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**SECTION**

**“D”**

**WASTEWATER COLLECTION**

**SYSTEM**



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### D1. GENERAL

The specific requirements of the sanitary sewage system will depend on whether the development is defined as a rural or urban development. Regardless, the intent of the sanitary system design is to properly convey sewage generated from the development to an appropriate treatment system. The conveyance and treatment systems are to be approved by the County and must meet current design standards.

The developer is responsible to confirm adequate capacity in any existing downstream collection or treatment system, if such information is not readily available from the system owner.

Generally, rural systems will involve individual disposal fields on each lot, or a collection system and communal treatment/disposal component. The selected system must meet Alberta Environment requirements. Site suitability for disposal fields is to be documented in the Geotechnical/Hydrogeological Report for the site.

The requirements for urban Sanitary Sewerage Systems will be dependent upon the existing and proposed population numbers, the site suitability, the establishment of contributing sanitary basins or benefiting sanitary areas, existing system capacities and flows, and future growth areas. If this specification does not cover an area of sanitary sewerage system concern, the onus will be upon the Developer to make recommendations and present alternative corrective measures based on sound economic, engineering, environmental, and operational and maintenance criteria for approval by the County. The system will meet the recommended standards of Alberta Environment Standards and Guidelines for Municipal Water Supply, Wastewater & Storm Drainage Facilities.

Weeping tile or storm run-off connections, or any stormwater contribution to the sanitary system, will not be permitted.

### D2. GUIDELINES FOR URBAN SANITARY SEWER DESIGN

The sanitary sewer system will be designed to include all of the total tributary area intended to be serviced by the sewer main at any particular point including any proposed future development areas as outlined in the Area Structure Plan. All specifications and standards listed herein will refer to the latest revision thereof.

#### D2.1 Design Flow:

Unless specified otherwise in the Development Agreement the minimum design standards and guidelines will be in accordance with the City of Lethbridge Design Standards and Alberta Environment Standards and Guidelines:

#### D2.2 Pipe Design:

Unless specified otherwise in the Development Agreement the minimum design standards and guidelines will be in accordance with the City of Lethbridge Design Standards and Alberta Environment Standards and Guidelines:



### **D2.3 Sewer Main Installation & Location:**

Unless specified otherwise in the Development Agreement the minimum design standards and guidelines will be in accordance with the City of Lethbridge Design Standards and Alberta Environment Standards and Guidelines:

### **D2.4 Manholes:**

Unless specified otherwise in the Development Agreement the minimum design standards and guidelines will be in accordance with the City of Lethbridge Design Standards and Alberta Environment Standards and Guidelines:

## **D3. Materials:**

All materials for main lines and manholes will be to the approved standards listed herein or as provided in Section C – Storm Water Drainage Systems. Unapproved material will be removed and replaced with acceptable materials at the Developer's expense. Manhole tops will be grey iron castings, NF 39 or equal.

### **D3.1 PIPE & JOINTS -**

1. Lay and join pipe as accordance with manufacturer's recommendations.
2. When no pipe laying is occurring, the open end of the pipe is to be securely closed. No water will be allowed to drain through a newly laid pipe. Upon completion, the sewer must be thoroughly cleaned and camera inspected. One copy of the video and report will be forwarded to the County.
3. All jointing will be made between clean pipe ends, as recommended by the pipe manufacturer. Pipe will not be deflected either vertically or horizontally in excess of that recommended by the manufacturer or as noted in these specifications.

### **D3.2 DEVELOPER'S RESPONSIBILITY FOR MATERIAL –**

1. Only approved materials are to be incorporated into the Work. The Developer will be responsible for all materials furnished by them and will produce certification by an independent testing authority that the materials used conform to the standards. The Developer will be responsible for the safe transit, delivery and storage of all materials and any found to be unsatisfactory, will be promptly replaced. Unapproved materials will be removed and replaced with acceptable materials, all at the Developer's expense.
2. All materials are to be approved by the County in order to ensure consistency and compatibility with materials currently in use.

## **D4. Construction:**

### **D4.1 EXCAVATION/PIPELAYING**

See Excavation and Pipe Laying Requirements as provided in Section C – Storm Sewerage System.



### D4.2 Inspection:

#### 1. General:

See Section C4 of C – Storm Sewerage Systems.

#### 2. Mechanical & Electrical Equipment:

All lift stations, valves, control structures or other sewer appurtenances will have operating manuals prepared for them by the Developer. A manual will include, but not be limited to, the following: All manufacturers' literature, parts listings, suppliers' addresses, special and normal maintenance requirements and schedules, proper operating sequence and as-built plans. A minimum of two (2) copies of all such manuals will be provided to the County.

## D5. LOW PRESSURE SEWERAGE SYSTEMS

The requirements listed herein include components to be installed on private property and public rights-of-way. The limits of responsibility must be determined by the Developer at the commencement of the planning and design stage.

1. Septic tanks and pumps - all properties to be serviced will have an adequately sized two-compartment septic tank. The pump will have an open impeller design suitable for handling septic tank effluent.
2. Sewer mains will be either p.v.c. pressure class 150 or polyethylene Series 100, and will be capable of operating at a continuous pressure level of 875 kpa at 23°C. The minimum pipe size for sewer mains will be 50 mm I.D.
3. Service pipes will be 1 ½ inch series 160 polyethylene or polybutylene tubing.
4. Fittings and joints - PVC fittings for use with PVC pipe will be a rubber gasket joint manufactured for the type of pipe used in the mains. Polyethylene pipe will be jointed by the butt fusion method and connected to fittings as recommended by the pipe manufacturer.
5. Fittings will be PVC polyethylene or cast iron conforming to CAN3-B137.3, CAN-B137.1 or CAN3-B131.9 as appropriate. Fittings will be designed for a working pressure of 900 kpa. Where flanged joints are used the bolts will be manufactured from stainless steel.
6. Service tees for use on 50 mm diameter mains will be tapped to accept 37 mm or adapters. Only bronze reducing bushings will be used to decrease the size of threaded opening in PVC tees down to 37 mm.

Service tees on pipes 75 mm diameter or larger will be made using Smith Blair Service Saddles as follows:

1. Smith Blair Style 342 for 75 mm and 100 mm mains.
2. Smith Blair Style 352 for 150 mm and larger mains.

Only bronze reducing bushings will be used to reduce the opening in the service saddle to 37 mm.



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7. Corporation stops for plastic service tubing will have a compression joint. Stainless steel stiffeners of the correct size will be used at all compression joints on polyethylene and polybutylene service tubing.
8. Curb stops for plastic pipe will have a compression type joint. The curb stop will be of the ball valve type. Curb stops will be equipped with an extension type valve box suitable for 3.0 meters bury in the extended position. Stainless steel stiffeners of the correct size will be used at all compression joints on polyethylene or polybutylene pipe.
9. Valves - ball valve curb stops will be used as valves on 50 mm diameter pipe and will be supplied with an extension type valve box suitable for 3 meter bury. Valve boxes will be protected against damage. Joints will be of the compression type for both outlets.  
  
For 75 mm and larger pipe, valves will be Epoxy lined water works gate valves conforming to A.W.W.A. specification C500.
10. Valve boxes for 75 mm and larger valves will be Norwood Foundry Type A or approved equivalent.
11. Testing - the low pressure sewerage system will be subjected to, and pass, a leakage test for 1hour at 875 kpa pressure. The allowable leakage will not exceed the pipe manufacturers recommended allowance.
12. The use of repair clamps will not be permitted when making repairs to the pipe of the low pressure sewerage system. Regardless of the pipe being used, the bedding will be placed to provide a minimum of 150 mm of sand bedding over the pipe.

### D6. FORCE MAINS

1. General - A "system-head" curve will be provided for each force main. Supplementary information to be provided with the curves will include but not be limited to, population estimates, area served, plan and profile of line, friction coefficients and line head losses.
2. Design Criteria - The minimum permissible velocity will be 0.60 m/sec. Where velocities in excess of 3.00 m/sec are attained, special provisions will be made as required by the Engineer. At each high point in line, gas relief will be provided.
3. Force mains will be constructed of HDPE pipe unless otherwise approved by the County.
4. Sewage force mains will be adequately sized to carry the anticipated peak hourly sewage flow. Pressure rating of the pipe will be at least twice the normal operating pressure of the pipe.

Surge pressures during starting and stopping of the pumps will not exceed the safe operating capacity of the force main.

If necessary the force main will be oversized to serve areas outside the development area. A gate valve will be provided at both ends of the sewage force main.



### D7. RURAL SYSTEM CONSIDERATIONS

#### D7.1 Water Table:

See section A21, Suitability of Lots for Development – Rural.

#### D7.2 Subsurface Soils Assessment:

If a proposed subdivision is not to be served by a municipal wastewater system, the Developer will be required to submit a report confirming the acceptability of the subsurface characteristics of the land for an on-site sewage disposal system:

Each report will include all pertinent information and recommendations of a qualified professional engineer. This report will contain:

- proposed septic field sites;
- accurate location of the above;
- location of any existing septic fields;
- any water wells and their locations;
- methodology of investigation;
- soils analysis;
- results;
- conclusions and recommendations;

Sealed sewer holding tanks are not accepted unless in extra ordinary circumstances and the system is approved.

### D8. PLANS AND SUBMISSIONS

#### D8.1 General:

All construction plans will conform to the standards outlined in Section B of this Manual.

#### D8.2 Plan Submission:

A description of existing and proposed sewer facilities and areas served must be submitted, including the following information as required:

- Soils Reports
- Approved drawings for all crossings

Prior to the issuance of the Final Acceptance Certificate, the following will be submitted:

- As-built Plans
- Maintenance & Operations Manuals
- Video Inspection Reports
- Exfiltration and Infiltration Reports
- Registered easements and caveats