This book of “Construction Standards” was prepared by the Calvert County Department of Public Works to provide engineering personnel, contractors and developers with a catalog of standards for roads, streets and incidental structures constructed within the jurisdiction of Calvert County.

Any Standards previously issued by Calvert County Department of Public Works are hereby superseded as of this date.

All Engineers, Land Surveyors and Contractors involved with the construction of roads, streets and incidental structures constructed within the jurisdiction of Calvert County should become thoroughly familiar with the contents of this book. Our goal is uniform design and construction throughout Calvert County.

These regulations may be revised periodically to reflect changing regulations and technology.

Any obvious errors found or any comments that you may have regarding these standards are welcome and will be given due consideration. Comments may be submitted to:

Calvert County Department of Public Works
150 Main Street, Suite 202
Prince Frederick, Maryland 20678
Telephone: 410-535-2204 – 301-855-1243   Fax: 410-535-2129

Effective Date:

July 1, 2012
INDEX OF STANDARD PLATES

ROADWAY PLATES

RD-1A......................... Rights-of-Way Recorded Prior to the Adoption of the C.C.Z.O. (July 29, 1967), Farm and Forest Districts, Rural Community Districts and Family Conveyance

RD-1B......................... Private Lanes

RD-1C......................... Alley

RD-2 ......................... Residential/Local Roadway – Rural (Existing Right-of-Way)

RD-3A......................... Residential/Local Roadway – Rural

RD-3B......................... Residential/Local Roadway – Urban

RD-3C......................... Residential/Local Roadway – Urban (Public One-Way)

RD-4A......................... Residential/Local Roadway – Rural

RD-4B......................... Residential/Local Roadway – Urban

RD-4C......................... Residential/Local Roadway – Urban w/ Parking on One Side

RD-4D......................... Residential/Local Roadway – Urban w/ Parking on Both Sides

RD-5A......................... Minor Residential Collector Roadway – Rural

RD-5B......................... Minor Residential Collector Roadway – Urban

RD-5C......................... Minor Residential Collector Roadway – Urban w/ Parking on One Side

RD-5D......................... Minor Residential/Local Roadway – Urban w/ Parking on Both Sides

RD-6A......................... Residential Collector Roadway – Rural

RD-6B......................... Residential Collector Roadway – Urban

RD-7A......................... Minor Collector Roadway – Rural

RD-7B......................... Minor Collector Roadway – Urban

RD-8A......................... Commercial & Industrial Roadway – Rural

RD-8B......................... Commercial & Industrial Roadway – Urban

RD-9 ......................... Typical Sections – Major Connector

RD-10 ......................... Town Center Boulevard Roadway

RD-11 ......................... Summary of Road Classification

RD-11A ....................... Summary of Road Classification

RD-11B......................... Standard Landing Requirements for Local and Collector Roadways
RD-12 ......................... Minimum Pavement Sections
RD-12A ....................... Minimum Pavement Sections
RD-13A ....................... Standard Entrance Detail
RD-13B ....................... Single & Channelized Commercial Entrances
RD-14 ......................... Typical 60° and 90° Off-Street Parking
RD-15A ....................... Typical Driveway Entrance: Curb & Gutter Roadway – Sidewalk Abutting Curb
RD-15B ....................... Typical Driveway Entrance: Curb & Gutter Roadway – Sidewalk Away From Curb
RD-15C ....................... Typical Driveway Entrance: Roadway Without Curb & Gutter
RD-16 ......................... Common Access Driveway (Private)
RD-17A ....................... Permanent Tee Turn-Around
RD-17B ....................... Temporary Tee Turn-Around
RD-17C ....................... Cul-De-Sac
RD-17D ....................... Landscaped Cul-De-Sac
RD-17E ....................... Offset Cul-De-Sac
RD-18A ....................... Transition Lane & Deceleration Lanes
RD-18B ....................... By-Pass Lanes
RD-19A ....................... Standard Concrete Curb & Gutter – Type A, B & Valley Gutter
RD-19B ....................... Standard Concrete Curb & Gutter – Type C, D, & S
RD-19C ....................... Curb Transition Details
RD-20A ....................... Standard Concrete Sidewalk
RD-20B ....................... Concrete Paver/Brick Sidewalk
RD-21 ......................... On-Street Parking Bump-Out Configurations
RD-22 ......................... Rural Roundabout
RD-23 ......................... Urban Roundabout
RD-23A ....................... Urban Roundabout Specific/Geometric Design Elements
RD-24 ......................... Utility Cuts
RD-25 ......................... Mailbox Turnout Detail
DRAINAGE FORMS AND CHARTS

SD-1 ......................... Runoff Factors, Rainfall Table and Maximum Time of Concentration
SD-2 ......................... Rainfall Intensity Chart
SD-3 ......................... Overland Sheet Flow Chart
SD-4 ......................... Gutter Flow Velocity and Time
SD-5 ......................... Inlet Time Solution
SD-6 ......................... Loss Coefficients (K_b) for Storm Drain Structures and Manning’s Formula
                          Value of “n”
SD-7 ......................... Limiting Velocities for Ditches
INLET DETAILS

CA-300.02 ................. Method of Depressing Curb at Inlets
CA-300.03 ................. Method of Curb and Gutter Transition at Inlet Curbs
CA-374.02 ................. Standard WR Inlet – Frame and Grate (Plan View)
CA-374.03 ................. Standard WR Inlet – Frame and Grate (Section Views)
CA-374.04 ................. Standard WR Inlet
CA-374.05 ................. Standard WRM Inlet
CA-374.06 ................. Standard WR Inlet – Without Curb
CA-374.07 ................. Standard WR Inlet – With Curb
CA-374.075 ............... Standard WR Inlet – Curb Head
CA-374.12 ................. Standard NR Inlet – Frame and Grate (Plan View)
CA-374.13 ................. Standard NR Inlet – Frame and Grate (Section Views)
CA-374.14 ................. Standard NR Inlet
CA-374.21 ................. Precast WR Inlet
CA-374.22 ................. Precast WRM Inlet
CA-374.23 ................. Precast Single WR Inlet – With Curb
CA-374.235 ............... Precast Single WR Inlet – Curb Head
CA-374.24 ................. Precast NR Inlet
CA-374.31 ................. Standard COG Inlet – 5”, 10”, 15” and 20”
CA-374.51 ................. Precast or Cast In Place Square and Rectangular COG Inlet 5”, 10”, 15” and 20”
CA-374.55 ................. Precast Concrete Inlet Slabs and Adjustment Collars for COG Inlets
CA-374.55-01 ............. Precast Concrete Inlet Slabs and Adjustment Collars for COG Inlets to Accommodate 6” Curb
CA-374.62 ................. Precast or Cast In Place Circular COG Inlets – 5”, 10”, 15” and 20”
CA-374.64 ................. Alternate Precast Troughs for COG Inlets
CA-374.65 ................. Depressed Concrete Gutter Pan for COG Inlets
CA-374.66 ................. Precast or Cast In Place Shallow COG Inlet – 5” or 10” Trough Opening
CA-374.68 ................. Precast or Cast In Place COG Opening for 8” Curb – 5” and 10” Only
CA-378.05 ................. Standard Single or Double Opening Type K Inlet Open-End Grate
MANHOLE DETAILS

CA-383.02 ................. Standard Stormwater Manhole
CA-373.03 ................. Standard Stormwater Manhole Frame and Cover
CA-383.61 ................. Standard Manhole Type "D" Frame and Cover
CA-383.91 ................. Standard Metal Ladder Rungs
CA-383.92 ................. Copolymer Polypropylene Steel Encapsulated Ladder Rungs Miscellaneous Structures
CA-384.01 ................. 48” Diameter Precast Manhole
CA-384.02 ................. Frame Anchorage for Precast Manholes
CA-384.03 ................. 60” Diameter Precast Manhole
CA-384.05 ................. 72” Diameter Precast Manhole
CA-384.07 ................. 84” Diameter Precast Manhole
CA-384.09 ................. 96” Diameter Precast Manhole
CA-384.11 ................. 120” Diameter Precast Manhole
CA-384.12 .................. Precast Flat Slab Top for 120” Diameter Precast Manhole
CA-384.13 .................. Precast Drip Stone Landing Details for 48” to 120” Diameter Manholes
CA-384.15 .................. Precast Combination Flattop Reducer and Drip Stone Landing for 60” to 120” Diameter manholes
CA-384.17 .................. Precast Combination Eccentrical Reducer and Drip Stone Landing for 60” to 72” Diameter Manholes
DRAINAGE DETAILS

CA-389.02 .................. Toe Wall Detail – 5” Concrete Gutter
CA-389.11 .................. 5” Concrete Energy Dissapating Gutter
CA-390.01 .................. Drainage Ditches
CA-391.00 .................. Concrete Cradle and Jacket for Stormwater Drains

SIDEWALK RAMP DETAILS

CA-650.10 .................. Sidewalk Ramp for the Handicapped – Type “A”
CA-650.11 .................. Sidewalk Ramp for the Handicapped – Type “B”
CA-650.12 .................. Sidewalk Ramp for the Handicapped – Parallel
FOR DEVELOPMENT OF PREVIOUSLY RECORDED RESIDENTIAL LOTS
(RECORDED PRIOR TO ADOPTION OF C.C.Z.O. - JULY 29, 1967)
RIGHT-OF-WAY WIDTH PER RECORDED PLAT
FARM AND FOREST DISTRICT ROADWAYS - 30'-0"(MIN.) RIGHT-OF-WAY UP TO 10 LOTS
(ARTICLE 7-1.06.D OF THE C.C.Z.O.)
RURAL COMMUNITY DISTRICT ROADWAYS - 30'-0"(MIN.) RIGHT-OF-WAY UP TO 10 LOTS
(ARTICLE 7-1.06.D OF THE C.C.Z.O.)
FAMILY CONVEYANCE ROADWAY - 16'-0"(MIN.) RIGHT-OF-WAY (1 TO 5 LOTS)
FAMILY CONVEYANCE ROADWAY - 24'-0"(MIN.) RIGHT-OF-WAY (6 TO 10 LOTS)

NOTE:
1. EARTH SHOULDERS AND SLOPES TO BE FERTILIZED, LIMED, AND SEEDED OR SODDED TO LIMIT OF DISTURBANCE.

RIGHTS-OF-WAY RECORDED PRIOR TO THE ADOPTION OF THE C.C.Z.O.
(JULY 29, 1967)
FARM AND FOREST DISTRICTS
RURAL COMMUNITY DISTRICTS
& FAMILY CONVEYANCE

RESIDENTIAL / LOCAL ROADWAY

STANDARD NUMBER RD-1A
TRAFFIC BARRIER W/BEAM WHERE REQ'D
SEE SPECIFICATIONS & MD. SHA ST'DS

1 1/2" HOT MIX ASPHALT SUPERPAVE 9.5 MM FOR SURFACE
2" HOT MIX ASPHALT SUPERPAVE 19.0 MM FOR BASE
6" GRADED AGGREGATE BASE COURSE
OR APPROVED EQUIVALENT
OR
6" OF CR-6, BANK RUN GRAVEL,
OR AN APPROVED ALTERNATE MATERIAL

NOTE:
1. EARTH SHOULDERS AND SLOPES TO BE FERTILIZED, LIMED, AND
   SEEDED OR SODDED TO LIMIT OF DISTURBANCE.
1. Earth shoulders and slopes to be fertilized, limed, and seeded or soded to limit of disturbance.

2. 1 1/2" Hot Mix Asphalt Superpave 9.5 MM for Surf.

3. 2" Hot Mix Asphalt Superpave 19.0 MM for Base.

4. 6" Graded Aggregate Base Course or Approved Equivalent.

NOTE:
NOTE:
1. A maximum lift thickness of 2" shall be used when placing base pavement.
2. Earth shoulders and slopes to be fertilized, limed, and seeded or sodded to limit of disturbance.

1 1/2" hot mix asphalt Superpave 9.5 mm for surface.
3" hot mix asphalt Superpave 19.0 mm for base.
6" graded aggregate base course or approved equivalent.
1. A maximum lift thickness of 2" shall be used when placing base pavement.
2. Earth shoulders and slopes to be fertilized, limed, and seeded or sodded to limit of disturbance.

NOTE:

TRAFFIC BARRIER W/BEAM WHERE REQ'D
SEE SPECIFICATIONS & MD. SHA ST'DS

1 1/2" HOT MIX ASPHALT SUPERPAVE 9.5 MM FOR SURFACE
3" HOT MIX ASPHALT SUPERPAVE 19.0 MM FOR BASE
6" GRADED AGGREGATE BASE COURSE
OR APPROVED EQUIVALENT
1 1/2" HOT MIX ASPHALT SUPERPAVE 9.5 MM FOR SURFACE
3" HOT MIX ASPHALT SUPERPAVE 19.0 MM FOR BASE
6" GRADED AGGREGATE BASE COURSE
OR APPROVED EQUIVALENT

TYPE "D" CURB
SEE PLATE RD-19B

SIDEWALKS AS REQUIRED BY
SUBDIVISION REGULATIONS

TRAFFIC BARRIER W/BEAM WHERE REQ'D
SEE SPECIFICATIONS & MD. SHA STDS

NOTE:
1. A MAXIMUM LIFT THICKNESS OF 2" SHALL BE USED WHEN PLACING
   BASE PAVEMENT
2. EARTH SHOULDERS AND SLOPES TO BE FERTILIZED, LIMED, AND
   SEEDED OR SODDED TO LIMIT OF DISTURBANCE.
SLOPE EASEMENT

30'-0" RIGHT-OF-WAY (MINIMUM)

16'-0"

8'

8'

5'-0" SIDEWALK

2% 1'

5'-0" SIDEWALK

2% 1'

1' 2'

4'-0"

SIDEWALKS AS REQUIRED BY SUBDIVISION REGULATIONS

1 1/2" HOT MIX ASPHALT SUPERPAVE 9.5 MM FOR SURFACE
3" HOT MIX ASPHALT SUPERPAVE 19.0 MM FOR BASE
6" GRADED AGGREGATE BASE COURSE
OR APPROVED EQUIVALENT

TYPE "D" CURB
SEE PLATE RD-19B
(TYPICAL)

TRAFFIC BARRIER W/BEAM WHERE REQ'D
SEE SPECIFICATIONS & MD. SHA ST'DS

NOTE:
1. A MAXIMUM LIFT THICKNESS OF 2" SHALL BE USED WHEN PLACING
   BASE PAVEMENT
2. EARTH SHOULDERS AND SLOPES TO BE FERTILIZED, LIMED, AND
   SEEDED OR SODDED TO LIMIT OF DISTURBANCE.

CALVERT COUNTY MARYLAND

APPROVED

DIRECTOR

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

REVIS

DATE

BY

STANDARD ROAD DETAILS
RESIDENTIAL / LOCAL ROADWAY - URBAN (PUBLIC - ONE-WAY)

STANDARD NUMBER RD-3C
NOTE:
1. A maximum lift thickness of 2" shall be used when placing base pavement.
2. Earth shoulders and slopes to be fertilized, limed, and seeded or sodded to limit of disturbance.

1 1/2" Hot Mix Asphalt Superpave 9.5 mm for surface
3" Hot Mix Asphalt Superpave 19.0 mm for base
6" Graded Aggregate Base Course
or approved equivalent

Traffic barrier w/beam where req'd
See Specifications & MD. SHA STDS

50'-0" (MIN.) Right-of-Way

2'-0"
2'-0"
6'-0"
10'-0"
10'-0"
6'-0"
4'-0"
5'-0"

slope easement

3:1 MAX
3:1 MAX

1'
1'

EARTH SHOULDER

CALVERT COUNTY MARYLAND
APPROVED
DIRECTOR

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS RESIDENTIAL / LOCAL ROADWAY - RURAL

STANDARD NUMBER RD-4A
NOTE:
1. A MAXIMUM LIFT THICKNESS OF 2" SHALL BE USED WHEN PLACING BASE PAVEMENT
2. EARTH SHOULDERS AND SLOPES TO BE FERTILIZED, LIMED, AND SEEDED OR SODDED TO LIMIT OF DISTURBANCE.
NOTE:

1. A maximum lift thickness of 2" shall be used when placing base pavement.
2. Earth shoulders and slopes to be fertilized, limed, and seeded or sodded to limit of disturbance.
1. A maximum lift thickness of 2" shall be used when placing base pavement.
2. Earth shoulders and slopes to be fertilized, limed, and seeded or sodded to limit of disturbance.

Traffic barrier w/beam where req'd, see specifications & MD. SHA stds.
NOTES:
1. A maximum lift thickness of 2 1/2" shall be used when placing base pavement.
2. Earth shoulders and slopes to be fertilized, limed, and seeded or sodded to limit of disturbance.

SIDEWALK NOTES:
1. Minimum clear zone distance of ten feet (10') between the edge of pavement and the edge of sidewalk must be maintained at all times. Sidewalk locations shown on the plans can be field adjusted to obstacles and slopes with the consent of DPW while maintaining a clear zone of six feet (6').
2. A non-mountable curb shall be added to the edge of paving if six feet (6') of minimum clear zone cannot be maintained. Where curbing is installed, the sidewalks shall be installed adjacent to the curb. Where residential sidewalks are placed adjacent to curb next to a travel lane, the minimum width shall be five feet (5').
3. The minimum residential sidewalk width shall be four feet (4') in accordance with AASHTO policy guidelines, which requires the addition of a passing section every two-hundred feet (200') or less for accessibility. Passing sections shall be five feet by five feet (5' x 5') minimum with a 2% minimum cross slope and two foot (2') tapers. Use of driveways and leader walks (from dwelling to roadway) are acceptable as long as cross slope requirements are met.

TRAFFIC BARRIER W/BEAM WHERE REQ'D SEE SPECIFICATIONS & MD. SHA STD'S

1 1/2" HOT MIX ASPHALT SUPERPAVE 9.5 MM FOR SURFACE
5" HOT MIX ASPHALT SUPERPAVE 19.0 MM FOR BASE
6" GRADED AGGREGATE BASE COURSE OR APPROVED EQUIVALENT

6" AGGREGATE BASE COMPACTED TO 95%
SUBGRADE COMPACTED TO 95%
NOTE:
1. A maximum lift thickness of 2 1/2" shall be used when placing base pavement.
2. Earth shoulders and slopes to be fertilized, limed, and seeded or sodded to limit of disturbance.
NOTE:
1. A maximum lift thickness of 2 1/2" shall be used when placing base pavement.
2. Earth shoulders and slopes to be fertilized, limed, and seeded or sodded to limit of disturbance.

1 1/2" hot mix asphalt Superpave 9.5 MM for surface
5" hot mix asphalt Superpave 19.0 MM for base
6" graded aggregate base course or approved equivalent
NOTE:

1. A maximum lift thickness of 2 1/2" shall be used when placing base pavement.
2. Earth shoulders and slopes to be fertilized, limed, and seeded or sodded to limit of disturbance.

1 1/2" Hot Mix Asphalt Superpave 9.5 MM for surface
5" Hot Mix Asphalt Superpave 19.0 MM for base
6" Graded Aggregate Base Course

Type "D" Curb
See Plate RD-19B

Sidewalk adjacent to curb
© Parking lane
Traffic barrier w/beam where req'd
See specifications & Md. SHA STDS

Calvert County
Maryland

Director of Public Works
July 1, 2012

Standard Road Details
Minor Residential Collector Roadway - Urban
W/ Parking on Both Side

Standard Number RD-5D
NOTE:
1. A maximum lift thickness of 3" shall be used when placing base pavement.
2. Earth shoulders and slopes to be fertilized, limed, and seeded or sodded to limit of disturbance.

TRAFFIC BARRIER W/BEAM WHERE REQ'D
SEE SPECIFICATIONS & MD. SHA ST'DS

1 1/2" HOT MIX ASPHALT SUPERPAVE 9.5 MM FOR SURFACE
6" HOT MIX ASPHALT SUPERPAVE 19.0 MM FOR BASE
6" GRADED AGGREGATE BASE COURSE
OR APPROVED EQUIVALENT
NOTE:
1. A maximum lift thickness of 3" shall be used when placing base pavement.
2. Earth shoulders and slopes to be fertilized, limed, and seeded or sodded to limit of disturbance.

1 1/2" hot mix asphalt Superpave 9.5 mm for surface
6" hot mix asphalt Superpave 19.0 mm for base
6" graded aggregate base course or approved equivalent

Type "D" curb see plate RD-19B
Sidewalks as required by subdivision regulations
Traffic barrier w/beam where req'd see specifications & MD. SHA STDS

SLOPE EASEMENT
1'-0" min. to toe of slope
5'-0" sidewalk
8" 1'-0"
2% 2% 2%

2'-0"
2'-0"
4'-0"
8"
1'

60'-0" (min.) right-of-way

SLOPE EASEMENT
2'-1" max
2'-1" max
TRAFFIC BARRIER W/BEAM WHERE REQ'D
SEE SPECIFICATIONS & MD. SHA ST'DS

TRAVEL LANES
- 2 1/2" HOT MIX ASPHALT SUPERPAVE 9.5 MM FOR SURFACE
- 6" HOT MIX ASPHALT SUPERPAVE 19.0 MM FOR BASE
- 6" GRADED AGGREGATE BASE COURSE
OR APPROVED EQUIVALENT

SHOULDER AREA
- 2" HOT MIX ASPHALT SUPERPAVE 9.5 MM FOR SURFACE
- 6" GRADED AGGREGATE FOR BASE

NOTE:
1. A MAXIMUM LIFT THICKNESS OF 3" SHALL BE USED WHEN PLACING BASE PAVEMENT
2. EARTH SHOULDERS AND SLOPES TO BE FERTILIZED, LIMED, AND SEEDED OR SODDED TO LIMIT OF DISTURBANCE.

NOT TO SCALE

CALVERT COUNTY MARYLAND

APPROVED

DIRECTOR

DEPARTMENT OF PUBLIC WORKS

STANDARD ROAD DETAILS
MINOR COLLECTOR ROADWAY - RURAL

STANDARD NUMBER
RD-7A
NOTE:
1. A maximum lift thickness of 3" shall be used when placing base pavement.
2. Earth shoulders and slopes to be fertilized, limed, and seeded or sodded to limit of disturbance.

2 1/2" Hot Mix Asphalt Superpave 9.5 MM for surface
6" Hot Mix Asphalt Superpave 19.0 MM for base
6" Graded Aggregate Base Course
or approved equivalent

Traffic barrier w/beam where req'd
See specifications & MD. SHA std's
DRAINAGE & SLOPE EASEMENT

60'-0" (MIN.) RIGHT-OF-WAY

2' MIN. 4'-6"  2'  8'-0"
PAVED. SHDR. 14'-0"  14'-0"
PAVED. SHDR. 8'-0"

SLOPE EASEMENT

NOTE:
1. A MAXIMUM LIFT THICKNESS OF 3" SHALL BE USED WHEN PLACING BASE PAVEMENT
2. A MAXIMUM LIFT THICKNESS OF 2" SHALL BE USED WHEN PLACING THE SURFACE COURSE
3. EARTH SHOULDERS AND SLOPES TO BE FERTILIZED, LIMED, AND SEEDED OR SODDED TO LIMIT OF DISTURBANCE.

TRAVEL Lanes & SHOULDER AREA
3 1/2" HOT MIX ASPHALT SUPERPAVE 9.5 MM FOR SURFACE
6" HOT MIX ASPHALT SUPERPAVE 19.0 MM FOR BASE
6" GRADED AGGREGATE BASE COURSE OR APPROVED EQUIVALENT

TRAFFIC BARRIER W/BEAM WHERE REQ'D SEE SPECIFICATIONS & MD. SHA STDS

NOT TO SCALE

STANDARD ROAD DETAILS
COMMERCIAL AND INDUSTRIAL ROADWAY - RURAL

CALVERT COUNTY MARYLAND

APPROVED

REVISED

DATE

BY

STANDARD NUMBER

RD-8A

DEPARTMENT OF PUBLIC WORKS
JULY 1, 2012
NOTE:

1. A maximum lift thickness of 3" shall be used when placing base pavement.
2. A maximum lift thickness of 2" shall be used when placing the surface course.
3. Earth shoulders and slopes to be fertilized, limed, and seeded or sodded to limit of disturbance.

3 1/2" HOT MIX ASPHALT SUPERPAVE 9.5 MM FOR SURFACE
6" HOT MIX ASPHALT SUPERPAVE 19.0 MM FOR BASE
6" GRADED AGGREGATE BASE COURSE
OR APPROVED EQUIVALENT

SLOPE EASEMENT
1'-0" MIN. TO TOE OF SLOPE

60'-0"(MIN.) RIGHT-OF-WAY

SIDEWALK
8'-0"

5'-0"

2% MAX.

1'-0"

1'-0" MIN. TO SLOPE

SLOPE EASEMENT

SIDEWALK
8'-0"

5'-0"

2% MAX.

1'-0"

2% MAX.

3 1/2" HOT MIX ASPHALT SUPERPAVE 9.5 MM FOR SURFACE
6" HOT MIX ASPHALT SUPERPAVE 19.0 MM FOR BASE
6" GRADED AGGREGATE BASE COURSE
OR APPROVED EQUIVALENT

TYPE "D" CURB
SEE PLATE RD-19B

SIDEWALKS AS REQUIRED BY SUBDIVISION REGULATIONS

NOT TO SCALE
44' ROADWAY
NORMAL SECTIONS

58' ROADWAY W/ 4' MEDIAN

NOTE:
1. PAVEMENT SECTION TO BE DESIGNED BY THE ENGINEERING PROFESSIONAL REPRESENTATIVE AND APPROVED BY THE DIRECTOR
2. A MAXIMUM LIFT THICKNESS OF 3" SHALL BE USED WHEN PLACING BASE PAVEMENT
3. A MAXIMUM LIFT THICKNESS OF 2" SHALL BE USED WHEN PLACING THE SURFACE COURSE
4. EARTH SHOULDERS AND SLOPES TO BE FERTILIZED, LIMED, AND SEEDED OR SODDED TO LIMIT OF DISTURBANCE.

CALVERT COUNTY MARYLAND
DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS
TYPICAL SECTIONS
MAJOR CONNECTOR

STANDARD NUMBER
RD-9
NOTE: 1. PAVEMENT SECTION TO BE DESIGNED BY THE ENGINEERING PROFESSIONAL REPRESENTATIVE AND APPROVED BY THE DIRECTOR
  2. A MAXIMUM LIFT THICKNESS OF 3" SHALL BE USED WHEN PLACING BASE PAVEMENT
  3. A MAXIMUM LIFT THICKNESS OF 2" SHALL BE USED WHEN PLACING THE SURFACE COURSE
  4. EARTH SHOULDERS AND SLOPES TO BE FERTILIZED, LIMED, AND SEEDED OR SODDED TO LIMIT OF DISTURBANCE.

NOT TO SCALE

CALVERT COUNTY MARYLAND
APPROVED

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS
TOWN CENTER BOULEVARD ROADWAY

STANDARD NUMBER RD-10
## SUMMARY OF ROAD CLASSIFICATION

<table>
<thead>
<tr>
<th>ROAD CLASSIFICATION</th>
<th>USE</th>
<th>PLATE</th>
<th>ROW WIDTH (MINIMUM)</th>
<th>PAVEMENT WIDTH</th>
<th>DESIGN SPEED</th>
<th>HORIZONTAL MINIMUM RADIUS</th>
<th>VERTICAL MAXIMUM GRADE</th>
<th>NUMBER OF LOTS / UNITS</th>
<th>DWELLING</th>
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</thead>
<tbody>
<tr>
<td>Residential/Local Roadway</td>
<td>Private</td>
<td>RD-1A</td>
<td>20'</td>
<td>12'-20'</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Residential/Local Roadway</td>
<td>Private</td>
<td>RD-1B</td>
<td>30'</td>
<td>16'</td>
<td>N/A</td>
<td>N/A</td>
<td>10.0%</td>
<td>5 LOTS</td>
<td></td>
</tr>
<tr>
<td>Residential Local Roadway</td>
<td>Private</td>
<td>RD-1C</td>
<td>20'</td>
<td>VARIABLE</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>Residential Local Roadway</td>
<td>Public</td>
<td>RD-2</td>
<td>30'</td>
<td>20' OPEN</td>
<td>40 MPH</td>
<td>300'</td>
<td>10.0%</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Residential Local Roadway</td>
<td>Public</td>
<td>RD-3A</td>
<td>40'</td>
<td>20' OPEN</td>
<td>40 MPH</td>
<td>300'</td>
<td>10.0%</td>
<td>6-10 NEWLY CREATED LOTS OR TBD DWELLING</td>
<td>SINGLE FAMILY</td>
</tr>
<tr>
<td>Residential Local Roadway</td>
<td>Public</td>
<td>RD-3B</td>
<td>40'</td>
<td>22' C&amp;G</td>
<td>40 MPH</td>
<td>300'</td>
<td>10.0%</td>
<td>6-10 NEWLY CREATED LOTS OR TBD DWELLING</td>
<td>SINGLE FAMILY</td>
</tr>
<tr>
<td>Residential Local Roadway</td>
<td>Public</td>
<td>RD-4A</td>
<td>50'</td>
<td>20' OPEN</td>
<td>40 MPH</td>
<td>300'</td>
<td>10.0%</td>
<td>1-50 LOTS</td>
<td>SINGLE FAMILY</td>
</tr>
<tr>
<td>Residential Local Roadway</td>
<td>Public</td>
<td>RD-4B</td>
<td>50'</td>
<td>23' C&amp;G</td>
<td>40 MPH</td>
<td>300'</td>
<td>10.0%</td>
<td>1-50 LOTS</td>
<td>SINGLE FAMILY</td>
</tr>
<tr>
<td>Residential Local Roadway</td>
<td>Public</td>
<td>RD-4C</td>
<td>50'</td>
<td>29' C&amp;G</td>
<td>40 MPH</td>
<td>300'</td>
<td>10.0%</td>
<td>1-50 LOTS</td>
<td>SINGLE FAMILY</td>
</tr>
<tr>
<td>Residential/Local Roadway</td>
<td>Public</td>
<td>RS-4D</td>
<td>50'</td>
<td>36' C7G</td>
<td>40 MPH</td>
<td>300'</td>
<td>10.0%</td>
<td>1-50 LOTS</td>
<td>SINGLE FAMILY</td>
</tr>
<tr>
<td>Minor Residential Collector Roadway</td>
<td>Public</td>
<td>RD-5A</td>
<td>50'</td>
<td>22' OPEN 24' OPEN</td>
<td>40 MPH</td>
<td>300'</td>
<td>10.0%</td>
<td>51-100 LOTS 101-150 LOTS</td>
<td>SINGLE FAMILY TOWNHOUSE OR MULTI-FAMILY</td>
</tr>
<tr>
<td>Minor Residential Collector Roadway</td>
<td>Public</td>
<td>RD-5B</td>
<td>50'</td>
<td>30' C&amp;G</td>
<td>40 MPH</td>
<td>300'</td>
<td>10.0%</td>
<td>51-150 LOTS 100-150 LOTS</td>
<td>SINGLE FAMILY TOWNHOUSE OR MULTI-FAMILY</td>
</tr>
</tbody>
</table>

**CALVERT COUNTY MARYLAND**

**APPROVED**

**REvised**

**STANDARD ROAD DETAILS**

**SUMMARY OF ROAD CLASSIFICATION**

**STANDARD NUMBER**

**RD-11**
<table>
<thead>
<tr>
<th>ROAD CLASSIFICATION</th>
<th>USE</th>
<th>PLATE</th>
<th>ROW WIDTH (MINIMUM)</th>
<th>PAVEMENT WIDTH</th>
<th>DESIGN SPEED</th>
<th>HORIZONTAL MINIMUM RADIUS</th>
<th>VERTICAL MAXIMUM GRADE</th>
<th>NUMBER OF LOTS / UNITS</th>
<th>DWELLING</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINOR RESIDENTIAL COLLECTOR ROADWAY</td>
<td>PUBLIC</td>
<td>RD-5C</td>
<td>50'</td>
<td>31' C&amp;G</td>
<td>40 MPH</td>
<td>300'</td>
<td>10.0%</td>
<td>51-150 LOTS</td>
<td>TOWN HOUSE OR MULTI-FAMILY</td>
</tr>
<tr>
<td>MINOR RESIDENTIAL COLLECTOR ROADWAY</td>
<td>PUBLIC</td>
<td>RD-5D</td>
<td>50'</td>
<td>38' C&amp;G</td>
<td>40 MPH</td>
<td>300'</td>
<td>10.0%</td>
<td>51-150 LOTS</td>
<td>TOWN HOUSE OR MULTI-FAMILY</td>
</tr>
<tr>
<td>RESIDENTIAL COLLECTOR ROADWAY</td>
<td>PUBLIC</td>
<td>RD-6A</td>
<td>60'</td>
<td>24' OPEN</td>
<td>40 MPH</td>
<td>USE AASHTO STANDARDS</td>
<td>8.0%</td>
<td>&gt; 150 LOTS</td>
<td>SINGLE FAMILY</td>
</tr>
<tr>
<td>RESIDENTIAL COLLECTOR ROADWAY</td>
<td>PUBLIC</td>
<td>RD-6B</td>
<td>60'</td>
<td>32' C&amp;G</td>
<td>40 MPH</td>
<td>USE AASHTO STANDARDS</td>
<td>8.0%</td>
<td>&gt; 150 LOTS</td>
<td>TOWNHOUSE OR MULTI-FAMILY</td>
</tr>
<tr>
<td>MINOR COLLECTOR ROADWAY</td>
<td>PUBLIC</td>
<td>RD-7A</td>
<td>60'</td>
<td>24' OPEN</td>
<td>45 MPH</td>
<td>USE AASHTO STANDARDS</td>
<td>8.0%</td>
<td>&gt; 2,000 ADT</td>
<td></td>
</tr>
<tr>
<td>MINOR COLLECTOR ROADWAY</td>
<td>PUBLIC</td>
<td>RD-7B</td>
<td>60'</td>
<td>36' C&amp;G</td>
<td>45 MPH</td>
<td>USE AASHTO STANDARDS</td>
<td>8.0%</td>
<td>&gt; 2,000 ADT</td>
<td></td>
</tr>
<tr>
<td>COMMERCIAL AND INDUSTRIAL ROADWAY</td>
<td>PUBLIC</td>
<td>RD-8A</td>
<td>60'</td>
<td>28' OPEN</td>
<td>40 MPH</td>
<td>USE AASHTO STANDARDS</td>
<td>8.0%</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>COMMERCIAL AND INDUSTRIAL ROADWAY</td>
<td>PUBLIC</td>
<td>RD-8B</td>
<td>60'</td>
<td>44' C&amp;G</td>
<td>40 MPH</td>
<td>USE AASHTO STANDARDS</td>
<td>8.0%</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>MAJOR COLLECTOR</td>
<td>PUBLIC</td>
<td>RD-9</td>
<td>64' OR 80'</td>
<td>44' OR 58' WITH 14' MEDIAN</td>
<td>TBD</td>
<td></td>
<td></td>
<td>&gt; 4,000 ADT</td>
<td></td>
</tr>
<tr>
<td>TOWN CENTER BOULEVARD ROADWAY</td>
<td>PUBLIC</td>
<td>RD-10</td>
<td>83'</td>
<td>44' WITH 16' MEDIAN</td>
<td>TBD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMMON ACCESS DRIVEWAY</td>
<td>PRIVATE</td>
<td>RD-16</td>
<td>50' X 50' MIN, 75' X 75' MAX</td>
<td>18' OPEN</td>
<td>N/A</td>
<td>N/A</td>
<td>10.0%</td>
<td>3-5 LOTS</td>
<td>SINGLE FAMILY</td>
</tr>
</tbody>
</table>

CALVERT COUNTY MARYLAND

APPROVED

DIRECTOR

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS

SUMMARY OF ROAD CLASSIFICATION

STANDARD NUMBER

RD-11A
FOR GRADES LESS THAN 5.5%

1.0% MAX.

OUTSIDE EDGE OF SHOULDER

* ALGEBRAIC DIFFERENCE CANNOT EXCEED 5%

FOR GRADES OF 5.5% TO 10%

* VARIABLE

100' MIN. VERTICAL CURVE

** VARIABLE

UP AT 5.5% TO 10%

***200' MIN. VERTICAL CURVE

25' MIN.

OUTSIDE EDGE OF SHOULDER

** VARIABLE

DOWN AT 5.5% TO 10%

3.0% MAX.

2.0% MAX.

** ALGEBRAIC DIFFERENCE CANNOT EXCEED 10%

*** FOR GRADES BETWEEN 5.5% AND 7.0%, MINIMUM VERTICAL CURVE LENGTH SHALL BE 200'. FOR GRADES BETWEEN 7.01% AND 10%, MINIMUM VERTICAL CURVE LENGTH SHALL BE 250'.

NOT TO SCALE

CALVERT COUNTY MARYLAND

APPROVED

DATE

REVISED

STANDARD ROAD DETAILS

STANDARD LANDING REQUIREMENTS FOR LOCAL AND COLLECTOR ROADWAYS

STANDARD NUMBER

RD-11B
# Minimum Pavement Sections

<table>
<thead>
<tr>
<th>PLATE</th>
<th>Subbase</th>
<th>MSHA Section</th>
<th>Base</th>
<th>MSHA Section</th>
<th>Surface</th>
<th>MSHA Section</th>
<th>Shoulders (As Provided For Open Section Roadways)</th>
<th>MSHA Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-1A</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>2&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>1&quot; Hot Mix Asphalt</td>
<td>901</td>
<td>EARTH SHOULDERS</td>
<td>601</td>
</tr>
<tr>
<td>RD-1B</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>2&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>1&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>EARTH SHOULDERS</td>
<td>601</td>
</tr>
<tr>
<td>RD-1C</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>2&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>1&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>EARTH SHOULDERS</td>
<td>601</td>
</tr>
<tr>
<td>RD-2</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>3&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>1&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>EARTH SHOULDERS</td>
<td>601</td>
</tr>
<tr>
<td>RD-3A</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>3&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>1&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>EARTH SHOULDERS</td>
<td>601</td>
</tr>
<tr>
<td>RD-3B</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>3&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>1&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>CURB &amp; GUTTER</td>
<td>602</td>
</tr>
<tr>
<td>RD-4A</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>3&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>1&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>EARTH SHOULDERS</td>
<td>601</td>
</tr>
<tr>
<td>RD-4B</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>3&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>1&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>CURB &amp; GUTTER</td>
<td>602</td>
</tr>
<tr>
<td>RD-4C</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>3&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>1&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>CURB &amp; GUTTER</td>
<td>602</td>
</tr>
<tr>
<td>RD-4D</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>3&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>1&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>CURB &amp; GUTTER</td>
<td>602</td>
</tr>
<tr>
<td>RD-5A</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>5&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>1&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>EARTH SHOULDERS</td>
<td>601</td>
</tr>
<tr>
<td>RD-5B</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>5&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>1&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>CURB &amp; GUTTER</td>
<td>602</td>
</tr>
<tr>
<td>RD-5C</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>5&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>1&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>CURB &amp; GUTTER</td>
<td>602</td>
</tr>
<tr>
<td>RD-5D</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>5&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>1&quot; Hot Mix Asphalt</td>
<td>904</td>
<td>CURB &amp; GUTTER</td>
<td>602</td>
</tr>
</tbody>
</table>

**Calvert County Maryland**

**Approved**

**Director**

**Date**

**July 1, 2012**

**Standard Road Details**

**Minimum Pavement Sections**

**Standard Number**

**RD-12**
## Minimum Pavement Sections

<table>
<thead>
<tr>
<th>PLATE</th>
<th>SUBBASE</th>
<th>MSHA SECTION</th>
<th>BASE</th>
<th>MSHA SECTION</th>
<th>SURFACE</th>
<th>MSHA SECTION</th>
<th>SHOULDERS (AS PROVIDED FOR OPEN SECTION ROADWAYS)</th>
<th>MSHA SECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-6A</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>6&quot; Hot Mix Asphalt Superpave 12.5 MM</td>
<td>904</td>
<td>1/4&quot; Hot Mix Asphalt Superpave 9.5 MM</td>
<td>904</td>
<td>Earth Shoulders</td>
<td>601</td>
</tr>
<tr>
<td>RD-6B</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>6&quot; Hot Mix Asphalt Superpave 12.5 MM</td>
<td>904</td>
<td>1/4&quot; Hot Mix Asphalt Superpave 9.5 MM</td>
<td>904</td>
<td>Curb &amp; Gutter</td>
<td>602</td>
</tr>
<tr>
<td>RD-7A</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>6&quot; Hot Mix Asphalt Superpave 12.5 MM</td>
<td>904</td>
<td>2/4&quot; Hot Mix Asphalt Superpave 9.5 MM</td>
<td>904</td>
<td>Earth Shoulders</td>
<td>601</td>
</tr>
<tr>
<td>RD-7B</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>6&quot; Hot Mix Asphalt Superpave 12.5 MM</td>
<td>904</td>
<td>2/4&quot; Hot Mix Asphalt Superpave 9.5 MM</td>
<td>904</td>
<td>Curb &amp; Gutter</td>
<td>602</td>
</tr>
<tr>
<td>RD-8A</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>6&quot; Hot Mix Asphalt Superpave 12.5 MM</td>
<td>904</td>
<td>3/4&quot; Hot Mix Asphalt Superpave 9.5 MM</td>
<td>904</td>
<td>8&quot; Paved Shoulder to Match Pavement Section</td>
<td>504</td>
</tr>
<tr>
<td>RD-8B</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>6&quot; Hot Mix Asphalt Superpave 12.5 MM</td>
<td>904</td>
<td>3/4&quot; Hot Mix Asphalt Superpave 9.5 MM</td>
<td>904</td>
<td>Curb &amp; Gutter</td>
<td>504</td>
</tr>
<tr>
<td>RD-16</td>
<td>6&quot; Graded Aggregate Base</td>
<td>901.01</td>
<td>2&quot; Hot Mix Asphalt Superpave 12.5 MM</td>
<td>904</td>
<td>1/4&quot; Hot Mix Asphalt Superpave 9.5 MM</td>
<td>904</td>
<td>Earth Shoulders</td>
<td>601</td>
</tr>
</tbody>
</table>

**Note:**

Pavement sections for plates RD-9 and RD-10 shall be designed by the engineering professional representative and approved by the Director.
ENTRANCES SHALL BE CONSTRUCTED AT INTERVALS NOT TO EXCEED 125 FEET ON MINOR COLLECTOR ROADS AND 250 FEET ON MAJOR COLLECTOR ROADS. ENTRANCE WIDTH MAY VARY DUE TO STREET AND MEDIAN WIDTH.

MEDIAN NOT TO EXTEND BEYOND RETURNS STRUCTURES OR SIGNAGE WITHIN THE MEDIAN TO BE LOCATED BEYOND RADIUS AND BE BREAK AWAY DESIGN.

LANDSCAPING WITHIN RADIUS OF MEDIAN AND RETURNS TO BE LIMITED TO (2') TWO FEET IN HEIGHT AT MATURITY TO PROTECT VISIBILITY.

MAINTENANCE OF LANDSCAPING, STRUCTURES OR SIGNAGE IN THE MEDIAN IS THE RESPONSIBILITY OF THE HOMEOWNERS ASSOCIATION.

FOR CURB AND VALLEY GUTTER STANDARDS REFER TO CALVERT STANDARDS RD−19A/19B.

CENTER ISLAND @ ENTRANCE SHALL HAVE VERTICAL TYPE "D" CURB.

1. CONCRETE CURB AND GUTTER
2. CONCRETE VALLEY GUTTER
3. HOT MIX ASPHALT
4. GRASSED MEDIAN
5. RETURN
6. RADIUS OF MEDIAN

TIE IN TO EXISTING ROAD SHALL MAINTAIN POSTIVE DRAINAGE PATTERNS IN ALL STREETS. AN OVERLAY OF THE EXISTING ROAD MAY BE REQUIRED TO PROVIDE NECESSARY CROSS SECTION FOR DRAINAGE. PROVIDE CENTERLINE AND EDGE OF PAVEMENT SPOT ELEVATIONS FOR EXISTING ROAD AT MAXIMUM 10 FEET INTERVALS AT ENTRANCE AND FOR 100 FEET BEYOND LIMITS OF WORK.

VISIBILITY AT INTERSECTIONS:
ON A CORNER LOT IN ANY ZONING DISTRICT, NOTHING SHALL BE CONSTRUCTED, ERECTED, PLACED OR ALLOWED TO GROW IN SUCH A MANNER AS TO OBSTRUCT VISION BETWEEN A HEIGHT OF TWO AND ONE HALF FEET (2 1/2') AND EIGHT FEET (8') IN HEIGHT ABOVE THE CENTER LINE GRADES OF THE INTERSECTING STREETS IN THE TRIANGULAR AREA FORMED BY EXTENDING THE STREET LINES (CURB LINES) OF SUCH CORNER LOTS TO A POINT OF INTERSECTION, THEN MEASURING BACK FROM THIS POINT OF INTERSECTION ALONG EACH STREET A DISTANCE OF TWENTY FIVE FEET (25') TO A POINT THEN CONNECTING THESE TWO POINTS WITH A BASE LINE TO FORM AN ISOSCELES TRIANGLE.

GENERAL:
- ENTRANCE TO BE DESIGNED TO MEET STANDARD ROAD DETAILS.
- Standard entrance detail number: RD−13A.
- Not to scale.
SINGLE & CHANNELIZED COMMERCIAL ENTRANCES
WITH STD CURB & GUTTER

SINGLE COMMERCIAL ENTRANCE
W/O STD CURB & GUTTER

NOTES:
1. NO ENTRANCES WILL BE PERMITTED BETWEEN THE P.C. AND P.T. OF CURB RETURNS AT ANY INTERSECTION.
2. THE PAVEMENT SECTION SHALL BE THE SAME AS THE TYPICAL FOR THE ROADWAY TO WHICH THE ENTRANCE IS TO BE CONSTRUCTED.
3. MINIMUM RADIUS MAY VARY BASED ON PROPOSED USE. TO BE DESIGNED USING AASHTO STANDARDS.

NOT TO SCALE
TYPICAL 60° PARKING

NOTE:
1. OTHER PARKING ANGLES MAY BE APPROVED BY THE ENGINEER.
2. A QUALIFIED GEOTECHNICAL ENGINEER SHALL DESIGN THE PAVEMENT SECTION BASED ON THE TESTING OF EXISTING SOILS. (MINIMUM RD-4 PAVEMENT SECTION).
3. SIGNING AND MARKING FOR HANDICAP SPACES PER ADA STANDARDS.
4. STRIPING & SIGNAGE IN ACCORDANCE WITH MUTCD STANDARDS.
5. WHEEL STOPS WHERE REQUIRED ADJACENT TO BUILDINGS, WALLS, SIGNS, SLOPES ETC. (20' MINIMUM SPACE DEPTH WHERE WHEEL STOPS ARE REQUIRED)

TYPICAL 90° PARKING

NOT TO SCALE

STANDARD ROAD DETAILS

TYPICAL 60° & 90°
OFF-STREET PARKING

CALVERT COUNTY MARYLAND

APPROVED

DATE

DIRECTOR

PUBLIC WORKS

REVISION

JULY 1, 2012

STANDARD NUMBER

RD-14
END OF FLARE SHALL NOT EXTEND BEYOND THE PERPENDICULAR PROJECTION FROM THE EDGE OF PAVEMENT TO THE PROPERTY CORNER AT THE RIGHT-OF-WAY.

NOTES
1. FOR USE IN AREAS WHERE THERE IS SIDEWALK ADJACENT TO THE BACK OF CURB OR WHERE IT IS EXPECTED THAT SIDEWALK WILL BE ADDED IN THE FUTURE.
2. EXPANSION JOINT MATERIAL TO BE INSTALLED IN ACCORDANCE WITH STD. MD-655.01. (CURRENT AS AMENDED)
3. SUBBASE 6" GAB

SECTION A-A

TYPE "C" CURB & GUTTER SEE PLATE RD-198
6" PLAIN CEMENT CONCRETE PAVEMENT (RESIDENTIAL)
8" PLAIN CEMENT CONCRETE PAVEMENT (COMMERCIAL)

NOT TO SCALE
END OF FLARE SHALL NOT EXTEND BEYOND THE PERPENDICULAR PROJECTION FROM THE EDGE OF PAVEMENT TO THE PROPERTY CORNER AT THE RIGHT-OF-WAY.

NOTES
1. FOR USE IN AREAS WHERE THERE IS SIDEWALK SEPARATED FROM THE BACK OF CURB BY 24" OR MORE, OR WHERE IT IS EXPECTED THAT SIDEWALK WILL BE ADDED IN THE FUTURE.

2. EXPANSION JOINT MATERIAL TO BE INSTALLED IN ACCORDANCE WITH STD. MD-855.01. (CURRENT AS AMENDED)

3. SUBBASE 6" GAB.

SECTION A-A

STANDARD ROAD DETAILS
TYPICAL DRIVEWAY ENTRANCE CURB & GUTTER ROADWAY - SIDEWALK AWAY FROM CURB

CALVERT COUNTY MARYLAND

APPROVED

REVISED

DATE

BY

STANDARD NUMBER

RD-15B
NOTES:
1. A MINIMUM OF 20 LIN. FT. OF C.M.P.A. (14 GAUGE MINIMUM) TO BE INSTALLED. (17"x13" MIN.) WITH END SECTIONS.
2. CHANNEL PROTECTION AND VELOCITY DISSIPATORS TO BE PROVIDED AS REQUIRED.
3. DRIVEWAY DETAILS FOR ALL OTHER OPEN SECTIONS TO BE SIMILAR. ADJUST DIMENSIONS TO CONFORM TO MAXIMUM GRADES AND MINIMUM COVER SHOWN HEREON.
1. Continuation of the driveways serving these lots shall be either private lane, common driveway easement or separate individual driveways.
2. When a common access driveway access a collector roadway, the use of a modified transition lane / deceleration lane (RD-18A) shall be used.

NOTE:

CALVERT COUNTY MARYLAND

APPROVED

DIRECTOR

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

REVISED

DATE BY

STANDARD ROAD DETAILS

COMMON ACCESS DRIVEWAY (PRIVATE)

STANDARD NUMBER

RD-16
TRAFFIC BARRIER W/BEAM BARRICADE
SEE MSHA STD. MD 605.27
(CURRENT AS AMENDED)
WITH "END OF ROADWAY" OBJECT
MARKERS, OM4-3 (RED)
(MIN. OF 3 MARKERS)

WIDTH OF RIGHT-OF-WAY

WIDTH OF PAVEMENT

NOTE: 1. A PERMANENT TEE TURN-AROUND SHALL BE USED IN LIEU OF A CUL-DE-SAC ONLY IF APPROVED BY ENGINEERING DIVISION.
2. THE ENGINEERING DIVISION IS TO APPROVE DIMENSIONS WHEN RIGHT-OF-WAY IS DIFFERENT THAN 50' AND FOR OFFSET CUL-DE-SACS.

CALVERT COUNTY MARYLAND
APPROVED
DATE
BY

REvised

STANDARD ROAD DETAILS
PERMANENT TEE TURN-AROUND

STANDARD NUMBER
RD-17A
TRAFFIC BARRIER W/BEAM BARRICADE
SEE MSHA STD. MD 605.27
(CURRENT AS AMENDED)
WITH "END OF ROADWAY" OBJECT
MARKERS, OM4-3 (RED)
(MIN. OF 3 MARKERS)

25'R.
WIDTH OF RIGHT-OF-WAY
WIDTH OF PAVEMENT

25'R.
MIN.
25'R.

TEMPORARY LIMIT OF CURB,
GUTTER & SIDEWALK

NOTE: 1. A TEMPORARY TEE TURN-AROUND SHALL BE USED IN LIEU OF A CUL-DE-SAC ONLY IF THE STREET IS TO BE EXTENDED IN THE FUTURE.
2. THE ENGINEERING DIVISION IS TO APPROVE DIMENSIONS WHEN RIGHT-OF-WAY IS DIFFERENT THAN 50' AND FOR OFFSET CUL-DE-SACS.

NOT TO SCALE

CALVERT COUNTY MARYLAND
APPROVED
DIRECTOR
DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS
TEMPORARY TEE TURN-AROUND

STANDARD NUMBER
RD-17B
### Rural Roads:

<table>
<thead>
<tr>
<th>Road</th>
<th>Right-Of-Way</th>
<th>Pavement Width</th>
<th>Cul-De-Sac Pavement Width</th>
<th>Right-Of-Way</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-1A</td>
<td>TO 50'</td>
<td>12' TO 18'</td>
<td>47'</td>
<td>56' TO 62'</td>
</tr>
<tr>
<td>RD-2A</td>
<td>30'</td>
<td>20'</td>
<td>47'</td>
<td>52'</td>
</tr>
<tr>
<td>RD-3A</td>
<td>40'</td>
<td>20'</td>
<td>47'</td>
<td>57'</td>
</tr>
<tr>
<td>RD-4A</td>
<td>50'</td>
<td>20'</td>
<td>47'</td>
<td>62'</td>
</tr>
<tr>
<td>RD-5A</td>
<td>50'</td>
<td>24'</td>
<td>47'</td>
<td>60'</td>
</tr>
<tr>
<td>RD-8A</td>
<td>60'</td>
<td>44'</td>
<td>61'</td>
<td>69'</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Road</th>
<th>Right-Of-Way</th>
<th>Pavement Width</th>
<th>Cul-De-Sac Pavement Width</th>
<th>Right-Of-Way</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-1B</td>
<td>30'</td>
<td>16'</td>
<td>47'</td>
<td>54'</td>
</tr>
<tr>
<td>RD-2B</td>
<td>30'</td>
<td>20'</td>
<td>47'</td>
<td>52'</td>
</tr>
<tr>
<td>RD-3B</td>
<td>40'</td>
<td>22'</td>
<td>47'</td>
<td>56'</td>
</tr>
<tr>
<td>RD-4B</td>
<td>50'</td>
<td>23'</td>
<td>47'</td>
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</tr>
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</tr>
<tr>
<td>RD-8B</td>
<td>60'</td>
<td>44'</td>
<td>61'</td>
<td>69'</td>
</tr>
</tbody>
</table>

* 47' Minimum turning radius for school buses per AASHTO

**NOTE:**

1. Standard road sections 4C, 4D, 5C and 5D include on-street parking. No on-street parking to be designed on Cul-de-Sacs.
2. The engineering division is to approve dimensions when right-of-way is different than 50' and for offset Cul-de-Sacs.

---

**CALVERT COUNTY MARYLAND**

**APPROVED**

**DIRECTOR DEPARTMENT OF PUBLIC WORKS**

**REVISED**

**STANDARD ROAD DETAILS**

**CUL-DE-SAC**

**STANDARD NUMBER**

**RD-17C**
### RURAL ROADS:

<table>
<thead>
<tr>
<th>RD</th>
<th>TO 50'</th>
<th>12' TO 18'</th>
<th>18'</th>
<th>63' TO 66'</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-1A</td>
<td>30'</td>
<td>20'</td>
<td>18'</td>
<td>52'</td>
</tr>
<tr>
<td>RD-2A</td>
<td>40'</td>
<td>20'</td>
<td>18'</td>
<td>57'</td>
</tr>
<tr>
<td>RD-3A</td>
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</tr>
<tr>
<td>RD-5A</td>
<td>60'</td>
<td>44'</td>
<td>18'</td>
<td>69'</td>
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</tbody>
</table>

### URBAN ROADS:

<table>
<thead>
<tr>
<th>RD</th>
<th>TO 50'</th>
<th>16'</th>
<th>20'</th>
<th>54'</th>
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</thead>
<tbody>
<tr>
<td>RD-1B</td>
<td>30'</td>
<td>20'</td>
<td>20'</td>
<td>52'</td>
</tr>
<tr>
<td>RD-2B</td>
<td>40'</td>
<td>22'</td>
<td>20'</td>
<td>56'</td>
</tr>
<tr>
<td>RD-3B</td>
<td>50'</td>
<td>23'</td>
<td>20'</td>
<td>60'</td>
</tr>
<tr>
<td>RD-4B</td>
<td>50'</td>
<td>30'</td>
<td>20'</td>
<td>57'</td>
</tr>
<tr>
<td>RD-5B</td>
<td>60'</td>
<td>44'</td>
<td>20'</td>
<td>69'</td>
</tr>
</tbody>
</table>

* 47' MINIMUM TURNING RADIUS FOR SCHOOL BUSES PER AASHTO

**NOTE:**

1. STANDARD ROAD SECTIONS 4C, 4D, 5C, AND 5D INCLUDE ON-STREET PARKING. NO ON-STREET PARKING SHALL BE DESIGNED ON THE CUL-DE-SAC.

2. THE ENGINEERING DIVISION IS TO APPROVE DIMENSIONS WHEN RIGHT-OF-WAY IS DIFFERENT THAN 50' AND FOR OFFSET CUL-DE-SACS.

3. LANDSCAPED ISLANDS WITHIN COUNTY RIGHTS-OF-WAY MUST BE DEEDED TO A HOMEOWNER'S ASSOCIATION. THE COUNTY WILL NOT BE RESPONSIBLE FOR THEIR MAINTENANCE. THE ENGINEERING DIVISION MUST APPROVE PLANTINGS WITHIN ISLANDS IN ORDER TO INSURE ADEQUATE SIGHT DISTANCE IS MAINTAINED.
### Rural Roads:

<table>
<thead>
<tr>
<th>ROAD</th>
<th>RIGHT-OF-WAY</th>
<th>PAVEMENT WIDTH</th>
<th>CUL-DE-SAC PAVEMENT</th>
<th>RIGHT-OF-WAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-1A</td>
<td>TO 50'</td>
<td>12' TO 18'</td>
<td>47''</td>
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</tr>
<tr>
<td>RD-2A</td>
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<td>44'</td>
<td>61'</td>
<td>69'</td>
</tr>
</tbody>
</table>

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<th>PAVEMENT WIDTH</th>
<th>CUL-DE-SAC PAVEMENT</th>
<th>RIGHT-OF-WAY</th>
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* 47'' minimum turning radius for school buses per AASHTO

**Note:**
1. Standard road sections 4C, 4D, 5C and 5D include on-street parking. No on-street parking to be designed on cul-de-sacs.
2. The engineering division is to approve dimensions when right-of-way is different than 50' and for offset cul-de-sacs.

---

**Calvert County, Maryland**

**Department of Public Works**

**July 1, 2012**
NOT TO SCALE

DECELERATION LANE MINIMUMS

<table>
<thead>
<tr>
<th>POSTED SPEED (MPH)</th>
<th>FULL WIDTH</th>
<th>TAPER</th>
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</thead>
<tbody>
<tr>
<td>30</td>
<td>130'</td>
<td>150'</td>
</tr>
<tr>
<td>35</td>
<td>170'</td>
<td>150'</td>
</tr>
<tr>
<td>40</td>
<td>235'</td>
<td>150'</td>
</tr>
<tr>
<td>45</td>
<td>300'</td>
<td>150'</td>
</tr>
<tr>
<td>50</td>
<td>380'</td>
<td>150'</td>
</tr>
</tbody>
</table>

NOTES:
1. TRANSITION & DECELERATION LINES TO BE UTILIZED FOR CONNECTIONS TO COLLECTORS AND COMMERCIAL/INDUSTRIAL ROADWAYS OR AS REQUIRED BY SITE PLAN APPROVAL.
2. THE PAVEMENT SECTION SHALL BE THE SAME AS THE TYPICAL PAVEMENT FOR THE CLASSIFICATION OF EXISTING COUNTY ROAD.
3. THE ENGINEERING DIVISION MAY REVISE THE TYPICAL WHEN EXISTING CONDITIONS REQUIRE.
4. PAVEMENT SHALL BE FULL WIDTH, 10' UP TO 12' THROUGH END OF PAINTED TAPER.
5. PAVEMENT & STRIPING MARKINGS IN ACCORDANCE WITH MUTCD.
SECTION A-A - OPEN SECTION

SECTION A-A - CLOSED SECTION

NOTES:
1. THE PAVEMENT SECTION SHALL BE THE SAME AS THE TYPICAL PAVEMENT FOR THE CLASSIFICATION OF EXISTING COUNTY ROAD.
2. THE ENGINEERING DIVISION MAY REVISE THE TYPICAL WHEN EXISTING CONDITIONS REQUIRE.
3. PAVEMENT SHALL BE FULL WIDTH, 10' UP TO 12' THROUGH END OF PAINTED TAPER.
4. PAVEMENT & STRIPING MARKINGS IN ACCORDANCE WITH MUTCD.

BYPASS LANE MINIMUMS

<table>
<thead>
<tr>
<th>POSTED SPEED (MPH)</th>
<th>L</th>
<th>Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>150'</td>
<td></td>
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<tr>
<td>35</td>
<td>205'</td>
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<td>40</td>
<td>270'</td>
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<tr>
<td>45</td>
<td>338'</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>420'</td>
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</tbody>
</table>

QUEUE LENGTH BASED ON TRAFFIC DATA.

STANDARD ROAD DETAILS

BY-PASS LANES

CALVERT COUNTY MARYLAND

APPROVED

DIRECTOR

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD NUMBER

RD-18B
NOTES

MAXIMUM JOINT SPACING FOR CONCRETE CURB AND COMBINATION CURB & GUTTER IS 10". SEE SPECIFICATION FOR LOCATIONS AND DESCRIPTION OF TREATMENT FOR THE TYPES OF JOINTS USED.

1. SLOPE GUTTER PAN 1/2" PER FOOT TOWARD FLOW LINE ON ALL ROADWAYS INCLUDING SUPERELEVATED SECTIONS, EXCEPT INTERCHANGE RAMPS.

2. ROADWAY PAVEMENT CONSTRUCTION JOINT

3. FLOW LINE

4. ROADWAY PAVEMENT SLOPE

#4 x 8" SMOOTH DOWEL @ 60" O.C.

SIDEWALK IF SPECIFIED IN THE CONTRACT DOCUMENTS.

TYPE 'A'
COMBINATION CURB & GUTTER
DESIGN SPEED 30-40 MPH

CONCRETE SIDEWALK
ADJACENT TO CURB INLET

#3 x 12" SMOOTH DOWEL @ 18" O.C. - ASPHALT COAT THROUGH SECOND POUR OR DOWEL SLEEVE.

TYPE 'B'
COMBINATION CURB & GUTTER
DESIGN SPEED 50 MPH

VALLEY GUTTER
SCALE: NTS

NOT TO SCALE

STANDARD ROAD DETAILS
STANDARD CONCRETE CURB & GUTTER - TYPE A, B AND VALLEY GUTTER

STANDARD NUMBER
RD-19A

CALVERT COUNTY MARYLAND

APPROVED

DIRECTOR

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

REVISED

DATE
2014_0225

BY
jfk
**Type 'C'*
Combination curb & gutter to be used for design speed 60 MPH and across entrances.

**Type 'S'*
Modified combination curb & gutter
Note: Modified combination curb & gutter to be used only on cul-de-sac and local roads.

**Notes**
A. Maximum joint spacing for concrete curb and combination curb & gutter is 10', see specification for locations and description of treatment for the types of joints used.
B. Type 'C' or 'D' combination curb and gutter shall be used for all applicable new construction and in those areas where the combination curb and gutter is to be replaced in-kind.
C. Type 'S' may be used as an alternate for RD4 & RD5 when approved by the director.

1. Slope gutter pan 1/2" per foot toward flow line on all roadways including super-elevated sections, except interchange ramps.
2. Roadway pavement construction joint.
3. Flow line.
4. Roadway pavement slope.

*Not to scale*

---

**Calvert County Maryland**
**Department of Public Works**

Approved: [Signature]
Date: 2014_0225
Director: [Signature]
JULY 1, 2012

**Standard Road Details**
**Standard Concrete**
**Curb & Gutter - Type C, D & S**

**Standard Number**: RD-19B
NOTES:

1. SIDEWALK TO BE SCRIBED WITH 5' WIDTH JOINT SPACING.
2. EXPANSION JOINTS ACROSS THE SIDEWALK NOT MORE THAN 15' APART.
3. 1/2" PREFORMED BITUMINOUS EXPANSION JOINT FILLER IN THE EXPANSION JOINTS TO BE 1/4" BELOW THE SURFACE OF THE SIDEWALK.
4. CONCRETE SHALL BE SH&A MIX NO. 3 PER SH&A STANDARD SPECIFICATIONS, BROOM FINISHED.
5. WHEN SIDEWALK ABUTS CURB, THE SIDEWALK SHALL BE 1/4" ABOVE CURB WITH 3 PLY ROOFING PAPER BETWEEN THEM.
6. FOR RESIDENTIAL SIDEWALK REQUIREMENTS; REFER TO "STANDARD ROAD DETAILS, MINOR RESIDENTIAL COLLECTOR ROADWAY - RURAL" STANDARD NUMBER RD-5A FOR SIDEWALK LOCATIONS AND CONSTRUCTION DETAILS.
7. ALL SIDEWALKS SHALL BE INSTALLED TO COMPLY WITH ADA STANDARDS AND IN ACCORDANCE WITH AASHTO POLICY GUIDELINES.

CALEB COUNTY MARYLAND

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS STANDARD CONCRETE SIDEWALK

CALIFORNIA MARYLAND

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS STANDARD CONCRETE SIDEWALK

CALIFORNIA MARYLAND

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS STANDARD CONCRETE SIDEWALK

CALIFORNIA MARYLAND

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS STANDARD CONCRETE SIDEWALK

CALIFORNIA MARYLAND

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS STANDARD CONCRETE SIDEWALK

CALIFORNIA MARYLAND

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS STANDARD CONCRETE SIDEWALK

CALIFORNIA MARYLAND

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS STANDARD CONCRETE SIDEWALK

CALIFORNIA MARYLAND

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS STANDARD CONCRETE SIDEWALK

CALIFORNIA MARYLAND

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS STANDARD CONCRETE SIDEWALK

CALIFORNIA MARYLAND

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS STANDARD CONCRETE SIDEWALK

CALIFORNIA MARYLAND

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS STANDARD CONCRETE SIDEWALK

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STANDARD ROAD DETAILS STANDARD CONCRETE SIDEWALK

CALIFORNIA MARYLAND

DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS STANDARD CONCRETE SIDEWALK

CALIFORNIA MARYLAND
NOTES:
1. WHEN SIDEWALK ABUTS CURB, THE SIDEWALK SHALL BE 1/4" ABOVE CURB WITH 3 PLY ROOFING PAPER BETWEEN THEM.
GENERAL NOTES:

(1) USE A 1% MINIMUM GUTTER GRADE.

(2) MAINTAIN 3% CROSS SLOPE THROUGH PARKING BAY.
NOTE:
1. LANDSCAPED ISLANDS WITHIN COUNTY RIGHTS-OF-WAY (WHEN APPROVED BY THE DIRECTOR) MUST BE DEEDED TO A HOMEOWNER'S ASSOCIATION. THE ENGINEERING DIVISION MUST APPROVE PLANTINGS WITHIN ISLANDS IN ORDER TO INSURE ADEQUATE SITE DISTANCE IS MAINTAINED. MAINTENANCE OF THE LANDSCAPED ISLAND SHALL BE THE RESPONSIBILITY OF THE HOMEOWNER'S ASSOCIATION.
2. RADIUS SMALLER THAN THE 50' FILLET MINIMUM MAY BE APPROVED BY THE DIRECTOR IF DICTATED BY SITE CONDITIONS.
3. STamped CONCRETE SHALL BE TRAFFIC BEARING AND SHALL BE GRADED TO THE CENTER OF THE ROUNDABOUT AT A 4% SLOPE.
4. FOR USE UP TO 400 ADT. ABOVE 400 ADT, DESIGN TO MARYLAND SHA STANDARDS.
FASTEST PATH - SINGLE LANE

<table>
<thead>
<tr>
<th>RADIUS</th>
<th>DESIRED RADIUS</th>
<th>SPEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1 ENTRY</td>
<td>89'–99'</td>
<td>15 MPH</td>
</tr>
<tr>
<td>R2 CIRCULATING</td>
<td>99'–116'</td>
<td>15 MPH</td>
</tr>
<tr>
<td>R3 EXIT</td>
<td>152'–178'</td>
<td>15 MPH</td>
</tr>
<tr>
<td>R4 LEFT TURN</td>
<td>99'–116'</td>
<td>15 MPH</td>
</tr>
<tr>
<td>R4 MINIMUM**</td>
<td>18'–20'</td>
<td>10 MPH</td>
</tr>
<tr>
<td>R5 RIGHT TURN</td>
<td>152'–178'</td>
<td>15 MPH</td>
</tr>
</tbody>
</table>

18' MIN. EXIT WIDTH (1–1.2 X E)

18' MAX. TRAVEL LANE WIDTH

NOTE:
Dimensions are from median or painted centerline for single lane roundabout.

* Range for super elevation rates from -4 to +4%
** R4 has a minimum requirement to reduce rear end accidents caused by excessive speed differential.

STAMPED CONCRETE BRICK PATTERN

TYPE B CURB AND GUTTER
SEE PLATE RD–19A

TYPE C CURB AND GUTTER
SEE PLATE RD–19B

NOT TO SCALE

CALVERT COUNTY MARYLAND
DEPARTMENT OF PUBLIC WORKS JULY 1, 2012

STANDARD ROAD DETAILS
URBAN ROUNDABOUT

REVISION HISTORY

<table>
<thead>
<tr>
<th>DATE</th>
<th>BY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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STANDARD ROAD DETAILS
URBAN ROUNDABOUT

STANDARD NUMBER
RD–23
SPECIFIC / GEOMETRIC DESIGN ELEMENTS

The approach roadway design elements include curb alignment, median width and transition, approach flare, crosswalk location, horizontal and vertical alignment of the approach lane, intersection and stopping sight distance calculations, approach speed, fastest path radii, and other assorted elements. Maximum/minimum standards include the following:

FASTEST PATH — SINGLE LANE

<table>
<thead>
<tr>
<th>RADIUS</th>
<th>*RADIUS MAX.</th>
<th>SPEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1 ENTRY</td>
<td>89'-99'</td>
<td>15 MPH</td>
</tr>
<tr>
<td>R2 CIRCULATING</td>
<td>99'-116'</td>
<td>15 MPH</td>
</tr>
<tr>
<td>R3 EXIT</td>
<td>152'-178'</td>
<td>15 MPH</td>
</tr>
<tr>
<td>R4 LEFT TURN</td>
<td>98'-116'</td>
<td>15 MPH</td>
</tr>
<tr>
<td>R4 MINIMUM**</td>
<td>18'-20'</td>
<td>10 MPH</td>
</tr>
<tr>
<td>R5 RIGHT TURN</td>
<td>152'-178'</td>
<td>15 MPH</td>
</tr>
</tbody>
</table>

* Range for super elevation rates from -4 to +4%.
** R4 has a minimum requirement to reduce rear end accidents caused by excessive speed differential.

Note: Radii are given as a range for various super elevation rates from 0% to 4%, positive for R1, R3, and R5, and negative for R2 and R4. Calculations for each specific segment and corresponding cross slope should follow AASHTO Geometric Design of Highway and Streets, 2001 or later.

Maximun Grade: 2% for 200’ on minor or principal arterial (approach)
4% for 100’ on minor or major collectors
4% for 50’ on local streets

Approach Decision Sight Distance:
375’ for 25 MPH or less
450’ for 30 MPH
525’ for 35 MPH
600’ for 40 MPH
675’ for 45 MPH
750’ for 50 MPH

Note: Approach Decision Sight Distance, DSD, is the distance which a driver is aware of the change in alignment caused by specifically the roundabout. If the desired DSD is not available due to topographic limitations, advance warning signs will be required. Vertical alignment must be checked as well as horizontal alignment for restrictions to DSD.

Minimum Approach Tangent:
100’ on all collectors, commercial and industrial roadways
50’ on local access

Min. distance to nearest access:
100’ on all collectors, commercial and industrial roadways
(distance to splitter island)
30’ on local access

Stopping sight distance (SSD) shall be addressed for each leg of the roundabout. SSD for the approach and yield at the roundabout are based on AASHTO standards for urban roadways. Section 9 of the 2001 or later geometric design manual, Case A for sight distance to the left, and Section 3, Ex 3-1 for SSD relating to pedestrians. Horizontal and vertical alignment must be checked.

Stopping Sight Distance:
80’ for 15 MPH
115’ for 20 MPH
155’ for 25 MPH
200’ for 30 MPH
250’ for 35 MPH
305’ for 40 MPH
360’ for 45 MPH

SPLITTER ISLANDS

Splitter islands shall provide proper deflection of vehicular traffic for speed controls and pedestrian refuge areas. They are required on all urban roundabouts. They shall be a minimum of 50’ long (measured from the outside of the circulator road) if there is a pedestrian crossing. Splitter islands where crosswalks are projected shall have a minimum 6’x6’ pedestrian refuge. Crosswalks shall be 25’ from the yield line. The curb face along the circulating roadway shall be offset for the traveled way a distance of 3’ on the approach side next to the circulating roadway tapering to 1.5’ at the intersection of the entry and the approach. Island nose radii shall be 1’ minimum to 3’ maximum.

SIGNING AND MARKING

Signing and marking shall conform to Manual on Uniform Traffic Control Devices (MUTCD) as modified by the latest recommended roundabout signing standards.

LANDSCAPE DESIGN ELEMENTS

Landscaping within the splitter islands (if proposed) and the center island shall be hardscaped or contain low level vegetation with a maximum curb, island and landscaping, at maturity, of 30” above the roadway.
NOTES

1. A UTILITY CUT PERMIT SHALL BE OBTAINED FROM THE DEPARTMENT OF PUBLIC WORKS FOR EXCAVATION OF ANY TRENCHES WITHIN THE RIGHT-OF-WAY LINES OF ANY CALVERT COUNTY ROAD.

2. IN CERTAIN CONDITIONS VARIATIONS TO THE DEPTH OF ASPHALT WILL CHANGE DEPENDING ON THE ROAD SURFACE.

3. BACKFILL IN TRENCH SHALL BE #57 STONE, #6 AGGREGATE, PEA GRAVEL OR APPROVED EQUAL. THE REMAINING DEPTH OF THE TRENCH (MINIMUM 2') SHALL BE FILLED WITH CR-6 OR GRADED AGGREGATE BASE, COMPACTED IN 6" LAYERS BY TAMPPING OR BY SOME OTHER APPROVED METHOD. WHENEVER SHEETING OR SHORING IS REQUIRED TO PREVENT CAVE-INS OR BELLYING DUE TO THE DEPTH OF THE TRENCH OR TYPE OF MATERIAL ENCOUNTERED, THE SHEETING, WHEREVER FOUND NECESSARY, SHALL REMAIN IN PLACE BUT CUT OFF 1' BELOW THE BOTTOM OF THE REPLACED SURFACING.

MSHA STD. NO. MD 578.01 MAY BE USED IN LIEU OF THIS DETAIL.
**DIMENSIONS**

| "X" WIDTH OF SHOULDER | 8'  | 6'  | 5'  | 4'  |
| "Y" WIDTH OF TURNOUT  | 6'  | 4'  | 3'  | 2'  |
| "L1"                  | 23' | 15' | 11' | 8'  |
| "L2"                  | 15' | 10' | 8'  | 5'  |

**NOTE:**

1. BALLAST REQUIREMENTS OF MAILBOX TURNOUTS SHALL BE THAT OF THE ADJACENT ROADWAY.

2. REFER TO THE UNITED STATES POST OFFICE STANDARDS AND THE CALVERT COUNTY ROAD ORDINANCE FOR MAILBOX INSTALLATION REQUIREMENTS.

**R/W**

<table>
<thead>
<tr>
<th>L1</th>
<th>20'</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2</td>
<td>14'</td>
</tr>
</tbody>
</table>

**EXISTING EDGE OF PAVEMENT**

| 4" THICKNESS OF CR-6 OR APPROVED EQUAL |

**MATCH SLOPE REQUIREMENTS OF ROADWAY**

**EXISTING SHOULDER**

**MAILBOX**

**TRAVEL WAY**

**EXISTING SHOULDER**

**NOT TO SCALE**

**CALVERT COUNTY MARYLAND**

**APPROVED**

**REVISED**

<table>
<thead>
<tr>
<th>DATE</th>
<th>BY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**STANDARD ROAD DETAILS**

**MAILBOX TURNOUT DETAIL**

**STANDARD NUMBER**

**RD-25**
### RUNOFF FACTORS

<table>
<thead>
<tr>
<th>C FACTORS</th>
<th>FLAT &gt; 2%</th>
<th>AVERAGE &lt; 2% - 7%</th>
<th>STEEP &lt; 7%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roofs</td>
<td>0.90</td>
<td>0.90</td>
<td>0.90</td>
</tr>
<tr>
<td>Roads: Concrete</td>
<td>0.90</td>
<td>0.90</td>
<td>0.90</td>
</tr>
<tr>
<td>Roads: Bituminous</td>
<td>0.85</td>
<td>0.85</td>
<td>0.85</td>
</tr>
<tr>
<td>Roads: Gravel</td>
<td>0.85</td>
<td>0.85</td>
<td>0.85</td>
</tr>
<tr>
<td>Sparse Vegetation: Sandy Soils</td>
<td>0.15</td>
<td>0.30</td>
<td>0.45</td>
</tr>
<tr>
<td>Sparse Vegetation: Gravelly Soils</td>
<td>0.25</td>
<td>0.43</td>
<td>0.60</td>
</tr>
<tr>
<td>Sparse Vegetation: Clay Soils</td>
<td>0.30</td>
<td>0.50</td>
<td>0.70</td>
</tr>
<tr>
<td>Lawns: Sandy Soils</td>
<td>0.10</td>
<td>0.20</td>
<td>0.30</td>
</tr>
<tr>
<td>Lawns: Gravelly Soils</td>
<td>0.15</td>
<td>0.25</td>
<td>0.35</td>
</tr>
<tr>
<td>Lawns: Clay Soils</td>
<td>0.20</td>
<td>0.30</td>
<td>0.40</td>
</tr>
<tr>
<td>Dense Vegetation: Sandy Soils</td>
<td>0.07</td>
<td>0.14</td>
<td>0.20</td>
</tr>
<tr>
<td>Dense Vegetation: Gravelly Soils</td>
<td>0.11</td>
<td>0.20</td>
<td>0.27</td>
</tr>
<tr>
<td>Dense Vegetation: Clay Soils</td>
<td>0.15</td>
<td>0.25</td>
<td>0.35</td>
</tr>
<tr>
<td>Woods: Sandy Soils</td>
<td>0.05</td>
<td>0.10</td>
<td>0.15</td>
</tr>
<tr>
<td>Woods: Gravelly Soils</td>
<td>0.07</td>
<td>0.12</td>
<td>0.15</td>
</tr>
<tr>
<td>Woods: Clay Soils</td>
<td>0.10</td>
<td>0.15</td>
<td>0.20</td>
</tr>
</tbody>
</table>

### TYPE OF DEVELOPMENT

<table>
<thead>
<tr>
<th>C FACTORS</th>
<th>FLAT &gt; 2%</th>
<th>AVERAGE &lt; 2% - 7%</th>
<th>STEEP &lt; 7%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>0.85</td>
<td>0.85</td>
<td>----</td>
</tr>
<tr>
<td>Industrial</td>
<td>0.60-0.85</td>
<td>0.60-0.85</td>
<td>----</td>
</tr>
<tr>
<td>Garden Type Apartments, Schools, Churches &amp; Similar Land Uses</td>
<td>0.60</td>
<td>0.60</td>
<td>0.70</td>
</tr>
<tr>
<td>Semi-Detached Residential (Townhouses)</td>
<td>0.45</td>
<td>0.45</td>
<td>0.55</td>
</tr>
<tr>
<td>Detached Residential 5,000 to 7,000 S.F. Lots</td>
<td>0.40</td>
<td>0.40</td>
<td>0.50</td>
</tr>
<tr>
<td>Quarter Acre Lots</td>
<td>0.38</td>
<td>0.38</td>
<td>0.48</td>
</tr>
<tr>
<td>Half Acre Lots</td>
<td>0.35</td>
<td>0.35</td>
<td>0.45</td>
</tr>
<tr>
<td>Parks and Flood Plain</td>
<td>0.12-0.25</td>
<td>0.12-0.25</td>
<td>0.20-0.35</td>
</tr>
<tr>
<td>One Acre Lots</td>
<td>0.27</td>
<td>0.27</td>
<td>0.44</td>
</tr>
<tr>
<td>Two Acre Lots</td>
<td>0.24</td>
<td>0.24</td>
<td>0.42</td>
</tr>
</tbody>
</table>

### CALVERT COUNTY RAINFALL TABLE (IN INCHES FOR DIFFERENT STORM FREQUENCY EVENTS)

<table>
<thead>
<tr>
<th>YEAR</th>
<th>INCHES PER 24 HOUR PERIOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 YR</td>
<td>2.8</td>
</tr>
<tr>
<td>2 YR</td>
<td>3.4</td>
</tr>
<tr>
<td>5 YR</td>
<td>4.4</td>
</tr>
<tr>
<td>10 YR</td>
<td>5.3</td>
</tr>
<tr>
<td>25 YR</td>
<td>6.1</td>
</tr>
<tr>
<td>50 YR</td>
<td>6.7</td>
</tr>
<tr>
<td>100 YR</td>
<td>7.6</td>
</tr>
</tbody>
</table>

### MAXIMUM TIME OF CONCENTRATION

<table>
<thead>
<tr>
<th>LOT SIZE</th>
<th>MINUTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,000 SF</td>
<td>10</td>
</tr>
<tr>
<td>10,000 SF</td>
<td>12</td>
</tr>
<tr>
<td>40,000 SF</td>
<td>15</td>
</tr>
</tbody>
</table>

---

**CALVERT COUNTY MARYLAND**

**APPROVED**

**DIRECTOR**

**DEPARTMENT OF PUBLIC WORKS**

**JULY 1, 2012**

**STANDARD DRAINAGE DETAILS**

**RUNOFF FACTORS, RAINFALL TABLE AND MAXIMUM TIME OF CONCENTRATION**

**STANDARD NUMBER**

**SD-1**
EXAMPLE:
L = 100 FT.
N = 0.40
S = 1%
READ: t = 13.6 min.

<table>
<thead>
<tr>
<th>TYPE OF SURFACE</th>
<th>VALUE OF N</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMOOTH IMPERVIOUS SURFACE</td>
<td>0.02</td>
</tr>
<tr>
<td>SMOOTH BARE PACKED SOIL</td>
<td>0.10</td>
</tr>
<tr>
<td>POOR GRASS, CULTIVATED ROW CROPS</td>
<td>0.20</td>
</tr>
<tr>
<td>OR MODERATELY ROUGH BARE SURFACE</td>
<td>0.20</td>
</tr>
<tr>
<td>PASTURE OR AVERAGE GRASS</td>
<td>0.40</td>
</tr>
<tr>
<td>DECIDUOUS TIMBERLAND</td>
<td>0.60</td>
</tr>
<tr>
<td>CONIFER TIMBERLAND, DECIDUOUS TIMBERLAND WITH DEEP FOREST LITTER OR DENSE GRASS</td>
<td>0.80</td>
</tr>
</tbody>
</table>

SOURCE: ARTICLE BY W.S. KERBY
MARCH 1959 ISSUE
CIVIL ENGINEERING
CHART: RD-401

CALVERT COUNTY
MARYLAND
DEPARTMENT OF
PUBLIC WORKS JULY 1, 2012

OVERLAND SHEET FLOW CHART

SD-3
EXAMPLE: GIVEN: SLOPE = 5.6%  DISTANCE (BEGINNING OF GUTTER FLOW TO INLET) = 305’
Determine average velocity and time of gutter flow
SOLUTION: AVERAGE VELOCITY = 5.22 FPS  TIME = 3.05 x 0.32 = 0.98 MINUTES

Q = QUANTITY OF FLOW INTO INLET (CFS)
D = DEPTH AT INLET

CALCULATIONS BASED ON STANDARD CURB AND GUTTER IN GOOD CONDITION.
NOTE: In drainage areas where note than 60% of land usage is for apartments or group houses or in any development where more than 50% of the area is impervious, a maximum inlet time of 7.0 minutes shall be used.

Maximum inlet time in residential areas where lot sizes are 20,000 sq. ft. or over shall be 15 minutes, less than 20,000 sq.ft. 10 minutes.

### VELOCITY OF SWALE FLOW IN FEET PER SECOND

<table>
<thead>
<tr>
<th>SLOPE OF LAWN</th>
<th>CLAY LAWNS</th>
<th>SANDY LAWNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>0.5</td>
<td>0.3</td>
</tr>
<tr>
<td>1.0</td>
<td>0.6</td>
<td>0.4</td>
</tr>
<tr>
<td>2.0</td>
<td>0.8</td>
<td>0.6</td>
</tr>
<tr>
<td>3.0</td>
<td>1.0</td>
<td>0.8</td>
</tr>
<tr>
<td>4.0</td>
<td>1.2</td>
<td>1.0</td>
</tr>
<tr>
<td>5.0</td>
<td>1.3</td>
<td>1.1</td>
</tr>
<tr>
<td>6.0</td>
<td>1.4</td>
<td>1.2</td>
</tr>
<tr>
<td>8.0</td>
<td>1.6</td>
<td>1.4</td>
</tr>
</tbody>
</table>

### SOLUTION

<table>
<thead>
<tr>
<th>SLOPE</th>
<th>DISTANCE</th>
<th>VELOCITY</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A TO B</td>
<td>2.0%</td>
<td>75'</td>
<td>*</td>
</tr>
<tr>
<td>B TO C</td>
<td>2.0%</td>
<td>70'</td>
<td>0.8 F.P.S.</td>
</tr>
<tr>
<td>C TO D</td>
<td>4.0%</td>
<td>305'</td>
<td>5.2 F.P.S.</td>
</tr>
</tbody>
</table>

Total time: 14.3 minutes

Use 10 minute inlet time (see note above)

* FROM OVERLAND FLOW TIME CHART (PLATE SD-3)
^ FROM VELOCITY OF SWALE FLOW (PLATE SD-5)
x FROM GUTTER FLOW CHART (SD-4)

Note: Velocity of swale flow chart applies only to grading plan shown (approx. 0.1 C.F.S in swale). For other grading plan or for swales carrying more than 0.1 C.F.S., different velocities shall be used.

Calvert County, Maryland

Director of Public Works - July 1, 2012

Standard drainage details

Inlet time solution

SD-5
### Factors for Computation of Losses within Storm Drainage Structures

<table>
<thead>
<tr>
<th>Structure Condition</th>
<th>Loss Coefficients (Kb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Inlet on straight run</td>
<td>0.50</td>
</tr>
<tr>
<td>2 Manhole on straight run</td>
<td>0.15</td>
</tr>
<tr>
<td>3 Manhole on straight run</td>
<td></td>
</tr>
<tr>
<td>90 degrees</td>
<td>1.50</td>
</tr>
<tr>
<td>60 degrees</td>
<td>1.25</td>
</tr>
<tr>
<td>45 degrees</td>
<td>1.10</td>
</tr>
<tr>
<td>22½ degrees</td>
<td>0.70</td>
</tr>
<tr>
<td>4 Bends with manholes</td>
<td></td>
</tr>
<tr>
<td>90 degrees</td>
<td>1.00</td>
</tr>
<tr>
<td>60 degrees</td>
<td>0.85</td>
</tr>
<tr>
<td>45 degrees</td>
<td>0.75</td>
</tr>
<tr>
<td>22½ degrees</td>
<td>0.45</td>
</tr>
<tr>
<td>5 Bends with radius equal to 2½ pipe diameter</td>
<td></td>
</tr>
<tr>
<td>90 degrees</td>
<td>0.25</td>
</tr>
<tr>
<td>60 degrees</td>
<td>0.20</td>
</tr>
<tr>
<td>45 degrees</td>
<td>0.18</td>
</tr>
<tr>
<td>22½ degrees</td>
<td>0.11</td>
</tr>
</tbody>
</table>

### Mannings’s Formula – Value of “n”

<table>
<thead>
<tr>
<th>Channels and Conduits Type</th>
<th>Value of &quot;n&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC</td>
<td>.010</td>
</tr>
<tr>
<td>Corrugated Polyethylene</td>
<td>.018</td>
</tr>
<tr>
<td>Corrugated Polyethylene (Smooth Interior)</td>
<td>.013</td>
</tr>
<tr>
<td>Concrete Pipe</td>
<td>.013</td>
</tr>
<tr>
<td>Concrete Gutters and Channels</td>
<td>.015</td>
</tr>
<tr>
<td>Bituminous Concrete Surfacing with Concrete Curb</td>
<td>.016</td>
</tr>
<tr>
<td>C.M.P., plain</td>
<td>.024</td>
</tr>
<tr>
<td>Ditches, earth</td>
<td>.025</td>
</tr>
<tr>
<td>Ditches, seed and mulch</td>
<td>.030</td>
</tr>
<tr>
<td>Ditches, sod</td>
<td>.30</td>
</tr>
<tr>
<td>Ditches, soil stabilization matting</td>
<td>.040</td>
</tr>
<tr>
<td>Ditches, grassed with flow greater than 6&quot;</td>
<td>.040</td>
</tr>
<tr>
<td>Ditches, grassed with flow less than 6&quot;</td>
<td>.060</td>
</tr>
<tr>
<td>Natural Stream Channels</td>
<td>.035 - .150</td>
</tr>
<tr>
<td>Rip Rap, Ungrounded</td>
<td>.035</td>
</tr>
<tr>
<td>DITCH DESIGN</td>
<td>DESIGN VELOCITIES</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>SEED AND MULCH</td>
<td>&lt; 2.5 F.P.S.</td>
</tr>
<tr>
<td>SOLID SODDING</td>
<td>&lt; 4.0 F.P.S.</td>
</tr>
<tr>
<td>SOIL STABILIZATION</td>
<td>&lt; 4.5 F.P.S.</td>
</tr>
<tr>
<td>DUMPED OR PLACED RIP RAP</td>
<td>NO MAXIMUM*</td>
</tr>
<tr>
<td>CONCRETE OR MACADAM PAVING</td>
<td>NO MAXIMUM*</td>
</tr>
</tbody>
</table>

* COMPUTATION SUBMITTED FOR LENGTH, SIZE AND/OR BEDDING REQUIRED, WILL BE CONSIDERED ON AN INDIVIDUAL BASIS AND WILL NOT BE RESTRICTED TO ANY STANDARD METHOD, HOWEVER, NATURAL RESOURCE CONSERVATION DISTRICT CHARTS FOR LENGTH OF PROTECTION ARE ACCEPTABLE.

<table>
<thead>
<tr>
<th>EXISTING DITCHES</th>
<th>DESIGN VELOCITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>EARTH WITHOUT VEGETATION</td>
<td>1 - 3 F.P.S.</td>
</tr>
<tr>
<td>GRAINS, STIFF STEMMED GRASSES</td>
<td>2 - 3 F.P.S.</td>
</tr>
<tr>
<td>BUNCH GRASSES</td>
<td>2 - 4 F.P.S.</td>
</tr>
<tr>
<td>STIFF CLAY AND GRAVEL</td>
<td>5 F.P.S.</td>
</tr>
<tr>
<td>FINE GRAVEL</td>
<td>5 F.P.S.</td>
</tr>
<tr>
<td>MEADOW TYPE GRASSES, SHORT PLIANT BLADES</td>
<td>5 F.P.S.</td>
</tr>
<tr>
<td>WELL ESTABLISHED GRASSES, SHORT PLIANT BLADES</td>
<td>6 F.P.S.</td>
</tr>
<tr>
<td>COURSE GRAVEL (SHINGLED CHANNELS)</td>
<td>6 - 8 F.P.S.</td>
</tr>
<tr>
<td>SHALE AND ROCK</td>
<td>NO MAXIMUM</td>
</tr>
</tbody>
</table>

CALVERT COUNTY MARYLAND

APPROVED

REVISED

DATE | BY

STANDARD DRAINAGE DETAILS
LIMITING VELOCITIES FOR DITCHES

STANDARD NUMBER
SD-7
Transition of curb face and cross slope at depressed inlets
PLAN

SECTION A - A

NOTE: SEE STD. NO. CA-300.02 FOR METHOD OF DEPRESSING CURBS AT INLETS.
NOTES:
1. INLET MAY BE CONSTRUCTED OF REINFORCED CONCRETE (MIX NO. 2) OR BRICK.
2. SIZE, TYPE, & DIRECTION OF INLET CONNECTION WILL VARY TO SUIT CONDITIONS.
3. TOP 4' OF WALLS MAY BE BRICK MASONRY. ADDITIONAL BRICK MAY BE USED TO
BRING THE GRATE TO GRADE IF REQUIRED. SEE S.H.A. SPECIFICATIONS FOR INLETS.
4. REINFORCEMENT REQUIRED ON THE OUTSIDE, AS WELL AS ON THE INSIDE, OF
WALLS BELOW 7'-0" WHEN "A" IS GREATER THAN 7'-0". SPACING, SAME AS FOR
INSIDE OF WALL.
5. PLACE - EXPANSION MATERIAL OF SAME TYPE APPROVED FOR PAVEMENT BETWEEN
THE FRAME & ABUTTING RIGID PAVEMENT, & BETWEEN ENDS OF INLET CURB &
NORMAL CURB.
6. "BRICK FOR MASONRY", TO COMPLY WITH S.H.A. SPECIFICATIONS.
7. FOR UNDEPRESSED INLETS, USE NORMAL PAVEMENT SLOPE. FOR DEPRESSED INLETS,
SEE CALVERT COUNTY STD. CA-300.02.
8. SEE STANDARD CA-383.91 FOR METAL LADDER RUNGS.
LEAVE 4" X 4" OPENINGS FOR SUBGRADE DRAINAGE IF DIRECTED

REINFORCEMENT:
NO. 4 DEFORMED BARS @ 6" C/C 2 WAYS

PLAN

CURB JOINT WITH 1/4" EXPANSION MATERIAL

SECTION A-A

NORMAL PAVEMENT SLOPE

WB X 31 ELEC. GALV. SUPPORT BEAM 6'-4 5/8" LONG FOR DETAILS SEE STD. NO. CA-374.03.

NO. 4 DEFORMED BARS @ 4" C/C 2 WAYS PRECAST INLET HEAD

SECTION B-B

BRICK INVERT TO SLOPE AT LEAST 2" PER FOOT TOWARD OUTLET.

5/8" PARGING

METHOD OF ANCHORING SUPPORT BEAM IF INLET IS CONSTRUCTED OF BRICK

NOTES

1. INLET MAY BE CONSTRUCTED OF REINFORCED CONCRETE (MIX NO. 2) OR BRICK. SIZE, TYPE & DIRECTION OF INLET CONNECTION WILL VARY TO SUIT CONDITIONS.

2. TOP 4" OF WALLS MAY BE BRICK MASONRY. ADDITIONAL BRICK MAY BE USED TO BRING THE GRATE TO GRADE IF REQUIRED. SEE S.H.A. SPECIFICATIONS FOR INLETS.

3. REINFORCEMENT REQUIRED ON OUTSIDE, AS WELL AS ON INSIDE OF WALLS BELOW 7'-0" WHEN "A" IS GREATER THAN 7'-0" SPACING, SAME AS FOR INSIDE OF WALL.

4. PLACE 1/4" EXPANSION MATERIAL OF SAME TYPE APPROVED FOR PAVEMENT BETWEEN ENDS OF INLET CURB & NORMAL CURB.

5. "BRICK FOR MASONRY" TO COMPLY WITH THE CALVERT COUNTY SPECIFICATIONS FOR UNEDEPRESSED INLETS, USE NORMAL PAVEMENT SLOPE. FOR DEPRESSED INLETS, SEE CALVERT CO. STD. NO. CA-300.02.

6. METAL LADDER RUNGS SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER (SEE STANDARD NO. CA-383.91).
STANDARD WR SINGLE FRAME & GRATE, FOR DETAILS SEE STD'S CA-374.02 & CA-374.03

5/8" ANCHOR BOLT, 4 PER FRAME
(FOR DETAILS SEE STANDARD CA-374.02)

REINFORCEMENT:
NO. 4 DEFORMED BARS
Ø 6" C/C 2 WAYS
2" COVER

NOTE:
1. CONCRETE (MIX NO. 2) WILL BE SUBSTITUTED FOR Brick WHEN DIRECTED BY THE ENGINEER.

2. SIZE, TYPE AND DIRECTION OF OUTLET PIPE WILL VARY TO SUIT EACH CASE AND THE INVERT WILL BE ALTERED ACCORDINGLY.

3. "BRICK FOR MASONRY", TO COMPLY WITH THE LATEST S.H.A. SPECIFICATIONS.

4. SEE STANDARD CA-363.91 FOR METAL LADDER RUNGS.
SEE STANDARD CA-374.075 FOR DETAILS OF CURB OVER INLET.

NORMAL CURB LINE

STANDARD WR SINGLE FRAME & GRATE WITH CUT FLANGE. SEE STANDARD CA-374.02 & CA-374.03.

LEAVE 4"X4" OPENING THRU WALL FOR SUBGRADE DRAINAGE (IF DIRECTED). USE STANDARD INLET PROTECTION AS A SEDIMENT FILTER. OPENING TO BE SEALED AFTER PAVING COMPLETED.

5/8" ANCHOR BOLT, 4 PER FRAME
(FOR DETAILS SEE STANDARD CA-374.02)

BRICK OR CONCRETE INVERT TO SLOPE AT LEAST 2" PER FOOT TOWARD OUTLET

CONCRETE - MD. S.H.A. MIX NO. 2

NOTE:

1. INLET MAY BE CONSTRUCTED OF BRICK OR SOLID CONCRETE BLOCK. (BLOCKS 4"X8"X16" ONLY).

2. SIZE, TYPE & DIRECTION OF PIPE CONNECTION WILL VARY TO SUIT CONDITIONS.

3. TOP OF WALLS MAY BE BRICK MASONRY TO BRING THE GRATE TO GRADE AS REQUIRED.

4. INLET WALL THICKNESS TO BE A MINIMUM OF 8" TO AN INLET DEPTH OF 8', OVER 8' OF DEPTH WALL THICKNESS TO BE 12".

5. SEE STANDARD NO. CA-300.02 FOR METHOD OF DEPRESSING PAVEMENT AT INLET.

6. LADDER RUNGS SHALL BE PLACED IN ACCORDANCE WITH STANDARD NO. CA-383.91.
GENERAL NOTES:
1. FRAME & GRATES TO BE SQUARE, FLAT & TRUE.
3. FRAMES & GRATES TO BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH A.S.T.M. A-123.
4. SEE LATEST S.H.A. SPECIFICATIONS.

GALVANIZED 5/8" Ø ANCHOR BOLT WITH DOUBLE NUT FOR ADJUSTING FRAME TO GRATE (4 BOLTS PER FRAME LENGTH TO BE DETERMINED IN FIELD.)

DRILL, SET, AND GROUT IN FIELD AS DIRECTED BY THE ENGINEER.

SECTION B-B

BEVEL BOTH ENDS

CHAMFER BOTTOM OF BAND BARS 5/16" X 5/16".
NOTE 'A'-WELD 5 1/2" X 1/2" BAR TO 4"X3"X1/2" L
BEFORE WELDING 3 1/2" X 1/2" BAR

SECTION C-C

SECTION D-D

(GRATE NOT SHOWN)

3 1/2" X 1/2" X 1/10 3/8" BAR
5 1/2" X 1/2" X 1"-10 1/8" BAR
L 4" X 3" X 1/2" X 4'-8 1/8"

3 1/2" X 1/2" X 2'-8 7/8" BAR

BEVEL BOTH ENDS

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GENERAL NOTES

1. CONCRETE (MIX NO. 2) WILL BE SUBSTITUTED FOR BRICK WHEN DIRECTED BY THE ENGINEER.

2. SIZE, TYPE AND DIRECTION OF OUTLET PIPE WILL VARY TO SUIT EACH CASE AND THE INVERT WILL BE ALTERED ACCORDINGLY.

3. "BRICK FOR MASONRY", TO COMPLY WITH THE LATEST S.H.A. SPECIFICATIONS.

4. SEE STANDARD NO. CA-383.91 FOR METAL LADDER RUNGS.

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS

STANDARD NR INLET

STANDARD NO. CA-374.14
GENERAL NOTES

1. CONCRETE TO BE MIX NO. 6 (4,500 P.S.I.).
2. REINFORCING – 2 LAYERS OF 4 x 4 W4.0 x W4.0 86#/SQ. FT. WELDED WIRE FABRIC AS SHOWN. 1 1/2" OF COVER IS TO BE PROVIDED OVER REINFORCING WIRE.
3. THREADED PLASTIC INSERTS TO BE PROVIDED FOR HANDLING.
4. GRADE AND SLOPE ADJUSTMENTS COMPLETED IN THE FIELD USING CONCRETE MIX NO. 6 OR BRICK AND MORTAR.
5. PIPE OPENINGS TO BE PROVIDED AS REQUIRED FOR SIZE, LOCATION, AND INVERT ELEVATIONS REFER TO CONSTRUCTION PLANS.
6. PLACEMENT OF SUBGRADE DRAINAGE WILL BE DIRECTED BY THE ENGINEER OR AS NOTED ON THE CONSTRUCTION PLANS.
7. LADDER RUNGS SHALL BE IN ACCORDANCE WITH STANDARD CA–383.91.
8. SEE STANDARD CA–300.02 FOR METHOD OF DEPRESSING PAVEMENT AT INLET.
9. JOINT SEALER (AASHTO M198, TYPE B) TO BE APPLIED TO THE INSIDE EDGE ONLY.
GENERAL NOTES

1. CONCRETE TO BE MIX NO. 6 (4,500 P.S.I.).
2. REINFORCING — 2 LAYERS OF 4 x 4 W4.0 x W4.0 B6#/SQ. FT. WELDED WIRE FABRIC AS SHOWN.
3. THREADED PLASTIC INSERTS TO BE PROVIDED FOR HANDLING.
4. GRADE AND SLOPE ADJUSTMENTS COMPLETED IN THE FIELD USING CONCRETE MIX NO. 6 OR BRICK AND MORTAR.
5. PIPE OPENINGS TO BE PROVIDED AS REQUIRED. FOR SIZE, LOCATION, AND INVERT ELEVATIONS, REFER TO CONSTRUCTION PLANS.
6. PLACEMENT OF SUBGRADE DRAINAGE WILL BE DIRECTED BY THE ENGINEER OR AS NOTED ON THE CONSTRUCTION PLANS.
7. LADDER RUNGS SHALL BE IN ACCORDANCE WITH STANDARD CA-383.91.
8. SEE STANDARD CA-300.02 FOR METHOD OF DEPRESSING PAVEMENT AT INLET.
9. JOINT SEALER (AASHTO M198, TYPE B) TO BE APPLIED TO THE INSIDE EDGE ONLY.

1 LAYER OF 4 x 4 - W4.0 x W4.0
.86 LBS./SQ. FT. WELDED WIRE FABRIC

THIS PORTION OF INLET SHALL BE PROVIDED IN THE FIELD AND SHALL BE CONSTRUCTED OF BRICK MASONRY OR REINFORCED CONCRETE MIX NO. 6 "BRICK FOR MASONRY" TO COMPLY WITH LATEST S.H.A. SPECIFICATIONS.
GENERAL NOTES

1. CONCRETE TO BE MIX NO. 6 (4,500 P.S.I.).
2. REINFORCEMENT - 2 LAYERS OF 4 x 4 W4.0 x W4.0 86#/SQ. FT.
welded wire fabric as shown. 1 1/2" COVER TO BE PROVIDED
OVER REINFORCEMENT.
3. THREADED PLASTIC INSERTS TO BE PROVIDED FOR HANDLING.
4. GRADE AND SLOPE ADJUSTMENTS COMPLETED IN THE FIELD USING
CONCRETE MIX NO. 6 OR BRICK AND MORTAR.
5. PIPE OPENINGS TO BE PROVIDED AS REQUIRED. FOR SIZE,
LOCATION, AND INVERT ELEVATIONS, REFER TO CONSTRUCTION PLANS.
6. PLACEMENT OF SUBGRADE DRAINAGE WILL BE DIRECTED BY THE
ENGINEER OR AS NOTED ON THE CONSTRUCTION PLANS.
7. LADDER RUNGS SHALL BE IN ACCORDANCE WITH STANDARD
CA-383.91.
8. SEE STANDARD CA-300.02 FOR METHOD OF DEPRESSING PAVEMENT
AT INLET.
9. JOINT SEALER (AASHTO M198, TYPE B) TO BE APPLIED TO THE
INSIDE EDGE ONLY.
SUPPORT BEAM
C
INLET
2'- 4 3/4''

A

1/2''

4'-9 1/2''

(0.A. FRAME)

4''-9 1/2''

(0.A. INLET & PRECAST CURB)

PLAN B

SECTION A-A

INVERT TO BE CONCRETE OR
BRICK, SLOPE 2" PER FOOT
TOWARD OUTLET OR AS DIRECTED
(1 TO BE PROVIDED IN THE FIELD)
NORMAL PAVEMENT SLOPE

SECTION B-B

BASE UNIT
(WALLS MAY TAPER
1/2'' PER FOOT)
KEYED JOINT

PROVIDE 6'' MIN. BEDDING
OF NO. 57 AGGREGATE
ON FIRM SUBGRADE.

SECTION C-C

LAP SPlice TO MAKE REINFORCING
CONTINUOUS AROUND OUTSIDE CORNER.

GENERAL NOTES

1. CONCRETE TO BE MIX NO. 6 (4,500 P.S.I.).
2. REINFORCING - 2 LAYERS OF 4 x 4 W4.0 x W4.0 86#/#50. FT.
   WELDED WIRE FABRIC AS SHOWN. 1 1/2'' OF COVER IS TO BE
   PROVIDED OVER REINFORCING WIRE.
3. THREADED PLASTIC INSERTS TO BE PROVIDED FOR HANDLING.
4. GRADE AND SLOPE ADJUSTMENTS COMPLETED IN THE FIELD USING
   CONCRETE MIX NO. 6 OR BRICK AND MORTAR.
5. PIPE OPENINGS TO BE PROVIDED AS REQUIRED. FOR SIZE,
   LOCATION, AND INVERT ELEVATIONS, REFER TO CONSTRUCTION PLANS.
6. PLACEMENT OF SUBGRADE DRAINAGE WILL BE DIRECTED BY THE
   ENGINEER OR AS NOTED ON THE CONSTRUCTION PLANS.
7. LADDER RUNGS SHALL BE IN ACCORDANCE WITH STANDARD
   CA-363.91.
8. SEE STANDARD CA-300.02 FOR METHOD OF DEPRESSING PAVEMENT
   AT INLET.
9. JOINT SEALER (AASHTO M198, TYPE B) TO BE APPLIED TO THE
   INSIDE EDGE ONLY.

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS
PRECAST STANDARD NR INLET

STANDARD NO. CA-374.24
STANDARD TYPE 'D'
FRAME & COVER
SEE STANDARD MD-383.81

ALL REINFORCEMENT TO BE #4 0 DIAMETER
DEFORMED BARS AT 6" C/C
2 WAYS 2" COVER EXCEPT AS NOTED

CONCRETE SLAB

SLAB ELEVATION

SECTION C-C

LADDER RUNGS ADJACENT TO MANHOLE

FACE OF NORMAL CURB
GUTTER PAN (TYP)

GUTTER PAN TO BE ROUGH FINISH

"1" THROAT OPENING

"1" (O.A. LENGTH)

"1" (TYP. BOTH ENDS)

PLAN

(Shown without conc. slab)

NOTE:
INLET DEPTH MUST
BE INCREASED WHEN
PIES LARGER THAN
10" ARE USED UNDER
THE TROUGH

NOTE:
CURB OPENING SHOULD NOT ENGAGE ON CROSSEWALK AREAS.
INLETS SHALL BE CONSTRUCTED OF REINFORCED CONCRETE
(MIX NO.2). SIZE, TYPE & DIRECTION OF INLET CONNECTION
WILL VARY TO SUIT CONDITIONS. REINFORCEMENT REQUIRED
ON OUTSIDE AS WELL AS ON INSIDE OF WALLS WHEN "A"
IS GREATER THAN 7'-0" SPACING. SAME AS FOR INSIDE OF
WALL PLACE EXPANSION MATERIAL (SAME TYPE APPROVED
FOR PAVEMENT) AS INDICATED. LADDER RUNGS SHALL
BE IN ACCORDANCE WITH MD-383.91 AND MD-383.92 OR
AS DIRECTED BY THE ENGINEER.

SECTION A-A

JOINT FILLER SHALL BE A CORK
MATERIAL MEETING REQUIREMENTS
OF AASHO M-153 TYPE III

3" RUSTPROOF PIPES
1'-0" LONG WITH FLANGE
AT EACH END. FILL PIPES
WITH CONCRETE.

DIRECTION OF FLOW
LOCATE TROUGHS ON
OPPOSITE SIDE OF INLET
WHEN DIRECTION OF FLOW
IS FROM THAT SIDE.

SECTION B-B

INVERT TO SLOPE 2" PER FOOT
TOWARD OUTLET OR AS DIRECTED.

INLET

COG-5
5'-0" 10'-0" 15'-0" 20'-0"

COG-10
5'-0" 10'-0" 15'-0" 20'-0"

COG-15
5'-0" 10'-0" 15'-0" 20'-0"

COG-20
5'-0" 10'-0" 15'-0" 20'-0"

* THIS DIMENSION TO BE MAINTAINED
FOR ALL STANDARD COG INLETS

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS

STANDARD COG INLET
5', 10', 15', AND 20'

STANDARD NO. CA-374.31
NOTES
1. THIS STANDARD TO BE USED WITH TYPE A COMBINATION CURB AND GUTTER ONLY.
2. CURB OPENINGS SHALL NOT ENCLOSE ON CROSSWALK AREAS.
3. CONCRETE OPENINGS SHALL BE MIX NO. 9 (4500 PSI) FOR PRECAST UNITS AND MIX NO. 3 (3500 PSI) FOR STRUCTURES CAST IN PLACE.
4. INLET MAY BE PRECAST OR CAST IN PLACE. REINFORCEMENT SHALL BE NO. 4 BARS PLACED IN THE CENTER OF INLET WALLS AT 6" C/C IN 2 WAYS OR 2 LAYERS OF 4" x 4" x 0.004 IN. WELDED WIRE FABRIC WITH 1/8" COVERS.
5. A CONCRETE OR BRICK CHANNEL WHICH SLOPES AT LEAST 2 IN/FT TOWARD THE OUTLET SHALL BE PROVIDED IN THE FIELD.
6. GRADE AND SLOPE ADJUSTMENTS SHALL BE COMPLETED IN THE FIELD USING PRECAST ADJUSTMENT COLLAR AND MORTAR.
7. SLOPED TROUGH FLOOR TO BE CAST IN THE FIELD AND USED ONLY WHEN ROAD UNABLE TO 1.5% OR LESS. WHEN SLOPED TROUGH FLOOR IS USED, ROUGHEN PRECAST TROUGH FLOOR.
8. PRECAST INLET JOINTS - THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATERPROOF USING THE MANUFACTURER'S RECOMMENDED SEALANT.
9. LADDER RUNGS SHALL BE PLACED IN VERTICAL ALIGNMENT AT 1'-3" C/C. RUNG TYPE SHALL BE IN ACCORDANCE WITH STANDARDS CA 383.91 OR CA 383.92. RUNGS ARE INCIDENTAL TO THE COST OF THE INLET.
10. ANGLE IRON AND SHEAR STUD CONNECTORS SHALL BE GALVANIZED AFTER WELDING IN ACCORDANCE WITH ASTM A 123. SEE STD. CA 374.55 & CA 374.64.
11. SEE STANDARD CA 374.65 FOR DEPRESSED GUTTER PAN.
12. SEE STANDARD CA 374.64 FOR ALTERNATE PRECAST COG INLETS.
13. PAY MEASUREMENTS FOR CAST IN PLACE UNIT SHALL BE THE SAME AS THE PRECAST UNIT. REFER TO NOTE 14. ALL OTHER DIMENSIONS SHOWN FOR PRECAST SHALL APPLY TO CAST IN PLACE.
14. MINIMUM DEPTH PER EACH SHALL BE 6'-2" MEASURED FROM THE PIPE INLET TO THE TOP OF THE TROUGH SLAB. VERTICAL DEPTH PER LINEAR FOOT SHALL INCLUDE ALL DEPTHS IN EXCESS OF 6'-2" INCLUDING ALL APPURTENANCES.
15. PRECAST BASE UNIT WALLS MAY TAPER PER MANUFACTURER'S DESIGN.

SECTION B-B (SHOWN AS PRECAST)

INLET TYPE T L
COG - 5 5' - 0" 6'-0"
COG - 10 10' - 0" 11'-0"
COG - 15 15' - 0" 16'-0"
COG - 20 20' - 0" 21'-0"

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS
PRECAST OR CAST IN PLACE
SQUARE AND RECTANGULAR COG INLETS
5', 10', 15' AND 20'

STANDARD NO. CA-374.51
PRECAST CONCRETE INLET SLAB
FOR CIRCULAR COG INLETS

* THIS DIMENSION FOR THE 96" AND THE
108" DIAMETER INLETS SHALL BE
THE SAME AS THE WALL THICKNESS
SEE STD. CA 374.62

NO. 4 BARS
AT 6" C/C
2 WAYS

1" DEEP
INTERLOCKING
BLOCKOUT

D + 2W = DIAMETER

4 1/2" SHEAR STUD
CONNECTORS AT
3" - 6" C/C MAX
GALV. AFTER WELDING

DEPRESSED CONCRETE GUTTER TO BE CAST IN THE FIELD
SEE STD. CA 374.65

NORMAL ROADWAY CROSS SLOPE

1/21" x 6' HE DEVICES
20° C/C CAST IN FRONT
FACE OF TROUGH OR
PLASTIC INSERT TO
RECEIVE NO. 4 REBAR

1" DEEP
INTERLOCKING
BLOCKOUT

NO. 4 BARS AT 10"
C/C 2 WAYS

NO. 4 BARS AT 10"
C/C CONTINUOUS
AROUND CORNERS

SECTION C-C
SEE STD. CA 374.51 OR CA 374.62

* * HEIGHT OF THE BACK WALL IS 3/4" HIGHER THAN
THE FRONT WALL DUE TO 2% SLOPE ON THE TOP
TROUGH SLAB.

DETAILS FOR COG & COS INLETS ARE SHOWN ON THE FOLLOWING STANDARDS
CA 374.51 PRECAST OR CAST IN PLACE SQUARE & RECTANGULAR COG INLETS 5', 10', 15', & 20'
CA 374.62 PRECAST CIRCULAR COG INLETS 5', 10', 15', & 20'
CA 374.64 ALTERNATE PRECAST TROUGHS FOR COS AND COS INLETS
CA 374.65 DEPRESSED GUTTER PAN FOR COG & COS INLETS

PRECAST CONCRETE
ADJUSTMENT COLLAR
FOR SQUARE, RECTANGULAR
AND CIRCULAR INLETS
(CAST IN 3", 6", & 9" THICKNESS)
SEE STD. CA 374.51

NO. 4 BAR

3" = 1 BAR
6" = 2 BARS
9" = 3 BARS

NOTES
1. CONCRETE SHALL BE MIX NO. 6 (4500 PSI).
2. ANGLE IRON AND SHEAR STUD CONNECTORS SHALL BE GALVANIZED AFTER WELDING
   IN ACCORDANCE WITH ASTM A 123.

PRECAST CONCRETE
INLET SLABS AND ADJUSTMENT COLLARS
FOR COG INLETS

STANDARD NO. CA-374.55

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS

APPROVAL
DIRECTOR - DEPARTMENT OF PUBLIC WORKS

JULY 1, 2012
DATE

REVISED

SCALE: NTS

DRAWN BY: JFK
2011_0209
PRECAST CONCRETE INLET SLAB
FOR CIRCULAR COG INLETS

* THIS DIMENSION FOR THE 96" AND THE
108" DIAMETER INLETS SHALL BE
THE SAME AS THE WALL THICKNESS
SEE STD. CA 374.62

PRECAST CONCRETE INLET SLAB
FOR SQUARE & RECTANGULAR
COG INLETS
(6" THICK)
SEE STD. CA 374.51

PRECAST CONCRETE ADJUSTMENT COLLAR
FOR SQUARE, RECTANGULAR
AND CIRCULAR INLETS
(CAST IN 3", 6", & 9" THICKNESS)
SEE STD. CA 374.51

NOTES
1. CONCRETE SHALL BE MIX NO.6 (4500 PSI).
2. ANGLE IRON AND SHEAR STUD CONNECTORS SHALL BE GALVANIZED AFTER WELDING
   IN ACCORDANCE WITH ASTM A 123.

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS
PRECAST CONCRETE
INLET SLABS AND ADJUSTMENT COLLARS FOR
COG INLETS TO ACCOMMODATE 6" CURB

STANDARD NO. CA-374.55-01
NOTES
1. THIS STANDARD TO BE USED WITH TYPE A COMBINATION CURB AND GUTTER ONLY.
2. CURB OPENINGS SHALL NOT ENTRAP ON CROSSWALK AREAS.
3. CONCRETE SHALL BE MIX. NO.6 (4500 PSI) FOR PRECAST UNITS AND CONCRETE MIX NO.3 (3500 PSI) FOR CAST IN PLACE UNITS.
4. INLET MAY BE PRECAST OR CAST IN PLACE. REINFORCEMENT SHALL BE EITHER WELDED WIRE FABRIC OR REINFORCING BARS AND SHALL CONFORM TO THE AREAS GIVEN UNDER R IN THE CHART ON THIS SHEET.
5. ANGLE IRON AND SHEAR STUD CONNECTORS SHALL BE GALVANIZED AFTER WELDING IN ACCORDANCE WITH ASTM A 123. SEE STDS. CA 374.55 & 374.64.
6. GRADE AND SLOPE ADJUSTMENTS SHALL BE COMPLETED IN THE FIELD USING PRECAST ADJUSTMENT COLLAR AND MORTAR.
7. A CONCRETE OR BRICK CHANNEL WHICH SLOPES AT LEAST 2 IN./FT. TOWARD OUTLET SHALL BE PROVIDED IN THE FIELD.
8. PRECAST INLET JOINTS–THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATERPROOF USING THE MANUFACTURER'S RECOMMENDED ASTM OR AASHTO APPROVED SEALANT.
9. LADDER RUNGS SHALL BE PLACED IN VERTICAL ALIGNMENT AT 1'-3". C/C. RUNGS SHALL BE INCIDENTAL TO THE COST OF THE INLET.
10. SLOPED TROUGH FLOOR TO BE CONSTRUCTED IN THE FIELD USING BRICK OR CONCRETE AND USED ONLY WHEN ROAD GRADE IS 1.5% OR LESS. WHEN SLOPED TROUGH FLOOR IS USED, ROUNCHED PRECAST TROUGH FLOOR.
11. MINIMUM DEPTH PAYMENT PER EACH SHALL BE 6'-2" MEASURED FROM THE PIPE INVERT TO THE TOP OF THE TROUGH SLAB. VERTICAL DEPTH PAYMENT PER LINEAR FOOT SHALL INCLUDE ALL DEPTHS IN EXCESS OF 6'-2" INCLUDING ALL APPURTENANCES.
12. INLET SLAB NOT REQUIRED FOR 36" DIAMETER INLET. TROUGH SEE DIRECTLY ON TOP OF CIRCULAR UNIT. MORTAR AREA BETWEEN THE OUTSIDE WALLS OF THE TROUGH AND THE UNIT WALLS.
13. SEE STDS. CA 374.64 FOR ALTERNATE PRECAST COG TROUGHS AND ST. CA 374.65 FOR DEPRESSED GUTTER PAN DETAILS.
14. BASE UNIT WALLS MAY TAPER PER MANUFACTURER'S DESIGN.

DEPRESSED GUTTER PAN
ADJUSTMENT COLLAR
STDS. CA 374.55
INLET SLAB SEE STDS. CA 374.55.
NOT REQUIRED FOR 36" DIAMETER UNIT SEE NOTE 12.

See Note 4
1/8" Min. Typ.
Provide 6" Min. Bedding of No.57 Aggregate on Firm Subgrade

SECTION A-A
(Shown Precast)

INLET TYPE
CG-5 5'-0" 6'-0"
CG-10 10'-0" 11'-0"
CG-15 15'-0" 16'-0"
CG-20 20'-0" 21'-0"

FOR SECTIONS A-C AND D-0 393.
STDS CA 374.55

APPROVAL

JULY 1, 2012
DEPARTMENT OF PUBLIC WORKS
CALVERT COUNTY, MD
PRECAST OR CAST IN PLACE
CIRCULAR COG INLETS
5', 10', 15' AND 20'
STANDARD NO. CA-374.62

DRAWN BY: JFK
2011_0209

SCALE: NTS
REVISED

DEPARTMENT OF PUBLIC WORKS
CALVERT COUNTY, MD
PRECAST OR CAST IN PLACE
CIRCULAR COG INLETS
5', 10', 15' AND 20'
STANDARD NO. CA-374.62

DRAWN BY: JFK
2011_0209

SCALE: NTS
REVISED

DEPARTMENT OF PUBLIC WORKS
CALVERT COUNTY, MD
PRECAST OR CAST IN PLACE
CIRCULAR COG INLETS
5', 10', 15' AND 20'
STANDARD NO. CA-374.62

DRAWN BY: JFK
2011_0209

SCALE: NTS
REVISED
NOTES

1. CONCRETE TO BE MIX NO.6 (4500 PSI).
2. ASTM A 185 GRADE 65 STEEL.
3. THESE TROUGHS MAY BE USED AS ALTERNATIVES FOR THOSE SHOWN ON
   STANDARDS CA 374.51 AND CA 374.62.
4. SLOPED TROUGH FLOOR TO BE CONSTRUCTED IN THE FIELD USING BRICK OR
   CONCRETE AND USED ONLY WHEN ROAD GRADE IS 1.5% OR LESS. WHEN SLOPED
   TROUGH FLOOR IS USED, ROUGHEN THE PRECAST TROUGH FLOOR.
5. ANGLE IRON AND SHEAR STUD CONNECTORS SHALL BE GALVANIZED AFTER WELDING
   IN ACCORDANCE WITH ASTM A 123.
6. WHEN USING THESE TROUGHS THE MINIMUM DEPTH PER EACH SHALL BE THE DEPTH
   SPECIFIED FOR THE RESPECTIVE INLET.
Detailed for Cog and COS inlets are shown on the following standards:

CA 374.51 Precast or cast in place square and rectangular cog inlets 5', 10', 15', & 20'
CA 374.55 Precast concrete trough inlet slabs and adjustment collar for Cog and COS inlets
CA 374.62 Precast circular cog inlets 5', 10', 15', & 20'
CA 374.64 Alternate precast troughs for cog inlets

NOTES

1. Cost of depressed concrete gutter pan is incidental to the cost of the inlet.
2. Standard type a combination curb and gutter paid for separately.
1. SLOPED TROUGH FLOOR TO BE CAST IN THE FIELD AND USED ONLY WHEN ROAD GRADE IS 1.5% OR LESS. WHEN SLOPED TROUGH FLOOR IS USED, RIVERWAYS PRECAST TROUGH FLOOR.

2. CONCRETE SHALL BE MIX NO. 6.

3. REINFORCEMENT SHALL BE NO. 4 BARS PLACED IN THE CENTER OF INLET WALLS AT 6" C/C. TWO LAYERS OF 4x4-W4.0/W4.0 WELDED WIRE FABRIC WITH 1 1/2" COVER.

4. FOR MANHOLE FRAME AND COVER SEE CA 383.61.

5. MINIMUM DEPTH PAYMENT SHALL BE 3'-6" MEASURED FROM THE BOTTOM OF THE BASE UNIT TO THE TOP OF THE TROUGH SLAB. VERTICAL DEPTH PAYMENT IN EXCESS OF 3'-6" IS NOT PERMITTED, USE OTHER STANDARDS IF ADDITIONAL VERTICAL DEPTH IS REQUIRED.

6. PIPE TO BE PAID FOR SEPARATELY.
PLAN

FRONT ELEVATION

DETAIL A - A

NOTE:
CONCRETE = MD. S.H.A. MIX NO. 6 (4500 P.S.I.)
FINISH = GRANOLITHIC

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS
PRECAST SINGLE WR INLET
CURB HEAD

STANDARD NO. CA-374.235
GENERAL NOTES

1. The inlet is to be constructed of concrete mix NO.2 or brick. If inlet is constructed of concrete, the reinforcement is to be No.4 deformed bars, 6" C/C, 2" cover.
2. Grate is to be of steel construction and shall be square, flat & true.
4. Grate to be galv. after fabrication in accordance with A.S.T.M. designation A-123.
5. See latest S.H.A. specifications.
6. This inlet is to be used in median ditches and any ditch beyond the shoulder area. This inlet is not to be used in roadway or shoulder pavement areas or areas where bicycle or motorcycle traffic is anticipated.

NOTE: Grate to be as shown or furnish approved equivalent.

SECTION A-A

SECTION B-B SINGLE OPENING

SECTION B-B DOUBLE OPENING

SECTION C-C

TYPICAL BOTH INLETS (SHOWN WITHOUT GRATE)

DOUBLE OPENING (SHOWN WITHOUT GRATE)

SINGLE OPENING

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS
STANDARD SINGLE OR DOUBLE OPENING
TYPE K INLET OPEN – END GRATE

STANDARD NO. CA-378.05
CAST IRON FRAME & COVER
(SEE STANDARD CA-383.03)

3/4" PARGING

INLET
CONNECTION

MANHOLE WALL THICKNESS
8" TO DEPTH OF 12'-0"
12 1/2" BELOW DEPTH OF 12'-0"
(EXCLUSIVE OF PARGING)

FOR LADDER RUNG
DETAILS
SEE STANDARD NO.
CA-383.91

BRICK

LADDER RUNGS

4'-0" DIAMETER

12 1/2"

BRICK ON EDGE
FALL PER FOOT

7'-0" FOR MANHOLES MORE THAN 12' DEEP
5'-0" FOR MANHOLES LESS THAN 12' DEEP

FOUNDATION
(MD. S.H.A. MIX NO. 2)

MIN. 12 1/2'

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS
STANDARD STORMWATER MANHOLE
STANDARD NO. CA-383.02

APPROVAL
JULY 1, 2012
DIRECTOR - DEPARTMENT OF PUBLIC WORKS
DATE

REVISED

SCALE: NTS

DRAWN BY: JFK
2011_0209
NOTE: FRAME AND COVER TO BE OF CAST IRON AND TO WEIGH APPROXIMATELY 250 LBS. & 190 LBS. RESPECTIVELY.

SECTION A-A

STORMWATER

PLAN

MATERIAL - CAST IRON (A.S.T.M. A 48, CLASS 30 B)

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS

STANDARD STORMWATER MANHOLE
FRAME AND COVER

STANDARD NO. CA-383.03
MATERIAL - CAST IRON
APPROX. WEIGHT OF FRAME 66 LBS.
APPROX. WEIGHT OF COVER 107 LBS.

SECTION A-A
SECTION A-A

SECTION B-B
ALUMINUM ALLOY
(SOLID BAR)

SECTION C-C

SECTION D-D
CAST IRON

SECTION B-B
EPOXY COATED STEEL

SECTION B-B
ALUMINUM ALLOY
(HOLLOW BAR)

NOTES

Metal ladder rungs are to be used in inlets, manholes, and junction boxes over three feet in depth or as directed by the engineer. Used either with brick or concrete construction (whichever construction is employed), the mortar joints shall be adjusted to accommodate ladder rungs.

1. Aluminium alloy—shall conform to A.S.T.M. designation B 221 alloy 6061-T6. That portion embedded in the structure shall be coated with zinc chromate or approved equivalent coating.

2. Cast iron—shall conform to A.S.T.M. A-48 Class 30 B.

3. Epoxy coated steel—shall conform to A.S.T.M. designation A-615 Grade 40.

4. Aluminium alloy—shall conform to A.S.T.M. designation B 221 alloy 6061-T6. That portion embedded in the structure shall be coated with zinc chromate or approved equivalent coating.
NOTES
1. TYPES A & B ARE TO BE DRIVEN INTO RECEPTACLES THAT ARE CAST INTO THE WALL.
2. TYPE C IS FOR BRICK AND BLOCK INSTALLATIONS.
3. TYPE D IS PRESS FITTED INTO PREFORMED CONCRETE HOLES.
4. LADDER RUNGS ARE TO BE USED IN INLETS, MANHOLES, AND JUNCTION BOXES OVER THREE FEET IN DEPTH OR AS DIRECTED BY THE ENGINEER, USED EITHER WITH BRICK OR CONCRETE CONSTRUCTION. (WHERE BRICK CONSTRUCTION IS EMPLOYED, THE MORTAR JOINTS SHALL BE ADJUSTED TO ACCOMMODATE LADDER RUNGS.)
5. COPOLYMER POLYPROPYLENE ENCAPSULATED 1/2 IN. DIA. STEEL REINFORCEMENT BAR. STEEL SHALL CONFORM TO ASTM 615 GRADE 60. COPOLYMER POLYPROPYLENE SHALL BE CERTIFIED BY THE MANUFACTURER TO CONFORM TO ASTM D 4101 AND HAVE A MINIMUM EXPOSED SECTION THICKNESS OF 1/8 IN.
6. SECTION A-A SHOWS 1/2" DIA. STEEL REINFORCEMENT BAR.
7. INSTALLATION SHALL CONFORM TO MANUFACTURER'S RECOMMENDATIONS.
**ALTERNATE ECCENTRICAL CONE UNIT**

GRADE ADJUSTMENT RING REINFORCED AS PER AASHTO M 199.

WALL REINFORCEMENT SEE NOTE 3.

LADDER RUNGS SEE NOTE 6.

JOINTS SEE NOTE 5.

Drip Stone Landing SEE NOTE 10.

Channel SEE NOTE 9.

Concrete or Brick Edge 1/4" Fall per Foot.

Flanged Conc. Base (Optional).

Base & Base Reinforcing SEE NOTE 4.

Promote 6" Min. Bedding of No. 57 Aggregate Below Concrete Base.

SECTION VIEW (SHOWN WITHOUT FRAME AND COVERS)

**FLAT SLAB TOP**

(Shown without frame and covers)

4 ADDITIONAL NO. 5 BARS DIAGONALLY AROUND OPENING.

NO. 5 BARS 12" C/C 2 WAYS.

FRAME ANCHORAGE SEE STANDARD CA-384.02.

BASE UNIT OR RISER UNIT.

**NOTES**

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M199.
2. CONCRETE SHALL BE MIX NO. 8 (4500 PSI).
3. WALL REINFORCEMENT FOR BASE UNITS, RISER UNITS, AND ECCENTRICAL CONE UNITS SHALL BE REINFORCEMENT BARS OR WELDED WIRE FABRIC WITH A MINIMUM AREA OF 0.12 SQ. IN./FT. FOR THE 48" DIAMETER MANHOLES. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 AND AB2 REINFORCEMENT BARS SHALL MEET ASTM A 615, GRADE 50.
4. BASE REINFORCEMENT SHALL BE REINFORCEMENT BARS OR WELDED WIRE FABRIC WITH A MINIMUM AREA OF 0.14 SQ. IN./FT. THE BASE MAY BE CAST MONOLITHIC WITH THE BASE UNIT OR JOINTED PER MANUFACTURER'S DESIGN.
5. THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATERPROOF. MORTAR, RUBBER O-RING GASKETS MEETING ASTM C 351 & C 443 OR FLEXIBLE PLASTIC GASKETS MEETING AASHTO M 198 TYPE B.
6. LADDER RUNGS SHALL BE INSTALLED IN VERTICAL ALIGNMENT AT 1'-3" C/C RUNG TYPES SHALL BE IN ACCORDANCE WITH STANDARD CA-383.91. LADDER RUNGS SHALL BE INCIDENTAL TO THE COST OF THE MANHOLE.
7. WHEN THE DISTANCE BETWEEN MULTIPLE OPENINGS IN THE BASE UNIT OR ANY RISER UNIT IS LESS THAN 6', ADDITIONAL NO. 3 BARS ARE REQUIRED AROUND OPENINGS.
8. LIFT HOLES OR LIFT EYES SHALL BE PROVIDED IN EACH SECTION FOR HANDLING.
9. MIX NO. 2 CONCRETE OR BRICK CHANNEL SHALL BE PROVIDED IN THE FIELD AND SHALL SLOPE 2" PER FOOT TOWARD OUTLET OR AS DIRECTED BY THE ENGINEER.
10. THE Drip Stone Landing shall be used only when there are pipes connected to the riser units. See Standard CA-384.13 for details.
11. MINIMUM DEPTH PAYMENT PER EACH SHALL BE 3'-11" MEASURED FROM THE BOTTOM OF THE BASE UNIT TO THE TOP OF THE MANHOLE COVER. VERTICAL DEPTH PAYMENT PER LINEAR FOOT SHALL INCLUDE ALL DEPTHS IN EXCESS OF 3'-11". THE COST OF THE Drip Stone Landing, No. 57 aggregate, grout, sealant, and all necessary appurtenances shall be incidental to the price bid.

**CALVERT COUNTY, MD**
**DEPARTMENT OF PUBLIC WORKS**

48 IN. DIAMETER PRECAST MANHOLE FOR 12 IN. TO 24 IN. PIPES

STANDARD NO. CA-384.01

**APPROVAL**

**DATE**

**DIRECTOR - DEPARTMENT OF PUBLIC WORKS**

**REVISED**

**SCALE:** NTS

**DRAWN BY:** JFK

2011_0209
3 1/2" DIA. HEX HEAD BOLTS WITH THREADED INSERTS OR
3 1/2" THREADED STUDS WITH HEX HEAD NUTS. STUDS TO BE GROUTED IN PLACE OR ANCHORED WITH A CONCRETE COMPATIBLE CHEMICAL ADHESIVE.

3 5/8" DIA. HOES FIELD DRILLED THROUGH FRAME.

STANDARD STORMWATER MANHOLE FRAME & COVER
SEE STANDARD CA-383.03

GRADE ADJUSTMENT VARIES 4' TYPICAL

ECCENTRICAL CONE UNIT, ALTERNATE ECCENTRICAL CONE UNIT OR FLAT SLAB TOP (SHOWN IS THE ECCENTRICAL CONE UNIT)

SECTION A-A
ECCENTRICAL CONE REDUCER
(ALTERNATE FOR FLATTOP REDUCER)

SECTION A-A

NOTES

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M 1999.
2. CONCRETE SHALL BE MIX NO. 6 (4500 PSI).
3. WALL REINFORCEMENT FOR BASE UNITS, RISER UNITS, AND ECCENTRICAL CONE UNITS SHALL BE REINFORCEMENT BARS OR WELDED WIRE FABRIC WITH A MINIMUM AREA OF 0.12 SQ. IN./FT, FOR THE 48" DIAMETER MANHOLES. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 AND A2B REINFORCEMENT BARS SHALL MEET ASTM A 615, GRADE 60.
4. BASE REINFORCEMENT SHALL BE REINFORCEMENT BARS OR WELDED WIRE FABRIC WITH A MINIMUM AREA OF 0.14 SQ. IN./FT. THE BASE MAY BE CAST MONOLITHIC WITH THE BASE UNIT OR JOINTED PER MANUFACTURER'S DESIGN.
5. THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATERTIGHT, MORTAR, RUBBER O-RING GASKETS MEETING ASTM C 351 & C 443 OR FLEXIBLE PLASTIC GASKETS MEETING AASHTO M 198 TYPE B.
6. LADDER RUNGS SHALL BE INSTALLED IN VERTICAL ALIGNMENT AT 1½ - 3½" C/C RUNG TYPES SHALL BE IN ACCORDANCE WITH STANDARD CA-363.91. LADDER RUNGS SHALL BE INCIDENTAL TO THE COST OF THE MANHOLE.
7. WHEN THE DISTANCE BETWEEN MULTIPLE OPENINGS IN THE BASE UNIT OR ANY RISER UNIT IS LESS THAN 6", ADDITIONAL NO. 3 BARS ARE REQUIRED AROUND OPENINGS.
8. LIFT HOLES OR LIFT EYES SHALL BE PROVIDED IN EACH SECTION FOR HANDLING.
9. MIX NO. 2 CONCRETE OR BRICK CHANNEL SHALL BE PROVIDED IN THE FIELD AND SHALL SLOPE 2" PER FOOT TOWARD OUTLET OR AS DIRECTED BY THE ENGINEER.
10. THE DRAIN LANDING SHALL BE USED ONLY WHEN THERE ARE PIPES CONNECTED TO THE RISER UNITS. SEE STANDARD CA-384.03 FOR DETAILS.
11. MINIMUM DEPTH PAYMENT PER EACH SHALL BE 5½" MEASURED FROM THE BOTTOM OF THE BASE UNIT TO THE TOP OF THE MANHOLE COVER. VERTICAL DEPTH PAYMENT PER LINEAR FOOT SHALL INCLUDE ALL DEPTHS IN EXCESS OF 5½". THE COST OF THE DRAIN LANDING, NO. 57 AGGREGATE, GROUT, SEALANT, AND ALL NECESSARY APPURTENANCES SHALL BE INCIDENTAL TO THE PRICE BID.

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS

60 IN. DIAMETER PRECAST MANHOLE
FOR 27 IN. TO 36 IN. PIPES

STANDARD NO. CA-384.03
ECCENTRIC CONE REDUCER
(ALTERNATE FOR FLATTOP REDUCER)

SECTION VIEW

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M1999.
2. CONCRETE SHALL BE MIX NO. 6 (4500 PSI).
3. WALL REINFORCEMENT FOR BASE UNITS, RISER UNITS, AND ECCENTRIC CONE UNITS SHALL BE REINFORCEMENT BARS OR WELDED WIRE FABRIC WITH A MINIMUM AREA OF 0.16 SQ. IN./FT. FOR THE 72" DIAMETER MANHOLES. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 195 AND A82 REINFORCEMENT BARS SHALL MEET ASTM A 615, GRADE 60.
4. BASE REINFORCEMENT SHALL BE REINFORCEMENT BARS OR WELDED WIRE FABRIC WITH A MINIMUM AREA OF 0.27 SQ. IN./FT. THE BASE MAY BE CAST MONOLITHIC WITH THE BASE UNIT OR JOINTED PER MANUFACTURER'S DESIGN.
5. THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATERTIGHT. MORTAR, RUBBER O-RING GASKETS MEETING ASTM C 361 & C 443 OR FLEXIBLE PLASTIC GASKETS MEETING AASHTO M 198 TYPE B.
6. LADDER RUNGS SHALL BE INSTALLED IN VERTICAL ALIGNMENT AT 1"-3" C/C RUNG TYPES SHALL BE IN ACCORDANCE WITH STANDARD CA-383.91.
7. LADDER RUNGS SHALL BE INCIDENTAL TO THE COST OF THE MANHOLE.
8. WHEN THE DISTANCE BETWEEN MULTIPLE OPENINGS IN THE BASE UNIT OR ANY RISER UNIT IS LESS THAN 6", ADDITIONAL NO. 3 BARS ARE REQUIRED AROUND OPENINGS.
9. LIFT HOLES OR LIFT EYES SHALL BE PROVIDED IN EACH SECTION FOR HANDLING.
10. MIX NO. 2 CONCRETE OR BRICK CHANNEL SHALL BE PROVIDED IN THE FIELD AND SHALL SLOPE 2" PER FOOT TOWARD OUTLET OR AS DIRECTED BY THE ENGINEER.
11. MINIMUM DEPTH PAYMENT PER EACH SHALL BE 6'-1" MEASURED FROM THE BOTTOM OF THE BASE UNIT TO THE TOP OF THE MANHOLE COVER, VERTICAL DEPTH PAYMENT PER LINEAR FOOT SHALL INCLUDE ALL DEPTHS IN EXCESS OF 6'-1". THE COST OF THE Drip Stone Landing, NO. 57 AGGREGATE, GROUT, SEALANT, AND ALL NECESSARY APPURTENANCES SHALL BE INCIDENTAL TO THE PRICE BID.

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS
72 IN. DIAMETER PRECAST MANHOLE
FOR 42 IN. TO 48 IN. PIPES
STANDARD NO. CA-384.05
NOTES

1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M1999.
2. CONCRETE SHALL BE MIX NO. 6 (4500 PSI).
3. WALL REINFORCEMENT FOR BASE UNITS, RISER UNITS, AND ECCENTRICAL CONE UNITS SHALL BE REINFORCEMENT BARS OR WELDED WIRE FABRIC WITH A MINIMUM AREA OF 0.21 SQ. IN./FT. FOR THE 84" DIAMETER MANHOLES. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 165 AND AB2 REINFORCEMENT BARS SHALL MEET ASTM A 615, GRADE 60.
4. BASE REINFORCEMENT SHALL BE REINFORCEMENT BARS OR WELDED WIRE FABRIC WITH A MINIMUM AREA OF 0.27 SQ. IN./FT. THE BASE MAY BE CAST MONOLITHIC WITH THE BASE UNIT OR JUNCTED PER MANUFACTURER'S DESIGN.
5. THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATERTIGHT, MORTAR, RUBBER O-RING GASKETS MEETING ASTM C 361 & C 443 OR FLEXIBLE PLASTIC GASKETS MEETING AASHTO M 195 TYPE B.
6. LADDER RUNGS SHALL BE INSTALLED IN VERTICAL ALIGNMENT AT 1'-3" C/C RUNG TYPES SHALL BE IN ACCORDANCE WITH STANDARD CA-383.91. LADDER RUNGS SHALL BE INCIDIONAL TO THE COST OF THE MANHOLE.
7. WHEN THE DISTANCE BETWEEN MULTIPLE OPENINGS IN THE BASE UNIT OR ANY RISER UNIT IS LESS THAN 6", ADDITIONAL NO. 3 BARS ARE REQUIRED AROUND OPENINGS.
8. LIFT HOLES OR LIFT EYES SHALL BE PROVIDED IN EACH SECTION FOR HANDLING.
9. MIX NO. 2 CONCRETE OR BRICK CHANNEL SHALL BE PROVIDED IN THE FIELD AND SHALL SLOPE 2" PER FOOT TOWARD OUTLET OR AS DIRECTED BY THE ENGINEER.
10. THE DRIP STONE LANDING SHALL BE USED ONLY WHEN THERE ARE PIPES CONNECTED TO THE RISER UNITS. SEE STANDARD CA-384.13 FOR DETAILS.
11. MINIMUM DEPTH PAYMENT PER EACH SHALL BE 10"-1" MEASURED FROM THE BOTTOM OF THE BASE UNIT TO THE TOP OF THE MANHOLE COVER. VERTICAL DEPTH PAYMENT PER LINEAR FOOT SHALL INCLUDE ALL DEPTHS IN EXCESS OF 10"-1" THE COST OF THE DRIP STONE LANDING, NO. 57 AGGREGATE, GROUT, SEALANT, AND ALL NECESSARY APPURTENANCES SHALL BE INCIDENTAL TO THE PRICE BID.
1. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M1999.
2. CONCRETE SHALL BE MIX NO. 6 (4500 PSI).
3. WALL REINFORCEMENT FOR BASE UNITS, RISER UNITS, AND ECCENTRICAL CONE UNITS SHALL BE REINFORCEMENT BARS OR WELDED WIRE FABRIC WITH A MINIMUM AREA OF 0.30 SQ. IN./FT. FOR THE 120" DIAMETER MANHOLES. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 AND A62. REINFORCEMENT BARS SHALL MEET ASTM A 615, GRADE 60.
4. BASE REINFORCEMENT SHALL BE REINFORCEMENT BARS OR WELDED WIRE FABRIC WITH A MINIMUM AREA OF 0.39 SQ. IN./FT. THE BASE MAY BE CAST MONOLITHIC WITH THE BASE UNIT OR JOINTED PER MANUFACTURER’S DESIGN.
5. THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATERPROOF. MORTAR, RUBBER O-RING GASKETS MEETING ASTM C 361 & C 443 OR FLEXIBLE PLASTIC GASKETS MEETING AASHTO M 198 TYPE B.
6. LADDER RUNGS SHALL BE INSTALLED IN VERTICAL ALIGNMENT AT 1'-3" C/C RUNG TYPES SHALL BE IN ACCORDANCE WITH STANDARD CA-384.91. LADDER RUNGS SHALL BE INCIDENTIAL TO THE COST OF THE MANHOLE.
7. WHEN THE DISTANCE BETWEEN MULTIPLE OPENINGS IN THE BASE UNIT OR ANY RISER UNIT IS LESS THAN 6", ADDITIONAL NO. 3 BARS ARE REQUIRED AROUND OPENINGS.
8. LIFT HOLES OR LIFT EYES SHALL BE PROVIDED IN EACH SECTION FOR HANDLING.
9. MIX NO. 2 CONCRETE OR BRICK CHANNEL SHALL BE PROVIDED IN THE FIELD AND SHALL SLOPE 2" PER FOOT TOWARD OUTLET OR AS DIRECTED BY THE ENGINEER.
10. THE DRIP STONE LANDING SHALL BE USED ONLY WHEN THERE ARE PIPES CONNECTED TO THE RISER UNITS. SEE STANDARD CA-384.13 FOR DETAILS.
11. MINIMUM DEPTH PAYMENT PER EACH SHALL BE 10'-7" MEASURED FROM THE BOTTOM OF THE BASE UNIT TO THE TOP OF THE MANHOLE COVER. VERTICAL DEPTH PAYMENT PER LINEAL FOOT SHALL INCLUDE ALL DEPTHS IN EXCESS OF 10'-7". THE COST OF THE DRIP STONE LANDING, NO. 57 AGGREGATE, GROUT, SEALANT, AND ALL NECESSARY APPURTENANCES SHALL BE INCIDENTAL TO THE PRICE BID.

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS
120 IN. DIAMETER PRECAST MANHOLE
FOR 78 IN. TO 84 IN. PIPES
STANDARD NO. CA-384.11

APPROVAL
JULY 1, 2012
DIRECTOR - DEPARTMENT OF PUBLIC WORKS
CALENDAR YEAR
DRAWN BY: JFK
2011_0209
REVISED
SCALE: NTS
DATE
PLAN
(FRAME AND COVER NOT SHOWN)

SECTION A-A

NOTES

1. CONCRETE SHALL BE MIX NO. 6 (4500 PSI).
2. THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN.
3. LIFT HOLES OR LIFT EYES SHALL BE PROVIDED IN EACH SECTION FOR HANDLING.
4. THE COST OF THE PRECAST FLAT SLAB TOP IS INCIDENTAL TO THE COST OF THE 120" PRECAST MANHOLE.
5. FOR USE WITH THE 120" DIAMETER PRECAST MANHOLE. SEE STD. CA-384.11.

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS
PRECAST FLAT SLAB TOP FOR
120" DIAMETER PRECAST MANHOLE
STANDARD NO. CA-384.12

DATE: JULY 1, 2012

Director - Department of Public Works

REVISED

DRAWN BY: JFK

SCALE: NTS

2011_0209

APPROVAL

LARRY S. CARLSON

CONCEPT PRINTS, INC.

DRAWN BY: JFK

2011_0209
**METHOD OF PLACING Drip STONE LANDINGS**

**NOTES**

1. The drip stone landing shall be used only when there are pipes connected to the riser units.
2. Concrete shall be mix no. 6 (4500 psi).
3. Reinforcement shall meet ASTM A 615 grade 60.
4. The manufacturer shall form male and female ends of joints using their own design.
5. Lift eyes shall be provided for handling.
6. Cost for the drip stone landing is incidental to the cost of the manhole.

<table>
<thead>
<tr>
<th>PRECAST MANHOLE DIAMETER</th>
<th>DRIP STONE DIMENSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>48&quot;</td>
<td>4'-10&quot; 8&quot; 2'-5&quot;</td>
</tr>
<tr>
<td>60&quot;</td>
<td>6'-0&quot; 8&quot; 3'-7&quot;</td>
</tr>
<tr>
<td>72&quot;</td>
<td>7'-2&quot; 8&quot; 4'-9&quot;</td>
</tr>
<tr>
<td>84&quot;</td>
<td>8'-4&quot; 8&quot; 5'-11&quot;</td>
</tr>
<tr>
<td>96&quot;</td>
<td>9'-6&quot; 9&quot; 7'-0&quot;</td>
</tr>
<tr>
<td>120&quot;</td>
<td>11'-8&quot; 10&quot; 9'-1&quot;</td>
</tr>
</tbody>
</table>

**CALVERT COUNTY, MD**

**DEPARTMENT OF PUBLIC WORKS**

**PRECAST Drip STONE LANDING DETAILS**

**FOR 48 IN. TO 120 IN. DIAMETER MANHOLES**

**STANDARD NO. CA-384.13**

**APPROVAL**

**JULY 1, 2012**

**DIRECTOR - DEPARTMENT OF PUBLIC WORKS**

**REVISED**

**SCALE: NTS**

**DRAWN BY: JFK**

**2011_0209**
NOTES

1. THE COMBINATION FLATTOP REDUCER DRIP STONE LANDING SHALL BE USED ONLY WHEN THERE ARE PIPES CONNECTED TO THE RISER UNITS. SEE STANDARD CA-384.13 FOR PLACEMENT.
2. CONCRETE SHALL BE MIX NO. 6 (4500 PSI).
3. REINFORCEMENT SHALL MEET ASTM A 615 GRADE 60.
4. THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN.
5. LIFT EYES SHALL BE PROVIDED FOR HANDLING.
6. COST FOR THE DRIP STONE LANDING IS INCIDENTAL TO THE COST OF THE MANHOLE.
**NOTES**

1. THE COMBINATION ECCENTRICAL CONE UNIT AND DRIP STONE LANDING SHALL BE USED ONLY WHEN THERE ARE PIPES CONNECTED TO THE RISER UNITS. SEE STANDARD CA-384.13 FOR PLACEMENT.
2. CONCRETE SHALL BE MIX NO. 6 (4500 PSI).
3. REINFORCEMENT SHALL MEET ASTM A 615 GRADE 60.
4. THE MANUFACTURER SHALL FURNISH MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN.
5. LIFT EYES SHALL BE PROVIDED FOR HANDLING.
6. COST FOR THE DRIP STONE LANDING IS INCIDENTAL TO THE COST OF THE MANHOLE.

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<thead>
<tr>
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<tr>
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<td>6'-0&quot;</td>
</tr>
<tr>
<td>72&quot;</td>
<td>7'-2&quot;</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>W</th>
<th>X</th>
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</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>3'-6&quot;</td>
</tr>
<tr>
<td>6'-0&quot;</td>
<td>4'-7&quot;</td>
</tr>
</tbody>
</table>
NOTE: COST OF TOE WALL TO BE INCIDENTAL TO SQUARE YARDS OF 5" CONCRETE GUTTER.

PLAN

ISOMETRIC VIEW

SECTION "A-A"

FLOW LINE

REINFORCEMENT DATA
ALL BARS TO BE NO. 3

1. BENT BARS
2. STRAIGHT BAR.
3. COVER TO BE 1/2" THICKNESS OF CONC. MIN. COVER ON ENDS.
4. EXPANSION MATERIAL.

FORM CHAMFER OR Rounding ON EARTH FORM.

2'-0" MIN. VARIABLE 2'-0" MIN.

12" 5" MIN.
NOTE: ROW OF STONES (AS SHOWN BELOW) OR PRECAST CONCRETE BLOCKS (4"x8"x8") SHALL BE 18" APART, STAGGER ALTERNATE ROWS.

SECTION A-A

STONES OR BLOCKS TO BE EMBEDDED 3" MIN.
TYPICAL NON-ROADSIDE DITCH
(NOT TO SCALE)

GENERAL NOTES

1. A GRADING PERMIT MUST BE OBTAINED BEFORE ANY CLEARING AND/OR DITCHING IS PERMITTED.

2. DITCH ELEVATIONS AND GRADIENT SHALL BE NOTED ON PLANS AND/OR PROFILES. MINIMUM GRADIENT ON ALL DITCHES SHALL BE 1.0%. ALL DITCHES INCLUDING OUTLET DITCHES MUST HAVE ADEQUATE CAPACITY TO CONTAIN DESIGN FLOWS.

5. ALL DITCHES WHICH EXCEED 4 FEET IN DEPTH SHALL BE PIPED. THE PIPE DESIGN MUST BE APPROVED BY CALVERT COUNTY DEPARTMENT OF PUBLIC WORKS.

6. ALL SLOPES TO BE SEEDED AND MULCHED.

7. WITHIN THE AREA DESIGNATED AS "DRAINAGE AND MAINTENANCE EASEMENT", OBJECTS (SUCH AS TREES, SHRUBS, STRUCTURES, FENCES, SIDEWALKS, PAVED DRIVEWAYS, AND/OR UTILITIES) WHICH MAY ACT AS AN OBSTRUCTION TO THE INTENDED USE AND/OR MAINTENANCE OF THIS EASEMENT, SHALL NOT BE PERMITTED.
SEE PLATES RD-19A AND RD-19B FOR DETAILS OF STANDARD COMB. CONCRETE CURB & GUTTER.

SEE PLATES RD-20A AND RD-20B FOR DETAILS OF STANDARD SIDEWALK AND GRASSLOT.

NO SLOPE SHALL EXCEED 12:1 ON THE RAMP OR SIDEWALK.

SURFACE TEXTURE OF RAMP SHALL BE COARSE BROOMING OR NON-SKID TYPE SURFACE

1/2" +/- 1/8" LIP

DETECTABLE WEARING SURFACE
STANDARD MD-655.40

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS

SIDEWALK RAMPS
FOR THE HANDICAPPED
TYPE "A"

STANDARD NO. CA-650.10
NO SLOPE SHALL EXCEED 12:1 ON THE RAMP OR SIDEWALK.

SURFACE TEXTURE OF RAMP SHALL BE COARSE BROOMING OR NON-SKID TYPE SURFACE

1/2” +/− 1/8” LIP

DETECTABLE WEARING SURFACE STANDARD MD-655.40

SEE PLATES RD-19A AND RD-19B FOR DETAILS OF STANDARD COMB. CONCRETE CURB & GUTTER.

SEE PLATES RD-20A AND RD-20B FOR DETAILS OF STANDARD SIDEWALK AND GRASSPLOT.

PLAN VIEW

ISOMETRIC VIEW

CALVERT COUNTY, MD
DEPARTMENT OF PUBLIC WORKS
SIDEWALK RAMPS FOR THE HANDICAPPED TYPE "B"

STANDARD NO. CA-650.11
PLAN VIEW

HEIGHT OF THE CURB 7'

SECTION A-A

SURFACE Texture OF RAMP SHALL BE COARSE BROOMING OR NON-SKID TYPE SURFACE

NOTE:
DETAIL TO BE USED WHERE SIDEWALK IS ADJACENT TO CURB. THIS DETAIL MAY BE MODIFIED TO SUIT A PARTICULAR SITUATION.