

# CHAPTER 5. ENGINEERING AND CONSTRUCTION STANDARDS

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35

1 **Article 5.1 General**

2 **5.1.1 Purpose**

3 The purpose of this Chapter is to set standards for the construction of public improvements to  
4 serve new development and for the reconstruction and upgrading of existing public  
5 infrastructure within the County. These improvements include roads, bikeways, sidewalks, on-  
6 site parking, stormwater management facilities, erosion control, and other enhancements as  
7 required by the development review process, this Code, the Charlotte County Code of Laws  
8 and Ordinances, and other policies that may be adopted by the Board of County  
9 Commissioners.

10 **5.1.2 Applicability**

11 The standards in this Chapter shall apply to all improvements within existing public rights-of-  
12 way, to all improvements within any proposed public and private rights-of-way, and for all  
13 improvements that require the approval of the County Engineer.

14 **5.1.3 Permits Required**

15 All construction within the public rights-of-way shall require a Right-of-Way Permit. Specific  
16 stipulations or conditions regarding the project will be imposed at the time of permit approval.

17 **5.1.4 Florida Greenbook**

- 18 1. Per Florida Statute, all construction and maintenance activities within the County's  
19 rights-of-way must comply with the latest edition of the Florida Department of  
20 Transportation's Manual of Uniform Minimum Standards for Design, Construction,  
21 and Maintenance for streets and Highways, commonly known as the "Florida  
22 Greenbook".

23 The Greenbook is available at the Florida Department of Transportation website:

24 <http://www.dot.state.fl.us>

- 25 2. In those instances where Charlotte County's standards exceed the minimum  
26 standards set forth in the "Greenbook", the standards in this Chapter shall  
27 supercede and control.

28 **5.1.5 County Engineer**

29 In case of unique circumstances regarding improvements within existing public rights-of-way,  
30 the County Engineer may waive the requirements of this Chapter.

31

**Article 5.2 Roads**

**5.2.1 Functional Classification**

All streets in the County shall be classified as depicted on Smart Charlotte 2050 FTRAM Series Map #1: Roadway Functional Classification.

**5.2.2 Street Design**

**A. Lane Widths**

1. Lane widths for local roads shall be a minimum of 11 feet.
2. Lane widths for all other road classifications shall be a minimum of 12 feet

**B. Paved Shoulders**

1. Local roads do not require paved shoulders.
2. All other road classifications shall require a minimum paved shoulder of four feet on the outside edge of the outermost travel lane in each direction.

**C. Structural Cross Sections**

The structural cross sections for all road classifications shall comply with the following table:

Road Classification	Subgrade 12"	Base Group*	Structural Coarse	Wearing Surface
Shoulder	Same as abutting pavement			
Local	LBR 40	6	1.25"	1.25"
Collector (Minor)	LBR 70	7	2.50"	1.25"
Collector (Major)	LBR 70	9	3.25"	1.25"
Arterial	LBR 70	10	4.25"	1.25"

\*Base Group per latest edition of FDOT Design Standards

**D. Intersection Sight Obstruction Requirements**

**1. Road-to-Road Intersections**

All road-to-road intersections shall be designed to provide minimum unobstructed sight lines in accordance with the latest edition of the *Florida Greenbook*.

**2. Road-to-Driveway Intersections**

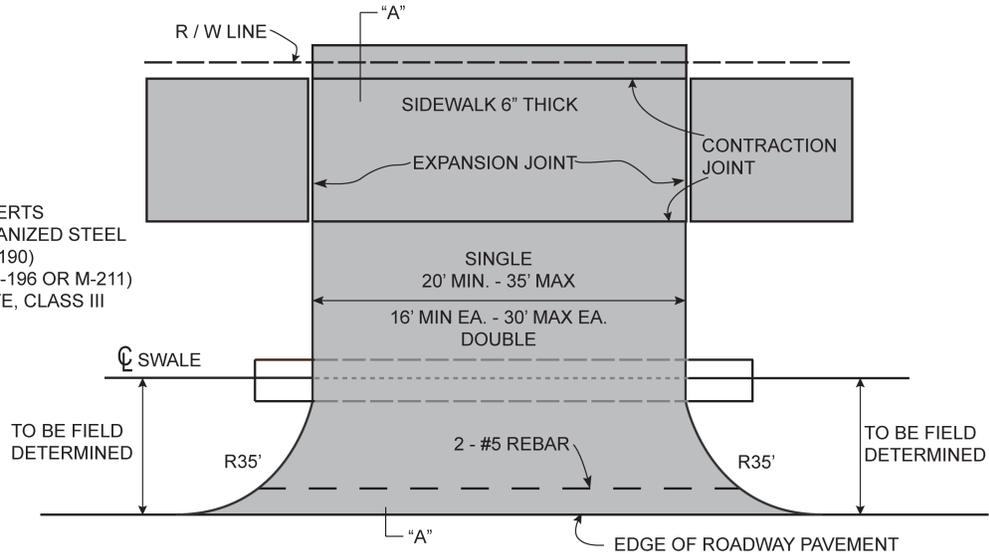
Curb cuts should only be as wide as necessary to accommodate needed lanes, and curb radii shall be a minimum of 25 feet.

**E. Utility Accommodations**

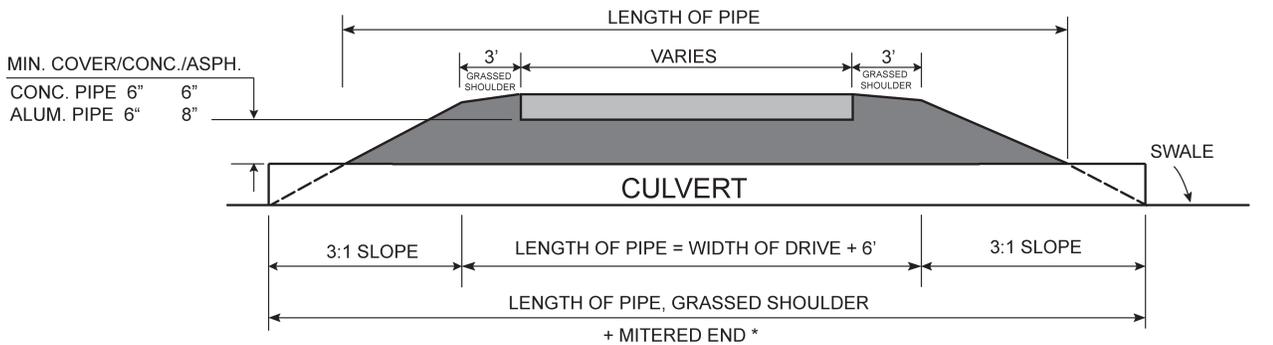
1. Utilities must be placed within established or planned road rights-of-way as much as possible. Drainage and utility easements may be used when the road right-of-way is not available.
2. Placement of utilities should be done according to the following standards as much as possible:
  - a. Potable and recycled water lines and all overhead utility lines shall be placed along the north and west sides of road rights-of-way.
  - b. Sanitary sewer lines and all other underground utility lines shall be placed along the south and east sides of road rights-of-way.
  - c. All aboveground facilities shall be placed at the outermost edge of the road right-of-way.



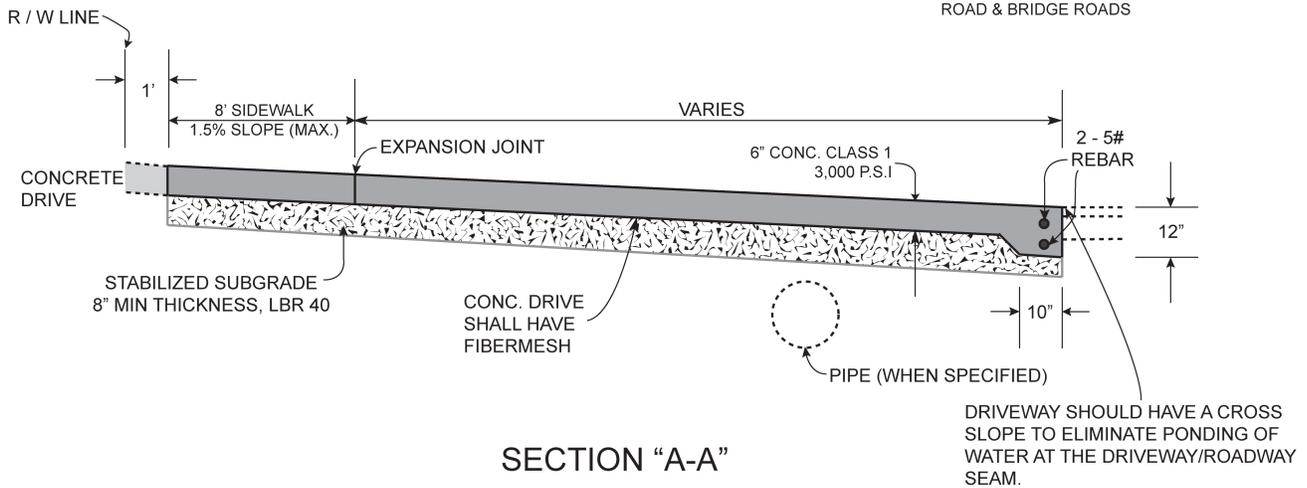
- SPECIFICATIONS OF CULVERTS**  
 A. ASPHALT COATED GALVANIZED STEEL (A.A.S.H.T.O. M-35 OR M-190)  
 B. ALUMINIUM (A.A.S.H.T.O.-196 OR M-211)  
 C. REINFORCED CONCRETE, CLASS III



**PLAN**



\* MITERED ENDS SECTIONS, PER THE MOST CURRENT FDOT INDEX, SHALL BE REQUIRED ALONG ALL ROAD & BRIDGE ROADS



**NOTE:**  
 1. SWALES LESS THAN 0.7 FEET BELOW THE EDGE OF THE PAVEMENT MAY NOT REQUIRE A CULVERT, BUT SWALES EXCEEDING 0.7 FEET WILL REQUIRE A CULVERT. THE CULVERT SIZE TO BE SPECIFIED BY THE COMMUNITY DEVELOPMENT RIGHT-OF-WAY INSPECTOR

**CHARLOTTE COUNTY DESIGN STANDARDS**



CHARLOTTE COUNTY  
 COMMUNITY DEVELOPMENT  
 Land Information Section  
 18400 Murdock Circle  
 Port Charlotte, FL 33948

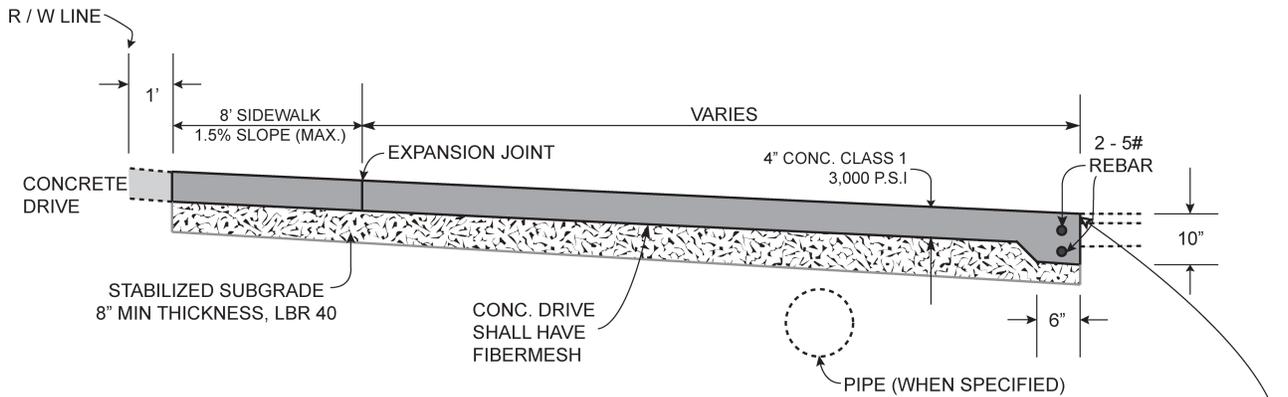
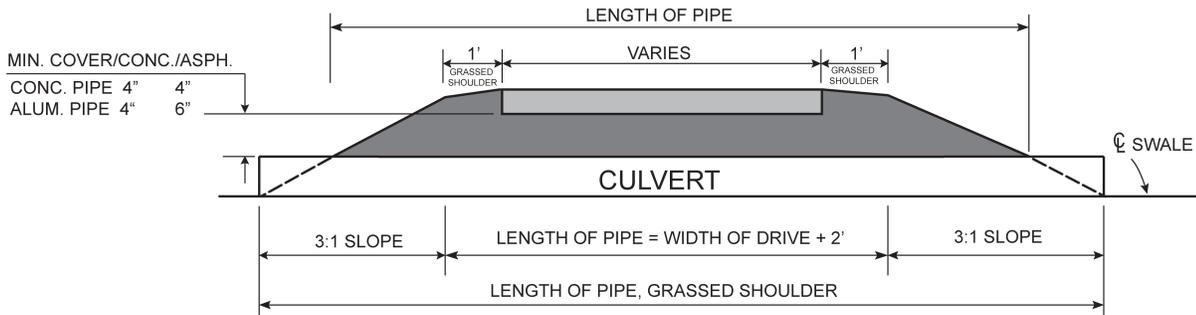
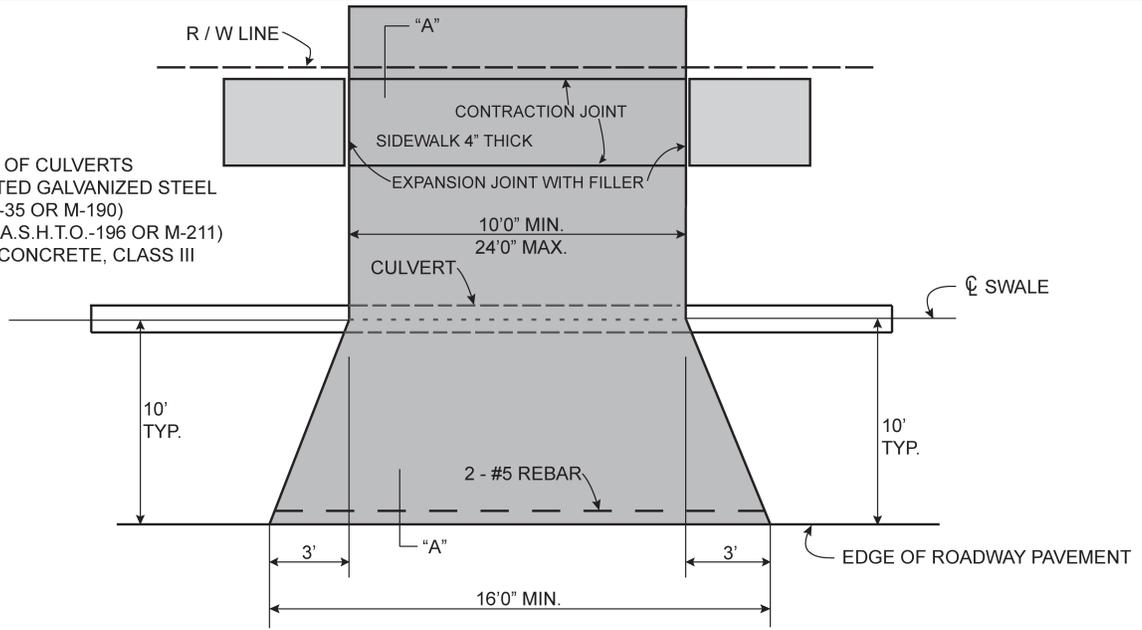
**STANDARD ROAD DETAIL  
 COMMERCIAL DRIVEWAY**

**NOT  
 TO  
 SCALE**

January 2014

Figure 1

- SPECIFICATIONS OF CULVERTS**  
 A. ASPHALT COATED GALVANIZED STEEL  
 (A.A.S.H.T.O. M-35 OR M-190)  
 B. ALUMINIUM (A.A.S.H.T.O.-196 OR M-211)  
 C. REINFORCED CONCRETE, CLASS III



**SECTION "A-A"**

**NOTE:**  
 1. SWALES LESS THAN 0.7 FEET BELOW THE EDGE OF PAVEMENT MAY NOT REQUIRE A CULVERT, BUT SWALES EXCEEDING 0.7 FEET WILL REQUIRE A CULVERT. THE CULVERT SIZE TO BE SPECIFIED BY THE COMMUNITY DEVELOPMENT RIGHT-OF-WAY INSPECTOR

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**STANDARD ROAD DETAIL  
 RESIDENTIAL DRIVEWAY**

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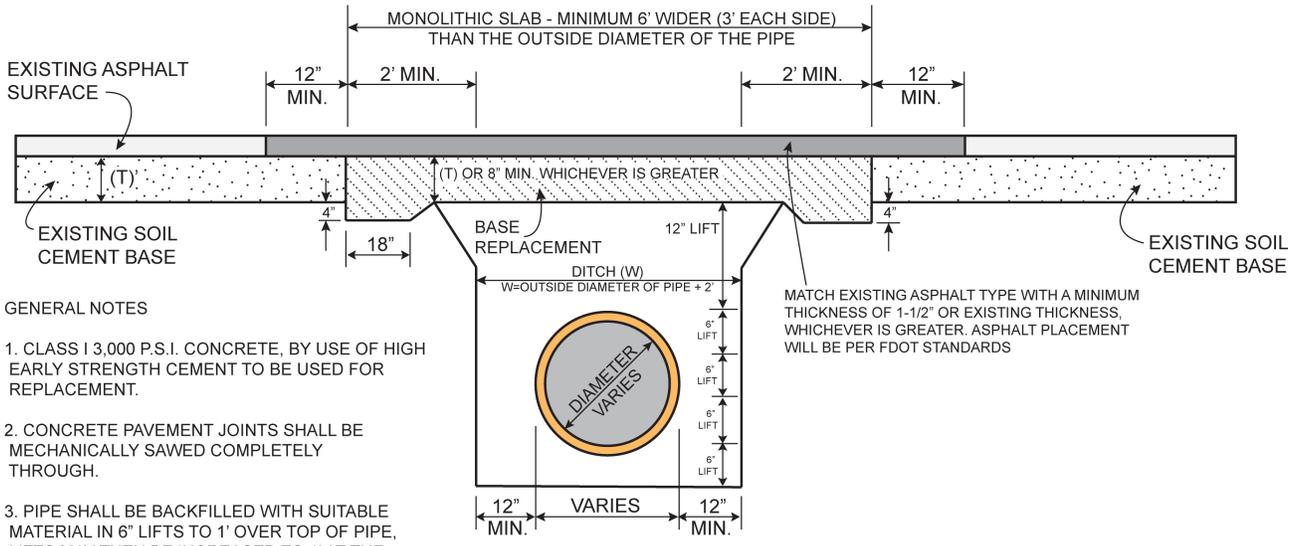
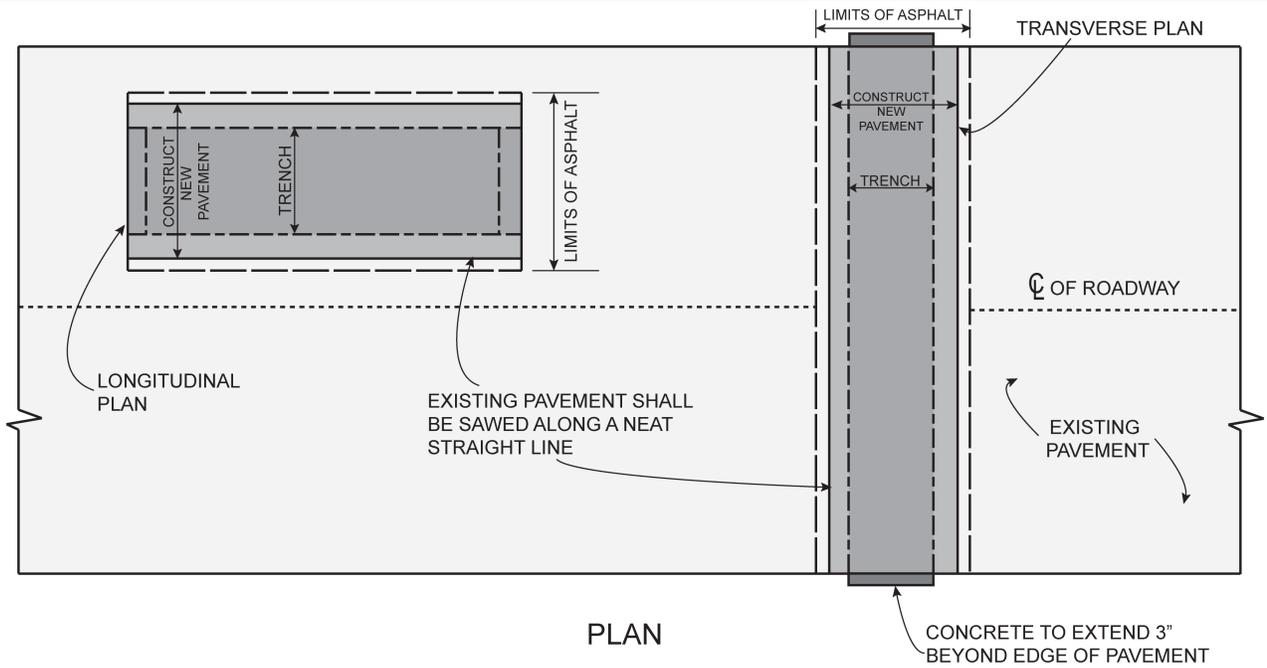
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Figure 2

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9

**5.2.8 Trench Backfill and Restoration**

1. Open cutting of existing pavements shall only be permitted where and when alternatives are not possible to implement, with the prior written permission of the County Engineer.
2. When permitted, an open cut shall be restored in accordance with the following figures, using whichever best applies to the pre-cut condition.



**GENERAL NOTES**

1. CLASS I 3,000 P.S.I. CONCRETE, BY USE OF HIGH EARLY STRENGTH CEMENT TO BE USED FOR REPLACEMENT.
2. CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED COMPLETELY THROUGH.
3. PIPE SHALL BE BACKFILLED WITH SUITABLE MATERIAL IN 6" LIFTS TO 1' OVER TOP OF PIPE, LIFTS MAY THEN BE INCREASED TO 1' AT THE DISCRETION OF THE ENGINEER.
4. DENSITY TESTS WILL BE PREPARED AT THE RATE OF TWO (2) PER ALTERNATING LIFT PER TRAVEL LANE.
5. ASPHALTIC CONCRETE SHALL MATCH EXISTING TYPE AND SHALL BE A MINIMUM OF 1-1/2" IN THICKNESS UNLESS OTHERWISE DIRECTED BY THE COUNTY ENGINEER.
6. CONCRETE SHALL EXTEND 3" BEYOND EDGE OF PAVEMENT.
7. ALL STRIPING, REFLECTORS OR OTHER MARKING OBLITERATED OR DAMAGED BY OVERLAYING, SHALL BE RESTORED IN ACCORDANCE WITH FDOT STANDARDS AND TO THE SATISFACTION OF CHARLOTTE COUNTY.

# CHARLOTTE COUNTY DESIGN STANDARDS



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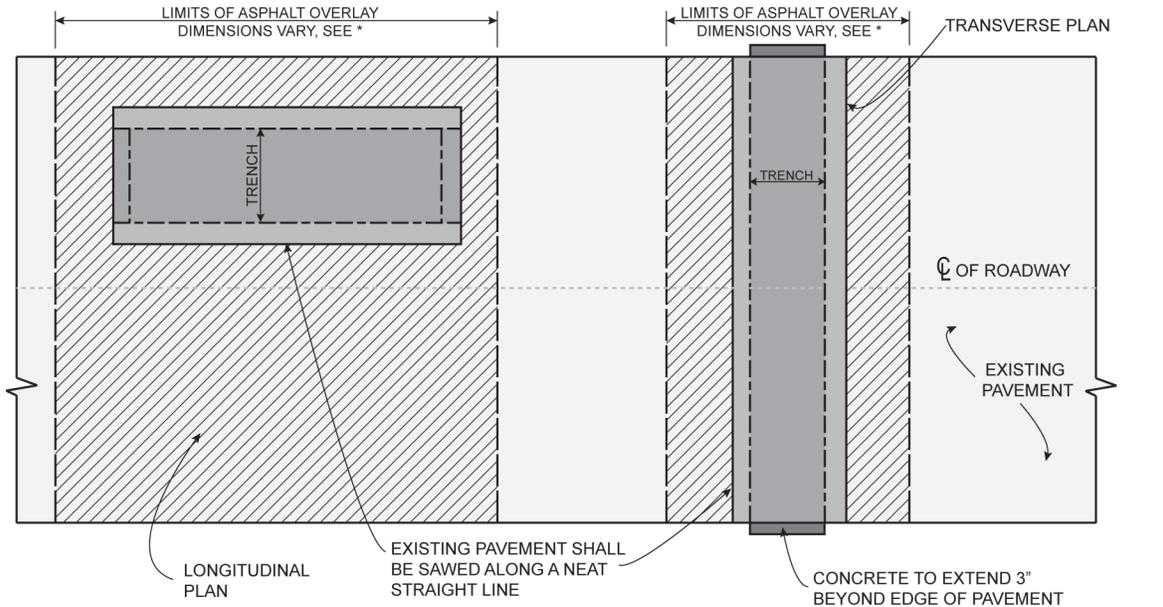
## STANDARD ROAD DETAIL

### RIGID BASE RESTORATION FOR TRENCHES CUT IN PUBLIC RIGHTS-OF-WAY

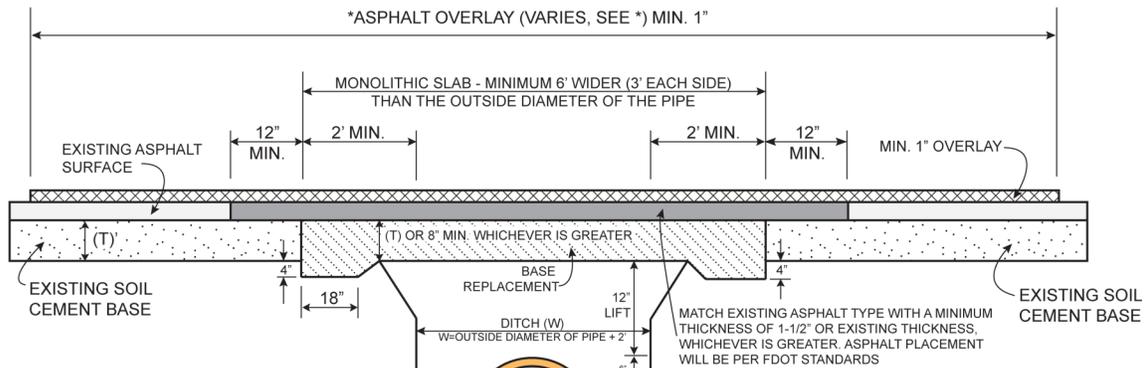
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Figure 1



PLAN



SECTION A-A

GENERAL NOTES

1. CLASS I 3,000 P.S.I. CONCRETE, BY USE OF HIGH EARLY STRENGTH CEMENT TO BE USED FOR REPLACEMENT.
2. CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED COMPLETELY THROUGH.
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6. CONCRETE SHALL EXTEND 3" BEYOND EDGE OF PAVEMENT.

TYPICAL SHOWN IS FOR AVERAGE CONDITIONS, FIELD CONDITIONS MAY DICTATE VARIATIONS AS PER COUNTY ENGINEER

MATCH EXISTING ASPHALT TYPE WITH A MINIMUM THICKNESS OF 1-1/2" OR EXISTING THICKNESS, WHICHEVER IS GREATER. ASPHALT PLACEMENT WILL BE PER FDOT STANDARDS

- \*1. OPEN CUTS SHALL BE REPAIRED AS SPECIFIED WITHIN, IN ADDITION, THE ENTIRE ROADWAY SHALL BE OVERLAYED WITH ASPHALTIC CONCRETE MATCHING THE TYPE EXISTING.
  - a. IN 30 MPH SPEED ZONES, ROADWAY SHALL BE OVERLAYED 20' EITHER SIDE OF DISRUPTED AREA.
  - b. IN 45 MPH SPEED ZONES, ROADWAY SHALL BE OVERLAYED 50' EITHER SIDE OF DISRUPTED AREA.
  - c. IN 55 MPH SPEED ZONE, ROADWAY SHALL BE OVERLAYED 100' EITHER SIDE OF DISRUPTED AREA.
2. ROADWAY SURFACE DISTORTIONS AS A RESULT OF JACK AND BORE (SETTLING), "PUSH" (HUMPING OF ROADWAY) OR ANY OTHER FORM OF DAMAGE WHICH WOULD REQUIRE PATCHING SHALL BE OVERLAYED WITH ASPHALTIC CONCRETE MATCHING THE TYPE EXISTING AS OUTLINED IN 1a, 1b AND 1c.

ALL STRIPING, REFLECTORS OR OTHER MARKINGS OBLITERATED OR DAMAGED BY OVERLAYING SHALL BE RESTORED IN ACCORDANCE WITH FDOT STANDARDS AND TO THE SATISFACTION OF CHARLOTTE COUNTY.

# CHARLOTTE COUNTY DESIGN STANDARDS



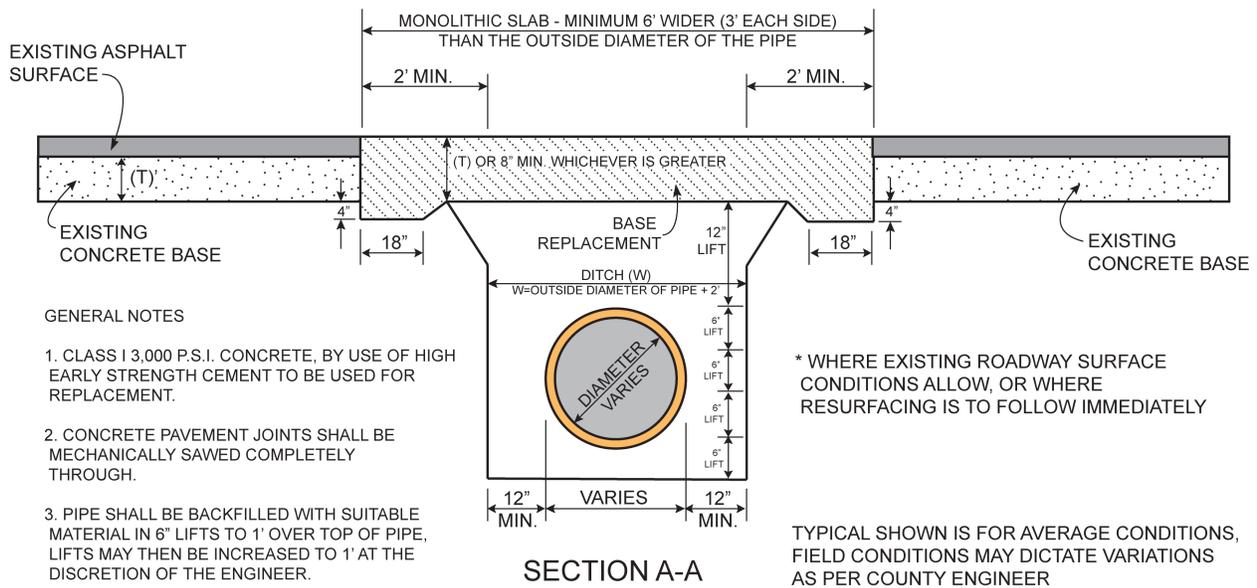
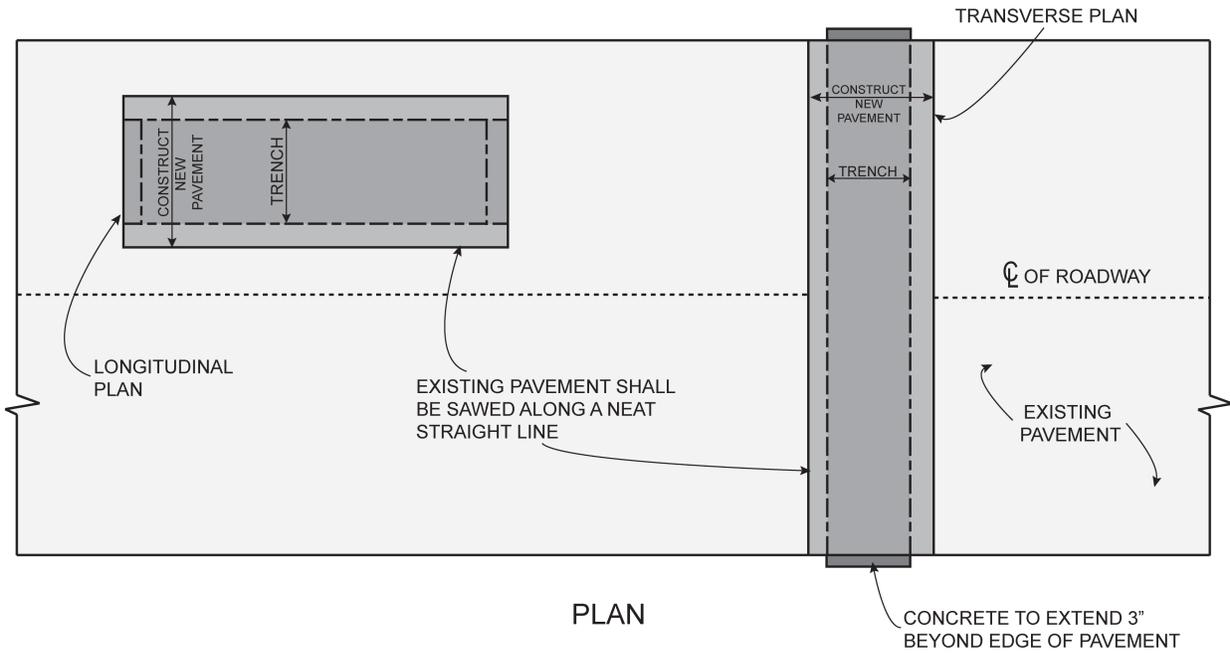
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## STANDARD ROAD DETAIL RIGID BASE RESTORATION FOR TRENCHES CUT IN PUBLIC RIGHTS-OF-WAY

NOT  
TO  
SCALE

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Figure 2



**GENERAL NOTES**

1. CLASS I 3,000 P.S.I. CONCRETE, BY USE OF HIGH EARLY STRENGTH CEMENT TO BE USED FOR REPLACEMENT.
2. CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED COMPLETELY THROUGH.
3. PIPE SHALL BE BACKFILLED WITH SUITABLE MATERIAL IN 6" LIFTS TO 1' OVER TOP OF PIPE, LIFTS MAY THEN BE INCREASED TO 1' AT THE DISCRETION OF THE ENGINEER.
4. DENSITY TESTS WILL BE PREPARED AT THE RATE OF TWO (2) PER ALTERNATING LIFT PER TRAVEL LANE.
5. CONCRETE SURFACE SHALL RECEIVE A "BROOM FINISH" THAT WILL ADEQUATELY CONVEY WATER OFF THE ROADWAY AND PROVIDE A NON-SKID SURFACE.
6. CONCRETE SHALL EXTEND 3" BEYOND EDGE OF PAVEMENT
7. ALL STRIPING, REFLECTORS OR OTHER MARKING OBLITERATED OR DAMAGED BY OVERLAYING SHALL BE RESTORED IN ACCORDANCE WITH FDOT STANDARDS AND TO THE SATISFACTION OF CHARLOTTE COUNTY.

\* WHERE EXISTING ROADWAY SURFACE CONDITIONS ALLOW, OR WHERE RESURFACING IS TO FOLLOW IMMEDIATELY

TYPICAL SHOWN IS FOR AVERAGE CONDITIONS, FIELD CONDITIONS MAY DICTATE VARIATIONS AS PER COUNTY ENGINEER

# CHARLOTTE COUNTY DESIGN STANDARDS



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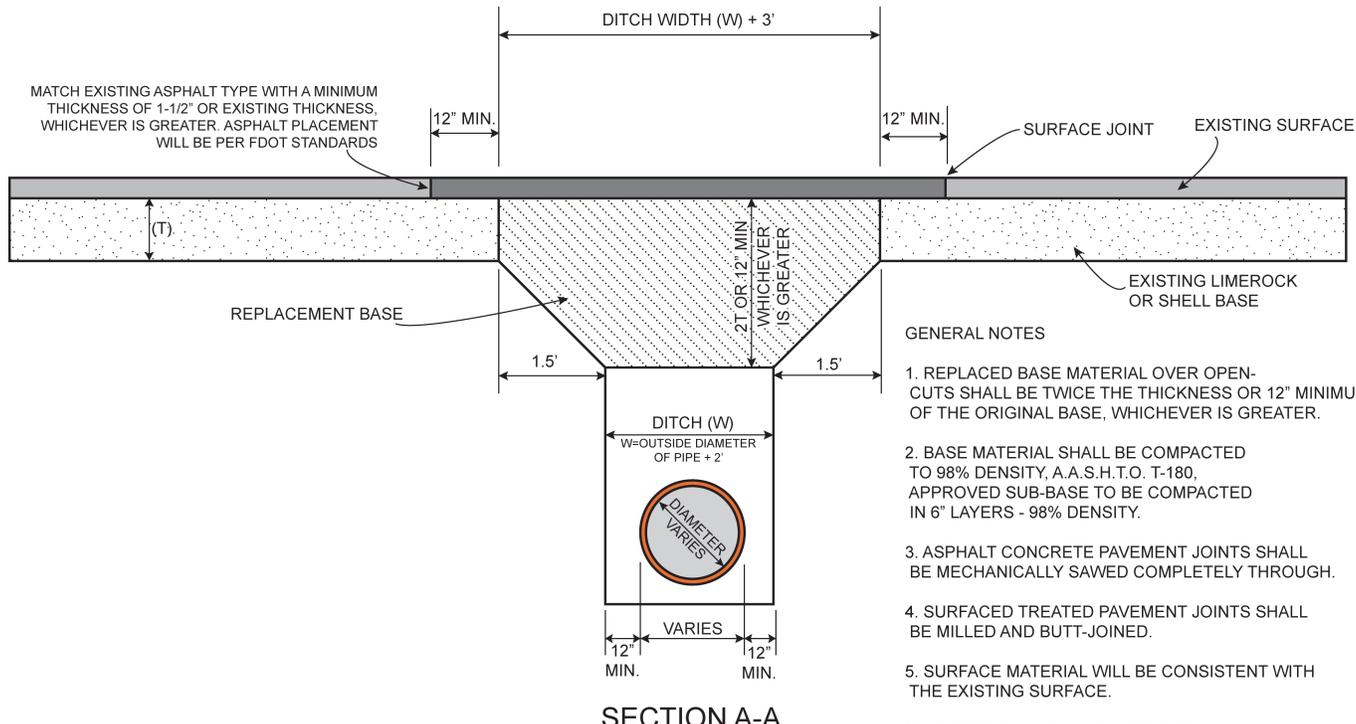
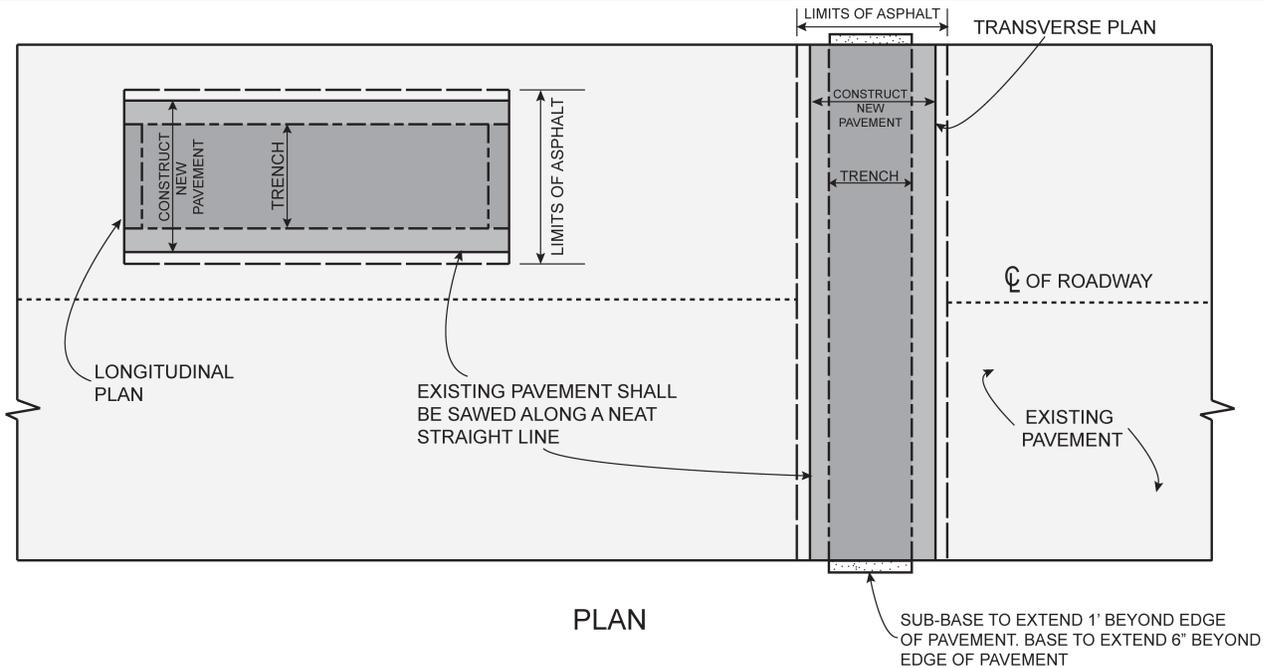
## STANDARD ROAD DETAIL

### RIGID BASE RESTORATION FOR TRENCHES CUT IN PUBLIC RIGHTS-OF-WAY

NOT TO SCALE

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Figure 3



- GENERAL NOTES**
1. REPLACED BASE MATERIAL OVER OPEN-CUTS SHALL BE TWICE THE THICKNESS OR 12" MINIMUM OF THE ORIGINAL BASE, WHICHEVER IS GREATER.
  2. BASE MATERIAL SHALL BE COMPACTED TO 98% DENSITY, A.A.S.H.T.O. T-180. APPROVED SUB-BASE TO BE COMPACTED IN 6" LAYERS - 98% DENSITY.
  3. ASPHALT CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED COMPLETELY THROUGH.
  4. SURFACED TREATED PAVEMENT JOINTS SHALL BE MILLED AND BUTT-JOINED.
  5. SURFACE MATERIAL WILL BE CONSISTENT WITH THE EXISTING SURFACE.
  6. RESTORATION OF UNPAVED SHELL, MARL, OR LIMEROCK ROADWAYS IS AS FOLLOWS:  
 A. ALL EXCAVATED MATERIALS TO BE REMOVED FROM THE SITE.  
 B. BACKFILL WITH VIRGIN MATERIALS OF THE SAME TYPE EXCAVATED IN MAXIMUM DEPTH LIFTS OF 6".
  7. ALL STRIPING, REFLECTORS OR OTHER MARKING OBLITERATED OR DAMAGED BY OVERLAYING SHALL BE RESTORED IN ACCORDANCE WITH FDOT STANDARDS AND TO THE SATISFACTION OF CHARLOTTE COUNTY.

TYPICAL SHOWN IS FOR AVERAGE CONDITIONS, FIELD CONDITIONS MAY DICTATE VARIATIONS AS PER COUNTY ENGINEER

# CHARLOTTE COUNTY DESIGN STANDARDS

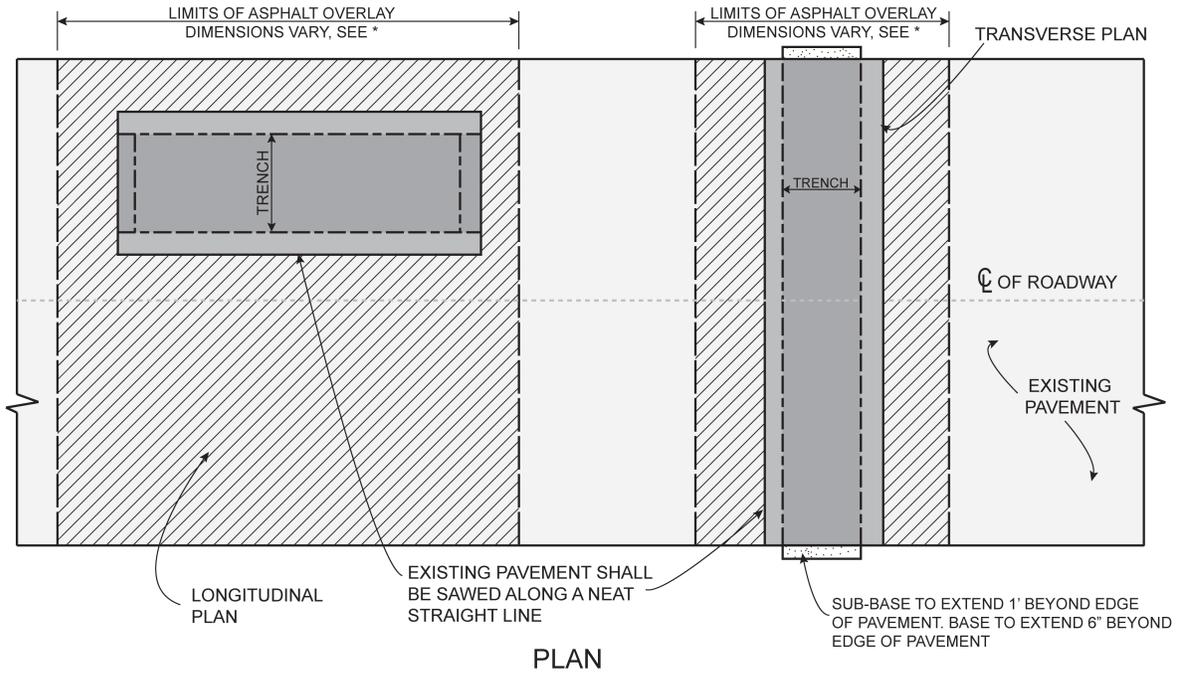


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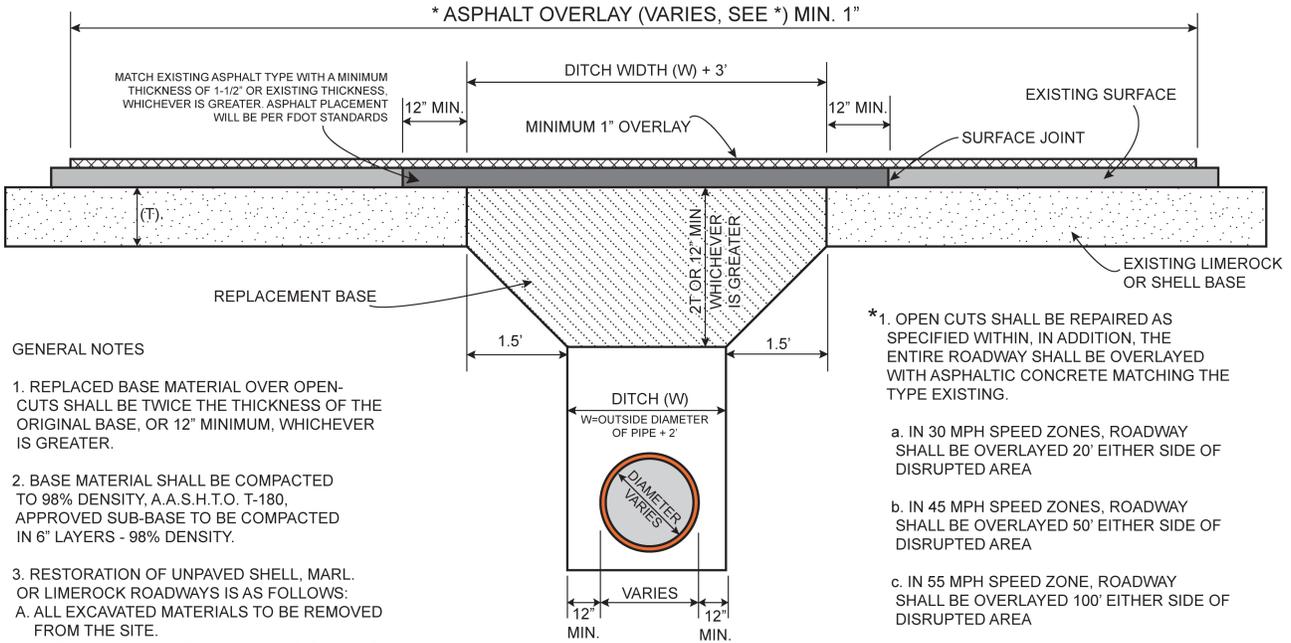
## STANDARD ROAD DETAIL FLEXIBLE PAVEMENT RESTORATION FOR TRENCHES CUT IN PUBLIC RIGHTS-OF-WAY

**NOT TO SCALE**

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 Figure 1



PLAN



SECTION A-A

GENERAL NOTES

1. REPLACED BASE MATERIAL OVER OPEN-CUTS SHALL BE TWICE THE THICKNESS OF THE ORIGINAL BASE, OR 12" MINIMUM, WHICHEVER IS GREATER.
2. BASE MATERIAL SHALL BE COMPACTED TO 98% DENSITY, A.A.S.H.T.O. T-180, APPROVED SUB-BASE TO BE COMPACTED IN 6" LAYERS - 98% DENSITY.
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  - B. BACKFILL WITH VIRGIN MATERIALS OF THE SAME TYPE EXCAVATED IN MAXIMUM DEPTH LIFTS OF 6".
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5. SURFACED TREATED PAVEMENT JOINTS SHALL BE MILLED AND BUTT-JOINED.
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TYPICAL SHOWN IS FOR AVERAGE CONDITIONS, FIELD CONDITIONS MAY DICTATE VARIATIONS AS PER COUNTY ENGINEER

- \*1. OPEN CUTS SHALL BE REPAIRED AS SPECIFIED WITHIN, IN ADDITION, THE ENTIRE ROADWAY SHALL BE OVERLAYED WITH ASPHALTIC CONCRETE MATCHING THE TYPE EXISTING.
- a. IN 30 MPH SPEED ZONES, ROADWAY SHALL BE OVERLAYED 20' EITHER SIDE OF DISRUPTED AREA
  - b. IN 45 MPH SPEED ZONES, ROADWAY SHALL BE OVERLAYED 50' EITHER SIDE OF DISRUPTED AREA
  - c. IN 55 MPH SPEED ZONE, ROADWAY SHALL BE OVERLAYED 100' EITHER SIDE OF DISRUPTED AREA
2. ROADWAY SURFACE DISTORTIONS AS A RESULT OF JACK AND BORE (SETTLING), "PUSH" (HUMPING OF ROADWAY) OR ANY OTHER FORM OF DAMAGE WHICH WOULD REQUIRE PATCHING SHALL BE OVERLAYED WITH ASPHALTIC CONCRETE MATCHING THE TYPE EXISTING, AS OUTLINED IN 1a, 1b AND 1c.

ALL STRIPING, REFLECTORS OR OTHER MARKINGS OBLITERATED OR DAMAGED BY OVERLAYING SHALL BE RESTORED IN ACCORDANCE WITH FDOT STANDARDS AND TO THE SATISFACTION OF CHARLOTTE COUNTY.

# CHARLOTTE COUNTY DESIGN STANDARDS



CHARLOTTE COUNTY  
COMMUNITY DEVELOPMENT  
Land Information Section  
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Port Charlotte, FL 33948

## STANDARD ROAD DETAIL

### FLEXIBLE PAVEMENT RESTORATION FOR TRENCHES CUT IN PUBLIC RIGHTS-OF-WAY

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Figure 2

## Article 5.3 Traffic Devices and Street Illumination

### 5.3.1 Street Signs

#### A. General

1. All sign blanks shall be fabricated from aluminum sheet conforming to ASTM Specifications B209, with 5052-H38 Alloy.
2. All signs shall be printed on 0.08 blanks.
3. All signs shall be of a standard size and shape, and conform to the latest edition of FHWA's *Manual on Uniform Traffic Control Devices*.
4. 3M material shall be used for all sheeting. Silk screening or Electro Cut material may be overlaid onto the sheeting.

#### B. Regulatory Signs

All regulatory signs shall be made of high intensity prismatic material.

#### C. Warning Signs

All warning signs, with the exception of pedestrian warning crossing signs, shall be made of high intensity prismatic material.

#### D. Pedestrian Warning Crossing Signs

All pedestrian warning crossing signs shall be made of Diamond Grade fluorescent VIP Yellow Green microprismatic reflective sheeting.

#### E. School Signs

All school signs shall be made of high intensity prismatic material, with the yellow made of Diamond Grade fluorescent VIP Yellow Green microprismatic reflective sheeting.

#### F. Road Signs

1. Road sign sizes shall be limited to nine inches in height and 30, 36, or 42 inches in length, depending upon the length of the road name.
2. All road signs shall be made of silver high intensity material with green EC material overlaid. Road signs shall be green with silver lettering.
3. All road signs shall have a border of 0.375 inches.
4. The radii of the corners of all road signs shall be 1.5 inches.
5. All Road names shall be printed in six-inch C Series letters, with three-inch C Series letters designating the road type. If the road name, once laid out, will not fit on the 42-inch blank, the size of the letters may be reduced to five-inch C Series letters.

#### G. Sign Height and Setback Distances

All post-mounted signs shall conform to the standards for height and setback from the roadway established in the latest edition of FHWA's *Manual on Uniform Traffic Control Devices*.

#### H. Sign Posts

1. All standard sign posts shall be fabricated from 14-gauge full-punched square galvanized steel posts.
2. All standard sign posts shall be square and two inches wide on each side unless a decorative post is requested or specified.
3. All standard sign posts, except those installed in concrete medians, shall be concreted in using a high-strength concrete mix which meets or exceeds ASTM C387 specifications.

- 1 4. All standard sign posts, except those installed in concrete medians, shall be  
2 installed in post holes that have a minimum of 20 pounds to a maximum of 40  
3 pounds of concrete mix added during sign installation.
- 4 5. Sign posts installed in concrete medians shall conform to the following standards:
  - 5 a. Posts shall have a ten-inch cutout in the median with a PVC, CPVC, or  
6 fiberglass insert placed into the cutout and fit firmly against the inner edge.  
7 This insert shall extend below the median into the substrate material at least  
8 12 inches, and must be cut off flush with the top of the median. The insert  
9 may be installed prior to the pouring of the concrete median.
  - 10 b. Following the installation of a post in a concrete median, the hole shall be  
11 filled with soil up to between one and 0.5 inches from the top of the median.
  - 12 c. The following figure shows details of a sign post installed in a concrete  
13 median:

### 14 5.3.2 Roadway Markings

#### 15 A. Roadway Striping, Longitudinal Lines, and Gore Markings and Islands

- 16 1. All longitudinal lines shall be applied with water emulsion-based materials that must  
17 be listed on FDOT's Qualified Products List.
- 18 2. All permanent striping shall be applied at a minimum wet film thickness of 15 mils.
- 19 3. All temporary striping shall be of sufficient thickness to last until permanent  
20 striping is applied.
- 21 4. Glass spheres, meeting the requirements of the latest edition of FDOT's *Standard*  
22 *Specifications for Road and Bridge Construction* Sections 971-1 and 971-14, shall be  
23 immediately and uniformly applied following the application of any painted lines, at  
24 a level of not less than six pounds per gallon of paint.

#### 25 B. Transverse Markings, Stop Bars, Crosswalks, Symbols, and Word Messages

- 26 1. All transverse markings, stop bars, crosswalk lines, symbols, and word messages  
27 shall be applied with thermoplastic or preformed thermoplastic materials that must  
28 be listed on FDOT's Qualified Products List.
- 29 2. All spray- or extrusion-applied markings shall have a thickness of between 0.10  
30 inches and 0.15 inches when measured above the pavement surface at the edge of  
31 the marking.
- 32 3. All preformed thermoplastic markings shall have a thickness of between 0.02 inches  
33 and 0.09 inches when measured above the pavements surface at the edge of the  
34 marking.
- 35 4. All stop bars shall be 24 inches wide.
- 36 5. All crosswalk lines shall be 12 inches wide and installed as two parallel lines  
37 horizontal to the direction of travel. Hash marks inside the crosswalk lines shall not  
38 be used unless the engineer states the lines are needed for additional visibility.
- 39 6. Glass spheres, meeting the requirements of the latest edition of FDOT's *Standard*  
40 *Specifications for Road and Bridge Construction* Sections 971-1 and 971-14, shall be  
41 immediately and uniformly applied following the application of any thermoplastic  
42 markings, at a level of not less than 0.10 pounds per square foot of thermoplastic  
43 surface, with 50 to 60 percent embedment. Glass spheres shall not be applied to  
44 preformed thermoplastic markings.

#### 45 C. Raised Retro-Reflective Pavement Markers

- 46 1. All raised pavement markers shall be Class B and meet the requirements of the  
47 latest edition of FDOT's *Standard Specifications for Road and Bridge Construction*  
48 Section 970, and must be listed on FDOT's Qualified Products List.

- 1                   2. All raised pavement markers shall be installed one inch off any double solid, solid-  
2 skip, or single solid painted lane lines.
- 3                   3. All raised pavement markers shall be installed at an interval of 40 feet along the  
4 road, except that raised pavement markers in single skip areas shall be installed at  
5 an interval of 80 feet directly in line with the skip line and spaced evenly between  
6 the skip directly before and after the raised pavement marker.

7                   **5.3.3 Traffic Signals**

8 Traffic signal installation shall conform to the requirements established by the latest editions  
9 of the following documents:

- 10                  **A.** FHWA's *Manual on Uniform Traffic Control Devices*.  
11                  **B.** FDOT's *Design Standards for Design, Construction, Maintenance, and Utility Operations*  
12                    *on the State Highway System*.  
13                  **C.** FDOT's *Standard Specifications for Road and Bridge Construction*.  
14                  **D.** FDOT's *Florida Intersection Design Guide*.  
15                  **E.** FDOT's *Plans Preparation Manual*.  
16                  **F.** FDOT's *Minimum Specifications for Traffic Control Signals and Devices*.  
17                  **G.** Charlotte County's *Supplemental Specifications for Traffic Signal Installations*.  
18                  **H.** The National Fire Protection Association's *National Electric Code*.  
19                  **I.** The Institute of Electrical and Electronics Engineers' *National Electric Safety Code*.  
20                  **J.** The Occupational Safety Health Administration.

21                  **5.3.4 Roadway Illumination**

- 22                  **A.** All roadway lighting shall be designed using the latest editions of the following  
23 documents:  
24                    1. FDOT's *Design Standards for Design, Construction, Maintenance, and Utility*  
25                    *Operations on the State Highway System*.  
26                    2. FDOT's *Standard Specifications for Road and Bridge Construction*.  
27                    3. FDOT's *Plans Preparation Manual*.  
28                    4. The Illuminating Engineering Society's *Model Lighting Ordinance*.  
29                    5. AASHTO's *Roadway Lighting Design Guide*.  
30                    6. The Institute of Transportation Engineers' *Fundamentals of Traffic Engineering*.  
31                    7. Charlotte County's *Supplemental Specifications for Roadway Lighting Systems*.  
32                    8. Charlotte County's *Supplemental Specifications for Decorative Lighting Systems*.  
33                    9. The National Fire Protection Association's *National Electric Code*.  
34                    10. The Institute of Electrical and Electronics Engineers' *National Electric Safety Code*.  
35                    11. The Occupational Safety Health Administration.
- 36                  **B.** All roadway lighting shall be high pressure sodium lighting, unless otherwise approved  
37 by the County Engineer.
- 38                  **C.** All electrical components shall be UL-approved or approved by testing labs accepted by  
39 FDOT.
- 40                  **D.** The installation of all roadway lighting shall require a roadway lighting plan which shall  
41 show the following:  
42                    1. The locations of all poles, conduits, junction boxes, photo cells, transformers and  
43                    controllers, cabinets, and electric utility service points.  
44                    2. Specifications for all proposed and existing lighting fixtures including photometric  
45                    data, fixture height, mounting and design, glare control devices, type and color  
46                    rendition of lamps, and hours of operation.  
47                    3. A photometric plan that illustrates the levels of illumination at ground level from all  
48 on-site light sources, proposed and existing.

- 1           **E.** Contractors shall be responsible for all traffic control during the installation of roadway
- 2                   lighting.
- 3           **F.** All roadway lighting on local residential streets shall be installed in locations that
- 4                   conform to criteria outlined by the Board of County Commissioners, and conform to
- 5                   criteria established by the electrical utility.
- 6
- 7

## Article 5.4 Stormwater Management

### 5.4.1 General

Unless otherwise specified, all stormwater management facilities in public or private rights-of-way shall be designed in accordance with the latest edition of FDOT's *Drainage Manual* and the appropriate Water Management District requirements.

### 5.4.2 Allowable Flooding Depths

All new or improved roads shall be designed and constructed to not exceed the following allowable flooding depths.

#### A. Local Roads

1. No flooding above the crown of the road elevation during a 5-year frequency, 24-hour duration rainfall event.
2. No more than six inches above the crown of the road elevation during a 25-year frequency, 24-hour duration rainfall event.
3. No more than ten inches above the crown of the road elevation during a 100-year frequency, 24-hour duration rainfall event.

#### B. Collector Roads

1. Not less than one lane of traffic in each direction shall remain above the design high-water elevation resulting from a 25-year frequency, 24-hour duration rainfall event, distributed in accordance with methodologies approved by the appropriate Water Management District.
2. No more than six inches above the crown of the road elevation during a 100-year frequency, 24-hour duration rainfall event.

#### C. Arterial Roads

Not less than all lanes shall remain flood-free, where water does not exceed the lowest edge of pavement elevation, from stormwater resulting from a 100-year frequency, 24-hour duration rainfall event, distributed in accordance with methodologies approved by the appropriate Water Management District.

### 5.4.3 Drainage Calculations

All drainage calculations shall be prepared in accordance with the latest edition of FDOT's *Drainage Manual* and the appropriate Water Management District requirements.

#### A. Water Quantity

##### 1. Open Basins

- a. Open basins shall be designed to manage a 25-year frequency, 24-hour duration rainfall event.
- b. The post-developed discharge rate from an open basin shall not exceed the calculated pre-developed discharge rate or an allowable discharge rate based upon a previously-approved drainage study.
- c. If attenuation is not required for an open basin, the facility must provide the elevation necessary to convey the post peak rate of runoff through the outfall structure. This elevation shall be contained within the banks of the facility.

##### 2. Closed Basins

- a. Closed basins shall be designed to manage a 100-year frequency, 24-hour duration rainfall event.
- b. The required retention volume of a closed basin shall be the post-developed runoff volume minus the pre-developed runoff volume.

1                   **B. Water Quality**  
2                   Water quality requirements shall be in accordance with all Federal, State, and local  
3                   requirements.

4                   **C. Off-Site**  
5                   1. Off-site drainage flow patterns or hydraulic features shall not be interrupted by the  
6                   proposed improvements, but may be redirected with the prior written permission of  
7                   the County Engineer.  
8                   2. Verification will be required to determine off-site flow patterns. Acceptable forms of  
9                   verification include, but are not limited to:  
10                  a. Historic drainage maps.  
11                  b. Contour maps.  
12                  c. Survey topography.

13                   **5.4.4 Stormwater Management Facilities**

14                  **A. Culverts**  
15                  1. All roadway culverts shall be made of concrete.  
16                  2. Non-roadway culverts may use other materials upon approval by the County  
17                  Engineer.  
18                  3. All culverts shall be a minimum of 15 inches in diameter, or an equivalent oval size.

19                  **B. Retention Ponds**  
20                  1. All stormwater management facility banks shall provide a minimum of three inches  
21                  of freeboard from the design high water elevation within the facility.  
22                  2. All outfall structures and overflow pipes shall be made of a hardened surface.  
23                  3. All discharge pipes draining onto County rights-of-way shall include concrete  
24                  mitered slope pads at the point of discharge.

25                  **C. Ownership and Dedication**  
26                  1. Stormwater management facilities permitted in the name of the County shall be  
27                  dedicated to the County.  
28                  2. Stormwater management facilities permitted in the name of a private entity, such  
29                  as a homeowners or property owners association, shall be dedicated to that private  
30                  entity.  
31                  3. When a stormwater management facility accepts runoff from public roads,  
32                  maintenance easements shall be dedicated to the County.  
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## Article 5.5 Bicycle and Pedestrian Facilities

### 5.5.1 ADA Compliance

All bicycle and pedestrian facilities shall be constructed to conform to the latest edition of FDOT's Design Standards for Design, Construction, Maintenance, and Utility Operations on the State Highway System and the Americans with Disabilities Act.

### 5.5.2 Bicycle Facilities

- A. Bicycle facilities shall be installed according to the Interconnectivity standards of this Code.
- B. Bicycle facilities shall be constructed according to the following standards:
  - 1. Bicycle lanes shall be a minimum of four feet wide.
  - 2. Bicycle lanes shall be provided on both sides of the road, unless otherwise approved by the County Engineer, and built to the same standards as the roadway itself.
  - 3. Bicycle lanes shall be separated from motor vehicle lanes with a white stripe. Each lane shall also be marked with the symbol for bicycle lane, as established by FHWA's *Manual on Uniform Traffic Control Devices*.
  - 4. Multi-use trails, where bicycles may encounter pedestrians, shall be a minimum of 12 feet wide.
  - 5. Dedicated bicycle facilities shall be constructed of either asphalt or concrete, and must be a minimum of four inches thick. Other construction techniques may be approved by the County Engineer.

### 5.5.3 Pedestrian Facilities

- A. Pedestrian facilities shall be installed according to the Interconnectivity standards of this Code.
- B. Pedestrian facilities shall be installed on both sides of the road unless otherwise approved by the County Engineer.
- C. Pedestrian facilities shall be constructed according to the following standards:
  - 1. Sidewalk widths on local streets shall be a minimum of five feet. Sidewalk widths on all other street classifications shall be a minimum of eight feet.
  - 2. Sidewalks shall be constructed to the following standards:
    - a. An eight inch Type B stabilizing subgrade and four inches of concrete with fibermesh.
    - b. Expansion joints shall not exceed a length of 32 feet and are required between existing sidewalks and curbs or driveways, at intersections between sidewalks and other fixed objects, at new pours, and at all cold joints.
    - c. Tooled joints shall be straight and perpendicular to the edge of the sidewalk. Saw cut contraction joints will not be allowed.
    - d. Expansion joint sealer shall be Sikaflex-1CSL and shall not be placed in depths greater than 0.75 inches at any one time.
    - e. All contraction joints shall be tooled to one-quarter of the pavement depth. Expansion joint caps with removable cap strips and joint sealer shall be used for all driveways.
    - f. Driveways shall be tooled at ten-foot intervals, both for longitudinal and transverse joints.
  - 3. Where a sidewalk meets pavement, the sidewalk shall be a minimum of eight inches thick within one foot of the edge of the pavement.
  - 4. Where a sidewalk crosses a driveway for a development requiring Site Plan Review, the sidewalk shall be a minimum of six inches thick for the entire width of the crossing.

- 1           5. All sidewalks shall have a cross slope of 1.5 percent, with a maximum deviation of
- 2           0.25 percent, and longitudinal slopes no steeper than 5 percent.
- 3           6. When an existing sidewalk is crossed by a new driveway crossing, the sidewalk shall
- 4           be removed and replaced to meet the standards of this Code.
- 5           7. Sidewalks shall be separated from streets using landscape zones, tree planting
- 6           areas, or other devices to clearly distinguish the pedestrian area from the vehicular
- 7           area. Landscape zones should be a minimum of three feet wide, and tree planting
- 8           areas should be a minimum of six feet wide, unless otherwise approved by the
- 9           County Engineer.
- 10          8. Sidewalks shall be installed along both sides of a corner lot, unless otherwise
- 11          approved by the County Engineer.
- 12          9. Sidewalks shall be located within the road right-of-way.
- 13          10. Sidewalks shall be provided for the full width of the lot with a direct link to the
- 14          primary building entrance.
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