# **REGIONAL MUNICIPALITY OF WOOD BUFFALO**

# RURAL WATER AND SEWER SERVICING (RWSS) SERVICE CONNECTION GUIDELINES



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# **Abbreviations**

Abbreviation	Full Name
ASTM	American Society for Testing and Materials
ANSI	American National Standards Institute
CSA	Canadian Standards Association
CSE	Confined Space Entry
=00	

**ESS** RMWB's Engineering Servicing Standards

**ESSDP** RMWB's Engineering Servicing Standards and Development Procedures

HDPE High-Density Polyethylene
HSE Health, Safety & Environment
NSF National Sanitation Foundation

PVC Polyvinyl Chloride

RWSS Rural Water and Sewer Servicing
SDR Standard Dimensional Ratio
STEP Septic Tank Effluent Pump



# 1. Introduction

#### 1.1.GENERAL

The purpose of the rural water and sewer servicing guidelines is to provide the minimum acceptable standards to follow to design and install water and sewer on private residential property in rural communities when connecting to the municipal sewer system. Property owners who request to connect to the municipal piped water and sewer systems are required to follow and adhere to this municipal guideline as the acceptable minimum standard.

The following are guidelines and not the complete design. The property owner is required to engage a certified contractor to design and install the system to follow these minimum guidelines while meeting the needs of the site specific constraints and dwelling size.

Any work completed on private property by the owners or their agents is the sole responsibility of the property owner. They are to apply sound engineering principles and industry best practices to provide an end product that is practical, economical, efficient, safe and sustainable. Work must be carried out in accordance with the current Occupational Health and Safety requirements.

The rural communities and the type of proposed water and sewer system covered by these guidelines include the following:

#### 1. Saprae Creek Estates

- Water Previous to these upgrades there was a full pressure municipal water distribution system with no fire flow in the community. With these upgrades the distribution pipes are upgraded/upsized to accommodate fire flows with fire hydrants in the community. No changes to the service connections on private property is required as the existing service connections will be connected to the new main.
- Sanitary Sewer Previously there was no municipal sewer system in the community. Each property used a private sewage treatment method or a tank and haul system. With these upgrades a new Septic Tank Effluent Pumping (STEP) sewer system is installed at each lot to pump into the municipal sewer system ultimately going to the RMWB WWTP.

#### Draper

- Water Previous to these upgrades there was no municipal water system in the community. Each property had a private water supply system or utilized hauling with a cistern for storage. With these upgrades a trickle fill water supply system is installed to distribute reliable potable water from the RMWB WTP into the water cistern at the house.
- Sanitary Sewer Previously there was no municipal sewer system in the community. Each property used a private sewage treatment method or a tank and haul system. With these upgrades a new Septic Tank Effluent Pumping (STEP) sewer system is installed at each lot to pump into the municipal sewer system ultimately going to the RMWB WWTP.

# 3. Anzac

- Water Previously, Anzac had limited water service and a few fire hydrants within the commercial areas. With these upgrades there will be full pressure water supplied to each lot with fire flow and fire hydrants throughout the community.
- Sanitary Sewer Previously, there were a few lots connecting directly to an existing lift station, however, there was no municipal sewer system to service the entire community. Most properties used a private sewage treatment method or a tank and haul system. With these upgrades the community will be serviced with a municipal gravity sewer system with the majority of lots having gravity sewer services, and a few lots with pumped services into the municipal main.



#### 4. Gregoire Lake Estates

- Water Previously Gregoire Lake Estates was not serviced by a municipal water distribution system. With these upgrades there will be full pressure water supply to each lot along with fire flow and fire hydrants throughout the community.
- Sanitary Sewer Previously there was no municipal sewer system in the community.
   Each property used a private sewage treatment method or a tank and haul system.
   With these upgrades, the community will be serviced with a municipal gravity sewer system.

#### 5. Janvier

- Water Apart from a few lots, previously Janvier was not serviced by a municipal water distribution system. Water was trucked into each lot and stored in cisterns. With these upgrades, the community will be serviced by a municipal trickle fill water supply into the water cistern at the house.
- Sanitary Sewer Previously Janvier was not serviced by a municipal sewer system.
   Wastewater was pumped out using hydrovac trucks. After this upgrade, Janvier will be serviced by a new Septic Tank Effluent Pumping (STEP) sewer system which will be installed at each lot to pump into a municipal sewer system.

#### 6. Conklin

- Water
   — Previously Conklin was not serviced by a municipal water distribution system.
   Water was trucked into each lot and stored in cisterns. After this upgrade, Conklin will be serviced by a full pressure water supply system.
- Sanitary Sewer Previously Conklin was not serviced by a municipal sewer system.
   Wastewater was pumped out using hydrovac trucks. After this upgrade, Conklin will be serviced by a municipal gravity sewer system with exception of 19 lots.

#### 1.2. COMMERCIAL AND BUSINESS INDUSTRIAL LOTS

The RWSS Guidelines for Rural Water and Sewer Servicing are developed for residential lots. For lots that are zoned as Commercial or Business Industrial, owners should complete the following steps to connect to the newly constructed water and sanitary systems:

- 1. Consult with certified contractor/consultant to design the system based on specific needs of the house, keeping in view the subsurface and surface conditions of the lot.
- 2. Design and construct the system based on applicable bylaws, engineering servicing standards, regulations, and codes as noted, but not limited, in Section 1.3.1.
- Ensure that backwater valves are provided in line with the requirements of the National Plumbing Code.
- 4. Ensure that hydrocarbon, grease and sediment traps are provided at all food processing establishments, shopping centers, service stations, car washes, hotels/motels, manufacturing, equipment servicing and cleaning facilities, institutions (churches, schools, etc.), and any other facilities that are expected to discharge sediment and/or grease, refer to ESSDP Sanitary Service Connections Section.
- 5. Ensure that certified contractor/consultant determines the need for any other additional pre-treatment system(s)/structure(s) and design the same in line with the discharge requirement of the Sanitary Sewer Utilities Bylaw and other applicable regulations and codes. It is the lot owners' responsibility to provide the pre-treatment design.
- 6. Apply for all applicable permits. The permit must be pulled by the authorize person as noted in Section 1.3.2 below.



- 7. Install the service connections in accordance with the issued permits.
- 8. Get RWMB Safety Codes to inspect the installed connection before backfilling.
- 9. Get RMWB Safety Codes to perform final inspection and issue the permit service report.

# 1.3.REGULATORY, APPLICATIONS, PERMITS AND INSPECTIONS

# 1.3.1 Regulatory

The latest edition of all applicable regulations are to be followed, including but not limited to the Alberta Government, Alberta Environment and Parks and Safety Codes. The homeowner is to reference the Alberta Government and Alberta Environment and Parks websites and contact the RMWB for the latest regulatory regulations prior to installation.

Regulatory Item	Web Link
Rural Area Water and Wastewater Service Connection Bylaw- 20/009	http://www.rmwb.ca/Municipal- Government/municipal_departments/Emergency-ServicesLaw- Enforcement/rcmp/Bylaw-Services/MunicipalBylaws.htm
RMWB's Engineering Servicing Standards	http://www.rmwb.ca/living/Services-and-Utilities/Engineering-Servicing-Standards.htm
Alberta Safety Codes	https://www.alberta.ca/safety-codes.aspx
Alberta Building Code	https://www.alberta.ca/building-codes-and-standards.aspx
Alberta Fire Code	https://www.alberta.ca/fire-codes-and-standards.aspx
Alberta Plumbing Code	https://www.alberta.ca/plumbing-code-and-standards.aspx
Alberta Private Sewage Code	https://www.alberta.ca/private-sewage-codes-and-standards.aspx
Alberta Private Sewer Systems	https://www.alberta.ca/private-sewer-systems.aspx
Alberta Environment and Parks Standards and Guidelines for Municipal Waterworks	https://open.alberta.ca/publications/5668185
Alberta Wastewater and Storm Water Legislation	https://www.alberta.ca/wastewater-and-storm-water-legislation.aspx
Plumbing Safety Information Bulletin – STANDATA P-14-01- NPC15	https://open.alberta.ca/dataset/standata-plumbing-safety-information-bulletin/resource/56c2095b-4bd0-4163-8d8c-83120468cd86
RMWB Land Use Bylaw	http://www.rmwb.ca/Municipal- Government/municipal_departments/Emergency-ServicesLaw- Enforcement/rcmp/Bylaw- Services/MunicipalBylaws/LandUse.htm
National Plumbing Code of Canada	https://nrc.canada.ca/en/certifications-evaluations- standards/codes-canada/codes-canada-publications/national- plumbing-code-canada-2015



RMWB Safety Codes Permitting	https://www.rmwb.ca/Assets/Departments/Legislative+and+Legal						
Bylaw	+Services/Bylaws/Safety+Codes+Permitting+bylaw.pdf						
RMWB Sanitary Sewer Utility Bylaw	https://www.rmwb.ca/Assets/Departments/Legislative+and+Legal +Services/Bylaws/Bylaw+85-51+- +Municipality\$!e2\$!80\$!99s+Sanitary+Sewer+Utilities.pdf						
RMWB Water Utilities	https://www.rmwb.ca/Assets/Departments/Legislative+and+Legal						
Management Bylaw	+Services/Bylaws/WaterUtilitiesManagement.pdf						

#### 1.3.2 Sanitary and Water Applications, Permits and Inspections

#### **Permits**

All existing lots (residential as well as commercial/industrial) that have a development permit and building permits issued and that have water and sewer stubs already provided at the lots shall obtain the following permits. Please see Appendix D for the RWSS permit requirements specific to your community.

Permit Name	Who will Issue and Inspect	Who will Pull the Permit					
Service Connection Permit	Safety Codes	Licensed Plumber or					
(STEP)		Certified Private Sewage System Installer					
Service Connection Permit (DIRECT)	Safety Codes	Licensed Plumber					
Plumbing Permit	Safety Codes	Licensed Plumber					
Electrical Permit	Safety Codes	Master Electricians					
Water Meter Permit	Water Meter Branch in Under Ground Utilities	Owner or the authorized Contractor					

New development(s)/lot(s) or existing development(s)/lot(s) that require new connections to water and sewer service lines or want to redevelop the site must obtain other permits as noted in these Guidelines, the latest edition of Engineering Services Standards and Developmental Procedures, RMWB Land Use Bylaw and RMWB Safety Codes Permitting Bylaw.

# **Commissioning and Inspections**

- Final commissioning and functional testing of the systems is to be completed by the certified contractor including infiltration or exfiltration testing of system and pressure testing of service lines is required.
- Final inspection by the RMWB or its representative is required of all buried and submerged equipment, tanks and piping. The Contractor is to ensure the tanks are empty prior to the inspection. Approval and signoff of the system by the RMWB or its representative is required prior to backfill.



#### 1.4.SITE PLAN

- The Owner is required to submit a site plan with the Service Connection Permit Application. The site
  plan should provide information about location, size, dimensions, depth, slope and other details of the
  following items:
  - a) Proposed sanitary sewer and water connections;
  - b) Proposed sanitary septic tank and pump station locations;
  - c) Existing building and driveways;
  - d) Existing septic system;
  - e) Existing water service locations or water wells (if any); and
  - f) Existing water disposal systems/tanks.
- Sample site plan is included in Appendix A. An aerial photo is not required if it is not available.

#### 1.5. CONTRACTORS / INSTALLERS

Under the RWSS program it is homeowner's responsibility to hire a certified contractor to design and construct the service connections keeping in view specific requirement of the house and surface and subsurface constraints of the lot.

The homeowner shall make sure that the contractor has adequate knowledge and experience to complete the work as per these guidelines, applicable codes and regulations.

The contractor is responsible to supply and install all equipment and materials required to complete a fully functional and operational service connection.

For service connection under RWSS program the contractor shall be chosen from the latest list of "Private Sewage Systems Installer Certification List" maintained by Alberta Municipal Affairs.

The list can be accessed using the link below or searched on the World Wide Web using common search engine.

https://open.alberta.ca/publications/private-sewage-systems-installer-certification-list.



# 2. Full Pressure Water Service

#### 2.1 OVERVIEW

The potable water service connection is the portion of the water system that runs from the municipal connection point to the building plumbing system, and generally includes the following:

- Water service pipe and fittings;
- Water meter: and
- Water pressure reducing valves may be required in some cases to reduce the pressure of the water entering the building plumbing system.

#### 2.2 MATERIAL

#### 2.2.1 Piping

Refer to the National Plumbing Code for acceptable service piping materials. Minimum water service size for residential lots can be found in the Water Service Connection Section of RMWB's Engineering Servicing Standards (ESS), latest edition.

Some residential dwellings like duplex, triplex and fourplexes may require different service connection sizes due to additional demands such as irrigation systems, fire sprinklers, and a higher number of fixtures. Each service should be designed according to the expected demand, maximum operating pressure of the system, and the equivalent fixture units according to the National Plumbing Code.

# 2.2.2 Water Service Fittings

Refer to the National Plumbing Code and RMWB ESS for acceptable fitting types and materials.

## 2.2.3 Water Meter

Water meters up to 100mm diameter shall be supplied by the Municipality and all other meters are to be supplied and installed by qualified plumber/contractor.

# 2.2.4 Water Pressure Reducing Valves

Direct-acting-water-pressure-reducing valves for domestic water supply systems, if required, shall conform to the requirements in the National Plumbing Code.

# 2.2.5 Bedding

Bedding material for pipes in sound dry soils is recommended to be Class B sand, conforming to the standard details and the gradation specified under water distribution section of RMWB's ESS.

#### 2.3 INSTALLATION

#### 2.3.1 Water Service Piping and Fittings

Any piping buried less than the frost depth is recommended to be insulated and/or heat traced.

## 2.3.2 Water Meter

- Water meter must be accessible with adequate clearance.
- All water meters up to 100 mm will be issued by RMWB's UGS/meter group and given to certified contractor for installation. The meter group will assist or install meter up to 25 mm.



 All other meters are to be supplied and installed by a qualified plumber/contractor, subject to selection review, approval, inspection and operation by the Municipality. Refer to the Standard Detail Drawings for installation requirements.

### 2.3.3 Water Pressure Reducing Valves

 Pressure reducing valves may be required at some building's plumbing system connections to the water service piping to protect the building plumbing from being over-pressurized. If the maximum operating pressure from the municipal system at the point of connection exceeds the pressure rating of the building plumbing system, a pressure reducing valve (PRV) is required to reduce the water pressure.
 It is required that the pressure reducing valve be installed within the building near the water meter.
 Refer to Community Specific Requirements for PRV requirements for each community below.

#### 2.4 COMMUNITY SPECIFIC REQUIREMENTS

#### 2.4.1 Saprae Creek

There is no need for installing new water meters. Existing water meters will be used.

# 2.4.2 Anzac

Normal operating pressures in the Anzac municipal water distribution system can be as high as 896 kPa (130 psi) when the fire pumps are running. Residential PRV's are required for all homes.

#### 2.4.3 Conklin

There is no need to install PRVs in Conklin.



# 3. Trickle Fill Water Service

#### 3.1 OVERVIEW

In a trickle feed water distribution system, a small-diameter distribution pipe supplies water to a private water storage facility (cistern) on each lot. With a small-diameter pipe and the ability to operate at lower pressures than conventional systems make this an economical alternative of providing domestic water distribution without fire suppression. However, the water quantity to each lot is controlled by a fixed rate. This system is appropriate for retrofitting existing rural areas currently served by truck fill water systems, as the trickle feed system can be plumbed into existing cisterns. Cisterns should be periodically cleaned and disinfected. Cistern maintenance/cleaning is the owner's responsibility. Trickle feed service connection components are:

- Water service pipe;
- Water service fittings;
- Water meter pit; and
- · Water cistern.

#### 3.2 MATERIAL

#### 3.2.1 Piping

Refer to the National Plumbing Code for acceptable service piping materials. Minimum water service size for residential lots can be found in Water Service Connection Section of RMWB's Engineering Servicing and Standards and Development Procedures (ESSDP), 2016.

Some residential dwellings like duplex, triplex and fourplexes may require different service connection sizes due to additional demands such as irrigation systems, fire sprinklers, and a higher number of fixtures. Each service should be designed according to the expected demand, maximum operating pressure of the system, and the equivalent fixture units according to the National Plumbing Code.

#### 3.2.2 Water Service Fittings

Refer to the National Plumbing Code for acceptable fitting types and materials.

#### 3.2.3 Bedding

Bedding material for pipes in sound dry soils is recommended to be Class B sand, conforming to the standard details and the gradation specified under water distribution section of RMWB's ESS.

#### 3.2.4 Meter Chamber

- A meter pit is to be installed at the property line of the lot.
- A meter pit includes water meter (submergible under water), dual check valve, and ball valve.
- Standard detail of the meter pit is included in drawing 3-3.

#### 3.2.5 Water Cistern

The cisterns minimum requirements are as follows:

- All cisterns are to be sized to provide a minimum of two (2) days storage of average day flow requirements. The cistern size shall be determined according to anticipated users' consumption, see table 1 in Appendix A for recommended cistern sizes based on number of bedrooms.
- A float valve to control the flow into the cistern based on the water level.
- It shall be watertight and leak proof.



- The access hatch lid must be lockable and designed to prevent entry of surface water runoff and insects, or vandalism, etc.
- A fill port should be used to prevent hoses, debris, and other contaminants from entering the cistern at the time of refilling. Fill ports equipped with cam locks and screening are an option to prevent entry of contaminants into cisterns.
- The withdrawal pipe, which is the connection between the dwelling/business and the cistern, shall be
  installed approximately 10 to 15 centimeters (about 4 to 6 inches) above the bottom of the cistern. This
  will reduce the possibility of sediment that collects at the bottom from entering the plumbing system.
- It shall be CSA and NSF approved.
- A minimum 300mm air gap between the end of the service pipe and the high level of the water within the water storage facility is required.

#### 3.3 Installation

# 3.3.1 Water Service Piping and fittings

- For each approved service connection, the Municipality will provide a 25mm flow-controlled water service connection at a location no more than 300mm outside the Municipality's right-of-way at a depth not to exceed 3 meters. The service connection will entail a meter pit and flow control valve, restricting flow to 0.5 US gpm (1.9 L/min).
- Installation of water service pipe shall follow the manufacturer's recommendations.
- All pipe installed with less than 3.0m cover will require insulation following the ESS details. If pipe is
  installed with less than 3.0m cover using trenchless methods, pre-insulated pipe is to be installed, with
  thickness to be determined by the supplier and heat trace installed if insulation will not protect the pipe
  from freezing.

# 3.3.2 Bedding

Bedding material for pipes in sound dry soils is recommended to be Class B sand, conforming to the standard details and the gradation specified in the RMWB ESS.

#### 3.3.3 Water Meter

Refer to Section 2.3.2 for water meter details.

#### 3.3.4 Water Cistern

- A cistern shall be installed according to the manufacturer's recommendations.
- In case of retrofitting an existing cistern, an assessment shall be carried out by a qualified plumber/contractor. The assessment shall assess the structural/environmental conditions of the existing cistern. Capacity shall be also included in the assessment.
- If the cistern is deemed to be suitable for retrofitting, the cistern shall be connected to the system by a
  qualified plumber/contractor.

#### 3.4 Community Specific Requirements

#### **3.4.1 Draper**

Due to the elevation difference of the Draper Community, some lots are located too high to transfer sufficient domestic trickle service water and these lots will require a small booster pump station located conveniently to service the specific lots, check with RMWB for the lots list during the application process. The specific requirements of the booster pump will be provided to the homeowner upon submission of the service connection application for the certified contractor to install.



# 4. Gravity Sewer Service

#### **4.1 OVERVIEW**

A gravity sewer service generally consists of the following components:

- a) Sewer piping sloped downwards from the source towards the municipal sewer main that allows for the free flow of sewage by gravity.
- b) Backwater valves may be installed on either the inside or outside of a building where the building sewer exits the building towards the municipal sewer main. A backwater valve's intent is to allow flow out of the building and prevent backflow of sewage into the building. It is recommended that backwater valves are checked and maintained regularly to ensure proper operation by the homeowner.
- Cleanouts are access points along the sewer pipe that allow for cleaning and inspection of the service.

#### 4.2 Material

## 4.2.1 Piping

Any pipe material classified for underground building sewer use in the National Plumbing Code is considered acceptable. If the service piping differs from the municipal connection or building piping, the fitting used to join the dissimilar pipe materials shall be designed to accommodate the required watertight transition. The service size shall not be less than 100mm diameter for single family dwellings. For commercial, industrial, institutional or multi-family areas, service piping shall not be less than 150mm diameter. In any case, services shall be designed appropriate for the expected flows from the development.

#### 4.2.2 Backwater Valves

Backwater valves must meet the requirements of the Plumbing Code. Backwater valves must be of a normally open design to allow the passage of air under normal operating conditions.

#### 4.2.3 Cleanouts

Cleanouts must meet the requirements of the National Plumbing Code.

#### 4.2.4 Bedding

Bedding material for pipes in sound dry soils is recommended to be Class B sand, conforming to the standard details and the gradation specified under the RMWB's ESS.

#### 4.3 Installation

#### 4.3.1 Pipe Slope

The service piping is recommended to be installed with a minimum downward slope of 2.0% in the direction of flow. Where this cannot be achieved, the minimum slope may be reduced to 1.0% provided the hydraulic load is within the limits identified in the National Plumbing Code.



#### 4.3.2 Cleanouts

Cleanouts must be installed to permit cleaning of the entire service. On service piping that is at an angle of less than 45 degrees with the horizontal, cleanouts shall be installed at the spacing requirements shown in the table below. A cleanout permitting one-way rodding only allows for rodding in one direction. A cleanout permitting two-way rodding allows for rodding in both directions.

Table 4-1. Cleanout Spacing

Diameter of Service Pipe	Maximum S	Spacing, m
	One-Way Rodding	Two-Way Rodding
100mm	15	30
Over 100mm	26	52

It may be necessary to use fittings to accommodate changes in direction of the service line. Cleanouts on 150mm diameter and smaller services are required at every cumulative change in direction more than 45°. It is recommended that long radius bends be used for alignment changes. 90° elbows of 100mm diameter shall have a center-line radius greater than the diameter of the connecting pipe. Refer to the National Plumbing Code for more details. Cleanouts on sewer service piping 200mm or larger in diameter shall be manholes.

#### 4.3.3 Backwater Valves

Backwater valves shall be installed in accordance with the requirements of the Plumbing Code. It is recommended that a backwater valve is installed in a location where it is easily accessible for maintenance. Backwater valves installed underground are recommended to allow for ground level access to remove the seat and gate from ground level regardless of depth.

# 4.3.4 Other

Roof leaders and building foundation drains are not permitted to be connected to the sanitary sewer service.

#### 4.4 STANDARD DETAIL DRAWINGS

For service connection details, see standard drawings in Appendix B.



# 5. Septic Tank Effluent Pumping (STEP) Sewer Service

#### 5.1 Overview

A STEP sewer service system is comprised of a two-compartment septic tank and pump system complete with a control. The sewage is discharged from the house to the septic tank, in which the primary treatment of sewage occurs. The pumping system pumps the effluent to the pressured or gravity mains and eventually to the municipal sewer system or a common collection point/septic field.

A STEP sewer service system generally consists of the following components:

- A two compartment tank the larger chamber of the tank is connected to the home and is where the solids are settled, and the liquid flows over a weir to the smaller compartment of the tank where the effluent pump is located to pump to the municipal system.
  - The solids must be hydrovaced out of the larger solids compartment when they reach a certain level. This level is set in the tank when it is installed, and the homeowner is responsible for having the sludge removed.
- An effluent pump and filter, complete with two check valves (one in the pump assembly and one in the hanging discharge assembly) and a rope/cable to pull the pump out from the surface.
- Piping connections from the home to the tank and from the pumps to the municipal service connection at the street property line will be required.
- A control panel will automatically operate the pump and float switches to control the effluent levels in the pump chamber.
- Power cables.

# **5.2 STEP System Suppliers**

Orenco Systems or approved equal will be used for the STEP pumping systems for the RWMB Rural Servicing STEP installations. The contractor/installer is to follow all installation requirements provided by Orenco on their website here: <a href="https://www.orenco.com/applications/municipal/orenco-sewers">https://www.orenco.com/applications/municipal/orenco-sewers</a> <a href="https://www.orenco.com/applications/municipal/orenco-sewers/"

The Installation Guide can be found here: <a href="https://odl.orenco.com/documents/NIM-EPS-1.pdf">https://odl.orenco.com/documents/NIM-EPS-1.pdf</a> Operation and Maintenance information for the homeowner is provided on the website here:

- Troubleshooting <a href="https://odl.orenco.com/documents/nch-efs-1.pdf">https://odl.orenco.com/documents/nch-efs-1.pdf</a>
- Clicktight and control panel <a href="https://odl.orenco.com/documents/NIN-CLK-1.pdf">https://odl.orenco.com/documents/NIN-CLK-1.pdf</a>
- HDA-Style Discharge assemblies <a href="https://odl.orenco.com/documents/NIN-HDA-1.pdf">https://odl.orenco.com/documents/NIN-HDA-1.pdf</a>
- Should a contractor propose a different pump the contractor shall provide all details with the permit application.

#### 5.3 Materials

# **5.3.1 Piping**

- Service connections from the house to the tank and from the single compartment tank to the new pump chamber shall be 100mm dia. DWV or Schedule 40 PVC pipe for all new pipe installed and is to have a positive slope of minimum 1%.
- Service connections from the effluent pump to the connection point near property line shall be 38mm HDPE DR 11, or approved equal as noted in ESS, except for Anzac (See Section 5.5 Community Specific Requirements).
- Some residential dwellings like duplex, triplex and fourplexes may require different service connection sizes due to a higher number of fixtures. Size of the service connection must be approved by the



Municipality during the permit process.

- All connections to the tank are to be watertight as per the manufacturers specification.
- For pre-approved pipe material specifications not included here, see the sewage service connection section of the RMWB ESS.

# 5.3.2 Sanitary Service Fittings

- Fittings and other devices are to be compatible with the type of service pipe and suitable for the maximum operating pressure of the system.
- For pre-approved fitting specifications, refer to the RMWB ESS.

## 5.3.3 Bedding

 Bedding material for pipes in sound dry soil is recommended to be Class B sand, conforming to the standard details and the gradation specified in the RMWB ESS.

# 5.3.4 Septic Tanks

The septic tanks are to be designed as follows:

- The STEP system tank shall be a two-compartment septic tank.
- The STEP system tank size shall be designed by the certified contractor based on the minimum guidelines set out in the Tank Sizing Chart.
- All necessary penetrations are to be watertight as per manufacturers specifications.
- It shall be watertight and leak proof.
- The access hatch lid must be bolted down or lockable and designed to prevent entry of surface water runoff and insects, or vandalism, etc. The hatch is to conform to the requirements of the Alberta private sewage system standard of practice (APSSOP).

#### 5.3.5 Pump System

- The effluent pump shall be able to handle sewage effluent without exceeding manufacturer's recommendations. The pump is specified to be the Orenco PF1005CV pumping system for all rural lots except Janvier which will use PF1005 (refer to community specific guidelines) using a STEP system.
- The pump shall be equipped with a BioTube filter screen.
- The lift out system will be able to provide access to the pump, motor, and filter from the surface.
- The pump removal system is to be a hanging discharge assembly or similar to allow for easy removal
  of pump and equipment.
- Further details and parts of the system are included in the detail drawings in Appendix B.

#### 5.3.6 Power and Controls

- The certified contractor is to provide the Orenco control panel and control system.
- Installation shall be in accordance with the most recent version of the Canadian Electrical Code (CEC) and acceptable to the Authority Having Jurisdiction (AHJ)
- The control panel includes an Orenco MVP control panel mounted on a 100mm x 100mm treated wood
  post or on the side of the house if in close enough proximity per the manufacturer.
- The electrical feeder to the Orenco control panel is to be connected from the home (load side of the electric meter) to the control panel
- Where acceptable by the CEC and AHJ, the contractor shall be permitted to interrupt the feeders from the load side of the meter to the consumer panel for the purpose of installing a splitter to feed both the house and the Orenco control panel provided that:
  - o All grounding and bonding are in accordance with Section 10 of the CEC.
  - System grounding of the grounded conductor (Neutral) shall only occur at one location (meter socket or consumer panel). No more than one (1) system ground shall be present.



- System bonding jumper to the grounded conductor (neutral) shall only occur at the location where the system ground is connected to the grounded conductor (neutral). No more than one (1) system bond point shall be present.
- The Orenco pump and control panel system shall be bonded to ground through a suitable bonding means as defined by the CEC.
- Electrical disconnect for the Orenco system shall be located next to the splitter and electrical meter and shall be lockable both on and off.
- Conductor sizes to re-feed the electrical meter from the splitter shall be of the same size as the existing wires that exist between the splitter and the consumer service.
- Tap conductor sizing from the splitter to the electrical disconnect and to the Orenco control panel shall be in accordance with Section 14 of the CEC.
- Electrical splitter shall be lockable and contain a utility seal / tag once final connections and measurements have been verified.
- No modifications are made to the existing lug configuration in the electrical meter.
- Where the requirements listed above cannot be met for the installation of a splitter at the electrical
  meter due to violations by the CEC or AHJ, the contractor shall be responsible for feeding the Orenco
  pump and control panel by a branch circuit from the electrical panel inside the home, shop, or garage
  (whichever is the closest based on proximity and has the available capacity).
- The Orenco system operates on a single phase, 120 VAC circuit and has individual overcurrent protection THE within the control panel for its control circuit (120 VAC, 10 Amp), and pumping circuit (120 VAC, 15 Amp).
- Contractor shall be responsible for providing a branch circuit(s) with conductors sized accordingly based on the requirements of the CEC.
- Level control will be with three float switches for pump on, pump off, and high-level alarm.
- The alarm system is to be a combination of both a visual and audible (greater than 80 dB).
- Should a cellular alarm connection be desired by the homeowner, they are to state this in the application package and the additional cost is to be covered by the homeowners.
- A Test-Normal-Silence switch accessible from panel exterior is required.
- Dry auxiliary contacts are required to allow connection to the building monitoring/security system.

# 5.4 Installation

#### **5.4.1 Installation Practices**

• It is recommended that all service piping, tanks, pumps and associated products are installed in accordance with the manufacturer's installation guidelines and all applicable codes.

# 5.4.2 Sewer Service Piping and Fittings

- For each approved service connection, a pipe stub will be provided by the Municipality at a location no more than 300mm outside the Municipality's right-of-way at varying depths, typically about 3m below grade.
- Horizontal separation between water and other services in the same trench is 0.3m for service with 50mm diameter pipe and less, and 2.0m for services with a pipe diameter greater than 50 mm.
- All pipe installed with less than 3.0m cover will require insulation following the ESS details. If pipe is
  installed with less than 3.0m cover using trenchless methods, pre-insulated pipe is to be installed, with
  thickness to be determined by the supplier and heat trace installed if insulation will not protect the pipe
  from freezing.



#### 5.4.3 Effluent Tank and Pump System

- If retrofitting an existing septic tank, an assessment shall be carried out by a certified contractor. The
  assessment shall review the structural / environmental conditions of the existing tank, and the capacity
  shall be also included in the assessment.
- If the septic tank is deemed to be suitable for retrofitting, the tank shall be connected to the system by a qualified plumber/contractor.
  - If the existing tank is a single compartment, a new single compartment tank is to be installed per the design drawing details attached.
  - The following modifications are required on the existing tank before putting in service:
    - i. All sludge must be removed from the tank; and
    - ii. The septic tank must be waterproofed so that no ground water can enter the tank and no sewage can exit the tank. This includes the access cover, penetrations and the tank itself.
- If the septic tank was deemed to be unsuitable for reuse, a new tank shall be installed according to the
  requirements in this section. The homeowner will be responsible to decommission the old tanks to meet
  regulatory requirements.
- The applicant shall use a certified contractor to install the tank and pump system service connection.

# 5.5 Community Specific Requirements

#### 5.5.1 Anzac

The Anzac sewage collection system is primarily comprised of gravity sewer mains with a few exceptions as follows. There are three types of sewer services within Anzac:

- 1. Gravity sewer (majority of lots)
- 2. Pumped sewer into gravity service pipe at property line where either a grinder pump or an effluent pump capable of meeting the localized pumping head to convey flows to the service stub is acceptable.
- 3. STEP sewer (three lots along Highway 881). The contractor is to contact the RMWB to identify the specific lots that will require a pumped system.

#### 5.5.2 Conklin

The Conklin sewage collection system is primarily comprised of gravity sewer mains with the exception of the lots listed below. These lots are considerably lower than the fronting road and therefore not serviceable with full gravity system. The waste water from the these lots is to be collected in septic tanks and pumped into the gravity service pipe.

The contractor is to contact the RMWB to identify the specific lots that will require a pumped system.

## **5.6 STANDARD DETAIL DRAWINGS**

For service connection details, see standard drawings in Appendix B.



# **Appendices**



# **APPENDIX A. TANK SIZING CHARTS**

# Regional Municipality of Wood Buffalo

#### Residential Septic Tank Sizing Requirements for a Compartmentalized Septic Tank to be used with Low Pressure Sewers

#### Notes:

- 1. Using Alberta Private Sewage System Standard of Practice (APSSSOP), calculate any additional fixture unit volume and/or high flow fixture volume and add to table
- 2. If a Garburator is present check box to automatically calculate extra wastewater and sludge volume
- 3. Minimum Pump Operating Volume is calculated using 5% of the Total Working Volume (approximate unusable volume of bottom 100 mm of pump chamber) plus 300 L (volume pumped during 2 minute average pump flow).
- 4. This table was created for use by the Municipality, any use by a third party is done so at their own risk.

#### **□ Show Only Results**

Bedro Number	mber of ooms and of Persons Bedroom	Required Septic Tank Volume based upon peak day demand	Sludge and Scum Accumulation Allowance	Base Working Volume	Additional allowance for additional Fixture Units and High Capacity Fixtures	Additional allowance for Garburator (additional 5% to wastewater volume and 50% to sludge and scum volume)	Total Working Volume (base + additional)	Minimum Pump Operating Volume (see Note 3)	One Day Emergency Storage allowance (within Pump Chamber)	Minimum Pump Chamber volume	Total Septic Tank Operational Volume	Recommended Base Worki without addito (Confirm Work Chamber Vo manufact submi	ng Volume nal allowance ing and Pump lumes with urer data
Number o f Bedrooms (BR)	Persons/BR for Residential Occupancy per APSSSOP	Peak Daily WW Volume as per ASSSOP @ 340 Liters/ Person/ Day in (L)	Add allowance for sludge as per APSSSOP section 4.2.1.1 of [Edition 3- December 2015 Page 43] in (L) (400 l/ person / 3 years)	Wastewater Flow + Sludge and Scum (L)	To be calculated per the ASSSOP and value manually entered (L)	☐ Garburator	Total Septic Tank Working Volume in (L)	Calculated from 5% of Total Working Volume + 300 L Pumping Volume (L)	Add one days allowance @228L/Person/Per day in (L)	one days allowance n (L) p Operating + One D		L	imp. Gal.
2	2	1360	1600	2960		0	2960	448	912 1360		4320	5455	1200
3	1.5	1530	1800	3330		0	3330	467	1026 <b>1493</b>		4823	6819	1500
4	1.5	2040	2400	4440		0	4440	522	1368	1890	6330	9092	2000
5	1.5	2550	3000	5550		0	5550	578	1710	2288	7838	9092	2000
6	1.5	3060	3600	6660		0	6660	633	2052	2685	9345	13638	3000
7	1.5	3570	4200	7770		0	7770	689	2394	3083	10853	13638	3000
8	1.5	4080	4800	8880		0	8880	744	2736	3480	12360	16366	3600
9	1.5	4590	5400	9990		0	9990	800	3078	3878	13868	18639	4100
10	1.5	5100	6000	11100		0	11100	855	3420	4275	15375	25458	5600

Table 1: Recommended Cistern Tank Size For Trickle Fill System

Number of Bedrooms and Number of Persons per Bedroom		Required Cistern Tank Volume based on 2 days of average day demand	Additional Operating Volume (see Note 2)	Total Working Volume (base + additional)	Total Cistern Tank Operational Volume	additonal allow	olume without ance (Confirm ump Chamber
Number o f Bedrooms (BR)	Persons/BR for Residential Occupancy per APSSSOP	Average Daily Water Volume as per ESS @ 360 Liters/ Person/ Day in (L)	Calculated from 5% of Total Working Volume + 10% to allow for 300 mm air gap on top of the floating valve	Total Cistern Tank Working Volume in (L)	Total Working Volume + Additional Operating Volume (L)	L	imp. Gal.
2	2	2880	432	3312	3312	4600	1020
3	1.5	3240	486	3726	3726	4600	1020
4	1.5	4320	648	4968	4968	6900	1500
5	1.5	5400	810	6210	6210	6900	1500
6	1.5	6480	972	7452	7452	8150	1800
7	1.5	7560	1134	8694	8694	9100	2000
8	1.5	8640	1296	9936	9936	10442	2300
9	1.5	9720	1458	11178	11178	12300	2700
10	1.5	10800	1620	12420	12420	12300	3200

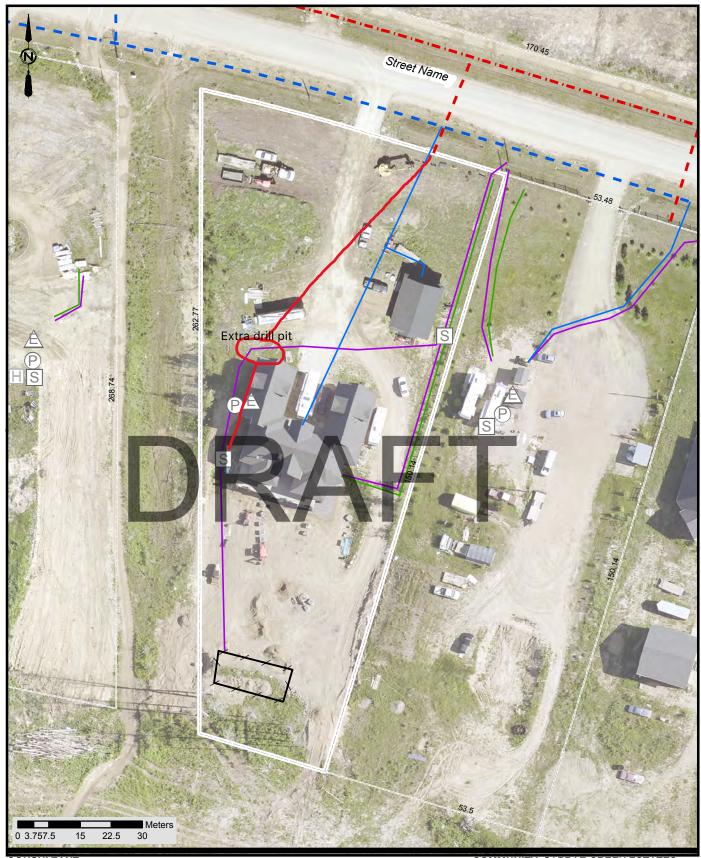
#### Notes:

<sup>1.</sup> Minimum Trickle fill cistern size is 2 days of average day demand, see ESS 7.20.3.2

<sup>2.</sup> Additional Operating Volume is calculated using 5% of the Total Working Volume (approximate unusable volume of bottom 100 mm of 3. This table was created for use by the Municipality, any use by a third party is done so at their own risk.



# **APPENDIX B. SAMPLE SITE PLAN**



CONSULTANT: CONSULTANT REP: CONTRACTOR: CONTRACTOR REP:

# Legend

H Sanitary Holding Tank

Sanitary Pump

Sanitary Septic Tank

Sanitary Exit

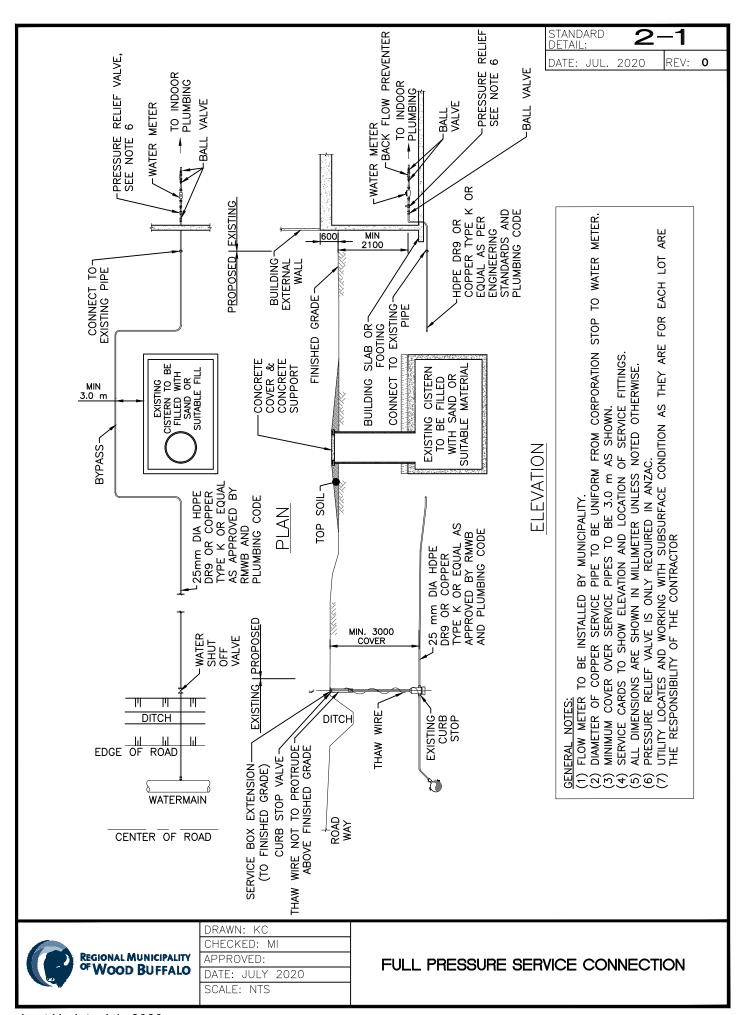
Water Mains
Sanitary Service Stub

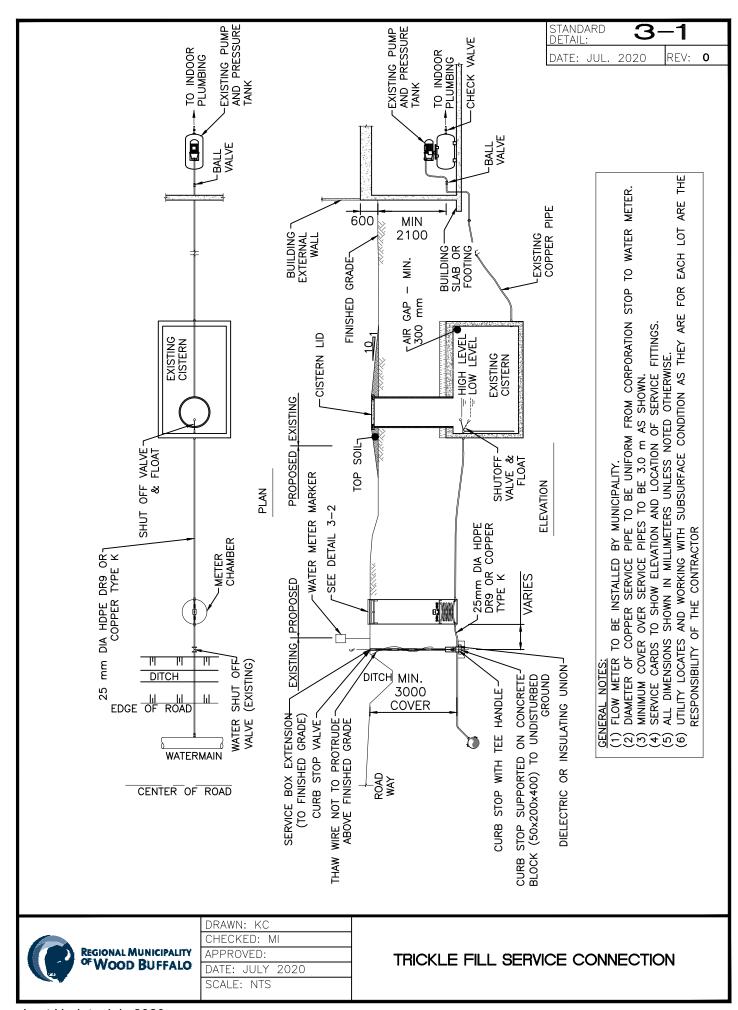
COMMUNITY: SAPRAE CREEK ESTATES
CIVIC ADDRESS: ### STREET NAME
LOT: ##
BLOCK: #
PLAN: ### ####

Sanitary Mains —— Power Lot Services
Sanitary Septic Field —— Gas Lot Services
Water Lot Service

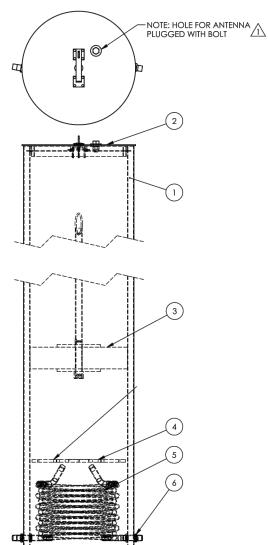


# **APPENDIX C. STANDARD DRAWINGS**





STANDARD 3-2.1
DATE: JUL. 2020 REV: 0



ITEM NO.	432415 - 8' HEIGHT QTY.	432414 - 10' HEIGHT QTY.	PART NUMBER	DRAWING / REFERENCE	DESCRIPTION	WEIGHT (LB)
1	1	1	428352	ML-BODY-10	BODY - MODEL 18	50.2
2	1	1	250047	ML-LID-ASM	LID ASSEMBLY	26.0
3	1	1	250001	ML-PLUG-ASM	PLUG ASSEMBLY	4.7
4	1	1	250071	ML-TABLE-ASM	TABLE ASSEMBLY	3.3
5	2	2	250083	ML-TUBING-ASM	SUPPLY COIL ASSEMBLY	3.7
6	4	4	250031		BULKHEAD NUT	0.1

NOTE: A SHOP DRAWING INFORMATION FROM PLAINSMAN MFG. INC

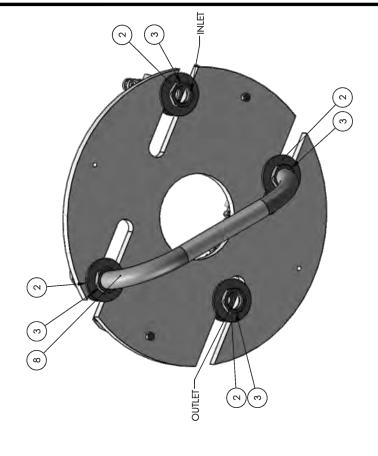


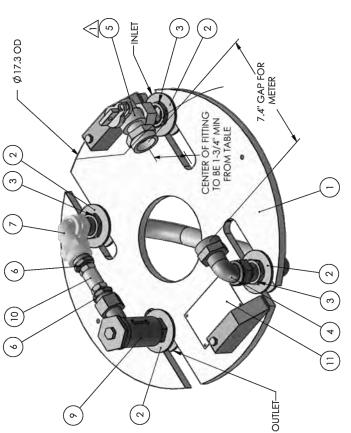
	DRAWN: KC
	CHECKED: MI
١	APPROVED:
	DATE: JULY 2020
	SCALE: NTS

METER LIFT ASSEMBLY SHEET 1 OF 3

STANDARD 3-2.2

DATE: JUL. 2020 REV: 0





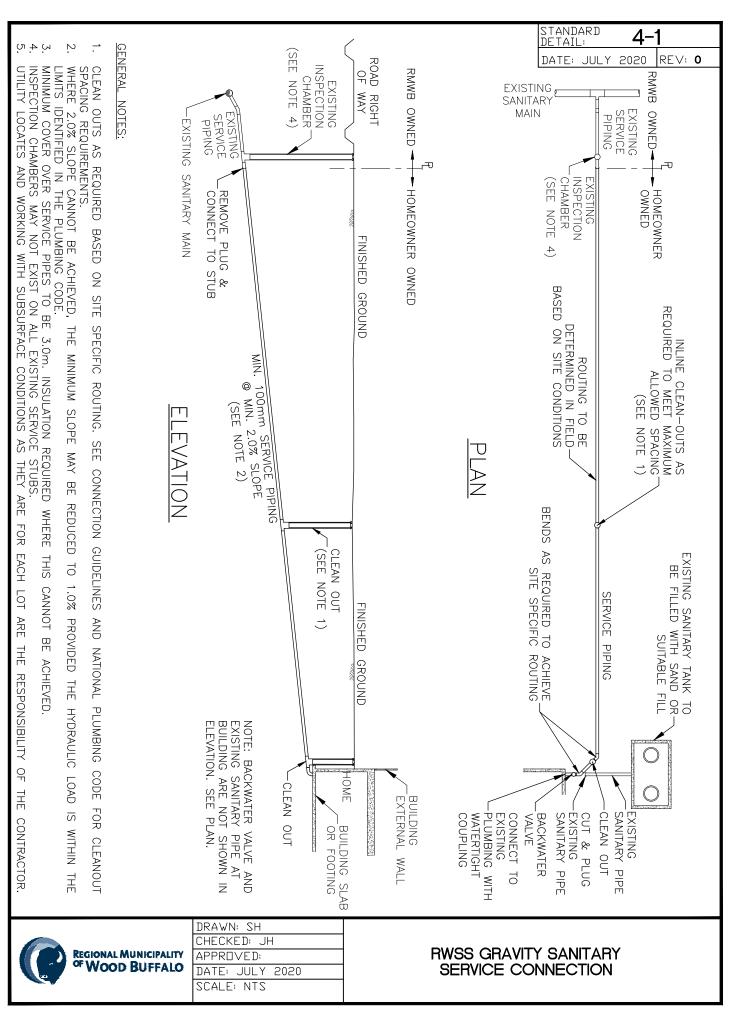
THE TOP OF THE METER LIFT SHALL EXTEND 150mm ABOVE FINISHED GRADE. A SIGN SHALL BE INSTALLED NEXT TO EACH METERLIFT TO BE USED FOR LOCATION PURPOSES. FOR ITEM QUANTITIES AND DESCRIPTIONS SEE SHEET 3 OF 3 NOTES: 7.22

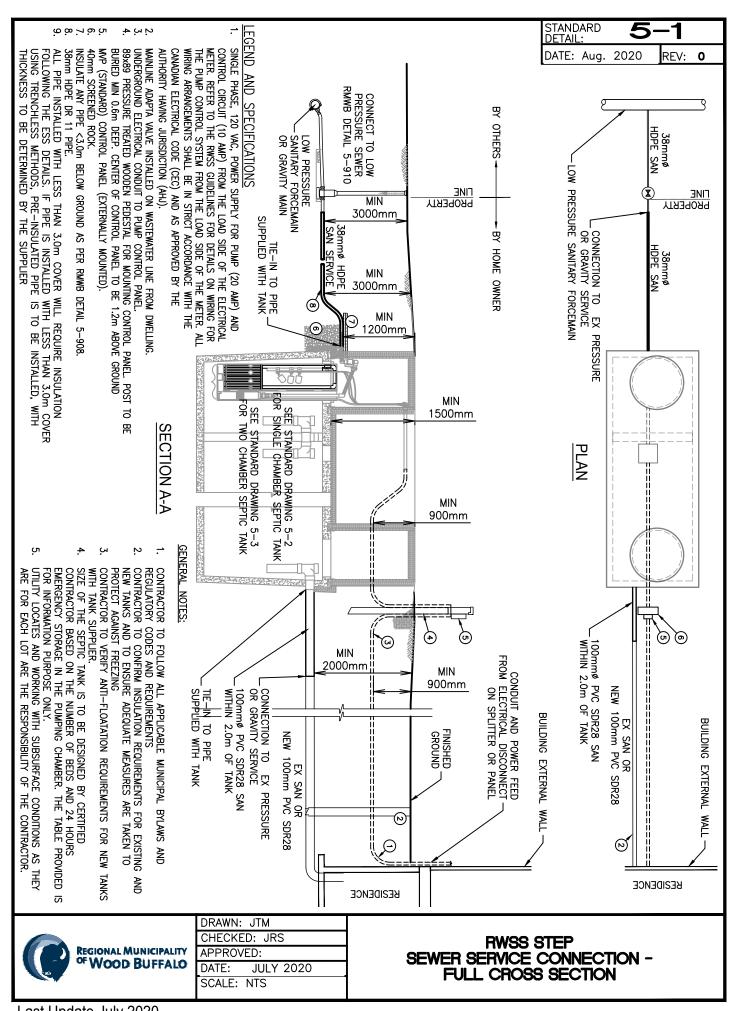
REGIONAL MUNICIPALITY OF WOOD BUFFALO

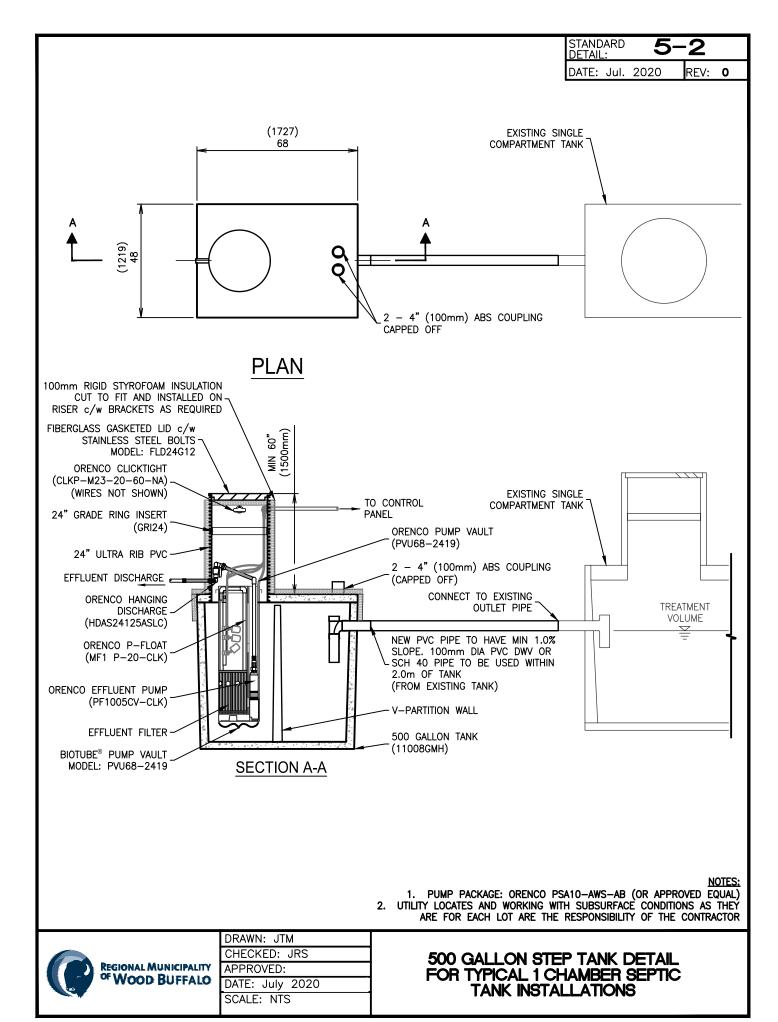
DRAWN: KC
CHECKED: MI
APPROVED:
DATE: JULY 2020
SCALE: NTS

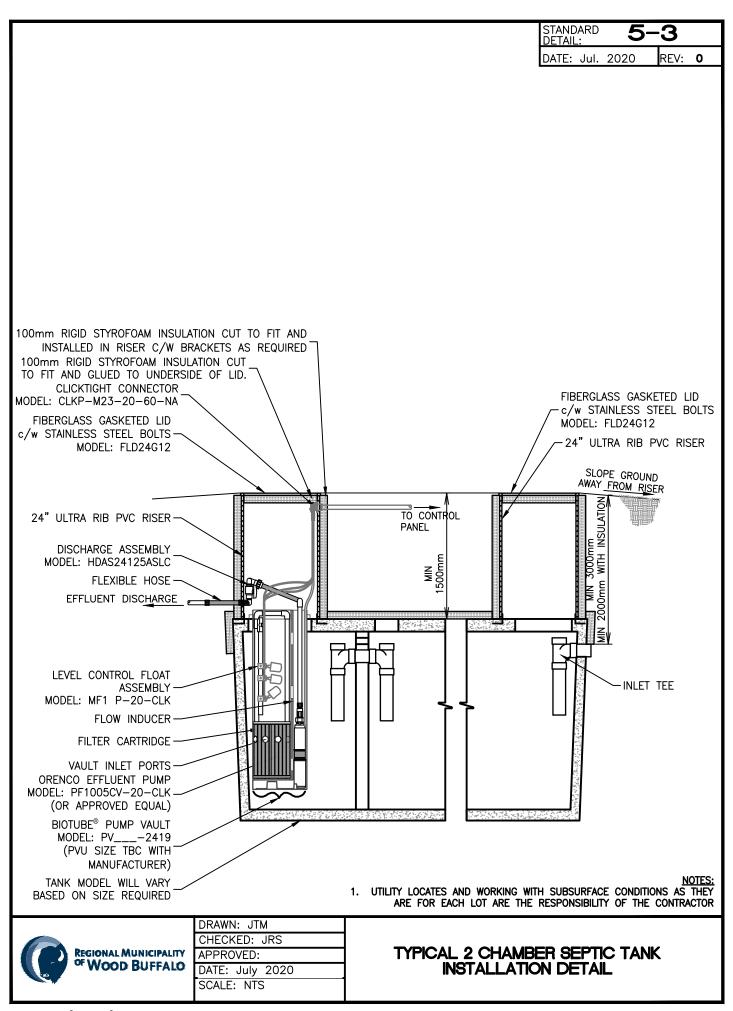
METER LIFT ASSEMBLY SHEET 2 OF 3

									S	TAN ETA	IDAR IL:	RD	(	3-2.3
										ATE			202	O REV: O
Ø 18.0		WEIGHT (LB)	3.3	0.2	0.1	0.9	1.4	0.2	0.1	2.2	2.7	0.2	0.1	ώ
SEE NOTES 1 & 2/1	BOTTOM VIEW  180° HOLES ACCORDING TO ML-BODY-10.	DESCRIPTION	TABLE ASSEMBLY	WASHER	BULKHEAD NUT	QUARTER BEND METER SWIVEL (3/4 fNPT X 3/4" SWIVEL)	ANGLE BALL VALVE (3/4" fNPT X 3/4" SWIVEL)	NPT ADAPTER	QUARTER BEND METER SWIVEL (3/4" fNPT X 5/8" SWIVEL)	JUMPER	ANGLE DUAL CHECK (3/4" fNPT x 5/8" SWIVEL)	0.5 GPM FLOW CONTROLLER (3/8" fNPT), HG SPEC	NAMEPLATE	SHALL EXTEND 150 mm ABOVE FINISHED GRADE. NEXT TO EACH METERLIFT TO BE USED FOR LOCATION PURPOSES.
	BOTTC BOTTC ING TO ML-BODY	PART DRAWING	ML-TABLE-ASM	ML-FTG-WASHER				METP-10-015		METP-10-001			METP-10-007	EXTEND 150 O EACH METE
OR WITH A OI NDICATE	ACCORDII	PART NUMBER	250071	250038	250031	250024	250021	431406	250025	250039	250022	432455	315295	
MARK THE INLET FITTING WITH TAPE OR WITH A MARKER TO INDICATE IT IS THE INLET	-	432414 - 10' HEIGHT QTY.	_	∞	7	_	_	2	1	1	1	l	1	METER LIFT INSTALLED
	△ NOTES:	432415 - 8' HEIGHT QTY.	1	8	7	1	1	2	1	1	1	1	1	<u>:S:</u> THE TOP OF THE A SIGN SHALL BE
		NOW	-	2	က	4	5	9	7	8	6	10	11	E TOI SIGN
														NOTES: 1. THE 2. A §
REGIONAL MUNICIPALITY OF WOOD BUFFALO	DRAWN: KC CHECKED: MI APPROVED: DATE: JULY 2020 SCALE: NTS			l	ME	TEI S	R L HE	IFT ET	` A(	SSE OR	EMI 3	BL'	Y	





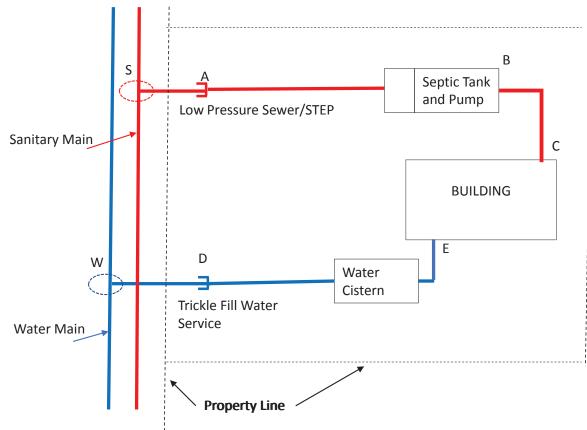






# APPENDIX D. RWSS PERMIT REQUIREMENTS FOR VARIOUS COMMUNITIES

Drawing 1: RWSS Permit Requirements **Draper and Janvier** 

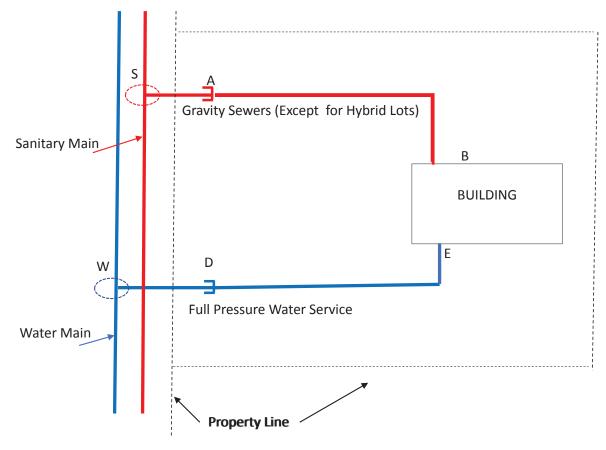


Note: Water and Sanitary service lines are shown in separate trench for illustration purpose only. Water Cistern shown outside of building for illustration purpose only.

STEP: Septic Tank Effluent Pump ; Water Cistern is shown outside, can be inside www.rmwb.ca

Permit Name, Issuance /Inspection	Who Can Pull the Permit
Service Connection Permit (STEP) (A-B) and (D-E) • Issued and Inspected by Safety Codes.	Licensed Plumber or Certified Private Sewage System Installer
Plumbing Permit May be Required If:  1) B- C is new/not already constructed or  2) Alteration to Internal Building Plumbing is required  • Issued and Inspected by Safety Codes.	Licensed Plumber
• Issued and Inspected by Safety Codes	Master Electricians
<ul> <li>Water Meter Permit</li> <li>Issued and Installed by Underground Utilities or Water Meter or Rural Operations.</li> <li>Water meter Installed inside the building for Anzac, Conklin and Gregoire Lake Estates.</li> <li>In Draper and Janvier, Water meter installed in Meter Chamber outside next to the property line.</li> <li>Turning on Water and Low Pressure Sewer Valves.</li> </ul>	Owner or Owner's Contractor
<ul> <li>Utility Connection Permit</li> <li>Not Required for lots that already have Service Stubs S-A and W-D</li> <li>Required, besides above permits, for lots that do not have Service Stubs S-A and W-D and needs to Connect/Tap to Main Lines</li> <li>Currently Issued and Inspected by UGS/Reviewed by Engineering. (Please See Drawing 4).</li> </ul>	Owner or Owner's contractor

Drawing 2: RWSS Permit Requirements **Anzac , Conklin and Gregoire Lake Estates** 



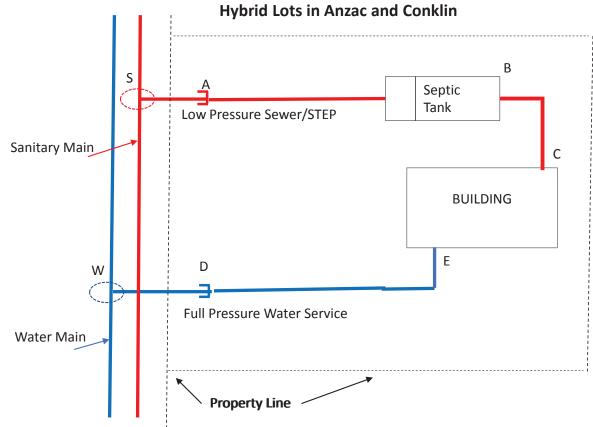
Note: Water and Sanitary service lines are shown in separate trench for illustration purpose only.

Permit Name, Issuance /Inspection	Who Can Pull the Permit
Service Connection Permit (DIRECT) (A-B) and (D-E) • Issued and Inspected by Safety Codes.	Licensed Plumber
Plumbing Permit May be Required If:  1) Alteration to Internal Building Plumbing is required  Issued and Inspected by Safety Codes.	Licensed Plumber
<ul><li>Electric Permit</li><li>Issued and Inspected by Safety Codes.</li></ul>	Master Electricians
<ul> <li>Water Meter Permit</li> <li>Issued and Installed by Underground Utilities or Water Meter or Rural Operations.</li> <li>Water meter Installed inside the building for Anzac, Conklin and Gregoire Lake Estates.</li> <li>In Draper and Janvier, Water meter installed in Meter Chamber outside next to the property line.</li> <li>Turning on Water and Low Pressure Sewer Valves.</li> </ul>	Owner or Owner's Contractor
<ul> <li>Utility Connection Permit</li> <li>Not Required for lots that already have Service Stubs S-A and W-D</li> <li>Required, besides above permits, for lots that do not have Service Stubs S-A and W-D and needs to Connect/Tap to Main Lines</li> <li>Currently Issued and Inspected by UGS/Reviewed by</li> </ul>	Owner or Owner's Contractor

Engineering. (Please See Drawing 4).

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# Drawing 3: RWSS Permit Requirements Saprae Creek Estates and



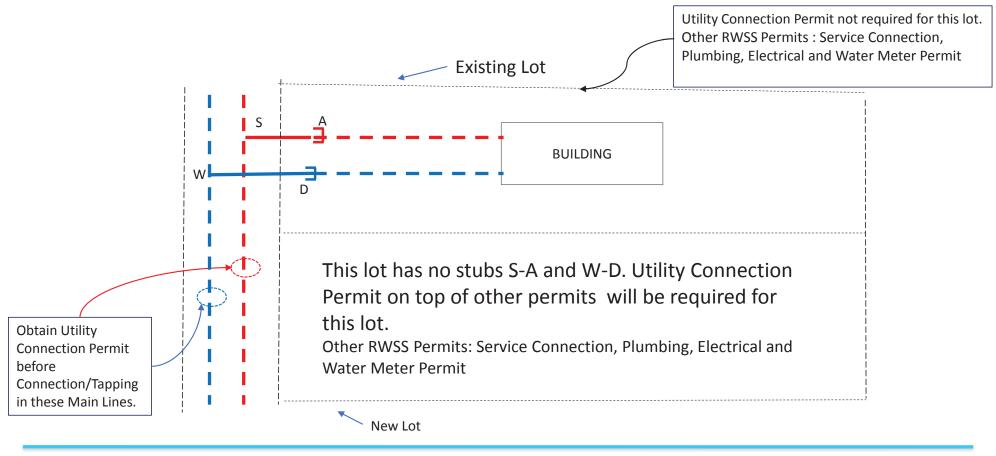
Note: Water and Sanitary service lines are shown in separate trench for illustration purpose only. STEP System: Septic Tank Effluent Pumping;

Hybrid lots requiring STEP tank and pump

www.rmwb.ca

Permit Name, Issuance /Inspection	Who Can Pull the Permit
Service Connection Permit (STEP) (A-B) and (D-E)  • Issued and Inspected by Safety Codes.	Licensed Plumber or Certified Private Sewage System Installer
Plumbing Permit May be Required If:  1) B- C is new/not already constructed or  2) Alteration to Internal Building Plumbing is required  • Issued and Inspected by Safety Codes.	Licensed Plumber
<ul><li>Electric Permit</li><li>Issued and Inspected by Safety Codes.</li></ul>	Master Electricians
<ul> <li>Water Meter Permit</li> <li>Issued and Installed by Underground Utilities or Water Meter or Rural Operations.</li> <li>Water meter Installed inside the building for Anzac, Conklin and Gregoire Lake Estates.</li> <li>In Draper and Janvier, Water meter installed in Meter Chamber outside next to the property line.</li> <li>Turning on Water and Low Pressure Sewer Valves.</li> </ul>	(Owner or Owner's Contractor
<ul> <li>Utility Connection Permit</li> <li>Not Required for lots that already have Service Stubs S-A and W-D</li> <li>Required, besides above permits. for lots that do not have Service Stubs S-A and W-D and needs to Connect/Tap to Main Lines</li> <li>Currently Issued and Inspected by UGS/Reviewed by Engineering. (Please See Drawing 4).</li> </ul>	Owner or Owner's Contractor

# Drawing 4: When Utility Connection Permit is Required



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