

PIONEER IRRIGATION DISTRICT
STANDARDS AND SPECIFICATIONS

PIONEER IRRIGATION DISTRICT
Caldwell, Idaho

Revised: February 2017

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Signature Page

Per the Idaho Administrative Code (IDAPA) Section 10.01.02 and Idaho Code Title 42, Chapter 12, Pioneer Irrigation District retained SPF Water Engineering, LLC to prepare the following Pioneer Irrigation District Standards and Specifications to ensure said Standards and Specifications meet the requisite standards of professional engineering thereby safeguarding the life, health, property, and welfare of the public at large. Pioneer Irrigation District personnel are an integral part of the design and construction review process due to their extensive knowledge of the operation, maintenance, and proper function of District facilities. These Standards and Specifications comply with applicable professional engineering standards for the construction of irrigation systems and further comply with the engineering Rules of Professional Responsibility when consulted and used appropriately by design personnel.

Per Idaho Code 54-1218, a licensed professional engineer must prepare the plans and specifications for public works projects as well as supervise or conduct construction observation. Therefore, it is the sole responsibility of the Registered Professional Engineer who is using the Pioneer Irrigation District Standards and Specifications for a specific project to ensure that the Standards and Specifications and drawings are appropriate for the specific use and used appropriately under all circumstances in order to prepare final specifications, drawings, or plans for any given project.



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**PIONEER IRRIGATION DISTRICT
SUPPLEMENTAL SPECIFICATIONS AND STANDARDS**
Effective: February 2017

STANDARD

The provisions of the current edition of the *Idaho Standards for Public Works Construction (ISPWC-2015 Edition)* and the following modifications and supplementation contained herein constitute the Pioneer Irrigation District Standard Specifications for work performed under the administration of the Pioneer Irrigation District, referred to as **PID**. These standard specifications supersede any and all previous standard specifications for **PID**.

PID's water distribution system functions as a continuous flow system. Consequently, any changes in existing canals, ditches, or drains could disrupt the operation of this continuous flow system unless components of this system are preserved and protected.

Therefore, in any proposal which impacts **PID** owned facilities or facilities owned by others which are used by **PID**, or in which **PID** has a property interest, such as a ditch use/irrigation easement or right-of-way, **PID** requires that all such facilities and **PID's** property interest therein be preserved and protected as part of any agreement with the person or entity who presents the proposal to **PID**.

Further, because of the various legal duties owed by **PID**, including those under Idaho Code Sections 42-1201 through 42-1204 and 43-304 and 43-316, among others, and pursuant to the written permission requirements of Idaho Code Sections 42-1102, 42-1207, and 42-1209, any developer/landowner proposing to encroach upon a **PID** easement or facility, including the crossing of the same, or proposing to relocate, realign, modify, or pipe a **PID** facility shall submit a written request to do so in the form of **PID's** Land Use Change/Encroachment Application form. All such requests/proposals are subject to **PID** licensing agreement requirements, and some requests/proposals may be subject to additional **PID** Board hearing requirements under the District's published Procedures for Evaluation of Proposed Encroachments.

Any person or entity proposing modifications to a **PID** facility shall bear the initial expense of the modification, any increased operation and maintenance costs caused by the modification, and the future facility rehabilitation and replacement costs. The **PID** Board of Directors, may waive the future rehabilitation and replacement cost requirement for projects where **PID** determines, in its sole discretion, that the proposed facility modification will provide a benefit to **PID** versus leaving the facility in its current location, state, or configuration.

PID shall also follow these standards for construction projects completed by or on behalf of **PID**.

1100 PRESSURE IRRIGATION SYSTEMS

Proposed developments shall provide pressure irrigation systems meeting the requirements of **PID** and the governing jurisdiction. The developer/landowner or his representative shall contact **PID** prior to pressure irrigation system design to determine the location of the District's delivery point for the pressure irrigation system.

1200 GRAVITY FLOW IRRIGATION

1201 Preservation of Existing Use and Delivery

All proposed development shall protect and preserve existing irrigation water use and delivery pursuant to, and consistent with, Idaho Code Sections 31-3805, 31-3806, and 67-6537. This includes development coordination with **PID** and the protection and preservation of existing irrigation delivery and removal infrastructure.. When existing system preservation is not feasible, development shall provide an independent replacement gravity irrigation system. This system shall ensure delivery of as much gravity irrigation water as was delivered prior to construction/development. The delivery points to adjacent properties shall remain unchanged. The gravity flow irrigation system must be entirely separate from the proposed pressurized irrigation system within a subdivision. Flow rates for all replacement gravity systems shall be obtained from **PID** for design purposes. **PID** recommends that the downstream water users be contacted regarding any changes to be made to their delivery system. Further, please note that developer compliance with the above-referenced Code Sections is not a substitute for the additional requirements of Idaho Code Sections 42-1102, 42-1207, and 42-1209.

1202 Drains

Drains adjacent to and within **PID** boundaries are essential to the District and its patrons for lowering high groundwater, conveying **PID** irrigation supply facility discharges and conveying irrigation return flows.

Any proposed improvements within Drain easements owned, operated or maintained by **PID** require the District's prior written plan approval. Requests to pipe Drains shall be submitted to **PID** and the **PID** Board will consider requests on a case by case basis. A **PID** or **United States Bureau of Reclamation** licensing agreement must be executed prior to construction.

Improvements impacting Drains providing irrigation supply to **PID** conveyance facilities shall be constructed during the deadlines outlined in Section 1300. Construction shall be in accordance to Section 1203 Gravity Irrigation Flow Piping standards at all locations including within road rights-of-way. Drains may require additional channel and bank stabilization as deemed necessary by **PID**.

The following Drains supply **PID** conveyance facilities:

Five Mile Drain, Ten Mile Drain, Fifteen Mile Drain, Elijah Drain, Mason Creek Drain, Pipe Gulch Drain, Purdum Drain, Solomon Drain, and Wilson Creek Drain

Developers/landowners shall contact **PID** to determine acceptable construction deadlines in all other Drains within **PID** boundaries.

Pathways to be constructed within **PID** Drain easements shall be located adjacent to the easement line and shall be no closer than 25 feet from the inside top of the adjacent bank.

Developers/landowners shall contact **PID** for Drain easement determination. Easements shall meet the requirements of Section 1310.

1203

Gravity Irrigation Plan

Any development proposing to relocate and/or pipe a **PID** facility shall provide a conceptual piping plan sent to **PID** for Board review and approval prior to final plan submittal. Proposed conceptual plans shall be reviewed on case-by-case basis.

No utilities shall be constructed within any **PID** easements parallel to canals, laterals, or other conveyance systems. Generally open channel realignment of **PID** owned and operated facilities is not acceptable. Modifications to the open channel will be reviewed for horizontal and vertical alignment.

If open channel realignment is approved by **PID**, no high fill areas or sharp deflections in channel alignment are acceptable. Piping and realignment project construction shall be completed in such a way as to minimize the amount of disturbance to the existing facility as possible.

Within realignment projects, no backfill shall be placed within the existing facility and no connection to existing facilities shall be made until **PID** inspections provide **PID** with a high level of assurance that the newly constructed alignment has been completed to **PID's** satisfaction.

1203.01

Gravity Irrigation Flow Pipe

Typically, gravity flow piping that is to be maintained by **PID** shall be Class III reinforced concrete minimum or Class 125 PVC SDR 32.5 minimum. Pipe shall be labeled with manufacturer information and date of manufacture. **PID** reserves the

right to reject pipe of questionable quality due to age or exposure to sunlight or other adverse conditions.

PVC SDR-35 or Poly-coated aluminized steel type 2 corrugated steel pipe (10 gage minimum wall thickness) may be permitted by **PID** in Drain crossing locations as determined by the **PID** Board on a case by case basis.

In access easements or rights-of-way where pipe is subject to wheel loading, pipe shall be Class IV reinforced concrete minimum, C-900 or C-905 PVC, Pressure Class 235 minimum, or with **PID** Board approval, poly-coated aluminized steel type 2 corrugated steel pipe with 2-2/3" x 1/2" corrugations with a 0.138 inch minimum wall thickness (10 gage). Pipe type and cover shall be sufficient to support a HS-25 loading.

All concrete pipes shall be manufactured in accordance with ASTM C76 Reinforced Concrete Pipe and tested in accordance with ASTM C 497. Joints shall be in accordance with ASTM C 443, Rubber Gasketed Joints. Installed pipe joints shall meet the maximum allowable joint gap requirements per the pipe manufacturer. Concrete pipe labeled non-air tested shall not be installed in **PID** delivery facilities. The **PID** Board and the District's engineer may allow non-air tested concrete pipe at crossings within drainage facilities, to be determined on a case by case basis.

All PVC pipe shall be manufactured in accordance with ASTM D 2241. Joints shall be bell and spigot end with ASTM F 477 elastomeric gaskets.

All aluminized steel type 2 corrugated steel pipe shall be manufactured in accordance with ASTM A760. The aluminized type 2 steel coils shall conform with ASTM A 929.

All gravity irrigation mains shall be a minimum of 12 inches in diameter and shall be designed and constructed to give mean velocities, when flowing full, of not less than 2.5 feet per second, based on Manning's formula using an "n" value of 0.013. Flow rates shall be obtained from **PID** for design purposes.

When a smaller gravity pipe joins a larger one, the invert of the larger pipe should be lowered sufficiently to maintain the same energy gradient. An approximate method for obtaining these results is to place the 0.8 depths of both pipes at the same elevation.

Piping shall be laid with uniform slope and alignment between manholes. Pipe lengths are required to be maximized to reduce the number of joints. Eight (8) foot lengths or twelve (12) foot lengths shall be utilized where possible.

Installation of finder wire attached to the top of pipe may be required as determined on a case by case basis.

If it is necessary to connect two dissimilar pipes together or two similar pipes where factory bell and spigot are not available; band seal couplers made by Mission Clay Products of Corona California, or **PID** Board approved equal, which provide a watertight connection and consistent pipe invert, shall be used.

Pipe bedding materials shall be in accordance with Section 1204.02.02

Pipe shall be provided with the following cover requirements unless otherwise specifically approved by the **PID** Board:

Pipe up to 24-inch diameter shall be provided with a minimum cover of 30 inches, and shall have a maximum cover of 48 inches.

Pipe greater than 24-inch diameter shall be provided with a minimum cover of 30 inches, and shall have a maximum cover of 36 inches, unless otherwise approved by **PID** Board.

1203.01.01 Siphons

No new siphons or inverted siphons are allowed. Siphons or inverted siphons existing prior to construction may be allowed on a case by case basis. If road reconstruction is required for the project existing siphons or inverted siphons shall be removed if possible.

1203.02 Utility Crossings

No above ground wet or pressurized utilities shall be constructed within **PID** easements outside of road rights-of-way.

Overhead utility crossings shall be reviewed and approved by the **PID** Superintendent or Board on a case by case basis, and may require a license agreement for approval.

1203.02.01 Underground Utility Crossings

Underground utility crossings shall be sleeved. Sleeves shall extend the entire width of the **PID** easement. Boring shall be required on all crossings within the Phyllis Canal, Highline Canal, Lowline Canal, and all other facilities and locations deemed necessary by the **PID** Board. Sleeves under open channels shall be smooth steel casing with 3/8-inch minimum wall thickness. Sleeves under piped portions of laterals and drains shall be smooth steel casing with 3/8-inch minimum wall thickness, Class 200 PVC C900 or C905, or High-density Polyethylene with a minimum wall thickness matching an equally sized PVC sleeve.

Underground utility crossings outside of road right-of-way improvements shall cross below **PID** operated and maintained facilities and shall have 5 feet minimum cover from flowline of supply facilities (canals and laterals) to the top outside edge of sleeve and 10 feet minimum cover from flowline of drain crossings to the top outside edge of sleeve.

Underground utility crossings within road rights-of-way shall cross below **PID** operated and maintained facilities and shall have 3 feet minimum inch separation from the bottom of the **PID** facility (pipe or box culvert) to the top of the crossing sleeve or utility.

Fiberglass reinforced composite utility marking posts shall be placed in line with all open channel underground utility crossings of supply facilities at the outside edge of the facility easement. Marking posts shall be labeled "CAUTION BURIED _____ [utility]".

Bollards shall be placed in line with all open channel underground utility drain crossings at the outside edge of the facility easement. Bollards shall be constructed of 8 inch diameter 3/8-inch steel pipe filled with concrete and shall be placed in a concrete foundation a minimum of 2 feet in diameter and 2-1/2 feet deep. Bollards shall extend 4 feet above finished grade and 2 feet into concrete foundation. A sign shall be affixed to each bollard stating "CAUTION: BURIED _____ [utility]".

A **PID** licensing agreement is required for all underground utility crossings.

1203.02.02 Underground Utility Crossings (Live Crossings) During Irrigation Delivery Season

Utility crossings of **PID** facilities during irrigation delivery season are undesirable and generally not acceptable. Live crossings completed by a Utility Company for emergency purposes only (i.e. without power, gas, communications...) may be considered by the **PID** Board on a case by case basis.

The Utility Company shall apply for the crossing using the Land Use Change/Encroachment Application so that each live crossing receives **PID** Board consideration.

The Utility Company shall provide the name of the directional drilling contractor completing the bore. Said contractor shall have competent bore operators to complete the work. The Utility Company shall also provide a hazard analysis identifying all perceived hazards of the bore project and submit for **PID** review. The hazard analysis should include potential for **PID** facility failure, damage to other utility crossings, as well as any other hazards and planned procedures to prevent identified hazards.

Utility crossing design must be reviewed by **PID's** engineering firm. Prior to engineering review, the Utility Company shall agree to pay any additional review costs beyond the standard utility fee. The Utility Company should be made aware additional review costs may be incurred even if the project is ultimately not feasible during the irrigation season.

If the Utility Company's plan and supplemental information satisfies the Board, **PID** will permit an approved crossing through its Utility Crossing Agreement.

The crossing shall be placed under public roadway improvements within road right-of-way and be bored and sleeved. Live crossings will only be considered in locations where the **PID** facility is tiled (i.e. 4 sided box culvert and piped locations).

Live bore sleeves should be a maximum of 4-inches in diameter, be a minimum of 15 feet below the bottom of the canal, a minimum of 25 feet outside of the **PID** easement on each side of the facility.

The length and depth of the bore should be determined based upon topography and geographical conditions as well as the condition of the facility. All utility crossings of live facilities will be site specific. For example, large elevation changes or known rock outcroppings near the facility may negate live crossing of any facility. Boring should be completed from existing road surface.

No bore pit shall be allowed during live facility boring.

Live facility crossings shall not be completed by open trench methods.

Project construction shall be monitored by a **PID** representative during the entire process. Any additional costs to the District for this monitoring should be paid for by the Utility Company.

The Utility Company's contractor shall keep a detailed log of the bore. Said log should be kept updated and include horizontal and vertical alignments of the bore. Said log shall be available for review by a **PID** representative at any time. A detailed bore report shall be delivered to **PID** upon completion of the project.

PID reserves the right, during construction observation, to stop all construction if facility integrity becomes a concern. In the event of a stop work order by **PID**, the Utility Company shall plug the bore cavity throughout its length with a pressure grout or equivalent. No additional attempts to cross the live facility will be allowed after a stop work order by **PID** is issued.

1203.03.02 Aerial Utility Crossings

All aerial utility crossings must receive approval of **PID**. **PID** will review and approve aerial utility crossings on a case by case basis, and may require a license agreement for approval.

All upgrades to existing overhead crossings shall meet Idaho Power Company minimum standards.

If approved by **PID**, new overhead crossings shall be a minimum of 18-feet of clearance spanning the entire width of the **PID** easement.

Additional separation may be required by other jurisdictions.

1203.03.03 Minor Utility Appurtenances

Above ground minor utility based appurtenances may be allowed to be placed within **PID's** easements through a Utility Agreement. All appurtenances and the locations of said appurtenances proposed within a **PID** easement will be reviewed by **PID's** Superintendent and/or Board on a case by case basis. Information regarding the appurtenance necessity, size, use, and location shall be provided to **PID** to enable review. Appurtenances causing a void below existing ground elevations will be denied. An excessive number of appurtenances proposed within a **PID** easement, or appurtenances interfering with **PID's** use of its easement, may be required to be placed outside of **PID's** easement or be exempt from using a **PID** Utility Agreement. All minor appurtenances must have the ability to be removed or secured during **PID's** maintenance activities.

Minor utility appurtenances that may be allowed by **PID** under a Utility Agreement include power poles and guy wires (replacement only), light poles, utility location markers, traffic signs, Jersey barriers, and guard rails.

1203.03.04 Temporary Irrigation Crossings

Temporary irrigation crossings may be allowed with **PID** approval at appropriate locations. Proposed fill extents and depths shall be detailed and discussed with **PID's** superintendent for proper consideration of any request to install a temporary crossing. Temporary crossings requiring excessive fill or any excavation within **PID** easements will not be allowed. Temporary crossings requiring a carrier pipe greater than 12-inches in diameter will require additional **PID** Board review.

Pipe proposed for a temporary irrigation crossing shall support HS- 25 loading with the manufacturer's minimum recommended cover. The Applicant shall furnish pipe manufacturer's specifications and/or loading calculations to provide the District with reasonable assurance the HS-25 and conveyance loading can be supported. Pipe must be in good quality condition. Pipe of questionable quality due to age,

ultraviolet damage, oxidization, lack of documentation, or other issues suggesting questionable pipe integrity will not be allowed within temporary crossings.

Approved temporary irrigation crossings shall not be constructed until a licensing agreement has been executed by the Applicant and the District. Applicant shall contact **PID's** Superintendent for temporary irrigation crossing licensing agreement requirements. Temporary crossing construction shall be scheduled with the **PID** superintendent to prevent interference with **PID** operation and maintenance activities and must be completed between November 1st and March 1st.

1204 Pipe Installation

1204.01 General

All pipe shall be assembled and installed in accordance with the pipe manufacturer's recommendations and as shown on the project engineering plans/drawings. All gravity irrigation mains shall be installed with the bell end upstream and spigot end downstream.

Pipe joints shall be wiped clean of all dirt, grease, and foreign matter. When work is halted, all open ends of the installed pipe shall be sealed to prevent material from entering the pipe.

Field cut pipe ends shall be beveled to match factory-finished beveled pipe ends.

Reinforced Concrete Pipe (RCP) joints shall be in accordance with ASTM C 443, Rubber Gasketed Joints. Installed RCP pipe joints shall meet the maximum allowable joint gap requirements per the pipe manufacturer.

When assembling gasketed PVC pipe, clean and inspect gaskets, pipe bells, and spigots thoroughly. Use only lubricant furnished or specified by the pipe manufacturer and apply as specified by the manufacturer.

1204.02 Pipe Installation--OUTSIDE Street Rights-of-Way

All work outside street rights-of-way shall meet both these specifications and the current *ISPWC* specifications including:

1204.02.01 Excavation

Utilities encountered within the pipe zone shall be relocated below the pipe zone. Topsoil shall be stockpiled and used for the top layer during backfill. New utility crossings shall cross below **PID** facilities. For the purposes of this standard, the pipe zone shall be defined as any area within 12 inches of the outside edge or bell of the pipe.

A minimum of 36 inches of clearance between outside bell of pipe and the utility shall be maintained. Clearances less than 36 inches shall be reviewed by the **PID** Board and approved on a case by case basis.

1204.02.02 Pipe Bedding Material

Pipe bedding and zone material shall be included in the full width of the trench from four (4) inches below the bottom of the pipe to six (6) inches above the top of the pipe. Pipe bedding system shall be Class A-1 within public right-of-way, which includes Type I bedding materials in the upper and lower bedding zones, unless otherwise approved by PID. Pipe bedding system shall be Class A-2 for all areas outside of right-of-ways, which includes Type I bedding materials in the lower bedding zone and Type II or III bedding materials in the upper pipe zone unless otherwise approved by PID.

CLASS A-1 BEDDING SYSTEM

- A. Place Type I Bedding 4 inches below the bottom of the pipe (6 inches for pipes, 30 inches and larger), to 6 inches above the pipe.

CLASS A-2 BEDDING SYSTEM

- A. Place Type I Bedding 4 inches below the bottom of the pipe, 6 inches for pipes 30 inches and larger, to springline, then place either Type II or Type III bedding to 6 inches above the pipe.

Type I Bedding Materials

Type I pipe bedding material shall be ¾-inch 60% crushed or fractured (at least on one side) gravel or sand meeting the following gradation and in accordance with Division 300 Section 305 Part 2 of the latest edition of the I.S.P.W.C.:

<u>Sieve Size</u>	<u>Percent Passing</u>
1 inch	100
¾ inch	80-100
⅜ inch	20-70
No. 4	5-20
No. 8	0-5
No. 200	0-3

Type II Bedding Materials

Type II Aggregate Material: Use for Foundation Stabilization meeting the following gradation and as otherwise specified in Section 801 – Uncrushed Aggregates in the latest edition of the I.S.P.W.C..

Sieve Size	Percent Passing
3 inch	100
No. 4	25-60
No. 200	0-12

Type III Bedding Materials

Sand with 100% passing the No. 4 sieve and less than 3% passing the No. 200 sieve.

Pipe base material shall be placed and compacted sufficiently to preclude future settlement. Compaction of pipe zone and trench backfill material shall begin when there is sufficient cover to protect the pipe from damage. For the purposes of this standard, the pipe zone shall be defined as any area within 12 inches horizontally, 4 inches below, and 6 inches above the outside edge or bell of the pipe.

PID may require silt or bentonite backfill materials within the pipe zone to prevent water migration into the pipe bedding adjacent to headwalls and in critical open channel locations.

All bentonite backfill materials referenced throughout the **PID** Standards and Specifications for construction shall be 50% bentonite with 50% fine grained native materials. If native materials are sands and gravels, fine grained materials shall be imported from off site and be mixed to the percentages above.

1204.02.03 Trench Backfill Above Pipe Zone

Native trench material free from cinders, ashes, refuse, organic and frozen materials, cobbles or rocks not larger than six (6) inches may be used. Trench backfill above that required to protect the pipe shall be placed in two (2) lifts and compacted sufficiently to preclude settlement. Mechanical compaction and/or water settling shall be used to compact backfill. Topsoil shall then be placed, compacted and graded.

PID may require silt or bentonite backfill materials within the trench backfill above the pipe zone to prevent water migration into the pipe bedding adjacent to headwalls and in critical open channel locations.

1204.03 Pipe Installation--INSIDE Street Rights-of-Way

All work inside street rights-of-way shall meet these specifications, the specifications of the governing agency, and the current *ISPWC* specifications. If specifications differ or conflict, the more stringent specification shall govern.

1205 Concrete Structure Requirements For Gravity Systems

Unless otherwise approved by the **PID** Board, all structures shall be cast in place reinforced concrete boxes and spacing shall be a maximum of 400 feet and at all horizontal angle points and changes in pipe grade. Irrigation boxes shall be sized so that the outside diameter (O.D.) of the pipe is a minimum of 6-inches clear from the nearest inside corner of the concrete structure.

Pipes shall be installed flush with the inside concrete wall. Structures shall be constructed without sumps. Waterstop shall be installed at all cold joints. Bentonite rope shall be placed around all pipe penetrations prior to concrete placement. Structure top shall be a minimum of 1-foot above and a maximum of 4-feet above finished grade. Polypropylene coated manhole steps may be required and, if required, shall be installed on the upstream side of the gravity irrigation structures.

1205.01 Inlet and Outlet Structures

Inlet and outlet structures shall be designed so that the upstream hydraulic grade line remains the same or is reduced at full flow. **PID** reserves the right to require vent piping near gravity irrigation structures. Vent piping will be considered on a case-by-case basis. Structures shall be concrete in accordance with Division 700 of the latest edition of the ISPWC.

Inlet and outlet structures shall be constructed with wing walls extending 1-foot minimum into the canal bank at the high water elevation. Top of structures shall be 1-foot minimum above the high water elevation. The top of the wing walls shall be 4-inches below top of bank in areas adjacent to irrigation facility access roads.

PID's Board may, on a case by case basis, require the wing walls be extended from the structure to the catch point of the slope, a minimum of 1-foot above high water elevation, in areas of substantial slope.

All joints shall be watertight and backfill shall be compacted to 95% of standard proctor as determined by ASHTO T99 Method A. Compaction effort shall meet the requirements of ISPWC Division 200 Section 202 Class A Compaction. Soil backfill material shall meet the requirements of ISPWC Division 200 Section 203 – Soil Materials Subsoil Types S3 or S4. Preferably S4 if it is available on-site. Material shall be placed and compacted in 6-inch lifts.

See **PID** Standard Drawing No. P-1209.

1205.02 Concrete Liner

Concrete liners shall be placed on any commercial or residential development adjacent to and below a **PID** facility within high fill areas, **PID** Board approved

realignment of **PID**'s open channel supply facilities, and may be required by **PID** in order to approve modification to or grading changes adjacent to **PID** supply facilities in areas of concern as determined by the Board.

Concrete liners shall be a minimum of 4-inches thick and shall at a minimum match existing channel dimensions. Side slopes shall not exceed 2:1 and liners shall extend a minimum of 1-foot above the high water elevation or to the top of bank. The concrete mix shall have a final minimum strength of 3,000 psi. Reinforcing fibers shall be added to the concrete mix at a minimum rate of 1.5 pounds per cubic yard of concrete. The individual fibers shall be 1/2 inch to 3/4 inch in length and shall be blended into the concrete mix according to the manufacturer's specifications.

Control joints shall be 1/4" wide perpendicular to the centerline of the concrete lining, at a depth equal to one-third of the lining thickness with a uniform spacing not to exceed 12 feet. Construction joints shall be the butt type, formed square with the lining surface and at right angles to the **PID** facility. Control and construction joints shall have smooth finishes.

AquaLastic®, AquaSeal™, or an approved equal shall be applied to all expansion joints to a minimum of 1 foot above high water elevation. Areas to be coated or sealed shall be sandblasted and cleaned in accordance with manufacturer's recommendations prior to applying coating.

Waterstop at cold joints and waterproofing products such as AquaLastic®, AquaSeal™, Xypex®, or approved equivalents may be required to seal the concrete liner as determined by the **PID** Board on a case by case basis.

Polypropylene coated manhole steps shall be installed in the concrete liner to create exit areas. Exit areas shall be a maximum of 400 feet apart. Manhole steps shall be firmly embedded and shall withstand ASTM C-497 pullout testing. Steps shall be aligned vertically and spaced 12-inches vertically on center. Manhole steps shall be placed no greater than 16 inches from bottom of liner and no greater than 24 inches from top of liner.

1206

Bridges/Crossings

The location and size of all bridges and box culverts, both new and replacement, shall be approved by the Board. All bridges and crossings that may accommodate vehicular traffic shall accommodate HS-25 loading.

Private bridge crossing locations, intended use, and design shall be reviewed and approved by the **PID** Board on a case by case basis. Pedestrian/other bridges shall meet local government requirements based on nature of use.

1206.01 Structures

Bridges and box culverts shall meet the following general requirements:

- (a) Span shall be from top of bank to top of bank without center supports.
- (b) A 1-foot minimum clearance between high water and the lowest appurtenances of crossing shall be maintained.
- (c) Maintenance shall be by the party operating said crossing and they shall execute the required **PID** licensing agreement.
- (d) Improvement plans for bridges shall be designed by a structural engineer and bridges supporting vehicular traffic shall accommodate HS-25 loading.

1207 Control Structures

1207.01 Weirs

Weirs shall be placed on all new or modified delivery locations unless water surface elevation head differences are inadequate for the weir to operate properly. Weirs shall be placed in a weir box with engineered scale depth gauge. See detail P-1211.

Weirs shall be owned and operated by **PID**, and weir easements shall be granted to **PID** for all weir structures.

1207.02 Checks

Checks utilizing 2-inch wide 1-1/2 inch deep notches into the concrete check structure wall shall be placed in all control structures less than 60-inches in width.

Checks utilizing 3-1/2 inches wide 2 inch deep notches into the concrete check structure wall shall be placed in all control structures 60 inches or greater in width.

Check notch location shall be determined by flow rate and size of structure. Check notches shall be located a minimum of 12 inches from the downstream check structure wall.

Bolts for necessary check rails shall be cast in place or shall not be installed via drilling and Redhead or expandable bolts or lags until the recommended cure period for the concrete mix design.

1207.03 Gates

Waterman C-10 canal gates or approved equal shall be used. Gates shall be installed in accordance with manufacturer's requirements. Canal gate wheel height

shall be a minimum of 2-7/8 inches above structure and a maximum of 6 inches above structure.

Bolts to attached gates shall be cast in place or shall not be installed via drilling and Redhead or expandable bolts or lags until the recommended cure period for the concrete mix design.

Slide gates are not acceptable.

1208 Final Observation Prior to Warranty Period

1208.01 Polyvinyl Chloride Pipe

PVC pipe shall be tested in accordance with ISPWC Division 500 Section 501 Part 3.4. Testing is required for PVC piping that is to be owned, operated, and maintained by **PID**. Governing agency requirements shall be met when crossing rights-of-way and easements. Final pressure testing shall be conducted after all utility installation is completed and before any asphalt is placed. Final acceptance and warranty period will not occur or commence prior to a passing pressure test.

1208.02 Reinforced Concrete Pipe and Poly-coated Corrugated Aluminized Steel Pipe

RCP and poly-coated CSP piping that is to be owned, operated, and maintained by **PID** shall be visually inspected by **PID** personnel and its engineer after all utility installation is complete and before any asphalt is placed. Any defects found during inspection shall be corrected and re-inspected. Gasketed RCP shall be pressure tested in the presence of the Engineer in accordance with ISPWC Division 500 Section 3.4. Final acceptance and warranty period will not occur or commence prior to a passing inspection and pressure test.

1209 Street Crossing Requirements

Street crossings shall be placed no closer than 200 feet from the nearest edge of any street crossing to nearest edge of another street crossing.

Concrete structures are to be placed outside of, and on both sides of, the right-of-way or ingress/egress easements. Structures shall conform to the *Concrete Structure Requirements For Gravity Systems*.

A minimum 12 foot wide, 20 foot long access road shall be constructed from the street crossing to the irrigation facility easements on **all** sides of street crossing for **PID** access. Said access roads shall be a minimum of 8 inch depth of ¾" minus road mix from back of walk or paved surface to existing grade at the irrigation facility. Access road slopes shall not exceed 5%. Concrete driveway approaches shall be constructed within vertical curb street crossings to facilitate access.

1210 Structure Lids

Structure lids in rights-of-way or ingress and egress easements shall be HS-25 wheel load rated. Structure lids outside of rights-of-way and ingress/egress easements shall be designed to withstand a 300 lb point load with a maximum allowable deflection of ½ inch at center span and in accordance with the International Building Code. Lids exceeding a 6 foot span shall be engineered. Lids shall be expanded metal and provide access to control structures inside the box via hinged access ports. Lids shall be bolted in place with a minimum of 4 (four) bolts with the access port to allow unobstructed access to the downstream side of the structure without bolt removal. Lids shall have a chain ring near canal gates to secure gates with a chain. Bolts and chain rings shall be cast in place or shall not be installed via drilling and Redhead or expandable bolts or lags until the recommended cure period for the concrete mix design. Canal gates shall be accessible without opening lid. All lids shall have a locking mechanism approved by **PID**.

See **PID** Standard Drawing No. P-1210.

1211 Method of Measurement and Basis of Payment (For PID Projects)

The following items shall constitute pay items for the work covered under this section of the specifications. Payment for these items shall be full compensation for providing all materials, tools, labor and equipment necessary to complete the item and all incidental work related thereto, whether specifically mentioned herein or not:

1211.01 Gravity Mains

Measurements of irrigation mains shall be made in lineal feet along the centerline of pipe through all boxes, control structures and appurtenances. Payment for gravity irrigation mains will be made at the contract unit price bid per lineal foot of the various sizes called for, which price shall include excavation and backfill and furnishing and installing pipe, fittings, boxes, control structures and headgates; cleaning and testing the pipe and all other work necessary or incidental for completion of the item as shown on the approved plans, unless otherwise specified in the "Special Provisions." Payment will be made under:

1309.01.01 _____ "Gravity Irrigation Main, Class _____Lineal Foot

1300 ADDITIONAL REQUIREMENTS

1301 Construction Deadlines

1301.01 Construction Dates

All construction/installation within **PID's** easements shall be completed between November 1st and March 1st of the following year. Once the deadline of March 1st arrives, all construction projects must be completed and no further projects may begin until the next November 1st.

A construction schedule shall be provided to **PID** at the pre-construction meeting. If **PID** has additional input to minimize impacts to existing facilities, the developer/landowner and contractor shall implement **PID's** input.

1301.02 Construction Postponement

PID reserves the right to postpone or halt construction on a project if the March 1st deadline is not achievable, or the integrity of the **PID** facility could be jeopardized by adverse construction techniques or conditions. Any exceptions shall be approved by the **PID** Board on a case by case basis.

1302 Financial Responsibility

1302.01 Developer/Landowner Proposed Projects

PID facilities shall remain fully operational and in place during realignment project construction with minor modifications. Minor modifications shall include, but are not limited to, ditch restoration, including minor backfill, removal of backfill, or shaping of the existing facility. Structure removal, headgate installation, and structure construction, among other construction activities, are not minor modifications. Due to adverse site conditions, along with other matters, the **PID** Board may determine no modifications are acceptable within **PID** easements until all improvement construction outside of **PID** easements has been constructed and approved by **PID**.

Upon final **PID** approval of the realignment construction, the existing facility may be abandoned and removed. If the realignment project is not completed to **PID's** satisfaction, the property developer/landowner shall remove obstructions to and restore the original facility. If the developer/landowner fails to remove obstructions, and restore the original facility, **PID** may, after providing prior written notice to the developer/landowner, either perform the removal and restoration work or cause it to be performed and the developer/landowner will be billed for **PID** costs.

If it is necessary to build within the existing facility, thus rendering the facility inoperable with approved minor modifications, the property developer/landowner shall submit a cost estimate for the project to **PID's** engineer. **PID's** engineer will confirm the validity of submitted costs. The developer/landowner shall provide five

percent (5%) of the confirmed project costs, to be deposited with **PID** in the form of a cashier's check payable to **PID**, at the time of execution of the applicable license agreement by the developer/landowner. **PID** shall refund this deposit if the construction is completed by March 1st, and in accordance with the terms of the agreement.

In the event the developer/landowner fails to complete the **PID** improvements, or in the opinion of **PID's** Board or superintendent and **PID's** engineer, cannot complete the project as set forth herein by March 1st, **PID** may, after providing prior written notice to the developer/landowner, either complete the project or cause it to be completed. In taking such action, **PID** may charge against the five percent (5%) deposit reasonable costs, including inspections, tests, or retests (whereby test results of the materials to be used and/or installed are shown not to conform to approved project specifications), liquidated damages, costs of litigation and reasonable attorney fees, which shall include paralegal fees and appellate fees. Developer/landowner shall be liable for any expenses incurred over and above the amount of the deposit.

If construction is not completed by March 1st in a manner which allows for the adequate delivery of water, the developer/landowner will pay non-refundable liquidated damages of two hundred dollars (\$200) per day until construction is completed and approved by **PID**. **PID** may, after providing prior written notice to the developer/landowner, intervene and either complete the project or cause it to be completed to ensure adequate delivery of water to patrons if it deems necessary. Developer/landowner may be required to forfeit the five percent (5%) deposit outlined above to **PID** if **PID** intervenes. Remedial work will be performed at the sole convenience and discretion of **PID**. **PID** will use the deposit to offset costs incurred by **PID**. The developer/landowner shall pay all additional costs not covered by the deposit to complete corrective work. Any unused deposit will be refunded to the developer/landowner.

1302.02 Bonding for PID Contracted Projects

If the project improvements are to be completed on behalf of **PID**, the contractor completing construction for **PID** shall furnish **PID** with a cash deposit or a one-year irrevocable letter of credit, with a one-year automatic renewal clause (hereinafter identified as "Instrument"). The amount of the Instrument shall be 110% of the estimated cost of any improvements associated with the irrigation system, to be constructed. The Instrument shall have an effective minimum term of one-year and, further shall ensure performance of the contractor's obligation(s) as designated on the approved plans. The Instrument shall only be issued by a financial institution authorized to do business in the State of Idaho.

In the event the contractor fails to complete the **PID** improvements, or in the opinion of **PID's** Board or superintendent and **PID's** engineer, cannot complete the

project as set forth herein by March 1st, **PID** may, after providing prior written notice to the contractor, either complete the project or cause it to be completed. In taking such action, **PID** may charge against the Instrument reasonable costs, including inspections, tests, or retests (whereby test results of the materials to be used and/or installed are shown not to conform to approved project specifications), liquidated damages of two hundred dollars (\$200) per day until construction is complete, costs of litigation and reasonable attorney fees, which shall include paralegal fees and appellate fees. Contractor shall be liable for any expenses incurred over and above the amount of the Instrument.

1303 Request Deadlines

To allow adequate time for project review, licensing and construction completion, requests for crossings that interfere with the function of a Pioneer Irrigation District facility, or for relocations or piping of any segment of Pioneer Irrigation District's irrigation system, shall be submitted on or before November 15th, unless otherwise provided herein, for construction activities to be considered which will be completed prior to March 1st of the following year.

1304 Delivery Point

PID will designate a site within the proposed subdivision plat, short plat subdivision, lot, tract, parcel or site for water delivery into the new system.

Where **PID** delivery facilities exist on the property being divided, piping shall be designed for delivery from that point unless otherwise designated by **PID**.

Where **PID** facilities do not exist on the property being divided, **PID** will designate the delivery point based on proximity to **PID** facilities, and efficiency and accuracy of delivery over a Cipolletti weir.

Connection of a pressure irrigation system to **PID** facilities shall include a continuous gravity overflow to prevent water level fluctuation within the **PID** delivery ditch/pipe in the event of pump station shutdown or failure.

Projects connecting to a new or existing pressure or gravity irrigation system must obtain irrigation water from the original supply facility or obtain **PID** Board approval to deviate from the original delivery point. Verification that the subject property is within **PID** boundaries shall be made prior to design and construction of the irrigation system. Water supplied by **PID** shall not to be used on property outside of **PID** boundaries. Projects removing an existing delivery point shall provide written agreement of the downstream water users to connect to a municipal or private facility that obtains irrigation water from a **PID** supply facility as stated above. If the downstream water users will not provide an agreement the existing delivery point shall remain in place and functioning.

1305 Contractor Licensing

All Contractors working on or installing irrigation facilities shall hold and be currently licensed as Public Works Contractors in the State of Idaho. Contractors shall be licensed to perform the type of construction involved to construct gravity irrigation systems.

1306 Plan Submittal and Review

Any and all proposed modifications, changes, removal or addition to any structure, equipment, piping, component, facility, canal, ditch, lateral, or any other conveyance facility owned, operated, or maintained by the **PID** shall be designed by an engineer licensed in the State of Idaho and plans and specifications shall be submitted to the District for review by the District's engineer. After the design engineer adequately addresses all District engineering comments, the District engineer will recommend approval of the improvement drawings. Final improvement drawing approval is subject to the approval of **PID's** superintendent.

Submittals must include the current Land Use Change/Encroachment Application on file with **PID** (an example of which is found on Page 30 of this publication). The developer/landowner must fill out the top portion of the form as indicated, and must include the following:

- A vicinity map of the project and detailed plans and specifications for the entire project, including the encroachment
- Legal Description that encompasses all property affected by project
- Warranty Deed for property involved in project
- A short written description of the proposed encroachment into **PID's** facilities
- Administrative, engineering, and legal fees

Incomplete submittals are **not acceptable for review** and will be rejected, and the applicant will be notified in the case of incomplete submittals. Electronic submittals are acceptable for review, however once plans are approved the applicant shall provide **PID** two (2) hard copies of the approved plans.

Review and approval by **PID** does not constitute an engineering review of project plans, specifications, or calculations. The sole purpose of the review is to ensure general conformance with **PID** policies, standards and requirements. The design engineer is solely responsible for the design including all project plans, specifications, or calculations. All submittals shall be stamped and signed by a Professional Engineer registered in the State of Idaho. All plan review submittals for subdivision projects shall include a final plat and all projects shall include a complete set of plans.

Upon approval of the final design, **PID** shall be provided electronic files of the approved design.

To compensate **PID** for its costs and expenses in reviewing proposed development plans, a Review Fee will be charged. Plan Review Fees are due in full when plans are submitted with the Land Use Change/Encroachment Application to **PID** for review and unused fees will be refunded. Continuing progress or delivery of license agreements may cease, if payments are not received.

The Plan Review Fee Schedule is:

***Minimum Base Review Fee:**

\$1,050 Plus \$5 Per Parcel or Lot for Initial Review.

*Any costs in addition to the above amounts shall be at the District engineer's prevailing rates.

Upon receiving engineering plan approval the developer/landowner shall execute a **PID** licensing agreement for any proposed construction modifying or impacting **PID's** facilities or property interest. The license agreement shall be executed and recorded before any construction activities relating to **PID** facilities begin, unless **PID** authorizes otherwise on a case by case basis.

Prior to finalizing the licensing agreement **PID** will require verification that any project crossing, modifying, altering, encroaching, encumbering, utilizing, or boring within **PID's** easement has received a Section 404-Permit as required by the Clean Water Act from the United States Army Corps of Engineers. A non-jurisdictional waiver letter will be required if a 404-Permit is deemed unnecessary by the Army Corps of Engineers. Electronic correspondence of the 404-Permit or non-jurisdictional waiver letter from the United States Army Corps of Engineers is acceptable.

The project developer/landowner shall be responsible for reimbursing **PID** for the costs incurred negotiating, preparing, and executing the required licensing agreement. Continuing progress or delivery of license agreements may cease, if payments are not received.

1307

Construction Observation

The contractor's surveyor shall verify the existing flowline, top of bank, and toe of slope match the approved plans both horizontally and vertically prior to construction