



SNYDERVILLE BASIN

WATER  
RECLAMATION  
DISTRICT

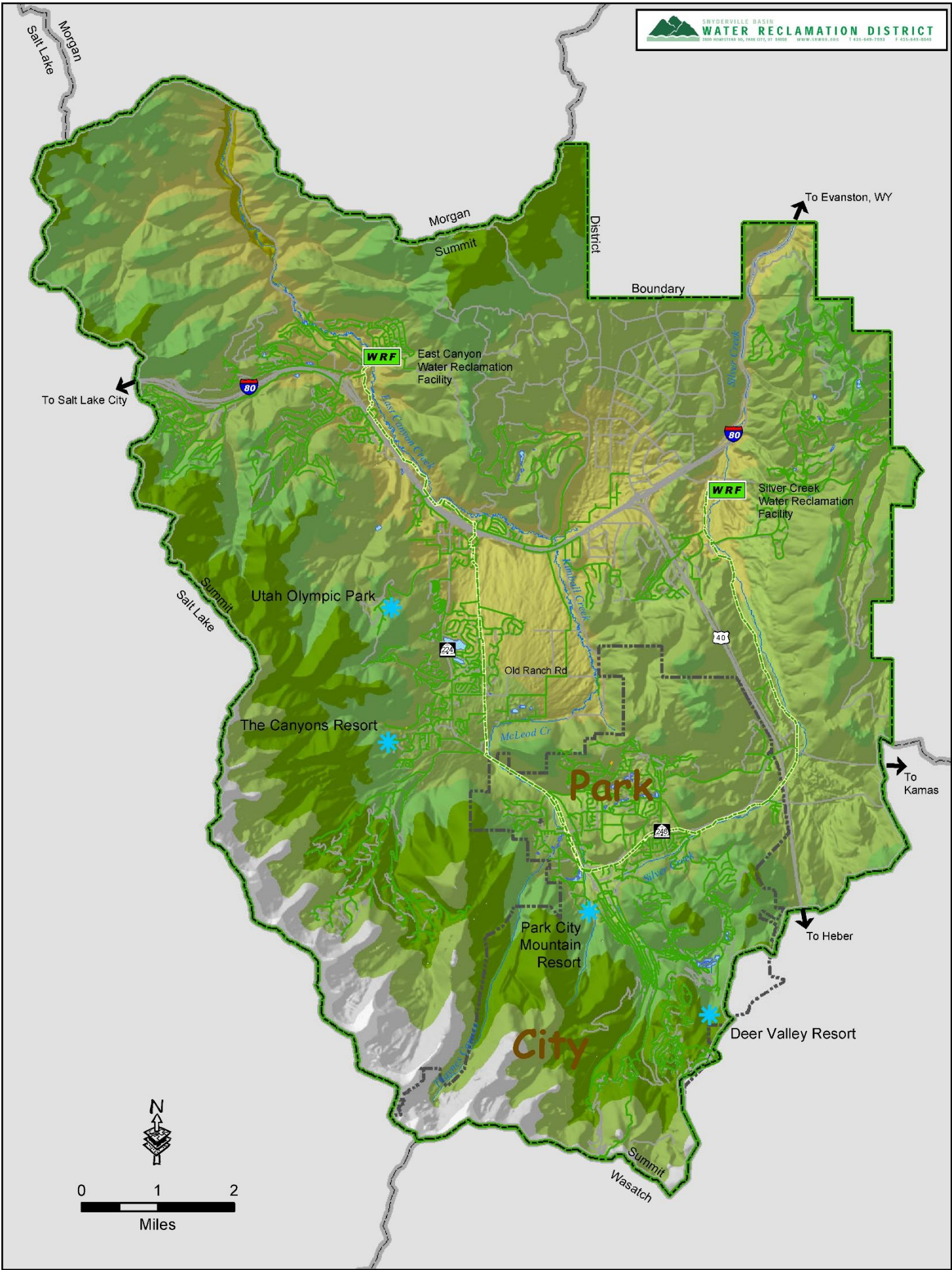
PARK CITY, UTAH



# Development Procedures, Design Standards and Construction Specifications for Wastewater Facilities

April 20, 2020

THE QUALITY OF  
OUR WATER  
REFLECTS THE  
QUALITY OF OUR  
COMMUNITY



**DEVELOPMENT PROCEDURES, DESIGN STANDARDS  
and  
CONSTRUCTION SPECIFICATIONS**

**for**

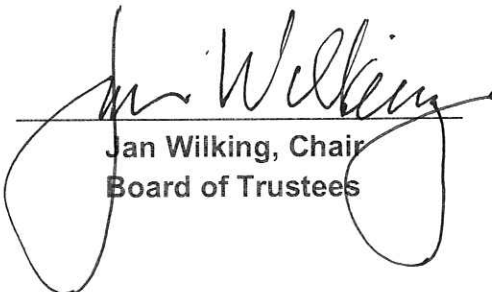
**WASTEWATER FACILITIES**

**in the  
SNYDERVILLE BASIN  
WATER RECLAMATION DISTRICT**

**April 20, 2020**

**Adopted by the  
Snyderville Basin Water Reclamation District  
Board of Trustees**

**This document supersedes all Development Procedures, Design Standards and Construction Specifications previously established or approved by Snyderville Basin Water Reclamation District.**



**Jan Wilking, Chair  
Board of Trustees**



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## **APPENDIX A**

### **FORMS FOR PUBLIC WASTEWATER SYSTEM EXTENSIONS AND MODIFICATIONS**

- Line Extension Agreement for Public Wastewater System (LEA)
- Improvement Completion Agreement
- Surety Bond
- Agreement for Off-road Public Wastewater Lines
- Grant of Easement
- Grant of Access Easement
- Grant of Easement and Access Easement
- Wastewater System Test Results
- Confined Space Notice, Acknowledgement and Waiver Form
- OSHA Confined Spaces in Construction – Subpart AA

## **APPENDIX B**

### **FORMS FOR PRIVATE LATERAL WASTEWATER CONNECTIONS TO THE PUBLIC WASTEWATER SYSTEM**

- Wastewater Service Application Information Form
- Wastewater Service Application Packet
  - Impact Fee Calculation
  - Wastewater Service Application
  - Private Lateral Construction Information
  - Private Lateral Wastewater Line Detail
  - Authorization to Use
  - Wastewater Calculation Non-Residential Only
- Industrial Waste and Pretreatment Questionnaire
- Notice of Conditions
- Grant of Easement for Private Lateral Wastewater Line (Example)
- Request for Collection System Location and/or Excavation Marking

## **APPENDIX C**

### **STANDARD DETAIL DRAWINGS**

#### **Manhole Details**

- MH-01 Precast Manhole with Precast Base
- MH-02 Shallow Manhole
- MH-03 Inside Drop Manhole
- MH-04 Pressure Line Connection to Manhole
- MH-05 Pipe-Manhole Connection (Pipe Slopes Greater than 10%)
- MH-06 Cast-In-Place Manhole Base
- MH-07 Manhole Adjustment in Asphalt Pavement
- MH-08 Manhole Adjustment in Concrete Pavement
- MH-09 Existing Manhole Adjustment in Asphalt
- MH-10 Off-Road Manhole Collar
- MH-11 Manhole Platform
- MH-12 Off-Road Manhole Collar (In Ski Run Area)
- MH-13 Manhole Wall Section Non-Matching Joint

#### **Pipe Details**

- PI-01 Pipe Trench
- PI-02 Off-Road Pipe Trench and Access Platform
- PI-03 Trench Dike
- PI-04 (Not Used)
- PI-05 Pipe Anchor (HDPE Main Line)

#### **Low-Pressure Sewer System Details**

- LP-01A Low-Pressure Junction Manhole
- LP-01B Low-Pressure Junction Manhole
- LP-02 Dead End Low-Pressure Flushing Connection
- LP-03 Low-Pressure Combination Air Valve
- LP-03A Dead End Low-Pressure Combination Air Valve
- LP-04 Low-Pressure Private Lateral Stub
- LP-05 Low-Pressure Lateral Stub to Building Connection

#### **Private Lateral Wastewater Line Details**

- LAT-01 Private Lateral Stub - Gravity Flow PVC Main Line to PVC Lateral Line
- LAT-02 Private Lateral Stub - Gravity Flow HDPE Main Line to PVC Lateral Line
- LAT-03 Private Lateral Stub - Gravity Flow HDPE Main Line to HDPE Lateral Line
- LAT-04 Lateral Connection to Existing Sewer Main
- LAT-05 Gravity Lateral Stub to Gravity Building Connection
- LAT-06 Sanitary Sewer Pressure Line to Gravity Line Connection
- LAT-07 Sanitary Sewer Cleanout and Protective Box
- LAT-08 (Not Used)
- LAT-09 Typical Exterior Pump Station Installation
- LAT-10 Abandonment of Existing Lateral
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#### **Pretreatment Details**

- PT-01 Grease Interceptor
- PT-02 Sampling Manhole Precast Base
- PT-03 Sand Interceptor
- PT-04 Sand and Oil Interceptor





# CHAPTER 1 - GENERAL REQUIREMENTS AND POLICIES

## SECTION 101 - GENERAL REQUIREMENTS

### 101.1 Title

- A. These regulations shall be known as Development Procedures, Design Standards and Construction Specifications for Wastewater Facilities in the Snyderville Basin Water Reclamation District (SBWRD Standards).

### 101.2 Scope

- A. The provisions of these regulations shall apply to the development, design, and construction of any extension, replacement, relocation, modification, repair, abandonment, connection to and use of the public and private wastewater facilities within the Snyderville Basin Water Reclamation District (SBWRD).

### 101.3 Intent

- A. The Board of Trustees of SBWRD has established certain requirements for development approval and construction of wastewater facilities in the SBWRD through adoption of these SBWRD Standards and other resolutions and policies.
- B. These regulations establish procedures and provide minimum standards and specifications to control and regulate the development, design, construction and use of wastewater facilities in the SBWRD. Certain environmental or site-specific conditions may require the design and construction of the wastewater facilities to exceed the minimum standards and specifications contained in these SBWRD Standards. It shall be the responsibility of the Project Engineer and Contractor to identify these conditions and modify the design and installation accordingly, as approved by SBWRD.

### 101.4 Deviations

- A. SBWRD does not intend these standards and specifications to replace professional judgment and competent workmanship on the part of the Project Engineer or Contractor.
- B. Proposed designs, materials or construction methods deviating from these regulations shall be submitted to SBWRD for review. The submittal shall include additional data, computations, exhibits, etc., as required by SBWRD.
- C. Written approval by SBWRD authorizing a deviation from these regulations shall be received prior to incorporating the design, material or construction method deviation into a project.

### 101.5 Abbreviations

- A. AASHTO: American Association of State Highway and Transportation Officials.
- B. ANSI: American National Standards Institute.

- C. ASTM: American Society for Testing and Materials.
- D. AWWA: American Water Works Association.
- E. IPC: International Plumbing Code.
- F. SBWRD: Snyderville Basin Water Reclamation District.

### 101.6 Definitions

- A. Approved Construction Drawings: Final design drawings approved, stamped, and signed by the SBWRD District Engineer. This includes modifications to final design drawings approved by SBWRD after Final Design Approval is given.
- B. Authorization To Use: An approval granted by SBWRD for occupancy of a residence, building or other facility after acceptance of the Public Wastewater System; connection, inspection, and approval of the Private Lateral Wastewater Line; and receipt of all required fees and forms. The Authorization To Use is required by the Summit County and Park City Building Departments prior to issuance of Certificate of Occupancy/Compliance.
- C. Board of Trustees: The governing body of SBWRD.
- D. Building Permit: A permit issued by the Summit County or Park City Building Departments to individual lot or unit owners which authorizes construction or modification of a residence, building or other facility to begin.
- E. Certificate of Occupancy/Compliance: A certificate issued by the Summit County or Park City Building Departments to individual lot or unit owners certifying the residence, building or other facility (based on on-site inspections by the Building Inspector) has been constructed or modified in full compliance with all representations made and conditions imposed on its approval.
- F. Common Private Lateral Wastewater Line: A private lateral which is designed and constructed to serve more than one individual unit.
- G. Contractor: The company or firm and its employees hired to construct the extension or modification of the Public Wastewater System. The Contractor is hired by the Developer on Developer Sponsored Projects and by SBWRD on SBWRD Sponsored Projects. Contractor is also the company or firm hired by a homeowner or building owner to construct the Private Lateral Wastewater Line.
- H. Developer: The owner, builder, or person sponsoring the construction of a development project requiring extension or modification of the Public Wastewater System as established by the LEA.
- I. Developer Sponsored Project: A development project requiring extension or modification of the Public Wastewater System that is sponsored by a Developer.
- J. Engineering Services Fees: Fees paid to SBWRD by a Developer to compensate the SBWRD for its time, effort and expense for design reviews, general project

## Chapter 1 – General Requirements and Policies

- coordination and construction inspection of extension or modification of the Public Wastewater System required for the Developer's project.
- K. Final Design Approval: Formal approval given by the SBWRD District Engineer of the completed final design drawings after all design review issues have been addressed and Engineering Service Fees paid, for Developer Sponsored Projects.
- L. Final Project Approval: Formal approval given by the Board of Trustees of the completed construction and related requirements of the Public Wastewater System improvements for Developer Sponsored Projects.
- M. Impact Fees: Fees paid to SBWRD by a homeowner, building owner or facility owner to allow connection to and reserve capacity in the Public Wastewater System in accordance with the SBWRD Impact Fees Policy.
- N. Improvement Completion Agreement: An agreement between the Developer of the land proposed to be developed and SBWRD guaranteeing that all wastewater system improvements will be fully and completely constructed as represented by means of a form of security including a letter of credit, escrow fund, security bond or cash deposit in an amount and form satisfactory to SBWRD.
- O. Industrial Waste and Pretreatment Questionnaire: A questionnaire submitted by a commercial or industrial building or facility owner which provides information regarding the operation or activities that will be conducted in that building or facility. The information will be used by SBWRD to determine what pretreatment requirements will be required prior to discharging wastewater from the building or facility to the Public Wastewater System.
- P. LEA Application Fee: Fees paid to SBWRD by the Developer at the time LEA is submitted for processing.
- Q. Line Extension Agreement for Public Wastewater System (LEA): A contract between the Developer of a proposed project and SBWRD for the design and construction of extensions or modifications to the Public Wastewater System required to provide wastewater service to the project.
- R. Low-Pressure Sewer System (LPSS): A wastewater collection and conveyance system consisting of Private Lateral Low-Pressure Wastewater Lines and Public Low-Pressure Wastewater Lines.
- S. Nonresidential Wastewater: All wastewater that is not domestically generated wastewater, or normal strength wastewater, as defined in the SBWRD Pretreatment Program or the SBWRD "A Resolution Fixing and Prescribing the Procedure for Determining Equitable Charges and Fees and Adopting Procedures for the Provision of Wastewater Service....".
- T. Off-road Public Wastewater Line: Any section of the Public Wastewater System (manhole to manhole) which is not located in a paved and maintained public or private street or road, and which has manholes further than 10 feet from the back of curb or edge of asphalt. Also included is any Public Wastewater Line that is located such that it is not accessible by SBWRD maintenance equipment.
- U. Off-road Public Wastewater Line Agreement: A contract between a Developer and SBWRD which establishes the responsibilities of each party regarding Off-Road Public Wastewater Lines.
- V. Private Lateral Low-Pressure Wastewater Line (Building Sewer as defined by the IPC): That portion of the Low-Pressure Wastewater System not owned or operated by SBWRD including a gravity wastewater service line from the building to a grinder pump installation, a grinder pump installation, a pressure discharge line with associated valving from the grinder pump installation to the Public Low-Pressure Wastewater Line and the connection of the pressure discharge line to the Public Low-Pressure Wastewater Line.
- W. Private Lateral Wastewater Line (Building Sewer as defined by the IPC): The wastewater line and appurtenances which provide the connection between a building in which plumbing fixtures are installed and the Public Wastewater System. The Private Lateral Wastewater Line shall include ejector pumps and appurtenances located outside of buildings, grease, oil, and sand interceptors and sampling manholes, if required for the building. For the purposes of these regulations, the Private Lateral Wastewater Line begins 30 inches outside the building and includes the connection to the Public Wastewater System collection line. Lateral stubs installed with the Public Wastewater System construction are part of the Private Lateral Wastewater Line.
- X. Private Wastewater System: That portion of the wastewater system not owned or operated by SBWRD. This shall include but not be limited to Private Lateral Wastewater Lines, Private Lateral Low-Pressure Wastewater Lines, Common Private Lateral Wastewater Lines, and private "ejector" pumps.
- Y. Project Engineer: The company or firm and its employees hired to provide the design of the project. The Project Engineer is hired by the Developer on Developer Sponsored Projects and by SBWRD on SBWRD Sponsored Projects.
- Z. Project Manager: The person or persons hired by the Developer to provide project management for Developer Sponsored Projects.
- AA. Project Surveyor: The company or firm and its employees hired by the Developer to provide the

construction staking and record drawing survey for Developer Sponsored Projects.

- BB. Public Low-Pressure Wastewater Line: That portion of the Low-Pressure Sewer System owned and operated by SBWRD and consisting of low-pressure wastewater main lines located within dedicated public roadways or easements, low-pressure flushing connections, low-pressure combination air valves, low-pressure junction manholes, the connections of the low-pressure wastewater main line to the gravity Public Wastewater System and other associated facilities.
- CC. Public Wastewater Line: That portion of the wastewater collection system owned and operated by SBWRD and located within dedicated public roadways or within easements granted to SBWRD across private roadways or other private property. This shall include public gravity flow wastewater lines 8 inches or larger, manholes, Public Low-Pressure Wastewater Lines and appurtenances, and force mains from wastewater pump stations. Some existing public gravity flow wastewater lines are 6-inch diameter.
- DD. Public Wastewater System: Public wastewater lines, public wastewater pump stations, force mains, water reclamation facilities, and other associated facilities accepted by SBWRD.
- EE. Reimbursable Costs: Costs determined by the Board of Trustees to be paid to a Developer of a project in which wastewater improvements are installed which would not normally be required to be installed at the Developer's expense or not necessary to provide wastewater service to that project according to these regulations.
- FF. Residential Equivalent (RE): A unit of measurement used to equate wastewater flow from a building or facility to a typical three-bedroom single family residence. The assumed wastewater flow from one Residential Equivalent unit equals 320 gallons per day.
- GG. SBWRD District Engineer: The individual employed by SBWRD and responsible for the coordination of new development projects and extensions or modifications of the Public Wastewater System within SBWRD, or their designated representative.
- HH. SBWRD Inspector: The person assigned by SBWRD to make inspections of Public Wastewater System extensions or modifications and Private Lateral Wastewater Lines.
- II. SBWRD Sponsored Project: A project sponsored by SBWRD to extend, modify, rehabilitate or upgrade the Public Wastewater System.
- JJ. "Shall"/"Should": Where the term "shall" is used, it is intended to mean mandatory requirement. Other terms such as "should" and "recommend" indicate discretionary use.

- KK. Substantial Completion Date: For Developer Sponsored Projects, the date when the Public Wastewater System improvements in a Project are sufficiently complete to be utilized for wastewater service as determined by SBWRD. The wastewater system improvements shall remain the property of the developer with respect to ownership, maintenance, and repair or replacement until Final Project Approval is granted.
- LL. Warranty Period: For Developer Sponsored Projects, the period of time following Final Project Approval during which the Developer and Contractor remain responsible for problems with the Public Wastewater System improvements due to defects in material and workmanship.
- MM. Wastewater Service Application: An application submitted to SBWRD by a homeowner, builder, building owner, facility owner or authorized agent to connect to and use the Public Wastewater System.

### 101.7 Referenced Codes and Standards

- A. When reference is made to a Standard Specification (ASTM, International Plumbing Code, Park City Standards, Summit County Standards, etc.), the specification referenced shall be understood to mean the latest revision of said specification.
- B. When not directly applicable to certain aspects of wastewater system construction projects, the referenced standard specifications may be modified or deleted by appropriate notation on the Approved Construction Drawings.

### 101.8 Indemnification of SBWRD on Developer Sponsored Projects

- A. SBWRD, its employees, officers, independent contractors, and agents shall be indemnified and held harmless from all claims resulting from the design, construction, inspection and operation of the new wastewater facilities which arise prior to Final Project Approval and acceptance of the wastewater improvement facilities by SBWRD.
- B. Public liability and property damage insurance shall meet the requirements contained in the LEA in Appendix A.
- C. Developer and Developer's Contractor shall be responsible for full compliance with the applicable excavation, trenching, and worker safety regulations of the U.S. Department of Labor Occupational Safety and Health Administration as administered by the Utah Occupational Safety and Health Division.
- D. Developer and Developer's Contractor shall assume full responsibility for all confined space requirements in US Department of Labor, OSHA Regulation 29 CFR Subpart AA, Confined Space in Construction, during construction of the line extension. Developer and Developer's Contractor are hereby informed that all gravity sewer lines and manholes, low-pressure

## Chapter 1 – General Requirements and Policies

sewer valve vaults and flushing manholes, sewer force main valve vaults, wastewater pump station wet wells and other similar structures and features on the District's wastewater collection system and treatment facilities qualify as confined spaces according to the Federal Regulation. Entering confined spaces without following the requirements of the Confined Spaces in Construction regulations is prohibited. If entry into an existing confined space is necessary to connect to the existing wastewater system, the Developer's Contractor will be required to execute the *Notice of Acknowledgement of Confined Space Requirements and Waiver of Claims* contained in the SBWRD Standards and will be provided with a copy of OSHA Regulation 29 CFR Subpart AA. By executing this document, the Developer's Contractor will confirm that they will abide by the safety requirements relating to entry into confined spaces as contained in US Department of Labor, OSHA Regulation 29 CFR Subpart AA, Confined Space in Construction. Confined Space requirements will be discussed during the preconstruction meeting.

### 101.9 Contractor Licensing Requirements

- A. Contractors performing construction on the wastewater system within SBWRD shall possess all licenses required by local and state rules and regulations.
- B. As a minimum Contractors shall possess a valid Utah Contractor's License and shall be licensed and insured to perform wastewater system construction in accordance with state law.

## SECTION 102 - POLICIES

### 102.1 Access to Public Wastewater System

- A. The design and construction of extensions or modifications of the Public Wastewater System for all new developments shall provide a Public Wastewater Line adjacent to all lots or parcels within each developed property for connection of Private Lateral Wastewater Lines.
- B. A Private Lateral Wastewater Line serving a lot or parcel shall not cross another lot or parcel to access the Public Wastewater System with the following limited exception.
  - 1. The public wastewater line to which the Private Lateral Wastewater Line is connecting is located along or near a common lot line with an adjacent lot or parcel and the area of encroachment into the adjacent lot or parcel is within an SBWRD easement. An easement for the Private Lateral Wastewater Line granted by the property owner of the adjacent property specifically to the property being served by the Private Lateral Wastewater Line shall be executed and recorded,

or a private lateral easement specifically granting the easement to the property being served by the Private Lateral Wastewater Line shall be indicated on the Subdivision Plat.

- C. Private Lateral Wastewater Lines may cross platted common areas, and platted private roads within the same platted development, provided the development dedication plat specifically dedicates these areas for private utilities and the Homeowners Association that controls those common areas and private roads is responsible for ownership and maintenance of the Private Lateral Wastewater Lines.
- D. A Private Lateral Wastewater Line shall not extend into a public right-of-way for a distance greater than the record width of the street, alley or public right-of-way to access the Public Wastewater System.
- E. To meet the requirements of this policy, individual ejector or grinder pumps, Low-Pressure Sewer Systems, Off-road Public Wastewater Lines, or Public Wastewater Pump Stations may be required to serve some lots, parcels or projects.

### 102.2 Ranking of Method of Providing Public Wastewater Service

- A. The method of providing public wastewater service to a development or to lots or parcels within a development shall comply with the following priority ranking order. A higher ranked method is preferable, and if feasible, will be required, over a lower ranked method.
  - 1. Gravity flow public wastewater collection lines located in maintained public or private streets, roads or rights-of-ways with gravity flow or ejector pump pressure private laterals. Projects that include short segments of gravity flow public wastewater collection lines in off-road areas, which do not include manholes in the off-road areas, are included in this category.
  - 2. Low-Pressure Sewer System with the public portion of the system located in maintained public or private streets, roads or rights-of-ways and low-pressure sewer system private laterals. Projects that include short segments of Low-Pressure Sewer System public lines in off-road areas, which do not include manholes in the off-road areas, are included in this category
  - 3. Gravity flow public wastewater collection lines located in off-road areas with gravity flow or ejector pump pressure private laterals.
  - 4. Low-Pressure Sewer System with the public portion of the system located in off-road areas and low-pressure sewer system private laterals.
  - 5. Public Wastewater Pump Stations.
- B. The proposed method of providing public wastewater service to each project or development shall require review and approval by SBWRD.

### 102.3 Off-Road Public Wastewater Lines

- A. All wastewater lines that are part of the Public Wastewater System, including gravity flow lines, low-pressure sewer system lines, and pump station force mains, shall be located in maintained public or private streets, roads or rights-of-way.
- B. If local conditions prevent compliance with this policy, SBWRD may allow Off-Road Public Wastewater Lines if the following requirements are met.
  - 1. The Developer shall execute an Agreement for Off-Road Public Wastewater Lines in the form contained in Appendix A. The Agreement shall fully indemnify and hold harmless SBWRD from all costs and damages which may arise due to stoppages and/or overflows in the Off-Road Public Wastewater Line for which SBWRD is unable to respond due to limited access.
  - 2. The Developer shall pay an Off-Road Public Wastewater Line Maintenance Fee. The amount of the Off-Road Public Wastewater Line Maintenance fee shall be according to the Agreement for Off-Road Public Wastewater Line in Appendix A.
  - 3. The Off-Road lines shall meet the requirements of these SBWRD Standards.
  - 4. A roadway platform meeting the requirements of the standard details in Appendix C shall be provided over the entire length of the Off-Road Public Wastewater Line.
    - a. A circular turn-around with a minimum radius of 40' and a maximum cross-slope of 5%, or a hammerhead turnaround with a maximum cross-slope of 5% shall be provided at appropriate locations.
    - b. If the slope of the surface over the length of the Off-Road Public Wastewater Line exceeds 15%, an alternate access road to each manhole or access and maintenance feature on the line, with a maximum slope of 15% shall be provided.
    - c. Maximum grade transition of roadway platform and alternate access road shall be 10% in 50'.
    - d. Access easements for all alternate access roads and turnarounds shall be granted to SBWRD.
    - e. The requirement for a roadway platform on certain short segments of off-road public wastewater lines where the off-road portion does not include a manhole may be waived, at the sole discretion of SBWRD.
  - 5. Revegetation and erosion protection of the off-road corridor shall be provided. Revegetation plans shall specifically exclude trees, bushes or other vegetation that would impede travel along

the corridor by SBWRD personnel and equipment.

- 6. Construction operations and revegetation shall meet Summit County requirements for control of noxious weeds.
- 7. Additional design considerations may be required. These may include, but are not limited to:
  - a. Increased pipe sizes and slopes.
  - b. Increased 'drop' through manholes.
  - c. Limited number of Off-Road line segments.
  - d. Use of specific pipe materials, bedding, and construction techniques.
- C. Agreements for Off-Road Public Wastewater Line shall be in place and all associated fees paid prior to Final Design Approval.
- D. The Developer shall be solely responsible for revegetation and erosion protection of Off-Road Public Wastewater Line corridors during the warranty period. The construction cost estimate which establishes the amount of the Improvement Completion Agreement shall include monies for revegetation and erosion protection during the warranty period.

### 102.4 Low-Pressure Sewer Systems (LPSS)

- A. Public Wastewater System design shall avoid Low-Pressure Sewer Systems. SBWRD permits the construction of Low-Pressure Sewer Systems as part of the Public Wastewater System only under certain limited conditions.
- B. SBWRD will permit Low-Pressure Sewer Systems to be used as part of the extension to the Public Wastewater System only where, at the sole discretion of SBWRD, the option of providing wastewater service by gravity flow main lines in roads, as described in Section 102.2, is not feasible.
- C. If the use of a Low-Pressure Sewer System is approved by SBWRD the following requirements shall be met.
  - 1. Notes concerning the Low-Pressure Sewer System shall be included on the subdivision plat for the project as described in Section 302.5.
  - 2. A Notice shall be recorded against each lot served by the Low-Pressure Sewer System which will serve as notification to all future lot owners of the responsibilities associated with the Private Lateral Low-Pressure Wastewater Lines.
  - 3. The Low-Pressure Sewer System shall meet the requirements of these SBWRD Standards.

### 102.5 Public Wastewater Pump Stations

- A. Public Wastewater System design shall avoid wastewater pump stations. SBWRD permits the construction of wastewater pump stations as part of the Public Wastewater System only under certain limited conditions.

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- B. SBWRD will permit wastewater pump stations to be used in connection with extensions to the Public Wastewater System only where, in the sole discretion of SBWRD, no physically feasible, financially reasonable, or legally achievable gravity flow collection system or Low-Pressure sewer system can be constructed to avoid the use of the pump station.
1. Financially reasonable is defined as the capital cost of a gravity flow or Low-Pressure system with a cost equal to or less than an amount which is equal to three (3) times the total actual (not present value) twenty (20) year operating, maintenance and replacement costs of a pump station. All capital costs, including, but not limited to, designing and constructing a pump station are to be included in the above calculation. Cost estimates used for this evaluation shall be prepared by the Project Engineer and approved by SBWRD.
  2. Not legally achievable means the Developer has no property interest, and cannot acquire an interest in the necessary property, such as an easement, which will allow the applicant to dedicate an easement to SBWRD for the proposed gravity flow or Low-Pressure system.
- C. Wastewater pump stations serving areas outside the natural East Canyon and Silver Creek drainage basins shall not be considered as a design alternative, unless the Developer agrees to pay to SBWRD a sum equal to 20 years operating, replacement, and repair cost for the pump station.
- D. Wastewater pump stations shall be designed and constructed according to these SBWRD Standards. Equipment and material which minimize operational costs and other replacement and repair expenses to SBWRD in the future shall be used.
- c. Limited to projects which are to be platted as condominium developments. The use of Common Lateral Wastewater Lines for projects other than condominium developments, but which meet all Common Lateral Wastewater Line criteria, is subject to the approval of SBWRD.
- C. Grease interceptors shall not be placed on common laterals. All facilities or businesses requiring a grease interceptor shall have a separate grease interceptor.
- D. Ejector pumps and Low-Pressure pumps shall not be placed on common laterals for multi-unit buildings.
- E. A special notation will be required on the development recordation plat, except for multiple buildings located on the same residential lot. This notation shall read as follows, unless otherwise approved or required by SBWRD:

“The units of this           (condominium, building, development)           are served by a Common Private Lateral Wastewater Line. The           (name of Project) (Homeowner’s, Condominium, Building)           Association shall be responsible for ownership, operation and maintenance of all Common Private Lateral Wastewater Lines.”

### 102.6 Common Private Lateral Wastewater Lines

- A. Each residence, building or other facility, including units of multiple unit buildings where the units are side by side, shall connect to the Public Wastewater System by way of a separate Private Lateral Wastewater Line.
- B. SBWRD will permit a Common Lateral Wastewater Line only under the following conditions.
1. Multiple buildings (main house, guest house, barn, etc.) located on the same residential lot.
  2. Stacked units where the upper unit(s) has no direct access to a separate Private Lateral Wastewater Line.
  3. Individual units that are not stacked provided the following conditions are met.
    - a. A separate Private Lateral Wastewater Line to each unit is not feasible.
    - b. Laterals shall be located within platted common areas. Dedicated common areas such as crawl spaces, underground parking
- F. If re-platting of a lot or development which has been approved with a Common Private Lateral Wastewater Line is proposed, and the re-platting would cause the private laterals serving the lot or development to not be in compliance with this Common Private Lateral Wastewater Line policy, then modifications to the common private lateral(s) serving the lot or development to conform to this policy or, if approved by SBWRD, revised plat notes addressing responsibility for ownership, operation and maintenance of the Common Private Lateral Wastewater Line will be required.
- G. Common Lateral Wastewater Lines shall have a nominal inside diameter of 6 inches unless the Common Lateral Wastewater Line serves multiple buildings on the same residential lot, in which case a nominal inside diameter of 4 inches may be used. When the cumulative flow rates of buildings or unit grouping requires a wastewater lateral to be sized in excess of 6 inch diameter, a Public Wastewater Collection Line shall be provided in accordance with these SBWRD Standards.
- H. Manholes are not allowed to be installed on Common Lateral Wastewater Lines.
- I. The connection of Common Lateral Wastewater Lines to the Public Wastewater Collection System shall be as follows:
  1. Connect to an existing Public Wastewater Collection Line with an approved lateral



connection or to an existing Public Wastewater Collection Line with an approved lateral connection.

2. Connect to an existing Public Wastewater Collection Line is subject to review of the condition of the existing collection line by SBWRD.
3. 8" and larger Common Laterals shall connect to a proposed or existing Public Wastewater Collection Line manhole.

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# CHAPTER 2 - DEVELOPMENT PROCEDURES

## SECTION 201 - GENERAL

### 201.1 Minimum Requirements

- A. The procedures contained in this Chapter include the minimum requirements necessary for developing wastewater facilities associated with Developer Sponsored projects in the SBWRD service area.
- B. Additional meetings, submittals, reviews, etc., may be necessary during the development process as determined by SBWRD.

### 201.2 Early Contact with SBWRD

- A. Developers are encouraged to contact SBWRD early in the development process for all projects in the SBWRD.
- B. Because of the historic nature and varied terrain of Park City and surrounding areas, public wastewater service in some areas may be unavailable or limited.

### 201.3 Submittal Schedules

- A. It is the responsibility of the Developer, homeowner, builder, building owner or facility owner to coordinate all requests and submittals to meet the schedules listed in the following procedures.
- B. These deadlines should be considered as such, but depending upon the current workload of SBWRD, submittals which are received just prior to these deadlines may not receive reviews in time to meet desired schedules.
- C. The Developer should consider adequate review time by SBWRD in all requests and submittals.

## SECTION 202 - PUBLIC WASTEWATER SYSTEM EXTENSIONS AND MODIFICATIONS

### 202.1 Applicability

- A. The development procedures contained in Section 202 shall apply to the extension or modification of the Public Wastewater System associated with Developer Sponsored Projects.
- B. The procedure to connect individual buildings or facilities to the Public Wastewater System through a Private Lateral Wastewater Line is a separate and distinct procedure and shall follow the requirements contained in Section 203.

### 202.2 LEA Required

- A. Approval to design and construct new wastewater facilities intended to become part of the Public Wastewater System or certain Private Wastewater Systems proposed to be connected to the existing Public Wastewater System shall first be obtained from the Board of Trustees.

- B. Approval is obtained by following the requirements of Section 202.

### 202.3 Service Provider Letter

- A. The Summit County Planning Department and Park City Planning Department may require the Developer to obtain a Service Provider Letter from SBWRD during the planning process to demonstrate that Public Wastewater Service is available to a Project.
- B. Unless otherwise approved, SBWRD will issue Service Provider letters only after the Initial Developer Meeting, as discussed in Section 202.4, has been held.
- C. Service Provider Letters will state that the proposed Project is within the SBWRD service area and that SBWRD can provide wastewater service to the Project provided the established procedures for obtaining said wastewater service are followed as outlined in appropriate sections of the Snyderville Basin or Park City Development Codes and these SBWRD Standards.
- D. Service Provider letters will also state that wastewater service is not committed by SBWRD until SBWRD receives full payment of all required fees including Impact Fees.

### 202.4 Initial Developer Meeting

- A. Prior to submittal of an LEA the Developer and the Project Engineer shall meet with the SBWRD District Engineer to explain the proposed project.
- B. The Developer shall provide the following information at this meeting:
  - 1. Drawings and maps indicating the location, boundary and configuration of the proposed project.
  - 2. The type of development being proposed.
  - 3. The phasing of the proposed project.
  - 4. The proposed number of Residential Equivalents.
  - 5. The type of wastewater that will be generated by the project.
  - 6. The proposed method of providing public wastewater service to the project.
- C. The SBWRD District Engineer will explain SBWRD development procedures, advise the Developer of the Board of Trustees meeting schedule and provide the Developer with a copy of these SBWRD Standards which include an LEA.

### 202.5 Acceptance of LEA

- A. The Developer and Project Engineer shall become familiar with these SBWRD Standards and the LEA in Appendix A.

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- B. The Developer shall submit the following items to SBWRD a minimum of two weeks prior to a regularly scheduled meeting of the Board of Trustees.
  - 1. The completed LEA form.
  - 2. LEA Application Fee and Engineering Services prepayment fee. The amount of these fees shall be according to the LEA form in Appendix A.
  - 3. Preliminary wastewater master plan for development prepared according to the requirements of Section 302.2 in the form of AutoCAD or compatible electronic files. A paper copy or PDF electronic file shall also be provided.
  - 4. Preliminary Title Report as of a date within 30 days of the date of submission to SBWRD, for the property being developed and for all other properties where easements for proposed wastewater lines required to provide wastewater service to the project will be necessary.
  - 5. Other information required by the SBWRD District Engineer which will allow for a complete evaluation of the application.
- C. The SBWRD District Engineer will review the capacity of the existing Public Wastewater System to determine if the existing system has adequate capacity for the proposed development. Capacity issues will be addressed according to the LEA.
- D. The SBWRD District Engineer will review the information submitted and provide comments or recommendations regarding the preliminary wastewater master plan and other information to the Developer and Project Engineer for incorporation into the drawings.
- E. The SBWRD District Engineer will present the LEA with the preliminary master plan and other information to the Board of Trustees at a regularly scheduled Board meeting for consideration.
- F. If the LEA is accepted by the Board of Trustees, SBWRD will notify the Developer of this acceptance and provide a copy of the executed LEA. SBWRD will retain the original in its files.
- G. Approval of the LEA by SBWRD authorizes the Developer to begin the design of the Public Wastewater System extension or modification.
  - 2. Preliminary design drawings.
  - 3. Preliminary plat or, if applicable, the preliminary site plan.
  - 4. Submittals shall be in the form of pdf electronic files. A full-size paper copy may be required at the discretion of the District Engineer.
- C. The SBWRD District Engineer will review the wastewater master plan, preliminary design drawings, and preliminary plat or site plan.
- D. The SBWRD District Engineer will send a letter of review comments and the “red-lined” wastewater master plan, preliminary design drawings and preliminary plat or site plan to the Developer and/or the Project Engineer.
- E. The Developer and the Project Engineer shall prepare final wastewater master plans and final design drawings according to the requirements of Chapter 3 and a final plat or site plan according to the requirements of Section 204, make corrections and address issues contained in the preliminary design review letter and submit the following to the SBWRD District Engineer for review.
  - 1. Revised wastewater master plan.
  - 2. Final design drawings.
  - 3. Copies of unsigned grant of easement documents, in an approved form, including descriptions and exhibits for all wastewater easements required for the project, and if not previously submitted, current Preliminary Title Report for all properties where easements are being granted.
  - 4. Final plat or final site plan.
  - 5. Any special agreements or permits required for construction of the project.
  - 6. Other information required by the preliminary design review letter.
  - 7. Submittals shall be in the form of pdf electronic files. A full-size paper copy may be required at the discretion of the District Engineer.
- F. The SBWRD District Engineer will review the final wastewater master plan, final design drawings, easement documents, plat and final site plan, and special agreements or permits and send a letter of review comments and “red-lined” final wastewater master plan and final design drawings to the Developer and the Project Engineer.
- G. The Developer and the Project Engineer shall make corrections or address issues contained in the final design review letter and submit the following to the SBWRD District Engineer for review and approval.
  - 1. One set of revised full size (24"x36") final design drawings.
  - 2. Final design drawings in the form of AutoCAD or compatible electronic files.
  - 3. Unrecorded original executed approved grant of easement documents with descriptions and

### 202.6 Design

- A. The Developer and the Project Engineer shall prepare preliminary design drawings according to requirements of Chapter 3 and a preliminary plat or site plan according to the requirements of Section 204.
- B. The Developer and the Project Engineer shall submit the following to the SBWRD District Engineer for review.
  - 1. Wastewater master plan which includes any modifications resulting from preparation of the preliminary design drawings.

- exhibits. SBWRD will send documents for recording.
4. Final Title Reports for the properties being developed and for all other properties where easements are being granted. The date of the Final Title Reports shall be within 30 days of the submittal and shall reflect the current land ownerships.
  5. Final plat or final site plan.
  6. Executed special agreements or permits.
  7. Construction cost estimate for proposed wastewater system improvements prepared in accordance with the requirements of Section 302.8,
- H. The SBWRD District Engineer will review the cost estimate and send a letter to the Developer and the Project Engineer which establishes the Improvement Completion Agreement amount and the Engineering Services Fee amount in accordance with the requirements of the LEA.
  - I. The Developer shall pay the balance of Engineering Services Fees and, if required, establish an Improvement Completion Agreement according to the requirements of Section 205.
  - J. Upon satisfactory completion of all requirements for Final Design Approval, payment of required Engineering Services Fees, and establishment of an Improvement Completion Agreement (if required), the SBWRD District Engineer will issue a Final Design Approval letter and will stamp and sign the full size set of final design drawings which become the Approved Construction Drawings.
  - K. The Developer or Project Engineer shall make copies of the Approved Construction drawings, with copies being distributed at the preconstruction meeting. A scanned copy of the Approved Construction Drawings in PDF format shall also be provided.
  - L. Proposed modifications to the Approved Construction Drawings, plat or final site plan shall be submitted in writing to the SBWRD District Engineer for review and approval prior to incorporation into the project.

#### **202.7 Construction and Inspection**

- A. Contractor Submittals shall be made according to the requirements of Section 501.2.
- B. After all Contractor Submittals are approved by the SBWRD District Engineer, a Preconstruction Meeting shall be held according to the requirements of Section 501.3.
- C. The Contractor shall construct the project according to the Approved Construction Drawings and the requirements of Chapter 4 and Chapter 5.
- D. The SBWRD Inspector will conduct periodic inspections, preliminary inspection and final inspection of the project according to the requirements of Section 501.

- E. Proposed modifications to the Approved Construction Drawings, plat or final site plan shall be submitted in writing to the SBWRD District Engineer for review and approval prior to incorporation into the project.

#### **202.8 Substantial Completion**

- A. In special and limited circumstances, and at the discretion of SBWRD, Substantial Completion of a Developer Sponsored Project may be granted prior to Final Project Approval.
- B. Substantial Completion is granted only when there is a need to issue an Authorization to Use for a building or facility as required in Section 203.2, prior to Final Project Approval and when SBWRD finds that the project can be placed into service while protecting the public health and safety.
- C. The Developer shall request in writing that SBWRD grant Substantial Completion. The request shall be submitted a minimum of two weeks prior to the regularly scheduled meeting of the Board of Trustees where Substantial Completion Approval is being requested.
  1. The request shall include the specific units or lots for which Substantial Completion is needed
  2. The request shall state that the Developer assumes all responsibility for the wastewater system in the project with respect to ownership, maintenance, and repair or replacement, including all liability from blockages and associated property damage, until Final Project Approval is granted.
- D. The following items require completion, submittal and/or approval by the SBWRD District Engineer prior to requesting Substantial Completion.
  1. Completion of all inspection "punch list" items except adjusting manholes to final grade after the final lift of paving is installed.
  2. Installation of temporary plywood bottoms in all manholes which require adjustment to final grade.
  3. Submittal of passing acceptance test results as required by Section 516.
  4. Submittal of Record Drawings as required by Section 302.9.
  5. Submittal of Operation and Maintenance Manuals, if applicable, as required by Section 302.10.
  6. Submittal of all executed easements and special agreements required for the project.
  7. Payment of all Engineering Services Fees.
  8. Establishment of an Improvement Completion Agreement for the wastewater system improvements.
  9. Final Project Approval of the downstream Public Wastewater System by SBWRD.

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- E. Upon completion of these items the SBWRD District Engineer will recommend Substantial Completion of the wastewater system improvements to the Board of Trustees.
- F. Substantial Completion is granted by the Board of Trustees at a regularly scheduled Board meeting.
- G. The wastewater system improvements shall remain the responsibility of the Developer with respect to ownership, maintenance, and repair or replacement until Final Project Approval is granted.

### 202.9 Final Project Approval

- A. The Developer shall request Final Project Approval of the completed wastewater system improvements. The request shall be submitted a minimum of two weeks prior to the regularly scheduled meeting of the Board of Trustees where Final Project Approval is being requested.
- B. The following items require completion, submittal, and/or approval by the SBWRD District Engineer prior to requesting Final Project Approval.
  - 1. Completion and approval of all final inspection "punch list" items.
  - 2. Submittal and approval of passing acceptance test results as required by Section 516.
  - 3. Submittal and approval of Record Drawings as required by Section 302.9.
  - 4. Submittal and approval of Operation and Maintenance Manuals, if applicable, as required by Section 302.10.
  - 5. Submittal and approval of all executed easements and special agreements required for the project.
  - 6. Payment of all Engineering Services Fees.
  - 7. Establishment of an Improvement Completion Agreement for the wastewater system improvements.
  - 8. Final Project Approval of the downstream Public Wastewater System by SBWRD.
- C. Upon completion of these items the SBWRD District Engineer will recommend Final Project Approval of the wastewater system improvements to the Board of Trustees.
- D. Final Project Approval of the wastewater system improvements is granted by the Board of Trustees at a regularly scheduled Board meeting.
- E. Final Project Approval of the wastewater system improvements results in the following.
  - 1. The start of the warranty period.
  - 2. SBWRD accepts ownership, responsibility, and maintenance of the wastewater system improvements.
  - 3. The Improvement Completion Agreement amount may be reduced according to the requirements of Section 205.4.

### 202.10 Warranty Period

- A. The warranty period for Developer Sponsored Projects shall extend to the latter of one year from the date of Final Project Approval or the date when all warranty "punch list" items are completed and approved by SBWRD.
- B. During the warranty period the Developer shall remain responsible for problems due to defects in materials and workmanship (this also includes elimination of infiltration and inflow) and correcting incomplete or incorrect information on the Record Drawings.
- C. The Improvement Completion Agreement shall remain in effect during the warranty period according to the requirements of Section 205.
- D. Toward the end of the warranty period, SBWRD will perform a project warranty inspection which will include a video inspection of the installed wastewater system by SBWRD personnel. A warranty inspection letter with a "punch list" of deficient items will be issued and sent to the Developer, the Project Engineer and the Contractor.
- E. Upon satisfactory completion of the warranty inspection "punch list" items by the Developer, as verified by the SBWRD Inspector, and at the expiration of the warranty period, the SBWRD District Engineer will recommend to the Board of Trustees the release of the remaining amount in the Improvement Completion Agreement to the Developer according to the requirements of Section 205.
- F. The Board of Trustees approves the release of the Improvement Completion Agreement at a regularly scheduled board meeting.

## SECTION 203 - PRIVATE LATERAL WASTEWATER LINE CONNECTIONS TO THE PUBLIC WASTEWATER SYSTEM

### 203.1 Applicability

- A. The development procedures contained in Section 203 shall apply to the actual connection of buildings and other facilities to the Public Wastewater System through a Private Lateral Wastewater Line. This procedure is separate and distinct from the procedure for Public Wastewater System Extensions and Modifications contained in Section 202.
- B. Projects that require extension or modifications of the Public Wastewater System shall follow the procedures contained in Section 202 for those extensions and modifications and shall follow the procedures in Section 203 for the actual connection of the building or other facility to the Public Wastewater System.

- C. Projects that require issuance of a Service Provider letter by SBWRD shall follow the requirements of Section 202.3.

**203.2 Wastewater Service Application and Authorization to Use Letter Required**

- A. Prior to connecting any residence, building or other facility to the Public Wastewater System, or prior to remodeling any existing residence, building or other facility that is connected to the Public Wastewater System, the homeowner, building owner, facility owner or authorized representative shall submit a Wastewater Service Application, with required plans and documents, to SBWRD and pay appropriate Application and Impact fees. Evidence of payment of fees to SBWRD is required by the Summit County and Park City Building Departments prior to issuance of a Building Permit.
- B. The Wastewater Service Application may not be required for minor remodeling plans, where the private lateral will not be impacted, the number of living sections will not be affected, and the building use will not be changed.
- C. Prior to occupying any new or remodeled residence, building or facility in the SBWRD service area, the homeowner, building owner, facility owner, or authorized representative shall acquire an Authorization To Use letter from SBWRD. The Authorization To Use letter is required by the Summit County and Park City Building Departments prior to issuance of a Certificate of Occupancy/Compliance.

**203.3 Approved Public Wastewater System**

- A. Prior to receiving an Authorization to Use letter from SBWRD for any residence, building or other facility connecting to the Public Wastewater System, all portions of the Public Wastewater System downstream of the Private Lateral Wastewater Line connection shall have received Final Project Approval according to Section 202.9 or, in special limited circumstances, Substantial Completion according to Section 202.8.
- B. In special limited circumstances and at the discretion of SBWRD, the actual physical connection of the Private Lateral Wastewater Line to the Public Wastewater System may be allowed on a case by case basis prior to Final Project Approval or Substantial Completion of the downstream Public Wastewater System. In this case, a preliminary inspection and passing test results of the downstream Public Wastewater System are required. The following information shall be submitted for evaluation by SBWRD.
  - 1. The Developer shall request in writing that SBWRD allow the connection.

- a. The request shall identify the specific units or lots for which connection is needed.
  - b. The request shall describe the current status of the Public Wastewater System extension or modification.
  - c. The request shall describe the proposed schedule for completion of all items required for Final Project Approval of the Public Wastewater System extension or modification as outlined in Section 202.9.
  - d. The request shall state that the Developer assumes all responsibility for connections to the Public Wastewater System in the project, including any damage to the existing Public Wastewater System, until Final Project Approval is granted.
- 2. The homeowner, builder or authorized representative proposing to connect a Private Lateral Wastewater Line to the Public Wastewater System shall request in writing that SBWRD allow the connection.
    - a. The request shall identify the lot requesting authorization to connect.
    - b. The request shall describe the proposed schedule for completion of the home or building and the anticipated date when an Authorization to Use will be needed.
    - c. The request shall state that the homeowner, builder or authorized representative acknowledges that the Public Wastewater System required to provide service to the home or building has not received Final Project Approval and that an Authorization to Use letter will not be issued by SBWRD until the Developer has met the requirements for Final Project Approval or Substantial Completion.
  - 3. SBWRD will evaluate the status of the downstream system and the information submitted and, if appropriate, allow the connection.
  - 4. The authorization to physically connect to the Public Wastewater System prior to Final Project Approval or Substantial Completion of the downstream Public Wastewater System shall not constitute an Authorization to Use by SBWRD.

**203.4 Wastewater Service Application and Payment of Fees for New or Remodeled Single-Family Residences**

- A. The homeowner, builder or authorized representative shall apply to SBWRD for wastewater service by submitting the following information. Where possible, this information should be submitted electronically in pdf format.
  - 1. Wastewater Service Application Information form as contained in Appendix B.



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2. Floor plan of all levels of the proposed residence.
  3. Site plan indicating the following items.
    - a. Property lines of the subject property and adjacent properties.
    - b. Adjacent streets.
    - c. Proposed location of the building on the property.
    - d. Proposed driveways, retaining walls, landscaping, and other site features that may affect the routing and construction of the Private Lateral.
    - e. Existing SBWRD and other utility easements. Encroachment into existing SBWRD easements by structures, retaining walls, fences, trees and other significant landscaping features is not allowed.
  - B. Additional information may be required by SBWRD for lots with non-typical Private Lateral installations. Non-typical installations include lots requiring ejector pumps, lots requiring long or complicated lateral routing and other similar installations. SBWRD will advise the applicant of the additional information required for review.
  - C. The SBWRD District Engineer and Accounting Department will review the information submitted and provide the following information to the homeowner, builder or authorized representative at the time Fees are paid. For typical Private Lateral installations this information will generally be available 24 to 48 hours (excluding weekends) after application is made. Additional time may be required during periods of high demand or if additional information from the homeowner, builder, or authorized representative is required.
    1. Impact Fees and Administration Fees as determined by the Impact Fee Calculation form.
    2. Notification if a floor plan check, after construction of the residence, is required.
    3. Private Lateral construction specifications, details, and other applicable special conditions as contained in the Lateral Construction Information form. This information shall be provided to the contractor constructing the Private Lateral and the Contractor shall have this information on-site when lateral inspections occur.
    4. Copies of available record information contained in SBWRD files that pertain to the Private Lateral connection for this lot. This information shall be provided to the contractor constructing the Private Lateral and the Contractor shall have this information on-site when lateral inspections occur.
  - D. The homeowner, builder, or authorized representative shall pay the Impact Fees and Administration Fees to SBWRD. SBWRD will not schedule inspections before fees have been paid.
  - E. SBWRD will issue a receipt for payment of Impact Fees and Administration Fees. This receipt is required by the Summit County and Park City Building Departments prior to issuance of a Building Permit.
- ### 203.5 Wastewater Service Application and Payment of Fees for New or Remodeled Duplexes, Condominiums, Hotels, Restaurants, Commercial Buildings, Ind. Facilities and Other Similar Facilities
- A. The building or facility owner or authorized representative shall apply to SBWRD for wastewater service by submitting the following information. Where possible, this information should be submitted electronically in pdf format.
    1. Wastewater Service Application Information form as contained in Appendix B.
    2. A copy of the Preliminary Site Plan and, if applicable, Preliminary Plat, for the project as required by Summit County or Park City. In addition to the information required by the City or County, the following information shall be included as part of the Preliminary Site Plan submittal to SBWRD.
      - a. Location of the existing Public Wastewater System collection line and, if applicable, the Private Lateral stub to which the Private Lateral will be connected. If this information is not known by the applicant, SBWRD will provide copies of any available record information contained in its files.
      - b. Proposed routing of the Private Lateral with proposed size, lengths, slopes, minimum depth of bury, etc.
      - c. Sizing calculations of the Private Lateral for larger facilities.
      - d. Proposed locations of bends and cleanouts.
      - e. Proposed locations and sizing calculations of grease interceptors and sampling manholes, if required.
      - f. Proposed method of connection of the Private Lateral to the Public Wastewater System (i.e., connect to existing Private Lateral stub, saddle connection on main line, etc.).
    3. Floor plan of all levels of the proposed building or facility.
    4. Plumbing plans for the building or facility.
    5. Industrial Waste and Pretreatment Questionnaire as contained in Appendix B.
  - B. The SBWRD District Engineer and Accounting Department will review the information submitted and send a letter of review comments to the building or facility owner.
  - C. The building or facility owner shall prepare and submit a Final Site Plan and, if applicable, Final Plat,

according to Park City and Summit County requirements and include the corrections or address issues contained in SBWRD review letter.

- D. The SBWRD District Engineer and Accounting Department will review the Final Site Plan and, if applicable, Final Plat, and other information submitted.
- E. SBWRD will advise the building or facility owner concerning the Impact Fees and Administration Fees for the building or facility as determined by the Impact Fee Calculation form in Appendix B.
- F. The building or facility owner shall pay the Impact Fees and Administration Fees.
- G. Upon satisfactory completion of all requirements for Final Site Plan or Final Plat approval and payment of required Impact and Administration Fees, the SBWRD District Engineer will send a letter to the building or facility owner advising that SBWRD is prepared to sign the Final Site Plan or Final Plat.
- H. The building or facility owner shall submit the Final Site Plan or Final Plat original to the SBWRD District Engineer for signature. The signed Final Site Plan or Final Plat is required by the Summit County and Park City Building Departments prior to issuance of a Building Permit.

### **203.6 Construction and Inspection**

- A. The Contractor shall schedule inspections and the SBWRD Inspector will conduct inspections of the Private Lateral according to the requirements of Section 502.
- B. The Contractor shall construct the Private Lateral Wastewater Line according to the following.
  - 1. Information provided to the homeowner, builder, or authorized representative by SBWRD at the time Fees are paid.
  - 2. Approved plans.
  - 3. The requirements of Chapter 4 and Chapter 5.

### **203.7 Authorization to Use**

- A. The homeowner, builder, building owner, facility owner or authorized representative shall request that an Authorization to Use be issued.
- B. The following items require completion, submittal, and/or approval by SBWRD prior to requesting issuance of an Authorization to Use.
  - 1. Payment of Impact fees and Administration fees.
  - 2. Floor Plan Check by SBWRD, if required.
  - 3. Construction of the Private Lateral Wastewater Line to SBWRD minimum standards as verified by the SBWRD Inspector.
  - 4. The Public Wastewater System to which the Private Lateral Wastewater Line connects has received approval in accordance with the requirements of Section 203.3.
- C. Upon completion of these items the SBWRD District Engineer will sign the Authorization to Use form.

The completed form will then be made available to the homeowner, builder, building owner or facility owner.

## **SECTION 204 - PLAT AND FINAL SITE PLAN APPROVAL PROCEDURES**

### **204.1 General**

- A. Summit County and Park City require review and approval by SBWRD of all plats, including Master Development Plats and plat amendments, and final site plans for properties within the SBWRD boundary prior to approval of the plat or final site plan.
- B. Approval of the plat or site plan by SBWRD shall be evidenced by the signature of the SBWRD District Engineer on the SBWRD signature block or by a plat approval letter when Summit County does not require the SBWRD signature block.
- C. Plats and final site plans shall meet the requirements of Section 302.5.

### **204.2 Plat and Site Plan Submittal and Review**

- A. The Developer, building owner or facility owner shall submit plats and site plans to SBWRD for review in accordance with Park City or Summit County requirements. Where possible, the plat and site plans should be submitted electronically in pdf format.
- B. If the project includes the extension or modification of the Public Wastewater System, the Developer, building owner or facility owner shall follow the procedures contained in Section 202.
- C. If the project involves a Private Lateral Wastewater Line connection to the Public Wastewater System, the Developer, building owner or facility owner shall follow the procedures contained in Section 203.

### **204.3 Plat and Site Plan Approval**

- A. Final Plat Approval.
  - 1. The following items shall be completed, submitted and approved by the SBWRD District Engineer prior to requesting Final Plat approval.
    - a. Final Design Approval, in accordance with Section 202.6 if applicable.
    - b. All Engineering Services Fees paid in accordance with the LEA, if applicable.
    - c. Off-road Public Wastewater System Maintenance Fee paid, if applicable.
    - d. An Improvement Completion Agreement established in accordance with the requirements of Section 205, if applicable.
- B. Final Site Plan Approval.
  - 1. The following items shall be completed, submitted and approved by the SBWRD District Engineer prior to requesting Final Site Plan approval.
    - a. All items in Section 204.3.A.

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- b. Building plans for the building or buildings for which the Site Plan Approval is being requested. Plans shall include Architectural, Site Civil and Plumbing plans and shall be to sufficient detail and sufficient completion to demonstrate that connection of the building or buildings to the public wastewater system can meet SBWRD standards. Final construction plans will be required for approval of a building permit according to the requirements of Section 203.
- C. Master Development Plat Approval.
- 1. Approval of Master Development Plats whose purpose is to create development parcels which will require the future approval of a Final Plat or Final Site Plan prior to development shall contain a note similar to the following:

Wastewater service to the \_\_\_\_\_ Development shall be provided by The Snyderville Basin Water Reclamation District. A Line Extension Agreement with the District will be required for each parcel created by the Plat. It shall be the responsibility of the Owner of each parcel to extend the public wastewater system to the parcel being developed according to the requirements of the Line Extension Agreement.

- 2. A Wastewater Master Plan meeting the requirements of Section 302 shall be submitted and approved by the SBWRD District Engineer prior to approval of the Master Development Plat.
- 3. The Master Development Plat shall indicate Easements required for future public wastewater lines identified by the Wastewater Master Plan. The easements shall be granted prior to or concurrent with the recording of the plat and shall meet the requirements of Section 302.6.

### SECTION 205 - IMPROVEMENT COMPLETION AGREEMENT PROCEDURES

#### 205.1 General

- A. An Improvement Completion Agreement with SBWRD shall be established by the Developer in accordance with the requirements of the LEA.
- B. The Improvement Completion Agreement shall have the form as contained in Appendix A.
- C. The Improvement Completion Agreement shall remain in effect from the time it is established through the Warranty Period.

#### 205.2 When an Improvement Completion Agreement Is Established

- A. An Improvement Completion Agreement shall be established on a project at the earliest occurrence of one of the following.
  - 1. Prior to Final Project Approval.
  - 2. Prior to Substantial Completion Approval.
  - 3. Prior to Plat Approval or Final Site Plan Approval if an extension or modification of the Public Wastewater System is required to provide wastewater service to the project.
  - 4. Prior to acceptance by SBWRD of Impact Fees for any building or facility located in the Project if an extension or modification of the Public Wastewater System is required to provide wastewater service to the project.
  - 5. Final Design Approval if the extension or modification to the Public Wastewater System will impact the ability of SBWRD to provide wastewater service to existing system users, as determined by SBWRD.

#### 205.3 Improvement Completion Agreement Security Amount

- A. The Improvement Completion Agreement security amount shall be 100% of the estimated construction cost of the extensions or modifications of the Public Wastewater System required for the Project.
- B. The total estimated construction cost for the wastewater system improvements shall be determined by the SBWRD District Engineer after reviewing an estimate of construction costs prepared by the Project Engineer according to the requirements of Section 202.6.

#### 205.4 Release of Improvement Completion Agreement Funds

- A. Release of Improvement Completion Agreement funds shall be in accordance with the requirements of the Improvement Completion Agreement.
- B. The Developer shall submit a written request to the SBWRD District Engineer for release of the Improvement Completion Agreement funds. The request shall include a summary of the project status prepared by the Project Engineer. The request shall be submitted a minimum 2 weeks prior to a regularly scheduled Board meeting.
- C. The SBWRD District Engineer will review the request for release and, if appropriate, recommend the release amount to the SBWRD Board of Trustees at a regularly scheduled Board of Trustees meeting. The release amount is based on the requirements of the Improvement Completion Agreement.
- D. The SBWRD Board of Trustees approves the Improvement Completion Agreement release at a regularly scheduled Board meeting.

## CHAPTER 3 - DESIGN REQUIREMENTS

### SECTION 301 - GENERAL

#### 301.1 Minimum Requirements

- A. The design requirements contained in this Chapter include the minimum requirements necessary for the design of wastewater facilities in the SBWRD.
- B. Proposed designs deviating from these regulations will be reviewed by SBWRD on a case by case basis upon the submittal by the Project Engineer of any additional data, computations, exhibits, etc., as required by SBWRD.

#### 301.2 Prohibited Waste Discharges

- A. Wastewater systems shall be designed to exclude wastes prohibited from being discharged to the Public Wastewater System and clear water connections as defined in the SBWRD Pretreatment Program, which is on file at SBWRD and can be viewed at [www.sbwrld.org](http://www.sbwrld.org).

### SECTION 302 -SUBMITTAL REQUIREMENTS FOR PUBLIC WASTEWATER SYSTEM EXTENSIONS AND MODIFICATIONS

#### 302.1 Description

- A. The design of Public Wastewater System extensions or modifications shall include the submittals and required information described in this Section. The procedures for submitting the information and receiving approval are contained in Section 202.

#### 302.2 Wastewater Master Plan

- A. A wastewater master plan shall be submitted for all proposed Developer Sponsored projects.
- B. The wastewater master plan shall consist of drawings, calculations, tables, etc. that adequately describe and document the location, routing, and sizing of the proposed wastewater system for the project.
- C. The wastewater master plan shall include the following information.
  1. The location of the development within the SBWRD.
  2. The boundary of the proposed project.
  3. The type of development.
  4. Other properties, outside of the proposed development, that would require wastewater service through the proposed development.

5. The configuration of the proposed development with roads, lots, proposed buildings, etc. shown.
  6. The number of lots, units, or rooms; commercial area, restaurants and other similar facilities; industrial area; and all other proposed facilities and areas that will contribute wastewater flows to the wastewater system.
  7. The estimated residential equivalents (REs) associated with the various uses within the proposed development.
  8. A conceptual layout of the wastewater system required to provide wastewater service to each lot or facility of the proposed development.
  9. Capacity requirements and size of the wastewater system features.
  10. Location of the proposed connection to the Public Wastewater System.
- D. On smaller projects without multiple phases, the required wastewater master plan information can be included on the overall wastewater system plan required as part of the final wastewater system design.
  - E. Wastewater master plan submittal shall be in the form of pdf electronic files. A full-size paper copy may be required at the discretion of the District Engineer.

#### 302.3 Preliminary Wastewater System Design

- A. The preliminary wastewater system design shall meet the requirements contained in Section 303.
- B. The preliminary wastewater system design shall include the following items.
  1. Site Location Map. The proposed project shown on a vicinity map indicating adjacent streets, projects, etc.
  2. Topographic Map. A topographic map of the area to be provided with wastewater service. This information may be included on the wastewater system layout plan.
  3. Wastewater System Layout. Plan of the proposed project indicating the following items with appropriate labeling:
    - a. The proposed location for connection of the proposed wastewater system improvements to the existing SBWRD wastewater collection system. SBWRD manhole numbering shall be included.
    - b. Location of the proposed wastewater system improvements in relation to streets, property lines, lots, other existing and proposed utilities, etc.

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- c. Proposed public wastewater collection lines and manholes, private laterals, and other wastewater system features.
- d. Lots or proposed facilities that may require ejector pumps for wastewater service, if applicable.
- e. Proposed Low-Pressure Sewer System facilities with appropriate design calculations, if applicable.
- f. Proposed wastewater pump stations, force mains and appurtenances with appropriate design calculations, if applicable.
- g. Estimated maximum number of units to be serviced by the proposed system and the estimated peak and average wastewater flows anticipated to come from the proposed project, as defined in Section 303.1.

### 302.4 Final Wastewater System Design

- A. The final wastewater system design shall meet the requirements contained in Section 303, and review comments from the preliminary design review.
- B. The final wastewater system design drawings shall include the following items:
  - 1. Title Page.
    - a. Project Name.
    - b. Owner/Developer Name.
    - c. Project Engineer Name.
    - d. State of Utah Professional Engineer's Stamp and Signature.
    - e. Location map with construction site identified.
    - f. Sheet Index.
    - g. Construction notes including the following.
      - i. Note stating that the construction of the wastewater system improvements shall conform to the SBWRD Development Procedures, Design Standards and Construction Specifications.
      - ii. Survey quality benchmark elevation with equation to convert to North American Vertical Datum of 1988 (NAVD 88)
    - h. Date.
  - 2. Index Sheet: Plan view of the entire development or phase of development indicating the areas and wastewater lines shown on each plan and profile drawing. This information may be shown on the Overall Wastewater System Plan.
  - 3. Overall Wastewater System Plan: Plan view of entire development or phase of development indicating the following.
    - a. Scale and North arrow. Scale shall not exceed 1" = 500'.
    - b. Streets, lots or parcels, and proposed buildings indicated and labeled or

- numbered. The lot or parcel numbering system shall be consistent throughout the project.
- c. Existing and proposed Public Wastewater System indicated with labeling: manhole location, size, stationing, and numbering (existing manholes referenced with SBWRD manhole number); pipe size; pipe type; and stubs.
- d. Private Lateral Wastewater Lines to all lots or building units shown.
- e. If applicable, lots or proposed facilities that may require ejector pumps identified.
- f. If applicable, lots or proposed facilities that will require Low-Pressure pumps identified.
- g. Existing and final contours (may be provided on a separate grading plan).
- h. This plan may be an overall utilities plan.
- i. The information shown on this plan shall be consistent with the information shown on the plan and profile drawings.
- j. If the entire project can be shown on one plan and profile drawing as described below, an overall wastewater system plan will not be required.
- 4. Plan and Profile Drawings (Plan and Profile shall be shown on the same sheet and sheets shall generally be arranged with the profile and stationing proceeding up-gradient from left to right) - **Plan View**.
  - a. Scale and North arrow. Scale shall not exceed 1" = 40'.
  - b. Street names.
  - c. Right-of-way lines and widths.
  - d. Parcel or lot lines.
  - e. Lots or buildings numbered. This numbering system shall be consistent throughout the project.
  - f. Existing and final contours.
  - g. Existing and proposed Public Wastewater System indicating: pipe size, length (centerline of manhole to centerline of manhole) and material; deflection angles of wastewater lines at manholes; curve information if curvilinear alignment; manhole size, type, stationing, and numbering; existing manholes referenced with SBWRD manhole number; and wastewater stubs with size, slope, length, deflection angle, and pipe material; wastewater pump stations, force mains, and appurtenances, if applicable; and Low-Pressure Sewer System and appurtenances, if applicable.
  - h. Private Lateral Wastewater Lines shown to all parcels or building units indicating:

- parcel or building unit to be served by lateral; pipe size, slope, length and material; deflection angle or bearing; mid-line bends with lengths between bends; elevation at end of lateral; cleanout locations, if applicable; and wastewater line stationing of private lateral at connection to main line.
  - i. Building pad location and elevation for each parcel or building unit to which private laterals are being extended or indication of how depth of main line and laterals was established, as determined necessary by the District Engineer.
  - j. If applicable, lots or proposed facilities that may require ejector pumps identified.
  - k. If applicable, lots or proposed facilities that will require Low-Pressure pumps identified.
  - l. Existing and proposed easements shown, with type (i.e., temporary, permanent, nonexclusive utilities, sewer, water, access) and recording information indicated.
  - m. Existing and proposed: pavement edges and width; sidewalks, walkways and paths (concrete, pavement, or gravel); curb and gutter; all structures (i.e., buildings, retaining walls, tunnels); fences and retaining walls.
  - n. Existing and proposed: water lines (including fire hydrants and service lines); irrigation and drainage ditches; storm drainage structures and pipe; utilities (existing, proposed, buried, and above ground) including power lines, telephone lines, gas lines, etc.
  - o. Erosion control notes.
5. Plan and Profile Drawings - **Profile View**.
- a. Information shown shall be consistent with the plan view (i.e., direction of flow, manhole stationing, existing land features, utilities, etc.).
  - b. Scale. Scale shall not exceed 1" = 40' horizontal and 1" = 10' vertical.
  - c. Existing and final grades shown at center line of wastewater lines or centerline of road if wastewater line is within the roadway.
  - d. Profile of crossings with existing and proposed utilities including water lines and storm drain lines. Provide elevations of wastewater lines, water lines or storm drain lines at crossing.
  - e. Profile of crossings with existing and proposed streets including curb, gutter, and sidewalk.
  - f. Profile of parallel ditches within 10' horizontally of wastewater lines, ditches that cross the wastewater line, and ditches parallel to roadways where wastewater laterals must cross ditch.
  - g. Proposed Public Wastewater System indicating: size and flow line (invert) elevation of all existing and proposed wastewater lines at connections to the existing SBWRD collection system; profile of proposed wastewater line flow line and top of pipe shown to scale; road stationing with centerline offsets to proposed manholes and wastewater line stationing based on wastewater line alignment; pipe size and material; distance from centerline of manhole to centerline of manhole; flow line elevations of all lines entering manholes at the inside manhole wall; slope of wastewater line (shown to hundredths of a percent), manhole type and size; manhole stationing and numbering; manhole rim elevations; special bedding, backfill and compaction requirements, if required; special pipe protection measures, if required; minimum cover noted; erosion control notes; and other special notes and instructions as required for construction of the wastewater system.
6. Low-Pressure Sewer System design calculations meeting the requirements of Section 303.9, if applicable.
7. Detailed plans for wastewater pump stations meeting the requirements of Section 303.10, if applicable.
8. Details
- a. Applicable SBWRD Standard Details as contained in Appendix C.
  - b. Manhole base details as required by Section 303.8.
  - c. Any additional Details required for items not covered by the Standard Details.
- C. Final wastewater system design drawings shall be formatted by the Project Engineer to provide individual layers for ease in adapting electronic record drawing file information into the SBWRD wastewater collection Geographic Information System (GIS).
- D. Approved final wastewater system drawings submitted to SBWRD shall be 24"x36" in size.
- E. Drawings shall be clear, legible, and conform to acceptable drafting practices. Design drawings shall be consistent with the standards in the industry for wastewater system construction drawing.
- F. It is recommended that the design drawings be set up to meet the requirements for Record Drawings as

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discussed in Section 302.9 with regard to State Plane Coordinates and elevations.

#### 302.5 Preliminary and Final Plat and Site Plan

- A. The submittal and approval process for preliminary and final plats and site plans shall be in accordance with the requirements of Section 204.
- B. The following information shall be included on the plat or site plan
  - 1. A signature block for SBWRD in the following form:

<b>SNYDERVILLE BASIN WATER RECLAMATION DISTRICT</b>
Reviewed for conformance to Snyderville Basin Water Reclamation District standards on this _____ day of _____, 20____.
By: _____

- 2. All existing SBWRD easements located on or adjacent to the property being platted or developed. Reference to the easement recording information shall be included.
- 3. All proposed SBWRD easements for Public Wastewater System collection lines.
  - a. Public roadways where Public Wastewater System collection lines will be located shall be specifically dedicated for use by SBWRD in the owner’s dedication language.
  - b. Easements for Public Wastewater System collection lines located outside of streets or roads dedicated as public rights-of-way shall be granted to SBWRD by an SBWRD Grant of Easement form as contained in Appendix A. The location of the easement shall be shown on the plat or site plan and reference to the easement recording information indicated.
- 4. Where applicable, lots that may require ejector pumps for wastewater service identified as EP (wastewater ejector pump) lots and the following plat note included on the plat:

EP: Wastewater Ejector Pump Lots. Lots _____ may require a privately owned and operated wastewater ejector pump for wastewater service.
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- 5. Where applicable, lots that will connect to a Low-Pressure Sewer System identified as LP (Low-Pressure) lots and the following plat notes included on the plat:

<p>1. Lots _____ are designated as Low-Pressure Sewer System Lots. The purchasers of these lots are hereby notified that wastewater service to these lots will be provided by a Low-Pressure Sewer System. The Private Low-Pressure Sewer Lateral to these lots consists of a Low-Pressure grinder pump station and Low-Pressure discharge line and appurtenances. The Private Low-Pressure Lateral System, which is the private property of each lot owner, connects to the Snyderville Basin Water Reclamation District’s (SBWRD) Public Low-Pressure Sewer System. Purchasers of the Low-Pressure Sewer System Lots shall be solely responsible for all costs of the Private Low-Pressure Lateral System related to or arising from the installation, operation, maintenance, repair and replacement of the Private Low-Pressure Sewer Lateral System. SBWRD shall have no liability or responsibility for Private Low-Pressure Sewer Lateral Systems, including any costs arising from or relating to installation, operation, maintenance, repair and replacement and matters arising from freezing or incorrect installation.</p> <p>2. Upon recordation of this plat, <u>(owner noted on plat)</u> _____ hereby consents and authorizes Snyderville Basin Water Reclamation District to record a notice for each Low-Pressure Sewer System Lot with the Summit County Recorder’s Office. The recorded notices shall serve as notification to all future lot owners of the responsibilities associated with the Private Low-Pressure Sewer Lateral System serving the lots.</p> <p>3. (Other Low-Pressure Sewer System notes specific to the project as required.)</p>
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- 6. Where applicable, a note regarding Common Private Lateral Wastewater Lines according to Section 102.6.
- 7. Where applicable, a note regarding ownership and maintenance responsibilities of individual Private Lateral Wastewater Lines located in common areas designated as public and private easements.
- 8. Where applicable, a note regarding adjustment of manholes in private roads and other paved areas as follows:

At the time of any resurfacing of ( <u>Private Road name or paved area</u> ), the ( <u>Homeowner’s Association, Condominium Association, Property Owner, etc.</u> ) shall be responsible to adjust wastewater manholes to grade according to Snyderville Basin Water Reclamation District (SBWRD) standards. Prior notification of the adjustments and inspection by SBWRD is required.
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- 9. Other notes or information as required by SBWRD.

### **302.6 Easements**

- A. Permanent easements for constructing, operating, maintaining and replacing the Public Wastewater lines, including access within the easement, shall be required for all Public Wastewater lines not located in dedicated public roadways. Permanent easements shall be submitted on the standard SBWRD Grant of Easement Form contained in Appendix A.
- B. A current Final Title Report for all properties where easements are being granted shall be submitted with the Grant of Easement Form.
  - 1. The Final Title Report shall demonstrate that the grantor of the easement is the owner of the property where the easement is being granted
  - 2. The Final Title Report shall demonstrate that there are no encumbrances on the property that would prevent SBWRD from exercising its rights as contained in the Grant of Easement Form.
  - 3. The date of issue of the Final Title Report shall be within 30 days of the date the Easement is executed and submitted.
- C. Access easements shall be provided for access to the permanent easement if access to the wastewater lines along the permanent easement alignment is not achievable. Access easements shall be submitted on the standard SBWRD Grant of Access Easement Form contained in Appendix A.
- D. The legal description of the easements shall be included in the body of the easement forms, not as an attachment to the easement form.
- E. An exhibit shall be attached to all easement forms showing the general location of the easements in relation to the wastewater line, property lines, and other pertinent features.
- F. Easements for wastewater lines shall be granted independent of other utilities.
- G. All permanent and access easements shall be a minimum 20' wide.
- H. Additional easement width shall be provided for wastewater lines exceeding 10' in depth, as determined from the finished grade to the top of pipe. An additional 2' of easement width shall be provided for each foot of depth beyond 10'.
- I. The wastewater line shall be centered within the permanent easement.
- J. Permanent Easements shall extend a minimum 10' beyond the center of the last manhole or last section of Public Wastewater line. An additional 1' of easement length shall be provided for each foot of depth beyond 10'.
- K. Where required for access, the permanent easement shall include areas for turnarounds as specified in standard detail PI-02 of Appendix C.
- L. SBWRD will generally record all signed easements with the County Recorder within two weeks of the date the fully executed document is received.

### **302.7 Special Agreements and Permits**

- A. All special agreements or permits required for construction of proposed Public Wastewater System extensions or modifications shall be submitted, reviewed by SBWRD, and executed along with the final design drawings according to Section 202.6.
- B. The developer shall submit documentation assuming responsibility for all costs and work associated with any third-party agreements, easements, or permits which SBWRD may be required to enter into for the project.

### **302.8 Construction Cost Estimate**

- A. A construction cost estimate prepared by the Project Engineer and approved by SBWRD shall be used to establish the amount of the Improvement Completion Agreement and Engineering Services Fees.
- B. The construction cost estimate shall include, as separate line items, the following items as applicable:
  - 1. Wastewater main line, each size and type.
  - 2. Wastewater lateral, each size and type.
  - 3. Wastewater manholes and structures, each size and type.
  - 4. Connection to existing manhole.
  - 5. Acceptance testing (TV inspection, air and vacuum testing, tracer wire continuity testing, etc.)
  - 6. Street cuts (including pavement and curb replacement).
  - 7. Manhole platform.
  - 8. Trench dike
  - 9. Maintenance access roadway.
  - 10. Revegetation and/or landscaping.
  - 11. Trench rock removal (including import material replacement).
  - 12. Existing manhole adjustment.
  - 13. Special construction items (i.e., borings, casings, dewatering, wetland restoration, temporary sewer, etc.).
- C. Unit costs shall be consistent with current local construction costs and shall be acceptable to SBWRD.

### **302.9 Record Drawings**

- A. The Developer shall assure that all data for Record Drawings is collected.
- B. The Record Drawing set shall consist of the approved Construction Drawings, including approved revisions, with all annotations and graphical representations modified to reflect the as-constructed condition of the Public Wastewater System improvements and Private Lateral Wastewater Lines as determined by a field survey conducted by the Project Surveyor.
- C. The Record Drawing set shall include: title page, overall wastewater system plan, plan and profile sheets, and special detail sheets. Landscaping plans,



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road cross-sections, erosion control plans, miscellaneous detail sheets, etc., which do not affect the construction or operation of the wastewater system shall not be included. Sheets not included in the Record Drawing set shall be lined-out in the drawing sheet index.

- D. Sheet size shall be 24"x36".
- E. Record Drawings shall be legible and scalable and must allow for clear photocopies and digital copies.
- F. Record Drawings shall include all information required for final wastewater system design drawings according to Section 302.4 and the following additional items:
  - 1. SBWRD manhole and structure numbers for new manholes and structures based on SBWRD numbering system. These numbers will be provided by SBWRD as part of the first Record Drawing review.
  - 2. Existing manholes removed as part of the project shall be shown on the record drawings with appropriate notes indicating SBWRD manhole number and how the manhole was abandoned or noted as removed.
  - 3. Two swing ties, or measured distances, to the private lateral stub marker for each lot or building and any cleanouts on private lateral stubs installed as part of the project. These ties shall be from the two front property corners, a "nail-in-curb" projected from the property corner, or other surveyed points of reference. Swing ties that cross onto other Record Drawing sheets shall include a note on each sheet indicating associated feature. Laterals shall not cross from sheet to sheet.
  - 4. Any field information obtained by the contractor.
  - 5. The location of the installed wastewater lines within easements. If revised easements are required, a copy of revised easements shall be submitted with the initial Record Drawing submittal for review by SBWRD.
  - 6. Written certification by the Project Surveyor or Project Engineer that a field survey of existing as-constructed wastewater system information has been performed and has been incorporated into the Record Drawings.
- G. A copy of the Record Drawings shall be submitted to the District Engineer for review prior to scheduling a final inspection.
- H. The final Record Drawing submittal shall consist of the following:
  - 1. Signed revised easements, if required.
  - 2. One set of plotted mylar drawings.
  - 3. A PDF digital file of all sheets in the Record Drawing set.
  - 4. CAD files in a format that is compatible with SBWRD GIS software (ESRI's ArcGIS) such as AutoCAD or other similar programs. The digital

files shall be converted from the project's ground survey coordinates to the State Plane Coordinate System (Utah North, NAD83, U.S. survey foot) by applying the appropriate rotation and elevation scale factors. The survey quality benchmark elevation shall be referenced to the North American Vertical Datum of 1988 (NAVD 88).

- I. Any incorrect or modified information shown on the Record Drawings found during the warranty period shall be corrected by the Developer and Project Engineer and the corrected sheets resubmitted.

### 302.10 Operation and Maintenance Manuals

- A. An Operation and Maintenance Manual, prepared by the Project Engineer and approved by SBWRD, shall be required for wastewater pump stations.
- B. Submittal Requirements.
  - 1. One copy of a preliminary draft of the Operation and Maintenance Manual shall be submitted at the 50% stage of construction for review and approval by SBWRD. No release of Improvement Completion Agreement monies beyond 40% will be approved until this submittal occurs.
  - 2. One copy of the final draft of the Operation and Maintenance Manual shall be submitted at the 90% stage of construction for review and approval by SBWRD. Comments from previous reviews shall be addressed. No release of Improvement Completion Agreement monies beyond 80% will be approved until this submittal occurs.
  - 3. Four hard copies and a PDF digital file of the final approved Operation and Maintenance Manual shall be submitted prior to Final Project Approval of the pump station.
- C. Content.
  - 1. General description of the facility and how it operates.
  - 2. Detailed description of all components and how they function in relation to other components.
  - 3. Operating procedures for the overall facility and for its specific components under all operating conditions.
  - 4. Maintenance procedures and schedules.
  - 5. Technical guidance for troubleshooting.
  - 6. Manufacturer's recommended spare parts list and special tools list.
  - 7. Record drawings of the pump station and force mains showing as-constructed condition and meeting the requirements of Section 302.9.
  - 8. Certified pump curves for the installed system.
  - 9. Drawings, schematic diagrams, wiring diagrams, etc. as required to adequately describe the as-constructed facility and its components.

10. Catalog cut sheets, equipment test certifications, and other information for all components of the station. Catalog cut sheets shall be marked to indicate the specific equipment models, serial numbers, etc. included in the station.
11. Other information as required by SBWRD.

proposed as submitted by the Developer and approved by SBWRD.

## **SECTION 303 - DESIGN CRITERIA FOR PUBLIC WASTEWATER SYSTEM EXTENSIONS AND MODIFICATIONS**

### **303.1 Basis of Design**

- A. Design Period.
  1. The wastewater system shall be designed to serve the estimated ultimate tributary area at build out.
  2. The wastewater system design shall be based on the best information available, including the SBWRD Capacity Model, current development regulations, and approved planning reports when available.
- B. Design Capacity: Main lines shall be designed to carry not less than the design peak flow from the tributary area as follows:
  1. Design Peak Flow.
    - a. 8" through 15" gravity lines: 4.0 times the design average flow.
    - b. Larger than 15" gravity lines: 2.5 times the design average flow.
    - c. Low-Pressure Sewer System: According to system manufacturer's recommendations. All gravity lines downstream of the Low-Pressure Sewer System shall be designed for the greater of the peak pumping rate of the Low-Pressure Sewer System and the peaking factors described above.
  2. Design Average Flow: 320 gallons per Residential Equivalent per day.
    - a. The number of Residential Equivalents assigned to single family residential subdivision lots, condominiums and other similar units shall be based on the projected number of bedrooms or living sections that will be built on the lot or unit as submitted by the Developer and approved by SBWRD (One bedroom or living unit is equivalent to 1/3 RE.) If this information is not available, the number of Residential Equivalents will be based on similar type developments in the area of the proposed development.
    - b. The number of Residential Equivalents assigned to lots in commercial and industrial subdivisions or other similar type developments shall be based on projected water usage for the type of development

### **303.2 Location**

- A. The location of all wastewater lines that are part of the Public Wastewater System shall comply with the requirements of Section 102.2.
- B. If construction of a new wastewater line in an existing road is detrimental to the existing road, is cost prohibitive as determined by SBWRD, or an alternative is in the best interest of SBWRD, the new line may be located along the edge of the road.
  1. Manholes or other access and maintenance features on the line shall be located a maximum 10' from the back of curb or edge of asphalt.
  2. A Manhole Platform meeting the requirements of the standard detail in Appendix C shall be provided.
  3. Grading around the manholes shall provide for roadside drainage and drainage away from the manhole.
  4. Roadway shoulders with steep cut or fill slopes.
    - a. Special grading shall be required for manholes located on steep slopes within roadway shoulder areas.
    - b. An acceptable design for grading under this circumstance shall be submitted to SBWRD for approval.
    - c. A minimum distance of 3' from the edge of the manhole to any slope retention shall be required.

### **303.3 Protection of Water Supplies**

- A. Wastewater system appurtenances shall be kept remote from public water supply wells, other water supply sources and structures, and water distribution systems. The following requirements shall be observed at all times.
- B. The water and wastewater systems shall be designed in accordance with the rules and requirements of *State of Utah Rule for Public Drinking Water Systems* as contained in R309-550, UAC, Facility Design and Operation: Transmission and Distribution Pipelines; R309-515, UAC, Facility Design and Operation: Source Development; and R309-600, UAC, Drinking Water Source Protection for Groundwater Sources.
- C. The Project Engineer shall be responsible to review Drinking Water Source Protection Plans and Management Programs for the project area and incorporate the requirements into the wastewater system design.
- D. The Project Engineer shall show existing wells or springs and source protection zones on the construction drawings and indicate horizontal distances from the well head to the wastewater system. Identification of aquifers (protected and

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unprotected) and source protection zones (zone 1 and zone 2) must be clearly identified on the design drawings.

- E. Generally, wastewater main lines and laterals may not be located within zone one and zone two of a public drinking water system's source protection zones, as stated in R309-515, UAC, Facility Design and Operation: Source Development.
- F. If local conditions require wastewater lines to be located within a source protection zone, the line may be installed provided:
  - 1. The installation is approved by SBWRD and the owner of the protected water source.
  - 2. Wastewater line materials shall be HDPE with fusion welded joints or PVC AWWA Specification C900 or C905 with restrained gasketed joints or fusion welded joints.
  - 3. Backfill shall be compacted to not less than 95% of the Modified Proctor Density.
  - 4. A trench dike shall be installed on the up-gradient edge of zone two (unprotected aquifer) and up-gradient of zone one (protected aquifer).
  - 5. Wastewater main lines shall be deflection-tested in accordance with the Division of Water Quality Rule R317-3.
  - 6. All other material, construction and testing requirements contained herein
- G. Horizontal and vertical pipe separation between culinary water lines and wastewater system main lines and private lateral lines shall comply with the following requirements.
  - 1. Horizontal separation: Wastewater main lines and private laterals shall be installed a minimum 10' horizontally from any existing or proposed water main or service, measured edge of pipe to edge of pipe.
  - 2. Vertical separation at crossings: Where wastewater main lines or private laterals must cross culinary water lines, wastewater lines shall be at least 18" below the bottom of the water line, measured edge of pipe to edge of pipe.
  - 3. Approvals for reduced separations or routing wastewater lines over culinary water lines may be obtained from the State of Utah Division of Environmental Quality, Division of Drinking Water and local water system authority on a case-by-case basis. This may include additional mitigation measures to protect public health.
- H. The separation of wastewater lines from all secondary water system lines and irrigation lines 6" diameter and greater shall comply with the rules and requirements in Paragraph G.

### 303.4 Separation from Other Utilities at Crossings

- A. Wastewater main lines and private lateral lines shall be located below all existing and proposed utilities with a minimum separation of 18" for main lines and

12" for private lateral lines, measured edge of pipe to edge of pipe or utility line.

- B. If local conditions prevent the wastewater lines from being located below other utilities, the wastewater line may be located over the other utilities with the following requirements:
  - 1. The routing is approved by SBWRD and the utility authority. The Project Engineer may be required to submit justification for the conditions preventing this requirement from being met.
  - 2. A minimum vertical separation of 18" for main lines and 12" for private lateral lines from edge of pipe to edge of pipe or utility line shall be maintained.
  - 3. Special bedding, consisting of cement treated backfill shall be required to be placed between the pipe or utility line and the wastewater line.
- C. If local conditions prevent a minimum vertical separation of 18" for main lines and 12" for private lateral lines between the wastewater line and other utilities, reduced separation may be allowed with the following requirements:
  - 1. The reduced separation and routing are approved by SBWRD and the utility system authority. The Project Engineer may be required to submit justification for the conditions preventing separation to be maintained.
  - 2. The vertical separation shall be maximized but in no case shall the pipes be in contact.
  - 3. Wastewater main line and private lateral line may be required to be constructed of HDPE with fusion welded joints, as determined by SBWRD. Special design requirements may also be required.
  - 4. Special bedding, consisting of cement treated backfill shall be required to be placed between the pipe or utility line and the wastewater line.

### 303.5 Site Improvements within Public Wastewater Line Easements

- A. Permanent structures shall not be located within Public Wastewater Line easements.
- B. Trees and other major landscaping features shall not be located within Public Wastewater Line easements.
- C. Lighting poles, retaining walls and large landscape rocks shall not be located within Public Wastewater Line easements.
- D. Irrigation systems within Public Wastewater Line easements shall be designed to minimize interference with the wastewater line alignment. Major feeder, valves, and controllers shall not be located within the easement.
- E. Driveways or streets with snowmelt or heating systems imbedded in the pavement shall not be located within Public Wastewater Line easements.
- F. Walks and trails shall be designed to minimize interference with the wastewater line alignment.

When walks, private driveways or trails are utilized as access roadways, the pavement or trail section shall be designed to support wastewater maintenance equipment (heavy axle) without damaging the surface.

- G. SBWRD may, on a case by case basis and at the discretion of SBWRD, allow certain surface improvements and landscaping features to be located within Public Wastewater Line easements. If encroachments into the Public Wastewater Line easements are allowed, the Encroachment Agreement contained in Appendix A shall be executed by the Developer (or landowner) and SBWRD.

**303.6 Gravity Flow Main Lines**

- A. Line Size: 8" minimum diameter.
- B. Line Depth.
  - 1. The depth of gravity flow main lines should be sufficient to provide gravity service to the lower building level(s) of each lot. This is determined from the roadway elevation at the center of the lot plus an allowance for 2 percent slope on laterals from the center of the anticipated building pad to the proposed wastewater main plus an additional 12" for the transition from the main line to the lateral.
  - 2. If the depth of a gravity line is required to exceed 16' to provide gravity service to lots or as a result of other site constraints, alternative design measures which will eliminate the lines with excessive depth may be required, including:
    - a. Reconfiguration of the lots and roads in the proposed development.
    - b. Realignment of the proposed wastewater lines.
    - c. Ejector or grinder pumps for those lots requiring the excessive depth.
    - d. Low-Pressure Sewer System.
    - e. Off-road wastewater lines.
  - 3. Depths exceeding 16' shall be specifically approved by SBWRD on a case by case basis.
  - 4. The minimum depth of gravity flow main lines from the top of the pipe to the finished grade elevation shall be as follows:
    - a. 5' for elevations below 7,000.
    - b. 6' for elevations above 7,000.
    - c. The design minimum depth shall provide required cover over gravity and pressure laterals, as applicable.
- C. Minimum Slope.
  - 1. Pipe slopes shall be calculated using the horizontal distance from inside manhole wall to inside manhole wall and the flow line elevations at the inside manhole wall.
  - 2. Gravity flow main lines shall be designed and constructed with slopes sufficient to achieve flow velocities of not less than 2.0 feet per

- second for the anticipated design peak flow, based on Manning's formula.
- 3. A Manning's "n" value of 0.013 shall be used for all pipe materials.
- 4. If site constraints such as topography or depth of existing wastewater lines results in pipe slopes less than those required to achieve a velocity of 2.0 feet per second, alternative design measures which eliminate the flat lines may be required including:
  - a. Realignment of the proposed wastewater lines.
  - b. Individual ejector or grinder pumps for those lots requiring the flat lines.
  - c. Low-Pressure Sewer System.
  - d. Off-road wastewater lines.
- 5. Exceptions to the requirement to achieve a velocity of not less than 2.0 feet per second for the anticipated design peak flow shall be specifically approved by SBWRD on a case by case basis.
- 6. In all cases the minimum slope of any line segment shall not be less than the following.

<u>Sewer Size</u>	<u>Minimum Slope in Feet per 100 Feet (%)</u>
8"	0.40
10"	0.28
12"	0.22
14"	0.17
15"	0.15
16"	0.14
18"	0.12
21"	0.10
24"	0.08

- 7. Any line segment that has any portion of the line with a slope less than minimum shall be re-installed.
- D. Maximum slopes.
  - 1. The maximum slopes of all lines entering manholes is 10 percent.
  - 2. In cases where the required slope from manhole to manhole exceeds 10 percent, HDPE pipe with vertical curves shall be utilized.
  - 3. The slope of the wastewater line should generally be less than 67 percent (1½:1).
  - 4. Special design consideration, including pipe anchoring and pipe material, shall be given to wastewater lines with slopes greater than 33.3%.
- E. Pipe Anchors.
  - 1. HDPE Wastewater lines on slopes 3:1 (33.3 percent) or steeper shall be anchored to prevent displacement per the standard details in Appendix C.
  - 2. Anchors shall be placed at alternating butt-fused joints or as directed by SBWRD.

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### F. Alignment.

1. Gravity flow main lines shall be designed on straight horizontal and vertical alignments between manholes. Curvilinear alignments meeting the requirements of Section 303.7 may be allowed on a case by case basis as approved by SBWRD.
2. Wastewater lines shall be located at a sufficient distance from curb and gutter and other improvements to reduce disturbance during possible future repair of the sewer line.

### 303.7 Curved Gravity Flow Main Lines

- A. Gravity flow main lines may be designed and constructed on curvilinear horizontal and vertical alignments on a case by case basis as approved by SBWRD. If the use of curvilinear lines is approved the following criteria shall apply.
- B. The requirements of Section 303.6 shall apply.
- C. Pipe material shall be HDPE meeting the requirements of Section 402.2.
- D. The number of horizontal and vertical curves in a line segment shall be minimized.
- E. Additional construction and as-constructed surveying will be required to provide accurate location information for the as-constructed line. The installed pipe must be surveyed by a qualified surveyor every 20' to determine proper horizontal and vertical placement. This information shall be indicated on the Record Drawings.
- F. Minimum slope: 5% unless the following special construction procedures are used in which case 3% minimum.
  1. Installed pipe must be surveyed by a qualified surveyor every 10' to demonstrate that a 3% slope is maintained.
  2. Any line segment that has any portion of the surveyed line with a slope less than 2.5% shall be re-installed.
  3. Survey notes shall be submitted to SBWRD to demonstrate compliance with these requirements.
  4. The party responsible for performing the survey and submitting survey notes shall be determined during the Pre-construction Meeting.
- G. Minimum radius of horizontal and vertical curves: 100' unless specifically approved by the District Engineer in which case special construction procedures similar to those contained in paragraph E shall be used. Radiuses less than 50' shall not be allowed
- H. The construction methods and procedures that will be used to assure that the lines are constructed to the design horizontal and vertical alignment shall be submitted and approved by SBWRD.

### 303.8 Manholes

#### A. Diameter:

1. Manholes shall have a minimum inside diameter of 4'.
  2. Manholes with the following conditions shall have an inside diameter of 5'.
    - a. Manholes constructed with an inside drop structure.
    - b. Manholes with a depth greater than 16'.
    - c. Manholes connecting to lines 18" and greater.
    - d. Low-Pressure Sewer System flushing connection, junction and combination air valve manholes.
  3. An evaluation to determine if a larger diameter manhole is required to accommodate connecting lines and provide an adequate shelf in the base of the manhole for maintenance shall be conducted for the following situations.
    - a. Manholes with 3 or more main lines or private lateral wastewater lines connecting to the manhole.
    - b. Other configurations as required by SBWRD.
    - c. A detail of the manhole base shall be provided on the construction drawings for these manholes. The detail shall be drawn to scale and shall include the deflection angle, flow line elevation, and type and size of pipe for all connecting lines.
- #### B. Location.
1. Manholes shall be installed at both ends of each main line segment; at all changes in pipe size; at all changes in alignment or grade (unless a curved gravity flow main line); and at intervals not to exceed 400' for lines 15" in diameter or smaller, or 500' for lines 18" in diameter and larger.
  2. Manholes shall be located within the pavement with a minimum distance of 2.5' required between edge of pavement, concrete curb or gutter, and edge of manhole rim. With approval by SBWRD, rotating the eccentric manhole cone to the center of the road may be done to achieve the required minimum distance.
  3. Manholes shall not be located in waterways, gutters or drainage swales.
  4. Manholes shall not be placed within 10' of storm drain manholes, catch basins, or in low points where catch basins are located.
  5. Cleanouts shall not be used as an alternative to manholes on public sewer lines.
  6. With the exception of sampling manholes installed according to pretreatment requirements, manholes shall not be placed on private lateral lines.
  7. Manholes shall not be located within sports playing field areas or where exercise activities may occur.

- C. Drop through Manholes.
  - 1. The minimum elevation difference between the flow line of incoming and outgoing lines in manholes (minimum drop) as calculated at the inside manhole wall shall meet the more restrictive of the following criteria.
  - 2. Slope of connecting lines:
    - a. Minimum slope to 5%.
      - i. 4-foot diameter manhole: 0.2'.
      - ii. 5-foot diameter manhole: 0.25'.
      - iii. 5% and above: Drop required to match slope of connecting lines. Provide smooth transition through manhole.
  - 3. Angle between incoming and outgoing line less than 110 degrees: 0.5'.
  - 4. Pipe Size Transitions: Meet requirements of Section 303.8.D.
- D. Pipe Size Transitions.
  - 1. To approximately maintain the flow energy gradient in manholes where pipe diameters change, the elevation of the 0.8 depth of the incoming pipe shall be placed at the same elevation as the 0.8 depth of the outgoing pipe, with additional allowance for the drop through manholes discussed in paragraph C above.
  - 2. Where a wastewater main line intersects with a manhole located on a major collector or trunk line, the crown of the incoming wastewater line shall match the crown of the collector or trunk line.
- E. Drop Manhole Connections.
  - 1. Drop manhole connections shall be avoided in the design of the wastewater collection system and will require approval on a case by case basis by SBWRD.
  - 2. Drop manhole connections shall be required whenever the elevation difference between the flow lines of the incoming pipe and the outgoing pipe, as calculated at the inside manhole wall, exceeds 18".
  - 3. Drop connections shall be constructed with an internal drop.
  - 4. Drop manholes shall be a minimum 5' diameter.
  - 5. If a drop manhole is to be constructed at an existing 4-foot diameter manhole, the existing manhole shall be replaced with a 5-foot diameter manhole and the drop constructed.
- F. Shallow Manholes:
  - 1. Shallow manholes shall be required for manhole depths less than 6.3', but not allowed for manholes with depths greater than 6.7' as measured from the top of rim to the invert.
  - 2. Shallow manholes shall be indicated on the construction drawings.
- G. Sufficient information shall be shown on the construction drawings to allow for efficient design

review, manufacture, construction and inspection of the manhole components and installed manhole.

### 303.9 Low-Pressure Sewer Systems

- A. Proposed Low-Pressure Sewer Systems and manufacturers shall be approved by SBWRD.
- B. Intermixing of different manufacturer's Low-Pressure Sewer System pumps within the same Low-Pressure System shall not be permitted.
- C. The layout of the Low-Pressure Sewer Systems shall minimize the length, number of branches, and number of connections on the Low-Pressure Sewer System. A combination of smaller Low-Pressure Sewer Systems discharging to gravity flow lines is preferable to a large and complex Low-Pressure Sewer System.
- D. The design of the Low-Pressure Sewer System shall be based on the system manufacturer's recommendations for line sizing and maximum total system head with the following minimum requirements.
- E. Line Size: shall be sized to provide a minimum velocity of 2.0 feet per second while minimizing head losses through the system during system operation.
- F. Maximum Total System Head: shall not exceed the system manufacturer's recommended allowable head for the pump system being proposed at any point on the Low-Pressure Sewer System. Total system head consists of static (elevation) head plus accumulated friction losses through the system.
- G. Detailed calculations for each branch of the Low-Pressure Sewer System, including the following minimum information, shall be required.
  - 1. Number of units connected to the Low-Pressure Sewer System
  - 2. Design maximum flow
  - 3. Pipe size
  - 4. Design velocity at design maximum flow
  - 5. Friction losses
  - 6. Static (elevation) head
  - 7. Total head
  - 8. Anticipated number of simultaneous pump operations
- H. Minimum Line Depth: shall be located below all other utilities with a minimum 18" vertical separation, measured edge of pipe to edge of pipe, from other utilities and shall have a minimum depth of 7' from the top of the pipe to the finished grade elevation.
- I. Vertical Alignment:
  - 1. Shall minimize the number of high and low points on the system.
  - 2. The connection of the Low-Pressure System to the gravity system shall be the highest elevation of the Low-Pressure System.
- J. Horizontal Alignment:

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1. Where possible, placed at a constant horizontal offset of 7' from the street center line.
  2. Located at a sufficient distance from curb and gutter and other structures to eliminate disturbance during possible future repair of the line.
  3. Not placed within 5' of catch basins, vaults or other similar structures.
- K. Connection of the Low-Pressure Sewer System main line to the gravity wastewater collection system shall occur at a manhole and shall meet the following requirements.
1. The invert of the Low-Pressure Sewer System main line shall enter the manhole 0.5' above the invert elevation of the gravity outlet line unless the depth of the Low-Pressure Sewer System main line would exceed 9', in which case a drop within the manhole will be allowed.
  2. The manhole base shall have a formed channel from the Low-Pressure Sewer System main line to the gravity outlet line to minimize disturbance of the wastewater entering the manhole.
  3. To minimize hydrogen sulfide attack on the manhole structure either the interior of the manhole shall have Manhole Interior Coating meeting the requirements of Section 404.17 applied to all interior concrete surfaces or the manhole shall be constructed of Polymer concrete meeting the requirements of Section 404.20.
  4. The receiving manhole shall be designed and located with consideration for proximity to existing and future residences, businesses and other facilities which may be affected by potential wastewater odors generated in the Low-Pressure Sewer System main line that may be released at the manhole.
  5. The receiving manhole shall have a frost-proof frame with vented cover and manhole odor control unit installed.
- L. Appurtenances
1. Combination air valves, junction manholes and flushing connections shall be included in the design of the Low-Pressure Sewer System. The location of these valves on the system shall be approved by SBWRD and should meet the following general guidelines.
  2. Combination air valves should be installed at intermediate system high points, at significant changes in grade where air pockets can form and at intervals of 2,000' to 2,500' in long horizontal runs that lack a clearly defined high point.
  3. Manholes containing air valves shall have a frost-proof frame with vented cover and manhole odor control unit installed.
  4. To minimize hydrogen sulfide attack on manholes containing air valves, either the

interior of the manhole shall have Manhole Interior Coating meeting the requirements of Section 404.17 applied to all interior concrete surfaces, or the manhole shall be constructed of Polymer concrete meeting the requirements of Section 404.20

5. Flushing connections shall be installed at the terminal end of each main line and at other locations, as determined by SBWRD, which will facilitate operation and maintenance of the system.
6. Flushing connection and junction manholes shall have a frost-proof manhole frame with aluminum inner lid.
7. The location of manholes containing these appurtenances should generally follow the requirements for manhole locations under Section 303.8.

### 303.10 Wastewater Pump Stations

- A. The SBWRD Wastewater Pump Station policy in Section 102.5 shall be followed.
- B. Wastewater pump stations shall meet the Utah Department of Environmental Quality, Division of Water Quality pump station design requirements as outlined in R317-3-3, Utah Administrative Code, Sewage Pumping Stations.
- C. In addition to the above requirements, wastewater pump stations shall meet the following requirements.
  1. Type of Pump Station.
    - a. Pump stations shall generally be of the submersible pump type and shall utilize variable frequency drives (VFD's).
    - b. A minimum of two pumps, each capable of pumping the total design flow, shall be provided.
    - c. The pump station controls shall provide for automatic alternating of the lead pump.
  2. Design Flows.
    - a. Pump station structures, equipment and piping shall be designed to handle the ultimate tributary flow at build out.
    - b. Provisions for smaller interim flows shall be provided for in the design of the pump station.
  3. Property Ownership: The property on which the pump station is located shall be deeded to SBWRD.
  4. Accessibility:
    - a. A paved, all-weather access road shall be provided to the pump station.
    - b. The access road may be granted by way of an easement.
    - c. The Developer may be required to provide ongoing snow removal from the access road as part of the LEA.

5. Security: The pump station equipment and controls shall be adequately protected with appropriate buildings and fencing to prohibit unauthorized entry by the public.
  6. Weather: The pump station equipment, buildings, vaults, piping, valves, controls, access roads, etc. shall be designed for the weather conditions experienced in the area including sub-zero temperatures, large accumulations of snow, blowing and drifting snow, etc.
  7. Pump Station Building: The emergency generator, pump and equipment controls, electrical panels, communication equipment, odor control equipment, etc. shall be housed in a heated and vented weatherproof building. It shall be the responsibility of the Developer to obtain approval of the building and site improvements from the local planning and building departments.
  8. Equipment Removal: Portable hoists or other equipment shall be provided to facilitate the removal of pumps and other equipment.
  9. Flow Measurement: Continuous measuring and recording of wastewater flow shall be provided at each pump station.
  10. Alarm, Control and Monitoring System.
    - a. A remote alarm, control and monitoring system which allows for remote control and monitoring of the pump station operation and noticing of alarm conditions shall be provided at each pump station.
    - b. The system shall be compatible with SBWRD pump station SCADA system.
  11. Odor Control Facilities: Facilities to control odors generated at the pump station shall be provided.
  12. Pump stations shall be equipped with in-line grinding devices, or equivalent, as approved by SBWRD, to prevent clogging of pumps.
  13. Emergency Operations:
    - a. An in-place, engine driven, emergency generator with an automatic transfer switch shall be provided at each pump station.
    - b. A piping connection for a portable pump with appropriate valving and a vault located connection shall be provided at the pump station to allow pumping of wastewater around the pump station. The valve vault shall be configured to allow the manual operation of valves and the connection of a portable pump to occur outside of the valve vault, thus eliminating the necessity of a confined space entry.
    - c. The generator shall be fueled by natural gas, if the natural gas supply is available near the pump station, or by diesel.
  14. Spare Parts and Service.
    - a. Equipment and spare parts for all pump station components shall be available from local manufacturers and suppliers.
    - b. Local service representatives shall be available for assistance with repair of pump station components.
  - D. Detailed calculations for the wastewater pump station and appurtenances shall be submitted for review and approval.
  - E. An Operation and Maintenance Manual shall be submitted according to the requirements of Section 302.10, Operation and Maintenance Manuals.
  - F. Start-up services and training on the completed pump station shall be completed according to the requirements of Section 510.
  - G. Acceptance testing of the completed pump station shall be completed according to the requirements of Section 516.9.
- 303.11 Force Mains**
- A. Number of Lines:
    1. Generally, a single force main from the wastewater pump station to the receiving manhole will be adequate. However, if the build out of the pump station service area will occur over several years, dual force mains may be required to assure adequate velocities in the lines during the early years.
    2. The projected timing of the service area build-out shall be considered during design.
  - B. Line Size: shall be sized to provide a minimum velocity of 2.0 feet per second while minimizing head losses through the system during system operation.
  - C. Design Friction Losses.
    1. Friction losses through force mains shall be based on the Hazen Williams formula or other hydraulic analysis to determine friction loss.
    2. When the Hazen Williams formula is used, the design shall be based on a value of C equal to 120.
  - D. Design Pressure: force mains and fittings, including reaction blocking, shall be designed to withstand normal pressure and pressure surges (water hammer).
  - E. Detailed calculations for the force main shall be submitted with the pump station calculations.
  - F. Air Valves.
    1. Combination air valves shall be included in the design of the force main. The location of these valves on the system shall be approved by SBWRD.
    2. Combination air valves should be installed at system high points, at significant changes in grade where air pockets can form and at intervals of 2,000' to 2,500' in long horizontal runs that lack a clearly defined high point.
    3. Combination air valves shall be sized for the specific location and system configuration.



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4. Manholes containing air valves shall have a frost-proof frame with vented cover and manhole odor control unit installed.
  5. To minimize hydrogen sulfide attack on the manhole structure, the interior of manholes containing air valves shall have Manhole Interior Coating meeting the requirements of Section 404.17 applied to all interior concrete surfaces or the manhole shall be constructed of Polymer concrete meeting the requirements of Section 404.20.
  6. The location of manholes containing the air valves should generally follow the requirements for manhole locations under Section 303.8. Manholes.
- G. Minimum Line Depth: shall be located below all other utilities with a minimum 18" vertical separation, measured edge of pipe to edge of pipe, from other utilities and shall have a minimum depth of 7' from the top of the pipe to the finished grade elevation. Certain environmental or site-specific conditions may require the line to be installed at a greater depth in order to prevent freezing, as determined by SBWRD.
- H. Vertical Alignment: shall minimize the number of high points, low points and significant changes in grade on the system.
- I. Horizontal Alignment.
1. Located at a sufficient distance from curb and gutter and other structures to eliminate disturbance during possible future repair of the line.
  2. Not placed within 5' of catch basins, vaults or other similar structures.
- J. Connection of the force main to the gravity wastewater collection system shall occur at a manhole and shall meet the following requirements.
1. The invert of the force main line shall enter the manhole 0.5' above the invert elevation of the gravity line. A drop greater than 0.5' will not be allowed.
  2. The force main shall enter the manhole as near to 180 degrees from the gravity outlet line as possible.
  3. The manhole base shall have a formed channel from the force main to the gravity outlet line to minimize disturbance of the wastewater entering the manhole.
  4. To minimize hydrogen sulfide attack on the manhole structure either the interior of the manhole shall have Manhole Interior Coating meeting the requirements of Section 404.17 applied to all interior concrete surfaces or the manhole shall be constructed of Polymer concrete meeting the requirements of Section 404.20.
5. The receiving manhole shall be designed and located with consideration for proximity to existing and future residences, businesses and other facilities which may be affected by potential wastewater odors generated in the pump station and force main that may be released at the manhole.
  6. The receiving manhole shall have a frost-proof frame with vented cover and manhole odor control unit installed.

### 303.12 Borings

- A. Borings under roadways or other similar facilities; consisting of a bored or jacked casing pipe, a carrier pipe and appurtenances; may be approved on a case-by-case basis when an open trench installation method is not allowed by the owner of the roadway or facility.
- B. Borings shall be designed in accordance with applicable City, County, State, or Federal standards and requirements.
- C. Approval for the boring shall be obtained from the owner of the roadway.
- D. Borings under Interstate Highways shall, as a minimum, extend from right-of-way line to right-of-way line.
- E. Casing pipe and carrier pipe material, size, length, and flow line elevations shall be shown on construction drawings.
- F. Casing pipe shall meet requirements of Section 409.
- G. Minimum casing diameter shall typically be 24" to allow for possible upsizing of the carrier pipe in the future, however smaller sized casings may be allowable on a case by case basis as approved by SBWRD.
- H. SBWRD may require submittal of additional structural calculations with construction drawings.
- I. The carrier pipe shall generally be the same pipe material as the connecting wastewater lines.
- J. The carrier pipe shall be supported by manufactured casing spacers designed specifically for this application. Redwood skids are not acceptable.
- K. Casing end seals shall be installed at either end of the casing pipe to prevent migration of water and soil along the carrier pipe.
- L. The design of the boring shall allow for some variance in the installed boring line and grade.
- M. Construction drawings shall require the bored portion of the wastewater line to be completed before construction of the adjacent portions of line to allow for discrepancies in alignment and grade which may occur during the boring operation.

### 303.13 Casings

- A. Wastewater lines shall be installed inside casings when additional protection of the line is necessary as determined by the Project Engineer or SBWRD.

- B. SBWRD may require submittal of additional structural and pipe loading calculations with construction drawings to determine the need for additional protection.
- C. Casing pipe and carrier pipe material, size, length, and flow line elevations shall be shown on construction drawings.
- D. Minimum casing diameter shall typically be 24" to allow for possible upsizing of the carrier pipe in the future, however smaller sized casings may be allowable on a case by case basis as approved by SBWRD.
- E. The carrier pipe shall generally be the same pipe material as the connecting wastewater lines.
- F. The carrier pipe shall be supported by manufactured casing spacers designed specifically for this application. Redwood skids are not acceptable.
- G. Casing end seals shall be installed at either end of the casing pipe to prevent migration of water and soil along the carrier pipe.

### 303.14 Groundwater Migration

- A. The Project Engineer shall consider methods to prevent the continuous migration of groundwater along the trench line including the installation of trench dikes. The methods used shall be approved by SBWRD.
- B. Trench Dikes shall be installed on wastewater lines down gradient from all ditch and stream crossings, periodically along all wastewater lines installed in areas subject to ground water, on the first (downstream) section of a wastewater line installed with a new project, and at other locations as determined by the Project Engineer and approved by SBWRD.

## SECTION 304 – SUBMITTAL REQUIREMENTS AND DESIGN CRITERIA FOR PRIVATE LATERAL WASTEWATER LINES

### 304.1 Description

- A. The design of Private Lateral Wastewater Lines shall include the submittals and required information described in Section 203. Section 304 covers the minimum criteria that shall be used for the design of Private Lateral Wastewater Lines.
- B. Ownership, construction, maintenance and operation of Private Lateral Wastewater Lines from the building to the Public Wastewater System line, including the connection to the Public Wastewater System line, shall be the responsibility of the property owner.
- C. However, to protect the Public Wastewater System to which they connect, Private Lateral Wastewater

Lines shall meet or exceed the minimum requirements contained in these specifications.

### 304.2 Basis of Design

- A. Private Lateral Wastewater Lines shall conform to applicable parts of the International Plumbing Code. Where the requirements of these SBWRD Standards are more restrictive than the International Plumbing Code, SBWRD Standards shall govern.
- B. Each residence, building or other facility shall connect to the Public Wastewater System by way of a separate Private Lateral Wastewater Line unless the requirements for Common Private Lateral Wastewater Lines in Section 102.6 are met and the Common Lateral Wastewater Line is specifically approved by SBWRD.
- C. Private Lateral Wastewater Lines shall be sized according to requirements of the International Plumbing Code for building sewers.
- D. A Private Lateral Wastewater Line stub shall be provided as part of the construction of the Public Wastewater System extension or modification to each lot or building that is part of the development project.
- E. If the extension of the Public Wastewater System passes adjacent to other lots or parcels outside of the proposed development with existing buildings or structures that are not connected to the Public Wastewater System, a Private Lateral Wastewater Line stub shall also be provided for those lots or parcels, as determined by SBWRD.
- F. Private Lateral Wastewater Lines shall not connect directly to Public Wastewater System lines larger than 15" in diameter.
- G. 4" and 6" Private Lateral Wastewater Lines shall not connect directly to manholes but shall connect to a Public Wastewater System Line by way of a wye or tee for new construction and an approved Saddle connection according to Section 410.9 for connections to existing public lines.
- H. In all cases, a manhole shall be used to connect Private Lateral Wastewater Lines 8" and larger to Public Wastewater System lines.
- I. Private Lateral Wastewater Lines shall be gravity flow meeting the requirements of Section 304.6, unless one of the following criteria is met.
  1. The topography of the development would require a gravity flow Public Wastewater line to have an excessive depth as defined in Section 303.6.
  2. The lot or building being served is part of an approved Low-Pressure Sewer System.
  3. The lot or building being served has received prior approval from SBWRD as an ejector lot as evidenced by a note on the subdivision plat, and a gravity flow lateral option is still not available.
  4. The existing Public Wastewater line to which the Private lateral will connect is not at a sufficient

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depth to allow for a gravity flow Private Lateral line.

- J. If a gravity flow Private Lateral line meeting the requirements of these SBWRD standards is achievable for a portion of the building being served, the Private Lateral line from the building to the connection to the Public Wastewater line shall be gravity flow, and any pumping required for lower levels of the building shall occur within the structure.

### 304.3 Location

- A. Private laterals should not be located under driveways, retaining walls or other areas that may restrict access to the private lateral for maintenance and repair, may cause damage to the private lateral, or may increase the possibility of the lateral freezing.
- B. In areas where this cannot be avoided, additional depth, additional cleanouts, material changes, or other precautions as conditions warrant, may be necessary, as proposed by the building owner or his contractor, and acknowledged by SBWRD.

### 304.4 Protection of Water Supplies

- A. Private laterals shall meet the requirements of Section 303.3.

### 304.5 Separation from Other Utilities

- A. Private laterals shall meet the requirements of Section 303.4.

### 304.6 Gravity Flow Private Lateral Lines

- A. Line Size: 4" minimum diameter. 6" maximum diameter unless specifically approved by SBWRD.
- B. Minimum Depth:
1. 4' from the top of the pipe to the finished grade for elevations below 7,000.
  2. 5' from the top of the pipe to the finished grade for elevations above 7,000.
  3. Additional depth is recommended for Private Lateral lines located under driveways or other areas where the clearing of snow and vehicular traffic may force the frost level deeper.
  4. For elevations below 7,000, gravity flow stubs serving ejector pump lots will require a minimum 6' bury depth at the pump to gravity connection to achieve the required 5' bury depth on the pressure lateral.
  5. For elevations above 7,000, gravity flow stubs serving ejector pump lots will require a minimum 8' bury depth at the pump to gravity connection to achieve the required 7' bury depth on the pressure lateral.
  6. Certain environmental or site-specific conditions, including elevation, surface features over the line (pavement vs. landscaping), etc. may require the

private lateral to be installed at a greater depth to prevent freezing.

7. Horizontal separations from retaining walls or other exposed surfaces shall follow the minimum depth requirements.
- C. Minimum Slope: 1/4" per foot (2 percent).
- D. Maximum Slope: 1 foot per foot (100 percent).
- E. Alignment.
1. Private laterals shall be designed on straight horizontal and vertical alignments between bends. Some minor roping or deflection of the private lateral pipe may be allowed.
  2. Vertical bends pose problems in obtaining adequate support during backfill and compaction and should therefore be avoided where possible.
  3. Curvilinear alignments meeting the requirements of Section 304.7 may be allowed on a case by case basis as approved by SBWRD.
- F. Pipe Bends: 22 1/2 degree and 45-degree pipe bends may be used to change direction of the pipe. 90-degree bends shall not be used. Individual pipe bends shall be a minimum 18" apart. 18" separation is also required from cleanouts to downstream bends.
- G. Slopes greater than 3:1 (33%):
1. Gasketed fittings and joints, including those on vertical bends, shall not be used.

### 304.7 Curved Gravity Flow Private Lateral Lines

- A. Gravity flow private lateral lines may be designed and constructed on curvilinear horizontal and vertical alignments on a case by case basis as approved by SBWRD.
- B. If the use of curvilinear lines is approved, the following criteria shall apply.
1. The requirements of Section 304.6 shall apply.
  2. Pipe material shall be HDPE.
  3. The minimum slope of all portions of the line shall be 3.0 percent.
  4. The number of horizontal and vertical curves shall be minimized.
  5. Minimum radius of horizontal and vertical curves: 50'.

### 304.8 Cleanouts

- A. Cleanouts shall be installed on all gravity flow Private Lateral Wastewater Lines according to the following requirements.
- B. Number and Location:
1. A minimum of one cleanout shall be required on each gravity flow private lateral line.
  2. The cleanout shall be located within 5' of the building being served.
  3. Additional cleanouts on the private lateral shall be located at intervals of not more than 100', measured from the entrance to the cleanout, along the lateral, to the next cleanout or the wastewater main line.

4. Where specifically approved by SBWRD, bi-directional cleanouts may be installed at intervals not to exceed 200' as measured from the upstream or downstream entrance of the cleanout on straight runs of piping.
- C. Size: same diameter as the private lateral to which it connects.

### **304.9 Pressure Private Lateral Lines**

- A. Line Size: shall be sized to provide a minimum velocity of 2.0 feet per second at the ejector pump design pumping rate.
- B. Maximum Total System Head: shall not exceed the ejector pump manufactures recommended allowable head for the pump system being proposed. Total system head consists of static (elevation) head plus friction losses through the system.
- C. Minimum Depth:
  1. 5' from the top of pipe to finished grade for elevations below 7,000.
  2. 7' from the top of pipe to finished grade for elevations above 7,000.
  3. 7' from the top of pipe to finished grade for Pressure Private Lateral Lines located under driveways or other areas where the clearing of snow and vehicular traffic may force the frost level deeper.
  4. Additional depth is recommended for Pressure Private Lateral lines installed in conditions such as higher elevations, surface features over the line (pavement vs. landscaping), etc., that may lead to freezing of the line at shallower depths.
- D. Vertical Alignment: shall minimize the number of high points, low points and significant changes in grade.
- E. Connection to Gravity Flow Public Wastewater Lines.
  1. The section of private lateral from the street right-of-way or easement line to the Public Wastewater line shall be gravity flow.
  2. A pressure to gravity transition with cleanout per the standard detail in Appendix C shall be installed at the end of the gravity line to allow access.
- F. Connection to Low-Pressure Sewer System Main Lines.
  1. The pressure Private Lateral wastewater line shall include a curb stop valve, curb box, and check valve assembly located at the right-of-way line or easement line. Curb boxes located in pavement shall be traffic rated.
  2. Private lateral stubs constructed as part of a Low-Pressure Sewer system shall connect to the Low-Pressure Sewer System main lines with an in-line fusion welded tee or an electrofusion branch saddle.

3. New connections to existing Low-Pressure Sewer System main lines shall be accomplished by pinching the main line up and down stream of the proposed connection and installing an electrofusion branch saddle.

### **304.10 Exterior Private Lateral Pump Station**

- A. In addition to the requirements of Section 304.9, private lateral pump stations located exterior to the building served shall meet the following requirements.
- B. A construction drawing of the proposed exterior pump station shall be submitted to SBWRD prior to installation. The plan must address the following items.
  1. Specify pump station vault/basin material. Concrete structures must be protected against corrosion with Manhole Interior Coating material meeting the requirements of Section 404.17. Vaults/basins of other material must be either intrinsically corrosion resistant or treated to a corrosion resistance comparable to the treated concrete structures.
  2. Vaults/basins shall be covered with a lid that is easily secured against casual entry and structurally capable of supporting the weight of traffic, landscaping equipment, etc. that it will be subject to at its installed location.
  3. Vaults/basins must have a floor sloped toward the pump intake to prevent solids buildup in the wet well.
  4. Pumps, piping and valving must be installed to allow removal, servicing and replacement of pumps without requiring entry into the vault/basin.
  5. Penetrations through the vault/basin wall shall be sealed to pass exfiltration test or vacuum test per Sections 517.6.
  6. All hardware in the vault/basin shall be corrosion resistant.

### **304.11 Private Lateral Stubs Constructed with Main Lines**

- A. Private lateral stubs constructed in conjunction with new wastewater main lines shall extend from the Public Wastewater line to a minimum 5' beyond the right-of-way or property line.
- B. Private lateral stubs deeper than 15' shall extend to 10' beyond the right-of-way or property line.
- C. Laterals installed in rock shall have the trench over cut 5' beyond the installed end of the lateral stub.
- D. The end of the Private Lateral stubs shall be capped with a gasketed plug or glued-on or fusion welded cap.
- E. Gravity private lateral stubs shall include cleanouts if required by Section 304.8.

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- F. Private lateral stubs constructed as part of a Low-Pressure Sewer system shall include a curb stop valve, curb box and check valve assembly located at the right-of-way line or easement line with concrete support block under valve box. Curb boxes located in pavement or future driveway areas shall be traffic rated.
- G. Private lateral stubs constructed as part of a Low-Pressure Sewer system shall have a minimum depth of 7' from top of pipe to finished grade. Certain environmental or site-specific conditions, including elevation, surface features over the line (pavement vs. landscaping), etc. may require the private lateral stub to be installed at a greater depth to prevent freezing.
- K. If multiple restaurants or other food service establishments are located within the same building, each restaurant or food establishment shall have a separate grease interceptor and sampling manhole.
- L. On a case by case basis and at the sole discretion of SBWRD, an interior grease trap may be allowed on smaller, low grease producing restaurants or kitchens where an exterior grease interceptor is not feasible. If allowed, the grease trap shall be of the semi-automatic type which allows for removal of the collected grease without removal of the trap cover. The trap shall be appropriately sized for the fixtures connected and installed according to the manufacturer's recommendations.

### 304.12 Grease Interceptors, Oil Separators, Sand Interceptors and Sampling Manholes

- A. A grease interceptor, oil separator or sand interceptor, located outside the facility or building, shall be provided as part of the Private Lateral Wastewater line of any commercial, industrial, and institutional facility or building that has the potential of introducing substances that would be detrimental to the Public Wastewater System, as determined by SBWRD according to the SBWRD Pretreatment Program.
- B. A separate sampling manhole shall be provided with grease interceptors serving restaurants and industrial facilities or as otherwise determined by SBWRD.
- C. To minimize hydrogen sulfide attack on the manhole structure either the interior of the sampling manhole shall have Manhole Interior Coating meeting the requirements of Section 404.17 applied to all interior concrete surfaces or the manhole shall be constructed of Polymer concrete meeting the requirements of Section 404.20.
- D. Sampling manholes are not required with sand/oil interceptors connected to parking structures or garage drains.
- E. Only grease or oil laden waste shall discharge to the interceptor. Sanitary waste shall be excluded from the interceptor.
- F. Building sewers transporting sanitary waste shall connect to the Private Lateral Wastewater line at or downstream of the sampling manhole
- G. Common laterals shall not connect to a lateral that is downstream of a grease interceptor.
- H. The structures should be located considering maintenance access and the potential for odors.
- I. Venting of the structure through a vent stack shall not be allowed.
- J. The capacity of the grease interceptor shall be according to the requirements of the International Plumbing Code or as directed by SBWRD. The minimum capacity of grease interceptors serving restaurants shall be 1,000 gallons. The minimum capacity for parking structures shall be 500 gallons.

### 304.13 Private Lateral Casings

- A. Private Lateral Wastewater lines shall be installed inside casings when additional protection of the line is necessary as determined by SBWRD.
- B. To allow for some variation in how the carrier pipe is positioned in the casing pipe, the casing pipe shall be installed at a minimum 3% slope.
- C. Casing end seals shall be installed at either end of the casing pipe to prevent migration of water and soil along the carrier pipe.

### 304.14 Private Lateral Borings

- A. Private Lateral Wastewater lines shall not be installed using the boring method unless specifically approved by SBWRD.

## CHAPTER 4 – MATERIAL REQUIREMENTS

### SECTION 401 - GENERAL

#### 401.1 Minimum Requirements

- A. The material requirements contained in this Chapter include the minimum requirements necessary for construction of wastewater facilities in the SBWRD.
- B. Contractor shall submit material cut sheets and specifications for proposed materials according to Section 501.2 to demonstrate compliance with SBWRD Standards.
- C. Materials proposed for incorporation into the work that do not conform to these specifications shall require written approval by SBWRD prior to delivery to the job site.
- D. Any material or equipment not conforming to the Approved Construction Drawings and/or these SBWRD Standards or has not received prior written approval by SBWRD shall be removed from the project site.

#### 401.2 Use of Materials

- A. All materials and equipment furnished for permanent installation in the work shall be new, unused, and undamaged when installed or otherwise incorporated in the work.
- B. No material or equipment shall be used by the contractor for any purpose other than that intended or specified.

### SECTION 402 - GRAVITY PIPE

#### 402.1 Acrylonitrile Butadiene Styrene (ABS) Pipe:

- A. Pipe: Schedule 40 DWV per ASTM F 628 or D 2661.
- B. Fittings: ASTM F 628 or D 2661.
- C. Joints: Solvent Cementing: ASTM D 2235.
- D. All products shall bear the seal of a nationally recognized listing or certifying agency.
- E. Permitted for 4" and 6" diameter gravity Private Lateral Wastewater Lines only. Shall not be used for ejector pump pressure lines or any public wastewater line.

#### 402.2 High Density Polyethylene (HDPE) Pipe

- A. Materials: Virgin resins, Cell Classification meeting or exceeding PE 345464C as defined in ASTM D 3350, resins shall be listed by the Plastic Pipe Institute in its pipe-grade registry TR-4.
- B. Pipe and Fittings:

1. ASTM Material Designation Code: PE 3608/3408 or PE 4710 high density, extra high molecular weight.
  2. SDR 17 in accordance with ASTM F 714.
  3. Outside diameter to be ductile iron pipe size (DIPS) or iron pipe size (IPS).
  4. Marked in accordance with ASTM F 714.
  5. Pipe shall be manufactured with an integral color-coded stripe of HDPE, color green.
- C. Fittings for Private Lateral Lines:
1. No molded HDPE fittings will be allowed.
  2. 45-degree bends shall be fusion welded seamless long radius HDPE sweep bends, or fusion welded 3 segment fabricated HDPE fittings.
  3. Wyes for cleanouts shall be fabricated fusion welded fitting.
  4. The SDR of the fitting shall match the SDR of the adjoining pipe.
- D. Joints:
1. Zero leak-rate heat-fusion joint conforming to ASTM D 3261.
  2. HDPE gravity lines 8" and larger shall have the internal bead resulting from the heat-fusion process removed and extracted from the pipe during the cooling stage of the fusion process.
  3. The bead removal process shall be in accordance with the bead removal equipment manufacturer's specifications.
  4. The extracted fusion bead shall be subjected to visual inspection and verification per Section 516.8.
- E. Minimum slope requirements in accordance with Section 303.7 shall apply.

#### 402.3 Polyvinyl Chloride (PVC) Pipe

- A. Material: PVC plastic having a cell classification of 12364 or 12454 as defined in ASTM D1784
- B. Pipe:
  1. 4" thru 15" diameter: ASTM D 3034, SDR-35.
  2. 18" thru 48": ASTM F 679 (Large diameter solid wall), SDR 35.
  3. Minimum pipe stiffness shall be 46 psi when tested in accordance with ASTM D 2412.
- C. Fittings:
  1. Gasketed sewer fittings conforming to ASTM F-1336.
  2. Solvent weld PVC fittings meeting ASTM D3034 may be used on 4" and 6" private laterals. Gasketed fittings shall not be used for solvent welding.
- D. Joints:

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1. Integral bell gasketed joints conforming to ASTM D3212. Rubber gaskets shall be factory installed and conform to ASTM F 477.
  2. Joints on 4" and 6" diameter pipe may be solvent weld joints conforming to ASTM D 2855. A purple primer conforming to ASTM D 656 and solvent cement not purple in color and conforming to ASTM 2564 shall be used.
- E. Pipe lengths shall not be greater than 20 feet.
- F. PVC pipe meeting requirements of ASTM D 1785, Schedule 40 or Schedule 80, with equivalent gasketed or solvent weld fittings, may be used for 4" and 6" Private Lateral Wastewater Lines.

### 402.4 Polyvinyl Chloride (PVC) AWWA C900 Pipe

- A. Material: PVC plastic having a cell classification of 12454 as defined in ASTM D1784
- B. Pipe:
1. Meets the requirements of the ANSI/AWWA C900 standard specification of polyvinyl chloride water distribution pipe.
  2. DR-18 or less
- C. Joints:
1. Restrained gasketed joints required.
  2. The integral bell joint system meets the requirements of ASTM D3139 and utilizes an elastomeric seal meeting the specification defined in ASTM F477.

## SECTION 403 - PRESSURE PIPE

### 403.1 High Density Polyethylene (HDPE) Pipe

- A. Materials: Virgin resins, Cell Classification meeting or exceeding PE 345434C as defined in ASTM D 3350, resins shall be listed by the Plastic Pipe Institute in its pipe-grade registry TR-4.
- B. Pipe and Fittings:
1. ASTM Material Designation Code: PE 3608/3408 or PE 4710 high density, extra high molecular weight.
  2. 1 1/4" thru 12" diameters. SDR and Pressure Class shall be based on specific requirements of installation with minimum SDR 11 and Pressure Class 160 in accordance with ASTM F 714.
  3. Outside diameter to be ductile iron pipe size (DIPS) or iron pipe size (IPS).
  4. Marked in accordance with ASTM F 714.
  5. Pipe shall be manufactured with an integral color-coded stripe of HDPE, color green.
- C. Joints: Zero leak-rate heat-fusion joint conforming to ASTM D 3261.
- D. Thrust Blocking: Appropriate thrust blocking, designed specifically for the pressures and soil conditions encountered, shall be installed at all fittings.

### 403.2 Polyvinyl Chloride (PVC) Pipe

- A. Material: PVC plastic having a cell classification of 12454 as defined in ASTM D1784.
- B. Pipe and Fitting.
1. 1 1/4" thru 3" diameters: ASTM D 1785, Schedule 40 or Schedule 80 depending on anticipated pressures. DWV cellular core pipe (ASTM F891) shall not be used.
  2. 4" thru 12" diameters: AWWA C900. DR and Pressure Class shall be based on specific requirements of installation with a DR of 18 or less and Pressure Class 150.
- C. Joints.
1. 1 1/4" thru 3" diameters. Solvent cement joints conforming to ASTM D 2855. A purple primer conforming to ASTM D 656 and solvent cement not purple in color and conforming to ASTM 2564 shall be used.
  2. 4" thru 12" diameters. Integral-bell gasketed joints conforming to ASTM D31339. Rubber gaskets shall be factory installed and conform to ASTM F 477.
- D. Fittings: ANSI A21.10. Fittings shall be consistent with the specified pipe.
- E. Thrust Blocking: Appropriate thrust blocking, designed specifically for the pressures and soil conditions encountered, shall be installed at all fittings.

## SECTION 404 - MANHOLES

### 404.1 General

- A. Manholes shall be watertight and shall be constructed with precast reinforced cementitious concrete or polymer concrete bases, wall and cone sections, thermo-plastic riser form, and castings.
- B. Steps shall be installed in all manholes except approved shallow manholes and Polymer Concrete manholes.
- C. Cast-in-place concrete bases will generally not be allowed, and if allowed only for connection of new main lines to existing main lines where the use of a precast concrete base is not practical, as specifically approved by SBWRD.
- D. Concrete manhole products shall not be installed within 7 days of manufacture date. The date stamped on the concrete product will be used as the starting date in determining this time period. Any concrete product installed prior to the completion of this 7-day period will not be approved by SBWRD and shall be removed.

### 404.2 Precast Concrete Bases

- A. Shall conform to ASTM C 478 and standard detail "Precast Manhole with Precast Base" in Appendix C. Shall consist of a monolithically cast precast base section with invert and shall be supplied with a

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flexible pipe connector for each pipe entering the manhole.

### B. Invert:

1. An invert shall be provided for each pipe, including private laterals, entering the manhole.
2. Inverts shall be full depth. The cross-sectional shape of the invert shall be uniform for the entire length and shall match the lower halves of the inflow and outflow pipe up to the spring line of the pipe and shall be vertical from the spring line to the top of the pipe.
3. In certain situations, extra depth of the channel may be required to contain the wastewater flow in the channel.
4. If a change in pipe diameter occurs at the manhole, a smooth transition from one size to the other shall be provided.
5. The invert shall have a uniform grade from inflow to outflow pipe flow lines with no areas of flat or reverse grade.
6. Changes in flow direction shall be smooth and uniform. Short radiuses or abrupt changes in direction will not be allowed.
7. The junction where the pipe abuts the invert shall be manufactured specifically for the type of pipe connecting to the manhole such that the flowline of the pipe matches the flowline of the invert.
8. The junction shall be constructed so that the distance from the inside of the manhole wall to the end of the pipe when installed is 5" for HDPE pipe and 3" for all other pipe material.
9. Minimum clear distance between two wall penetrations shall be 6 inches. Minimum clear distance between wall penetration and joint shall be 3 inches.
10. Minimum drop through manhole as required by Section 303.8.

### C. Apron: Minimum 2% cross-slope.

### D. Private Lateral Wastewater Line connections to Pre-cast Base:

1. Private Lateral Wastewater Line connections to manholes are only allowed for 8" diameter lines as specifically approved by SBWRD. 4" and 6" lateral connections to the public wastewater system shall be according to Section 304.2.
2. If allowed, Private Lateral Wastewater Line connections to pre-cast bases shall meet the requirements for flexible pipe connector and inverts listed above.
3. In addition, the elevation of the lateral line entering a manhole shall be at or above the spring line of the main line.
4. If allowed, the number of Private Lateral Wastewater Lines connecting directly to each manhole shall be limited to two (2). Exceptions shall be as approved by SBWRD.

- E. Steps: Shall be located over the largest apron of the manhole base except when rotating the eccentric cone away from the edge of road is required.

### 404.3 Cast-in-Place Concrete Bases

- A. If approved by SBWRD, shall conform to standard detail "Cast-in-Place Manhole Base" in Appendix C and applicable portions of ASTM C-478, and shall include a precast wall section with a cast-in-place invert.
- B. The cast-in-place concrete base shall be located at the approximate midpoint of an individual pipe section on the existing main line in order to avoid including a joint of the existing pipeline within the new manhole base.
- C. The material around the existing pipe shall be removed to a level that is a minimum 12" below the bottom of the pipe extending radially from the center of the new manhole a sufficient distance to allow for placement of bedding material and concrete as discussed below.
- D. The existing pipe shall be adequately supported to prevent settlement or damage.
- E. A minimum 6" depth of compacted bedding material shall be placed to provide a level subgrade for the cast-in-place base.
- F. The initial precast wall section shall be supported on concrete blocks and adjusted to proper alignment and grade prior to pouring the invert. The concrete blocks shall be positioned to not interfere with the coring of the base for placement of the new pipe and shall not be exposed in the finished manhole base.
- G. The precast wall section may have "doghouse" cutouts to span the existing pipe.
- H. The precast wall section shall not bear directly on the existing pipe.
- I. Adequate separation between any part of the precast wall section and the pipe shall be provided to allow for placement of the pipe to manhole adapters and to provide a minimum 3" thickness of concrete between the pipe and the wall section.
- J. Prior to placing the concrete, the outside of the existing pipe shall be cleaned and pipe to manhole adapters (2 per side), located at each outside manhole wall, shall be installed on the existing pipe.
- K. Prior to placing the concrete, a circular form extending from the prepared subgrade to a minimum 6" above the top of the highest pipe entering the manhole shall be installed and anchored. The form shall be a minimum 12" greater in diameter than the outside of the manhole section wall and shall be located concentric with the manhole section.
- L. The cast-in-place invert shall be a continuous pour of Class 4000 concrete and shall meet the following requirements.
  1. Concrete shall be a minimum 6" in thickness below the bottom of the existing pipe and the



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- bottom of the precast manhole wall section and shall extend a minimum 6" radially, measured from the outside of the precast manhole wall section.
2. The concrete on the outside of the manhole shall extend a minimum 6" above the top of the highest pipe that will connect to the manhole and shall be level for the full circumference of the manhole.
  3. The concrete on the inside of the manhole shall extend to the top of the highest pipe that will connect to the manhole.
  4. The concrete shall be formed around the existing pipe to provide an invert in the manhole. The bottom half of the existing pipe will remain in place to form the bottom of the invert. The concrete above the existing pipe shall be formed to provide a uniform channel with vertical sides that matches the diameter of the pipe from spring line to the top of pipe.
  5. In certain situations, extra depth of the channel may be required to contain the wastewater flow in the channel.
  6. After the cast-in-place base has been completed and cured for a minimum of 48 hours and after the wall section, cone and casting have been placed and tested, the top half of the existing pipe shall be removed to within 3" of the manhole wall in the length of the pipe and to the spring line of the pipe in the width.
  7. Rough edges of the pipe and concrete thus exposed shall be ground smooth and, if necessary, grouted with epoxy grout in such a manner as to produce a smooth and acceptable finish.
  8. Any gaps at the interface of the precast wall section and the cast-in-place concrete due to concrete shrinkage shall be grouted or sealed as directed by SBWRD.
  9. Minimum drop through manhole as described in Section 303.8.
  10. Apron: Minimum 2% slope.
- M. Connections of new pipe to Cast-in-place manholes:
1. After invert has been poured and cured, the cast-in-place base shall be core drilled at the design elevation to accept a flexible pipe connector and to form a full depth invert for the new pipe.
  2. A flexible pipe connector shall be installed in the core drilled base to provide a watertight seal.
  3. Installation of pipe in flexible pipe connectors shall be per manufacturer's recommendation.
  4. Additional forming of the core drilled invert by chipping and grouting may be required to provide a smooth transition to the existing invert.
- N. Private Lateral Wastewater Line Connections to Cast-in-Place Base:
1. The connection of Private Laterals to cast-in-place bases shall meet the requirements listed in item L above.
  2. In addition, the elevation of the Private Lateral line entering a manhole shall be at or above the spring line of the main line.
- O. Any portion of the existing line damaged shall be repaired or replaced by the contractor as approved by SBWRD.
- P. Debris and construction material shall not be allowed to enter the existing wastewater system.
- Q. If debris and construction material does enter the existing wastewater system the Contractor shall be responsible for removal of the material, as approved by SBWRD.

### 404.4 Manhole Sections

- A. Precast reinforced concrete conforming to ASTM C 478.
- B. Joints: Tongue and groove type specifically designed for type of joint sealant material being used.
- C. Lifting Insert: Designed to not extend completely through section wall with a minimum 3/4" cover from inside of wall.
- D. Steps: Installed in all sections except sections in shallow manholes.
- E. Precast base sections shall be monolithically poured.
- F. Cone sections shall be of the eccentric type, excepting polymer manholes.

### 404.5 Grade Rings

- A. Grade rings shall only be used as a component of the adjustment of frame and cover to final grade when specifically approved by SBWRD. Standard adjustment shall be accomplished with a Thermoplastic Riser Form. If approved, grade rings shall meet the following requirements.
- B. Grade rings shall be expanded polypropylene grade rings, "Pro-Ring™" as manufactured by Cretex Specialty Products or approved equal, installed per manufacturer's specifications.
- C. The joints between the grade ring and cone, between grade rings, and between the grade ring and Thermoplastic Riser Form shall be sealed with M-1 Structural Adhesive/Sealant as manufactured by Chem Link or approved equal per manufacturer's instructions.
- D. Designed to meet H-20 live loading.
- E. Sizes: 6" height only.
- F. Concrete grade rings shall not be used.

### 404.6 Flat-Slab Lid

- A. Precast reinforced concrete conforming to ASTM C 478.
- B. Designed to meet H20 live loading.

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- C. Joints: Tongue and groove type compatible with manhole sections and specifically designed for type of joint sealant being used.
  - D. Allowed only on 6-foot diameter or larger manholes or on manholes meeting the requirements of standard detail “Shallow Manhole” in Appendix C.
  - E. Opening for casting on 6 foot or larger diameter manholes shall be offset to align with steps in the manhole sections.
  - F. Opening for casting on “Shallow Manholes” shall be centered in lid.
- a. a. 27 3/4" in diameter, non-vented with closed-pick pick hole for removal.
  - b. Low profile cross-hatch pattern, D&L Supply A-1018-32 or approved equal.
  - c. Marked "SEWER."
- 5. Inner Cover:
    - a. 1/4" Aluminum with recessed handle, D&L Supply A-1019 or approved equal.
- D. Odor Control Units.
    - 1. Frost-proof Frame and Cover as specified in C. above without inner cover.
    - 2. Cover shall be drilled with 12 – 3/4" diameter holes for venting.
- E. Metal Adapter Rings (Risers).
    - 1. Shall only be allowed for adjusting the top of frame elevation on existing manholes for pavement overlays as approved by SBWRD.
    - 2. Shall not be allowed on manholes constructed as part of a new development project.
    - 3. The maximum depth of adapter rings shall be 4".
    - 4. The maximum number of adapter rings shall be 2.
    - 5. D&L Supply G-2088 thru G-2093, Olympic Foundry or approved equal.
    - 6. Shall not have slots for dust pans.
    - 7. Shall include 4 set-screws to anchor ring to existing frame.
    - 8. Shall be compatible with the existing frame being adjusted.

### 404.7 Frame and Cover

- A. Standard Frame and Cover.
  - 1. Cast iron conforming to ASTM A48 Class 35B.
  - 2. Combined minimum weight of 400 pounds with the cover approximately 150 pounds and the frame approximately 250 pounds.
  - 3. Frame.
    - a. Shall be of the cone construction, D&L Supply A-1180 series or approved equal.
    - b. Shall not have slots for dust pans.
    - c. Frames with flat slab construction are not allowed.
  - 4. Cover.
    - a. 24 3/4" in diameter, non-vented with closed pick hole for removal.
    - b. Low profile cross-hatch pattern, D&L Supply A1181-10, or approved equal.
    - c. Marked "SEWER."
- B. Oversized Frame and Cover.
  - 1. Shall be used on manholes connecting to pipelines 27" diameter and greater.
  - 2. Cast iron conforming to ASTM A48 Class 35B.
  - 3. Combined minimum weight of 422 pounds.
  - 4. Frame.
    - a. Shall be of the cone construction, D&L Supply A-1353 or approved equal.
    - b. Shall not have slots for dust pans.
    - c. Frames with flat slab construction are not allowed.
  - 5. Cover.
    - a. 30" in diameter, non-vented with closed-pick pick hole for removal.
    - b. Low profile cross hatch pattern, D&L Supply A-1361 or approved equal.
    - c. Marked "SEWER."
- C. Frost -proof Frame and Cover
  - 1. Cast iron conforming to ASTM A48 Class 35B.
  - 2. Combined minimum weight of 442 pounds.
  - 3. Frame.
    - a. Shall be of the cone construction, D&L Supply A-1017-R1 Ring or approved equal.
    - b. Shall not have slots for dust pans.
    - c. Frames with flat slab construction are not allowed.
  - 4. Cover.

### 404.8 Manhole Steps

- A. Shall conform to ASTM C 478 with 1/2" deformed grade 60 steel reinforcing rods encased in polypropylene conforming to ASTM 2146, Type II, Grade 16906.
- B. See Section 509.4 for spacing and alignment requirements.

### 404.9 Flexible Pipe Connector (Boot)

- A. Shall conform to ASTM C-923.
- B. Manufactured and sized specifically for the type and size of pipe connecting to the manhole.

### 404.10 Pipe to Manhole Adapter

- A. “Romac Style ‘LCT’ Manhole Adapter Gasket” as manufactured by Romac Industries, Inc., Fernco Large Diameter Waterstop or Manhole Adapter as manufactured by Fernco, Inc., or approved equal.

### 404.11 Joint Sealant Material

- A. Shall meet the following requirements.
  - 1. Preformed flexible joint sealant (mastic) meeting requirements of ASTM C 990. Ram-Nek as manufactured by Henry Company Sealants Division, Kent Seal as manufactured by Hamilton Kent, Polysealant as manufactured by J-K Polysource, Inc., or approved equal.

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### 404.12 Concrete

- A. Pre-cast: Shall meet the requirements of ASTM C-478.
- B. Cast-in-place: Class 4000: 28-day minimum compressive strength of 4000 psi and contain not less than 6 ½ bags of low alkali, Type II or Type V Portland Cement per cubic yard and air entrainment per ASTM C-150.

### 404.13 Non-Shrink Cementitious Grout

- A. High strength, non-shrink, non-metallic, cement-based grout.
- B. Surfaces shall be prepared and grout shall be prepared and placed according to manufacturer's directions.

### 404.14 Non-Shrink Epoxy Grout

- A. High strength, non-shrink, 100% solids, 3 component epoxy grout system.
- B. Surfaces shall be prepared and grout shall be prepared and placed according to manufacturer's directions.

### 404.15 Prohibited Manhole Adjustment Materials

- A. Brick, block, rocks, wood, metal or plastic shims and all other similar material shall not be used for adjustment of frame and cover to final grade. Standard adjustment shall be accomplished with a Thermo-plastic Riser Form trimmed to allow the frame to sit firmly on the form without any further adjustment.

### 404.16 Thermoplastic Riser Form

- A. Thermoplastic riser form: As manufactured by Whirlygig® or approved equal.
- B. Sealant for Thermoplastic riser: One-compound, all purpose, polyurethane sealant. Sikaflex® Construction Sealant as manufactured by Sika Chemical; Dynatrol®-XL as manufactured by Pecora Corporation or approved equal.

### 404.17 Manhole Interior Coating

- A. Manhole interior coating shall be installed by a licensed contractor that has been trained and certified to install the coating system of choice.
- B. Holiday (spark) testing shall be required. Coating system submittal shall include the required testing and installation procedures.
- C. All required surface preparation, including manhole void patching and repair, cleaning, concrete cure time, and drying shall be done in accordance with the product installation guidelines and procedures. Manhole interior coating shall meet the requirements of one of the following coating systems.
  - 1. 100% solids, high-built epoxy coating. Structure Guard® as manufactured by Quadex™ (a Vortex Company) in Sandy, UT or approved equal.

- 2. Fiber reinforced geopolymer mortar. GeoKrete® geopolymer, as manufactured by Quadex™ (a Vortex Company) in Houston TX or approved equal.
  - 3. Solvent Free 100% solids, ultra-high build epoxy-based coating system. Raven 405 as manufactured by Raven Lining Systems, Broken Arrow, OK; Sewer Shield® 150, as manufactured by Environmental Coatings, LLC, Mesa, AZ; or approved equal.
  - 4. 100% solids – VOC free polyurethane coating system. Spraywall® as manufactured by Sprayroq Protective Lining Systems, Irondale, AL, or approved equal.
  - 5. Multi-layer polymer resin-based lining system. SpectraShield Lining System as manufactured by CCI Spectrum or approved equal.
  - 6. Aggregate-filled epoxy-based lining system. Sauereisen Sewergard® 210 as manufactured by Sauereisen, Pittsburg, PA, or approved equal.
  - 7. Spray application Polyurea system. OBIC LLC Lining System as manufactured by OBIC Products or approved equal.
- D. Surfaces shall be prepared and filled, and coating material shall be prepared and applied according to manufacturer's directions.

### 404.18 Manhole Odor Control Units

- A. Thermo-plastic manhole insert with removable carbon filled canister designed to remove hydrogen sulfide and other odorous components in the exhaust air from the wastewater system.
- B. "Sweet Street Odor Control Module" as manufactured by Continental Carbon Group, "Odoreater Manhole Insert" as manufactured by Parson Environmental Products, Inc., "Manhole Odor Control Module: as manufactured by ECS Environmental Solutions, "Wolverine Brand Manhole Odor Insert" as manufactured by Wolverine Brand, or approved equal.
- C. The unit shall be supplied with high activity, chemically treated activated carbon specifically designed for use in odor control applications.
- D. The odor control unit shall be secured to the manhole with a ¼" cable, epoxy coated eye bolt, and clamp (all stainless steel). Cable shall be of sufficient length to allow the odor control unit to be placed on the surrounding surface without the need to disconnect the clamp.
- E. The manhole frame and cover supplied for manholes with these Manhole Odor Control Units shall meet the requirements of Section 404.7.E.

### 404.19 Expandable Waterstop

- A. Composite bentonite clay based or expandable rubber-based water-stop designed to create watertight joints in concrete.

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- B. Hydrotite as manufactured by Greenstreak, Superstop as manufactured by Tremco, Mirastop as manufactured by Carlisle Coatings and waterproofing, or approved equal.
- C. Provide adequate concrete cover over water-stop per manufacturer's recommendation.
- D. Surface preparation and installation per manufacturer's recommendation.

### 404.20 Polymer Concrete Manholes

- A. Polymer Concrete Manholes shall meet the requirements of this Section 404. ASTM C-478 material and manufacturing is allowed compositional and dimensional differences required by a polymer product.
- B. Manhole risers, transition slabs, conical tops, grade rings and manhole base sections shall be designed, by manufacturer, to requirements of ASTM C-478 and ASTM C 857 as modified to accept polymer construction in lieu of cementitious concrete as follows.
  - 1. Polymer Mixture – the mixture shall consist solely of thermosetting resin, sand and aggregate. No cementitious materials shall be allowed as part of the mix design matrix. All sand and aggregate shall be nonreactive in an acid environment.
  - 2. Required wall thickness for all members will be that stated by polymer manhole manufacturer based upon loading conditions and materials properties. The wall thickness of risers and conical tops shall be not less than that prescribed by the manufacturer's design by more than 5%. A wall thickness greater than the prescribed design shall not be cause for rejection.
  - 3. Thermosetting Resin – the resin shall have a minimum deflection temperature of 158° F when tested at 264 psi following Test Method D 648. The resin content shall not be less than 7% of the weight of the sample as determined by Test Method D2584. Resin selection shall be suitable for applications in the corrosive conditions to which the structures will be exposed.
  - 4. Each manhole component shall be free of all defects, including indentations, cracks, foreign inclusions and resin starved areas that, due to their nature and degree or extent, detrimentally affect the strength and serviceability of the component part. The internal diameter of the manhole components shall not vary more than 1%. Variations in height of two opposite sides of risers and conical tops shall not be more than 5/8 inch. The under run in height of a riser or conical top shall not be more than ¼ in/ft of height with a maximum of ½ inch in any one section.
  - 5. Marking and Identification – each manhole component shall be marked on the inside and

outside with the following information:

Manufacturer's name or trademark,  
Manufacturer's location and production date.

- 6. Manhole joints shall be assembled with a bell and spigot or shiplap butyl mastic joint so that on assembly, manhole base riser and top section make a continuous and uniform manhole. Joint sealing surfaces shall be free of dents, gouges and other surface irregularities that would affect joint integrity.
- 7. Construct invert channels to provide smooth flow transition waterway with no disruption of flow at pipe to manhole connections. Invert slope through manhole is as indicated on drawings. Provide curves for side inlets and smooth invert fillets for flow transition between pipe inverts. Polymer bench and channel are to be constructed with all resin aggregate material – no alternative fill material is allowed.
- 8. Provide resilient connectors per Section 404.9.
- 9. Exceptions to ASTM C-478 – components shall be designed for the intended combinations of manufacturing materials. Component designs may be as non-reinforced members as recommended by the manufacturer. Steel reinforcement is not required for circumferential reinforcement, joint reinforcement, base slab reinforcement or hoop reinforcement, but may be placed for the purpose of product handling.
- C. Grouting – all material needed for grouting and patching shall be a polyester mortar compound provided by the manhole manufacturer.
- D. Manhole steps will not be required in Polymer Concrete Manholes.
- E. The design of Polymer Concrete Manholes to be located in areas where the groundwater level is higher in elevation than the bottom of the manhole shall consider the effects of buoyancy. An extended base footer may be necessary.
- F. Polymer Concrete Manholes shall be 'Armorock' polymer manhole system as manufactured by Geneva Polymer Products, Clark County, Nevada, or approved equal.

### 404.21 External Joint Collar for Manholes

- A. For use on existing manholes where new wall sections are placed on existing sections with non-matching joints.
- B. Shall conform to ASTM C877. Cretex Wrap as manufactured by Cretex Specialty Products or approved equal.

### 404.22 Inside Drop Manhole

- C. Inside drop bowl: Sized for the size of incoming pipe connection and manhole. As manufactured by Reliner®/Duran, Inc. or approved equal.

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- D. Stainless steel support brackets, as manufactured by Reliner®/Duran, Inc. or approved equal.

### SECTION 405 - LOW-PRESSURE SEWER SYSTEM

#### 405.1 General

- A. The design of the Low-Pressure Sewer System shall meet the requirements of Section 303.9.
- B. The proposed Low-Pressure Sewer System and appurtenances shall be consistent within each development.

#### 405.2 Main Line Materials

- A. Low-Pressure Sewer System pipe: HDPE pressure pipe meeting the requirements of Section 403.1.
- B. Flushing Connections.
1. Manhole: Minimum 5' diameter meeting the requirements of Section 404.
  2. Ball Valves:
    - a. 2" Main Ball Valve: PVC, True Union ball valve, full port, threaded X PE butt fused end connections, 150 psi working pressure, non-locking handle
    - b. 1" Hose End Ball Valve: Bronze (Brass) body with Type 316 stainless steel ball and stem, full port, vinyl coated stainless steel lever-style handle, threaded, minimum 150 psi working pressure.
  3. Universal Coupling: Brass, 110 psi working pressure, 1". Air King Universal Coupling as manufactured by Dixon Valve and Coupling Co. or approved equal.
  4. Pressure Hose:
    - a. Tube: Nitrile synthetic rubber or Type P(EDPM) RMA Class A or B (High to medium oil resistance).
    - b. Temperature: -20° to 190° F.
    - c. Reinforcement: spiral or braided synthetic textile cord.
    - d. Cover: Synthetic rubber or Type P(EDPM) RMA Class A or B (high to medium oil resistance).
    - e. Pressure Class: Min 250 psi working pressure.
    - f. Connectors: Threaded brass with minimum 250 psi working pressure.
    - g. Size: Minimum 1" inside diameter.
    - h. Manufacturers: Gates 6B Dura Master® as manufactured by Gates Corporation, Wingfoot® as manufactured by Goodyear Engineered Products Grizzly™ 500 as manufactured by Parker Industrial Hose or approved equal.
  5. Pipe Supports.
    - a. Adjustable Pipe Saddle Support w/ Strap: Two-piece, full circle pipe saddle with strap

and neoprene liner to isolate and protect pipe; threaded pipe w/ adjuster; and threaded standpipe, cross bolted to prevent up-lift. All metal items shall be stainless steel. TolCo Figures 311, 319 and 316T as manufactured by TolCo a brand of NIBCO, Inc., Standon Pipe Support as manufactured by Standon Pipe Supports Inc. or approved equal.

- b. Adjustable Pipe Saddle Support: One piece, saddle support with neoprene liner to isolate and protect pipe; threaded pipe w/ adjuster, and threaded standpipe, cross bolted to prevent up-lift. All metal items shall be stainless steel. TolCo Figures 317A and 316T as manufactured by TolCo a brand of NIBCO, Inc. or approved equal.
  - c. Pipe supports for smaller diameter pipe (2" and 3") may consist of Unistrut, or approved equal, channel, brackets and clamps. All metal parts shall be stainless steel. Neoprene liner is required on all pipe-to-support contact areas to isolate and protect pipe.
  6. Miscellaneous Pipe and Fittings: Threaded, schedule 80 PVC.
- C. Combination Air Valve.
1. Manhole: Minimum 5' diameter meeting the requirements of Section 404.
  2. Sewage Combination Air Release and Air/Vacuum Valve with Accessories. A.R.I. Series D-025, Reinforced Nylon body, as manufactured by A.R.I. Flow Control Accessories or approved equal. Size of valve shall be determined by Engineer and approved by SBWRD.
  3. HDPE to Brass Adapter: SDR 11 HDPE X aluminum bronze or red brass MPT with Full length HDPE. Aluminum Bronze MPT Adapter as manufactured by High Country Fusion Company, Inc., Red Brass Transition Fitting as manufactured by Industrial Pipe Fittings, LLC, or approved equal.
  4. Valves: Meeting requirements of Section 405.2.B.2.
  5. Dielectric Fittings: Shall be used at the connection of any dissimilar metallic pipe or fittings.
  6. Miscellaneous Pipe and Fittings: Threaded, schedule 40 brass.

#### 405.3 Private Lateral Wastewater Line Materials

- A. Individual Low-Pressure grinder pump station: Environment One D-Series as manufactured by Environment One Corporation.
- B. Low-Pressure Sewer System pipe: HDPE pressure pipe meeting the requirements of Section 403.1.

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- C. Private Lateral Components:
1. Stainless steel combination curb stop valve/check valve assembly with valve box: Environment One Corporation “Uni-lateral” or approved equal with compatible polypropylene compression adapter fittings for connection to HDPE pipe.
  2. Valve box shall be arch pattern.
  3. Valve boxes shall include valve operator extension rod.
  4. Valve boxes located in traffic areas shall be traffic rated iron or shall have a traffic rated frame and cover installed over the valve box.
  5. Other components used in connecting the Low-Pressure grinder pump station to the public Low-Pressure system shall be compatible with the components of the pump station; especially in regards to galvanic corrosion of dissimilar metals.
1. Flexible PVC or rubber pipe connector with stainless steel shear ring, Strong Back - RC Series Repair Coupling as manufactured by Fernco, Inc., Flex-Seal ARC Series as manufactured by Mission Rubber Co. or approved equal. Transition couplings or bushings required for pipe material of differing outside diameter.
- B. HDPE Pipe: HDPE Electro fusion coupling as manufactured by Central Plastics Company or approved equal.
- C. PVC Pipe.
1. PVC double bell repair coupling, ASTM D 3034, SDR 35, with gasketed joints conforming to ASTM 3212.
  2. If approved by SBWRD, Flexible PVC or rubber pipe connector with stainless steel shear ring, Strong Back - RC Series Repair Coupling as manufactured by Fernco, Inc., Flex-Seal ARC Series as manufactured by Mission Rubber Co. or approved equal.

### SECTION 406 - WASTEWATER PUMP STATIONS

#### 406.1 General

- A. Equipment and materials proposed for wastewater pump stations shall be reviewed and approved by SBWRD during the design review process.
- B. As a minimum the pump station construction shall incorporate the following features.
1. Wet Well Structure.
    - a. Concrete structure with integrally cast PVC lining system, T-Lock PVC Lining as manufactured by Ameron International, polymer concrete manhole per Section 404.20, or approved equal.
    - b. All exposed concrete surfaces that cannot be manufactured with PVC lining system shall be coated with an approved coating system designed specifically for wastewater environments.
    - c. All pipe and conduit penetrations shall be sealed to the lining system according to the lining system manufacturer’s recommendations.
  2. Wet Well Metal Items.
    - a. All metal items within the wet well including guide rails, lifting cable or chain, anchor bolts, fasteners, clips, etc., shall be stainless steel.
- D. Ductile Iron Pipe to PVC or HDPE Pipe.
1. Ductile iron pipe short body tee, mechanical joint with gasketed cap, transition gaskets sized for outside pipe diameters. Lining shall be High-build multi-component Amine cured Novolac Epoxy lining, Protecto 401 Ceramic Epoxy or approved equal, applied according to manufacturer’s recommendations.
- E. HDPE Pipe to PVC Pipe:
1. Poly-CAM Series 731 transition for HDPE/PVC, stainless steel sleeve
  2. Central Plastics gasketed outlet x butt-fused outlet or approved equal.
  3. Ductile iron pipe short body tee, mechanical joint with gasketed cap, transition gaskets sized for outside pipe diameters. Lining shall be High-build multi-component Amine cured Novolac Epoxy lining, Protecto 401 Ceramic Epoxy or approved equal, applied according to manufacturer’s recommendations.
- F. Coupling bolts shall be greased with non-oxidizing grease and the coupling shall be wrapped with polyethylene sheeting and taped.

#### 407.2 Private Lateral Wastewater Line Pipe Couplings

- A. Shall meet the requirements of Section 407.1 for the type of pipe being used.
- B. Connection of the exterior lateral pipe to the waste pipe exiting the building.
1. Flexible PVC or rubber pipe connector with stainless steel shear ring, Strong Back - RC Series Repair Coupling as manufactured by Fernco, Inc., Flex-Seal ARC Series as

### SECTION 407 - PIPE COUPLINGS

#### 407.1 Main Line Pipe Couplings

- A. Concrete Pipe, Asbestos Cement Pipe, Clay Pipe and connection of dissimilar pipe material not covered below.

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manufactured by Mission Rubber Co. or approved equal.

2. Transition couplings or bushings required for pipe material of differing outside diameter.
3. A concentric reducer and short pipe section matching material on house side of connection may be used in conjunction with the flexible pipe connector and sheer ring if diameter of pipe exiting house is smaller than exterior lateral pipe.
4. “No-hub” type couplings shall not be used.

### SECTION 408 - BEDDING AND BACKFILL MATERIAL

#### 408.1 Bedding and Initial Backfill Material

- A. Manufactured, angular, crushed stone or rock, or crushed stone/sand mixtures free from organic matter meeting one of the following gradations when tested in accordance with ASTM D 2487.
1. For pipe diameters 4" and larger:

US Stand. Sieve	Open Graded	Dense Graded
	Percent Passing	
1 ½"	100	100
¾"	95-100	95-100
#4	0-10	10-50
200	0-5	0-5

2. For pipe diameters less than 4":

US Stand. Sieve	Open Graded	Dense Graded
	Percent Passing	
¾"	100	100
½"	95-100	95-100
#4	0-10	10-50
200	0-5	0-5

- B. Coarse, dense graded sand with 100% passing the #4 sieve and 0-5% passing the #200 sieve may be used as bedding and initial backfill material for 1 ¼" and 1 ½" Low-Pressure sewer system Private Lateral Wastewater Lines.
- C. Pea gravel, squeegee, or other similar material that will flow when unconfined are not acceptable bedding and initial backfill material.

#### 408.2 Final Backfill Material

- A. Final backfill material in public or private roads, streets and rights-of-way shall meet the requirements of applicable City, County or State standards and permits.
- B. Final backfill material in areas of Off-Road Wastewater Lines, as defined in Section 101.6, shall be acceptable material free of hard clods, frozen material or excessive amounts of large rocks. If

existing material cannot meet compaction requirements, acceptable import material will be required.

#### 408.3 Cement Treated Fill Material (Flowable Fill)

- A. Cement treated fill shall consist of low alkali Type II Portland cement, water, non-plastic sand or concrete aggregate, and other additives to meet the performance requirements.
- B. Performance Requirements: Unconfined compressive strength per ASTM D4832.
1. 10 psi minimum in 24 hours.
  2. 150 psi maximum in 28 days.

#### 408.4 Untreated Base Course Material

- A. Untreated base course material shall consist of clean, hard, tough, durable and sound mineral aggregates that consist of crushed stone, crushed gravel or crushed slag, free of detrimental and organic matter.
- B. Gradation. Shall conform to Utah Department of Transportation specification for Untreated Base Course as follows:

US Stand Sieve	1 ½"	1"	¾"
	Percent Passing		
1 ½"	100	-	-
1"	-	100	-
¾"	81-91	-	100
½"	67-77	79-91	-
3/8"	-	-	78-92
#4	43-53	49-61	55-67
#16	23-29	27-35	28-38
#200	6-10	7-11	7-11

#### 408.5 Trench Dike Material

- A. Cement Treated Fill Material: Shall meet the requirements of Section 408.3.

### SECTION 409 - CASINGS

#### 409.1 Casings Under Roadways

- A. Casings shall meet the requirements of the applicable City, County or State standards.
- B. As a minimum, casings shall be steel pipe conforming to ASTM A 139, Grade A. Alternate casing pipe material may be allowable, as approved by SBWRD and the roadway owner.
- C. Joints between sections of casing pipe shall be welded around the full circumference to provide a water-tight joint.
- D. Minimum casing diameter shall be 24" to allow for future upsizing of carrier pipe. In situations where upsizing of the carrier pipe is not likely, a smaller diameter casing may be allowable, as approved by SBWRD.

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- E. Minimum wall thickness shall be in accordance with the following:

Casing Diameter (inches)	Nominal Wall Thickness (inches)
24	0.312
30	0.438
36	0.462

- F. Casing Spacers meeting requirements of Section 409.3 shall be installed on carrier pipe inside all casings.

### 409.2 Other Main Line Casings

- A. Casings required on main lines outside of roadways shall, as a minimum, be steel pipe conforming to ASTM A 139, Grade A. Alternate casing pipe material may be allowable, as approved by SBWRD.
- B. Joints between sections of casing pipe shall be welded around the full circumference to provide a water-tight joint.
- C. Minimum casing diameter shall be 18" to allow for future upsizing of the carrier pipe. In situations where upsizing of the carrier pipe is not likely, a smaller diameter casing may be allowable, as approved by SBWRD.
- D. Minimum wall thickness shall be in accordance with the following:

Casing Diameter (inches)	Nominal Wall Thickness (inches)
18	0.312
24	0.312
30	0.438
36	0.462

- E. Casing Spacers meeting requirements of Section 409.3 shall be installed on carrier pipe inside all casings.

### 409.3 Casing Spacers

- A. Maximum of 6' separation between spacers with one casing spacer within 2' of each side of a pipe joint and the rest evenly spaced Maximum 12" distance between end of casing and first spacer.
- B. Band shall be 14-gauge heat fused PVC coated steel.
- C. Risers shall be 10-gauge heat fused PVC coated steel welded to the band.
- D. Liner shall be PVC.
- E. Runners shall be reinforced plastic.
- F. Hardware shall be stainless steel.
- G. Spacer configuration shall be restrained with spacer intervals and locations per manufacturer's recommendations.
- H. Spacers shall be concentric.

### 409.4 Casing End Seals

- A. Casing end seal shall be a pull-on type or approved wrap-around type comprised of 1/8" thick synthetic rubber compound sized to fit the carrier pipe and casing.
- B. Stainless steel bands shall be used to secure the end seal to the pipe.

### 409.5 Private Lateral Wastewater Line Casings

- A. Casings on private laterals 6" in diameter and smaller shall meet the requirements of Section 402 or approved equal.
- B. Casings shall be sealed to prevent the migration of materials in the casing pipe.

## SECTION 410 – MISCELLANEOUS MATERIAL

### 410.1 Marking Tape

- A. Marking tape shall be a type specifically manufactured for marking underground utilities and shall meet the following requirements.
  1. Tape shall be of an acid and alkali-resistant polyethylene film.
  2. Tape width shall be 2" minimum on laterals and 3" minimum on main lines. Minimum thickness shall be 0.004".
  3. Tape color shall be GREEN and shall bear a continuous printed inscription "SEWER."

### 410.2 Tracer Wire

- A. Tracer wire shall be a type specifically manufactured for the purpose of detecting buried utilities and shall meet the following requirements.
  1. Minimum 12 AWG copper wire or copper clad steel core wire coated with a minimum 30 mil High Molecular Weight Polyethylene (HMWPE) jacket designed specifically for buried use.
  2. Jacket color shall be green.
  3. Tracer Wire Connectors.
    - a. Silicon filled direct bury wire nuts: Dryconn Direct Bury Wire Nut (10600), as manufactured by King Innovation or approved equal.
    - b. Direct bury splice kit: 3M™ Direct Bury Splice Kit as manufactured by 3M Company, or approved equal.

### 410.3 Material for Filling in Annular Space Between Host Pipe and Pipe Lining

- A. CPP Gel, as manufactured by EPOXYTEC™ or approved equal.
- B. Single component, pre-catalyzed hydrophobic polyurethane grout, as manufactured by Quadex™ (a Vortex Company) in Sandy, UT or approved equal.



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### 410.4 Caps for Main Line and Private Lateral Stubs

- A. Glued, fused or gasketed cap.
- B. Expansion type (Brandt™) plugs shall not be used.

### 410.5 Off-road Manhole Marker

- A. 2" inside diameter by 10' long, Schedule 40, galvanized steel pipe.
- B. Bury Depth: 3'.
- C. The exposed portion of the marker shall be painted green.
- D. Glass reinforced composite utility markers; High Performance Utility Marker as manufactured by Carsonite Composites, Newberry, South Carolina, or approved equal, in ski runs and other areas, as directed by District. Color Green.

### 410.6 Private Lateral Wastewater Line Stub Markers

- A. Redwood or pressure treated wood 2"x4" or larger wrapped with marking tape.
- B. The marker shall extend from the top of the stub end to a minimum 2' above final grade.
- C. The exposed portion of the marker shall be painted green.

### 410.7 Cleanout Cap

- A. In paved areas and un-paved traffic areas, including ski runs: Threaded brass cap in threaded x solvent weld PVC adapter, threaded brass cap in cast iron body, cast iron blind cap or PVC threaded cap in threaded x solvent weld PVC adapter. Cast iron body shall be connected to cleanout riser pipe with flexible-type neoprene coupling as manufactured by FERNCO or approved equal or no-hub type connector to provide a water-tight connection. Cleanout Ring and Cover per Section 410.8 shall be placed over the cleanout assembly.
- B. In unpaved non-traffic areas: Threaded brass cap in cast iron body or cast-iron blind cap per Section 410.7.A. Sprinkler irrigation box per Section 410.8 shall be placed over the cleanout assembly.

### 410.8 Cleanout Ring and Cover

- A. In paved areas and un-paved traffic areas, including ski runs
  - 1. 4" and 6" cleanouts:
    - a. Cast iron Frame and Cover conforming to ASTM A48 Class 35B similar to D&L Supply H-8030 or approved equal. Ring and cover shall be cleaned and painted with an asphalt coating prior to delivery to site.
    - b. Heavy Duty Cleanout Housing with cast iron, bronze or other approved cover similar to Zurn Z1474 or Jay R. Smith 4880.
    - c. If a more decorative cover is required in pedestrian traffic areas, an access cover

similar to Zurn Z1456 Deck Cleanout or Jay R. Smith 4890 Round Deck Plug may be used.

- d. In all cases the Ring and Cover must be large enough in diameter to provide separation from the cleanout standpipe and cleanout cap and allow access for removal of the Cleanout Cap.
- 2. Larger than 6" cleanout: a properly supported standard manhole frame and cover per Section 404.
- B. Landscaped Areas: Sprinkler irrigation box and cover or other similar enclosure. 10" minimum diameter, blank or marked "SEWER".

### 410.9 Private Lateral Wastewater Line Connections

- A. Private lateral saddles on all gravity main line pipe material except HDPE or lined pipe shall be "Romac 'CB' Sewer Saddle" as manufactured by Romac Industries Inc. or approved equal.
- B. Private lateral saddles on gravity flow and low-pressure HDPE main line pipe shall be electrofusion HDPE branch saddles.
- C. Private lateral connections on lined main line pipe shall be Inserta Tee® Fatboy® sewer tap three-piece lateral connection, consisting of a PVC hub, rubber sleeve, and stainless-steel band, or approved equal. The sewer tap shall be customized for proper fit on the lining and host pipe.

### 410.10 Grease Interceptors, Oil Separators and Sand Interceptors

- A. Precast reinforced concrete structure consisting of a vault with integral floor, vault riser sections, baffle wall, lid, approved manhole adjustment, frames and covers, and piping.
- B. Size as approved by SBWRD.
- C. Precast vault, vault riser sections, and lid.
  - 1. Shall be designed by a Registered Professional Engineer licensed in the State of Utah.
  - 2. Loading condition:
    - a. Walls designed for a saturated equivalent fluid at rest.
    - b. Design surcharge loading: AASHTO H-20 truck load.
  - 3. Concrete: Minimum 28-day compressive strength of 4000 psi.
  - 4. Reinforcing steel: ASTM A615 Grade 60.
  - 5. Concrete cover over reinforcing steel: Minimum 1 ½".
- D. Manhole Adjustment Materials: meeting requirements of Section 404.
- E. Frame and cover: meeting requirements of Sections 404.7.
- F. Piping: PVC with solvent weld joints meeting the requirements of Section 402.3.

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- G. Piping connection to precast vault: Flexible Pipe Connector (Boot) meeting the requirements of Section 404.9.
- H. Joints between vault, vault riser sections, lid, grade rings and frame and cover shall be sealed with flexible butyl blend sealant (mastic) meeting the requirements of Section 404.11.

### 410.11 Grease Traps

- A. If specifically approved on a case by case basis and at the sole discretion of SBWRD, the grease trap shall be of the semi-automatic type which allows for removal of the collected grease without removal of the trap cover.
- B. The trap shall be appropriately sized for the fixtures connected and installed according to the manufacturer's recommendations.
- C. Manufacturers: Zurn Z1173 as manufactured by Zurn, Josam 60100-SA as manufactured by Josam, or approved equal.

### 410.12 Private Residence Sand/Oil Interceptors

- A. Fabricated coated steel or pre-cast concrete structure consisting of a water-tight vault, heavy duty grate, outlet trap seal and pipe connections.
- B. Minimum capacity below outlet pipe shall be 60 gallons.
- C. Fabricated Steel structure with integral outlet trap seal: Sand Trap as manufactured by Jay R. Smith Mfg. Co. or approved equal.
- D. Precast Concrete structure.
  - 1. Designed for AASHTO H-20 loading.
  - 2. Outlet Trap Seal: The Snout® Oil and Debris Stop as manufactured by Best Management Products, Inc. or approved equal.
- E. Pipe connections to structure shall be watertight as demonstrated by water test of structure.
- F. Private Residence Sand/Oil Interceptors shall pass manhole acceptance test standards.

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## CHAPTER 5 - CONSTRUCTION REQUIREMENTS

### SECTION 501 - INSPECTION OF PUBLIC WASTEWATER SYTSEM EXTENSION AND MODIFICATIONS

#### 501.1 General

- A. Inspection of Public Wastewater System extensions and modifications by SBWRD for Developer Sponsored Projects will include the following activities. Inspection of SBWRD Sponsored Projects will generally follow the same process but may be modified to meet the specific needs of the project.
  - 1. Review and approval of required submittals from Contractor.
  - 2. Preconstruction Meeting.
  - 3. Periodic Inspections.
  - 4. Preliminary Inspection.
  - 5. Final Inspection.
  - 6. Warranty Inspection.
- B. All work and materials shall be subject to inspection by SBWRD until the end of the warranty period.
- C. The SBWRD Inspector shall have access to the work site at all times.
- D. Inspections conducted by the SBWRD Inspector will be according to the Approved Construction Drawings and these SBWRD Standards.
- E. Inspections will be conducted as appropriate and as time and scheduling permits, as determined by SBWRD.
- F. The Contractor shall notify the SBWRD Inspector a minimum 48 hours prior to the following.
  - 1. Start of construction.
  - 2. Any change of schedule.
  - 3. Work to be conducted on weekends, or holidays.
- G. SBWRD will notify the Project Manager of any non-conforming work or material as soon as practical after that non-conforming work or material becomes known to SBWRD.
- H. The Contractor shall make necessary corrections. Non-conforming work or material will not be approved by SBWRD and shall be removed.

#### 501.2 Contractor Submittals

- A. Contractor shall deliver required submittals to SBWRD District Engineer for review and approval a minimum 1 week prior to Preconstruction Meeting.
- B. SBWRD District Engineer will advise Contractor of any deficiencies.
- C. Contractor shall make revisions and resubmit, if required.

- D. Approval of all required submittals is required prior to holding the preconstruction meeting.
- E. Product data sheets shall be marked to identify applicable products, models, options, and other data.
- F. Fabrication and/or purchase of any item shall not be commenced before the District Engineer has reviewed and approved the pertinent information.
- G. Required Material Submittals.
  - 1. Pipe, fittings and appurtenances.
  - 2. Manholes and appurtenances.
  - 3. Pipe bedding sieve analysis.
  - 4. Tracer wire and connectors.
  - 5. Marking tape.
  - 6. Flowable Fill.
  - 7. Casings and appurtenances.
  - 8. Low-Pressure sewer system materials and appurtenances.
  - 9. Odor control units.
  - 10. Manhole interior coating.
  - 11. Pump station equipment, materials and appurtenances.
- H. Other Required Submittals.
  - 1. Insurance and licensing documentation.
  - 2. Proposed construction schedule.
  - 3. Proposed acceptance testing companies.
  - 4. Proposed manhole lining companies.
  - 5. Any other specialized subcontractors.
  - 6. Bypass pumping plan, if required.
  - 7. Other submittals as required by SBWRD.

#### 501.3 Preconstruction Meeting

- A. A preconstruction meeting, specifically for wastewater system construction, shall be held for all projects that include extensions and modifications to the Public Wastewater System.
- B. The preconstruction meeting shall be held after final design approval and prior to the start of construction.
- C. The preconstruction meeting shall be scheduled through SBWRD and will generally be held at the SBWRD office.
- D. The preconstruction meeting will be under the direction of SBWRD.
- E. The following individuals shall be present at the preconstruction meeting.
  - 1. Owner, Developer, Project Manager, or designated project representative.
  - 2. Project Engineer.
  - 3. Project Surveyor, if different than the Project Engineer.
  - 4. General Contractor for project.
  - 5. Contractor performing actual wastewater system construction including the Contractor's foreman

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who will be on-site during construction of the wastewater system.

6. SBWRD District Engineer and SBWRD Inspector.
7. Other individuals requested to attend by the Developer, Contractor or SBWRD.

### 501.4 Periodic Inspections

- A. The SBWRD Inspector conducts periodic inspections of the wastewater system extensions and modifications during the course of construction.
- B. The primary areas of interest for the periodic inspections are as follows.
  1. Pre-construction Checks.
    - a. Locate and become familiar with existing/proposed public wastewater system tie-ins.
    - b. Verify that necessary plugs are in-place prior to construction.
    - c. Verify that appropriate measures are in place to protect the existing wastewater system.
  2. Approved Drawings: Verify that Approved Construction Drawings are on site and being used by the Contractor for construction of the wastewater improvements.
  3. Material verification: Verify that all materials used for construction of the wastewater system conform to the approved materials submittals, the Approved Construction Drawings and these Construction Standards.
  4. Manholes.
    - a. Verify conformance to manhole details and specifications
    - b. Observe manhole base placement and stacking of sections.
    - c. Verify all joints are sealed according to specifications.
    - d. Verify proper grouting of pipe to manhole interface.
    - e. Verify proper core drilling, if required.
    - f. Verify acceptable conformance to cast-in-place requirements, if required.
    - g. Verify proper final adjustment of manhole frame and cover to final elevation.
    - h. Verify installation of valves, supports and other fittings and features, if Low-Pressure Sewer System.
  5. Installation of Pipe.
    - a. Review grades and alignments with Approved Construction Drawings.
    - b. Conduct periodic inspection of main line installation.
    - c. Visual inspection of lines.
  6. Pipe Bedding.
    - a. Verify conformance to bedding details and specifications.

- b. Observation of bedding material, backfill and compaction efforts.
7. Lateral Stubs.
  - a. Verify location of wye or other connection to main line.
  - b. Verify length and slope.
  - c. Inspect and verify bedding, pipe and end cap, initial backfill, marking tape and installation of stub marker.
  - d. Inspect cleanout construction, if required.
  - e. Inspect installation of curb stop valve, concrete support block and check valve assembly, if Low-Pressure Sewer System.
8. Other System Features: Verify conformance to specifications and Approved Construction Drawings.
9. Utility Encounters: Verify conformance with proper separation and crossing requirements.
10. Observe required acceptance tests.
11. Inspection reports for each visit to the site will be prepared by the SBWRD Inspector.

### 501.5 Preliminary Inspection

- A. After installation of the pipe, manholes and other features and backfilling of trenches and prior to paving and final adjustment of manholes to grade, the Contractor shall request that SBWRD conduct a preliminary inspection.
- B. All required survey information of curvilinear HDPE pipe shall be provided to the SBWRD District Engineer prior to the preliminary inspection.
- C. All low-pressure air tests, vacuum tests, hydraulic pressure tests, initial continuity test of tracer wires, and TV Inspections of the installed system, meeting the requirements of Section 516, shall be performed prior to the preliminary inspection.
- D. Testing results and TV inspection videos shall be provided to SBWRD for review prior to the preliminary inspection.
- E. Plywood bottoms shall be placed in the manholes after the TV Inspection in order to protect the system from debris resulting from the paving and manhole adjustment process. The plywood bottoms shall remain in place until after the final inspection. Temporary removal of the plywood bottoms may be necessary during the preliminary inspection and during correction of deficient items on the preliminary “punch list”, but shall be immediately replaced to protect the system.
- F. SBWRD will review the test results and TV inspection video and perform the preliminary inspection.
- G. The Contractor shall provide an individual familiar with the newly constructed wastewater system to assist the SBWRD Inspector with the preliminary inspection.

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- H. The primary areas of interest for the preliminary inspection are as follows.
  1. Construction of manholes and inverts.
  2. Condition of pipe.
  3. Cleanliness of pipe.
  4. Construction of other system features.
  5. Private Lateral stub markers.
  6. Deficiencies noted during periodic inspections.
- I. SBWRD will prepare a preliminary inspection letter with a “punch list” of deficient items. A copy of the preliminary inspection letter will be sent to the Developer, the Project Engineer and the Contractor.
- J. The Contractor shall correct the deficient items listed in the preliminary inspection letter and advise the SBWRD Inspector when the items are complete.
- K. The SBWRD Inspector will verify completion of the deficient items.
- L. After the deficient items have been corrected and verified, paving and final adjustment of manholes to grade may occur.

### 501.6 Final Inspection

- A. After completion of paving and adjustment of manholes to grade, and after submittal of Record Drawings as required by Section 302.9 and results of the final continuity test on the installed tracer wire, as required by Section 516.7, the Contractor shall request that a final construction inspection be performed.
- B. SBWRD will perform the final inspection.
- C. The Contractor shall provide an individual familiar with the newly constructed wastewater system to assist the SBWRD Inspector with the final inspection.
- D. The primary areas of interest for the final inspection are as follow
  1. Preliminary inspection “punch list” items.
  2. Adjustment of manholes to final grade.
  3. Alignment and tolerances of cone, manhole adjustment, and frame and cover.
  4. Private Lateral stub markers.
  5. Placement of off-road manhole markers.
  6. Final grading around off-road manholes.
  7. Revegetation.
  8. Access roads.
  9. All other items required for completion of the project.
- E. SBWRD will prepare a final inspection letter with a “punch list” of deficient items. A copy of the final inspection letter will be sent to the Developer, the Project Engineer and the Contractor.
- F. The Contractor shall correct the deficient items listed in the final inspection letter and advise the SBWRD Inspector when the items are complete.
- G. The SBWRD Inspector will verify completion of the deficient items.

- H. When all deficient items have been completed and upon approval and direction by SBWRD, the Contractor shall remove plywood bottoms and all plugs installed on the system. The SBWRD Inspector shall observe the removal of all plugs.

### 501.7 Warranty Inspection

- A. SBWRD will conduct a warranty inspection according to Section 202.10.

## SECTION 502 - INSPECTON OF PRIVATE LATERAL WASTEWATER LINES

### 502.1 Scheduling Inspection Appointments

- A. Prior to starting construction of the Private Lateral Wastewater line, and at various times during the construction process, the Contractor shall contact SBWRD to request a Private Lateral inspection.
- B. Contractors shall call the SBWRD Engineering Department secretary for an inspection a minimum of 1 day (excluding weekends) prior to the time it is needed. Same-day or spot inspections will not be provided. During periods of heavy inspection requests, additional notice may be necessary
- C. Inspections are scheduled on a first-come first-served basis.
- D. If an inspection is scheduled and the construction is not ready for the inspection at the scheduled time, the contractor will be required to schedule another inspection with SBWRD at the next available time slot.
- E. Excessive call-back inspections caused by the contractor not being ready for an inspection at the scheduled time may result in additional Administration Fees being charged to the homeowner, building owner or facility owner.

### 502.2 Required Inspections

- A. Inspections by the SBWRD Inspector are required at the following times.
  1. New Private Lateral Connections.
    - a. If a direct connection of the Private Lateral to an existing Public Wastewater System collection line or manhole is required, inspection of the coring operation and installation of the saddle or manhole connection is required.
    - b. After installation of the Private Lateral pipe, fittings and other appurtenances but prior to backfilling and completion of bedding above spring line.
    - c. When deficiencies in the installation noted during a prior inspection are corrected and ready for re-inspection.
  2. Grease Interceptors and Sampling Manholes.

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- a. After placement of the grease interceptor and sampling manhole but prior to backfilling.
  - b. After backfilling, paving and adjustment of frame and cover to grade.
  - c. Holiday testing of manhole interior coating on sampling manholes (to be completed immediately after coating has been installed).
3. Abandoned Private Laterals: If an existing Private Lateral to the Public Wastewater System is abandoned, the abandonment shall be inspected prior to backfilling.
  4. Damaged Private Laterals: If an existing Private Lateral is damaged, the repair shall be inspected by the SBWRD Inspector prior to backfilling.

### 502.3 Private Lateral Cleanout Locations

- A. 54-8a-10.5 Utah Code Annotated (UCA) requires that:

*“(a) An operator or person installing or replacing a sewer lateral cleanout beginning August 1, 2009 shall install or replace the sewer lateral cleanout in a manner so that the lateral can be located, including:*

  - (i) House sheets; or*
  - (ii) Electronic markers.*

*(b) An operator or person installing a sewer lateral cleanout shall notify the sewer operator of the sewer lateral cleanout location for record keeping purposes.”*
- B. To assist the Contractor in meeting the requirements of the UCA, and to standardize the cleanout location information provided to SBWRD as the “Sewer Operator”, the SBWRD Inspector will assist the Contractor in taking measurements and preparing the “house sheet” which will document cleanout locations.
- C. The Contractor shall provide personnel and, if necessary, equipment required to take measurements for the location of cleanouts.
- D. In addition to providing the “house sheet” information, the Contractor may choose to place electronic markers at the cleanout location. However, placing electronic markers will not replace the requirement for providing the “house sheet” information.
- E. For long or complicated private lateral installations, the Contractor shall prepare and provide a drawing with appropriate measured distances to all cleanout locations or coordinates of all cleanout locations.

### 502.4 Inspection Procedure

- A. The Contractor shall have a copy of the Private Lateral Construction Information on site during inspections.
- B. The primary areas of interest for inspections of Private Lateral Wastewater Lines are as follows.
  1. Material verification: Verify that pipe, fittings, couplings, bedding and initial backfill materials, cleanout caps, ring and cover, and other material conform to the specifications.
  2. Installation of Pipe.
    - a. Check slope and alignments.
    - b. Visual inspection of lines prior to backfilling (after bedding to spring line is installed).
    - c. Verify that minimum cover requirements are met.
  3. Couplings: Verify alignment of pipe and couplings and conformance to specifications.
  4. Connections: Verify that connections to manholes, main lines or stubs and to the building stub meet the specifications.
  5. Pipe Bedding: Verify conformance to bedding details and specifications.
  6. Marking tape: Verify that marking tape is on site for installation.
  7. Cleanouts: Document locations and verify that standpipe is vertical and that fittings, cap, ring and cover, and other materials conform to specifications.
  8. Other Features: Verify conformance to specifications.
  9. Utility Encounters: Verify conformance with proper separation and crossing requirements.
- C. The SBWRD Inspector will perform or witness tests on the Private Lateral Wastewater Line as required by Section 517.
- D. The SBWRD inspector will assist the Contractor in documenting the location of the Cleanouts on the Private Lateral Wastewater Line, as required by Section 502.3, and will document other aspects of the Private Lateral Wastewater Line.
- E. The Contractor shall provide an individual familiar with the newly constructed private lateral to assist the SBWRD Inspector with the inspection.
- F. The SBWRD Inspector will advise the Contractor’s on-site representative of any deficient items at the time of the inspection and, if required, will prepare a Partial Inspection letter that documents those deficient items. A copy of the Partial Inspection Letter will be sent to the homeowner, building owner or authorized representative and the Contractor.
- G. The homeowner, building owner or authorized representative and the Contractor shall correct the deficient items listed in the Partial Inspection Letter and schedule another appointment with the SBWRD Inspector according to Section 502.1.

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- H. The SBWRD Inspector will verify completion of the incomplete items and repair of deficient items.

### SECTION 503 - GENERAL CONSTRUCTION REQUIREMENTS

#### 503.1 Protection of the Existing Public Wastewater System

- A. No connection to the existing Public Wastewater System or to existing Private Lateral Wastewater Line stubs shall be made without approval of SBWRD and inspection by the SBWRD Inspector.
- B. No modification of the existing Public Wastewater System or existing Private Lateral Wastewater Lines shall be made without approval of SBWRD and inspection by the SBWRD Inspector.
- C. The Public Wastewater System and Private Lateral Wastewater Lines shall be protected from damage. Any damage to the existing system resulting from the Contractor's operation shall be corrected by the Contractor at his expense.
- D. All repairs to the Public Wastewater System shall be observed by the SBWRD Inspector.

#### 503.2 Excluding Construction Debris and Material from the Existing Public Wastewater System

- A. All construction debris and material, including water, native soil, bedding material, backfill material, pipe and other construction material, garbage, etc., shall not be placed in or allowed to enter the existing Public Wastewater System.
- B. The Contractor shall conduct his operations and provide adequate controls to exclude this debris and material from the system.
- C. Any debris or construction material that does enter the existing Public Wastewater System shall be removed by the Contractor at the Contractor's expense.
- D. Any costs incurred by SBWRD in removing the debris or construction material will be billed to the Contractor.
- E. Any wastewater overflows or damages to structures affected by wastewater backups caused by the actions of the Contractor shall be the responsibility of the Contractor and the Developer to mitigate.
- F. A video inspection of the cleaned downstream lines demonstrating that the debris and construction material has been removed shall be provided by the Contractor.

#### 503.3 Maintaining Existing Wastewater Flows

- A. Wastewater flows in the existing wastewater system shall be maintained at all times.
- B. Bypass pumping, temporary bypass piping, or other means required to divert wastewater flow around the construction site shall be provided by the Contractor.

- C. Placing a plug and allowing wastewater to back up in existing wastewater lines will not be allowed.
- D. A bypass plan shall be submitted to SBWRD for review and approval prior to the start of construction.
- E. Bypass plans using pumping equipment shall include continuous (24 hr./day) monitoring of the pumping equipment.
- F. Bypass plans using pumping equipment shall include backup or redundant pumping and piping systems, as approved by SBWRD, in the event the primary system fails.

#### 503.4 Isolation of New Construction

- A. At the start of construction of Public Wastewater System Extensions and Modifications, the Contractor shall install and maintain a plug near the connection of the new construction to the existing Public Wastewater System. The plug shall isolate the new system under construction from the existing system.
- B. The location of the plug shall be determined by SBWRD.
- C. The plug shall be anchored to the apron of the manhole as approved by SBWRD.
- D. The plug shall remain in-place until approval to remove the plug is given by SBWRD.
- E. Removal of the plug shall be the responsibility of the Contractor.
- F. Removal of the plug shall be witnessed by SBWRD.
- G. Failure to install and maintain this plug will subject the Developer and Contractor to additional final "punch-list" items such as cleaning all existing downstream collection lines as determined by SBWRD and repair of damage to the existing wastewater system.

#### 503.5 Record Drawing Information Collected by Contractor

- A. During construction of Public Wastewater System Extensions and Modifications, the Contractor shall record "As-Built" measurements and information.
- B. Information measured and recorded shall include the following.
  - 1. Private Laterals:
    - a. Wye location on main line.
    - b. Pipe size, slope and length.
    - c. Cleanout and bend locations and degree of bend.
    - d. Horizontal distance ties from the end of the lateral stub to property corners.
    - e. In the absence of established property corners, finished surface improvements, preferably sewer manholes or fire hydrants, shall be used.
    - f. If no finished surface improvements are near the lateral stub, lateral markers shall be installed on nearby trees or features and



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horizontal distance ties to the maker provided.

2. Location of other utilities encountered.
- C. The information recorded shall be incorporated into the Record Drawings as required in Section 302.9.
- D. A set of the record information shall be maintained at the construction site.
- E. The SBWRD Inspector may periodically and independently measure and record installed lateral information for the purpose of verifying submitted Record Drawing information.

### 503.6 Safety

- A. In all cases, the contractor is responsible for safety.
- B. The contractor shall be responsible for full compliance with applicable excavation and trenching regulations set forth by the U.S. Department of Labor Occupational Safety and Health Administration as administered by the Utah Occupational Safety and Health Division (UOSH) of the Utah Labor Commission.
- C. The contractor shall assume full responsibility for all confined space requirements in US Department of Labor, OSHA Regulation 29 CFR Subpart AA, Confined Space in Construction, during construction of the line extension. Contractor is hereby informed that all gravity sewer lines and manholes, Low-Pressure sewer valve vaults and flushing manholes, sewer force main valve vaults, wastewater pump station wet wells and other similar structures and features on the District's wastewater collection system and treatment facilities qualify as confined spaces according to the Federal Regulation. Entering confined spaces without following the requirements of the Confined Spaces in Construction regulations is prohibited. If entry into an existing confined space is necessary to connect to the existing wastewater system, the Contractor will be required to execute the Notice of Acknowledgement of Confined Space Requirements and Waiver of Claims contained in Appendix A By executing this document the Contractor will confirm that they will abide by the safety requirements relating to entry into confined spaces as contained in US Department of Labor, OSHA Regulation 29 CFR Subpart AA, Confined Space in Construction.
- D. The contractor shall furnish and maintain all necessary safety equipment, such as barriers, signs, warning lights, and guards to provide adequate protection for persons and property during all phases of construction.
- E. The contractor shall give reasonable notice to the owners of public or private property and utilities when such property and utilities are within the construction area.
- F. The contractor shall at all times observe and comply with all Federal, State, and local laws, ordinances,

permits and regulations which will in any manner affect the work.

### 503.7 Materials Handling

- A. All material to be incorporated into the project shall be transported, handled and stored in a manner which will insure proper installation in an undamaged condition.
- B. The contractor shall replace all material found to be defective or which has been damaged before inclusion in the work.

### 503.8 Installation of Precast Concrete Products

- A. Precast concrete products shall not be installed within seven days of manufacture date.
- B. The date stamped on the precast concrete product will be used as the starting date in determining this time period.
- C. Any precast concrete product installed prior to completion of this seven-day period will not be approved by SBWRD and shall be removed.

## SECTION 504 - TRENCH EXCAVATIONS

### 504.1 General

- A. Trench Excavation shall include every operation necessary for excavation of all materials of whatever nature within the designated limits of the trenches.
- B. Contractor shall support and maintain the excavation with shoring, bracing, trench boxes or other methods.
- C. Contractor shall provide for the uninterrupted flow of surface water.
- D. Contractor shall protect all utilities, pipes, conduits, culverts, bridges and all other public and private improvements and property which may be endangered by the work.
- E. Contractor shall provide temporary support, adequate protection, and maintenance of all underground and surface structures and other obstructions affected by the trench excavation. Any structure that has been disturbed shall be restored or replaced at the Contractor's expense.

### 504.2 Pavement Removal

- A. All pavement removal shall be in accordance with applicable City, County, or State Standards and permits.

### 504.3 Trenching

- A. Alignment: Trench excavations shall be performed to the alignment and grade as indicated on the Approved Construction Drawings.
- B. Trench Width
  1. Trenches shall be excavated to provide adequate working space for proper pipe installation, jointing, and embedment.
  2. Minimum sidewall clearance shall be 8".

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- C. Trench Depth: The trench shall be over-excavated to a minimum depth of one-fourth the pipe diameter (6" minimum) below the bottom of the pipe.
- D. Fill Areas.
  - 1. Trench excavations in fill areas shall extend to the level of native, undisturbed soil.
  - 2. The area between the native, undisturbed soil and the normal bottom of trench shall be backfilled with suitable material in maximum 12" lifts and compacted to 95% of the Modified Proctor Density as determined by the compaction control test specified in ASTM D-1557 and verified by ASTM D-1556 or ASTM D-2922.
  - 3. If fill areas were placed with appropriate lifts and compactive effort, evidence of that effort shall be provided to SBWRD prior to excavation.
- E. Trenching Method.
  - 1. The use of mechanical equipment will be permitted except in locations where machines may cause damage to existing structures, in which case, hand methods shall be employed.
  - 2. The trenching method used and the width of the trench excavated shall provide adequate space for proper installation of the pipe, manholes and other appurtenances. This shall include placement and compaction of bedding and backfill materials, jointing of pipe and manholes, and haunching of pipe.

### 504.4 Dewatering

- A. All excavations shall be dewatered before any construction is undertaken.
- B. Pipe shall be laid only in dry trenches.
- C. Concrete shall be placed only on dry, firm foundation material.
- D. The Contractor shall have adequate dewatering equipment on-site.
- E. Groundwater shall not be allowed to enter the Public Wastewater System.

### 504.5 Blasting

- A. The Contractor shall comply with all Federal, State, and City laws, rules and regulations governing the keeping, storage, use, manufacture, sale, handling, transportation, or distribution of explosives used for blasting operations.
- B. The Contractor shall be responsible to secure blasting permits from the Park City Building Department, Summit County Building Department and Park City Fire District, as required, prior to blasting.

### 504.6 Borings and Casings

- A. Borings and casings shall meet the requirements of Section 303 and Section 409.
- B. The proposed boring method, qualifications and experience of the boring contractor, and other boring related information, as required by SBWRD, shall be

submitted for approval by SBWRD prior to mobilizing the boring operation.

## SECTION 505 - PIPE EMBEDMENT

### 505.1 General

- A. Bedding material meeting the requirements of Section 408.1 shall be placed and compacted from the bottom of the excavated trench to the bottom of the pipe.
- B. Bedding material shall extend a minimum depth of one-fourth the pipe diameter (6" minimum) below the bottom of the pipe.
- C. After placement of the pipe, additional bedding material shall be placed in maximum 6" lifts to the spring line of the pipe.
- D. The bedding material shall be shovel sliced and compacted in the pipe haunch areas to insure uniform and continuous bearing along the pipe.
- E. Initial Backfill meeting the requirements of Section 408.1 shall be placed and compacted in the trench simultaneously on each side of the pipe in 6" lifts for the full width of the trench in such a manner as not to damage or disturb the pipe.
- F. Initial backfill shall be placed to a minimum depth of 12" above the top of the pipe.

## SECTION 506 - PIPE INSTALLATION

### 506.1 General

- A. Alignment and Grade: Non-pressurized pipe shall be laid to the alignment and grades indicated on the Approved Construction Drawings within the following limits.
  - 1. Alignment: 2"
  - 2. Grade:  $\pm 1/2"$
  - 3. When installed at minimum allowable slopes, as defined in Section 303.6, the variation in grade listed above shall not be applicable.
  - 4. Obvious bellies, low spots in pipe segments or abrupt changes in grade shall be corrected.
  - 5. Flat or reverse grade lines or segments of lines are not acceptable.
  - 6. SBWRD reserves the right to require whatever action is necessary to correct (including replacement of all affected sections of line including manholes) any unacceptable items generated as a result of pipe installation at less than minimum allowable slopes or with other deficiencies in alignment or grade.
- B. Except where a curvilinear alignment has been specifically approved by SBWRD, pipe shall be laid in a straight line at a constant and uniform slope between manholes on main lines and between bends on Private Lateral lines. Some minor roping or deflection of Private Lateral lines may be allowed.

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- C. A pipe laser shall be used to install all non-curved pipe.
  - D. Pipe laying shall begin at the lowest elevation and proceed upstream with the bell end of bell-and-spigot pipe positioned upstream.
  - E. The interior of all pipe and fittings shall be thoroughly cleaned before installation and shall be kept clean during installation and until the work has been accepted.
  - F. Pipe shall not be laid in water nor under unsuitable weather or trench conditions.
  - G. Cold weather wastewater collection line construction requirements in accordance with Section 513 shall be utilized when temperature or weather conditions could affect the final product, or as deemed necessary by SBWRD. Cold weather construction shall be in accordance with the pipe manufacturer's recommendations.
  - H. All field cuts shall be made at right angles to the axis of the pipe. All pipes shall be filed and beveled to remove roughness.
  - I. Pipe material shall be consistent between manholes unless specifically approved by SBWRD.
  - J. If a pipe coupling is required to install a lateral wye or manhole, the following requirements shall be met.
    - 1. The pipe coupling shall meet the requirements of Section 407.
    - 2. Clearance between pipes at the coupling shall be a maximum of 1/8".
    - 3. Pipes shall be aligned to provide a smooth transition without a lip or misalignment at the joints.
    - 4. Pipe shall be video inspected as soon as possible after backfilling to verify the above requirements.
  - K. If a change of pipe material between manholes is approved by SBWRD the following requirements shall be met.
    - 1. The connection between different pipe materials shall be made with pipe couplings meeting the requirements of Section 407.
    - 2. Clearance between pipes at the coupling shall be a maximum of 1/8".
    - 3. Pipes shall be aligned to provide a smooth transition without any lip or misalignment at the joints.
    - 4. Pipe shall be video inspected as soon as possible after backfilling to verify the above requirements.
  - L. Whenever pipe laying is stopped, the open end of the pipe shall be plugged with a watertight plug and the trench shall be properly backfilled to protect the pipe from floating.
  - M. If adjustment of the position of a pipe length is required after being laid, it shall be removed, re-laid and rejoined.
  - N. Any pipe that has floated due to water entering the trench shall be removed from the trench and the pipe shall be re-laid as directed by SBWRD.
- ### 506.2 Pipe Laying
- A. In addition to the above general requirements, all pipe installation shall comply with the specific requirements of the pipe manufacturer as follows.
    - 1. ABS Pipe: ASTM D 2321, "Standard Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe." ASTM D 2751 "Standard Specification for ABS Sewer Pipe and Fittings."
    - 2. PVC Pipe: ASTM D 2321 "Standard Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe."
    - 3. High Density Polyethylene (HDPE) Pipe: ASTM D 2321 "Standard Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe."
- ### 506.3 Tracer Wire Installation
- A. Tracer wire shall be installed directly on top of the pipe, along the entire length of all main gravity lines, Low-Pressure lines and force mains.
  - B. The tracer wire shall be attached to the pipe at maximum 5' intervals with duct tape or zip ties.
  - C. The tracer wire shall be continuous from manhole to manhole and shall terminate inside the manhole according to Standard Detail MH-01.
  - D. Splices in the tracer wire between manholes using approved wire connectors will be allowed but shall be kept to a minimum.
  - E. A successful continuity test on the installed tracer wire according to Section 516.7 will be required.
- ### 506.4 Marking Tape Installation
- A. Marking tape shall be installed vertically above the pipe, along the entire length of all main lines.
  - B. The marking tape shall be located at a depth of 2' to 3' above the top of pipe.
  - C. The marking tape depth shall be consistent along the entire length of the line.
  - D. Where other utilities are crossed, a second strip of marking tape may be required between the utility and the wastewater line.
  - E. Where AWWA C900 pipe is used, marking tape shall be placed directly on top of the pipe in addition to the locations outlined above.
- ### 506.5 Connecting to Pipe Stubs
- A. The Contractor shall verify that existing pipe stubs are acceptable (i.e., condition, alignment, grade, leakage) prior to connecting to the stub.
  - B. To the extent possible, the acceptability of the stub shall be verified by SBWRD.

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- C. Unacceptable main line stubs shall be removed and replaced with new pipe to the manhole or to a location on the stub where the remaining pipe to the manhole is acceptable.
- D. Unacceptable Private Lateral stubs shall be removed and replaced to the main line or to a location on the stub where the remaining pipe to the main line is acceptable.
- E. The extension of main line pipe stubs shall be accomplished with pipe having the same type, size, and joint type as the existing stub to the next manhole.
- F. If new pipe material matching the material of the existing stub is no longer available, then a change of pipe material may be approved by SBWRD.

### 506.6 Installing Private Lateral Stubs

- A. Private Lateral Wastewater Line stubs installed as part of the main line construction shall be extended at the slope and to the length or location indicated on the Approved Construction Drawings.
- B. Lateral stub trenches that require either blasting, rock sawing, rock hammering/chipping, or similar techniques for trench excavation shall be over excavated to a minimum of 5' beyond the installed stub end to allow re-excavation and extension of the lateral without damage to the existing lateral stub
- C. Connection to Main Line.
  - 1. The connection of Private Lateral Wastewater Lines to the main line shall be an in-line wye or tee branch made specifically for wastewater lateral connections per the standard details in Appendix C.
  - 2. The wye or tee shall be turned up so that the invert of the wye or tee branch at the connection is at or above the spring line of the main line.
- D. Caps: All stubs shall be plugged at the end of the pipe with a glued, fused or approved gasketed cap or plug. Expansion type (Brandt™) plugs shall not be used.
- E. Private Lateral Stub Marker.
  - 1. Immediately following installation of the Private Lateral stub, a Private Lateral stub marker shall be installed by the Contractor at the end of each lateral stub.
  - 2. The marker shall be placed straight and erect at the end of the capped lateral and extended upward to at least 2' above grade.
  - 3. The exposed portion of the marker shall be painted green.
  - 4. Record Drawing information required by Section 503.5 shall be collected.
  - 5. Private Lateral markers disturbed or lost prior to Final Approval shall be reset using accepted survey practices and procedures.
  - 6. Lateral markers shall be in-place and visible at the Final Inspection.

## SECTION 507 - TRENCH BACKFILL AND PAVING

### 507.1 Trench Backfill in Roads

- A. If settlement of pavement over installed wastewater lines is observed at the final inspection or warranty inspection, the contractor shall remove the settled pavement and any unsuitable or uncompacted backfill, replace the backfill with appropriate compaction efforts, and reinstall the pavement.
- B. Trench backfill in public or private roads, streets and rights-of-way shall be in accordance with the applicable City, County, or State standards, permits, and/or as designated on Approved Construction Drawings. The responsibility for any necessary compaction testing shall be with the developer and their contractor.
- C. Trench backfill in privately owned paved areas, such as parking lots and driveways, shall be placed such that settlement of the paved areas over the wastewater line trenches does not occur. The responsibility for any necessary compaction testing shall be with the developer and their contractor.

### 507.2 Trench Backfill for Off-Road Lines

- A. Trench Backfill for unpaved Off-Road Lines, as defined in Section 101.6, shall meet the following requirements.
  - 1. Backfill material shall meet the requirements of Section 408.2.
  - 2. Suitable backfill material shall be placed in maximum 12" lifts and compacted to 90% of the Modified Proctor Density as determined by the compaction control test specified in ASTM D-1557 and verified by ASTM D-1556 or ASTM D-2922.
  - 3. If existing material cannot meet compaction requirements, acceptable import material will be required.

### 507.3 Pavement Replacement

- A. All pavement replacement shall be in accordance with the applicable City, County, or State standards, permits, and/or as designated on Approved Construction Drawings.

## SECTION 508 - TRENCH DIKES

### 508.1 General

- A. Trench dikes shall be constructed at the locations indicated and in accordance with details as shown on the Approved Construction Drawings and standard detail drawings.
- B. Additional trench dikes may be required at other locations to prevent migration of ground water along

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the sewer trench as determined and directed by SBWRD.

### 508.2 Construction Method

- A. Trench dikes shall be constructed of cement treated fill material.
- B. Placement of the cement treated fill material shall occur after pipe installation and placement of bedding and initial backfill material.
- C. The trench dike shall be keyed into undisturbed soil a minimum 12" below the bottom of the pipe embedment material (18" below bottom of pipe) and a minimum 12" beyond each side of the excavated trench.
- D. The trench dike shall extend a minimum 12" above the top of the pipe embedment (24" above the top of pipe).
- E. Pipe to Manhole Adapters (2 per trench dike) shall be placed on the pipe.
- F. Cement treated fill material shall be placed in one continuous pour for the full depth of the trench dike.
- G. Care shall be taken while placing the cement treated fill material to assure that displacement or distortion of the pipe does not occur.
- H. The area around the trench dike shall remain dewatered for a period of 24 hours after placement of the cement treated backfill material and until the backfill is brought to approximate final grade.

## SECTION 509 - MANHOLES

### 509.1 General

- A. Manholes shall be constructed at the locations indicated and in accordance with details as shown on the Approved Construction Drawings and standard detail drawings.

### 509.2 Subgrade

- A. Manholes shall be constructed on a stable foundation capable of supporting the imposed loads.
- B. A minimum 6" depth of bedding material shall be placed, leveled and compacted prior to placing the manhole bases.

### 509.3 Manhole Bases

- A. Precast Concrete Bases:
  - 1. Shall meet the requirements of Section 404.2.
  - 2. Shall be placed to be fully and uniformly supported in proper horizontal and vertical alignment.
- B. Cast-in-Place Bases on Existing Lines: (prior approval required)
  - 1. Shall meet the requirements of Section 404.3.
  - 2. Shall be constructed to be fully and uniformly supported in proper horizontal and vertical alignment.

- C. Installation of pipe in manhole bases with flexible pipe connectors shall be per manufacturer's recommendation.
- D. Installation of pipe in manhole bases where use of a flexible pipe connector is not possible, as approved by SBWRD, shall include a pipe to manhole adapter placed around the pipe and centered on the manhole wall and grouted with non-shrink grout to form a watertight seal.
- E. In all cases, a watertight manhole to pipe connection is required.
- F. Installation of a manhole base on an existing lined pipe:
  - 1. Visual inspection by SBWRD is required prior to placing manhole base.
  - 2. Any annular space between the host pipe and the pipe lining shall be filled with an epoxy gel as specified in Section 410.3, installed per manufacturer's specifications.

### 509.4 Wall and Cone Sections

- A. Precast wall and cone sections shall be placed and aligned to provide vertical sides.
- B. Steps:
  - 1. Uniform vertical spacing for entire depth of manhole with a maximum 16" vertical spacing between steps.
  - 2. Vertically aligned with less than 1" deviation.
  - 3. 4" maximum vertical distance from top of cone to top step.
  - 4. 24" maximum, 12" minimum vertical distance from center of bottom step to manhole apron.
  - 5. Located over the largest apron of the manhole base except when rotating the eccentric cone away from the edge of road is required.
- C. Joints:
  - 1. Mastic installed according to manufacturer's recommendations. Grouted joints shall not be used.
  - 2. Mastic shall be installed when the temperature of the material is above 70 degrees to assure a watertight seal. Heating of the material may be required to achieve a proper seal.

### 509.5 Backfilling Manholes

- A. All backfilling shall be in accordance with the applicable City, County, or State standards, permits, and/or as designated on Approved Construction Drawings.
- B. Backfilling shall be accomplished in a manner to prevent damage or disturbance to the installed manholes.
- C. Manhole sections disturbed during backfilling shall be removed, rejointed and restacked.
- D. Manhole sections damaged during construction shall be replaced with new sections.

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### 509.6 Installation of Temporary Plywood Bottoms

- A. Plywood bottoms shall be placed in the manholes after the TV Inspection in order to protect the system from debris resulting from the paving and manhole adjustment process.
- B. The plywood bottoms shall remain in place until after the final inspection and removal is authorized by SBWRD.
- C. Temporary removal of the plywood bottoms may be necessary during the preliminary inspection and during correction of deficient items on the preliminary “punch list”, but shall be immediately replaced to protect the system.
- D. Plywood bottoms shall be constructed of minimum 3/4" CDX plywood with adequate bracing to prevent sagging.
- E. The plywood bottom shall be constructed in two or three pieces with a 1/8" maximum clearance at the joints.
- F. The plywood shall be placed in the manhole bottom such that the joint is perpendicular to the flow channel.
- G. A means to prevent the plywood from shifting out of place, such as 2x4's attached to the plywood, metal or rope hinges, etc., shall be incorporated. The plywood bottom shall be placed above the crown of all pipes entering the manhole.
- H. Removal of the plywood bottoms shall be the responsibility of the Contractor.
- I. All debris collected on the plywood bottoms shall be removed from the manhole prior to removal of the plywood bottoms.

### 509.7 Adjustment of Manhole Frame and Cover to Final Grade

- A. Manholes in Asphalt Paved Areas.
  1. Manholes located in asphalt paved areas shall be raised to final grade after final paving is completed.
  2. Shall conform to standard details in Appendix C.
  3. The top of the manhole frame shall be 1/2" below and parallel to the plane of the asphalt paving at the outside edge of the collar.
  4. The distance from the top of the cone to the top of the frame shall generally not exceed 20" and the height of the Plastic Riser Form shall not exceed 14". Distances greater than 20" from the top of the cone to the top of the frame require specific approval by SBWRD and will require use of an Expanded Polypropylene grade ring per Section 404.5. In no case shall the distance exceed 24". Distances greater than approved will require the addition of a manhole wall section and retesting.
  5. The distance from the top of the cone to the lowest point on the bottom of the frame shall not be less than 3".

6. Prior to paving, a manhole frame and cover or a circular metal plate shall be placed on top of the cone temporarily to prevent material from entering the manhole.
7. After the final lift of asphalt is placed, the asphalt and base course material shall be removed to a diameter a minimum 30" greater than the diameter of the top of the manhole frame and to the level of the top of the cone and 6" outside the cone. The edge of the asphalt shall be smooth and uniform.
8. Manhole Adjustment with Whirlygig® or Approved Equal.
  - a. Install per manufacturer's recommendations and standard details.
  - b. Set thermoplastic riser form in a bead of sealant meeting requirements of Section 404.16 to achieve a watertight seal between form and top of manhole cone.
  - c. After the frame has been set to final grade, Class 4000 concrete shall be placed and consolidated in the excavated area around the cone, riser form and frame. Care shall be taken to assure that the thermoplastic form does not become displaced during placement of concrete.
  - d. The concrete shall be allowed to cure for a minimum of three days prior to allowing traffic over the manhole.
9. Metal adapter rings (risers) shall not be used for final adjustment of the frame on new development projects.
- B. Manholes in Concrete Paved Areas.
  1. Manholes located in concrete paved areas shall be raised to final grade after placement of concrete paving.
  2. Shall conform to standard details in Appendix C.
  3. When installation is complete, the top of the manhole frame shall be 1/4" below and parallel to the plane of the surrounding concrete paving.
  4. The distance from the top of the cone to the top of the frame shall generally not exceed 20" and the height of the Plastic Riser Form shall not exceed 14". Distances greater than 20" from the top of the cone to the top of the frame require specific approval by SBWRD and will require use of an Expanded Polypropylene grade ring per Section 404.5. In no case shall the distance exceed 24". Distances greater than approved will require the addition of a manhole wall section and retesting.
  5. The distance from the top of the cone to the lowest point on the bottom of the frame shall not be less than 3".
  6. Prior to paving, a manhole frame and cover or a circular metal plate shall be placed on top of the

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- cone temporarily to prevent material from entering the manhole.
7. Prior to placement of concrete pavement, block out area around the manhole adequate for manhole adjustment.
  8. After concrete pavement is placed, the base course material shall be removed to a diameter a minimum 30" greater than the diameter of the top of the manhole frame and to the level of the top of the cone and 6" outside the cone.
  9. Manhole Adjustment with Whirlygig® or Approved Equal.
    - a. Install per manufacturer's recommendations and standard details.
    - b. Set thermoplastic riser form in a bead of sealant meeting requirements of Section 404.16 to achieve a watertight seal between form and top of manhole cone.
    - c. After the frame has been set to final grade, Class 4000 concrete shall be placed and consolidated in the excavated area around the cone, riser form and frame. Care shall be taken to assure that the thermoplastic form does not become displaced during placement of concrete.
    - d. The concrete shall be allowed to cure for a minimum of three days prior to allowing traffic over the manhole.
  10. Metal adapter rings (risers) shall not be used for final adjustment of the frame on new development projects.
- C. Manholes in Roadway Shoulders.
1. Shall conform to standard details in Appendix C.
  2. Roadway shoulders without curb.
    - a. Adjustment to final grade shall occur after placement of pavement around manhole.
    - b. Adjustment shall meet the requirements of Section 509.7.A or B.
  3. Roadway shoulders with curb.
    - a. The top of manhole frames shall be set horizontal and flush with the finished grade.
    - b. An Off-Road Manhole Collar conforming to standard details in Appendix C shall be placed around the frame.
    - c. The distance from the top of the cone to the top of the frame shall generally not exceed 18" and the height of the Plastic Riser Form shall not exceed 12". Distances greater than approved will require the addition of a manhole wall section and retesting.
- D. Manholes in Off-Road Areas.
1. Shall conform to standard details in Appendix C.
  2. Grading around the manhole shall not result in a depressed area around the manhole.
  3. The manhole frame shall be placed directly on the manhole cone or adjusted to grade according to the requirements of Section 509.7 C. When the frame is placed directly on the cone, the joint between the cone and frame shall be made by placing mastic around the cone, placing the frame, and applying pressure to distribute the mastic material and form a watertight seal.
4. Mastic shall be installed when the temperature of the material is above 70 degrees to assure a watertight seal. Heating of the material may be required to achieve a proper seal.
  5. An Off-road Manhole Collar conforming to standard details in Appendix C shall be installed around the frame and cone.
- E. Manholes in Concrete or Asphalt Walkways.
1. When installation is complete, the top of the manhole frame shall be flush with the surrounding walkway.
  2. Adjustment shall meet requirements of Section 509.7, A or B.
- F. Adjustment of Existing Manholes
1. Shall conform to standard detail in Appendix C.
  2. Remove all grade rings, concrete collars and other adjustment material to top of cone.
  3. Clean and repair the top of cone, if necessary, to provide clean, smooth surface for placement of new adjustment material.
  4. Repair of top of cone may require cutting down or grinding top surface of cone, patching with approved patch material or a combination of both.
  5. Adjust frame to final grade in accordance with Sections 509.7.A thru E.
  6. If distance from top of cone to top of rim exceed 20", up to 3 – 6" expanded polypropylene grade rings per Section 404.5 installed per manufacturer's recommendations may be installed in addition to the plastic riser form.

### 509.8 Drop Manholes

- A. Drop manholes shall only be installed where indicated on the Approved Construction Drawings.
- B. Drop manholes shall meet the requirements of Section 303.8.E and the Standard Detail Drawings.

### 509.9 Connection to Existing Manhole

- A. Prior to the start of construction, the condition of the existing manhole shall be assessed by SBWRD.
- B. If the existing manhole is determined by SBWRD to be suitable for core drilling the following procedure shall be followed.
  1. The existing manhole wall and apron shall be core drilled to allow for placement of the new pipe and flexible pipe to manhole connector (boot) in the manhole at the design elevation and provide a channel in the apron for the new line.
  2. The SBWRD Inspector shall witness all core drilling of manholes.

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3. A flexible pipe to manhole connector (boot) shall be installed in the core drilled wall to provide a watertight seal.
  4. The existing apron shall be built up with class 4000 concrete anchored to the existing concrete with stainless steel anchors or as otherwise directed by the SBWRD Inspector to provide a full depth channel from the new pipe to the existing channel as directed by the SBWRD Inspector.
  5. Chipping, cutting and grinding of the existing apron and channel and finishing with epoxy grout may be required.
  6. The transition from the new invert to the existing invert shall be smooth and uniform and shall provide a long radius sweep to redirect flow to the existing downstream pipe.
- C. If the existing manhole is determined by SBWRD to not be suitable for core drilling, the existing manhole shall be removed and replaced with a new manhole with precast base.
  - D. During the connection of new sewer lines to existing manholes, the alignment of the existing precast sections, grade rings, and castings shall be maintained and the joints between sections, grade rings, and casting, lift holes and connections of existing inflow and outflow pipes shall be watertight.
  - E. The Contractor shall provide for continuous wastewater flow and shall prevent entrance of any ground water, storm water, debris or dirt into the existing facilities during this construction process.
  - F. The Contractor shall meet all the requirements for entry into a Confined Space as specified in Section 503.6.C.

### SECTION 510 - WASTEWATER PUMP STATIONS

#### 510.1 General

- A. Wastewater pump stations shall be constructed in accordance with the requirements of the Approved Drawings.

#### 510.2 Startup Services

- A. Prior to acceptance of the wastewater pump station, the manufacturers of all major equipment installed in the pump station, in conjunction with the contractor and Project Engineer, shall provide start-up services for the equipment.
- B. Reports by the manufacturers confirming that the installation complies with the manufacturer's requirements shall be submitted.
- C. All changes recommended by the manufacturer shall be completed.
- D. A one-year warranty of the equipment shall be included in the report. The one-year warranty will

begin on the date the pump station receives Final Project Approval by SBWRD

#### 510.3 Training

- A. A minimum of 4 hours of training shall be provided by the manufacturers of all major equipment for SBWRD operation and maintenance personnel. Training shall be completed and organized in conjunction with the contractor and Project Engineer.
- B. A proposed training outline and schedule shall be submitted by the Project Engineer for approval by SBWRD.

### SECTION 511 - REPAIR OF EXISTING WASTEWATER SYSTEM

#### 511.1 General

- A. Existing wastewater lines, manholes and other appurtenances damaged or disturbed during construction shall be repaired or replaced by the Contractor at the Contractor's expense.
- B. Notify the SBWRD Inspector 24 hours prior to making repairs. The inspector must be present during the repair.
- C. Provide for pumping or diversion of wastewater around the damaged section as required.
- D. The Contractor shall meet all the requirements for entry into a Confined Space as specified in Section 503.6.C.

#### 511.2 Repair of Wastewater Lines

- A. Cut and remove the broken pipe section. Locate the repair to reduce the number of repair couplings required (removal to the spigot end of the adjacent pipe is preferred).
- B. Check remaining pipe for splits and cracks.
- C. Remove the existing material below the pipe in the area of the broken pipe section to 6" below the bottom of the pipe.
- D. Bedding material meeting the requirements of Section 408.1 shall be placed from the bottom of the excavated trench to the bottom of the pipe and compacted prior to placement of the pipe. Assure that the bedding material is worked under the existing pipe.
- E. Insert new pipe section of the same pipe material, inside diameter and outside diameter.
- F. The Contractor shall notify SBWRD if the same pipe material is not available and a suitable replacement pipe material will be determined.
- G. Clearance between pipes at the coupling shall be a maximum of 1/8".
- H. Pipes shall be aligned to provide a smooth transition through the repaired section without any lip or misalignment at the joints.
- I. Install pipe couplings meeting the requirements of Sections 407 and 506.1.J.



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- J. Additional bedding material shall be placed in maximum 6" lifts to the spring line of the pipe.
- K. The bedding material shall be shovel sliced and compacted in the pipe haunch areas to insure uniform and continuous bearing along the pipe.
- L. Prior to placing initial backfill above the spring line of the pipe, the alignment of the repaired pipe section with the existing pipe and the coupling installation shall be inspected to assure proper alignment and installation. If the repair is not properly aligned or installed, remove the couplings and reinstall the repaired section.
- M. Initial Backfill meeting the requirements of Section 408.1 shall be placed and compacted in the trench simultaneously on each side of the pipe in 6" lifts for the full width of the trench in such a manner as not to damage or disturb the pipe.
- N. Final backfill above the pipe zone, including replacement or installation of marking tape and pavement replacement, shall meet the requirements of Section 507.

### 511.3 Repair of Manholes and Other Appurtenances

- A. Remove damaged frame and covers, grade rings, wall sections or other features and replace with new materials. Reinstall new materials according to requirements of Section 509.
- B. Remove disturbed frame and covers, grade rings, wall sections or other features and install new material according to requirements of Section 509.
- C. Some existing manholes may have joints that do not match new manhole construction material. SBWRD shall review and approve the proposed method of connecting the new manhole material to the existing manhole.

## SECTION 512 - ABANDONING EXISTING WASTEWATER SYSTEM

### 512.1 General

- A. Existing public wastewater lines, manholes and other appurtenances and private lateral wastewater lines and appurtenances that are approved by SBWRD for abandonment shall meet the following requirements.

### 512.2 Abandoning Public Wastewater Lines

- A. The line to be abandoned shall be filled with cement treated fill.
- B. Contractor shall provide the means to deliver the cement treated fill to the full length of the line to be abandoned, as approved by SBWRD.
- C. Cement treated fill shall be introduced into the line through an up-gradient manhole that is being abandoned or an excavated up-gradient end of pipe to facilitate flow of material to the full pipe length.

- D. Alternatively, the pipe may be removed and disposed of by the Contractor and the excavated area backfilled with compacted granular fill.

### 512.3 Abandoning Manholes

- A. As a minimum the manhole frame and cover, grade rings or other manhole adjustment material, and cone or flat slab lid shall be removed and disposed of by Contractor.
- B. The manhole shall then be filled with cement treated fill.
- C. Alternatively, the entire manhole, including base and wall sections may be removed and disposed of by Contractor and the excavated area backfilled with compacted granular fill.
- D. In certain limited cases and as approved by SBWRD, where removal of the cone section is not possible due conflicts with adjacent utilities, structures or other features, the cone or flat slab lid may be left in place.

### 512.4 Abandoning Private Lateral Wastewater Lines

- A. The end of the pipe to be abandoned shall be capped with a glued cap, if PVC, or an expansion type "Brandt" plug if other type pipe material and the excavated area backfilled with compacted granular material.
- B. Grease interceptors, sampling manholes and septic tanks shall be abandoned by one of the off the following methods:
  - 1. Crushed in place and the void filled
  - 2. Completely filled with earth, sand or gravel (As a minimum, the lid shall be removed or crushed)
  - 3. Removal of entire structure

## SECTION 513 - COLD WEATHER CONSTRUCTION

### 513.1 General

- A. During cold weather conditions, special precautions shall be used to ensure that proper construction is maintained.
- B. A cold weather condition is defined as periods where sustained temperatures are 40 degrees and lower.

### 513.2 Trenching

- A. Trench excavation shall be limited to the amount of material that the Contractor can install in one day.
- B. Trenches shall be completely backfilled at the end of each day.
- C. When frost is encountered, it shall be moved off to the side and not placed in the trench as pipe backfill material.
- D. All snow must be removed from the immediate construction area to prevent it from becoming mixed with the pipe zone and pipe backfill material.

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- E. Dewatering of the trench during cold weather construction shall be designed to discharge all water well away from the project site to prevent any possibility of increasing frost depths.

### 513.3 Pipe Installation

- A. All pipe and fittings shall be protected and installed according to manufacturer's recommendations for cold weather construction.
- B. Special consideration shall be given to thermal expansion and contraction.
- C. Stresses resulting from extreme temperature variations shall be considered in the design.
- D. Additional or supplemental acceptance tests may be required for pipe installed during weather conditions when warmer temperature conditions return.

### 513.4 Manhole Construction

- A. Concrete bases, sections and grade rings shall be adequately cured prior to transporting to the site to ensure that deterioration of the concrete, due to freeze-thaw action, does not occur.
- B. Mastic used in manhole joints and between grade rings and frames shall be installed when the temperature of the material is above 70 degree to assure a watertight seal. Heating of the material may be required to achieve a proper seal.
- C. Grout must be protected from freezing prior to installation and during the cure period.
- D. Appropriate equipment shall be available for heating or protecting the construction materials and for maintaining favorable temperatures after grout is placed.
- E. Concrete placed during cold weather conditions shall be in accordance with the American Concrete Institutes requirements for cold weather concreting.

### 513.5 Manhole Collar Construction

- A. Concrete collars shall be blanketed when over-night temperatures are 40 degrees and lower.
- B. Collars installed under cold weather conditions will be noted by the SBWRD Inspector and may be required to be replaced when weather and site conditions permit.

## SECTION 514 - PRIVATE LATERAL WASTEWATER LINES

### 514.1 General

- A. Private Lateral Wastewater Lines shall meet or exceed the minimum submittal and design requirements contained in Section 304.
- B. It shall be the responsibility of the Property Owner and his Contractor to verify and/or determine the bury depths of the existing private lateral stubs and new private lateral extension. Bury depths greater than SBWRD minimum standards may be necessary

to protect the private lateral from freezing. Factors such as elevation and surface features over the lateral (driveways vs. landscaping) should be considered.

- C. The SBWRD Inspector shall witness all Private Lateral Wastewater Line installations before backfilling.
- D. Buried Private Laterals not inspected, witnessed or verified shall be re-excavated at the Contractor's expense. As approved by SBWRD, a video inspection of the installed private lateral meeting the requirements of Section 516.6 may be allowed in place of re-excavation of the buried pipe.
- E. Existing Public Wastewater System lines shall remain in service while connecting Private Laterals.
- F. Any damage to Public Wastewater System lines resulting from the connection of Private Laterals shall be corrected by the Contractor as directed by SBWRD at the Contractor's expense.
- G. The cost to remove any debris that enters the Public Wastewater System as a result of the connection of the Private Lateral shall be the responsibility of the Contractor.

### 514.2 Connection to Existing Private Lateral Stubs

- A. Prior to connecting to or extending existing gravity or Low-Pressure Private Lateral stubs, it shall be the responsibility of the Contractor to verify acceptability of the existing stubs (condition, alignment, grade, elevations, depths, leakage, etc.). Non-functional stubs shall not be used. SBWRD shall be notified immediately and prior to making a connection to any stub found to be unacceptable.
- B. The extension of Private Lateral stubs shall generally be accomplished with pipe of the same material and size as the existing stub.
- C. A change in pipe material or size I may be approved by SBWRD on a case by case basis.
- D. Requirements for approved changes of pipe material.
  - 1. The connection between the different pipe materials shall be made with couplings meeting the requirements of Section 407.
  - 2. Clearance between pipes at the coupling shall be a maximum of 1/8".
  - 3. Pipes shall be aligned to provide a smooth transition without any lip or misalignment at the joints.
- E. Test Tee
  - 1. A test tee shall be installed at the connection to the existing stub to allow for testing of the new construction.
  - 2. The tee shall remain exposed until all testing has been completed, after which the tee shall be plugged and properly backfilled.
  - 3. The test tee plug shall match the type of tee fitting used (gasketed, solvent weld, or threaded). Brandt™ type expansion plugs shall not be used.

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If a threaded fitting is used, a thread sealant shall be used on the joint to provide a watertight fit.

### 514.3 Connection to Existing Gravity Public Wastewater System Main Lines

- A. The connection of Private Lateral Wastewater Lines to existing gravity main lines shall be made by installing a Private Lateral connection fitting meeting the requirements of Section 410.9.
- B. A circular hole saw shall be used to core the existing main line. The edges of the cored hole shall be filed to remove burrs from the coring operation. Rough or jagged edges on the cored hole shall not be allowed.
- C. The cored hole shall be large enough to prevent the formation of a lip between the saddle fitting and the main line.
- D. The SBWRD Inspector shall witness the coring operation.
- E. The invert of the saddle fitting shall be at or above the spring line of the main line.
- F. Romac ‘CB’ Sewer Saddle: silicon sealant shall be used between the gravity saddle gasket and the existing pipe to insure a watertight seal.
- G. Inserta Tee® Fatboy® sewer tap:
  1. Only to be used for lateral connections to lined pipe, with specific SBWRD approval.
  2. Sewer tap shall be custom built for the proper fit on the lining and host pipe.
  3. Sewer tap shall be installed per manufacturer’s specifications.
  4. Any annular space between the host pipe and the pipe lining shall be filled with an epoxy gel as specified in Section 410.3, installed per manufacturer’s specifications.
  5. Following the installation of the tap, and prior to backfilling, the main line shall be video inspected to verify proper installation.
  6. Connections to lined concrete or other rigid pipe shall require the removal of the host pipe 2” wider than the diameter of the sewer tap fitting. Sewer tap shall be placed on the pipe liner, with the annular space between the fitting and the host pipe filled with Class 4000 concrete.
- H. Test Tee.
  1. A test tee shall be installed on the Private Lateral Wastewater Line, near the saddle connection to the main line to allow for testing of the new construction.
  2. The tee shall remain exposed until all testing has been completed, after which the tee shall be plugged and properly backfilled.
  3. The test tee plug shall match the type of tee fitting used (gasketed, solvent weld, or threaded). Brandt™ type expansion plugs shall not be used. If a threaded fitting is used, a thread sealant shall be used on the joint to provide a watertight fit.

### 514.4 Connection to Existing Public Low-Pressure Main Lines

- A. The connection of Low-Pressure Private Lateral Wastewater Lines to existing Low-Pressure Main Lines shall be made by installing a Private Lateral saddle fitting meeting the requirements of Section 410.9.
- B. The installation of the electrofusion branch saddle shall require the main line to be locally shut off (depressurized) by using HDPE pipe squeeze tools upstream and downstream of the new branch saddle. Approval to shut off the main line shall be obtained by the SBWRD District Engineer and must be coordinated with downstream users. The SBWRD Inspector shall witness the shut off of the main line and the installation of the electrofusion branch saddle.
- C. Test Tee.
  1. A test tee shall be installed on the Low-Pressure Private Lateral Wastewater Line, near the saddle connection to the main line to allow for testing of the new construction.
  2. The tee shall remain exposed until all testing has been completed, after which the tee shall be plugged and properly backfilled.
  3. The test tee plug shall be fused or threaded. If a threaded fitting is used, a thread sealant or glue shall be used on the joint to provide a watertight fit.
- D. A curb stop valve, valve box and check valve assembly with concrete support block shall be installed on the Private Lateral Wastewater Line at the right-of-way line or easement line.

### 514.5 Connection to Existing Manhole

- A. 4” and 6” Private Lateral Wastewater Lines shall not connect directly to manholes but shall connect to a Public Wastewater System Line by way of a wye for new construction and an approved Saddle connection according to Section 514.3 for connections to existing public lines.
- B. Connection of 8” and larger Private Lateral Wastewater Lines to existing manholes, where approved, shall be made in accordance with Section 509.9.

### 514.6 Cleanout Requirements

- A. Cleanouts shall meet the requirements of Section 304.8.
- B. A concrete support block shall be poured under the wye for the cleanout.
- C. Cleanout risers shall be the same size and material as the lateral.
- D. Cleanout risers shall be located directly above the private lateral line. Offsetting or laying the cleanout riser over to avoid surfacing in a paved area or other obstruction shall not be allowed.

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- E. Cleanout risers shall be capped with a cleanout cap.
- F. The top of the cleanout cap shall be located 4" to 6" below the finished paved or landscaped surface
- G. Cleanouts within paved surfaces and unpaved traffic areas, including ski-runs, shall be provided with a traffic rated cleanout frame and cover. In unpaved traffic areas, including ski runs, a concrete collar shall be installed around the frame and cover to provide additional protection for the cleanout riser.
- H. Cleanouts in non-traffic areas shall be provided with a sprinkler irrigation box or other similar structure.

### 514.7 Connection to Building Sewer

- A. Connection of the Private lateral to the building sewer exiting the building shall be made with couplings meeting the requirements of Section 407.
- B. Clearance between pipes at the coupling shall be a maximum of 1/8".
- C. Pipes shall be aligned to provide a smooth transition without any lip or misalignment at the joints.

## SECTION 515 - GREASE INTERCEPTORS AND SAMPLING MANHOLES

### 515.1 General

- A. Grease interceptors, oil separators, sand interceptors and sampling manholes shall be constructed in accordance with the Standard Details in Appendix C.
- B. Grease interceptors, oil separators, sand interceptors and sampling manholes shall meet the submittal and design requirements contained in Section 304.12 and the material requirements contained in Section 410.10.
- C. The frame and cover shall be adjusted according to the requirements of Section 509.7.
- D. The distance from the top of the interceptor or separator concrete lid to the top of the frame shall not exceed 20". If this distance exceeds 20", a vault riser section shall be added to the interceptor, the concrete lid replaced, and the manhole retested.
- E. Sampling manholes shall meet the requirements of Section 509.
- F. The interior of the sampling manhole shall have Manhole Interior Coating meeting the requirements of Section 404.17 applied to all interior concrete surfaces to minimize hydrogen sulfide attack. Holiday (spark) testing of the interior coating shall be required according to coating manufacturer's instructions.

## SECTION 516 - ACCEPTANCE TESTING FOR PUBLIC WASTEWATER SYSTEM EXTENSIONS AND MODIFICATIONS

### 516.1 General

- A. One or more of the following acceptance tests and inspections are required for Public Wastewater System Extensions and Modifications depending on the type of component being tested.
  - 1. Visual inspection by the SBWRD inspector.
  - 2. Low-pressure air test.
  - 3. Hydrostatic test.
  - 4. Manhole vacuum test.
  - 5. Continuity test of tracer wires.
  - 6. Visual inspection of removed and extracted heat fusion bead on HDPE pipe.
  - 7. TV inspection.
  - 8. Pump station and force main testing.
  - 9. Compaction testing.
  - 10. Holiday (spark) testing
  - 11. Deflection testing
- B. All costs associated with testing and TV Inspections, including retesting and reinspection, shall be the responsibility of the Developer or Contractor.
- C. All tests and TV Inspections shall be witnessed by the SBWRD Inspector.
- D. The contractor shall give the SBWRD Inspector 24 hours' notice of any test or inspection to be performed.
- E. Testing firms and TV Inspection firms shall be approved by SBWRD prior to the testing or inspection. The Contractor shall confirm the status of the testing and TV Inspection firms with SBWRD prior to the Contractor authorizing testing or inspection.
- F. Contractor, testing firm or TV Inspection firm shall provide all plugs, compressors, pumps, gauges, water, video equipment, etc., required to perform tests and TV Inspections.
- G. All testing and TV inspection, with the exception of compaction testing, shall occur after backfilling of all pipe and manholes is completed but prior to paving.
- H. Test Results Form.
  - 1. Each item tested shall be noted on a "Public Wastewater System Main Line Test Result" form as contained in Appendix A.
  - 2. Acceptances, failures, reasons for failure, and retests shall be shown on the form.
  - 3. The completed form shall be submitted to SBWRD.
- I. A passing test is required on each item tested.
- J. Items failing any test or TV inspection shall be repaired or replaced according to the requirements of Section 516.11, and the test or inspection repeated until successful performance of all tests and inspections is achieved.

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- K. Any testing nullified by repairs or replacements of any component shall be re-done and passing tests achieved.

### 516.2 Visual Inspection

- A. A visual inspection by the SBWRD Inspector of the installed pipe, manholes, laterals, and other features on the Public Wastewater System Extension or Modification is required.
- B. The visual inspection shall include all items discussed in Section 501 and shall verify that the system has been installed according to these SBWRD Standards.

### 516.3 Low-Pressure Air Test

- A. A Low-Pressure Air Test shall be performed on the following installed pipes.
1. The full length of each installed section (manhole to manhole) of gravity flow Public Wastewater main line.
  2. Private Lateral stubs installed in conjunction with the gravity flow main line.
  3. Gravity flow main line stubs.
  4. Gravity flow private lateral stubs connecting directly to a manhole.
- B. Method of Testing.
1. PVC and HDPE Pipe: UniBell UNI-B-6, Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe.
  2. Other Pipe Material: As recommended by the pipe manufacturer and approved by SBWRD.
  3. Pressure gauges with a maximum pressure reading that exceeds 30 psi shall not be used.

### 516.4 Hydrostatic Test

- A. A hydrostatic test shall be performed on the following installed pipes.
1. Force Mains.
  2. Low-Pressure Sewer System main lines.
  3. Low-Pressure Sewer System main line stubs.
  4. Private Lateral stubs installed in conjunction with the Low-Pressure Sewer System main lines.
- B. Prior to the hydrostatic test the line shall be flushed with an adequate flow volume and rate to remove any debris, silt, gravel, or other material in the line. The SBWRD Inspector shall witness the flushing operation.
- C. Method of Test.
1. The lines to be tested shall be filled with clean water.
  2. Air release taps shall be provided at the pipeline's highest elevations and all air in the system shall be expelled before the test. Insert approved permanent plugs after test has been completed.
  3. The test pressure shall be the greater of 150% of the maximum design pressure or 100 psi.

4. The test pressure shall be maintained for 2 hours.
5. Leakage rate shall be less than determined by the formula:

$$Q = \frac{LD \times \text{square root of } P}{133,200}$$

Where:

Q = allowable leakage rate, in gallons per hour

L = length of pipe, in feet

D = nominal diameter of pipe in inches

P = average test pressure, in psi (gauge)

6. Locate and repair defective joints and retest until leakage rate is less than allowable.
7. Repair any noticeable leakage even if total leakage is less than allowable.

### 516.5 Manhole Vacuum Test

- A. A vacuum test shall be performed on each manhole installed.
- B. Each manhole shall be tested to the top of the cone/flat slab section.
- C. Method of Testing: ASTM C 1244, Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test, excluding the provision of Paragraph 7.5.

### 516.6 TV Inspection

- A. A TV Inspection shall be performed on the following installed system.
1. The full length of each installed section (manhole to manhole) of gravity flow Public Wastewater main line.
  2. Gravity flow main line stubs.
  3. Manholes.
  4. Where new manholes are installed on existing public wastewater lines, the connections to the new manhole and the existing wastewater lines 50 feet each side of the new manhole shall be TV Inspected.
- B. The TV Inspection shall be performed after all other acceptance testing has been completed and passing tests are achieved.
- C. The TV Inspection shall be performed after the lines have been thoroughly cleaned and all dirt, debris, and obstructions have been removed.
- D. The TV Inspection shall be performed while water is running in the pipes.
- E. The video equipment shall provide adequate illumination of the interior of the pipe to produce a clear and viewable image.
- F. The TV Inspection shall not be performed while steam or mist in the pipe obscures visibility. Venting of the line to remove the steam or mist will be required prior to proceeding.
- G. Any debris on the camera lens that obscures the video shall be removed prior to proceeding with the TV Inspection.

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- H. TV Inspection video recordings shall be of an acceptable quality subject to the discretion of SBWRD. Inadequate results will require re-inspection.
- I. The TV Inspection video shall consist of a color digital video in electronic or DVD format.
- J. The TV Inspection video and supporting data for each section of line inspected shall include the following information.
  - 1. Project name.
  - 2. Date and time of inspection.
  - 3. Camera direction (with flow or against flow).
  - 4. Starting distance (0' at end of pipe at manhole wall).
  - 5. Ending distance (to end of pipe a manhole wall).
  - 6. Type of pipe.
  - 7. Diameter of pipe.
  - 8. Lateral connections; location (distance from manhole), orientation (12 o'clock to 11 o'clock), diameter.
  - 9. Pipe and joint defects identified (type of defect and location).
  - 10. Low spots or bellies and changes in grade identified (location of beginning and end).
- K. All TV Inspection videos and supporting data shall be turned over to and become the property of SBWRD.
- L. Evaluation Criteria.
  - 1. Straight Alignments: Each section shall be straight and uniformly graded.
  - 2. Curvilinear Alignments: Each section shall have uniform horizontal and vertical curves with no signs of distorted or irregular pipe.
  - 3. Lines with debris, silt or other construction material will not be approved.
  - 4. Lines that are flat or reverse grade or with a belly or low spot will not be approved.
  - 5. Lines with damaged pipe, misaligned or displaced joints, or other defects will not be approved.
  - 6. Lines with improperly installed Private Lateral wyes will not be approved.
  - 7. Lines with improper connections to manholes will not be approved.
  - 8. Lines with evidence of infiltration will not be approved.
  - 9. Other defects, as determined by SBWRD, will not be approved.

### 516.7 Tracer Wire Continuity Testing

- A. A continuity test shall be performed on all tracer wire segments installed on sewer main lines.
- B. The continuity test shall be performed after installation and backfilling of the sewer lines and prior to paving and adjustment of manholes.
- C. The method of performing the continuity test shall be approved by SBWRD.

### 516.8 Visual Inspection of Heat Fused HDPE Pipe Bead Removal and Extraction

- A. Removal and extraction of the HDPE pipe internal bead resulting from the heat fusion jointing process shall be required for all gravity flow HDPE pipe.
- B. An SBWRD inspector must be on-site during the fusion operation to perform the visual inspection of the removed and extracted fusion bead.
- C. The visual inspection shall include:
  - 1. Verification that complete internal fusion bead removal was performed.
  - 2. The extracted internal fusion bead appearance shall have the same double roll back appearance as the external fusion bead.
  - 3. The extracted internal fusion bead shall possess a smooth root cut.
  - 4. Removal of the internal bead may include pipe wall mass. However, any wall mass that is removed shall not exceed 1/10<sup>th</sup> of the pipe wall thickness.
- D. Any joints not meeting the visual inspection requirements shall have the joint cut out, a new heat fusion joint made, and the interior bead removed and extracted.

### 516.9 Wastewater Pump Station Testing

- A. 72-Hour Test.
  - 1. The pump station shall be operated continuously for a period of 72 hours without any failure. If a failure occurs, the 72-hour test period shall be restarted.
  - 2. The test shall be conducted with clear water provided by the Contractor. Recycling of the test water shall be provided to minimize the impact on the wastewater system.
  - 3. All equipment, valves, controls, etc. shall be successfully operated during the 72-hour test.
- B. Electrical and Control System Testing.
  - 1. According to International Electrical Testing Association Incorporated (NETA).
  - 2. As recommended by equipment manufacturers.

### 516.10 Compaction Testing

- A. Compaction testing shall be performed on the following installed material.
  - 1. Trench backfill material for Off-Road Lines, as defined in Section 507.2.
- B. Frequency of testing.
  - 1. Off-road Lines: 1 test per lift for every 200' of Off-Road Line.
  - 2. Bedding and initial backfill: 1 test for every 200' of sewer line.
  - 3. Frequency of testing may be increased if consistent compaction effort and testing results are not achieved.

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### 516.11 Holiday (Spark) Testing

- A. Holiday testing shall be required for all lined manholes.
- B. Testing shall occur shortly after the installation of the manhole lining.
- C. Testing method and voltage shall be in accordance with coating manufacturer's instructions.
- D. Testing shall be performed by the coating installation contractor and witnessed by an SBWRD inspector.

### 516.12 Deflection Testing

- A. Deflection testing shall be performed on wastewater main lines installed within a source protection zone.
- B. Testing shall be conducted after the final backfill has been in place at least 30 days.
- C. The deflection test is run by using a rigid ball or mandrel with a diameter equal to 95% of the inside diameter of the pipe.
- D. Test shall be performed without mechanical pulling devices.

### 516.13 Failed Test Correction

- A. Procedure.
  - 1. Notify SBWRD Inspector of test failure.
  - 2. Locate leak or defect location, expose, and identify defect.
  - 3. Contact SBWRD for approval of the proposed correction procedures.
  - 4. Evaluation is on a case-by-case basis.
- B. General evaluation considerations for corrections are as follows.
  - 1. Damaged main line, damaged wye, or defective joints.
    - a. Within 3 pipe lengths or 30' of a manhole or other structure: remove and replace main line to the manhole or structure.
    - b. Beyond 3 pipe lengths or 30' of a manhole or other structure: remove and replace the defective area or section. Make pipe coupling repair in accordance with Section 511.2.
  - 2. Damaged Private Lateral stubs - remove and replace entire length of lateral stub from wye to end cap.
  - 3. Damaged or defective manholes.
    - a. Remove and replace the defective section(s), joint sealant material or other defective feature, re-stack the manhole, backfill and re-vacuum test.
    - b. Repairs using supplemental sealants or surface grouting of wall sections without removing the sections are not acceptable repair methods and shall not be approved.

## SECTION 517 - ACCEPTANCE TESTING FOR PRIVATE LATERAL WASTEWATER LINES

### 517.1 General

- A. One or more of the following acceptance tests are required for Private Lateral Wastewater Lines depending on the component being tested.
  - 1. Visual inspection by the SBWRD Inspector.
  - 2. Exfiltration test or low-pressure air test of all gravity flow private laterals.
  - 3. Hydrostatic test of all Low-Pressure Sewer System private laterals and ejector pump pressure lines.
  - 4. Exfiltration test or vacuum Test of grease interceptors, sampling manholes and private exterior pump stations.
  - 5. Dye test.
  - 6. TV inspection
  - 7. Exterior pump operation
  - 8. Holiday (spark) testing
- B. All tests shall be performed or witnessed by the SBWRD Inspector.
- C. The Contractor shall provide all plugs, compressors, pumps, gauges, water, etc., required to perform tests.
- D. Additional tests may be required by SBWRD.
- E. Defects identified by acceptance testing shall be repaired prior to backfilling, prior to the wastewater lines being approved, or prior to issuance of an Authorization to Use by SBWRD.

### 517.2 Visual Inspection

- A. A visual inspection of the entire length of Private Lateral Wastewater Line, from the connection to the Public Wastewater System or Private Lateral Stub installed as part of the Public Wastewater System, to the connection to the building drain line, including clean-outs and other appurtenances, is required.
- B. The visual inspection will include items contained in Section 502.

### 517.3 Exfiltration Test or Low-Pressure Air Test of Gravity Flow Private Laterals

- A. An Exfiltration Test or Low-Pressure Air Test shall be performed on the following installed pipes.
  - 1. The full length of each gravity flow Private Lateral Wastewater Line from the Test Tee installed at the connection to the Public Wastewater System or Private Lateral Stub installed as part of the Public Wastewater System, to the connection to the building sewer.
  - 2. Cleanouts installed as part of the Private Lateral Wastewater Line.
- B. Method of Testing:
  - 1. Exfiltration Test. The Test shall be underway prior to the inspector arriving on-site.

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- a. Install plugs in Test Tee and end of lateral line at connection to building drain line to isolate newly installed line.
  - b. Install cleanout standpipe to a height 3' above finished grade.
  - c. Fill lateral line with water to top of installed cleanout standpipe.
  - d. Test shall be maintained as long as necessary to locate all leaks but not less than 15 minutes.
  - e. Leakage shall not exceed 0.16 gallons/diameter inch/100 feet/hour.
  - f. Pipe shall be dewatered upon completion of testing.
2. Low-Pressure Air Test: According to the requirements of Section 516.3.
- C. Installation of additional test tees and performing tests in sections may be required for long private lateral lines or private lateral lines with a large elevation difference between each end.

### 517.4 Hydrostatic Test

- A. A Hydrostatic test shall be performed on the following installed pipes.
1. Low-Pressure Sewer System private laterals
  2. Ejector pump pressure lines.
- B. The full length of each Low-Pressure Private Lateral Wastewater Line or ejector pump pressure line from the Test Tee installed at the connection to the Public Wastewater System or Private Lateral Stub installed as part of the Public Wastewater System, to the connection to the building sewer or pump station shall be tested.
- C. Method of Testing: According to the requirements of Section 516.4. The test pressure shall be 5 psi above the pump maximum rating and shall be held for 15 minutes. Pumping system information that provides the pump maximum rating shall be provided to the SBWRD inspector.
- D. The hydrostatic test for pressure lines from an ejector pump located interior to the structure shall be performed after the pressure line has been extended through the foundation wall and capped or connected to a closed valve.
- E. The hydrostatic test for pressure lines from an exterior pump station shall be performed after the pressure line has been connected to the installed pump station and against a closed valve.

### 517.5 Testing of Pressure to Gravity Transitions

- A. Testing of the pressure to gravity transition shall consist of a separate test of the pressure portion of the transition and a separate test of the gravity portion of the transition.
- B. Testing of the pressure portion of the transition shall be a hydrostatic test per Section 516.4 performed

prior to the connection of the pressure line to the gravity line.

- C. The piping shall be arranged, and the testing performed such that the final connection into the pressure to gravity transition is a single cut or glue joint. Dis-assembly and re-assembly of any previously tested compression or threaded joint to make the final connection will invalidate the test.
- D. Testing of the gravity portion of the transition shall be either a static head test or a low-pressure air test and shall occur after the pressure portion of the transition is successfully tested and connected to the gravity portion of the transition. The contractor should schedule 2 inspections, separated, to allow the glued joint adequate time to cure.

### 517.6 Exfiltration Test or Vacuum Test of Grease Interceptors, Sand/Oil Interceptors, Sampling Manholes and Private Exterior Pump Stations

- A. An exfiltration test or vacuum test shall be performed on the following items.
1. Grease interceptor.
  2. Sampling manhole.
  3. Private exterior pump stations
- B. Method of Testing:
1. Exfiltration Test: The Test shall be underway prior to the inspector arriving on-site.
    - a. Install plugs as required to isolate newly installed grease interceptor, sampling manhole, or private exterior pump stations.
    - b. Completely fill structure with water
    - c. After water level has stabilized additional water shall be added to bring water level back to fill level.
    - d. Test shall be maintained as long as necessary to locate all leaks but not less than 30 minutes.
    - e. No drop in water level shall occur during the 30-minute test period.
  2. Vacuum Test: According to the requirements of Section 516.5.
  3. Exfiltration or vacuum testing of private pump stations may be waived if the pump basin and pipe connections are factory installed and tested.

### 517.7 Dye Test

- A. A dye test shall be performed on the following installed pipes.
1. Gravity flow Private Lateral Wastewater Lines.
  2. Ejector pump pressure line connected to a gravity flow Public Wastewater line.
- B. Method of testing for gravity flow lines.
1. The SBWRD Inspector will add dye to the water placed in the private lateral for the exfiltration test through the cleanout standpipe.



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2. At the direction of the SBWRD Inspector, the plug in the test tee will be removed to release the dyed test water.
3. The SBWRD Inspector will observe the dyed test water as it passes the nearest manhole downstream to the connection of the private lateral to the Public Wastewater System.
4. If dyed test water is not observed at the nearest downstream manhole or if the flow characteristics of the dyed test water as it passes the nearest downstream manhole are unusual, the SBWRD Inspector will require a second dye test.
5. If the second dye test is also unsuccessful, the cause of the failed test shall be investigated by the Contractor, the problem causing the failed test shall be identified and corrected by the Contractor as approved by the SBWRD Inspector, and another dye test shall be performed.
6. A TV inspection of the lateral, performed at the cost of the Contractor, may be required to verify acceptability of the Private Lateral connection to the Public Wastewater System.

### 517.8 TV Inspection

- A. A TV inspection of the lateral, performed at the cost of the contractor, may be required to verify acceptability of the Private Lateral connection to the Public Wastewater System.
- B. The video equipment shall provide adequate illumination of the interior of the pipe to produce a clear and viewable image.
- C. The TV Inspection shall not be performed while steam or mist in the pipe obscures visibility. Venting of the line to remove the steam or mist will be required prior to proceeding.
- D. Any debris on the camera lens that obscures the video shall be removed prior to proceeding with the TV Inspection.
- E. TV Inspection video recordings shall be of an acceptable quality subject to the discretion of SBWRD. Inadequate results will require re-inspection.
- F. The TV Inspection video shall consist of a color digital video in electronic or DVD format.
- G. All TV Inspection videos and supporting data shall be turned over to and become the property of SBWRD.
- H. Video shall include a footage counter.

### 517.9 Exterior Pump Operation

- A. The operation of the exterior pump station shall be observed by an SBWRD inspector.

- B. For pumps on Low-Pressure sewer system laterals, the pump supplier shall perform a pump start-up service.
- C. For pumps on standard ejector pump pressure lines, dye is placed upstream of the ejector pump and the pump is operated until the dyed test water is observed at the nearest downstream manhole.

### 517.10 Holiday (Spark) Testing

- A. Holiday (spark) testing of lined sampling manholes shall meet the requirements of Section 516.11.

### 517.11 Failed Test Correction

- A. Procedure.
  1. Locate leak or defect location, expose, and identify defect.
  2. Receive approval of the proposed correction procedures from SBWRD Inspector.
  3. Evaluation of the proposed correction procedures is on a case-by-case basis.

## SECTION 518 - CLEANUP

### 518.1 General

- A. All surplus materials, tools, and any temporary structures shall be removed from the construction site by the contractor.
- B. All rubbish, dirt or excess earth from the excavation shall be removed by the contractor at the earliest possible date and the construction site left clean and acceptable to SBWRD.
- C. All components of the Public Wastewater System and Private Lateral Wastewater Lines shall be clean and free of any foreign material and will be subject to a high pressure, high volume water wash or a high-pressure jet wash.