the drainage inlet.
2. Drainage inlet sediment traps shall be limited to a three (3) acre 0.2 hectare maximum drainage area.
3. The dimensions of the drainage inlet sediment trap are to be as indicated on the plans or as directed by the engineer.
### Elevation

#### Notes:
1. This device is intended to be used as an outlet for sediment traps.
2. The pipe outlet shown shall only be used with sediment traps with drainage areas of 5 acres (2.0 hectares) or less. Larger drainage areas require an engineered design.
3. The height of the skimmer dewatering device shall be specified by the engineer in the field.

### Table: OUTFALL PIPE DIAMETER

<table>
<thead>
<tr>
<th>OUTFALL PIPE DIA.</th>
<th>MIN. RISER DIA.</th>
<th>MAX. DRAINAGE AREA ACRES (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; (150)</td>
<td>6&quot; (150)</td>
<td>1 (0.41)</td>
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<tr>
<td>8&quot; (200)</td>
<td>8&quot; (200)</td>
<td>2 (0.82)</td>
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<td>10&quot; (250)</td>
<td>10&quot; (250)</td>
<td>3 (1.22)</td>
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<tr>
<td>12&quot; (300)</td>
<td>12&quot; (300)</td>
<td>4 (1.61)</td>
</tr>
<tr>
<td>14&quot; (350)</td>
<td>14&quot; (350)</td>
<td>5 (2.0)</td>
</tr>
</tbody>
</table>

*OUTFALL PIPE DIAMETER MAY BE SAME SIZE AS RISER DIAMETER.*
<table>
<thead>
<tr>
<th>RISER PIPE DIAMETER</th>
<th>B (IN)</th>
<th>H (IN)</th>
<th>TRASH HOOD SUPPORT BAR</th>
<th>MINIMUM SIZE SUPPORT BAR</th>
<th>MINIMUM TOP THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10&quot; (255)</td>
<td>27&quot; (686)</td>
<td>7&quot; (178)</td>
<td>16 (406)</td>
<td>16 (406)</td>
<td>16 (406)</td>
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<tr>
<td>18&quot; (450)</td>
<td>27&quot; (686)</td>
<td>7&quot; (178)</td>
<td>16 (406)</td>
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<tr>
<td>27&quot; (686)</td>
<td>36&quot; (914)</td>
<td>8&quot; (203)</td>
<td>16 (406)</td>
<td>16 (406)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>24&quot; (600)</td>
<td>36&quot; (914)</td>
<td>9&quot; (229)</td>
<td>16 (406)</td>
<td>16 (406)</td>
<td>16 (406)</td>
</tr>
<tr>
<td>36&quot; (914)</td>
<td>44&quot; (1,118)</td>
<td>7&quot; (178)</td>
<td>14 (356)</td>
<td>14 (356)</td>
<td>12 (305)</td>
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</tbody>
</table>

**Trash Hood Details**

- **Plan:** Support Bar
- **Front:** Support Bar, Trash Hood, Riser Pipe
- **Isometric View:** Pressure Relief Holes, Tack Weld Top to Trash Hood in three places, Tack Weld Support Bar to Riser Pipe (TYP) at four locations.
STABILIZATION OF EMBANKMENTS

NOTES:
1. STAPLES TO BE STAGGERED AT 18"x150" SPACING.
2. TOPSOIL UNDER EROSION CONTROL BLANKET IS TO BE TRACED AND SEEDED.
3. WHEN OFFSITE RUNOFF OCCURS, ADDITIONAL MEASURES AS DIRECTED BY THE ENGINEER SHALL BE USED TO ENSURE STABILITY OF EMBANKMENT.

STABILIZATION OF DITCHES

PLAN

NOTES:
1. ADDITIONAL STAPLES NOT SHOWN ARE REQUIRED AT OVERLAPS.
2. OVERLAPS ARE TO BE STAGGERED.
3. TOPSOIL UNDER EROSION CONTROL BLANKET IS TO BE TRACED AND SEEDED.
SECTION A-A

24" MAX.
GEOTEXTILE
SECURING PINS
LIMIT OF EXCAVATION

24" MAX.
GEOTEXTILE
SECURING PINS

28" MAX.
GEOTEXTILE
SECURING PINS

SECTION B-B

6'-3501
GEOTEXTILE
SECURING PIN
1'-13001
GEOTEXTILE

PLAN

24"(600) MINIMUM OVERLAP

NOTE:
1. SECURING PINS ARE TO BE PLACED AT LOCATIONS SHOWN AND AT 24" (600) LONGITUDINAL AND LATERAL SPACING.
2. SEE PLANS FOR LOCATION, DIMENSIONS, GRADES, ETC.
3. USE OF R-7 RIPRAP WILL REQUIRE A SEPARATE PROFESSIONAL ENGINEERING DESIGN FOR SIGHT SPECIFIC CONDITIONS.

PLAN SYMBOL

DELAWARE DEPARTMENT OF TRANSPORTATION

RIPRAP DITCH

STANDARD NO. E-10 (2001) SHT. 1 OF 1

APPROVED

RECOMMENDED

05/3/2001
**CHART A - STABILIZATION**

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>SWALE GRADE</th>
<th>TYPE OF TREATMENT</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>DRAINAGE AREA A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5 AC to 12 h sf OR LESS)</td>
</tr>
<tr>
<td>1</td>
<td>0.5-2.0%</td>
<td>SEED USED WITH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EROSION CONTROL BLANKET</td>
</tr>
<tr>
<td>2</td>
<td>2.0-6.0%</td>
<td>R-4 RRRA P</td>
</tr>
<tr>
<td>3</td>
<td>6-20%</td>
<td>ENGINEERED DESIGN</td>
</tr>
</tbody>
</table>

**CHART B - SWALE DIMENSIONS**

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>SWALE A</th>
<th>SWALE B</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1' (9001 MIN.)</td>
<td>1' (9001 MIN.)</td>
</tr>
<tr>
<td>D</td>
<td>4' (12000 MIN.)</td>
<td>6' (18000 MIN.)</td>
</tr>
</tbody>
</table>

**NOTES:**

1. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
2. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
3. IF TEMPORARY SWALES OR CLEAN WATER DIVERSIONS ARE TO BE OPERATIONAL FOR LESS THAN 14 DAYS, THEY SHALL BE STABILIZED IN ACCORDANCE WITH CHART A PRIOR TO BECOMING OPERATIONAL.
4. IF TEMPORARY SWALES OR CLEAN WATER DIVERSIONS ARE TO BE OPERATIONAL FOR LESS THAN 14 DAYS, THEY SHALL BE STABILIZED WITH GEOTEXTILE IN ACCORDANCE WITH THE STANDARD DETAIL "GEOTEXTILE LINED CHANNEL DIVERSION."

**PLAN SYMBOL**

- **A - 2 (COND)**
- **B - 3 (COND)**
- **CLEAN WATER DIVERSION**
- **A - 2**
- **B - 3**
- **TEMPORARY SWALE**
SECTION A-A

OUTLET AS REQUIRED SEE NOTES 1 & 2.

NOTES:
1. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
2. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
3. IF PERIMETER DIKE SWALE ARE TO BE OPERATIONAL FOR MORE THAN 30 DAYS, THEY SHALL BE STABILIZED IN ACCORDANCE WITH CHART A PRIOR TO BECOMING OPERATIONAL.
4. IF TEMPORARY SWALE OR CLEAN WATER DIVERSIONS ARE TO BE OPERATIONAL FOR LESS THAN 30 DAYS, THEY SHALL BE STABILIZED WITH GEOTEXTILE IN ACCORDANCE WITH THE STANDARD DETAIL "GEOTEXTILE-LINED CHANNEL DIVERSION."
### CHART A - FLOW CHANNEL STABILIZATION

<table>
<thead>
<tr>
<th>TYPE</th>
<th>CHANNEL GRADE</th>
<th>TYPE OF TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.5-2.0%</td>
<td>SEED AND EROSION CONTROL BLANKET</td>
</tr>
<tr>
<td>2</td>
<td>2.0-4.0%</td>
<td>R-4 RIPRAP</td>
</tr>
<tr>
<td>3</td>
<td>4.0-20%</td>
<td>ENGINEERED DESIGN</td>
</tr>
</tbody>
</table>

### CHART B - EARTH DIKE DIMENSIONS

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>DIKE A (5 cc/2 hPa or less)</th>
<th>DIKE B (5-10 cc/2-4 hPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>c-OKE HEIGHT</td>
<td>24&quot; (600)</td>
<td>18&quot; (450)</td>
</tr>
<tr>
<td>b-OKE WIDTH</td>
<td>12&quot; (300)</td>
<td>12&quot; (300)</td>
</tr>
<tr>
<td>c-OKE WIDTH</td>
<td>40&quot; (1000)</td>
<td>48&quot; (1200)</td>
</tr>
<tr>
<td>c-OKE DEPTH</td>
<td>14&quot; (350)</td>
<td>27&quot; (680)</td>
</tr>
</tbody>
</table>

**NOTES:**

1. IF DESIRED, TOP WIDTH MAY BE WIDER AND SIDE SLOPES MAY BE FLATTER TO FACILITATE CROSSING BY CONSTRUCTION TRAFFIC.

2. FIELD LOCATION SHOULD BE ADJUSTED AS NEEDED TO INSURE A STABILIZED OUTFALL.

---

**PLAN SYMBOL**

<table>
<thead>
<tr>
<th>A-2</th>
<th>B-3</th>
</tr>
</thead>
</table>
DISCHARGE INTO A STABILIZED DITCH - GEOTEXTILE, STONE OR DRAINED OR A SEDIMENT TRAP.

TOE OF SLOPE

FILL SLOPE

EDGE BERM AT TOP OF FILL SLOPE

INTERCEPTOR BERM, 36" (900) MIN. HEIGHT, LENGTH AS REQUIRED TO CONTAIN SURFACE DRAINAGE AND DIRECT INTO TEMP. SLOPE DRAIN.

R-4 RIPRAP

CORRUGATED PIPE - SEE PLANS FOR LOCATIONS OR AS DIRECTED BY THE ENGINEER.

TOP OF FILL SLOPE AS EMBANKMENT IS CONSTRUCTED

ANTI-SEEP COLLAR

PLAN

SLOPE DRAIN PROFILE

FOR FILL SLOPES

PLAN SYMBOL

T.S.D.

DELAWARE DEPARTMENT OF TRANSPORTATION

TEMPORARY SLOPE DRAIN

STANDARD NO. E-14 (2000)

SHT. 1 OF 1

APPROVED

RECOMMENDED

05/2/2001

NOTES:

1. ALL TEMPORARY SLOPE DRAINS SHALL DISCHARGE INTO THE BACK OF SEDIMENT TRAPS OR INTO DITCHES DISCHARGING INTO TRAPS OR BASINS.

2. TEMPORARY SLOPE DRAINS SHALL BE USED AT THE TOP OF FILL SLOPES AS EMBANKMENT IS CONSTRUCTED, TO PREVENT EXCESSIVE EROSION UNTIL SHOULDERS ARE CONSTRUCTED AND THE SLOPES ARE SEEDED AND MULCHED.
NOTES:
1. The work shall consist of constructing a stilling well for the purpose of pumping clean water around a disturbed construction area to a stabilized outfall.

2. The dimensions of the stilling well shall be as shown on the plans or as directed by the engineer.

PLAN SYMBOL

DELWARE
DEPARTMENT OF TRANSPORTATION
STILLING WELL

STANDARD NO. B-15 (2001) SHT. 1 OF 1

APPROVED
RECOMMENDED

04/17/2001
NOTES:

1. THE WORK SHALL CONSIST OF CONSTRUCTING A SUMP PIT FOR THE PURPOSE OF FILTERING AND PUMPING WATER TO A STABILIZED OUTFALL.

2. GEOTEXTILE FOR THE 36' (900) CMP SHALL BE REPLACED WHEN CLOGGED WITH SEDIMENT.

3. 3/4" x 5/8" x 13/16" GAGE STEEL WIRE MESH SHALL BE PLACED AROUND THE REMOVABLE 36' (900) CMP BEFORE ATTACHING THE GEOTEXTILE TO INCREASE FLOW THROUGH THE GEOTEXTILE.

4. ALL PERFORATIONS SHALL BE 1" (25) IN DIAMETER AND 12" (300) ON CENTER IN ALL DIRECTIONS.

5. TYPE I SUMP PIT SHALL BE USED ONLY WHEN PUMPING IS NEEDED FOR LESS THAN 7 DAYS.
NOTES:
1) A DEWATERING BASIN (DB) IS USED TO REMOVE SEDIMENT FROM SEDIMENT-LADEN WATER PUMPED FROM A CONSTRUCTION SITE BEFORE THE WATER RE-ENTERS THE WATERWAY. THE DB SHALL HAVE A MINIMUM TOP WIDTH OF 15' (1670) AND A MINIMUM DEPTH OF 4'3" (1300). THE MINIMUM TOP LENGTH SHOWN IN THE PLAN IS USED ONLY FOR QUANTITY CALCULATIONS BY THE ENGINEER. THE ACTUAL TOP LENGTH IN THE FIELD SHALL BE CALCULATED BY THE EQUATION:

   \[ \text{US customary} = \text{top length (feet)} = 26 + 0.25 \times y \]
   \[ \text{METRIC} = \text{top length (m)} = 1300 + 6.83 \times y \]

   WHERE \( y \) IS THE MAXIMUM CAPACITY IN GALLONS PER MINUTE (CUBIC METERS PER SECOND) OF THE DEWATERING PUMP.

2) THE OUTFALL FROM THE BASIN TO THE RECEIVING WATERS SHALL BE STABILIZED. PUMPING INTO THE DB SHALL CEASE WHEN THE EFFLUENT FROM THE BASIN BECOMES SEDIMENT-LADEN.

3) A SUMP PIT OR STILLING WELL (SEE STANDARD SHEET 5) SHALL BE USED IN CONJUNCTION WITH A DB. THE BASIN MAY BE BYPASSSED INTO THE STABILIZED OUTFALL. IF THE WATER BEING PUMPED IS NON-SEDIMENT-LADEN, DIRECT DISCHARGE TO THE RECEIVING WATERS SHALL CEASE AND BE REDIRECTED TO THE DB WHEN EFFLUENT FROM THE PUMP BECOMES SEDIMENT-LADEN.

4) MAINTENANCE MUST BE PERFORMED IN ORDER THE DB TO FUNCTION PROPERLY. ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED DISPOSAL AREA WHEN THE BASIN IS FILLED TO WITHIN 0'1500' FROM THE OUTFALL.

5) WHEN USED IN CONJUNCTION WITH A COFFERDAM, DEWATERING SHALL BEGIN NO SOONER THAN 12 HOURS AFTER COFFERDAM INSTALLATION IN ORDER TO ALLOW SEDIMENT PRODUCED DURING INSTALLATION TO SETTLE COMPLETELY.
NOTES:
1. THE WORK SHALL CONSIST OF INSTALLING FLOW DIVERSIONS FOR THE PURPOSE OF EROSION CONTROL.
   WHEN CONSTRUCTION ACTIVITIES TAKE PLACE WITHIN THE STREAM CHANNEL SUCH AS BANK STABILIZATION OR BRIDGE ABUTMENT CONSTRUCTION.

2. THE DIVERSION STRUCTURE SHALL BE INSTALLED FROM UPSTREAM TO DOWNSTREAM.

3. THE EFFECTIVE CHANNEL WIDTH SHALL BE SIZED TO PASS A ONE YEAR STORM EVENT PEAK FLOW, OR \( \frac{1}{3} \) OF STREAM WIDTH, WHICHER IS GREATER.

4. THE SANDBAG DIVERSION HEIGHT (H) SHALL BE 1' (300) ABOVE THE PEAK ELEVATION OF THE ONE YEAR STORM.
NOTES:
1. THE WORK SHALL CONSIST OF INSTALLING A SANDBAG DIKE FOR THE PURPOSE OF EROSION CONTROL.
    WHEN CONSTRUCTION ACTIVITIES TAKE PLACE WITHIN THE STREAM CHANNEL SUCH AS BANK STABILIZATION OR BRIDGE ABUTMENT CONSTRUCTION.

2. THE SANDBAG DIKE SHALL BE INSTALLED AT THE UPSTREAM LOCATION FIRST.

3. THE HEIGHT OF THE SANDBAG DIKE SHALL BE 1.50 FEET ABOVE THE PEAK ELEVATION OF THE ONE YEAR STORM, OR EQUAL WITH THE TOP OF BANK, WHICHER IS LESS, SEE PLANS FOR INFORMATION.

4. THE SPILLWAY SHALL BE SIZED TO PASS A 11 YEAR STORM EVENT PEAK FLOW, SEE PLANS.

5. THE PIPE, WHEN UTILIZED, SHALL BE SIZED TO PASS THE STREAM BASE FLOW.
NOTES:
1. ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED UNDER THE ENTRANCE, IF NECESSARY. A MOWABLE BERMS WITH SLOPES SHALL BE ALLOWED TO FACILITATE PLACEMENT OF PIPES IN SHALLOW CONDITIONS.

2. THE LOCATION AND NUMBER OF STABILIZED CONSTRUCTION ENTRANCES SHALL BE AS INDICATED ON THE PLANS. ANY CHANGE IN LOCATION, ADDITION, OR DELETION OF AN ENTRANCE SHALL BE APPROVED IN ADVANCE BY THE ENGINEER.

3. DRAINAGE PIPE, IF UTILIZED, SHALL BE PAID FOR SEPARATELY UNDER THE APPROPRIATE BID ITEM.

4. THE TOP 2" (50) OF STONE SHALL BE REMOVED AND REPLACED WITH 2" (50) OF CLEAN STONE WHEN Voids ARE FILLED OR AS DIRECTED BY THE ENGINEER.
NOTES

1. All P.V.C. pipes are to be 4" 000 LD, Schedule 40.
2. All joints of the floatation section shall be solvent welded, joints of skimmer section need not be water-tight.
3. 4" 000 flexible drain pipe is to be attached to the pond outlet structure with water-tight connections.
4. Orifice is to be sized according to storage volume and to slowly release 0.250 runoff for at least 24-40 hours.

DELTADE
DEPARTMENT OF TRANSPORTATION

SKIMMER DEWATERING DEVICE

STANDARD NO. E-22 (066)

APPROVED

RECOMMENDED

10/02/2006
PLAN VIEW
OPEN WATER APPLICATION

PLAN VIEW
SHORELINE APPLICATION

FLOATING TURBIDITY CURTAIN

NOTE:
1) ADDITIONAL PANEL REQUIRED FOR DEPTHS GREATER THAN 5' (0.000)
2) FLOATING TURBIDITY CURTAIN SHALL REACH BOTTOM UP TO
DEPTHS OF 10' (0.000) BY USING TWO PANELS. DEPTHS GREATER
THAN 10' (0.000) SHALL REQUIRE SPECIAL DEPTH CURTAINS SPECIFICALLY
CALLED FOR IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

DELTA RIVER ENVIRONMENTAL DISCHARGE SPECIFICATIONS

TURBIDITY CURTAIN

STANDARD NO. E-25 (2001)
SHT. 1 OF 2

APPROVED

RECOMMENDED

04/17/2001
NOTES:
8. THE PORTABLE SEDIMENT TANK SHOWN MAY BE USED IN SITES WHERE SPACE IS LIMITED TO CONSTRUCT A DEWATERING BASIN.

2. THE MAXIMUM PUMP DISCHARGE INTO THIS TYPICAL PORTABLE SEDIMENT TANK SHALL BE 425 GALLONS PER MINUTE OR LITERS PER SECOND. THE FILTER FABRIC SHALL BE REPLACED WHEN THE PORTABLE SEDIMENT TANK CAN NO LONGER ALLOW THIS FLOW RATE, WHEN THERE IS A TEAR, OR WHEN DIRECTED BY THE ENGINEER.

3. SEVERAL UN-CONNECTED OR CONNECTED IN PARALLEL PORTABLE SEDIMENT TANKS MAY BE USED WHEN A HIGHER FLOW RATE IS NEEDED TO DE-WATER THE JOB.

4. OTHER DESIGNS MAY BE USED PROVIDED THE HYDRAULIC DESIGN IS SUBMITTED TO AND APPROVED BY THE STORMWATER ENGINEER.

SECTION B-B

SECTION A-A

EYE BOLTS (TYP, ALL FOUR CORNERS)

24" (600) CLEANOUT DEPTH

3/8" x 1/4" x 6' WIRE MESH

PORTABLE SEDIMENT TANK

DEPARTMENT OF TRANSPORTATION

DELWARE

STANDARD NO. E-24 (2000) SHT. 1 OF 1

APPROVED

RECOMMENDED

05/2/2001
PLAN VIEW

SECTION A-A

NOTES:
1. RIPRAP IS TO BE PLACED PRIOR TO PLACING PIPE.
2. PLACE DELAWARE NO. 3 STONE UNDER PIPE.
3. ELEVATION (EL) SHOULD NOT BE HIGHER THAN PIPE INVERT.
4. REFER TO THE PIPE ENERGY DISSIPATOR SCHEDULE ON THE CONSTRUCTION PLANS FOR THE VALUE OF DIMENSION VARIABLES.

SEE DETAIL B

SEE NOTES 1 & 2

SEE NOTE 3

GEOTEXTILE

DELTA R

PROPOSED PIPE

RIP-RAP
(SEE PLANS FOR TYPE)
ALL DEAD, BROKEN, & CROSSING BRANCHES SHALL BE PRUNED OFF FOLLOWING INSTALLATION.

ROOT BALL SHALL BE SET FLUSH TO GRADE OR 1'-0" TO 2'-0" ABOVE GRADE IF SOILS ARE SLOW TO DRAIN, DO NOT COVER THE TOP OF THE ROOTBALL WITH SOIL.

ALL SOIL SHALL BE EXCAVATED FROM THE PIT, MIXED WITH APPROVED AMENDMENTS AND USED AS BACKFILL DURING INSTALLATION OF SHRUB.

MULCH IN ACCORDANCE WITH SPECIFICATIONS, DO NOT PLACE MULCH AGAINST THE SHRUB STEMS.

REMOVE BURLAP & WIRE BASKETS TO 3/4 OF THE ROOTBALL, DO NOT LEAVE BURLAP, BASKET, OR ROPE DEBRIS IN THE PIT.

ROOT BALL SHALL BE PLACED ON TAMPERED OR UNEXCAVATED SOIL.

NOTES:
1. BASE OF PLANTING PIT SHALL BE A MINIMUM WIDTH OF TWICE THE ROOT BALL SIZE AND A MAXIMUM OF THREE TIMES THE ROOT BALL SIZE.
2. SHRUBS SHALL BE INSTALLED IN MASSES OF NO LESS THAN 3 PLANTS, A MINIMUM OF 8' 8" ON CENTER IS REQUIRED FROM THE BACK OF CURB TO THE EDGE OF SIDEWALK FOR INSTALLATION OF SHRUBS.
3. ALL PRUNING SHALL BE DONE BY AN UCA CERTIFIED ARBORIST, CERTIFIED NURSERY PROFESSIONAL, OR UNDER THE DIRECTION THEREOF, DO NOT HEAVILY PRUNE SHRUBS AT PLANTING.
4. AUGERED HOLES SHALL BE HAND DUG TO FINAL WIDTH AND TO ELIMINATE GLAZING.
5. ALL SHRUB MASSES SHALL BE MULCHED AS ONE CONTINUOUS BED.

ROADSIDE SHRUB PLANTING DETAIL

DELWARE DEPARTMENT OF TRANSPORTATION

STANDARD NO. L-1 (2006) SHIT. 1 OF 3

08/04/2006
1. All pruning shall be done by or under the direction of an L.S.A. certified arborist or certified nursery professional. Do not heavily prune trees at planting.

2. All dead, broken, or crossing branches shall be pruned off following installation.

3. Base of planting pit size shall be a minimum width of twice the root ball size and a maximum of three times the root ball size.

4. When planting trees along streets, there must be a minimum of 6' (1800) between the back of curb and the edge of sidewalk and shall be centered between the back of curb and the edge of sidewalk.

5. When planting trees along sidewalks, the tree shall be lined to 7' (2100) for pedestrian clearance.

Stake & Guy Trees, Guy Wire, Stakes, & Rubber Hose shall be as specified in Section 1st.

Mulch in accordance with specifications, do not place mulch against the trunk.

All soil shall be excavated from the pit, mixed with approved amendments as per specifications and used as backfill. During installation of trees, place root ball on tamped or undecayed soil.

Remove burlap and baskets to 1/2 of the root ball. Do not bury excess burlap, rope or remnants of basket in the planting pit.

Set root ball flush to grade or +1.5 to 2' (50) above grade. If soils are slow to drain, plant trees such that the trunk flare is visible. Any tree where trunk flare is not visible shall be rejected. Do not cover the top of the root ball with soil.

Tamp soil around the root ball base with foot pressure so root ball does not shift.

Tree Planting Detail

Delaware Department of Transportation

Standard No. L-1 (2006) Sht. 2 of 1

Approved

Recommended

08/04/2006
NOTES:
1. SEE PLANT LIST FOR SPACING X.

PERENNIAL/GROUND COVER
FINISHED GRADE
3" (75 mm) MULCH - NOT TO COVER LEAVES
ROOT MASS
6" (150 mm) PREPARED SOIL MIX AS PER SPECIFICATION.
SUBGRADE TILLED TO 6" (150 mm) DEPTH

SECTION VIEW

PERENNIAL/GROUND COVER PLANTING DETAIL
LONGITUDINAL STEEL 6 GAGE 14.59 WIRE SPACED 3" (75) C.C., 26" (660) LONG (TYP.)
TRANSVERSE STEEL 7 GAGE 14.59 WIRE SPACED 8" (203) C.C.

NOTES:
1. LONGITUDINAL STEEL SHALL BE HELD IN PLACE BY CRADLES.
2. LETTERS AND CROSS TO BE COUNTERSUNK IN TOP OF MARKER 1/4" (6).
**Shared Use Path Intersection**

**Notes:**

1. The 4" (100) concrete shared-use path shall be finished to include a textured warning surface by using a joint strike to produce a 1/2" dotted V-joint at 6" (150) o.c. Payment for installing the grooved finish shall be incidental to the sidewalk construction.
2. For 8' (2450) and 10' (3050) path widths, the outside dimension from center of bollard to edge of path shall be 2' (610) and 3' (915) respectively.
3. If the shared use path ends at a roadway, then detectable warning truncated domes 24" (600) long and the full width of the path shall be installed. See Sheet C-2.
4. Steel tube to extend 1/2" above ground with concrete to slope away from tube to keep water and sediment from draining into tube.

---

**Bollard Details**

- **M-3 (2004)**
- **Date:** 11/05
- **Approved:** 1/05
- **Recommended:** 1/05

---

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**Diagram:**

- **Scale:** N.T.S.
- **Chief Engineer:**
- **Design Engineer:**

---

**Notes:**

- **Steel Tube:** 4" (100) x 6" (150) x 16" (405) steel tube stock.
- **Reflectors:** Panel (place on all four sides).
- **Hinge:** 6" (150) steel hinge welded to steel tube 3" (75) long.
- **Eye Bolt:** Lagged into post.
- **Hinged Post:** 6" (150) x 6" (150) NS 50 treated post.
- **Stones:** 18" (450) dia. stone plate welded to tube with 3" (75) o.c. hole.
- **Detachable Hasp:** 6" (150) x 6" (150) (nom) treated post.
- **Treated Post:** See Note 4.
- **Black Stripe:** Yellow stripe.
- **Steel Tube:** To extend 1/2" (13) above ground to keep water and sediment from draining into tube.
BIKE RACK DETAILS


1. Bicycle Rack Diagram:
   - 5 Bikes: W = 87" (2200)
   - 7 Bikes: W = 67" (1690)
   - 9 Bikes: W = 87" (2200)
   - 11 Bikes: W = 111" (2819)

2. Dimensions:
   - Width: 36" (915)
   - Height: 6" (150)
   - Depth: 10" (255)
   - Slope to Drain: 2" (50)
   - Rebar: #4, 6" (150) long
   - Tubing: 2 3/8" (60) dia.

3. Materials:
   - Concrete (typ.)
   - Stone (typ.)

4. Placement:
   - Outer edge of concrete footing to be flush with surrounding grade (typ.)
   - Footing to be flush with surrounding grade (typ.)


DELTA 
DEPARTMENT OF TRANSPORTATION

BIKE RACK DETAILS

STANDARD NO. M-4 (2004) SHT. 1 OF 1

APPROVED

DELTA 
DEPARTMENT OF TRANSPORTATION

BIKE RACK DETAILS

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APPROVED 
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DEPARTMENT OF TRANSPORTATION

BIKE RACK DETAILS

STANDARD NO. M-4 (2004) SHT. 1 OF 1
WOOD RAIL FENCE DETAILS

1. ALL RAIL JOINTS SHALL BE CENTERED AT THE POSTS.
2. ALL JOINTS SHALL BE ATTACHED WITH 3 - 12d NAILS AND TWO ADJACENT RAILS SHALL NOT END ON THE SAME POST.
3. RAILS SHALL BE FLUSH TO THE POSTS AT THE END POSTS.

TYPICAL JOINT DETAIL

ATTACH WITH 4 - 12d HOT DIP GALVANIZED RING NAILS (TYP.)

4"x4"x4" (NOMINAL) TREATED POSTS (TYP.)

PATH

SECTION A-A

NOTES:

1. ALL RAIL JOINTS SHALL BE CENTERED AT THE POSTS.
2. ALL JOINTS SHALL BE ATTACHED WITH 3 - 12d NAILS AND TWO ADJACENT RAILS SHALL NOT END ON THE SAME POST.
3. RAILS SHALL BE FLUSH TO THE POSTS AT THE END POSTS.
PATTERNED HOT-MIX OR CONCRETE & BRICK PAVER DETAILS

NOTES:

1. Actual pattern to be used shall be specified on the plans. Color is to be "brick red" unless otherwise noted on the plans.
2. Materials and pavement box may vary depending on plans.
3. For crosswalk applications, 8" (200) white lines should be placed on both sides.
4. The patterns above are the preferred patterns available for sidewalk or crosswalk applications.

BRICK PAVER SIDEWALK DETAIL

NOTES:

1. All pavers are to be "brick red" unless otherwise specified on the plans. The pattern shall be specified on the plans.
2. Expansion joint may be needed on non-curb side of brick paver sidewalk if this is against building or other confining feature.
TRANVERSE JOINT

TIE BAR OR TIE BOLT (TYP)

30° (1750) (TYP) FOR TIES

EDGE OF SLAB WITH TIED LONGITUDINAL JOINT WHEN ADJACENT TO CONCRETE PAVEMENTS.

12" (3000) MIN
8" (1450) MAX

EDGE OF SLAB WHEN NOT ADJACENT TO CONCRETE PAVEMENT.

SLAB LENGTH

20' (6000) TYP.

(7' (2100) MIN, 20' (6000) MAX)

NOTES:
1. TRANVERSE JOINTS ARE PERPENDICULAR TO THE CENTERLINE OF THE PAVEMENT WHEN THE PAVEMENT IS STRAIGHT.
2. TRANVERSE JOINTS ARE PERPENDICULAR TO A TANGENT LINE TO THE OUTSIDE ARC OF THE PAVEMENT WHEN THE PAVEMENT IS CURVED.
3. ALIGN THE TRANVERSE JOINTS FOR ALL ADJACENT SLABS WITH EACH OTHER.
4. ABRID CHANGES IN PAVEMENT WIDTH MAY OCCUR ONLY AT THE TRANVERSE JOINT LINE; LONGITUDINAL JOINTS SHALL BE CONTINUOUS WHENEVER POSSIBLE.
5. LONGITUDINAL JOINTS SHOULD NOT BE LOCATED WITHIN PROPOSED WHEEL PATHS. THE WHEEL PATH IS GENERALLY LOCATED 2' (6000) INSIDE OF THE LANE EDGELINE OR CENTERLINE.

SLAB PLAN (WITH DOWEL AND TIE LOCATIONS)

DELAWARE DEPARTMENT OF TRANSPORTATION

P.C.C. PAVEMENT

STANDARD NO. P-1 (2001) SHT. 1 OF 5

APPROVED

RECOMMENDED

04/18/2001
NOTES:
1. AS DIMENSIONED, THE WIDTH OF THE TRANSVERSE SEALANT RESERVOIR IS APPLICABLE WHEN THE TEMPERATURE OF THE PAVEMENT SURFACE IS BETWEEN 60°F (16°C) AND 80°F (27°C). WHEN THE TEMPERATURE IS BELOW 60°F (16°C), THE SEALANT RESERVOIR SHALL BE CUT 1/2" WIDER. WHEN THE TEMPERATURE IS ABOVE 80°F (27°C), THE SEALANT RESERVOIR SHALL BE CUT 1/4" NARROWER.
2. "T" REFERS TO THE ACTUAL CONSTRUCTED SLAB THICKNESS.
3. TOLERANCE ON ALL JOINT SEALANT DETAIL DIMENSIONS SHOWN WITHOUT RANGES SHALL BE PLUS 1/16" MINUS 0."
4. THE TOP EDGES OF THE CONTACT SURFACES OF THE SEALANT MATERIAL ON BOTH SIDES OF THE JOINT RESERVOIR SHALL BE AT THE SAME ELEVATION.
5. TRANSVERSE JOINT MATERIAL SHALL BE PLACED BEFORE LONGITUDINAL JOINT MATERIAL. THE TRANSVERSE JOINT MATERIAL SHALL BE CONTINUOUS FOR THE FULL WIDTH OF ALL ADJACENT P.C.C. PAVEMENT SLABS.
6. LONGITUDINAL JOINT MATERIAL SHALL BE PLACED WITHOUT GAPS WHENEVER INTERRUPTED BY THE TRANSVERSE JOINT MATERIAL.
7. TRANSVERSE JOINT SEAL TO BE RECESSED 3/8" TO 1/2" DEEP FROM THE TOP OF THE SLAB.
8. A 45° CHAMFER SHALL BE CUT 1/8" TO 1/4" DEEP AT THE TOP OF THE SLAB ALONG BOTH SIDES OF THE TRANSVERSE SEALANT RESERVOIR.
9. THE TOP EDGES OF THE COMPRESSION SEAL SHALL BE IN FULL CONTACT WITH THE SLAB SIDES.

KEYWAY DETAIL

LONGITUDINAL JOINT DETAIL

SEALANT DETAIL - TRANSVERSE JOINT

SEALANT DETAIL - LONGITUDINAL JOINT

SEALANT RESERVOIR

LONGITUDINAL SAW-CUT JOINT DETAIL

TRANSVERSE SAW-CUT JOINT DETAIL

TRANSVERSE CONSTRUCTION JOINT DETAIL

TOP OF SLAB

SEALANT RESERVOIR

TOP OF SLAB

SEALANT RESERVOIR

TIE BAR

DOWEL

TOP OF SLAB

SEALANT RESERVOIR

DOWEL

TOP OF SLAB

SEALANT RESERVOIR

HOT-POURED JOINT SEALANT

PREFORMED ELASTOMERIC COMPRESSION SEAL

BACKER ROD (UNCOMPRESSED DIAMETER = 3/8"

SEALANT RESEVOIR

TOP OF SLAB

TOP OF SLAB

KEYWAY

SEE DETAIL

SEALANT RESEVOIR

SEALANT RESEVOIR

SEALANT RESEVOIR
Dowel & Tie Bar Placement Tolerances

Vertical Translation

Vertical Rotation

Horizontal Translation

Longitudinal Translation

Horizontal Rotation

Delaware Department of Transportation
**PLAN**

- Proposed locations for transverse joints shall exactly match the alignment of the final existing or relocated transverse joints in all immediately adjacent lanes.

**NOTES:**

1. When repairing existing transverse joints, the patch shall extend a minimum of 24" (600mm) through the existing joint, when will relocate the joint.

2. Proposed locations for transverse joints, when not aligned with the final expected transverse joint locations in the immediately adjacent lanes, shall be offset a minimum of 24" (600mm) from the aforementioned joints.

3. The longitudinal joint alignment shall be straight and continuous through the repaired area.

**FULL DEPTH PATCH**
SECTION A-A

SECTION B-B

SECTION C-C

FULL DEPTH PATCH

P.C.C. PAVEMENT PATCHING

DELAWARE
DEPARTMENT OF TRANSPORTATION

APPROVED


RECOMMENDED

DATE

SCALE: N.T.S.
NOTES:
1. AS DIMENSIONED, THE WIDTH OF THE TRANSVERSE SEALANT RESERVOIR IS APPLICABLE WHEN THE TEMPERATURE OF THE PAVEMENT SURFACE IS BETWEEN 60°F (16°C) AND 80°F (27°C). WHEN THE TEMPERATURE IS BELOW 60°F (16°C), THE SEALANT RESERVOIR SHALL BE CUT ¼" (6) WIDER.
2. "T" REFERS TO THE EXISTING "AS- BUILT" SLAB THICKNESS.
3. TOLERANCE ON ALL JOINT SEALANT DETAIL DIMENSIONS SHOWN WITHOUT RANGES SHALL BE PLUSS/MINUS 0.125".
4. THE TOP EDGES OF THE CONTACT SURFACES OF THE SEALANT MATERIAL ON BOTH SIDES OF THE JOINT RESERVOIR SHALL BE AT THE SAME ELEVATION.
DOWEL & TIE BAR PLACEMENT TOLERANCES

FULL DEPTH PATCH

DELWARE
DEPARTMENT OF TRANSPORTATION

P.C.C. PAVEMENT PATCHING

STANDARD NO. P-2 (2001) SHT. 4 OF 5

APPROVED

RECOMMENDED
NOTE: CLOSED CELL POLYETHYLENE FOAM SHALL BE THE SAME WIDTH AS THE JOINT AND 3" (75MM) IN DEPTH. AFTER THE CONCRETE IN THE REPAIR AREA HAS ACHIEVED THE SPECIFIED STRENGTH, THE FOAM SHALL BE REMOVED AND REPLACED WITH BACKER ROD AND HOT-POUR SEALANT MEETING ALL APPLICABLE STANDARD DETAILS AND SPECIFICATIONS.

SECTION WITH SPALL ADJACENT TO JOINT

PARTIAL DEPTH PATCH

NOTE: WHEN X > 12" (300MM), THEN Y" (75MM) AND POLYETHYLENE FOAM IS NOT USED. WHEN X < 12" (300MM), THEN Y"-X AND POLYETHYLENE FOAM IS USED.
NOTES:
1. TYPE 1 CONDUIT JUNCTION WELL SHALL BE PRECAST CONCRETE. AT LEAST ONE HOLE IN PRECAST WELLS WILL BE OF A 5" (125) DIAMETER COMpletely THROUGH THE WALL. UNUSED HOLES SHALL BE PLUGGED.
2. TYPE 2 AND TYPE 3 CONDUIT JUNCTION WELLS SHALL BE BRICK AND WILL CONFORM TO STANDARD SPECIFICATIONS FOR BRICK MASONRY. JOINTS SHALL BE CONCEAL TYPE. TYPE 2 WALLS WILL BE A NOMINAL 4" (100) THICK. TYPE 3 WALL WILL BE A NOMINAL 8" (200) THICK.
3. TYPE 2 AND TYPE 3 CONDUIT JUNCTION WELLS SHALL NOT BE PLACED UNDER ANY TYPE OF PAVEMENT.
4. ALL CONDUIT JUNCTION WELLS CONSTRUCTED WITHIN PAVEMENT, SIDEWALKS, ETC. WILL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM CONDUIT JUNCTION WELL.
**NOTES:**

1. TYPE 4 CONDUIT JUNCTION WELL SHALL BE PRECAST CONCRETE. AT LEAST ONE HOLE IN PRECAST WELLS WILL BE OF A 5" (125MM) DIAMETER COMPLETELY THROUGH THE WALL. Unused Holes SHALL BE PLUGGED.

2. ALL CONDUIT JUNCTION WELLS CONSTRUCTED WITHIN PAVEMENT, SIDEWALKS, ETC. WILL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM CONDUIT JUNCTION WELL.

---

**PLAN SYMBOL**

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**DEL. 57 STONE**

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**SECTION A-A**

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**SECTION B-B**

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**CAST IRON COVERS**

---

**CAST IRON FRAME**

---

**FINISHED GRADE (PAVEMENT)**

---

**FINISHED GRADE (UNPAVED)**

---

**4" (100MM) CONCRETE WALL**

---

**CALVR. CONDUIT**

---

**4" (100MM) MIN. 3" (75MM) MAX. BUSHING FLUSH**

---

**20" (508MM) X 42" (1067MM) X 42" (1067MM)**

---

**CONDUIT**

---

**DEL. 57 STONE**

---

**PLAN SYMBOL**

---

**DELAWARE DEPARTMENT OF TRANSPORTATION**

---

**CONDUIT JUNCTION WELL, TYPE 4**

---

**APPROVED**

---

**STANDARD NO. T-2 (2002) SHT. 1 OF 1 RECOMMENDED**

---

**01/31/2002**
NOTES:

1. TYPE 5 CONDUIT JUNCTION WELL SHALL BE PRECAST CONCRETE. AT LEAST ONE HOLE IN PRECAST WELLS WILL BE OF A 5" (125) DIAMETER COMPLETELY THROUGH THE WALL. UNUSED HOLES SHALL BE PLUGGED.

2. ALL CONDUIT JUNCTION WELLS CONSTRUCTED WITHIN PAVEMENT, SIDEWALKS, ETC. WILL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM CONDUIT JUNCTION WELL.
CONCRETE CABINET BASE

- Ground Rods
- 2" Cabinet (50) Min. - 3" (75) Max.
- 2" (50) Conduit
- Cabinet Bases (Types 'M' & 'P')
- Raised Concrete Base
- Concrete Cabinet Base
- Expansion Bolt (6)
- Install Insulating Bushings at this end of conduit.
- Conduit Sweep
- Ground Rods
- 2" (50) Conduit
- 2" (50) Conduit
- Conduit (50)
- Plan Symbol

DELTAWARE DEPARTMENT OF TRANSPORTATION

CABINET BASES (TYPES 'M' & 'P')

STANDARD NO. T-4 (2000) SHT. 1 OF 1

APPROVED

RECOMMENDED

DATE: 24/04/2004
ROUND BASE

- UNDERGROUND CONDUIT ENDS SHALL BE CAPPED WITH A GALVANIZED THREADED CONDUIT PLUG UNLESS CONNECTED TO AN EXISTING CONDUIT.
- BOLT CIRCLE DIAMETER TO BE AS DIRECTED BY THE ENGINEER
- DIRECTION OF LOAD (MASTARM OR SPAN)
- EQUALLY SPACED 8 (M3) REINFORCING BARS
- 2 1/2" 1640 CONDUIT SWEEPS
- EXISTING CONDUIT

SQUARE BASE

- UNDERGROUND CONDUIT ENDS SHALL BE CAPPED WITH A GALVANIZED THREADED CONDUIT PLUG UNLESS CONNECTED TO AN EXISTING CONDUIT.
- BOLT CIRCLE DIAMETER TO BE AS DIRECTED BY THE ENGINEER
- DIRECTION OF LOAD (MASTARM OR SPAN)
- EQUALLY SPACED 8 (M3) REINFORCING BARS
- 2 1/2" 1640 CONDUIT SWEEPS
- EXISTING CONDUIT

NOTE: BASE DEPENDENT ON POLE AND EQUIPMENT TO BE ATTACHED.
FINISHED GRADE (PAVEMENT, ETC.)

TYPICAL SECTION (BASES 5 AND 6)

POLE BASE DATA CHART

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<td>4</td>
<td>24&quot; (600)</td>
<td>2&quot;-4&quot; (75)</td>
<td>NONE</td>
<td>NONE</td>
</tr>
<tr>
<td>5</td>
<td>36&quot; (915)</td>
<td>6&quot; (150)</td>
<td>4</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>24&quot; (600)</td>
<td>6&quot; (150)</td>
<td>4</td>
<td>B</td>
</tr>
<tr>
<td>7</td>
<td>48&quot; (1220)</td>
<td>3&quot;-4&quot; (75)</td>
<td>7</td>
<td>B</td>
</tr>
</tbody>
</table>

* ADDITIONAL DEPTH FOR POLE BASE EXTENSION, IF REQUIRED, TO BE DETERMINED BY TRAFFIC ENGINEERING AND MANAGEMENT TEAM/ FIELD REPRESENTATIVE.

ANCHOR BOLT DATA CHART AND DETAILS

GROUND ROD 13/4" X 24" (60) EMBED 8" (205) INTO UNDISTURBED SOIL

ANCHOR BOLTS

DELWARE DEPARTMENT OF TRANSPORTATION

POLE BASES

STANDARD NO. T-5 (2002)

SHT. 3 OF 3

APPROVED

RECOMMENDED

PLAN SYMBOL

01/3/2002
**SECTION A-A**

**NOTES:**

1. UNDERGROUND CONDUIT ENDS SHALL BE CAPPED WITH A GALVANIZED THREADED CONDUIT PLUG UNLESS CONNECTED TO AN EXISTING CONDUIT.

2. PLACE 2 EACH 6" (150) X 1/2" (13) P.V.C., SCHEDULE 40 (TYP) VENTS IN THE GROUT AS DIRECTED IN THE FIELD BY THE ENGINEER.

---

**FOUNDATION DETAILS**

- **3" (76mm) DIA.**
- **4.5" (114mm) DIA.**
- **3" (76mm) DIA.**
- **2 1/4" (60mm) CONDUIT SWEEP**
- **8 (25mm) BARS**
- **GROUND ROD (3/4" (19mm) X 240" (6096mm)) EMBED 8" (200mm) INTO UNDISTURBED SOIL.**

**GROUND ROD (3/4" (19mm) X 240" (6096mm))**

**EXISTING CONDUIT**

**DIRECTION OF MAST ARM**

---

**DELTA DEPARTMENT OF TRANSPORTATION**

**SPECIAL POLE BASE**

STANDARD NO. T-6 (2003)  
SHT. 1 OF 1  
APPROVED

**PLAN SYMBOL**

(SAME AS NORMAL POLE BASE)

07/31/2002
1 - #3 (10) SPIRAL BAR, 504" (12800) long at 8" (200) pitch

8 - #5 (16) BARS, 48" (1200) long

NOTES: 1, STUB POST TO BE SUPPLIED BY THE DEPARTMENTS TRAFFIC, ENGINEERING, AND MANAGEMENT SECTION.

SECTION A-A

STUB POST

#3 (10) SPIRAL BAR

8 - #5 (16) BARS

PLAN SYMBOL

DELAWARE
DEPARTMENT OF TRANSPORTATION

SIGN FOUNDATION

STANDARD NO. T-7 (2002) SHT. 1 OF 1

APPROVED

RECOMMENDED

01/10/2002
NOTES:
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE CONDUIT AGAINST ANY POSSIBLE DAMAGE IN PAVING OPERATIONS.
2. THE WEATHERPROOF FITTING SHALL CONSIST OF A GALVANIZED 1/2" C80 COUPLING CONTAINING A STEEL THREADED REDUCING BUSHING 1/2" C80 TO 1/2" C80 AND A 1/2" C80 WATERTIGHT CONNECTOR FOR SERVICE ENTRANCE CABLE.
3. THE LEAD-IN WIRE SHALL BE RUN THROUGH THE RUBBER OF THE WEATHERPROOF FITTING.

DETAIL A - TYPICAL INSTALLATION UNDER INTEGRAL CURB AND GUTTER

DETAIL B - TYPICAL INSTALLATION UNDER CURBING

DETAIL C - TYPICAL INSTALLATION WITHOUT CURBING

DEL. 57 STONE

PLAN SYMBOL

DELAWARE DEPARTMENT OF TRANSPORTATION

LOOP DETECTOR TO CONDUIT JUNCTION WELL CONNECTION

STANDARD NO. T-8 (2002) SHT. 1 OF 1

APPROVED

RECOMMENDED

01/31/2002
1. Saw cuts for wire slot construction shall be extended beyond the corners so that the slot is full depth at turn points. A forty-five (45) degree angle shall be cut 12" (300) back from the point of the extended corner.
2. The diagonal cut shall be stopped approximately 2" (50) from the corner to prevent the triangular portion of the pavement from breaking.
3. A maximum of two loop detectors can be spliced to one lead-in cable. The detail illustrates the method of splicing two loop detectors (Loop #1 and Loop #2) to a lead-in cable.
4. Loop detector shall be centered in travel lane.
SAW CUTS

WIRE SLOT CONSTRUCTION

1. SAW CUTS FOR WIRE SLOT CONSTRUCTION SHALL BE EXTENDED BEYOND THE CORNERS SO THAT THE SLOT IS FULL DEPTH AT TURN POINTS. A FORTY-FIVE (45) DEGREE ANGLE SHALL BE CUT 1' (0.3m) BACK FROM THE POINT OF THE EXTENDED CORNER.
2. THE DIAGONAL CUT SHALL BE STOPPED APPROXIMATELY 2" (50) FROM THE CORNER TO PREVENT THE TRIANGULAR PORTION OF THE PAVEMENT FROM BREAKING.
3. A MAXIMUM OF TWO LOOP DETECTORS CAN BE SPLICED TO ONE LEAD-IN CABLE. THE DETAIL ILLUSTRATES THE METHOD OF SPLICING TWO LOOP DETECTORS (LOOP #1 AND LOOP #2) TO A LEAD-IN CABLE.
4. LOOP DETECTOR SHALL BE CENTERED IN TRAVEL LANE.

SECTION A - A

SECTION B - B

NOTES:

1 2 3 4

DETAILS FOR INSTALLING LOOP DETECTOR WIRE (SINGLE WRAP)

125°+/

TRAVEL LANE

DETAILS OF SPLICING DETAIL

SEE NOTE 3

SEE STANDARD DETAILS SHEET T-6 FOR LOOP DETECTOR TO JUNCTION WELL CONNECTION DETAIL

SEALANT

EDGE OF PAVEMENT (CURB) LINE

TO CONTROLLER

SECTION A - A

SECTION B - B

SEALANT

EDGE OF PAVEMENT (CURB) LINE

TO CONTROLLER

PLAN SYMBOL

DRAWN WITH

APPROVED

DELTA WIRE SPLICING DETAIL

4/#18 SHIELDED LOOP DETECTOR WIRE

4/#18 SHIELDED LEAD-IN CABLE (HOME RUN)

4/#18 SHIELDED LEAD-IN CABLE

4/#18 SHIELDED LOOP DETECTOR WIRE

EDGE OF PAVEMENT (CURB) LINE

TO CONTROLLER

JUNCTION WELL (SEE SPLICING DETAIL)

CONDUIT AS DIRECTED BY THE ENGINEER

SEE STANDARD DETAILS SHEET T-8 FOR LOOP DETECTOR TO JUNCTION WELL CONNECTION DETAIL

PLAN SYMBOL

DRAWN WITH

APPROVED

DELTA WIRE SPLICING DETAIL

4/#18 SHIELDED LOOP DETECTOR WIRE

4/#18 SHIELDED LEAD-IN CABLE (HOME RUN)

4/#18 SHIELDED LEAD-IN CABLE

4/#18 SHIELDED LOOP DETECTOR WIRE

EDGE OF PAVEMENT (CURB) LINE

TO CONTROLLER

JUNCTION WELL (SEE SPLICING DETAIL)

CONDUIT AS DIRECTED BY THE ENGINEER

SEE STANDARD DETAILS SHEET T-8 FOR LOOP DETECTOR TO JUNCTION WELL CONNECTION DETAIL

PLAN SYMBOL

DRAWN WITH

APPROVED
SPAN WIRE ATTACHMENT BETWEEN POLES

NOTE: SPAN WIRE ATTACHMENT BETWEEN METAL POLES IS THE SAME AS SHOWN FOR WOOD POLES EXCEPT THAT THE STRAIN PLATES AND GUY HOOKS ARE NOT USED. FOR DETAIL SEE T-14 SHEET 2 - "DEAD END MESSENGER WIRE ATTACHMENT, METAL POLES".

PLAN SYMBOL

WOOD POLE

GALVANIZED SCREW 1/4" X 2 1/4" X 16G

GALVANIZED BOLT 5/16" X 2 1/4" X 16G

GALVANIZED NUT 5/16" X 16G

MATCH LINE A - A

WOOD POLE

SPAN WIRE

GALVANIZED 3-BOLT GUY CLAMPS (2 REQUIRED)

SERVICE SLEEVE

SPAN WIRE

RECOMMENDED

DELAWARE DEPARTMENT OF TRANSPORTATION

SPAN WIRE ATTACHMENT BETWEEN POLES

STANDARD NO.  T-12  (2004)  SHT.  1  OF  2  APPROVED

DATE

DATE

OCTOBER 2005

OCTOBER 2005

09/30/2004

09/30/2004
DEAD END MESSENER WIRE ATTACHMENT

**PLAN SYMBOL**
- SERVICE SLEEVE
- MESSENER WIRE
- CABLE SPACER
- LASHING WIRE
- ELECTRICAL CABLE
- WOOD POLE
- METAL POLE
- SERVICE WEDGE CLAMP
- MESSENER WIRE
- MESSENER CLAMP
- CABLE SPACER
- LASHING WIRE
- ELECTRICAL CABLE
- WOOD POLE
- METAL POLE

**NOTES:**
1. INSTALLATION METHOD SHOWN FOR DEAD END MESSENER WIRE ATTACHMENT TO METAL POLES SHALL BE USED FOR SPAN WIRE ATTACHMENT BETWEEN METAL POLES.

**DELWARE DEPARTMENT OF TRANSPORTATION**

**DEAD END MESSENER WIRE ATTACHMENT**

**STANDARD NO.** T-12 (2004)  **SHT.** 2  **OF** 2  **APPROVED**

**RECOMMENDED**

**DATE** 11/10/05

**SIGNATURE**

**DATE** 11/10/05
NOTES:
1. TYPE 6 CONDUIT JUNCTION WELL SHALL BE PRECAST POLYMER CONCRETE.
2. ALL CONDUIT JUNCTION WELLS CONSTRUCTED WITHIN PAVEMENT, SIDEWALKS, ETC. WILL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN AWAY FROM THE CONDUIT JUNCTION WELL.
3. POLYMER CONCRETE COVERS SHALL BE THE HEAVY-DUTY TYPE WITH A DESIGN LOAD OF 5,000 LBS (6800 KG) OVER A 10" (255) SQUARE.
POLYMER CONCRETE WITH A
HEAVY-WEAVE FIBERGLASS
REINFORCEMENT

3/8" (9) - 16 UNC HEX BOLT
WASHERS TO BE SECURED
INTO THE WELL FRAME

1/2" x 13/4" X 1" (100)
PULL SLOT

SKID RESISTANT
SURFACE

64 1/4" (064D)
66 1/4" (066D)

NOTES:

1. TYPE T CONDUIT JUNCTION WELL SHALL BE PRECAST POLYMER CONCRETE.

2. ALL CONDUIT JUNCTION WELLS CONSTRUCTED WITHIN PAVEMENT, SIDEWALKS,
   ETC., WILL BE CONSTRUCTED FLUSH WITH THE SURFACE OF THE SAME. INSTALLATION
   IN UNPAVED AREAS WILL BE CONSTRUCTED ABOVE GRADE AND GRADED TO DRAIN
   AWAY FROM THE CONDUIT JUNCTION WELL.

3. POLYMER CONCRETE COVERS SHALL BE THE HEAVY DUTY TYPE WITH A DESIGN LOAD
   OF 5,000 LBS (6800 kg) OVER A 12" (305) SQUARE.

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DELAWARE
DEPARTMENT OF TRANSPORTATION

CONDUIT JUNCTION WELL, TYPE 7


SHT. 2 OF 3

APPROVED

RECOMMENDED

05/13/2006
Notations:
1. Types 8 & 10 conduit junction wells shall be precast polymer concrete.
2. All conduit junction wells constructed within pavement, sidewalks, etc. will be constructed flush with the surface of the same. Installation in unpaved areas will be constructed above grade and graded to drain away from the conduit junction well.
3. Polymer concrete covers shall be the heavy-duty type with a design load of 85,000 lbs (6000 kN) over a 10" (255) square.

Dimensions Table:

<table>
<thead>
<tr>
<th>Item</th>
<th>Type 8</th>
<th>Type 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>47 3/4&quot; (1.220)</td>
<td>35 3/4&quot; (0.950)</td>
</tr>
<tr>
<td>B</td>
<td>30 3/4&quot; (0.765)</td>
<td>24&quot; (0.600)</td>
</tr>
<tr>
<td>C</td>
<td>48 3/4&quot; (1.220)</td>
<td>37 3/4&quot; (0.950)</td>
</tr>
<tr>
<td>D</td>
<td>32 3/4&quot; (0.825)</td>
<td>26&quot; (0.660)</td>
</tr>
<tr>
<td>E</td>
<td>45 3/4&quot; (1.150)</td>
<td>33 3/4&quot; (0.860)</td>
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<tr>
<td>F</td>
<td>28 3/4&quot; (0.740)</td>
<td>22 3/4&quot; (0.575)</td>
</tr>
<tr>
<td>G</td>
<td>36&quot; (0.914)</td>
<td>50&quot; (1.267)</td>
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<tr>
<td>H</td>
<td>33&quot; (0.839)</td>
<td>21&quot; (0.531)</td>
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<tr>
<td>I</td>
<td>58&quot; (1.473)</td>
<td>46&quot; (1.168)</td>
</tr>
<tr>
<td>J</td>
<td>46&quot; (1.168)</td>
<td>34&quot; (0.864)</td>
</tr>
</tbody>
</table>
NOTES:
1. UPRIGHT CONFIGURATION SHALL BE USED FOR MOUNTING ON MAST ARMS, SIGNAL HEAD FRAMEWORKS AND PEDESTALS.
2. UPRIGHT MOUNTING HARDWARE SHALL BE SUPPLIED BY THE DEPARTMENT.
3. TEFON TAPE SHALL BE APPLIED TO THREADS BEFORE MOUNTING.
1. Inverted configuration shall be used for span mount.
2. Span wire mounting hardware shall be supplied by the department.
3. Teflon tape shall be applied to threads before mounting.
4. Route the lead-in cable through the metal cap and the rubber plug. Replace the metal cap, sealing the cable entry port. Tighten the metal cap so the cable will not slide through the rubber plug.