Brookings Municipal Utilities (BMU)

Water Distribution & Sanitary Sewer Collection Design Standards

(City of Brookings)

Revision Date: March 1, 2023

Brookings Municipal Utilities
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PART 1.0 - GENERAL

1.1 GENERAL

A. The design for water and sanitary sewer facilities shall be in conformance with this chapter. Where design information is not provided herein, the most current edition of the following standards shall be used.

1. City of Brookings Design Standards, Standard Specifications, and Standard Plates,
2. Recommended Standards for Water Works, Great Lakes—Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (Ten State Standards).
3. Requirements and Standards of the South Dakota Department of Environment and Natural Resources.
4. American Water Works Association Standards.
5. South Dakota Plumbing Code.
6. Uniform Plumbing Code.
7. International Fire Code and referenced NFPA Standards.

B. Conflict: In case of a conflict between the above design standards, the most restrictive requirement shall apply

1.2 CONSTRUCTION STANDARDS

A. Construction standards shall be the current version of the City of Brookings Standard Specifications for Water and Sanitary Sewer Main Construction and Standard Plates together with the latest addenda. All details, materials, and water/sanitary sewer appurtenances shall conform to these standards.

1. City of Brookings Standard Specifications for Water and Sanitary Sewer Main Construction shall be included with Designer's bid package. Specifications can be retrieved from the BMU website http://www.brookingsutilities.com

1.3 BMU FACILITY CHARGES

A. Any BMU facility charges that are associated with previous water and sanitary sewer main project, such as reimbursement for BMU installed water and/or sanitary sewer main, are to be submitted with the "Application for Extension of Mains and Connection into City Water System". The Contractor shall not be allowed to start any water and/or sanitary sewer main construction until all BMU facility charges have been paid and the application for main extension has been BMU approved.

1.4 GEOTECHNICAL REPORT

A. All developments, with proposed PUBLIC utilities, over twenty (20) acres are required to perform a Geotechnical Report. The Developer shall obtain a

Geotechnical Report, prepared by a licensed South Dakota Professional Engineer, to aide in the installation of the utilities.

1. All costs associated with obtaining the Geotechnical Report shall be the responsibility of the Developer.
2. Developer and/or Engineer of Record shall provide BMU with a copy of the Geotechnical Report with the submittal of the plans

B. The Engineer of Record hired by the Developer shall be responsible for engaging and coordinating the services of a Geotechnical company to perform the site investigation. The Engineer of Record shall be responsible for incorporating any of the findings and recommendations of the Geotechnical Report into the design of the project.

C. The Engineer of Record shall determine the location and depth of the soil borings and provide a site location map showing soil bore locations and elevations. Soil borings shall be obtained for every 500 feet of the project corridor (i.e. street length), with a minimum of three (3).

D. Scope of Work for the Geotechnical Report shall include the following information, as a minimum:

1. Soil borings shall extend to a minimum depth five (5) feet lower than the utility excavation in that vicinity.
2. Standard penetration sampling (ASTM D1586) shall be conducted at each of the boring locations at vertical intervals of 2.5 feet in the upper 15 feet and at vertical intervals of 5 feet below a depth of 15 feet.
3. Complete logs of all soil borings describing and classifying the observed soil classification and showing the measured ground water levels.
4. Provide blow counts for all split spoon samples including moisture content levels at a minimum of 5-foot vertical intervals.
5. Discussion of surface and subsurface conditions including groundwater conditions and whether dewatering may be needed during construction.
6. Provide analyses as required to show whether material on the site will be suitable for construction of the subgrade for the proposed project, along with compaction requirement and necessity for stabilization.
7. Provide recommendations for the pavement sections to be constructed with the following:
    a. Preparation and compaction requirements for utility backfill.
    b. Preparation and construction of subgrade including compaction requirements, necessity for importing material and other construction requirements.
    c. Asphalt surfacing pavement section with thickness of surfacing material and depths of base course materials with or without geotechnical fabric or geogrid.
8. Perform standard proctor(s) on the anticipated on-site trench backfill materials.

1.5 PRIVATE WATER AND SEWER UTILITIES

A. In the event that the Developer elects not to make their proposed water and sewer improvements public or decides not to follow the requirements outlined in these design standards, those improvements will be considered PRIVATE.

B. In these prior approved cases, PRIVATE utilities will need to be operated and maintained by an entity other than Brookings Municipal Utilities. These improvements will not be considered public and will not receive the same benefits and level of service that BMU provides to other customers located on the PUBLIC water and sanitary sewer systems.

C. The PRIVATE owner shall be identified and be responsible for the operation, maintenance and replacement of those PRIVATE utilities.

D. A single water meter will be installed in an separate, easily accessed, above ground or below ground structure that allows BMU staff to maintain, operate, replace the water meter as needed.

   1. The PRIVATE system owner shall be responsible for the monthly billing and expenses generated by BMU for that metered location.

   2. The water meter will be located in a centralized location that measures the entire flow to the PRIVATE system.

   3. BMU will not provide individual water customers served by the PRIVATE water system billing related services. Individual metering and the allocation of the monthly water and sanitary sewer expenses will be the sole responsibility of the PRIVATE system owner.

E. PRIVATE water systems will need to comply with the SD Department of Natural Resources (SDDENR) requirements for community water systems. BMU will provide notification to SDDENR of the formation of the private water system and SDDENR will decide on the requirements that the PRIVATE water system shall adhere to.

F. PRIVATE systems will not be required to proceed with the entire review process identified in the following portions of these Design Standards. However, the Developer and/or Engineer of Record shall submit plans and specifications to BMU for review.

PART 2.0 - DEFINITIONS

2.1 ACCOUNT HOLDER

A. Any person, business, or organization as designated and verified on the billing records of the BMU water department that is financially responsible for water used through a water or sanitary sewer service.

2.2 APPLICATION TO CONNECT

A. Utility Board driven process required by Brookings Municipal Utilities (BMU) to facilitate the transfer of ownership from the Developer to BMU. Application to Connect includes information pertaining to the scope of work, connection to existing utilities and Engineer of Record. The applicant for the Application to Connect shall be an authorized representative of the Developer. Application to Connect is included in Appendix A.

2.3 AS-BUILT

A. A working copy of drawings or files that are modified by hand written notes, electronic markup, etc., most commonly shown in red, that reflect changes that occurred during construction of a project. Documents that are prepared by multiple parties, including but not limited to, engineer, inspector or appropriate onsite personnel. These are a collection of markups that document any changes that occurred during construction.

2.4 AUTOCAD

A. Computer-aided design and drafting software program used to create blueprints for water lines, sewer lines, roads, storm sewers, buildings, bridges, and facilities, among other things.

2.5 CITY FURNISHED MATERIALS

A. BMU shall furnish the Developer's Contractor with hydrants, valves and valve boxes for PUBLIC water mains located in public right-of-ways and/or easements that are associated with the Developer's project and identified with the Application to Connect.

2.6 COMMUNITY WATER SYSTEM[1]

A. A public water system, which serves as least 15 service connections, used by year-round residents or regularly serves 25 year-round residents.

2.7 CONTRACTOR

A. A person or business which performs construction related services for another person or entity under a contract between them, with the terms spelled out such as duties, pay, the amount and type of work and other matters. The Contractor is typically hired by the Developer and enters into agreement to install the necessary improvements, including but not limited to water and/or sanitary sewer utilities, paving, concrete, dirt work, landscaping, etc.

2.8 COMMERCIAL BUILDING

[1] SDDENR Requirements for New Water Systems

A. Buildings where commercial activities take place. Commercial buildings include office buildings, restaurants, retail space, hotels, warehouses, industrial, healthcare and others. Commercial buildings are where commerce happens.

1. Multi-use buildings that have a mix of spaces, such as a retail area and apartments, shall be considered commercial buildings.

2.9 CUSTOMER

A. Any account holder of the BMU water department.

B. Consumers of city water who are not BMU water department account holders are not consider direct customers of BMU. They are direct customers of the account holder. i.e. consecutive water such as City of Aurora, North Brookings Sanitary and Water District, condo and homeowner association members, landlord and tenants.

2.10 DEVELOPER

A. Group or individuals that takes raw land, obtains the necessary permits, creates building lots, and puts in the sewers, the water and electric lines, the streets and curbs or as defined by City of Brookings Ordinances, Chapter 94, Article 1, Definitions. Developer is considered to be the Owner of the project until the transfer of ownership is executed. BMU, nor the City of Brookings, is not party to the agreement between the Developer and his representatives. The Developer is solely responsible for hiring the associated Engineer and associated contractors.

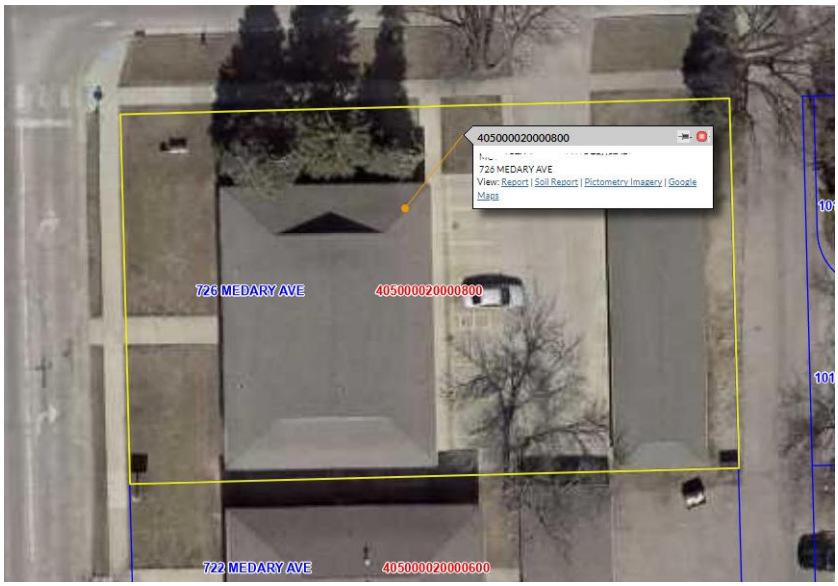
2.11 DWELLING

A. A building, or portion thereof, used exclusively for permanent human habitation, including single-family and two-family dwellings, apartments, condominiums, townhouses, boardinghouses, fraternities and sororities, but not including hotels, motels or other structures designed or used primarily for transient residents or as defined by City of Brookings Ordinances, Chapter 94, Article 1, Definitions.

2.12 DWELLING - APARTMENT

A. A room or suite of rooms with toilet and culinary accommodations used or designed for use as a residence by a family or any four or more people located in a building containing three or more such rooms or suites or located in a building devoted primarily to uses other than residential. A building, or portion thereof, used exclusively for permanent human habitation, but not including hotels, motels or other structures designed or used primarily for transient residents or as defined by City of Brookings Ordinances, Chapter 94, Article 1, Definitions.

Figure 1 – Example of Apartment Dwelling

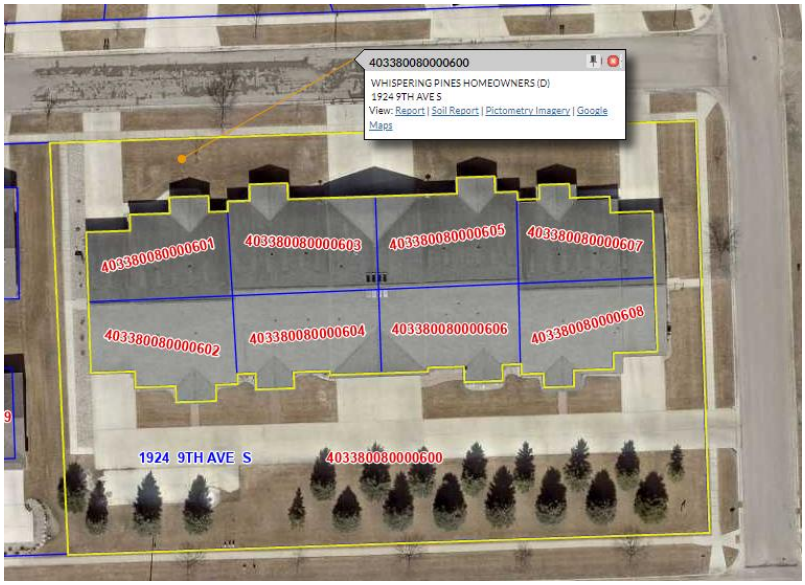


2.13 DWELLING – CONDOMINIUM

A. An apartment building where the space within each dwelling unit is owned individually but the building and land is owned in common (see "Dwelling-Apartment") or as defined by City of Brookings Ordinances, Chapter 94, Article 1, Definitions.

B. Condominiums must be registered with the State of South Dakota to be considered a Condominium. Current list of Condominiums list with the City of Brookings can be found at https://sdrec.sd.gov/registration/condolist.aspx

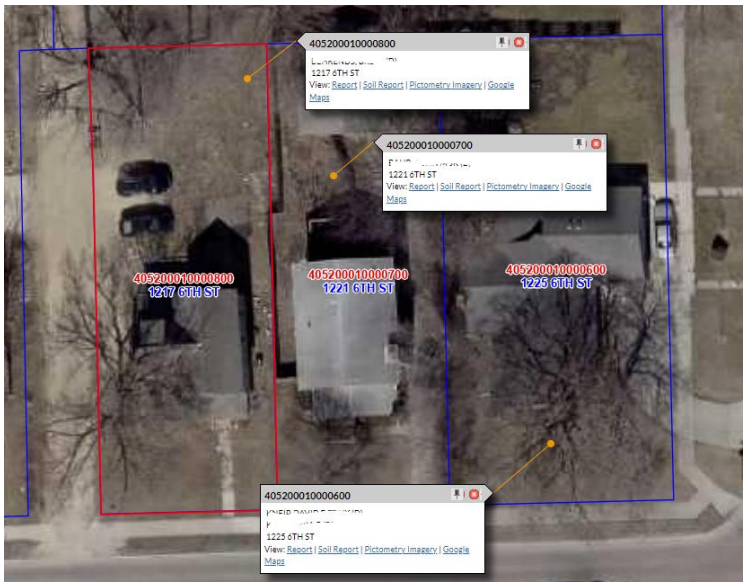
Figure 2 – Example of Condominium Dwelling



2.14 DWELLING – SINGLE FAMILY

A. A building designed or used exclusively for occupancy by one family or as defined by City of Brookings Ordinances, Chapter 94, Article 1, Definitions. One building that occupies a single platted lot is considered a single-family dwelling.

Figure 3 – Example of Single-Family Dwelling



2.15 DWELLING – TOWNHOME

A. One of a group or row of two or more single-family dwellings designed and built as a single building in which each individual townhouse may or may not have separate ownership. For the purpose of side yard regulations, the building containing the row or group of townhouses shall be considered as one building occupying a single lot or as defined by City of Brookings Ordinances, Chapter 94, Article 1, Definitions.

Figure 4 – Example of Townhome Dwelling

2.16 DWELLING - ZERO-FOOT SIDE YARD STRUCTURE (DUPLEX, TRIPLEX, QUADPLEX, ETC)

A. A multi-family dwelling that has two (2) or more units in the same building, sharing a common wall with individually platted lots under and including a portion of the building structure. There may be separate buyers, or there could be one buyer who purchases the entire property and rents out the other home as an investment.

B. One of a group or row of two or more buildings having a common wall located on the side lot line or as defined by City of Brookings Ordinances, Chapter 94, Article 1, Definitions.

Figure 5 – Example of Zero-Foot Side Yard Structure Dwelling

2.17 ENGINEER OF RECORD

A. Person or firm that stamps and seals the design documents and is qualified to practice engineering in South Dakota by reason of special knowledge and use of mathematical, physical and engineering science and the principles and methods of engineering analysis and design, acquired by education and engineering experiences.

2.18 FACILITY CHARGES

A. Previously determined costs for previously completed Brookings Municipal Utilities projects. Any Developer desiring to connect into the previously constructed water or sanitary sewer pipes funded by the utility shall pay the required fee. Facility charges can be frontage fees or area charges. Frontage fees are based on a per foot charge for such length of the property as they own abutting the project. Area charges are based on a cost per area and are calculated based on the area of the land or parcel being serviced at the associated utilities.

2.19 HOMEOWNERS ASSOCIATION (HOA)

A. An organization in a subdivision, or planned community, that makes and enforces rules for the properties and residents. Those who purchase property within a HOA's jurisdiction automatically become members and are required to pay dues, which are known as HOA fees. can do with their properties while others may give residents more freedom.

1. HOA members are the residents of the subdivision, community, or building.

2. HOAs are run by a board of directors and typically collect monthly or annual fees to pay for common area maintenance and the upkeep of facilities.

2.20 LAND DEVELOPMENT

A. Process of acquiring land for residential housing construction, and of making, installing, or constructing nonresidential housing improvements, including, without limitation, waterlines and water supply installations, sewer lines and sewage disposal and treatment installations, steam, gas and electric lines and installations, roads, streets, curbs, gutters, sidewalks, storm drainage facilities, other related pollution control facilities, and other installations or works.

2.21 LOCATION

A. Defining and stating the geographic positions or locations of points on the surface of the earth within the State of South Dakota. SDCL 43-22-1 (Reference on earth capable of obtaining GPS coordinates are a unique identifier of a precise geographic location on the earth.) (Precise geographic location on the earth referencing the South Dakota State Plane North Zone coordinate system.)

1. Horizontal location must be recorded in the following;

   a. Datum: NAD 83

   b. Projection: South Dakota State Plane North Zone

2. Vertical elevation must be recorded in the following;

   a. Datum: NAVD 88

   b. Geoid: Noted on Plans

2.22 MASTER METER

A. A device that measures a quantity of consumption of water furnished to a multi-user property through a single meter, where the individual units are not metered by the utility.

2.23 OWNER

A. The entity that will own, operate and maintain the constructed utilities. Brookings Municipal Utilities is the owner of PUBLIC water and sanitary sewer improvements.

2.24 PORTABLE DOCUMENT FORMAT (PDF)

A. File format that provides an electronic image of text or text and graphics that looks like a printed document and can be viewed, printed, and electronically transmitted.

2.25 PUBLIC UTILITIES

A. Water, and sewer pipes and valves, lift stations, and all other facilities and equipment necessary for conducting a service by a government, or public utility.

2.26 PRIVATE UTILITIES

A. All utilities which provide water or sanitary sewer service and that are not associated with BMU. The ownership of a private utility may be in a corporation, nonprofit or for profit, in a cooperative association, in a mutual organization, or in individuals.

2.27 RECORD DRAWING ANNOTATION

A. AutoCAD feature that is text. Annotation objects include dimensions, notes, and other types of explanatory symbols or objects commonly used to add information to your drawing. Annotation objects provide information about a feature, such as the length of a wall, the diameter of a fastener, or an elevation.

2.28 RECORD DRAWING

A. Revised set of plan sheets, associated AutoCAD files and supporting documentation prepared by the Engineer of Record and submitted by either the Owner or Owner's representative upon completion of a project or a particular job. They incorporate all changes made in the specifications and working drawings during the construction process, and show the exact dimensions, geometry, and location of all elements of the work completed under the contract.

2.29 SEWER AND WATER INSTALLER LICENSES

A. Special licenses shall be issued by the SD State Plumbing commission to persons engaged in plumbing necessary for installing and repairing sewer and water plumbing installations. This license allows the licensee to only carry on such plumbing as may be necessary for sewer and water installation, as per defined by SD Administrative Rule Chapter 20:53:06:01, Sewer and Water Installer Licenses.

B. Class 1 and above certified water and wastewater operators are exempt from sewer and water licensing when performing work on rural and municipal water and wastewater systems.

2.30 SEWER AND WATER INSTALLATION

A. The setting up of building sewer and water service, the repair of existing building sewer and water service, and the setting up of water treatment plant piping and equipment designed to purify water, chemical treatment piping, and sewer treatment plant piping and equipment designed to treat sewage, and the repair of the piping and equipment, as per defined by SD Administrative Rule Chapter 20:53:01:01, Definitions.

2.31 SEWER AND WATER CONTRACTOR

A. A person who engages in the trade or business of selling and setting up sewer and water installations, as per defined by SD Administrative Rule Chapter 20:53:01:01, Definitions.

2.32 SEWER AND WATER INSTALLER

A. A person other than a sewer and water contractor who is engaged as an employee of or is otherwise working under the direction of a Sewer and Water Contractor in

sewer and water installation as a principal occupation, as per defined by SD Administrative Rule Chapter 20:53:01:01, Definitions.

2.33 SUBSTANTIAL COMPLETION

A. The time at which the work (or a specified part thereof) has progressed to the point where, in the opinion of the Engineer of Record and concurrence by BMU, the work is sufficiently complete, in accordance with Contract, so that the work can be utilized for the purpose for which it is intended. BMU substantial Completion certificate is included in Appendix A.

2.34 TRANSFER OF OWNERSHIP

A. Process for the Developer and BMU for transferring ownership from the Developer to BMU. BMU agrees that upon completion of project and connection to the municipal system, BMU will takes ownership of said PUBLIC project. BMU shall operate and maintain the improvements as part of the City system in accordance with Brookings Utility Rules and Regulations. Transfer of Ownership certificate is included in Appendix A.

2.35 WARRANTY PERIOD

A. The Developer is required to warranty the work completed and transferred to BMU for a period of one (1) year after the date of Substantial Completion. The Developer can transfer this responsibility to the Contractor as long as it is documented in the Substantial Completion Certificate and warranty security is provided to the Owner.

2.36 WARRANTY SECURITY

A. A security bond (sometimes referred to as a maintenance bond) provides assurance that Contractor (or if necessary the surety) will meet the contractual warranty period obligations during a specified period of time after construction has been completed. The bond shall be used to provide insurance to the Owner that that work determined to be defective during the warranty period will be corrected at no cost to the Owner.

PART 3.0 - PLAN REVIEW PROCESS

3.1 GENERAL

A. City of Brookings Water Distribution and Sanitary Sewer Collection improvements require plans to be submitted for review. The Engineer of Record (professional engineer hired by Developer) shall submit plan, specifications and profile sheets to the Brookings Municipal Utilities (BMU) staff for review prior to soliciting bids for the Developer.

B. All water and sanitary sewer system improvements that will be turned over to Brookings Municipal Utilities (BMU) shall be designed by an Engineer registered in the State of South Dakota. Once the improvements are turned over to BMU for Ownership, they become PUBLIC utilities.

C. The intent of these standards is to clarify the requirements and expectations necessary to navigate the review process. A successful review process concludes with the Developer and/or Engineer of Record submitting an Application for Sanitary Sewer or Water Main Extension, gaining BMU board approval and constructing the approved sanitary sewer and/or water main facilities.

D. Documentation of these expectations will allow a more efficient review process and will allow the Engineer of Record and/or Developer to navigate the review process by having a clear understanding of what is expected. It is also the goal of this section to adhere to South Dakota (SD) State Statues, Administrative Rules and SD Department of Environment and Natural Resources (SDDENR) requirements for water and sanitary sewer projects.

E. The review process shall include the following steps to obtain approval:

1. Preliminary Plans Submittal,
2. BMU Review and Comments,
3. Final Plans Submittal,
4. BMU Review and Approval,
5. Application for Sanitary Sewer or Water Main Extension Submittal,
6. BMU Staff Approval and Recommendation to BMU Board,
7. BMU Board Application Approval,
8. Construction & Observation,
9. Determination of Substantial Completion,
10. Warranty Security,
11. Record Drawings,
12. Final Completion & Transfer of Ownership

3.2 PRELIMINARY PLANS SUBMITTAL

A. The Engineer of Record shall submit plans via email, ftp site or hard copies to BMU staff for review. Preliminary Plans shall include the minimum requirements set

forth in the City of Brookings Design Standards for Water and/or Sanitary Sewer facilities. In lieu of submitting a complete set of project documents, Designer can provide a consolidated set of preliminary plans that includes a cover sheet and the necessary pages to display the following information:

1. Plan and profile of the existing utilities with sizes noted,
2. Plan and profile of the proposed utilities with size, materials, installation notes, etc.,
3. Easement locations for drainage or other facilities, noted and dimensioned,
4. Applicable BMU standard details,
5. Anticipated City Hall approved road grades,
6. Anticipated lot numbers with block & addition info, street/avenue names, reference business names for driveways and any other pertinent info.
7. NAVD(88) benchmark(s) on project site, preferably to an 'O' on open on hydrant.

B. The cover sheet, or the subsequent sheet, shall include the following information:

1. Project Title and Location,
2. Vicinity Map with North Arrow, subset area of interest,
3. Developer Information (Name, Address, Phone Number, Contact, etc.),
4. Quantity and Description of BMU provided materials,
5. Identify which BMU specification revision date are used for design,
6. Horizontal Datum, SD State Plane 1983, North Zone (4001)
7. Vertical Datum, NAVD 88.
8. Note indicated that documents are "PRELIMINARY – NOT FOR CONSTRUCTION" [2]

C. A transmittal letter or email correspondence should be included with the preliminary plans to indicate when the project is anticipated to be constructed. This information will be used to order BMU provided materials and schedule BMU staff.

3.3 BMU PRELIMINARY PLANS REVIEW AND COMMENTS

A. Engineer of Record or Developer shall allow BMU up to ten (10) working days to complete a review of the preliminary design.

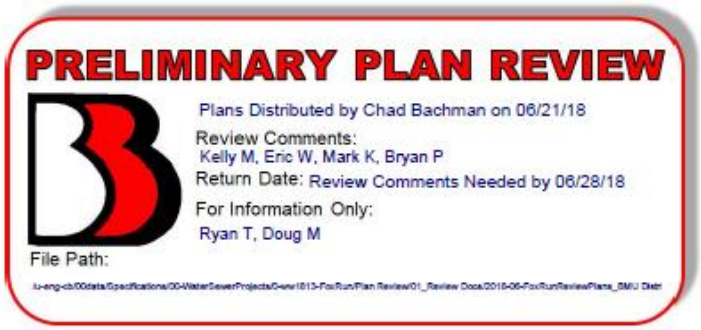
B. A cursory review of the preliminary documents will be completed upon submittal, if it is determined that the preliminary plans do not contain the basic information outlined in **Section 3.2** of these standards, the Engineer of Record or Developer will be notified and the preliminary documents will be returned without any further review.

C. BMU staff will review preliminary plans for compliance with BMU design standards and standard specification requirements. BMU staff will consolidate review

[2] South Dakota Codified Law 36-18A-45 (2)

comments pertaining to electric, water and sewer and will provide written review comments back to the Designer within the allowed time frame.

Figure 6 - BMU Preliminary Plan Stamp



D. Review comments will be sent back to the Engineer of Record or Developer indicating the items that will need to be addressed in the final plans. Comments will be generally categorized as Coordination, General, Water, Sanitary Sewer, Electric and Special interest (i.e. sump pump collection, drainage, etc.).

3.4 CONSTRUCTION PLANS SUBMITTAL

A. The Designer or Engineer of Record shall submit final construction documents (project plans and specifications) via email, ftp site or hard copies to BMU staff for review.

B. The final construction documents should incorporate any review comments that were identified in the preliminary review process. The final plan submittal shall be the documents that will be used for actual construction. Final plan sheets shall include all the items identified in Section 3.2 plus the following additional information:

1. City approved road grades,
2. City approved preliminary or final plats showing location of streets and lots,
3. City approved storm water conveyance and retention facilities,
4. Certification/Seal of Professional Engineer[3],

C. The final documents should also include a transmittal letter or language in the email correspondence to indicate the following:

1. Updated construction schedules,
2. Indication that plans have been submitted to SDDENR[4],
3. Exceptions to preliminary plan review comments,
4. Engineer's estimate of project costs.

[3] Compliance with South Dakota Administrative Rule 74:53:04:02
[4] Compliance with South Dakota Administrative Rule 74:53:04:01

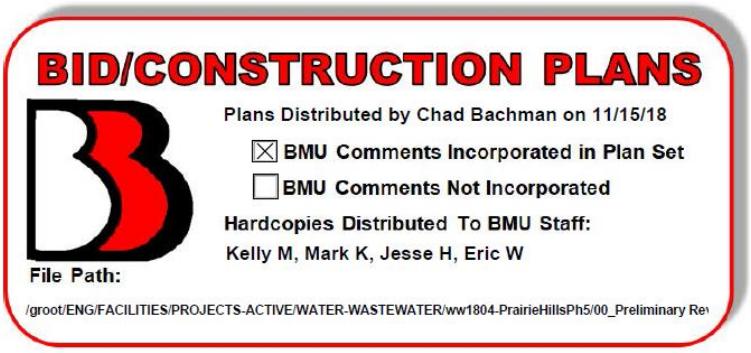
3.5 BMU CONSTRUCTION PLANS REVIEW

A. Designer or Engineer of Record shall allow BMU up to five (5) working days to complete a review of the construction plans.

B. Incomplete or documents that do not adequately address preliminary plan review comments, will be treated as preliminary plan and will be returned with BMU review comments. Final construction documents (plans and specifications) must be stamped and sealed by a SD professional engineer, no exception. Documents that are not properly stamped and sealed will be promptly returned without review or approval consideration.

C. Upon determining that the preliminary review comments have been addressed, the cover page of the final plans will be marked with a stamp that includes a BMU logo and language that indicates documents are ”BID/CONSTRUCTION PLANS” and that BMU comments have been incorporated into the documents. An example of this type of stamp is included in Figure 7.

Figure 7- BMU Construction Plans Stamp



D. BMU will return the cover page of the construction plans, including the BMU stamp indicating that the documents are ready for construction. Cover page will be returned by the same means submitted (i.e. email, hard copy, etc.). BMU staff will be provided with construction plans that carry this BMU stamp; therefore, indicating to staff which documents have been approved and shall be used for construction related activities.

3.6 SUBMIT APPLICATION TO CONNECT (WATER/SEWER)

A. Prior to any construction, an approved Application to Connect is required for water and/or sanitary sewer improvements.

B. The Developer shall fill out, sign, notarize and deliver hard copies to the BMU office for consideration. The BMU board will act on the requested application during a normally scheduled monthly meetings. It may be beneficial to the Developer to submit the application to connect with the Final Plans, to shorten the review process.

C. The application indicates that upon completion of the project, connection to the municipal system and successfully transferring ownership to BMU the system shall be owned and operated by the BMU.

3.7 APPLICATION TO CONNECT – STAFF APPROVAL

A. Upon receipt of the Application to Connect and approval of the Construction Plans, BMU will recommend approval and place the application on the next available board meeting.

B. The Application to Connect will be placed on the second Monday of the month board meeting agenda. Hard copies of the application must be received by BMU no later than the Wednesday prior to the board meeting (first Wednesday of the month). Missing this deadline will result in the Application being placed on the following month's agenda.

3.8 APPLICATION TO CONNECT – BMU BOARD APPROVAL

A. The BMU board will decide to either approve or reject the Developer's Application to Connect. Upon BMU Board approval of the Application to Connect, the Developer will be notified and hard copies of the executed Application will be returned.

B. Should the Application be denied, BMU staff will notify that Developer and communicate the reasons why the application was denied.

3.9 CONSTRUCTION AND OBSERVATION

A. Upon commencement of construction activities, BMU staff will be on-site to observe construction activities. BMU staff will use approved Construction plans, as identified in **Section 3.4 and 3.5**, as the basis for construction activities.

B. The Engineer of Record is responsible to provide all staking and surveying, construction administration tasks and coordinating directly with the Contractor.

C. Construction administration services shall be provided by the Engineer of Record as required for compliance with South Dakota Codified Law[5].

D. BMU staff are on site to observe general conformance of materials and construction activities. BMU staff are only there to assist the Contractor with opening and closing valves, installing new water and sewer taps, coring manholes, coordinating with the public on outages, documenting locations of services, etc.

E. BMU staff are **NOT** onsite to perform construction inspection or contract administrative functions. BMU staff will **NOT** provide construction related staking or surveying.

F. Any construction activities observed by BMU staff that are not in compliance with the approved Construction Documents will be promptly communicated to the Engineer of Record. It is the responsibility of the Developer and/or Engineer of Record to coordinate with the Contractor to take corrective action to correct the noted deficiency.

3.10 SUBSTANTIAL COMPLETION

[5] Compliance with South Dakota Codified Law 36-18A-46

A. It shall be the responsibility of the Engineer of Record to determine if the project is Substantially Complete.

B. When the project, or some portion of the project is deemed Substantial Complete, the Engineer of Record, Contractor and Developer shall execute the Certificate of Substantial Completion.

   1. The Substantial Completion of the underground utilities will not be achieved until the hard surface (i.e. asphalt paving, concrete, gravel) is in place.

   2. The issued Substantial Completion certificate and associated completion date will be for the completed portion of the project, including, but not limited to, underground piping (water, sanitary sewer, storm sewer, sump pump collection), grading, paving and concrete curb and gutter.

C. The Certificate shall include a list of items (punch list) that need to be completed prior to final acceptance and Transfer of Ownership of the project.

D. A copy of the Substantial Completion Certificate can be found in Appendix A of these design standards.

3.11 WARRANTY SECURITY

A. The Developer and/or their underground Contractor shall be responsible for providing a Warranty or Maintenance Bond for the water and sanitary sewer portion of the project.

   1. The warranty security shall be for 10% of the estimated project costs. The estimated project costs shall be determined by the Engineer of Record.

   2. Brookings Municipal Utilities shall be identified as the Owner on the warranty security.

   3. The warranty security shall be provided for only the scope of work identified in the Application to Connect (water and sanitary sewer facilities).

   4. In the event that the Developer utilizes a Performance Bond for construction purposes, a Performance Bond with Brookings Municipal Utilities listed as an Owner can be used in lieu of a warranty bond.

3.12 RECORD DRAWING REQUIREMENT

A. It is the responsibility of the Developer and/or Engineer of Record to ensure information is collected and presented on the Record Drawings per these requirements.

B. During construction and post construction activities, onsite personal (Engineer of Record, Contractor, Developer, BMU Staff, etc.) create as-built documents that record the changes that occurred during construction activities. These are non-inclusive, informal, working documents used to record changes. The following activities are examples of as-built documentation:

   1. BMU staff recording locations of water and sewer service locations. Red line notes indicating distance from some above ground feature is generated for each service location.

2. Contractor recording changes on as-built drawings as required by Contract, Division 1 requirements.

3. Surveyor providing as-built construction survey to identify all above ground features (i.e. valve boxes, hydrants, manholes location, sewer invert, etc.).

4. Engineer of Record approved shop drawing that indicates deviation from the original design.

C. The Record Drawing is prepared by the Engineer of Record and is a formal document that incorporates all the as-built information that was compiled during construction and post-construction activities. The Engineer of Record shall be responsible for collecting and obtaining all the as-built information generated throughout the project. The Record Drawing shall be generated within AutoCAD and reflect the actual construction completed with any deviations from the final design plans.

D. AutoCAD objects representing horizontal or surface features shall be spatially correct in in model space. Model space shall be set up with a datum and projection consistent with the requirements indicated in the previous section.

E. Plan and Profile sheets, similar to the information provided in the design documents, shall be set up in paper space. Viewports shall be scaled accurately and consistently to be allow the ability to scale distances correctly. AutoCAD annotations are not needed to indicate correct locations of horizontal features (i.e. Plan View) due to objects being spatially correct in model space. AutoCAD annotations are needed in the profile view, to accurately indicate as-built elevations of below ground features (i.e. sanitary sewer manhole invert elevations). Section 2.0 indicates the record drawing requirements of each utility.

F. Record drawing for sanitary sewer shall include the following:

Table 1- Sanitary Sewer As-Built Information

Feature	Spatially Correct Geometry	Annotation
Structure(s)	Location	Type
		Invert Elevation(s)
Manhole[6]	Location	Type
		Rim Elevation
		Invert Elevation(s)
Sewer Main	Location	Size
	Length	Material
		Slope
Sewer Service	Location	Size
	Length	Material
		Slope
Force Main	Location	Size
	Length	Material
		Fittings

[6] Provide pdf of approved shop drawings for manholes. Indicating depths, materials, elevations, etc.

G. Record drawing for water shall include the following:

Table 2- Water As-Built Information

Feature	Spatially Correct Geometry	Annotation
Structure(s)	Location	Type
		Invert Elevation(s)
Water Main	Location	Size
	Length	Material
Water Service	Location	Size
	Length	Material
Water Valve(s)	Location	Size
		Type
Fire Hydrant(s)	Location	Size
		Bury Depth
Fitting(s)	Location	Size
		Material
		Type

H. The Record Drawing Plans must be submitted after construction is completed and the "Certificate of Substantial Completion" is issued and prior to the execution of the "Transfer of Ownership Certificate". Owner or Owner's representative shall deliver Record Drawings in PDF and DWG format.

1. PDF Format

   a. An electronic format of the record drawings shall be provided in a PDF format. The PDF must reflect a layout similar in nature to the design documents. Including, but not limited to, legends, general site layout showing lot layout and lot numbers, plan and profile, details showing associated work. The PDF document shall be all inclusive and stand alone because it will be distributed to the locators, water and sewer collections staff and used to provide a detailed view of the system. The PDF document will be stamped with a watermark that reads "Record Drawing" on each sheet.

2. DWG Format

   a. An electronic format of the record drawings shall also be provided in a DWG format. The DWG shall include only the State Plane coordinate, spatially correct AutoCAD objects that are in Model Space. All Paper Space viewports and layouts shall be removed from the DWG file prior to submission to BMU. All Civil 3D surfaces, databases, etc. may be removed from the DWG file prior to submission to BMU. DWG shall include spatially correct lot lines, section corners, curb and gutter, water and sewer facilities. The AutoCAD features shall consist of vector lines, blocks, and polylines. Attached or embedded raster images are not acceptable. Lot lines, block

lines, curb and gutter, water and sewer features shall be on separate drawing layers from each other.

3.13 TRANSFER OF OWNERSHIP

A. Upon the project being considered ready for final payment or final completion has been achieved by the Engineer of Record, BMU will initiate the process of executing the Transfer of Ownership document for the constructed utilities (water, sanitary sewer, etc.).

B. The following items need to be complete prior to BMU initiating the Transfer of Ownership document:

   1. Concurrence by BMU that project is complete,
   2. Punch list items completed to the satisfaction of the BMU,
   3. Record Drawings delivered to BMU,
   4. City of Brookings Certificate of Completion (if appropriate),
   5. Warranty Bond covering warranty period,

C. Upon execution of the Transfer of Ownership, BMU becomes the Owner and shall be responsible for operation and maintenance of the utilities.

D. If determined appropriate, the BMU “Transfer of Ownership Certificate” and the City of Brookings “Transfer of Street Ownership Certificate” shall be executed jointly.

PART 4.0 - WATER DISTRIBUTION SYSTEM

4.1 GENERAL DESIGN REQUIREMENTS

A. The design for water main distribution facilities shall be in conformance with this chapter. Where design information is not provided herein, the most current edition of the following standards shall be used:

1. Brookings Municipal Utilities (City of Brookings) Standard Specifications, and Standard Plates. Construction standards shall be the current version of the BMU issued Standard Specifications for Water Main Construction and Standard Plates. All water construction, details, materials, and appurtenances shall conform to these standards.

   a. City of Brookings Standard Specifications for Water Main Construction shall be included with Designer's bid package. Specifications can be retrieved from the BMU website http://www.brookingsutilities.com/.

2. Recommended Standards for Water Works, Great Lakes—Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers (Ten State Standards).

3. Requirements and Standards of the South Dakota Department of Environment and Natural Resources (SDDENR).

4. American Water Works Association (AWWA) Standards and Manual of Practice.

5. South Dakota Plumbing Code.

6. Uniform Plumbing Code.

7. International Fire Code and referenced NFPA Standards.

B. Conflict

1. In case of a conflict between the above design standards, the most restrictive requirement shall apply.

C. Facility Requirements in Development Area

1. Developer shall extend water main facilities to the development area perimeter extents, whether it is required internally or not. This will ensure the water main is in place for extension by the adjacent Developer.

4.2 CITY FURNISHED MATERIALS & WATER SERVICE TAPPING FEES

A. The City shall furnish the Developer fire hydrants, valves and valve boxes for PUBLIC UTILITIES. The City will not furnish hydrants and valves for PRIVATE UTILITES.

1. Hydrants, gaskets, bolts and hydrant markers will be furnished by the City and installed by the Contractor. All hydrant leads shall be installed with a valve for hydrant isolation.
2. Valves, gaskets, bolts, valve box adaptors, and valve boxes with metallic inserts which have a cast iron drop cover marked "WATER" will be furnished by the City and installed by the Contractor.

B. After the Contractor pays the water tapping fee, the City shall furnish & install all corporations with saddle up to and including 2-inch corporations. A water service 2-inch or larger shall require prior Utility approval. Water tapping fees shall be charged to the Contractor at the cost identified on the “SERVICE CHARGES – WATER/SEWER” rate sheet.

C. All curb stops shall be furnished and installed by the Contractor.

4.3 WATER PIPE DESIGN

A. Water Main Location

1. Water mains shall be located to best conform to the layout of the existing facilities.

2. In streets where no pattern has been established, water mains shall generally be located 10-feet to the north or 10-feet to the east of the road centerline. A minimum horizontal separation of 10-feet shall be provided between the water mains and the sanitary sewer mains except as allowed in the Ten States Standards.

3. Water main extensions shall be installed in public right-of-ways or City of Brookings utility easements. Water mains shall not be allowed to cross private property without a BMU approved easement. Adequate easement width and a hard surfacing, to allow access for BMU maintenance vehicles, shall be provided. Asphalt is the preferred hard surfacing method but 6-inches of compacted gravel may be allowed.

4. Water mains shall be at least 20-feet away from buildings and located under paved areas whenever possible. Water mains will not be allowed under buildings or structures.

B. Minimum Water Main Cover

1. Minimum depth of cover for a water main, as measured from the top of the pipe to the finished surface elevation, shall be 6-feet, although 6.5-feet of depth shall be the nominal design depth. Where a vertical adjustment is required in order to pass under another utility, the length of the deeper water main shall be kept to a minimum, bends with restraining glands may be required to achieve the desired vertical offset.

C. Water Main Size

1. For new development the minimum water main size shall be 8-inches in diameter; with the exception of hydrant leads which shall be a minimum of 6-inches in diameter.

2. The BMU Engineer shall determine if a water main larger than 8-inches is required for the benefit of the overall water distribution system.

D. Approved Pipe Materials

1. Refer to City of Brookings Standard Specifications for Water Main Construction.

E. Cross-Connection Control and Backflow Prevention

1. The BMU's potable water system shall be protected from all cross connections by a backflow prevention assembly in accordance with the South Dakota Plumbing Code and shall be BMU Engineer approved.

F. Water Main Testing

1. Disinfection, bacteriological, and hydrostatic tests shall be required in accordance with requirements of the City of Brookings Standard Specifications for Water Main Construction.

G. Unused Water Main Stubs

1. Unused water main (4-inch and larger) shall be capped at the fitting (cross, tee, etc.). If a valve was installed on the unused water main / service stub, it shall be removed and returned to BMU.

H. Pipe to Pipe Clearances from Storm Sewer

1. Typical pipe to pipe clearances between a water main and a storm sewer shall adhere to the following to ensure the water main does not freeze.

2. These are typical pipe to pipe clearances, the BMU Engineer may require additional clearance depending on storm inlet locations, water main flow conditions or other design criteria.

Table 3- Water Pipe to Storm Sewer Clearance

Storm Sewer Size	Minimum Clearance (pipe to pipe)
Smaller than 18-inch	1.5-feet
18-inch to 24-inch	2-feet
27-inch to 36-inch	3-feet
Larger than 36-inch	BMU Engineer Determined
All sizes of Box Culverts	BMU Engineer Determined

4.4 WATER APPURTENANCE DESIGN

A. Fire Hydrants

1. For arterial streets, collector streets and local streets, fire hydrants shall be spaced not more than 500-feet, 400-feet preferred, along the centerline of the street.

2. Spacing of hydrants around multiple family, commercial, or manufacturing establishments shall be considered as individual cases and shall be determined by consultation with the local Fire Department.

3. Hydrants shall be located in the road right-of-way 3-foot (preferred) to 5-feet behind the back of curb and on a lot line whenever possible. Fire hydrants installed within curbside sidewalk shall be located 2-feet behind the back of curb and on a lot line whenever possible.

4. Fire hydrants shall be installed on the end of all dead-end mains. If the main terminates in a cul-de-sac, the fire hydrant shall be installed to meet clear space requirements as outlined below.

5. Flushing hydrants installed for testing purposes shall be removed once testing has been completed. If the flushing hydrants will remain in place for the duration of a winter season, they shall be installed behind the proposed curb and gutter, unless otherwise approved by the BMU Engineer.

6. A minimum of 3-foot clear space shall be maintained around the circumference of the fire hydrants, except as otherwise required or approved by the City Fire Department. Light poles, posts, fences, vehicles, vegetative growth, trash, storage, mailboxes, and other materials or things shall not be placed or kept near fire hydrants in a manner that would prevent such fire hydrants from being immediately visible and/or usable.

7. When fire hydrants are located outside of the City right-of-way and are subject to impact by motor vehicles; guard posts, curb and gutter, or other approved means shall be provided for hydrant protection.

B. Hydrant Leads

1. Hydrant leads shall be a minimum of 6-inches in diameter and have a gate valve located as close as possible to the tee. This will ensure that the gate valve will not be located in the future concrete gutter.

   a. Gate valves located in the concrete gutter will not be allowed. Engineer of Record shall be responsible for providing design (i.e. foster adaptor, spool, pipe length, etc.) that does not result in hydrant isolation valves constructed in concrete gutter.

2. Hydrant lead valve shall be mechanically restrained and attached to the tee. Restrainer devices will be required on all bends. Hydrants shall be set on a concrete block to prevent settlement. Concrete thrust blocks shall be installed against undisturbed soil to prevent movement of the hydrant lead.

3. Fittings and bends shall not be permitted on hydrant leads. Hydrant leads shall be designed such that fittings are not needed to install hydrants in proper locations.

C. Valves

1. In general, valves on cross connecting mains shall be located so that no single break requires more than 1,000-feet to be out of service.

2. Valves on water main 12-inches in diameter and larger shall be spaced not more than one-quarter mile apart.

3. Valves shall be arranged so that any section can be isolated by closing not more than four (4) valves, with a maximum of 30 residential lots out of service.

4. Valves shall be located such that they will not intersect with sidewalk crossings or adjacent to driveways.

5. All valves shall be installed with valve boxes.

6. Valves shall be placed on all dead-end mains for future extension, unless no services are planned and re-chlorination can be completed without interruption of water service.

7. Perpendicular connections to existing mains, where deemed necessary to keep the water main in service, shall be by means of a smith tap and tapping valve.

8. Valves 12-inches in diameter and greater shall be installed with two restrainer devices.

D. Encasement Pipe

1. If an encasement pipe is required because of vertical separation issues between a water main and sanitary sewer main, the Contractor may utilize PVC sanitary sewer pipe or PVC water main pipe for the encasement pipe. Water piping or sanitary sewer piping used for encasement piping shall adhere to the "City of Brookings Standard Specifications for Sanitary Sewer Main Construction" or these "City of Brookings Standard Specifications for Water Main Construction".

2. Encasement pipe for permitted right-of-way crossings, such as interstate crossings, railroad crossings, major or minor arterial roadways, county or township roadways, etc. shall be steel piping conforming to Grade B ASTM A53 with joints butt welded around the entire pipe. Wall thickness shall be schedule 10 (min) or schedule 20, as specified by the Engineer.

E. Water Main Tapping

1. Water Services shall not be tapped off water mains 16" and larger unless prior approved by BMU Engineer.

4.5 WATER SERVICE PIPE DESIGN

A. Ownership

1. Water services are owned by the Property Owner and considered PRIVATE. The private water main to the dwelling, business or industry, and any maintenance required to the water service shall be at the Property Owner's expense.

B. Individual Water Service per Residential Dwelling

1. A separate water service is required for each dwelling which has the potential of being sold individually, which shall include the following:
    a. Dwelling – Single Family
    b. Dwelling – Zero-Foot Side Yard Structure (Duplex, Triplex, Quadplex, etc.)
2. A separate water service are not required for each unit in the following dwelling types:
    a. Dwelling – Apartment
    b. Dwelling – Townhome
    c. Dwelling - Condominium
3. In the event that the ownership model for the dwelling does not adhere to one of the previously defined classifications, the number of water services installed to the dwelling will dictate how many meters are installed in the dwelling.

C. Individual Water Service per Commercial Establishments

1. All commercial establishments are required to have at least one (1) individual water service. In the event that there are multiple commercial tenants in a commercial establishment, it is recommended that a separate water service be provided for each tenant.
    a. The number of water services installed to the commercial establishment will dictate how many meters are installed in the establishment.

D. Water Service Sizing

1. The criteria for sizing and constructing Water Services for single-family residential homes from the BMU main to the curb stop, valve or building shall be:
    a. Those dwellings that have a plumbing fixture load which requires a demand of 40 Fixture Units (FU) or less are allowed to be sized with a minimum 1-inch service.
    b. Those dwellings that have a plumbing fixture load which requires a demand of greater than 40 FU shall be sized with a minimum 1 1/2-inch service.
    c. Reference Appendix A of the most current edition of the Uniform Plumbing Code for FU allocations to various fixture demands.
    d. Water service sizes shall be detailed within the Construction Drawings for review and approval.

E. Water Service Location

1. The water service location shall be determined by the Developer and/or Engineer of Record, but the water service and water service tap must be installed a minimum of 10-feet from the side property line or ownership line, adjacent to the right-of-way line.
2. All dwellings and platted lots shall have a separate water service to a public water main without crossing adjacent properties.

a. Per South Dakota Plumbing Code, a PRIVATE water service shall not cross or infringe on an adjacent property owner's property.

3. Individual water services shall be constructed to the property line, for each preliminary or platted lot, as a part of the Developer's project.

F. Minimum Water Service Cover

1. Minimum depth of cover for a water service, as measured from the top of the pipe to the finished surface elevation, shall be 6-feet, although 6.5-feet of depth is the nominal design depth. Where a vertical adjustment is required in order to pass under another utility, the length of the deeper water service shall be kept to a minimum.

G. Shut off Unused Services

1. Any unused water services shall be dug up and shut off at the expense of the Developer or water service owner. Any unused water services, because of re-platting, sale of lot, etc.; shall be disconnected at the connection to the PUBLIC main.

a. Services 1-inch to 2-inch shall be shut off at the corporation.

b. Unused water service (4-inch and larger) shall be capped at the fitting (cross, tee, etc.). If a valve was installed on the unused water service, it shall be removed and returned to BMU.

2. Repairs to the hard surface shall be the sole expense of the developer or water service owner.

4.6 WATER METERS

A. Owner or builder shall contact BMU and request a new water meter. Owner or builder shall be responsible for all costs associated with obtaining the water meter/s. Water meter/s shall be furnished and installed by the BMU Water Department. BMU shall be responsible for the maintenance, upkeep and replacement of the meter for the life of the structure.

B. Contractor is required to install PVC conduit from the meter setter to the remote reading point. Provide installation per City of Brookings Standard Specifications for Water Main Construction.

C. Number of Water Meters

1. BMU will only install the number of meters equal to the number of water services. The following examples are:

a. A single-family dwelling with a single water service will receive a single water meter,

b. A four (4) unit Zero-Foot Side Yard Structure (Quadplex) with four (4) water services will receive four (4) water meters,

c. An eight (8) unit apartment dwelling with a single water service will receive a single water meter,

d. A two (2) unit townhome with two (2) water services will receive two (2) water meters,

e. A five (5) unit townhome with one (1) water services will receive one (1) water meter,

D. Exceptions to Single Water Meter per Service

1. BMU will make an exception to the single meter per single service and provide additional water meters for residential and commercial dwellings if the following criteria are met:

a. Multiple meters will be installed in a single location. The location shall be located as close as possible to where the water service enters the building,

b. All meters are to be located in a dedicated room. Access to the dedicated area shall be through a secure, outside entry door. NO EXCEPTION. Area shall be devoted to water or other utility metering devices. Meters located in shared or common use areas (i.e. common laundry area, utility room, etc.) are not allowed,

c. Meters shall be located in heated area to prevent freezing of the water meter.

d. All other requirements identified in Section 3.30 - *Water Meter Installation* in Standard Specifications for Water Main Construction.

2. Condominium dwellings will be allowed an exception to this requirement only when the condominium association is properly registered with the State of South Dakota.

a. Prior to being registered with the State of South Dakota, the dwelling will be handled similar to an apartment dwelling such that the number of meters installed shall be equal to the number of water services.

b. Once the association is registered with the State of South Dakota, BMU will install the number of meters equal to the number of units in the condominium.

4.7 MASTER METER

A. Master metering shall only be used for providing water service to PRIVATE water systems. Master metering on new or proposed PUBLIC water systems is not allowed and will not be considered.

1. Master meters for main line metering of industrial, commercial, and multifamily residential complexes shall be subject to the approval of the BMU Engineer.

B. Mater meters are to be installed in a separate, easily accessed, above ground or below ground structure that allows BMU staff to gain access to the water meter.

1. Master meters installed in above ground structures shall meet all the requirements for the exceptions to Paragraph 4.6 - *Water Meters*, Subparagraph D – *Exceptions to Single Water Meter Per Service*, Paragraph 1 of these Design Standards.

2. Master meters installed in below ground structures shall meet the following minimum requirements:
    a. Below ground structure can be constructed of concrete or steel as long as the structure is water tight and does not leak groundwater into structure,
    b. Below ground structure shall be equipped with a permanent ladder with safety post for access in and out of the structure,
    c. Below ground structure shall have permanent electrical service to structure to operate heat, sump pump and adequate ventilation,
    d. All capital and operating costs associated with the underground structure shall be the sole responsibility of the entity requesting the mater meter,
    e. All other requirements identified in Section 3.30 Water Meter Installation in Standard Specifications for Water Main Construction.

C. All master meter assemblies must also be constructed with adequate backflow prevention assemblies as per BMU Engineer.

D. Mechanical design shall include a dismantling joint or flange coupling adapter (adjustable telescoping flanged restraint with tie-rods) downstream of the master meter to allow removal of the meter for maintenance.

1. Dismantling joint or flanged coupling adapter shall be furnished and installed by the owner. BMU will not install the flow meter without an owner provided dismantling joint.

4.8 WATER MAIN EASEMENTS AND ACCESS

A. Water main easements shall be obtained for all water mains located on private property. Water main easements shall have a minimum width of 20-feet unless larger easement widths are deemed necessary by the BMU Engineer. In addition, temporary construction easements may be required for construction.

B. The most current version of the water easement forms shall be used and obtained from the BMU Engineer's Office.

C. Easements shall be shown on the Preliminary Plans, Development Engineering Plans, and CIP Plans. Plans are to show the easement dimensioned from the centerline of the pipe to the outside edge of the easement and labeled "Utility Easement".

D. Water mains located outside of public right-of-ways shall require easement access and must be accessible by BMU maintenance vehicles. Easement access road topping shall be asphalt (preferred) or compacted gravel, as determined by BMU Engineer.

4.9 MANUFACTURED HOME PARKS

A. Water main ownership and associated water metering is dependent on the ownership model of the water and sanitary sewer mains within the manufactured home park.

1. If the water mains within the park are constructed per BMU standards, the Owner can go through the Application to Connect process and make these mains PUBLIC. If the mains are PUBLIC, BMU will install individual meter meters to each dwelling unit.
2. If the water mains within the park are not constructed up to BMU standards, these utilities will be considered PRVIATE and a master meter will be required. The master meter shall be installed prior to any dwellings within the park and individual water meters will not be provided to the individual dwellings within the park.

B. Existing manufactured home parks are not required to comply with the design standards for manufactured home parks. Existing manufactured home parks are encouraged to bring the existing water mains up to BMU standards and transfer ownership, but it is not required.

PART 5.0 - SANITARY SEWER COLLECTION

5.1 GENERAL DESIGN REQUIREMENTS

A. The design for sanitary sewer main collection facilities shall be in conformance with this chapter. Where design information is not provided herein, the most current edition of the following standards shall be used.

1. Brookings Municipal Utilities (City of Brookings) Standard Specifications, and Standard Plates. Construction standards shall be the current version of the BMU issued Standard Specifications for Sanitary Sewer Main Construction and Standard Plates. All sanitary sewer construction, details, materials, and appurtenances shall conform to these standards.

   a. City of Brookings Standard Specifications for Sanitary Sewer Main Construction shall be included with Designer's bid package. Specifications can be retrieved from the BMU website http://www.brookingsutilities.com/.

2. Recommended Standards for Wastewater Facilities Great Lakes-Upper Mississippi River Board of State Public Health and Environmental Managers." Edition (Ten State Standards).

3. Requirements and Standards of the South Dakota Department of Environment and Natural Resources.

4. American Water Works Association (AWWA) Standards.

5. South Dakota State Plumbing Code.

6. Uniform Plumbing Code of International Association of Plumbing and Mechanical Officials.

B. Conflict:

1. In case of a conflict between the above design standards, the most restrictive requirement shall apply.

C. Facility Requirements in Development Area:

1. Developer shall extend sanitary sewer main facilities to the development area perimeter extents, whether it is required internally or not. This will ensure the sanitary sewer main is in place for extension by the adjacent Developer.

D. Sewer Main Size:

1. The BMU Engineer shall determine if a sanitary sewer main larger than 8-inches is required for the benefit of the overall sanitary sewer collection system.

   a. Minimum sanitary sewer main size shall be 8-inches in diameter.

E. Sanitary Sewer Main Location

1. Sanitary sewer mains shall be located to best conform to the layout of the existing facilities. In streets where no pattern has been established, sanitary

sewer mains shall generally be located in the centerline of the road. A minimum horizontal separation of 10-feet shall be provided between the sanitary sewer mains and the water mains and storm sewers except as allowed in the Ten States Standards.

2. With the exception of sanitary sewer interceptor mains (12" and larger) sanitary sewer main extensions shall be installed in public right-of-ways and are not allowed to cross private property without a BMU approved easement width and a hard-surfacing width of 8-foot (min) to allow access for BMU maintenance vehicles. Asphalt is the preferred hard surfacing method but compacted gravel may be allowed.

3. Sanitary sewer mains shall be at least 20-feet away from buildings and located under paved areas whenever possible. Sanitary sewer mains will not be allowed under buildings and must be encased under enclosed walkways and tunnels.

5.2 DETERMINATION OF FLOW

A. Lateral Sewers

1. Discharge (QA) Average Daily Flow (gpd)

   a. Equation 1: Area x Area Density x Unit Density x Rate = Average Daily Flow

   b. Equation 2: Number of Units x Unit Density x Rate = Average Daily Flow. Density for multiple dwelling units shall be not less than 2.5 persons/unit. Density for single family dwelling units shall be not less than 3.5 persons per unit.

2. Discharge (QP) Peak Lateral Sewer Flow (gpm)

   Average Daily Flow x 400% = Peak Lateral Sewer Flow

3. Design Density and Rate (reference Density Design Table below)

B. Trunk Sewers

1. Discharge (QA) Average Daily Flow (gpm)

   Equation 1: Area x Area Density x Unit Density x Rate = Average Daily Flow

   Equation 2: Number of Units x Unit Density x Rate = Average Daily Flow

2. Discharge (QP) Peak Trunk Flow (gpm)

   Average Daily Flow x 250% = Peak Trunk Sewer Flow

3. Design Density and Rate (reference Sanitary Sewer Density Design Table below)

C. Area

1. Gross area shall be used in determining design flows and shall include streets and alleys but exclude parks, school grounds, and similar dedicated open space.

Table 4- Sanitary Sewer Density Design Table

Land Use	Area Density	Unit Density	Rate*
Low Density Residential	6 units/acre	3.5 people/unit	100 gpcd
Medium Density Residential	12 units/acre	3.5 people/unit	100 gpcd
High Density Residential	25 units/acre	2.5 people/unit	100 gpcd
Office and Institutional	Special Design Density – dependent on water use		
Commercial	Special Design Density – dependent on water use		
Industrial	Special Design Density – dependent on water use		
*gpcd – gallons per capita per day			

D. Special Design Densities

1. Special design densities shall be subject to approval by the BMU Engineer based on methodology provided by the Design Professional.

5.3 SANITARY SEWER PIPE DESIGN

A. Capacity of Pipe

1. The Manning Equation shall be used to determine pipe capacities. The design Manning's (n) for PVC Pipe Materials shall be 0.011.

B. Gravity Pipe Minimum and Maximum Velocity

1. Min. at peak flow = 2-feet per second (fps)

2. Max. at peak flow = 14-feet per second (fps)

C. Minimum Sewer Size

1. PUBLIC sanitary sewer main shall be no less than 8-inch diameter.

2. No PRIVATE sanitary sewer main shall be less than 6-inches in diameter. 6-inch diameter pipe may be used as PRIVATE sanitary sewer main where there are relatively low flows, a small number of people to be served, future extensions are not anticipated, and the sewer is capable of handling the design flows.

   a. The justification for using the 6-inch pipe shall be provided by the design professional in writing. The possibility of cleaning problems shall be identified by the design professional and accepted by the development.

D. Depth of Sewer

1. PUBLIC gravity sewers shall have a minimum depth of 5-feet to the invert.

    a. Insulation shall be required above the sanitary sewer when the dimension from the finished grade elevation to the top of the pipe is five (5) feet to seven (7) feet.

    b. Insulation above the sanitary sewer main is not required when pipe is greater than seven (7) feet deep.

E. Sanitary Sewer Pipe Class

1. Nominal Depth:

    a. PVC pipe shall meet the requirements of ASTM D-3034, Type PSM, SDR 35 minimum, for depths 20-feet deep and less. The pipe shall be made of PVC plastic having a cell classification of 12454-B or 12454-C or 12364-C or 13364-B.

2. Excess Depth (Greater than 20 feet):

    a. PVC pipe shall meet the requirements of ASTM D-3034, Type PSM, SDR 26, for pipe depths greater than 20-feet. Sanitary sewer service pipe, wyes, and bends installed at depths greater than 20-feet shall be SDR 26.

3. Sanitary Sewer Service Risers, Directional Boring & Hole-Hogging Sanitary Sewer Services.

    a. ASTM D-3034, Type PSM, SDR 26 piping shall be required at all depths for directional boring or hole-hogging; and for all sanitary sewer service riser materials up to nominal depth virgin ground.

4. Schedule 40 Sanitary Sewer Service.

    a. Schedule 40 PVC shall be required for sanitary sewer services where the water service is in the same trench and the water service is not shelved above the sanitary sewer service.

F. Alignment of Sewers

1. Sewers shall be straight between manholes. In no case, shall the sanitary sewer main curve or bend between manholes. All sanitary sewer mains on curved streets shall be designed to minimize the number of manhole but eliminate any bending of the sewer main between manholes.

2. Manholes shall be located in the centerline of the road where possible. The manholes shall not be located in the centerline of the road, designer shall attempt the center the manholes in the middle of the driving lanes.

G. Force Main Minimum and Maximum Velocity

1. The minimum force main velocity shall be 2-feet per second.

2. Suction and discharging piping for lift stations shall be sized so that the maximum velocities do not exceed 5-feet per second and 8-feet per second, respectively.

3. Dual force mains will be required if the initial force main velocities cannot meet the minimum velocity standards or if odor problems are anticipated.

H. Crossings

1. Sanitary sewer crossings of storm sewers shall have no less than 6-inches of clearance. Special structural support and insulation will be required if there is less than 18-inches clearance. The minimum horizontal clearance shall be 2-feet. Clearance refers to the distance from the outside of the sewer pipe to the outside of the storm sewer pipe.

a. Sanitary sewer crossings of other utilities shall be done in accordance with the South Dakota Department of Environment and Natural Resources, the City of Brookings Standard Specifications for Sanitary Sewer Construction, and the City Standard Plates.

I. Pipe Plug

1. Sanitary sewer mains ending at development phase boundaries that do not terminate with a manhole shall be ended with a bell end section of pipe and watertight plug. A one foot or less section of pipe with a glued-on cap inserted into the bell end of the pipe will be allowable as a watertight plug. Couplings will not be allowed for this type of connection.

J. Cleanouts

1. PRIVATE sanitary sewer service clean-outs will not be allowed in the public right-of-way. All clean-outs shall be protected with a BMU Engineer approved cover protection.

5.4 SANITARY SEWER SERVICES (LATERAL) PIPE DESIGN

A. Ownership

1. Sanitary sewer services are privately owned by the property Owner from the sanitary sewer main to the home, business or industry, and any maintenance required to the sanitary sewer service shall be at the property Owner's expense.

B. Individual Sanitary Sewer Service per Residential Dwelling

1. A separate sanitary sewer service is required for each dwelling which has the potential of being sold individually, which shall include the following:

a. Dwelling – Single Family

b. Dwelling – Zero-Foot Side Yard Structure (Duplex, Triplex, Quadplex, etc.)

2. A separate sanitary sewer service is not required for each unit in the following dwelling types:

a. Dwelling – Apartment

b. Dwelling – Townhome

c. Dwelling - Condominium

3. In all cases, the number of sanitary sewer services shall be equal to the number of water services provided per dwelling.

C. Individual Sanitary Sewer Service per Commercial Establishments

1. All commercial establishments are required to have at least one (1) individual sanitary sewer service. In the event that there are multiple commercial tenants in a commercial establishment, it is recommended that a separate sanitary sewer service be provided for each tenant.

D. Sanitary Sewer Service Size

1. The sanitary sewer service for each of the following dwelling types shall be a minimum of 4-inches in diameter:

a. Dwelling – Single Family

b. Dwelling – Zero-Foot Side Yard Structure (Duplex, Triplex, Quadplex, etc.)

2. The sanitary sewer service for each of the following dwelling types shall be a minimum of 6-inches in diameter:

a. Commercial Building

b. Dwelling – Apartment

c. Dwelling – Townhome with Single Sanitary Sewer service

d. Dwelling – Condominium with Single Sanitary Sewer service

E. Sanitary Sewer Service Location

1. The sanitary sewer service location shall be determined by the Developer and/or Engineer of Record, but the sanitary sewer service and sanitary sewer service tap must be installed a minimum of 10-feet from the side property line or ownership line, adjacent to the right-of-way line. No sanitary sewer service bends shall be allowed from the sanitary sewer service tap to the sanitary sewer service stub location at the right-of-way line.

2. All dwellings and platted lots shall have a separate sanitary sewer service to a public sanitary sewer main without crossing adjacent properties.

a. Per South Dakota Plumbing Code, a PRIVATE sanitary sewer service shall not cross or infringe on an adjacent property owner's property.

3. New sanitary sewer service lines shall be constructed to the property line as a part of the development project.

a. All residential sanitary sewer services shall be stubbed to a minimum of five (5) feet past the property line.

F. Sanitary Sewer Service Minimum Grade

1. Sewers shall have minimum grade sufficient to maintain 2 fps at peak flow. For low flow lines where feasible, a minimum grade of 1-percent shall be used. Minimum grade on building sanitary sewer stub-outs shall be 1-percent, the preferred grade is 2-percent.

G. Minimum Sanitary Sewer Service Cover

1. Minimum depth of cover for a sanitary sewer service, as measured from the top of the pipe to the finished surface elevation, shall be five (5) feet.

   a. An exception maybe granted if the BMU Engineer deems that the cover material will allow additional freezing depth or the sewage flows are minimal to allow freezing.

2. Risers on service stub-outs shall be provided for sewers greater than 14-feet deep.

H. Connections to Manholes

1. Sanitary sewer services six (6) inch and smaller shall not be connected into manholes per Ten State Standards.

I. Shut off Unused Services

1. Any unused sanitary sewer services shall be dug up and capped off at the expense of the Developer or sanitary sewer service owner. Any unused sanitary sewer services, because of re-platting, sale of lot, etc.; shall be disconnected.

   a. When the sanitary sewer PUBLIC main and service pipe is of PVC construction, the service pipe can be dug up and capped at the property and/or right-of-way line.

   b. When the sanitary sewer PUBLIC main and service pipe is of clay or similar material, the connection to the PUBLIC main (i.e. wye or tee) will need to be dug up and removed from the PUBLIC main. This work will occur within the right-of-way or easement.

2. Repairs to the hard surface shall be the sole expense of the developer or sanitary sewer service owner.

5.5 SANITARY SEWER MANHOLE DESIGN

A. Manhole Materials

1. All manholes shall be precast concrete manufactured by a supplier that is capable of providing various sizes and configurations of sanitary sewer manholes.

2. Cast-in-place sanitary sewer manhole base sections (doghouse) are not considered watertight and are not allowed unless prior prebid BMU Engineer approval has been obtained.

3. Only HDPE adjustment rings shall be allowed; concrete adjusting rings, bricks, blocks, or shimming devices will not be allowed for adjusting sanitary sewer manholes.

B. Manhole Liners

1. All manholes installed on sanitary sewer mains 15-inch or larger shall require manhole liners.

   a. Manhole liners may be required on sanitary sewer mains smaller than 15-inch, if deemed necessary by the BMU Engineer. Liners shall be required on manholes that provide service a commercial or industrial business that produces industrial or high strength wastewater.

C. Minimum Manhole Diameter

1. Minimum diameter manholes are 48-inches when both the influent or effluent piping is less than 18-inches. Sanitary sewer manholes shall be a minimum diameter of 60-inches when either the influent or effluent pipes are 18-inches to 30-inches. Sanitary sewer manholes shall be a minimum diameter of 72-inches when either the influent or effluent pipes are greater than 30-inches. In all cases, the Manufacturer's recommended minimum spacing between pipes shall be followed.

D. Maximum Manhole Spacing

Table 5- Sanitary Sewer Manhole Spacing

Diameter of Sewer	Distance
All sanitary sewer pipe diameters	450-feet

1. Note: Exceptions will be permitted within a development; however, said exceptions shall not be for more than 5-percent of the manholes in the development. Said exceptions shall not exceed 5-percent of the above distance unless BMU Engineer approved.

E. Manhole Locations

1. Manholes shall be installed at the following locations:

   a. At the end of each sewer main.

   b. At all changes in pipe size, grade, or alignment.

   c. At all sewer pipe intersections.

F. Invert Elevation Through Manhole

1. Same pipe size for opposite directions: 0.10-feet.

2. Same pipe size for adjacent or offset directions: 0.20-feet.

3. Change in pipe size: match 0.8 depth point of all lines as a minimum, and match tops of pipes whenever possible.

G. Inside Drop Bowl

1. Inside drop bowls are required when the drop exceeds 2.00' between 80% above the carrier pipe invert (bottom pipe invert) to the higher inflow invert. In the event that the carrier pipe is greater than 24-inch in diameter and the drop assembly will be install in the flowline of the carrier pipe, the drop pipe assembly shall not be installed.
2. Outside drop sanitary sewer manholes are not allowed.

H. Manhole in Cul-De-Sac

1. Manholes located at the end of cul-de-sacs shall be located 8-feet to 10-feet from the back of curb and gutter to shorten the sewer service lengths.

I. Dead-end Manholes

1. Dead-end manholes shall be extended beyond the midpoint of the last serviced lot. If the dead-end manhole is the last manhole of an Owner's development, the manhole shall be extended to the end of the Owner's property.

J. Manhole Rim Elevations in Floodplain

1. Developer and/or Engineer of Record shall determine minimum height of manhole rim elevation in floodplain: 1-foot minimum above 100 year flood elevation.

5.6 SEWAGE LIFT STATIONS

A. The Design Standards and Standard Details for sanitary sewage lift stations shall be used for all lift stations unless a separate design is determined necessary by the BMU Engineer. Permanent lift stations shall be BMU owned, operated and maintained after meeting all design criteria and testing requirements.

B. Temporary lift stations (Developer owned) may be considered by the BMU Engineer where future gravity sanitary sewer mains are planned to eliminate the need for the lift station within a reasonable time frame.

C. Each pumping station shall be provided with a minimum of two pumps, each having a capacity sufficient to pump the peak design flow. Submersible pump system is preferred (no drywell with wetwell).

D. No sanitary sewage shall be allowed to be discharged into a newly constructed lift station wet well until final completion is made and notification is made by BMU assuring operation responsibilities.

E. Specific Equipment Required

1. The sewage lift station shall be supplied with, but not be limited to, the following specific items:

a. Wet well shall be 8-foot diameter (min) and HDPE lined precast concrete with monolithic base.

b. Wet well shall require fall protection under both the pump and trash basket access hatch doors. A 3-sided railing, opposite the hinged side of pump access hatch door, shall be required.

c. Wet well steel bar screen style trash basket with rail system (solid aluminum wheels and stainless steel axles) and pump guide rail system shall be 316 stainless steel.

d. Valve vault shall be a separate precast manhole for housing check valves, gate valves, and shall include a hatch operated blower.

e. Discharge piping from the pumps through the valve vault shall be schedule 80.

f. Pump voltage shall be 208/120Y 4-wire (preferred) or 480/277Y 4-wire.

g. Control system including electrical equipment and apparatus shall be housed in climate-controlled building, with heating & cooling systems that are energy star qualified.

h. Secondary power supply – diesel engine generator system with adequate diesel storage for prolonged run time. Exterior stand-alone generator systems are allowed.

i. Automatic closed-transition transfer switch for the secondary power supply.

j. Programmable logic controller and HMI to control and monitor the lift station remotely and locally shall be Allen-Bradley; coordinated and approved with BMU. Control system shall include an online UPS backup approved by BMU Engineer.

k. Wet well level control shall include level sensor and float backup.

l. SCADA shall be compatible with existing BMU equipment; coordinated and approved with BMU.

m. Variable Frequency Drive (VFD) with factory bypass shall be required for all pump motors and shall be Allen-Bradley; coordinated and approved with BMU.

F. Wet Well Design

1. The wet well design shall be coordinated with pump sizing in order to avoid frequent on/off cycling of the pumps. To prevent septicity, wet well detention time at average daily flow (QA) should not exceed 30 minutes.

2. Cycle time is the total time between starts of an individual pump and can be determined by comparing the volume between the “on” and “off” levels in the wet well with the pump capacity. Cycle time is computed as follows:

   CT = Cycle Time (minutes)
   V = Wet Well Volume between On and Off Levels (gallons)
   D = Rated Pump Capacity (gallons per minute) and
   (QP) = Peak Hourly Lateral Sewer Flow (gallons per minute)
   CT = V/(D- QP) + V/ QP

3. With a given wet well volume and pumps of uniform pumping rate, minimum cycle time will occur when the rate of inflow is equal to one-half of the discharge rate of the individual pump under consideration and the formula for cycle time simplifies to CT = 2V/ QP = 4V/D.

a. An effective wet well volume of at least 2.5 times the discharge rate of the pump is required.

4. The operating volume of the wet well shall be designed to provide the following maximum motor starting times at the design pumping rates.

Table 6-Sewer Lift Station Starting Frequency

Motor Size (hp)	Maximum Motor Starting Times
0–25	6 starts per hour
26–35	5 starts per hour
36–60	4 starts per hour

G. Pump Design

1. The operating speed of the pumps shall not exceed 1,800-rpm. The test sphere minimum diameter shall be no less than 3-inches in diameter. The minimum suction and discharge diameter shall be no less than 4-inches in diameter.

H. Engine Generator Design

1. The engine generator shall be designed to operate each pump separately; the generator controls shall be set up so it interlocks to allow operation of only a single pump (in a duplex application) and all other electrical equipment when under generation. If more than two pumps are used, the engine generator shall be designed to start the pumps necessary for the firm pumping capacity of the station simultaneously. It shall be at the BMU Engineer's discretion to change the generator sizing requirements when the size of the lift station warrants it. The engine generator system shall be a four-cycle water-cooled type. The generator shall be supplied with a closed-transition automatic transfer switch. An enclosure for the automatic transfer switch shall be supplied and sized large enough to contain the station on/off switches, telephone termination boxes, and other necessary controls. The generator shall be enclosed in a sound attenuation enclosure and supplied with all accessories which make it a complete operating system.

I. Power Supply

1. Power supply shall be coordinated with BMU Electrical Department.

J. Access Road to the Lift Station

1. An access into the lift station will be required and shall be shown on the construction drawings. The access road shall meet minimum thickness and materials standards for streets. The surfacing shall be asphalt or concrete.

K. Site Landscaping

1. The Contractor shall maintain the grass areas by watering, fertilizing, reseeding, mulching, and mowing until the grass has established a 2-inch

catch of grass. The Contractor shall immediately reseed and mulch areas which show bare spots at no additional cost.

L. Odor Control

1. Odor control shall be provided at the lift station and/or the force main discharge where it is determined to be a detectable problem.

M. Flooding

1. Wastewater pumping station structures and electrical and mechanical equipment shall be protected from physical damage by a 100-year flood event and shall remain fully accessible during a 100-year flood event.

5.7 SANITARY SEWER MAIN EASEMENTS AND ACCESS

A. Sanitary Sewer Main Easements

1. Sanitary sewer main easements shall be obtained for all sanitary sewer mains located on private property. Sanitary sewer main easements shall have a minimum width of 20-feet. In addition, temporary construction easements may be required for construction.

2. The most current version of the sanitary sewer easement forms shall be used and obtained from the BMU Engineer's Office.

3. The following Easement Table lists the minimum easement widths for sanitary sewer main with a pipe diameter of 30-inches or less. The minimum easement widths shall be used when preparing plans. Easements shall be shown on the Preliminary Plans, Development Engineering Plans, and CIP Plans. Plans are to show the easement dimensioned from the centerline of the pipe to the outside edge of the easement and labeled "Utility Easement" (preferred) or "Sanitary Sewer Easement". The easement widths may be required to be wider depending upon specific site conditions.

4. Easement Table

Table 7- Sanitary Sewer Easement Width Requirement

Pipe Depth (Feet)	Min Easement Width Required	Pipe Depth (Feet)	Min Easement Width Required
8	20	**20**	48
9	20	**21**	52
10	20	**22**	54
11	22	**23**	58
12	24	**24**	60
13	28	**25**	64
14	30	**26**	66
15	34	**27**	70
16	36	**28**	72
17	40	**29**	76

18	42	**30**	78
19	46		

B. Access to Sanitary Sewer Mains

1. Sanitary sewer mains located outside of public right-of-ways shall require easement access and must be accessible by BMU maintenance vehicles. Easement access road topping shall be asphalt (preferred) or 6-inches of compacted gravel, as determined by BMU Engineer. Manhole lids to be installed up to the road topping grade.

5.8 MANUFACTURED HOME PARKS

A. The building pad for manufactured home park dwellings shall be a minimum elevation of 1-foot above the 100-year flood elevation. Sanitary sewer service risers which accommodate the manufactured home park dwellings shall extend above the pad.

5.9 INDUSTRIAL SEWER MONITORING FACILITY

A. New buildings constructed or proposed to be constructed which produce industrial or high strength wastewater shall install a BMU Engineer approved sanitary sewer monitoring facility prior to final building inspection approval. The monitoring facility shall normally be situated outside of the building on the Owners' premises. If the industrial Owners' sanitary sewer service line ties into an existing BMU manhole and such manhole allows for safe sampling and isolation of the industrial Owners' discharge, the BMU Engineer may allow said manhole to serve as the industrial Owners' monitoring facility.

5.10 GREASE INTERCEPTORS

A. A grease interceptor shall be required to receive the drainage from fixtures and equipment with grease-laden waste located in food preparation areas, such as in restaurants, hotel kitchens, hospitals, bars, cafeteria and clubs. Fixtures and equipment shall include pot sinks, pre-rinse sinks, coup kettles or similar devices; work stations, floor drains or sinks into which kettle are drained; automatic hood wash units, dishwashers and especially dishwashers without pre-rinse sinks.

1. A grease interceptor shall not be required for individual dwelling units or private living quarters.

B. Grease interceptors shall only receive waste only from fixtures and equipment that allow fats, oil or grease to be discharged. Water closets, urinals, and other plumbing fixtures conveying human waste shall not drain into or through the grease interceptor.

C. All new grease interceptors installed within the City of Brookings shall be hydromechanical grease interceptor (HGI). Gravity grease interceptors will not be allowed unless with prior approval.

1. HGI; fats, oils and grease disposal systems shall be sized in accordance with ASME A112.14.3, ASME 112.14.4, ASME A112.14.6, CSA B481.3 or PDI G101.

2. HGI devices shall be installed in accordance with the manufacturer's instructions.
3. HGI shall be equipped with a device to control the rate of water flow so that the water flow does not exceed the rated flow of the HGI. The flow control device shall be vented and terminate not less than 6-inches above the flooded rim level or be installed in accordance with the manufacturer's instructions. The flow control device shall not have any adjustable or removable parts to allow the maximum flow to the HGI to be modified.

D. Grease interceptors installed with new construction shall be located outside and be easily accessed. Initial Installation and inspection of the grease interceptor will be inspected by BMU water department. Owner shall provide access to grease interceptor to BMU staff for periodic inspection of the HGI to verify that the HGI is maintained and operating as intended.