# Appendix B-1

## Standard Construction Drawings

### Table of Contents

**TYPICAL STREET SECTIONS**

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>110.01</td>
<td>Local Road with Shoulders</td>
</tr>
<tr>
<td>110.02</td>
<td>Local Road with Curb and Gutter</td>
</tr>
<tr>
<td>110.03</td>
<td>Collector Road with Shoulders</td>
</tr>
<tr>
<td>110.04</td>
<td>Collector Road with Curb and Gutter</td>
</tr>
<tr>
<td>110.05</td>
<td>Arterial Road with Shoulders</td>
</tr>
<tr>
<td>110.06</td>
<td>Arterial Road with Curb and Gutter</td>
</tr>
<tr>
<td>110.07</td>
<td>Commercial/Industrial</td>
</tr>
<tr>
<td>110.08</td>
<td>Typical cul-de-sac - Local Road with Shoulders</td>
</tr>
<tr>
<td>110.09</td>
<td>Typical cul-de-sac - Local Road with Curb and Gutter</td>
</tr>
<tr>
<td>110.10</td>
<td>Typical cul-de-sac – Commercial/Industrial</td>
</tr>
<tr>
<td>110.11</td>
<td>Typical offset cul-de-sac – Local</td>
</tr>
<tr>
<td>110.12</td>
<td>Temporary cul-de-sac</td>
</tr>
<tr>
<td>110.13</td>
<td>Typical offset cul-de-sac</td>
</tr>
<tr>
<td>120.01</td>
<td>Patching Paved Streets</td>
</tr>
</tbody>
</table>

**CONCRETE PAVEMENTS**

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>200.01A</td>
<td>Joint Details</td>
</tr>
<tr>
<td>200.01B</td>
<td>Joint Details</td>
</tr>
<tr>
<td>210.01</td>
<td>Local Street</td>
</tr>
<tr>
<td>220.01</td>
<td>Collector Street</td>
</tr>
</tbody>
</table>

**DRIVEWAYS – SIDEWALKS – RAMPS**

<table>
<thead>
<tr>
<th>Category</th>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscellaneous</td>
<td>400.01</td>
<td>Curb Details – Sidewalk Ramp</td>
</tr>
<tr>
<td></td>
<td>400.02</td>
<td>Curb Details – Residential Driveways</td>
</tr>
<tr>
<td></td>
<td>400.03</td>
<td>Curb Details – Commercial Driveway</td>
</tr>
<tr>
<td>Driveways</td>
<td>410.01A</td>
<td>Driveway Locations with Curb and Gutter</td>
</tr>
</tbody>
</table>
Standard Construction Drawings (Continued)

410.01B Driveway Locations without Curb and Gutter

Sight Distance
410.01C Sight Distance Diagram
410.02 Driveway – Residential with Curbs
410.03 Driveway – Commercial with Curbs
410.04 Driveway – Hard Surfaced/Improved Gravel Roadways
410.05 Driveway – Gravel Roadways
410.06 Alternate Expansion Joint for Driveways on PCC Streets

Sidewalks
420.01 Sidewalk
420.02 Sidewalk at Back of Curb
420.03 Sidewalk Reinforcement at Drainage Structure

Ramps – Sidewalks with Grass Parkway
430.01 Sidewalk Ramp – Type A
430.02 Sidewalk Ramp – Type B
430.03 Sidewalk Ramp – Type C
431.01 Mid-block Sidewalk Ramp

Ramps – Sidewalks at Back of Curb
432.01 Sidewalk Ramp – Type A
432.02 Sidewalk Ramp – Type B
432.03 Sidewalk Ramp – Type C
433.01 Mid-block Sidewalk Ramp

Ramps – General
435.01 Detectable Warning

Patching
440.01 Patching Driveways and Sidewalks
### Standard Construction Drawings (Continued)

#### STORM DRAINAGE

<table>
<thead>
<tr>
<th>Category</th>
<th>Numbers</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscellaneous</td>
<td>500.01</td>
<td>Drainage Structure Steps</td>
</tr>
<tr>
<td></td>
<td>500.02</td>
<td>Drainage Structure Invert</td>
</tr>
<tr>
<td></td>
<td>500.03</td>
<td>Inlet Opening Trash Rack</td>
</tr>
<tr>
<td></td>
<td>500.04</td>
<td>Drainage Structure Weep Holes</td>
</tr>
<tr>
<td>Curb Inlets</td>
<td>505.01A</td>
<td>Type M Inlet – Plan and Sections</td>
</tr>
<tr>
<td></td>
<td>505.01B</td>
<td>Type M Inlet – Notes</td>
</tr>
<tr>
<td></td>
<td>505.01C</td>
<td>Type M Inlet – Section and Detail</td>
</tr>
<tr>
<td></td>
<td>505.01D</td>
<td>Type M Inlet – Setting Diagram</td>
</tr>
<tr>
<td></td>
<td>505.01E</td>
<td>Type M Inlet – Deflector Detail</td>
</tr>
<tr>
<td></td>
<td>505.01F</td>
<td>Type M Inlet – Edge Angle Assembly</td>
</tr>
<tr>
<td></td>
<td>505.02</td>
<td>Type A Inlet</td>
</tr>
<tr>
<td>Junction Boxes and</td>
<td>510.01</td>
<td>Junction Box</td>
</tr>
<tr>
<td>Area Inlets</td>
<td>510.02</td>
<td>Side Opening Inlet</td>
</tr>
<tr>
<td></td>
<td>510.03</td>
<td>Catch Basin</td>
</tr>
<tr>
<td>Outfalls</td>
<td>525.01</td>
<td>Toewall and End Section</td>
</tr>
<tr>
<td></td>
<td>525.02</td>
<td>Rock Lining for Culvert Outfalls</td>
</tr>
<tr>
<td></td>
<td>525.03</td>
<td>CMP – Mitered End Detail</td>
</tr>
<tr>
<td>Swales</td>
<td>530.01</td>
<td>Concrete Swale – V Type</td>
</tr>
<tr>
<td></td>
<td>530.02</td>
<td>Concrete Swale – Flat Bottom Type</td>
</tr>
<tr>
<td></td>
<td>530.03</td>
<td>Rip Rap with Filter Fabric</td>
</tr>
<tr>
<td>Signs</td>
<td>540.00</td>
<td>Street Identification Sign Layouts</td>
</tr>
</tbody>
</table>
APPENDIX B-1

ASPHALT PAVEMENT WITH SHOULDERS

1 1/2" TYPE 'C' ASPHALTIC CONCRETE PAVEMENT
6 1/2" PLANT MIX BITUMINOUS COURSE
4" TYPE 1 ROLLED STONE BASE
95% COMPACTED SUBGRADE

50' RIGHT OF WAY

24" DEEP DITCH (MINIMUM)

PROPERTY LINE

PROPERTY LINE

DITCH DEPTH AND SETBACK TO BE DETERMINED BY SIZE OF PIPE REQUIRED.
6" DITCH DEPTH MINIMUM

CONCRETE PAVEMENT WITH SHOULDERS

50' RIGHT OF WAY

PROPERTY LINE

PROPERTY LINE

6" CLASS "A" PORTLAND CEMENT CONCRETE (4,000 psi mix)
4" TYPE 1 ROLLED STONE BASE
95% COMPACTED SUBGRADE

LOCAL ROAD
WITH SHOULDERS
TYPICAL CROSS SECTIONS

JPW-II 1/29/09
Approved
Revisions

PUBLIC WORKS
COUNTY OF MISSOURI

110.01
APPENDIX B-1

32 FT. ASPHALT PAVEMENT
(Standard)

32 FT. P.C.C. PAVEMENT
(Standard)

LOCAL ROAD
WITH CURB AND GUTTER
TYPICAL CROSS SECTIONS
38 FT. ASPHALT PAVEMENT
(Standard)

38 FT. P.C.C. PAVEMENT
(Standard)
APPENDIX B-1

52 FT. ASPHALT PAVEMENT
(Standard)

52 FT. P.C.C. PAVEMENT
(Standard)
42 FT. ASPHALT PAVEMENT
(Standard)

42 FT. P.C.C. PAVEMENT
(Standard)
APPENDIX B-1

LOCAL ROAD

TYPICAL OFFSET CUL-DE-SAC

110.11

158
APPENDIX B-1

EXISTING ASPHALTIC PAVEMENT

NOTE: CONCRETE MUST BE LEFT WITH ROUGH FINISH. CONCRETE MUST BE TACKED BEFORE ASPHALT IS APPLIED.

EXISTING CONCRETE PAVEMENT

NOTES: 1) IF THE DISTANCE FROM SAW-CUT TO ANY LONGITUDINAL OR TRANSVERSE JOINT OR CRACK IS LESS THAN 4', THE PAVEMENT SHALL BE REMOVED TO THAT TRANSVERSE JOINT OR CRACK.

2) CONCRETE SHALL BE CLASS AA.

3) HIGH/EARLY CONCRETE IS PERMITTED WITH AUTHORIZATION.
JOINT LOCATION PLAN

NOTE:

1. TRANSVERSE TYPE C JOINTS SHALL BE SAWED AS SOON AS CONCRETE CAN WITHSTAND RAVELING, JOINTS SHALL BE CLEANED AND FILLED WITH BITUMINOUS COMPOUND IMMEDIATELY FOLLOWING SAWING. NO TRAFFIC SHALL BE ALLOWED ON ROADWAY UNTIL JOINTS ARE SEALED.

2. INSTALL TYPE A EXPANSION JOINTS AT INTERSECTIONS, AND AT STRUCTURES.

3. INSTALL TYPE A EXPANSION JOINTS AT PC & PT OF CURVES. WITH DEFLECTION ANGLE OF GREATER THAN 30°.

4. INSTALL TYPE A EXPANSION JOINT AT BULB OF CUL-DE-SAC.

5. USE TYPE D JOINT AT END OF DAYS WORK.

6. ALL JOINTS TO BE FILLED PER SECTION A-1, 231.6.8
**TYPE A**
EXPANSION JOINT

![Diagram of Type A expansion joint](image)

- Joint sealer
- 1" radius
- 5'-0" expansion joint

**TYPE C & CS**
SAWED OR PREMOLDED STRIP

- Fill w/joint sealer
- 1/8"-1/4" depth

**TYPE C** — CONSTRUCTED WITHOUT TIE BAR
**TYPE CS** — REQUIRES TIE BAR

**TYPE A — ALTERNATE**
EXPANSION JOINT

- 3/4" dia smooth dowel
- 15" long @ 12" centers
- 1" min. expansion
- Lubricate this end

**TYPE D**
TRANSVERSE CONSTRUCTION JOINT

- Fill w/joint sealer
- 1/8" radius
- #5 bar 30" long @ 30" ctrs.

**TYPE BS**
KEYED CONSTRUCTION JOINT
(With Steel)

- #5 bar 30" long @ 30" ctrs.
- 3/4" dia smooth dowel
- 15" long @ 12" centers

**NOTE:** JOINT SEALER — SEE SECTION 1-A, 231.6.8.
APPENDIX B-1

INTEGRAL CURB SECTION

ALTERNATE: SEE DRAWING 400.02
ROLLBACK CURB MAY BE USED. DESIGN ENGINEER
SHALL PROVIDE CURB SECTION AND DESIGN STORMWATER
IMPROVEMENTS TO MEET B.C.P.W. APPENDIX A.
DESIGN ENGINEER MUST ALSO PROVIDE DESIGN FOR
SIDEWALK RAMP CONNECTIONS WITH DETAILS.

NOTES:
1. ALL P.C. CONCRETE SHALL BE CLASS A.
2. SEE DETAIL 200.01A AND 200.01B FOR JOINT DETAILS.

LOCAL STREET
(Concrete Pavement) 210.01
NOTES:

1. ALL P.C. CONCRETE SHALL BE CLASS A.

2. SEE DETAIL 200.01A AND 200.01B FOR JOINT DETAILS.
**SIDEWALK RAMP CURB (Alternate)**

**PCC PAVEMENT NOTES:**

1. CONCRETE SHALL BE CLASS A.
2. PAVEMENT THICKNESS SHALL MATCH EXISTING.
3. EXPANSION JOINTS AND CONTRACTION JOINTS SHALL BE PLACED AT LOCATIONS SIMILAR TO THE PAVEMENT WHICH WAS REMOVED.
4. CURB EDGE SHALL BE TOOLED WITH 1/4" RADIUS
5. WHERE EXISTING PAVEMENT IS P.C.C., LOW CURB REPLACEMENT SHALL BE DOWELLED INTO EXISTING 12" LONG #4 BARS AT 24" CTR.

**ACC PAVEMENT NOTES:**

1. CONCRETE SHALL BE CLASS A.
2. GUTTER THICKNESS SHALL MATCH EXISTING,
   BASE SHALL MATCH EXISTING
3. EXPANSION JOINTS AND CONTRACTION JOINTS SHALL BE PLACED AT LOCATIONS SIMILAR TO THE CURB AND GUTTER WHICH WAS REMOVED.
4. CURB EDGE SHALL BE TOOLED WITH 1/4" RADIUS
RESIDENTIAL DRIVEWAY CURB
MAXIMUM RISE (PREFERRED)

RESIDENTIAL DRIVEWAY CURB
MAXIMUM RISE (ALTERNATE)

ROLLBACK CURB ALTERNATIVE

GENERAL NOTES:
1. ELEVATION OF DRIVEWAY AT R.O.W. LINE
   REQUIRED TO BE A MINIMUM OF 8 1/4" ABOVE
   GUTTER ELEVATION. VERIFY R.O.W. WIDTH AND
   ALLOWABLE DRIVEWAY SLOPES PRIOR TO
   CONSTRUCTING MINIMUM RISE DRIVEWAY CURB.

2. ALTERNATE CURB PROFILES WHICH FALL
   WITHIN THE MINIMUM RISE AND MAXIMUM
   RISE CURBS SHOWN WILL BE APPROVED.
   SLOPE ACROSS RESIDENTIAL DRIVEWAY CURB
   TOP MUST BE AT LEAST 1/2" IN 6" TOWARD
   THE STREET.

3. FOR RESIDENTIAL DRIVEWAYS, HORIZONTAL
   SAWING OF CURB IS REQUIRED. HORIZONTAL
   SAWING NOT ALLOWED ON NEW CONSTRUCTION
   WHERE DRIVEWAYS ARE IDENTIFIED.
   HORIZONTAL SAWING MACHINES
   AND METHOD REQUIRES PRIOR APPROVAL.

PCC / ACC PAVEMENT NOTES:
1. CONCRETE SHALL BE CLASS A.
2. PAVEMENT THICKNESS SHALL MATCH EXISTING.
   BASE SHALL MATCH EXISTING
3. EXPANSION JOINTS AND CONTRACTION JOINTS
   SHALL BE PLACED AT LOCATIONS SIMILAR TO THE
   PAVEMENT WHICH WAS REMOVED.
4. CURB EDGE SHALL BE TOOLED WITH 1/4" RADIUS
5. WHERE EXISTING PAVEMENT IS P.C.C., LOW CURB
   REPLACEMENT SHALL BE DOWELLED INTO EXISTING.
   12" LONG #4 BARS AT 24" CTR.
PCC PAVEMENT NOTES:

1. CONCRETE SHALL BE CLASS A.
2. PAVEMENT THICKNESS SHALL MATCH EXISTING BASE SHALL MATCH EXISTING
3. EXPANSION JOINTS AND CONTRACTION JOINTS SHALL BE PLACED AT LOCATIONS SIMILAR TO THE PAVEMENT WHICH WAS REMOVED.
4. CURB EDGE SHALL BE TOOLED WITH 1/4" RADIUS
5. WHERE EXISTING PAVEMENT IS P.C.C., LOW CURB REPLACEMENT SHALL BE DOWELLED INTO EXISTING, 12" LONG #4 BARS AT 24" CTR.

ACC PAVEMENT NOTES:

1. CONCRETE SHALL BE CLASS A.
2. GUTTER THICKNESS SHALL MATCH EXISTING, BASE SHALL MATCH EXISTING
3. EXPANSION JOINTS AND CONTRACTION JOINTS SHALL BE PLACED AT LOCATIONS SIMILAR TO THE CURB AND GUTTER WHICH WAS REMOVED.
4. CURB EDGE SHALL BE TOOLED WITH 1/4" RADIUS

COMMERCIAL DRIVEWAY CURB

CURB DETAILS
(Commercial Driveway)
FOR STREETS/ROADS WITH CURBS/GUTTERS

STREET

<table>
<thead>
<tr>
<th>TYPE OF STREET</th>
<th>MINIMUM DISTANCES *</th>
<th>DRIVeway WIDTH</th>
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<tr>
<td></td>
<td>&quot;D&quot;</td>
<td>&quot;E&quot;</td>
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<tr>
<td>LOCAL</td>
<td>30'</td>
<td>10'</td>
</tr>
<tr>
<td>COLLECTOR</td>
<td>150'</td>
<td>50'</td>
</tr>
<tr>
<td>ARTERIAL</td>
<td>400'</td>
<td>150'</td>
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<tr>
<td>COMMERCIAL/INDUSTRIAL</td>
<td>150'</td>
<td>150'</td>
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* MINIMUM DISTANCES MEASURED FROM POINT OF CURVATURE TO POINT OF CURVATURE

DRIVEWAY LOCATIONS & DIMENSIONS

NTS
FOR STREETS/ROADS WITH NO CURBS

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<tr>
<th>TYPE OF STREET</th>
<th>MINIMUM DISTANCES *</th>
<th>DRIVEWAY WIDTH</th>
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</thead>
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<td>&quot;D&quot;</td>
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<tr>
<td>LOCAL</td>
<td>30'</td>
<td>10'</td>
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<td>COLLECTOR</td>
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<tr>
<td>COMMERCIAL/INDUSTRIAL</td>
<td>150'</td>
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* MINIMUM DISTANCES MEASURED FROM POINT OF CURVATURE TO POINT OF CURVATURE

DRIVEWAY LOCATIONS & DIMENSIONS

NTS
VERTICAL STOPPING DISTANCE

* NOTE: SEE APPENDIX B, 1.5 FOR SIGHT DISTANCE REQUIREMENTS

HORIZONTAL STOPPING DISTANCE
NOTES:

1. DRIVEWAY APPROACH SHALL BE 6" CLASS A CONCRETE ON 4" OF AGGREGATE BASE.
2. RECOMMEND CURB CUT OR REPLACE STANDARD CURB & GUTTER SECTION WITH DRIVEWAY CURB SECTION. SEE DETAIL 400.02. IF ROLLBACK CURB OPTION IS USED, CURB DOES NOT HAVE TO BE REMOVED. PLACE 3/4" EXPANSION JOINT BETWEEN CURB AND DRIVEWAY APPROACH.
3. EXPANSION JOINT SHALL BE 3/4" RUBBERIZED EXPANSION JOINT MATERIAL.
4. ALL DRIVEWAY APPROACHES SHALL SLOPE TOWARD THE STREET.
5. ALL DRIVEWAY APPROACHES SHALL BE CONSTRUCTED TO ACCOMMODATE SIDEWALKS. (EXISTING AND FUTURE) STANDARD SIDEWALK LOCATION IS 1 FT INSIDE RIGHT OF WAY LINE.
6. DRIVEWAY APPROACH SHALL PROVIDE A MINIMUM 5' WIDE ACCESSIBLE SIDEWALK PASSING ZONE.
7. DRIVEWAY SLOPE ACROSS ACCESSIBLE SIDEWALK PASSING ZONE IS 1/4" PER FT.
8. MINIMIZE SIDEWALK WARPING ADJACENT TO DRIVEWAY APPROACH.
9. DRIVEWAY SLOPE WITHIN RIGHT OF WAY SHALL NOT EXCEED SLOPES SHOWN ABOVE.
NOTES:
1. DRIVEWAY APPROACH SHALL BE 7" THICK CLASS A CONCRETE ON 4" OF AGGREGATE BASE.
2. RECOMMEND CURB CUT OR REPLACE STANDARD CURB & GUTTER SECTION WITH DRIVEWAY CURB SECTION. SEE DETAIL 400.02. IF ROLLBACK CURB OPTION IS USED, CURB DOES NOT HAVE TO BE REMOVED. PLACE 3/4" EXPANSION JOINT BETWEEN CURB AND DRIVEWAY APPROACH.
3. EXPANSION JOINT SHALL BE 3/4" RUBBERIZED EXPANSION JOINT MATERIAL.
4. ALL DRIVEWAY APPROACHES SHALL SLOPE TOWARD THE STREET.
5. ALL DRIVEWAY APPROACHES SHALL BE CONSTRUCTED TO ACCOMMODATE SIDEWALKS. (EXISTING AND FUTURE) STANDARD SIDEWALK LOCATION IS 1 FOOT OFF OF RIGHT OF WAY LINE.
6. DRIVEWAY APPROACH SHALL PROVIDE A MINIMUM 5' WIDE ACCESSIBLE SIDEWALK PASSING ZONE.
7. DRIVEWAY SLOPE ACROSS ACCESSIBLE SIDEWALK PASSING ZONE IS 1/4" PER FT.
8. MINIMIZE SIDEWALK WARPING ADJACENT TO DRIVEWAY APPROACH.
9. DRIVEWAY SLOPE WITHIN RIGHT OF WAY SHALL NOT EXCEED SLOPES SHOWN ABOVE.
NOTES:

1. MINIMUM APPROACH ON A HARD SURFACED ROADWAY SHALL BE 2’ FROM EDGE OF SHOULDER OR TRAVELED ROADWAY.

2. APPROACH SHALL BE COMMERCIAL GRADE ASPHALT HOT MIX EQUAL TO DEPTH OF SHOULDER OF ROADWAY, OR A MINIMUM OF 5”, WHICHEVER IS GREATER, OR 6” THICK CLASS A P.C. CONCRETE.

3. VALLEY SECTION IS REQUIRED. VALLEY SHALL BE A MINIMUM OF 6’ FROM EDGE OF ROADWAY OR SHOULDER.

4. PIPE UNDER DRIVEWAY SHALL BE SIZED TO CARRY 10 YEAR STORM, MINIMUM 15” DIAMETER. SEE APPENDIX B, 1.1.

5. PIPE LENGTHS SHALL BE BASED ON 3:1 SLOPES. USE OF FLARED END SECTIONS (FES) ARE AT OWNER’S DISCRETION. NOTE: FES WILL NOT BE REPLACED BY BCPW SHOULD THEY BECOME DAMAGED OR NON-FUNCTIONAL.

6. MINIMUM DITCH DEPTH SHALL BE 24”.

7. CMP SHALL BE ANNULAR RIVETED AND GALVANIZED OR POLYMERIC COATED. SEE APPENDIX A, SECTION 260.3.5

8. EXCEPTION:
   PIPE PLACEMENT ON HARD SURFACED ROADWAYS WHERE THE FLOW LINES ARE NOT LOCATED AS PER SPECIFICATIONS SHALL BE ALLOWED TO BE LOCATED TO MEET THE EXISTING FLOW LINE, BUT SHALL IN NO CASE BE CLOSER THAN 3’ FROM THE EDGE OF THE ROAD.

9. ALTERNATE METHOD:
   WHERE THE ROADSIDE DITCH DRAINS LESS THAN 10,000 SQ. FT. (AND THERE ARE NO UPSTREAM PIPES DRAINING MORE THAN 10,000 SQ. FT.), THE PIPE CAN BE OMITTED. HOWEVER THE VALLEY SECTION MUST BE INCREASED TO A DEPTH OF 6” AND PAVEMENT SECTION MUST COVER FROM EDGE OF ROADWAY TO 4’ PAST THE LOW POINT OF THE VALLEY. PAVEMENT TYPE IS AT OWNER’S DISCRETION.

10. FOR GRAVEL DRIVES ON GRAVEL ROADWAYS THE 2’ APRON MUST BE A MINIMUM OF 8” OF 2 1/2” MINUS ROCK.
THIS DRIVEWAY SPECIFICATION APPLIES TO THE GRAVELED ROADWAYS WITHIN RURAL BOONE COUNTY WHERE ANY OF THE FOLLOWING CONDITIONS EXIST.

1. There are no current swales or ditches located within 500 L.F. of the project area.
2. Cross culvert will not allow a minimum of .5% fall from the proposed outlet.
3. If more than 500 L.F. of ditching will be required by Maintenance Operations (Outside the owners 10:1 taper requirement) in order to make drain.
4. If none of the above items exist, driveway must be built according to drawing 410.04.

IF ANY OF THE ABOVE-MENTIONED CONDITIONS EXIST, THE FOLLOWING REQUIREMENTS MUST BE MET.

1. Driveway approach material shall be a minimum of 8" of 2 ½" minus rock or shall be a hard surfaced driveway according to the specifications stated in # 2.
2. If applicant wants a hard surfaced driveway, the approach shall be a minimum 5" of hot mix asphalt or 6" of P.C. Concrete. In either case, the hard surfaced approach shall be set back a minimum of 12" beyond edge of road.
3. Valley section is required and must meet the existing flowline.
4. Driveway shall be built so that the water from the existing ditch will flow across driveway without backing up within the traveled roadway or shoulder area.
5. Driveway shall meet the Sight Distance Requirement as per Appendix B. 1.5
6. Install heavy gauge filter fabric (i.e. Mirafi 180N or equivalent) 8" deep by The Width of the driveway.

J. PW II
1/29/09
Approved
Date

County of Boone
Public Works

DRIVEWAY
Gravel Roadways

410.05
Gravel
THE MOVEMENT OVER TIME OF CONCRETE STREETS DUE PRIMARILY TO
THE THERMAL EXPANSION AND CONTRACTION PROPERTIES OF CONCRETE
HAS CAUSED DAMAGE TO PRIVATE RESIDENCES IN SOME NEW SUB-
DIVISIONS IN BOONE COUNTY WHERE CONCRETE STREETS ARE USED.

IN ORDER TO CONTROL SUCH DAMAGE, THE COUNTY IS RECOMMENDING THE
USE OF ONE OF THE JOINT DETAILS ABOVE WHEN THE DRIVEWAY IS
LOCATED AS DEPICTED ON THIS DRAWING.

BOONE COUNTY SHALL NOT BE LIABLE FOR ANY DAMAGE THAT MAY OCCUR TO ANY
STRUCTURE DUE TO NON-COMPLIANCE WITH THIS RECOMMENDATION. A WAIVER MUST BE
SIGNED BY OWNER BEFORE DRIVEWAY WILL BE APPROVED. A FEE IN THE AMOUNT TO
RECORD A 1 (ONE) PAGE DOCUMENT PAYABLE TO THE RECORDER OF DEEDS WILL
BE REQUIRED.

ALTERNATE EXPANSION JOINTS FOR
DRIVEWAYS ON P.C.C. STREETS 410.05
SIDEWALK WITH GRASS PARKWAY

NOTE:

1. SIDEWALK SHALL BE 4” THICK CLASS A CONCRETE.
2. INSTALL 1/2” EXPANSION JOINTS AT INTERSECTIONS, RAMPS, STRUCTURES, AND DRIVEWAY APPROACHES.
3. INSTALL TRANSVERSE SAW JOINTS AT SPACING = SIDEWALK WIDTH.
4. FOR SIDEWALKS WIDER THAN 6 FT, INSTALL LONGITUDINAL SAW JOINT AT 1/2 SIDEWALK WIDTH.
5. FOR SIDEWALKS LESS THAN 5’-0” WIDE, INSTALL A 60” BY 60” PASSING SPACE AT 200 FT MAXIMUM INTERVALS. DRIVEWAYS, RAMP LANDINGS AND INTERSECTING SIDEWALKS WHICH PROVIDE THE REQUIRED AREA QUALIFY AS PASSING SPACE. CROSS SLOPE OF PASSING SPACE CAN NOT EXCEED 1/4” PER FT.
6. STANDARD SIDEWALK PLACEMENT IS 12” FROM RIGHT OF WAY LINE.
NOTE:
1. SIDEWALK SHALL BE 4" THICK CLASS A CONCRETE.
2. INSTALL 1/2" TRANSVERSE EXPANSION JOINTS TO MATCH STREET OR CURB AND GUTTER EXPANSION JOINTS AND AT ALL DRIVEWAY APPROACHES, AND SIDEWALK RAMPS.
3. INSTALL TRANSVERSE SAW JOINTS AT SPACING = SIDEWALK WIDTH.
4. FOR SIDEWALKS WIDER THAN 6 FT., INSTALL LONGITUDINAL SAW JOINT AT 6, TRANSVERSE SAW JOINT SPACING = SIDEWALK WIDTH.
5. FOR SIDEWALKS LESS THAN 5'-0" WIDE, INSTALL A 60" BY 60" PASSING SPACE AT 200 FT MAXIMUM INTERVALS. DRIVEWAYS, RAMP LANDINGS AND INTERSECTING SIDEWALKS WHICH PROVIDE THE REQUIRED AREA QUALIFY AS PASSING SPACE. CROSS SLOPE OF PASSING SPACE CAN NOT EXCEED 1/4" PER FT.
WELDED WIRE MESH NOTE REMOVED & REPLACED

#4 BARS PLACED ON 12" CENTERS EACH WAY

PLAN VIEW

6" THICKENED EDGE

#4 DOWEL BAR

TYPE ‘M’ INLET

WELDED WIRE MESH NOTE REMOVED

SECTION A--A

NOTES:

1. SIDEWALK SHALL BE 4" THICK CLASS A CONCRETE
2. REINFORCING STEEL SHALL BE GRADE 60
NOTE:

1. RAMP SHALL BE 4" THICK CLASS A CONCRETE.
2. EXPANSION JOINT SHALL BE 1/2" PREFORMED CORK OR BITUMINOUS EXPANSION JOINT MATERIAL.
3. MAXIMUM RAMP CROSS SLOPE IS 1/4" PER FT.
4. ALL SLOPES ARE MEASURED FROM THE HORIZONTAL.
5. REPLACE STANDARD CURB SECTION WITH SIDEWALK RAMP CURB SECTION — DETAIL 400.01
6. RAMP LENGTH IS DEPENDENT ON 1:12 MAX. SLOPE. USE FLATTER WHEN POSSIBLE.
7. LANDING AREA AT TOP OF RAMP SHALL BE 4'-0" MIN WIDTH, CROSS SLOPE OF LANDING SHALL NOT EXCEED 1/4" PER FT., INCREASE SIDEWALK RADIUS TO OBTAIN MINIMUM 4'-0" LANDING.
8. TYPE "A" RAMP NOT APPLICABLE IF SIDEWALK AND PARKWAY WIDTH DOES NOT PROVIDE 4'-0" LANDING AT TOP OF RAMP.
9. FLARES ARE REQUIRED AT RAMPS TO KEEP GRASS PARKWAY SLOPES IN CONFORMANCE WITH THE TYPICAL CROSS SECTION.
10. CURB TRANSITION LENGTH IS DEPENDENT ON FLARE SLOPE
11. IF RAMP EXTENDS INTO NORMAL SIDEWALK, FLARE SLOPE MUST NOT EXCEED 1:10.

A LANDING IS REQUIRED, SEE NOTE 7.
NOTE:

1. RAMP SHALL BE 4" THICK CLASS A CONCRETE.
2. EXPANSION JOINT SHALL BE 1/2" PREFORMED CORK OR BITUMINOUS EXPANSION JOINT MATERIAL.
3. MAXIMUM RAMP CROSS SLOPE IS 1/4" PER FT.
4. ALL SLOPES ARE MEASURED FROM THE HORIZONTAL.
5. REPLACE STANDARD CURB SECTION WITH SIDEWALK RAMP CURB SECTION – DETAIL 400.01
6. RAMP 1:12 MAX. USE FLATTER WHEN POSSIBLE.
7. LANDING AREA SHALL BE 4'-0" MIN WIDTH, CROSS SLOPE OF LANDING SHALL NOT EXCEED 1/4" PER FT.
8. FLARES ARE REQUIRED AT RAMP TO KEEP GRASS PARKWAY SLOPES IN CONFORMANCE WITH THE TYPICAL CROSS SECTION. (SEE SECTION A-A)
9. CURB TRANSITION LENGTH IS DEPENDENT ON FLARE SLOPE
NOTE:

1. RAMP SHALL BE 4" THICK CLASS A CONCRETE.
2. EXPANSION JOINT SHALL BE 1/2" PREFORMED CORK OR BITUMINOUS EXPANSION JOINT MATERIAL.
3. MAXIMUM RAMP CROSS SLOPE IS 1/4" PER FT.
4. ALL SLOPES ARE MEASURED FROM THE HORIZONTAL.
5. REPLACE STANDARD CURB SECTION WITH SIDEWALK RAMP CURB SECTION – DETAIL 400.01
6. RAMP LENGTH IS DEPENDENT ON 1:12 MAX. SLOPE. USE FLATTER WHEN POSSIBLE.
7. LANDING AREA SHALL BE 4'-0" MIN WIDTH, CROSS SLOPE OF LANDING SHALL NOT EXCEED 1/4" PER FT.
8. USE TYPE "C" RAMP ONLY IF TYPE "A" & "B" ARE NOT FEASIBLE.
9. FLARES ARE REQUIRED AT RAMPS TO KEEP GRASS PARKWAY SLOPES IN CONFORMANCE WITH THE TYPICAL CROSS SECTION. (SEE SECTION A-A)
10. CURB TRANSITION LENGTH IS DEPENDENT ON FLARE SLOPE
NOTE:
1. RAMP SHALL BE 4" THICK CLASS A CONCRETE.
2. EXPANSION JOINT SHALL BE 1/2" PREFORMED CORK OR BITUMINOUS EXPANSION JOINT MATERIAL.
3. ALL SLOPES ARE MEASURED FROM THE HORIZONTAL.
4. REPLACE STANDARD CURB SECTION WITH SIDEWALK RAMP CURB SECTION - DETAIL 400.01
5. RAMP LENGTH IS DEPENDENT ON 1:12 MAX. SLOPE. USE FLATTER WHEN POSSIBLE.
6. LANDING AREA AT TOP OF RAMP SHALL BE 4'-0" MIN WIDTH, CROSS SLOPE OF LANDING SHALL NOT EXCEED 1/4" PER FT.
7. TYPE "A" RAMP NOT APPLICABLE IF PARKWAY WIDTH DOES NOT PROVIDE ENOUGH LENGTH FOR PERPENDICULAR RAMP AT 1:12 SLOPE.
8. FLARES ARE REQUIRED AT RAMPS TO KEEP GRASS PARKWAY SLOPES IN CONFORMANCE WITH THE TYPICAL CROSS SECTION.
9. CURB TRANSITION LENGTH IS DEPENDENT ON FLARE SLOPE.
NOTE:
1. RAMP SHALL BE 4" THICK CLASS A CONCRETE.
2. EXPANSION JOINT SHALL BE 1/2" PREFORMED CORK OR BITUMINOUS EXPANSION JOINT MATERIAL.
3. MAXIMUM RAMP CROSS SLOPE IS 1/4" PER FT.
4. ALL SLOPES ARE MEASURED FROM THE HORIZONTAL.
5. REPLACE STANDARD CURB SECTION WITH SIDEWALK RAMP CURB SECTION – DETAIL 400.01
6. RAMP LENGTH IS DEPENDENT ON 1:12 MAX. SLOPE. USE FLATTER WHEN POSSIBLE.
7. LANDING AREA AT TOP OF RAMP SHALL BE 4'-0" MIN WIDTH, CROSS SLOPE OF LANDING SHALL NOT EXCEED 1/4" PER FT.
8. TYPE “A” RAMP NOT APPLICABLE IF SIDEWALK WIDTH DOES NOT PROVIDE 4'-0" LANDING AT THE TOP OF RAMP. USE TYPE “B” RAMP.
9. RAMP EXTENDS INTO SIDEWALK, FLARE SLOPE MUST NOT EXCEED 1:10.
10. CURB TRANSITION LENGTH IS DEPENDENT ON 1:10 FLARE SLOPE.
NOTE:

1. RAMP SHALL BE 4" THICK CLASS A CONCRETE.
2. EXPANSION JOINT SHALL BE 1/2" PREFORMED CORK OR BITUMINOUS EXPANSION JOINT MATERIAL.
3. MAXIMUM RAMP CROSS SLOPE IS 1/4" PER FT.
4. ALL SLOPES ARE MEASURED FROM THE HORIZONTAL.
5. REPLACE STANDARD CURB SECTION WITH SIDEWALK RAMP CURB SECTION – DETAIL 400.01
6. RAMP 1:12 MAX. USE FLATTER WHEN POSSIBLE.
7. LANDING AREA SHALL BE 4'-0" MIN WIDTH, CROSS SLOPE OF LANDING SHALL NOT EXCEED 1/4" PER FT.
8. TYPE "B" RAMP PROVIDES PARALLEL RAMPS TO REDUCE THE PERPENDICULAR RAMP LENGTH AND PROVIDE ADEQUATE LANDING.
9. RAMP EXTENDS INTO SIDEWALK, FLARE SLOPE MUST NOT EXCEED 1:10.
NOTE:

1. RAMP SHALL BE 4" THICK CLASS A CONCRETE.
2. EXPANSION JOINT SHALL BE 1/2" PREFORMED CORK OR BITUMINOUS EXPANSION JOINT MATERIAL.
3. MAXIMUM RAMP CROSS SLOPE IS 1/4" PER FT.
4. ALL SLOPES ARE MEASURED FROM THE HORIZONTAL.
5. REPLACE STANDARD CURB SECTION WITH SIDEWALK RAMP CURB SECTION — DETAIL 400.01
6. RAMP LENGTH IS DEPENDENT ON 1:12 MAX. SLOPE. USE FLATTER WHEN POSSIBLE.
7. LANDING AREA SHALL BE 4'-0" MIN WIDTH, CROSS SLOPE OF LANDING SHALL NOT EXCEED 1/4" PER FT.
8. USE TYPE "C" RAMP ONLY IF TYPE "A" & "B" ARE NOT FEASIBLE.
NOTE:
1. RAMP SHALL BE 4" THICK CLASS A CONCRETE.
2. EXPANSION JOINT SHALL BE 1/2" PREFORMED CORK OR BITUMINOUS EXPANSION JOINT MATERIAL.
3. MAXIMUM RAMP CROSS SLOPE IS 1/4" PER FT.
4. ALL SLOPES ARE MEASURED FROM THE HORIZONTAL.
5. REPLACE STANDARD CURB SECTION WITH SIDEWALK RAMP CURB SECTION – DETAIL 400.01
6. RAMP LENGTH IS DEPENDENT ON 1:12 MAX. SLOPE. USE FLATTER WHEN POSSIBLE.
7. LANDING AREA SHALL BE 4'-0" MIN WIDTH, CROSS SLOPE OF LANDING SHALL NOT EXCEED 1/4" PER FT.
8. TYPE "A" RAMP NOT APPLICABLE WHEN NORMAL SIDEWALK WIDTH DOES NOT PROVIDE 4'-0" LANDING AT THE TOP OF RAMP, WIDEN SIDEWALK OR USE TYPE "B" RAMP.
9. 10:1 FLARES ARE REQUIRED ON TYPE "A" RAMPS.

APPENDIX B-1

MIDBLOCK SIDEWALK RAMP
Sidewalk at Back of Curb

433.01
NOTE: DETECTABLE WARNING SHALL CONSIST OF
OF RAISED TRUNCATED DOMES WITH A DIAMETER OF 0.9".
A HEIGHT OF NOMINAL 0.2", AND A CENTER-TO-CENTER
SPACING OF NOMINAL 2.35". AND SHALL
CONTRAST VISUALLY WITH ADJOINING SURFACES, ACHIEVED BY
THE ADDITION OF A RED PIGMENT TO THE CONCRETE MIX.
DOME PATTERN SHALL BE STAMPED INTO THE WET CONCRETE
AND SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.
REMOVE EXISTING PAVING TO EXISTING JOINT

EXISTING PAVING

D

12" MIN.

12" MIN.

COMPACTED BACKFILL 1" MINUS CRUSHED STONE

BEDDING AND PIPE SUPPORT PER PIPE SPECIFICATION.

NOTE:

D = 4" PORTLAND CEMENT CONCRETE FOR SIDEWALKS
D = 6" PORTLAND CEMENT CONCRETE FOR RESIDENTIAL DRIVEWAYS
D = 7" PORTLAND CEMENT CONCRETE FOR COMMERCIAL DRIVEWAYS
NOTES:
1. STEPS NOT REQUIRED WHERE H IS LESS THAN 4'.
2. CAST IRON STEPS STEPS SHALL BE NEENAH R-1980-J OR EQUAL
3. STEPS SHALL BE PLACED ON VACANT WALL WHEN POSSIBLE
4. MANHOLE RING SHALL BE OFFSET TOWARD WALL WITH STEPS.
5. MANHOLE RING SHALL BE CENTERED ON CENTERLINE OF STEPS
6. STAGGER STEPS 2" EACH WAY FROM CENTERLINE OF MANHOLE RING.
7. TOP STEP 24" BELOW TOP OF SLAB
8. STEP SPACING TO BE 16", BOTTOM STEP TO BE NO HIGHER THAN 16" FROM INVERT.

DRAINAGE STRUCTURE STEPS 500.01
NOTES:
1. FORM ALL INVERTS FOR SMOOTH FLOW THRU STRUCTURE.
2. INVERT SHALL BE FORMED UP TO 1/2 THE PIPE DIAMETER.
3. INVERT SHALL BE CLASS E CONCRETE.
NOTES:

1. STRUCTURAL STEEL SHALL BE GRADE A-36

2. EXPOSED STEEL SURFACES TO BE FINISHED SMOOTH.

3. HOT DIP GALVANIZE ASSEMBLY, EXCEPT THAT GALV. NOT REQUIRED ON DEFORMED ANCHORS. CHIPPING NOT REQUIRED ON ANCHOR WELDS.

4. NAILS OR BOLTS USED TO ANCHOR ANGLE ASSEMBLY TO FORM SHALL BE REMOVED OR CUT OFF FLUSH WITH SURFACE OF ANGLE.

5. DIMENSION "L" REPRESENTS THE INSIDE INLET DIMENSION.

INLET OPENING
TRASH RACK

500.03
NOTE:

1. PLACE WEEP HOLES ON UPSTREAM FACE OF ALL STRUCTURES AND ALSO ON ROADWAY FACE OF CURB INLET STRUCTURES.

2. WEEP HOLE FILTER FABRIC SHALL CONSIST OF A NON-WOVEN, POLYPROPYLENE TYPE FABRIC SUCH AS: AMOCO 4553 NON-WOVEN GEOTEXTILE FABRIC OR APPROVED EQUAL.
APPENDIX B-1

PLAN

SECTION A-A

SECTION B-B

SECTION C-C

TYPE M INLET
(Plan & Sections)
TYPE M INLET NOTES

1. CONCRETE SHALL BE: CLASS E FOR BASE, CLASS D FOR WALLS AND TOP.

2. REINFORCING STEEL SHALL BE GRADE 60

3. THIS DESIGN IS FOR L = 4'-0", 6'-0", 8'-0", OR 10'-0".

4. INLET WILL BE CALLED OUT ON PLANS AS ‘L’x’W’ STD. CURB INLET, OR ‘L’x’W’ DEFLECTOR CURB INLET. DIMENSIONS ‘L’&‘W’ GIVEN ON PLANS AS ‘L’x’W’.

5. STA AND OFFSET OR COORDINATES SHOWN ON PLAN ARE GIVEN TO CENTER OF INLET WALLS.


7. DIMENSIONS TU AND TD AS SHOWN EXCEPT WHERE NOTED OTHERWISE IN PLANS.

8. TRANSITIONS ALONG LENGTH TU & TD MUST BE UNIFORM BETWEEN STANDARD CURB & GUTTER CROSS SECTION & THAT SHOWN AT INLET. FORM CURB FACE WITH FLEXIBLE FORM.

9. REINFORCEMENT:
   (A) BEND AROUND MH RING WHEREVER FEASIBLE. (SEE PLAN)
   (B) MINIMUM 2" COVER REQUIRED UNLESS NOTED OTHERWISE.

10. BROOM FINISH TOP SLAB.

11. HORIZONTAL PROJECTION OF PIPE CENTERLINE SHALL INTERSECT AT THE CENTER OF INLET, UNLESS OTHERWISE SHOWN.

12. TRIM PIPE FLUSH WITH INSIDE WALLS.

13. CAST IRON STEPS, FRAME, AND LID:
    STEPS NOT REQUIRED WHERE H IS LESS THAN 4’.
    CAST IRON STEPS SHALL BE NEENAH R-1980-J,
    AMERICAN STEP COMPANY INC. #ML-13 OR APPROVED EQUAL
    STEPS SHALL BE PLACED ON VACANT WALL WHEN POSSIBLE
    MANHOLE RING SHALL BE OFFSET TOWARD WALL WITH STEPS.
    MANHOLE RING SHALL BE CENTERED ON CENTERLINE OF STEPS
    STAGGER STEPS 2" EACH WAY FROM CENTERLINE OF MANHOLE RING.
    TOP STEP 24" BELOW TOP OF SLAB
    STEP SPACING TO BE 16", BOTTOM STEP TO BE NO HIGHER THAN 16" FROM INVERT.

14. CLASS E CONCRETE INVERT SHALL BE FORMED UP TO 1/2 THE PIPE DIAMETER.

15. 3/4” EXPANSION MATERIAL TO BE PLACED BETWEEN THROAT AND INLET AS WELL AS CURB AND INLET.

16. TWO (2) LAYERS OF TAR PAPER SHALL BE PLACED BETWEEN THROAT POUR AND INLET WALL TO ALLOW MOVEMENT.
OPENING FOR AREA DRAINAGE
WHERE SPEC. ON PLANS
PROVIDE EDGE ASSEMBLY WITH
TRASH ROD FOR ALL BACK
OPENINGS GREATER THAN 6".

VERTICAL WALL REINFORCEMENT
#4 @ 12" ctr.

NOTE:
FOR L OVER 6' & H OVER 10',
BRACE TO RESIST EARTH
COMPACTON STRESSES
DURING BACKFILL

HORIZONTAL WALL REINFORCEMENT
#4 @ 12" ctr.

NOTE:
CLASS E CONCRETE INVERT
SHALL BE FORMED UP TO 1/2
THE PIPE DIAMETER.
FORM INVERT FOR SMOOTH
FLOW THROUGH STRUCTURE.

#4 @ 12" ctr. EACH WAY

EXTEND REINFORCING
THRU JOINT IN STRUCTURE.

SECTION D-D

LAP EDGE L ANCHORS
W/TRANSV. REINF.
2-#5 ADDNL. BARS FULL LENGTH
3-#5 TOP BARS FULL LENGTH

EDGE L ASSEMBLY
SEE DETAIL 505.01F

2-6" 12" SETBACK 2'-6"

TOP OF CURB

NORMAL C&C

1'-1 3/4" MAX.
1'-6 3/4" MAX.

PLACE C&C CONCRETE
AGAINST WALLS &
TOP SLAB

3" STD.

2 LAYERS OF
TAR PAPER

THROAT DETAIL

NOTE:
3/4" EXPANSION MATERIAL TO BE PLACED BETWEEN
THROAT AND INLET, AND CURB AND INLET.
INLET PLAN INFORMATION

TOP ELEVATION SHOWN ON PLAN IS GIVEN TO FRONT OF EDGE ANGLE

ON SLOPE

AT LOW POINT

INLET SETTING DIAGRAMS
GUTTER DEFLECTOR NOTES:

1. ASSEMBLY TO BE HOT DIP GALVANIZED.
2. TO BE USED WHERE DEFLECTOR CURB INLET IS SPECIFIED
3. BEFORE PLACING CONCRETE; SUPPORT UNIT SECURELY IN FINAL
   POSITION BY ATTACHING TO METAL RODS DRIVEN INTO SUBGRADE
4. TO BE USED WHEN GRADE IS 4% OR GREATER.
5. CONCRETE IN CAST DEFLECTOR MAY BE INSTALLED IN LIEU OF HOT DIPPED GALVANIZED
NOTES:
1. STRUCTURAL STEEL SHALL BE GRADE A-36
2. EXPOSED STEEL SURFACES TO BE FINISHED SMOOTH.
3. HOT DIP GALVANIZE ASSEMBLY, EXCEPT THAT GALV. NOT REQUIRED ON DEFORMED ANCHORS. CHIPPING NOT REQUIRED ON ANCHOR WELDS.
4. NAILS OR BOLTS USED TO ANCHOR ANGLE ASSEMBLY TO FORM SHALL BE REMOVED OR CUT OFF FLUSH WITH SURFACE OF ANGLE.
5. DIMENSION "L" REPRESENTS THE INSIDE INLET DIMENSION.
APPENDIX B-1

TYPE "A" INLET

505.02

DEPRESSED GUTTER SECTION, TRANSITION 5 FT FROM INLET
C.I. FRAME & GRATE NEENAH R-3246 OR APPROVED EQUAL

USE TYPE 'A' EXPANSION JOINT IF PAVEMENT IS P.C.C.

PLAN - SINGLE

BACK OF CURB
DEPRESSED GUTTER TRANSITION 6'-7" FROM INLET
C.I. FRAME & GRATE NEENAH R-3296 OR APPROVED EQUAL

PLAN - DOUBLE

SECTION A-A
ALTERNATE

2-#4 BARS (EXTENDS 2' BEYOND C.I.)

6'-6"
6"
8"
2'-0"
8"
6"
6"
6"
6"
6"
6"

DEPRESS PAV'T.
TOP OF GRATE
CURB CASTING

C.I. STEP
SEE DETAIL 500.01

SECTION C-C

SECCTION B-B

NOTES:
1. CONCRETE SHALL BE CLASS E FOR BASES AND D FOR WALLS AND TOP.
2. REINFORCING STEEL SHALL BE GRADE 60
3. INSTALL WEEP HOLES AS PER DETAIL 500.04
4. STRUCTURES WHERE H>8' SHALL BE REINFORCED CONCRETE
   (#4 BARS AT 12" CTRS, BOTH WAYS AND #4 BARS DIAGONAL AT PIPE OPENINGS)
OPTIONAL TOP
(Use only when specified on plan)

NEENAH R1726-A
OR APPROVED EQUAL
BITUMINOUS SETTING
COMPOUND

#4 BARS DIAG.
MANHOLE FRAME
AND LID PER
NOTE 5.

#4 BARS @ 8"
O.C. BOTH WAYS

PLAN VIEW

REINF. CONCRETE TOP
6" REINF. CONC.
OR 8" CONC. WALL

CAST IRON STEPS
SEE DETAIL 500.01
CONSTRUCT INVERT
SEE DETAIL 500.02

SECTION A-A
(Showing Standard Flush Top)

NOTES:
1. CONCRETE SHALL BE CLASS E FOR BASES AND D FOR WALLS AND TOP.
2. REINFORCING STEEL SHALL BE GRADE 60
3. INSTALL WEEP HOLES AS PER DETAIL 500.04
4. STRUCTURES WHERE H>8' SHALL BE REINFORCED CONCRETE
   (#4 BARS AT 12" CTRS, BOTH WAYS AND #4 BARS DIAGONAL AT PIPE OPENINGS)
5. FRAME AND LID SHALL BE NEENAH R-1960-A (TYPE C LID), DEETER 1180, OR
   APPROVED EQUAL. SEE DETAIL 500.01 FOR PLACEMENT.

JUNCTION BOX
510.01
APPENDIX B-1

NOTES:
1. CONCRETE SHALL BE CLASS E FOR BASES AND D FOR WALLS AND TOP.
2. REINFORCING STEEL SHALL BE GRADE 60
3. INSTALL WEEP HOLES AS PER DETAIL 500.04
4. STRUCTURES WHERE H>8' SHALL BE REINFORCED CONCRETE
   (#4 BARS AT 12" CTRS, BOTH WAYS AND #4 BARS DIAGONAL AT PIPE OPENINGS)
5. FRAME AND LID SHALL BE NEENAH R-1960-A (TYPE C LID), DEETER 1180, OR
   APPROVED EQUAL. SEE DETAIL 500.01 FOR PLACEMENT.
6. SIDE OPENINGS TO BE ON ALL FOUR SIDES UNLESS NOTED OTHERWISE
7. INSTALL TRASH RACK ON OPENINGS OVER 6" SEE DETAIL 500.03

SIDE OPENING INLET 510.02
FRAME & GRATE: CAST IRON, SIZE AND DUTY DEPENDENT ON APPLICATION.

2'-6" MIN.

#4 BARS @ 8" O.C. BOTH WAYS

CATCH BASIN
PLAN VIEW

REINF. CONCRETE TOP

6" REINF. CONC. OR 8" CONC. WALL

CAST IRON STEPS
SEE DETAIL 500.01

CONSTRUCT INVERT
SEE DETAIL 500.02

H' VARIES

6"

8" 2'-6" MIN. 8"

NOTES:
1. CONCRETE SHALL BE: CLASS E FOR BASES, CLASS D FOR WALLS AND TOP.
2. REINFORCING STEEL SHALL BE GRADE 60
3. INSTALL WEEP HOLES AS PER DETAIL 500.04
4. STRUCTURES WHERE H>8' SHALL BE REINFORCED CONCRETE
   (#4 BARS AT 12" CTRS, BOTH WAYS AND #4 BARS DIAGONAL AT PIPE OPENINGS)
NOTE:
CONCRETE FOR TOE WALL SHALL BE CLASS E OR PRE-CAST EQUIVALENT.
THE USE OF PRE-CAST MUST BE PRE-APPROVED.

TOEWALL & END SECTION
(FOR R.C.P.)
**NOTES:**
1. ROCK LINER FILTER FABRIC BETWEEN RIP RAP AND BANK SOIL. (see 530.03)
2. 2% DOWN GRADE REQUIRED FROM OUT FALL TO END OF ROCK BLANKET.

**NOTE:** FLARED END SECTIONS ALLOWED FOR R.C.P. ONLY. C.M.P. SHALL BE MITRED AS PER APPENDIX A-1.8

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### ROCK LINING FOR CULVERT OUTLETS

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<th>ROCK LINING CU. YDS.</th>
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APPENDIX B-1

SECTION THRU MITERED END
CMP 15" THRU 21" DIAMETER

EXAMPLE FOR 18" CMP:
LOWER VERTICAL STEP=18" divided by 4= 4 ½" 
LENGTH OF MITER= 18" times 9 divided by 4= 40 ½"

SECTION THRU MITERED END
CMP 24" THRU 144" DIAMETER

EXAMPLE FOR 60" CMP:
UPPER AND LOWER VERTICAL STEPS=60" divided by 4= 15" 
LENGTH OF MITER= 60" times 3 divided by 2= 90"
LEGEND

C) SAW JOINT, FILL WITH BITUMASTIC JOINT SEALANT - SEE DETAIL.

E) 1/2" EXPANSION JOINT AT 50' INTERVALS.

I) TOE WALL TO BE CONSTRUCTED AT OUTLET END OF PAVED DITCHES.

B) KEY JOINT (SEE DETAIL)

W) CUT-OFF WALL @ 50'-0" SPA.

PLAN VIEW

SAW JOINT

C JOINT DETAIL

B JOINT DETAIL

VARIABLE SLOPE
2:1 OR 3:1 TYP.

SECTION THROUGH SWALE
SHOWING TOE WALL OR CUT-OFF WALL

NOTE:
CONCRETE SHALL BE CLASS E
CONCRETE SWALE
(Flat-Bottom Type)

530.02
NOTE:

1. ROCK LINER FILTER FABRIC SHALL CONSIST OF A NON-WOVEN, POLYPROPYLENE TYPE FABRIC SUCH AS: AMOCO 4553 NON-WOVEN GEOTEXTILE FABRIC OR APPROVED EQUAL.