

## **ATTACHMENT B – SPECIAL PROVISIONS**

### **S105-05a, s105-05D, S105-10A SURVEY**

**General.** Survey includes scheduling, coordinating and providing all construction surveying, staking, quantity computations for pay items requiring volume measurement excluding concrete pay items, and calculations essential for the completion of the project and to properly control the work in its entirety. Perform all work in accordance with the plans and specifications and standard Engineering and Surveying practices under the responsible charge of a Professional Engineer or Professional Land Surveyor duly and properly licensed in the State of Idaho.

**Personnel.** Furnish technically qualified survey crews and crew supervisor capable of performing in a timely and accurate manner, and experienced in highway and bridge surveying and layout. The qualified crew supervisor shall be on the project whenever surveying/staking is in progress.

**Equipment.** Furnish survey instruments and supporting equipment capable of achieving the specified tolerances. Check survey equipment for accuracy prior to beginning survey work and as required.

**Submittals.** All submittals shall be signed and sealed by a Professional Engineer or Professional Land Surveyor duly and properly licensed in the State of Idaho. Resubmittals may be required depending on completeness and correctness of the work. No initial ground disturbing activities or bridge deck construction is permitted until the Contractor is notified in writing to proceed. Notification will be provided within 7 days after receipt of the applicable submittal or any resubmittals. Submittals and notification to proceed shall not relieve the Contractor of the responsibility for maintaining the survey work and for correcting errors, whether the errors are discovered during the actual survey work or in subsequent phases of the project.

**Information provided by the State.** The State will furnish the following data:

- a) Plans showing locations of control points at beginning and end of project, PIs (Point of Intersection of tangents), PCs (Point of Curvature) and PTs (Point of Tangency) of horizontal curves, POCs (Point on Curve) and POTs (Point on Tangent).
- b) Plans showing locations of BMs (Bench marks).
- c) Cross sections developed during design, if any.
- d) Design survey notes, if any.
- e) Grade book of finished grade, if any.

Copies of State-provided survey data are available for the Bidder's inspection at the office of the Engineer. Verify all survey data provided by the State and as shown on the plans prior to use.

**Existing survey monuments.** Reference all public and private land survey monuments that will be disturbed by construction activities prior to disturbing. Reestablish such monuments at no additional cost to the State before project completion. Section corner and quarter monuments reset after construction shall include corner perpetuations and filing with appropriate county. Perform all monument work in accordance with Title 55, Chapter 16 of the Idaho State Code. If a monument is found during construction but is not shown on the contract plans and must be reset, this additional work shall be paid under the Directed Survey item.

Coordination. Before survey work begins, discuss and coordinate the following with the Engineer:

- 1) Survey and staking methods.
- 2) Stake marking.
- 3) Grade control.
- 4) Referencing.
- 5) Structure control.
- 6) Any other procedures and controls necessary for the work.
- 7) Project documentation

**Materials.**

General. Furnish acceptable tools, supplies and stakes of the type and quality normally used in highway survey work and suitable for the intended use. Furnish stakes and hubs of sufficient length to provide a solid set in the ground with sufficient surface area above ground for necessary legible markings.

Remove and dispose of all flagging, lath, stakes and other staking material after the project is complete.

Flagging. Florescent paint and/or mark with plastic flagging the top 2 in. (50 mm) of all stakes with the following florescent colors:

Type	Stake with:	Color
Centerline	Hub w/ tack or PK nail in pavement	White
Centerline Reference Point	Hub w/ tack and lath	Red, White and Blue
Bench Mark	Solid permanent point w/ lath	White and Blue
Slope Stake	Stake and lath	White
Reference to Slope Stake	Hub w/ tack and lath	Red and White
Grade (Finish) stake	Grade stake w/ stake chaser	Blue
Right of Way Limit	Lath	Orange
Clearing Limits	Lath or flagging	Orange and White
Gas Lines; Petroleum	Hub w/ guard stake and lath	Yellow
Drain Lines; Sewers	Hub w/ guard stake and lath	Green
Water Lines; Irrigation	Hub w/ guard stake and lath	Blue
Conduit	Hub w/ guard stake	Red

Note: Mark all reference stakes with the color of the referred item (e.g. red for conduit).

**Construction Requirements.**

General. Establish construction survey points, elevations and grades as necessary to control, layout and complete the work including, but not limited to: centerlines, Bench Marks (BMs) and Temporary Bench Marks (TBMs), culverts, sewers, waterlines, slopes, subgrade, base course, paving, structures, forms and falsework, pile layout and appurtenances, channels and appurtenances, and erosion control ; and any curb, curb and gutter, sidewalk, Barrier, illumination, signalization, delineation, signs, foundations and right of way, monuments, traffic control both temporary and permanent, pavement markings, approaches, and any other points, elevation and grades deemed necessary for proper control of the

work. Clear the survey line to facilitate surveying and remove clearing slash from the travel or work area. Cut all brush and trees flush to the ground. Minimize removal unless area is to be cleared and grubbed during construction. Check all control surveying and staking to ensure specified tolerances are met prior to use.

Calculate all grades, elevations, offsets and alignment data necessary for staking and/or setting items of work. The Contractor may request approval for alternate methods of establishing grade control with wire lines, computer or laser controlled grading equipment or other suitable methods.

The Contractor is responsible for survey and control of the work and for correcting Contractor errors at no additional cost, whether the errors are discovered during the actual survey work or in subsequent phases of the project. Any cost overruns resulting from Contractor errors shall be at no expense to the State.

The work may be spot checked for accuracy and unacceptable portions of work may be rejected. The Contractor shall resurvey rejected work and correct work that is not within the specified tolerances at no additional expense to the State.

Discrepancy notification. Complete a preliminary check of the plans and specifications prior to beginning construction. Immediately notify the Engineer of any discrepancies or deficiencies including discrepancies in grade, elevations, alignment, locations, and/or dimensions.

Compare staked cut and fill depths with the contract plans. Refer to the Engineer differences found between the horizontal or vertical alignment data shown on the drawings and the alignment observed on the ground during progress of the work that are not immediately correctable or that require interpretation.

Record-keeping. Comply with Title 55, Chapter 19 of the Idaho State Code if a Record of Survey is required.

Keep a signed daily diary that is neat and legible, listing the following information for each day's work: date, weather, crew, equipment, location, and type of work performed. List all measurement equipment such as theodolites, distance meters, total stations, GPS receivers, levels etc., that require calibration for correct operations by their serial number and document calibration at the time of use. Delete errors by lining out. The daily diary is in addition to and complementary of any electronic data collection technology used by the Contractor. Keep a bench level book and transit book containing the data on vertical and horizontal control. Also keep a diary containing a log of office work.

Keep all field notes, diaries and books according to Standard Surveying practice. Loose leaf books will not be accepted. Make available the field notebooks and forms used for the work to the Engineer upon request (either verbally or in writing) at any time. Provide to the Engineer weekly copies of all diaries, books, and notes. After project completion, return to the Engineer all survey and design data and two sets of "as staked/constructed" drawings clearly showing all final dimensions, lines, grades, tie-ins and deviations from contract plans.

Computations and plots. Use cross-sections to calculate pay items that require volume measurements. Submit plots of the original cross sections and superimpose the design cross sections as slope staked.

Calculate preliminary quantities from this data, using the average end area method and submit plots and calculations for approval. When work is complete, superimpose final with original cross sections and calculate final quantities using the average end area method. Alternate methods for calculating quantities may be requested for approval.

Submit all measurements and calculations for quantity computations including a copy of all grade calculations, cross sections plots, and computer print outs in a format approved. Supply two copies of all grade sheets to the Engineer. Submit a horizontal and vertical control base map showing all primary and secondary control points annotated with x, y, z coordinate data. Plot the base map at a legible scale, and update and resubmit as new control is added.

Cross-sections. Develop cross-sections from field measurements. Take cross section measurements both before and after excavation and prior to back fill. When the centerline curve radius is less than or equal to 500 ft. (150 m), take cross-sections at a maximum centerline spacing of 25 ft. (8 m) . When the centerline curve radius is greater than 500 ft (150m), take cross-sections at a maximum spacing of 50 ft. (15 m). Take additional cross-sections at breaks in terrain and at changes in typical sections. For each cross-section, measure and record points at breaks in terrain, but at least every 10 ft. (3 m) unless otherwise approved. Measure and record points to at least the anticipated slopes and reference locations. Reduce all cross-section distances to horizontal distances from centerline. Take cross sections at right angles to tangents and normal to curves. Include in cross sections all grades, locations, and existing ground line profiles.

Cross sections may be developed from digital terrain models provided that: the ground survey locations do not exceed 100 ft (30 m) in any direction, major breaks in terrain are also included, and the horizontal and vertical control for the project is used.

Length verification. Field verify lengths of pipe, pipe culvert, Barrier, pipe siphon, and sign posts at an appropriate time and in accordance with Subsection 106.02.

Stake maintenance and marking. Maintain all reference stakes, bench marks, slope stakes, slope reference stakes, clearing limits, and culvert reference stakes, grade stakes, curb, curb and gutter, radii and other stakes necessary for the work until the construction has been completed and accepted. Mark all survey stakes with station, elevation and offset referenced to their respective control line. Legibly mark all stakes. Renew illegible stakes at no additional cost to the State. Mark slope, reference and guard stakes with station.

Centerline reestablishment. Reestablish centerline from instrument control points. The maximum spacing between centerline points is 25 ft (8 m) when centerline curve radius is less than or equal to 500 ft. (150 m). When the centerline curve radius is greater than 500 ft (150 m), the maximum distance between centerline points is 50 ft. (15 m). Reestablish centerline as many times as necessary to construct the work. Points to be reestablished include but are not limited to:

PI	Point of Intersection of Tangents
PC	Point of Curvature
POC	Point on Curve
PT	Point of Tangency
POT	Point on Tangent

RP Reference Point  
 "L" L-Line (Final Location Line)  
 BM Bench Mark  
 TBM Temporary Bench Mark

Control points and survey tolerances. Relocate initial horizontal and vertical control points in conflict with construction to areas that will not be disturbed by construction operations. Furnish the coordinates and elevations for the relocated points before the initial points are disturbed.

Establish and check bench marks. Protect bench marks from construction activities. All bench marks shall allow a level rod to stand vertically and squarely on the mark and shall be referenced to centerline and horizontal measurements.

Establish alignment points at all PCs, PTs, and stations on the alignment spaced not further than 50 ft. (15 m) apart, at significant breaks in the ground, at drainage structure locations and at approaches. Mark stakes on the side facing the initial station of the project.

Survey and establish controls within the following tolerances:

Description	Horizontal	Vertical
Control points	+/- 0.01 ft (3mm)	+/- 0.01 ft (3mm)
Centerline points including references	+/- 0.02 ft (6mm)	+/- 0.02 ft (6mm)
Cross sections and slope	+/- 0.10 ft (30mm)	+/- 0.10 ft (30mm)
Slope stake references	+/- 0.10 ft. (30 mm)	+/- 0.05 ft. (15 mm)
Culverts, ditches and minor drainage structures	+/- 0.10 ft. (30 mm)	+/- 0.03 ft. (10 mm)
Retaining walls	+/- 0.05 ft (15mm)	+/- 0.02 ft (6mm)
Bridge substructure components and overall	+/- 0.02 ft (6mm)	+/- 0.02 ft (6mm)
Bridge superstructure components and overall	+/- 0.02 ft (6mm)	+/- 0.02 ft (6mm)
Clearing and grubbing limits	+/- 1.0 ft. (300 mm)	-----
Right of way limits	+/- 0.10 ft. (30 mm)	-----
Roadway subgrade finish stakes	+/- 0.10 ft (30mm)	+/- 0.03 ft. (10 mm)
Roadway finish grade stakes	+/- 0.10 ft (30mm)	+/- 0.02 ft (6mm)
Paving reference line	+/- 0.04 ft (12mm)	+/- 0.02 ft (6mm)

Coordinate the survey tolerances of any items not listed above with the Engineer.

Clearing and right-of-way limits. Stake clearing limits on both sides of centerline at each established station. Locate the clearing limit on the ground as shown by the cut and fill limits on the plans. Stake right of way limits every 100 ft. (30 m) on tangents, every 50 ft. (15 m) on curves and at all right-of-way breaks.

Slope stakes and references. All slope stakes and stakes for setting items for work shall have reference stakes. Maintain the reference stakes for the duration of the project until approved for removal. Establish and set slope stakes and references on both sides of centerline at cross-section locations. Establish slope stakes in the field as the actual point of intersection of the design slope with the natural ground line. Record the following information on the slope stake; cut(C) or fill(F) from catch to subgrade

shoulder (SGS), distance to SGS, distance to center line, and design slope (4:1). Set slope stake references outside the clearing limits. Include all slope stake information on the reference stakes including the horizontal and vertical distance from the reference stake to the catch (slope stake). Record the station on the back side of the slope and reference stakes.

Grade finishing stakes. Set grade finishing stakes, for grade elevations and horizontal alignment: on centerline, the center of each travel lane, on each shoulder at roadway cross-section locations and between centerline and shoulder with a maximum spacing of 15 ft. (4.5 m). Set stakes at the top of subgrade and the top of each aggregate course.

Where turnouts are constructed, set stakes on centerline, on each normal shoulder, and on the shoulder of the turnout. In parking areas, set hubs at the center and along the edges of the parking area. Set stakes in all ditches to be paved.

The maximum spacing between stakes in any direction is 50 ft. (15 m). Use brushes or guard stakes at each stake. Reset grade finishing stakes as many times as necessary to construct the subgrade and each aggregate course.

Concrete paving. Concrete paving requires stringline on each side of screed for each placement. Set string line control with vertical and horizontal control points as needed but placed at no more than a maximum of 50 ft. (15 m) intervals. Set stringline on both sides of roadway. Profile surface at each edge of placement and adjust grades for smoothness as approved. Check pavement thickness every 25 ft (8 m) and adjust as needed. Stake concrete joint locations.

Drainage structures. Stake drainage structures to fit field conditions and in coordination with the Engineer. The location of the structures may differ from the plans. Perform the following:

- 1) Survey and record the ground profile along centerline of structure.
- 2) Determine the slope catch points at inlets and outlets.
- 3) Set reference points and record information necessary to determine structure length and end treatments.
- 4) Stake ditches or grade to make the structure functional.
- 5) Plot the profile along centerline of the structure to show the natural ground, the flow line, the roadway section, and the structure.
- 6) Submit the plotted field-design cross-section final structure length and alignment
- 7) Mark guard stakes with the following, when applicable:
  - a) Diameter, length and type of culvert (i.e. 18 in. x 36 ft. (450 mm x 11 m) corrugated metal pipe (cmp)),
  - b) The vertical and horizontal distance from the hub to the invert at the end of the culvert or any intermediate point as needed or directed.
  - c) Flow line grade of the pipe.
  - d) Pipe camber.
  - e) Station.
  - f) Elevation.
- 8) For storm sewers and waterlines provide a reference at a maximum spacing of 50 ft. (15 m) Reference inverts of pipe at all manholes.

Bridges. Set horizontal and vertical control and reference points for all bridge substructure and superstructure components. Establish, reference and submit the following:

- 1) Bridge chord or the bridge tangent
- 2) Abutments and bridge piers.
- 3) Elevations for footings, pile cutoffs, pile layouts, pier caps, bridge seats, bridge beam profiles, and screed elevations.
- 4) Cross sections, structure excavation sections
- 5) Deck grades and profile.
- 6) Bridge approach grades and profile.
- 7) All other controls necessary for a complete structure.

Set intermediate slope stakes at bridge abutments to establish transitions. Place finish grade stakes on the centerline of abutment bearing and at the top of slope of all bridge berms. Place finish grade stakes on each side at top, mid-point of slope and toe of bridge berm.

Box culverts. Set horizontal and vertical control and reference points. Establish and reference the centerline, back of parapet, skew and flow line elevations at inlet, outlet, and breaks.

Retaining walls. Survey and record profile measurements along the face of the proposed wall and 5 ft. (1.5 m) in front of the wall face. Take cross-sections every 15 ft. (4.5 m) along the length of the wall and at all major breaks in terrain. For each cross-section, measure and record points every 15 ft. (4.5 m) and at all major breaks in terrain. Set adequate references and horizontal and vertical control points.

Borrow sites. Perform the work essential for initial layout and measurement of the borrow site. Establish a referenced baseline, site limits, and clearing limits. Survey and record initial and final cross-sections and provide end area volume calculations.

Curb and gutter. Set curb and gutter staking at 25 ft (8m) intervals on tangent and 10 ft (3m) intervals on curve radii. Set line and grade for curb and gutter to the nearest 0.01 ft. (3 mm) of the proposed or established grade line. Set radius points.

Barrier. Stake Barrier vertical and horizontal control at a maximum spacing of 25 ft (8m) on tangent sections and 10 ft (3m) on curved sections unless otherwise approved.

Scales. Perform the initial level check of scales and subsequent level checks weekly. Document the level checks and supply the documentation to the Engineer.

Repairs required to mailboxes at various locations along the project.

**Materials.** Furnish all materials. Materials shall meet the respective requirements of these specifications or as directed.

**Construction Requirements.** Furnish all equipment and labor to complete the directed repairs as directed. Work shall conform to the directed section of the standard specifications.

**Method of Measurement.** S105-05A Directed Surveying will be measured by the hour authorized for each crew size with travel time to and from the project considered incidental to these items. S105-05D Directed Survey Office Computations will be measured by the hour authorized. S105-10A Survey will be measured by lump sum.

**Basis of Payment.** Payment for accepted work will be made as follows:

<b>Pay Item</b>	<b>Pay Unit</b>
S105-05A Directed Surveying 2-Person Crew	HR
S105-05D Directed Surveying Office Computation	HR
S105-10A Survey	LS

**S900-50B, S900-50C CONTINGENCY AMOUNT (WATER POLLUTION AND EROSION CONTROL)**

**Description.** This work shall consist of installing and maintaining erosion control measures not foreseen in the design of the project. These measures are not shown on the plans but may be ordered for the life of the contract. These measures may consist of seeding, erosion blanket, slope drains, check dams, straw bales and barriers, sediment traps, ditches, berms, swales, dikes, fiber mats, netting, gravel, mulches, and other erosion control devices or methods.

The emergency erosion control provisions shall be coordinated with the permanent erosion control features specified elsewhere in the contract. The measures shall be practical, economical, effective, and continuous with the permanent erosion controls throughout the construction and post construction period.

**Materials.** Materials shall meet the requirements specified in the following Subsections:

Seeding	621.02	Mulch	711.10
Metal Apron	708.21	Erosion Blanket	711.11
Pipe	708.21	Gabion	715
Riprap	711.04	Revet Mattress	715
Commercial Fertilizer	711.07	Geotextile	718

All other materials shall meet commercial grade standards and shall be approved before being used.

**Construction Requirements.** Erosion and pollution control measures will be used to correct conditions that develop during construction that were not foreseen during the design of the project. The measures are to temporarily control erosion that develops during normal construction practices, which are not associated with the permanent erosion control features on the project.

In the event that erosion and pollution control measures are required due to the Contractor’s negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or ordered, such work shall be performed by the Contractor at the Contractor’s expense.



Temporary erosion and pollution control work, which is not attributed to the Contractor's negligence, carelessness, or failure to install permanent controls will be performed as directed.

Temporary erosion and pollution control may include construction work outside the right-of-way where such work is necessary as a result of roadway construction such as borrow pit operations, haul roads, and equipment storage sites.

The erosion control features installed by the Contractor shall be maintained by the Contractor.

All temporary erosion and pollution control shall follow Section 212 – Erosion and Sediment Control

**Method of Measurement.** Work covered under other sections will be measured as outlined in the appropriate section. Work not covered by other sections will be measured in accordance with Subsection 109.03 – Extra and Force Account Work.

<b>Pay Item</b>	<b>Pay Unit</b>
Contingency Amount (Directed Repairs)	CA
Contingency Amount (Water Pollution and Erosion Control)	CA

### **S901-05A 8" GATE VALVE**

**Description.** The work shall consist of furnishing and installing a 8" Resilient Wedge Gate Valve as shown on the plans and according to Division 400 – WATER of the ISPWC.

**Materials.** Materials as shown and as required in Division 400. Gate Valve shall be 8" Resilient Wedge Gate Valve as approved by the City of St. Anthony water division. Connection to the water line shall be by mechanical joints. The valve box and lid shall be as shown on Standard Drawing SD-406 of the ISPWC.

**Construction.** The construction shall meet requirements of Division 400 of the ISPWC. Trenching and backfill shall be included with this bid item and will not be paid for separately. Trenching and backfill shall be according to Division 300 of the ISPWC and shall conform to the Standard Drawing No. SD-301 and SD-302.

**Method of Measurement.** Measurement for 8" Gate shall be by the each. All materials and labor including shall be included in this bid item. All incidental items, including the valve box and lid as shown on the detail shall be included in the bid item will not be paid for separately.

**Basis of Payment.** Payment for accepted work will be as follows:

<b>Pay Item</b>	<b>Pay Unit</b>
SP (8" Gate Valve)	EA

Excavation and backfill for the trench will not be paid for separately but will be included in work for the 8" Gate Valve.

**S901-05B PERMANENT PRESSURE METER TAP**

**Description.** The work shall consist of furnishing and installing a 3/4" Water Service Connection as shown on the plans and according to Division 400 – WATER of the ISPWC. The purpose of the tap is to allow insertion of a small meter or pressure gauge to determine leakage or pressure loss and obtain water samples on each side of the valve.

**Materials.** Materials as shown and as required in Division 400. Connection shall be as shown on Standard Drawing No. SD-401. Connection to the water line shall be as shown on the detail and include the service line, the box and the lid. It shall include items 1-10 and item 12 on the detail. Items 11-17 are not included and shall not be installed. The valve box and lid shall be as shown on Standard Drawing SD-401 of the ISPWC.

**Construction.** The construction shall meet requirements of Division 400 of the ISPWC. Trenching and backfill shall be included with this bid item and will not be paid for separately. Trenching and backfill shall be according to Division 300 of the ISPWC and shall conform to the Standard Drawing No. SD-301 and SD-302.

**Method of Measurement.** Measurement for permanent pressure meter tap shall be by the each. All materials and labor including shall be included in this bid item. All incidental items, including the valve box and lid as shown on the detail shall be included in the bid item will not be paid for separately.

**Basis of Payment.** Payment for accepted work will be as follows:

<b>Pay Item</b>	<b>Pay Unit</b>
SP (Permanent Pressure Meter Tap)	EA

All incidental items, including the valve box and lid as shown on the detail shall be included in the bid item will not be paid for separately.

Excavation and backfill for the trench will not be paid for separately but will be included in work for the Permanent Pressure Meter Tap.

**S904-05A LIFT STATION**

**Description.** This work shall consist of installing the sewer lift station as shown on the plans.

**Materials.** Materials shall meet the requirements specified in the following Subsections:

Manholes/vaults	Section 605 - Sewers
Pipes	Section 505 Pressure Sewers, Idaho Standards for Public Works Construction
Valves	Section 505 Pressure Sewers, Idaho Standards for Public Works Construction
Fittings and joints	Section 505 Pressure Sewers, Idaho Standards for Public Works Construction

## **FLYGT GRINDER PUMP**

### **GRINDER PUMP**

Each grinder pump shall be a **heavy duty pump** a grinder. Each grinder pump shall contain special cutters to reduce sewage to a fine slurry. The stationary cutter shall consist of **hardened 316 "L" stainless steel** and the rotary cutter shall consist of chrome alloyed cast iron. The cutter materials shall provide maximum corrosion and abrasion resistance. The remaining portion of the grinder pumps, with the exception of seal materials and wet end, shall be similar to the heavy duty pumps used in larger pump stations for daily operation.

### **REQUIREMENTS - See Plans for details.**

Furnish and install submersible non-clog wastewater pump(s). Each pump shall be equipped with an HP, submersible electric motor connected for operation as shown on the plans, with 25 feet of submersible cable (SUBCAB) suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval. The pumps shall be NO 3102 SH 3 ~ Adaptive 256. Each pump shall be fitted with a lifting chain or stainless steel cable. The working load of the lifting system shall be 50% greater than the pump unit weight.

### **PUMP DESIGN**

Grinder pump(s) shall be available in the following two configurations:

1. MP - Guide Bar Mounting - 2" Discharge.
2. MF - Free Standing - 1 1/2" Discharge.

The MP Grinder pump(s) shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact.

**Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable.** No portion of the pump shall bear directly on the sump floor.

### **PUMP CONSTRUCTION**

Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. The lifting handle shall be of stainless steel. All exposed nuts or bolts shall be AISI type 316 stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

Sealing design shall incorporate **metal-to-metal contact** between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.

Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

## COOLING SYSTEM

Motors are sufficiently cooled by the environmental atmosphere or pumped media. A water jacket is not required.

## CABLE ENTRY SEAL

The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function, separate from the function of sealing the cable. The assembly shall provide ease of changing the cable when necessary using the same entry seal. **The cable entry junction chamber and motor shall be separated by a stator lead sealing gland or terminal board, which shall isolate the interior from foreign material gaining access through the pump top. Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable.**

## MOTOR

The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is not acceptable. The motor shall be designed for continuous duty handling pumped media of 40°C (104° F) and capable of no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of cast aluminum. Thermal switches set to open at 125°C (260°F) shall be embedded in the stator end coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The junction chamber containing the terminal board, shall be hermetically sealed from the motor by an elastomer compression seal. Connection between the cable conductors and stator leads shall be made with threaded compression type binding posts permanently affixed to a terminal board. The motor and the pump shall be produced by the same manufacturer.

The combined service factor (combined effect of voltage, frequency and specific gravity) shall be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed 80°C. A performance chart shall be provided upon request showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting current and no-load characteristics.

The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater.

The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.

### **BEARINGS**

The pump shaft shall rotate on two bearings. Motor bearings shall be permanently grease lubricated. The upper bearing shall be a single deep groove ball bearing. The lower bearing shall be a two row angular contact bearing to compensate for axial thrust and radial forces. **Sleeve or single row lower bearings are not acceptable.** The minimum  $L_{10}$  bearing life shall be 50,000 hours at any usable portion of the pump curve.

### **MECHANICAL SEAL**

Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals shall operate in a lubricant reservoir that hydro-dynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary and one positively driven rotating, corrosion and abrasion resistant tungsten-carbide ring. The upper, secondary seal unit, located between the lubricant chamber and the motor housing, shall contain one stationary and one positively driven rotating, corrosion and abrasion resistant tungsten-carbide seal ring.

Each seal interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment nor **depend on direction of rotation for sealing.** The position of both mechanical seals shall depend on the shaft. Mounting of the lower mechanical seal on the impeller hub will not be acceptable. For special applications, other seal face materials shall be available.

**The following seal types shall not be considered acceptable or equal to the dual independent seal specified:** shaft seals without positively driven rotating members, or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces. No system requiring a pressure differential to offset pressure and to effect sealing shall be used.

Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. **The motor shall be able to operate dry without damage while pumping under load.**

Where a seal cavity is present in the seal chamber, the area about the exterior of the lower mechanical seal in the cast iron housing shall have cast in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.

**Seal lubricant shall be non-hazardous.**

### **PUMP SHAFT**

Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. Couplings shall not be acceptable. The shaft shall be stainless steel – ASTM A479 S43100-T.

If a shaft material of lower quality than stainless steel – ASTM A479 S43100-T is used, a shaft sleeve of stainless steel – ASTM A479 S43100-T is used to protect the shaft material. However, shaft sleeves only protect the shaft around the lower mechanical seal. No protection is provided in the oil housing and above. Therefore, the use of stainless steel sleeves will not be considered equal to stainless steel shafts.

#### **IMPELLER**

The impeller(s) shall be of grey cast iron, Class 35B, dynamically balanced, single shrouded design having a long throughlet without acute turns. The impellers shall be capable of handling fine slurry from the special cutters. Impeller(s) shall be taper collet fitted and retained with an Allen head bolt. All impellers shall be coated with an acrylic dispersion zinc phosphate primer.

#### **VOLUTE**

Pump volute(s) shall be single-piece grey cast iron, Class 35B, non-concentric design with smooth passages large enough to pass any media that may enter the impeller. Minimum inlet and discharge size shall be as specified.

#### **PROTECTION**

All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. At 125°C (260°F) the thermal switches shall open, stop the motor and activate an alarm.

A leakage sensor shall be available as an option to detect water in the stator chamber. The Float Leakage Sensor (FLS) is a small float switch used to detect the presence of water in the stator chamber. When activated, the FLS will send an alarm and, if desired, stop the motor. **USE OF VOLTAGE SENSITIVE SOLID STATE SENSORS AND TRIP TEMPERATURE ABOVE 125°C (260°F) SHALL NOT BE ALLOWED.**

The thermal switches and FLS shall be connected to a Mini CAS (Control and Status) monitoring unit. The Mini CAS is designed to be mounted in any control panel.

#### **MODIFICATIONS**

1. Explosion-proof Pumps.
2. Seawater Applications

Refer to the General Guide Specifications for additional information.

#### **Electrical Equipment and Pump Controls**

1. Connect to electrical service of customer
2. Set new electrical service that would be dedicated to said lift station (240 volt single phase 200 amp).
3. Supply all electrical gear and parts to complete lift station including (transfer switch 200 amp automatic voltage switch , 200 amp main disconnect, meter base , motor control panel with 2 VFD'S and over current protection and necessary wiring , all conduit and raceways wire and connections.
4. Provide a state electrical permit,
5. Build motor control panels
6. Coordinate system with the telemetry provider to ensure compatibility and function.

## Telemetry Equipment

### **Control Panel Specifications:**

- Panel must be assembled per UL508A and listed by a UL508A Panel Shop
- Enclosure must be minimal NEMA 4 rated with a padlock handle
- No conduit may enter through the top of the enclosure
- Control panel must have a heater to maintain temperatures above freezing in the enclosure
- Programmable Logic Controller (PLC) shall be an Allen Bradley Micrologix 1100 or 1400 with an additional 4 channel 4-20mA Analog Input card
- Radio shall be a 900-928MHz unlicensed GE-MDS INET-II Access Point/Gateway with din rail mount
- Radio shall be installed with a lightning arrestor bulkhead into the enclosure
- Antenna for the radio shall be a Yagi Directional Antenna rated for 900-928 MHz and the gain shall be appropriately sized for the distance of the lift station to the main office. A site survey must be performed before the antenna and mounting height/location is chosen.
- Uninterruptable Power Supply (UPS) must be provided rated for 120VAC with 500VA minimum

### **Instrumentation Specifications:**

Submersible Level Transducer - The transducer shall be a Measurement Specialties model LT.

Part# LT-B-G-B-B-D-J-S-B-005-P-G-050

Model LTB Submersible Analog Pressure

Transducer with:

- B - Non-Fouling protective cage
- G\_4\_20 mA output with lightning protection
- B\_ ETFE cable
- B - 0.25% FS accuracy
- D\_ no intrinsic safety approval
- J\_ Extended two year warranty
- S\_ Stainless Steel construction
- B\_ gland seal electrical cable connection
- O\_ 005 psi pressure range (11.5-feet)
- P\_ PSI Units
- G\_ Vented gauge pressure
- 50 feet of attached cable

All other materials shall meet commercial grade standards and shall be approved before being used.

**Construction Requirements.** Construction shall be per ITD specifications for manhole installation, ISPWC for pressure sewer installation and industry standard and as specified by the suppliers.

**Method of Measurement.** Lift Station will be measured by the Lump Sum basis. All components in the details as shown shall be included. No separate payment will be made of incidental items.

**Basis of Payment.** Payment for accepted work will be made for a complete lift station operating and functioning properly.

<b>Pay Item</b>	<b>Pay Unit</b>
SP (LIFT STATION)	LS

**S904-05B SP 4" BLOW-OFF ASSEMBLY**

**Description.** The work shall consist of furnishing and installing a 4" Blow-off Assembly as specified in Division 400 – WATER of the ISPWC.

**Materials.** Materials as shown and required in Division 400 – Water for a 4" Blow-off Assembly as shown on the standard detail SD-405 – 4" Blow-off Assembly Detail.

**Construction.** The construction shall meet requirements of Division 400 of the ISPWC.

**Method of Measurement.** Measurement for 4" Blow-off Assembly shall be by the lump sum. All materials and labor including shall be included in this bid item. All incidental items as shown on the detail shall be included in the lump sum item will not be paid for separately.

**Basis of Payment.** Payment for accepted work will be as follows:

<b>Pay Item</b>	<b>Pay Unit</b>
SP (4" Blow-off Assembly)	LS

Excavation and backfill for the trench will not be paid for separately but will be included in work for the 4" Blow-off Assembly.

**S904-05C SP TRAFFIC CONTROL**

**Description.** This work consists of planning, furnishing, initial placement, inspection, resetting and removal of all temporary traffic control signs and devices during construction. The contractor shall prepare a traffic control plan as part of the construction work plan.

**Materials.** All traffic control materials shall meet or exceed the requirements of the Manual of Uniform Traffic Control Devices (MUTCD) as adopted by the State, and the requirements in Section 626 – Temporary Traffic Control Devices found in the 2012 edition of the Idaho Transportation Department Standard Specifications for Highway Construction, and the current version of supplemental specifications.

All signs and channelizing devices shall be new or in like new condition and shall meet the retro reflectivity requirements of subsection 712.02.

**Construction Requirements.** Traffic Control shall include the planning, all placement, inspection and removal of all temporary traffic control signs, temporary pavement markings and channelizing devices.



The Contractor shall prepare a traffic control plan that corresponds to the pipe construction plan. This plan shall be submitted to ITD a minimum of 14 days prior to construction. This plan must comply with the road closure requirements of Fremont County. Planned closures must be approved by ITD and Fremont County prior to construction. Extended closures shall be avoided. An estimate of quantity for all traffic control items shall be provided to the Resident Engineer (14) days prior to implementation. Items shall be identified by the Idaho Transportation Department's standard pay item numbering system.

The Contractor shall ensure the traffic control in place during construction conforms to the approved construction plan, MUTCD standards, and the Idaho Transportation Department Work Zone Safety and Mobility Program standards.

The Contractor shall inspect the traffic control for damaged or missing devices every eight (8) hours or sooner, including nights and weekends, while the traffic control is in place. All damaged or missing devices shall be immediately replaced (within two (2) hours) at no additional cost to the State. Traffic control devices deemed unacceptable by the Engineer shall be immediately replaced at no additional cost to the State.

**Method of Measurement.** Traffic Control will be measured on a lump sum basis. It will include all work, including flagging, and materials required to develop and implement the Traffic Control.

**Basis of Payment.** Payment for accepted work will be made as follows:

<b>Pay Item</b>	<b>Pay Unit</b>
Traffic Control	LS

**S911-05A SP 4" PRESSURE SEWER MAIN**

**Description.** The work shall consist of furnishing and installing a 4" Pressure Sewer Main as shown on the plans and according to Division 505 – Pressure Sewers of the ISPWC.

**Materials.** Materials as shown and as required in Division 500. Pressure Sewer Mainline Pipe shall be 4" IPS DR26 160 PSI; ASTM D 2241: PVC Pressure Rated Pipe

**Construction.** The construction shall meet requirements of Division 505 of the ISPWC. Trenching and backfill shall be included with this bid item and will not be paid for separately. Trenching and backfill shall be according to Division 300 of the ISPWC and shall conform to the Standard Drawing No. SD-301 and SD-302

**Method of Measurement.** Measurement for 4" Pressure Sewer Main shall be by the foot. All materials and labor including shall be included in this bid item. All incidental items as shown on the detail shall be included in the bid item will not be paid for separately.

**Basis of Payment.** Payment for accepted work will be as follows:

<b>Pay Item</b>	<b>Pay Unit</b>
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Excavation and backfill for the trench will not be paid for separately but will be included in work for the 4" Pressure Sewer Main.

**S911-05B SP DIRECTIONAL UTILITY 4" PRESSURE SEWER BORE****S911-05C SP DIRECTIONAL UTILITY 8" WATER BORE**

**Description.** The work shall consist of furnishing and installing underground conduits using trenchless technology. Utility bore shall be in accordance with the plans and these specifications.

**Materials.** The drilling fluids shall be mixed according to the manufacturer's recommendations and be appropriate for the anticipated soil conditions. No hazardous additives may be used. Materials shall meet requirements of Section 309 of the Idaho Standards for Public Works Construction.

Pipe used for direction utility bore shall be High Density Polyethylene (HDPE) 4208 Series. The connections to the water and sewer main pipe at each end must be secure and firm to avoid against contraction from cold temperatures. At a minimum the connection to the HDPE pipe shall be done with a welded flange to be flanged with the water or sewer main. Additionally a constraint must be installed on the water and sewer pipe to ensure that contraction does not cause separation of the pipe sections. This shall be done with either a concrete anchor or other mechanical restraint. The Contractor shall propose a method to ITD prior to installation of successful practices mitigating this potential concern for approval. Methods shall meet requirements of ASTM F2620 and ASTM F1962 as applicable.

**Construction Requirements.** The Contractor shall provide a written plan to the Engineer describing the proposed operation. Construction shall meet requirements of Section 309 of the Idaho Standards for Public Works Construction.

**EQUIPMENT:**

The directional drilling equipment shall consist of a directional drilling rig and a drilling fluid mixing and delivery system of sufficient capacity to successfully complete the product installation without exceeding the maximum tensile strength of the product being installed.

The directional drilling rig shall:

- Consist of a leak free hydraulically powered boring system to rotate, push, and pull hollow drill pipe into the ground at a variable angle while delivering a pressurized fluid mixture to a guidable drill head.
- Contain a guidance system to accurately guide boring operations.
- Be anchored to the ground to withstand the rotating, pushing, and pulling forces required to complete the product installation.
- Be grounded during all operations unless otherwise specified by the drilling rig manufacturer.

The drill head shall be steerable by changing its rotation, be equipped with the necessary cutting surfaces and drilling fluid jets, and be of the type for the anticipated soil conditions.

The guidance system shall be setup, installed, and operated by trained and experienced personnel. The operator shall be aware of any magnetic or electromagnetic anomalies and shall consider such influences in the operation of the guidance system when a magnetic or electromagnetic system is used.

The drilling fluid mixing system shall be of sufficient size to thoroughly and uniformly mix the required drilling fluid.

The delivery system shall have sufficient flow capacity to ensure that all slurry volumes are adequate for the length and diameter of the final bore and the anticipated soil conditions. Connections between the delivery pump and drill pipe shall be leak-free.

General:

The Engineer shall be notified at least 48 hours in advance of starting work.

The work site shall be graded or filled to provide a level working area for the drilling rig. No alterations beyond what is required for drilling operations are to be made. All activities shall be confined to designated work areas.

Minimum horizontal and vertical clearances to existing facilities as specified in the Contract Documents shall be maintained. Clearances shall be measured from the nearest edge of the largest backreamer required to the nearest edge of the facility being paralleled or crossed.

EXISTING UNDERGROUND FACILITIES SHALL BE EXPOSED TO VERIFY ITS HORIZONTAL AND VERTICAL LOCATIONS WHEN THE BORE PATH COMES WITHIN 1.0 M HORIZONTALLY OR VERTICALLY OF THE EXISTING FACILITY. EXISTING FACILITIES SHALL BE EXPOSED BY NON-DESTRUCTIVE METHODS. THE NUMBER OF EXPOSURES REQUIRED TO MONITOR WORK PROGRESS SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS.

MANUFACTURER'S HANDLING AND STORAGE RECOMMENDATIONS SHALL BE FOLLOWED FOR ALL MATERIALS.

TRENCHING, BACKFILLING, AND COMPACTING FOR ENTRY AND EXIT POINTS OR OTHER LOCATIONS ALONG THE BORE SHALL BE ACCORDING TO SECTION 205.

THE STABILITY, SAFETY, OR FUNCTION OF AN EXISTING ROADWAY, RAILWAY, WATERCOURSE, OTHER WORKS, OR PROPOSED WORKS MAY BE IMPAIRED DUE TO THE METHOD OF OPERATION, PROTECTION SHALL BE PROVIDED. PROTECTION MAY INCLUDE SHEATHING, SHORING, AND PILES WHERE NECESSARY TO PREVENT DAMAGE TO SUCH WORKS OR PROPOSED WORKS.

The pilot bore shall be drilled along the bore path in accordance with the grade, alignment, and tolerances specified in the Contract Documents. In the event the pilot bore does deviate, the Engineer shall be notified. The Engineer may require the Contractor to pullback and re-drill from the location along the bore path before the deviation. In the event that a drilling fluid fracture, inadvertent returns, or loss of circulation occurs during pilot bore drilling operations, the Engineer be advised of the event and of the action taken.

IF A DRILL HOLE BENEATH THE CANAL MUST BE ABANDONED, THE HOLE SHALL BE BACKFILLED WITH BENTONITE TO PREVENT FUTURE SUBSIDENCE.

When necessary, the bore shall be reamed using 12 inches beyond the product diameter.

THE DRILLING MUD IN THE ANNULAR REGION SHOULD NOT BE REMOVED AFTER INSTALLATION, BUT PERMITTED TO SOLIDIFY AND PROVIDE SUPPORT FOR THE PIPE AND SURROUNDING SOIL.

**INSTALLATION:**

The product shall be jointed according to manufacturer's recommendations. Where space and the Contract Documents permit, the length of the product to be pulled shall be jointed as one length before commencement of the pulling operation.

The product shall be protected from damage during the pullback operation.

The minimum allowable bending radius for the product shall not be exceeded at the entry point, exit point, or any other location along the bore path.

PRODUCT SHALL BE ALLOWED TO RECOVER BEFORE CONNECTIONS TO NEW OR EXISTING FACILITY ARE MADE. PRODUCT RECOVERY TIME SHALL BE ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

After successfully reaming the bore to the required diameter, the product shall be pulled through the bore path. Once the pullback operation has commenced, it shall continue without interruption until the product is completely pulled into bore unless otherwise approved by the Engineer.

A swivel shall be used between the reamer and the product being installed to prevent rotational forces from being transferred to the product. When specified in the Contract Documents, a weak link or breakaway connector shall be used to prevent excess pulling force from damaging the product.

The product shall be inspected for damage where visible at excavation pits and where it exits the bore. Any damage noted shall be rectified to the satisfaction of the Engineer.

Verification record of the alignment and depth of the installed product shall be maintained. A copy of the verification records shall be given to the Engineer at the completion of the drilling operations.

SITE SHALL BE RESTORED AND ANY EXCESS MATERIAL SHALL BE DISPOSED OF.

**Method of Measurement.** Measurement for a multi conduit installation is in feet along the horizontal centerline of the bore between the connecting points. Each bore will be paid for by the foot of each conduit in the bore(s). All materials included joint restraints, HDPE pipe, flanges and connections and drilling material shall be included in this bid item. Any necessary appurtenances for a functioning system shall be included. Incidental items will not be paid for separately. Pressure testing and disinfection will not be paid for separately but shall be included.

**Basis of Payment.** Payment for accepted work will be as follows:

<b>Pay Item</b>	<b>Pay Unit</b>
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Additional Special Provisions	1 / 1 8

SP (Directional Utility 4" Pressure Sewer Bore)  
SP (Directional Utility 8" Water Bore)

FT

Excavation and backfill for restoration will not be paid for separately but will be included in work for Directional Utility 4" Pressure Sewer Bore and Directional Utility 8" Water Bore. Pits shall be backfilled and compacted in accordance with Section 205 Class A compaction.

#### **S911-05D SP REPAIR ROADWAY**

**Description.** The work shall consist of furnishing and installing pavement, ¾" Base and Pit Run materials for the repair of the roadway surface where trenching is required in the roadway. The locations where repair is required is shown on the plans.

**Materials.** The pavement shall be Superpave HMA pavement SP-2. The ¾" aggregate shall be ¾" Aggregate Type B for Base. Pavement, ¾" aggregate and Pit Run shall all be considered small quantities as defined in section 270.02 of the ITD QA Manual.

**Construction.** The construction of the pavement, aggregate and pit run materials shall be as specified in the ITD standard specifications.

**Method of Measurement.** Measurement for a roadway repair is in feet along the horizontal centerline of the pipe between the existing edges of the roadway. All materials and labor including sawcutting, pavement, ¾" base and pit run shall be included in this bid item. Incidental items will not be paid for separately.

**Basis of Payment.** Payment for accepted work will be as follows:

<b>Pay Item</b>	<b>Pay Unit</b>
SP (Roadway Repair)	FT

Excavation and backfill for the trench will not be paid for separately but will be included in work for the water and sewer lines.

#### **S911-05E SP 8" WATER MAIN**

**Description.** The work shall consist of furnishing and installing a 8" Water Main as shown on the plans and according to Division 400 – WATER of the ISPWC.

**Materials.** Materials as shown and as required in Division 400. Water Line shall be 8" AWWA C 900: Polyvinyl Chloride (PVC) Pressure Pipe.

**Construction.** The construction shall meet requirements of Division 400 of the ISPWC. Trenching and backfill shall be included with this bid item and will not be paid for separately. Trenching and backfill shall be according to Division 300 of the ISPWC and shall conform to the Standard Drawing No. SD-301 and SD-302. Crossings of Potable and Non-Potable water line shall be in accordance with Standard Drawing SD-407 of the ISPWC.

**Method of Measurement.** Measurement for 8” Water Main shall be by the foot. All materials and labor including shall be included in this bid item. All incidental items as shown on the detail shall be included in the bid item will not be paid for separately.

**Basis of Payment.** Payment for accepted work will be as follows:

<b>Pay Item</b>	<b>Pay Unit</b>
SP (8” Water Main)	FT

Excavation and backfill for the trench will not be paid for separately but will be included in work for the 8” Water Main.

**S911-05F SP WATER LINE 2” SERVICE**

**Description.** The work shall consist of furnishing and installing a 2” Water Service line as shown on the plans and according to Division 400 – WATER of the ISPWC.

**Materials.** Materials as shown and as required in Division 400. Water Service Line shall be 2” ANSI/AWWA C 901: Polyethylene (PE) Pressure Pipe. The water service connection shall be per Division 400 of the ISPWC and as shown on Standard Drawing No. SD-402.

**Construction.** The construction shall meet requirements of Division 400 of the ISPWC. Trenching and backfill shall be included with this bid item and will not be paid for separately. Trenching and backfill shall be according to Division 300 of the ISPWC and shall conform to the Standard Drawing No. SD-301 and SD-302. The water service connection shall be per Division 400 of the ISPWC and as shown on Standard Drawing No. SD-402. The water service connection and components as shown on the detail shall be included with the bid item SP (WATER LINE 2” SERVICE). Each of the components required in the detail shall be considered incidental to that bid item.

**Method of Measurement.** Measurement for 2” Water Service shall be by the foot. All materials and labor including shall be included in this bid item. All incidental items as shown on the detail shall be included in the bid item will not be paid for separately.

**Basis of Payment.** Payment for accepted work will be as follows:

<b>Pay Item</b>	<b>Pay Unit</b>
SP (Water Line 2” Service)	FT