9 ▪ WASTEWATER COLLECTION FACILITIES

9.01 *Design Basis*

This Chapter provides minimum standards for the design and construction of gravity sewers and low pressure sewer systems. All sewer system extensions of the City of Belmont wastewater system shall meet the requirements of the North Carolina Administrative Code, Title 15A, Subchapter 02T - Waste Not Discharged to Surface Waters, the NCDENR *Minimum Design Criteria for the Permitting of Gravity Sewers* with the following modifications and additions.

9.02 *Information Required*

a. Plans and specifications for sanitary sewer system extensions shall be submitted to the City of Belmont for review and approval prior to the submittal to NCDENR – Division of Water Quality (DWQ) for construction permit. Included in the submittal to the City shall be the average and maximum flow rates expected in each section of the proposed extension project, total projected daily wastewater flow, and character of wastewater. Calculations shall be provided to demonstrate that the flow level in sewers will be less than half the full pipe diameter at the projected average daily flow rate for the area tributary to the sewer.

b. Recorded easement documents must be provided for improvements that are off-site of the development and which are located on private property. These easements must be recorded at the Gaston County Register of Deeds prior to approval of the plans.

9.03 *Downstream Capacity & Condition Analysis*

a. design professional shall verify that the existing downstream sewer system has sufficient capacity to serve the proposed tributary area, including future extensions thereof. When the City indicates there are concerns regarding the condition of the downstream sewers, design professional shall perform investigation including internal CCTV inspection of pipe, and recommend remedies to the system deficiencies. It is the financial responsibility of the Developer to correct downstream deficiencies if there are improvements required to provide adequate capacity.

9.04 *Minimum Pipe Sizes*

a. The minimum sanitary sewer pipe size is 8 inch diameter.

b. Where proposed sewer extension can be reasonably extended to serve areas outside the immediate tributary area of the proposed extension, pipe size shall be determined based on projected future flows.

9.05 *Collection System Design*

a. Sewers shall be provided in the public right of way fronting all lots and parcels. If necessary to provide service to lots where topographic conditions prevent the providing service to the front of the lot, and only when specifically approved by the City, a sewer may be placed in a dedicated easement.

b. The maximum length of sewer between manholes shall be 400 feet. When directed by the City, manhole spacing of less than 400 feet may be required.

c. The maximum depth of sewer shall be 20 feet from finished surface elevation to invert of the pipe.

d. Design professional shall provide gravity sewer service to all lots where practical. Where gravity service is not possible, lots and parcels requiring pumped service connections shall be noted on the plans, preliminary plat, and final recorded plat.

e. Pumping equipment and force mains necessary for pumped service connections will be the financial and maintenance responsibility of the Developer or property owner.

f. Gravity sewers shall be located under the street pavement at the street centerline where possible.

g. Easement areas shall be graded flat with little or no cross slope.

h. The City will not replace walks or driveway pavements within easements when they must be removed for water main repairs.

9.06 *Phased Construction*

a. Developers are encouraged to phase the construction of sewer systems in order to limit the liability associated with unused sewers that have no customer service connections.

a. DWQ permit applications shall designate phases and indicate the phase limits on the plans and in the application. Engineer's certification and DWQ final approval on Fast Track Permits must be on a phase by phase basis.

9.07 *Pipe Materials*

a. Laying Conditions – Pipe material and strength class shall be determined based on laying conditions and trench bedding preparation.

b. Minimum pipe materials and strength class gravity sewers are:

(1) 18 inch and larger – Cement lined ductile iron pipe (DIP), AWWA C151, minimum Pressure Class 250 with 401 Protecto or as approved ceramic epoxy interior coating, or polyvinyl chloride (PVC) pipe ASTM F1803 closed profile, minimum pipe stiffness of 46 psi at 5 percent deflection when tested in accordance with ASTM D2412.

(2) 8 inch to 15 inch – Cement lined DIP, AWWA C151, Pressure Class 350 with 401 Protecto or as approved ceramic epoxy interior coating or polyvinyl chloride (PVC) pipe ASTM D3034, Type PSM, SDR35.

9.08 *Pipes in Steel Casing Pipes*

a. Casing pipes are required in some circumstances to avoid open cut installation of gravity sewers and force mains. These situations are generally governed by the NCDOT and railway companies. The installation shall meet all requirements of these agencies.

b. Spider supports and spacers are required to adequately support the sewer and force main pipes within the casing pipe.

c. Appropriate casing pipe end seals are required.

d. Detail plans are required for review by the City.

9.09 *Pipe Installation in Trenches*

a. Stone bedding shall be provided for the installation of PVC pipe. Bedding shall extend to 4 inches below the pipe.

9.10 *Manholes*

a. Precast concrete construction with monolithically cast base only.

b. Resilient penetration gaskets shall be provided for the connection of sewers to the manhole.

c. Steps shall be polypropylene plastic coated steel.

d. Manhole sidewall sections shall be sealed with external joint sealing bands conforming to ASTM C877, Type I, Rubber and Mastic Bands, Cadillac External Pipe Joint, or as approved.

e. Manhole frames and covers shall be US Foundry 669 or as approved with “SANITARY SEWER” cast into cover. Manholes extending above final grade shall have the frame bolted to the manhole. In areas where flooding of the manhole may occur, a watertight

frame and cover assembly bolted to manhole shall be provided. City may require watertight frames and covers bolted to manhole in other locations.

f. Drop pipe assemblies shall be external.

g. Where directed by City, concrete marker posts shall be installed within five feet of manhole.

9.11 *Sewer Services*

a. Each lot or parcel shall have a separate sewer service consisting of wye fitting at the sewer main, 4 inch PVC ASTM D1785 – Schedule 40 service line, and a cleanout with screw cap at the property line.

b. Minimum pipe slope for the service line is 1/4 inch per foot. Sewer service lines shall be located near the center of the subdivision lot frontage.

c. A single service line and cleanout may be used for buildings containing up to four individual dwelling units such as duplexes and “pinwheels”. The service line shall be 6 inch diameter and shall extend from the sewer main to the property line at which point a 4 inch vertical cleanout pipe is required. Between the cleanout and the building, the Developer may branch individual service lines to each dwelling unit or run a single pipe under the structure tying into one combined building waste collection system.

d. All fittings and materials are subject to City approval.

e. Cleanouts shall not be located in sidewalks, driveways or other pavements. A concrete ring shall be provided around cleanout.

f. The location of the sewer service line shall be indicated by a “S” stamped or chiseled into the curb at a point closest to the cleanout. The “S” shall be painted green.

g. Cleanouts shall be protected with orange fencing after installed. The fencing shall be maintained by the Developer until the building is permanently occupied.

h. Service taps on existing sewers shall be made with fittings or tapping saddles as approved by the City.

i. Oil and water separators and grease traps, where applicable, shall be provided in accordance with the City’s *Fats, Oils and Grease Program* under the *Sewer Use Ordinance*.

9.12 *Connections to Existing System*

a. Connections to the existing City wastewater collection system shall be made at manholes. The entry to the manhole must be cored at the elevation of the existing fillet bench in the manhole. If a drop pipe is necessary, the lower pipe invert shall be at the top of the existing bench.

b. The pipe extension shall be plugged at the connection point until the proposed extension is activated.

c. Force main connections to the existing City system shall include a new force main discharge manhole with Polyurea or as approved interior coating, and a gravity sewer connection to the existing manhole. Pipe entry to the existing manhole must be cored and at the elevation of the bench.

a. Where permitted by the City, a proposed force main may connect to an existing force main. The connection to the existing City force main shall be made under pressure. The pressure tap shall be made in the presence of City personnel. City may require that tap be made during off-peak flow periods, including evening and night hours. Pressure taps shall be made using a 304 stainless steel tapping sleeve and gate valve. If an isolation valve on the existing force main is not within 50 feet of the point of connection, an insertion valve is required. This shall be installed under pressure.

9.13 *Low Pressure Sewer Systems*

a. Low pressure sewer systems will only be permitted when the design professional has demonstrated that a gravity sewer system is not feasible and upon written concurrence of the City.

b. In such cases where low pressure sewer systems are permitted, they shall meet the following requirements:

   (1) Low pressure system shall be designed to meet the requirements of DWQ.

   (2) The number of lots tributary to the system shall be minimized by installing gravity sewers wherever possible.

c. All materials shall be subject to City review and approval.

d. Design professional shall provide Operation and Maintenance procedures manual for the system which shall include procedures for cleaning and flushing the force mains, pump inspection, and pump testing frequency.

e. The City will not maintain the low pressure system including the low pressure force mains, service valves, and the individual grinder pumps.

f. Developer shall provide long term maintenance plan for the low pressure system. If the property owner's association will be responsible, recorded bylaws are to be submitted to the City.

9.14 *Contractor Qualifications*

a. Any contractor that will install wastewater collection improvements must have a valid North Carolina General Contractor License for utility construction.

b. Contractor shall present proof of licensure prior to the preconstruction meeting.

c. If any of the development improvements will be constructed within public rights of ways, the contractor shall provide evidence of adequate insurance coverage to protect the general public. This provision applies to rights of ways that may have been dedicated within the development through the Final Plat process where improvements were bonded by the Developer.

9.15 *Testing Procedures*

a. All sewers and service lines shall be tested for leakage using the infiltration, exfiltration, or air test method.

b. Manholes shall be vacuum tested.

c. PVC sewers shall be deflection tested.

d. Testing procedures are contained in Appendix B of this Manual.

9.16 *Internal Sewer Inspection*

a. Prior to acceptance by the City, contractor shall conduct at no expense to the City, internal CCTV inspection of the mainline sanitary sewers. The CCTV inspection shall be witnessed by City personnel and recorded for future City reference.

9.17 *Re-Activation of Sewers*

a. Sewers which have been constructed, but were de-activated for a period of 6 months or more because of slow development build out, are subject to the following upon re-activation:

(1) The design professional and City Inspector must jointly inspect all manholes and cleanouts.

(2) The sewer must be thoroughly flushed to remove silt and debris. The downstream sewer shall be plugged to prevent flushed water and debris from entering the City's system.

(3) The sewers must be videotaped to inspect joint integrity and pipe roundness

(4) Sewers and service lines must be air tested in accordance with Appendix B herein.

(5) The design professional must witness and record all data and test results regarding flushing and air testing in a summary report.

9.18 *Acceptance for Maintenance*

a. The City may accept sewers upon activation providing the first customer account has been established, all tests are successfully passed, the CCTV inspection has occurred, and record drawings have been submitted. Activation for acceptance purposes is defined as the point in time when the first service connection is placed into service.

b. The City may elect to accept sewers on a block by block basis as the first customer account per block is established.

c. Record drawings for sewers shall be full sized paper copy and in digital formats. The required digital formats include both AutoCAD and Adobe PDF formats. Digital files shall be provided on CD labeled with name of development, date of record drawings, name of contractor, and name of design professional.

d. The acceptance requirements and procedures are contained in Appendix E of this Manual.

e. Upon acceptance, the Developer shall provide one year written warranty on the workmanship, materials and installation of the wastewater collection system. Warranty shall also cover trench settlement caused by backfill consolidation.

9.19 *Notification of Impact Fees*

a. The City of Belmont has adopted impact fees for sewer extensions falling in the areas defined for each impact fee zone. The fees are based on land use and number of defined units.

9.20 *Abandonment of Sewer Services*

a. When existing buildings are demolished for the purpose of clearing the parcel(s), any change of use, or for the redevelopment of the parcel(s), the sewer services must be terminated in accordance with the following requirements:

   (1) Contractor retained by developer/property owner for completing the abandonment of the service must be licensed by the State of North Carolina for utility construction. The City of Belmont can perform the abandonment if requested and upon the payment of the fees established by the City Council. Abandonments to be completed by City staff must be scheduled through the City Public Works Department.

   (2) Contractor shall notify the City Public Works Department for verification of the sewer service line location. Contractor shall contact NC One Call for the location of underground utilities before any excavation is started.

   (3) Abandonment of the sewer service shall include exposing the tap at the sewer main and making a physical disconnection of the service line from the mainline sewer. If the existing sewer pipe is PVC or DIP, the wye fitting may be capped. If the sewer pipe is clay or if a wye fitting is not present, a stainless steel pipe repair clamp or replacement section of pipe must be installed. Other methods of abandonment will be considered including trenchless methods.

   (4) Sewer service piping shall be pumped full with grout. It this is not possible, contractor shall notify the City.

   (5) Curb markings on curbs indicating the former location of the cleanout shall be obliterated.

b. Upon completion of the abandonment, contractor shall notify the City Billing Department so that the service account may be cleared.

c. The abandonment of sewer services must be completed within 30 calendar days of the demolition of a building. Contractor/developer/property owner are required to obtain a Demolition/Grading Permit from the City of Belmont before any work on site may be completed.

d. The abandonment of sewer services for single family structures on existing subdivided lots may only be completed by City personnel. The fee for Sewer Service Termination shall be paid prior to the City issuing a Demolition/Grading Permit. If a Zoning Permit for a new single family structure is obtained within one year of the date of the abandonment of the service, the City will install a new 4 inch sewer service at no cost when the structure is constructed. If the Zoning Permit is obtained later than one year after the

original abandonment date, the owner must pay the Sewer Tap Fee. All other fees associated with establishing a sewer service account shall be the responsibility of the owner. Sewer Service Termination fees for voluntarily demolished single family structures in violation of the City of Belmont Minimum Housing Standards Code of Ordinances, will be waived.