IRRIGATION SPECIFICATIONS:

1. SCOPE OF WORK

1.1. THE WORK CONSISTS OF FURNISHING LABOR, TOOLS, MACHINERY, MATERIALS, AND PROCEDURE REQUIRED TO COMPLETE THE SPRINKLER SYSTEM, INSTALLED READY FOR USE WITHOUT FURTHER COST IN LABOR OR MATERIALS TO THE CITY/OWNER.

1.2. WHEN NOT OTHERWISE SPECIFIED, WORKMANSHIP AND MATERIAL SHALL CONFORM TO THE LOCAL PLUMBING CODE.

1.3. THE CONTRACTOR SHALL APPLY FOR ALL NECESSARY PERMITS AND PAY FOR SAME.

1.4. THE CONTRACTOR SHALL KEEP THE PREMISES CLEAN AND FREE OF EXCESS EQUIPMENT, MATERIALS AND RUBBISH INCIDENTAL TO THIS WORK.

1.5. THE INTENT OF THE DRAWINGS AND SPECIFICATIONS IS TO INDICATE AND SPECIFY A COMPLETE SPRINKLER SYSTEM, INSTALLED AND READY FOR USE WITHOUT FURTHER COST IN LABOR OR MATERIALS TO CITY/OWNER.

1.6. ANY ITEM SHOWN OR WRITTEN ON THE DRAWINGS OR IN THESE SPECIFICATIONS SHALL BE CONSIDERED TO APPEAR ON BOTH.

1.7. IN THE EVENT OF "CONFLICT" BETWEEN THE DRAWINGS AND SPECIFICATIONS, THE LANDSCAPE ARCHITECT SHALL BE CONSULTED.

1.8. PRIOR TO SUBMISSION OF HIS BID, THE CONTRACTOR SHALL EXAMINE THE SITE, THE COMPLETE DRAWINGS OF THE PROJECT AND THE SPECIFICATIONS OF SAME, IN ADDITION TO THE DRAWINGS AND SPECIFICATIONS FOR THE SPRINKLER IRRIGATION PORTION OF THE WORK.

2. REFERENCE SPECIFICATIONS AND STANDARDS

2.1. THE INTENT OF THE DRAWING AND SPECIFICATIONS IS TO GRAPHICALLY INDICATE AND SPECIFY A COMPLETE AND EFFICIENT SPRINKLER IRRIGATION SYSTEM.

2.2. PLOT DIMENSIONS ARE APPROXIMATE. CONTRACTOR SHALL CAREFULLY CHECK AND VERIFY ALL DIMENSIONS AND SHALL REPORT ANY VARIATIONS TO THE LANDSCAPE ARCHITECT.

2.3. DUE TO THE SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, ETC. WHICH MAY BE REQUIRED. CONTRACTOR SHALL CAREFULLY INVESTIGATE THE STRUCTURAL AND FINISHED CONDITIONS AFFECTING ALL HIS WORK, AND PLAN HIS WORK ACCORDINGLY. DRAWINGS ARE GENERALLY DIAGRAMMATIC AND INDICATIVE OF THE WORK TO BE INSTALLED. THE WORK SHALL BE INSTALLED IN THE MOST DIRECT AND WORKMANLIKE MANNER, SO THAT CONFLICTS BETWEEN SPRINKLER SYSTEMS, PLANTING AND ARCHITECTURAL FEATURES WILL BE AVOIDED.

2.4. LANDSCAPE ARCHITECT/OWNER'S REPRESENTATIVE SHALL DECIDE ALL QUESTIONS RELATIVE TO THE QUALITY OF WORKMANSHIP AND MATERIALS FURNISHED.

2.5. THE LANDSCAPE ARCHITECT SHALL DECIDE ALL QUESTIONS RELATING TO THE "INTERPRETATION" OF THE DRAWINGS AND SPECIFICATIONS AND THE ACCEPTABLE FULFILLMENT OF THE CONTRACT.

3. SUBSTITUTIONS

3.1. THE CONTRACTOR SHALL FURNISH THE ARTICLES, EQUIPMENT OR MATERIALS SPECIFIED BY NAME IN THE DRAWINGS AND SPECIFICATIONS. NO SUBSTITUTION WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL BY THE LANDSCAPE ARCHITECT.

3.2. EQUIPMENT OR MATERIALS INSTALLED OR FURNISHED WITHOUT THE PRIOR APPROVAL OF THE LANDSCAPE ARCHITECT MAY BE REJECTED AND THE CONTRACTOR REQUIRED TO REMOVE SUCH MATERIALS FROM THE SITE AT THIS OWN EXPENSE.

3.3. APPROVAL OF ANY ITEM, ALTERNATE OR SUBSTITUTE, INDICATES ONLY THAT THE PRODUCT(S) APPARENTLY MEET THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS ON THE BASIS OF THE INFORMATION SUBMITTED.

3.4. MANUFACTURER'S WARRANTIES SHALL NOT RELIEVE THE CONTRACTOR OF HIS LIABILITY UNDER THE GUARANTEE. SUCH WARRANTY SHALL ONLY SUPPLEMENT THE GUARANTEE.

3.5. THE LANDSCAPE ARCHITECT CAN, AT HIS OPTION, REQUIRE A MANUFACTURER'S WARRANTY ON ANY PRODUCT OFFERED FOR USE.

4. IRRIGATION GUARANTEE

4.1. THE ENTIRE SPRINKLER SYSTEM SHALL BE UNCONDITIONALLY GUARANTEED BY THE CONTRACTOR AS TO MATERIAL AND WORKMANSHIP, INCLUDING SETTLING OF BACK-FILLED AREAS BELOW GRADE FOR A PERIOD OF ONE (1) YEAR FOLLOWING THE DATE OF FINAL ACCEPTANCE OF WORK.

4.2. IF, WITHIN ONE (1) YEAR FROM THE DATE OF FILING OF THE NOTICE OF COMPLETION, SETTLEMENT OCCURS AND ADJUSTMENTS IN PIPES, VALVES AND SPRINKLER HEADS, SOD OR PAVING IS NECESSARY TO BRING THE SYSTEM, SOD OR PAVING TO THE PROPER LEVEL OF THE PERMANENT GRADES, THE CONTRACTOR, AS PART OF THE WORK UNDER HIS CONTRACT, SHALL MAKE ALL ADJUSTMENTS WITHOUT COST TO THE CITY/OWNER, INCLUDING THE COMPLETE RESTORATION OF ALL DAMAGED PLANTING, PAVING, OR OTHER IMPROVEMENTS OF ANY KIND.

4.3. SHOULD ANY OPERATIONAL DIFFICULTIES DEVELOP IN CONNECTION WITH THE SPRINKLER SYSTEM WITHIN THE SPECIFIED GUARANTEE PERIOD WHICH, IN THE OPINION OF THE CITY/OWNER, MAY BE DUE TO INFERIOR MATERIAL AND/OR WORKMANSHIP, SAID DIFFICULTIES SHALL BE IMMEDIATELY CORRECTED BY THE CONTRACTOR TO THE SATISFACTION OF THE CITY/OWNER AT NO ADDITIONAL COST TO THE CITY/OWNER, INCLUDING ANY AND ALL OTHER DAMAGE CAUSED BY SUCH DEFECTS.

5. RESPONSIBILITY

5.1. THE CONTRACTOR SHALL LOCATE LINES, VALVES, AND OTHER UNDERGROUND UTILITIES, ETC., PRIOR TO EXCAVATING TRENCHES. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES.

6. RECORD DRAWINGS

6.1. LOCATIONS ON DRAWINGS ARE DIAGRAMMATIC AND APPROXIMATE ONLY, AND SHALL BE CHANGED AND ADJUSTED AS NECESSARY OR AS DIRECTED TO MEET EXISTING CONDITIONS AND TO FOLLOW THE INTENT OF THE DRAWINGS AND SPECIFICATIONS IN OBTAINING COMPLETE WATER COVERAGE. IT IS, THEREFORE, THE CONTRACTOR'S RESPONSIBILITY TO RECORD ANY CHANGES AS TO LOCATION OF EQUIPMENT ON "AS-BUILT" DRAWINGS.

6.2. PROCEDURE FOR "AS-BUILT" PREPARATION SHALL BE:

6.2.1. OBTAIN FROM THE LANDSCAPE ARCHITECT ONE (1) SET OF REPRODUCIBLE DRAWINGS. RECORD ACCURATELY ON THIS SET ALL CHANGES IN THE WORK CONSTITUTING DEPARTURES FROM THE ORIGINAL CONTRACT DRAWINGS.

6.2.2. DIMENSION FROM TWO PERMANENT POINTS OF REFERENCE (BUILDINGS, MONUMENTS, SIDEWALKS, CURBS, PAVEMENT). POST INFORMATION ON "AS-BUILT" DRAWINGS, DAY-TO-DAY, AS THE PROJECT IS INSTALLED. ALL DIMENSIONS NOTED ON DRAWINGS SHALL BE ONE-QUARTER (1/4) INCH IN SIZE.

6.2.3. SHOW DIMENSIONAL LOCATIONS AND DEPTHS OF THE FOLLOWING:

ALL POINT OF CONNECTION / CONTROL EQUIPMENT
ROUTING OF SPRINKLER PRESSURE LINES (DIMENSION MAXIMUM OF ONE-HUNDRED (100) FEET ALONG ROUTING AND ALL DIRECTIONAL CHANGES)
BALL VALVES / GATE VALVES
SPRINKLER CONTROL VALVES (BURIED ONLY)
QUICK COUPLING VALVES
ROUTING OF CONTROL VALVE WIRING
OTHER RELATED EQUIPMENT (AS MAY BE DIRECTED BY THE LANDSCAPE ARCHITECT)

6.2.4. MAINTAIN "AS-BUILT" DRAWINGS ON SITE AT ALL TIMES.

6.2.5. MAKE ALL CHANGES TO REPRODUCIBLE DRAWINGS IN INK (NO BALL-POINT PEN). USE ERADICATING FLUID WHEN REDOING DRAWINGS. MAKE CHANGES IN A MANNER EQUAL TO THE ORIGINAL DRAWING.

7. CONTROLLER CHARTS

7.1. "AS-BUILT" DRAWINGS SHALL BE APPROVED BY LANDSCAPE ARCHITECT OR LANDSCAPE COORDINATOR BEFORE CHARTS ARE PREPARED.

7.2. PROVIDE ONE CONTROLLER CHART OF THE MAXIMUM SIZE CONTROLLER DOOR WILL ALLOW, FOR EACH CONTROLLER SUPPLIED, SHOWING THE AREA COVERED BY AUTOMATIC CONTROLLER.

7.3. THE CHART SHALL BE A REDUCTION OF THE ACTUAL "AS-BUILT" SYSTEM DRAWING. IF THE CONTROLLER SEQUENCE IS NOT LEGIBLE WHEN THE DRAWINGS IS REDUCED, ENLARGE IT TO A SIZE THAT WILL BE READABLE WHEN REDUCED.

7.4. CHART SHALL BE BLACKLINE PRINT AND A DIFFERENT PASTEL COLOR USED TO SHOW AREA OF COVERAGE FOR EACH STATION.

7.5. WHEN COMPLETED AND APPROVED, HERMETICALLY SEAL THE CHART BETWEEN TWO PIECES OF PLASTIC, EACH PIECE BEING A MINIMUM TWENTY (20) MIL THICKNESS.

7.6. CHARTS SHALL BE COMPLETED AND APPROVED PRIOR TO FINAL INSPECTION OF THE IRRIGATION SYSTEM.

8. OPERATION AND MAINTENANCE MANUALS

8.1. PREPARE AND DELIVER TO THE LANDSCAPE ARCHITECT WITHIN TEN (10) CALENDAR DAYS PRIOR TO COMPLETION OF CONSTRUCTION, ALL REQUIRED AND NECESSARY DESCRIPTIVE MATERIAL IN COMPLETE DETAIL AND SUFFICIENT QUANTITY, PROPERLY PREPARED IN FOUR INDIVIDUALLY BOUND COPIES. DESCRIBE THE MATERIAL INSTALLED IN SUFFICIENT DETAIL TO PERMIT OPERATING PERSONNEL TO UNDERSTAND, OPERATE AND MAINTAIN ALL EQUIPMENT. INCLUDE SPARE PARTS LIST AND RELATED MANUFACTURER INFORMATION FOR EACH EQUIPMENT ITEM INSTALLED. EACH MANUAL SHALL INCLUDE THE FOLLOWING:

INDEX SHEET STATING SUBCONTRACTOR'S ADDRESS AND TELEPHONE NUMBER.
DURATION OF GUARANTEE PERIOD.
LIST OF EQUIPMENT WITH NAMES AND ADDRESSES OF MANUFACTURER'S LOCAL REPRESENTATIVES.
COMPLETE OPERATING AND MAINTENANCE INSTRUCTIONS ON ALL MAJOR EQUIPMENT.

8.2. IN ADDITION TO THE MAINTENANCE MANUALS, PROVIDE THE MAINTENANCE PERSONNEL WITH INSTRUCTIONS FOR MAJOR EQUIPMENT AND SHOW WRITTEN EVIDENCE AT THE END OF THE PROJECT THAT THIS SERVICE HAS BEEN RENDERED.

8.3. LOOSE SPRINKLING EQUIPMENT, OPERATING KEYS AND SPARE PARTS WILL BE FURNISHED BY THE CONTRACTOR IN QUANTITIES AS SHOWN ON PLANS OR IN SPECIFICATIONS.

9. MATERIALS

9.1. USE NEW MATERIALS OF THE BEST GRADE OF EACH RESPECTIVE KIND AND OF THE SAME MANUFACTURERS FOR ALL ITEMS OF ONE TYPE.

9.2. STEEL PIPE.

9.2.1. STEEL PIPE AND STEEL FITTINGS WHERE INDICATED ON THE DRAWINGS OR SPECIFIED SHALL BE SCHEDULE 40 GALVANIZED MILD STEEL THREADED PIPE AND BEADED GALVANIZED MALLEABLE IRON THREADED FITTINGS, EXCEPT COUPLINGS WHICH SHALL BE A.P.I. (AMERICAN PIPE INSTITUTE) STEEL COUPLINGS. THREAD ON PIPE AND FITTINGS SHALL BE OF TAPER TYPE.

9.2.2. ALL UNIONS TWO (2) INCHES AND SMALLER SHALL BE GROUND JOINT PATTER. UNIONS LARGER THAN TWO (2) INCHES SHALL BE FLANGED UNIONS. ALL FLANGED UNIONS SHALL BE PLACED WITH ONE-SIXTEENTH (1/16) INCH THICK ASBESTOS FIBER GASKETS. RIGHT AND LEFT COUPLINGS SHALL BE USED INSTEAD OF GROUND JOINT UNIONS IN ALL UNDERGROUND LINES, EXCEPT AT VALVES.

9.2.3. STEEL STREET ELBOWS, BUSHINGS, CLOSE NIPPLES, AND LONG SCREWS SHALL NOT BE USED IN THE WORK.

9.3. PLASTIC PIPE

9.3.1. PLASTIC PIPE SHALL BE EXTRUDED FROM VIRGIN PVC (POLYVINYL CHLORIDE) TYPE 1, GRADE 11 (CLASS 1220) AS MANUFACTURED BY LASCO INDUSTRIES, BALDWIN, PACIFIC WESTERN, JOHNS-MANVILLE OR EQUAL. CLASS SCHEDULE AS INDICATED IN THE LEGEND.

9.3.2. ALL PLASTIC PIPE SHALL BE CONTINUOUSLY AND PERMANENTLY MARKED WITH THE FOLLOWING INFORMATION: MANUFACTURER'S NAME, NOMINAL PIPE SIZE, PVC 1220, S.D.R. (STANDARD DIMENSION RATIOS, OR THE PRESSURE RATING IN POUNDS PER SQUARE INCH) AND THE N.S.F. (NATIONAL SANITATION FOUNDATION).

9.3.3. PLASTIC FITTINGS SHALL BE PVC 11, I.P.S, (INTERNATIONAL PIPE SOCIETY), SCHEDULE 40, N.S.F., SCHEDULE 80, N.S.F., AND SCHEDULE 80 THREADED FITTINGS AS SHOWN IN THE DETAILS AS MANUFACTURED BY SLOANE MANUFACTURING CO. SOLVENT AND PRIMER ARE TO BE PER PIPE MANUFACTURER'S RECOMMENDATIONS.

9.4. PVC PRESSURE RATED PIPE TYPE 1220 (PVC CLASS 160, 200 & 315) AND TYPE 1120 (PVC SCHEDULE 40 & PVC SCHEDULE 80)

9.4.1. TYPE I GRADE II PRESSURE RATED PIPE.

9.4.2. MATERIALS SHALL MEET THE REQUIREMENTS SET FORTH IN ASTM D1784-60T.

9.4.3. OUTSIDE DIAMETER OF PIPE SHALL BE THE SAME SIZE AS IRON PIPE.

9.4.4. PIPE SHALL BE MARKED AT INTERVALS WITH THE FOLLOWING INFORMATION (NOT TO EXCEED 5'): MANUFACTURER'S NAME, NOMINAL SIZE, PVC TYPE AND GRADE (I.E., PVC 1220) SDR RATING CLASS, NSF APPROVAL AND COMMERCIAL STANDARD DESIGNATION.

9.4.5. PVC FITTINGS SHALL BE PVC TYPE II, SCHEDULE 40 NSF, SCHEDULE 80 NSF, OR APPROVED.

9.4.6. SOLVENT SHALL BE #175 GRAY NSF APPROVED AS MANUFACTURED BY INDUSTRIAL POLYCHEMICAL SERVICE, GARDENA CALIFORNIA.

9.4.7. CAUTIONED SHALL BE UTILIZED IN HANDLING TYPE I PIPE DUE TO THE POSSIBILITY OF CRACKING OR OF SPLITTING WHEN DROPPED OR HANDLED CARELESSLY.

9.4.8. WHEN CONNECTION IS PLASTIC TO METAL, MALE ADAPTERS SHALL BE HAND TIGHTENED, PLUS ONE TURN WITH A STRAP WRENCH. JOINT COMPOUND SHALL BE PERMATIX TYPE II.

9.5. SPRINKLER HEADS

9.5.1. SPRINKLER HEADS SHALL BE AS SHOWN ON PLAN.

9.6. VALVES

9.6.1. REMOTE CONTROL VALVES - ELECTRIC REMOTE CONTROL VALVES SHALL BE AS SHOWN ON PLAN.

9.6.2. QUICK COUPLING VALVES - QUICK COUPLING VALVES SHALL BE AS INDICATED ON PLANS AND SHALL HAVE A LOCKING COVER. EACH QUICK COUPLER VALVE SHALL HAVE A MOLDED VINYL COVER, YELLOW IN COLOR (PURPLE WHERE CALLED FOR IN RECYCLED WATER SYSTEMS). ALL QUICK COUPLER VALVES KEYS AND HOSE SWIVELS SHALL BE OF SAME MANUFACTURER AS THE QUICK COUPLER.

9.7. AUTOMATIC CONTROLLERS - AUTOMATIC CONTROLLERS SHALL BE AS SHOWN ON PLANS AND DETAILS.

9.8. CONTROL WIRES FOR RCV'S - ALL WIRING TO BE USED FOR CONNECTING THE AUTOMATIC CONTROLLER TO THE ELECTRICAL SOLENOID ACTUATED BY REMOTE CONTROL VALVE SHALL BE SOLID COPPER, PVC INSULATION, SINGLE CONDUCTOR, UL APPROVED UNDERGROUND FEEDER CABLE. EACH PILOT OR "HOT" WIRE SHALL BE BLACK OR COLOR-CODED WITH THE COMMON WIRE BEING WHITE.

9.9. RUN TWO SPARE CONTROL WIRES TO THE FARTHEST VALVE IN EACH MAINLINE DIRECTION. SHOW ON AS-BUILTS. COLOR CODE DIFFERENT THAN PILOT AND COMMON WIRES.

9.10. WIRING FOR FLOW SENSORS AND MASTER VALVES SHALL BE AS RECOMMENDED BY THE MANUFACTURER AND SHALL BE COLOR CODED DIFFERENTLY THAN COMMON WIRE, CONTROL WIRES, AND SPARE WIRES.

9.11. VALVE BOXES - ALL REMOTE CONTROL VALVES, SHUT-OFF VALVES, FLOW SENSORS, AND QUICK COUPLING VALVES SHALL BE INSTALLED IN SUITABLE VALVE BOXES AS SHOWN IN DETAILS, COMPLETE WITH LOCKING COVERS. ALL SHALL BE N.D.S. OR APPROVED EQUAL AND SHALL BE IDENTIFIED ON THE LID WITH HEAT-BRANDED NUMBERS / LETTERS IN 2" HIGH BLOCK LETTERS AS SHOWN ON THE DETAILS. ALL BOXES SHALL HAVE GREEN COVERS (PURPLE FOR RECYCLED WATER SYSTEMS).

9.12. BACKFLOW PREVENTION UNITS THE BACKFLOW PREVENTION UNITS SHALL BE AS SHOWN ON PLANS AND DETAILS.

9.13. ANY OTHER EQUIPMENT NOT SPECIFICALLY NOTED HEREIN BUT REQUIRED BY THE PLANS, DETAILS, OR LEGENDS SHALL BE SUPPLIED AND INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS. IF ANY QUESTION ARISES AS TO PROPER PROCEDURE, IT SHALL BE RESOLVED WITH THE LANDSCAPE ARCHITECT BEFORE INSTALLATION.

10. INSTALLATION

10.1. SITE CONDITIONS

10.1.1. ALL SCALED DIMENSIONS ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON THE SITE PRIOR TO PROCEEDING WITH WORK UNDER THIS CONTRACT.

10.1.2. EXTREME CARE SHALL BE EXERCISED IN EXCAVATING AND WORKING NEAR EXISTING UTILITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ANY FACILITIES.

10.1.3. SHOULD UTILITIES NOT LOCATED OR MARKED BE FOUND DURING EXCAVATION, THE CONTRACTOR SHALL PROMPTLY NOTIFY THE OWNER AND SHALL DISCONTINUE WITH WORK IN THE AREA, EXCEPT NECESSARY EMERGENCY WORK NECESSARY TO REPAIR OR PREVENT DAMAGE UNTIL INSTRUCTIONS ARE RECEIVED.

10.1.4. FAILURE TO NOTIFY THE OWNER OF DISCOVERY OF SUCH UTILITIES OR DAMAGE THERETO WILL RESULT IN THE CONTRACTOR BEING LIABLE FOR ANY AND ALL DAMAGE CAUSED TO THE UTILITIES AS A RESULT OF HIS ACTIONS.

10.1.5. THE CONTRACTOR SHALL, BEFORE STARTING WORK ON THE SPRINKLER SYSTEM, CAREFULLY CHECK ALL FINISH GRADES TO SATISFY HIMSELF THAT HE MAY PROCEED WITH THE WORK.

10.2. WATER SUPPLY

10.2.1. THE CONTRACTOR SHALL ARRANGE FOR THE PROVISION OF THE WATER SUPPLY AND COORDINATE WITH THE OWNER AS NECESSARY.

10.2.2. THE CONTRACTOR SHALL CONNECT TO THE WATER SOURCE AS INDICATED ON THE DRAWINGS.

10.3. ELECTRICAL

10.3.1. THE OWNER SHALL ARRANGE FOR THE PROVISION OF THE ELECTRICAL SUPPLY. POWER SOURCES SHALL BE AS INDICATED ON THE DRAWINGS. THE CONTRACTOR SHALL CONNECT AT THE POINT SHOWN ON THE DRAWINGS.

10.3.2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ELECTRICAL CONNECTIONS TO THE AUTOMATIC CONTROLLERS. ALL WIRING SHALL BE ROUTED AS SHOWN ON PLANS. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH ALL LOCAL OR COUNTY ORDINANCES.

10.4. EXISTING UTILITIES - THE CONTRACTOR SHALL LOCATE AND MARK ALL EXISTING UTILITIES SUCH AS POWER, TELEPHONE, DOMESTIC WATER AND TILE DRAINS. EXTREME CARE SHALL BE TAKEN BY THE CONTRACTOR WHEN EXCAVATING OR WORKING IN THESE AREAS AND COORDINATION AND COOPERATION WITH OTHER CONTRACTOR IS REQUIRED AS THE WORK PROGRESSES TO THESE AREAS.

10.5. TRENCHES IN GENERAL

10.5.1. TRENCHES SHALL BE DUG STRAIGHT, AND PIPE SHALL HAVE THE CONTINUOUS SUPPORT FOR THE DITCH BOTTOM AND SHALL BE LAID TO AN EVEN GRADE. TRENCHING EXCAVATION SHALL FOLLOW THE LAYOUT INDICATED ON THE DRAWINGS.

10.5.2. ALL PRESSURE SUPPLY LINES SHALL HAVE A MINIMUM DEPTH OF EIGHTEEN (18) INCHES MINIMUM UNLESS OTHERWISE NOTED.

10.5.3. ALL NON-PRESSURE SUPPLY LINES SHALL HAVE A MINIMUM DEPTH OF TWELVE (12) INCHES MINIMUM AS SHOWN IN THE DETAILS.

10.5.4. ALL LINES SHALL HAVE A MINIMUM CLEARANCE OF SIX (6) INCHES FROM EACH OTHER AND FROM LINES OF OTHER TRADES.

10.5.5. NO LINE SHALL BE INSTALLED DIRECTLY OVER ANOTHER LINE.

10.5.6. IF NECESSARY, CALL UNDERGROUND ALERT, OR SIMILAR COMPANY.

10.6. BACKFILLING

10.6.1. BACKFILL FOR TRENCHING SHALL BE COMPACTED TO DRY DENSITY EQUAL TO THE ADJACENT UNDISTURBED SOIL, AND SHALL CONFORM TO THE ADJACENT GRADES WITHOUT DIPS, SUNKEN AREAS, HUMPS OR OTHER IRREGULARITIES. INITIAL BACKFILL ON ALL LINES SHALL BE OF A FINE GRANULAR MATERIAL WITH NO FOREIGN MATTER LARGER THAN ONE-HALF (1/2) INCH IN SIZE.

10.6.2. IF, IN THE OPINION OF THE CONTRACTOR/LANDSCAPE ARCHITECT, THE EXCAVATED MATERIAL IS NOT SATISFACTORY FOR USE AS BACKFILL, THE CONTRACTOR SHALL DISPOSE OF THIS UNSATISFACTORY MATERIAL.

10.6.3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SETTLING OF TRENCHES FROM HIS WORK.

10.7. PVC PIPE

10.7.1. PVC PIPE SHALL BE INSTALLED IN A MANNER WHICH WILL PROVIDE FOR EXPANSION AND CONTRACTION AS RECOMMENDED BY THE PIPE MANUFACTURER.

10.7.2. ALL PLASTIC TO METAL JOINTS SHALL BE MADE WITH PLASTIC MALE ADAPTERS, UNLESS OTHERWISE SHOWN IN DETAILS.

10.7.3. THE JOINTS SHALL BE ALLOWED TO SET AT LEAST TWENTY-FOUR (24) HOURS BEFORE PRESSURE IS APPLIED TO THE SYSTEM ON PVC PIPE.

10.7.4. AFTER ALL NEW SPRINKLER PIPING AND RISERS ARE IN PLACE AND CONNECTED, AND ALL NECESSARY WORK AS BEEN COMPLETED AND PRIOR TO THE INSTALLATION OF SPRINKLER HEADS, CONTROL VALVES SHALL BE OPENED AND A FULL HEAD OF WATER USED TO FLUSH OUT THE SYSTEM. AFTER THE SYSTEM IS THOROUGHLY FLUSHED, RISERS SHALL BE CAPPED OFF AND THE SYSTEM PRESSURE TESTED.

10.7.5. SPRINKLER LINES SHALL BE TESTED IN PLACE BEFORE BACKFILLING FOR A PERIOD OF NOT LESS THAN TWENTY-FOUR (24) HOURS AND SHALL SHOW NO LEAKAGE OR LOSS OF PRESSURE. DURING THE TEST PERIOD, MINIMUM TEST PRESSURE AT THE HIGHEST POINT OF THE SECTION BEING TESTED, SHALL BE 100 POUNDS PER SQUARE INCH.

10.7.6. AT THE CONCLUSION OF THE PRESSURE TEST, THE HEAD SHALL BE INSTALLED AND TESTED FOR OPERATION IN ACCORDANCE WITH DESIGN REQUIREMENTS UNDER NORMAL OPERATING PRESSURE, CONTRACTOR SHALL VERIFY HEAD PRESSURES WITH PITOT TUBE OR PRESSURE GAUGE ASSEMBLY, AND ADJUST VALVE TO CORRESPOND WITH DESIGN PRESSURE.

10.8. SPRINKLERS

10.8.1. ALL POP-UP SPRINKLERS SHALL BE PROVIDED WITH SWING JOINTS AND SHALL BE ADJUSTED TO THE PROPER HEIGHT. ALL NOZZLES SHALL BE ADJUSTED FOR PROPER THROW RADIUS FOR EFFICIENT COVERAGE.

10.8.2. SPRINKLER HEADS AND RISERS SHALL BE INSTALLED ACCORDING TO DETAILS.

10.9. VALVES

10.9.1. REMOTE CONTROL VALVES SHALL BE ADJUSTED SO THAT THE MOST REMOTE SPRINKLER HEADS OPERATE AT THE PRESSURE RECOMMENDED BY THE HEAD MANUFACTURER. REMOTE CONTROL VALVES SHALL BE ADJUSTED SO THAT A UNIFORM DISTRIBUTION OF WATER IS APPLIED BY THE SPRINKLER HEADS TO THE PLANTING AREAS FOR EACH INDIVIDUAL VALVE SYSTEM.

10.9.2. QUICK COUPLING VALVES SHALL BE SET IN VALVE BOXES APPROXIMATELY 12" FROM WALKS, CURBS, HEADERBOARDS, OR PAVED AREAS WHERE APPLICABLE. VERTICAL POSITIONING OF QUICK COUPLING VALVES SHALL BE SUCH THAT SLEEVE TOP WILL BE FLUSH WITH THE SETTLED FINISH GRADE AS DETERMINED AFTER THE TURF IS ESTABLISHED AND 2" ABOVE GRADE IN GROUND COVER AREAS.

10.10. VALVE BOXES

10.10.1. VALVE BOXES SHALL BE SET ONE-HALF INCH (1/2") ABOVE THE DESIGNATED FINISH GRADE IN LAWN AREAS AND ONE INCH (1") ABOVE FINISH GRADE IN GROUND COVER AREAS.

10.10.2. VALVE BOXES INSTALLED NEAR WALKS, CURBS, HEADERBOARDS AND PAVING SHALL ABUT THOSE ITEMS. TOP SURFACES SHALL BE FLUSH WITH ITEMS LISTED ABOVE.

10.11. AUTOMATIC CONTROLLER LOCATION AND INSTALLATION

10.11.1. THE AUTOMATIC CONTROLLER SHALL BE INSTALLED AT THE APPROXIMATE LOCATION SHOWN ON THE PLAN. VERIFY EXACT LOCATION WITH THE OWNER.

10.11.2. ALL LOCAL AND OTHER APPLICABLE CODES SHALL TAKE PRECEDENCE IN CONNECTING THE 110 VOLT ELECTRICAL SERVICE TO CONTROLLER. OWNER SHALL PROVIDE POWER TO CONTROLLER. CONTRACTOR SHALL COMPLETE HOOK-UP TO CONTROLLER.

10.11.3. THERE SHALL BE ADEQUATE COVERAGE OF EARTH (18" MINIMUM) OVER THE 24-VOLT CONTROL WIRE. INSTALL WIRE IN TRENCH AND TAPE TO MAIN LINES ON SIDE OF PIPE AT 10' INTERVALS.

10.12. CONTROL WIRE

10.12.1. ALL ELECTRICAL EQUIPMENT AND WIRING SHALL COMPLY WITH LOCAL AND STATE CODES AND BE INSTALLED BY THOSE SKILLED AND LICENSED IN THE TRADE.

10.12.2. CONNECTING AND SPLICING OF WIRE AT THE VALVES OR IN THE FIELD SHALL BE MADE USING A DRI-SPLICE CONNECTOR OR EQUAL.

10.13. PRESSURE TEST

10.13.1. ALL PRESSURE LINES SHALL BE TESTED UNDER PRESSURE WITH WATER AND AIR OF ONE-HUNDRED FIFTY (150) POUNDS PER SQUARE INCH, AND ALL NON-PRESSURE LINES SHALL BE TESTED UNDER THE EXISTING STATIC PRESSURE, AND BOTH BE PROVEN WATERTIGHT.

10.13.2. PRESSURE SHALL BE SUSTAINED IN THE LINES FOR A 24 HOUR PERIOD. IF LEAKS DEVELOP, THE JOINTS SHALL BE REPLACED AND THE TEST REPEATED UNTIL THE ENTIRE SYSTEM IS PROVEN WATERTIGHT.

10.13.3. TEST SHALL BE OBSERVED AND APPROVED BY THE OWNER PRIOR TO BACKFILL.

10.13.4. UPON COMPLETION OF EACH PHASE OF THE WORK, THE CONTRACTOR SHALL CHECK AND ADJUST EACH SPRINKLER HEAD TO MEETING THE SITE REQUIREMENTS.

10.14. COVERAGE TEST - UPON COMPLETION OF ALL SYSTEMS, THE CONTRACTOR, IN THE PRESENCE OF THE ARCHITECT, SHALL PERFORM A COVERAGE TEST TO DETERMINE IF THE COVERAGE OF WATER AFFORDED ALL AREAS IS COMPLETE AND ADEQUATE. THE CONTRACTOR SHALL CHANGE ANY HEADS, NOZZLES, OR ORIFICES AS MAY BE REQUIRED TO PROVIDE COVERAGE AS INDICATED ON THE DRAWINGS AND AS SPECIFIED.

10.15. LOWERING OF HEADS - UNLESS OTHERWISE NOTED, ALL SPRINKLERS INSTALLED IN LAWN AREAS SHALL BE LOWERED TO FINISH GRADE WITHIN FIVE DAYS FOLLOWING NOTIFICATION BY THE CITY/OWNER. AT THE TIME OF LOWERING HEADS, THE CONTRACTOR SHALL COMPLETELY CHECK AND ADJUST THE ENTIRE SYSTEM AND MAKE ANY REPAIRS THAT ARE NECESSARY TO COMPLETE THIS WORK TO THE SATISFACTION OF THE CITY/OWNER, LANDSCAPE ARCHITECT AND/OR OWNER'S CHOSEN REPRESENTATIVE. THE CONTRACTOR SHALL NOTIFY THE OWNER IN WRITING UPON COMPLETION OF THIS WORK.

10.16. WORKMANSHIP AND PROCEDURE

10.16.1. THE ROUTING OF THE PRESSURE SUPPLY LINES AS INDICATED ON THE DRAWINGS IS DIAGRAMMATIC. THE CONTRACTOR SHALL INSTALL LINES IN A MANNER THAT CONFORMS WITH THE VARIOUS DETAILS, WITHOUT OFFSETTING THE VARIOUS ASSEMBLIES FROM THE PRESSURE SUPPLY LINE.

10.16.2. NO MULTIPLE ASSEMBLIES SHALL BE INSTALLED ON PLASTIC LINES. EACH ASSEMBLY SHALL BE PROVIDED WITH ITS OWN OUTLET.

10.16.3. ALL ASSEMBLIES SPECIFIED HEREIN SHALL BE INSTALLED IN ACCORDANCE WITH THE RESPECTIVE DETAIL. IN THE ABSENCE OF DETAIL DRAWINGS OR SPECIFICATIONS PERTAINING TO THE SPECIFIC ITEMS REQUIRED TO COMPLETE THE WORK, THE CONTRACTOR SHALL PERFORM SUCH WORK IN ACCORDANCE WITH THE BEST STANDARD PRACTICE AND TO THE SATISFACTION OF THE LANDSCAPE ARCHITECT/CONTRACTOR.

11. INSPECTION OF WORK

11.1. INSTALLATIONS AND OPERATIONS MUST BE APPROVED BY THE CITY/OWNER AND LANDSCAPE ARCHITECT.

11.2. PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL ARRANGE A MEETING WITH THE CITY/OWNER, AT WHICH TIME THE CONTRACTOR WILL BE INFORMED OF SPECIFIC INSPECTIONS REQUIRED AND THE METHOD OF CALLING FOR SUCH INSPECTIONS AS THE INDIVIDUAL WORK IS COMPLETED.

12. RESPONSIBILITY

12.1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK TO BE PERFORMED UNDER THIS CONTRACT. NO CONTRACTOR SHALL BE RELIEVED OF HIS LIABILITY TO COMPLETE THE WORK SHOWN ON THE DRAWINGS AND INDICATED IN THE SPECIFICATIONS, UNLESS AUTHORIZED IN WRITING BY THE CITY/OWNER OR OWNER'S APPROVED REPRESENTATIVE.

12.2. THE CONTRACTOR SHALL PROTECT HIS WORK FROM DAMAGE AND THEFT AT ALL TIME, AND REPLACE ALL DAMAGED OR STOLEN PARTS AT HIS EXPENSE UNTIL THE WORK IS ACCEPTED IN WRITING BY THE CITY/OWNER.

12.3. THE CONTRACTOR SHALL PROTECT THE CITY/OWNER'S PROPERTY FROM INJURY OR LOSS. ALL DAMAGE TO EXISTING PROPERTY (BUILDINGS, UTILITIES, ETC.) OR PLANTING (TREES, SHRUBS, LAWNS OR GROUNDCOVERS) CAUSED BY THE CONTRACTOR DURING HIS OPERATION OR AS A RESULT OF MALFUNCTION OF INSTALLED WORK DURING THE GUARANTEE PERIOD SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

12.4. THE CONTRACTOR SHALL CAREFULLY NOTE ALL FINISH GRADE BEFORE COMMENCING WORK. ANY FINISH GRADE CHANGED DURING THE COURSE OF HIS WORK SHALL BE RESTORED TO THE ORIGINAL CONTOURS.

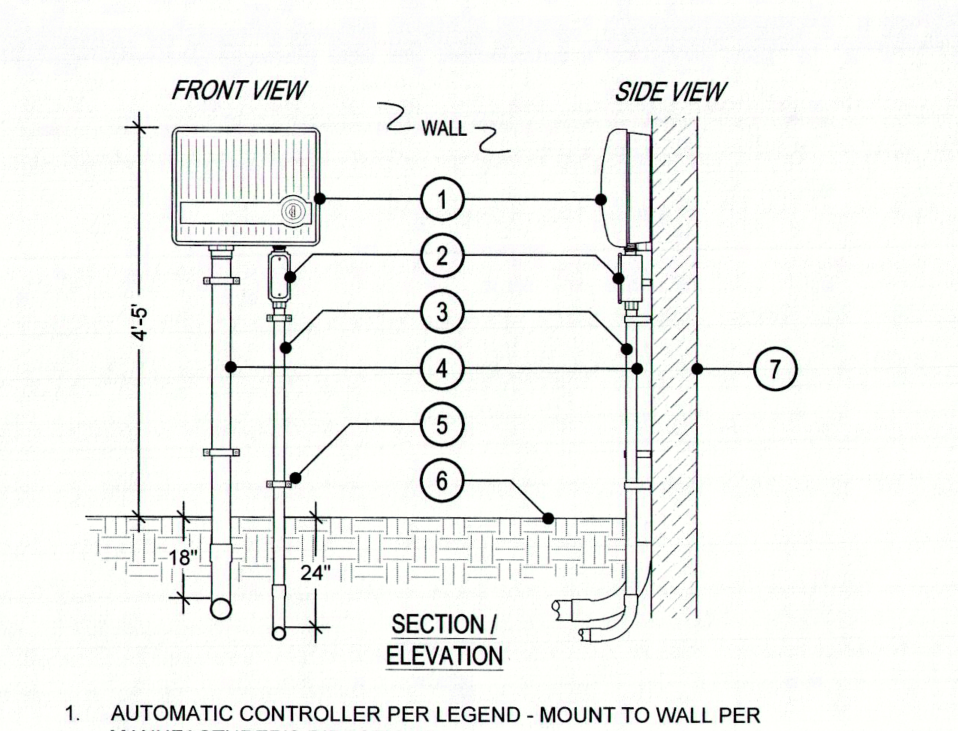
12.5. THE CONTRACTOR SHALL CAUSE MINIMUM INTERFERENCE WITH WORKMEN OR THE MATERIALS AND EQUIPMENT OF OTHER TRADES PEOPLE WORKING ON THE PROJECT.

13. COMPLETION CLEAN-UP

13.1. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REMOVE EXCESS MATERIALS, RUBBISH, DEBRIS, ETC., AND HIS CONSTRUCTION AND INSTALLATION EQUIPMENT FROM THE PREMISES.

14. MAINTENANCE

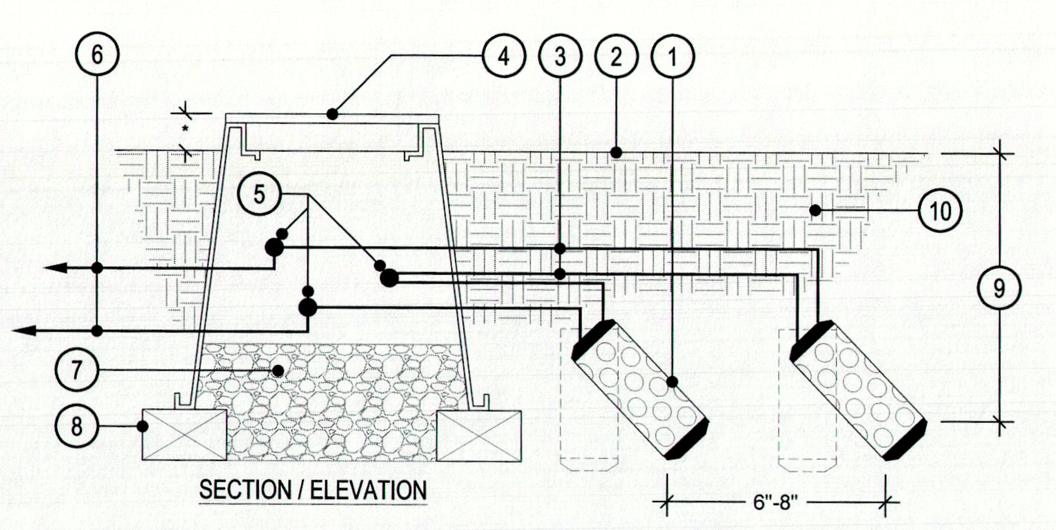
14.1. UPON FINAL ACCEPTANCE BY THE CITY/OWNER, THE CONTRACTOR SHALL PROVIDE A NINETY (90) DAY MAINTENANCE SERVICE FOR THE ENTIRE IRRIGATION SYSTEM. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO BROKEN SPRINKLER REPAIR AND/OR REPLACEMENT, CLOGGED DRIP LINE REPAIR / REPLACEMENT, BROKEN PIPE REPAIR AND/OR REPLACEMENT, ADJUSTMENT OF HEADS, ADJUSTMENT OF CONTROLLER PROGRAMMING, AND WEEKLY INSPECTIONS FOR ANY MALFUNCTIONS.



1. AUTOMATIC CONTROLLER PER LEGEND - MOUNT TO WALL PER MANUFACTURER'S DIRECTIONS
2. ELECTRICAL JUNCTION BOX FOR 115V AC POWER CONNECTION
3. 1/2" CONDUIT WITH 115V AC POWER WIRES TO POWER SOURCE
4. SCH 40 PVC CONDUIT FOR CONTROL WIRES
5. SECURE ALL CONDUITS TO WALL WITH "C" CLAMP IN A MINIMUM OF TWO PLACES (TYP)
6. FINISH GRADE
7. WALL

CONTROLLER - WALL MOUNT

M

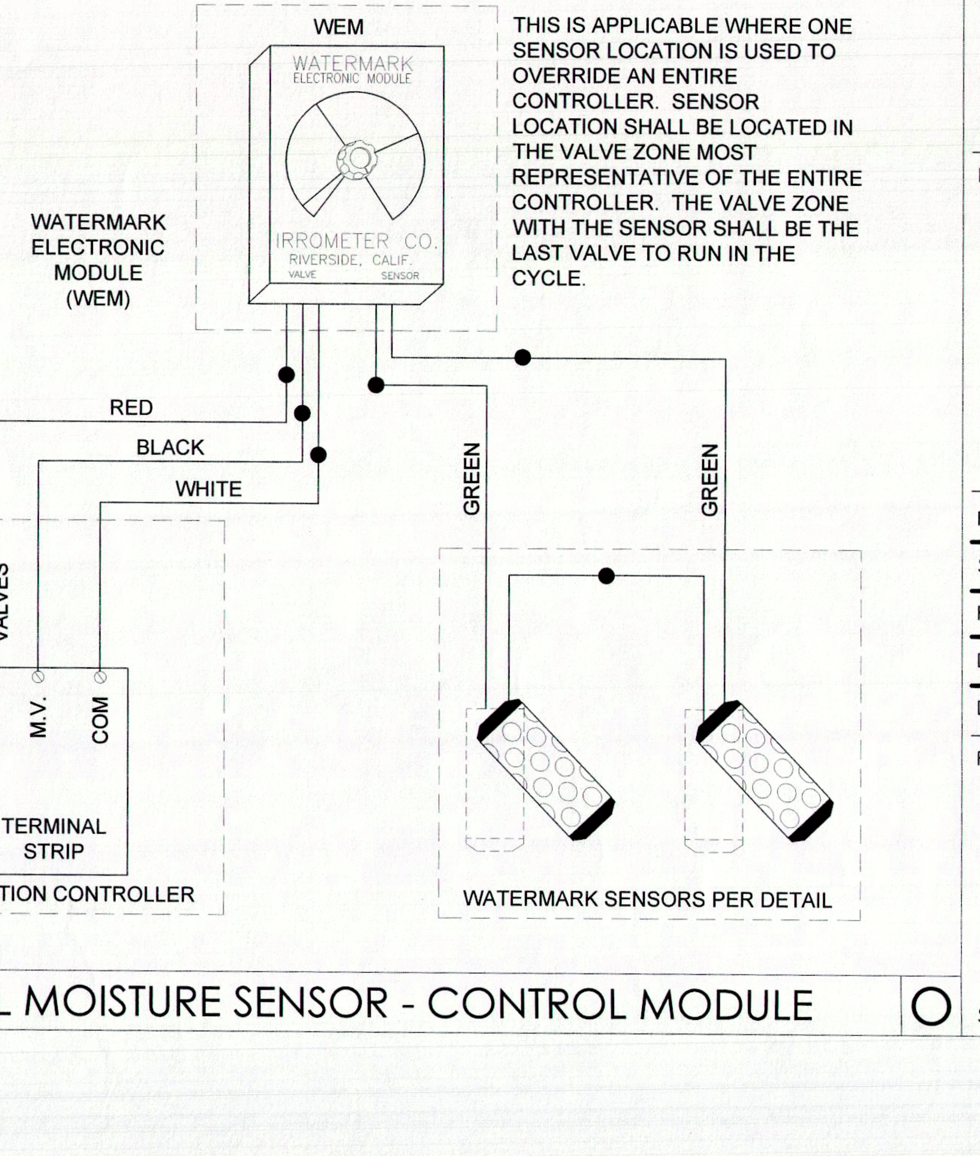


1. TWO (2) IRROMETER WATERMARK SERIES SOIL MOISTURE SENSORS - WIRED IN SERIES - ANGLE BETWEEN 0 AND 45 DEGREES
2. FINISH GRADE
3. WIRES FROM SENSORS TO CONNECTION BOX (TYPICAL)
4. 6" ROUND PLASTIC CONNECTION BOX - LOCATE 2'-3' FROM SENSORS
5. WATERPROOF WIRE CONNECTORS
6. WIRES FROM CONNECTION BOX TO IRROMETER WEM AT CONTROLLER
7. FILL BASE OF BOX WITH PEA GRAVEL
8. COMMON BRICK SUPPORT (TWO REQUIRED)
9. DEPTH AS REQUIRED - APPROXIMATELY 40-50% OF THE EFFECTIVE ROOT DEPTH
10. NATIVE SOIL
* 1/2" IN TURF AREAS, 2" IN SHRUB AREAS

NOTES:
INSTALL SENSOR IN ACTIVE ROOT ZONE AREAS. LOCATE SENSORS IN ZONE REPRESENTATIVE OF CONTROLLER AS DIRECTED BY THE MANUFACTURER. INSTALL AND WIRE PER MANUFACTURER'S DIRECTIONS. CONTACT IRROMETER AT 951-689-1701 FOR SUPPORT

SOIL MOISTURE SENSOR - FIELD PLACEMENT

N



THIS IS APPLICABLE WHERE ONE SENSOR LOCATION IS USED TO OVERRIDE AN ENTIRE CONTROLLER. SENSOR LOCATION SHALL BE LOCATED IN THE VALVE ZONE MOST REPRESENTATIVE OF THE ENTIRE CONTROLLER. THE VALVE ZONE WITH THE SENSOR SHALL BE THE LAST VALVE TO RUN IN THE CYCLE.

SOIL MOISTURE SENSOR - CONTROL MODULE

O

RPV

REVISIONS:		
NO.	DATE	ITEM

PROJECT:
ABALONE COVE SHORELINE PARK IMPROVEMENTS

SHEET TITLE:
IRRIGATION DETAILS AND SPECIFICATIONS

MELÉNDREZ
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www.melendrez.com

REGISTRATION:
LICENSED LANDSCAPE ARCHITECT
JENNIFER PACKER
No. 4973
Signature
2-28-15
Renewal Date
10/11/13
Date
STATE OF CALIFORNIA

PROJECT NO: 1305101.00
SUBMITTAL DATE: 10/11/2013
PHASE: BID SET
DESIGNED BY: AH
DRAWN BY: JM / TA
PLAN NO:

L-5.3

SHEET NO: 13 OF 17