

## CHAPTER 1E - QUALITY CONTROL

### SECTION 1E-1-INTRODUCTION

A primary emphasis must be placed on providing high quality in the development of roadway plans. In the design process, the Project Manager is responsible for the project design and compilation of the plan assembly and also decides when plans have been developed to the point that Quality Reviews are to be made. The Program Manager is both responsible and accountable for the quality of all of the projects under his/her management.

Section 1E-3 of this Chapter includes a [Quality Control Checklist](#) to be used as a "tool" to facilitate the process of maintaining high quality plans during the design process. The appropriate Section Manager and Program Manager will complete the checklist review at Field Inspection, Right of Way and Advertisement stages. It is required that the Project Manager maintain a current copy of this checklist in each project file for checking appropriate stages in the project development process. This checklist is available as form LD-436.

### SECTION 1E-2-PROCESS

#### PROJECT SELECTION

Quality Control Reviews will be conducted on all projects.

#### FIELD INSPECTION QUALITY REVIEW

The Project Manager initiates this quality review when the plans depict sufficient design detail to hold a [Field Inspection](#). The Quality Review will be conducted by the Section Manager and approved by the Program Manager. After completion of the Quality Review, the Project Manager will schedule a Field Inspection.

#### RIGHT OF WAY AND CONSTRUCTABILITY QUALITY REVIEW

The Project Manager will determine when the project plans should undergo a detailed Quality Review for R/W acquisition and for constructability. This Quality Review will be conducted when the items in the Right of Way column of the checklist have been completed. The Section Manager is responsible for conducting this Quality Review. There may be situations in which the Section Manager peers will conduct this review. The Program Manager must also approve this Quality Review.

Plan assemblies for Right of Way and Constructability Review should include the following:

- 2 complete sets of full size prints (xerox process), including any available preliminary plans for bridges, signs, signals, lighting, utility, landscaping, structures, etc.
- 1 set of prints of cross sections
- Field Inspection Report
- Soils Report
- [Value Engineering Report](#)
- Permit information
- Any other pertinent correspondence or information

When the review is complete the Project Manager will provide copies of the marked prints to the appropriate divisions (Bridge, Traffic Engineering, etc.). Each division is responsible for revising its portion of the plans.

### **ADVERTISEMENT QUALITY REVIEW**

This review of the completed construction plans is conducted when all items have been checked in the Advertisement column of the checklist (approximately 45 days prior to the [First Submission](#) to the Construction Division). The Section Manager will conduct this review. There may be situations in which the Section Manager peers will conduct this review.

It is the Project Manager's responsibility to coordinate with other disciplines involved (Bridge, Traffic Engineering, etc.) to insure complete plan assemblies for checking. It will be the other disciplines' responsibility to conduct their own internal plan reviews before submitting plans to the Project Manger for review.

The Section Manager will monitor problem areas in which additional training would be beneficial and report needs to division management.

Plan assemblies for Advertisement Quality Review should include the following:

- 2 complete sets of full size prints (xerox process), including bridges, signs, signals, lighting, utility, landscaping, structures, etc.
- 1 set of prints of cross sections
- Cost Estimate
- Field Inspection Report
- Soils Report
- Value Engineering Report
- Permit information
- Any other pertinent correspondence or information

When the review is complete the Project Manager will provide copies of the marked prints to the appropriate divisions (Bridge, Traffic Engineering, etc.). Each division is responsible for revising its portion of the plans.

Plan corrections should be made promptly so that second submission will be on schedule.

### **SECTION 1E-3-CHECKLIST**

Three columns are available for the three different time frames during which an overall review of the plan assembly should be conducted: Field Inspection, Right of Way, and Advertisement (first submission). The items that have an **asterisk** beside them indicate items to be reviewed to check the constructability adequacy of the plans. Not all items have a line to check for all three time frames. That indicates that the information would not typically be available for review at that stage of development. As the Project Manager approaches a particular targeted review, he/she should check off the items on the checklist as they are completed.

In order for this checklist to serve as a "useful tool" to make your job easier, it also includes references to sections in the Road Design Manual and the Instructional and Informational Memoranda where supportive instructions on developing the particular item in the checklist may be found. These references should not be considered "all-inclusive", since there are always various references within Department directives relative to similar guidelines and instructions (i.e. reference may be to a particular IIM, when in fact you could also find information in the Road and Bridge Specifications as well as in the Drainage Manual).

The Checklist has been divided into different categories of sheets, which reference sections in the Road Design Manual and/or Instructional and Informational Memoranda. For the individual items listed under those particular categories of sheets, you will find specific page references for the Road Design Manual, when appropriate.

You will receive updates to this checklist from time to time. Use the checklist to your best advantage by making sure that you have the most current version of the checklist at each appropriate time frame by checking the revision date on the current sheets in your Road Design Manual with the copy you have been working on in your project file. As new instructions are issued, you may want to add to the checklist until the Engineering Services Section can update the checklist (probably on an annual basis).

Following are the pages that make up the Quality Control Checklist. Copies should be made directly from the most current revisions of these sheets and kept in the project file for completion at various stages of project development.

1E-4

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Project No. \_\_\_\_\_

**QUALITY CONTROL CHECKLIST**  
**[ \* Denotes Items Affecting Constructability ]**

(RDM denotes Road Design Manual; IIM denotes Instructional & Informational Memo.)  
 (This checklist will be retained in the Project file.)

(Review completed by: \_\_\_\_\_ @F.I.; \_\_\_\_\_ @R/W; \_\_\_\_\_ @ADV.)

**F.I. R/W ADV. ALL SHEETS (when applicable)**

- \_\_\_ \_\_\_ \_\_\_ Project Number(s) (Upper & Lower Blocks) (Check against PPMS)  
**(RDM - p. 2D-1)**
- \_\_\_ \_\_\_ \_\_\_ Sheet Numbers **(RDM - p. 2C-5; 2D 50...52, 54)**
- \_\_\_ \_\_\_ \_\_\_ North Arrow and Scale **(RDM - p. 2C-7, 2D-48)**
- \_\_\_ \_\_\_ \_\_\_ Supervisor/Designer Names, District, phone numbers **(RDM - p. 2D-1,59)**
- \_\_\_ \_\_\_ \_\_\_ \* Equalities Shown **(RDM - p. 2C-8, 10, 2D-7,49, 2D-8)**
- \_\_\_ \_\_\_ \_\_\_ Limited Access Note **(RDM - p. 2D-40, 41)**
- \_\_\_ \_\_\_ \_\_\_ Design Features Note **(RDM - p. 2D-66)**
- \_\_\_ \_\_\_ \_\_\_ \* Stationing shown correctly & in agreement with plans **(RDM - p. 2D-60)**  
 \_\_\_ \_\_\_ \_\_\_ Match Lines **(RDM - p. 2C-6)**
- \_\_\_ \_\_\_ \_\_\_ Plan Revisions carried throuh to all sheets (plan, profile, cross sections)
- \_\_\_ \_\_\_ \_\_\_ Legible with design intent clearly shown
- \_\_\_ \_\_\_ \_\_\_ Compliance with all approved F.I. & VE recommendations
- \_\_\_ \_\_\_ \_\_\_ Check project limits on plan sheets
- \_\_\_ \_\_\_ \_\_\_ Cross-check final bridge plan applicable eidltas with roadway details on all  
 applicable sheets

**TITLE SHEET (RDM - Section 2D-9)**

- \_\_\_ \_\_\_ Federal Aid Number **(RDM - p. 2D-47, 50, 54; IIM (D) 117)**
- \_\_\_ \_\_\_ Construction Type Code, PPMS and FHWA 534 Data Numbers **(IIM (D) 192, 151 & 164; RDM - p. 2D-49, 50, 52)**
- \_\_\_ \_\_\_ Copyright Date **(IIM (D) 186)**
- \_\_\_ \_\_\_ \* Functional Classification **(RDM - p.2D-51, A-58)**
- \_\_\_ \_\_\_ \* Design Speed **(IIM (D) 117)**
- \_\_\_ \_\_\_ Description Matches in Length Tabulation Block, Estimate and PPMS **(RDM- p. 2D-50)**
- \_\_\_ \_\_\_ Check Tabulation Block Lengths **(RDM - p. 2D-50)**
- \_\_\_ \_\_\_ "B" and/or "D" Numbers **(RDM - p. 2D-50,51)**
- \_\_\_ \_\_\_ Update Signature Block
- \_\_\_ \_\_\_ \* Notes Updated - Current Standards, Specifications, 3R Guidelines (if  
 applicable) and Work Area Protection Manual Data Block; TC Standards  
**(RDM - p. 2D-51; IIM (D) 110)**
- \_\_\_ \_\_\_ Appropriate Notes for Minimum and No Plan Projects **(RDM - p. A-105)**
- \_\_\_ \_\_\_ R/W Note when all work within existing R/W **(RDM - p. 2G-12)**

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(TITLE SHEET cont'd.)

- \_\_\_ Layered Plan Notes **(IIM (D) 204)**
- \_\_\_ Traffic Updated (Not more than 2 years old) **(RDM - p. 2G-11; IIM (D) 117)**
- \_\_\_ \_\_\_ Design Speed Exception **(RDM - p. 2D-9; IIM (D) 132)**
- \_\_\_ Description Reference Station
- \_\_\_ City/Town Population & Date of Census **(RDM - p. 2D-44)**
- \_\_\_ \_\_\_ Corporate Limits/County Line
- \_\_\_ \_\_\_ Route/Street Name **(RDM - p. 2C-8, 2D-48)**
- \_\_\_ \_\_\_ Railroad Name/Destination/Nearest R.R. Mile Post **(RDM - p. 2D-48,49)**
- \_\_\_ \_\_\_ River/Creek With Flow Arrow **(RDM - p. 2D-48)**
- \_\_\_ \_\_\_ Destination shown for mainline, connections and railroads **(RDM - p. 2D-48)**
- \_\_\_ \_\_\_ Begin and End Station and Arrow **(RDM - 2D-48)**
- \_\_\_ \_\_\_ Ramps, loops, frontage roads and bridges labeled **(RDM - p. 2D-48)**
- \_\_\_ Computer Job Number & Computer Listing **(RDM - p. 2D-54; IIM (D) 118)**
- \_\_\_ \_\_\_ Index Matches Plan Sheets **(RDM - p. 2D-53)**
  - a. Order of sheets in accordance with Road Design Manual **(RDM - p. 2C-5,9; 2D-53...55)**
  - b. All sheets listed (bridge, utility, signal, sign, landscape, cross sections, box culvert standards and box culvert skew data sheet) **(RDM- p. 2D-54)**
- \_\_\_ \_\_\_ Cross Sections Listed **(RDM - p. 2D-54)**
- \_\_\_ Standard Slab Span Bridges
- \_\_\_ PE Seal and Signature for Consultant
- \_\_\_ \_\_\_ Adjoining projects, if applicable
- \_\_\_ \_\_\_

**LOCATION SHEET** **(RDM - Section 2D-9, 10)**

- \_\_\_ \_\_\_ Project Limits clearly shown, including adjoining projects **(RDM - p. 2D-56)**
- \_\_\_ \_\_\_ County/City Name denoted
- \_\_\_ \_\_\_
- \_\_\_ \_\_\_

**RIGHT OF WAY DATA SHEET** **(RDM - Section 2D-9 , 2F-1; IIM (D) 189)**

- \_\_\_ \_\_\_ Property owner names, parcel numbers, acreage, takes and remainders **(RDM - p. 2D-56, 2F-1; IIM (D) 189)**
- \_\_\_ \_\_\_
- \_\_\_ \_\_\_
- \_\_\_ \_\_\_

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**REVISION DATA SHEET (RDM - Section 2G-7)**

- \_\_\_ Program/Project Management System Number (P/PMS) (RDM - p. 2G-11)
- \_\_\_ All State and Federal Project Numbers (RDM - p. 2G-17...18)
- \_\_\_ Project Descriptions (RDM - p. 2G-17...18)
- \_\_\_ Revision dates
- \_\_\_ Each revised sheet listed with description of change to sheet (RDM - p. 2G-17 & 2G-24)
- \_\_\_

**SURVEY DATA SHEET (IIM (D) 185)**

- \_\_\_ \* Bench Marks (RDM - p. 2C-10)
- \_\_\_ \* Reference Points (RDM - p. 2C-7; IIM (D) 185)
- \_\_\_ \* Control Points
- \_\_\_ \* Survey Alignment Sheet (IIM (D) 185)
- \_\_\_ \* Construction Alignment Layout Sheet matches alignment information on plans  
Note stating this map was compiled to meet the Commonwealth of Virginia  
Standard for Class 1 map accuracy as of \_\_\_\_\_.
- \_\_\_ \* Note stating that survey is based on (USC & GS) or NAGS Datum)(IIM (D)  
185)
- \_\_\_

**MAINTENANCE OF TRAFFIC/SEQUENCE OF CONSTRUCTION PLANS (RDM - Section 2D-6, 2D-13, Section A-2, Section A-3, Section A-8 (Vol. 2); IIM (D)93)**

- \_\_\_ \* Clear Zone requirements maintained (RDM - p. A-32...42)
- \_\_\_ \* Review Barrier/Attenuator Service Need (IIM (D) 93)  
(Applicability of Quickset Barrier System)
- \_\_\_ \* Barriers shown in appropriate locations in accordance with guidelines and  
standards (IIM (D) 93)
- \_\_\_ \* Appropriate Barrier Transition provided for detour operating speed (IIM (D)  
93)
- \_\_\_ \* Maintenance of Traffic/Sequence of Construction Plan coordinated with  
Grading Diagram
- \_\_\_ \* Constructability - sufficient plan information to construct all aspects of project  
Sufficient detour capacity for closures or rerouting traffic
- \_\_\_ \* Detours (alignment, grade, length, width, strength, pavement design & truck  
restrictions, etc.) (RDM - p. 2G-10, 11)  
Quantities for detours (including grading, pavement, etc.)  
Detail for detour removal (with pay items)
- \_\_\_ \* Operating speed of detour approximates existing highway operating speed
- \_\_\_ \* Temporary grade separation for hauling material across existing or detour  
road
- \_\_\_ Traffic channelization/impact attenuators

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[ \* Denotes Items Affecting Constructability ]

(MAINTENANCE OF TRAFFIC/SEQUENCE OF CONSTRUCTION PLANS cont'd.)

- \_\_\_ \* Utility Adjustment accommodated
- \_\_\_ Note - salvaging maintenance of traffic materials **(IIM (D) 120)**
- \_\_\_ \_\_\_ \* Adequate pavement width and pavement design to maintain traffic during box culvert construction
- \_\_\_ \_\_\_ \* Efficient maintenance of traffic while "tie-ins" and pavement stubs are constructed (beginning & end of project)
- \_\_\_ \_\_\_ \* Traffic maintained while constructing deep cuts and high fills
- \_\_\_ Traffic Items provided by District Traffic Engineer
- \_\_\_ \* Details provided for any special pavement marking requirements
- \_\_\_ Eradication of pavement markings **(IIM (D) 93)**
- \_\_\_ State Police Participation **(IIM (D) 93)**
- \_\_\_ \* Time of Day restrictions for lane reduction/installation or removal of Traffic Barrier Service
- \_\_\_ \* Provisions for Pedestrian Traffic included
- \_\_\_
- \_\_\_

**TYPICAL SECTION/GENERAL NOTES (RDM - Section 2D-9,2D-16,A-1; IIM (D) 110)**

- \_\_\_ \_\_\_ \* Geometrics in accordance with guidelines **(RDM - p. A-4...A-26)**
  - a. Lane widths
  - b. Shoulder widths (include additional width for guardrail install.)
  - c. Slopes
  - d. Median width,raised/flush **(RDM - p. 2D-22...24)**
  - e. Clear zone **(RDM - p. A-32...42)**
  - f. Ditch width/depth
  - g. Curb & Gutter width and standard, aggregate under **(RDM - p. 2D-21...22; IIM (D) 141)**
  - h. Sidewalk width and depth
- \_\_\_ \_\_\_ \* Typical Section for all situations on project
- \_\_\_ \_\_\_ \* Typical Sections for all connections
- \_\_\_ \_\_\_ \* Point of finished grade labeled **(RDM - p. 2D-60)**
- \_\_\_ \_\_\_ \* Soil Report (Pavement Design, Unsuitable Material Removal, Pre-split slopes and other slope recommendations **(RDM - p. 2D-60 & 72)**
- \_\_\_ Stabilized Shoulder Requirement
- \_\_\_ Paved Shoulders **(IIM (D) 158)**
- \_\_\_ Safety slopes **(RDM - Section A-2)**
- \_\_\_ \_\_\_ \* Pavement Design (including crossovers & entrances) **(RDM - p. 2D-60...62, p. C-19; IIM (D) 158)**
- \_\_\_ \_\_\_ \* Applicable Pavement Design Notes **(IIM (D) 158)**
- \_\_\_ Placement of Unsuitable Material **(RDM - p. 2D-72...77)**
- \_\_\_ Underdrain Under Median/Sidewalk **(IIM (D) 130; RDM - p. 2D-32,33)**
- \_\_\_ General Notes correct and current **(IIM (D) 110)**
- \_\_\_ Rumble Strips **(IIM (D) 212)**



F.I. R/W ADV.      [ \* Denotes Items Affecting Constructability ]

(TYPICAL SECTIONS/GENERAL NOTES cont'd.)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ Bicycle Facilities (**RDM - p. A-76**)

\_\_\_\_\_  
\_\_\_\_\_ Type Median Barrier (**RDM - p. A-45**)

**SUMMARY/SPECIAL DESIGN/DETAIL SHEETS** (**RDM - Section 2D-13, 2G-1 & 2G-2**)

\_\_\_\_\_  
\_\_\_\_\_ Determine need for Special Design drawings (**RDM - p. 2D-71, 2G-2**)

\_\_\_\_\_  
\_\_\_\_\_ Up-to-date versions of Special Design Drawings, Provisions and Insertable Sheets (Review list for applicable drawings, pay items, quantities) (**RDM - p. 2D-71, 2G-2**)

\_\_\_\_\_  
\_\_\_\_\_ \* Summary Headings agree with Estimate Item Code Listing;

Quantities reasonable and complete

a. Incidentals (**RDM - p. 2D-21...35, 2G-9, 23<sup>1</sup>**; **IIM (D) 47, (D) 93, (D) 119, (D) 131, (D) 143, (D) 150, (D) 182, (D) 184, (D) 197, (D) 202**)

b. Grading/DRD (**RDM - p. 2G-5**; **IIM (D) 47, (D) 138**)

c. Pavement (**RDM - p. 2G-6...8, 23<sup>1</sup>**; **IIM (D) 158**)

d. Drainage (**RDM - p. 2G-6, 22<sup>2</sup>**; **IIM (D) 71, (D) 121, (D) 214**)

(1) Separate columns for Pipe, Concrete Pipe and Corrugated Pipe

(2) Type of grate for DI-5, DI-7, DI-11 and DI-12 noted in Remarks Column

(3) Pipe bends or fittings noted in Remarks Column

(4) Connection to existing pipe or structure noted in remarks column

e. Roadside Development (**RDM - p. 2G-9**; **IIM (D) 11, (D) 122**)

f. Stormwater Management and Erosion Control Items (**IIM (D) 11 & 195**)

g. Underdrains (**IIM (D) 130**)

\_\_\_\_\_  
\_\_\_\_\_ \* Documented Quantity Review (plans match summaries)

\_\_\_\_\_  
\_\_\_\_\_ \* Drainage Summary Sheet Notes, Allowable Types of Pipe (**RDM - p. 2G-6**; **IIM (D) 121**)

\_\_\_\_\_  
\_\_\_\_\_ Special Design Bridges & Culverts with "D" numbers summarized properly

\_\_\_\_\_  
\_\_\_\_\_ Erosion & Sediment Control; Means provided for cleanout (**IIM (D) 11**)

\_\_\_\_\_  
\_\_\_\_\_ Foundation Data Sheet, where applicable (**IIM (D) 211**)

\_\_\_\_\_  
\_\_\_\_\_ Channel change, drain ditch, minor structure excavation used in fills?

\_\_\_\_\_  
\_\_\_\_\_ \* Utility Conflict Data (**IIM (D) 140**)

\_\_\_\_\_  
\_\_\_\_\_ St'd. R/W monuments. Installation by Contract or State Forces (**IIM (D) 90**)

<sup>1</sup> For metric example see **RDM Vol. 2 page 40**

<sup>2</sup> For metric example see **RDM Vol. 2 page 39**

F.I. R/W ADV.

[ \* Denotes Items Affecting Constructability ]

(SUMMARY/SPECIAL DESIGN/DETAIL SHEETS cont'd.)

- \_\_\_\_\_ Demolition of Buildings and Clearing of Parcels (**RDM - p. 2F-1, 2; 2G-9, 25**)
- \_\_\_\_\_ Permit Work Included in compliance with permit requirements
- \_\_\_\_\_ Approach Slab Sheet/Quantities (**RDM - p. 2G-9; IIM (D) 74, (D) 144**)
- \_\_\_\_\_ Demolition of Pavement (**IIM (D) 47**)
- \_\_\_\_\_ Pavement Markings, Construction Signs, Type III Barricades (**IIM (D) 213**)
- \_\_\_\_\_ Asphalt Paving under guardrail (**IIM (D) 150**)
- \_\_\_\_\_ Coal Tar Pitch Emulsion for parking areas (**RDM - p. 2G-8**)
- \_\_\_\_\_ Preboring for Guardrail (**IIM (D) 131**)
- \_\_\_\_\_ Crash Cushions/Impact Attenuators (**RDM - p. 2G-2, A-52.1 ...52.4**)
- \_\_\_\_\_ Railroad warning signs,signals & pavement markings required
- \_\_\_\_\_ Maintenance of traffic materials & unit costs
- \_\_\_\_\_ Hours and unit cost for mowing
- \_\_\_\_\_ Work to be done by State Forces
- \_\_\_\_\_ Construction surveying by contract on all projects (**IIM (D) 152**)
- \_\_\_\_\_ Plan Quantity Items (**IIM (D) 135**)
- \_\_\_\_\_ Plan data for concrete items (**RDM - p. 2D-24**)
- \_\_\_\_\_ Construction next to railroads (**IIM (D) 176**)
- \_\_\_\_\_ Joint details for concrete pavement (**IIM (D) 190**)
- \_\_\_\_\_ Nuclear Gauge Storage Facility (**IIM (D) 209**)
- \_\_\_\_\_ Undercut set up as bid item?
- \_\_\_\_\_ Field Office (Type)
- \_\_\_\_\_ Rustication treatment for Retaining Walls
- \_\_\_\_\_ Additional barbed wire for swine control; Cattle Guard
- \_\_\_\_\_ Allaying Dust quantities
- \_\_\_\_\_ Aggregate provided for mailbox turnouts

**PLAN SHEETS**

- \_\_\_\_\_ \* Connections/Geometrics/Tie-ins, Begin/End Stations/Turning Radius  
Beg. & End Proj.
- \_\_\_\_\_ Project number and description of bridges and major drainage structures  
(**RDM - p. 2D-50**)
- \_\_\_\_\_ Special Notes
- \_\_\_\_\_ \* Review Hor. Align. Exceptions - Also noted on title sheet (**RDM - p. A-2**)
- \_\_\_\_\_ \* Curve Data shown (including design speed & % superelevation) (**RDM - p. 2C-6, 2D-2**)
- \_\_\_\_\_ Survey bearing and distance in place where applicable (**RDM - p. 2C-6, 7, 8**)
- \_\_\_\_\_ Edges of proposed pavement (**RDM - p. 2D-12**)
- \_\_\_\_\_ Ramps, loops, frontage roads labeled
- \_\_\_\_\_ Ramp Terminal Design (**IIM (D) 20**)
- \_\_\_\_\_ Grading contours in ramp gore areas (**RDM - p. 2D-34**)

F.I. R/W ADV.**[ \* Denotes Items Affecting Constructability ]**

(PLAN SHEETS cont'd.)

- \_\_\_\_\_ Pavement stub for future construction (**RDM - p. 2D-14**)
- \_\_\_\_\_ Limited Access Note/Lines/Begin & End Station (**RDM - p. 2D-40, 41, 42, 43**)
- \_\_\_\_\_ Locations for Limited Access fence elimination
- \_\_\_\_\_ Limited Access Fence Type (**RDM - p. 2D-42...43**)
- \_\_\_\_\_ \* Sufficient easements and R/W to Construct Project
- \_\_\_\_\_ Property Owners, deed book, acreage and parcel numbers (house numbers, where applicable) (**RDM - p. 2C-7, 8**)
- \_\_\_\_\_ Existing and proposed R/W labeled clearly and sufficiently (**RDM - p. 2C-7, 2D-36...37, C-30...32**)
- \_\_\_\_\_ R/W Breaks Correct at PC's and PT's & match curve data (**RDM - p. C-30**)
- \_\_\_\_\_ Scaled pluses and distances (Proposed R/W & Easements)
- \_\_\_\_\_ Temporary or permanent easements identified, notes shown (i.e. drainage, utility, constr., etc.) (**IIM (D) 89, (D) 203; RDM - p. 2D-37...39.2**)
- \_\_\_\_\_ Parcel and Demolition Numbers, identification of wells & underground storage tanks, outdoor advertising signs, etc. (**RDM - p. 2F-1,2, 2G-9**)
- \_\_\_\_\_ Permanent or temporary slope easements
- \_\_\_\_\_ Consideration of multiple use of R/W for bikeways & pedestrians
- \_\_\_\_\_ R/W or easement for SWM (**IIM (D) 195**)
- \_\_\_\_\_ Permanent or temporary drainage easements
- \_\_\_\_\_ Construction Limits (**RDM - 2D-14**)
- \_\_\_\_\_ Correct Std. Entrances (**IIM (D) 208**)
- \_\_\_\_\_ Turn Lanes & Crossovers (including storage lane capacity and acceleration/deceleration lane lengths) (**RDM - p. C-1...2, 4...7, 14...16**)
- \_\_\_\_\_ Crossover Grades (**RDM - p. C-2...4**)
- \_\_\_\_\_ Crossovers for police, emergency & maintenance vehicles
- \_\_\_\_\_ Shoulder Slope Transition
- \_\_\_\_\_ Horizontal & vertical sight distances at intersections & entrances ;revise for improved sight distance (**RDM - p. 2A-11, 2D-2, 6...9**)
- \_\_\_\_\_ Revised entrances to accommodate trucks
- \_\_\_\_\_ \* Foundation data for major drainage structures, retaining walls, and soundwalls included in plan assembly
- \_\_\_\_\_ \* Drainage (including SWM ponds) (**IIM (D) 195**)
- \_\_\_\_\_ \* Proposed Drainage (all pipes, drop inlets, end sections, etc. drawn to scale, complete drainage descr. including inverts) (**RDM - 2D-16, 17**)
- \_\_\_\_\_ Entrances (proposed) plotted (**RDM - p. 2D-12, 13; C-18...20**)
- \_\_\_\_\_ \* Channel Change and Ditch details (**RDM - p. 2D-17**)
- \_\_\_\_\_ Standard PG-2A Type noted
- \_\_\_\_\_ Utility Owners Noted; utility legend (**RDM - p. 2C-7,IIM (D) 140**)
- \_\_\_\_\_ Utility Easements (**RDM - p. 2D-38, IIM (D) 203**)
- \_\_\_\_\_ Flow arrows on existing and proposed pipes - inverts (**RDM - 2C-7, 2D-16**)
- \_\_\_\_\_ Existing Pipe/Structures "to be removed"; plugged pipes (**RDM - p. 2D-19, IIM (D) 121**)

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[ \* Denotes Items Affecting Constructability ]

(PLAN SHEETS cont'd.)

- \_\_\_\_\_ Existing Pipe/Structures "to be abandoned" (**RDM - p. 2D-19**)
- \_\_\_\_\_ Profile Index (**see RDM - p. 2D-8 for example**)
- \_\_\_\_\_ Sheet reference for Drainage Descriptions not on plan sheets
- \_\_\_\_\_ Metes and Bounds For Special Properties (**RDM – p. 2D-41...41.2**)
- \_\_\_\_\_ Demolition of Pavement - legend, hatching, etc. (**IIM (D) 47**)
- \_\_\_\_\_ Proposed and existing bridge piers not in conflict
- \_\_\_\_\_ Bridge Approach Slab included
- \_\_\_\_\_ Hazardous Waste (**IIM (D) 191**)
- \_\_\_\_\_ Proposed erosion control items ( EC-2, EC-3 - Type A & B [including width], Riprap [class & thickness] (**IIM (D) 11**)
- \_\_\_\_\_ Locations for asphalt concrete curb for erosion control
- \_\_\_\_\_ Future design features for stage construction (**RDM - p. 2D-2**)
- \_\_\_\_\_ All fixed objects outside clear zone or protected by barrier (**RDM - p. A-32. A-52**)
- \_\_\_\_\_ Guardrail Type/Deflection Distance (**RDM - p. 2D-29, A-43...52**)
- \_\_\_\_\_ Proper guardrail and concrete barrier end treatments (**Road & Bridge Standards; RDM - p. A-50**)
- \_\_\_\_\_ Correct Fixed Object Attachments (**Road and Bridge Standards, p. 501; IIM (D) 150**)
- \_\_\_\_\_ GR-9 Guardrail Terminal (**IIM (D) 104**)
- \_\_\_\_\_ Handrail or fence provided on retaining wall for pedestrian safety
- \_\_\_\_\_ Crash Cushion Devices (shown and labeled) (**RDM - p. 2G-2, A-52.1 ...52.7**)
- \_\_\_\_\_ Sign Islands recommended by District Traffic Engineer
- \_\_\_\_\_ Special Design Retaining Walls (shown and labeled)
- \_\_\_\_\_ Sound Barrier Walls (shown and labeled)
- \_\_\_\_\_ Fence SWM Basins (where required); gates included (**IIM (D) 195**)
- \_\_\_\_\_ Fence (type) shown correctly (**RDM - p. 2D-28**)
- \_\_\_\_\_ Cattle passes (**RDM - p. 2D-34...35**)
- \_\_\_\_\_ Rest area design (**RDM - p. -20...26**)
- \_\_\_\_\_ Mountable curb if Design Speed exceeds 45 MPH (**RDM - p. 2D-34**)
- \_\_\_\_\_ Curb Ramps/Cross-Walks Provided (**IIM (D) 55**)
- \_\_\_\_\_ \* Incidental Items (**RDM - p. 2D-21...35, 2G-9, 23<sup>1</sup>** )
- \_\_\_\_\_ All proposed standard items labeled (e.g. St'd. CG-6 Req'd., St'd. MS-2 Req'd., St'd. CG-9D Req'd., St'd. RW-2 Req'd., etc.)
- \_\_\_\_\_ Airport Clearances (**IIM (D) 181**)
- \_\_\_\_\_ Bicycle Facilities (**RDM - p. A-76...A-100.1**)
- \_\_\_\_\_ Bridge Project Number (**RDM - p. 2D-1**)
- \_\_\_\_\_ Legend shown for symbols denoting Erosion & Siltation Controls
- \_\_\_\_\_ Landscape Design at FI, RW and ADV.

<sup>1</sup> For metric example see [RDM Vol. 2 page 40](#)



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[ \* Denotes Items Affecting Constructability ]

(HYDRAULICS cont'd.)

- \_\_\_\_\_ Ditch Details, Grades, Computations and Linings (include on Typical Section Sheets) **(IIM (D) 166; Drainage Manual 2-16...2-17F)**
- \_\_\_\_\_ Entrances checked for pipe length, size and cover
- \_\_\_\_\_ Commercial Entrances checked for curb, pipe length, size & cover
- \_\_\_\_\_ \* Utility Conflicts (If No Utility Plans Included) **(IIM (D) 140)**
- \_\_\_\_\_ Underdrains In Gore Areas **(IIM (D) 130)**
- \_\_\_\_\_ EW-12's For Underdrains **(IIM (D) 130)**
- \_\_\_\_\_ \* Outlets for Underdrains **(IIM (D) 130)**
- \_\_\_\_\_ Special Bedding For Pipes With Less Than Minimum Cover **(IIM (D) 110)**
- \_\_\_\_\_ Note for Box Culvert in Tidal Flow Areas **(IIM (D) 121)**
- \_\_\_\_\_ Diversion Channels **(IIM (D) 182)**
- \_\_\_\_\_ Box Culvert Extensions, skewed details, & low-fill guardrail **(IIM (D) 104 & (D) 121)**
- \_\_\_\_\_ Radial Pipe, Minimum Radii **(IIM (D) 121)**
- \_\_\_\_\_ Minor Structure Excavation **(RDM - p. D-12...27; IIM (D) 71)**
- \_\_\_\_\_ Siltation Control Excavation **(IIM (D) 11)**
- \_\_\_\_\_ \* Causeway Design **(IIM (D) 173)**
- \_\_\_\_\_ Pipe Plugging Detail
- \_\_\_\_\_ Stabilized Construction Entr. **(IIM (D) 11)**
- \_\_\_\_\_ Fish Passage **(IIM (D) 121, (D) 214)**
- \_\_\_\_\_ Requirements for Railroads **(IIM (D) 121)**
- \_\_\_\_\_ Spring Boxes
- \_\_\_\_\_ Downstream constrictions that would cause backwater on proposed structure site
- \_\_\_\_\_ Erosion and Sedimentation Control Review **(IIM (D) 11)**
- \_\_\_\_\_ Stormwater Management Plan Review **(IIM (D) 195)**
- \_\_\_\_\_ Details of Basins (Typical Sections, Plan View, etc.)
- \_\_\_\_\_ Dewatering Basins **(IIM (D) 11)**
- \_\_\_\_\_ Adequate Easement For Sediment Basins **(IIM (D) 11)**
- \_\_\_\_\_ Sediment Basins Pay Item **(IIM (D) 11)**
- \_\_\_\_\_ Permanent access from public road for inspection and maintenance Stormwater Management basins and/or silt trap basins **(IIM (D) 195)**
- \_\_\_\_\_ Cleanout of existing pipes
- \_\_\_\_\_ Revisions to Hydraulics design to reflect all roadway design changes made after initial submission to Hydraulics (i.e. alignment, grades, noise walls, retaining walls, etc.)

**CROSS SECTIONS (RDM - Section 2D-2)**

- \_\_\_\_\_ \* Spot check application of all typical sections and grades to plans, for completeness and compatibility with plans.
- \_\_\_\_\_ \* Cross sections agree with plan grades and design requirements.

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[ \* Denotes Items Affecting Constructability ]

(CROSS SECTIONS cont'd.)

- \_\_\_\_\_ Proposed grade elevation (**RDM - p. 2D-10**)
- \_\_\_\_\_ Construction baseline and station
- \_\_\_\_\_ Shoulder width provided for guardrail
- \_\_\_\_\_ Recoverable slopes
- \_\_\_\_\_ Channels and ditches shown
- \_\_\_\_\_ Temporary Sediment Basins
- \_\_\_\_\_ Stormwater Management Basins
- \_\_\_\_\_ Proposed pavement trench
- \_\_\_\_\_ Demolition of pavement
- \_\_\_\_\_ Template Separators for Intersection Earthwork computations
- \_\_\_\_\_ Connection Cross Section
- \_\_\_\_\_ Bridge Stations shown
- \_\_\_\_\_ Cross Section Index (**RDM - p. 2D-11**)
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

**ESTIMATE (RDM - Section 2D-11)**

- \_\_\_\_\_ Description
- \_\_\_\_\_ Length of Project
- \_\_\_\_\_ Funding
- \_\_\_\_\_ Finance Codes
- \_\_\_\_\_ Longitudes and Latitudes (**IIM (D) 171**)
- \_\_\_\_\_ Type Code Agrees with Title Sheet
- \_\_\_\_\_ Estimate For Each Project Number (**RDM - p. 2G-12**)
- \_\_\_\_\_ Need For Special Provision
- \_\_\_\_\_ Contract Combined Into One Estimate
- \_\_\_\_\_ Plan Quantity Items (**IIM (D) 135**)
- \_\_\_\_\_ Quantities With Plans and summaries
- \_\_\_\_\_ Pay items agree with standards and specifications
- \_\_\_\_\_ State Forces Grouping (Standard/Non-Standard grouping)
- \_\_\_\_\_ Railroad Force Account
- \_\_\_\_\_ All other participating items set up properly (sidewalk, drainage, etc.)
- \_\_\_\_\_ All items entered under the appropriate group code
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

**VALUE ENGINEERING**

- \_\_\_\_\_ Incorporate approved recommendations into plans
- \_\_\_\_\_
- \_\_\_\_\_

F.I. R/W ADV.

[ \* Denotes Items Affecting Constructability ]

**MISCELLANEOUS**

- \_\_\_ Number of temporary construction entrances
- \_\_\_ Special Provisions for fills in marsh
- \_\_\_ Sources of Borrow (**RDM - p. 2D-72**)
- \_\_\_ Any Historically significant bridges
- \_\_\_ Bridge safety shields
- \_\_\_ Notify Environmental Division when the total disturbed area of the project is 5 acres or greater (VPDES permit required)(use LD-252 for F.I. or R/W)
- \_\_\_
- \_\_\_

**SIGNS, SIGNAL, LIGHTING PLANS**

- \_\_\_ \* Clear Zone requirements are met
- \_\_\_ \* Deflection Clearance from guardrail is sufficient
- \_\_\_ \* No conflicts with drainage items, utilities (overhead or underground)
- \_\_\_ \* Sufficient Right of Way
- \_\_\_ Special Provisions or Plan Notes for Non-Standard Items
- \_\_\_ Pay Items agree with Specifications and Item Code List
- \_\_\_ Plan Quantities and Cost Estimates agree
- \_\_\_ Pay items included to cover grading, pavement, and barriers
- \_\_\_ Temporary Signalization Plans
- \_\_\_ Construction Pavement Marking
- \_\_\_

**STRUCTURE & BRIDGE PLANS**

**(Bridges, Special Design Box Culverts and drainage structures, Sound Barrier Walls and Special Design Retaining Walls)**

- \_\_\_ \* Geometrics agree with road plans  
(Bridge width, grade, tie stations, skew, beginning & ending of bridge)  
BM's agree with Road and Situation Plans.  
Bridge and Roadway centerline designations agree.
- \_\_\_ \* Clearances (horizontal & vertical)
- \_\_\_ Fixed Object Attachments (guardrail, attenuators)
- \_\_\_ \* Sequence of Construction & Maintenance of Traffic
- \_\_\_ \* Access to site and permit requirements
- \_\_\_ Temporary structure (if required)
- \_\_\_ \* Utility conflicts (Type and location of utilities on bridge match roadway plans)
- \_\_\_ \* Drainage conflicts
- \_\_\_ \* Conflicts with signing, lighting, signal or other
- \_\_\_ Pay items agree with Specifications and Item Code List
- \_\_\_ Plan quantities and Cost Estimate agree
- \_\_\_ Riprap details



F.I. R/W ADV.

**[ \* Denotes Items Affecting Constructability ]**

(STRUCTURE AND BRIDGE cont'd.)

- \_\_\_\_ Architectural treatment (if applicable)
- \_\_\_\_ Cost for temporary traffic barriers (single/double faced) on bridge either included in bridge or roadway quantities
- \_\_\_\_ For approach slabs with asphalt overlay, asphalt type agree with roadway plans
- \_\_\_\_ Confirm major obstructions are indicated (high voltage line, ect.)
- \_\_\_\_ Confirm hydraulic information (design flood year, level and drainage area)
- \_\_\_\_
- \_\_\_\_

**NOTE: IN SITUATIONS WHEN THERE IS A CONSULTANT REVIEWING FINAL BRIDGE PLANS, THE CONSULTANT SHALL REVIEW BOTH THE ABOVE AND FOLLOWING STRUCTURE AND BRIDGE ITEMS:**

- \_\_\_\_ Shoring or sheeting if required
- \_\_\_\_ Pay items completeness and estimated quantities reasonableness
- \_\_\_\_ Specifications for non-standard items
- \_\_\_\_ Plan clarity and completeness of details
- \_\_\_\_ Conformance with design specifications and VDOT guidelines and standards
- \_\_\_\_ Completeness of dimensions
- \_\_\_\_ Completeness of reinforcing steel schedule
- \_\_\_\_ Completeness of standards
- \_\_\_\_ Conflicts with specifications and special provisions
- \_\_\_\_ Special provisions format and completeness
- \_\_\_\_ Construction estimates coding, completeness and agreement with the plans
- \_\_\_\_ Completeness of hydraulic data and scour counter measures details
- \_\_\_\_ Completeness of geology and reasonableness of foundation