

# Plan Preparation Guide

## Chapter 18

### QUALITY CONTROL / QUALITY ASSURANCE

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**NOTE: DUE TO FREQUENT CHANGES TO THE CHECKLIST (PAGES 18-12 THROUGH 18-36), USERS SHOULD OBTAIN THE MOST CURRENT EDITION FROM THE FOLLOWING WEB SITE**

[www.dot.state.sc.us/doing/QC\\_docs.html](http://www.dot.state.sc.us/doing/QC_docs.html)

## **QUALITY CONTROL/QUALITY ASSURANCE FOR ROADWAY PLANS**

Quality Control for Roadway Plans will be performed in accordance with Engineering Directive Memorandum PC-27, “Quality Control/Quality Assurance of Road Plans”; this procedure describes the quality control/quality assurance review of roadway plans prepared by Road Design. Plans are to be reviewed for design, accuracy of quantities, presentation of information, and compliance with guidelines, policies and procedures as adopted by the department. Design Services Group has compiled a summary of quality control reviews for roadway plans.

**SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION**

**ENGINEERING DIRECTIVE MEMORANDUM**

Number: PC-27

Subject: QUALITY CONTROL/QUALITY ASSURANCE OF ROAD PLANS

This procedure describes the quality control/quality assurance review of road plans prepared by Road Design and by engineering consultant firms. Plans are to be reviewed for design, accuracy of quantities, presentation of information, and compliance with guidelines, policies, and procedures as adopted by the Department. Reviews will be made of the Design Plan Field Review plans, right of way plans and construction plans. Upon special request, reviews may be made at other stages of plan development.

For right of way and construction plans developed by Road Design, the review process begins in the design group with the Design Group Coordinator. One of the Project Facilitators then reviews the plans before submitting to the Design Services Group whose task is to perform a complete quality control review. The plans are then sent to the Hydrology Section on the way to the Program Manager, then to the Project Development Engineer. The plans are sent back to Road Design for a final review by the Road Design Engineer. Right of way plans and construction plans are mailed at prescribed times to the appropriate District Engineering Administrator for a review. While the plans are in the District both construction and maintenance personnel should take the opportunity to review the plans in respect to each of their areas of expertise. Design Plan Field Review plans will not follow the above process, but will be sent to the Design Services Group at the same time that Design Plan Field Review plans are sent to the Program Manager for the field review. After the Design Services Group's review of the Design Plan Field Review plans, their comments will be sent to the Program Manager and design group for action. Fast Track Bridge road plans and other priority projects should be reviewed and processed as quickly as possible.

Consultant prepared road plans will be reviewed by the consultant's quality control process at the Design Plan Field Review, right of way and construction phases prior to submittal to the Department. The consultant's in-house quality control procedures should be on file in the Design Services Group for each specific project involving road plans. Plans are to be submitted by the consultant to the section in the Department that is responsible for hiring the consultant. A review by that section should first be done to determine if the consultant's plans are in compliance with the terms of the agreement. Road plans should then be sent to the Design Services Group for a quality assurance review. This review does not relieve the consultant of the responsibility for the accuracy, design, or compliance with guidelines, policies and procedures required by the

Department. After the Design Services Group's review, the right of way and construction plans will follow the same process as the Department's prepared road plans. Comments are to be returned to the consultant through the section engaging the consultant. Design Plan Field Review plans will be given to the Design Services Group prior to the field review. Comments from the Design Services Group will be returned to the consultant on the field review or within ten days thereafter.

A descriptive outline and a flow chart of each plan review process are attached. Also attached are checklists of the quality control review for Design Plan Field Review plans, right of way plans and construction plans.

Approved: \_\_\_\_\_  
Director of Preconstruction

Effective Date: March 1, 1995

## **Quality Control/Assurance Review Process for SCDOT Road Plans**

The following review processes are performed to insure all Department's policies; procedures, specifications and standards are followed for construction of SCDOT roadways. A flow chart of each process is attached.

### **(A) SCDOT Plans (See Flow Chart A)**

All road projects except rehabilitation projects will have Design Plans Field Review reviewed by the Design Services Group concurrently with the field review. Designs not meeting the Department specified criteria and policies will be noted and sent to the Design Group and to the Program Manager for action. The Program Manager will obtain a "design exception" or determine necessary revisions.

All Right of Way and Construction plans prepared by Department should adhere to the following quality control procedure.

#### **(A1) Design Group Coordinator**

Responsible for preparing construction plans after receiving all necessary information from Program Managers and other Departmental support staff. Assembles plans to meet all Department policies, procedures, specifications and standards. Reviews plans for correct design, right of way (existing and new), and estimated quantities. Performs Design Plans Field Review so as to make final revisions to design and other plan information. Also reviews and completes revisions to plans.

#### **(A2) Project Facilitator**

Responsible for seeing that plans are prepared and reviewed for accuracy and completeness. Responsible for meeting right of way and letting obligation schedules with plans. Also reviews revisions to plans.

#### **(A3) Design Services Group**

Performs final quality control. Reviews plans for accuracy, completeness, policies, procedures, specifications and standards.

(A4) Hydraulic Engineer	Performs final quality control of Hydraulic Design and NPDES.
(A5) Program Manager	Reviews plans for completeness, meeting design policies and property owner input.
(A6) Program Development Engineer	Reviews plans for completeness and meeting design policies.
(A7) Road Design Engineer	Reviews plans for completeness and meeting design policies. Also receives and reviews comments and revisions of plans. Directs comments and revisions for appropriate action.
(A8) Operations/Project Facilitator	Reviews plans' estimated quantities for completeness and checks for correct pay item numbers in preparation for letting. Directs plans to District Engineering Administrator, Director of Rights of Way, and Federal Highway Administrator (FHWA) for review. All comments are sent back to Road Design for action. FHWA Major Revisions are sent to the Program Manager for review. In addition, reviews requested plan revisions before sending back to the Design Group. May make minor changes to plans if deemed appropriate.
(A9) District Engineering Administrator	Reviews plans for constructability, completeness of design information, and omission of quantities.
(A10) Director of Rights of Way	Checks rights of way and property lines against county courthouse and Department records. Notes revisions of moving items, demolition items, and other property owner information. Advises Road Design of any design revisions due to right of way negotiations.
(A11) Federal Highway Administration	On National Highway System projects only, reviews plans for completeness and compliance with specifications and guidelines.

**(B) Rehabilitation Plans  
(See Flow Chart B)**

Rehabilitation projects that are federally funded Rehabilitation projects. No right of way plans are needed for these types of projects.

(B1) District Engineering Administrator

Compiles all necessary data for Rehabilitation projects throughout District. Follows standards, procedures and practices for all projects. Assists in Preparing necessary items for strip map plans. Reviews items for completeness and adequate quantities.

(B2) Program Manager

Prepares project authorization request and project planning report. Reviews cost estimates and directs District strip maps and quantities to Design Service Group. Determines which roads are to be in contracts with Districts' assistance. Performs Design Plans Field Review

(B3) Design Services Group

Prepares strip map plans to meet all standards, specifications, policies and procedures of Department and FHWA. Performs Design Plans Field Review so as make final revisions to design and other plan information. Finalizes plans for letting including information from field review.

(B3a) District Engineering Administrator

Performs Design Plans Field Review with Design Services Group and Pavement Design Engineer.

(B4) Road Design Engineer

Reviews plans for completeness and conformance with design standards.

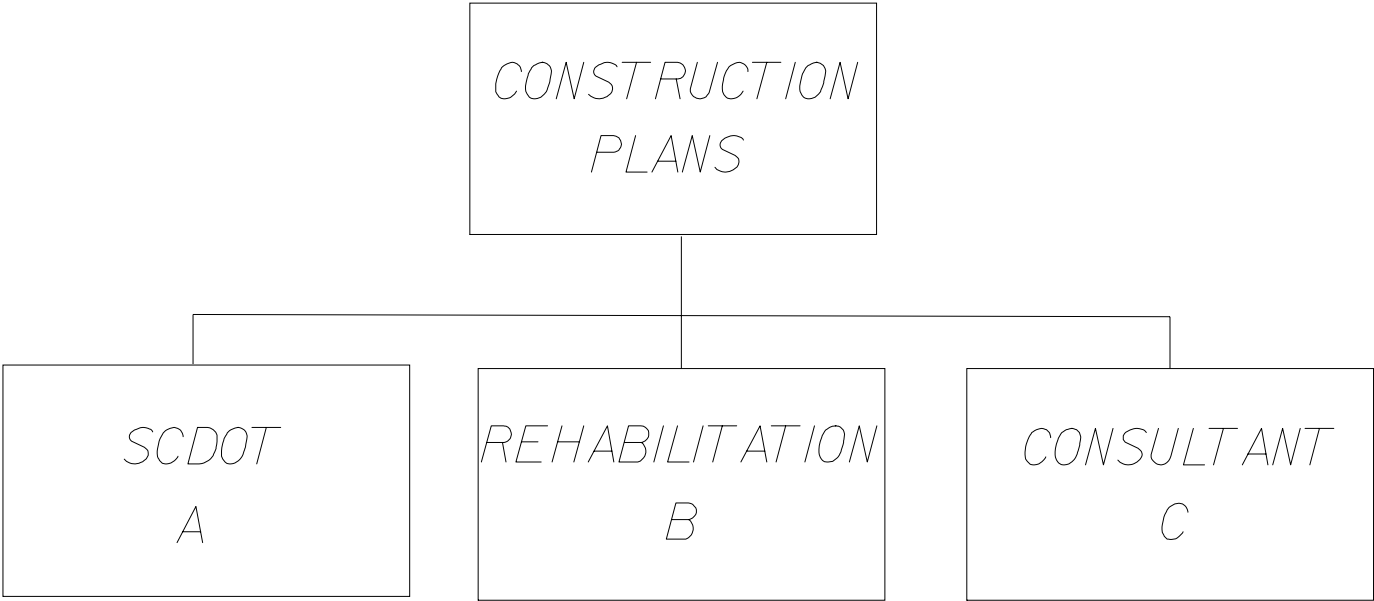
(B5) Operations/Project Facilitator

Directs plans to FHWA for review. Also reviews any revisions of plans for construction. Sends copy of final plans to District Engineering Administrator for review and comments.

(B6) District Engineering Administrator	Perform final quality control review for constructability and estimated quantities.
(B7) Federal Highway Administration	Reviews plans for compliance with federal policies and procedures.
<b>(C) Consultant Plans (See Flow Chart C)</b>	Performs Quality Assurance process to insure all Department's policies, procedures, specifications and standards are followed in the preparation of plans for construction of Department roadways. Consultant certifies to the Department that plans are in compliance with all Departmental policies, procedures, specifications and standards.
(C1) Consultant	Assembles plans to meet all policies, specifications, procedures and standards set by the Department using quality control criteria throughout plan preparation. Consultant to provide to the Department their detailed quality control process for each project. Consultant should have completed their reviews prior to each stage submittal to the Department.
(C1a) Department	During assembly of plans, Program Manager and Design Services Group will oversee preparation of plans by reviewing and commenting on plan submittals at predetermined stages of completion. In addition, the Program Manager and a member of the Design Service Group participate on Design Plans Field Review.
(C2) Program Manager	Consultant submits plans to the Program Manager who reviews them for compliance with scope of work; then, directs plans to Design Services Group to begin final Department quality assurance review process. Review procedure follows Department's quality control process beginning at Design Services Group level (A3) and proceeds through a similar process as Department prepared plans. See Flow Chart 'A'.

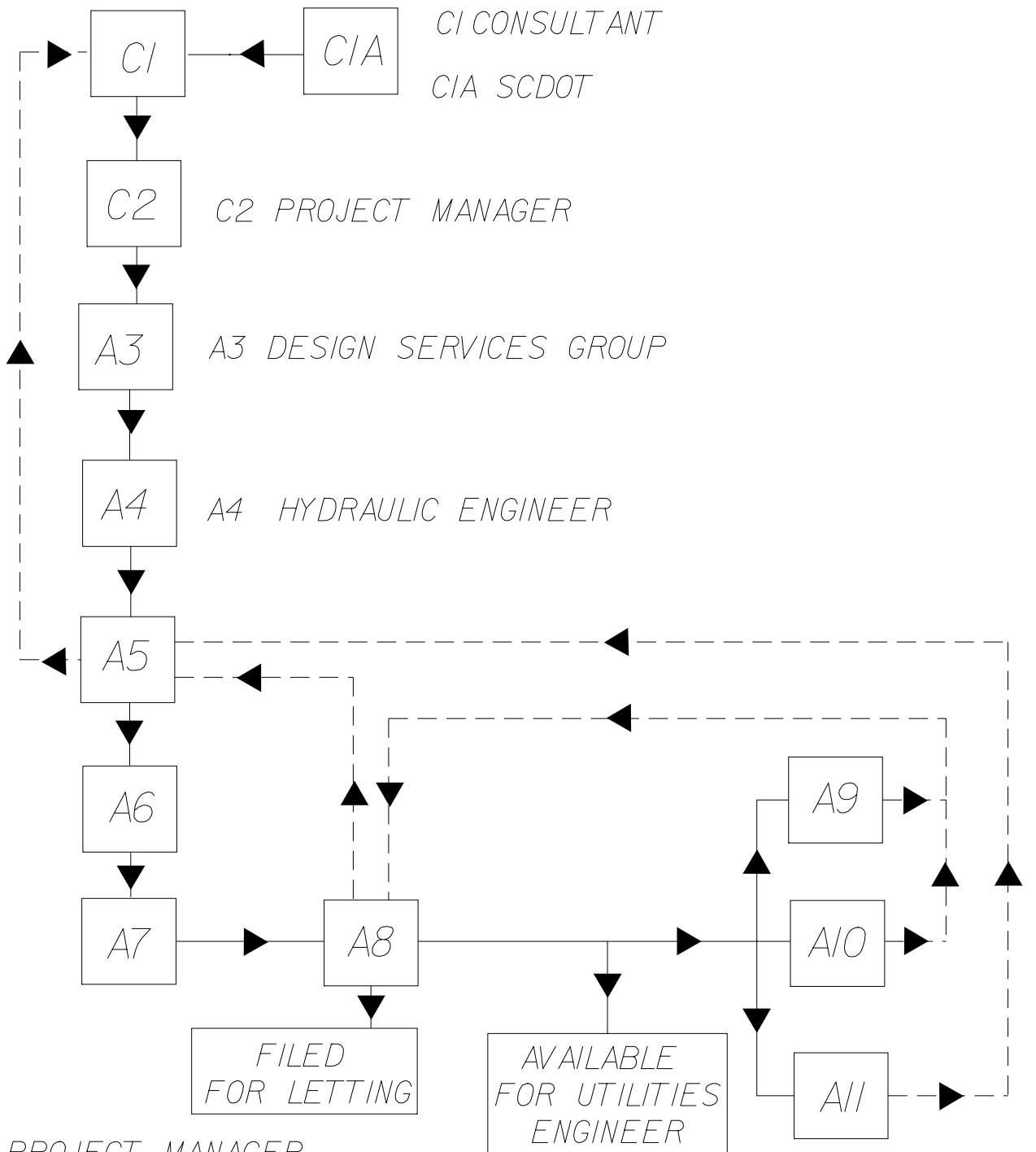


*QUALITY CONTROL/QUALITY ASSURANCE  
PLAN REVIEW PROCESS  
FOR SCDOT*



# CONSULTANT PLANS

## C

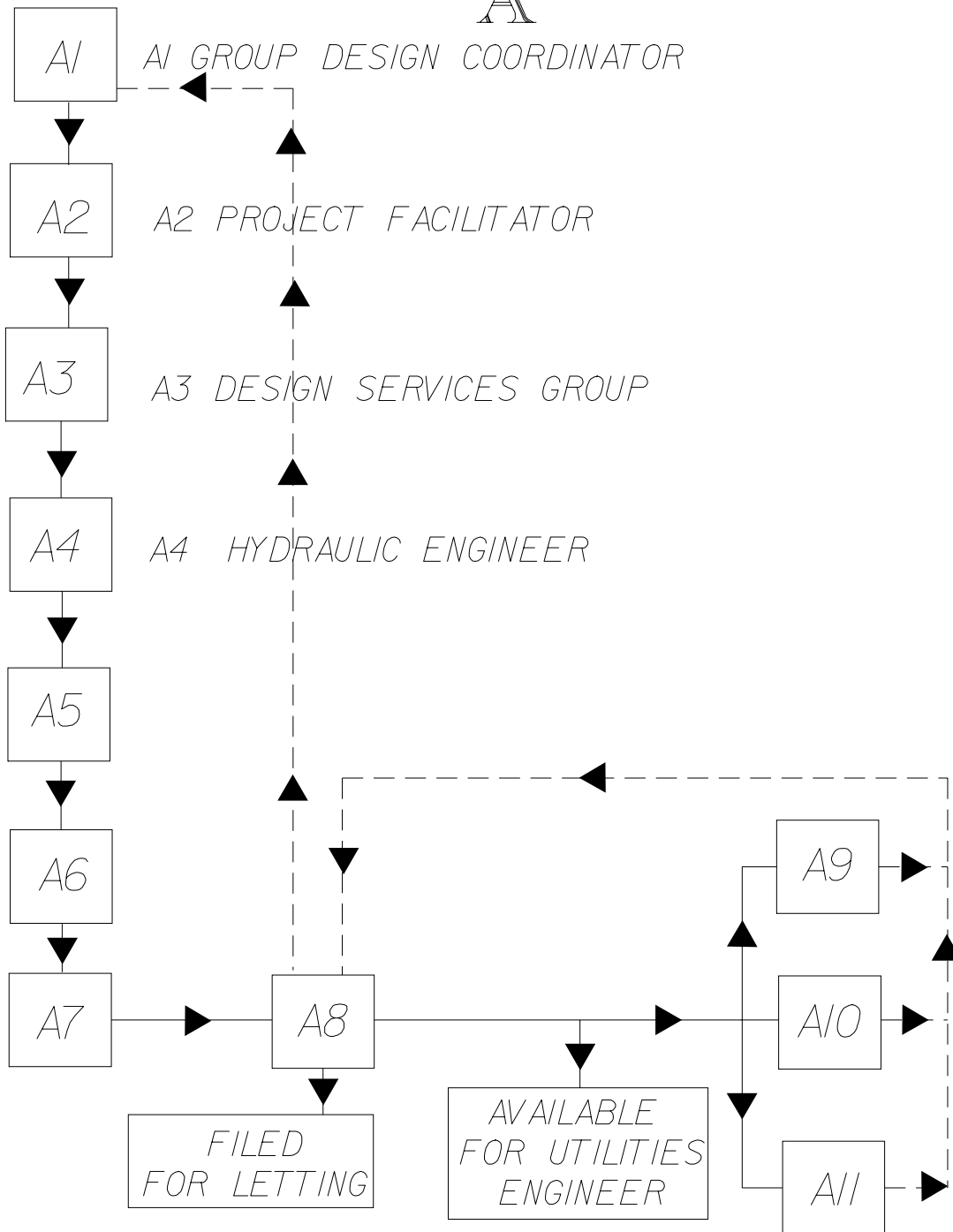


- A5 PROJECT MANAGER
- A6 PROGRAM DEVELOPMENT ENGINEER
- A7 ROAD DESIGN ENGINEER
- A8 OPERATIONS/PROJECT FACILITATOR
- A9 DISTRICT ENGINEERING ADMINISTRATOR
- A10 DIRECTOR OF RIGHTS OF WAY
- A11 FEDERAL HIGHWAY ADMINISTRATION

NOTE:  
 DASHED LINE DENOTES  
 REVISION PROCESS.  
 AFTER REVISIONS,  
 PLANS WILL BE  
 RECHECKED IN  
 NORMAL PROCEDURE.

# S.C.D.O.T. CONSTRUCTION PLANS

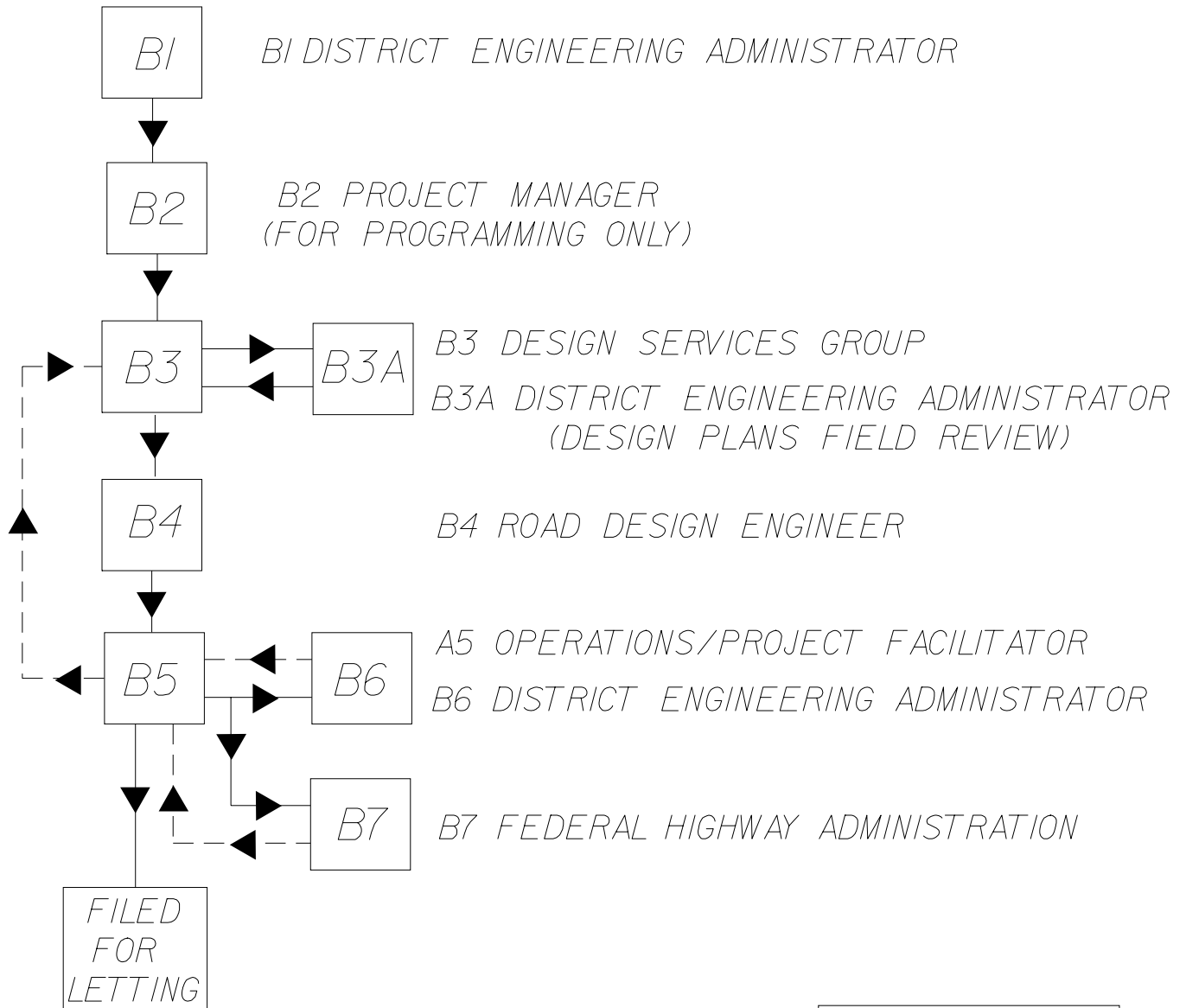
## A



- A5 PROJECT MANAGER
- A6 PROGRAM DEVELOPMENT ENGINEER
- A7 ROAD DESIGN ENGINEER
- A8 OPERATIONS/PROJECT FACILITATOR
- A9 DISTRICT ENGINEERING ADMINISTRATOR
- A10 DIRECTOR OF RIGHTS OF WAY
- A11 FEDERAL HIGHWAY ADMINISTRATION

**NOTE:**  
 DASHED LINE DENOTES  
 REVISION PROCESS.  
 AFTER REVISIONS,  
 PLANS WILL BE  
 RECHECKED IN  
 NORMAL PROCEDURE.

# FEDERAL AID REHABILITATION PLANS B



*NOTE:  
DASHED LINE DENOTES  
REVISION PROCESS.  
AFTER REVISIONS,  
PLANS WILL BE  
RECHECKED IN  
NORMAL PROCEDURE.*

### **Quality Assurance of Design Field Review Plans**

The procedure below describes the quality assurance (QA) review of Design Field Review Plans prepared by Road Design for all projects with the exception of 'C' funded or partly funded projects.

Design Field Review (DFR) Plans are to be reviewed by the Design Services Group for design and compliance with guidelines, policies, and procedures as adopted by the Department. A copy of the QA review checklist is listed below.

DFR Plans are to be delivered by the Design Group to the Design Services Group five working days prior to the date of the scheduled design field review. Upon completion of the Design Services Group's review of the DFR Plans, the Design Services Group's comments will be returned to the Design Groups for revisions, if any, that may need addressing.

The review of the DFR plans will be done during the same time the DFR is being performed. The QA review of the DFR is not to delay or interfere with the scheduling and/or completing the DFR.

Design Field Review Plan  
Revised January 28, 2004

**Index:**  
**HDM – Highway Design Manual**  
**IB – Instructional Bulletins**  
**PPG – Plan Preparation Guide**

**DESIGN FIELD REVIEW PLANS**  
**(30% COMPLETE)**

**QUALITY ASSURANCE REVIEW**

County: \_\_\_\_\_ Road/Route: \_\_\_\_\_ PIN: \_\_\_\_\_

Design Group No.: \_\_\_\_\_ - Secondary/Primary (Circle one)

Consultant: \_\_\_\_\_

Reviewed By: \_\_\_\_\_  
**Initials                  Begin Date                  End Date                  Let Date**

**I. CHECK PPMS DATA**

- A. Project Identification Number (PIN)
- B. County
- C. File Number
- D. Project Number
- E. Road/Route Number(s)

**II. TITLE SHEET**

- A. Correct Reference Title Sheet for Project (dfrts2.dgn PER IB 2003-2)
- B. Location / Description
  - 1. Check Map against Description.
  - 2. North Arrow
  - 3. Location Map Labels (.....County or Town/City of.....)
- C. Traffic Data (year 2002)
- D. Check Beginning and Ending Stations Notes on Location Map Agree with:
  - 1. Plans/ Profiles
  - 2. Project area clearly highlighted on map.

**III. DESIGN EXCEPTIONS**

- A. Pre-Construction Report Items
  - 1. Design Speed (HDM 11.2.5)
  - 2. Horizontal Alignment (HDM CHP. 11)
  - 3. Vertical Alignment (HDM CHP. 12)
  - 4. Vertical Clearance (HDM 19.3.2)
  - 5. Grade (HDM CHP. 12)
  - 6. Bridge width (HDM 13.5.1)
  - 7. Superelevation (HDM CHP. 11)
  - 8. Cross Slope (HDM 13.2.3)
  - 9. Lane width (HDM 13.2.2)
  - 10. Shoulder width (HDM 13.2.6)



Design Field Review Plan  
Revised January 28, 2004

- 11. Stopping sight distance (HDM 10.1.3)
- 12. Structural Capacity of Bridges (HDM 9.2.2)
- 13. Horizontal clearance (HDM 11.2.7)
- B. Copy of "Request for Approval of Design Exceptions", if applicable (HDM 9.2.3)

**RIGHT OF WAY PLANS**  
**(70% COMPLETE)**

**QUALITY CONTROL/ASSURANCE REVIEW**

**PRELIMINARY**                       **FINAL**

County: \_\_\_\_\_ Road/Route: \_\_\_\_\_ PIN: \_\_\_\_\_

Design Group No.: \_\_\_\_\_ - Secondary/Primary (Circle one)

Consultant: \_\_\_\_\_

**Reviewed By:** \_\_\_\_\_  
Initials      Begin Date      End Date      Let Date

**Forwarded to Hydrology Group :** \_\_\_\_\_ **On:** \_\_\_\_\_ **By:** \_\_\_\_\_

**I. CHECK PPMS DATA:**

- A. Project Identification Number (PIN)
- B. County
- C. File Number
- D. Project Number
- E. Road/Route Number(s)

**II. COVER**

- A. Project Identification Number (PIN)
- B. County and County Number Agree
- C. File Number
- D. Project Number
- E. Road/Route Number(s)
- F. From/To Description
- G. Design Group Initials

**III. TITLE SHEET (Sheet 1 OR Sheet 1A if to be bound w/Const. Plans)**

- A. Correct Reference Title Sheet for Project
- B. Index with Subtotals and Total Sheets  
    Note: Show Sheet 1 “omitted” in Index if Title Sheet No. 1A is used  
        Also sheets 2, 5, TC series & PM Series “omitted” for R/W Plans
- C. Project Identification Box
  - 1. Project Identification Number (PIN)
  - 2. County
  - 3. File Number
  - 4. Road/Route Number
  - 5. Sheet Number (“1” OR “1A” per III B Note)
  - 6. Total Sheets
- D. Location / Description
  - 1. Check Map against Description
  - 2. North Arrow
  - 3. Location Map Labels (.....County or Town/City of.....)
    - a. Fill out town / city approved by box (cross out in not in town / city)



- E. NPDES Data
- F. Longitude and Latitude
- G. Railroad Involvement Indicated
- H. Traffic Data
- I. Check Beginning and Ending Stations
  - 1. Notes on Location Map Agree with:
    - a. Typical Sections
      - Plans
      - Profiles
      - Cross Sections
    - b. Include arrows indicating “Begin” and “End” of project survey(s)
    - c. Project area clearly highlighted on map
  - 2. Include notes for bridges/culverts and notes for exceptions Agree with:
    - Typical Sections
    - Plans
    - Profiles
    - Cross Sections
- J. Check Length of Project
  - 1. Show Length(s) in Thousandths (Three Decimal Places)
  - 2. Show mileage for each mainline survey (sideroads, connectors, ramps, etc.)
  - 3. Show total mileage if multiple roads/lines
  - 4. Check for Exceptions for Roadway.
  - 5. Show equalities in stationing
    - a. Agrees with Plans
    - b. None
  - 6. Check for Bridge/Structures Over 6.1 m (20') In Length
    - a. Included in plans
    - b. Note: "Bridge plans bound under separate cover"
- K. Group Coordinator's Initials and Date
- L. Project Facilitator's Initials and Date
- M. Standard Drawing & Specification Note - Date 1986 (Or Latest Edition)
- N. Design Group No./Group Coordinator Initials & Initials of Preparer
- O. Check for correct Seal on Title Sheet
  - 1. "Signature only" Required by Eargle for "C" Projects. Sealed by Williamson
  - 2. In addition to Eargle's Seal check Program Development map legend for correct Seal (Rocque Kneece or John Walsh) on STP, BRT, Etc. Projects.

#### IV. MOVING ITEMS and REMOVAL & DISPOSAL ITEMS

- A. Not Required per Project Manager
- B. Included
  - 1. Location
  - 2. Description
  - 3. Owner
  - 4. Work To Be Done
- C. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number

V. TYPICAL SECTION (S) (Sheet 3)

- A. Check against Pavement Design and/or Field Review Recommendations
  - 1. Widths and Thickness/Rates of Materials
    - a. Agrees with plans and x-sections
  - 2. Pavement Legend
  - 3. Materials/Rates per Current PPG Guidelines
  - 4. Alternate Aggregate Bases Shown (if required) - note: not to be used in areas with 6' or less width.
- B. “NTS” If Not To Scale
  - 1. Vertical Dimensions agrees with plans
  - 2. Horizontal dimensions agrees with plans
- C. Drawn to Scale
  - 1. Vertical Dimensions agrees with plans
  - 2. Horizontal dimensions agrees with plans
  - 3. Slopes
- D. For “variable” Widths Show
  - 1. Variation (example: Variable 1.5 to 7.0)
  - 2. Dimension Shown on Typical Section (example: Shown 5.5)
- E. For “variable” Slopes, Show
  - 1. Variation (6:1 to 2:1)
  - 2. Slope Shown on Typical Section (shown 4:1)
  - 3. Fill Height at each Slope Change
- F. Inclusive of Beginning/Ending Stations of Project
  - 1. Notes To Cover Areas Not Represented In Typical Stations
- G. Point of Grade Indicated
- H. Design Speed Block (Horizontal)
  - 1. Completed
  - 2. Exceptions Noted
- I. Other Notes/Details
  - 1. Re: Applicable Standard Drawings
  - 2. Re: Guardrail
  - 3. Re: Curb & Gutter/Sidewalk
  - 4. Necessary Detail Drawings
- J. Ditch note allowing variable ditch where applicable
- K. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number
- L. Lane Width
  - 1. Agrees with Plans
- M. Shoulders - 3.5' for guardrail

VI. RIGHT OF WAY DATA SHEET (Sheet 4)

- A. Tract Numbers
  - 1. Agree with property Strip Map
  - 2. Agree with Plans
- B. Owner(s)
  - 1. Agree with property Strip Map
  - 2. Agree with Plans
- C. Tax Map Reference

- D. Tract Total
  - 1. Hectares and (Acres) or square meters and (square feet) per Right of Way Instrument
  - D. Obtain in square meters and (square feet) and hectares and (acres)
  - E. Remain in Hectares and (Acres)
    - 1. If equal to or less than 0.1 Hectare (0.25 acres) show remain in square meters (square feet)
  - F. Date Acquired
- G. Permissions Noted
  - 1. Outfall Ditches
  - 2. Slope
  - 3. Drainage Structures
  - 4. Erosion Control
  - 5. Entrance
- H. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number

VII. PROPERTY STRIP MAP (Sheet 4A)

- A. Tracts Numbered
- B. Owner
- C. Clearly Note Present and New Right of Way
  - 1. Agrees with Plans
- D. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number

VIII. GENERAL CONSTRUCTION NOTE (Sheet 5)

- A. Omitted for R/W Plans

IX. REFERENCE DATA SHEETS (Sheet 5A, 5B, etc.)

- A. Plan Data
  - 1. Control Points
  - 2. Reference Points
  - 3. Curve Data
    - a. Superelevation per Std. 100-6
  - 4. Benchmarks
    - a. Description
    - b. Elevation
    - c. Datum (Assumed, NAVD-88, Or NGVD-29 Per Instructional Bulletin 96-3)
  - 5. Curb Grade Profile Data
- B. Project Staking Data
  - 1. Curves Numbered to Agree with Plans
- C. Plan Sheet Layout Diagram
  - 1. Agrees with Plans
  - 2. Match Lines & Stations
- D. Relocation Control Points Per Instructional Bulletin 97-10

- E. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number

X. FIRST PLAN SHEET

- A. Right of Way Note(s) for Present R/W
  - 1. File/Docket/Project Number
  - 2. Date
- B. Utility Notes
- C. All Items in Section XII Below

XI. ALL PLAN SHEETS

- A. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number
- B. North Arrow
  - 1. Bearing(s) on all Centerline Tangents
- C. Begin/End Notes
- D. R/W Data
  - 1. Show Property Lines
  - 2. Tracts numbered
  - 3. Property owners
  - 4. Give Pluses for Shifts and at Beginning and End of Tapers for New R/W.
  - 5. Label R/W at Beginning and End of each Plan Sheet.
  - 6. Label R/W at Breaks/Shifts for New R/W.
  - 7. Label sight Areas (see P.P.G. page 12-7)
  - 8. Label Moving Items per Project Manager
  - 9. Label Removal and Disposal Items per Project Manager.
  - 10. Label "Obtain permission"
    - a. Ditches Beyond Right of Way Limits.
    - b. Entrances
      - 1. Beyond Right of Way Limits
      - 2. Relocated Due New Construction/Alignment.
    - c. Pipe/Drainage Structures Beyond Right of Way Limits.
- E. Show Travelway Widths
  - 1. Beginning & End of Each Sheet.
  - 2. Beginning and End of Tapers
    - a. Give Pluses at Beginning and End.
  - 3. Radii at Intersections per Face of Gutter/Edge of Pavement
  - 4. Medians Labeled & per Std. 100-8
- F. Construction Lines Plotted and labeled (cut / fill)
- G. NPDES Lines Plotted.
- H. New Guardrail plotted - use only after all other options are considered
- I. Special Notes
- J. Drainage - Pipe and Structures
  - 1. Per Hydrology Study or Field Review Recommendations.
- K. Label Control of Access
- L. Utility Information provided by Surveys (Including alignment, elevations, etc.).
- M. Symbology as per STD 100-8

- N. Design:
  - 1. Travelway Widths and Lane Widths
  - 2. Turning Radii (meets design)
  - 3. Sight Distances (Stopping)
  - 4. Lane Alignment
  - 5. Design Speed
- O. Relocation Notes
- P. Plotted For Readability at 50% reduction.

## XII. PROFILE SHEETS

- A. Begin and End Notes
- B. Grade Line
  - 1. Percent of Grade
  - 2. Vertical Curves
    - a. PI Station and elevation
    - b. Lengths
    - c. Design speed(s) for Federal Aid projects
  - 3. Percent of Grade
    - a. Check for minimum or maximum grade
      - Ditch Section 0.10%
      - Curb and Gutter 0.30%
      - Valley Gutter 0.40%
  - 4. Exceptions Noted
  - 5. Equalities in stationing plotted.
- C. Special Ditches (Noted Only)
- D. Proposed Outfall Ditch Grades
- E. Elevations
  - 1. P.C. s
  - 2. P.T. s
  - 3. Percent of Grade Shown
  - 4. Type of Gradeline Noted (Finished, Subgrade, Spline).
  - 5. Agrees with X-Sections.
- F. Vertical Design (Sight Distances)
- G. Vertical Clearances (Bridges, Overpasses, Trees etc.)
  - 1. Structure Stations.
  - 2. Toe of fill.
- H. All information shown can be readable at 50% reduction.
- I. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number

## XIII. EROSION CONTROL PLANS

- 1. Need Erosion Control Data sheet if N.P.D.E.S. is over 5.0 Acres

## XIII. CROSS SECTIONS

NOTE: If Cross Sections Are Bound Separately, Check Cross-Section Cover per Section II of Checklist (include a copy of title sheet)

- A. Begin/End Notes
- B. Exception Notes
- C. Equality in Stationing Notes
- D. Agrees with Typical Section

- E. S. E. Notes
  - 1. Beginning and Ending
  - 2. Maximum
  - 3. Not required on Curb and Gutter Sections.
- F. Bridge Notes
  - 1. Begin and End of Bridge
  - 2. Toe of Fills
- G. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number
  - 5. Sheet Number (X1- \_\_)

**CONSTRUCTION PLANS**  
**BOUND WITH COMPLETED R. /W. PLANS**  
**QUALITY CONTROL / ASSURANCE REVIEW**  
 \_\_\_ PRELIMINARY \_\_\_ FINAL

County: \_\_\_\_\_ Road/Route: \_\_\_\_\_ PIN: \_\_\_\_\_

Design Group No.: \_\_\_\_\_ Secondary/Primary (Circle one)

Consultant: \_\_\_\_\_

**Reviewed By:** \_\_\_\_\_ - \_\_\_\_\_  
                    Initials                      Begin Date                      End Date                      Let Date

**Forwarded to Hydrology Group :** \_\_\_\_\_ **On:** \_\_\_\_\_ **By:** \_\_\_\_\_

**I. CHECK PPMS DATA**

- A. Project Identification Number (pin) and Item Number
- B. County
- C. File Number
- D. Project Number
- E. Route / Road

**II. TITLE SHEET (Sheet 1)**

- A. Index with Subtotals and Total Sheets
  - 1. Sheet 1a for R/W Title sheet (For Information Only)
- B. Project Identification Box
  - 1. Project Identification Number (PIN)
  - 2. Total Sheets
  - 3. File and Project Numbers
  - 4. Route / Road
- C. Check Beginning and Ending Stations agrees with Typical, Plans, Profile, Cross -Sections.
  - 1. Notes on Location Map
    - a. Include notes for Bridges/Culverts and notes for exceptions
- D. Check Length of Project
  - 1. Show Length(s) in Thousandths (Three Decimal Places)
  - 2. Show mileage for each mainline survey (sideroads, connectors. ramps, etc.).
  - 3. Show total mileage if multiple roads/lines.
  - 4. Check for Exceptions for Roadway.
  - 5. Show equalities in stationing:
    - a. Agrees with Plans
    - b. None
  - 6. Check for Bridge/Structures Over 6.1 m (20') In Length.
    - a. Included in plans

II. TITLE SHEET (continued)

- b. Note: "Bridge plans bound under separate cover".
- E. Group Coordinator Initials and Date
- F. Project Facilitator's Initials and Date
- G. Design Group No./ Design Group Coordinator Initials, & Initials of Preparer
- H. Check for correct Seal on Title sheet
  - 1. "Signature only" Required by Eargle for "C" Projects Sealed by Williamson
  - 2. In addition to Eargle's Seal check Program Development map legend for correct Seal (Rocque Kneece or John Walsh) on STP, BRT, Etc. Projects.

III. SUMMARY OF ESTIMATED QUANTITIES (sheet 2)

- A. Proofread Quantities
  - 1. Check CATS numbers against descriptions
  - 2. Check for 2000 specifications on english jobs
  - 3. Check for 1986 specifications on metric jobs
- B. Agrees with Cats
- C. Check Quantity for correct Unit
- D. Inclusion Items Reflected in Totals
- E. Minimum Quantities Per Plan Preparation Guide
- F. Asphalt Materials Used Comply With Guidelines for Hot Mix Asphalt Selection (Latest Version)
- G. Open Graded Friction Course - use 6.5% for liquid asphalt binder (cement)
- H. Check for milled in rumble strips on inside & outside shoulders of all interstate projects excluding ramps.
- I. Check also for 4 x 4 Yellow Markers
- J. All District 6 Projects to include
  - 1. 1050800 Construction stakes lines & Grades.
  - 2. 1090200 As-built construction plans.
- K. Check for Graded Aggregate Base Course not shown with alt. on english jobs.
- L. Check for New Alternate Bases on metric jobs.
  - 1. Marine Limestone Base Cr.
  - 2. Portland Cement Concrete Base Cr.
  - 3. Macadam Base Cr.
- M. Check for Coquina Base in district 5.
  - 1. Note placed on General Construction Note sheet when Coquina Base is selected. (see Instructional Bulletin 2000-2)
- N. All Bridge Projects Developed by Road Design will Include Pavement Markings
  - 1. 6011010 Paint 4" White Solid Lines (Pvt. Edge Lines)
  - 2. 6012005 Paint 4" Yellow Broken Lines (Gaps Exc.)
  - 3. 6012010 Paint 4" Yellow Solid Lines (Pvt. Edge & No Passing Zone)
  - 4. 6033005 Permanent Yellow Pavement Markers Bi-Dir., Refl. 4"x4"  
(See Instructional Bulletin No. 99-4)



IV. MOVING ITEMS and REMOVAL & DISPOSAL ITEMS (sheet 2A)

— A. Not Required per Project Manager

B. Included

— 1. Location

— 2. Description

— 3. Owner

— 4. Work To Be Done

C. Project Identification Box

— 1. County

— 2. File Number

— 3. Road/Route Number

— 4. Sheet Number

— D. Shown on Plans

V. TYPICAL SECTION'S (Sheet 3)

— A. Check Plan Quantities

— 1. Pavement

— a. Base

— b. Binder

— c. Surface

— d. Liquid Asphalt Binder (Check section number and type)

— e. Prime coat (use only on Earth Type Base Course & Graded Aggregate Base Course)

— f. Agrees w/ Plans

V. GENERAL CONSTRUCTION NOTE AND INCLUSIONS (SHEET 5)

— A. Standard Construction Note

— B. Inclusion Items -Items Not Shown in Detail on Plans

— 1. Check items for appropriate unit

— a. Observe minimums per Plan Preparation Guide

— b. Accurate description for intended use

— C. Clearing and Grubbing Outfall Ditches

— D. Drives & Build Up/Leveling

— 1. Base/Binder

— 2. Surface

— 3. Liquid Asphalt Binder

— E. Extra Pipe Per Field Review

— F. Perforated Pipe Underdrain Per Field Review

— 1. Aggregate Underdrain

— a. For 100 mm (4") pipe=0.28 m<sup>3</sup> per meter (11CY per 100LF)

— b. For 150 mm (6") pipe = 0.33 m<sup>3</sup> per meter (13CY per 100LF)

— H. Riprap (Tons)

— 1. Geotextile Fabric under Riprap

— 2. Quantities broken down for specific use (bride ends, ditches, etc.)

V. GENERAL CONSTRUCTION NOTE AND INCLUSIONS (continued)

- I. Reset Fence
- J. Seeding/Sodding
  - 1. Unmulched unless otherwise specified on field review
    - a. Fertilizer (10-10-10) - Tons (1,121 Kg/Hectare [1000#/Ac])
    - b. Lime - Tons (2.24 Ton/Hectare [1 Ton/Acre])
    - c. Nitrogen - Kg (53.8 Kg/Hectare) [Pounds (48# Per Acre)]
  - 2. Temporary Seeding
    - a. 50% unless otherwise specified on Field Review
    - b. Fertilizer @560 kg/ha (500 lbs. /Ac) unless otherwise specified on Field Review
- K. Mowing
- L. Erosion Control Items (Listed Separate)
  - 1. Baled Straw per Field Review / Job Requirements
  - 2. Silt Fence per Field Review / Job Requirements
  - 3. Other Items
    - a. Specified on Field Review
    - b. Necessary for adequate erosion control
- M. Unclassified Excavation & Borrow Per Field Review - removal and replacing unstable material
- N. Prime Coat for Aggregate or Sand Clay Bases
- O. "These Plans Developed . . . ." Scroll Data
- P. Alternate Pipe Notes
- Q. Removal of Asphalt
- R. Recommend checking inclusion note for State Highway Engineer not Deputy Director of Construction.

IX. REFERENCE DATA SHEETS (Sheet 5A, 5B, etc.)

- A. Plan Data
  - 1. Control Points
  - 2. Reference Points
  - 3. Curve Data
    - a. Superelevation per Std. 100-6
  - 4. Benchmarks
    - a. Description
    - b. Elevation
    - c. Datum (Assumed, NAVD-88, Or NGVD-29 Per Instructional Bulletin 96-3)
  - 5. Curb Grade Profile Data
- B. Project Staking Data
  - 1. Curves Numbered to Agree with Plans
- C. Plan Sheet Layout Diagram
  - 1. Agrees with Plans
  - 2. Match Lines & Stations
- D. Relocation Control Points Per Instructional Bulletin 97-10

- E. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number

#### VII. ALL PLAN SHEETS

- A. File Number, County, Road/Route No., and Sheet Number
- B. Begin/End Notes as Needed
- C. Guardrail and Notes (Check as per Roadside Design Guide)
- D. Special Notes (ie. Removal of Asphalt, Construction of Entrance, etc.)
- E. Earthwork (Plan Sheets)
  - 1. Connectors
  - 2. Entrances
  - 3. Outfall Ditches
- F. Drainage - Pipe and Structures
  - 1. Check against Field Review Recommendations / Hydrology
  - 2. New Pipe (Correct Symbology)
  - 3. Divisible by 1.22 meters (4.0')
  - 4. Adequate Cross line Lengths
  - 5. Location of Catch Basins
    - a. Agrees with grades
    - b. Locations (Low Points and Spacing)
  - 6. Agrees with Summary of Estimated Quantities
  - 7. Extra depth of box
  - 8. Structures (ie. Culvert)
    - a. Agrees with Culvert Details (Bridge Department)
  - 9. Drainage Information provided by Hydraulic Section (Including invert elevation for storm sewer and cross line pipe)
  - 10. Check Profile for cross line pipe (36" or greater-Hydrology data)
  - 11. Length of pipe plotted correctly.
- G. Moving Items and Removal & Disposal Items
  - 1. Agrees with sheet 2a

#### VIII. PROFILE SHEETS

- A. Earthwork
  - 1. Notes Agree with Excavation / Embankment on Cross-Sections
  - 2. Balance Points
  - 3. Overhaul
    - a. 1,000 m (3,000 ft) Freehaul - Roadway Only
    - b. Include calculations in quantity folder
  - 4. Agrees with sheet 2
  - 5. Vertical curves - (D.S. for F.H.W.A only)
- B. Toe of fill
- C. Begin and End Notes

- D. Percent of Grade
- 1. Check for minimum or maximum grade
  - Ditch Section 0.10%
  - Curb and Gutter 0.30%
  - Valley Gutter 0.40%
- E. Curb grades included in plans.
- 1. Agree with centerline grades when parallel.
- 2. Agree with top of curb elevations on cross sections.

#### IX. EROSION CONTROL PLANS

- 1. Need Erosion Control Data sheet if N.P.D.E.S. is over 5.0 Acres

#### X. CROSS SECTIONS

- A. Volumes agrees with earthwork
- B. Elevations Agree with Profile
- C. Agrees with Typical Sections
- D. Toe of fill
- E. Begin and End Notes



- 2. Include notes for bridges/culverts and notes for exceptions Agree with :
  - a. Typical Sections
  - b. Plans
  - c. Profiles
  - d. Cross Sections
- I. Check Length of Project
  - 1. Show Length(s) in Thousandths (Three Decimal Places)
  - 2. Show mileage for each mainline survey( sideroads, connectors. ramps, etc.).
  - 3. Show total mileage if multiple roads/lines.
  - 4. Check for Exceptions for Roadway.
  - 5. Show equalities in stationing:
    - a. Agrees with Plans
    - b. None
  - 6. Check for Bridge/Structures Over 6.1 m (20') In Length.
    - a. Included in plans
    - b. Note: "Bridge plans bound under separate cover".
- J. Group Coordinator - Initials and Date
- K. Project Facilitator - Initials and Date
- L. Standard Drawing & Specification Note - Date 1986 (Or Latest Edition)
- M. Design Group No. / Group Coordinator Initials & Initials of Preparer
- N. Check for correct Seal on Title sheet
  - 1. "Signature only" Required by Eargle for "C" Projects Sealed by Williamson
  - 2. In addition to Eargle's Seal check Program Development map legend for correct Seal (Rocque Kneece or John Walsh)on STP, BRT, Etc. Projects.
- O. Project Identification Box
  - 1. Project Identification Number (PIN)
  - 2. County
  - 3. File Number
  - 4. Project Number
  - 5. Road/Route Number
  - 6. Total Sheets
- IV. SUMMARY OF ESTIMATED QUANTITIES (sheet 2)
  - A. Proofread Quantities
    - 1. Check CATS numbers against descriptions.
    - 2. Check for 2000 specifications on english jobs
    - 3. Check for 1986 specifications on metric jobs
  - B. Agrees with Cats
  - C. Check Quantity for correct Unit.
  - D. Inclusion Items Reflected in Totals
  - E. Minimum Quantities Per Plan Preparation Guide
  - F. Asphalt Materials Used Comply With Guidelines for Hot Mix Asphalt Selection (Latest Version).
  - G. Open Graded Friction Course - use 6.5% for liquid asphalt binder (cement)
  - H. Check for milled in rumble strips on inside & outside shoulders of all Interstate projects excluding ramps.
  - I. Check also for double 4 x 4 Yellow markers.
  - J. All District 6 Projects to include
    - 1. 1050800 Construction stakes lines & Grades
    - 2. 1090200 As-Built Construction Plans
  - K. Check for Graded Aggregate Base Course not shown with alt. on english jobs.
  - L. Check for New Alternate Bases on metric jobs.
    - 1. Marine Limestone Base Cr.
    - 2. Portland Cement Concrete Base Cr.
    - 3. Macadam Base Cr.

- M. Check for Coquina Base in district 5.
  - 1. Note placed on General Construction Note sheet when Coquina Base is selected. (see Instructional Bulletin 2000-2)
- N. All Bridge Projects Developed by Road Design will Include Pavement Markings
  - 1. 6011010 Paint 4" White Solid Lines (Pvt. Edge Lines)
  - 2. 6012005 Paint 4" Yellow Broken Lines (Gaps Exc.)
  - 3. 6012010 Paint 4" Yellow Solid Lines (Pvt. Edge & No Passing Zone)
  - 4. 6033005 Permanent Yellow Pavement Markers Bi-Dir., Refl. 4"x4"  
(See Instructional Bulletin No. 99-4)
  
- V. MOVING ITEMS and REMOVAL & DISPOSAL ITEMS (sheet 2A)
  - A. Not Required per Project Manager
  - B. Included
    - 1. Location
    - 2. Description
    - 3. Owner
    - 4. Work To Be Done
  - C. Project Identification Box
    - 1. County
    - 2. File Number
    - 3. Road/Route Number
    - 4. Sheet Number
  - D. Shown on Plans
  
- VI. TYPICAL SECTION (S) (Sheet 3)
  - A. Check against Pavement Design and/or Design Plans Field Review Recommendations.
    - 1. Widths and Thickness/Rates of Materials
      - a. Agrees with plans and x-sections
    - 2. Pavement Legend
    - 3. Asphalt Materials Used Comply With Guidelines for Hot Mix Asphalt Selection (Latest Version).
    - 4. Alternate Aggregate Bases Shown (if required for metric) - not to be used in areas with 6' or less width (Requires note on typical section).
  - B. "NTS" If Not To Scale
    - 1. Vertical Dimensions
    - 2. Horizontal dimensions
      - a. Agrees with plans
  - C. Drawn to Scale
    - 1. Vertical Dimensions
    - 2. Horizontal dimensions
      - a. Agrees with plans
    - 3. Slopes
  - D. For "variable" Widths Show:
    - 1. Variation (example: Variable 1.5 to 7.0)
    - 2. Dimension Shown on Typical Section (example: Shown 5.5)
  - E. For "variable" Slopes, Show:
    - 1. Variation (6:1 to 2:1)
    - 2. Slope Shown on Typical Section (shown 4:1).
    - 3. Fill Height at each Slope Change
  - F. Inclusive of Beginning/Ending Stations of Project
    - 1. Notes To Cover Areas Not Represented In Typical Stations.
  - G. Point of Grade Indicated

- H. Design Speed Block
  - 1. Completed
  - 2. Exceptions Noted (Horizontal)
  - 3. Lowest Speed Noted For Group 1 Roads (No Exceptions To Be Noted)
- I. Ditch note allowing variable ditch where applicable
- J. Check Pavement / Base Quantities
  - 1. Check that quantities agree with plans (sheet 2)
- K. Other Notes/Details
  - 1. Re: Applicable Standard Drawings
  - 2. Re: Guardrail (Extra 3.5')
  - 3. Re: Curb & Gutter/Sidewalk
  - 4. Necessary Detail Drawings
- L. Lane Width
  - a. Agrees with Plans
- M. Minimum 1.0 Depth of Ditch
- N. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number

VII. RIGHT OF WAY DATA SHEET (Sheet 4)

- A. Tract Numbers
  - 1. Agree with Property Strip Map
  - 2. Agree with Plans
- B. Owner(s)
  - 1. Agree with Property Strip Map
  - 2. Agree with Plans
- C. Tax Map Reference
- D. Tract Total
  - 1. Hectares and (Acres) or square meters and (square feet)  
per Right of Way Instrument
  - D. Obtain in square meters and (square feet) and hectares and (acres)
  - E. Remain in Hectares and (Acres)
    - 1. If equal to or less than 0.1 Hectare (0.25 acres) show remain in  
square meters (square feet)
- F. Date Acquired
- G. Permissions Noted
  - 1. Outfall Ditches
  - 2. Slope
  - 3. Drainage Structures
  - 4. Erosion Control
  - 5. Entrance
- H. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number



VIII. PROPERTY STRIP MAP (Sheet 4A)

- A. Tracts Numbered
- B. Owner
- C. Clearly Note Present and New Right of Way
- 1. Agrees with Plans
- D. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number

IX. GENERAL CONSTRUCTION NOTE (Sheet 5)

- A. Omitted for R/W Plans
- B. Standard Construction Note
- C. Inclusion Items -Items Not Shown in Detail on Plans
  - 1. Check items for appropriate unit
    - a. Accurate description for intended use.
- D. Clearing and Grubbing Outfall Ditches
- E. Drives & Build Up/Leveling
  - 1. Base/Binder
  - 2. Surface
  - 3. Liquid Asphalt Binder
- F. Extra Pipe Per Field Review
- G. Perforated Pipe Underdrain Per Field Review
  - 1. Aggregate Underdrain
    - a. For 100 mm (4") pipe = 0.28 m<sup>3</sup> per meter (11CY per 100LF)
    - b. For 150 mm (6") pipe = 0.33 m<sup>3</sup> per meter (13CY per 100LF)
- H. Riprap (Tons)
  - 1. Geotextile Fabric under Riprap
  - 2. Quantities broken down for specific use (bride ends, ditches, etc.)
- I. Reset Fence
- J. Seeding/Sodding
  - 1. Unmulched unless otherwise specified on field review
    - a. Fertilizer (10-10-10) - Tons (1,121 Kg/Hectare [1000#/Ac])
    - b. Lime - Tons (2.24 Ton/Hectare [1 Ton/Acre])
    - c. Nitrogen - Kg (53.8 Kg/Hectare) [Pounds (48# Per Acre)]
  - 2. Temporary Seeding
    - a. 50% unless otherwise specified on field review
    - b. Fertilizer @560 kg/ha (500 lbs. /Ac) unless otherwise specified on field review
- K. Mowing
- L. Erosion Control Items (Listed Separate)
  - 1. Baled Straw per field review / Job Requirements
  - 2. Silt Fence per field review / Job Requirements
  - 3. Other Items
    - a. Specified on field review
    - b. Necessary for adequate erosion control
- M. Unclassified Excavation & Borrow Per field review - for removal and replacing unstable material.
- N. Prime Coat for Aggregate or Sand Clay Bases (Per Instructional Bulletin 94-7).
- O. "These Plans Developed . . . ." Scroll Data (Per Instructional Bulletin 94-8).
- P. Alternate Pipe Note (Per Instructional Bulletin 96-8).
- Q. Note for Removal of Asphalt (Per Instructional Bulletin 97-2).

- R. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number
  
- X. REFERENCE DATA SHEETS (Sheet 5A, 5B, etc.)
  - A. Plan Data
    - 1. Control Points
    - 2. Relocation Control Points(Per Instructional Bulletin 97-10)
    - 3. Reference Points
    - 4. Curve Data
      - a. Superelevation Noted (Per Standard Drawing No. 100-6)
      - 5. Benchmarks
        - a. Description
        - b. Elevation
        - c. Datum (Assumed, NAVD-88, Or NGVD-29 Per Instructional Bulletin 96-3)
      - 5. Curb Grade Profile Data
  - B. Plan Sheet Layout Diagram
    - 1. Agrees with Plans
  - C. Project Identification Box
    - 1. County
    - 2. File Number
    - 3. Road/Route Number
    - 4. Sheet Number
  
- XI. FIRST PLAN SHEET
  - A. Right of Way Note(s) for Present R/W
    - 1. File/Docket/Project Number / Date
  - B. Utility Notes
  - C. All Items in Section XII Below?
  
- XII. ALL PLAN SHEETS
  - A. North Arrow
    - 1. Bearing(s) on all Centerline Tangents
  - B. Begin/End Notes
  - C. R/W Data
    - 1. Show Property Lines
    - 2. Tracts numbered
    - 3. Property owners
    - 4. Give Pluses for Shifts and at Beginning and End of Tapers for New R/W.
    - 5. Label R/W at Beginning and End of each Plan Sheet.
    - 6. Label R/W at Breaks/Shifts for New R/W.
    - 7. Label sight Areas (see Plan Preparation Guide page 12-7)
    - 8. Label Moving Items.
    - 9. Label Removal and Disposal Items.
    - 10. Label "Obtain permission":
      - a. Ditches Beyond Right of Way Limits.
      - b. Drainage Beyond Right of Way Limits.
    - 11. Estimated Excavation
      - a. Entrances
        - 1. Beyond Right of Way Limits
        - 2. Relocated (New Construction/Alignment)
        - 3. Estimated Excavation
      - b. Pipe/Drainage Structures Beyond Right of Way Limits

- D. Show Travelway Widths
  - 1. Beginning & End of Each Sheet
  - 2. Beginning and End of Tapers
    - a. Give Pluses at Beginning and End.
  - 3. Radii at Intersections per Face of Gutter/Edge of Pavement.
  - 4. Medians Labeled per Standard Drawing No. 100-8
- E. Construction Lines Plotted and labeled (cut/fill)
  - 1. N.P.D.E.S. lines (Per Instructional Bulletin 96-2).
- F. New Guardrail Plotted (Check Roadside Design Guide) - use only after all other options are considered.
- G. Relocation Notes (Per Instructional Bulletin 97-10)
- H. Plotted For Readability at 50% reduction
- I. Label Control of Access
- J. Special Notes
- K. Drainage - Pipe and Structures
  - 1. Check against Design Plans Field Review Recommendations / Hydrology.
  - 2. Divisible by 1.22 meters (4.0')
  - 3. Adequate Cross line Lengths
  - 4. Location of Catch Basins
    - a. Agrees with grades
    - b. Locations (Low Points and Spacing)
  - 5. Agrees with Summary of Estimated Quantities.
  - 6. Extra depth of box
  - 7. Structures (ie. Culvert)
    - a. Agrees with Culvert Details (Bridge Department).
  - 8. Drainage Information provided by Hydraulic Section (Including invert elevation for storm sewer and cross line pipe).
  - 9. Check Profile for cross line pipe 36" or greater (Hydrology data)
  - 10. Length of pipe plotted correctly.
- L. Symbology (Per Standard Drawing No. 100-8)
- M. Design
  - 1. Travelway Widths and Lane Widths
  - 2. Turning Radii (meets design)
  - 3. Sight Distances (Stopping)
  - 4. Lane Alignment
  - 5. Design Speed
- N. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number

### XIII. PROFILE SHEETS

- A. Grade Line
  - 1. Percent of Grade
    - a. Check for minimum grade
      - ditch section 0.10
      - curb and gutter 0.30
      - valley gutter 0.40
  - 2. Vertical Curves
    - a. PI Station and elevation
    - b. Lengths
    - c. Design speed(s) for federal aid projects
    - d. Sight Distance

- 3. Exceptions Noted
- 4. Equalities in stationing plotted
- B. Begin and End Notes
- C. Special Ditch Notes
- D. Proposed Outfall Ditch Grades
- E. Elevations
  - 1. P.C. s
  - 2. P.T. s
  - 3. Percent of Grade Shown.
  - 4. Type of Gradeline Noted (Finished, Subgrade, Spline).
  - 5. Agrees with X-Sections
- F. Vertical Design (Sight Distances)
- G. Vertical Clearances (Bridges, Overpasses, Trees etc.)
  - a. Structure Stations
  - b. Toe of fill
- H. Vertical curves - (D.S. for F.H.W.A only)
- I. All information shown can be readable at 50% reduction
- J. Earthwork
  - 1. Notes Agree with Excavation / Embankment on Cross-Sections.
  - 2. Balance Points
  - 3. Overhaul
    - a. 1,000 m (3,000 ft) Freehaul - Roadway Only
    - b. Include calculations in quantity folder.
  - 4. Agrees with sheet 2
- K. Curb grades included in plans.
  - 1. Agree with centerline grades when parallel.
  - 2. Agree with top of curb elevations on cross sections.
- L. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number

#### XIV. CROSS SECTIONS

NOTE: If Cross Sections Are Bound Separately, Check Cross Section Cover per Section II of Checklist. (include a copy of Title sheet)

- A. Begin/End Notes
- B. Exception Notes
- C. Equality in Stationing Notes
- D. Agrees with Typical Section
- E. Volumes agrees with earthwork
- F. Elevations Agree with Profile
- G. S. E. Notes
  - 1. Beginning and Ending
  - 2. Maximum
  - 3. Not required for Curb and Gutter Sections.
- H. Bridge Notes
  - 1. Begin and End of Bridge
  - 2. Toe of Fills
- I. Project Identification Box
  - 1. County
  - 2. File Number
  - 3. Road/Route Number
  - 4. Sheet Number
  - 5. Sheet Number (X1- \_\_ )

May 22, 2000

## **ROAD DESIGN REFERENCE MATERIAL**

### **FOR CONSULTANT PREPARED PLANS**

#### **AERIAL PHOTOGRAPHY, CONTROL SURVEYS, AND MAPPING**

Control surveys to allow the production of 1" = 50-foot mapping at one-foot contour interval will be performed. Necessary surveys will be conducted to identify control points and GPS points to provide sufficient coverage of the final alignment. Coordinates and elevations will be established for these critical control points. Composition and placement of legal advertisement for notice to affected landowners prior to field surveys will be provided by the Department, as required by law.

Base mapping, at a scale of 1" = 50' and one-foot contour interval, will be digitized in three dimensional (3D) Intergraph format. The width of the topography and planimetrics will cover the width of the proposed right-of-way. The mapping will be provided on electronic media in Intergraph format and bond (22" x 36" 'D'-size) prints. No reverse-side prints are acceptable.

#### **ENGINEERING SURVEYS**

- A. Engineering surveys will be performed on the final alignments to determine accurate elevations and locations of existing facilities such as roadways, bridges, culverts, utilities, railroads, and drainage facilities as needed for design. The items to be incorporated in the engineering surveys will be in accordance with the approved Department design survey assumptions and the Department's Survey Manual.
- B. All points shot on the survey will be shown in the original topography.

#### **PRELIMINARY ROADWAY PLAN PREPARATION**

The purpose of this task is to perform roadway design efforts to the point necessary for development of final right-of-way plans. In this regard, efforts will focus on the identification of construction limits and property requirements. Preliminary design relating to the following activities will be developed:

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- A. Plan and profile sheets for highways, interchanges, streets, and roads showing information necessary to permit construction stakeout and to indicate and delineate details necessary for construction. Profile shall be shown in the plans at a scale of 1" = 10' vertically and 1" = 50' or 20' horizontally to match scale of plans.
- B. Design and earthwork shall be accomplished on a CADD system using the software MicroStation. It is strongly recommended that the design software be GEOPAK.
- C. Detailed plan sheets for all design features requiring additional detailed design information, including but not limited to the items below:
  - 1. The geometry of intersections
  - 2. Local street treatment
  - 3. Drainage facilities
  - 4. Appurtenances
  - 5. Geotechnical subsurface investigations
  - 6. Geometric control (vertical and horizontal)
  - 7. Construction limits (lines)
  - 8. Right-of-Way (present and proposed)
  - 9. Ties and equalities
  - 10. Property lines
  - 11. Property ownership
  - 12. Property parcel number
  - 13. Control of access, and

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14. Others as per Department Standards.

- D. Design standards will be in compliance with AASHTO's A Policy of Geometric Design of Highways and Streets (1990) or latest edition; SCDOT's Standard Specifications for Highway Construction (1986); AASHTO's Standard Specifications for Highway Bridges (1989); SCDOT's Highway Design Manual, SCDOT's Standard Drawings for Road Construction and SCDOT's Access and Roadside Management Standards and Engineering Directive Memorandum PC-27 "Quality Control/Quality Assurance of Road Plans". Road and Bridge Plan Preparation Standards and CADD Standards utilized by the Department should be used, whenever possible.
- E. Designs should meet desirable standards, whenever possible, unless the minimum criteria is specifically approved by the Department in writing.
- F. Cross-sections of highways, interchanges, intersections, roads, streets, and ramps showing the existing and proposed typical sections, at intervals of 100 feet on tangents and 50 feet on horizontal curves, measured along the centerline or baseline of construction. In areas of ramps and interchanges, cross-sections are to be perpendicular to the referenced centerline.

Templates are to be placed on original cross-section by CADD. Cross-section scale shall be 1" = 5' both vertical and horizontal, unless another scale is authorized by the Department. In the areas of ramp and mainlines, templates are to be perpendicular to the referenced centerline.

- G. Additional cross-sections, as necessary, to complete construction of the project.

Upon completion of the preliminary plans, one set of bond (22" x 36" 'D'-size) prints will be submitted to the Department for review. After initial review, the Department will return one set of plans marked with desired changes. After revision, one set of bond (22" x 36" 'D'-size) prints of the revised preliminary plans will be provided. No reverse-side prints are acceptable.

**RIGHT-OF-WAY PLANS**

- A. Final right-of-way plans will be developed to depict the following:

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1. All projects, except secondary ('C') projects, non-surveyed projects, and bridge projects, shall have all affected properties numbered and closed. Greenville County is the exception to this rule. Secondary ('C') projects in Greenville County shall also be closed.
2. Property ownership
3. Property improvements
4. Access control
5. Existing and proposed right-of-way
6. Existing known utilities
7. Construction limits
8. Show all easements, or right of way, needed for road construction and for implementation of the Sedimentation and Erosion Control Plan.
9. Design speed on the first Typical Section Sheet.
10. Rate of Superelevation, design speed, control points, state plane coordinates and bench marks located on Reference Sheets.
11. Location of all topographic features including utilities by stations and offsets.
12. Include stations and offsets for right of way changes (i.e. step out /in and beginning and end of tapers).
13. Appropriate labeling of triangular areas to be obtained as well as present triangular areas.
14. Verification of present right of way (File and date obtained).
15. Identify any pipe, drainage structures, etc., outside R/W with "Obtain Permission".



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16. Label all ditches with "Obtain permission" for cleaning, constructing and include estimated length and excavation.
17. Include Right of Way Summary Sheet with all information provided.
18. Designate obtains as marsh lands/highlands if pertinent to job.
19. Dimension lines for critical R/W areas such as nonparallel survey/construction centerlines and complicated intersections etc. where more clarification would be necessary.
20. Adequate horizontal and vertical control data to facilitate ease of construction for department personnel - Reference points for all PC's, PI's, PT's, and POT's.
21. Include PIN (Project Identification Number) on cover and title sheet.
22. Fences which are not "standard" as shown in drawings 806-1, 806-2, and 806-3 to be shown as moving items and not reset fence if relocation is necessary.
23. Detailed description of moving items if included in notes. Also include Moving Item Sheet and show on plans.
24. Completion of Hydrology that affects Right-of-Way.
25. Plan sheets shall have Tract No. and Owner's name; also, drainage and relocated driveway permission must be shown.
26. Property layouts need only Tract Numbers.
27. Right of Way obtains and remainders shall be shown in acres or square feet.  
  
Total obtains less than 0.25 acre will be shown in square feet.
28. All Right of Way revisions shall be noted in the revision block or in the upper right hand corner of the sheet if no revision block is available.

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- B. All parcels of property to be acquired as right-of-way will be assigned a parcel number, identification of property owner, areas of property obtained and remaining, and acreage of permanent easements indicated. The entire parcel of property from which right-of-way is to be acquired will be shown (even if illustrated as an insert at a reduced scale).
- C. All field inspection and public hearing recommendations accepted for inclusion in the plans are to be verified and made part of the right-of-way plans. Right-of-way plans will be provided to the Department Program Manager on bond (22" x 36" 'D'-size) prints (1" = 50') and on electronic media in MicroStation format. It is recommended that GEOPAK software be used for design, etc. No reverse-side prints are acceptable.
- D. Electronic media receivables for right of way plans will be provided to the Road Design Consultant Services Facilitator on CD-ROM and will include the following items:
  - 1. Preliminary index of all files provided with detailed descriptions of their content or purpose.
  - 2. All MicroStation CADD files that pertain to existing property lines, owners, layouts their improvements and labeling.
  - 3. All MicroStation CADD files that pertain to existing and proposed Right of Way lines, obtains and remains and it's labeling as well as Right of Way Data sheets.
  - 4. All MicroStation CADD files that pertain to existing and proposed pipes, drainage structures, Bridges and other hydraulic features as well as the labeling of these items.
  - 5. All MicroStation CADD files that pertain to Utilities or Rail Roads.
  - 6. All MicroStation CADD files that contain Typical Sections for projects.
  - 7. All MicroStation and Raster CADD files that pertain to project Title Sheets.
  - 8. All MicroStation CADD files that show construction limits of project.
  - 9. All MicroStation CADD files that pertain to Moving Items.

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10. Any other MicroStation CADD files that would supplement the ability to view files correctly such as reference files and cell libraries.
  11. If GEOPAK Civil Design Software was used for developing plans, then all .gpk files and any other GEOPAK files, such as input and criteria files that are needed to facilitate the checking of Right of Way plans should be submitted.
  12. If other Civil Engineering software package was used for project development then all binary or ASCII files that are software dependant for that package should be submitted.
  13. Copies of any manual or electronic calculations or notes (non-CADD) that will facilitate the checking of Right of Way plans.
  14. All hard copies of the plans submitted should have the name of the electronic file printed on the sheet.
  15. Provide plotting instructions in order to reproduce all sheets including levels plot boundary and pen tables.
- E. During the course of completing the final plans for construction, should changes be necessary which will affect right-of-way, these revisions will be promptly made, documented as revisions on plans, and identified to those implementing right-of-way appraisal and acquisition.

**ROADWAY CONSTRUCTION PLANS**

- A. Construction plans will be a continuation of right of way plans and a separate set is not acceptable. Original right of way plans will be retained by the Consultant after appropriate Department reviews and signatures and then developed into construction plans.
- B. Plan and profile sheets for mainline roadways and intersection streets showing information necessary to permit construction stakeout and to indicate and delineate details necessary for construction.
- C. Title Sheet for construction plans with title sheet for right of way to follow as sheet 1A (for information only).

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D. Detailed plan sheets for all design features requiring additional detail design information, including but not limited to:

- The geometry of intersections
- Local street treatment
- Drainage facilities
- Appurtenances
- Details covering special problems
- Geometric control (vertical and horizontal)
- Construction limits (lines)
- Right-of-way (existing and proposed)
- Ties and equalities
- Other as per Department standards
- Utilities
- Sedimentation and Erosion Control Plan
- Traffic Control Plan
- Pavement Marking Plan
- Moving Items
- Signing plans

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- E. Drainage designs in accordance with the approved hydrological/hydraulic criteria. A complete tabulation of the drainage analysis along with the calculations used to determine the size of drainage structures will be submitted.
- F. Additional cross-sections as necessary to complete construction of the project.
- G. At locations where existing traffic is to be maintained, a detailed construction staging plan, showing details of all detour ratings, temporary pavements, and special traffic control devices will be provided. Required restrictions to construction sequence will also be included.
- H. Construction Plans will be provided to the Department on bond (22" x 36" 'D'-size) prints (1" = 50') and on electronic media in MicroStation format. It is recommended that roadway design be provided with the use of GEOPAK software. No reverse-side prints are acceptable.
- I. Benchmarks shall be provided at a minimum of every 1,000 LF of mainline or sideline length - Benchmark descriptions shall be placed on Reference Sheets.
- J. Cross-sections plotted on a scale of 1" = 5' vertical and horizontal, unless another scale is authorized by the Department.
- K. Construction plans shall also include the following:
  - 1. Show riprap on plan sheets (in Tons) for areas requiring riprap.
  - 2. Use of Type 16, 17, & 18 catch basins in areas of curb and gutter.
  - 3. Show linear feet of guardrail and type anchor(s) to be used at each installation location on plans.
  - 4. When needed to maintain traffic, use "Maintenance Stone" in lieu of Aggr. CR-14.
  - 5. Traffic data including schematics of major intersections showing traffic flow should be shown on the Title Sheet.
  - 6. Include Permanent Construction Signs and Mobilization on ALL roads.

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7. If full depth patching is used be sure to include Maintenance Stone for this purpose.
8. Show all erosion control quantities in general construction note as inclusion items, unless detailed on plan sheets.
9. Include traffic control, pavement marking, and permanent signing in plans, if applicable.
10. Verify item numbers and units for quantities near end of completion of plans in case of recent changes and/or additions.
11. Constructability of project to meet present Department policies, standards and specifications.
12. Typical section stations should be inclusive of stations on job, ending and beginning at common stations or project exceptions and bridges.
13. Include all station equalities on title sheet under mileage box, plan and profile sheets, cross-sections and typical sections.
14. Include those items listed under the "Right-of-Way Plans" as required for construction.
15. All bid items shall have an item number on the Department's CATS System.
16. Final description of moving items.
17. Bridges, exceptions, and bridge length box culverts (>20') should be flagged or shown in a box on the Title Sheet.
18. Special drawings for items not covered by standard drawings.

**SPECIFICATIONS AND BID PROPOSAL**

Consultant will prepare detailed specifications and special provisions covering items of construction not covered by the State's standard specifications or standard bridge special provisions. In addition, consultant will prepare a bid proposal as required by the Department. All bid items shall have an item number on the Department's CATS system.

**CONSTRUCTION PHASE RECEIVABLES**

One set of the bid proposal, specifications, special provisions and one set of bond (22" x 36" 'D'-size) prints of the final construction plans will be submitted to the Department for review. No reverse-side prints are acceptable.

Upon receipt of the final construction documents by the Department, one copy of the completed, checked and signed bond (22" x 36" 'D'-size) prints of the final construction plans will be provided to the Department along with one copy of all quantity and design calculations, and final CADD and computer outputs.

The full size construction plans will be delivered to either the Department's Program Manager or Construction and Resource Manager, whichever is applicable, who will then forward them to the Road Design Operation's Manager. After a review of the plans for letting, the plans will be taken to Engineering Reproduction Services for printing and distribution to prospective Bidders. Any revisions made prior to the Long Ad shall be made by (A) the Consultant mailing a complete set of plans with revisions and up to date signatures to the same person mentioned above or (B) the Consultant inserting the revised sheet or sheets into the plans at the Department. After the revisions are made the old plans or old plan sheets will be discarded. Any revised plan sheets after the project has been made available to the Bidders will be delivered to the Department in the same way discussed above, but the revised sheets will not be inserted into the plans. The revised sheets with an addendum letter to the Bidder will be distributed with the original plans. For example if there are three addenda to the plans, then the original plans will be distributed to the Bidder with three addendum letters and the revised sheets. After the Letting, the plans will be corrected using the revised sheets. These revised plans will be marked by the Engineering Reproduction Manager on the Title Sheet, "DUPLICATE CONFORMED COPY" denoting that these plans have been revised and are now complete.

The Consultant will mark "Original Conformed Copy" on the top right quadrant of the Title Sheet of the original plans, which will include all revisions, made available to the Bidders prior to the Letting date.

After the Letting the Consultant will retain the Original Conformed Copy of the plans until construction is complete. At which time, the consultant will then deliver the plans to the Road Design Operation's Manager for permanent storage. The "Original Conformed Copy" of the plans will not be revised after the highway Letting. Any revisions made during construction will be included only in the "As-built" set of plans.

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The complete bid Proposal shall be provided to the Department by electronic media in Adobe Acrobat (. pdf) format for reproduction. The electronic files for the bid Proposal will be provided by E-mail or CD-ROM to the Engineering Reproduction Manager or Construction and Resource Manager (CRM) who will deliver them to the Engineering Reproduction Manager in accordance with the letting schedule (no later than one week prior to “Plans and Proposal available to Contractors”). Changes to the Proposal after the Proposal has been made available to the Bidders will be sent by the Consultant to the Program Manager or the CRM, whichever is applicable, then the revised pages will be sent to the Contract Administration Office along with an addendum letter to the Bidder describing the change. The Contract Administration Office will distribute the revised sheets of the Proposal with the addendum letter to the Bidders along with the original Proposal (unchanged).

Electronic media receivables for roadway construction plans will be provided to the Road Design Consultant Services Facilitator on CD-ROM.

1. All files that were previously submitted for Right of Way phase with corrections and changes per SCDOT review and in their final form.
2. All surveyed mapping, 2D or 3D contours, spot points, manual surveys, ortho photos and any other CADD files or data used in developing surveys for the project.
3. All MicroStation CADD files that pertain to the project plan and profiles sheets which contain all horizontal and vertical alignments.
4. All MicroStation CADD files that contain any special drawings for the project.
5. All MicroStation CADD files that pertain to Sedimentation and Erosion Control plans.
6. All MicroStation CADD files that pertain to traffic control, pavement markings, detours and special traffic control devices.



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7. All MicroStation CADD files that pertain to cross-sections for all project alignment.
8. All MicroStation CADD files that pertain to hydrological/hydraulic data and summary of drainage.
9. If GEOPAK Civil Engineering software was used for project development, then all gpk, ddb, inputs, criteria and tin files used for job should be submitted.
10. If other Civil Engineering software package was used for project development then all binary or ASCII files that are software dependant for that package should be submitted.
11. All electronic files that pertain to the construction stake out. Files should be in SMI format and should include all horizontal controls, vertical controls and templates.

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**AERIAL PHOTOGRAPHY, CONTROL SURVEYS, AND MAPPING**

Control surveys to allow the production of 1:500 mapping at 0.3 m contour intervals in flat terrain, 1.0 m intervals in rolling terrain and 1.5 m intervals in mountainous terrain will be performed. Necessary surveys will be conducted to identify control points and GPS points to provide sufficient coverage of the final alignment. Coordinates and elevations will be established for these critical control points. Composition and placement of legal advertisement for notice to affected landowners prior to field surveys will be provided by the Department, as required by law.

Base mapping, at a scale of 1:500 and contour intervals as shown above, will be digitized in three dimensional (3D) Intergraph format. The width of the topography and planimetrics will cover the width of the proposed right-of-way. The mapping will be provided on electronic media in Intergraph format and bond (914 mm x 559 mm) prints. No reverse-side prints are acceptable.

**ENGINEERING SURVEYS**

- A. Engineering surveys will be performed on the final alignments to determine accurate elevations and locations of existing facilities such as roadways, bridges, culverts, utilities, railroads, and drainage facilities as needed for design. The items to be incorporated in the engineering surveys will be in accordance with the approved Department design survey assumptions and the Department's Survey Manual.
- B. All points shot on the survey will be shown in the original topography.

**PRELIMINARY ROADWAY PLAN PREPARATION**

The purpose of this task is to perform roadway design efforts to the point necessary for development of final right-of-way plans. In this regard, efforts will focus on the identification of construction limits and property requirements. Preliminary design relating to the following activities will be developed:

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- A. Plan and profile sheets for highways, interchanges, streets, and roads showing information necessary to permit construction stakeout and to indicate and delineate details necessary for construction. Plans scales shall be 1:500 or 1:250 as designated by the Department. Horizontal profile scale shall be the same as plan scale with vertical profile scale of 1:100 or 1:60 to match scale of plans.
- B. Design and earthwork shall be accomplished on a CADD system using the software MicroStation. It is strongly recommended that the design software be GEOPAK.
- C. Detailed plan sheets for all design features requiring additional detailed design information, including but not limited to the items below:
  - 1. The geometry of intersections
  - 2. Local street treatment
  - 3. Drainage facilities
  - 4. Appurtenances
  - 5. Geotechnical subsurface investigations
  - 6. Geometric control (vertical and horizontal)
  - 7. Construction limits (lines)
  - 8. Right-of-Way (present and proposed)
  - 9. Ties and equalities
  - 10. Property lines
  - 11. Property ownership
  - 12. Property parcel number
  - 13. Control of access, and

14. Others as per Department Standards.
- D. Design standards will be in compliance with AASHTO's A Policy of Geometric Design of Highways and Streets (1994) or latest edition; SCDOT's Standard Specifications for Highway Construction (1986); AASHTO's Standard Specifications for Highway Bridges (1989); SCDOT's Highway Design Manual, SCDOT's Standard Drawings for Road Construction, and SCDOT's Access and Roadside Management Standards, SCDOT's Engineering Directive Memorandum PC-27 "Quality Control/Quality Assurance of Road Plans, and Road and Bridge Plan Preparation Standards and CADD Standards used by the Department, whenever possible.
- E. Designs should meet desirable standards, whenever possible, unless the minimum criteria is specifically approved by the Department in writing.
- F. Cross-sections of highways, interchanges, intersections, roads, streets, and ramps showing the existing and proposed typical sections, at intervals of 20 m on tangents, measured along the centerline or baseline of construction. Additional cross sections may be necessary in special design situations and at major drainage structures. In areas of ramps and interchanges, cross-sections are to be perpendicular to the referenced centerline.

Templates are to be placed on original cross-section by CADD. Cross-section scale shall be 1:50 both vertical and horizontal, unless another scale is authorized by the Department. In the areas of ramp and mainlines, templates are to be perpendicular to the referenced centerline.

- G. Additional cross-sections, as necessary, to complete construction of the project.

Upon completion of the preliminary plans, one set of bond (914 mm x 559 mm) prints will be submitted to the Department for review. After initial review, the Department will return one set of plans marked with desired changes. After revision, one set of bond (914 mm x 559 mm) prints of the revised preliminary plans will be provided. No reverse-side prints are acceptable.

### **RIGHT-OF-WAY PLANS**

- A. Final right-of-way plans will be developed to depict the following:

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1. All projects, except secondary ('C') projects, non-surveyed projects, and bridge projects, shall have all affected properties numbered and closed. Greenville County is the exception to this rule. Secondary ('C') projects in Greenville County shall also be closed.
2. Property ownership
3. Property improvements
4. Access control
5. Existing and proposed right-of-way
6. Existing known utilities
7. Construction limits
8. Show all easements, or right of way, needed for road construction and for implementation of the Sedimentation and Erosion Control Plan.
9. Design speed on the first Typical Section Sheet.
10. Rate of Superelevation, design speed, control points, state plan coordinates and bench marks located on Reference Sheets.
11. Location of all topographic features including utilities by stations and offsets.
12. Include stations and offsets for right of way changes (i.e. step out /in and beginning and end of tapers).
13. Appropriate labeling of triangular areas to be obtained as well as present triangular areas.
14. Verification of present right of way (File and date obtained).
15. Identify any pipe, drainage structures, etc., outside R/W with "Obtain Permission".

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16. Label all ditches with "Obtain permission" for cleaning, constructing and include estimated length and excavation.
17. Include Right of Way Summary Sheet with all information provided.
18. Designate obtains as marsh lands/highlands if pertinent to job.
19. Dimension lines for critical R/W areas such as nonparallel survey/construction centerlines and complicated intersections etc. where more clarification would be necessary.
20. Adequate horizontal and vertical control data to facilitate ease of construction for department personnel - Reference points for all PC's, PI's, PT's, and POT's.
21. Include PIN (Project Identification Number) on cover and title sheet.
22. Fences which are not "standard" as shown in drawings 806-1, 806-2 and 806-3 to be shown as moving items and not reset fence if relocation is necessary.
23. Detailed description of moving items if included in notes. Also, include Moving Item Sheet and show on plans.
24. Completion of Hydrology that affects Right-of-Way.
25. Plan sheets shall have Tract No. and Owner's name; also, drainage and relocated driveway permission must be shown.
26. Property layouts need only Tract Numbers.

Only property plats, property corners, and related property data that is surveyed will be expressed in meters. Other property data will be shown in units as recorded in courthouse records.

27. Right of Way obtains and remainders shall be shown in hectares or square meters with acres or square feet in parenthesis.

Total obtains less than 0.10 hectare will be shown in square meters.

28. All Right of Way revisions shall be noted in the revision block or in the upper right hand corner of the sheet if no revision block is available.

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- B. All parcels of property to be acquired as right-of-way will be assigned a parcel number, identification of property owner, areas of property obtained and remaining, and acreage of permanent easements indicated. The entire parcel of property from which right-of-way is to be acquired will be shown (even if illustrated as an insert at a reduced scale).
- C. All field inspection and public hearing recommendations accepted for inclusion in the plans are to be verified and made part of the right-of-way plans. Right-of-way plans will be provided to the Department Program Manager on bond (914 mm x 559 mm) prints and electronic media in MicroStation format. It is recommended that GEOPAK software be used for design, etc. No reverse-side prints are acceptable.
- D. Electronic media receivables for right of way plans will be provided to the Road Design Consultant Services Facilitator on CD-ROM and will include the following items.
  - 1. Preliminary index of all files provided with detailed descriptions of their content or purpose.
  - 2. All MicroStation CADD files that pertain to existing property lines, owners, layouts their improvements and labeling.
  - 3. All MicroStation CADD files that pertain to existing and proposed Right of Way lines, obtains and remains and it's labeling as well as Right of Way Data sheets.
  - 4. All MicroStation CADD files that pertain to existing and proposed pipes, drainage structures, Bridges and other hydraulic features as well as the labeling of these items.
  - 5. All MicroStation CADD files that pertain to Utilities or Rail Roads.
  - 6. All MicroStation CADD files that contain Typical Sections for projects.
  - 7. All MicroStation and Raster CADD files that pertain to project Title Sheets.
  - 8. All MicroStation CADD files that show construction limits of project.

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9. All MicroStation CADD files that pertain to Moving Items.
  10. Any other MicroStation CADD files that would supplement the ability to view files correctly such as reference files and cell libraries.
  11. If GEOPAK Civil Design Software was used for developing plans, then all .gpk files and any other GEOPAK files, such as input and criteria files that are needed to facilitate the checking of Right of Way plans should be submitted.
  12. If other Civil Engineering software package was used for project development then all binary or ASCII files that are software dependant for that package should be submitted.
  13. Copies of any manual or electronic calculations or notes (non-CADD) that will facilitate the checking of Right of Way plans.
  14. All hard copies of the plans submitted should have the name of the electronic file printed on the sheet.
  15. Provide plotting instructions in order to reproduce all sheets including levels, plot boundary and pen tables.
- E. During the course of completing the final plans for construction, should changes be necessary which will affect right-of-way, these revisions will be promptly made, documented as revisions on plans, and identified to those implementing right-of-way appraisal and acquisition.

**ROADWAY CONSTRUCTION PLANS**

- A. Construction plans will be a continuation of right of way plans and a separate set is not acceptable. Original right of way plans will be retained by the Consultant after appropriate Department reviews and signatures and then developed into construction plans.



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- B. Plan and profile sheets for mainline roadways and intersection streets showing information necessary to permit construction stakeout and to indicate and delineate details necessary for construction.
- C. Title Sheet for construction plans with Title Sheet for right of way to follow as Sheet 1A (for information only).
- D. Detailed plan sheets for all design features requiring additional detail design information, including but not limited to:
  - The geometry of intersections
  - Local street treatment
  - Drainage facilities
  - Appurtenances
  - Details covering special problems
  - Geometric control (vertical and horizontal)
  - Construction limits (lines)
  - Right-of-way (existing and proposed)
  - Ties and equalities
  - Other as per Department standards
  - Utilities
  - Sedimentation and Erosion Control Plan
  - Traffic Control Plan

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D. (Continued)

- Pavement Marking Plan
  - Moving Items
  - Signing Plans
- E. Drainage designs in accordance with the approved hydrological/hydraulic criteria. A complete tabulation of the drainage analysis along with the calculations used to determine the size of drainage structures will be submitted.
- F. Additional cross-sections as necessary to complete construction of the project.
- G. At locations where existing traffic is to be maintained, a detailed construction staging plan, showing details of all detour ratings, temporary pavements, and special traffic control devices will be provided. Required restrictions to construction sequence will also be included.
- H. Construction Plans will be provided to the Department on reproducible bond (914 mm x 559 mm) prints and on electronic media in MicroStation format. It is recommended that roadway design be provided with the use of GEOPAK software. No reverse-side prints are acceptable.
- I. Benchmarks shall be provided at a minimum of every 300 m of mainline or sideline length - Benchmark descriptions shall be placed on Reference Sheets.
- J. Cross-sections plotted on a scale of 1:50 vertical and horizontal, unless another scale is authorized by the Department.
- K. Construction plans shall also include the following:
1. Show riprap on plan sheets (in Tons) for areas requiring riprap.
  2. Use of Types 16, 17, & 18 catch basins in areas of curb and gutter.

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3. Show linear feet of guardrail and type anchor(s) to be used at each installation location on plans.
4. When needed to maintain traffic, use "Maintenance Stone" in lieu of Aggr. CR-14.
5. Traffic data including schematics of major intersections showing traffic flow should be shown on the Title Sheet.
6. Include Permanent Construction Signs and Mobilization on ALL roads.
7. If full depth patching is used be sure to include Maintenance Stone for this purpose.
8. Show all erosion control quantities in general construction note as inclusion items, unless detailed on plan sheets.
9. Include traffic control, pavement marking, and permanent signing in plans, if applicable.
10. Verify item numbers and units for quantities near end of completion of plans in case of recent changes and/or additions.
11. Constructability of project to meet present Department policies, standards and specifications.
12. Typical section stations should be inclusive of stations on job, ending and beginning at common stations or project exceptions and bridges.
13. Include all station equalities on title sheet under mileage box, plan and profile sheets, cross-sections and typical sections.
14. Include those items listed under the "Right-of-Way Plans" as required for construction.
15. All bid items shall have an item number on the Department's BAMS System.

ROAD DESIGN REFERENCE MATERIAL  
FOR CONSULTANT PREPARED PLANS  
IN METRIC  
May 23, 2000

16. Final description of moving items.
17. Bridges, exceptions, and bridge length box culverts (>6 m) should be flagged or shown in a box on the Title Sheet.
18. Special drawings for items not covered by standard drawings.

**SPECIFICATIONS AND BID PROPOSAL**

Consultant will prepare detailed specifications and special provisions covering items of construction not covered by the State's standard specifications or standard bridge special provisions. In addition, consultant will prepare a bid proposal as required by the Department. All bid items shall have an item number on the Department's CATS system.

**CONSTRUCTION PHASE RECEIVABLES**

One set of the bid proposal, specifications, special provisions and one set of bond (914 mm x 559 mm) prints of the final construction plans will be submitted to the Department for review. No reverse-side prints are acceptable.

Upon receipt of the final construction documents by the Department, one copy of the completed, checked and signed bond (914mm x 559 mm) prints of the final construction plans will be provided to the Department along with one copy of all quantity and design calculations, and final CADD and computer outputs.

The full size construction plans will be delivered to either the Department's Program Manager or Construction and Resource Manager, whichever is applicable, who will then forward them to the Road Design Operation's Manager. After a review of the plans for letting, the plans will be taken to Engineering Reproduction Services for printing and distribution to prospective Bidders. Any revisions made prior to the Long Ad shall be made by (A) the Consultant mailing a complete set of plans with revisions and up to date signatures to the same person mentioned above or (B) the Consultant inserting the revised sheet or sheets into the plans at the Department. After the revisions are made the old plans or old plan sheets will be discarded. Any revised plan sheets after the project has been made available to the Bidders will be delivered to the Department in the same way discussed above, but the revised sheets will not be inserted into the plans. The revised sheets with an addendum letter to the Bidder will be distributed with the original plans. For example if there are three addenda to the plans, then the original plans will be distributed to the Bidder with three addendum letters and the revised sheets. After the Letting, the plans will be corrected using the revised sheets. These revised plans will be marked by the Engineering Reproduction Manager on the Title Sheet, "DUPLICATE CONFORMED COPY" denoting that these plans have been revised and are now complete.

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The Consultant will mark "Original Conformed Copy" on the top right quadrant of the Title Sheet of the original plans, which will include all revisions, made available to the Bidders prior to the Letting date.

After the Letting the Consultant will retain the Original Conformed Copy of the plans until construction is complete. At which time, the consultant will then deliver the plans to the Road Design Operation's Manager for permanent storage. The "Original Conformed Copy" of the plans will not be revised after the highway Letting. Any revisions made during construction will be included only in the "As-built" set of plans.

The complete bid Proposal shall be provided to the Department by electronic media in Adobe Acrobat (. pdf) format for reproduction. The electronic files for the bid Proposal will be provided by E-mail or CD-ROM to the Engineering Reproduction Manager or Construction and Resource Manager (CRM) who will deliver them to the Engineering Reproduction Manager in accordance with the letting schedule (no later than one week prior to "Plans and Proposal available to Contractors"). Changes to the Proposal after the Proposal has been made available to the Bidders will be sent by the Consultant to the Program Manager or the CRM, whichever is applicable, then the revised pages will be sent to the Contract Administration Office along with an addendum letter to the Bidder describing the change. The Contract Administration Office will distribute the revised sheets of the Proposal with the addendum letter to the Bidders along with the original Proposal (unchanged).

Electronic media receivables for roadway construction plans will be provided to the Road Design Consultant Services Facilitator on CD-ROM.

1. All files that were previously submitted for Right of Way phase with corrections and changes per SCDOT review and in their final form.
2. All surveyed mapping, 2d or 3d contours, spot points, manual surveys, ortho photos and any other CADD files or data used in developing surveys for the project.
3. All MicroStation CADD files that pertain to the projects plan and profiles sheets which contain all horizontal and vertical alignments.
4. All MicroStation CADD files that contain any special drawings for the project.
5. All MicroStation CADD files that pertain to Sedimentation and Erosion Control plans.
6. All MicroStation CADD files that pertain to traffic control, pavement markings, detours and special traffic control devices.

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7. All MicroStation CADD files that pertain to cross-sections for all project alignment.
8. All MicroStation CADD files that pertain to hydrological/hydraulic data and summary of drainage.
9. If GEOPAK Civil Engineering software was used for project development, then all gpk, ddb, inputs, criteria and tin files used for job should be submitted.
10. If other Civil Engineering software package was used for project development then all binary or ASCII files that are software dependant for that package should be submitted.
11. All electronic files that pertain to the construction stake out. Files should be in SMI format and should include all horizontal controls, vertical controls and templates.