

YAKIMA COUNTY, WASHINGTON

Special Provisions For Buena Sanitary Sewer Construction

The 2004 Standard Specifications for Road, Bridge, and Municipal Construction as prepared by the Washington State Department of Transportation and the American Public Works Association, Washington State Chapter, are adopted by the Board of County Commissioners of Yakima County as Standard Specifications. These Standard Specifications and the Amendments thereto shall apply to all work to be done under this project except as these Special Provisions expressly alter or modify them. In using said Standard Specifications and Amendments thereto, Secretary of Transportation, Engineer and like terms therein will be construed to mean Yakima County Engineer and where State or Thurston County is used it will mean Yakima County.

The Special Provisions hereinafter contained supersede any conflicting provisions of the 2004 Standard Specifications for Road, Bridge, and Municipal Construction and the Amendments thereto.

1-06 CONTROL OF MATERIAL

1-06.1 Source of Supply and Quality of Materials

Section 1-06.1 of the Standard Specifications shall be supplemented with the following:

The Contractor shall submit to the County for review shop, catalog, and other appropriate drawings and descriptive information prior to fabrication or ordering of all materials specified. Information shall be submitted in sufficient time to allow the County not less than 10 regular working days for review. The minimum number of copies of such information to be submitted shall be three.

When the submittals have been reviewed by the County, one set will be returned to the Contractor. If major changes or corrections are necessary, the submittals will be returned to the contractor with such changes or corrections indicated, and the Contractor shall correct and resubmit in the same manner and quantity as specified for the original submittals.

No manufactured items or materials shall be installed until the submittals have been approved and appropriately stamped by the County.

7-17 SANITARY SEWERS

7-17.3(2)H Television Inspection

The first paragraph of Section 7-17.3(2)H of the Standard Specifications shall be replaced with the following:

All sanitary sewer lines shall be inspected by the use of a television camera before final acceptance. The inspection shall be at the Contractor's expense.

7-18 SIDE SEWERS

7-18.1 Description

Section 7-18.1 of the Standard Specifications shall be replaced with the following:

This work shall consist of constructing side sewers in accordance with the Plans and as specified herein, at locations designated by the Engineer, on both the right-of-way and private property between the main sanitary sewer line and the septic tanks, and between the septic tanks and the piping from the residence or other building.

Side sewers shall be designated as follows:

- Type 1** Side sewers of various diameters connecting the main sanitary sewer line to the septic tank.
- Type 2** Side sewers of various diameters connecting the residence or other building to the septic tank.

7-18.2 Materials

Section 7-18.2 of the Standard Specifications shall be replaced with the following:

Materials shall be Solid Wall PVC Sanitary Sewer Pipe as required for sanitary sewers in Section 7-17.

Sewer saddles installed where no tee, wye or riser is available, shall be Style CB Sewer Saddle, as manufactured by Romac Industries, Inc., or equal.

Gravel Backfill for Pipe Zone Bedding shall meet the requirements of Section 9-03.12(3) except that 100% of the material shall pass the 5/8" square sieve size.

7-18.3 Construction Requirements

Section 7-18.3 of the Standard Specifications shall be supplemented with the following:

7-18.3(1) General

The construction requirements for sanitary sewers in Section 7-17 shall apply to the construction of side sewers.

Side sewers shall not be backfilled prior to inspection.

Side sewers shall be constructed with a maximum joint deflection not to exceed the manufacturer's printed recommendations and in no case shall exceed 2 inches per foot in any joint. Larger changes in direction shall be made by use of standard 1/8 or smaller bends.

The Contractor will be responsible for obtaining the necessary permits for working in County Road right-of-way.

7-18.3(1)A Connection at Main Sanitary Sewer Line

Side sewers shall be connected to the tee, wye, or riser provided in the public sewer, where such is available, utilizing approved fittings or adapters. Where no tee, wye, or riser is provided or available, connection shall be made by machine-made tap and approved saddle. Care shall be taken during installation to assure that side sewer is not over-stressing the connection fittings.

7-18.3(1)B Connection at Residence or Building

All sewage outfalls from the existing residences or buildings shall be located by the Contractor. The actual location of outfalls shall be recorded by the Contractor and Engineer.

The existing outfalls shall be cut and a new Calder coupling installed to form a transition from existing to new sewer lines. A cleanout shall be installed at each connection.

7-18.3(1)C Slopes

Minimum slopes for 4" through 6" diameter side sewers between the septic tank and the house shall be 2%, except when approved by the County, and where it is impractical to obtain a slope of 2%, the minimum slope may be reduced to 1%.

Minimum slope for side sewers between the septic tank and the sewer main shall be 0.2%.

7-19 SEWER CLEANOUTS

7-19.3 Construction Requirements

Section 7-19.3 of the Standard Specifications shall be supplemented with the following:

In addition to the clean-out locations required by this section (Section 7-19.3), cleanouts shall be required at the final outfall of all septic tanks and at the connection of the Type 2 side sewer to the sewage outfall at the residence or building.

Cleanout locations shall be in accordance with the latest edition of the International Plumbing Code and shall be located not more than 100-feet apart and at each change of direction greater than 45-degrees. Where more than one change of direction occurs in a run of piping, only one cleanout shall be required for each 40-feet of piping.

All clean-outs downstream of the septic tank shall be extended to grade with approved castings as shown on the Plans.

7-20 SEPTIC TANKS (New Section)

7-20.1 Description

This work shall consist of the installation of septic tanks and appurtenances in accordance with the plans and as specified herein, at locations staked by the Engineer.

7-20.2 Materials

Materials shall meet the requirements of the following sections:

Septic Tanks	9-35.1
Precast Concrete Septic Tanks	9-35.1(1)
Fiberglass Septic Tanks	9-35.1(2)
Polyethylene Septic Tanks	9-35.1(3)
Risers and Lids (Non-Traffic Bearing)	9-35.2
Effluent Filters	9-35.3

Bedding material to be used for all backfill to top of tanks shall be clean, granular, sands and gravels conforming to Section 9-03.9(3) – Top Course, or Section 9-03.12(3), except that 100% of the material shall pass the 1" square sieve size.

Sand material to be used between the top of tanks and concrete hold down beams shall be clean sand conforming to Section 9-03.1(2)B Class 1 or 2, or approved equal.

7-20.3 Construction Requirements

New septic tanks shall replace any and all septic tanks that now exist for each structure to be serviced by this project. No existing tanks shall remain in use. All septic tanks that now exist shall be abandoned in accordance with the Uniform Plumbing Code by pumping the sewage and completely filling the tank with soil, sand, gravel, concrete, or other approved material.

The contractor shall be responsible to locate, horizontally and vertically, all domestic sewage and grey water outfalls, septic tanks, dry/wet wells, and other appurtenances that would affect this project.

It is anticipated that existing utilities and/or on-site sewage lines and facilities will be encountered during the installation of the new septic tanks required for the completion of this project. It shall be the responsibility of the Contractor to notify the appropriate companies/individuals to inform them of the action that will occur and to receive guidance as to locations, restrictions, etc., if any, that will affect the Contractor's performance of his work.

The new septic tanks shall be installed according to the manufacturer's specifications and these Special Provisions. In case of a conflict, the Special Provisions shall be followed.

All fiberglass and polyethylene tanks shall be installed with pre-cast concrete hold down beams as shown on the Plans to prevent flotation. As an alternate, the Contractor may use an underground cast-in-place reinforced cement concrete pad over the septic tank as designed by the septic tank manufacturer, and as approved by the Engineer. Design conditions for the hold down pad shall include full submergence of the tank and riser(s). Design calculations and drawings detailing pad dimensions, reinforcing steel size and placement, and other necessary details shall be submitted for approval.

Bedding and sand backfill materials shall be compacted to 90% of maximum density in layers not to exceed 12" in thickness.

9-12 MASONRY UNITS

9-12.4 PRECAST CONCRETE MANHOLES

Section 9-12.4 of the Standard Specifications shall be supplemented with the following:

All manholes shall be constructed with non-corrosive lining systems. Liner systems shall be comprised of either a liner for the manhole top and barrel sections with a polyurethane coated channel section or a complete interior polyurethane coating.

The liner shall be manufactured from polyvinyl chloride resin (PVC), white in color, and shall be factory formed into sections to be made a permanent part of the manhole inside surface during the manhole pre-casting process. Liners shall have preformed horizontal ribs to form a permanent mechanical bond to the concrete and shall provide protection at manhole joints through use of a continuous PVC return into the joint for a minimum of $\frac{3}{4}$ -inch. Provisions shall be made to allow the pipe entry openings to be lined and sealed. Liners shall be free of cracks, pinholes, or other defects which, in the opinion of the Engineer, would affect the protective characteristics of the liner and shall be a minimum of 65 mils in thickness. Liners shall be DuraPlate 100 as manufactured by A-Lok Products, Inc., T-Lock by Ameron, or approved equal.

If the liner system is used, the liner shall be installed on all inside surfaces of the manhole sections and flat slab cover (including inside of 24-inch diameter opening), all in strict accordance with the liner manufacturer's recommendations. All other inside surfaces not protected by the liner, including channel, shelf and inside of all adjustment rings, shall receive a polyurethane coating applied according the manufacturer's recommendations to a minimum cured film thickness of 30 mils.

Concrete and grout shall be allowed to cure for a minimum of 18-20 days before application of the coating. Surfaces shall be prepared as per the coating manufacturer's recommendations.

Joints between manhole liner sections and other components shall be fully sealed with butyl rubber sealant material as recommended by the liner manufacturer.

The complete interior polyurethane coating option shall include complete grouting of all manhole joints, cracks, holes, etc. in the manhole and all risers. The polyurethane coating shall be applied to all interior surfaces of the manhole structure except for the manhole cover in a manner as specified for the liner system above.

As an additional alternative, the Contractor may elect to utilize a prefabricated fiberglass, or other approved non-corrosive material, manhole base which is cast into the manhole base section, as manufactured by Gu-Manhole Liners, or equal, in lieu of a polyurethane coating on the base.

9-35 SEPTIC TANK MATERIALS (New Section)

This specification addresses septic tanks and materials. Septic tank materials incorporated into the work shall be new.

9-35.1 Septic Tanks

Septic tanks shall be precast concrete, fiberglass or polyethylene tanks and shall have been designed by a registered structural engineer for structural integrity. All tanks shall be manufactured for acceptance of effluent filters specified elsewhere in these contract documents and other appurtenances as detailed, without having to be field modified in any way.

All tanks shall be designed so that they will not collapse or rupture when subjected to anticipated earth and hydrostatic pressures when the tanks are either full or empty, and when being tested (full of water and not backfilled).

All tanks located in travel areas shall be designed to withstand a H-20 live load with a minimum soil cover of 12 inches, as well as the loading conditions given for non-traffic bearing tanks. All riser and lid assemblies for traffic bearing tanks shall be furnished with I.F.C.O. No. 719, or equal, cast iron covers as detailed on the Plans.

All tanks shall be watertight and shall be guaranteed in writing by the tank manufacturer for a period of two (2) years from the date of final acceptance. The tank guarantee/warranty shall be furnished at the time of submittals.

Septic tanks shall have a minimum capacity of 1,250 gallons for up to a 4-bedroom single-family residence. Septic tanks for single-family residences with more than 4-bedrooms shall be an additional 250 gallons in size for each additional bedroom.

9-35.1(1) Concrete Septic Tanks

Concrete septic tanks shall meet ASTM C1227 and the following requirements:

1. The walls and bottom slab shall be poured monolithically; alternatively, water stops may be provided.
2. Reinforcing steel shall be ASTM A-615 Grade 60, $f_y = 60,000$ psi. Details and placement shall be in accordance with ACI-315 and ACI-318.
3. Concrete shall be ready-mix with cement conforming to ASTM C150, Type II. It shall have a cement content of not less than six (6) sacks per cubic yard and maximum aggregate size of $\frac{3}{4}$ inch. Water/cement ratio shall be kept low ($<0.35 \pm 0.02$), and concrete shall achieve a minimum compressive strength of 4,000 psi in 28 days.
4. Tanks shall be protected by applying a heavy cement-base waterproof coating (Thoroseal or equal), on both inside and outside surfaces, in compliance with Council of American Building Officials (CABO) report #NRB-168; 6181.
5. Form release used on tank molds shall be Nox-Crete or equal. Diesel or other petroleum products are not acceptable.
6. Tanks shall not be moved from the manufacturing site to the job site until the tank has cured for seven (7) days or has reached two-thirds of the design strength.
7. Tanks shall be manufactured and furnished with access and piping openings of the size and configuration as shown in the contract drawings. Modifications of any type to the completed tanks will not be permitted.
8. The septic tank and the top slab, if not of single-piece construction, shall be sealed with a preformed flexible gasket. The flexible plastic gasket shall be equal to the flexible butyl resin sealant conseal CS-102 or CS-202 as manufactured by Concrete Sealants, Inc., of New Carlisle, Ohio, and shall conform to federal specifications SS-S-00210(210A) and AASHTO M-198.
9. Tanks shall be furnished without concrete access hole lids. In order to demonstrate water tightness, the tanks shall be tested as follows.

Inlets to the septic tank will be water-tight pipe seal as Polylok pipe seal or equal. Outlets for effluent filters shall be configured as shown on the contract plans.

- a. **Field Tests** – The tank shall be tested by filling with clean water to the soffit and let stand for a minimum of 24 hours. After the 24 hour period, the water will be replaced to the soffit. The water level shall be checked after 2 hours. Any water loss will not be acceptable. Any tank that fails the test shall be repaired and/or replaced until the tank passes the said test.

9-35.1(2) Fiberglass Septic Tanks

Fiberglass septic tanks shall meet the following requirements:

1. The tank shall be constructed with a glass fiber and resin content specified by the manufacturer and with no exposed resin-coated glass fibers. The manufacturer shall supply to the Engineer, without charge, satisfactory evidence of testing by an approved laboratory showing compliance with IAPMO IGC 3-74, excepting as herein modified. Any metal part shall be 300 series stainless steel.
2. Inspections may be made by the engineer in the supplier's yard, within the plant, upon delivery and again after installation. The wall thickness shall average at least $\frac{1}{4}$ inches. When less than 3/16 inch in thickness or any delamination is suspected within any portion of the tank, the engineer may drill a $\frac{1}{4}$ inch diameter hold through the tank wall for inspection purposes. If the required minimum 3/16-inch thickness is not found or delamination is occurring, repair, if feasible, shall be made to bring the tank up to acceptable standards. If repair is judged not feasible, the tank shall be rejected. If twenty percent or more of the tanks are rejected for any of the aforementioned reasons, each tank under this bid will become suspect of substandard quality and subject to rejection by the engineer. If the required minimum 3/16-inch thickness is found, and no delamination is present, repair of the inspection hold shall be made to bring the tank back to acceptable condition. All repairs, regardless of when or where the repairs are required, will be the responsibility of the contractor or the tank manufacturer or both, as negotiated between themselves.
3. Holes required in the tank shall be provided by the manufacturer. Resin shall be properly applied to all cut or ground edges so that no glass fibers are exposed and all voids are filled.
4. Dual Tite or Ty-Seal neoprene gaskets, or equal, shall be used at the inlet to join the tank wall and the PVC inlet piping. PVC Schedule 40 pipe and fittings shall be used at the inlets.
5. Inlet and outlet plumbing shall penetrate into the liquid from the flow line as shown on the contract drawings.
6. Each tank shall be water tested on the project site after assembly by the manufacturer and witnessed by the Engineer. Every tank shall be assembled by the manufacturer and water raised to the brim of the manhole for a minimum of two hours. The tank shall show no leakage from section seams, pin-holes or other imperfections. Any leakage is cause for rejection.
7. When leakage occurs, if the tank is not rejected by the engineer, an additional water test for a minimum of two hours shall be made on the tank after repairs have been completed, upon request by the engineer. The manufacturer shall be responsible for

making all corrective measures in production or assembly necessary to ensure a completely water-tight tank.

8. After installation of tank with riser is completed, each tank shall be filled with water to 6" above the riser to tank connection for a two hour period as per paragraph 6, to assure that there is no leakage. Every tank test shall be witnessed by the Engineer.
9. Installation shall be in accordance with the manufacturer's recommendations and as shown on the contract plans.

9-35.1(3) Polyethylene Septic Tanks

Polyethylene septic tanks shall meet the following requirements:

1. The tanks shall be designed to sustain the design loads for an indefinite period of time without showing signs of creeping or deformation. Additionally, polyethylene tanks shall be Hancor I and A septic tanks or equal.
2. Polyethylene tanks will be subject to field exfiltration testing as specified for fiberglass tanks.
3. Factory testing shall conform to either of the following:
 - a. Tanks may be tested for water tightness by filling the tank with water and checking for leaks through any seams or joints. Any leakage will be a cause for rejection.
 - b. Vacuum Test: tanks may be tested to withstand an internal vacuum of at least 2" of mercury for a period of five minutes as a way of simulating external hydrostatic loading conditions. Higher values may be required for more severe water table conditions. Tank deformation which would impair the structural integrity of the septic tank would constitute failure.

9-35.2 Risers and Lids (Non-Traffic Bearing)

1. Risers shall be ribbed PVC as manufactured by ORENCO Systems, Inc. or approved equal. Risers shall be at least 12 inches high, with a minimum nominal diameter of 24 inches for 2000 gallon tanks and 21 inches for all other tanks. A factory supplied two part epoxy adhesive shall be used to bond the riser to the tank.
2. One lid shall be furnished with each riser. Lids shall be ORENCO SYSTEMS Model FL-21g or FL-24g or approved equal, as appropriate, fiberglass with green aggregate finish, and provided with neoprene gasket, stainless steel bolts, and wrench. The riser and lid combination shall be able to support a 2,500 lb. Wheel load. (Note: This is not to imply that PVC risers are intended for traffic areas. Please refer to section on traffic bearing tanks.)

3. Riser installation shall be accomplished according to the manufacturer's instructions.

9-35.3 Effluent Filter

Tanks shall be equipped with ORENCO SYSTEMS Model FT0854-36 Biotube Effluent Filter or approved equal. The Effluent Filter shall have 1/8th inch openings.