

SPECIAL REQUIREMENTS FOR RECYCLED WATER IRRIGATION SYSTEMS (CON'T)
WO 12457

h. Swing Joint Assemblies:

I. All sprinkler heads shall be installed with a swing joint. The swing joint shall consist of two Marx street ell, a Schedule 40 P.V.C. threaded ell, and two Schedule 80 P.V.C. threaded nipples. One threaded nipple shall be the lay pipe and the second shall be a riser between the swing joint and the sprinkler head inlet. The lay pipe for 4 inch and 6 inch pop-up heads shall be a minimum of 8 inches in length. The lay pipe for 12 inch pop-up heads shall be a minimum of 12 inches in length. All sprinkler swing joints shall be sized per the inlet of the sprinkler on which they are used.

II. All quick coupler valves, mainline flush valves and other components as required shall be installed with a swing joint. The swing joint shall consist of two Marx street ell, a brass threaded ell, and two brass threaded nipples. One threaded nipple shall be the lay pipe and the second shall be a riser between the swing joint and the component inlet. The lay pipe shall be a minimum of 12 inches in length. All swing joints shall be sized per the inlet of the component on which they are used.
Booster Pump:

a. Booster pumps shall be a pre-assembled unit provided by a pump supply company routinely building booster pump systems for use with irrigation systems. Booster pump shall deliver the system water pressure at the specified irrigation volume indicated on the irrigation drawings and if needed a internal pressure relief transducer shall be included. External pressure relief valves are not acceptable on recycled irrigation water systems.

b. Electrical requirements for the booster pump shall be as indicated on the irrigation drawings. Electrical power shall be provided by the Owner / Developer. The Contractor is responsible for final hook-up to booster assembly and low voltage connection, if required, to irrigation controller.

c. Booster pump shall be grounded as per the manufacturer's specifications.

Type: Barret pump systems or approved equal.

IRRIGATION SPECIFICATIONS: EXECUTION

1. Site Conditions

a. Inspections:

I. Prior to all work of this section, the Contractor shall carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence. Before starting work on irrigation system, determine that work may proceed without disruption of activities of other trades.

II. The Contractor shall verify that irrigation system may be installed in strict accordance with all pertinent codes and regulations, the original design, the referenced standards, and the manufacturer's recommendations.

III. The Contractor is responsible for taking all reasonable investigative actions and precautions, when working around any utility system.

IV. The Contractor shall be responsible for verification of site conditions and minor revisions as approved by the Landscape Architect and EMWD Representative to insure 100% irrigation coverage in all areas.

b. Discrepancies:

I. In the event of any discrepancy between the Drawings and the actual field conditions or in the event of any other discrepancy found on the Drawings, immediately notify the EMWD Representative.

II. Do not proceed with installation in areas of discrepancy until all discrepancies have been resolved.

c. Grades:

I. Before starting work, the Contractor shall carefully check all grades to determine that work may safely proceed, keeping within the specified material depths with respect to finish grade.

II. The final grades shall be accepted by the Engineer and the EMWD before work on this section will be allowed to begin.

d. Field Measurements:

I. The Contractor shall make all necessary measurements in the field to ensure precise fit of items in accordance with the original design. The Contractor shall coordinate the installation of all irrigation materials with all other work.

II. All scaled dimensions are approximate. The Contractor shall check and verify all size dimensions prior to proceeding with work under this section.

III. The Contractor shall exercise extreme care in excavating and working near existing utilities. The Contractor shall be responsible for damages to utilities, which are caused by his operations or neglect.

e. Diagrammatic Intent:

The drawings are essentially diagrammatic. The size and location of equipment and fixtures are drawn to scale where possible. The Contractor shall provide offsets in piping and changes in equipment locations as necessary to conform with structures and to avoid obstructions or conflicts with other work at no additional expense to the Owner / Developer or the EMWD.

f. Layout:

I. Prior to installation, the Contractor shall stake out all pressure supply lines, routing and location of sprinkler heads, valves, backflow prevention devices, and automatic controller.

II. Layout irrigation system and make minor adjustments required due to differences between site and drawings. Any such deviations in layout shall be within the intent of the original drawings and approved by the Landscape Architect and EMWD Representative.

III. Where piping is shown on drawings under paved areas, but running parallel and adjacent to planted areas, install the piping in the planted areas.

IV. The lay out all irrigation equipment, using an approved staking method, and maintain the staking of approved layout.

v. All layouts shall be approved by the EMWD Representative prior to equipment installation.

2. Water Supply:

a. Connections to the water meter and 1st temporary highline shall be as approved and inspected by EMWD. The location indicated shall be at the approximate locations shown on the drawings. Minor changes caused by actual site conditions shall be made without additional cost to the Owner/Developer or EMWD.

b. Utilize water meter and provide connections to backflow prevention device per the irrigation drawings and details.

c. The backflow prevention unit shall be tested by a certified backflow prevention technician and its operation certified in writing. Contractor shall arrange and pay for all testing and certification fees. The original written certification of the backflow prevention device shall be submitted to the EMWD Representative.

3. Electrical Service:

a. Connections to the electrical supply shall be at the locations shown on the drawings. Minor changes caused by actual site conditions shall be made at no additional expense to the Owner/Developer or EMWD.

b. Contractor shall make electrical connections to the irrigation controllers and booster pumps. Electrical power supply shall be provided by the Owner/Developer.

c. The electrical supply, and all associated electrical equipment, shall be installed in conformance with the national uniform electrical codes.

4. Assemblies:

a. Do not install multiple assemblies on plastic lines. Provide each assembly with it's own outlet.

b. Install all assemblies specified herein according to the respective installation detail drawings or specifications, using the best standard practices with prior approval.

c. Assemble brass pipe and fittings and plastic threaded fittings, using a non-hardening Teflon pipe sealant applied to the male threads only.

d. Install concrete thrust blocking at all changes of direction 45 degrees or greater on all mainline, 2 1/2 inch diameter in size. Install thrust blocks per details. Pipe restraint system shall be used in lieu of thrust blocks on ball and gasket pipe.

5. Line Clearance:

a. All lines shall have a minimum lateral clearance of 6 inches from each other and 24 inches from lines of other trades.

b. Do not install parallel lines directly over one another. Refer to Details for Recycled Water clearance requirements for potable and recycled water.

6. Trenching:

a. Dig trenches and support pipe continuously on bottom of trench. Lay pipe to an even grade. Pipe shall be snaked from side to side to allow for expansion and contraction. Trenching excavation shall follow layout indicated and as noted. Where lines occur under paved area, these dimensions shall be considered below subgrade.

b. Provide the following minimum covers:

i. Pressure mainlines 2 inches size or greater: 24 inches

ii. Pressure mainlines less than 2 inches: 24 inches

iii. Non-pressure lateral lines 3 inches and greater: 18 inches

iv. Non-pressure lateral lines less than 3 inches: 12 inches

v. Control wiring 18 inches

7. Backfilling:

a. Initial backfill on all lines shall be of a fine granular material, not larger than 1/4-inch diameter.

b. Compact backfill to dry density equal to the adjacent undisturbed soil, conforming to adjacent grades without dips, sunken areas, humps, or other irregularities.

c. In appropriate types of soil, the Architect may authorize the use of flooding in lieu of tamping.

d. Under no circumstances shall vehicle wheels be used for compacting soil.

e. Provide sand backfill a minimum of 4 inches over and under all piping under paved areas, and a minimum of 2 inches on all other piping.

f. If settlement occurs and subsequent adjustments in pipe, valves, irrigation heads, turf or other plantings, or other construction are necessary, the contractor shall make all required adjustments without cost to the Owner/Developer or MCS.D.

8. Flushing the System:

a. After all irrigation pipe lines and risers are in place and connected, and prior to installation of irrigation heads, the control valves shall be opened and full head of water used to flush out the system.

b. Sprinkler heads shall be installed only after flushing of the system has been accomplished to the complete satisfaction of the EMWD Representative.

9. Under Existing and/or Proposed Pavement:

a. Trenches located under areas where paving, asphalt or concrete will be installed shall be backfilled with sand and compacted in layers to 95% compaction, using manual or mechanical tamping devices. Trenches for piping shall be compacted to equal the compaction of the existing adjacent undisturbed soil and shall be left in flush with the adjoining grade. The Contractor shall set in place, cap and pressure test all piping under paving prior to paving work.

b. Piping under existing pavement may be installed by jacking, boring, or hydraulic driving. However, no hydraulic driving will be permitted under asphalt paving.

c. Provide a minimum cover of 36 inches between the top of the pipe and the bottom of the aggregate base for all pressure piping (mainlines) and 24 inches for all non-pressure piping (laterals) installed under asphalt or concrete paving.

d. Sleeves shall be two times the diameter of lateral line, mainline, and wire bundle size, and a minimum of 2 inch in size. Install separate sleeves for each lateral, mainline and wire bundle.

e. Under public roads, all mainlines, lateral piping and wire sleeves must have a minimum cover of 36 inches from the top of the pipe to the bottom of aggregate base.

f. Secure permission from the EMWD Representative before cutting or breaking existing pavement. All necessary repairs and replacements shall be approved by the EMWD Representative and made at no additional cost to the Owner/Developer or EMWD.

10. Controller:

a. The contractor shall install a new controller as specified on the irrigation drawings.

b. Controller shall be installed in the locations indicated on the irrigation drawings and approved by the MCS.D Representative.

c. Contractor shall install separate wire conduits and sweeps into the controller enclosure for the control wiring, master valve wiring, flow sensor wiring, communication cable, ground wire and electrical power wiring as indicated on the installation detail drawings.

d. Install one extra 1 inch size P.V.C. conduit and sweep into the controller enclosure for future use.

e. Communication from the valves to the controller and to the ET based programming must be installed and operational prior to the start of the 90 day maintenance period.

11. Adjusting the System:

a. The contractor shall flush and adjust all irrigation heads and valves for optimum performance and to prevent over spray onto walks, roadways, buildings, walls and other structures as much as possible.

b. If it is determined that adjustments in the irrigation equipment or nozzle changes will provide proper and more adequate coverage, make all such changes or make arrangements with the manufacturer to have adjustments made, prior to any planting. All necessary adjustments shall be approved by the EMWD Representative and made at no additional cost to the Owner/Developer or EMWD.

12. Tests and Inspections:

a. The Contractor is responsible for notifying the EMWD Representative in advance for the irrigation system inspections as indicated in the Pre-Construction meeting and EMWD notes within these Specifications.

b. Pre-job Conference:

i. Prior to the start of the landscape installation the Contractor shall meet with the EMWD Representative, the General contractor and the landscape contractor to review the project site, the Drawings, the EMWD installation detail drawings, the specifications, the as-built requirements and the inspection schedule.

ii. When specified, the Contractor shall schedule the GPS as-built service field technician to be present at the pre-job conference.

c. System Layout Inspection:

Prior to the installation of any irrigation equipment including sleeving a Pre-Construction Meeting specific to recycled water irrigation installation shall be held and the EMWD Inspector shall inspect the irrigation system as noted in the inspections. The installation of the irrigation system shall not commence without approval of the EMWD Representative.

d. Pressure Testing:

I. All irrigation mainlines shall be tested under a hydrostatic pressure of 150 PSI for a period of two (2) hours, and approved watertight, prior to the backfilling of the trenches.

II. All piping under paved areas shall be tested under a hydrostatic pressure of 150 PSI for a period of two (2) hours, and approved watertight, prior to the paving operation.

III. Make hydrostatic tests only in the presence of the EMWD Representative. No pipe shall be backfilled until it has been inspected, tested, and approved in writing by the EMWD Representative.

IV. The Contractor shall furnish a force pump and all other necessary equipment for the pressure test.

v. All testing shall be approved prior to the installation of remote control valves, quick couplers, or other valve assemblies.

vi. The piping to be tested shall be completely disconnected from the force pump and water source prior to the start of the pressure test.

vii. No air pressure testing of lines shall be allowed.

viii. The collection of the as -built data for the mainline installation as-built drawings shall take place on the same day as the mainline pressure test.

e. Coverage Test:

I. When the irrigation system installation is complete, and prior to any planting operations, the Contractor shall perform a coverage test in the presence of the EMWD Representative to determine if the water coverage for the landscaped areas is complete and adequate. Sprinkler coverage must be 100% or "head to head" in order to be accepted by the EMWD Representative.

II. The Contractor shall furnish all materials and perform all work required to correct any inadequacies of coverage due to deviations from the plans or where the system has been willfully installed as indicated in the drawings; when it is obviously inadequate or inappropriate, without bringing this to the attention of the EMWD Representative.

III. When performing the irrigation coverage test, the contractor shall be responsible for having a two-way communication system or sufficient personnel, so that the directions from the inspection area to the controller of the system can be readily accomplished.

IV. The coverage test shall be accomplished before any plant material is installed (excluding trees). The entire irrigation system shall be under full automatic operation for a period of seven days prior to any planting or hydrosedding.

v. The collection of the data for the final as-built drawings shall take place within three (3) days of EMWD Representative approval of the coverage test.

vi. The marking of the limits of the irrigation zones shall be performed prior to the coverage test and be available for viewing by the EMWD Representative during the test. The marking of the irrigation shall be made using orange spray chalk lines to clearly define the limits of coverage of each irrigation zone. The contractor shall define the areas of each zone prior to calling for the "final" mapping inspection.

f. Pre-Maintenance Inspection:

I. Prior to the start of the maintenance period the EMWD Representative shall inspect the installation of the irrigation system. The irrigation system installation shall be 100% complete and the system completely operational prior to the inspection. The maintenance period shall not commence without written approval of the EMWD Representative.

II. The EMWD Representative shall prepare a punch list of required corrections or repairs necessary for completion prior to the approved start of the maintenance period. The maintenance period shall not commence without correction of the punch list items, re-inspection and written approval of the EMWD Representative.

III. The EMWD Representative shall prepare a punch list of required corrections or repairs necessary for completion prior to the beginning of the maintenance period. The punch list items shall be corrected prior to the final acceptance inspection by the EMWD Representative.

g. Final Acceptance Inspection and Cross Connection Shut Down Test:

I. AS-BUILT DRAWINGS MUST BE SUBMITTED PRIOR TO FINAL SITE INSPECTION; THE FINAL INSPECTION WILL NOT COMMENCE WITHOUT AS BUILT DRAWING APPROVAL. In the event the contractor calls for a final inspection without as-built drawings, without completing previously noted corrections, or without preparing the system for inspection, he shall be responsible for reimbursing the EMWD for the cost of the inspection per the current rate established by the EMWD. No further inspections will be scheduled until this charge has been paid.

II. Prior to final acceptance the EMWD Representative shall inspect the installation of the irrigation system. The irrigation system installation shall be 100% complete and the system completely operational prior to the inspection. All previously prepared punch list items shall be corrected prior to the final acceptance inspection. The final acceptance shall not take place without written approval of the EMWD Representative.

III. The EMWD Representative shall prepare a punch list of required corrections or repairs necessary for completion prior to the final acceptance of the project. The project shall not receive final acceptance without correction of the punch list items, re-inspection, a cross connection shut down test and written approval of the EMWD Representative.

IV. EMWD Representative shall conduct a cross Connection Shut Down Test as described in the Pre- Construction Meeting. The contractor shall make all corrections required as a result of the test prior to final written acceptance by EMWD.

14. Maintenance:

a. The Contractor shall maintain the irrigation system for a minimum of 90 days or until final acceptance by EMWD.

b. During the maintenance period the Contractor shall adjust and maintain the irrigation system in a fully operational condition providing complete irrigation coverage to all intended plantings.

13. Completion Cleaning:

a. Clean-up shall be made as each portion of the work progresses. Refuse and excess dirt shall be removed from the site, all walks and paving shall be broomed, and any damage sustained on the work of others shall be repaired to original conditions.

b. Upon completion of the work, make ground surface level, remove excess materials, rubbish, debris, etc., and remove construction and installation equipment from the premises.

END OF SECTION

APPROVAL	
DATE	
DESCRIPTIONS	
SYMBOL	

EASTERN MUNICIPAL WATER DISTRICT
PERRIS DESALINATION FACILITY
PERRIS, CALIFORNIA
IRRIGATION SPECIAL NOTES SHEET

COLOR CODING NOTE:

SPRINKLERS, ROTOR HEADS AND OTHER TYPES OF DISPERSION HEADS SHALL HAVE THE EXPOSED SURFACE COLORED PURPLE. THE EXPOSED SURFACE SHALL BE COLORED THROUGH THE USE OF INTEGRALLY MOLDED PURPLE PLASTIC OR PERMANENTLY ATTACHED PURPLE PLASTIC RING OR DISC. VALVE BOXES SHALL BE PURPLE PER INDUSTRY STANDARDS. THE LIDS SHALL HAVE THE WARNING "RECYCLED; DO NOT DRINK" IN ENGLISH AND SPANISH AND THE INTERNATIONAL "DO NOT DRINK" ON ONE SIDE AND "PELIGRO: AGUA IMPURA - NO BEBER" ON THE OPPOSITE SIDE. ALL SHRUB HEADS SHALL HAVE PURPLE CAPS.

OMISSION STATEMENT:

THERE ARE NO DECORATIVE FOUNTAINS, COMFORT STATIONS, SWIMMING POOLS, PLAYGROUND EQUIPMENT, OR WELLS ON SITE. DRINKING WATER FOUNTAIN, DESIGNATED OUTDOOR EATING AREAS, PICNIC TABLES, BENCHES, ETC. SHALL BE PROTECTED AGAINST CONTACT WITH RECYCLED WATER SPRAY, MIST, OR RUN-OFF. THE POTABLE WATERLINE SUPPLYING THE DRINKING FOUNTAIN MUST HAVE A WARNING BLUE COLORED TAPE IDENTIFYING IT AS A POTABLE WATERLINE AND STATING "CAUTION: BURIED WATERLINE BELOW" INSTALLED OVER IT.

POTABLE & RECYCLED WATER SEPARATION NOTE:

RECYCLED MAINLINE (CONSTANT PRESSURE) SHOWN DIAGRAMMATIC ALLY FOR CLARITY ONLY. ACTUAL LOCATION MUST PROVIDE A MINIMUM FOUR (4) FEET HORIZONTAL CLEARANCE BETWEEN ALL POTABLE AND CONSTANT PRESSURE RECYCLED WATER LINES. RECYCLED WATER MAINLINE SHOULD BE INSTALLED UNDER POTABLE WATER LINES AND MAINTAIN ONE (1) FOOT OF VERTICAL CLEARANCE. WHERE THE RECYCLED WATER CONSTANT PRESSURE LINE MUST BE INSTALLED ABOVE THE POTABLE WATER LINE, A FOUR (4) INCH MINIMUM VERTICAL CLEARANCE MUST BE MAINTAINED AND THE RECYCLED WATER PRESSURE LINE MUST BE INSTALLED IN A CONTINUOUS PVC CLASS 200 PIPE SLEEVE WHICH EXTENDS A MINIMUM OF TEN (1) FEET EACH SIDE OF THE POTABLE WATER LINE.



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