Plan Preparation Guide

Chapter 7

Design - Channelization

1. Horizontal Roadway Design

SCDOT horizontal roadway design shall be as set forth in the following manuals:

a. SCDOT Highway Design Manual
b. SCDOT Access and Roadside Management Standards
c. SCDOT Standard Drawings for Road Construction
d. AASHTO A Policy on Geometric Design of Highways and Street (Green Book)
e. AASHTO Roadside Design Guide
f. Memorandums superceding portions of the above manuals

2. Traffic Lane Lines

On projects where a valley gutter lip is proposed or where a portion of the shoulder is to be paved only the travel lane (s) shall be shown on the plans. The edge of paved shoulder or lip shall not be shown except where a variation from the typical section is necessary. The typical section should show the travel lane and dimension.

The Preliminary Design Section will provide the edge of pavement (EOP) line, in all cases. Preliminary Design is showing the EOP line on all projects including those with curb and gutter. This should enhance the automation of creating the templates for the project. For the plan sheet, the EOP line should be paralleled with a FOC line available in the custom line style palette called "FOC". Back of curb line will not be shown in any case. When there is grass plot, the front edge of the sidewalk will be shown. In all cases, the back of the sidewalk will be shown.

The radius dimensions will be drawn to the EOP line on the plans as shown on Sheet No. 7-7. For clarification, a cell has been created to demonstrate the radius measurement. It should be used on each plan sheet, where applicable, to emphasize the measurement location. It can be found in the cell libraries under the name: marker.

In order for the FOC line style to be legible for different scales and types of projects several guidelines should be followed.

1. New Edge of Pavement Weight = 6
2. FOC line style weight = 3
3. Sidewalk line and pattern weight = 3
4. Fill under view attributes should be on
5. The scale factor toggle on the custom line palette will vary for english projects
   The following are the appropriate scale factors for different projects:
   English
   20:1 Scale Factor = 1
   50:1 Scale Factor = 1.5
6. Consideration should be given to the orientation of the integral label of the FOC line.

See sheet 7-3 and 7-7 for an example.

3. Concrete Sidewalk

When concrete sidewalk is designated on plans, it is to be drawn at the correct location, labeled and patterned. When sidewalk is used in areas of high pedestrian traffic, particularly in area of schools, consideration should be given requiring curb and gutter adjacent to sidewalk. A valley gutter section with sidewalk should be discouraged in high pedestrian traffic areas.

If during the field review a valley gutter with sidewalk is recommended, the Project Development Engineer or Program Manager must approve the concept by initialing and dating the proposed design. Their Approval shall be required prior to proceeding with plan preparation.

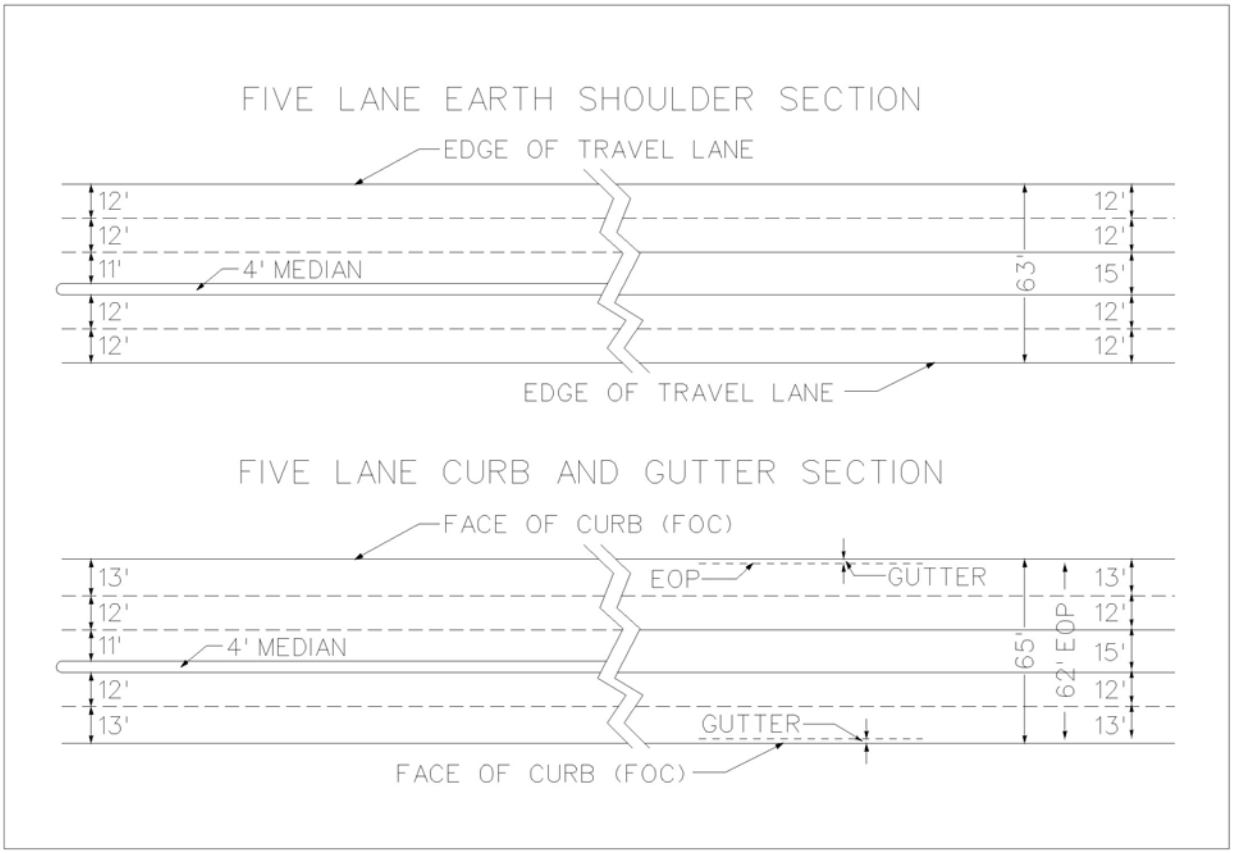
In order to comply with the Americans with Disabilities Act, the width of a standard concrete sidewalk has increased from 4.5' to a width of 5.0'. When plotting an earth sidewalk area, the width of this area is increased accordingly.

Where crosswalks have been marked and sidewalks are a feature of the mainline roadway, there is sometimes an offset between the sidewalk and the crosswalk as shown as "A" on Attachment I. This results in pedestrians walking on the grass to reach the crosswalk or encourages pedestrians not to use the crosswalk. This can be unsafe for the pedestrians.

On future projects, sidewalks should be extended to the beginning of the corner radius on the adjacent roadway as shown on Attachments I and II as Illustration B. Note extension of sidewalk on Attachment II beyond radius in order to match opposite corner. Sidewalk termini should be discussed on the Design Field Review.

4. Five Lane Sections

Five (5) lane projects should be developed using a 63-foot pavement width with earth shoulders. A five (5) lane curb and gutter section should be developed using a 63 foot pavement width plus 1.5 foot gutter on each side for a total width, face of curb to face of curb, of 66 foot. See following examples.



5. Considerations for Bicycle Facilities

On February 20, 2003, the SCDOT Commission in meeting affirmed that bicycling accommodations should be a routine part of the Department's planning, design, construction, and operating activities, and will be included in the everyday operations of our transportation system. In order to provide guidance to Department personnel, guidelines have been developed for the selection and design of bicycle facilities on all new projects. The following describes shared roadways and bike lanes/paved shoulders and gives guidance on their design requirements for new projects. Please see pages 7-10 through 7-14 for examples of these sections.

Shared Roadways

Shared roadways are the way most bicycle travel in the United States occurs. This type of facility can be used to accommodate bicyclists without signing and striping the roadway for bicycle travel. This type of facility works well to accommodate bicycles through urban areas that are not considered high bicycle-demand corridors or where other constraints do not allow the development of a bike lane/paved shoulder.

On urban sections (curb and gutter), an outside travel lane width of 14 feet is the minimum recommended width for a shared-use lane. The gutter pan is not to be included in the width of the shared roadway. On stretches of roadways with grades greater than five percent, consideration should be given to providing a 15-foot travel lane width. Shared roadway widths greater than 14 feet that extend continuously along a stretch of roadway may encourage the undesirable operation of two motor vehicles, especially in urban areas, and are therefore not recommended as shared use roadways and consideration should be given to striping the additional width. The Department's Pedestrian and Bicycle Coordinator and Traffic Engineering can provide assistance in determining the need for a shared roadway as opposed to bike lanes/paved shoulders.

Bike Lanes/Paved Shoulders

This type of facility incorporates bicyclists into a roadway by utilizing a bike lane/paved shoulder adjacent to the motor vehicle traffic. A bike lane should be a lane specifically signed and marked as indicated in the Manual on Uniform Traffic Control Devices (Part 9). A paved shoulder may be used to accommodate bicycle travel without specific markings and signs present. A bike lane provides for more predictable movements by the motorist and bicyclist. Bike lanes should be one-way facilities and carry bike traffic in the same direction as adjacent motor vehicle traffic. This type of facility should be used where the Department desires to provide continuity to other bicycle facilities or designate preferred routes through high demand corridors, such as any of our designated South Carolina bicycle touring routes or a municipality's bikeway.

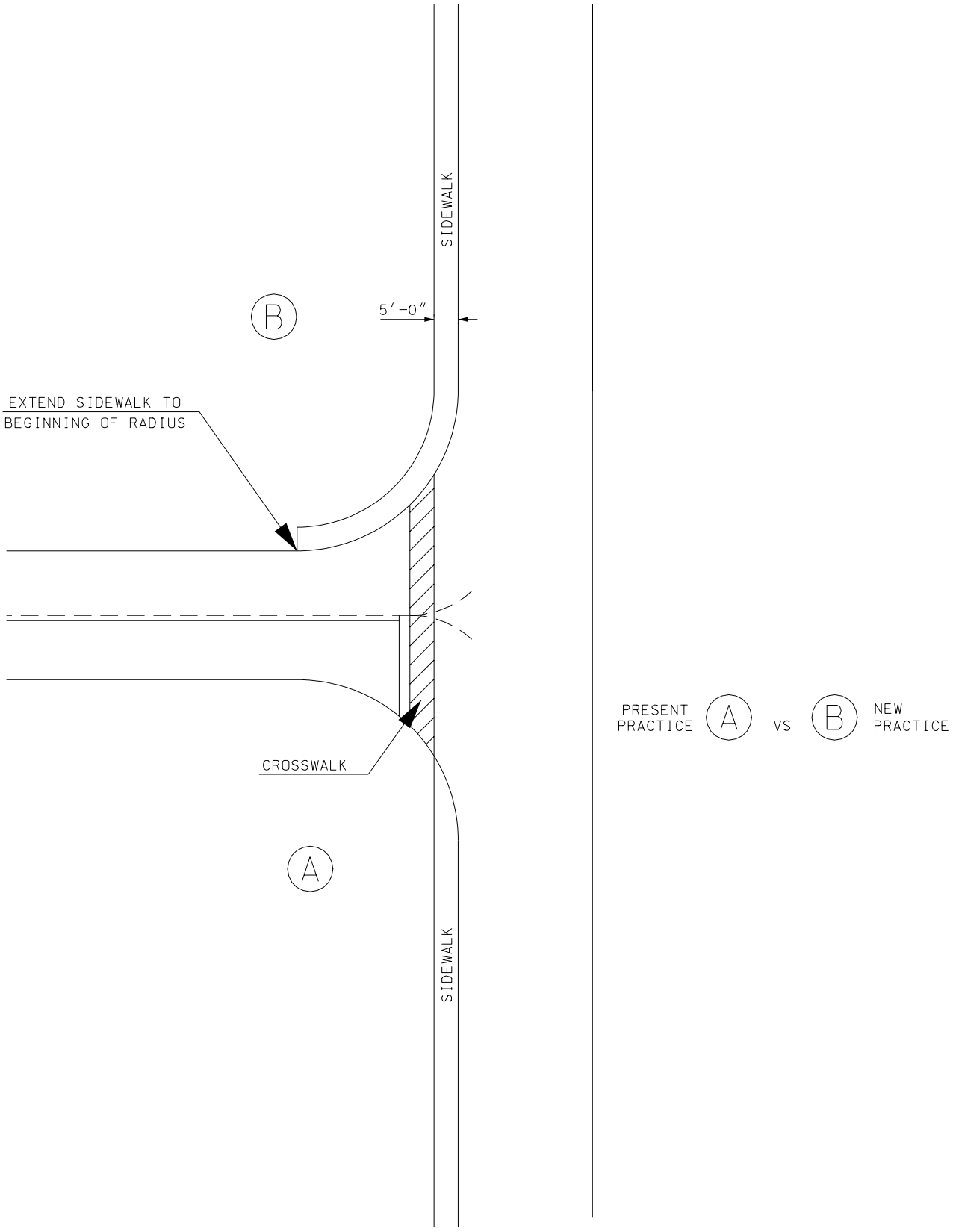
On rural sections (shoulder) with ADT greater than 500, bike lanes/paved shoulders should be a minimum of four feet wide in each direction to accommodate bicycle travel. The bike lanes/paved shoulders will have a cross slope of 24H:1V (4.17%). Where motor vehicle speeds exceed 50 mph or the percentage of trucks, buses, and recreational vehicles are greater than five percent of the ADT, consideration should be given to providing a minimum 6 feet of width to accommodate bicycle travel adjacent to the higher speeds (50 mph or greater) and to lessen the effect of windblast from the larger vehicles.

On rural sections (shoulder) with ADT less than 500, paving 2 feet of the earthen shoulder will be adequate to better accommodate bicyclists.

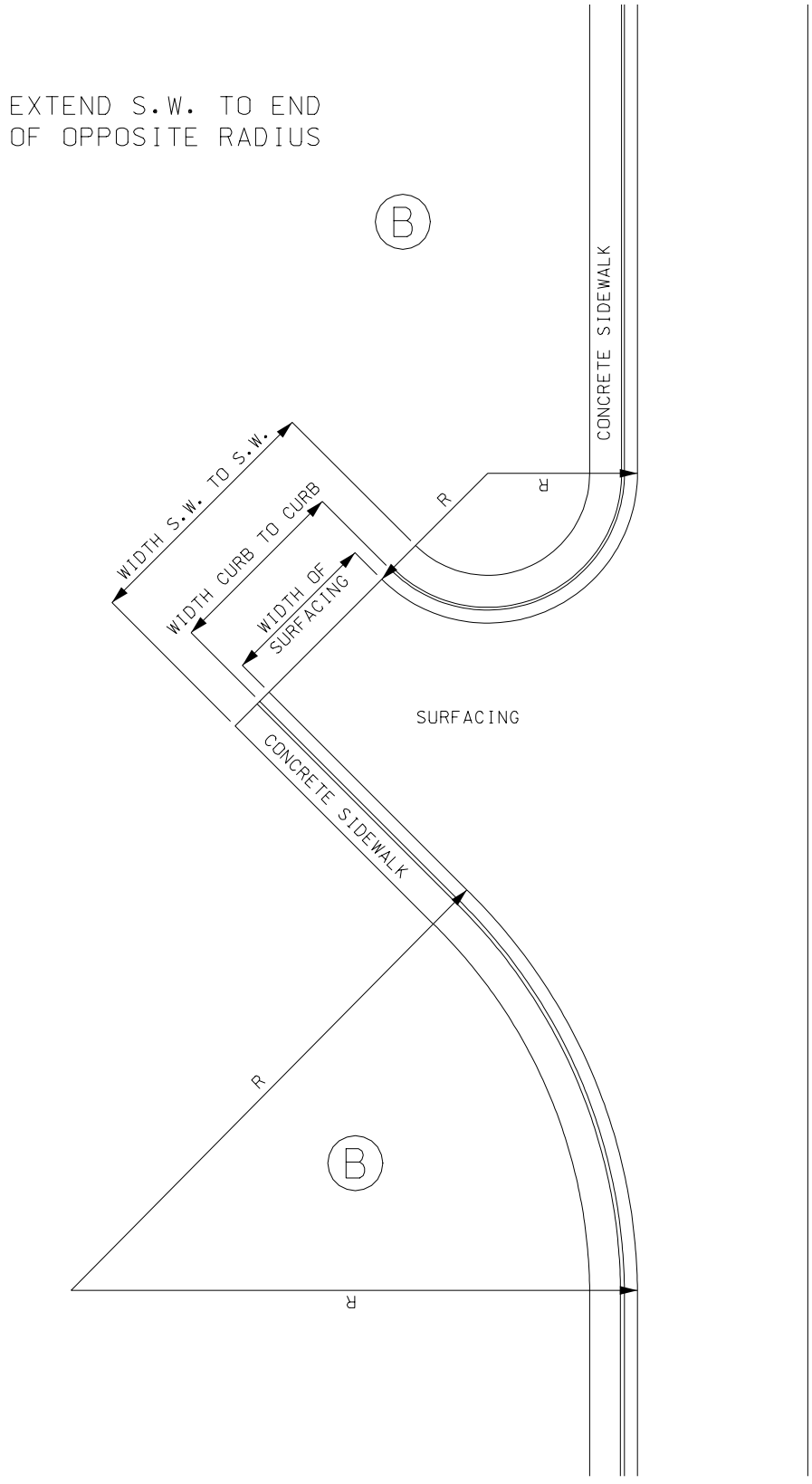
On urban sections (curb and gutter), bike lanes/paved shoulders should be a minimum of 4 feet wide to accommodate bicycle travel. The bike lanes/paved shoulders will have a cross slope of 24H:1V (4.17%). The gutter pan is not to be included in the width of the bike lane/paved shoulder. Where the percentage of trucks, buses, and recreational vehicles are greater than five percent of the ADT, consideration should be given to providing a minimum 6 feet of width. Where motor vehicle speeds are 50 mph or greater, Department guidelines for shoulder widths should be utilized as defined in the SCDOT Highway Design Manual, thus giving the bicyclist either 8 or 10 feet of paved shoulder width to utilize.

The guidelines for shared roadways and bike lanes/paved shoulders will be utilized to accommodate bicycle facilities on roadways with valley gutter. Due to the fact that valley gutter sections are typically used on low volume, two-lane secondary roadways, the cross slope of the paved shoulder/bike lane should be 48H:1V (2.08%).

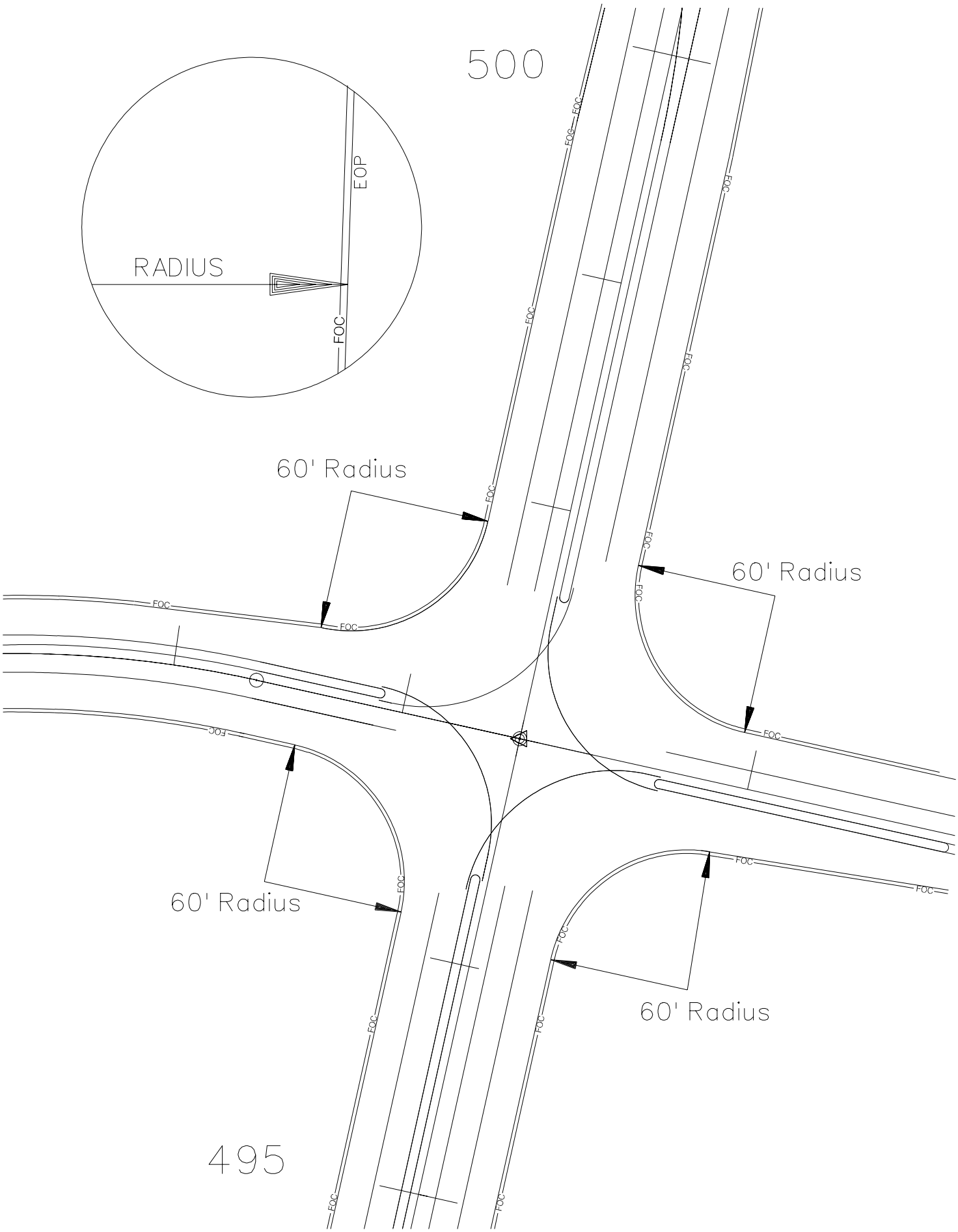
ATTACHMENT I



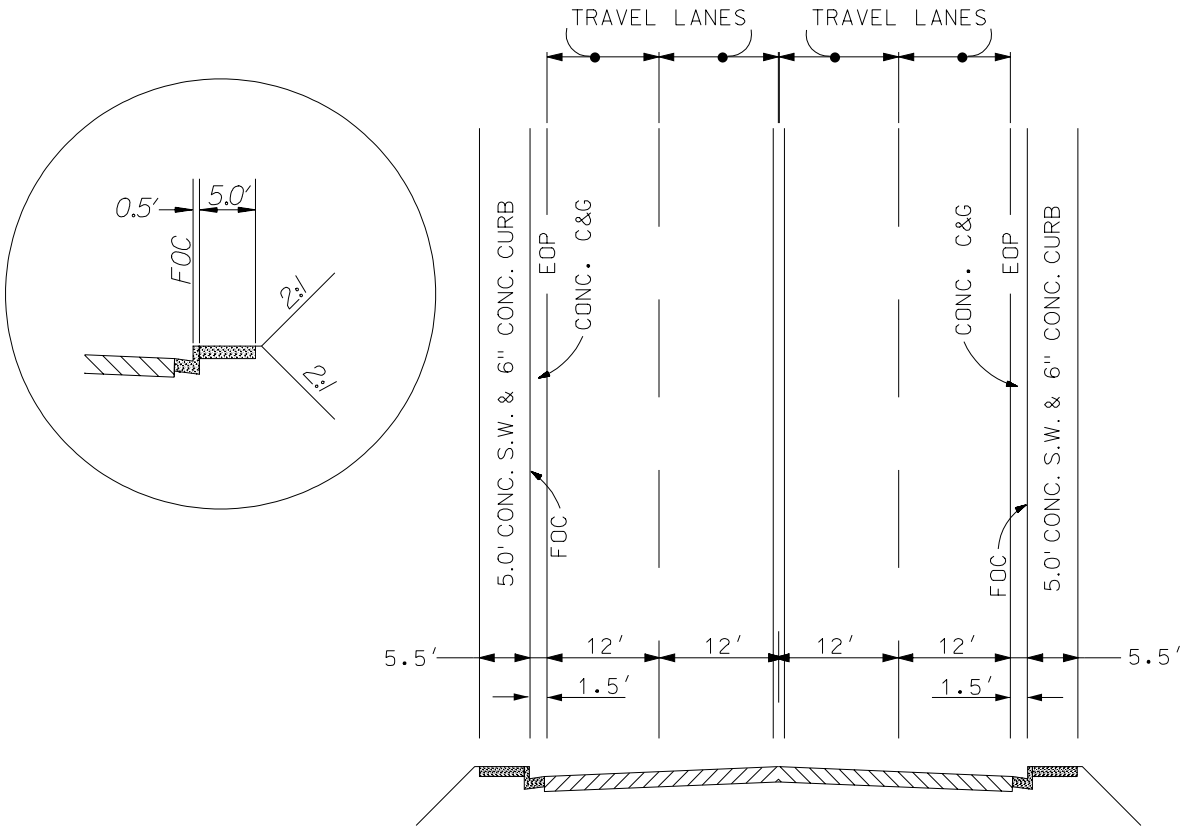
ATTACHMENT II



EXAMPLE OF RADIUS DIMENSIONS

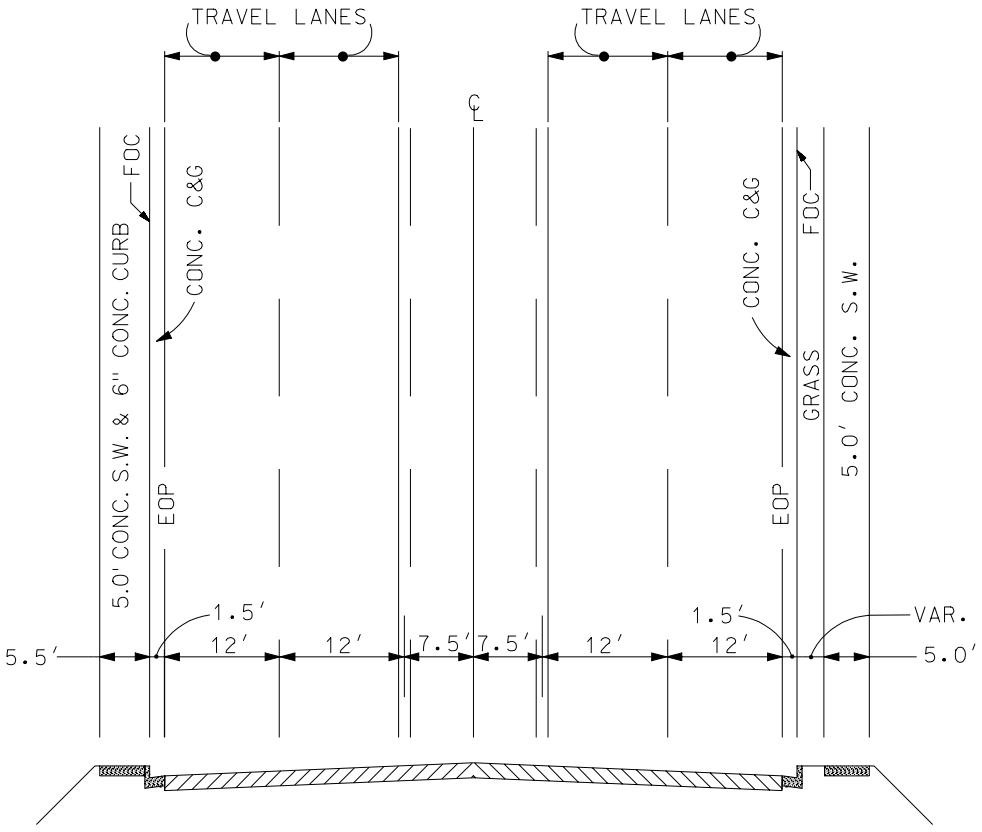


EXAMPLE OF TRAFFIC LANE LINES



CURB & GUTTER

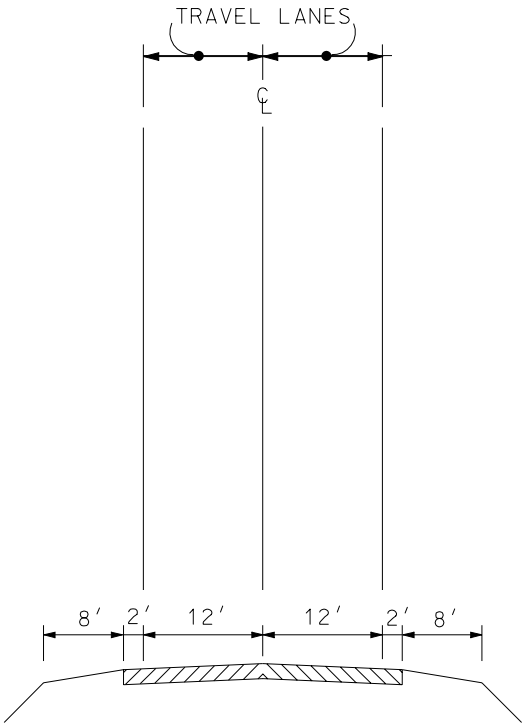
WHEN USING 1"= 50' SCALE



CURB & GUTTER

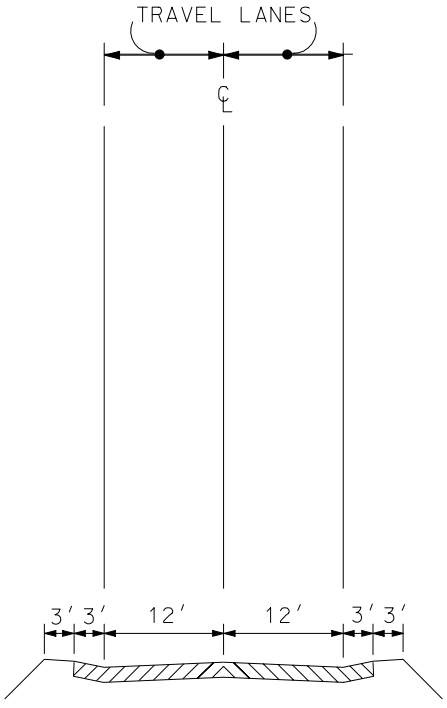
WHEN USING 1"= 20' SCALE

EXAMPLE OF TRAFFIC LANE LINES



SHOULDER SECTION

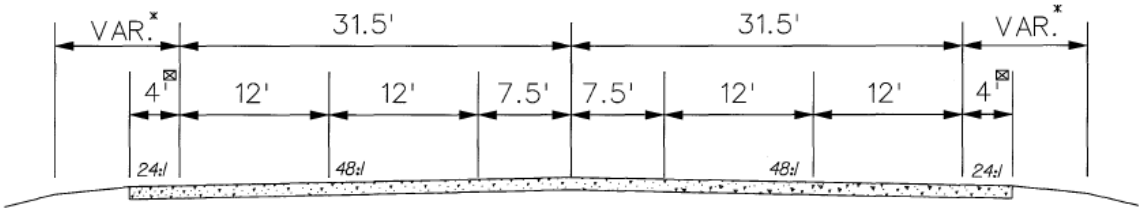
WHEN USING ANY SCALE



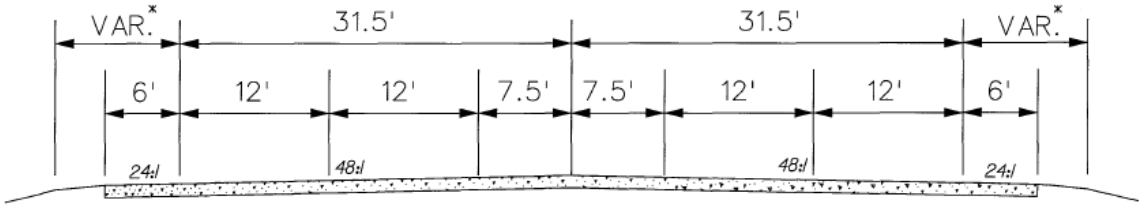
VALLEY GUTTER

WHEN USING ANY SCALE

BICYCLE FACILITIES
NEW CONSTRUCTION
5-LANE RURAL SECTION (SHOULDER)



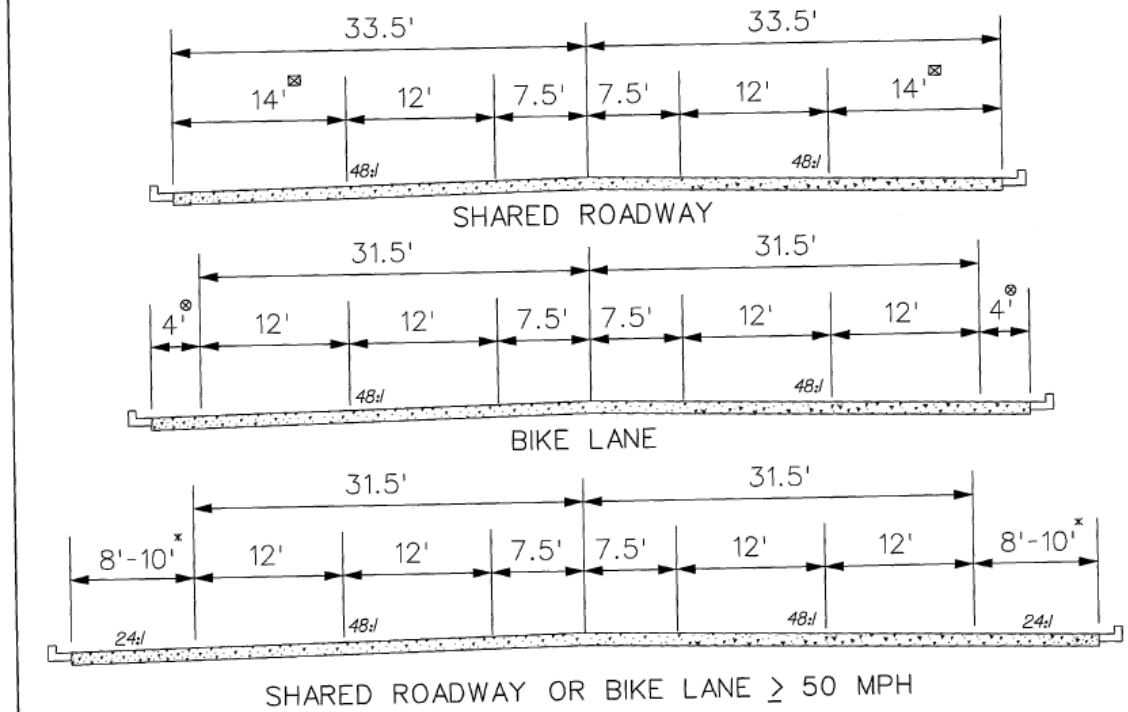
BIKE LANE - POSTED SPEED < 50 MPH OR ≤ 5% TRUCKS



BIKE LANE - POSTED SPEED ≥ 50 MPH OR > 5% TRUCKS

* SHOULDER WIDTH PER SCDOT HIGHWAY DESIGN MANUAL
⊠ USE A 2' PAVED SHOULDER FOR A SHARED ROADWAY

BICYCLE FACILITIES
NEW CONSTRUCTION
5-LANE URBAN SECTION (CURB AND GUTTER)

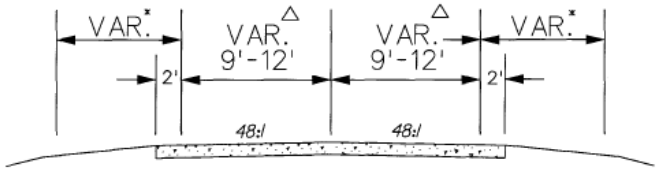


* SHOULDER WIDTH PER SCDOT HIGHWAY DESIGN MANUAL
⊠ CONSIDER USING 15' WHEN GRADES > 5%
⊗ CONSIDER USING 6' WHEN > 5% TRUCKS

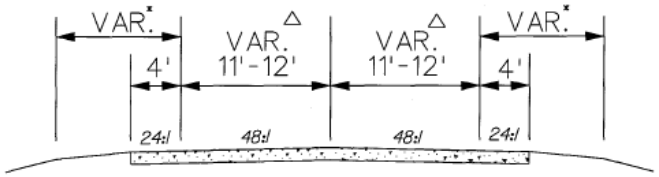
BICYCLE FACILITIES
NEW CONSTRUCTION
2-LANE RURAL SECTION (SHOULDER)

* SHOULDER WIDTH PER SCDOT HIGHWAY DESIGN MANUAL

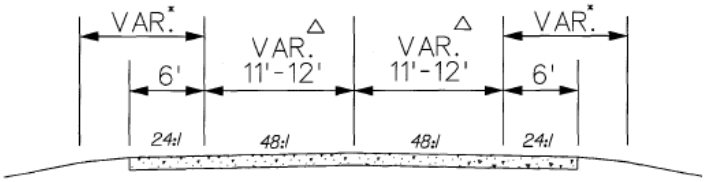
△ LANE WIDTHS PER SCDOT HIGHWAY DESIGN MANUAL



SHARED ROADWAY - LESS THAN 500 ADT

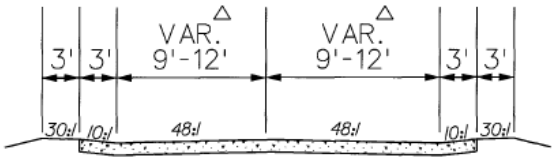


BIKE LANE - POSTED SPEED < 50 MPH OR ≤ 5% TRUCKS

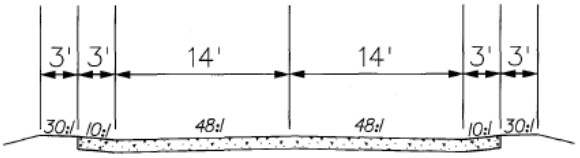


BIKE LANE - POSTED SPEED ≥ 50 MPH OR > 5% TRUCKS

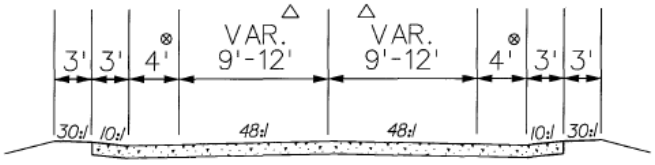
BICYCLE FACILITIES
NEW CONSTRUCTION
2-LANE VALLEY GUTTER SECTIONS



SHARED ROADWAY - LESS THAN 500 ADT



SHARED ROADWAY

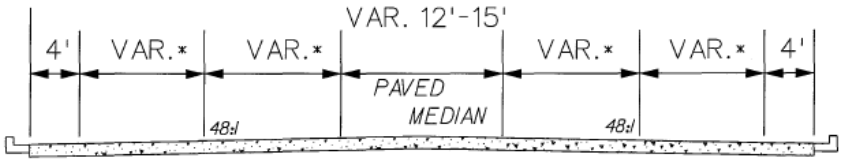


BIKE LANE

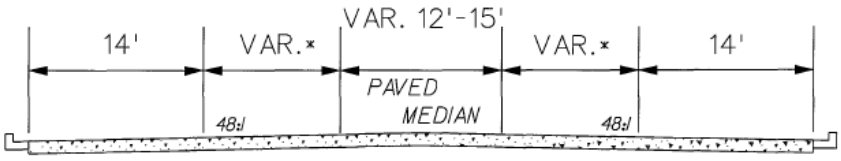
△ LANE WIDTHS PER SCDOT HIGHWAY DESIGN MANUAL

⊗ CONSIDER USING 6' WHEN > 5% TRUCKS

BICYCLE FACILITIES
RESTRIPING EXISTING 5-LANE
URBAN SECTION (CURB AND GUTTER)



BIKE LANE



SHARED ROADWAY

* 11'-12' LANE WIDTHS
(ON NATIONAL OR SOUTH CAROLINA TRUCK NETWORK USE 12' MIN. LANE WIDTH)