

irrigation system specifications

part 1 - general

1.01 scope:

a. furnish labor materials, equipment, tests, water connections, inspections, approvals and cleanup to complete a fully functional automatic, underground sprinkler system.

1.02 general conditions:

a. the irrigation design shall be completed by the contractor per the conditions and requirements identified herein. scaled dimensions on plans are approximate. before proceeding with work, check and verify site dimensions.

b. do not install the irrigation system when unknown obstructions, grade differences or discrepancies exist. immediately bring discrepancies to the attention of the owner's representative, and notify the landscape architect in writing. if notification is not performed, the contractor shall assume responsibility for all necessary revisions.

c. coordinate installation of irrigation work to avoid conflicts with planting, utilities, engineering and architectural features.

d. protect existing or new buildings, walks, planting, walls and other property from damage. mark and barricade open trenches.

e. protect installed contract work and work of other. contractor shall replace or repair damage to grading, soil preparation, seeding, sodding, and planting during work associated with the installation of irrigation system at no additional cost to the owner.

f. apply and pay for necessary permits and fees required in pursuit of work as required by local agencies.

g. local, municipal and state laws, rules and regulations governing or relating to a portion of this work are hereby made a part of these specifications.

h. keep premises clean and free of excess equipment, materials and rubbish incidental to work during construction and maintenance period. broom clean all paved areas.

i. note all finish grades before commencing work. restore finish grades changed during course of this work to original or intended contours where practicable.

1.03 submittal:

a. record drawings:

- 1. reproduce one set of the drawings of the original irrigation design prepared by contractor and record work as actually installed.
2. make changes to drawings in ink (no ballpoint pen).
3. maintain record drawings on site. drawings shall be brought up to date weekly.

- a. turn over record drawings to the owner's representative before the end of the specified maintenance period.
b. dimension from two permanent points of reference (buildings, monuments, pavements, curbs, etc.):
1. connections to existing water lines.
2. gate, quick coupling and sprinkler control valves.
3. routing of sprinkler mainline and lateral lines.
4. routing of electrical wiring.

b. controller charts:

- 1. submit record drawings with changes to the owner's representative before the charts are prepared.
2. reduce record drawings to 11x17. reproduce as a blackline print and color code area of coverage for each station.
3. laminate chart between two pieces of 10 mil plastic.
4. provide 2 copies of chart for each controller showing the area covered by that controller.

1.04 guarantee:

the site sprinkler system including all work done under the contract, shall be guaranteed in writing to the owner as to material and workmanship. this is to include settling of backfilled areas below grade for a period of one year following the specified maintenance period ending date. this date shall be determined by the owner's representative after review of the specified irrigation work. if damage to the irrigation system and site occurs due to faulty materials or workmanship, immediately repair damage at no cost to owner.s

part 2 - products

2.01 guarantee:

a. provide new materials and equipment of best recommended quality obtainable, which comply with specifications.

b. no substitution of specified material or equipment shall be made without review by the landscape architect.

2.02 irrigation equipment:

a. includes, but is not limited to, quick coupling valves, control valves, check valves, gate valves, backflow prevention unit, battery powered automatic controller and irrigation heads from one or a combination of the following mfg's: rainbird, toro, and hunter. type, size and performance as necessary to achieve 100% coverage without overspray onto buildings and pavements.
b. for large broadcast areas, contractor shall use rotor type sprinklers on fixed risers ranging in height from 24 to 48 inches as applicable.

2.03 plastic pipe and fittings:

a. pressure lines, solvent welded type, pvc class 315 2 inches and larger, solvent welded type pvc sch 40 for 2 inches and smaller.

b. non-pressure lines, solvent welded type pvc class 200.

c. pipe shall be made from nsp approved, type i, grade ii pvc compound conforming to astm resin specification d1784. pipe shall meet requirements set forth in federal specification ps-22-70 with an appropriate standard dimension ratio.

d. pipe shall bear the following markings: manufacturer's name, nominal pipe size, schedule or class, pressure rating in psi, nsf approval and date of extrusion.

e. fittings, solvent welded type pvc sch 40, 1-2, 11-1 nsf approved shall conform to astm test procedure d 2466.

f. fittings shall bear the manufacturers' name or trademark, material designation, size, applicable i.p.s. schedule and nsf approval.

g. solvent cement and primer shall be of type and installation per the manufacturer.

h. pipe under ac paving shall be pvc minimum sch 40.

2.04 other pipe and fittings:

a. low volume/ volume drip tubing shall be manufactured of flexible vinyl chloride compound, conforming to astm d2855m, d380 and d1599.

b. copper pipe shall be type k hard tempered in accordance with astm b4284. fittings are wrought copper solder joint type.

2.05 control wiring:

a. use direct burial copper wire awg-uf. 600 volt. size shall be #14 or larger. common wire to be white, control wires to be color-coded.

b. use water tight splice kits for all splices and wire connections bundle wire splices where applicable and enclose in valvebox

c. conform to underwriters laboratories (ul) - ul wires and cables.

2.06 valve box:

a. install valve boxes in the quantity and size required, where possible, manifold multiple valves in single box. valve box floor to be 2" aggregate min with top of box flush with grade.

b. use 9 inch diameter x 24 inches deep, round, green plastic box with cover marked "water" for gate valves.

c. use 9 inches wide x 11 inches long x 16 inches deep rectangular, green plastic box with bolt-down cover marked "control valve" for electrical control valves.

d. brand valve box lids. letter and number shall be no smaller than 1" and no greater than 1-1/2". depth of branding is to be no more than 1/8" into valve lid as follows:

- 1. electric control valves - brand controller letter and station number.
2. quick coupling valves - brand "q.c.".
3. wire splices - brand "w.s.".
4. drip tubing blow-out stubs - brand controller letter and station number.
5. gate valves - brand "g.v."

part 3 - execution

3.01 general:

a. if no detail is provided for work under this contract, install in accordance with manufacturer's recommendations or recommended standard practice. submit recommended procedures to owner's representative before proceeding with work.

3.02 water supply:

a. connect irrigation system to poc location downstream from utilities metering device- see civil dwg's.

b. allow for minor changes at poc caused by actual site conditions.

c. verify available water pressure before construction. if pressure is not sufficient to operate systems as designed, bring this to the immediate attention of the owner's representative. if notification is not performed, the contractor shall assume responsibility for all necessary revisions.

3.03 electrical supply:

a. no electrical supply is needed for this project. controllers shall be battery operated, programable by handheld system.

3.04 trenching:

a. dig trenches straight and support pipe continuously on bottom of trench. lay pipe to an even grade. at owners discretion, owner may negotiate with contractor to amend approach to at grade supply for irrigation system.

b. minimum depth requirements: provide 18 inches of cover for pressure supply lines and control wires, 12 inches of cover for non-pressure lines and 24 inches of cover for lines between the top of the pipe or sleeve and the bottom of the aggregate roadway sub-base material installed under paving, or as per city or county requirements.

c. piping under paving:

- 1. provide for a minimum cover of 24 inches, or as per city or county requirements, between the top of the pipe and the bottom of the aggregate roadway base for all pressure and non-pressure piping installed under asphaltic concrete or concrete paving.
2. piping shall be bedded with construction grade sand or squeegee - 6 inches below pipe to 6 inches above pipe and width of excavation.
3. compact backfill material in 6 inch lifts at 95 % maximum density determined in accordance with astm d 1557 using manual or mechanical tamping devices.
4. set in place, cap, and pressure test all piping under paving in presence of owner's representative prior to backfilling and paving operation.
5. piping under existing walks or concrete pavement shall be done by jacking, boring, or hydraulic driving, but where cutting or breaking of walks and/ or concrete is necessary, it shall be done and replaced at no cost to owner. obtain permission and prior approval to cut or break walks and/ or concrete from owner.

d. water supply and point of connection - water supply shall be extended from domestic supply lines into landscaped area.

3.05 control wiring:

a. install wiring in same trench as pressure supply lines with wires consistently located below and to one side of the pipe or in separate trenches. multiple wires shall be taped together at intervals of 15 feet.

b. no splices shall be made between controller and remote control valve.

c. provide a 1 inch diameter by 12 inch long expansion curl within 3 feet of each wire splice and at 100 feet on center.

3.06 hydrostatic pressure test:

a. notify owner's representative. testing shall occur prior to backfill and installation of control valves.

b. test all pressure lines under hydrostatic pressure of 150 p.s.i. for not less than four hours. test all non-pressure lines under existing static pressure.

c. if leaks develop, replace joints and repeat test until system is shown to be watertight.

d. furnish necessary force pump and other test equipment.

3.07 backfilling:

a. mechanically compact backfill for trenching to dry density equivalent to adjacent undisturbed soil, and meet adjacent grades without sunken areas, humps or other irregularities.

b. place 6 inches or more of cleans soil, free of debris, rock, etc., as initial backfill on pressure supply lines.

c. place fine granular material with no foreign matter larger than 1 inch in size as initial backfill on all non-pressure lines.

d. place a minimum of 6 inches of sand on pipes located under areas where paving will be installed. use specified initial backfill for remaining backfill necessary.

e. install piping under existing walks by jacking or boring. if cutting or breaking of walks is necessary, it shall be done and replaced as part of this contract. receive permission from owner's representative before proceeding.

f. the trenches shall not be backfilled until all required tests are performed.

3.08 line clearance:

a. lines shall have a clearance of 6 inches or more from each other and from lines of other trades.

b. parallel lines shall not be installed directly over one another, nor against the sides of the trench.

3.09 irrigation equipment, as defined above:

a. install as per manufacturer's standard details.

b. spacing of irrigation heads shall not exceed manufacturer's minimum performance specifications.

c. riser heights for irrigation heads shall be level.

d. install sprinkler heads 12 inches out from low lying windows.

e. hydrostatic drain valves will be installed at low points in the lateral lines. valves shall be terminated in 9" diameter valvebox.

3.10 assemblies:

a. install no multiple assemblies on plastic lines. provide each assembly with its own outlet.

b. pvc to metal connection shall be by pvc male thread adapter fitting screwed into metal female fitting.

c. teflon tape shall be used on all threaded pvc to pvc and pvc to metal joints.

d. install all assemblies in accordance with mfg's standard details. if there is no detail available pertaining to a specific item to complete work, then use the best standards of practice available, with prior approval.

3.11 adjusting the system:

a. after irrigation pipelines and risers are in place and connected, and prior to installation of irrigation heads, open control valves and use a full head of water to flush out system.

b. adjust valves and alignment and coverage of irrigation heads. adjustments may include changes in nozzle sizes and degrees of arc. these changes shall be made without additional cost to the owner.

c. all sprinkler heads shall be set perpendicular to finished grade or as required for proper head-to-head coverage (slopes, etc.).

3.12 observation schedule:

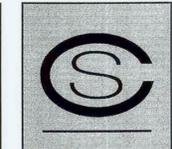
a. a pre-job conference shall be required before proceeding with work under this contract. an observation schedule shall be determined at this time for all work. observations shall include, but not be limited to, one walk-through for substantial completion at the start of the 60-day maintenance period and a walk-through for final completion at the end of the 60-day maintenance period. prior to the scheduled substantial completion walk-through, the irrigation system shall be fully installed and operational. the owner's representative will generate a punch list of items to be corrected prior to final completion. the owner's representative, due to the contractor's performance or lack of performance, reserves the right to lengthen or shorten the 60-day maintenance period.

b. contact owner's representative 72 hours or 3 working days in advance of each agreed observation or conference.

c. prior to final walk-through, the contractor shall furnish the owner all the 'as-builts', equipment, charts, guarantees, or other required items specified.

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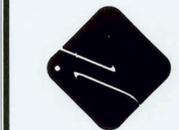
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J.T. SMITH
companies



Teresa's Vineyard
Public Improvements
Sub-07-02/NDW-07-02/VAR-07-01
West linn, Oregon

Table with 3 columns: REV, DATE, SUMMARY. Row 1: 1, 8/5/11, Client/Agency Comments.

Project #: 9130 Drawn: dpc

IRRIGATION SPECIFICATIONS

Date: April 15, 2011

L1.4

APPROVED FOR CONSTRUCTION BY
CITY OF WEST LINN
This approval is only for general conformance with the design concept and general compliance with applicable codes and requirements and shall not be construed as relieving the Design Engineer of full responsibility for accuracy and completeness of the drawings. This plan review approval does not prevent the City from requiring further code corrections.
DATE: 8-5-11 BY: [Signature] ENGINEERING
DATE: 8-5-11 BY: [Signature] PLANNING