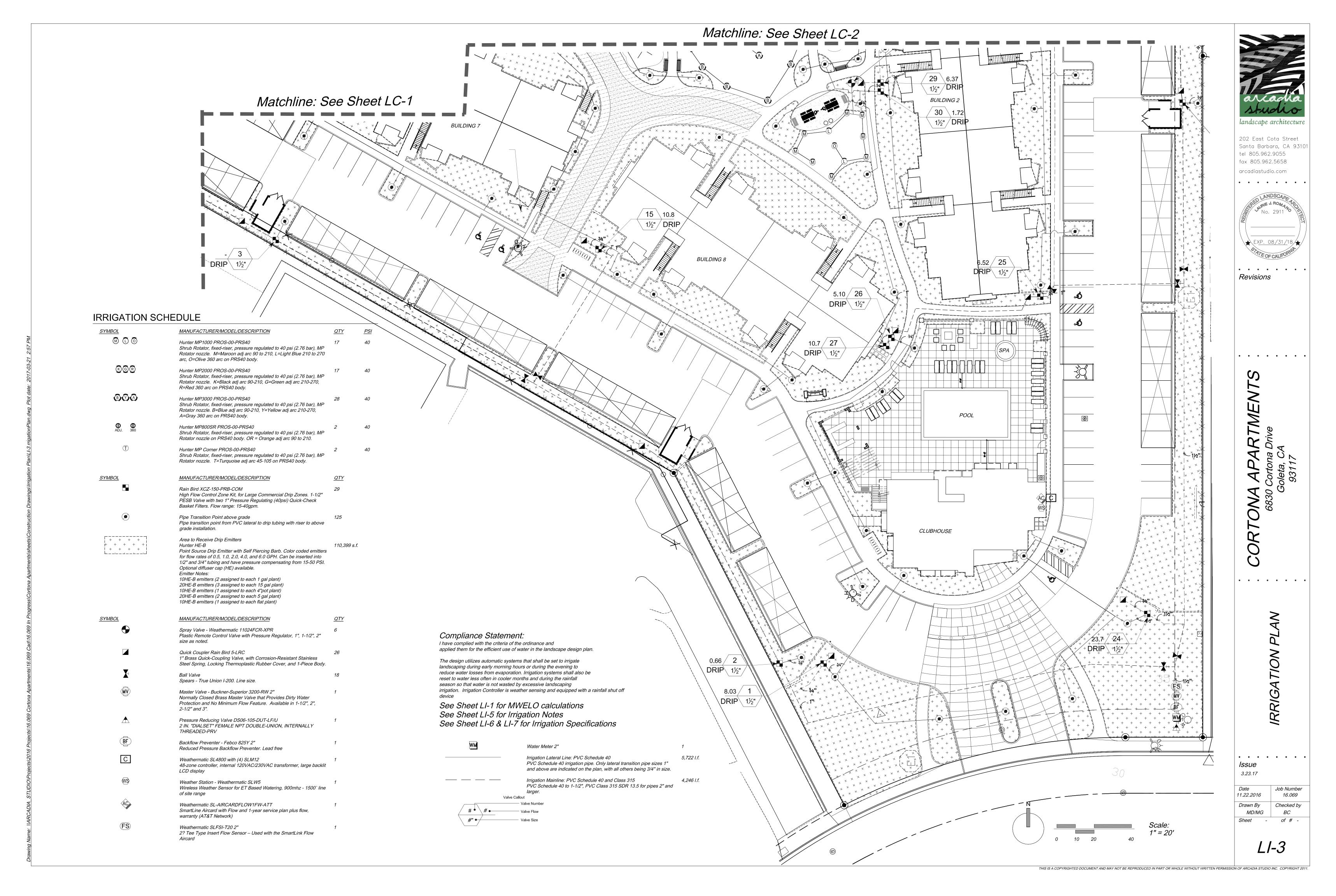


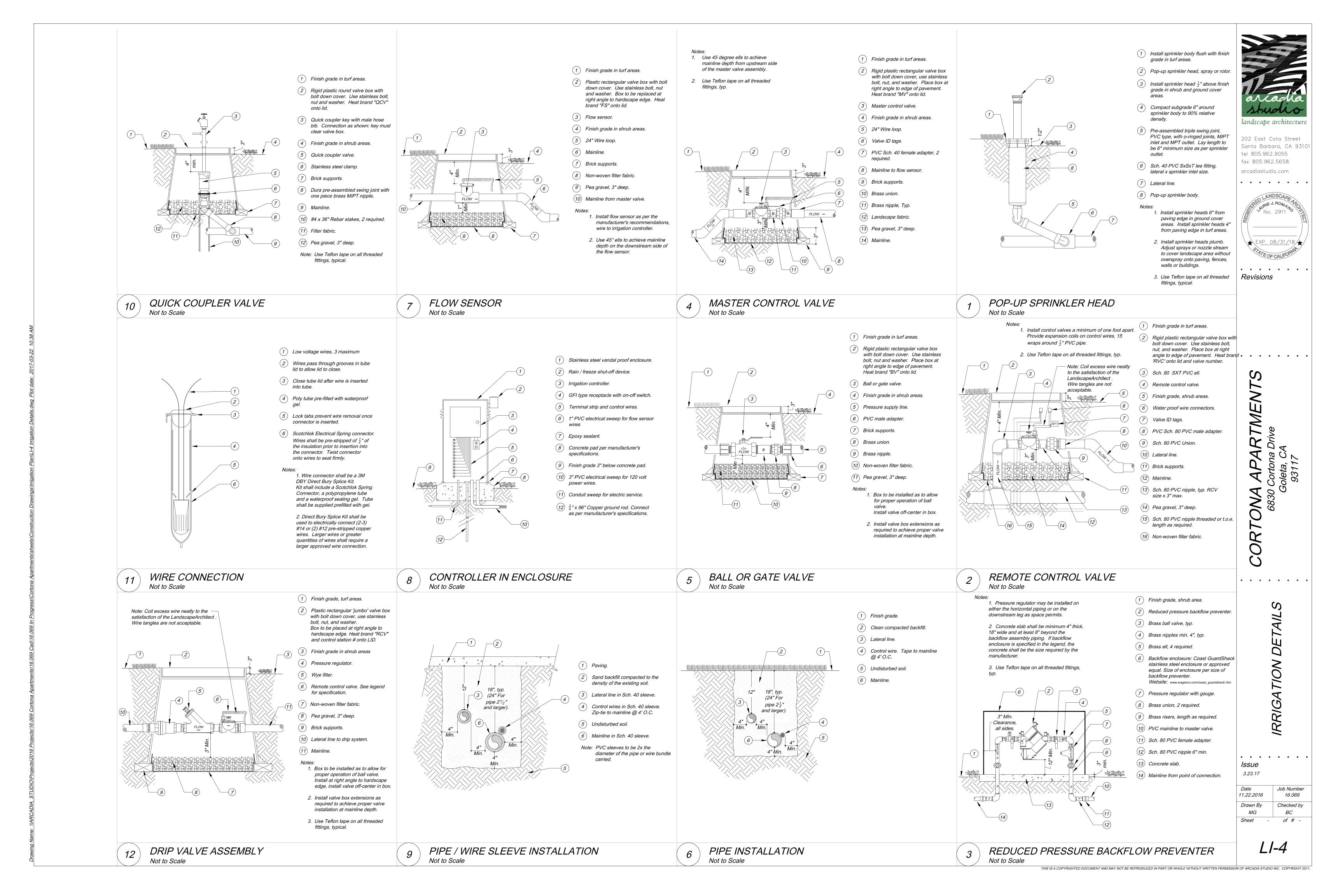
landscape architecture

202 East Cota Street Santa Barbara, CA 93101 tel 805.962.9055 fax 805.962.5658

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Job Number 16.069 Checked by BCof # -





Irrigation Notes:

- 1. See irrigation legend for complete descriptions of all symbols shown on irrigation plan.
- 2. Point of connection is at the approximate location shown on plan.
- 3. Install all valves in locking plastic valve boxes in shrub and groundcover area where it can be screened by plantings. Install one valve per box. Identify locations and flag on site for Landscape Architect's approval BEFORE excavating for installation.
- 4. Install irrigation system in accordance with manufacturer's specifications, irrigation details, and local
- 5. Indicated pipe locations are schematic. Do not place pipe under paving except where absolutely necessary. Coordinate pipe installation with other trades.
- 6. All piping installed under paving, through walls or footings must be placed inside Schedule 40 PVC sleeves of adequate size to allow free movement of the pipe in the sleeve. All pipe runs in sleeves must be straight, with no bends or angles. Sleeves for recycled-water irrigation lines shall be colored to match the pipe.
- 7. Locate irrigation controller at approximate location shown on plan. 110-v j-box by others. Obtain Landscape Architect's approval of location before installing.
- 8. Emitters shall be located on grade and staked a maximum of 6" (six inches) from the center of the plant, or at edge of rootball, whichever is greater.
- 9. Install flush end valves at the ends of all $\frac{5}{8}$ " polyethylene drip tubing in round valve boxes with gravel fill.
- 10. Install irrigation lines at the following minimum depths:

Schedule 40 and class 315 PVC mainline: 18" minimum cover Schedule 40 PVC lateral line: 12" minimum cover

 $\frac{5}{8}$ " polyethylene drip tubing: place on grade with galvanized stakes @ 3' O.C. $\frac{1}{4}$ " polyethylene micro-tubing: place on grade with plastic tube stakes.

**Install all rigid pipe as near to edges of planting areas, to avoid conflict with large plants.

11. Emitter layout:

4" pot or flatted groundcover:

1 - 1 GPH emitter per plant (flatted groundcover can be watered with microspray emitters).

2 - 1 GPH emitters per plant.

5 gallon shrubs: 2 - 2 GPH emitters per plant. 3 - 2 GPH emitters per plant. 15 gallon shrubs/trees:

24" box tree: 3 - Hunter HE-60-B Point Source Emitters (Orange 6 GPH) 36" box tree: 4 - Hunter HE-60-B Point Source Emitters (Orange 6 GPH).

6 - Hunter HE-60-B Point Source Emitters (Orange 6 GPH) 48" box tree: 60" box tree or field grown tree: 10 - Hunter HE-60-B Point Source Emitters (Orange 6 GPH) Provide 14 - Hunter HE-60-B Point Source Emitters Trees larger than 60" box:

(Orange 6 GPH) Confirm final number of emitters with Landscape Architect.

Punch emitter into polyethylene tubing. Attach microtubing to emitter. Attach bug cap to open end of microtubing. Bring microtubing to edge of rootball. Stake end of microtubing with plastic stake manufactured for that purpose.

- 12. In the event of discrepancies in irrigation equipment count, quantities indicated by symbols on the plan prevail.
- 13. Include in the contract price a sufficient amount to allow for supply and installation of additional irrigation equipment to be used. Include 200 linear feet of lateral line, 200 near feet of mainline, and 50 additional spray heads and bodies. Provide the unit price for such irrigation equipment in the bid and credit the owner for each piece of equipment not installed.
- 14. In vicinity of existing trees, use discretion to route lateral lines and mainline as necessary to avoid root damage. Under canopies of existing trees, excavate using hand tools, and route pipe under roots with a minimum 4" clearance. Do not cut roots larger than 2" (two inches) in diameter, unless approved by the Landscape Architect.
- 15. Use variable arc nozzles and / or pressure compensating screens as necessary to prevent overspray in areas where standard nozzles would not be efficient.
- 16. Verify location of backflow preventer, master control valves, controller and point of connection with Landscape Architect prior to installation.
- 17. Install and adjust all spray and bubbler heads to prevent water contact with all built elements.
- 18. Adjust all spray and bubbler heads to minimize overspray onto paved areas.
- 19. Install sprinklers on a 12" pop-up body in shrub areas, on a 12" pop-up body in no-mow turf areas such as (Leymus triticoides 'Lagunita') on a 6" pop up body in Marathon II (or other traditional turf) areas, and on a 4" pop-up body in planters directly adjacent to parking spaces.
- 20. Install check valves at the low end of all irrigation lines to prevent low head drainage.

Irrigation Pipe Sizing Guidelines:

Schedule 40 mainline up to 1-1/2"

0-4 gpm 1/2" 5-8 gpm 3/4" 9-12 gpm 1-1/4" 13-22 gpm 1-1/2" 23-30 gpm

Class 315 mainline 2" and up

30-50 gpm 2- 1/2" 51-70 gpm 71-100 gpm

Schedule 40 lateral line

0-4 gpm 5-10 gpm 3/4" 11-16 gpm 17-26 gpm 1-1/4" 27-35 gpm 1-1/2" 36-55 gpm 2-1/2" 56-80 gpm

Weathermatic valves

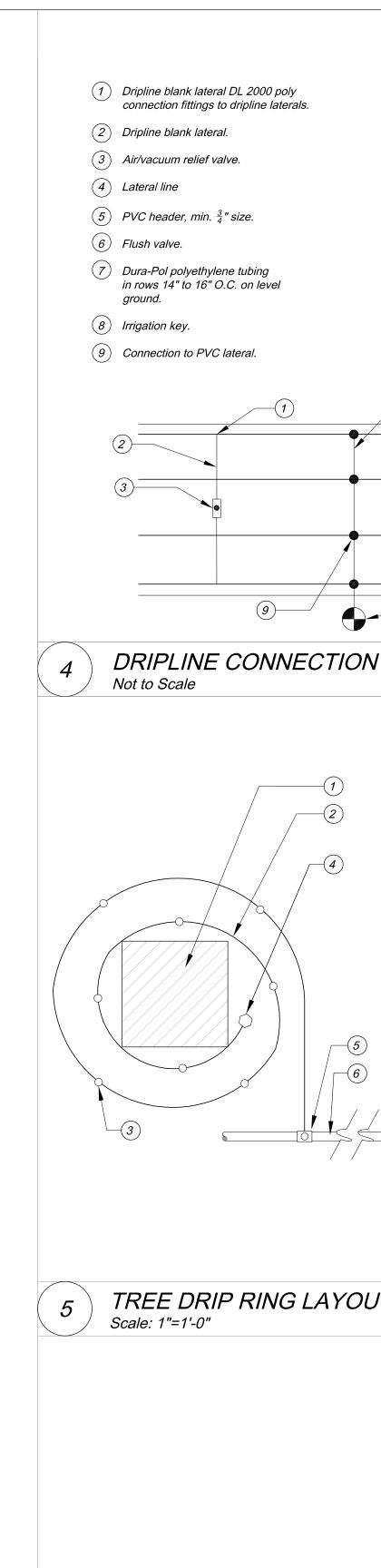
81-120 gpm

0-20 gpm 1-1/2" 20-40 gpm 40-80 gpm

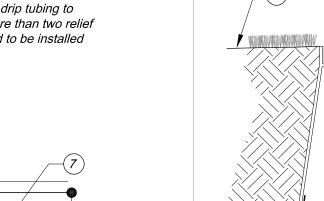
Rainbird XCZ drip valves

0-15 gpm 15-40 gpm

See Sheet LI-1 for MWELO calculations See Sheet LI-6 & LI-7 for Irrigation Specifications



- 3. Run air/vacuum relief blank tubing
- 4. Attach all in-line drip tubing to blank lateral. More than two relief valves may need to be installed



1. Install drip flush valve per detail at the end of each tubing section per

- 2. Install air relief valves per detail at high points of each tubing section per plan.
- lateral along high point of mound or berm.
- per section.

1 Tree rootball.

(2) Polyethylene tubing in rows around

tree, 2 required 4 - 6" below grade.

around rootball of tree. See irrigation notes for schedule and quantities.

flush cap SL $X \frac{3}{4}$ " MHT with plastic cap

box. Place flush valve a minimum of 4'

from trunk. If installation is on sloping

ground, install the flush valve on the

tubing and PVC pipe, SXT PVC ell or

installed with a FT-050 combination tee

and a $\frac{3}{4}$ " x $\frac{1}{2}$ " reducer bushing, install

air relief assembly inside a 6" planter, min. 1 air / vacuum relief valve per

2. Box to be installed as to allow for

proper operation of ball valve.

3. Install valve box extensions as required to achieve proper valve

installation at mainline depth.

Install at right angle to hardscape edge, install valve off-center in box.

tee $(\frac{1}{2}")$ with spin loc x thread male

downhill side of the tree.

(5) Connection between polyethylene

adapter AG products model

(7) YD-500-34 Air / vacuum relief valve

1. All drip tubing to be 4" min. below finish grade.

#S1/2MA-565.

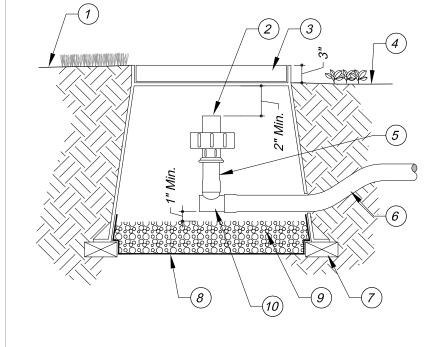
500' of dripline.

6 Lateral line.

(3) Xeribubblers or emitters spaced evenly

(4) AGR products "SPIN-LOC" 1025 SETC

installed within a round plastic pull



1) Finish grade, turf areas. (2) Toro FCH-H with DL200 automatic flush valve with DL-75MA-9153 $\frac{3}{4}$ " male adapter.

(3) Plastic round valve box, 6" size.

Heat brand "FV" onto lid. (4) Finish grade, shrub areas.

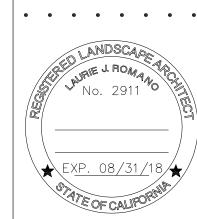
(5) Drip tubing, length as required.

(6) Drip tubing, sweep down to enter valve

(7) Brick supports.

(8) Filter fabric. (9) Pea gravel, 3" deep.

(10) Toro barbed ell (DL-E9018).



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202 East Cota Street

tel 805.962.9055

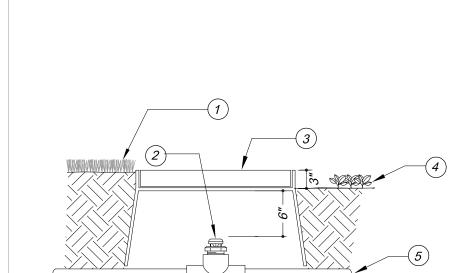
fax 805.962.5658

arcadiastudio.com

Santa Barbara, CA 9310

Revisions

DRIP FLUSH VALVE Scale: 1"=1'-0"



(1) Finish grade in turf areas. Toro YD-500-34 air/vacuum

size heat brand "ARV" onto

relief valve. (3) Plastic round valve Box, 6"

Grade in shrub areas.

DL2000. (6) Brick supports.

7 Filter fabric.

(8) Pea gravel, 3" deep.

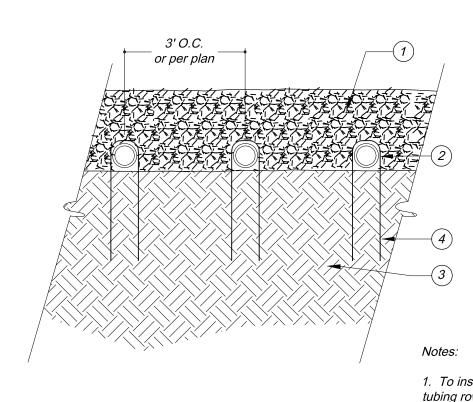
9 $\frac{1}{2}$ " PVC tee (SxSxT) with toro CA710 comp. adapter.

2A/

TME

TREE DRIP RING LAYOUT

DRIP AIR RELIEF VALVE Not to Scale



(1) Mulch, see planting

(2) Dura-Pol polyethylene

(3) Amended soil per planting notes and specifications. Bring soil level to 3" below finish grade of mulch prior to drip tubing installation.

(4) Galvanized wire Stake. 3'

o.c per irrigation notes.

1. To insure even parallel and level

tubing rows it is recommended that the soil level in the planter areas be brought to 3" below grade and properly compacted per the landscape drawings prior to the installation of tubing. 2. Install tubing as indicated on these

drawings and secure to grade using wire hoop stakes at 5 feet on center spacing. 3. Backfill final 2" of mulch over the tubing after

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Drawn By MGinstallation of the tubing.

DRIPLINE STAKING AND LAYOUT Not to Scale

of # -

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Job Number

Checked by

BC

16.069

Issue

3.23.17

11.22.16

0.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including the Project Conditions of Approval, General and Supplementary Conditions and other Division 1 Specification Sections apply to this Section
- 0.2 SUMMARY
- A. This Section includes the following:
- 1. Automatic Irrigation System including piping, fittings, sprinkler heads and accessories.
- 2. Valves, backflow preventer, and fittings.
- 3. Controller(s), control wire.
- Testing. 5. Excavating and backfilling Irrigation System Work.
- 6. Associated interior and exterior plumbing, and accessories to complete the system.
- B. Definition: The words Landscape Architect as used herein shall refer to the Owner's authorized representative:
- 1. Division 2 Section "Landscape Planting".
- 2. Division 2 Section "Landscape Maintenance"

C. Related Sections include the following:

- 3. Division 2 Section "Sodding"
- 0.3 QUALITY ASSURANCE AND REQUIREMENTS
- A. Permits and Fees: Obtain and pay for required permits and inspections.
- B. Manufacturer's Directions: Manufacturer's directions and detailed drawings shall be followed in all cases where the manufacturers of the articles used in this Contract furnish directions covering points not shown in the Drawings and Specifications.
- C. Ordinances and Regulations: All local, municipal and state laws, rules and regulations governing or relating to any portion of this Work are hereby incorporated into and made a part of these Specifications, and their provisions shall be carried out by the Contractor. Anything contained in these Specifications shall not be construed to conflict with any of the above rules and regulations or requirements of the same. However, when these Specifications and Drawings call for or describe materials, workmanship, or construction of a better quality, higher standard, or larger size than is required by the above rules and regulations, the provisions of these Specifications and Drawings shall take precedence.
- D. Explanation of Drawings:
- 1. 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 the Work and plan the 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.
- 2. Furnish and install all Work called for on the Drawings by notes or details whether or not specifically mentioned in the Specifications.
- 3. Do not 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 design. Bring such obstructions or differences to the attention of the Landscape Architect. In the event this notification is not performed, the Contractor assumes FULL RESPONSIBILITY FOR ANY REVISION NECESSARY.

0.4 SUBMITTALS A. Material List:

- 1. Furnish the articles, equipment, materials, or processes specified in the Drawings and Specifications. No substitutions will be allowed without approval as
- required by Division-1 "Product Substitutions" section 2. Submit complete materials list prior to performing Work. Include the manufacturer, model number and description of all materials and equipment to be used.
- 3. Equipment or materials installed or furnished which are not specified on the Drawings may be rejected with the Contractor required to remove such materials
- 4. Approval of any item, alternate or substitute indicates only that the product or products apparently meet the requirements of the Drawings and Specification on the basis of the information or samples submitted
- 5. Manufacturer's warranties shall not relieve the Contractor of its warrantee under the Contract Documents.

B. Record Drawings

- 1. Provide and keep up to date and complete a record set of prints which shall be corrected daily and show every change from the original Drawings and
- Specifications and the locations, sizes, and kinds of equipment. Prints for this purpose shall be kept on the site and shall be used only as a record set. 2. These Drawings shall also serve as Work progress sheets and shall be the basis for measurement and payment for Work completed. Make neat and legible
- annotations thereon daily as the Work proceeds, showing the Work as actually installed. These Drawings shall be available at all times for inspection. 3. Before the date of the final inspection, transfer all information from the record prints to a reproducible plan, procured from the Landscape Architect. All Work shall be neat, legible and in ink.
- 4. Dimension from two (2) permanent points of reference, building corners, sidewalk, or road intersections, etc., the location of the following items:
- a. Connection to existing water lines.
- b. Connection to existing electrical power.
- C. Gate valves.
- d. Routing of sprinkler pressure lines (dimension max. 100' along routing). e. Sprinkler control valves.
- f. Routing of control wiring.
- g. Quick coupling or garden valves.
- h. Other related equipment.
- 5. On or before the date of the final inspection, deliver the corrected and completed reproducibles to the Landscape Architect. Delivery of the reproducibles will not relieve the Contractor of the responsibility of furnishing required information that may be omitted from the prints.
- C. Controller Charts:
- 1. Landscape Architect must approve Drawings before controller charts are prepared.
- 2. Provide two controller charts for each controller supplied.
- 3. The chart shall show the area controlled by the automatic controller and shall be the maximum size that the controller door will allow. 4. The chart is to be a reduced drawing of the actual system. However, in the event the controller sequence is not legible when the drawing is reduced, it shall
- be enlarged to a size that will be readable when reduced. 5. The charts shall be a on stable (non-fading) paper, and a different color shall be used to indicate the area of coverage for each station.
- 6. When completed and approved, laminate the charts between two pieces of plastic.
- 7. These charts shall be completed and approved prior to final inspection of the Irrigation System.
- 8. Install the controller chart on the controller door. In the event that there are multiple controllers, include the other controller charts for reference at each
- 9. Include a duplicate controller chart for each controller in the operation and maintenance manual.

D. Operation and Maintenance Manuals:

- 1. Prepare and deliver to the Landscape Architect within ten calendar days prior to completion of construction, two binders containing the following information:
- a. Index sheet stating Contractor's address and telephone number, list of equipment with name and addresses of local manufacturer's representative.
- b. Catalog and parts sheets on every material and equipment installed under this Contract.
- c. Guarantee statement. d. Complete operating and maintenance instruction on all major equipment.
- e. One (set) of controller chart(s) that are duplicates of the charts installed on the controller door(s).
- 2. In addition to the above-mentioned maintenance manuals, provide the Owner's maintenance personnel with instructions for major equipment and show evidence
- in writing to the Landscape Architect at the conclusion of the Project that this service has been rendered. E. Equipment to be Furnished:
- 1. Supply as a part of this Contract the following tools:
- a. Two (2) sets of special tools required for removing, disassembling and adjusting each type of sprinkler and valve supplied on this Project.
- b. Two (2) five foot valve keys for operation of gate valves.
- c. Two (2) keys for each automatic controller
- d. One (1) quick coupler key and matching hose swivel for every five (5) or fraction thereof of each type of quick coupling valve installed.
- 2. Turn over the above-mentioned equipment to the Owner at the conclusion of the Project. Evidence that the Owner has received material must be shown to the Landscape Architect before final project review.
- 0.5 PRODUCT DELIVERY, STORAGE AND HANDLING A. Handling of PVC pipe and fittings: Exercise care in handling, and storing of PVC pipe and fittings. Transport all PVC so as not to subject it to undue bending or
- concentrated external load at any point. Any section of pipe that has been dented or damaged will be discarded and, if installed, shall be replaced with new piping. 0.6 GUARANTEE A. The guarantee for the irrigation system shall be made in accordance with the following form. The General conditions and Supplementary conditions of these
- specifications shall be filed with Owner or his representative prior to acceptance of the irrigation system.
- B. A copy of the guarantee form shall be included in the operations and maintenance manual.
- C. The guarantee form shall be re-typed onto the Contractor's letterhead and contain the following information:
- 0.7 GUARANTEE FOR IRRIGATION SYSTEM
- A. We hereby guarantee that the irrigation system we furnished and installed is free from defects in materials and workmanship, and work has been completed in accordance with the drawings and specifications, ordinary wear and tear and unusual abuse or neglect excepted. We agree to repair or replace any defects in material or workmanship which may develop during the period of one year from the date of acceptance and also to repair or replace any damage resulting from the repairing or replacing of such defects at no additional cost to the Owner. We shall make such repairs or replacements within a reasonable time, as determined by the Owner, after receipt of written notification. In the event of our failure to make such repairs or replacement within a reasonable time after receipt of written notice from the Owner, we authorize the Owner to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore
- B. Include following information:
- 1. PROJECT:
- 2. CONTRACTOR:
- ADDRESS:
- 4. PHONE NUMBER:
- 6. DATE OF ACCEPTANCE:
- PART 2 PRODUCTS

0.1 MATERIALS

- A. General: Use only new materials of brands and types noted on Drawings, specified herein, or approved equals.
- B. Copper: ASTM B88, Type L, hard-drawn copper tube and wrought solder type, paint per detail.
- C. PVC Pressure Main Line Pipe and Fittings:
 - 1. Pressure main line piping for sizes 2" and larger shall be Pacific Western (or approved equal) PVC Class 315 pipe. Pipe shall be made from an NSF approved Type I, Grade I PVC compound conforming to ASTM resin specification D1784. All pipes must meet requirements as set forth in Federal Specification PS-22-70, with an appropriate standard dimension (S.D.R.) (Solvent-weld pipe)
 - 2. Pressure main line piping for sizes 1-1/2" and smaller shall be Pacific Western (or approved equal) PVC Schedule 40 pipe. Pipe shall be made from NSF approved Type I, Grade I PVC compound conforming to ASTM resin specification 1785. All pipes must meet requirements as set forth in Federal Specification
 - 3. PVC solvent-weld fittings shall be Schedule 40, 1-2, II-I NSF approved conforming to ASTM test procedure D2466.
 - 4. Solvent cement and primer for solvent-weld and fittings shall be of type and installation methods prescribed by the manufacturer.
 - 5. All PVC pipe must bear the following markings:
 - a. Manufacturer's name
 - b. Nominal pipe size
 - c. Schedule or class d. Pressure rating in P.S.I.
 - e. NSF (National Sanitation Foundation) approval
 - f. Date of extrusion.
 - 6. All fittings shall bear the manufacturer's name or trademark, material designation, size, applicable I.P.S. schedule and NSF seal of approval.
- D. PVC Non-Pressure Lateral Line Piping:
- 1. Non-pressure buried lateral line piping shall be Pacific Western (or approved equal) PVC Class 200 pipe with solvent-weld joints. 2. Pipe shall be made from NSF approved, Type I, Grade II PVC compound conforming to ASTM resin specification D1784. All pipes must meet requirements set forth in Federal Specification PS-22-70 with an appropriate standard dimension ratio. Except as noted in paragraphs 1 and 2 of Article 2.1B, all requirements for
- non-pressure lateral line pipe and fittings shall be the same as for solvent-weld pressure main line pipe and fittings as set forth in Article 2.01B of this Section. E. PVC Pipe Sleeves: All piping installed under paving, through walls or footings shall be placed inside Schedule 40 PVC pipe sleeves of adequate size to allow free movement of the pipe in the sleeve
- F. Copper Pipe and Fittings: Type "L" copper pipe with wrought copper fittings. G. Ball Valves:
- 1. PVC Ball valves.
- 2. Install per installation detail.
- H. Quick coupling valves or garden valves: size and type as indicated on Drawings.
- I. Check Valves: Anti-drain valves shall be of heavy-duty virgin PVC construction with F.I.P. thread inlet and outlet. Internal parts shall be stainless steel and neoprene. Anti-drain valve shall be field adjustable against drawout from 5 to 40 feet of head. Anti-drain valve shall be similar to the Hunter "ADV" or approved
- J. Control Wiring:
- 1. Make connections between the automatic controller(s) and the electric control valves with direct copper wire AWG-U.F. 600 volt. Common wires shall always be white in color. Install in accordance with valve manufacturer's specifications and wire chart. In no case shall wire size be less than #14. Provide permanent tag identifying valve number on each control wire within controller cabinet.
- 2. Wiring shall occupy the same trench and shall be installed along the same route as pressure supply or lateral lines wherever possible.
- 3. Where more than one (1) wire is placed in a trench, tape the wiring together at intervals of ten (10) feet.
- 4. Provide an expansion curl within three (3) feet of each wire connection
- 5. Expansion curl shall be of sufficient length at splice connection at each electric control, so that in case of repair, the bonnet may be brought to the surface without disconnecting the control wires. Lay the control wires loosely in trench without stress or stretching of control wire connectors.
- 6. Make all splices with 3M DBY Direct burial splice kit or approved equal. 7. Field splices between the automatic controller and electrical control valves will not be allowed without prior approval of the Landscape Architect.
- K. Automatic Controller: 1. Automatic controller shall be per Drawings.

1. All electric control valves shall be per Drawings.

- 2. Final location of automatic controller shall be approved by Owner
- 3. Unless otherwise noted on the Drawings, the 120-volt electrical power to the automatic controller location shall be furnished by others. The final electrical hook-up shall be the responsibility of the irrigation installer.
- L. Electrical Control Valves:
- 2. All electric control valves shall have a manual flow adjustment. 3. Provide and install one control valve box for each electric control valve.
- M. Control Valve Boxes: 1. Heavy duty rectangular box, Carson, Ametek, Roby, with lockable lid. Install as detailed. Burn the valve number on the lid of the valve box with a branding iron
 - manufactured for that purpose. Install a plastic pre-printed valve tag with a number corresponding to the valve number on each valve. a. Use 10" x 10-1/4" round box for all gate valves. Extension sleeve, where required, shall match box.
- b. Use 12" x 17" measured top rectangular box for all remote control valves. Extension sleeve, where required, shall match box c. Use 15" x 21" measured top jumbo rectangular box for all remote control drip assembly valves. Extension sleeve, where required, shall match box
- 1. All sprinkler heads shall be of the same size, type, and deliver the same rate of precipitation with the diameter (or radius) of throw, pressure, and discharge as
- shown on the Drawings or as specified. 2. Spray heads shall have a screw adjustment.
- 3. Riser units shall be fabricated in accordance with the details as shown on the Drawings. 4. Riser nipples for all sprinkler heads shall be the same size as the riser opening in the sprinkler opening.
- 5. All sprinkler heads shall be as specified. O. Drip Irrigation Equipment:
- 1. Drip Emitters: type as indicated on Drawings. 2. Pressure Regulator: type as indicated on Drawings.
- 3. Y-Filter: Ag Products or approved equal.
- 4. Stainless steel wire staples to secure polyethylene tubing and plastic tubing stakes as necessary to locate emitters. 5. Polyethylene Tubing and Micro-Tubing:
- a. Rain Bird Xeri-Tube 700 1/2 ", Polyethylene tubing or approved equal for spot emitter drip applications.
- b. Rain Bird XT-025 1/4" Distribution tubing or approved equal for spot emitter drip applications.
- 6. Flush End Valve: size and type as indicated on Drawings or approved equal. P. Rainfall Shut-off Device: size and type as indicated on Drawings as part of weather-sensing system.

PART 3 - EXECUTION

- 0.1 INSPECTION
- A. Site Conditions:
- 1. All scaled dimensions are approximate. The Contractor shall check and verify all size dimensions and report any discrepancies to the Landscape Architect prior
- to proceeding with Work in this Section. 2. Exercise extreme care in excavating and Working near existing utilities. Contractor shall be responsible for damages to utilities that are caused by the
- Contractor's operations or neglect. Check existing utilities Drawings for existing utility locations. 3. Coordinate installation of irrigation materials including pipe, so they do not interfere with utilities or other construction or cause difficulty in planting trees, shrubs
- 4. Carefully check grades before starting Work on the Irrigation System.

2. Pipe layout must be approved by Landscape Architect prior to installation.

0.2 PREPARATION A. Physical Layout:

1. Prior to installation, stake out all pressure supply lines, routing and location of sprinkler heads.

1. Make electrical connections for automatic controller to electrical points of connection as indicated.

- B. Water Supply:
- 1. Connect the irrigation system to water supply point of connection indicated.
- 2. Make connections at approximate locations shown. Contractor is responsible for minor changes caused by actual site conditions.
- 2. Make connections at approximate locations as shown. Contractor is responsible for minor changes caused by actual site conditions. 0.3 INSTALLATION

B. Backfilling:

- A. Trenching: 1. Dig trenches straight and support pipe continuously on bottom of trench. Lay pipe to an even grade. Trenching excavation shall follow layout indicated on
- Drawings and as noted.
- 2. Provide for a minimum of eighteen (18) inches cover for all pressure supply lines.
- 3. Provide for a minimum of twelve (12) inches cover for all non-pressure lines.
- 4. Provide for a minimum of six (6) inches cover for all drip irrigation lines unless otherwise specified in the Drawing Details. 5. Provide for a minimum of eighteen (18) inches cover for all control wiring.

- 1. Do not backfill trenches until all required tests are performed. Carefully backfill trenches with the excavated materials approved for backfilling, consisting of earth, loam, sandy clay, sand, or other approved materials, free from large clods of earth or stones. Mechanically compact backfill in landscaped areas to a dry density equal to adjacent undisturbed soil in planting area. Backfill will conform to adjacent grades without dips, sunken areas, humps or other surface
- 2. Place a fine granular material backfill to a depth of 6" immediately above all lines. No foreign matter larger than one-half (1/2) inch in size will be permitted in
- 3. Flooding of trenches will be permitted only with the approval of the Landscape Architect.
- 4. If settlement occurs and subsequent adjustments in pipe, valves, sprinkler heads, lawn or planting, or other construction are necessary, make all required adjustments without cost to the Owner.
- C. Trenching and Backfill Under Paving:
- 1. Backfill trenches located under areas where paving, asphaltic concrete or concrete will be installed with sand (a layer six [6] inches below the pipe and three [3] inches above the pipe) and compact in layers to 95% compaction, using manual or mechanical tamping devices. Compact trenches for piping to equal the compaction of the existing adjacent undisturbed soil and leave in a firm unyielding grade. Set in place, cap and pressure test, all piping under paving prior to the paving Work.
- 2. Piping under existing walks is generally done by jacking, boring or hydraulic driving, but where any cutting or breaking of sidewalks and/or concrete is necessary, it shall be done and replaced by the Contractor as a part of the Contract cost. Obtain permission to cut or break sidewalks and/or concrete from the Landscape
- Architect. No hydraulic driving will be permitted under concrete paving. 3. Provide for a minimum cover of eighteen (18) inches between the top of the pipe and the bottom of the aggregate base for all pressure and on-pressure piping installed under asphaltic concrete paving.
- D. Assemblies. 1. Routing of irrigation lines as indicated on the Drawings is diagrammatic. Install lines (and various assemblies) in such a manner as to conform with the details.
- 2. Install no multiple assemblies in plastic lines. Provide each assembly with its own outlet. 3. Install all assemblies specified herein in accordance with respective details. In absence of detail Drawings or Specifications pertaining to specific items required to complete the Work, perform such Work in accordance with best standard practice with prior approval of the Landscape Architect
- 4. Clean all PVC pipe and fittings before installation. Installation and solvent welding methods shall be as recommended by the pipe and fitting manufacturer. 5. On PVC to metal connections, work the metal connections first. Use teflon tape, or approved equal, on all threaded PVC, and on all threaded PVC to metal
- joints. Where threaded PVC connections are required, use threaded PVC adapters into which the pipe may be welded. E. Line Clearance: All lines shall have a minimum clearance of six (6) inches from each other and from lines of other trades. Parallel lines shall not be installed
- F. Automatic Controller: Install per manufacturer's instructions. Connect remote control valves to controller in numerical sequence as shown on the Drawings.
- G. Line Voltage Wiring for Automatic Controller:
- 1. 120-volt stub-out to controller locations will be provided by electrical installer. 2. Provide the 120-volt power connection to the automatic controller.
- 3. All electrical Work must conform to local codes, ordinances and union authorities having jurisdiction. H. Remote Control Valves:
- 1. Install where shown on Drawings and details. When grouped together, allow at least twelve (12) inches between valves. Install each remote control valve in a separate valve box. Label each controller and station number at the valve with a 2-1/4" x 2-3/4" polyurethane I.D. tag attached to the control wire of the valve.
 - 2. Burn valve number onto lid of valve box with branding iron manufactured for the purpose.
- 1. Install the sprinkler heads as designated. Sprinkler heads to be installed in this Work shall be equivalent in all respects to those specified. 2. Do not exceed the maximum spacing of heads indicated. In no case shall the spacing exceed the maximum recommended by the manufacturer.
- 1. Install drip emitters only after flushing of the system has been accomplished to the satisfaction of the Landscape Architect.
- transfer tubing stake. Install a bug cap at the end of each transfer tubing line. Locate emitters equally spaced around the plant at the edge of the rootball or

0.6 FIELD QUALITY CONTROL

A. Adjustment of the System:

A. The Owner reserves the right to make temporary repairs as necessary to keep the irrigation system equipment in operating condition. The exercise of this right by

2. Bring drip emitters to the soil surface with transfer tubing attached with a barb fitting to buried polyethylene tubing. Surface mount and stake emitters with

- the Owner shall not relieve the Contractor of responsibility under the Contract Documents. 0.5 EXISTING TREES AND SHRUBS
- A. Where it is necessary to excavate adjacent to existing trees and shrubs, use all possible care to avoid injury to trees, tree roots and shrubs. Excavate by hand only in areas where two (2) inch and larger roots occur. Tunnel under all roots two (2) inches and larger in diameter. Wrap roots in heavy burlap to prevent scarring or excessive drying. Where a ditching machine is run close to trees having roots smaller than two (2) inches in diameter, hand trim the wall of the trench adjacent to the tree, making clean cuts through. Paint roots one (1) inch and larger in diameter with two (2) coats of tree paint. Close trenches adjacent to tree within twenty-four (24) hours, and where this is not possible, shade the side of the trench adjacent to the tree with burlap or canvas. Excavations within the driplines of
- 1. If it is determined that adjustments in the irrigation equipment will provide proper and more effective coverage, make adjustments prior to planting. Adjustments may also include changes in emitter sizes as required.
- B. Testing of Irrigation System:

existing Oak trees shall be performed under the supervision of the project Arborist.

- 1. Request the presence of the Landscape Architect in writing at least forty-eight (48) hours in advance of testing. 2. Test all pressure lines under hydrostatic pressure of 150 pounds per square inch and prove watertight.
- a. Testing of pressure mainlines shall occur prior to installation of electrical control valves. 3. Test all piping under paved areas under hydrostatic pressure of 150 pounds per square inch and prove watertight prior to paving.
- 5. Make all hydrostatic tests only in the presence of the Landscape Architect or other duly-authorized representative of the Owner. Do not backfill pipe until it has been duly inspected, tested, and approved.
- 6. Furnish force pump and all other necessary test equipment. 7. When the irrigation system is completed, perform a coverage test in the presence of the Landscape Architect to determine if the water coverage for planting areas is complete and adequate. Furnish all materials and perform all Work required to correct any inadequacies of coverage due to deviations from Drawings,

4. Sustain pressure in lines for not less than two (2) hours. If leaks develop, replace joints and repeat test until entire system is proven watertight.

- or after bringing this to the attention of the Landscape Architect. This test shall be accomplished before any groundcover is planted. 8. Upon completion of each phase of Work, test and adjust the entire system to meet site requirements. 0.7 MAINTENANCE
- A. The entire irrigation system, with the exception of drip tubing and emitters, must be under full automatic operation prior to any planting. 0.8 CLEAN-UP
- Work of others to original conditions 0.9 FINAL OBSERVATION PRIOR TO ACCEPTANCE

A. Clean-up as each portion of Work progresses. Remove refuse and excess dirt from the site, sweep all walks and paving clean, and repair any damage done to the

- A. Operate each system in its entirety for the Landscape Architect at time of final observation. Rework any items deemed not acceptable by the Landscape Architect to the complete satisfaction of the Landscape Architec B. Show evidence to the Landscape Architect that the Owner has received all accessories, charts, record drawings, and equipment as required before final observation
- 0.10 OBSERVATION SCHEDULE
- A. Notify the Landscape Architect in advance for the following observation meetings, according to the time indicated:
- 1. Pre-Job conference: 7 days 2. Pressure supply line installation and testing: 48 hours

5. Lateral line and emitter installation: 48 hours

- 3. Automatic controller installation: 48 hours 4. Control wire installation: 48 hours
- 6. Coverage test: 48 hours 7. Final inspection: 7 days.
- B. When observations have been conducted by other than the Landscape Architect, show evidence in writing of when and by whom these observations were made. C. No site observations will commence without record drawings. In the event that the Contractor calls for a site visit without record drawings, without completing previously noted corrections, or without preparing the system for said visit, he shall be responsible for reimbursing the Owner for the Landscape Architect's time for the site visit at his current billing rates per hour portal to portal (plus transportation costs) for inconvenience. No further site visits will be scheduled until this charge

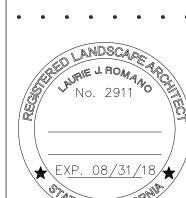
END OF SECTION 028100

has been paid and received.



202 East Cota Street Santa Barbara, CA 9310

tel 805.962.9055 fax 805.962.5658 arcadiastudio.com



. Revisions

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3.23.17 Job Number 11.22.2016 Checked by Drawn Bv

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