



**AGENDA
CLEAN WATER SERVICES
BOARD OF DIRECTORS**

Agenda Category: Public Hearing ALL CPOs

Agenda Title: CONDUCT A PUBLIC HEARING AND ADOPT REVISED DESIGN AND CONSTRUCTION STANDARDS

Presented by: Bill Gaffi, General Manager (nmc)

SUMMARY (Attach Supporting Documents if Necessary)

Clean Water Services (District) has completed revisions to its Design and Construction Standards (Standards). These regulations, which set the minimum standards for construction of components of the sanitary sewer and storm and surface water management systems within the District's boundary, are adopted pursuant to Ordinance 27. The District's last update to the content of its Standards occurred in February, 2004. The current Standards are contained in Resolution and Order No. 04-9 (R&O 04-9), which were adopted by the District's Board of Directors (Board) on February 3, 2004. R&O 04-9 primarily included changes to the Vegetated Corridors sections of the Standards and substantial changes to the technical Standards associated with pump stations and force mains.

In accordance with the Board's direction, no large policy changes are proposed with this update, although several chapters have been significantly reformatted and reorganized for clarification and ease of use. The currently proposed changes include revisions necessary to meet the requirements of the District's National Pollutant Discharge Elimination System (NPDES) Watershed Based

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FISCAL IMPACT: N/A

REQUESTED ACTION: Hold a public hearing on the proposed Design and Construction Standards and, after receiving testimony, adopt the standards.

(A copy of the Design and Construction Standards is available at the Clerk's desk.)

Agenda Item No. _____
Date: 04/17/07

Permit and the District's role as permitting agent for the Department of Environmental Quality (DEQ) 1200-C program regulating erosion control on construction sites 1 acre and larger. In cooperation with the cities' and Washington County's efforts to comply with Goal 5, new language has been added to support low impact development approaches to managing stormwater. Changes are also proposed to increase flexibility for trail placement within vegetated corridors, expand the use of proprietary treatment systems, and to add proportionality criteria to the mitigation requirements for total and partial wetland fills and to the treatment requirements for redevelopment sites.

The proposed changes will become effective for all development applications received after June 1, 2007.

Public Involvement Process:

A comprehensive public involvement process was completed to review proposed changes. During the months between April 25, 2006 and March 6, 2007, 12 stakeholder meetings and three presentations to CWAC were completed. Email invitations were sent to 180 stakeholders representing nearly 100 entities, including conservationists, builders and developers, engineering and landscape consultants, Cities, Washington County, park districts, ODOT, and regulators. More than 200 stakeholders have participated in the 12 meetings in addition to District staff. A core group of individuals attended many of the meetings. All meeting notices and notes were posted on the District's website and stakeholders were encouraged to invite anyone who might be interested. Issue papers, draft changes, CWAC presentations, public comments and supporting documents were also posted on the website. Written comments have been received from 22 entities, a number of whom have submitted multiple comments. Many of these comments are reflected in proposed changes.

Notification of the final language proposal and this public hearing was published in local newspapers and individually sent to involved stakeholders during the week of April 4, 2007. A summary of all proposed changes to the current Standards is attached. Copies of the complete text of the proposed revised Standards is available at the Clerk's desk and on Clean Water Services' website (www.CleanWaterServices.org).

Summary of Proposed Changes Clean Water Services Design and Construction Standards Update

The proposed changes are focused on the Vegetated Corridors sections of the Standards and substantial changes to the technical Standards associated with pump stations and force mains.

In accordance with the Board's direction, no major policy changes are proposed with this update, although several chapters have been significantly reformatted and reorganized for clarification and ease of use. The currently proposed changes include revisions necessary to meet the requirements of the District's National Pollutant Discharge Elimination System (NPDES) Watershed Based Permit and the District's role as permitting agent for the Department of Environmental Quality (DEQ) 1200-C program regulating erosion control on construction sites 1 acre and larger. In cooperation with the cities' and Washington County's efforts to comply with Goal 5, new language has been added to support low impact development approaches to managing stormwater. Changes are also proposed to increase flexibility for trail placement within vegetated corridors, expand the use of proprietary treatment systems, and to add proportionality criteria to the mitigation requirements for total and partial wetland fills and to the treatment requirements for redevelopment sites.

A summary of the changes is outlined below.

Chapter 1 – General Requirements and Administrative Provisions

General Notes

The primary changes to this Chapter include additional definitions and inclusion of the Purpose Section to be applicable for the entire D&C Standards.

1.01 Purpose

- Moved the Purpose section that is currently in section 3.0 of the Standards to be applicable to the entire Standards.
- Added to a Purpose a statement of intent that includes protection of surface water quality and quantity
- Added a paragraph to include the objective of minimizing future maintenance costs

1.02 Applicability

- Changed, throughout the Standards, “District and City sanitary sewer and storm and surface water systems” to “public sanitary sewer and storm and surface water systems” for clarification
- Changed, throughout the Standards, “District and City boundaries” to “District boundaries” for clarification

1.03 Definitions

- Added definition for “*Approved by District or City*”
- *BMP* is defined
- Clarified *Building Sewer*, *Lateral*, and *Side Sewer* definitions
- *Designee* modified to denote co-implementers
- Clarified *Edge of Sensitive Area* definition
- Definition of *Enhancement* modified to reflect the Purpose Section

- *Impervious Area* definition modified to exclude some Low Impact Development Approach techniques
- Clarified definition of *Intermittent Streams and Springs* to eliminate duplication with other sections of the Standards
- Added the acronym *LIDA* to signify *low impact development approaches*
- Added definition for *Linear Development Project* to accommodate a new section in Section 3.12 and to better account for projects like paths and sewer lines
- Added definition of *Path* to assist in the implementation of the Vegetated Corridor standards in Chapter 3
- *Perennial flow* has been changed to *Perennial Streams and Springs* to be consistent with Chapter 3
- Clarified definition of *Redevelopment* to exclude any conversion of existing pervious areas to impervious on the subject property, regardless of existing impervious areas
- Definition of *Stream* has been modified to be consistent with Table 3-1
- Definition of *Vegetated Corridor* modified so as not to limit water quality protection only to Water Quality Sensitive Areas
- Term *Isolated Wetland* added to assist with calculation of Vegetated Corridor widths

1.04 *Prohibited Activities*

- Moved section on *Prohibited Activities* from Chapter 12 to Chapter 1 to be applicable to the entire Standards

1.05 *Enforcement*

- Added Enforcement section to combine multiple similar provisions in the current Standards, and be applicable to the entire Standards

1.06 *Alternate Methods*

- Renumbered and renamed existing section 1.17 – *Approval of Alternate Methods, Materials, or Designs*

1.07 *Provisions Within Cities Operating the Local Program*

- Combined provisions for plan submittals and inspections for projects within cities, currently in sections 1.04 and 1.06. Added allowance for submitting electronic plans.

1.08 *Other Provisions*

- Sections 1.03, 1.05, and 1.07 through 1.16 in the current Standards renumbered and combined into new section 1.08
- *Easement* definition (proposed 1.08.2) modified and clarified to include sensitive area, vegetated corridor, and created and constructed wetlands.

Chapter 2 – Administrative Procedures

General Notes

Chapter 2 was written to apply only to projects in the unincorporated areas and small cities. However, some provisions apply throughout the District (e.g., Pre-Development Site Certification and Assessment, erosion control, and plan submittal minimums,. These rules which apply throughout the District are now noted in Section 2.01.1. In addition, storm and surface water requirements do not apply to Gaston and this is noted.

2.01 *General*

- Clarified applicability of D&C Standards to include all areas within the District Service Boundary
- Added requirements for maintenance assurance
- Noted City of Gaston exemption for stormwater and vegetated corridors requirements
- Added fees statement intent which is to collect fees to defray incurred costs for plan reviews, inspections, etc.

2.02 *Pre-Development Site Certification and Assessment*

- Re-numbered subsections.

2.03 *Construction Permits*

- Section 2.03 reorganized to clarify the requirements
- Requires payment of all fees and approval of engineering plans prior to issuance of the Site Development permit
- Clarifies when Erosion Control Only Permits can be issued prior to Site Development Permit issuance
- Deleted reference to the *Erosion Prevention and Sediment Control Planning and Design Manual* – relevant requirements of the *Manual* incorporated into proposed Chapter 6
- Added exemption for erosion control permit requirements associated with pavement overlays and other minor road maintenance projects

2.04 *Requirements for Engineering Plan Approval*

- Section 2.04 identifies minimum District requirements; allowance for Cities to require additional information.
- Includes allowance for submitting electronic plans for review
- Eliminates the total square footage of vegetated corridor during first plan submittal to avoid redundancy
- Includes provision for requiring sanitary flow calculations if the District deems necessary
- Clarifies water quantity and water quality facilities submittal requirements, including planting plans
- Clarifies vegetated corridor restoration submittal requirements, including planting plans
- Allows 1200-C plan submittal to substitute for the District required EC plan submittal
- Provides clear requirements for drainage reports, including potential waiver of report requirements for small projects like partitions
- Downstream system analysis threshold changed to 5,280 sq. ft. to be consistent with the assumed 2,640 sq. ft. for a single-family EDU
- Requires maintenance plans for privately maintained water quantity or quality facilities or conveyance systems
- Allows for Post-Approval Plan modifications to be electronically submitted
- Easement dimension requirements moved to Chapter 5

2.06 *Performance Assurances*

- Added minor section headings for clarification
- Added “including landscaping” to the second row in Table 2-1 (2. Performance Assurance) inadvertently left out before

- 2.08 *Project Construction Phase Completion and Acceptance*
- Provides clarification for when delay in plantings is allowed before the substantial completion is issued
- 2.09 *As-Built Drawings*
- Includes requirement for electronic versions of as-built drawings
- 2.11 *Maintenance Period Inspection and Completion*
- Requires visual inspection of the water quantity and quality facilities during the one year warranty period
 - Adds flexibility for the District and Cities to extend the required maintenance period if required planting survivability rates are not met
- 2.12 *General Administrative Rules*
- Clarifies the purpose of District's inspection program. The Owner has the primary responsibility of the project. The District's inspection program is to monitor compliance with these Standards.
 - Clarifies that guidance documents are for guidance and that they do not supersede any provision of these Standards.
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Chapter 3 – Sensitive Areas and Vegetated Corridors

General Notes

The proposed Chapter 3 includes requirements for protecting Sensitive Areas and associated Vegetated Corridors. Stormwater design requirements have been moved to Chapters 4 and 5. Much of the proposed changes are revisions solely for readability and clarity. Major changes include:

- Vegetated corridor width for hydrologically connected wetlands greater than 0.5 acres is proposed to be 50-ft, increased from 25-ft
- Definition of paths updated to include 1-ft shoulder on either side of the paved paths
- Flexibility added for trail placement in the Tualatin River vegetated corridor
- Flexibility added for paths wider than 12-ft with the use of low impact development approaches
- Vegetated corridor determination associated with changed Sensitive Areas resulting from partial and total wetland fills
- Provides reasonable enhancement and restoration requirements for linear projects within vegetated corridors

3.02 Service Provider Letter and Permits Required

- Provides clarification for obtaining SPLs for lot line adjustments that are not part of a land use or building permit application
- Clarifies process for submitting the simplified and standard site assessment
- Requires complete submittal before review for SPL issuance is initiated

3.03 Vegetated Corridors

- Table 3-1 reformatted for clarity
- Vegetated Corridors widths for hydrologically connected wetlands greater than 0.5 acres is proposed as 50-ft, increased from 25-ft
- Clarifies that vegetated corridor averaging methods cannot be used in conjunction with certified geotechnical analysis to further reduce vegetated corridor width

3.05 *Activities Allowed in a Vegetated Corridor*

- Clarifies when riparian enhancement projects are required to obtain SPL
- Added cross reference on erosion control requirements
- Provides requirements for utility infrastructures to qualify as allowed uses in the vegetated corridors
- Provides requirements for stormwater facilities to be allowed uses in the vegetated corridors
- Path width increased to include the 1-ft shoulder area, which was inadvertently left off before
- Flexibility added for path placements in the Tualatin River vegetated corridor
- Flexibility added for paths wider than 12-ft with the use of low impact development approaches

3.06 *General Requirements for Development Activities*

- Correction on reference
- Clarifies requirements associated with pre-development clearing activities

3.07 *Encroachment Standards*

- Require the District to provide a written denial
- Corridor Averaging is now included in the Encroachment Standards section to maintain continuity in the description of encroachment requirements
- Standard Site Assessment wording replaced by reference to Section 3.02.2 where requirements are located

3.08 *Vegetated Corridor Mitigation Standards*

- Table 3-2 added to replace general, non-specific language in the mitigation requirements
- The District mitigation requirements are no long tied to DSL to allow increased flexibility in allowing Payment to Provide for Vegetated Corridor mitigation
- Clarification that replacement vegetated corridor must be contiguous with existing vegetated corridor
- Payment to provide mitigation expanded to allow its use for small impact projects
- Added an option to meet mitigation requirements by providing enhancement of existing vegetated corridor has been added

3.11 *Wetland Fills*

- Vegetated corridor mitigation requirements for partially or totally filled wetlands modified. The intent of this section is to provide full vegetated corridor to the post-fill and/or mitigation wetlands in accordance with Table 3-1.
- In certain circumstances, impacted edge of partially filled wetlands will be allowed zero vegetated corridor.
- Vegetated corridor mitigation requirements vary depending on the pre-filled condition, i.e., good, marginal, or degraded.
- The proposed changes are not to inadvertently “encourage” more degradation of wetlands than absolutely necessary. The proposed changes also must be consistent with the DSL and COE regulations.
- The staff attempted to address as many scenarios as possible, but some flexibility is needed to address unforeseen circumstances. As such, added provision that will allow this flexibility to be exercised only during the most unusual situations.

3.12 *Linear Development Projects*

- Provides reasonable enhancement and restoration requirements for linear projects

3.13 *Site Assessment Requirements*

- Final conditions site plan is a new figure requirement intended to increase staff efficiency associated with plat reviews

3.14 *Assessment Methods*

- Methodology for documenting intermittent status of streams modified to allow leeway in the sampling period from 30 days apart to 37 days apart
- Precipitation table 3-4 updated to reflect DSL methodology
- Methodology for measuring slope changed to require measurement perpendicular to the contours, rather than to the Sensitive Area

Chapter 4 – Runoff Treatment and Control

General Notes

This chapter represents a combination of Sections 3.11 (Water Quality Facility Design Standards), 3.12 (Water Quantity Design Standards), and Appendix B (Water Quality and Quantity Facility Design) in the current D&C Standards. Other than minor additions and clarification which are noted below, the primary additions to the current standards are the inclusion of rules for Low Impact Development Approaches and allowance for the use of proprietary treatment systems.

4.01 *General Provisions*

- Provides general applicability of these Standards
- Clarifies that the District standards supersede when they conflict with Cities' standards

4.02 *General Requirements for Water Quantity and Quality Facilities*

- Current requirements of Appendix B are included in this section
- Planting requirements are as included in the proposed Appendix A, except for low impact development approaches
- Added allowance for wildlife friendly fencing
- Clarifies when a curb is required
- Added new section to clarify the ownership and maintenance responsibility for water quantity and quality facilities

4.03 *Water Quantity Control Requirements*

- This section is from existing Section 3.11 and requires mitigating impacts on the public stormwater system
- Clarifies the on-site detention requirements
- Computational hydraulic models added to acceptable list of methodology
- Included provision for meeting water quantity control requirements using approved low impact development approaches

4.04 *Water Quantity Facility Design Standards*

- Deleted requirements for over excavation because these facilities should not be used for sedimentation and erosion control
- Deleted details based on their lack of performance in the field

4.05 *Water Quality Treatment Requirements*

- This proposed section is from section 3.12 of the current Standards
- Clarifies when in-lieu of treatment fee is required
- Provides an approved list of stormwater quality facilities
- Introduces allowed use of proprietary system
- Allows the use of low impact development approaches
- Allows for the use of actual impervious areas for calculation, if appropriate
- Table 4-1 provides proportionality for redevelopment projects
- Water Quality Storm re-worded to eliminate redundancy
- Includes allowance for small portions of site runoff to discharge directly into a swale without prescribed pre-treatment
- Allowance for limited use of proprietary treatment systems

4.06 *Water Quality Facility Design Standards*

- Requirements for emergency overflows deleted here as they are in 4.03.3(d)

4.07 *Low Impact Development Approaches (LIDA)*

- This is a new section with provisions for the use of low impact development approaches for water quality treatment. Primary benefit from the use of LIDA will be reduction in effective impervious area which may result in smaller or no water quality treatment facilities.
- Added Table 4-2 to provide a general description of LIDAs. Until the District has finalized the LIDA Guidance Manual (expected in mid-2007), approval of these facilities will be on a case-by-case basis.
- Requires long-term maintenance plan.
- Clarification on how LIDA can substitute for water quality treatment

Chapter 5 – Conveyance Design

General Notes

This chapter represents a complete rewrite of the conveyance design sections of the Standards to combine the sanitary and storm conveyance requirements for consistency, and to move all the conveyance design requirements into a single chapter. To accomplish these goals, requirements from the following sections in the current D&C were pulled together into this chapter:

Chapter 3 – Sections 3.03 through 3.10 (Stormwater conveyance requirements)

Chapter 4 (Std Design Spec for Public Sanitary Sewer)

Chapter 9 (Std. Tech Specs for Building Sewers, Side Sewers, and Side Storm Pipelines)

Appendix A – Sections 1.0 (Hydrologic Analysis) and 2.0 (Hydraulics)

Other changes are noted below.

5.02 *Extension of Public Conveyance Systems*

- This is a rewrite of current sections 4.02 and 3.03.2. It also clarifies the criteria for not requiring an extension of the public system

5.03 *Conveyance Easements*

- This section (based on the current Section 2.05) is expanded to clarify requirements for substandard easements.
- Adds clarification on encroachments into easements
- Modified to allow larger easements when sewer depths exceed 10 feet and for topographical constraints
- Clarifies requirements for reduced conveyance easement widths

5.04 *Flows*

- Adds acceptable hydrologic models for storm flow calculations methodology
- Clarification that using the Rational Method storm flow calculation methodology, is allowed only for basins smaller than 1 acre

5.05 *Storm Conveyance Design Considerations*

- Clarification of storm conveyance design criteria requirements
- Clarifies that travel lane is motor vehicle travel lane
- Provides guidance on acceptable overland flow distances in urban settings

5.06 *Pipe Design*

- Section 5.06 combines the current pipe standards in Chapter 4 (sanitary) and Chapter 3 (storm). No major changes except for reformatting to accommodate combining sections of two chapters.
- Clarifies downstream sewer pipe sizes
- Clarifies when minimum size can be varied
- Provides additional flexibility for separation requirement for parallel sanitary and storm sewers
- Clarifies minimum pipe cover requirements for non-reinforced pipes
- Adds flexibility for minimum pipe cover requirements for catch basin leaders

5.07 *Conveyance Structure Design*

- Clarifies design of sanitary and storm manholes to require appropriate alignment of various sized pipes entering and exiting manholes
- Modifies the depth of laterals entering and exiting manhole
- Clarifies catch basins and inlets regarding sumps
- Allows deeper catch basins as appropriate
- Modifies storm channel and outfall design requirements to include geotextile fabric uses

5.09 *Laterals*

- This section combines current Section 4.04.2 and Chapter 9 of D&C Standards. Rewrite of these sections clarifies requirements for Building Sewer, Lateral, and Side Sewer. Definitions for each of these terms added and modified in the proposed Chapter 1.
- Clarifies the District's requirements for laterals and introduces some flexibility in allowing building sewers to cross adjoining properties
- Clarifies requirements for weepholes to be consistent with current practice
- Clarifies allowed side sewer material
- Adds requirements for marking laterals from the mainline to the building

5.10 *Flood Management Design Standards*

- Deleted reference to an attachment that does not exist

Chapter 6 – Erosion Prevention and Sediment Control

General Notes

The EC chapter is a complete re-write of the existing Chapter 8 to:

1. Create consistency with the new 1200-C requirements
2. Clarify the standards for erosion control and clearly separate these standards, which are included in 6.01 & 6.02 below, from the BMPs in 6.03.

In addition to the changes in this chapter, Chapter 2 – Procedures will be changed to reflect the new 1200-C requirements. All requirements relating to EC plan contents are in Chapter 2.

6.01 General Provisions

- Clarifies applicability of erosion control rules for all properties within the District boundary

6.02 Erosion Prevention and Sediment Control (EPSC) Standards

- Clarifies prohibited activities
- Clarifies who is required to obtain erosion control permits
- Clearly indicates the minimum required BMPs
- Wet weather period is extended to May 31st (from April 30) to be consistent with DEQ's 1200-C permit requirements

6.03 Best Management Practices

- This new section requires base measures that are required for all projects with erosion control permit
- Approved erosion prevention BMPs are included in Table 6-1
- Approved runoff control BMPs are included in Table 6-2
- Approved sediment control BMPs are included in Table 6-3
- Includes requirements for dust control and non-stormwater pollutant management

6.04 Inspection

- Minimum erosion control inspection frequencies are included in Table 6-4 to be consistent with DEQ's 1200-C program
- Includes requirements for ground cover before final inspection

Chapter 7 – General Construction Specifications for Conveyance Systems

General Note:

This chapter is a duplicate of the current Chapter 5 with the section numbers changed. Other major changes are below.

7.02 Trench Excavation and Backfill

- Clarification that the design engineer is responsible for trench design, rather than the District
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Chapter 8 – Technical Specifications for Conveyance Systems

General Note

This chapter is a combination of the current Chapters 6-Technical Specifications for Sanitary Sewer System and Chapter 7-Technical Specifications for Storm Systems. Changes other than consolidating identical requirements and reformatting the chapters are noted below.

8.02 Manholes and Structures

- Updated to reference the latest ODOT/APWA Construction standards
- Knockouts are allowed only for future storm pipe stubouts
- Concrete Manhole Closure Collar requirement modified to be applicable to both sanitary and storm manholes
- Clarification on Structure Marker
- Modification on Pipe Connections section to include same level of care required for storm and sanitary sewers
- Eliminated flexible joints to reflect current practices
- Specific requirements for drop manholes as they relate to storm system
- Specific watertight seal specifications (as required for sanitary) are extended to storm sewers
- Provides allowance for meeting the finished grade for manholes located outside of roadways

8.03 Catch Basins and Inlets (Storm only)

- Clarifies acceptable form materials

8.04 Sewer Pipe and Fittings

- Clarifies accepted specifications for the use of Corrugated Polyethylene (CPP), Corrugated Aluminum (CAP), and Corrugated Aluminum Pipe Arches (CPAP) for storm sewers
- Clarifies use of Ductile Iron fittings
- Minor changes incorporated in Workmanship section to be consistent for sanitary and storm sewers
- Tapping into existing sewer lines requires prior approval by the District
- Clarifies Transition Fittings and allowed Line Taps methods

8.05 Testing and Acceptance

- Clarifies the sequence of testing
- Clarifies testing procedures
- Requires video inspection report on approved form

Chapter 9 – Wastewater Pump Stations and Force Mains

General Notes

The chapter is currently Chapter 10 of the D&C Standards. In addition to the renumbering of the sections to change Chapter 10 to Chapter 9, the following changes are included in this chapter:

- 1) Citation changes to reflect the new section numbers throughout this version of the D&C Standards.
- 2) The *Standby Power* is modified with an addition shown to section 9.02.7(f)(1)
- 3) The current Section 10.02.8, Electrical and Instrumentation Control Requirements is completely rewritten and replaced by Section 9.03.

9.01 General Provisions

- The turning radius requirement for pump station location reduced from 60- to 30-ft.

9.02 Design and Construction Requirements

- The turning radius requirement for access reduced from 60- to 30-ft.
- Air release valves section is modified to provide a better basis for design of these systems.

9.03 Electrical and Instrumentation Control Requirements

- Section 9.03 replaces the current Section 10.02.8.

Chapter 10 – Septic Tank Effluent Pump (STEP) Systems

General Notes

This section is Chapter 11 of the current D&C Standards. No changes other than section numbering are included.

10.01 General Provisions

- While the District takes the lead role in determining when STEP systems can be approved, the section is modified to include the City in the review, construction, and inspection of the systems

Appendix A – Planting Requirements

General Notes

Appendix A is a revision to the current Appendix D in the D&C Standards. Some of the major changes include:

- Previous density equation and Table 1 were inconsistent. Changes clarify by removing 'on-center' spacing suggestion.
- Added allowance for use of bare root stock.
- Clarification on what is required vs. suggested.
- Clarifies that all sites and Water Quality Sensitive Areas are unique and site preparation/planting may be modified according to individual project site constraints
- Section 2, step 3b was eliminated as Vegetated Corridor conditions are based on Table 3.2 Vegetated Corridor Standards. Allowance of non-natives in VC would not meet goal of enhancing Water Quality Sensitive Areas to 'good condition'.
- Section 2, step 4b added option of using native grass for erosion control where appropriate.

1.0 Introduction

- Provides general overview of the District's responsibilities
- Provides an overview of other Agency involvements as they relate to Sensitive Areas protection

2.0 PLANTING PLAN METHODS

- Provides overview of planting plan requirements for stormwater quality facilities and vegetated corridor enhancement areas
- Allows for use of non-native plants for highly urbanized sites
- Clarification on the plant quantities and placements
- Clarification on ideal planting time frame
- Flexibility added for irrigation requirements
- Requires monitoring/site visits throughout the growing season
- Clarification on construction document and specifications requirements
- Clarification on meeting successful enhancement requirements
- Modified Table A-1 to reflect that these are a "suggested" list and not intended to be an exhaustive native plants list

Appendix B – Standard Details

This section is reorganized and the standard details renumbered to allow the reader to find relevant details quicker.

The bullets denote:

- – Existing detail with possible minor revisions
- – New detail or significant revision to existing details

The following details are eliminated in this revision:

- 175 6" Public Side Sewer
- 544 Alternative Outflow Control Structure
- 600 Float Switch Plan and Detail C
- 610 Float Switch Section A
- 620 Float Switch Detail B
- 630 Sample Design Data Table
- 640 Force Main Pressure Gauge
- 1170 Geotextile Stabilization

Manholes and Appurtenances

- 010 Standard Manhole
- 020 Pre-cast Concrete Manhole Base
- 030 Pre-Cast Rubber Gasket Manhole
- 040 Shallow Flat Top Manhole
- 050 Flat Top Manhole
- 060 Mechanical Inside Drop Manhole
- 070 Partitioned Inside Drop Manhole
- 080 Open Inside Drop Manhole
- 090 Inside Drop Manhole, with Bowl
- 100 Manhole Step
- 110 Suburban and Standard Manhole Frame and Cover (Sanitary)
- 120 Stormwater Manhole Lid

- 130 Water Tight Manhole Frame and Cover
- 140 Concrete Manhole Closure Collar
- 150 Manhole Chimney Seal
- 160 Large Pre-Cast Concrete Manhole
- 170 Large Pre-Cast Concrete Manhole – Bases
- 180 Large Pre-Cast Concrete Manhole – Types
- 190 Large Pre-Cast Concrete Manhole Base Slabs
- 200 Large Pre-Cast Concrete Manhole – Long. Base Section Reinforcement
- 210 Large Pre-Cast Concrete Manhole – Base Section Reinforcement 108” & 120”
- 220 Large Pre-Cast Concrete Manhole – Top Slabs
- 230 T- Top Manhole with 48” Riser
- 240 Water Quality Manhole (Mechanical)
- 250 Water Quality Manhole (Snout) A
- 260 Water Quality Manhole (Snout) B
- 270 Detention Manhole

Storm Structures

- 300 Gutter and Curb Inlet Catch Basin (CG – 2)
- 310 Gutter and Curb Inlet Catch Basin (CG – 2) Reinforcement
- 320 Catch Basin Frame and Grate (CG – 2)
- 330 Inlet Catch Basin (CG – 30)
- 340 Inlet Catch Basin (CG – 48)
- 350 Curb Inlet Manhole (CG - 48 M.H.)
- 360 Modified Curb Inlet Manhole (MOD.CG – 48 M.H.)
- 370 Top – Curb Inlet Manhole and Modified Curb Inlet Manhole (CG – 48M.H. and MOD. CG – 48 M.H.)
- 380 Area Drain Type II
- 390 Ditch Inlet
- 400 Ditch Inlet Frame and Grate

Pipes

- 500 Standard Cleanout
- 510 Cleanout Frame and Cover
- 520 Side Sewer / Side Storm Pipeline
- 530 Inserta – Tee
- 540 Indexed PVC Gasketed Saddle
- 550 Concrete Cap
- 560 Concrete Encasement / Closure Collar
- 570 Concrete Anchor Wall
- 580 ODOT Pipe Slope Anchor
- 590 Trench Backfill Details
- 600 T – Cut Asphalt Details
- 610 Bore Detail
- 620 Creek Crossing Restoration

Water Quality

- 700 Water Quality Swale
- 710 Water Quality Swale Construction and Maintenance Notes
- 720 Outflow Control Structure
- 730 Orifice Plate and Guide
- 740 Chain Link Fence and Gate
- 750 Concrete Spreader Detail
- 760 Removable Bollard
- 770 Rip Rap Specifications
- 780 Tree Planting –Container/Burlapped
- 790 Vegetated Corridor Signage

Erosion Control

Erosion Prevention:

- 800 Matting Channel Installation
- 805 Matting Slope Installation
- 810 Plastic Sheeting

Runoff Control:

- 815 Pipe Slope Drain
- 820 Outlet Protection - Rip Rap
- 825 Outlet Protection - Stilling Basin
- 830 Surface Roughening - Cat Tracking
- 835 Surface Roughening - Stair Stepping/Grooving Slopes
- 840 Check Dam - Rock
- 845 Check Dam - Bio Filter Bag
- 850 Diversion Dike/Swale

Sediment Control:

- 855 Construction Entrance
- 860 Oak Mats
- 865 Tire Wash - Manual Hose Wash
- 870 Tire Wash - Drive Through
- 875 Sediment Fence
- 880 Wattles
- 885 Wattles - Single Family Application
- 890 Filter Berm Rock/Brush
- 895 Sidewalk Subgrade
- 900 Inlet Protection - Type 1
- 905 Inlet Protection - Type 2
- 910 Inlet Protection - Type 3
- 915 Inlet Protection - Type 4
- 920 Inlet Protection - Type 5
- 925 Inlet Protection - Type 6
- 930 Sediment Trap
- 935 Sediment Basin
- 940 Spacing Tables
- 945 Standard Erosion Control Notes for Sites Less Than 1 Acre

Pump Stations

- 1001 Wastewater Pump Station and Force Main Design Data Summary Table (Page 1)
- 1002 Wastewater Pump Station and Force Main Design Data Summary Table (Page 2)
- 1003 Conceptual Site Schematic
- 1005 Chain Link Fence & Gate
- 1007 Force Main Pressure Gauge
- 1009 Yard Hydrant
- 1011 Reduced Pressure Backflow Preventer
- 1070 General Title Sheet
- 1070b Electrical Abbreviations & Symbols (E00)
- 1071 Electrical One-Line Diagram (E01)
- 1072 Electrical Interior Enclosure-01 (E02)
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- 1074 Electrical Control Panel Detail (E04)
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- 1080 Electrical Disconnect Air-Gap Junction Box (E10)
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- ~~1090 Operational Ready Test (ORT) – Factory Demonstration Template (1 of 4)~~
- ~~1091 Operational Ready Test (ORT) – Factory Demonstration Template (2 of 4)~~
- ~~1092 Operational Ready Test (ORT) – Factory Demonstration Template (3 of 4)~~
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Flow Monitoring

- 1100 Sanitary Sewer Permanent Flow Monitor Details (Manhole Conduit Installation)
- 1105 Conduit Trench Backfill Details (Flow Monitors)

Testing Forms

- 1200 Air Test Form
- 1205 Nomograph
- 1210 Manhole Vacuum Test Form
- 1215 Manhole Hydrostatic Test

Computational Aids

- 1250 Average velocities for Estimating Travel Time for Overland Flows
- 1255 Headwater Depth for Corrugated Pipe W/Inlet Control
- 1260 Headwater Depth for Smooth Interior Pipe Culverts with Inlet Control
- 1265 Head for Culverts (Pipe / “N” = 0.012), Flowing Full with Outlet Control
- 1270 Head for Culverts (Pipe / “N” = 0.024), Flowing Full with Outlet Control
- 1275 Rational Method Rainfall Intensities
- 1280 24-Hour Rainfall Depths
- 1285 Design Storm Distribution Chart