

SECTION 500

LOW-PRESSURE SEWER SYSTEM DESIGN STANDARDS

TABLE OF CONTENTS

| | | |
|---------|-----------------------------------|----|
| 5.01.00 | GENERAL STATEMENT | 2 |
| 5.01.02 | List of Abbreviations | 2 |
| 5.01.03 | Definitions | 3 |
| 5.01.04 | Responsibilities | 4 |
| 5.02.00 | DESIGN CRITERIA | 4 |
| 5.02.01 | Quantity of Wastewater | 4 |
| 5.02.02 | Pump Station..... | 4 |
| 5.02.03 | Pumps and Motor | 7 |
| 5.02.04 | Controls and Instrumentation..... | 8 |
| 5.02.05 | Electrical | 9 |
| 5.02.06 | Low-Pressure Sewer Lateral..... | 9 |
| 5.02.07 | Low-Pressure Sewer Main | 10 |
| 5.02.08 | Pipe Materials | 11 |
| 5.02.09 | Valves | 12 |
| 5.02.10 | Easements | 13 |
| 5.02.11 | Testing and Acceptance | 13 |
| 5.03.00 | Design Example..... | 13 |
| 5.03.01 | Flow determination:..... | 13 |
| 5.03.02 | Pump Sizing | 14 |
| 5.03.03 | Pump Basin Sizing | 14 |
| 5.04.00 | Standard Details | 15 |

| | | | | | |
|---------|--------|--------------|-----|---|-------|
| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 1 |

5.01.00 GENERAL STATEMENT

This section of the Engineering Design Standards outlines the design requirements for public and private Low Pressure Sewer (LPS) systems. The LPS system is to be considered an alternative for providing sewer service for a site, particularly if the site cannot be serviced by conventional gravity sewer systems or conventional lift stations. The use of LPS systems shall be subject to review on a case-by-case basis by the Washoe County Community Services Department (CSD).

The CSD reserves the right to modify or waive any design standard for a particular application. Any deviations from these design standards will require justification and the approval of the CSD prior to construction.

When a development project requires an LPS system, a pre-design meeting shall be held with the design engineer and the CSD to determine the design parameters, including tributary area and design period.

5.01.02 List of Abbreviations

| | |
|-------|---|
| CC&Rs | Covenants, Codes and Restrictions |
| CFR | Code of Federal Regulations |
| DIPRA | Ductile Iron Pipe Research Assn. |
| gpm | Gallons per Minute |
| LPS | Low Pressure Sewer |
| MGD | Million Gallons per Day |
| NEC | National Electric Code |
| NPT | National Pipe Thread |
| OSHA | Occupational Safety and Health Administration |
| psig | Pounds per Square Inch Gauge |
| PVC | Polyvinyl Chloride |
| RPM | Revolutions per Minute |
| SMH | Sewer Manhole |
| TDH | Total Dynamic Head |

| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
|---------|--------|--------------|-----|---|-------|
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 2 |

5.01.03 Definitions

| | |
|------------------------|---|
| Domestic Wastewater: | Wastewater is produced from domestic households and originates from non-commercial or non-industrial activities |
| Dry Well: | Compartment where non-submerged pumping equipment, devices, and appurtenances are installed |
| Engineer: | A registered Nevada Professional Engineer actively furnishing the professional and technical skills required in planning, administration, and construction of the works |
| Gravity Sewer: | A conventional gravity-flow sewer where all wastewater flows in descending gradients from source to outlet, or where no pumping is required |
| Groundwater: | Subsurface water occupying the saturation zone of the ground |
| H-20 loading: | H-20 traffic loading as defined by AASHTO for utilities located in travel roadways or driveways |
| Industrial Wastewater: | Wastewater produced from industrial activities |
| Infiltration: | Groundwater that leaks into the wastewater collection system typically through pipe joints and structural defects |
| Inflow: | Surface water enters the wastewater collection system via cleanouts, manhole covers, etc. |
| Invert: | The lowest point in the internal cross-section of a pipe |
| LPS System: | A system of two or more LPS pump stations discharging to a common force main |
| LPS Pump Station : | Grinder pump unit (including pump basin, cover, discharge piping, valves, level controls, and miscellaneous wiring) within an LPS system |
| LPS System Main: | Common force main header pipe serving more than one LPS pump station |
| LPS System Lateral: | Discharge pipe connecting LPS system pump station and LPS system main or gravity sewer |
| Manhole: | An access shaft or chamber from the surface of the ground to a gravity sewer or pressure pipe |

| | | | | | |
|---------|--------|--------------|-----|---|-------|
| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 3 |

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|---------------------|---|
| Operational Volume: | Pump station basin volume between “pump on” and “pump off” levels |
| Tracer Wire: | Metallic tape used to assist with locating buried utilities |
| Transition Manhole: | Discharge manhole of LPS system main located between LPS system main and (private/public) gravity sewer |
| Wet Well: | Compartment used for the storage of wastewater for pumping purposes |

5.01.04 Responsibilities

The CSD shall be responsible for each public portion of the LPS system including all repairs and operations of the public force main, in-line valve boxes, air release valves (ARVs), and flushing assemblies.

Responsibility for the private portion of the LPS system shall be as follows:

1. All permits, inspections, and acceptances of each individual branch system shall be the sole responsibility of the developer or homeowner.
2. The individual homeowners shall be liable for the maintenance and operation of their own individual systems. Homeowners are also responsible for performing upgrades with in-kind parts or parts as outlined in the O&M Manual, which includes pump replacements or pump station replacements.
3. The homeowners' branch system is considered to be:
 - a. The lateral piping runs from the pump station to the public force main, including the check valve and isolation valve inside of the valve junction box.
 - b. The individual pump station and all related appurtenances.
 - c. Any branch gravity systems running from the private building to the pump station if present.

5.02.00 DESIGN CRITERIA

5.02.01 Quantity of Wastewater

Design average daily and design peak daily wastewater flows shall be determined using the procedures in Section 2.1.02.1 of the Washoe County Gravity Sewer Collection Design Standards

5.02.02 Pump Station

5.02.02.01 Pump Station Ownership
 The LPS system pump station will be privately owned by the homeowner or Homeowners Association (HOA).

5.02.02.02 Pump Station Location
 Each property connected to the LPS system shall contain a pump station that complies with the following suggested minimum horizontal clearances from the

| | | | | | |
|---------|--------|--------------|-----|---|-------|
| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 4 |

edge of the pump station excavation.

Property line: 5 feet

Exterior Wall line of any structure or building: 5 feet

Large trees (edge of tree spread): 5 feet

Septic tanks: 5 feet

Pond, lake, or other surface water body: 50 feet

The CSD shall be notified on the location of the LPS system pump stations. The engineer shall determine if the indicated minimum horizontal clearances are adequate and available for each installation. Based on site conditions, alternative horizontal clearances shall be provided as necessary. Deviations or variances shall be submitted and reviewed by the CSD.

Site conditions that mandate the installation of the LPS system pump station in a vehicular traffic area shall be designed for a traffic-rated top or cover to withstand H-20 loading. The design of a traffic-rated top or cover shall be submitted and reviewed by the CSD.

When metal covers for the LPS system pump stations are to be used, the engineer shall preferably locate the pump station basin away from direct sunlight to prevent the cover from reaching excessive temperatures, allowing easier cover removal.

5.02.02.03 Pump Station Basin

The pump basin shall be determined by the LPS system manufacturer. The LPS system pump station basin shall be designed to keep wastewater levels within the following limits:

High level alarm: Invert of incoming sewer

“Pump Off” level: Not lower than pump inlet

Vertical distance between “pump on” and “pump off” levels: 4 inches minimum

The LPS system pump station basin operational volume shall be sized such that each pump within the pump station will not start more than an average of 5 times per hour at the design average daily flow.

The LPS system pump station basin shall be made of corrosion-resistant material which is suitable for contact with sewage and direct burial below grade.

The LPS system pump station basin shall be watertight and consist of a dry well and wet well section in order to facilitate maintenance duties. All pump station maintenance tasks must be possible without OSHA confined space entry into the pump station.

The LPS system pump station basin wall and bottom shall be designed to withstand the pressure exerted by saturated soil loading at maximum burial

| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
|---------|--------|--------------|-----|---|-------|
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 5 |

depth. All pump station components must function normally when exposed to 150 percent of the maximum external soil and hydrostatic pressure.

The LPS system pump station basin cover shall be watertight and shall be provided with a factory-furnished lockable cover. If necessary, the cover shall be designed to withstand flood conditions. Except for vehicular traffic area installations, the cover shall be made of non-metallic material to ease cover removal by maintenance personnel.

In high groundwater areas, LPS system pump station basins shall be designed to be securely anchored to avoid floating. The design of anchoring shall be based on the submergence of the entire pump station basin. The engineer shall design anchoring based on site conditions and pump station basin properties. The method of anchoring shall be submitted to the CSD for review.

Anchors shall have a minimum thickness of 10” and shall extend a minimum of 8” beyond all sides of the pump LPS system pump station basin.

5.02.02.04 Appurtenances

A gravity-operated flapper-type check valve, flapper-type anti-siphon valve, and isolation valve shall be included within the LPS system pump station basin. Valves shall be made of PVC or stainless steel material.

Pump discharge piping within the pump station basin shall be 304 Series Stainless Steel.

The LPS system pump station shall be equipped with PVC inlet flanges to accept a 4-½ inch minimum outside diameter inlet pipe and a 1-¼ inch minimum outside diameter female PVC socket discharge pipe.

5.02.02.05 Site Improvements

Areas surrounding the basin shall be graded to provide positive drainage away from the pump.

5.02.02.06 Ventilation

A vent pipe for the LPS system pump station shall be installed to allow proper ventilation of air from the pump station basin wet well. The vent pipe shall pass through the side wall of the wet well.

The vent pipe shall conform to the requirements of the current Uniform Plumbing Code of the CSD.

Size and Location: The vent pipe shall have a minimum diameter of two (2) inches and be extended to affix to the nearest dwelling or structure unless otherwise reviewed by the CSD. The vent pipe shall be located a minimum of six (6) inches above the “high-level alarm” level of the LPS system pump station wet well.

| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
|---------|--------|--------------|-----|---|-------|
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 6 |

Minimum Cover: The vent pipe shall have a minimum cover of 12 inches.

Slope: The vent pipe shall be free from sags and shall be sloped continuously down to the pump station.

Vent Termination: The vent pipe shall terminate vertically no less than six (6) inches above the roof of the nearest dwelling or structure unless otherwise directed by the CSD.

The vent pipe shall have a mushroom top or be configured so rainwater and/or foreign objects cannot enter the vent pipe. The vent pipe opening must have a No. 20 mesh wire screen, or similar barrier, to prevent birds, insects, and other foreign objects from entering.

5.02.03 Pumps and Motor

5.02.03.01 Types of Pumps

The LPS system shall be of the semi-positive displacement type grinder pump from a list of suppliers below. The grinder pump will be directly driven by an electric motor. Grinder pumps shall contain grinders suitable for grinding and pumping domestic wastewater. Grinder pumps shall be capable of reducing components in domestic wastewater, including a reasonable amount of “foreign objects,” such as paper, wood, plastic, glass, and rags, to finely divided particles that will pass freely through the passages of the pump and the discharge piping. Grinder pumps shall be suitable for parallel operation in a system containing multiple pumps connected to a common discharge line. The grinder pump shall contain type 400 Series Stainless Steel cutter bars.

Acceptable low-pressure sewer manufacturers include the following:

1. Signa Mechanical
2. Environmental One Corporation
3. Other manufacturers listed on <https://washoecounty.gov/csd/>

5.02.03.02 Pump and Motor Performance

Each LPS system pump station shall contain a minimum of one pump capable of discharging the design peak daily flows. Standard LPS system pump station installations for residential dwellings will require 1 pump. A redundant pump is required for institutional and commercial installations.

For pump stations with multiple pumps, each pump shall be capable of discharging the design peak daily flows. All pumps within the pump station shall be equal in capacity.

Each LPS system pump shall be capable of delivering a minimum of 14 gallons per minute (gpm) against a total dynamic head (TDH) of 0 feet (0 pounds per square inch (psig)) and a minimum of 7 gpm against a TDH of 185 feet (80 psig) at a maximum current draw of 8 amps. The pump shall be 240 volts and have 3 phases. The pump shall not produce a pressure that exceeds the maximum pressure allowed by the LPS system piping manufacturer. The pump must also

| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
|---------|--------|--------------|-----|---|-------|
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 7 |

be capable of operating at a negative total dynamic head without overloading the motor.

In calculating the required pump TDH, head losses in LPS system lateral and main piping shall be calculated using a Hazen-Williams “C” value of 150. In computing static head, the pump elevation shall be based on the proposed “pump off” elevation at which the pump will be installed.

LPS system pump motors shall be a minimum of 1 horsepower and the motor speed shall not exceed 1,750 RPM. The motor shall be 240 volts and of the air-cooled induction type.

Maximum pumping head for system design shall not exceed ninety percent (90%) of the pump manufacturer’s maximum allowable TDH.

LPS system pump motors shall contain an integral thermal overload protector to protect against running overloads or locked rotor conditions.

5.02.03.03 Pump Serviceability

Each pump in the LPS system pump station shall be equipped with a NEMA 6P electrical quick disconnect using a single turn-locking ring that is compatible with OSHA regulations. The electrical quick disconnect shall be located in the dry well and shall require no tools for connecting.

Each LPS system pump shall have a lifting hook complete with a corrosion resistant lift-out harness connected to its top housing to facilitate pump removal when necessary. Pump maintenance tasks must be possible without entry into the pump station.

5.02.04 Controls and Instrumentation

5.02.04.01 Control Panel

All major components of the control panel shall be provided by one manufacturer.

Control panel wiring shall exit from the bottom of the control panel.

Each control panel shall be installed with a corrosion-proof NEMA 4X enclosure. The control panel shall include a hinged and lockable cover.

Each control panel shall contain one 12 amp or 240 volts, double pole circuit breaker for the power circuit and one 12 amp single pole circuit breaker for the alarm circuit. Each control panel shall contain terminal blocks, an integral power bus, push to run feature, and a complete alarm circuit.

Each control panel may be equipped with an optional generator receptacle and transfer switch.

The control panel shall be located in plain view of the LPS system pump station

| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
|---------|--------|--------------|-----|---|-------|
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 8 |

and should be installed on the nearest house or structure.

5.02.04.02 Liquid Levels and Alarms

Pressure level switches shall be used for LPS system pump station level control.

Each LPS system pump station shall be designed with a high level alarm (external visual and audible) including a silence button. The visual alarm lamp shall be inside a red-fluted lens and should be visible to the property owner. Visual alarm shall be mounted on the top of the control panel in such a manner as to maintain NEMA 4X rating.

5.02.05 Electrical

5.02.05.01 Electrical System

Electrical system shall conform to the National Electric Code, the Building Code of the CSD, and the Flood Hazard Ordinance of the CSD.

The circuit breaker/disconnect box shall be located on the dwelling as close to and on the same side as the LPS system pump station.

5.02.05.02 Emergency Provisions

Emergency generators or other backup power devices are not required at LPS system pump stations but provisions shall be provided so that an optional emergency generator can be connected by the homeowner to temporarily supply power during power outages. Each pump station shall be equipped with a generator receptacle and transfer switch.

5.02.06 Low-Pressure Sewer Lateral

5.02.06.01 Ownership

The property owner is responsible for the entire portion of the lateral up to the connection to the LPS system main.

5.02.06.02 Location

The sewer system lateral shall be located within the parcel to which it serves unless there is a variance. Each dwelling unit (including each portion of a duplex) shall have one LPS system lateral. No more than one dwelling unit shall connect to any pump or lateral.

5.02.06.03 Design

Each LPS system pump station shall discharge to only one LPS system lateral. Each dwelling unit shall have one LPS system lateral. Townhomes shall require a separate unit for each living space. Multi-family and apartments shall require a conventional lift station. The LPS System lateral shall be designed to meet the following limits and installed per detail W-502 and W-503:

| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
|---------|--------|--------------|-----|---|-------|
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 9 |

Lateral Diameter: minimum of one and one-fourth inch (1-1/4 inches) in diameter

Minimum Velocity: 2 feet per second

Maximum Velocity: 6 feet per second

Cover: Lateral and private sewer installation must have a minimum of 4 feet of cover at the curb and/or property line or as reviewed by CSD.

5.02.06.04 Pipe Materials

The material selected shall be adapted to local conditions with special considerations given to the quality of wastewater, possible septic conditions, soil characteristics, internal pressure, abrasion, external loadings, foundations, the necessity of reducing the number of joints, and other similar problems. Corrosion protection measures shall be taken, where necessary. The following materials are acceptable for LPS system laterals subject to the conditions indicated:

HDPE Pipe: HDPE pipe shall be the heat-fused joint type and the maximum SDR shall be 11

PVC Pipe: PVC pipe shall be Schedule 80 and shall be joined together using solvent-welded joints

5.02.06.05 Appurtenances

Tracer wire shall be installed on the LPS system main and lateral to ease future identification of the underground pipes.

No elbows greater than 45 degrees for vertical or horizontal bend, and no serpentine sections shall be used

Each LPS system lateral shall be designed with an isolation valve and check valve immediately within the owner's property line before it enters the LPS system main or gravity sewer manhole in accordance with detail W-502. The valves shall be enclosed in an access manhole. However, depending on site conditions, a valve box may be allowable.

5.02.06.06 Discharge

LPS system laterals shall connect to either an LPS system main or a gravity sewer manhole.

Each LPS system lateral shall not connect to the LPS system main or gravity sewer manhole at more than one location.

5.02.07 Low-Pressure Sewer Main

5.02.07.01 Location

CSD-owned and private LPS system mains shall be located in the street or within the road right of way whenever possible.

| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
|---------|--------|--------------|-----|---|--------|
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 10 |

5.02.07.02 Design

All LPS system mains shall be able to carry the peak wastewater flow and transport solids in such a manner that deposits in the LPS system and odor nuisances are kept to a minimum. The LPS System main shall be designed to meet the following limits:

Main Diameter: LPS main diameter shall be a minimum of one and one-fourth inch (1-¼ inches) and a maximum of four inches (4 inches).

Minimum Velocity: 2.5 feet per second

Maximum Velocity: 10 feet per second

Cover: Lateral and private sewer installation must have a minimum of 4 feet of cover at the curb and/or property line or as reviewed by CSD.

In calculating pipe friction losses in LPS system main piping, a Hazen- Williams “C” value of 150 shall be used. Accepted design practices provided by the manufacturer shall be followed.

In an LPS system, it is highly unlikely that all connected pump stations will be operating simultaneously. If pipes are sized assuming all pump stations are running simultaneously, pipes will be oversized, and minimum velocities will be difficult to maintain. To keep pipe velocities in desirable ranges, only a portion of pump stations shall be assumed to be operating simultaneously.

Pipes shall be laid in a straight alignment and with constant grades where possible. Ideally, high points and low points are to be avoided and a continuously rising LPS system profile toward the point of discharge shall be designed. LPS system mains may be curved by deflecting the joints to eliminate the necessity for fittings. In no case shall the deflection exceed the maximum as set forth by the manufacturer for the type of pipe used. Fittings shall be used when alignment or grade changes cannot be accomplished by joint deflection.

5.02.08 **Pipe Materials**

The material selected shall be adapted to local conditions with special considerations given to the quality of wastewater, possible septic conditions, soil characteristics, internal pressure, abrasion, external loadings, foundations, the necessity of reducing the number of joints, and other similar problems. Corrosion protection measures shall be taken, where necessary. The following materials are acceptable for LPS system mains subject to the conditions indicated:

HDPE Pipe: HDPE pipe shall be the heat-fused joint type and the maximum SDR shall be 11

PVC Pipe: PVC pipe shall be Schedule 80 and shall be joined together using solvent-welded joints

| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
|---------|--------|--------------|-----|---|--------|
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 11 |

5.02.08.01

Appurtenances

Air valves shall be placed at significant high points where air accumulation may be significant along the LPS system main.

Thrust blocks shall be provided at bends and fittings, as determined by the engineer. The design of thrust blocks shall conform to W-320A and W-320B.

LPS system mains shall have in-line flushing stations for line flushing at intervals of at most one thousand feet (1,000 feet) for straight runs of pipe, prior to bends no greater than 45 degrees, before a main joins another main, and at the upstream terminal end of any main. Flushing stations shall include an isolation valve and capped wye-branch fitting pointed downstream for access during maintenance procedures.

Tracer wire shall be installed on the LPS system main to ease future identification of the underground pipes.

No elbows greater than 45 degrees for vertical or horizontal bend, no serpentine sections

5.02.08.02

Discharge

LPS system mains shall be designed to discharge into another LPS system main or into a gravity sewer manhole. The invert of the LPS system discharge shall match the invert of the outgoing gravity sewer manhole. Electrofusion or butt-fused welds must be used to connect to system main. Saddle taps are not authorized.

If the LPS system has 3 or more pump stations, the discharge of the LPS system main into a gravity sewer system shall be designed with a transition manhole to minimize turbulence. A transition manhole shall also be required if the total length of the LPS system main exceeds 1,000 feet.

The interior of the transition manhole shall be epoxy-coated to provide protection from corrosion. The interior of the gravity sewer pipeline shall be coated or lined to the first downstream manhole for corrosion protection if the pipe material is not corrosion resistant. If a transition manhole is required, the interior of the first downstream manhole (from the transition manhole) shall also be epoxy-coated to provide protection from corrosion. The type of epoxy coating shall be determined by the engineer and shall be reviewed by the CSD.

5.02.09 Valves

5.02.09.01

Plug Valves/Ball Valves

Designs will provide for plug type valves or ball valves to be installed on all LPS system mains.

All main line valves must be installed in the vertical position per detail W-303

| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
|---------|--------|--------------|-----|---|--------|
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 12 |

5.02.09.02 Valve Boxes
Adjustable valve boxes must be included on design drawings for all buried valves per detail W-303.

5.02.09.03 Air release and/or Combination Air Release Valves
Air release and/or combination air release valves will be required on pipelines' high points and changes in grade. Air valves must be sized and detailed by the design engineer and installed per CSD details W-504. Air release valves shall be placed at 2,000-foot intervals and when grade changes 25 vertical feet.

5.02.09.04 Flush Valve
Assemblies are required on all permanent dead-end pipe runs and may be required at stub-out locations. Flush valves must be sized to provide a minimum velocity of 2.5 fps in the main. Flush valve assemblies for these locations must be located within CSD right of way whenever possible and installed in accordance with CSD's Construction Standards and details W-505.

5.02.09.05 Check Valves
Check Valves are to be placed on the customer side of the private shut-off valve, or as required by CSD. Check valves must be enclosed within a vault per CSD standards and detail W-501 unless prior approval for a direct bury valve is obtained. Check valves must be installed with isolation valves and a separate valved bypass line to facilitate maintenance or emergencies if required by CSD. A flushing device must be installed on the checked side of the valve if required by CSD. Materials, trim, seats, coating, lining, and options must be in accordance with site-specific requirements as determined by CSD.

5.02.10 Easements

The LPS main shall be located within the rights-of-way dedicated for public streets unless the use of dedicated easements is specifically allowed by the CSD

5.02.11 Testing and Acceptance

LPS System force main shall be hydrostatic tested in accordance ASTM F2164: PPI (Plastic Pipe Institute) Technical note 46 Section 7.0. Testing shall be in the presence of Washoe County staff and performed utilizing calibrated gauges and equipment within a 12-month period. The LPS system force main shall be completely flushed prior to acceptance by the CSD. The complete flushing shall take place after all structures that tie into force main have been constructed. Operation and maintenance manuals for the system shall be created by the system designer and submitted to the owner and CSD. Manuals must indicate the routine maintenance and flushing schedule of the pipeline. Applications for LPS systems shall include an O&M manual for the proposed system.

5.03.00 Design Example

5.03.01 Flow determination:

Flow Determination – The average flow from residential units shall be based on

| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
|---------|--------|--------------|-----|---|--------|
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 13 |

an average daily residential rate of 270 gallons. Fixture units may be used to determine the flow from commercial and industrial areas or by historical water consumption records. If fixture unit counts are not available, average daily flows for commercial properties shall be:

- 1.) Parks and Open Space: 664 gallons/day/acre
- 2.) Commercial:
 - General Commercial (GC): 780 gallons/day/acre (9.9 employees/acre)
 - Neighborhood Commercial (NC): 2,536 gallons/day/acre (32.2 employees/acre)
 - Tourist Commercial (TC): 3,245 gallons/day/acre (41.2 employees/acre)
- 3.) Industrial: 457 gallons/day/acre

5.03.02 Pump Sizing

Per Section 5.02.01, the pump must be able to pump the design peak daily flow.

5.03.03 Pump Basin Sizing

Per Section 5.02.02.03, the pump station operational volume shall be sized such that each pump will not start more than an average 5 times per hour at the design average daily flow.

The design average daily flow of 270 gpd translates to an average of approximately 11.25 gallons per hour. At an average of 5 pump starts per hour, the minimum operational volume of the pump basin (volume between “pump on” and “pump off”) is 2.5 gallons.

Using a single pump configuration inside a 2-foot inside diameter basin with 4 inches between “pump on” and “pump off” the operational volume is

$$\text{Operational Volume} = \pi/4 * (2')^2 * (4/12)' * (7.48 \text{ gal./ft}^3) = 7.8 \text{ gallons}$$

Verify the average number of pump starts per hour:
 (11.25 gallons per hour)/(7.8 gallons per cycle) = 1.4 starts per hour

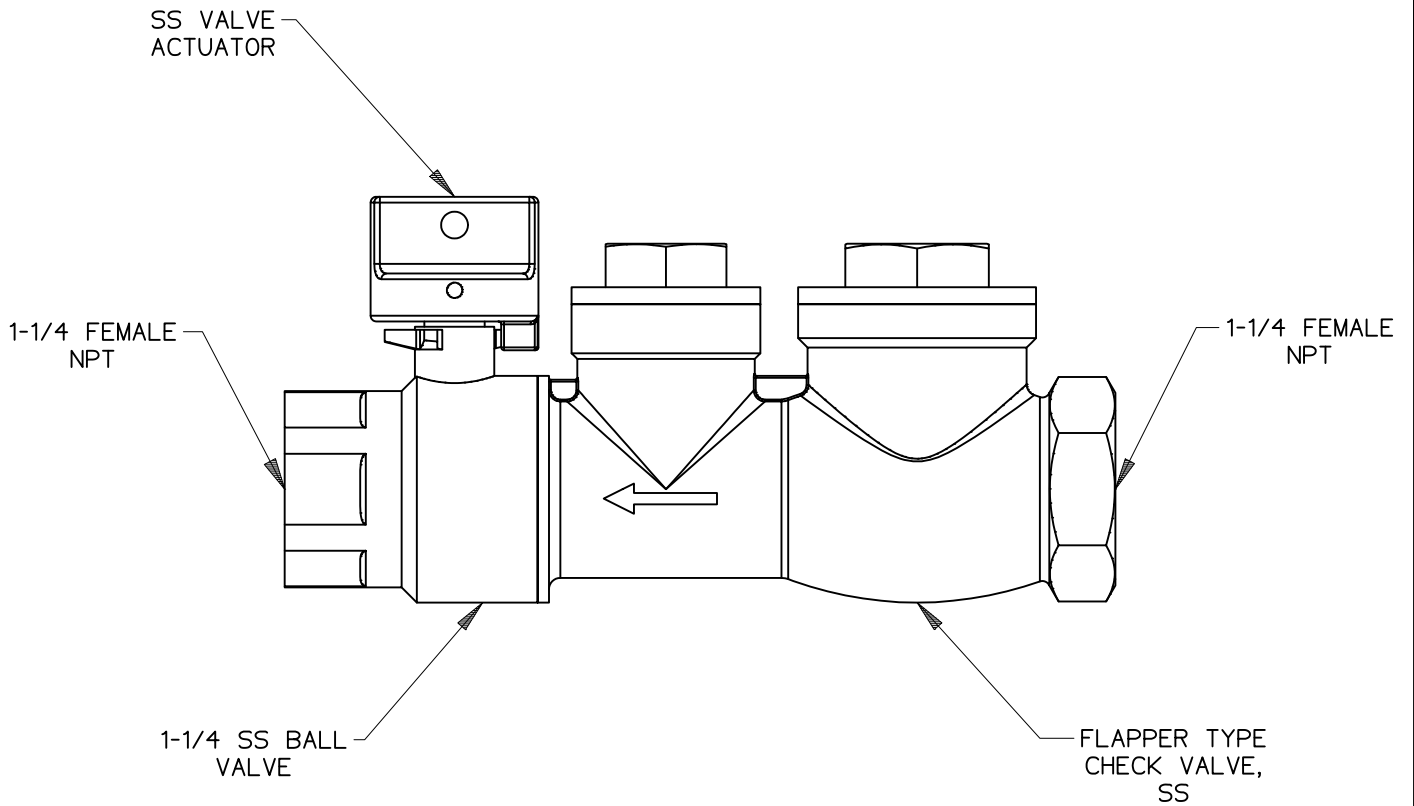
Since the average number of starts per hour at the design average flow is 1.4, which is less than 5, the pump basin size is satisfactory.

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|---------|--------|--------------|-----|---|--------|
| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 14 |

5.04.00 Standard Details

- Check Valve Assembly: W-501
- Low Pressure Sewer System Lateral Kit: W-502
- Low Pressure Sewer System Typical Lateral Installation: W-503
- Combination Air Release Valve: W-504
- Low Pressure Sewer System Terminal Flushing Assembly: W-505A
- Low Pressure Sewer System In-Line Flushing Assembly: W-505B
- Low Pressure Sewer System Offset Flushing Assembly: W-505C
- Low Pressure Sewer System Main Branch Detail: W-506
- Low Pressure Sewer System Transition Manhole: W-507
- Low Pressure Sewer System Pump Station Installation: W-508
- Low Pressure Sewer System Typical Service Crossing: W-509

| DRAWING | DESIGN | DATE | REV | WASHOE COUNTY COMMUNITY SERVICES DEPARTMENT | |
|---------|--------|--------------|-----|---|--------|
| | | Sep. 2024 | 1 | ENGINEERING DESIGN STANDARDS SECTION 5 – LOW PRESSURE SEWER SYSTEM DESIGN STANDARDS | 5 - 15 |



PART IS A BALL VALVE CURB STOP WITH FEMALE PIPE THREADS,
 VALVE POSITION STOPS (OPEN/CLOSED), AND INTEGRAL CHECK
 VALVE MATERIAL: STAINLESS STEEL 316 SS

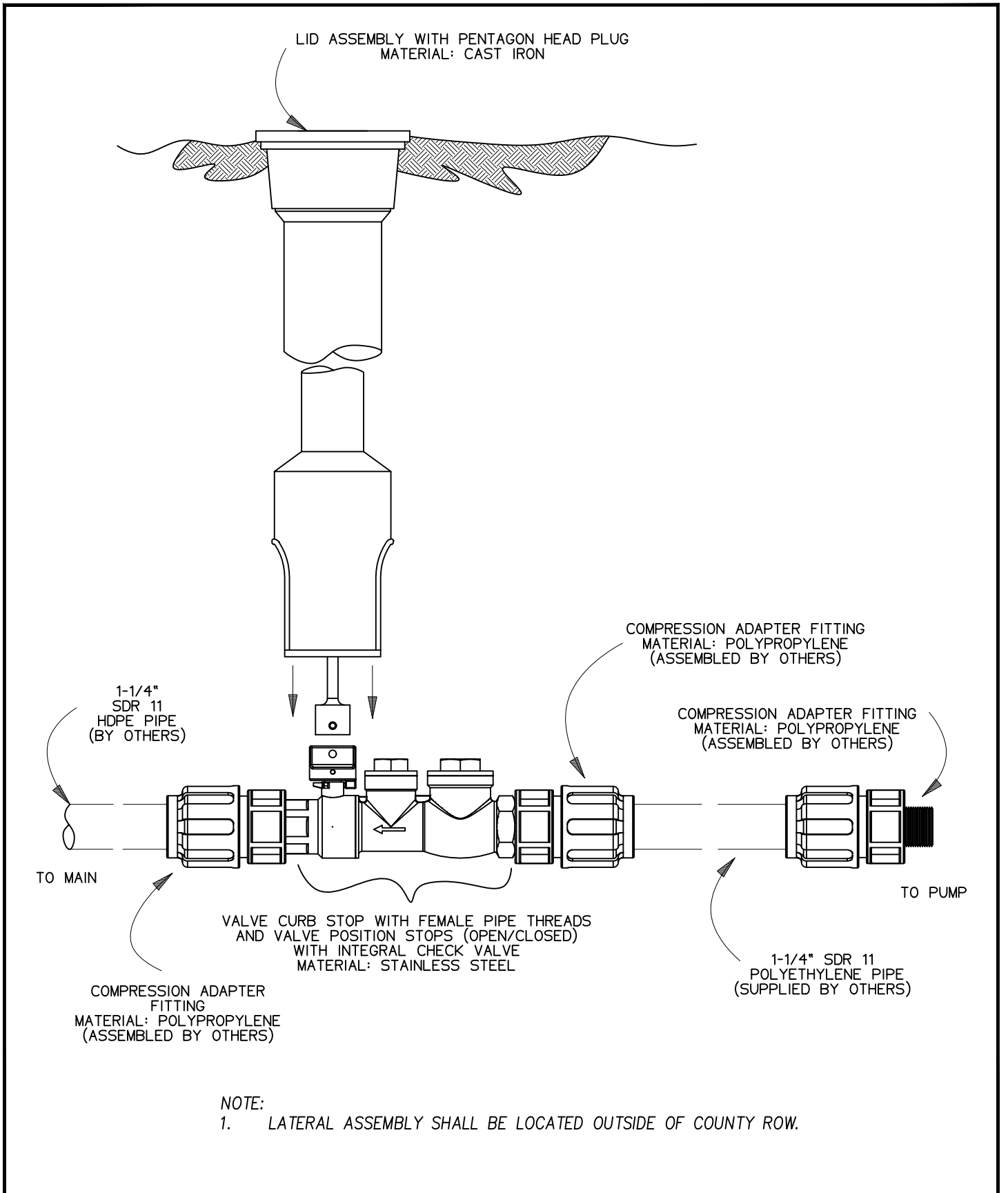
PRESSURE RATING: 235 PSI


| DATE | REVISIONS |
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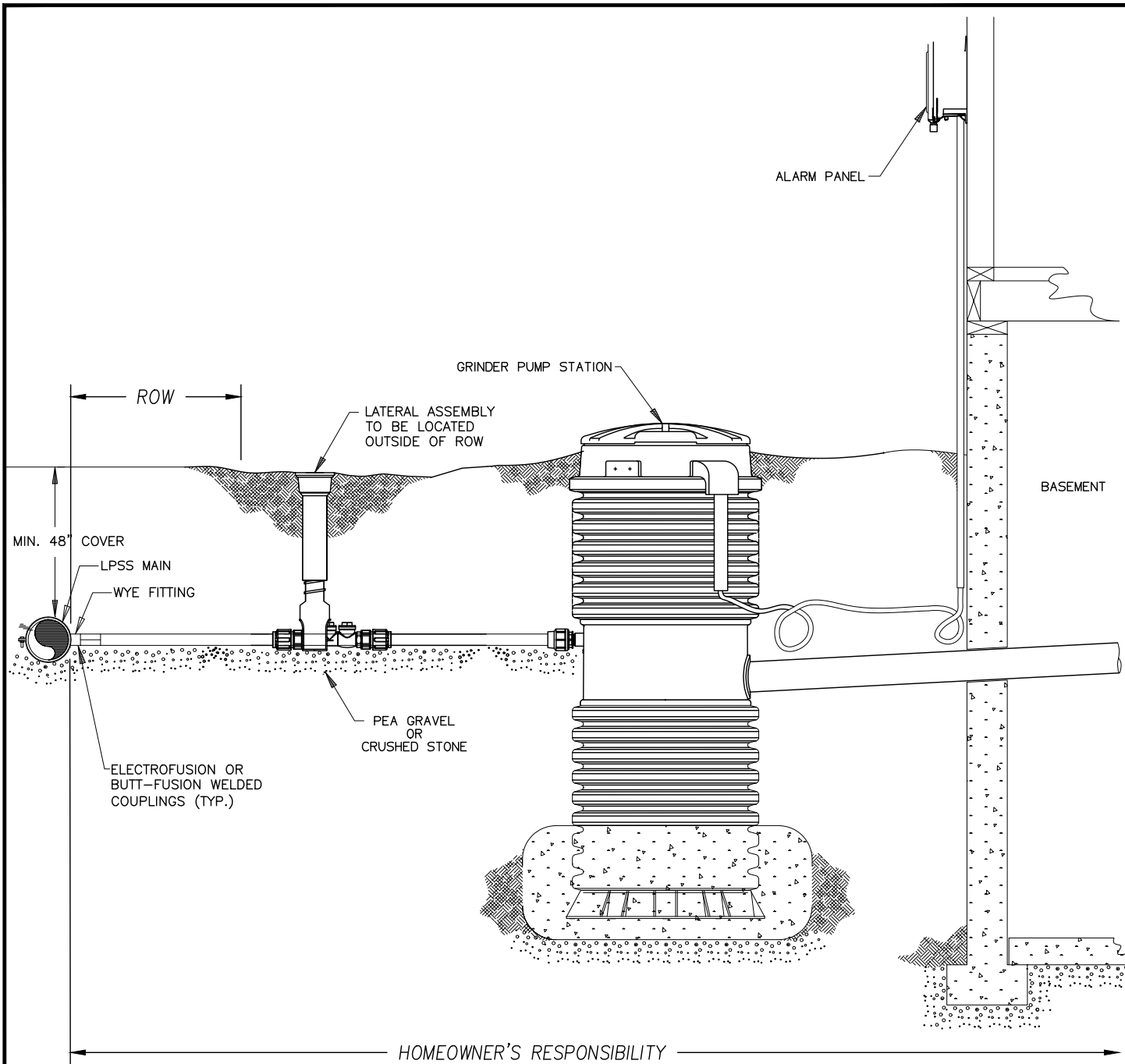


STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION
**LATERAL CHECK VALVE
 ASSEMBLY**

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| SECTION NUMBER: 500 |
| DRAWING NUMBER: W-501 |
| DATE: 9/17/2024 |



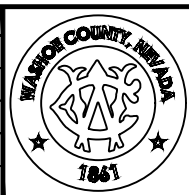
| DATE | REVISIONS |  | STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION | SECTION NUMBER: 500 |
|------|-----------|---|--|---------------------------------|
| | | | LOW PRESSURE SEWER SYSTEM PRIVATE LATERAL | DRAWING NUMBER: W-502 |
| | | | | DATE: 9/17/2024 |
| | | | | |



NOTES:

1. USE WYE FITTING FOR SDR-11 HDPE FORCE MAIN
2. ALL FITTINGS SHALL BE INSTALLED BY BUTT-FUSION WELDING OR ELECTROFUSION COUPLINGS.

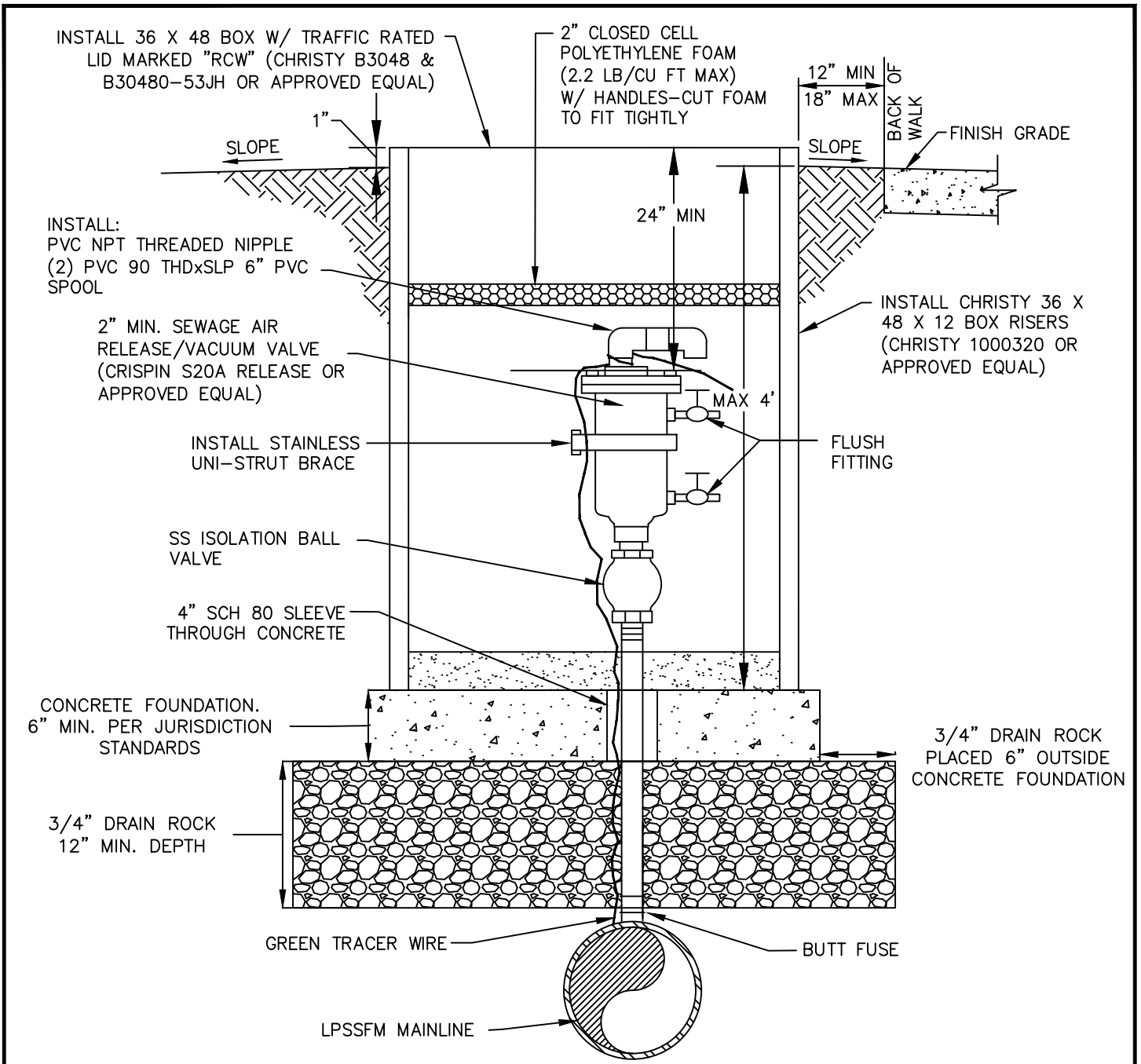
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STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**LOW PRESSURE SEWER SYSTEM
TYPICAL LATERAL INSTALLATION**

| |
|---------------------------------|
| SECTION NUMBER: 500 |
| DRAWING NUMBER: W-503 |
| DATE: 9/17/2024 |



TYPICAL SECTION
NTS

NOTES:

1. IF APPLICABLE AIR RELEASE/VACUUM VALVES SHALL BE INSTALLED OUTSIDE PAVEMENT SECTION. SLOPE GROUND AWAY FROM AIR RELEASE/VACUUM VALVE BOX OR CONSTRUCT MINIMUM HEIGHT CURBING TO PROTECT FROM FLOODING BY SURFACE WATERS.
2. ALL PIPES SHALL HAVE POSITIVE SLOPE FROM MAIN LINE TO AIR/VACUUM VALVE.
3. CAV LOCATIONS SHOWN ON THE PIPELINE PLANS ARE APPROXIMATE, ACTUAL CAV PLACEMENT SHALL BE DICTATED BY THE PHYSICAL RELATIVE HIGH POINT OF THE PIPELINE.

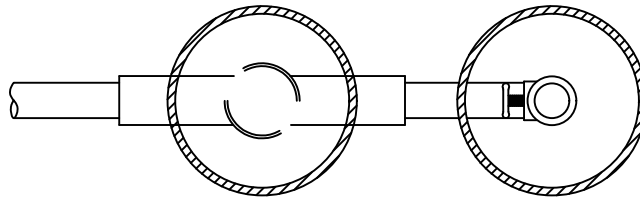
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STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

COMBINATION AIR RELEASE VALVE

| |
|---------------------------------|
| SECTION NUMBER: 500 |
| DRAWING NUMBER: W-504 |
| DATE: 9/17/2024 |



PLAN VIEW

TRAFFIC RATED LID
IN ROADWAY.
SEE W-303 FOR
CAN AND COLLAR
REQUIREMENTS.

TRAFFIC RATED LID IN ROADWAY
W/ INSULATION

6" MIN.
12" MAX

12" MIN.

LPSSFM
FLUSH VALVE

BALL VALVE TO
BE THREADED
STAINLESS STEEL
OR SCH 80 PVC.
VALVE TO HAVE
THREADED
NIPPLE AND CAP.

LPSSFM ISOLATION
VALVE (MAINLINE)
SEE NOTE 3.

MAIN SIZE X 2"
BUTT FUSED
REDUCER

SDR11 HDPE TO
STAINLESS STEEL
MALE NPT
TRANSITION

2" BUTT FUSION
SWEEP ELBOW

2" SDR
11 HDPE

NOTES:

1. FLUSH VALVE ASSEMBLY TO BE LOCATED OUTSIDE OF RIGHT OF WAY. CONSTRUCTION TO BE IN LINE OFFSET. SEE W-505C.
2. FLUSH VALVE ASSEMBLY TO BE CONSTRUCTED IN-LINE WHEN OFFSET FLUSH CANNOT BE CONSTRUCTED. SEE W-505B.
3. MAINLINE VALVE TO BE POLY VALVE OR EQUIVALENT IAW WASHOE COUNTY STANDARDS.
4. TRAFFIC RATED BOX TO BE CHRISTY'S G5 OR EQUIVALENT. NON TRAFFIC RATED BOX TO BE 12" RECTANGULAR NDS OR EQUIVALENT.

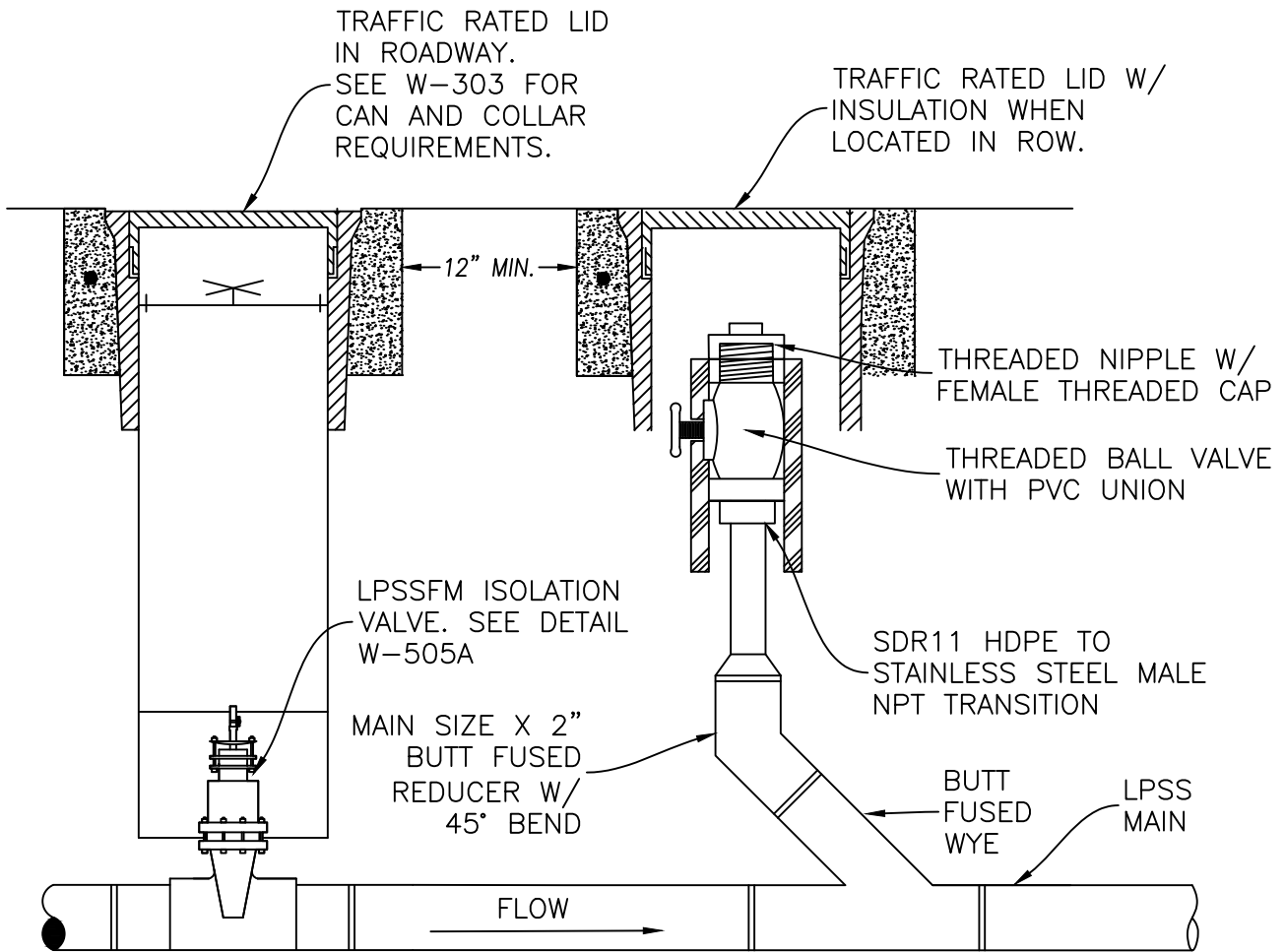
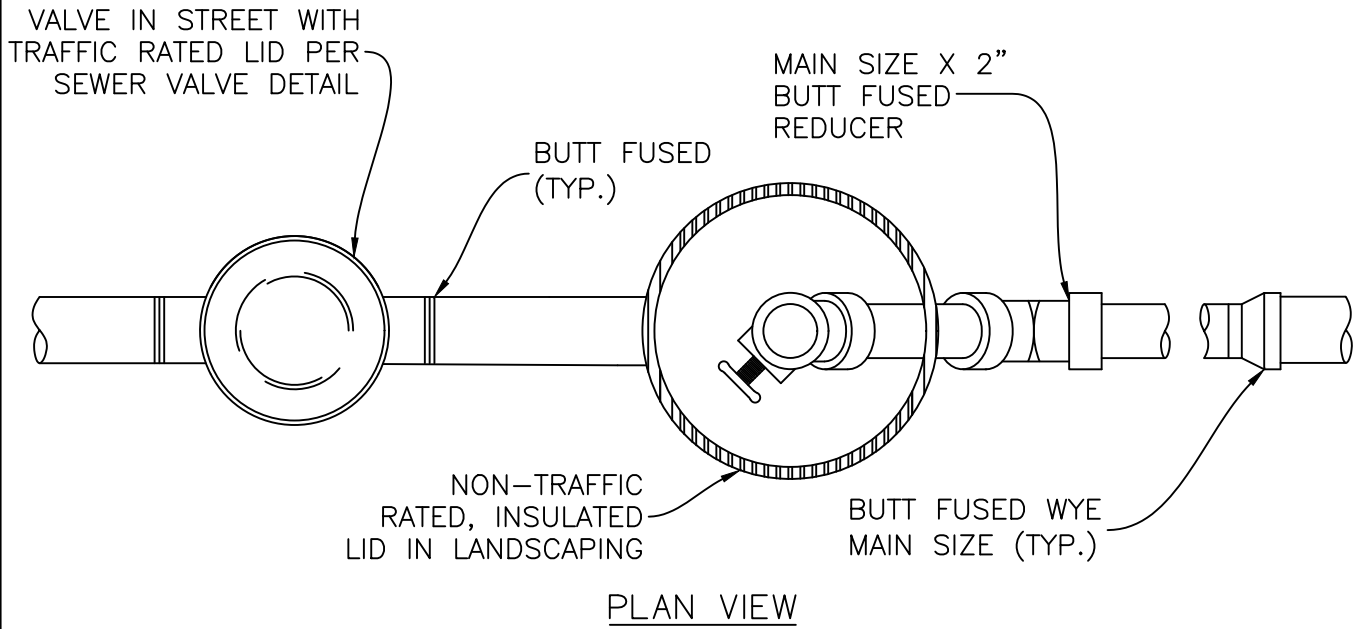
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STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

LOW PRESSURE SEWER SYSTEM
TERMINAL FLUSHING ASSEMBLY

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| SECTION NUMBER: 500 |
| DRAWING NUMBER: W-505A |
| DATE: 9/17/2024 |



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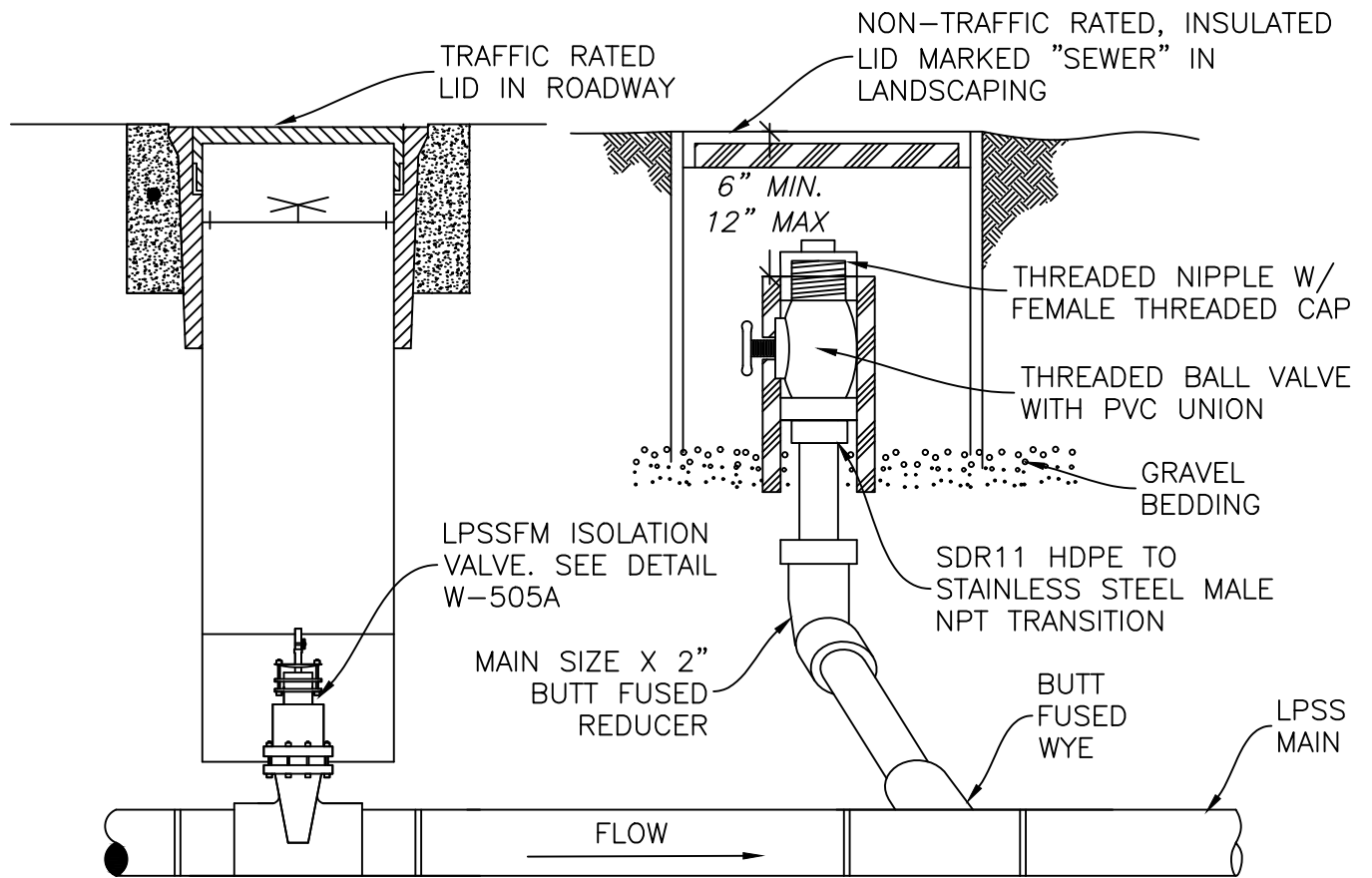
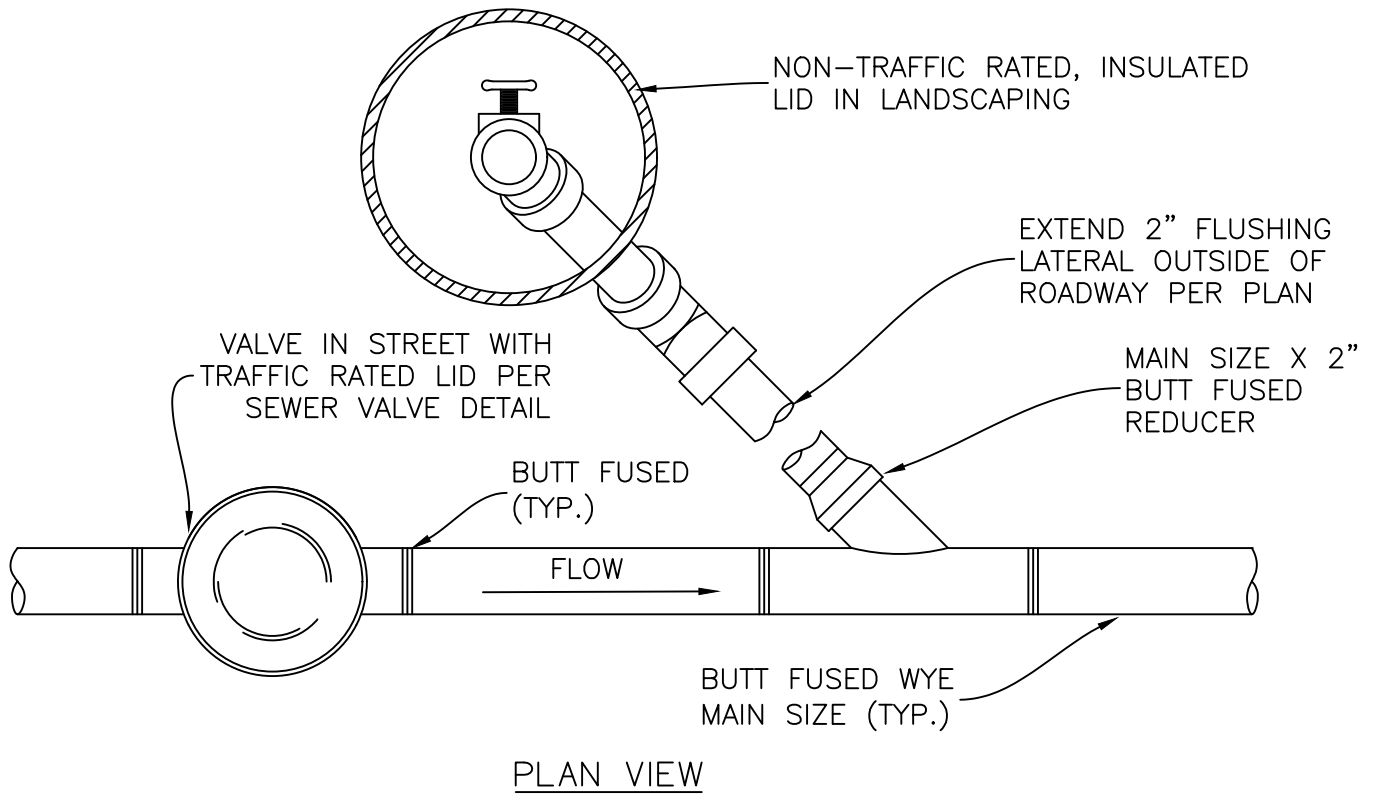
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

LOW PRESSURE SEWER SYSTEM

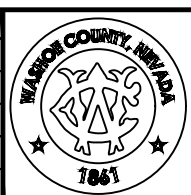
IN-LINE FLUSHING ASSEMBLY

PLAN VIEW

| | |
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| SECTION NUMBER: | 500 |
| DRAWING NUMBER: | W-505B |
| DATE: | 9/17/2024 |



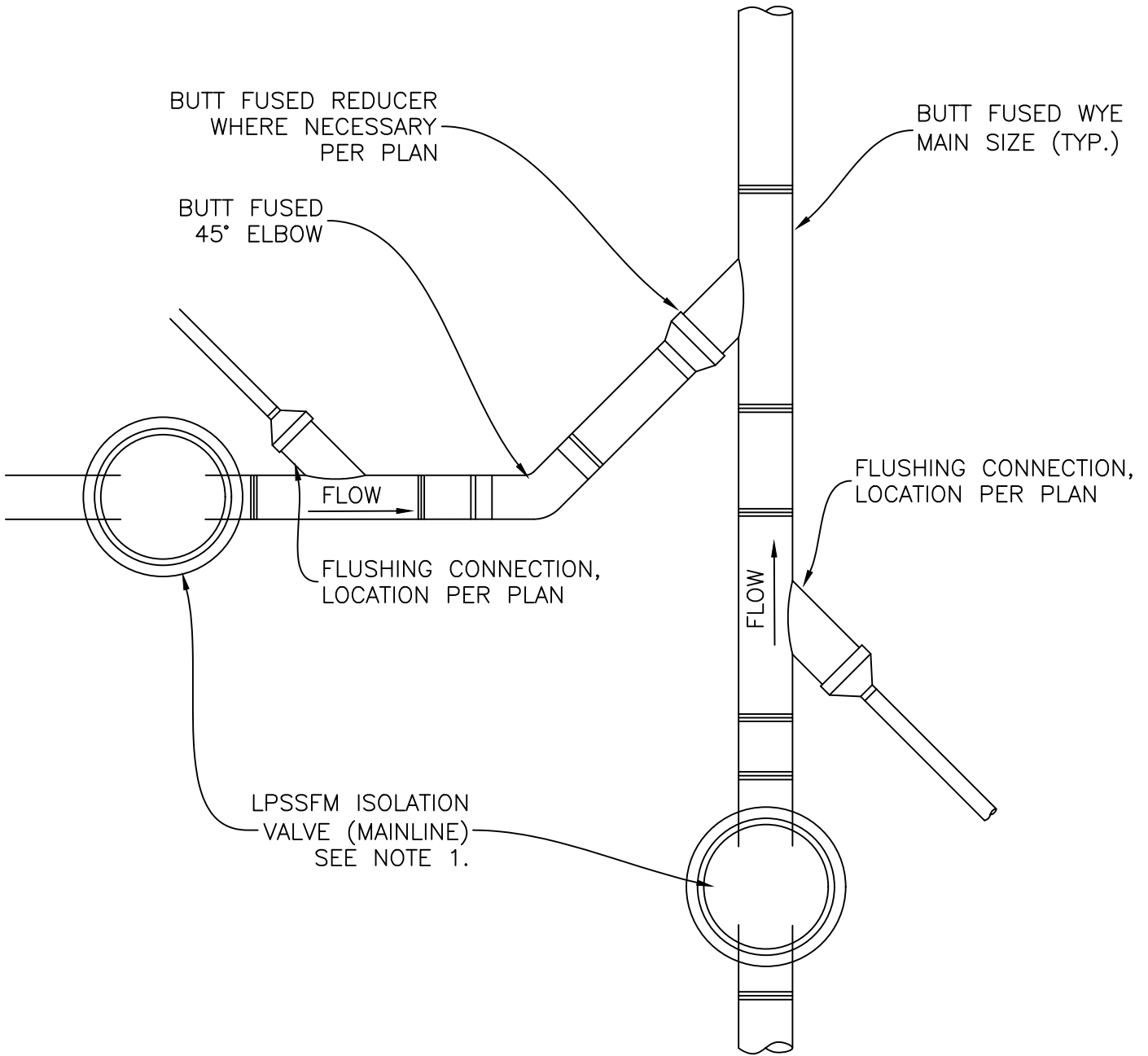
| DATE | REVISIONS |
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STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

LOW PRESSURE SEWER SYSTEM OFFSET FLUSHING ASSEMBLY

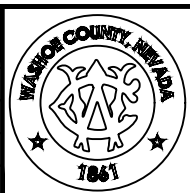
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| SECTION NUMBER: 500 |
| DRAWING NUMBER: W-505C |
| DATE: 9/17/2024 |



NOTE:

1. MAINLINE VALVE TO BE POLY VALVE (BALL TYPE) OR WASHOE COUNTY APPROVED EQUIVALENT.

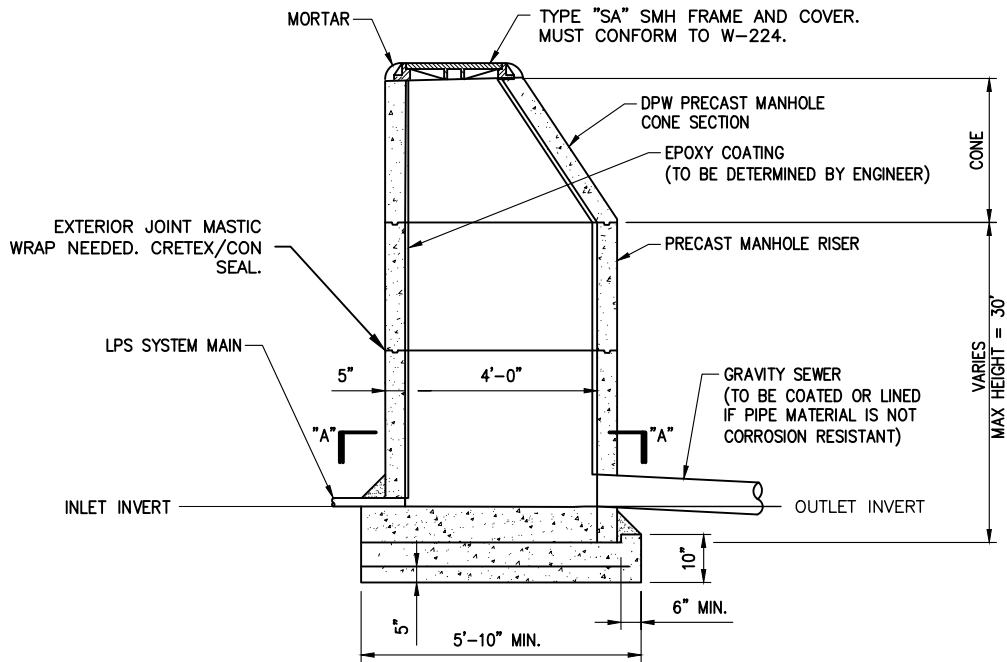
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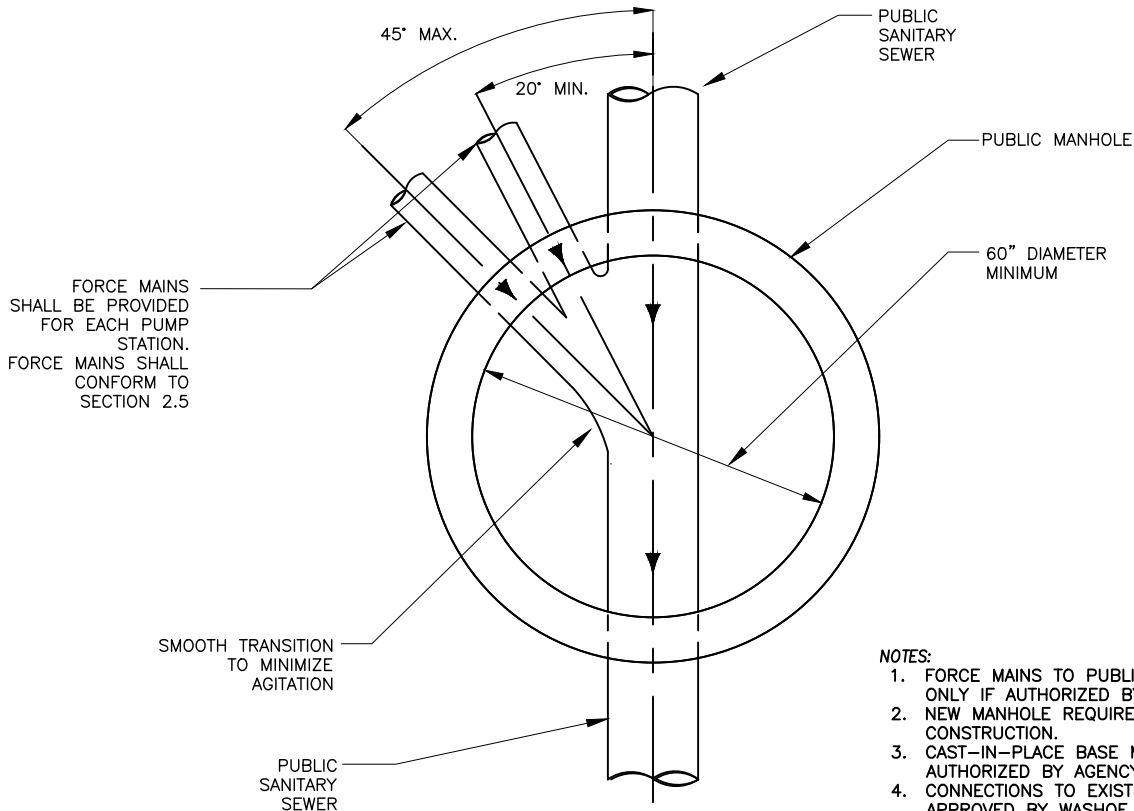
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**LOW PRESSURE SEWER
SYSTEM MAIN BRANCH
DETAIL**

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| SECTION NUMBER: 500 |
| DRAWING NUMBER: W-506 |
| DATE: 9/17/2024 |



ELEVATION



"A-A" SECTION

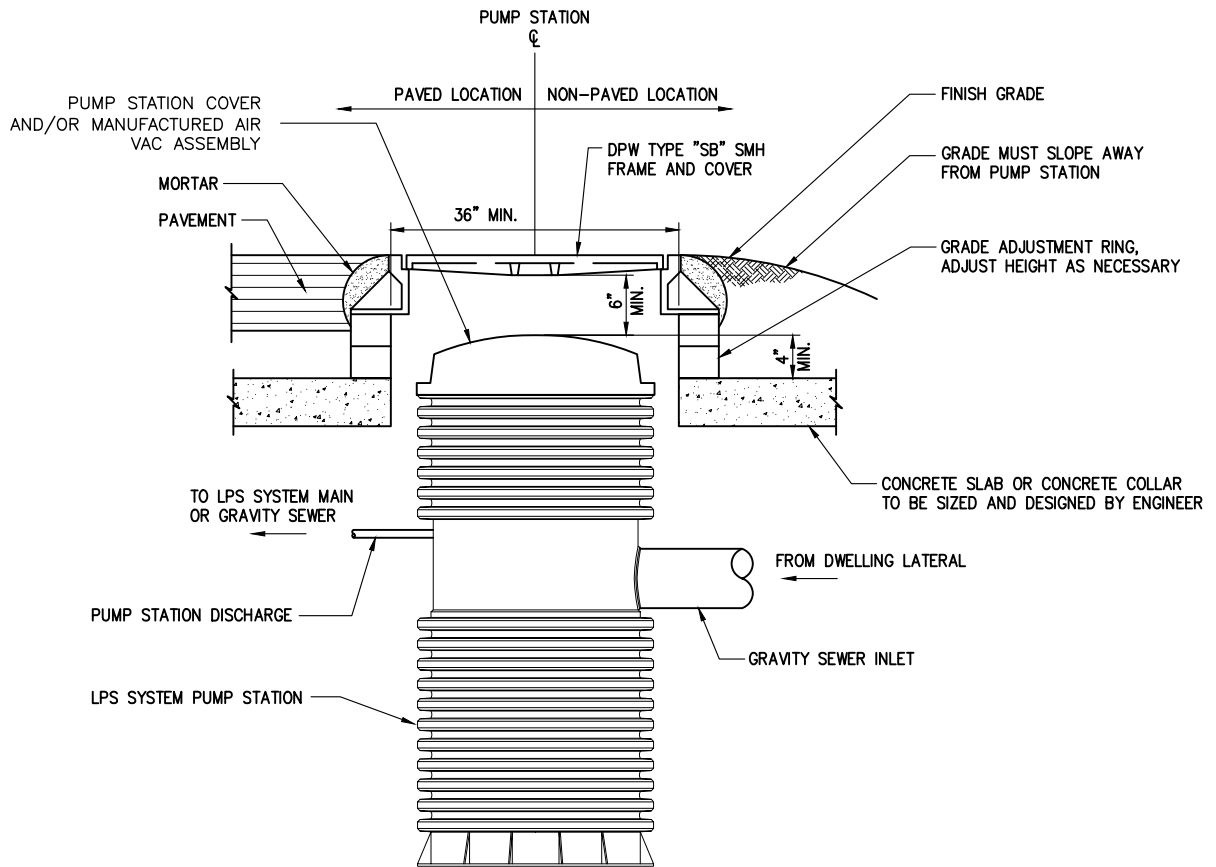
- NOTES:
1. FORCE MAINS TO PUBLIC SEWER MAY BE USED ONLY IF AUTHORIZED BY WASHOE COUNTY.
 2. NEW MANHOLE REQUIRED FOR NEW CONSTRUCTION.
 3. CAST-IN-PLACE BASE MAY BE USED ONLY IF AUTHORIZED BY AGENCY.
 4. CONNECTIONS TO EXISTING MANHOLE MUST BE APPROVED BY WASHOE COUNTY.

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STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION
**LOW PRESSURE SEWER
 SYSTEM TRANSITION
 MANHOLE**

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|---------------------------------|
| SECTION NUMBER: 500 |
| DRAWING NUMBER: W-507 |
| DATE: 9/17/2024 |

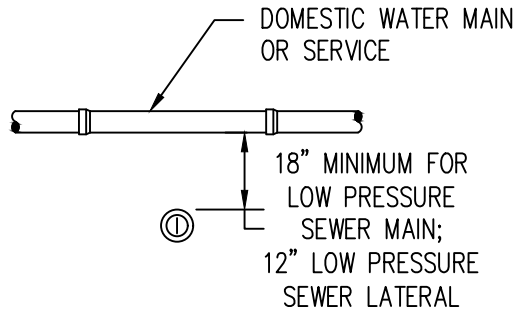


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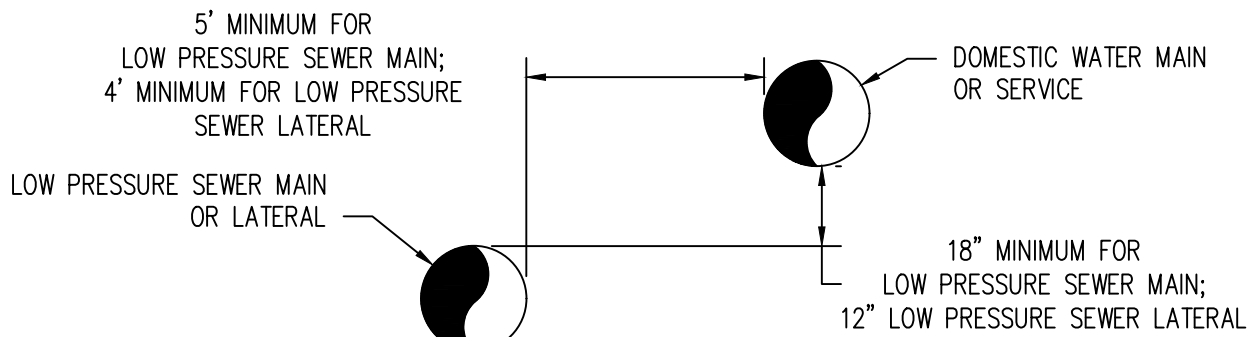
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION
LOW PRESSURE SEWER SYSTEM
PUMP STATION PROTECTIVE
COVER/COLLAR

| |
|---------------------------------|
| SECTION NUMBER: 500 |
| DRAWING NUMBER: W-508 |
| DATE: 9/17/2024 |

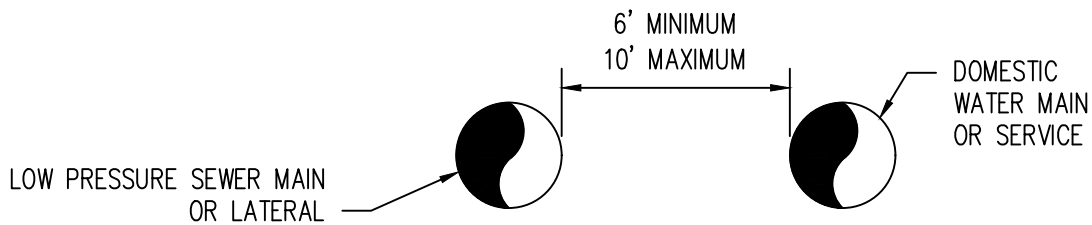


PREFERRED

WATER CROSSING
N.T.S.



PREFERRED



MITIGATED
DESIGN

| DATE | REVISIONS |
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STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

LOW PRESSURE SEWER SYSTEM
TYPICAL SERVICE CROSSING

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|---------------------------------|
| SECTION NUMBER: 500 |
| DRAWING NUMBER: W-509 |
| DATE: 9/17/2024 |