IRRIGATION SPECIFICATIONS

SECTION 02810

PART 1 - GENERAL

1.1 SCOPE

A. Provide complete sprinkler installation as detailed and specified herein, including furnishing all labor, materials, and equipment for the proper installation. Work includes but is not limited to:
   1. Trenching and backfill.
   2. Automatic controlled system.
   3. Upon completion of installation, supply drawings showing details of construction including location of mainline piping, manual and automatic valves, electrical supply to valves, and specifically exact location of automatic valves.

B. NOTE: All sleeves as shown on plans will be furnished by General Contractor. Meter and power source to be provided by General Contractor.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. See Irrigation Plans. See plans for controller, heads, and valves.
B. Section 02900-Landscape
C. Section 02811-Underground Irrigation Sleeve and Utility Conduits

1.3 APPLICABLE STANDARDS

A. America Standard for Testing and Materials (ASTM)- Latest edition.
   1. D2241 Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR)
   2. D2464 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Thread, Schedule 80
   3. D2455 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
   4. D2467 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Socket Type, Schedule 80
   5. D2564 Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
   6. D2287 Flexible Poly Vinyl Chloride (PVC) Plastic Pipe
   7. F656 Poly Vinyl Chloride (PVC) Solvent Weld Primer
   8. D2855 Making Solvent- Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

1.4 MAINTENANCE AND GUARANTEE

A. Materials and workmanship shall be fully guaranteed for one (1) year after final acceptance.

B. Provide maintenance of system, including raising and lowering of heads to compensate for lawn growth, cleaning and adjustment of heads, raising and lowering of shrub heads to compensate for shrub growth for one (1) year after completion of installation.

C. Guarantee is limited to repair and replacement of defective materials or workmanship, including repair of backfill settlement.

1.5 SUBMITTALS

A. Procedure: Comply with Division I requirements.
B. Product Data: Submit copies of equipment maufacturer's specifications and literature for approval.
C. Project Record Documents
   1. Comply with Division I requirements.
   2. Locate by written dimension, routing of mainline piping, remote control valves and
   3. When dimensioning is complete, transpose work to mylar reproducible tracings. tracings will be provided by Architect.
   4. Submit completed tracings prior to final acceptance. Mark tracings "Record Prints
   5. Provide three complete operation manuals and equipment brochures neatly bound in
D. Quick Coupler Keys: Provide 3 coupler keys with boiler drains attached using brass reducer.
E. Controller Keys: Provide two sets of keys to controller enclosure(s).
F. Use of materials differing in quality, size, or performance from those specified will only be allowed upon written approval of Owner/Landscape Architect. The decision will be based on comparitive ability of material or article to perform fully all proposes of mechanics and general design considered to be possessed by item specified.
G. Bidders desiring to make a substitution for specified sprinklers shall submit manufacturer's catalog sheet showing full specification of each type sprinkler proposed as a substitute, including discharge in GPM maximum allowable operating pressure at sprinkler.
H. Approval of substitute sprinkler shall not relieve Contractor of his responsibility to demonstrate that final installed sprinkler system will operate according to intent of originally designed and specified system.
I. It is the responsibility of the Irrigation Contractor to demonstrate that final installed sprinkler system will operate according to intent of originally originally designed and specified system. If Irrigation Contractor notes any problems in head spacing or potential coverage, it is his responsibility to notify the Landscape Architect in writing, before proceeding with work. Irrigation Contractor guarantees 100% coverage of all areas to be irrigated.

1.6 TESTING

A. Perform testing required with other trades, including earthwork, paving, and plumbing, to avoid unnecessary cutting, patching and boring.
B. Water Pressure: Prior to starting construction, determine if static water pressure is as

1.7 COORDINATION

A. Coordinate installation with other trades, including earthwork, paving, and plumbing, to avoid unnecessary cutting, patching and boring.
B. Coordinate to ensure that electrical power source is in place.
C. Coordinate system installation with work specified in other sections and coordinate with landscape installer to ensure plant material is uniformly watered in accordance with intent shown on drawings.

PART 2 - PRODUCTS

2.1 GENERAL

A. Mainline: Piping from water source to operating valves. This portion of piping is subject to surges, being a closed portion of sprinkler system. Hydrant lines are considered a part of sprinkler main.

B. Lateral Piping: Lateral piping is that portion of piping from operating valve to sprinkler heads. This portion of piping is not subject to surges, being an "open end" portion of sprinkler system.

2.2 POLY VINYL CHLORIDE PIPE (PVC PIPE)

A. PVC pipe shall be manufactured in accordance with commercial standards noted herein.

B. Marking and Identification: PVC pipe shall be continuously and permanently marked with the following information: manufacturer's name, pipe size, type of pipe, and material, SDR number, product standard number, and the NSF (National Sanitation Foundation) seal.

C. PVC Pipe Fittings: Shall be of the same material as the PVC pipe specified and shall be compatible with PVC pipe furnished.

2.3 COPPER TUBING

A. Hard, straight, lengths of domestic manufacture only. No copper tube of foreign extrusion or any so-called irrigation tubing (thin wall) shall be used.

2.4 COPPER TUBE FITTINGS

A. Cast brass or wrought copper, sweat-solder type.

2.5 WIRE

A. Type UF with 4-64" insulation which is Underwriter's Laboratory approved for direct underground burial when used in a National Electric Code Class II Circuit (30 volts AC or less).

2.6 SCHEDULE 80 PVC NIPPLES

A. Composed of Standard Schedule 40 PVC Fittings and PVC meeting noted standards. No clamps or wires may be used. Nipples for 1812 heads and shrub risers to be nominal one-half (1/2") inch diameter by eight (8") inches long, where applicable.

B. Polyethylene nipples six (6") inches long to be used on all 1804 and 1806 pop-up spray heads.

2.7 MATERIALS - See Irrigation Plan

A. Sprinkler heads in lawn area as specified on plan.
B. PVC Pipe: Class 200, SPR 21
   Copper Tubing (City Connection): Type "M"
   24V Wire: Size 14, Type UF.
C. Electric valves to be all plastic construction as indicated on plans.
D. Refer to drawing for backflow prevention requirements and flow valve. Coordinate exact location with Landscape Architect.

PART 3 EXECUTION

3.1 INSTALLATION - GENERAL

A. Staking: Before installation is started, place a stake where each sprinkler is to be located, in accordance with drawing. Staking shall be approved by Landscape Architect before proceeding.
B. Excavations: Excavations are unclassified and include earth, loose rock, rock or any combination thereof, in wet or dry state. Backfill trenches with material that is suitable for compaction and contains no lumps, clods, rock, debris, etc. Special backfill specifications, if furnished take preference over this general specification.
C. Backfill: Flood or hand-tamp to prevent after settling. Hand rake trenches and adjoining area to leave grade in as good or better condition than before installation.
D. Piping Layout: Piping layout is diagrammatic. Route piping around trees and shrubs in such a manner as to avoid damage to plantings. Do not dig within ball of newly planted trees or shrubs.

3.2 PIPE INSTALLATION

A. Sprinkler Mains: Install a four (4") inch minimum trench with a minimum of eighteen (18") inches of cover.
B. Lateral Piping: Install a four (4") inch wide minimum trench deep enough to allow for installation of sprinkler heads and valves, but in no case, with less than twelve (12") inches of cover.
C. Trenching: Remove lumber, rubbish, and large rocks from trenches. Provide firm, uniform bearing for entire length of each pipe line to prevent uneven settlement. Wedging or blocking of pipe will not be permitted. Remove foreign matter or dirt from inside of pipe before welding, and keep piping clean by approved means during and after laying of pipe.

3.3 PVC PIPE AND FITTING ASSEMBLY

A. Solvent: Use only solvent recommended by manufacturer to make solvent-welded joints. Thoroughly clean pipe and fittings of dirt, dust and moisture before applying solvent.
B. PVC to metal connection: Work metal connections first. Use a non-hardening pipe dope such as Permatex No. 2 on threaded PVC adapters into which pipe may be welded.

3.4 COPPER TUBING AND FITTING ASSEMBLY

A. Clean pipe and fitting thoroughly and lightly sand pipe connections to remove residue from pipe. Attach fittings to tubing in an approved manner using 50-50 soft solid core solder.

3.5 SHRUB SPRAY HEADS (FIXED)

A. Shrub Spray Heads: Supply in accordance with materials list, with nozzling in accordance with drawings. Drawings indicate size of nozzling and degree of arc. Determine correct degree of arc of nozzle (if conditions warrant) by area to be covered and by wind conditions that may affect coverage.
B. Height: Install heads on PVC Schedule 80 risers sufficiently high to water under shrubs and plants, or as directed by the Landscape Architect.

3.6 POP-UP SPRAY HEADS

A. Supply pop-up spray heads in accordance with materials list and plan. Attach sprinkler to lateral piping with a semi-flexible polyethylene nipple not less than tree (3") inches or more than six (6") inches long.

3.7 VALVES

A. Supply valves in accordance with materials list and sized according to drawings. Install valves in a level position in accordance with Manufacturer's Specifications. See plan for typical installation of electric valve, valve box.

3.8 WIRING

A. Supply wiring from the automatic sprinkler controls to the valves. No conduit will be required for U.F. wire unless otherwise noted on the plan. Wire shall be tucked under the piping.
B. A separate wire is required from the control to each electric valve. A common neutral wire is also required from each control to each of the valves served by each particular control.
C. Bundle multiple wires and tape them together at ten (10') foot intervals. Install ten (10") inch expansion coil at not more than one hundred (100') foot intervals. Make splices waterproof.

3.9 AUTOMATIC SPRINKLER CONTROLS

A. Supply in accordance with Irrigation Plan. Install according to manufacturer's recommendations.

3.10 TESTING

A. Sprinkler Mains: Test sprinkler main only for a period of twelve (12) to fourteen (14) hours under normal pressure. If leaks occur, replace joint or joints and repeat test.

B. Complete tests prior to backfilling. Sufficient backfill material may be placed in trenches between fittings to insure stability of line under pressure. In each case, leave fittings and couplings open to visual inspection for full period of test.

3.11 FINAL ADJUSTMENT

A. After installation has been completed, make final adjustment of sprinkler system in preparation for Landscape Architect's final inspection. Completely flush system to remove debris from lines and turning on system. Check sprinklers for proper operation and proper alignment for direction of flow. Check each section of spray heads for operating pressure and balance to other sections by use of flow adjustment and top of each valve. Check nozzling for proper coverage. Prevailing wind conditions may indicate that arch of angle of spray should be other than shown on drawings. In this case, change nozzles to provide correct coverage.

END OF SECTION

SLEEVING NOTES

1. Contractor shall lay sleeves and conduits at twenty-four (24") inches below finish grade of the top of pavement.
2. Contractor shall extend sleeves one (1') foot beyond edge of all pavement.
3. Contractor shall cap pipe ends using PVC caps.
4. All sleeves shall be Schedule 40 PVC pipe.
5. Contractor shall furnish Owner and Irrigation Contractor with an 'as-built' drawing showing all sleeve locations.

IRRIGATION LEGEND

- WEATHERMATIC LX-4 POP-UP LAWN HEAD
- WEATHERMATIC LX-12 POP-UP SHRUB HEAD
- WEATHERMATIC TURBO ROTARY FC
- WEATHERMATIC TURBO ROTARY PC
- 106.5 BUBBLER (2 PER TREE)
- WEATHERMATIC 11000 SERIES ELECTRIC VALVE
- WEATHERMATIC V075R QUICK COUPLER
- CONTROLLER, SIZE AS INDICATED
- WATER METER, SIZE AS INDICATED
- D.C.A., SIZE AS INDICATED
- PVC CLASS 200 LATERAL LINE
- PVC CLASS 200 MAINLINE
- PVC SCHEDULE 40 SLEEVING
- VALVE SIZE / GPM

IRRIGATION NOTES

1. All sprinkler equipment numbers reference the Weathermatic equipment catalog unless otherwise indicated.
2. LAWN SPRAY HEADS are LX-4 installed as per detail shown.
3. SHRUB SPRAY HEADS are LX-12 installed as per detail shown.
4. ELECTRIC CONTROL VALVES shall be #11000 CR installed per detail shown. Size valves as sown on plan. Valves shall be installed in value boxes large enough to permit manual operation, removal of solenoid and/or valve cover without any earth excavation.
5. QUICK COUPLING VALVES shall be #VO75R installed per detail shown. Swing joints shall be constructed using 3/4" Schedule 80 elbows. Contractor shall supply owner with three (3) #CO75 couplers and three (3) #10 swivel hose ells as part of this contract.
6. AUTOMATIC CONTROLLER shall be installed at location shown. Power (120V) shall be located in a junction box within five (5') feet of controller location by other trades.
7. All 24 volt valve wiring is to be UF 14 single conductor. All wire splices are to be permanent and waterproof.
8. SLEEVES shall be installed by General Contractor. Sleeve material shall be Schedule 40. Size as indicated on plan.
9. Ten days prior to start of construction, Landscape or Irrigation Contractor shall verify static water pressure. If static pressure is less than 50 P.S.I., do not work until notified to do so by Owner.
10. All main line and lateral piping to a minimum of 12 inches of cover. All piping under paving shall have a minimum of 18" of cover.
11. The Irrigation Contractor shall coordinate installation of the system with the Landscape Contractor so that all plant material will be watered in accordance with the intent of the plans and specifications.
12. The Irrigation Contractor shall select the proper arc and radius for each nozzle to insure 100% and proper coverage of all lawn areas and plant material. All nozzles shall be Weathermatic 5500 Series. All nozzles in parking lot islands and planting beds shall be low angle to minimize over spray on pavement surfaces. No water will be allowed to spray on building.

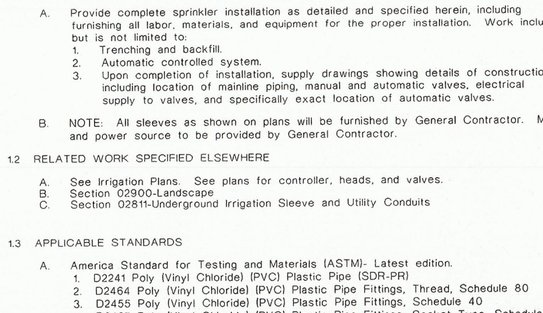
IRRIGATION PERFORMANCE SPECIFICATIONS

1. All sprinkler equipment numbers reference the Weathermatic equipment catalog.
2. ELECTRIC CONTROL VALVES shall be: #11000 CR installed per detail shown. Valves shall be installed in valve boxes large enough to permit manual operation, removal of solenoid and/or valve cover without earth excavation.
3. QUICK COUPLING VALVES shall be: #VO75R, 1" Quick Coupler with vinyl yellow cover installed per detail shown. Swing joints shall be constructed using 3/4" Schedule 80 elbows. Contractor shall supply owner with three (3) couplers and three (3) swivel hose ells as part of this contract.
4. SLEEVES shall be: PVC Schedule 40.
5. MAINLINE PIPE shall be: PVC Class 200 or better, SDR-21 Solvent Weld.
6. LATERAL PIPE shall be: PVC Class 200 or better, SDR-21 Solvent Weld.
7. HEADS shall be: TORO S700 C FC 3.0 SA, groundlevel installation, spacing shall be 25'-0" - 40'-0".
8. All 24 volt valve wiring is to be UF 14 single conductor. All wire splices are to be permanent and waterproof.
9. Irrigation Notes, Details and Specifications shall be used as a directive for irrigation layout and installation.
10. All main line and lateral piping shall have a minimum of 12 inches of cover. All piping under paving shall have a minimum of 18 inches of cover.
11. Contractor shall submit head layout and material list to Architect for review and approval prior to installation.
12. Plans shall be drawn to scale. Contractor shall submit 'as-built' record drawing of complete irrigation system to owner.
13. Square spacing of heads shall not be permitted. All heads to be "head-to-head" spacing.
14. Contractor shall be responsible for verifying conditions of existing irrigation system. Contractor shall be responsible for maintaining the integrity of existing irrigation where possible, including but not limited to irrigation controller, meter, sleeving, etc.
15. Contractor shall perform site visit prior to bidding and construction, to review extent of existing irrigation system.
16. The irrigation contractor shall coordinate installation of the system with the landscape contractor so that all plant material will be watered in accordance with the intent of the plans and specifications.
17. The irrigation contractor shall select the proper arc and radius for each nozzel to insure 100% and proper coverage of all lawn areas.

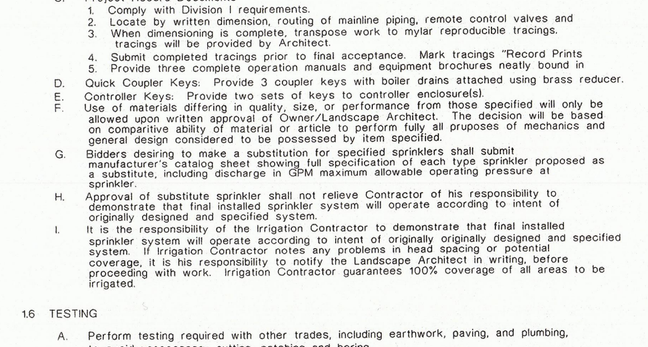
PROGRESS SET - FOR REVIEW ONLY
ISSUED
12.07.01

These documents are for Design Review and NOT intended for Construction or Permit Purposes. They were prepared by, or under the supervision of:

Brian Denis Adams, Tx. Lic. #1761
Steven M. Rahn, Inc.



01 ROTARY HEAD
NOT TO SCALE



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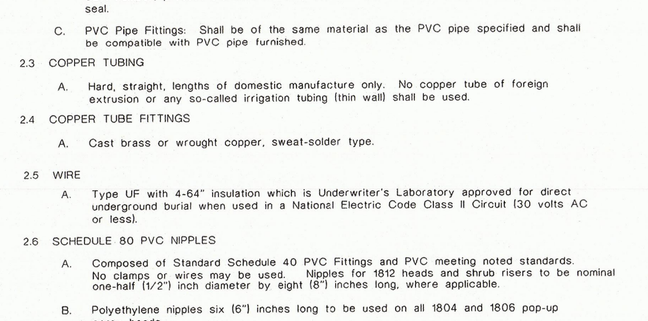

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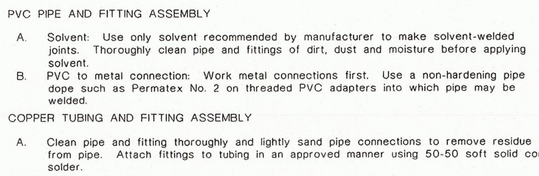

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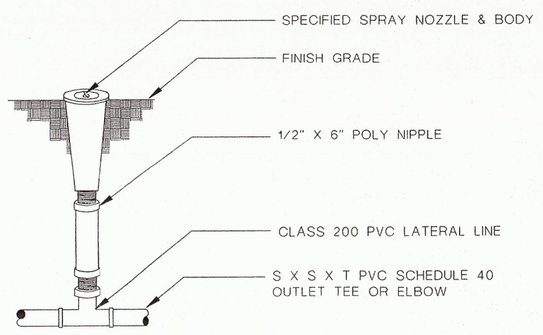

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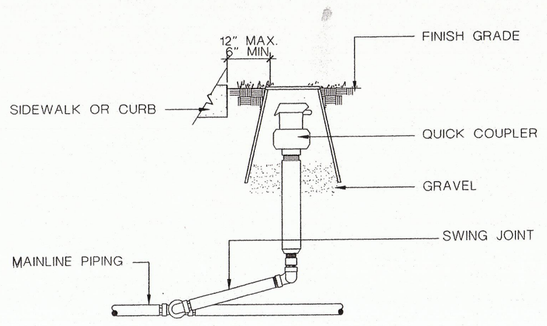

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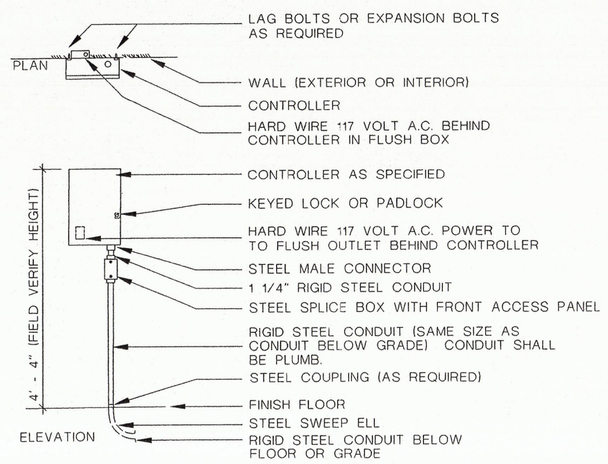

07 WALL MOUNTED CONTROLLER
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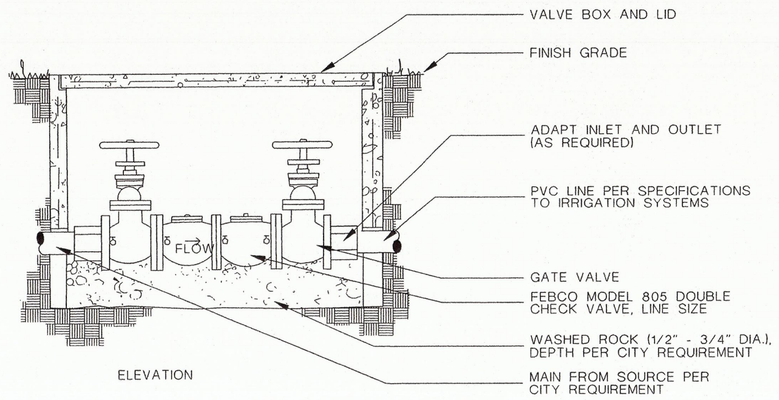

08 BACKFLOW PREVENTER
NOT TO SCALE

IRRIGATION SPECIFICATIONS
AS SHOWN

STATE OF TEXAS
BRIAN D. ADAMS
1761
REGISTERED
LANDSCAPE ARCHITECT
EXPIRES 03/02/2002
SEAL VALID ONLY IF SIGNED AND DATED

A Proposed Facility For
OST
Addison, Texas

M&A
MEINHARDT & ASSOCIATES
ARCHITECTS, P.L.L.C
14800 LANDMARK
SUITE 650
DALLAS TEXAS 75254
972 980-8880

smr
landscape architecture
STEVEN M. RAHN, INC.
The Brewery Building
703 McKinney Ave.
Suite 438 LB 107
Dallas, Texas 75202
Tel 214.871.0083
Fax 214.871.0545
email smr@smr-la.com

DATE: 12-07-01
DRAWN BY: BKR
CHECKED BY: BA
SHEET:

L1.3