

**PRESSURIZED
SECONDARY WATER CONSTRUCTION
SPECIFICATIONS**

For

**Davis and Weber
Counties Canal Company**

Approved 6-17-2020

SECTION 1: GENERAL QUALITY CONTROL REQUIREMENTS

1.1 SCOPE: This section defines the general requirements a DEVELOPER (defined to include developer, contractor, subcontractors, or owner) must meet when installing a Secondary Water system in a new subdivision or new area, to be accepted and maintained by the Davis and Weber Counties Canal Company (DWCCC). Any questions regarding these specifications should be directed to the DWCCC at (801) 774-6373

1.2 APPLICATION FOR SERVICE: The DEVELOPER shall give notice to DWCCC of their intention of providing secondary water to a new subdivision by completing an application for service and paying appropriate review fees at the DWCCC office.

1.3 SECONDARY PLAN: The DEVELOPER shall send TWO (2) sets of plans, stamped by a Professional Engineer, for the secondary water system, showing location, type, size, and class of:

- a) Pipe & fittings - including depth of cover and relationship to other utilities in plan and profile
- b) Services - typical detail required, including type of fittings, saddles and meters.
- c) Valves
- d) Drains
- e) Thrust Blocks
- f) Metallic Indicator Tape
- g) Air Vacs
- h) Pressure Reducing Stations (if required)
- i) Detectable Locating Wire
- j) Location of Meter Boxes/Enclosures

Pipelines shall be designed to meet the demands of the development. Design must also provide for future extension to adjacent development. In the event that DWCCC determines that a larger line is needed to meet future demands of the system, the DEVELOPER shall be responsible to install the up-sized lines up to 12" (If pipes larger than 12" are required, then the difference of said pipe costs and installation will be paid by D&W). All mains shall be installed to the boundary lines of the subdivision.

DWCCC should receive a master plan of the total property to be developed and a preliminary plat of the subdivision. DWCCC will then determine the water allotment requirements, identify any existing DWCCC easements in the area, determine the best connection source for the subdivision, and determine inspection and review fees required by DWCCC.

Once the secondary water plans are reviewed, DWCCC will provide a review letter showing required changes, if any. Once the changes have been made, a revised set of drawings shall be resubmitted for final approval. Once final approval has been given there is to be a set of 11X17 set of plans delivered to the DWCCC office for the secondary supervisor and his inspection processes.

1.4 FINAL SECONDARY PLANS: The final plans are reviewed by DWCCC and if all requirements are met, DWCCC will send the DEVELOPER and CITY, a letter of approval. DWCCC requires that all necessary fees be paid and all requirements be met prior to connecting the proposed secondary water system to existing DWCCC facilities.

1.5 BONDS: Before construction begins, DWCCC reserves the right to require the DEVELOPER to furnish DWCCC with a PERFORMANCE BOND, warranting 100% of the cost of the secondary system. This warranty shall extend for one year following an approved inspection and the system being put into operation. In typical developments, the CITY requires such bonding as part of their overall bonding amount.

1.6 PRECONSTRUCTION MEETING: Following approval of the secondary water system plans, the CITY and/or DEVELOPER shall invite DWCCC to a preconstruction meeting to discuss the plans, clarify any items, or bring up any problems they may encounter during the review process. At the conclusion of the preconstruction meeting, if all concerns are answered, all fees are paid, and water is transferred (if needed), then DWCCC will give approval to proceed. At this meeting the developer and contractor will be asked to sign a form that they have received from DWCCC or have access to the current Specifications and policies approved by our Board of Directors. The Davis & Weber Counties canal reserves the right to change the current specifications within reason to the developer and contractor, so long as costs and availability are similar.

1.7 CONSTRUCTION INSPECTIONS: All construction work involving the installation of the Secondary Water system must be inspected by DWCCC. It shall be the responsibility of the DEVELOPER to ensure that these inspections take place where and when required. Failure to have the system installation inspected before backfilling occurs, will result in requiring the DEVELOPER to uncover the system again at the DEVELOPER'S expense. DWCCC will not allow any connections to their existing systems be made unless the subdivision system installation has been inspected and approved by DWCCC. Points of required inspection include:

- Pipe installation, including backfilling.
- Services, including connections to main line and meter box/meter installation.
- Valves
- Drains
- Air-Vacs
- Pressure Reducing Station (as required)
- Thrust Blocks
- Proper installation of metallic indicator tape.
- Proper installation of detectable locating wire.
- Connection to existing lines.

1.8 REQUESTS FOR INSPECTIONS: Requests for construction inspections shall be made to DWCCC by the DEVELOPER or CONTRACTOR not less than two (2) business days in advance of the start of work requiring periodic inspection, unless

specific advance written approval is given otherwise by DWCCC.

1.9 PRESSURE TESTING: After the proper installation of the system, but before connection to DWCCC's existing lines, the DEVELOPER shall hydrostatically pressure test the subdivision system. This test must be witnessed in person by DWCCC. (REFERENCE SECTION 6)

1.10 COMPACTION TESTING: At the discretion of DWCCC, density testing may be required. All in-place density testing shall be coordinated and paid for by the DEVELOPER. Any tests failing to meet 95% of modified proctor or the standards of the local governing agency will be retested at the CONTRACTOR's expense. (Typically such testing requirements will be per the governing body whose roadway the pipe installation is within.)

1.11 PLACEMENT OF INDICATOR TAPE: Metallic indicator tape marked "Irrigation Water" and 3" in width shall be used when installing DWCCC waterlines. The indicator tape shall be installed at a maximum depth of 12-inches below subgrade, but shall not be any closer than 12-inches above the top of the waterline.

1.12 PLACEMENT OF LOCATING WIRE: 12-gauge copper locating wire shall be installed with all DWCCC main waterlines. The locating wire shall be placed under the bottom haunch of the waterline and shall be terminated and accessible at all valve boxes, meter pits and air/vac structures. All splices should be connected by a 3M Direct Bury Splice connection. (equals are allowed)

1.13 STAKING SERVICE METER BOXES: The DEVELOPER shall mark every meter box with a 2"x2"x4' wood stake before final inspection. The stakes shall remain in place until the subdivision is fully developed, and/or home is completely built and landscaped. Should only be removed by DWCCC personal at time of inspect and unlock.

1.14 FINAL INSPECTION: An inspection shall be made by DWCCC after all construction work is completed. All faulty or defective work shall be corrected by the CONTRACTOR within a period of fifteen (15) days. Once all roads are paved and DWCCC's operational valves brought to the surface, DWCCC will assume operational control of the system.

1.15 DRAWINGS: All references within these specifications to "The Drawings" shall mean DWCCC's own construction drawings attached, or such other construction drawings as shall be pre-approved in writing by DWCCC.

1.16 GUARANTEE OF WORK: Although DWCCC performs regular inspections during installation to ensure compliance with DWCCC specifications and standards, the CONTRACTOR is ultimately responsible for all workmanship in regards to construction of the secondary water system. The DEVELOPER shall warrant and guarantee that the secondary water system provided for, and every part thereof, will remain in good condition and not fail for a period of one (1) year, following the Final Inspection

approvals. **The city/county processes of bringing their systems into the one-year warranty period will govern the one-year warranty. Requirements and periods will be different for every city/county area and will follow those requirements for which the development/project resides in.** The DEVELOPER agrees to make all repairs to and maintain the system, and every part thereof, in good condition during the warranty period with no expense to DWCCC.

1.17 TAKEOVER INSPECTION: DWCCC shall perform a takeover inspection at the conclusion of the one (1) year warranty period. **The city/county processes of removing the development from the one-year warranty and assuming full operational control and maintenance will govern the takeover inspection. Requirements and periods will be different for every city/county area and will follow those requirements for which the development/project resides in.** Notice of all items needing repair will be forwarded to the DEVELOPER in writing and said repairs shall be completed within (30) days of notification. DWCCC will assume operation and maintenance of the system only when all repairs have been completed, inspected and deemed acceptable. A final acceptance memo shall be provided to the developer and city by DWCCC upon completion of all the punch list items provided to the developer after the takeover inspection.

1.18 AS-BUILT DRAWINGS: The DEVELOPER shall submit one set of as-built drawings to DWCCC following construction of the subdivision secondary water system. This shall include a PDF version and 11X17 paper copy of the plat and record/as-built improvement drawings.

1.19 GPS SHOTS: During installation of the entire secondary water system, all fittings, connections, etc. will need to be left open for a GPS shot. A 48 hrs. notice minimum will be given to the inspector. After this notice, the inspector has a minimum of 24 hrs. to acquire the GPS shots.

SECTION 2: EXCAVATION AND BACKFILL FOR PIPELINES

2.1 GENERAL: The work under this specification consists of furnishing all labor, tools, materials, equipment, and in performing all operations in connection with the excavation, trenching, and backfilling for underground pipelines and appurtenances.

2.2 GROUNDWATER CONTROL: Trenches must be kept free of standing water during excavation, pipe installation and jointing, and pipe bedding operations. If the static level of ground water is above the bottom of the trench, such water must be lowered to the extent necessary to keep the trench free of water and stable when work is in process. Surface water shall also be kept from entering the trench.

2.3 EXCAVATION FOR PIPELINES: Trenches for pipelines shall be to the depths and widths required to accommodate the construction of the pipelines. The main pipelines must be installed in a line parallel to the top-back of the proposed curb based on typical cross sections in the respective municipality and shall be a minimum of twenty-four (24) inches deep with a maximum depth of five (5) feet to the top of pipelines. Variations must be approved and documented by DWCCC.

Excavation in ledge rock, cobble-rock, stones, or other unsuitable materials shall extend at least six (6) inches below the elevation of the bottom of the pipe. A select material shall be used as bedding material to bring the elevation of the trench to the required grade. Where unstable material is encountered in the excavation, within 12-inches of the final grade of the pipe, a minimum of twelve (12) inches of material shall be removed below the grade of the pipe and select gravel shall be installed to provide a stable subgrade. All select material shall be approved by the CITY and DWCCC prior to use.

2.4 TRENCH SAFETY: Excavation shall be sheeted, braced, and shored as required to support the walls of the excavation to eliminate sliding and settling and as may be needed to protect the workers and other structures and improvements. All safety measures shall comply with the requirements of the Utah State Industrial Commission and OSHA. Any damage, injury, or death resulting from the lack of adequate shoring and bracing shall be the responsibility of the DEVELOPER.

2.5 BACKFILLING: Care shall be taken while backfilling when pipe is exposed. Rock larger than 2-inches shall not be permitted to fall directly on the pipe from any height. **Pipe Backfill Zone:** All material around and above the pipe, fittings, etc. shall be imported sand to a level not less than 12 inches above all pipe, fittings, etc. On site material that is believed to be suitable for use for pipe backfill material has to be approved in writing by DWCCC. Remaining trench backfill above the Pipe Backfill Zone shall follow City standards & specs. Trench backfilling above the level of the pipe bedding shall normally be done with native excavated materials unless it's deemed unsuitable by the CITY in which whose roadway the pipe is being installed or by DWCCC. The backfill shall be compacted or consolidated to an in-place density of not less than 95% of modified maximum dry density, as determined by AASHTO T-180 (ASTM D-1557) or the standard of the local governing agency. The backfill material shall be brought to within 2% of optimum moisture during compaction. No more than twelve (12) inch lifts shall be allowed when using

mechanical compaction equipment. The DEVELOPER shall take all necessary precautions to prevent damage to the pipeline and fittings during backfilling.

2.6 IMPORTED BACKFILL MATERIAL: In the event that the native materials are too difficult to compact or consolidate to the required densities, or are unacceptable as backfill, as determined by DWCCC or other governing agency, the DEVELOPER may be required to provide select imported granular material. This material should be sand or road base to level of a 12" minimum covering over/around the piping and all fittings. Material needed past the pipe covering shall pass a 2-inch square sieve and shall not contain more than 15% of material passing a 200 mesh sieve, and shall be free from sod, or other organic or deleterious materials. All select material shall be approved by the CITY and/or DWCCC prior to use.

SECTION 3: PRESSURE PIPE

3.1 GENERAL: This specification consists of furnishing and installing the PVC or Ductile Iron (DI) pressure pipe as shown on the Drawings. This specification only applies to the main lines of the secondary water system.

3.2 MATERIALS: All PVC pipe(purple) from 4" to 48" diameter shall be furnished with integral bell and spigot joints and shall be made from clean, virgin, Type 1, Grade 1, non-plasticized PolyVinyl Chloride (PVC) and shall meet the requirements of AWWA C900/C905 DR-14. Ductile Iron Pipe (pressure class 250) will only be allowed under certain circumstances and must be approved in writing by DWCCC.

3.3 JOINTS: The bell shall consist of an integral wall section with a cross-section rubber ring which meets the requirements of ASTM D-1 869. The bell section shall be designed to be at least as strong as the pipe wall.

3.4 FITTINGS: Fittings shall be short body ductile iron, iron pipe size for PVC application, in accordance with AWWA C-1 10. They must be capable of withstanding hydrostatic tests of three times the rated working pressure of the pipe. Fittings should be wrapped with an 8-mil polyethylene film and all bolts shall be Tripacs' 2000 coating system (blue bolts) with food grade grease applied before wrapping any mechanical fitting.

3.5 PLACEMENT OF METALLIC INDICATOR TAPE: Metallic indicator tape shall be a minimum of three (3) inches wide and shall be marked "IRRIGATION WATER". The tape shall be installed at a maximum depth of twelve (12) inches below subgrade, but shall not be installed closer than twelve (12) inches above the top of the waterline.

3.6 POLYETHYLENE WRAPPING: All fittings for PVC pipe shall be wrapped as specified herein. All materials placed shall be wrapped with a polyethylene plastic wrap, including all fittings and valves, in accordance with the manufacturer's specifications. All compression couplings, mechanical joints, flanged joints, and valves exposed to soil shall be wrapped with 8-mil thick polyethylene film adhesive tape equal to Polyken No. 900 or Scotchrap No. 50. The tape shall be installed to adhere securely to both the pipe and polyethylene. Enough film shall be used to overlap the adjoining pipe a minimum of one foot (1').

Valves shall be wrapped by bringing the wrap on the adjacent pipe over the bells of flanges of the valve and sealing with the adhesive tape. The valve bodies are then wrapped with a flat sheet of the film passed under the valve bottom and brought up around the body to the stem and fastened in place with the adhesive tape.

All fittings that require concrete blocking should be completely wrapped prior to pouring the concrete backing block. Polyethylene wrap shall be protected from the sun and weathering prior to use. Care shall be exercised during backfilling of the protected areas to prevent puncturing the film.

3.7 PLACEMENT OF LOCATING WIRE: 12-gauge copper locating wire shall be installed with all DWCCC main waterlines. The locating wire shall be placed under the bottom haunch of the

waterline and shall be terminated and accessible at all valve boxes, meter pits and air/vac structures. All splices should be connected by a 3M Direct Bury Splice connection. (equals are allowed)

3.8 MECHANICAL FITTINGS: All followers/gaskets shall be a mega-lug style and made for the type of piping being installed with accompanying Tripacs' 2000 coating system (blue bolts). Repair sleeves of 12" or smaller (Romic 2-bolt ALPHA) will be allowed.

SECTION 4: SERVICE CONNECTION

4.1 GENERAL: This specification consists of the requirements for the service line connections, materials, installation, and inspection.

4.2 SERVICE SADDLES: Service saddles shall be OD/Control or double strap brass and meet all applicable parts of ANSI/AWWA C800, and shall be rated for a minimum 250 psi operating pressure. Service saddles shall be Mueller, Ford or when approved in writing Romac Industries, Inc.

4.3 SERVICE LATERALS: Pipe for service laterals shall be purple flexible polyethylene plastic pipe (PE) PE 3408, CTS ASTM D-2737, SDR-9. The pipe shall be marked to show the pressure rating, pipe size and type. All connections on PE pipe shall be made with compression style connections with stainless steel inserts. COMPRESSION CONNECTIONS SHALL BE MUELLER or FORD, (NO SUBSTITUTIONS ALLOWED)

ALL SERVICE LATERALS WILL BE INSTALLED TO THE MAIN LINE CONNECTION BY A SOLID PIECE OF APPROVED POLY: This includes, but is not limited to, all new development, road expansion by cities, counties and state entities. This includes any line that is struck during all work around our operational system. Examples: Boring, road reconstruction, etc. **NO COUPLINGS WILL BE ALLOWED.**

4.4 METERS: Meters shall be as specified by DWCCC for the particular installation and shall report instantaneous flow in gallons per minute (gpm) and totalized flow in gallons via encoded register output. The meter(s) shall be supplied to D&W with accompanying AMI, AMI cable and meter gaskets. (see 4.5) Meters will only be accepted in person with an inspection sign off sheet for quality control. The meter enclosure shall be set so that the elevation of the top of the box is equal to that of the top back of the curb or sidewalk. ONE (1) INCH METERS SHALL BE SENSUS IPERL 10.75 LL 1 GAL TR/PL, 2 WIRE TRPL W/6FT CABLE 1 GAL, CONFIG# 14-S-1GB-XX. ONE AND ONE HALF (1 ½) INCH AND LARGER METERS SHALL BE ELSTER EVOQ4 SET UP FOR THE SENSUS 520-M SINGLE PORT. NO "OR EQUAL" PRODUCTS WILL BE ALLOWED.

4.5 1 INCH METER SPEC:

Complete Meter Setup

- **Meter:** SENSUS 1 IPERL 10.75 LL 1 GAL TR/PL, 2-WIRE TRPL W/6FT CABLE 1 GAL, CONFIG# 14-S-1GB-XX
- **AMI:** SENSUS 520-M SINGLE PORT

Individual Meter Parts

- **Meter:** SENSUS 1 IPERL 10.75 LL 1 GAL TR/PL, 2-WIRE TRPL W/6FT CABLE 1 GAL, CONFIG# 14-S-1GB-XX

- **AMI Cable:** 6FT IPERL X TRPL CABLE (mfg.# 5M50535200001)
- **AMI:** SENSUS 520-M SINGLE PORT

4.6 Removal: Any service that is part of development that has or is being discontinued because of said development shall be capped at the main. Contractor will notify D&W 48 hrs. in advance to allow adequate time to shut the main down and allow D&W to be on site to GPS discontinued service connection.

4.7 Modification of Existing Service: If a lot is subdivided or modified, DWCCC requires that the existing secondary service be updated to the current meter pit/meter specifications and standard. If a dual service, DWCCC will provide meter pit/meter materials for only neighboring service.

SECTION 5: VALVES

5.1 GENERAL: This specification consists of the requirements for valves.

5.2 GATE VALVES: Valve sizes 4" through 10" shall be gate valves of the iron body, non-rising bronze stem, resilient seated type, manufactured to equal or exceed all applicable AWWA standards of C-509 latest revision and all specific requirements outlined in these specifications. Gate valves shall open left and provided with 2" square operating wrench nuts unless otherwise specified. The valves are to be Mechanical Joint or Flanged type as directed by the DWCCC and shall be furnished with all necessary glands, followers, bolts and nuts to complete installation. The disc shall have integrally cast ASTM B-62 bronze stem nut to prevent twisting, binding or angling-of the stem. Designs with loose stem nuts are not acceptable. Provide fusion bonded epoxy lining and coating in compliance with AWWA C550. It shall protect all seating and adjacent surfaces from corrosion and prevent build-up of scale or tuberculation. Valve design shall incorporate a positive metal-to-metal stop to prevent over-compression of the sealing element. GATE VALVES SHALL BE MUELLER A-2361 OR CLOW C515, 'NO OR EQUAL' PRODUCTS WILL BE ALLOWED. THE VALVE TYPE INSTALLED SHALL BE PROVIDED TO THE DWCCC GIS PERSONAL FOR TRACKING.

5.3 BUTTERFLY VALVES: Valve sizes 12" and greater shall be butterfly valves of the short body type, cast iron body, cast or ductile iron disc, Type 304 stainless steel shafts, Buna-N or EPDM rubber seat bonded or molded in body only, and stainless steel seating surface. Provide fusion bonded epoxy lining and coating in compliance with AWWA C550. BUTTERFLY VALVES SHALL BE MUELLER or CLOW, 'NO OR EQUAL' PRODUCTS WILL BE ALLOWED.

5.4 AIR VACUUM RELIEF AND DRAIN VALVES: Air vacuum relief valves, permanent drain valves and temporary drain valves shall be constructed at locations determined by the Engineer who designed the system and pre-approved by DWCCC in writing, in accordance with the attached drawings. All lids shall be marked "IRRIGATION".

5.5 VALVE BOX/MANHOLE LIDS: All valve box/manhole lids/covers shall be stamped "IRRIGATION". All valve/manhole lids/covers in the road shall have concrete collars(Utah State bag mix), and shall be 12" min. in depth X 12" min. in circumference from the outer circumference of the valve housing with a square design unless not allowed by city standard/spec.

SECTION 6: TESTING OF SECONDARY WATER SYSTEM

6.1 GENERAL: This specification consists of the requirements for flushing and testing the secondary water system waterlines.

6.2 TESTING: Tests shall be made upon completion of the system installation, but prior to any connection to existing DWCCC facilities. All tests shall be made at the expense of the DEVELOPER and in the presence of DWCCC. Although pressure testing is completed & passed, the release of the system for a 1-year warranty or final will be governed by the city/county processes. **The city/county processes of bringing their systems into the one-year warranty period will govern the one-year warranty. Requirements and periods will be different for every city/county area and will follow those requirements for which the development/project resides in. The city/county processes of removing the development from the one-year warranty and assuming full operational control and maintenance will govern the takeover inspection. Requirements and periods will be different for every city/county area and will follow those requirements for which the development/project resides in.** If for any/all reasons the system does not meet the DWCCC standards/specs it will be asked to be brought back to working order. (Example: leaking water pit)

200 PSI PRESSURE TEST PROCEDURES: Lines shall be slowly filled with water, venting off all air. All main line valves shall be in the fully open position during the test. The line shall be pressurized to a minimum of 200 pounds per square inch (200 psi). This pressure shall remain steady for a minimum of 2 hours. This shall include testing the service laterals to behind the curb line. Meter pits will be allowed to be connected after the curb is installed, but will be required to pass a second test of line pressure for leaks at the meter pits connections throw to the meter pit valve, and is to be inspected and passed off by DWCCC.

***150 PSI PRESSURE TEST PROCEDURES:** Lines shall be slowly filled with water, venting off all air. All main line valves shall be in the fully open position during the test. The line shall be pressurized to a minimum of 150 pounds per square inch (150 psi). This pressure shall remain steady for a minimum of 2 hours. This shall include testing the service laterals to behind the curb line. Meter pits will be allowed to be connected after the curb is installed, but will be required to pass a second test of line pressure for leaks at the meter pits connections throw to the meter pit valve, and is to be inspected and passed off by DWCCC.

***(ONLY ALLOWED WHERE DWCCC BELIEVES THE WATER HAMMER RISK WILL NOT EXCEED 150 PSI. THE DECISION IS COMPLETELY THAT OF THE DWCCC AND IF DEEMED NECESSARY WILL NOT ALLOW THIS TEST AND REVERT TO THE 200 PSI PRESSURE TESTING PROCEDURES LISTED ABOVE.)**

6.3 FLUSHING: If cleaning practices during installation are questionable, DWCCC may require the DEVELOPER to flush all lines after the pressure test. Flushing shall be

accomplished through the end of the line blow-offs or drains, with a minimum of four (4) inch diameter pipes. The velocity in the largest pipe shall be a minimum of 2.5 feet per second.

SECTION 7: THRUST BLOCKS

7.1 GENERAL: This specification consists of the requirements for thrust blocks on the installed water lines.

7.2 PLACEMENT: Thrust blocks are required at points where the pipe changes direction such as; at all tees, elbows, caps, valves, reducers, crosses, etc. Thrust blocks should be constructed so that the bearing surface is in direct line with the major force created by the pipe or fitting. The earth bearing surface shall be undisturbed. Refer to the Drawings for thrust block details.

7.3 CONCRETE DESIGN: The concrete used for thrust blocks shall have a minimum 28-day compressive strength of 3,000 psi and shall comply with the requirements of class C concrete. Thrust block dimensions and size shall be calculated by the DESIGN ENGINEER, and approved by DWCCC.