

SPECIAL REQUIREMENTS FOR RECYCLED WATER IRRIGATION SYSTEMS
WO 12457

1. Summary:

a. It is the intent of the specifications and drawings that the finished irrigation system is complete in every respect and shall be ready for operation satisfactory to the EMWD.
b. The work shall include all materials, labor, services, transportation, and equipment necessary to perform the work as indicated on the irrigation drawings, in the specifications, and as necessary to complete the installation of the irrigation system.
c. The Contractor shall keep a full set of the most recent irrigation drawings on the project site at all times throughout the construction period.

d. The Contractor shall obtain a copy of the most recent edition of the EMWD Landscape Standards Booklet prior to starting the work. The Contractor shall keep a copy of the Landscape Standards Booklet on the project site at all times throughout the construction period.

2. Construction Drawings:

a. Due to the scale of the drawings, it is not possible to indicate all offsets, fittings, sleeves, etc. which may be required. The Contractor shall carefully investigate the structural and finished conditions affecting all of his work and plan his work accordingly, furnishing such fittings, etc. as may be required to meet such conditions. Drawings are generally diagrammatic and indicative of the work to be installed. The work shall be installed in such a manner as to avoid conflicts between irrigation systems, planting, and architectural features.

b. All work called for on the drawings by notes or details shall be furnished and installed whether or not specifically mentioned in the specifications. When an item is shown on the plans but not shown on the specifications or vice versa, it shall be deemed to be as shown on both. The Contracting Officer shall have final authority for clarification.

c. The Contractor shall not willfully install the irrigation system as shown on the drawings when it is obvious in the field that obstructions, grade differences or discrepancies in area dimensions exist that might not have been considered in engineering. Such obstructions or differences should be brought to the attention of the Contracting Officer as soon as detected. In the event this notification is not performed, the Contractor shall assume full responsibility for any revision necessary.

3. Quality Assurance:

a. Provide at least one person who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of materials being installed and the manufacturer's recommended methods of installation and who shall direct all work performed under this section.

b. Manufacturer's directions and detailed drawings shall be followed in all cases where the manufacturer of articles used in this contract furnish directions covering points not shown in the drawings and specifications.

c. All materials supplied for this project shall be new and free from any defects. Contractor shall replace all defective materials.

4. Submittals:

a. Materials List:

i. After award of contract and before any irrigation system materials are ordered from suppliers or delivered to the job site, the Contractor shall submit to the Contracting Officer a complete list of all irrigation system materials, or processes proposed to be furnished and installed as part of this contract.

ii. The submittals shall include the following information:

1) A title sheet with the job name, the contractor's name, contractor's address, telephone number, fax number, submittal date and submittal number.

2) An index sheet showing the item number (i.e., 1,2,3, etc.); an item description (i.e. sprinkler head); the manufacturer's name (i.e. Hunter Industries); the item model number (i.e. I-40-ADV/36V); and the page(s) in the submittal set that contain the catalog cuts.

3) The catalog cuts shall be one or two pages from the most recent manufacturer's catalog that indicate the product submitted. Do not submit parts lists, exploded diagrams, price lists or other extra information.

4) The catalog cuts shall clearly indicate the manufacturer's name and the item model number. The item model number, all specified options and specified sizes shall be circled on the catalog cuts.

5) Submittals for equipment indicated on the legend without manufacturer names, or "as approved", shall contain the manufacturer, Class or Schedule, ASTM numbers and/or other certifications as indicated in these specifications.

iii. Submittal format requirements:

1) Submittals shall be provided as one complete package for the project. Multiple partial submittals will not be reviewed.

2) Submittal package shall be stapled or bound in such a way as to allow for disassembly for review processing.

3) Submittal package shall have all pages numbered in the lower right hand corner. Page numbers shall correspond with submittal index.

iv. The Contracting Officer will not review the submittal package unless provided in the format described above.

v. Manufacturer's warranties shall not relieve the Contractor of his liability under the guarantee. Such warranties shall only supplement the guarantee.

b. Shop Drawings:

After award of contract and before any irrigation system installation has begun, the Contractor shall submit to the Contracting Officer detailed shop drawings for all irrigation assemblies not covered by detail drawings in the EMWD Landscape Standards Booklet or shown on the Drawings.

5. Substitutions:

a. If the Contractor wishes to substitute equipment or materials for those equipment or materials listed on the Drawings and Specifications, he may submit a request for approval to the Contracting Officer that includes the following information.

i. Provide a written statement indicating the reason for making the substitution.

ii. Provide catalog cut sheets and technical data for each substitute item.

iii. Provide in writing the difference in installed price if the item is accepted.

b. The Contracting Officer will allow no substitutions without prior written acceptance.

c. The Contracting Officer shall have the final decision on whether to accept or reject the substitutions suggested by the Contractor. If a Contractor suggested substitution is rejected, the Contractor shall provide and install the equipment or materials as listed in the Drawings and Specifications.

6. Existing Conditions:

a. The Contractor shall verify and be familiar with the locations, size and detail of points of connection provided as the source of water, electrical supply, and telephone line connection to the irrigation system.

b. Irrigation design is based on the available static water pressure shown on the drawings. Contractor shall verify static water on the project prior to the start of construction. Should a discrepancy exist, notify the Contracting Officer prior to beginning construction.

c. Prior to cutting into the soil, the Contractor shall locate all cables, conduits, sewer septic tanks, and other utilities as are commonly encountered underground and he shall take proper precautions not to damage or disturb such improvements. If a conflict exists between such obstacles and the proposed work, the Contractor shall promptly notify the Contracting Officer who will arrange for relocations. The Contractor will proceed in the same manner if a rock layer or any other such conditions are encountered.

d. The Contractor shall protect all existing utilities and features to remain on and adjacent to the project site during construction. Contractor shall repair, at his own cost; all damage resulting from his operations or negligence.

e. The Contractor shall install all required sleeving as per the plans. Installation of sleeving requires a separate Recycled Water Pre-Construction meeting as stated in the EMWD Notes on the Title Sheet.

7. Inspections:

a. The Contractor shall permit the Contracting Officer or the Owner Representative to visit and inspect at all times any part of the work and shall provide safe access for such visits. The contractor shall attend all inspections with the inspector.

b. Where the specifications require work to be tested by the Contractor, it shall not be covered over until accepted by the Contracting Officer. Should any work be covered without testing or acceptance, it shall be, if so ordered, uncovered at the Contractor's expense.

c. The Contractor shall be solely responsible for notifying the Contracting Officer where and when the work is ready for testing. The Contractor shall notify the Contracting Officer seven calendar days in advance for pre-job conferences, pre-maintenance finals and pre-acceptance final inspections. The Contractor shall notify the Contracting Officer 48 hours in advance for all other inspections including but not limited to system layout, mainline pressure testing, coverage testing, and final irrigation installation inspections.

d. Inspections will be required for the following at a minimum:

i. Pre-job conference

ii. Sleeve installation, System layout and POC Sequence

iii. Pressure test of irrigation mainline (Two hours at 150 PSI)

iv. Layout of lateral lines, all irrigation valve components and recycled water id signs

v. Coverage test of irrigation system (Prior to planting)

vi. Final Inspection and Cross Connection Test prior to start of maintenance period

vii. Final acceptance

e. Work that fails testing and is not accepted will require retesting until said work passes the testing and is accepted.

8. As Built Drawings for Irrigation:

a. Record accurately on one set of drawings all changes in the work constituting departures from the original contract drawings and the actual final installed locations of all required components as shown below.

b. As-built drawings shall be compiled using manual field measurements on the record drawings as stated in the specifications. Record drawing information shall be provided as a hand drawn redline of the record drawings of the project irrigation system.

c. The data collection shall be accurate to within 6 inches of the actual equipment locations. The changes and dimensions shall be recorded on the drawing file. Prior to final inspection of work, submit record drawings drawn onto bond sheets for review by the Contracting Officer.

d. Data for the as-built drawings shall be collected during the installation of the pressure mainline, valve and quick coupler installation as required to fully indicate all routing locations and pipe depths. Data for all other irrigation equipment locations shall be collected prior to the final EMWD inspection of the work.

e. Dimensions from/to permanent points of reference such as buildings, sidewalks, curbs, etc. shall be shown for each piece of irrigation equipment shown below. All irrigation symbols shall be clearly shown matching the irrigation legend for the drawings. All lettering on the as-built drawings shall be minimum 1/10 inch in size.

f. The information collected for the irrigation system shall consist of equipment manufacturer, model numbers, size, type, flow rates and area of irrigation coverage, and POC sequence. Show locations, depths and the required information of the following items:

g. Point of connection (including water and electrical points of connection, backflow devices, master control valves, flow sensors, etc.) (indicate manufacturer, model, size and overall square footage)

ii. Routing of constant pressure main lines (dimensions shown at a maximum of 100 feet along routing)

iii. Isolation valves (indicate type, manufacturer, model and size)

iv. Automatic remote control valves (indicate manufacturer, model, size, flow rate and square footage of area served)

v. Quick coupling valves (indicate manufacturer, model and size)

vi. Routing of control wires

vii. Irrigation controllers (indicate manufacturer, model and size)

viii. Related equipment (as may be directed)

ix. Tree locations (see Planting Specifications)

h. The data collection shall include a measurement of the area covered by each remote control valve circuit on the project. This area measurement must appear on the as-built drawings in the valve callout and on a chart contained on the drawings. The chart shall contain a list of control valves, the type of sprinklers installed, a description of the plant types and the area covered in square feet. Areas shall include an adjustment for any slopes covered by the control valves.

The data mapping shall take place after the irrigation zones have been clearly marked onto the ground surface by the Contractor. The Contractor shall be responsible for clearly marking the limits of the irrigation zones as directed in the pre-construction meeting. 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. The Contracting Officer shall be consulted to confirm the information required for the as-built.

i. As required by the specifications, a firm specifically engaged in GPS/GIS data collection and mapping shall collect GPS/GIS data for the as-built drawings.

j. Contractor must submit as built drawings (one set of bond copies) to the Contracting Officer as required by the general specifications.

9. Controller Charts (with square footage per station and per POC):

a. The Contracting Officer shall approve as-built drawings before charts are prepared.

b. Provide two controller charts for each controller supplied, showing the area covered by the automatic controller.

c. The chart shall be a reproduction of the as built irrigation drawings. If the controller sequence is not legible when the drawing is reduced, enlarge it to a size that will be readable when reduced.

d. Charts shall be blackline print with a different transparent color used to show area of coverage for each station.

e. When completed and approved, hermetically seal the chart between two pieces of plastic, each piece being a minimum of 10 mils thick.

f. Charts shall be completed and approved prior to final inspection of the irrigation system.

IRRIGATION SPECIFICATIONS: PRODUCTS

1. Summary:

Use only new materials of the manufacturer, size and type shown on the drawings and specifications. Materials or equipment installed or furnished that do not meet EMWD standards will be rejected and shall be removed from the site at no expense to EMWD.

2. General Piping:

a. The pressure mainline from point of connection (P.O.C.) through the master valve shall be brass pipe and brass fittings.

b. Pressure mainlines 2 inches and smaller in size downstream of master valve shall be Schedule 40 solvent welded P.V.C. unless otherwise noted.

c. Pressure mainlines 2 1/2 inches in size downstream of master valve shall be Class 315 solvent welded P.V.C. unless otherwise noted.

d. Lateral lines (intermittent pressurized) 1 1/2 inches and smaller in size shall be Schedule 40 solvent welded P.V.C. unless otherwise noted. The minimum lateral line pipe size shall be 3/4 inch for spray type systems and 1/2 inch for drip systems.

e. Lateral lines (intermittent pressurized) 2 inches and larger shall be Class 315 solvent welded P.V.C. unless otherwise noted.

f. Rubber gasket P.V.C. Class 200 (SDR 21) pipe shall be Iron Pipe Size (IPS) conforming to ASTM D-3139 with joint gaskets conforming to ASTM F-477.

3. Plastic Pipe and Fittings:

a. Pipe and fittings shall be manufactured from virgin rigid P.V.C. (Polyvinyl Chloride) vinyl compounds with a Cell Class of 12454-B as identified in ASTM D-1784. Compound shall have a 2,000 P.S.I. hydrostatic design stress rating.

b. P.V.C. Schedule 40 pipe shall be Iron Pipe Size (IPS) conforming to ASTM D-1785.

Type: Pacific Plastics or approved equal.

c. P.V.C. Class 315 (SDR 13.5) pipe shall be Iron Pipe Size (IPS) conforming to ASTM D-2241 for plain end pipe. P.V.C. Class 200 (SDR 21) pipe shall be Iron Pipe Size (IPS) conforming to ASTM 2672 for belled-end pipe.

Type: Pacific Plastics or approved equal.

d. Primers used for the solvent cementing of P.V.C. pipe shall conform to ASTM F-656 and be purple in color. Solvent cement used for the joining of P.V.C. pipe shall conform to ASTM D-2584. Make solvent cement joints for plastic pipe and fittings as prescribed by the manufacturer and ASTM D-2855.

Type: IPS Weld-on or approved equal.

e. Rubber gasket P.V.C. Class 200 (SDR 21) pipe shall be Iron Pipe Size (IPS) conforming to ASTM D-3139 with joint gaskets conforming to ASTM F-477.

Type: Pacific Plastics or approved equal.

f. All P.V.C. pipe shall conform to commercial standards CS64 (pressure rated pipe). All P.V.C. pipe shall meet the requirements of NSF Standard #14, "Plastic Piping Components and Related Materials," and Standard #61, "Drinking Water System Components Health Effects." The pipe displays the NSF-PW listing mark signifying use in potable water applications. All piping for recycled water shall be purple pipe displays the NSF-RW listing mark signifying use in recycled water applications

g. All pipe and fittings shall bear the following markings: Manufacturer's name, nominal pipe size, schedule or class or SDR number, pressure rating P.S.I., and date of extrusion.

h. All P.V.C. fittings used on pressurized mainlines and all threaded P.V.C. nipples and unions shall be Schedule 80 P.V.C. All P.V.C. fittings used on lateral lines (intermittent pressurized) shall be Schedule 40 P.V.C.

i. All mainlines shall have Schedule 80 fittings. Schedule 80 P.V.C. fittings shall conform to ASTM D-1784, ASTM D-2467, and ASTM D-2464. All Schedule 40 P.V.C. fittings shall conform to ASTM D-1784 and ASTM D-2468. All threaded P.V.C. fittings shall be injection molded, no cut P.V.C. threads shall be acceptable. Type: Dura Plastic Products, or approved equal.

j. Rubber gasket fittings shall be ductile iron deep bell type. Fittings shall be constructed of grade 65-45-12 ductile iron in accordance with ASTM A-536. Fitting gaskets shall be rubber in accordance with ASTM F-477. All ductile iron fittings shall be manufactured with exterior lugs and shall be fitted with a joint restraint system as indicated on the installation detail drawings.

Type: Leemco ductile iron slant bell or approved equal. Leemco Joint Restraint System or approved equal.

k. All threaded nipples shall be standard weight Schedule 80, with molded threads. Schedule 80 nipples shall conform to ASTM D-1784 and D-2464.

l. All threaded fittings shall be assembled using a non-hardening Teflon pipe sealant. No Teflon tape shall be allowed

m. Recycled water pipe shall conform to all the pipe specifications described above and be color coded purple with the words "CAUTION- RECYCLED WATER" Printed in black letters on two sides of the pipe. Recycled water pipe shall use standard Schedule 80 P.V.C. or Schedule 80 fittings as described above.

n. Ultraviolet resistant (U.V.R.) P.V.C. pipe shall conform to all of the pipe specifications described above and shall be manufactured using a process and/or ingredients proven to resist weakening or corrosion by ultra-violet radiation. Pipe shall be color-coded light brown. U.V.R. water pipe shall use Schedule 40 Ultraviolet resistant P.V.C. fittings manufactured of the same material or process as the U.V.R. pipe on which they are used.

Type: Pipe: Sun Stop or approved equal. Fittings: Dura or approved equal.

4. Brass Pipe and Fittings:

a. Brass pipe shall be 85% red brass, American National Standard Institute (ANSI), Schedule 40 screwed pipe.

b. Fittings shall be medium brass, screwed, 125-pound class.

5. Backflow Prevention Units:

a. Backflow prevention units shall be approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California.

b. Backflow prevention units shall be the reduced pressure principle (R/P) type.

c. Backflow prevention devices shall be installed at a minimum of 12 inches above finished grade and be equipped with approved test cocks.

d. Backflow assemblies 2 inches in size and smaller shall be installed using brass ells, unions and nipples. The backflow prevention assembly shall include two ball valves for isolating the device.

Type: Irrigation systems: Febco 825YA or approved equal. Non-irrigation: Febco 825Y or approved equal.

e. Backflow device enclosure shall be constructed of stainless steel tubing and wire utilizing a smooth surface to prevent handling injury. All enclosure hardware shall be stainless steel. Enclosures shall have a hinge on one end and that allows for removal of the enclosure, without tools, for backflow service. Enclosures for large size backflow devices shall be a two-piece "clam shell" type. The enclosure shall have a locking system that accepts a standard padlock. The application and size of the backflow device shall determine the backflow device enclosure style.

Type: Irrigation systems up to 2": V.I.T. Strongbox SBBC-20SS Irrigation systems over 2": V.I.T. Strongbox SBBC-40SS Non-irrigation: V.I.T. Strongbox: Size as required Or approved equal for all of above.

f. All backflow devices shall be protected from freezing by a removable insulation device. The freeze protection device shall be constructed of radiant barrier foil, closed cell foam and a water repellent cover. The exterior cover shall carry a five year warranty against loss of color or strength due to exposure to the elements. The insulating cover shall have brass grommets at the base of the unit to allow the installation of padlocks for theft prevention. Freeze protection covers shall have the MCSD logo located on the exterior of the insulated cover.

Type: Parkside Products "Polar Barrier" insulated covers, size as required or approved equal.

6. Pressure Reducing Valves:

a. Pressure reducing valves used on irrigation systems with backflow device sizes of 2 inches and smaller shall be of bronze and stainless steel construction and be adjustable from 25 P.S.I. to 125 P.S.I. Pressure regulators shall have threaded inlet and outlet and be installed as part of the backflow assembly.

Type: Wilkins 500HLR series or approved equal.

7. Wye Strainers:

a. Wye strainers shall be used on all potable water irrigation systems with a backflow device size of 2 inches and smaller. Wye strainer shall be of bronze construction with a stainless steel or Monel screen element. Wye strainer shall have a standard filtration size of 60 mesh. Wye strainer shall be installed as part of the backflow assembly.

Type: Wilkins 100YSBR or approved equal.

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 BODIES 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) FOR 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 BLEEVE WHICH EXTENDS A MINIMUM OF TEN (1) FEET EACH SIDE OF THE POTABLE WATER LINE.



Table with columns: SYMBOL, DESCRIPTIONS, DATE, APPROVAL

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

DESIGNED BY: U.S. ARMY ENGINEER DISTRICT LOS ANGELES CORPS OF ENGINEERS
DRAWN BY:
CHECKED BY:
SUBMITTED BY: CH2MHILL
CADD FILE NAME: PDF002d.dgn
SPEC. NO.: NOT APPLICABLE
L.A. DISTRICT FILE NO. XXX-XXXX
SHEET 226 OF 226 SHEETS