

Proposed 2020 SDFDM Outline

Chapter 1 – General Information

- 1.1 Introduction (New)
- 1.2 City's Authority to Manage and Operate the Public Sewer System
- ~~1.3 The City Sewerage System (Deleted)~~
- 1.3 Urban Services Boundary (New)
- 1.4 Relationships between this Manual and the Stormwater Management Manual (SWMM)
- 1.5 Organization
- 1.6 Applicability (New)
- 1.7 The Need for Standards
- 1.8 Manual Revision and Variance from these Standards (updated)
- 1.9 Coordination with other City Bureaus
- 1.10 Useful Contacts within the City (updated)
- 1.11 Companion Documents and Internet Links (updated)
- 1.12 Glossary (updated & moved, See Chapter 9)

Chapter 2 – Project Delivery, Permitting, and General Procedures

- 2.1 Introduction
- 2.2 Types of Projects
 - 2.2.1 Local Improvement
 - 2.2.2 Public Improvement
- 2.3 General Design Responsibilities
 - 2.3.1 BES Staff
 - 2.3.2 Consultant under Contract with the City
 - 2.3.3 Consultant under Contract with a Permittee (updated)
- 2.4 Plan, Specification, Computation and other Requirements
 - 2.4.1 Plan Requirements (updated)
 - 2.4.2 Specifications Requirements
 - 2.4.3 Use of Standard Details and Drawings (updated)
 - 2.4.4 Computation and Other Supporting Document Requirements (updated)
 - 2.4.5 Ownership of Documents
 - 2.4.6 Consistency
 - 2.4.7 BES Lacks Permitting Jurisdiction for other City Bureaus or Outside Agencies
- 2.5 Public Works Permit
 - 2.5.1 Public Works Permit Application Requirements (updated)
 - 2.5.2 Level 1 Sewer Connection Permits (updated)
 - 2.5.3 Level 2 Simplified Permit in Public ROW/Easements



- 2.5.4 Short Sewer Extensions (updated)
- 2.5.5 Level 3 Public Works Permit Process
- 2.6 Design Manual Revision and Variance Request
 - 2.6.1 Manual Revisions
 - 2.6.2 The Design Variance Process
- Chapter 3 – General Design Requirements
 - 3.1 Project Service Life (updated)
 - 3.2 Service Requirements
 - 3.2.1 Service to Existing and Future Deployment
 - 3.2.2 Gravity Systems Versus Pumped Systems
 - 3.2.3 Sewer Separation (updated)
 - 3.2.4 Sanitary Sewers
 - 3.2.5 Storm Drainage Facilities
 - 3.2.6 Combined Sewers
 - 3.3 Drainage for Seeps, Springs and Artesian Conditions
 - 3.4 Standard Sewer Locations
 - 3.4.1 Within a Right of Way(New)
 - 3.4.2 Within a Public Easement
 - 3.4.2.1 Location (New)
 - 3.4.2.2 Width (New)
 - 3.4.2.3 Uses and Encroachments (New)
 - 3.5 Obtaining Easements – Preparation, Form, and Recordings(New)
 - 3.6 Drainage Reserve (City Code Chapter 17.38 and Zoning Code Title 33 Planning and Zoning)
 - 3.7 Survey Requirements
 - 3.7.1 Survey Standard
 - 3.7.2 City of Portland Datum
 - 3.7.3 Vertical Control(updated)
 - 3.7.4 Horizontal Control
 - 3.8 Geotechnical Investigations Requirements
 - 3.8.1 Utility Investigation Requirements
 - 3.8.2 Underground Utility Location
 - 3.8.3 Addressing and Resolving Utility Relocation Conflicts
 - 3.9 Resiliency and Seismic Considerations (new)
 - 3.10 ODEQ Review of City Projects (updated)
 - 3.11 Flow Conversion Factors
- Chapter 4 – General Pipeline Design Criteria and Procedures
 - 4.1 Introduction
 - 4.2 Pipe Materials



- 4.2.1 Pipeline Materials (updated)
- 4.2.2 Joints (updated)
- 4.2.3 Fusion Welding
- 4.2.4 Selection of Pipe Class and Wall Thickness(updated)
- 4.3 General Horizontal Alignment(updated)
- 4.3.1 No Curved Sewers Requiring Pulled Joints and the use of Blind Bends (New)
- 4.4 General Vertical Alignment
 - 4.4.1 Minimum Depth Determination
 - 4.4.2 Minimum Vertical Separation(updated)
 - 4.4.3 Crossing Between Sanitary Sewers and Water Lines(updated)
 - 4.4.4 Vertical Alignment – Profile Requirements(updated)
 - 4.4.5 Determining Sewer Slope Between Manholes/Structures(updated)
- 4.5 Pipeline Strength Design
 - 4.5.1 Dead (Soil) Loads (updated)
 - 4.5.2 Live Loads (updated)
 - 4.5.3 Types of Pipes and Their Design Strength Standards
 - 4.5.4 Rigid Pipe Design(updated)
 - 4.5.5 Flexible Pipe Design(updated)
- 4.6 Manhole Location and Design(updated)
 - 4.6.1 Types of Manholes
 - 4.6.2 Flow Diversion Manhole Design (New)
 - 4.6.3 Horizontal and Vertical Manhole Locations (updated)
 - 4.6.4 Maximum and Minimum Spacing Between Manholes
 - 4.6.5 Manhole Design
 - 4.6.6 Pipe to Manhole Geometry(updated)
 - 4.6.7 Inside Manhole Drop Connections(updated)
 - 4.6.8 Pipe Stubouts from Manholes
 - 4.6.9 Manhole Channel Design
 - 4.6.10 Manhole Depth Design
 - 4.6.11 Diameter of Frames and Cover
 - 4.6.12 Setting Elevation of Manhole Frame and Cover(updated)
 - 4.6.13 Alternate Manhole Features
- 4.7 Cleanouts – When and Where They Can be Used (updated)
 - 4.7.1 Lateral Cleanout
 - 4.7.2 Terminal Cleanout
- 4.8 Abandonment of Sewers, Manholes, Sumps and Structures(updated)
 - 4.8.1 Sewers 12 Inches and Less in Diameter
 - 4.8.2 Sewers Greater than 12 Inch in Diameter



- 4.8.3 Manholes and Sumps
 - 4.9 Buoyancy of Sewers(updated)
 - 4.10 Constructing Sewers on Steep Slopes(updated)
 - 4.10.1 Anchors for Pipe 12 Inches Diameter and Smaller and Shallow Burial (updated)
 - 4.10.2 Anchors for Pipe Greater Than 12 Inch Diameter and Shallow Burial (updated)
 - 4.11 Corrosion and Odor Control Design Considerations
 - 4.11.1 Design Approach
 - 4.12 Sewer System Repairs
 - 4.13 The use of Trenchless Technologies in Construction (new)
- Chapter 5 – Sanitary Sewer Design
- 5.1 Introduction
 - 5.2 Criteria for Estimating Design Flows(updated)
 - 5.2.1 Drainage Basin
 - 5.2.2 Population
 - 5.2.3 Land Use
 - 5.2.4 Net Developable Area
 - 5.2.5 Unit Wastewater Flow Rates
 - 5.2.6 Contingency Factor for Unanticipated Land Use Changes
 - 5.3 Calculating Design Flows
 - 5.3.1 Peak Factor
 - 5.4 Design Criteria for Mainline Sewers
 - 5.4.1 Capacity
 - 5.4.2 Minimum Pipe Size
 - 5.4.3 Manning Roughness Coefficient
 - 5.4.4 Minimum and Maximum Velocity
 - 5.4.5 Minimum Slope
 - 5.5 Design Criteria for Sewer Service Laterals
 - 5.5.1 Pipe Size and Material(updated)
 - 5.5.2 Horizontal Alignment
 - 5.5.3 Slope
 - 5.5.4 Vertical Alignment
 - 5.5.5 Calculating Service Lateral and Mainline Inverts
 - 5.5.6 City maintenance Limits of Responsibility
 - 5.5.7 Pressure Service Line Systems Located in the Public Right of Way (New)
 - 5.5.8 Connection to the Public Sewer System (New)
 - 5.5.9 Use of Wye or Wye Head Fittings (New)
 - 5.6 Deep Connection Riser (DCR) (updated)



Chapter 6 – Hydraulic Analysis for Drainage (New)

6.1 Introduction

6.2 Overview

6.3 Applicability

6.3.1 Variance from These Standards

6.3.2 Facility Sizing to Serve Future Development

6.4 Facility Classification

6.4.1 Return Period (updated)

6.5 Hydrologic Analysis – Converting Rainfall to Runoff

6.5.1 Select a Storm Return Period

6.5.2 Select a Method to Convert Precipitation into Runoff (updated)

6.5.2.1 Rational Method (updated)

6.5.2.2 National Resource and Conservation Service Soil Conservation Service TR55 (New)

6.5.2.3 Santa Barbara Urban Hydrograph (SBUH) Method (updated)

6.5.2.4.1 HEC HMS formerly HEC-1 (updated)

6.5.3 HEC-HMS and EPA-SWMM Applications (New)

6.6 Precipitation Data and Antecedent Conditions

6.6.1 Total Rainfall Depth

6.6.2 Intensity Duration Frequency (IDF) Information(updated)

6.6.3 Hyetographs – Rainfall Intensity Distributions

6.6.4 Antecedent Conditions(updated)

6.7 Physical Characterization of Site(New)

6.7.1 Area

6.7.2 Land Use and Surface Type

6.7.3 Soils(updated)

6.7.4 Hydrologic Length and Slope

6.7.5 Lakes, Wetlands or Storage Facilities

6.8 Time of Concentration

6.8.1 Flow Regimes(updated)

6.8.2 Sheet Flow

6.8.3 Shallow Concentrated Flow

6.8.4 Open Channel Flow(New)

6.9 Design Criteria

6.9.1 Capacity

6.9.2 Manning’s Roughness Coefficient (n)

6.9.3 minimum Conduit Sizes

6.9.4 Minimum and Maximum Velocity

6.9.5 Minimum Slope



6.9.6 Energy Losses

6.10 Data Collection, Monitoring, and Instrumentation Installation Requirements (New)

Chapter 7 – Combined Sewer Design

7.1 Introduction (New)

7.2 Combined Sewer History in Portland (New)

7.3 Applicability

7.4 Sizing Facilities to Serve Future Development (New)

7.4.1 Sanitary Wastewater

7.4.2 Stormwater Runoff

7.5 Analysis Methods (New)

7.6 Design Criteria (New)

7.6.1 Capacity (New)

7.6.2 Manning's Roughness Coefficient (n) (New)

7.6.3 Minimum Conduit Sizes

7.6.4 Minimum and Maximum Velocity

7.6.5 Minimum Slope

7.6.6 Energy Losses

7.6.7 Other Considerations (New)

7.7 Surcharged Combined Sewers

7.7.1 Background (New)

7.7.2 Allowable Surge Criteria

7.7.3 Exceptions Requiring BES Approval (updated)

7.7.4 Serving and Protecting Future Development from Basement Flooding

7.7.5 Rehabilitation Considerations (New)

Chapter 8 – Hydraulic Design

8.1 Introduction

8.2 Manning's Equation (updated)

8.3 Methods of Application and Calculations

8.3.1 Critical Flow Calculations

8.3.2 Hydraulic Ratios of Standard Sections (updated)

8.3.3 Hydraulic Grade Lines

8.4 Closed Conduits

8.4.1 Closed Conduits – Design Criteria

8.4.2 Manning's n_{ch} Values for Closed Conduits

8.5 Open Channels

8.5.1 Design Criteria (updated, SWMM?)

8.5.2 Channel Classification

8.5.3 Velocity Limitations (updated)

8.5.4 Manning's n_{ch} Values for Channels (updated)



- 8.5.5 Stable Channel Design(updated)
- 8.5.6 Vegetative Design
- 8.5.7 Design Procedures(updated)
- 8.5.8 Flexible Channel Lining (Riprap) Design(updated)
- 8.6 Outlet Structures
 - 8.6.1 General
 - 8.6.2 Outlet Structure Types
 - 8.6.3 Orifices
 - 8.6.4 Perforated Risers
 - 8.6.5 Pipe and Culverts
 - 8.6.6 Sharp Crested Weir(updated)
 - 8.6.7 Broad-Crested Weir(updated)
 - 8.6.8 V-Notched Weir
 - 8.6.9 Proportional Weirs
 - 8.6.10 Combination Outlets(updated)
 - 8.6.11 Clogging Potential for Small Diameter Orifices
- 8.7 Secondary Outlets
- 8.8 Trash Racks and Safety Grates
 - 8.8.1 Trash Rack Design
- 8.9 Energy Dissipation
- Chapter 9 – Definitions (updated)
- Index/Appendices (Deleted)

