

## VDOT DRAINAGE MANUAL REVISIONS JULY 2014

### Explanations:

“DDM” is an abbreviation for Drainage Design Memoranda

Numbers in parentheses pertain to the chapter and section number of that data, for example:

(3.4.2); “3” is for Chapter 3, “4” is for Section 4 of Chapter 3, and “2” is for Subsection 2 of Section 4

### Chapter 1

- Page 1 added information on the year of the manual 2014 and the sixth edition
- Page 5 The VAC code was added along with the BMP Manual
- Page 6 updated the Title of the State Hydraulics Engineer to include Utilities
- Page 8 revised the acknowledgements list to include the current State Hydraulics and Utilities Engineer and added The Virginia Department of Environmental Quality

### Chapter 2

- Page 5 was revised to update the location of the information on State participation in the cost of storm sewers

### Chapter 3

- Page 7 the section Guidelines (3.3.4) was revised with information from DDM2
- Pages 8 through 16 were updated with more information in various sections (3.3.4.2 to 3.3.4.8) Guidelines, Plan Measurements, Pipe Lengths, Skew Angle of Culverts, Structure Numbers, Protective Coatings, Pipe Descriptions, Typical Culvert Descriptions, Concrete Pipe on Radius, Jacked Pipe, Multiple Pipe Installation, Existing Pipe Extension, Storm Sewer Pipe, Box Culvert Description, Precast, Structures, Curb Drop Inlets, Grate Drop Inlets, Manholes, Junction Boxes, Stormwater Management Structures, Existing Structures, Drainage Summaries, Pipe Culvert Example, Standards Cast In Place and Storm Sewer Pipe Example
- Page 17 information from DDM1 went to Existing Drainage Structures (3.3.4.8.6)
- Pages 18-21 were revised with information from DDM1 into the section Drainage Summaries and Allowable Type Pipe (3.3.4.9)
- Page 22 the section Post Installation Pipe Inspection (3.3.4.10) was revised with information from DDM1

### Chapter 6

- Page 19 added the Department’s recommendation for maximum flow length

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### **Chapter 7**

- Page 6 & 7 these pages contain the section Minor Channels (7.3.3) and were updated with information from DDM1
- Page 9 Design Considerations (7.4.1.2) was revised
- Page 30 a new section (7.4.6.3.2) on Paved Flumes was added from IIM 166 and DDM1

### **Chapter 8**

- Pages 3 & 4 were revised with information from DDM1 on Type of Structural Selection (8.3.1.1), Soil and Water Data (8.3.1.4)
- Pages 5-7 new sections were added to the Drainage Manual from DDM1 which includes (8.3.1.5) Protective Coating for Structures Exposed to Tidal Water or Corrosive Environment, (8.3.1.6) Requesting Culvert Data & Materials Division Recommendations, (8.3.1.7) Foundation Investigation, (8.3.1.8) Pipe Camber
- Page 14 the title of the State Hydraulics Engineer was updated to State Hydraulics and Utilities Engineer (8.3.2.8)
- Pages 16 & 17 were updated with information from DDM1 to these sections Culvert Skew (8.3.3.3) and End Treatment (8.3.3.4)
- Page 19 & 20 also received information from DDM1 on Safety Considerations (8.3.4), Allowable Pipe Materials (8.3.5)
- Page 21 add information from DDM1 on Fish Passage (8.3.6.5)
- Pages 22 through 27 added new sections from DDM1 (and IIM244.2) (8.3.6.6 -8.3.6.11) which includes Pipe in High Fills (8.3.6.6), Pipe Rehabilitation (8.3.6.7), Existing Box Culvert Extensions (8.3.6.8), Small Box Culverts (8.3.6.9), Pipe Foundation Design For Box Culverts (8.3.6.10) and Jacking Pipe(8.3.6.11)
- Pages 29 through 36 added a new section from DDM4 which is Drainage Design at Railroads (8.3.8).
- Pages 56 & 57 section (8.4.4.4) Minor Structure Excavation was added from DDM3
- Page 58 Figure 8-10 (a) Typical Box Culvert was added

### **Chapter 9**

- Page 7 added section 9.3.9 in the chapter on Drainage Design at Railroads
- Page 14-17 added a section from DDM5 on Under drains (9.4.3.9)
- Page 19 revised the section title to include Structures it was just Inlets
- Page 20 & 21 added additional information from DDM1 in the section on Inlets Curb-Opening Inlets (9.4.5.1.1) and the section on Combination Inlets (9.4.5.1.2) for example DI-12 Multi-grate Drop Inlets, DI-5 Drop Inlets, DI-13 Shoulder Slot Inlets
- Page 22 & 23 added information from DDM1 on Grate Inlets and Structures (9.4.5.2), Structure Heights (9.4.5.2.1) and Safety Slabs (9.4.5.2.2)
- Page 24 a new section was added on Safety Slabs (9.4.5.2.2) from DDM1

## **VDOT DRAINAGE MANUAL REVISIONS JULY 2014**

- Pages 37-39 updated information on Maximum Grades (9.4.8.7) from DDM1, along with the Pipe on Radius (9.4.8.8), Jacking Pipe (9.4.8.10) , Extension of Existing Pipes (9.4.8.11) and information from DDM3 on Minor Structure Excavation (9.4.8.9)
- Page 48 & 49 have updated information from DDM1 on Use of Alternate Pipe Materials and Acceptable Manning Roughness Coefficient (9.4.9.4)

### **Chapter 10**

- Page 1 Information is being updated to provide access to the Virginia Erosion and Sediment Control Handbook and the Virginia Erosion and Sediment Control Regulations

### **Chapter 11**

- Pages 2& 3 added update information on DEQ
- Page 19 information on culverts was added to SWM-1 (11.4.7.4) from DDMI
- Pages 5-8, 10, 12, 13-17, 20, 22, 24, 28, 34, 35 added Part IIC

### **Chapter 13**

- Page 8 updated the web site to the National Oceanic and Atmospheric Administration (NOAA) to provide a table for the tidal benchmarks for Virginia including the Chesapeake Bay.

### **Chapter 14**

- Page 3 has information added on Site Plans and Subdivisions (14.2.2) from DDM1
- Page 5 has the minimum length of an entrance culvert added to this section

### **Chapter 15**

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## VDOT DRAINAGE MANUAL REVISIONS JULY 2014

The information below provides a guide to where the Drainage information which was in the Drainage Design Memorandums (DDM) and Instructional and Informational Memorandums is now located within the Drainage Manual.

IIM 166.4 → DM 7.4.6.3.1

IIM 214.2 → DM 8.3.7.2, 8.3.7.3, & 8.3.7.4

IIM 225.2 → Removed

IIM 244.2 → DM 8.3.6.7

DDM1 "Type of Structure Selection – Culverts" → DM 8.3.1.1

DDM1 "Acceptable Manning Roughness Coefficient" → DM 9.4.9.4

DDM1 "Culvert End Treatment" → DM 8.3.3.4

DDM1 "Pipe in High Fills" → DM 8.3.6.6

DDM1 "Skewed Box Culvert Details" → DM 8.3.3.3

DDM1 "Existing Box Culvert Extensions" → DM 8.3.6.8

DDM1 "Small Box Culverts" → DM 8.3.6.9

DDM1 "Pile Foundation Design for Box Culverts" → DM 8.3.6.10

DDM1 "Jacking Pipe" → DM 8.3.6.11 & 9.4.8.10

DDM1 "Fish Passage" → DM 8.3.6.5.1

DDM1 "Pipe Rehabilitation" → DM 8.3.6.7

DDM1 "Non-Standard Roadside Ditches" → DM 7.3.3

DDM1 "Berm/Toe Ditch Locations" → DM 7.4.1.2

DDM1 "Pipe on Radius" → DM 9.4.8.8

DDM1 "Pipe on Steep Slopes" → DM 9.4.8.7

DDM1 "Existing Drainage Structures" → DM 3.3.4.8.6

DDM1 "Soil and Water Data" → DM 8.3.1.4

DDM1 "Protective Coating for Culverts, Storm Sewers and Concrete Structures Exposed to Tidal Water or Corrosive Environment" → DM 8.3.1.5

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- DDM1 “Requesting Culvert Data and Materials Division Recommendations” → DM 8.3.1.6
- DDM1 “Foundation Investigation” → DM 8.3.1.7
- DDM1 “Pipe Camber” → DM 8.3.1.8
- DDM1 “Stormwater Management Basin Outlet Pipe” → DM 11.4.7.4
- DDM1 “Post Installation Pipe Inspection” → DM 3.3.4.10
- DDM1 “Drainage Summaries” → DM 3.3.4.9
- DDM1 “Allowable Pipe Type Tables” → DM 3.3.4.9, 8.3.5 & 9.4.9.4
- DDM1 “Storm Sewer Pipe – Site Plans and Subdivisions” → DM 14.2.2
- DDM1 “Structures (DI-12 Multigrate Drop Inlets, DI-5 Drop Inlets, Concrete Gutters, & Grates)” → DM 9.4.5.1.4
- DDM1 “Structures (End Sections for Pipe Culverts)” → DM 8.3.3.4
- DDM1 “Structures (Pipe Endwalls with Load Carrying Grate)” → DM 8.3.4
- DDM1 “Structures (Extension of Existing Pipes)” → DM 9.4.8.11
- DDM1 “Structures (DI-13 Shoulder Slot Inlets)” → DM 9.4.5.1.1 & 9.4.5.1.2
- DDM1 “Structures (Structure Heights)” → DM 9.4.5.2.1
- DDM1 “Structures (Safety Slabs)” → DM 9.4.5.2.2
- DDM1 “Structures (Stormwater Conveyance Down Steep Slopes)” → DM 7.4.6.3.2
- DDM2 “Basic Drainage Description Formats for Hydraulic Plan Items” → DM 3.3.4
- DDM3 “Minor Structure Excavaion” → DM 8.4.4.4 & 9.4.8.9
- DDM4 “Drainage Design at Railroads” → DM 8.3.8
- DDM5 “Underdrain” → DM 9.4.3.9
- DDM6 “Board Policies on Participation by Towns, Cities and Counties” → IIM 146