

PREFACE

The Plan Preparation Guide is intended for the use of Road Design and other SCDOT Personnel as a technical guide for the design of highways and preparation of plans. It is to be used as a supplement to the SCDOT Highway Design Manual, various AASHTO Manuals, and the accepted standard practices of the South Carolina Department of Transportation.

This Guide was prepared by the Department's Road Design Personnel from previous design material and accepted engineering practices with the approval of the Road Design Engineer. This Guide is written to provide assistance to the designer by supplementing existing design policies, manuals, and directives recognized by the Department. The Plan Preparation Guide is an effort in providing uniformity, clarity, and accuracy to the plans developed by and for the Department. Revisions and updates to the Guide can be viewed in the Plan Preparation Guide hotlink in the Design Documents Section on Road Design's Home Page. A full, updated version of the Plan Preparation Guide will also be available in this section. It is the responsibility of the user to acquire the new version of the guide.

Road Design

Plan Preparation Guide

Table of Contents

	<u>Page</u>
Chapter 1 Plan Covers – Title Sheets – Quantity Sheets – Revised Standard Drawings	
Plan Covers	1-1
Title Sheets	1-3
Summary of Estimated Quantities	1-6
Demolition, Moving Items, and Fences	1-9
Revised Standard Drawings	1-12
Chapter 2 Typical Sections – Pavement Design	
Typical Sections	2-1
Secondary (“C”) Typical Sections	2-3
Base Course	2-4
Full Depth Asphalt Patching	2-5
Maintenance of Roadway and Drives During Construction	2-5
Curb Ramps	2-5
Mill-in Strips	2-5
Asphalt Weight and Thickness	2-5
Pavement Designs	2-6
Detectable Warnings	2-7
Guidelines for Hot Mix Asphalt Selection	2-15
Chapter 3 Quantity Computations and Information	
General Quantities	3-1
Maintenance of Roadway and Drives During Construction	3-1
Liquid Asphalt Binders in Paving Mixture	3-1
Sand-Clay Base Course	3-2
Graded Aggregate Base Course	3-2
Hot Mix Asphalt Base Course	3-2
Hot Mix Asphalt Binder Course	3-3
Hot Mix Asphalt Surface Course	3-3
Bituminous Surfacing	3-3
Prime Coat	3-4
Riprap	3-4
Geotextile for Erosion Control Under Riprap	3-6
Borrow Excavation	3-6
Fine Grading	3-7
Seeding and Sodding.....	3-8
Temporary Seeding	3-8
Mowing	3-8

Table of Contents (continued)

Chapter 3 (continued)	
Removal and Disposal of Existing Asphalt Pavement	3-9
Removal and Disposal of Existing Pavement	3-9
Concrete Driveway	3-9
Brick Masonry-Reinforced Brick Masonry	3-9
Erosion Control Blanket	3-11
Reinforced Concrete Box Culvert	3-11
National Pollution Discharge Elimination System (NPDES)	3-11
Guardrail End Treatment	3-12
Pavement Markings For Bridge Plans	3-12
Pavement Under Guardrail	3-13
Quality Control by Contractor	3-13
Examples	3-14
Chapter 4 Special Drawing – Construction Notes – Miscellaneous Notes	
Special Drawings	4-1
General Construction Notes	4-1
Miscellaneous Notes	4-2
Reclaiming Existing Roadway Notes	4-3
Document Fees	4-4
Alternate Pipe Note	4-4
Plan Revisions and Construction Changes	4-5
Revisions to Right-of-Way and Construction Plans	4-7
Examples.....	4-10
Chapter 5 Existing Topography & Profile – Present Right-of-Way – Project Preparation Guidelines and Criteria	
Existing Topography, Profile, and Cross-Sections	5-1
Project Data File Storage	5-2
File Backup	5-3
Preparing Project for Field Review	5-3
Design Field Review Plans to Project Web	5-4
Present Right-of-Way	5-5
Electronic Files for “As-Built” Plans	5-6
Hydrology Data	5-6
Road Design Production Criteria for ‘C’ Projects	5-6
Examples	5-8
Chapter 6 Horizontal Alignment	
Horizontal Curves (Circular)	6-1
Formulas for Circular Curves	6-3
Short Radius Curve Data	6-4
Short Radius Curve Values	6-5
Maximum Degree of Curve for Design Speed	6-7

Table of Contents (continued)

Chapter 7 Design – Channelization	
Horizontal Roadway Design	7-1
Traffic Lane Lines	7-1
Concrete Sidewalk	7-2
Five Lane Section	7-3
Considerations for Bicycle Facilities	7-3
Examples	7-5
Chapter 8 Vertical Alignment – Profile	
Vertical Alignment	8-1
Method of Computing Odd Intersection Point	8-1
Properties of Vertical Curves	8-2
Curve Offset Computations	8-3
Length of Crest Vertical Curves	8-7
Length of Sag Vertical Curves	8-8
Plan-Profile Sheet (Example)	8-9
Chapter 9 Drainage Structures – R.C. Box Culverts – Ditches – Gutters – Curbs	
Plans for Hydrology	9-1
Catch Basin Types & Usage	9-2
Drop Inlet Types & Usage	9-5
Pipe End Structures & Usage	9-6
Catch Basin Spacing for Types 16, 17, & 18	9-7
Catch Basin Spacing for Type 15	9-25
Precast Drainage Structures	9-28
Pipe Requirements	9-30
Concrete Pipe Data	9-32
Beveled End Pipes	9-33
Pipe Tee Joints, WYE Joints, & Bends	9-35
Criteria for Placing Paved Gutter	9-37
Culvert Sketches	9-37
Curb Profile	9-37
Green Areas	9-37
Trench Drain Applications	9-38
Chapter 10 Clear Zone – Guardrail – Crash Cushions – Barriers – Walls	
Clear Zone Concept	10-1
Guardrail	10-6
Guardrail Length of Need	10-7
Impact Attenuators	10-9
Type "T" End Treatment	10-9
Retaining Walls	10-9
Guardrail in Radius	10-10
Examples	10-11

Table of Contents (continued)

Chapter 11 Cross-Sections

Existing Cross-Sections	11-1
Proposed New Construction	11-2
Example	11-3

Chapter 12 New Right-of-Way

General Right-of-Way Information	12-1
Setting New Right-of-Way (Secondary Projects)	12-2
Setting New Right-of-Way (Primary and Major Secondary)	12-2
Right-of-Way Widths	12-5
Illustrating New Right-of-Way on Plans	12-7
Triangular Areas	12-9
Right-of-Way on Sharp Horizontal Curves	12-10
Outfall Ditches	12-11
Channel Changes	12-11
Culvert Sites	12-11
Bridge Locations.....	12-12
Retaining Walls	12-13
Temporary Right-of-Way	12-13
Property Closure	12-13
Control Access/Limited Access	12-14
Placement of Right-of-Way Marker	12-15
Property Information	12-16
Right-of-Way Plans Distribution	12-17
Railroad Right-of-Way	12-17
Highway Design versus Local Tree Ordinances	12-17

Chapter 13 Bridge Information

Plan Production Criteria for Bridge Replacement Projects	13-1
Bridge Information	13-2
Bridge Construction Access	13-2
Concrete Transition Curb & Flume at Bridge Ends	13-3
Examples	13-5

Chapter 14 Railroad Information

Railroad Information	14-1
Railroad Grade Separation	14-1
Prints to Utilities	14-2
Examples	14-3

Chapter 15 Plan Index

Plan Organization	15-1
Index of Plan Sheets	15-2

Table of Contents (continued)

Chapter 16 Miscellaneous Tables – Charts – Formulas	
Riprap for Box Culverts	16-1
Riprap for Pipe	16-2
Inches and Fractions in Decimals of a Foot	16-3
Decimal Equivalents of Fractional Parts of One Inch	16-4
ASTM Standard Reinforcing Bars	16-5
Properties of the Circle	16-6
Trigonometric Formulas	16-7
Areas of Plane Figures	16-8
Slope Distances	16-11
Metric Conversion	16-12
New Concrete Designations	16-13
Chapter 17 Sediment/Erosion Control Plans	
Sediment/Erosion Control Plans	17-1
Sediment Dams and Temporary Sediment Control Structures & Basins	17-1
Sediment Trap for Catch Basin/Drop Inlet	17-2
Inlet Structure Filters	17-2
Ditch Checks	17-3
Erosion Control Blanket	17-3
Silt Fence	17-3
Baled Straw/Sediment Tubes/Curb Inlet Filters	17-4
Temporary Slope Drains	17-4
Erosion Control Data Sheet	17-5
Chapter 18 Quality Control/Quality Assurance	
QC/QA for Roadway Plans	18-1
Engineering Directives PC-27	18-2
QC/QA for Review Process for SCDDOT and Consultant Road Plans	18-4
QC/QA Flow Charts	18-8
QC/QA of Design Field Review Plans	18-12
QC/QA Review Checklist for R/W, Construction, and R/W-Construction Plans	18-15
Road Design Reference Material for Consultant Prepared Plans in English	18-36
Road Design Reference Material for Consultant Prepared Plans in Metric	18-49
Chapter 19 Specifications	
Specifications	19-1
Supplemental Specifications	19-1
Special Provisions	19-1
Instructional Bulletins	