STANDARDS FOR INSTALLATION OF PRIVATE GRINDER PUMP SYSTEMS, PRESSURE SIDE SEWERS AND PRIVATE FORCE MAIN/DISCHARGE PIPELINES FROM GRINDER PUMPS

The information provided herein is intended to assist the contractor or homeowner in the installation of a private grinder pump system, a pressure side sewer and/or private force main/discharge pipeline from a private grinder pump system. Any work to be performed on side sewers, as defined below, shall be performed by a Lakehaven-authorized side sewer contractor, maintaining the required bonding and current insurance certificate. Work to be performed on private grinder pump systems and private force main/discharge pipelines from private grinder pump systems, as defined below, and located within the applicant's private property or within adjacent private property, may be performed by the property owner or property owner's contractor-of-choice, provided all materials and workmanship meet the requirements of these standards, and the property owner holds Lakehaven harmless from any damage that may be incurred as a result of the installation.

DEFINITIONS:

Gravity Building Sewer: A privately owned and maintained pipeline system located within private property that is designed to carry sewage or wastewater leading from a building drain/plumbing outlet of a structure to the gravity side sewer, or emptying into a private grinder pump wet well, if applicable. The gravity building sewer shall begin at the terminus of the "building drain" as defined by the applicable plumbing code and shall terminate at the property line/right-of-way margin or Lakehaven easement boundary, or at a private grinder pump wet well, if applicable. The "STANDARDS FOR INSTALLATION OF GRAVITY BUILDING SEWERS / SIDE SEWERS" provide requirements for gravity building sewers conveying the flow from the structure or group of structures and emptying into the wet well.

Private Grinder Pump System: A privately owned and maintained pumping system, including all mechanical and electrical components and appurtenances, which is designed to convey sewage or wastewater generated within a structure or group of structures to the public sanitary sewer system. A private grinder pump system is required where the property cannot be served by a gravity building/side sewer connection.

Private Force Main/Discharge Pipeline: A privately owned and maintained pipeline system that is designed to carry sewage or wastewater under pressure from a private grinder pump system to a gravity side sewer or pressure side sewer. The private force main/discharge pipeline shall begin at the outlet/discharge of a private grinder pump and shall typically terminate at the property line/right-of-way margin or Lakehaven easement boundary, and include a service box enclosing a check valve and two (2) isolation valves. If discharging to a public gravity sewer system, a private force main/discharge pipeline shall connect to the upstream terminus of a gravity side sewer, and shall not connect directly into a gravity sewer main without express written permission of Lakehaven.

Pressure Side Sewer: A privately owned and maintained pipeline system located within a public right-of-way or Lakehaven easement that is designed to carry sewage or wastewater under pressure leading from the terminus of a private force main/discharge pipeline from a private grinder pump system or other approved facilities, to the public pressure sanitary sewer system main.

Gravity Side Sewer: A privately owned and maintained pipeline system located within a public right-of-way or Lakehaven easement that is designed to carry sewage or wastewater leading from a gravity building sewer terminus, a private force main/discharge pipeline from a private grinder pump, or other approved facilities to the public gravity sanitary sewer system main. The "STANDARDS FOR INSTALLATION OF GRAVITY BUILDING SEWERS / SIDE SEWERS" provide requirements for gravity side sewers conveying the flow from the gravity building sewer terminus to the public gravity sanitary sewer system main.

INSTALLATION:

1. **Permitting.** A Sewer Service Connection Permit (SSCP, a.k.a. Side Sewer Permit) is required for installation and/or repair of all gravity building sewers, private grinder pump systems, private force

main/discharge pipelines from private grinder pump systems, pressure side sewers, and/or gravity side sewers. The permit application shall include a site plan prepared to scale, illustrating the proposed structure/facility to be served. Refer to the sample plan showing the minimum site plan requirements. Lakehaven will obtain from the right-of-way authority having jurisdiction any required right-of-way construction permit for a pressure side sewer located within public rights-of-way. The owner of the property served by a private grinder pump system must enter into a Private Pump Station Agreement with Lakehaven that will be recorded against said property.

2. **Utility Locates.** To properly identify and locate existing utilities, and in accordance with State law, the contractor shall request utility locates not less than two (2) business days or more than ten (10) business days before excavation, except for emergencies, by calling **811**.

3. **Structure Served.** The contractor shall verify that all plumbing fixtures and facilities within a structure, and all plumbing building drain outlets as defined in the applicable plumbing code, are connected to the private grinder pump system, by dye testing or other approved means, if necessary.

4. **Pipe/Fittings Material.** Pipe and fitting material shall be the following:

Private Force Main/Discharge Pipelines for Private Grinder Pump Systems:

- High Density Polyethylene (HDPE), ASTM D-3350, DR-11 wall thickness, Iron Pipe Size, flanged or thermal-welded joints (internal thermal-weld bead at all joints need not be mechanically removed).
- The material for reducers and other fittings shall match that used for the pipe.

Pressure Side Sewers:

- High Density Polyethylene (HDPE), ASTM D-3350, DR-11 wall thickness, Iron Pipe Size, flanged or thermal-welded joints (internal thermal-weld bead at all joints need not be mechanically removed).
- The material and wall thickness class used for a pressure side sewer shall match that used for the pressure sewer main to which connection is being made.
- The material for reducers and other fittings shall match that used for the pipe.

5. **Pipeline Size/Trench Width.** The inside diameter for private force main/discharge pipelines from private grinder pump systems shall be one and one quarter inches (1¼"), or greater as necessary to conform to the design of the specific grinder pump system used. The inside diameter for pressure side sewers shall be one and one quarter inches (1¼"), or greater as necessary to conform to the design of the specific grinder pump system used. The pipeline size shall be that necessary to provide a fluid velocity between two and eight feet per second (2 - 8 fps) at the grinder pump's discharge rate. The minimum width of the trench shall be the inside pipe diameter, plus six inches (6") on each side of the pipeline.

6. **Pipeline Alignment/Bends.** Pressure side sewers shall be laid at uniform slope and straight alignment from the pressure sewer main to their termini; changes in horizontal and/or vertical direction should be avoided and will only be allowed with prior written approval by Lakehaven. Private force main/discharge pipelines from private grinder pump systems shall be laid at uniform grade and alignment; changes in horizontal and/or vertical direction shall be made in "sweeps" of a radius no less than that recommended by the pipe manufacturer, or with proper pipe fittings. Single bend fittings shall not exceed 45°; a change in direction exceeding 45° may be made with multiple bends, provided a minimum of two feet (2') of pipe is placed between bends.

7. **Pipeline Cover.** The minimum cover over a pressure side sewer and/or private force main/discharge pipeline from a private grinder pump system within public right-of-way, as measured from the final finished grade to the exterior top of the pipe, shall be five feet (5'). The minimum cover within private property over a pressure side sewer and/or private force main/discharge pipeline from a private grinder pump system, as measured from the final finished grade to the exterior top of the pipe, shall be two feet (2') in non-traffic or traffic areas, except the cover over the pipeline within twenty feet (20') of the

grinder pump wet well shall be a minimum of one foot (1'). Any acceptable pipe material listed above may be used in non-traffic or traffic areas.

8. **Service Box.** A service box enclosing a private isolation valve, a private check valve and Lakehaven's isolation valve (oriented from upstream to downstream), and meeting the requirements of Lakehaven's Standard Plan, shall be installed within private property on the downstream end of the private force main/discharge pipeline directly adjacent to the property line/right-of-way margin or Lakehaven easement boundary.

9. **Monitoring Manholes.** A monitoring/sampling manhole (APWA Type 1, 48-inch diameter) is required for all new or modified multi-family residential and non-residential sewer service connections. The monitoring/sampling manhole shall be installed in the gravity building sewer component of the system upstream of the grinder pump wet well. The "STANDARDS FOR INSTALLATION OF GRAVITY BUILDING SEWERS/ SIDE SEWERS" provide other requirements for monitoring/sampling manholes.

10. **Pipeline Bedding Material**

Private Property:

- There is no specifically exclusive requirement for bedding private force main/discharge pipelines from private grinder pump systems on private property outside of Lakehaven easement, except that the material should be 'clean' with no large rocks or sharp objects. Lakehaven recommends sand; 'clean' native soil material or crushed rock may also be used.

Public Right-of-Way or Lakehaven Easement:

- Crushed surfacing top course (a.k.a. 5/8-inch minus crushed rock) shall be placed and compacted four inches (4") below the bottom surface of pressure side sewer pipelines, and six inches (6") above the top surface of pressure side sewer pipelines. No other bedding material is acceptable in public right-of-way or Lakehaven easement.

11. **Trench Backfill Material.** Native material may be used for trench backfill for private force main/discharge pipelines on private property, and for pressure side sewers within Lakehaven easements, provided it is free of organic material and contains no rocks larger than four inches (4") in diameter and can be adequately compacted by mechanical means. Material for, placement of, and compaction of trench backfill for pressure side sewers in public rights-of-way, and subsequent surface restoration, shall conform to the most current adopted standards of the right-of-way authority issuing the permit for the work.

12. **Tracer Wire and Tracer Tape.** It is recommended, but not required, that tracer wire or tracer tape be installed for private force main/discharge pipelines from private grinder pump systems for locating purposes. It is required that tracer wire be installed for pressure side sewers. Tracer wire shall be continuous THHN-insulated 12-guage solid-core copper wire wrapped around the pipe, with the ends looped and exposed at both ends of the pipeline. The tracer tape shall be the detectable type, minimum two inches (2") in width, and marked with the word **"SEWER"** (Lineguard Type II Detectable or approved equal). The tracer tape shall be placed in a continuous fashion approximately six inches (6") to twelve inches (12") above the top of the pipeline, extending along the full length of the pipeline.

13. **Sewer and Water Pipeline Crossings.** A minimum of eighteen inches (18") vertical separation shall be provided between public water mains/ public water service lines AND gravity building sewers, private grinder pump systems, private force main/discharge pipelines from private grinder pump systems, pressure side sewers, and/or gravity side sewers at points of crossing, with the water pipeline crossing over the sewer pipeline. If these separation criteria cannot be met, special designs must be developed to meet Washington State Department of Ecology guidelines and/or requirements. A minimum of twelve inches (12") vertical separation shall be provided between private water lines/building supply lines AND

gravity building sewers, private grinder pump systems, private force main/discharge pipelines from private grinder pump systems, pressure side sewers, and/or gravity side sewers at points of crossing, with the water pipeline crossing over the sewer pipeline. If these separation criteria cannot be met, special designs must be developed to meet the applicable guidelines and/or requirements of the plumbing code of the agency having jurisdiction.

14. **Parallel Sewer and Water Pipelines.** A minimum of ten feet (10') horizontal separation shall be provided between public water mains/ public water service lines AND paralleling gravity building sewers, private grinder pump systems, private force main/discharge pipelines from private grinder pump systems, pressure side sewers, and/or gravity side sewers. If these separation criteria cannot be met, special designs must be developed to meet Washington State Department of Ecology guidelines and/or requirements. A minimum of twelve inches (12") horizontal separation shall be provided between private water lines/building supply lines AND paralleling gravity building sewers, private force main/discharge pipelines from private grinder pump systems, pressure side sewers, and/or gravity side sewers. The private water lines/building supply lines AND paralleling gravity building sewers, private force main/discharge pipelines from private grinder pump systems, pressure side sewers, and/or gravity side sewers shall be laid in separate trenches. If these separation criteria cannot be met, special designs must be developed to meet the applicable guidelines and/or requirements of the plumbing code of the agency having jurisdiction.

15. **Crossing Under Existing A.C. Water Mains.** At the discretion of Lakehaven's inspector and where a pressure side sewer or private force main/discharge pipeline from a private grinder pump system is constructed under an existing asbestos-cement (A.C.) water main, the contractor, at his/her own expense, shall replace that portion of the A.C. water main with new ductile iron pipe and transition couplings meeting current Lakehaven standards, a minimum of two feet (2') into both trench walls. Portland concrete or Controlled Density Fill (CDF) cradles will not be allowed to support the existing A.C. water main.

16. **Sewer Tap.** If a pressure side sewer stub or tee is not provided, the active pressure sewer main shall be saddled and tapped and a pressure side sewer stub installed. The saddling, tapping, and pressure side sewer stub installation work within a public right-of-way or Lakehaven easement shall be performed by Lakehaven staff, unless Lakehaven expressly allows in writing another party to perform this work. Taps for pressure side sewer stubs onto active pressure sewer mains shall be made by use of Electrofusion High Volume Tapping Tees, HDPE material with a PPI rating of PE3408, base to fit IPS pressure sewer main, and 1¼" or 2" butt fusion outlet, as manufactured by Central Plastics Company of Shawnee, Oklahoma, or an approved equal; said fittings shall be installed in strict compliance with the manufacturer's requirements and recommendations. The connection effected by this method shall have perfectly round holes, with no sharp or jagged edges. The tap shall be oriented at the top of the cross-section of the pressure sewer main. The connection made shall be water-tight. No "size-on-size" Electrofusion High Volume Tapping Tees will be allowed; "size-on-size" connections shall be produced by cutting-in and thermally-welding an HDPE tee fitting into the pressure sewer main.

17. **Stormwater Restrictions. NO** roof downspouts, building footing drains/ sump pump discharge pipes, groundwater/ spring drains, drains from uncovered outdoor impervious surfaces, etc., shall be connected to the private grinder pump system. In accordance with Lakehaven's approved Sewer Use Rules, storm water, surface water, ground water, artesian well water, roof runoff, subsurface drainage, swimming pool drainage, condensate, deionized water, non-contact cooling water, and unpolluted wastewater shall be prohibited from entering the private grinder pump system, unless specifically allowed otherwise by Lakehaven's General Manager.

18. **Joint Use Side Sewer and Grinder Pump Systems.** No private force main/discharge pipeline from a private grinder pump system may be connected to another private force main/discharge pipeline from

another private grinder pump system for an adjacent property, or to a pressure side sewer serving an adjacent property, without prior written approval by Lakehaven and execution of a Joint Use Agreement and private easement(s). If joint use is allowed, no more than two (2) single family residences may jointly use a single private force main/discharge pipeline or pressure side sewer pipeline. The pipeline downstream of the point of connection of separate private force mains/discharge pipelines from separate private grinder pump systems, shall be a minimum one and one half inches (1½") in size. Separate private service boxes shall be installed on each private force main/discharge pipeline as required elsewhere in these standards.

No single grinder pump system shall provide service to premises and structures with plumbing systems that are under separate ownership. At the option of the owner, a single grinder pump system may serve more than one structure with plumbing systems that are situated on a single undivided property under a single ownership. It is recommended that separate grinder pump systems be provided for separate structures with plumbing systems, if there is an opportunity for property subdivision and subsequent separate ownerships.

19. **Leakage Testing.** All pressure side sewers and private force main/discharge pipelines from the private grinder pump systems shall be hydrostatically pressure tested at one and one-half (1½) times the working design pressure of the system, or 100 psi, whichever is greater, under Lakehaven observation. Testing shall meet the requirements set forth in Section 6.3 "Testing of Pressure Pipelines" of the current version of Lakehaven's standard specifications for sanitary sewers.

20. **Private Grinder Pump System.** It is recommended that the property owner retain a design professional to prepare plans and specifications for a private grinder pump system, including, but not limited to, the gravity building sewer emptying into the wet well and the private force main/discharge pipeline discharging from the wet well, between the building plumbing/ mechanical improvements on the property served and a point on Lakehaven's public gravity or pressure sewer system designated by Lakehaven. Many issues should be considered in the design and construction of private grinder pump systems (including sewer flow management in case of a commercial power outage, commercial power for grinder pumps, surface improvement considerations, etc.); reference to Lakehaven's "On-Premises Private Grinder Pump Systems Discharging to Pressure Sewer Systems-Design and Construction Issues to Consider" is recommended. Plans and specifications for the private grinder pump system shall NOT be submitted to Lakehaven; Lakehaven will have no obligation to review or approve said plans or specifications. If discharging to a public pressure sewer system, the grinder pump system shall be installed in conformance with that which was specified by the designer of the community's public pressure sewer system, and the manufacturer and model number of the required grinder pump system shall be noted on the Sewer Service Connection Permit (a.k.a. Side Sewer Permit).

The property owner may request the installation of a different grinder pump system; to do so, he/she shall submit for Lakehaven approval, at his/her expense, a report prepared and sealed by a professional engineer licensed in the State of Washington analyzing the impact of the proposed differing grinder pump system on the community's public pressure sewer system, and certifying that the community's public pressure sewer system will continue to operate efficiently and effectively to Lakehaven's satisfaction by use of the differing grinder pump system that has been deemed compatible.

The private grinder pump system, including all mechanical and electrical components and appurtenances, shall be installed in accordance with the manufacturer's recommendations. No visible leakage will be permitted in the grinder pump wet well. The owner-selected method to manage sewer flows in the event of a commercial power outage that renders the pump station inoperable, either provision of a 24-hour holding capacity, or a standby engine-driven emergency generator, shall be designated in the Private Pump Station Agreement.

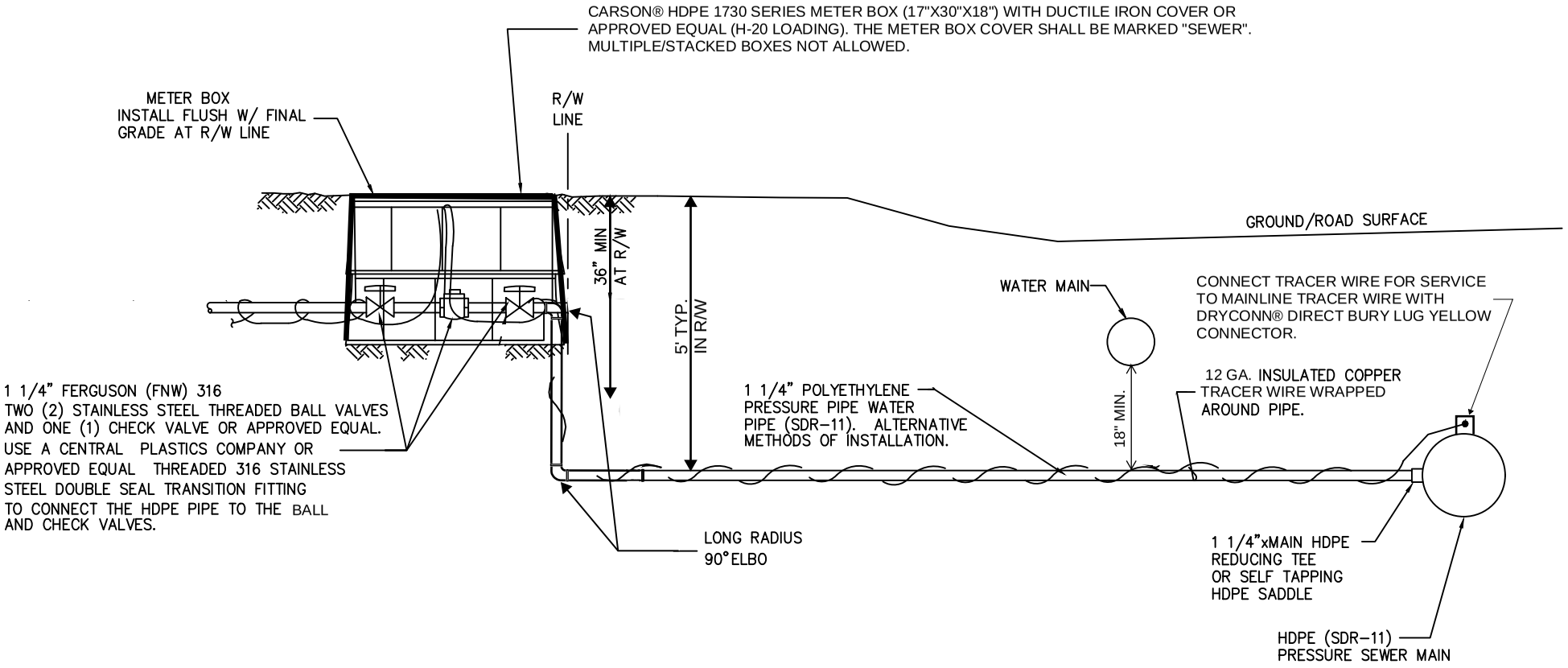
STANDARDS FOR INSTALLATION OF PRIVATE GRINDER PUMP SYSTEMS, PRESSURE SIDE SEWERS AND PRIVATE FORCE MAIN/DISCHARGE PIPELINES FROM GRINDER PUMPS

21. **Inspection of Installation and Leakage Testing.** A minimum of twenty-four (24) hours advance notice is required for site inspections of gravity building sewers, private grinder pump systems, and private force mains/discharge pipelines on private property. A minimum of twenty-four (24) hours advance notice is required for site inspections of pressure side sewers within public rights-of-way. The contractor shall email **Inspections@Lakehaven.org** to request/schedule site inspection of the installed gravity building sewers, private grinder pump systems, private force mains/discharge pipelines and pressure side sewers. The trenches for the gravity building sewers, grinder pump systems, private force mains/discharge pipelines, and pressure side sewers shall be de-watered prior to the inspection. Approval of the installation and leakage testing results by Lakehaven's inspector is required prior to backfilling the trenches and compacting the backfill material.

22. **Standard Plans.** Refer to the Standard Plan entitled "Building Sewer/Side Sewer Installation Details." If you have any questions, contact Lakehaven's Development Engineering Inspections staff for clarification at **Inspections@Lakehaven.org**.

23. **Existing On-Site Sewage Disposal System Abandonment.** If applicable, existing on-site sewage disposal systems, septic tanks, holding tanks, or cesspools shall be abandoned and decommissioned in accordance with the approved standards and regulations of the King County Health Department, Environmental Health Services Division.

Lakehaven Water & Sewer District
31627A – 1st Avenue South
P. O. Box 4249
Federal Way, WA 98063-4249
Development Engineering Email: DE@Lakehaven.org
Email for Inspection Staff:
Inspections@Lakehaven.org (available inspection time slots: 8AM-10AM, 10AM-Noon, Noon-2PM)



SPECIAL NOTES:

1. ALL TRENCHING WITHIN PAVEMENT AREAS SHALL BE RESTORED WITH PAVEMENT AND BASE ROCK MATCHING EXISTING SECTION. ONCE CONSTRUCTION IS COMPLETE, THE STREET SHALL BE RESTORED IN ACCORDANCE WITH THE LOCAL JURISDICTION REQUIREMENTS.
2. SEWER LINES SHALL ALWAYS CROSS UNDER WATER LINES. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 10 FEET HORIZONTAL AND 18 INCHES VERTICAL SEPARATION BETWEEN WATER AND SEWER FACILITIES. IF MINIMUM VERTICAL SEPARATION CANNOT BE OBTAINED, THE SEWER PIPE SHALL BE CASED 1/4" THICK CONTINUOUS STEEL, DUCTILE IRON OR PRESSURE RATED PVC PIPE WITH A SDR RATIO OF 18 OR LESS, WITH ALL VOIDS PRESSURE-GROUTED WITH SAND-CEMENT GROUT OR BENTONITE, FOR A DISTANCE OF AT LEAST 10 FEET ON EACH SIDE OF THE CROSSING.
3. SEWER FORCE MAIN PIPE MATERIAL SHALL BE HIGH-DENSITY POLYETHYLENE RATED FOR THE CORRECT WORKING SYSTEM PRESSURE, AND MIN. SDR RATING OF 11 FOR 1 1/4", 2", 3", AND 4" PIPE.
4. FOR A SURFACE CUT INSTALLATION, THE TONING WIRE (TRACER WIRE) CAN BE LAID ON TOP OF THE PRESSURE SEWER FORCE MAIN IN LIEU OF WRAPPING.

TYPICAL PRESSURE SEWER SERVICE
CONNNECTION DETAIL

NOT TO SCALE

STANDARD PLAN PSS-02 -REV

LAKEHAVEN WATER & SEWER DISTRICT
KING COUNTY WASHINGTON

TYPICAL PRESSURE SEWER
SERVICE CONNECTION DETAIL

DATE: 10/17/22
DRAWN: BIA
CHECK:
APPR: BIA

SCALE: NTS
SHEET 1
OF 1