



# INFRASTRUCTURE POLICIES & DESIGN CRITERIA

**Effective March 1, 2001**

**Amended September 18, 2001**

**Amended December 1, 2002**

**Amended July 1, 2003**

**Amended May 1, 2004**

**Amended January 1, 2007**

**Amended November 27, 2018**

Dev Proc, Design Policy, Design Policy-18.11



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### I. INTRODUCTION & PURPOSE

#### A. General

1. The City of Cheyenne Board of Public Utilities (BOPU) is responsible for construction, operation and maintenance of the water and wastewater collection systems for the City of Cheyenne, WY. It is necessary that the BOPU review and approve all plans, specifications and construction activities for extensions or changes in the water and sanitary sewer systems owned and operated by the BOPU.
2. The purpose of the *Infrastructure Policies & Design Criteria (IPDC)*, previously titled *Rules & Regulations for Establishing Policies & Design Criteria*, is to provide minimum standards for the design and construction of the water and sanitary sewer utilities to be owned and operated by the BOPU including additions or replacements of the existing systems.
3. Where a local, state, or federal applicable code, statute, or regulation addresses the requirements set forth in these standard criteria, the most stringent requirement shall control. The provisions of the *IPDC* are minimum requirements and do not preclude imposition of more restrictive standards by agreement or by law. The Director or authorized delegate of the BOPU shall provide the official interpretation of the *IPDC*. Any design criteria not addressed in the *City of Cheyenne & Board of Public Utilities Construction Specifications and Standard Drawings (City Specs)* or the *IPDC* shall meet minimum criteria required by Wyoming Department of Environmental Quality (DEQ). 10 States Standards may be used as a supplemental design aid when necessary.
4. All work and activities of utility extensions, construction, and/or modification must comply with the current versions of the *IPDC*, the *City Specs*, and other codes adopted into the *Cheyenne Municipal Code (CMC)*, which are incorporated into the *IPDC* by this reference.
5. Prior to the contractor beginning work, an approved set of plans and specifications must be on file with the BOPU and the City Engineer's Office (CEO). All plans, specifications, and calculations submitted to the BOPU, the CEO, and DEQ to be reviewed, must be prepared by or under the direct supervision of a Professional Engineer duly registered and licensed to practice engineering in the State of Wyoming. All associated fees shall be paid, easements recorded, and a preconstruction meeting shall be completed prior to the contractor beginning work.
6. Exceptions to these rules and regulations may be considered on a case by case basis if deemed appropriate by the BOPU Director or authorized delegate.

### II. ANNEXATION, PRELIMINARY PLATS AND SURVEY, USER AGREEMENTS

#### A. General

1. Annexation shall be per the criteria and procedures of Chapter 1.16 of the *CMC*. Preliminary plats and surveys shall also be per Chapters 1.12 and 1.16 of the *CMC*. All annexations must go through the City of Cheyenne Development Services Office approval process.
2. A property must be annexed to the City of Cheyenne or the property owner must obtain approval from BOPU Staff, City of Cheyenne Development Department Staff, BOPU Board, and Cheyenne City Council to enter into an Outside City User Agreement (Appendix D) to receive water and sanitary sewer services from the BOPU.

**III. UTILITY EXTENSIONS AND CONNECTIONS**

**A. Extensions Required Across the Property**

1. As per sections 1.16.040, 1.16.050 and 1.16.060 of Chapter 1.16 of the *CMC*, the property owner/developer shall be required to extend the water and sanitary sewer utilities to the farthest point (or points) of the property being developed. These utility extensions shall be to a point (or points) that are logical for projected future connections by future development projects, as determined by the BOPU and the property owner/developer. In some situations, the BOPU may allow, at their discretion, that water and sanitary sewer easements be provided to facilitate future utility connection and/or extensions, in lieu of the physical construction of the water and/or sanitary sewer utilities.

**B. Over-sizing & Cost Sharing**

1. All water and sanitary sewer system extensions shall be sized as per the current BOPU water and sewer system master plans and/or shall be sized to meet the potential demands of the maximum possible service area as determined by appropriate hydraulic modeling methods and in no case, shall be less than eight inches in diameter. Hydraulic modeling shall be performed as outlined in Appendix E.
2. Upon entering into a written agreement with the BOPU, prior to the start of any related work or activity, the BOPU may participate in the cost of the water and sanitary sewer mains that are over-sized to meet future needs. The BOPU may only cost share for main sizes greater than eight inches in diameter and greater in size than that required to meet the potential demand of the planned development project. The BOPU will only reimburse for direct costs relating to the design and construction of the over-sized main by use of bid alternates, one alternate being for the required main size and the second bid alternate being for the over-sized main. Reimbursement payments shall be made within 45 days of receipt of valid invoices for the work, or portions of the work.

**C. Reimbursements to Developers and for BOPU/City Main Extensions**

1. Persons and/or the BOPU and/or the City of Cheyenne financing the construction of water and sanitary sewer utilities through undeveloped areas may be entitled to future reimbursements as per Chapter 1.16 of the *CMC*.

**D. Adjustments to Existing System**

1. As per Chapters 13.04, 13.08, and 13.12 of Title 13 of the *CMC*, no one shall operate, connect to or make alteration to the City of Cheyenne water and sanitary sewer systems without first obtaining written approval from BOPU.

**E. Connections to Existing System**

1. As per Sections 13.08.040 through 13.12.380 of Chapters 13.08 and 13.12 of the *CMC*, it is unlawful for anyone to alter, operate or connect to the City of Cheyenne's water and sanitary sewer systems without the approval of and under the supervision of the BOPU.
2. Criteria for the Purchase of Water and Sewer Tap Permits - The following criteria shall be met before the BOPU shall issue a tap permit:
  - a. The property to be served must be annexed to the City or the property owner shall hold an Outside City User Agreement meeting the approval of the BOPU Staff, City of Cheyenne Development Department Staff, BOPU Board, and Cheyenne City Council.

- b. A final plat of the property (including lots and blocks) shall be recorded with the Laramie County Clerk.
    - c. A water and/or sewer main shall exist, abutting the property and available to serve the property; or the following two conditions shall be met:
      - i. The BOPU shall be in possession of a set of plans, bearing the approval signature of the BOPU, the City Engineer, and the City Fire Department for the construction of the necessary water and sewer mains; and
      - ii. The BOPU shall be in possession of the DEQ Notice of Coverage (Permit to Construct) of said water and sewer construction project.
    - d. Owner/Developer/Contractor shall submit to BOPU a Utility Layout Plan identifying the water and/or sanitary sewer connection(s), service line size(s), curb stop and meter pit locations from the BOPU main line to the property. The Utility Layout Plan shall clearly show the property location (lot, block, subdivision), street names and addresses if available.
    - e. After BOPU approval of the Utility Layout Plan, the owner/developer/contractor shall complete the connection permit application and pay all fees due prior to the issuance of a tap/connection permit ("PERMIT"), except for system development fees, which may be paid at either the time of issuance of a PERMIT or prior to the issuance of a building permit. The fees due shall be the amount of the fee in effect at the time payment is received. Annual increases generally go into effect on January 1<sup>st</sup> of every year.
    - f. Connection permit applications require a minimum processing time of five working days.
  3. A tap permit is associated with the property it was applied for and cannot be moved to another property. If a property owner/developer/contractor purchases a tap permit for a certain lot and block (parcel A) and later wants to install a tap at a different lot and block (parcel B) then;
    - a. The BOPU may refund or give credit for the (Parcel A) tap fees, the system development fees, pump station fees, or other fees associated with the permit as outlined in the "Tap Permit Refunds and Credits" section; and
    - b. The owner/developer/contractor shall purchase a new permit for the new property (parcel B) at the scheduled fee rate that is in effect at the time of the purchase of said permit.
    - c. Installed and unused taps must be disconnected (killed) at the main prior to installation of new taps on the same property.
  4. Tap Sizing and Location
    - a. A tap permit must be obtained from the BOPU before any tap is installed. It is the applicant's responsibility to size the tap and service line appropriately to meet the needs and demands of the facility being served. The tap size (corporation stop) and the service line size shall be the same size to the meter. Water service lines shall be no less than ¾-inch in diameter and sewer service lines shall be no less than 4-inches in diameter.
    - b. The water and sewer service lines to each building shall be separate and independent from any other building.
    - c. The BOPU shall inspect the tapping of mains, insertion of corporation and curb stops, and laying of service pipes to the curb stop to assure proper installation.

- 5. Meters & Meter Pits
  - a. All water use must be metered, except for emergency service lines (i.e. fire protection). Water meters shall be furnished and installed by the BOPU. The meter will remain the property of the BOPU. The meter shall be the same size as the service tap.
  - b. All 1½-inch and larger meters for new construction shall be placed in outside meter pits.
  - c. Per *CMC* Section 13.04.100 every building, structure, or consumer in the City shall have a separate utility service connection, except for common ownership projects approved by the Board. Common ownership projects must submit a Common Ownership Agreement with the BOPU and receive Board approval (see Appendix C).
- 6. Living Units Served
  - a. Water services and meters shall be sized to provide adequate flow rates to the proposed building. The table below is a generalization of criteria to consider when calculating tap/meter sizes.

Minimum Tap/Meter Size (Inches)	Maximum Allowable Flow Rate (GPM)*	Maximum Water Supply Fixture Units (WSFU)**	Total Number of Living Units***
¾	15	11	1
1	25	36	2-4
1½	50	129	5-10
2	80	275	11-20
3	175	783	21-50
4	300	1777	51-90

*Note:* Owner/Developer/Contractor shall have their Wyoming licensed Engineer of Record submit stamped fixture unit calculations for sizing of service lines for BOPU review and approval if deviating from the above table. The analysis shall indicate adequate flow rates considering, but not limited to service line development length. Max velocities shall not exceed 10 feet per second at peak hour demand.

\*Maximum Allowable Flow Rates based on *AWWA M22 Third Edition Meter Standards* Table 6-1 for High Normal Flow Rates for Multijet (¾"-2") and Compound Class II (3"-4") meters.

\*\*Maximum Water Supply Fixture Units interpolated from *2015 International Plumbing Code* E103.3 Tables.

\*\*\*Total Number of Living Units Served is based on local and historical data.

- 7. Disconnected (Killed) Services
  - a. The disconnected services will be disconnected (killed) at the main line. Disconnection (killing) of Sewer and Water services shall be inspected by BOPU and City inspection staff. Any sewer or water service that is disconnected (killed), at the direction of the property owner, and removed will be allowed a capacity credit as outlined in the "Tap Permit Refunds and Credits" section.
  - b. Reuse of lead service lines, for new units shall not be permitted. A new service line shall be installed to replace the lead service line.
- 8. Increase in Tap Size
  - a. If a new larger tap is requested to replace an active existing tap, the applicant shall apply for a new tap permit.
  - b. The applicant shall be granted a credit as outlined in the "Tap Permit Refunds and Credits" section, and then be required to pay all appropriate current fees, as defined



and adopted by the BOPU, for the new larger tap size. A credit shall only be applied if the existing tap is killed at the main and replaced within forty-five days, and shall not exceed the cost of the new larger tap fees to be paid. Fees and credits may only be applied to the same physical address.

9. Decrease in Tap Size
  - a. If a new smaller tap is requested to replace an active existing tap, the applicant shall apply for a new tap permit.
  - b. The applicant shall be granted a credit as outlined in the “Tap Permit Refunds and Credits” section, and then be required to pay all appropriate current fees, as defined and adopted by the BOPU, for the new smaller tap size. A credit shall only be applied if the existing tap is killed at the main and replaced within forty-five days, and shall not exceed the cost of the new smaller tap fees to be paid. Fees and credits may only be applied to the same physical address.
10. Wet Taps to Water Main, 3-inch up to 12-inch
  - a. After applying for a tap permit and paying all appropriate fees, the BOPU shall make all water line taps that are 3-inch in diameter or greater. The applicant shall be responsible for excavation and backfill of the trench.
  - b. The applicant shall use a licensed and qualified contractor to make all sewer line taps, after all appropriate permits are obtained and all appropriate fees are paid.
11. Wet Taps to Water Main, 2-inch & Smaller and 12-inch & Larger
  - a. The applicant shall use a licensed and qualified contractor to make all water taps that are 2-inch and smaller and 12-inch and larger, after all appropriate permits are obtained and all appropriate fees are paid.
12. Tapping Water Mains Larger than 12-inches
  - a. No taps (service line connections) smaller than 6-inches in diameter will be allowed on water transmission mains. All connections to water mains larger than 12-inches shall be made by means of a tee or tapping saddle.
13. BOPU Easements
  - a. Property owner shall provide easements for water and sanitary sewer utilities that are not located or constructed within the roadway or Public Right of Way. The easement width shall be for no less than 20 feet for one utility main located in the center of the easement and shall be no less than 30 feet wide when two utility lines are constructed in parallel and are centered within the easement.
  - b. No other utility shall be placed within 10 feet (horizontally) of the water and/or sanitary sewer main.
  - c. A minimum 10-foot horizontal set-back from edge of BOPU easement shall be maintained for permanent structures. Permanent structures shall be considered, but not limited to, building foundations, building walls, retaining walls, underground anchoring systems, and trash enclosures. Sleeves may be used where appropriate in lieu of a 10-foot set-back.
  - d. The following note shall appear on all applicable construction drawings, plat maps, easement documents, etc.:
    - i. “This WATER AND SEWER UTILITY EASEMENT (hereinafter referred to as the “BOPU UTILITY EASEMENT”), as shown and described hereon, is granted to the

Board of Public Utilities of the City of Cheyenne (“BOPU”). No other utilities may install facilities on or within the BOPU UTILITY EASEMENT, except as follows: Other utilities may cross the BOPU UTILITY EASEMENT, if and only if: (i) a utility’s facilities cross the BOPU facilities at no less than a 60 degree angle; (ii) a minimum of 24 inches of vertical clearance is provided between the BOPU facilities and the crossing facilities, unless otherwise approved by the BOPU; and (iii) a copy of any utility easement authorizing the crossing of the BOPU UTILITY EASEMENT is provided to the BOPU prior to any construction within the BOPU UTILITY EASEMENT.”

14. Tap Permit Refunds and Credits

a. Uninstalled Taps

- i. Tap permit and system development fees paid are 100% refundable for a tap that has not been installed and is cancelled at the request of the property owner/developer/contractor. The BOPU will refund or credit only the actual amounts paid.
- ii. If a Service Tap Connection has not been installed within forty-five days of its purchase or if a re-plat of the lot and block occurs, then the Tap Permit becomes invalid. In this case, the BOPU will refund or credit the actual amounts paid.

b. Installed Taps

- i. The BOPU will not issue refunds for any fees related to a tap permit or service tap connection that has been installed. This applies to both unused and used service tap connections.
- ii. The BOPU will not issue credit for any fees related to a tap permit or service tap connection that is not disconnected (killed) at the main.
- iii. The BOPU will not issue credit for any portion of the tap permit fee.

1. Fully Paid Taps

- a. If a service tap connection is disconnected (killed) at the main, the BOPU will issue a system development capacity credit, and if applicable a pump station capacity credit, toward the purchase of a new tap. The capacity credit will be equal to the current effective system development fee (and pump station fee if applicable) that corresponds to the size of the tap being killed. The capacity credit must be used toward the purchase of a new service tap, otherwise the credit will be forfeited.
  - i. If the service tap connection has been used, the capacity credit can only be used to offset the cost of a new service tap connection to the same property.
  - ii. If the service tap connection has not been used, the capacity credit can be used to offset the cost of a service tap connection within the same subdivision or development.

2. Partially Paid Taps

- a. If a service tap connection is disconnected (killed) at the main, the BOPU will issue a credit for the actual amount paid for the system development fees, and if applicable pump station fees. The credit must be used toward the purchase of a new service tap, otherwise the credit will be forfeited. The credit can only be used to offset the cost of the system development

fees (or pump station fees if applicable) of a new service tap connection within the same subdivision or development.

15. Future Tap Permits

- a. Where applicable, BOPU may issue tap permits and postpone related tap and system development fees for properties adjacent to new developments subject to the following conditions:
  - i. BOPU receives a request for said tap permit,
  - ii. An engineer (other than BOPU staff) identifies the size and location of the tap,
  - iii. The tap and permit are assigned to a specific parcel of property,
  - iv. The entity installing said tap(s) is identified,
  - v. The property owner signs the tap permits,
  - vi. The taps cannot be utilized until the property is annexed or an Outside User Agreement is filed, and all deferred fees are paid in full. Said fees due will be fees in effect at the time of payment of said fees.

**IV. PRELIMINARY DESIGN REPORT**

**A. General**

- 1. A preliminary design report shall be submitted to the BOPU for review and approval as part of the design for water and sanitary sewer construction projects. All preliminary reports must be received by the BOPU prior to approval of final design drawings and must comply with the requirements of the Wyoming DEQ, Water Quality Rules and Regulations, Chapters 11 and 12.
- 2. The engineering report shall be submitted with each application. The purpose of the report shall be to describe and provide technical justification for all aspects of the proposed construction, modifications, and/or installations. The report should address existing conditions, known or suspected problems, proposed actions, and the reasoning used to arrive at those proposed actions.
- 3. The preliminary report, construction plans, and specifications must be submitted to the Wyoming DEQ and a DEQ Permit to Construct must be obtained prior to construction. BOPU approval of report should expedite Wyoming DEQ review and approval process.
- 4. Any hydraulic modeling shall be performed as outlined in Appendix E.
- 5. Minimum requirements for water distribution and sewerage system extensions shall be:
  - a. Water distribution system extensions:
    - i. A description of the service area including scaled vicinity plan map(s) of the project with regard to adjacent and proposed development, elevations, and topographic features.
    - ii. Current and projected system water demand for average day, maximum day, peak hour, needed fire flows, and per capita maximum daily flows.
    - iii. Information of fire protection and fire flow capabilities of the proposed system.
    - iv. Description of high service pumping systems, finished water storage facilities, and water utility upgrades and extensions.
  - b. Sewerage system extensions:
    - i. A description of the service area including scaled vicinity plan map(s) of the project with regard to adjacent and proposed development, elevations, and topographic features.

- ii. Current and projected average and peak hour flows for the design of the project, per capita design flows, extraneous flows (inflow and infiltration), and industrial and/or commercial waste flows.
- iii. The downstream impact on existing sewers, lift stations and treatment facilities. This information shall include existing population, waste loads, existing flows and capacity of downstream facilities.
- iv. A description of new lift stations and sewer collection system upgrades and extensions.

### **V. APPROVALS AND REQUIREMENTS FOR CONSTRUCTION PLANS, SPECIFICATIONS AND RECORD DRAWINGS**

#### **A. Construction Plans**

1. All plans and specifications for projects within the limits of the City of Cheyenne, or foreseeable annexable boundary, shall be submitted to the City of Cheyenne Building Department, ATTN: City Engineer's Office Room 206, Cheyenne, WY 82001. A master application form shall accompany the submittal along with all other applicable items outlined on the Engineering Plan Review (EPR) Checklist for the CEO Engineering Plan Review. The City will distribute plans to BOPU for review.
2. At the time of the submittal of the plans to the City and BOPU, the following information shall be displayed in the plan set:
  - a. All water mains and their sizes.
  - b. All sewer mains and their sizes.
  - c. Distance between sewer and water mains and other utilities.
  - d. Street names, street widths, and the width of the right-of-way.
  - e. Type of materials the mains are made of.
  - f. All property lines and distances from the property lines to the utility mains.
  - g. Subdivision names, also showing block and lot numbers.
  - h. House addresses if known.
  - i. Size and location of all water taps and curb stops and meter pits.
  - j. Size and location of all sewer service connections.
  - k. Distances from the main line water valve to the water service taps.
  - l. Distances from the center of the manhole cover to the sewer service taps.
  - m. All utility easements must be shown.
  - n. Proper orientation of the north arrow.
  - o. The drawing scale must be shown as a bar scale and in written format.
  - p. The elevations of all sewer main inverts at the manholes and the manhole rim.
  - q. The diameter of all manholes shall be shown.
  - r. The distances between all manholes and pipe grade must be shown.
  - s. The drawing must contain at least two points and ties to the PLSS (State Plane System NAD83 and NAVD88).
  - t. The electronic copy must be submitted in DXF, DWG, or shapefile formats referenced using NAD 1983 State Plane Wyoming East FIPS 4901 Feet.
3. Upon final approval by the CEO and BOPU, BOPU will sign the DEQ permit application. A DEQ Permit to Construct shall be obtained prior to preconstruction meeting. The BOPU

construction plan approval shall be valid for a period of two years. If no construction progress occurs during a 24-month period, the plan approval will be voided and re-application will be required.

4. For projects outside city limits please submit plans to BOPU Engineering & Water Resources Division at BOPU Engineering & Administration Building. The BOPU will not sign a DEQ permit application until plans and specifications have been reviewed and approved by BOPU staff.

### **B. Requirements for Notice to Proceed**

1. No construction of utilities shall be permitted to begin prior to the Board's issuance of a notice to proceed. The following criteria must be satisfied before the Notice to Proceed will be issued:
  - a. Construction plans approved and signed by the City Engineer, BOPU, and Fire Department.
  - b. Receipt of the water and sewer facilities cost estimate.
  - c. Receipt of the cash bond or irrevocable letter of credit.
  - d. DEQ review and issuance of a Permit to Construct.
  - e. Completion of a BOPU utility agreement document (if applicable).
  - f. Receipt of the application for inspection.
  - g. Appropriate easements recorded (if applicable).
  - h. Attendance at a BOPU pre-construction meeting.
  - i. Submittal of one hard copy and one electronic format, in NAD 1983 State Plane Wyoming East FIPS 4901 Feet, of the final approved and signed plans and project specifications to the BOPU.
  - j. Receipt of the associated fees.
  - k. Developer's signature on the Record Drawing Guarantee Form (see Appendix B).

### **C. Construction Inspection and Testing**

1. Any deviations from the approved plans and specifications shall be approved in writing by the CEO, BOPU, and DEQ prior to the work being performed. The City and BOPU inspectors have the authority to sign off on minor changes.
2. The BOPU construction inspector will visit the construction site periodically to provide assurance to BOPU that work complies with the pre-approved plans and specifications.
3. The BOPU inspector will be present during all testing of completed work.
4. Written requests shall be required for system startup and testing. Such requests shall indicate that contractor and all subcontractors are ready for startup and the system is ready to operate as designed.

### **D. Inspection Fees**

1. The BOPU will charge the owner/developer/contractor the following Inspection Fees:
  - a. The owner/developer/contractor will be billed at the current rate for BOPU inspection time that is performed during regular working hours. 7:30 a.m. to 4:00 p.m. Monday through Friday.
  - b. The owner/developer/contractor will be billed at the current rate for all inspection overtime. Overtime includes hours worked on weekends, holidays and hours outside of 7:30 a.m. to 4:00 p.m. time frame on normal working days.

- c. Only one inspector's time will be charged against the project, for any given time frame, unless the project is large enough to justify more than one inspector or unless an event on the project justifies two inspectors for a temporary time frame.
- d. Inspections require a minimum of two working days' notice.

**E. Record Drawings and Guarantee of Delivery**

1. The owner/developer/contractor of the project shall be required to complete and sign the General Project Guarantee Form for Delivery of Record Drawings (see Appendix B). The owner/developer/contractor is to provide the BOPU with complete and accurate record drawings upon completion of the work on the water and sanitary sewer utilities. The record drawings shall consist of one Mylar copy, .pdf copy, and an electronic copy in DXF, DWG, or shapefile referenced using NAD 1983 State Plane Wyoming East FIPS 4901 Feet. The record drawings shall be submitted to the BOPU within 90 days of the issuance of the Release for Service by the BOPU. Owner/developer/contractor shall provide BOPU with a cash deposit, performance bond or an irrevocable letter of credit in the amount of \$5,000 or 5% of the estimated cost of the water and sewer utility work, whichever is greater. However, in no case will the cash deposit, performance bond or an irrevocable letter of credit exceed \$20,000. The estimated cost of the project shall be based upon the construction costs of the water mains, valves, fire hydrants, sewer main and manholes. The cash deposit, performance bond or irrevocable letter of credit shall be delivered to the BOPU prior to issuance of a Notice to Proceed with construction of the water and sanitary sewer facilities. Therefore, no work on the water and/or sanitary sewer is to begin until the cash deposit, performance bond or irrevocable letter of credit is received by the BOPU. If the drawings are not delivered prior to the established date, the owner/developer/contractor will forfeit his cash deposit, performance bond or irrevocable letter of credit. The guarantee will be released by the BOPU when the required and acceptable Record Drawings are delivered to the BOPU in a timely manner (unless the owner/developer/contractor has requested and the BOPU has issued written approval of a time extension). The BOPU shall make payment to the owner/developer/contractor within 30 days of receipt of acceptable Record Drawings by the BOPU.
2. An exception to the requirement for a cash deposit will be made for the City of Cheyenne if the appropriate Department Head provides the BOPU with a letter pledging the timely delivery of Record Drawings in lieu of providing the cash deposit (see Appendix B)

**VI. RELEASE FOR SERVICE, ACCEPTANCE, WARRANTY**

**A. Release for Service**

1. The owner/developer/contractor shall submit a written letter or e-mail to BOPU requesting the system be released for service after all required work has been completed and all testing requirements have been met. All required disinfection, flushing and testing shall be completed before the release for service is issued. All valve boxes, stop boxes, manhole covers and fire hydrants shall be raised to surface grade and fully accessible before release for service will be issued. The BOPU will then conduct a final inspection and all deficiencies must be corrected before a Release for Service shall be issued. The owner/developer/contractor shall be fully

responsible for the performance, safety, maintenance and repair of all deficiencies of the water and sewer utilities until the Final Acceptance is issued.

**B. Issuance of Final Acceptance**

1. Final Acceptance will not be issued until the following have been fully and satisfactorily completed:
  - a. A letter of request for Final Acceptance has been received by the BOPU.
  - b. All valve boxes, stop boxes, manhole covers and fire hydrants have been raised to final grade and are fully accessible, and record drawings are submitted and approved
  - c. All work is completed to the satisfaction of the BOPU. The two-year warranty period shall begin with the issuance of the Notice of Final Acceptance.

**C. Warranty**

1. The owner/developer/contractor shall guaranty and warranty all water and sanitary sewer utility work for a period of two years after the issuance of the Notice of Final Acceptance is issued by the BOPU. All repairs arising out of defective work or materials shall be corrected immediately during the warranty period. If not corrected in a timely manner, or in the case of an emergency, the BOPU shall make necessary repairs at the owner’s/developer’s/contractor’s expense. The BOPU will conduct an inspection of the work approximately twenty-one months into the warranty period and all deficiencies found shall be corrected by the owner/developer/contractor.

**VII. WATER DESIGN CRITERIA**

**A. Main Sizing & Flow Rates**

1. The minimum water main size shall be 8-inches in diameter, except water mains of 6-inches in diameter may be used to serve a cul-de-sac of not more than 12 living units. Water mains shall be sized to provide peak hour water service and max day plus fire flows while maintaining a minimum pressure of 20 psi and minimum normal working pressure of 60 psi at ground level. Water demand analysis shall be based on the following water consumption criteria:

<b>Typical Water Duties</b>			
<b>Use</b>	<b>Average (gpd)</b>	<b>Max Day<sup>1</sup> (gpm)</b>	<b>Peak Hour<sup>2</sup> (gpm)</b>
Residential/Person <sup>3</sup>	95	2.6 x Average	5.3 x Average
Commercial & Business/Acre <sup>4</sup>	3000		
Industrial/Acre <sup>4</sup>	3000		
Schools (with showers)/Student <sup>5</sup>	25		
Schools (w/out showers)/Student <sup>5</sup>	15		
Parks & Greenway/Acre <sup>4</sup>	2000		

Table Notes:

All required fire flows shall be determined by the City’s adopted Fire Code.

1 - Max Day = 2.6 x Average, from BOPU historic meter data

2 - Peak Hour = 5.3 x Average, from BOPU historic meter data

3 - Residence = 2.5 People/Residence (U.S. Census Bureau)

4 - Derived from *Water Distribution Systems Handbook* by Larry W. Mays, publication 2000, Table 3.2, BOPU meter data, and evaluations of similar agency’s design criteria.

5 - From U.S. Department of Energy Federal Water Use Indices. Does not account for irrigation. Use “Parks & Greenway/Acre” to assess irrigation demand.



### **B. Taps & Service Lines**

1. All service taps and connections shall be made by a contractor licensed by the City of Cheyenne or BOPU, as outlined in section III.E.
2. All taps and connections shall be inspected by the BOPU prior to backfill and release for service.

### **C. Fire Hydrants**

1. The hydrant piping shall be a minimum of 6-inches in diameter or sized appropriately to supply required fire flows. Hydrant drains shall not be connected to or located within 10 feet of sanitary sewers or storm drains.
2. Fire hydrant location, spacing, and flow rates shall be approved by the Cheyenne Fire Department in accordance with the City's adopted Fire Code.

### **D. Valves**

1. Valves shall be provided on water mains so that inconvenience and sanitary hazards will be minimized during repairs.
2. Valves shall be located at not more than 500-foot intervals in commercial districts and at not more than 1-block or 600-foot intervals in residential areas.
3. Isolation valves shall also be located at all water line crossings such as tees and crosses. Tees shall have two (2) isolation valves installed and crosses shall have three (3).
4. Control valves shall be sized according to maximum flow velocity allowed based on the main pipe size.

### **E. Air Relief/Vacuum Valves**

1. At the high points of all transmission lines and in distribution lines 12-inches and larger, provisions shall be made for air relief.
2. Fire hydrants or active service taps may be substituted for air relief valves on 6-inch and 8-inch lines.
3. Manholes or vaults for automatic air relief valves shall be designed to prevent submerging the valve with ground water or surface water. Such manholes or vaults shall be properly vented.

### **F. Dead End Mains**

1. Dead-end water mains shall only be allowed in cul-de-sacs and hammerheads or parking lots and will be no more than 250 feet in length. There shall be a fire hydrant at the beginning and end of the dead-end main.
2. The fire hydrant located at the entrance to the cul-de-sac shall be connected to a water main different than the main which runs up the cul-de-sac. (Such as connecting to the main located on the cross street).
3. Cul-de-sacs, hammerheads and parking lots that are more than 250 feet in length, will be required to meet additional BOPU and Fire Department criteria as determined on a case by case basis. Such additional requirements may include, but not be limited to: Additional fire hydrants, additional valves, larger diameter water mains, and a paved access/utility easement of no less than 20 feet in width.

### **G. Alignment and Bury Depth**

1. Alignment:



- a. For City streets with a 60-foot right-of-way, water mains shall be 18-feet off north property line on east/west streets or 18-feet off west property line on north/south streets. All public water mains shall be no closer than 20 feet to any building or permanent structure. Alignment deviation shall not exceed 0.5 foot from the approved plan without authorization from the BOPU.
- 2. Bury Depth:
  - a. All water mains shall be buried to a depth of no less than 5½-feet and no more than 7-feet of cover to top of pipe.

**H. Pressure Zones**

- 1. Portions of the City of Cheyenne water distribution system are within zones of varied water pressure. Such zones are located at various locations. Development projects that are within, adjacent to, or that connect to these pressure zones will be required to design and construct adequate PRV vaults, booster pumps, water tanks, and other facilities as necessary, to maintain the pressure of the zones.

**VIII. SANITARY SEWER DESIGN CRITERIA**

**A. Main Sizing & Flows**

- 1. The minimum sewer main shall be 8-inches in diameter, except sewer mains of 6-inches in diameter may be used to serve a cul-de-sac of not more than 14 living units. Pipelines shall be sized based on the number of residences proposed for the development in addition to acreage for potential future development. Pipelines shall be sized to serve flows based on the following table:

<b>Typical Sewer Duties</b>			
<b>Use</b>	<b>Average (gpd)</b>	<b>Max Day<sup>1</sup> (gpm)</b>	<b>Peak Hour<sup>2</sup> (gpm)</b>
Residential/Person <sup>3</sup>	75	2 x Average	5.6 x Average
Commercial & Business/Acre <sup>4</sup>	3000		
Industrial/Acre <sup>4</sup>	3000		
Schools (with showers)/Student <sup>4</sup>	25		
Schools (w/out showers)/Student <sup>4</sup>	15		
Parks & Greenway/Acre <sup>4</sup>	250		

Table Notes:

- 1 - Max Day = 2 x Average, from BOPU historic meter data which includes I/I
- 2 - Peak Hour = 5.6 x Average, from BOPU historic meter data which includes I/I
- 3 - Residence = 2.5 People/Residence (U.S. Census Bureau)
- 4 - Derived from *Wastewater Engineering* by Metcalf & Eddy, publication 1991, and evaluations of similar agency's design criteria.

- 2. If the new collection system is to serve existing development, the likelihood of inflow/infiltration (I/I) must be considered, and pipelines shall be sized using Average flows as shown in the above table.
- 3. Sanitary sewers shall be sized accordingly\*:  
d/D of 50% for Max Day

\*as outlined in *City of Cheyenne Board of Public Utilities 2013 Final Water & Wastewater Master Plans Volume 7.4*

4. A sewer model shall be developed or referenced to ensure existing infrastructure is adequately sized to accept additional upstream flow.
5. BOPU will analyze existing infrastructure and modeling within the proposed development will be performed by the design engineer (Appendix E).

**B. Taps & Service Lines**

1. All service taps and connections shall be made by a contractor licensed by the City of Cheyenne. No taps or connections shall be made to the sanitary sewer system prior to obtaining a tap permit from the BOPU.
2. All taps and connections shall be inspected by the BOPU prior to backfill as outlined in section VI.
3. Separate storm sewers shall be provided for the collection of storm water, roof drains, sump pumps, foundation drains and other drains.
4. There shall be no extraneous flow connections to the sanitary sewer. Examples of extraneous flow sources include, but are not limited to sump pumps, window wells, surface drains, roof drains, etc.
5. Each building or structure shall have a separate sanitary sewer service line.

**C. Manholes & Drop Manholes**

1. Manholes shall be located at all changes in pipe size, changes in vertical or horizontal alignment, at pipe intersections, and the end of all lines. Maximum spacing for various line sizes are as follows:

Line Size (In)	Maximum M.H. Spacing
15 or less	350 ft.
16-30	500 ft.
31 or more	600.

2. Drop manholes must be constructed where the change in elevation between two lines is greater than 18-inches. The drop pipe shall be exterior of the manhole, unless otherwise approved by the BOPU in writing. Lamp holes shall not be permitted.

**D. Inverted Siphons**

1. Inverted siphons shall have a minimum of two 6-inch barrels. The inlet and outlets shall be arranged to cause only one pipe to be used during normal flows. The minimum velocity shall be 3 fps at average flow, and occur at least daily. The siphon shall be designed for flushing and maintenance.

**E. Alignment Grade & Depth to Cover**

1. Manholes and sanitary sewers shall be horizontally located in the center of the street. If width of street does not allow for centerline placement or curved streets prohibit proper centerline placement, the sanitary sewer pipeline may be located within 5 feet of the center, with prior approval of the BOPU. All sewers shall be designed for straight and uniform slope and alignment between manholes. Alignment and slope changes shall occur

at manholes only. Curvilinear sewers may be permitted only for sewers greater than 24 inches in diameter.

2. A drop of at least 0.1 foot shall be allowed through the manhole except where there is a change in the direction of flow. In which case, the drop within the manhole shall be a minimum of 0.2 foot. Sewers shall be laid with uniform slope between manholes. Minimum/Maximum slopes shall be:

**Sanitary Sewer Slope**

<b>Sewer Size (in)</b>	<b>Minimum<sup>1</sup> (ft/100ft)</b>	<b>Maximum<sup>2</sup> (ft/100 ft)</b>
6	0.60	7.22
8	0.40	4.96
10	0.28	3.68
12	0.22	2.88
14	0.17	2.35
15	0.15	2.12
16	0.14	1.94
18	0.12	1.68
20	0.11	1.45
21	0.10	1.36
24	0.08	1.14
27	0.067	0.98
30	0.058	0.84
33	0.051	0.75
36	0.046	0.66

Table Notes

1 - Minimum slopes from *Wyoming DEQ Chapter 11*

2 - Maximum slopes derived from Manning’s equation,  $Q=(1.49/n)*A*(R^{2/3})*(S^{1/2})$ , using n=0.01 for PVC pipe not to exceed 10 fps velocity.

3. Per DEQ Chapter 11 minimum velocities shall be 2 fps when flowing full and velocities greater than 10 fps require special design considerations. All sewer pipe size changes shall be at manholes. Pipe size shall not be decreased in the direction of flow. The energy gradient line should be maintained when a smaller sewer joins a larger one. Sewers shall be located to protect them from freezing and frost heave. Sewer mains should be kept between 8 and 20 feet deep, shallower mains could be allowed if there is no opportunity to extend the sewer to serve other users (such as in a dead-end cul-de sac). Shallower sewers shall have no less than 4 feet cover to top of pipe and require prior BOPU approval. No sewer shall be allowed or installed nearer than 20 feet from a wall or structure. Increased separation may be required for mains deeper than 8 feet.

**F. Deep Sewers**

1. The BOPU shall not accept or allow sewers with a flow line over 20 feet in depth. Deep sewers shall be avoided by use of lift stations and drop manholes. Sewers encased in a steel encasement pipe, such as under highways and railroads, may be deeper than 20 feet as long as the manholes on each end of the encasement pipe are less than 20 feet deep and the encasement pipe does not exceed a length of 250 feet. Exceptions to this deep sewer policy

may only be granted upon the review and written approval from the Board of Directors of the BOPU and their staff.

**G. Access to Manholes**

1. Manholes must be accessible by means of 12-foot wide asphalt road, paved driveway or a graveled surfaced roadway (such as an alley way) compacted to 95% maximum density and capable of supporting the loads of a large sewer jet maintenance truck.

**H. Lift Stations**

1. Any proposed development that cannot drain sanitary wastewater (sewage) by gravity shall be required to construct a sewage lift station at its own expense. This lift station shall be of proper design capacity to meet all required regulations and shall have a minimum pump size of 4-inches. The lift station shall be an underground and self-contained Gorman-Rupp Wastewater Pumping Station or a pre-approved equal. The proposed specification and design shall be submitted to the BOPU for approval. All designs shall be in accordance with the DEQ. Designs shall be submitted for review and approval by BOPU staff.

**I. Grease Traps and Sand Traps**

1. It shall be unlawful for any person to deposit, by any means whatsoever, into any plumbing fixture, floor drain, interceptor, sump, receptacle or device, which is connected to any public sewer, any sand, ashes, cinders, solids, rags, flammable, poisonous or explosive liquids or gasses, oils, grease or any other thing whatsoever which would, or could cause, damage or flow restriction to the public sewer or treatment facilities.
2. As required by Chapters 2.68, 13.04, 13.08, 13.12 and 13.20 of the *CMC*, grease, oil and sand interceptors shall be provided or modified when, in the Board's opinion, they are necessary for the proper handling of liquid wastes containing floatable grease in excessive amounts or flammable wastes, sand, or other harmful constituents. All grease traps/interceptors must be in compliance with the Rules and Regulations for Grease Traps and Interceptors and Inspection Manholes (Monitoring Facilities) published on the BOPU website.

**IX. INDUSTRIAL COMMERCIAL & DOMESTIC SEWAGE QUALITY & PRETREATMENT REQUIREMENTS**

**A. General**

- i. To protect the public's health, and to comply with applicable laws and regulations, the discharge and disposal of all wastewaters within the Cheyenne service area, shall comply with Chapters 2.68, 13.04, 13.08, 13.12 and 13.20 of the *CMC*.



## Appendix A

# City Project Guarantee Form For Delivery of Record Drawings

I, \_\_\_\_\_ representing the City of Cheyenne for the construction of the \_\_\_\_\_, do  
*(Name of project and/or other description)*

hereby agree to submit the required record drawing to the Board of Public Utilities (BOPU) within a reasonable time, but no later than 90 days after the issuance of the release of service by the BOPU.

---

Signature

Date



## Appendix B

# General Project Guarantee Form For Delivery of Record Drawings

I, \_\_\_\_\_ being the owner of the

\_\_\_\_\_  
*(Name of subdivision and/or property description)*

Having reviewed the Board of Public Utilities (BOPU) Policy concerning the delivery of "Record Drawings, do hereby agree to submit the required record drawings within 90 days after the issuance of the Release for Service by the BOPU. To assure that the record drawings are produce in a complete, accurate, timely and acceptable manner to the BOPU. The BOPU will require the Developer to provide the BOPU with a cash deposit, performance bond or irrevocable letter of credit in the amount of \$ 5,000.00 or 5% of the estimated cost of the water and or sewer utility work, whichever is greater, not to exceed \$20,000.00 maximum. However, the Developer and BOPU may negotiate the required bond fee for very small projects

Once the Record Drawings are properly provided to the BOPU, the bond or letter of credit will be released and the Developer's obligation will have been met.

If the drawing are not delivered prior to the established date, the Developer will forfeit his cash deposit, performance bond or irrevocable letter of credit, unless the developer has requested and the BOPU has issued written approval of a time extension establishing a new due date for the record drawing.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



## Appendix C

# Common Tap Request Form

(One Tap Serving Two Buildings / Structures)

Date: \_\_\_\_\_

Address(s), Location / Legal Description

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I/we \_\_\_\_\_ owner of said above described property am aware of Section 13.04.100 of the *CMC* in which it states " Every building, structure or consumer in the City of Cheyenne shall have a separate utility service connection except for common ownership projects approved by the Board ".

I/we \_\_\_\_\_ owner would like to apply for permission to serve two buildings from a single water service line and a single sanitary sewer service. A deed restriction shall be filled out and recorded with the Clerk of Laramie County by owner and forwarded to the Board of Public Utilities. If buildings, structures or property are separated into individual ownerships at a future date it shall be the owner's responsibility to install separate service connections.

The following information is attached:

A copy of the Deed to the property

A site plan / plumbing plan

A vicinity map

Respectfully Submitted,

\_\_\_\_\_



## Appendix D

# Application For Board of Public Utilities Water, Sanitary Sewer, or Re-use Water Services Outside the Limits of the City of Cheyenne

- |   |  |
|---|--|
| <input type="checkbox"/> Connect to BOPU Water        | <input type="checkbox"/> Proposed Residential        |
| <input type="checkbox"/> Connect to BOPU Sewer        | <input type="checkbox"/> Proposed Commercial         |
| <input type="checkbox"/> Existing Residential Unit    | <input type="checkbox"/> Re – Use Water (Irrigation) |
| <input type="checkbox"/> Existing Commercial Business | <input type="checkbox"/> _____                       |

Address or Location Description

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Name of Subdivision

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Legal Description of Area:

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Map (Plat) of Area is to be attached:

Total Site Area: \_\_\_\_\_ Sq. Ft. or \_\_\_\_\_ Acres

Owner: \_\_\_\_\_ Telephone: \_\_\_\_\_

Owner's Address: \_\_\_\_\_

Applicant/Agent: \_\_\_\_\_

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Applicant/Agent's Address:

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**For Proposed Developments:**

It is proposed that the property will be developed for the following purposes.

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If the property is developed for commercial or industrial use, please describe in detail any chemicals or wastes that will be used at the property:

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Proposed Size(s) of the Water service connection \_\_\_\_\_ Inches.

Estimated Monthly Water Usage \_\_\_\_\_ Gallons.

Intended Uses of Water (Restrooms, Kitchen, Manufacturing?) \_\_\_\_\_.

Proposed Size(s) of the Sewer service connection \_\_\_\_\_ Inches.

Sources(s) of Sewerage Discharge (Restrooms, Kitchen, Manufacturing?) \_\_\_\_\_.

If the property is developed for commercial or industrial use, please describe in detail any chemicals or wastes that will be used at the property and or discharged to the into the sewer.

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- There is an application fee that is due upon receipt of this form.
- Applicant must visit with the City Planning Office and return the attached Clearance Form, with this Application to Board of Public Utilities Development Specialist (Linda Gunter).

SIGNATURE OF OWNER \_\_\_\_\_ DATE \_\_\_\_\_

PRINT NAME \_\_\_\_\_

Person(s) who should be contacted regarding the application:

\_\_\_\_\_ Telephone \_\_\_\_\_

Additional Comments:

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**APPLICATION SHOULD BE RETURNED TO  
LINDA GUNTER  
PO BOX 1469  
2416 SNYDER AVENUE  
CHEYENNE, WY 82003  
307-637-6497**



## Appendix E

# Hydraulic Model Analysis Process

Revised August 27, 2018  
Change Authority: Engineering and Water Resources Manager

Step	Description/Action	Responsible
1	Provide desired connection points to the BOPU systems, water demands (including max day, peak hour, and required fire flows determined by the Fire Department) and sewer flows (max day and peak hour). Provide flow calculations that comply with BOPU design criteria. Use the Project Information Form and Flow Calculation Worksheet located in Appendix F.	Development Engineer
2	Run the existing system water and sewer models. Confirm the existing systems can support the proposed development. If the existing systems cannot support the development, work with Development Engineer to determine the necessary off-site improvements. Once the need for off-site improvements (if any) are reconciled and/or the existing systems are deemed capable to support the development, proceed to Step 3.	BOPU & Development Engineer
3	Provide existing pipe information and hydraulic grade lines at the connection points for specific hydraulic conditions (maximum day + fire, maximum day and peak hour). Provide flow test data. BOPU will provide packet with results from Steps 2 and 3.	BOPU
4	Design the water and sewer networks for the proposed developments using the results from Step 3. Include hydraulic calculation results in the engineering report.	Development Engineer
5	Review the engineering report and hydraulic designs for conformance to BOPU and DEQ standards. Deliver comments to Development Engineer.	BOPU
6	Reconcile comments (if any) from Step 5.	Development Engineer
7	Once comments are reconciled, seal and sign engineering report and plans.	Development Engineer
8	Prepare DEQ permit application and obtain signatures.	Development Engineer
9	Sign the DEQ permit.	BOPU
10	Submit the DEQ permit to DEQ.	Development Engineer



## Appendix F Project Information Form

Project Name: \_\_\_\_\_

### Project Owner Information

Owner Name: \_\_\_\_\_

Contact Name: \_\_\_\_\_

Phone No: \_\_\_\_\_ E-mail: \_\_\_\_\_

### Engineering Firm Information

Firm Name: \_\_\_\_\_ Main office phone: \_\_\_\_\_

Address: \_\_\_\_\_

Prj. Manager: \_\_\_\_\_ E-mail: \_\_\_\_\_

Prj. Engineer: \_\_\_\_\_ E-mail: \_\_\_\_\_

### Project Location

Street address or intersection: \_\_\_\_\_

Tax Map, Parcel ID, or GPIN: \_\_\_\_\_

**Note:** Please provide a general location map (no smaller than 1"-2000') showing the project location and proposed water and sewer tie-in locations.

### Project Description *(attach additional sheets, if necessary)*

### Proposed Sewer Lift Station Work *(check all applicable)*

- New facility       Modifications - Upgrades       Replacement       N/A

## Proposed Sewer Service Connection Type *(check all applicable)*

- |  |   |
|--|---|
| <input type="checkbox"/> Existing gravity sewer manhole    | <input type="checkbox"/> Existing force main branch valve |
| <input type="checkbox"/> Replacement gravity sewer manhole | <input type="checkbox"/> New force main tap valve         |
| <input type="checkbox"/> New gravity sewer manhole         | <input type="checkbox"/> N/A                              |

## Proposed Water Service Connection Type *(check all applicable)*

- |   |  |
|---|--|
| <input type="checkbox"/> Existing main branch valve | <input type="checkbox"/> Existing main tap valve |
| <input type="checkbox"/> Modified (re-route) main   | <input type="checkbox"/> Modified (upsized) main |
| <input type="checkbox"/> N/A                        | <input type="checkbox"/>                         |

## Project Estimated Design Flow

Please use the **Flow Calculations [worksheet](#)** and submit with this form. The worksheet can be accessed from our web site at [cheyennebopu.org](http://cheyennebopu.org).

## Project Required Fire Flow

Please provide the required fire flow as recommended by the fire marshal:  
(attach correspondence with fire marshal's office).

## Projects with Commercial and/or Industrial Flows

Give a brief description of all operations at this facility, including primary products and/or services (attach additional sheets if necessary).

## Notice to Applicant

The following resources are available by request or by visiting the Cheyenne BOPU official web site at [cheyennebopu.org](http://cheyennebopu.org):

- [BOPU water and sewer infrastructure maps](#)
- [BOPU Infrastructure Policies and Design Criteria](#)
- [BOPU Project Flow Calculations Worksheet](#)
- [BOPU Rate Schedule](#)

For all development project requests, please use the following email link: [lgunter@cheyennebopu.org](mailto:lgunter@cheyennebopu.org)

Applicant's Name: \_\_\_\_\_

Date: \_\_\_\_\_