MURRIETA COMMUNITY SERVICES DEPARTMENT
LANDSCAPE STANDARDS BOOKLET

For:

Murrieta Community Services Department
1 Town Square
24601 Jefferson Ave.
Murrieta, Ca 92562
(951) 461-6124

Revised January 2014

Murrieta
the future of southern california

IMPORTANT NOTE TO ARCHITECTS

BEFORE STARTING ON ANY PROJECT OR DRAWING ANY PLANS, PLEASE CONTACT THIS OFFICE FOR A PRELIMINARY DESIGN MEETING WITH COMMUNITY SERVICES DEPARTMENT STAFF.

THE COMMUNITY SERVICES DEPARTMENT TELEPHONE NUMBER IS (951) 461-6124

SECTION A
GENERAL INFORMATION

CONTENTS:

A. INTRODUCTION

1. The Murrieta Community Services Department shall here in after be referred to as "MCSD".

2. Properties maintained by MCSD are composed of five general divisions:

   a. Streetscapes, parkways and medians;

   b. Park and Recreation facility;

   c. Drainage channels, open space and specified areas;

   d. Multi-purpose trails and bicycle trails;

   e. Entries and entry monuments.

3. The Applicant / Developer whose parcel qualifies into these categories may wish to submit to MCSD for dedication; thereby becoming a MCSD maintained area. This book has been composed to provide pertinent information to the Applicant / Developer regarding the elements required to meet MCSD standards. This information only applies to MCSD parcels, not the whole project site.

4. This book outlines the requirements current to the date shown on the first page of this document. As new products and installation methods become available or accepted by the MCSD they may be incorporated into this book without actually updating the book. MCSD reserves the right to add or incorporate into these standards specific design principles, product usage and installation methods as may be deemed necessary by the MCSD.

B. PLAN SUBMITTAL PROCESS

1. MCSD requires that a deposit be in place to offset the plan check fees. The Architect shall contact the MCSD to obtain the actual plan check fees prior to the submittal of any plans.

2. MCSD requires that a performance bond be in place for the installed value of the landscape in the areas to be dedicated to the City of Murrieta. If the project is not installed as per the MCSD's specifications, the bond will be forfeited.

3. The Applicant / Developer with properties considered for MCSD dedication to the City of Murrieta will need to submit the following:

   a. Letter of request signed by Applicant / Developer.

   b. One copy of the final tract map for the total project showing areas dedicated on the map.

   c. One site plan (8 1/2" X 11") or; on the required title sheet, identify all properties to be deeded over to MCSD.

   d. Finished landscape planting and irrigation plans with specifications. Three (3) sets of plans are required for review of compliance with design guidelines.

   e. One set of blueline grading and fencing plans.

4. Address all plans submitted to:

Murrieta Community Services Department
1 Town Square
Murrieta, Ca. 92562

5. Once all of the above referenced criteria have been met, plans submitted to MCSD will be forwarded to the Director of Community Services.

6. Allow a minimum of twelve (12) to fifteen (15) working days for the plan check of the initial landscape plan.

7. All plans will be checked by the Director of Community Services for consistency, accuracy, clarity, and conformity with the MCSD standard specifications, drawings and design criteria before submission for approval. If during initial review by the Director of Community Services, the plans are found to be incomplete, they will be returned to the Applicant / Developer for completing with a letter explaining the reason.

8. The MCSD office will act as a processing center for all submittal coordination to and from the Director of Community Services.

9. All projects will be processed in the order received, on a first come-first serve basis. No special consideration will be given to any project.

C. SITE APPROVAL PROCESS

1. If plan review approval has been authorized, the Landscape Contractor / Developer may proceed with installation. **NO INSTALLATION CONSTRUCTION MAY BEGIN WITHOUT GRANTED APPROVAL.** Landscape Contractor / Developer is responsible for notifying the MCSD supervisor in advance for the following irrigation and planting inspections, according to the time indicated:

   a. Pre-job conference: 7 calendar days notice required.

   b. Pressure mainline installation (prior to backfilling of trenches) and pressure testing: 48 hours notice required.

   c. System layouts: 48 hours notice required.

   d. Coverage tests: 48 hours notice required.

   e. Final irrigation inspection: 48 hours notice required.

   f. Plant material inspection: 48 hours notice required.

   g. Prior to hydroseeding: 48 hours notice required.

   h. At the final inspection of installation and prior to the commencement of the 90-day maintenance period: 7 calendar days notice required.

   i. A scheduled walkthrough every 30 days during the maintenance period.

   j. Prior to the final acceptance of the 90-day maintenance period: 7 calendar days notice required.

2. Prior to the Pre-job meeting, a soil report shall be provided.

   a. Landscape Contractor will be responsible for providing an agronomic soil report with soil preparation recommendations for this meeting.

   b. Soil Analysis must be representative of site soils.

   c. Landscape Architect will make soil amendment recommendations based on report received from Landscape Contractor, prior to commencement of construction.

3. Before any final inspection takes place, as-built drawings must submitted to the MCSD office per the specifications.

4. These inspections are for installation conformance to MCSD standards. In no way does the inspection relieve the Landscape Architect, Landscape Contractor, or Applicant / Developer of any liabilities that may be incurred. **FINAL SITE MAINTENANCE APPROVAL WILL NOT BE GRANTED UNTIL THE LANDSCAPE PROJECT MEETS ALL OF MCSD STANDARD SPECIFICATIONS.** A letter will be sent to the Applicant / Developer after each site inspection, explaining the site maintenance review.

5. After all inspections have been completed, and the property has been accepted for the quality of landscaping installed, the MCSD office will submit the plans and legal information to the necessary departments / personnel to begin the transfer process.

D. GENERAL PLAN FORMAT

1. All plans submitted for MCSD approval must meet general plan requirements, the specifics of which shall be discussed in each subchapter.

2. Construction plan sheet size shall be 24" x 36" or 30" x 42".

3. Project title sheet shall include:

   a. Project name;

   b. Applicant / Developer's name, address, telephone number, fax number, and project manager;

   c. Landscape Architect's name, address, and telephone number; fax number;

   d. Date plans were prepared;

   e. Seal of the Landscape Architect, signed and dated on each page of project;

   f. Tract number with project address and street location;

   g. Revision block & sheet number block (sheet _____ of _____);

h. Hold harmless clause for each page of project;

i. MCSD approval signature block;

j. Square footage of all MCSD maintenance areas shown separate as:

i. Parkways/streetscape
ii. Medians
iii. Entries and entry monuments
iv. Slopes
v. Drainage Channels
vi. Open Spaces
vii. Multi-purpose trails
viii. Turf grass areas

4. Scale shall not exceed 1"= 20'. Note: If special conditions should exist and the project Landscape Architect believes an exception to scale is warranted, then submittal of a letter requesting a variance of scale, in duplicate, should be written to MCSD. The letter should also indicate his reason or hardship compliance to scale would create. Final approval or denial is granted through MCSD.

5. All plans with multiple sheets shall have match lines shown on each plan sheet. Match lines shall be labeled to provide adequate references for identification and cross-indexing to the other sheets.

6. All sheets should clearly identify area to be maintained by MCSD.

7. Details referenced from MCSD guidelines will require placement on to the plans. No generic references to master guideline details will be accepted.

8. A title sheet for the set of plans is required. Site plans, vicinity plans and table of contents are required, as well as an exhibit showing MCSD parcels.

E. SPECIFIC PLAN REQUIREMENTS

Water in Southern California is a precious resource that requires continuous monitoring. The intent of MCSD is to conserve water wherever and whenever possible. To assist in the effort of water conservation, all landscape plans will require designs that are water use conscious. MCSD will be looking at these areas of the construction plans for water conservation. They are as follows:

1. The use of native plants in site planting should be considered, to bring down the water demands over general ornamental plants;

2. Plants shall be grouped by water use to provide a consistent water requirement for entire areas. Use of the Water Use Classification of Landscape Species (WUCOLS) and The Landscape Coefficient Method is encouraged. The publication "A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California" is available free of charge from:

   Department of Water Resources
   Bulletins and Reports
   P.O. Box 942836
   Sacramento, California 94236-0001
   (916) 653-1097

3. Thoughtful and innovative designing with regard to water conservation will require that plant material placement harmonize with the layout of irrigation equipment. (See irrigation section);

4. Irrigation equipment shall include water-monitoring devices that can document a minimum of 20% savings when installed.

END OF SECTION

LANDSCAPE PLAN CHECK APPROVAL LIST

Project Name: _____ Date of Submittal: _____

Tract Number: _____

Developer Name: _____ Telephone Number: _____

Contact Name: _____ Fax Number: _____

Landscape Architect: _____ Telephone Number: _____

Contact Name: _____ Fax Number: _____

SUBMITTALS:

Plans (3 sets)
Specifications (1 set)
Irrigation Pressure Calculation(s) on Plans
Park Equipment Catalog Cuts (when requested)

GENERAL:

Screen out areas other than MCSD maintained areas
Maximum plan sheet size is 24" x 36"
Plans are clear and easy to interpret
Plans are complete, all sheets are properly numbered and all sheets are listed on title sheet

___ Maximum scale 1" = 20'
___ North arrow on each plan sheet
___ Match lines used on multiple sheet plans
___ Street names shown for all streets
___ Underground Service Alert
___ Maintenance responsibilities defined clearly
___ Handicap ramps shown
___ Plan cross referencing clear
___ Project limits, building coverage, paved areas, R.O.W., private areas shown clearly

TITLE SHEETS:

___ Project name
___ Developer's name / address/ tel. & fax numbers
___ Project Manager's name / address/ tel. & fax numbers
___ Landscape Architect's name / address/ tel. & fax numbers
___ Date plans were prepared
___ Landscape Architect seal / signature
___ Tract number / project address / street location
___ Revision block & sheet number block
___ Hold harmless clause on each sheet
___ MCSD approval signature block
___ MCSD "Take Precedence" Clause
___ Inspection schedule approval process
___ Revision Block
___ Square footage of MCSD areas per standards Booklet
___ General Notes: Landscape Quantities:
  ___ Total acres in R.O.W.
  ___ Total sq. ft. in MCSD maintained areas
  ___ Total acres in MCSD maintained areas
  ___ Total trees in R.O.W. – by size
___ Location map
___ Vicinity map
___ Sheet index
___ Title block on right side of the first sheet of plans

IRRIGATION PLANS:

___ Maintenance responsibilities defined
___ Spot elevations (top of curb at B.C.R. and Point of connection (P.O.C.))
___ Location of water meter and / or P.O.C.
___ Water information (blocked out) including:
  ___ Water source and telephone number
___ Booster pump / enclosure
___ Precipitation rates for each valve
___ Strainer (with ball valves if basket type)
___ Irrigation pressure loss calculations – farthest zone, largest zone, worst case zone (15 – 20 PSI residual)
___ Play fields – rubber covers on all heads

IRRIGATION PLANS: (Continued)

- ___ Potable or reclaimed water
- ___ Water meter size in inches
- ___ Available water pressure range (high / low)
- ___ Peak demand in gallons per minute (GPM)
- ___ Date pressure information was obtained
- ___ Backflow preventer provided (potable only)
- ___ Pressure regulator
- ___ Master Valve
- ___ Flow sensor
- ___ Controller / enclosure
- ___ Telephone line for controller communication
- ___ Radio for controller communication
- ___ Cross connections (none allowed)
- ___ Drinking fountains (handicap accessible)
- ___ Isolation gate / ball valves
- ___ Quick coupler valves (200 ft. on center)
- ___ Approved irrigation equipment
- ___ Standard reclaimed water notes from District
- ___ Cross references on each sheet for irrigation legend, details, notes and specifications
- ___ Details per MCSD Landscape Guidelines
- ___ Specifications per MCSD Landscape Guidelines
- ___ Drip systems used where required
- ___ Irrigation schedules per MCSD Landscape Guidelines

PLANTING PLANS:

- ___ Conformance with master plan
- ___ Maintenance responsibilities defined
- ___ Concrete header (MCSD area)
- ___ Trees on approved street tree list
- ___ Minimum street tree spacing distance
- ___ Site distance: Primary Corners
- ___ Site distance: Secondary Corners
- ___ Plants on approved street tree list
- ___ Cross references on each sheet for planting legend, details, notes and specifications
- ___ Provide maintenance access for slopes, open space and Drainage Channels
- ___ Details per MCSD Landscape Guidelines
- ___ Specifications per MCSD Landscape Guidelines
- ___ Legend:
  - ___ Botanical plant name
  - ___ Common Plant Name
  - ___ Plant size
  - ___ Plant quantities
  - ___ Plant spacing
  - ___ Special comments
  - ___ Tree trunk caliper & canopy diameter

RESUBMIT THE FOLLOWING:

- ___ Redline set
- ___ Revised Plans (2 sets)
- ___ Specifications (1 set)
- ___ Title sheet
- ___ Irrigation pressure loss calculations (on plans)
- ___ Fencing plan and grading plan
- ___ Irrigation controller schedules (2 sets)
- ___ Catalog cuts for park equipment (when requested)
- ___ Area take-offs for MCSD maintained areas; provide square footages on title sheet
- ___ Street improvement plans

NOTES:

_____

_____

_____

MCSD APPROVAL:

The landscape and irrigation plans for this project have been reviewed by the Murrieta Community Services Department Representative for consistency, accuracy, clarity, and conformity with the MCSD standard specifications, drawings and design criteria. The MCSD Representative has approved these landscape and irrigation plans if the following information has been completed:

MCSD Representative: _____ Date of Approval: _____

SECTION B
STANDARD IRRIGATION PLANS

CONTENTS:

A. PLAN REQUIREMENTS

1. It is the MCSD Representative's intent, with this water moratorium on MCSD landscape areas, to draw upon the pool of Landscape Architects to be inventive with their planting plans and irrigation systems.

   a. All irrigation systems for slopes and street medians shall be designed using drip / bubbler systems as indicated in the standard detail drawings and specifications. Street parkway shrub plantings shall be designed with drip emitters. The Landscape Architect shall discuss the method of parkway irrigation with the MCSD Representative during the preliminary design meeting.

      In mitigation areas, and with prior written MCSD approval, slope areas may be irrigated with light application, overhead spray systems. Overhead spray slope irrigation systems shall consist of 12 inch pop-up, gear driven rotor heads with an application rate not exceeding 0.60 inches per hour. All trees located in overhead spray irrigated areas shall be irrigated with a supplemental bubbler system controlled by separate remote control valves.

   b. Irrigation systems shall be designed to maximize efficiency. Drip type irrigation systems shall be designed to target an efficiency of between 90%. Rotor type irrigation systems shall be designed to target 80% efficiency. Large turf rotor irrigation systems must attain 80% efficiency to avoid excessive over irrigation and/or brown spotting.

   c. Sprinkler system layout shall not exceed 50% of the diameter of the sprinkler head used. This is also referred to as head to head coverage. Due to local wind conditions it is often more efficient to space heads at 45% of diameter, closer than head to head. Large turf rotor heads shall be spaced at no more than 95% and no less than 80% of the maximum radius shown in the manufacturer's catalog.

   d. Sprinkler systems shall utilize a triangular spacing pattern for spray and rotor heads where possible. Large turf rotor systems shall be designed to have triangular spacing in at least 90% of their coverage areas.

   e. Irrigation systems shall be designed with one controller per point of connection. In no case shall multiple controllers control irrigation from a single P.O.C., or shall a single controller control multiple points of connection.

f. The MCSD is currently operating one central controlled irrigation system. The manufacturer of the controller is Calsense. The irrigation system shall be designed to connect to this system. The Landscape Architect shall discuss the central control system with the MCSD Representative during the preliminary design meeting.

2. The following formal information shall be required on all irrigation plans:

a. Irrigation Legend:

A comprehensive legend shall be shown on each sheet of the irrigation plans. The legend shall include:

i. Symbols for all referenced material used on the plans.

ii. The manufacturer, model number, size and optional features of all referenced material used on the plans.

iii. For sprinkler heads, include the sprinkler nozzle arc patterns, nozzle sizes or numbers, nozzle discharge rates in GPM, radius of throw, design operating pressure and precipitation rates.

b. The MCSD standard irrigation detail drawings for all referenced material used on the plans.

c. Water Service Information:

i. A description and the location of the water service(s).

ii. Installation requirements and responsibility of the appropriate Water District (include the district telephone number).

iii. Whether the service is domestic and/or reclaimed water.

iv. Water meter size(s) in inches.

v. Available static water pressure, high and low measurements and the date that the water pressure information was obtained from the District.

vi. Peak demand in gallons per minute (GPM) for the meter based on the irrigation design.

vii. Design water pressure.

viii. Total area serviced by each water meter acres as well as square feet. For areas with slopes include the slope factor into the area calculations.

ix. Irrigation controller settings, for each controller / water meter, for the four seasons using the provided MCSD water cost analysis and seasonal controller schedules spreadsheet. Use the appropriate spreadsheet for either spray irrigation or drip / bubbler irrigation.

x. Yearly water demand, by season gallons for each water meter. This calculation should be based on post establishment landscape requirements using the provided MCSD water cost analysis and seasonal controller schedules spreadsheet.

xi. Total site square footage with slope factor and total annual water demand in gallons. This number shall be the sum of all points of connection on the project.

d. Pressure Calculations: 2 calculations at each point of connection (P.O.C.) as follows:

i. At worst condition, as determined by site conditions (ie. distance from the P.O.C., elevation change, operating pressure, etc.).

ii. At farthest irrigation head away from the P.O.C.

e. The MCSD requires that a water cost analysis and seasonal controller schedules be provided for each controller on the project. (See exhibit number 3.)

f. Reclaimed Water Information:

i. The installation of the reclaimed water system shall conform to the regulations set forth for the construction of reclaimed water systems by the county, state, local health departments and local water purveyor.

ii. The locations of reclaimed water warning signage shall be depicted on the drawings whenever reclaimed water is used for irrigation systems.

g. Additional Information:

i. Electrical power locations and requirements for irrigation controllers and booster pumps.

ii. Booster requirements and locations, if needed, with appropriate calculations and details.

iii. Location of all existing plant materials to remain on site with specific requirements for work around them.

h. Hold Harmless and Indemnification Clause to Appear on Each Sheet:

Contractor agrees to assume sole responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours, and that the Contractor shall defend, indemnify, and hold the Owner / City, the MCSD, County of local jurisdiction, and the Landscape Architect harmless from any and all liability real or alleged, in connection with the performance of work on this project, excepting for liability arising from the sole negligence of the Owner / City, the MCSD, county of local jurisdiction, or the Landscape Architect.

i. The MCSD approval signature block shall appear on each sheet of the Drawings.

j. The following MCSD "Take Precedence" note shall appear on each sheet of the Drawings.

The Murrieta Community Services Department Landscape Standards Booklet shall take precedence over the approved landscape plans. Should a discrepancy occur between any notes, specifications, details, site conditions, or other situation regarding the interpretation of construction from these plans, the MCSD Representative's decisions shall be final.

B. STANDARD IRRIGATION EQUIPMENT LIST

VALVES

Ball Valves:	Wilkins bronze body 3/4" – 2" size
Gate Valves:	Leemco iron 2 1/2" and larger size
Wye Strainer:	Wilkins 100YSBR – potable water systems
Basket Strainer:	Hayward #72 – reclaimed water systems (Threaded for 1" - 2", flanged for 3" and larger)
Backflow Prevention:	Wilkins – 1" – 2" size for irrigation Wilkins – 3" and larger size for irrigation Wilkins – drinking fountains and bathrooms
Flow Meters:	Calsense brass – size as required (Calsense)
Pressure Regulator:	Wilkins 500HLR (High Low Range) series
Master Valve:	Hunter ICV-AS w/ "Accu-Set" regulator
Remote Control Valves:	Hunter ICV-AS w/ "Accu-Set" regulator
Drip Control Equipment:	RCV - Hunter ICV-AS w/ "Accu-Set" regulator Wye Filter – Amiad #1-1201 Pressure Regulator – Senninger PR-40 series Flush Valve – Hydro-Rain/Orbit #50240-Threaded
Quick Coupler:	Rain Bird 44LRC – potable water systems Nelson 7642 – reclaimed water systems
Swing Check Valves:	King Brothers, Inc., Flow Controls
Spring Check Valve:	Hunter, King Brothers, Inc., Flow Controls
Pressure Relief Valve:	Crispin

SPRINKLER HEADS

Spray Heads:	Rain Bird 1800-SAM-PRS, Hunter INST-CV
Spray Nozzles:	Hunter MP Rotator
Rotor Medium Range:	Hunter MP Rotator
Rotor Large Range:	Hunter I-25 Plus, Hunter I-40, Rain Bird 7005 ss

BUBBLER HEADS / DRIP EMITTERS

Bubbler Heads:	Rain Bird 1400, Hunter PCB
Drip Emitters:	Bowsmith 210 – Barbed fitting
Subsurface Lawn Drip	Rainbird XFS series

PIPE, FITTINGS AND WIRE

P.V.C. Pipe:	Pacific Plastics Schedule 40 Mainline and Laterals Pacific Plastics Class 315 Mainline Hydro-Rain bullock pipe for drip systems
P.V.C. Pipe Fittings:	Lasco Schedule 40 lateral lines Lasco Schedule 80 mainlines
Pipe Stabilizers:	V.I.T. Products PS-18
Control Wire:	Paige Cable #14UF AWG Direct Burial
Communication Cable:	Paige Cable #P-7171-D (Calsense)
Flow Sensor Cable:	Arizona Electric, Inc. #9516-2SP
Wire Connections:	3M DBY Waterproof Direct Burial Connections

CONTROLLERS AND ENCLOSURES

Controllers:	Calsense ET2000 – Calsense central systems LEIT light powered
Radio Remote Control:	Rainmaster PROMAX-UA W/ Wire Harness 12pc/24pc/32pc
Controller Enclosures:	Calsense SSE
Electrical Pedestal:	Meyers MEUG16XM100
Backflow Enclosure:	V.I.T. Strongbox
Backflow Insulation:	Polar Bearier
Enclosure Pad:	Concrete pad per detail
Valve Boxes:	N.D.S., Applied Engineering

EXHIBIT 1

WATER COST ANALYSIS AND IRRIGATION SCHEDULING SOFTWARE

In order to better determine the irrigation system run times and projected water costs, the City of Murrieta requires that all irrigation systems submitted to the MCSD for acceptance include a seasonal irrigation schedule. To facilitate this requirement, an irrigation scheduling spreadsheet has been developed. This spreadsheet requires that the designer enter only basic irrigation system data into the spreadsheet. All other calculations are performed automatically. The following are instructions for use of the spreadsheet.

Format:

The spreadsheet has been created and saved in Microsoft Excel 5.0/95. The spreadsheet can be used in higher versions of Microsoft Excel and can usually be read and converted in most other spreadsheet software. The spreadsheet is not available for Apple Macintosh systems.

Spreadsheet:

It is recommended that the designer start with the original MCSD spreadsheet named **MCSD-SIS.xls** (or **MCSD-DIS.xls** for drip irrigated projects). This will insure that the spreadsheet does not contain previous data that can be confused with new project data. The spreadsheet has been divided into four individual work sheets that coincide with the four seasons. At the bottom of the screen you will see these individual sheets. Click the tab on which season you wish to view.

The spreadsheets have been protected from changes to prevent inadvertent changing of the required formulas. The cells that require input by the designer are displayed with the entire cell contents in a red font color.

The basic irrigation data for the project is to be entered in the winter worksheet. The data will be automatically transferred to the other seasonal worksheets. The only data cell that can be changed on the spring, summer and autumn worksheets is the number of days per week that the system will operate. The number of days per week should vary with the season. The MCSD rules do not allow for irrigation seven days per week so if a number higher than "6" is entered here a warning statement will be displayed.

The designer shall enter the name of the project and the tract number in the space provided. The designer shall also enter the name of the irrigation designer, Landscape Architect or consultant responsible for the irrigation design.

EXHIBIT 1 (Continued)

The designer shall enter the water meter number and indicate the water supply as either "R" for reclaimed water or "P" for potable water. Any input in this cell other than "R" assumes potable water shall be used. The designer shall also enter the controller letter designation in the space provided.

The spreadsheet allows for 40 individual valve stations on each irrigation controller. The designer shall enter the following information for each controller station:

1) The flow in GPM of the control valve
2) The plant factor of the plant materials irrigated by the valve circuit
3) The precipitation rate of the sprinklers used on the valve circuit
4) The estimated irrigation efficiency of the sprinkler system
5) The allowable plant factors and irrigation efficiencies are provided for reference at the top of the spreadsheet.
6) Flow rate of the control valve should match the flow rates shown on the irrigation plans.

The irrigation precipitation rate shall be based on the standard industry calculation method shown below:

$$Pr = \frac{96.3 \times GPM}{Area}$$

Where: 96.3 = Constant used to convert to inches per hour

GPM = GPM of the equivalent full circle head

Area = The area the value of which would be based on the spacing distance and type. For square spacing this would be: Spacing x Spacing. For Triangular spacing this would be: Spacing x Spacing x 0.866.

Example: Rain Bird 1800 series spray heads with 10 foot radius nozzles, operating at 30 PSI, spaced in a 10 foot triangular pattern.

$$Pr = \frac{96.3 \times 1.57}{10 \times 10 \times 0.866}$$

Pr = 1.74 Inches per hour

EXHIBIT 1 (Continued)

Example: Rain Bird 1800 series spray heads with 15 foot radius nozzles, operating at 30 PSI, spaced in a 14 foot triangular pattern.

$$Pr = \frac{96.3 \times 3.7}{14 \times 14 \times 0.866}$$

Pr = 2.09 Inches per hour

Once the data has been entered, all of the calculations are automatically made and the spreadsheet updated. For unused valve circuits enter a zero into all of the unused irrigation data cells. This will result in all calculation cells returning a zero value.

Submittal:

The designer shall provide the MCSD a hard copy of the project schedules as well as a digital copy on diskette as part of the plan submittals. The digital files submitted shall be named using the tract number and the controller letter as follows:

For a tract number 145677 and controller "B" the correct file name would be **145677-B.xls**. Submit digital files to the MCSD only on a compact disc (CD) formatted for IBM compatible computers. Clearly label the CD with the project name, designer name, designer telephone number and the names of the digital files submitted.

EXHIBIT 2

SAMPLE CONVENTIONAL IRRIGATION
WATER COST ANALYSIS AND IRRIGATION SCHEDULE

MURRIETA COMMUNITY SERVICES DEPARTMENT - SEASONAL IRRIGATION SCHEDULE:	WINTER (Dec., Jan. and Feb.)

Project Name:	(INSERT NAME OF PROJECT AND TRACT NUMBER)	Water meter Number:	1
Designer Name:	(INSERT NAME OF IRRIGATION DESIGNER)	Reclaimed / Potable:	R
Date Prepared:	(INSERT THE DATE THIS SCHEDULE WAS PREPARED)		

Evapotranspiration Rates:			Plant Factors (% of ETo):		Irrigation Efficiency (%):	
Historical:	55.45	In. / Yr.	Turf:	0.8	Stream Rotors:	0.75
Seasonal:	6.52	In.	Low Water Use Shrubs:	0.3	Spray Heads:	0.65
Seasonal:	0.50	In. / Wk.	Medium Water Use Shrubs:	0.4	Bubbler Heads:	0.85
			High Water Use Shrubs:	0.6	Drip Systems:	0.90

Controller Letter:	A

VALVE NUMBER	FLOW IN GPM	PLANT FACTOR	PRECIP. RATE	IRRIG. EFFIC.	MAX. MIN./CYCLE	IR/WK INCHES	IR/WK MINUTES	CYCLES PER WK	GALLONS PER WK
1	32	0.5	1.74	0.65	3	0.39	13	4	426
2	24	0.8	1.74	0.65	3	0.62	21	6	511
3	43	0.8	1.74	0.65	3	0.62	21	6	915
4	43	0.8	0.50	0.80	12	0.50	60	5	2,588
5	45	0.4	1.74	0.65	3	0.31	11	3	479
6	51	0.4	1.74	0.65	3	0.31	11	3	543
7	23	0.4	0.50	0.80	12	0.25	30	3	692
8	26	0.4	0.50	0.80	12	0.25	30	3	782
9	34	0.4	0.50	0.80	12	0.25	30	3	1,023
10	45	0.4	0.50	0.80	12	0.25	30	3	1,354
11	23	0.4	0.50	0.80	12	0.25	30	3	692
12	34	0.3	1.74	0.65	3	0.23	8	2	271
13	35	0.3	1.74	0.65	3	0.23	8	2	279
14	51	0.3	0.50	0.80	12	0.19	23	2	1,151
15	48	0.8	0.50	0.80	12	0.50	60	5	2,889
16	42	0.8	0.50	0.80	12	0.50	60	5	2,528
17	0	0.0	0.00	0.00	0	0.00	0	0	0
18	0	0.0	0.00	0.00	0	0.00	0	0	0
19	0	0.0	0.00	0.00	0	0.00	0	0	0
20	0	0.0	0.00	0.00	0	0.00	0	0	0
21	0	0.0	0.00	0.00	0	0.00	0	0	0
22	0	0.0	0.00	0.00	0	0.00	0	0	0
23	0	0.0	0.00	0.00	0	0.00	0	0	0
24	0	0.0	0.00	0.00	0	0.00	0	0	0
25	0	0.0	0.00	0.00	0	0.00	0	0	0
26	0	0.0	0.00	0.00	0	0.00	0	0	0
27	0	0.0	0.00	0.00	0	0.00	0	0	0
28	0	0.0	0.00	0.00	0	0.00	0	0	0
29	0	0.0	0.00	0.00	0	0.00	0	0	0
30	0	0.0	0.00	0.00	0	0.00	0	0	0
31	0	0.0	0.00	0.00	0	0.00	0	0	0
32	0	0.0	0.00	0.00	0	0.00	0	0	0
33	0	0.0	0.00	0.00	0	0.00	0	0	0
34	0	0.0	0.00	0.00	0	0.00	0	0	0
35	0	0.0	0.00	0.00	0	0.00	0	0	0
36	0	0.0	0.00	0.00	0	0.00	0	0	0
37	0	0.0	0.00	0.00	0	0.00	0	0	0
38	0	0.0	0.00	0.00	0	0.00	0	0	0
39	0	0.0	0.00	0.00	0	0.00	0	0	0
40	0	0.0	0.00	0.00	0	0.00	0	0	0

Run Time Totals:	
447	Min. / Wk.
7.45	Hrs. / Wk.
3	Days / Wk.
2.48	Hrs. / Day

Water Use Totals:	
17,124 Gal. / Wk.	0.05 Acft / Wk.
74,146 Gal. / Mo.	0.23 Acft / Mo.
222,610 Gal. / Ssn.	0.68 Acft / Ssn.
5,708 Gal. / Day	0.02 Acft / Day

Water Cost Totals:	
$185.00	Cost / Acft.
$42.10	Cost / Mo.
$126.39	Cost / Ssn.
$1,074.93	Cost / Yr.

EXHIBIT 3

SAMPLE DRIP IRRIGATION
WATER COST ANALYSIS AND IRRIGATION SCHEDULE

MURRIETA COMMUNITY SERVICES DEPARTMENT-SEASONAL DRIP IRRIGATION SCHEDULE	WINTER (Dec., Jan. and Feb.)

Project Name:	(INSERT NAME OF PROJECT AND TRACT NUMBER)			Water meter Number:	1
Designer Name:	(INSERT NAME OF IRRIGATION DESIGNER)			Reclaimed / Potable:	R
Date Prepared:	(INSERT THE DATE THIS SCHEDULE WAS PREPARED)				
Evapotranspiration Rates:		Plant Factors (% of ETo):		Irrigation Efficiency (%):	
Historical:	55.45 In. / Yr.	Turf:	0.8	Drip Systems:	0.90
Seasonal:	6.52 In.	Low Water Use Shrubs:	0.3		
Seasonal:	0.50 In. / Wk.	Medium Water Use Shrubs:	0.4	Wetted % of Plant Area:	
		High Water Use Shrubs:	0.5		0.65
Controller Letter:	A				

VALVE NUMBER	FLOW IN GPM	PLANT FACTOR	PLANT SPACING	PLANT AREA	WETTED AREA	EMITTER VOLUME	IR/WK MINUTES	G/PLANT PER WK	GALLONS PER WK
1	20	0.3	6.00	28.29	18.39	2.00	57	1.92	1,150
2	19	0.3	6.00	28.29	18.39	2.00	57	1.92	1,092
3	21	0.3	6.00	28.29	18.39	2.00	57	1.92	1,207
4	15	0.3	6.00	28.29	18.39	2.00	57	1.92	862
5	17	0.4	4.00	12.57	8.17	2.00	34	1.14	579
6	18	0.4	4.00	12.57	8.17	2.00	34	1.14	613
7	20	0.4	4.00	12.57	8.17	2.00	34	1.14	681
8	15	0.4	4.00	12.57	8.17	2.00	34	1.14	511
9	17	0.3	5.00	19.64	12.77	2.00	40	1.33	679
10	18	0.3	5.00	19.64	12.77	2.00	40	1.33	719
11	20	0.3	5.00	19.64	12.77	2.00	40	1.33	798
12	21	0.3	5.00	19.64	12.77	2.00	40	1.33	838
13	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
14	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
15	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
16	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
17	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
18	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
19	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
20	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
21	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
22	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
23	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
24	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
25	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
26	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
27	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
28	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
29	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
30	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
31	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
32	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
33	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
34	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
35	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
36	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
37	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
38	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
39	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0
40	0	0.0	0.00	0.00	0.00	0.00	0	0.00	0

Run Time Totals:	
526	Min. / Wk.
8.76	Hrs. / Wk.
2	Days / Wk.
4.38	Hrs. / Day

Water Use Totals:			
9,729	Gal. / Wk.	0.030	Acft / Wk.
42,128	Gal. / Mo.	0.129	Acft / Mo.
126,483	Gal. / Ssn.	0.388	Acft / Ssn.
4,865	Gal. / Day	0.015	Acft / Day

Water Cost Totals:	
$185.00	Cost / Acft.
$23.92	Cost / Mo.
$71.81	Cost / Ssn.
$610.75	Cost / Yr.

EXHIBIT 4

GUARANTEE FOR IRRIGATION SYSTEM

The Landscape Contractor shall provide a written guarantee for the irrigation system. The guarantee shall use this text verbatim and be printed on the Landscape Contractor own letterhead. An original wet signed copy shall be provided to the MCSD Representative:

Guarantee for irrigation system - ****Insert Name of Project****

We hereby guarantee that the irrigation system we have furnished and installed for ****Insert Name of Project**** is free from defects in materials and workmanship, and the work has been completed in accordance with the drawings and specifications, ordinary wear and tear and unusual abuse, or neglect expected. We agree to repair or replace any defects in material or workmanship which may develop during the period of one (1) year from 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 City. We shall make such repairs or replacements within a reasonable time, as determined by the City, after receipt of written notice. In the event of our failure to make such repairs or replacements within a reasonable time after receipt of such written notice from the City, we authorize the City to proceed to have said repairs or replacements made at our expense and we will pay for the costs and charges therefore upon demand.

Project Name: _____

Location (Legal Description of Project Property): _____

_____

Owner: _____

Landscape Architect: _____

Landscape Contractor: _____

Signed: _____ Title: _____

Date of Signature: _____ Telephone: _____

Fax: _____

Address: _____

_____

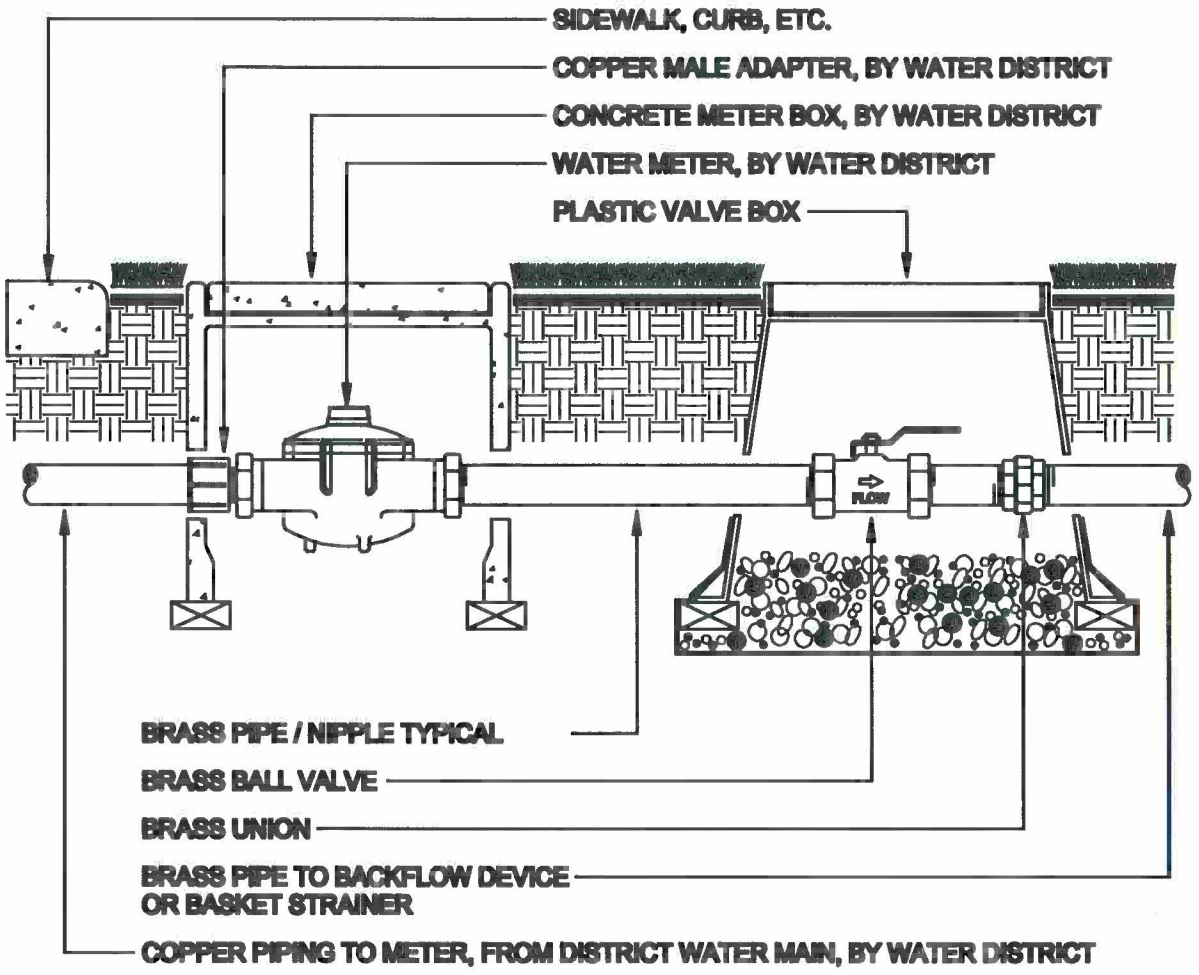
C. STANDARD IRRIGATION DETAILS

The MCSD standard irrigation installation details are provided on the compact disc as "DWG" files in AutoCAD 2000 format. The details are also included in this book as images inserted into the document for reference purposes only, all irrigation design for MCSD projects shall be prepared using AutoCAD drafting software. The details must be used as they are found on the compact disc and must not be altered in any way. These details are for use only for projects in the MCSD jurisdiction and are copyright protected by Sweeney & Associates, Inc.

Detail No.	Detail Description	Drawing Name
SID001	Typical Water Meter Hook-Up	SID001.DWG
SID002	Backflow Preventer, "N" Type w/ Valve Setter	SID002.DWG
SID003	Backflow Preventer with Enclosure	SID003.DWG
SID004	Basket Strainer	SID004.DWG
SID005	Fertilizer Injector	SID005.DWG
SID006	Pressure Regulator	SID006.DWG
SID007	Master Control Valve	SID007.DWG
SID008	Flow Sensor	SID008.DWG
SID009	Ball Valve, 2" and Smaller	SID009.DWG
SID010	Gate Valve, 2 ½" and Larger	SID010.DWG
SID011	Remote Control Valve	SID011.DWG
SID012	Drip remote Control Valve and Wye Filter Assembly	SID012.DWG
SID013	Valve Box Placement	SID013.DWG
SID014	Pop-Up Sprinkler, Rotor Type (4" – 6")	SID014.DWG
SID015	Pop-Up Sprinkler, Rotor Type (12")	SID015.DWG
SID016	Pop-Up Sprinkler, Spray Type (6")	SID016.DWG
SID017	Pop-Up Sprinkler, Spray Type (12")	SID017.DWG
SID018	Pop-Up Sprinkler Head, On Grade Pipe	SID018.DWG
SID019	Point to Point Drip Irrigation Detail	SID019.DWG
SID020	Drip Pressure Regulator and Check Valve Detail	SID020.DWG
SID021	Tree Drip Layout	SID021.DWG
SID022	Drip Emitter Assembly Detail	SID022.DWG
SID023	End Flush Cap	SID023.DWG
SID024	Quick Coupler Valve in Valve Box	SID024.DWG
SID025	Mainline Flush Valve Installed in Box	SID025.DWG
SID026	Pipe and Wire Trenching	SID026.DWG
SID027	Sleeve Trenching	SID027.DWG
SID028	Thrust Blocks	SID028.DWG
SID029	Pipe Restraint System	SID029.DWG
SID030	Irrigation Mainline Crossing Bench Drain	SID030.DWG
SID031	Irrigation Lines Crossing Down Drain	SID031.DWG
SID032	Wire Connector	SID032.DWG
SID033	Control Wire Pull Box	SID033.DWG

C. STANDARD IRRIGATION DETAILS (Continued)

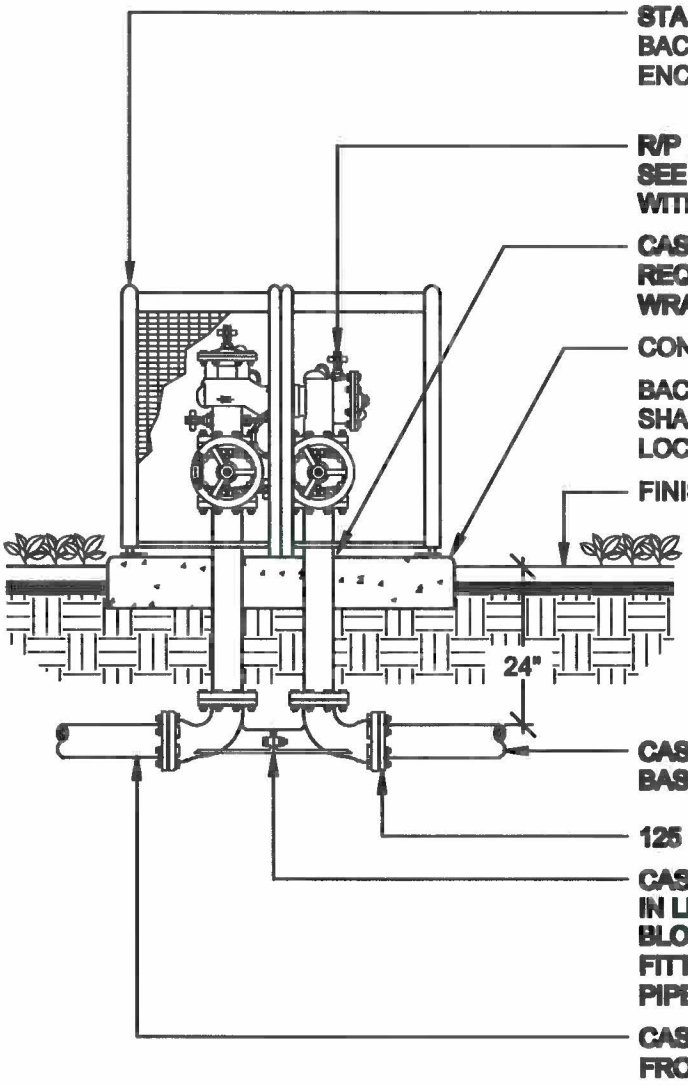
Detail No.	Detail Description	Drawing Name
SID034	Calsense Satellite, Interior Installation	SID034.DWG
SID035	Calsense Satellite, Exterior Installation	SID035.DWG
SID036	Controller Enclosure Concrete Footing	SID036.DWG
SID037	Light Powered Controller	SID037.DWG
SID038	Pressure Relief Valve	SID038.DWG



SECTION VIEW - N.T.S.

NOTE:
ALL EQUIPMENT UPSTREAM OF WATER METER, THE WATER METER AND METER BOX SHALL BE INSTALLED BY THE LOCAL WATER DISTRICT. ALL PIPING AND EQUIPMENT DOWNSTREAM OF METER SHALL BE INSTALLED BY THE CONTRACTOR. ALL PIPING BETWEEN THE WATER METER AND THE MASTER CONTROL VALVE, THROUGH ALL REQUIRED ASSEMBLIES, SHALL BE BRASS WITH BRASS FITTINGS AND UNIONS. WATER DISTRICT REQUIREMENTS SHALL SUPERCEDE THIS DETAIL.

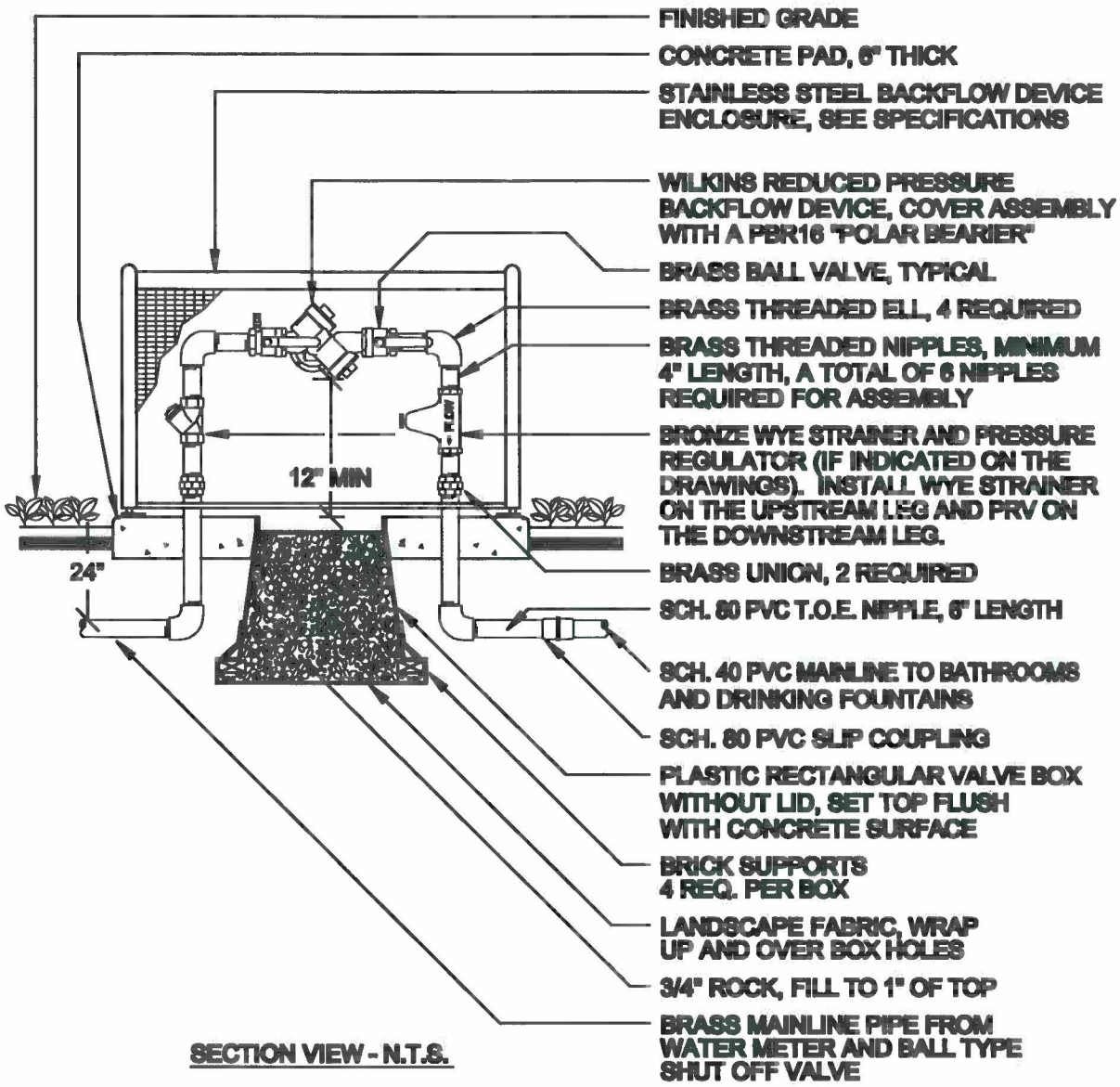
Murrieta	CITY OF MURRIETA	NO SCALE
	TYPICAL WATER METER HOOK-UP	SID001
		JANUARY 2014



SECTION VIEW - N.T.S.

NOTE:
WRAP BELOW GRADE CAST IRON PIPE AND FITTINGS WITH A BLACK PLASTIC PIPE WRAP.
INSTALL AN "POLAR BEARIER" INSULATING COVER OVER THE ENTIRE BACKFLOW ASSEMBLY.
VERIFY WATER DISTRICT REQUIREMENTS.

Murrieta	CITY OF MURRIETA	NO SCALE
	BACKFLOW PREVENTER "N" TYPE W/ VALVE SETTER	SID002
		JANUARY 2014

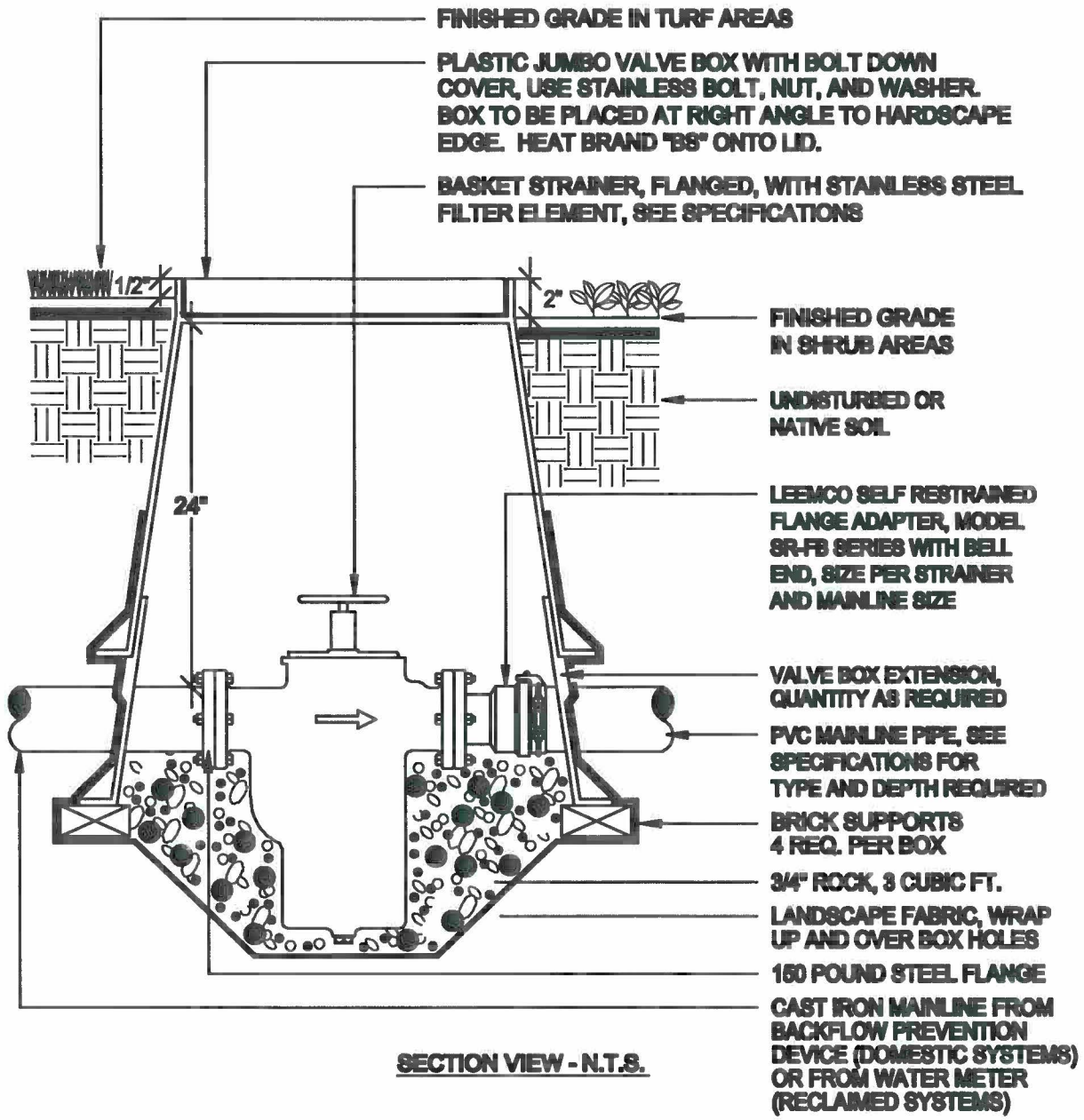


SECTION VIEW - N.T.S.

NOTE:

IF WYE STRAINER OR PRESSURE REGULATOR IS SPECIFIED, ONLY INSTALL ON EITHER THE HORIZONTAL PIPING OR ON THE DOWNSTREAM LEG AS SPACE PERMITS IF PERMITTED BY THE WATER AGENCY. INSTALL AN "POLAR BEARIER" INSULATING COVER OVER THE ENTIRE BACKFLOW ASSEMBLY,

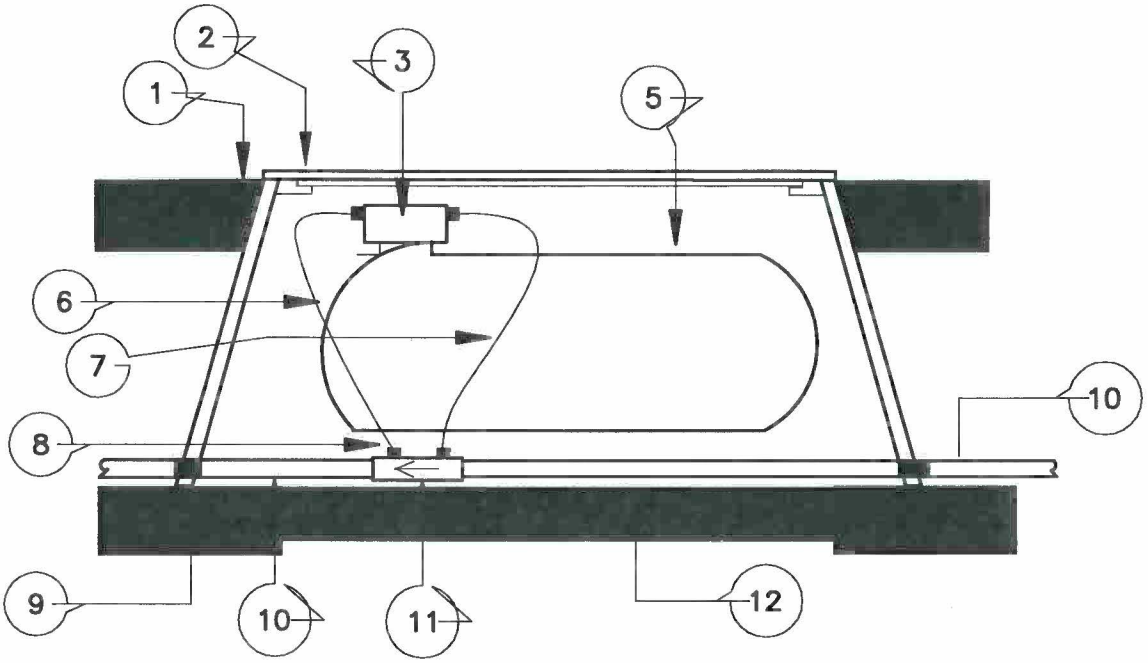
	CITY OF MURRIETA	NO SCALE
Murrieta	BACKFLOW PREVENTER WITH ENCLOSURE	SID003
		JANUARY 2014



SECTION VIEW - N.T.S.

NOTE:
WRAP CAST IRON PIPE (SPOOL) FROM BACKFLOW DEVICE WITH BLACK PLASTIC PIPE WRAP.

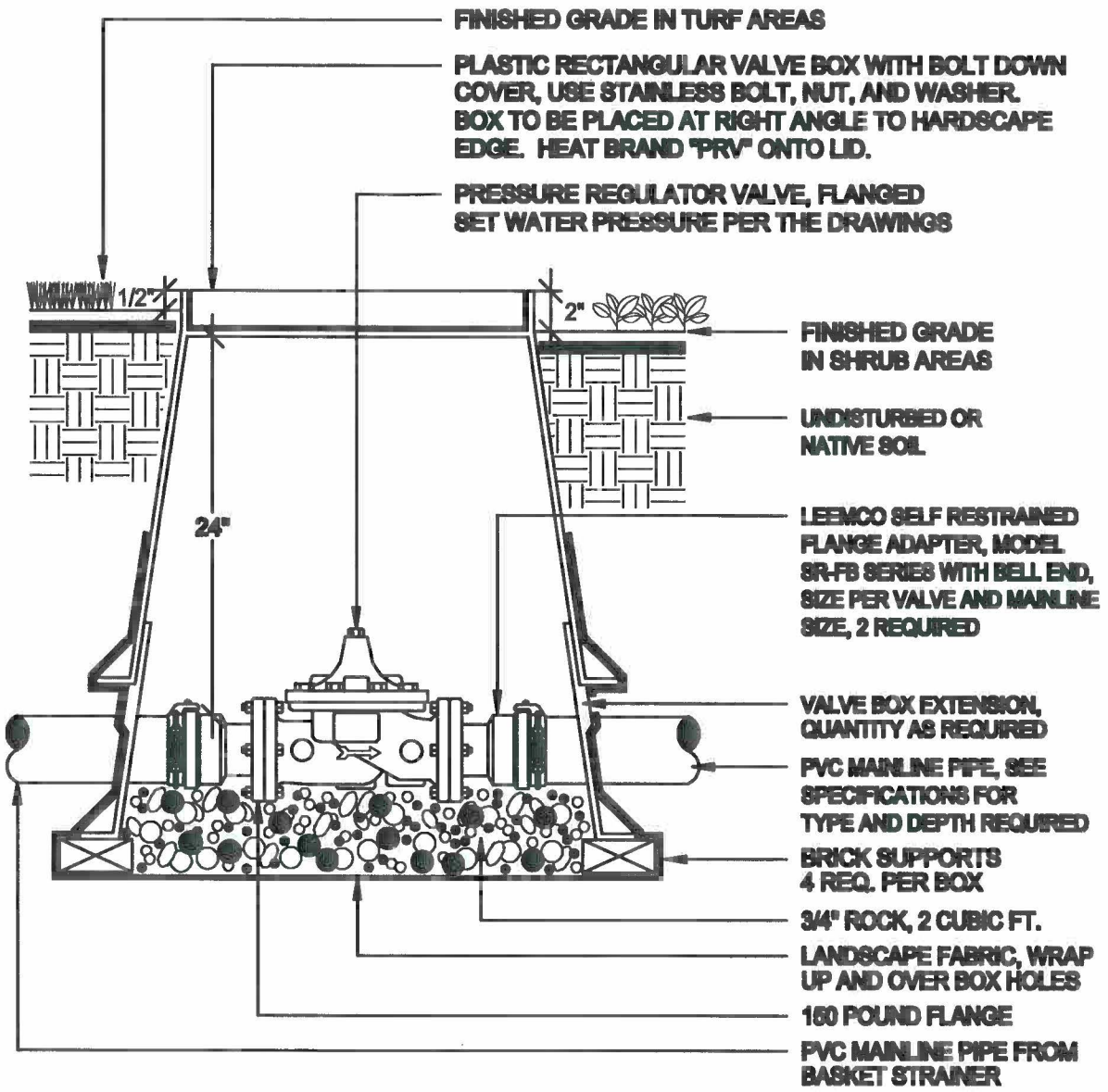
	CITY OF MURRIETA	NO SCALE
Murrieta	BASKET STRAINER	SID004
		JANUARY 2014



1. FINISH GRADE
2. VALVE BOX & COVER 17X12X11-3/4
3. PROPORTIONING CAP W/ FEED ADJUSTING KNOB
4. EZ-FLOW SHUTOFF VALVES
5. EZ-FLOW MODEL
6. FERTILIZER OUT-CONNECT CLEAR TUBE TO GREEN CONNECTIONS
7. WATER IN-CONNECT BLACK TUBE TO BLUE CONNECTIONS
8. 1/4" TUBING CLAMP-BOTH BLUE & GREEN CONNECTIONS
9. APPROVED BACKFILL
10. PVC MAIN LINE
11. EZ-FLOW COUPLING CONNECTOR-INSTALL PER WATER FLOW ARROW
12. PEA GRAVEL

EZ-FLO FERTILIZING SYSTEM MODEL NUMBER - EZ005-FX 5 GALLON CAPACITY

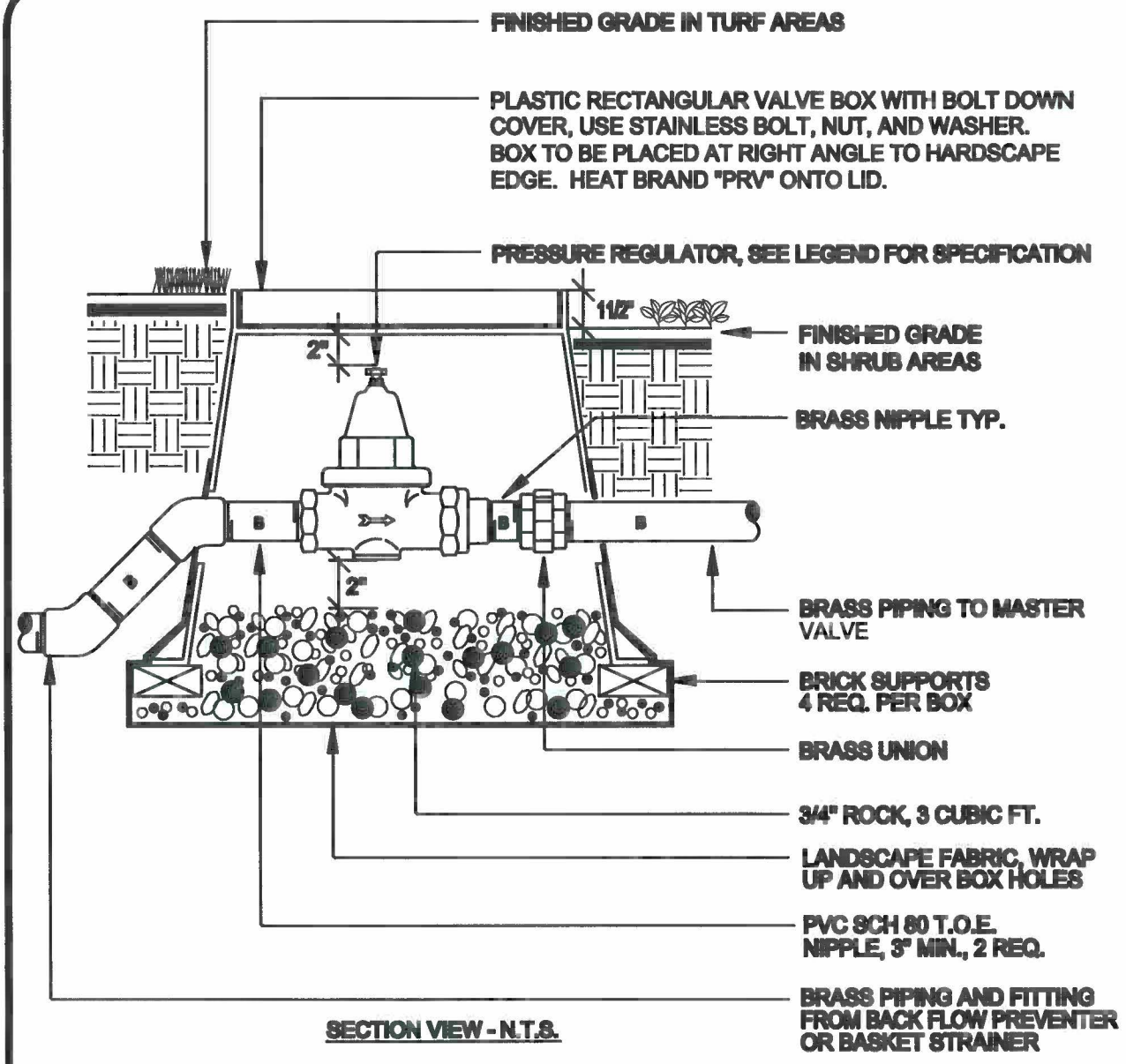
	CITY OF MURRIETA	NO SCALE
Murrieta	FERTILIZER INJECTOR	SID005
		JANUARY 2014



SECTION VIEW - N.T.S.

NOTE:
WRAP CAST IRON PIPE (SPOOL) FROM BACKFLOW DEVICE WITH BLACK PLASTIC PIPE WRAP.

	CITY OF MURRIETA	NO SCALE
Murrieta	PRESSURE REGULATOR	SID006A
		JANUARY 2014



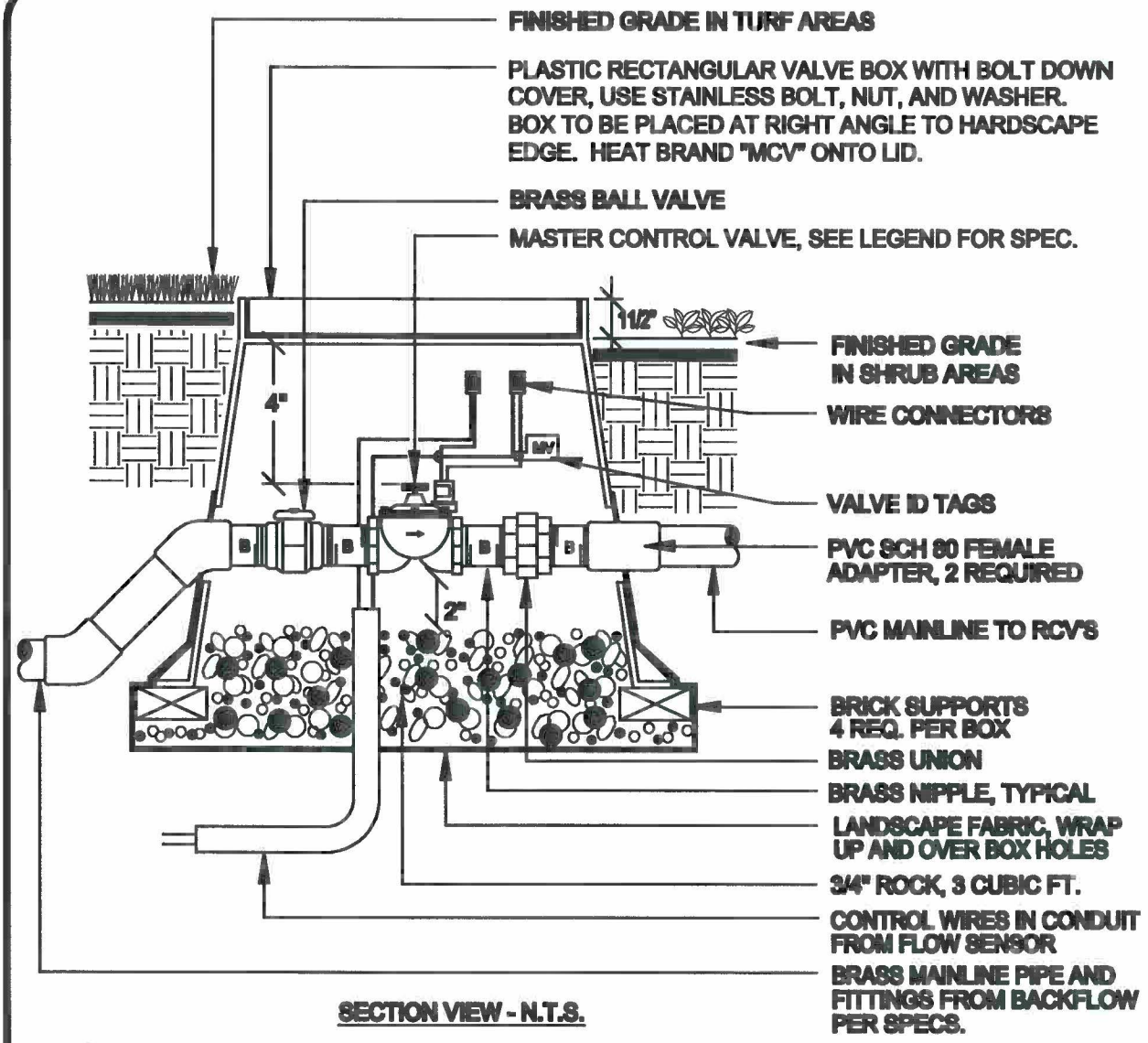
SECTION VIEW - N.T.S.

NOTE:

INSTALL CONTROL VALVES A MINIMUM OF 18" APART IN SHRUB AREAS UNLESS OTHERWISE NOTED.

USE 45 DEGREE ELLS TO ACHIEVE MAINLINE DEPTH FROM UP-STREAM SIDE OF THE PRESSURE REGULATOR ASSEMBLY.

Murrieta	CITY OF MURRIETA	NO SCALE
	PRESSURE REGULATOR	SID006B
		JANUARY 2014



SECTION VIEW - N.T.S.

NOTE:

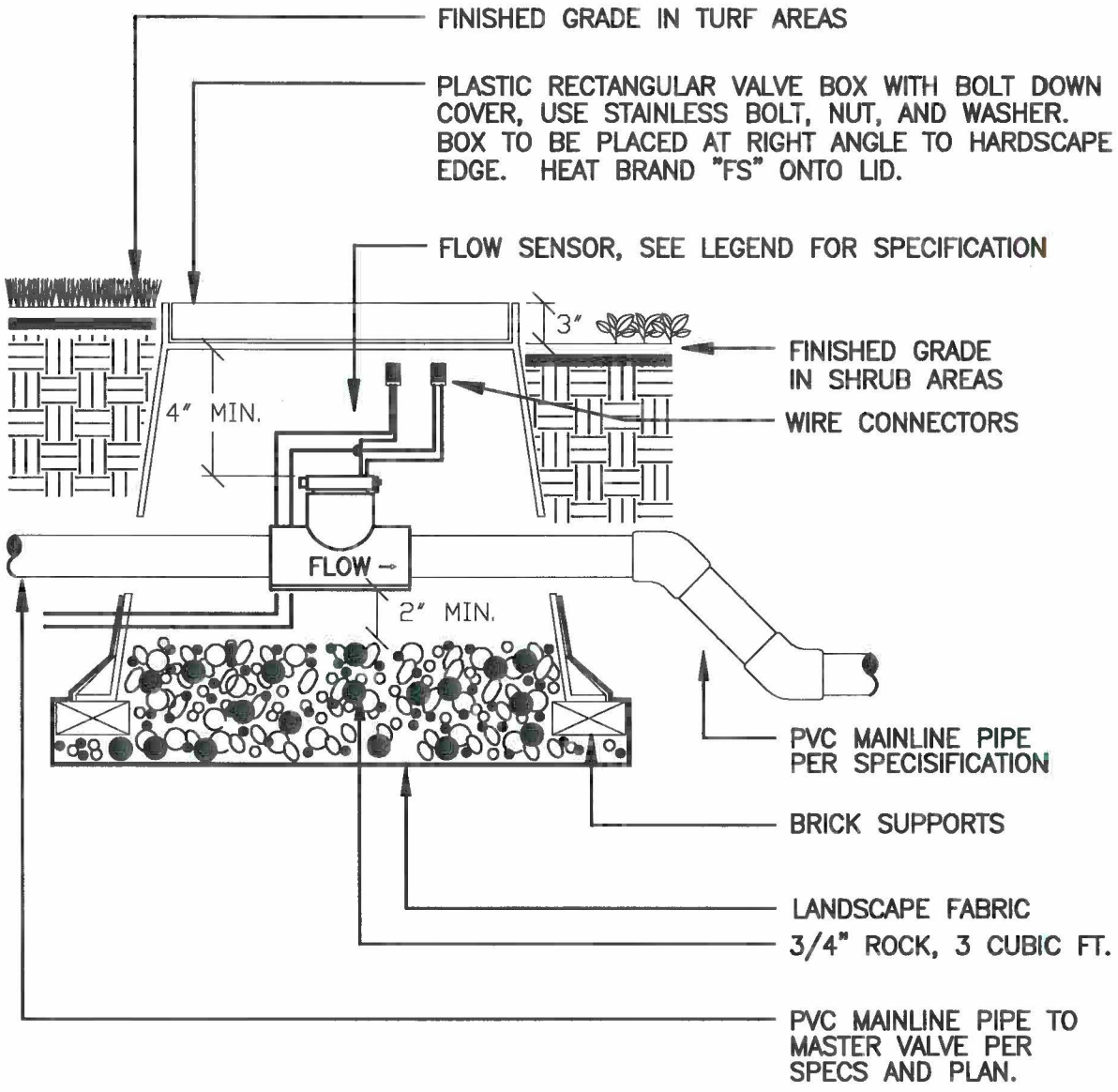
INSTALL CONTROL VALVES A MINIMUM OF 18" APART IN SHRUB AREAS UNLESS OTHERWISE NOTED.

USE 45 DEGREE ELLS TO ACHIEVE MAINLINE DEPTH FROM UP-STREAM SIDE OF THE MASTER VALVE ASSEMBLY.

EQUIPMENT SHALL BE INSTALLED SUCH THAT THERE IS NO LEVERAGE OR STRESS ON THE VALVE ASSEMBLY. PIPE SHALL NOT COME INTO CONTACT WITH VALVE BOX.

USE A NON-HARDENING TEFLON PIPE SEALANT ON ALL THREADED CONNECTIONS.

	CITY OF MURRIETA	NO SCALE
Murrieta	MASTER CONTROL VALVE	SID007
		JANUARY 2014

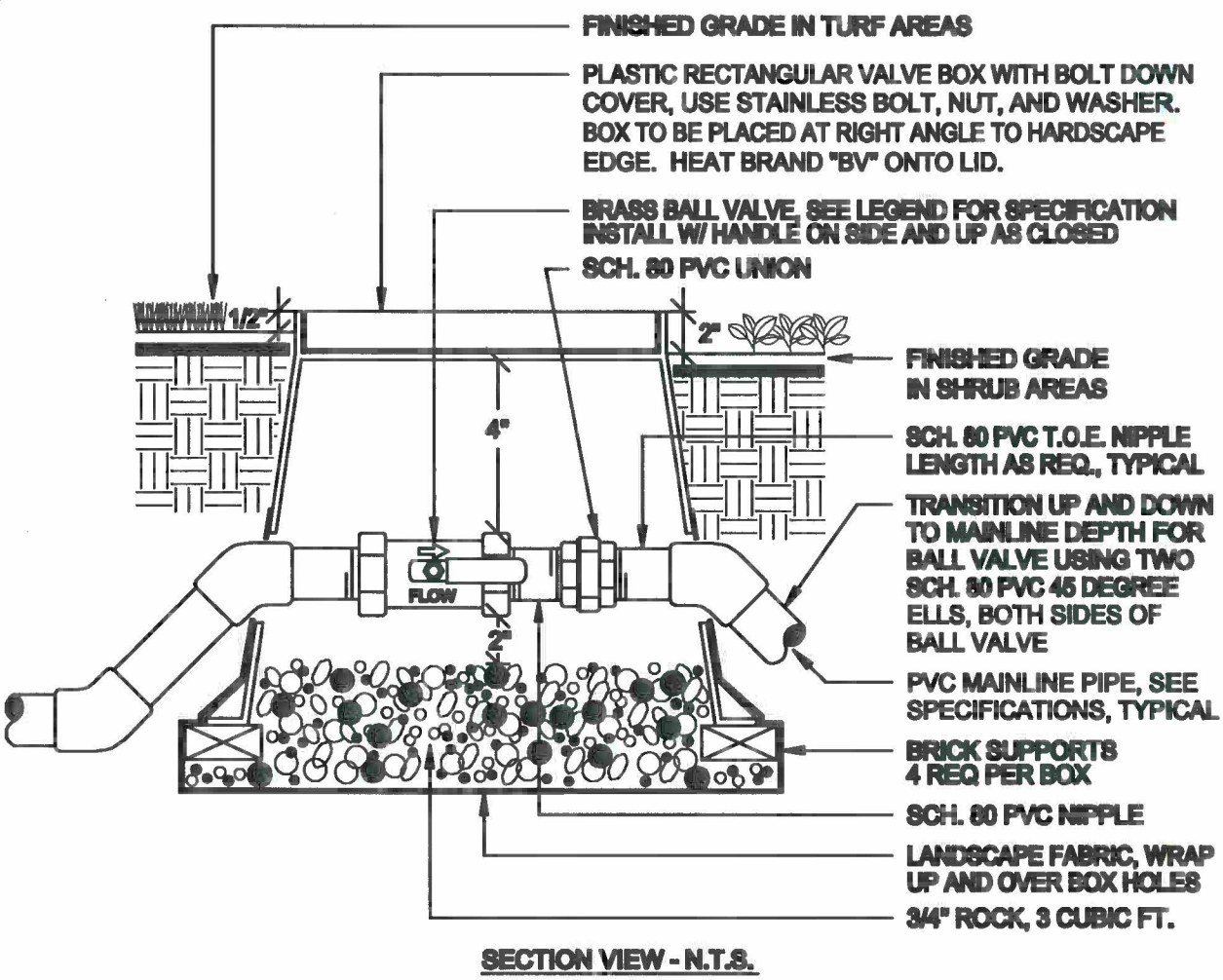


SECTION VIEW – N.T.S.

NOTE:
INSTALL FLOW SENSOR AS PER THE MANUFACTURER'S RECOMMENDATIONS, WIRE TO IRRIGATION CONTROLLER.

USE 45 DEGREE ELLS TO ACHIEVE MAINLINE DEPTH ON THE DOWN–STREAM SIDE OF THE FLOW SENSOR.

	CITY OF MURRIETA	NO SCALE
Murrieta	FLOW SENSOR	SID008
		JANUARY 2014

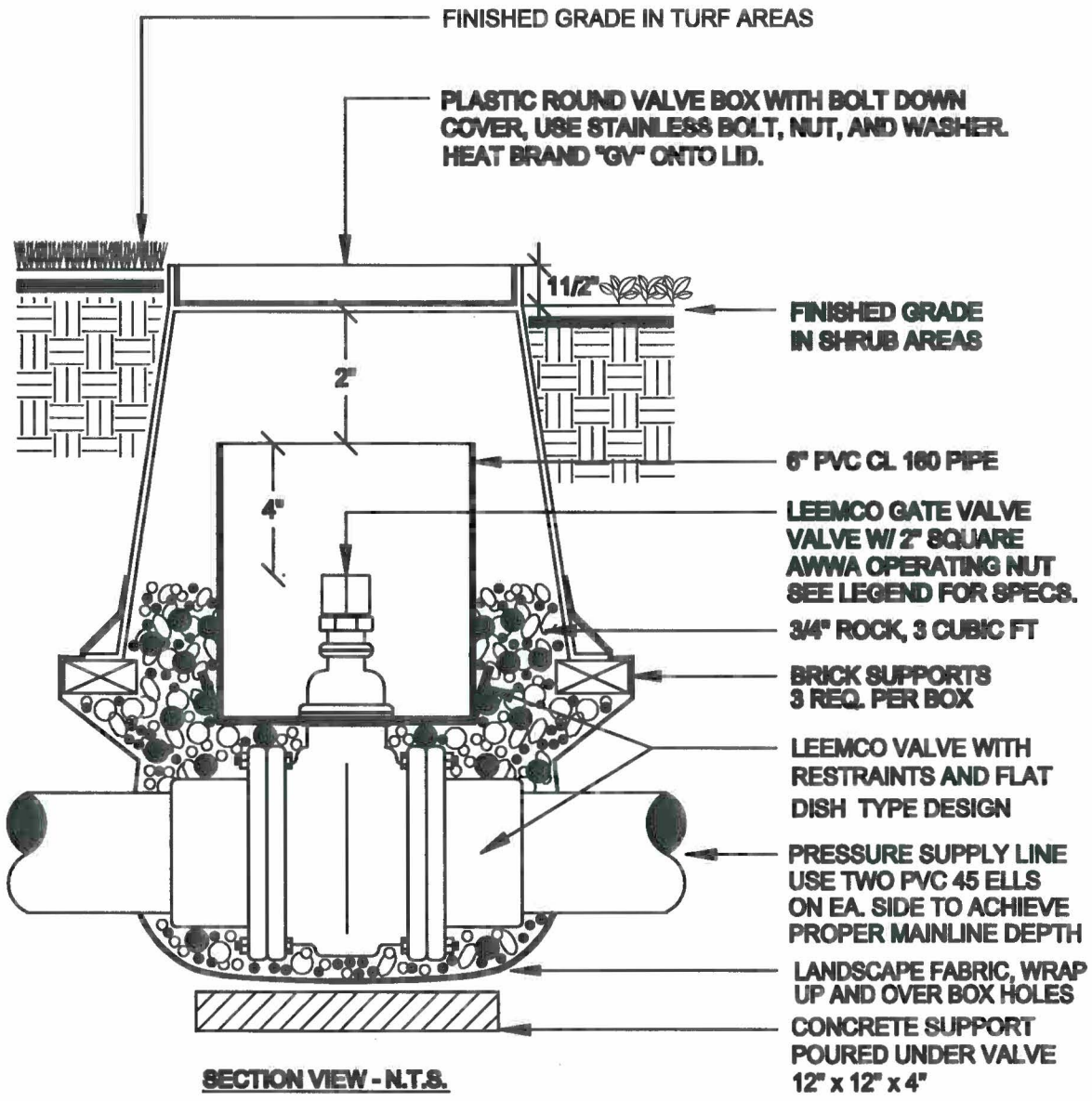


SECTION VIEW - N.T.S.

NOTE:

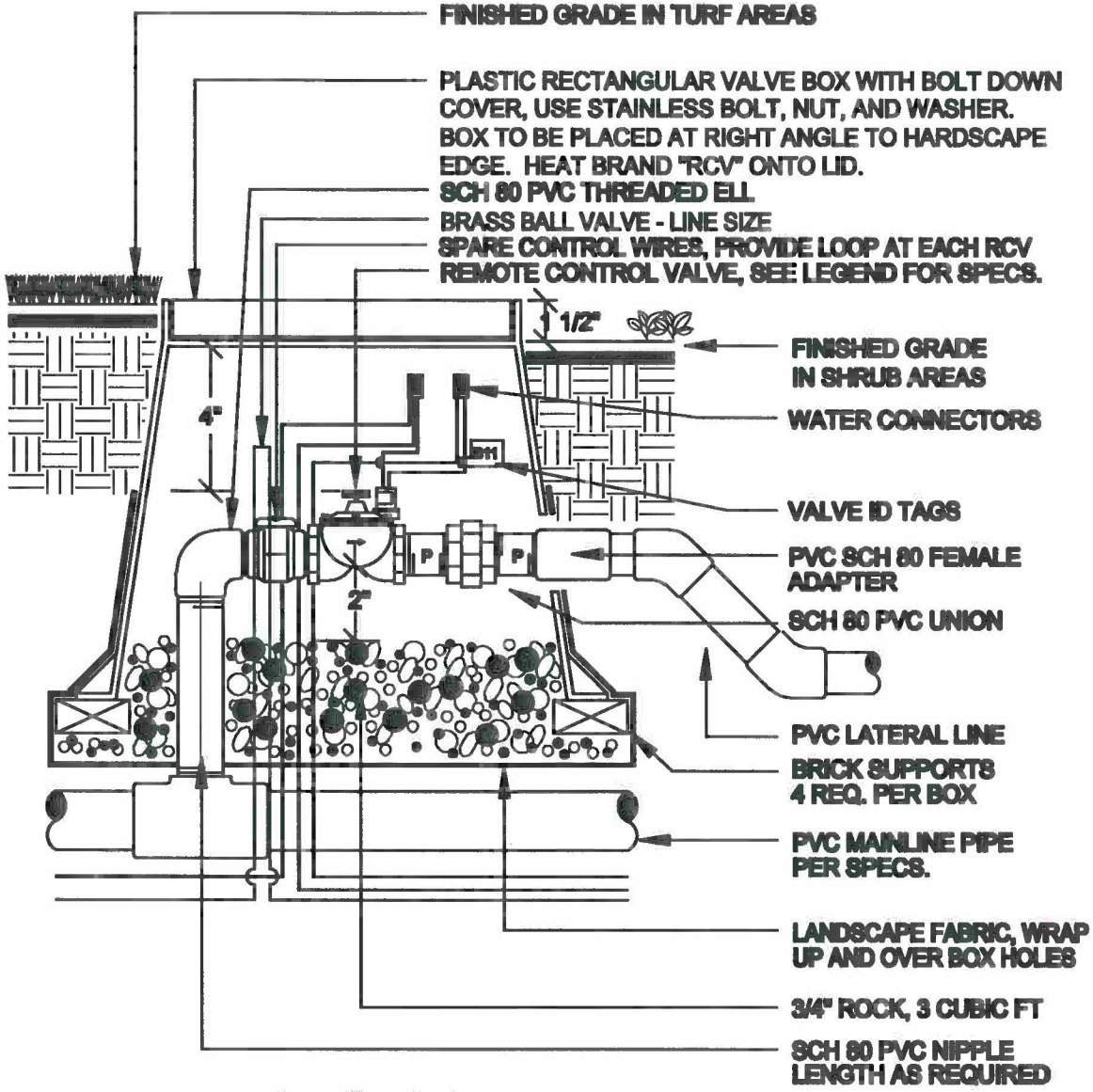
BOX TO BE INSTALLED AS TO ALLOW FOR PROPER OPERATION OF BALL VALVE, INSTALL VALVE AND BOX PARALLEL TO HARDSCAPE EDGE, INSTALL BOX OFF-CENTER OF VALVE. INSTALL VALVE BOX EXTENSIONS AS REQ. TO ACHIEVE PROPER VALVE AND PIPE DEPTH

	CITY OF MURRIETA	NO SCALE
Murrieta	BALL VALVE 2" AND SMALLER	SID009
		JANUARY 2014



NOTE:
CONTRACTOR TO PROVIDE ONE 5 FOOT LONG TEE WRENCH WITH SQUARE NUT ADAPTER FOR THE OPERATION OF GATE VALVES.

	CITY OF MURRIETA	NO SCALE
Murrieta	GATE VALVE 2 1/2" AND LARGER	SID010
		JANUARY 2014



SECTION VIEW - N.T.S.

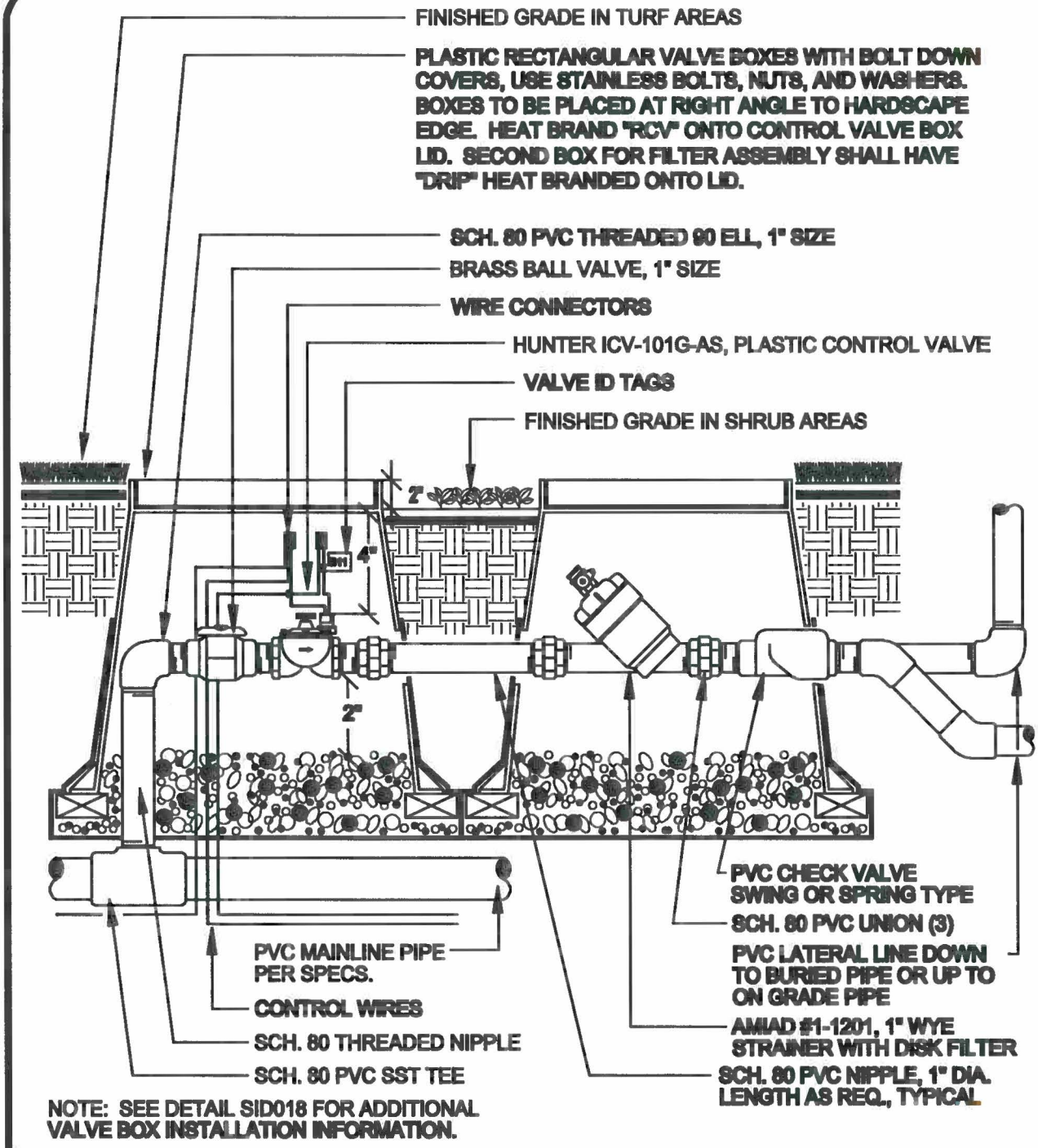
NOTE:

INSTALL CONTROL VALVES A MINIMUM OF 18" APART IN SHRUB AREAS UNLESS OTHERWISE NOTED.

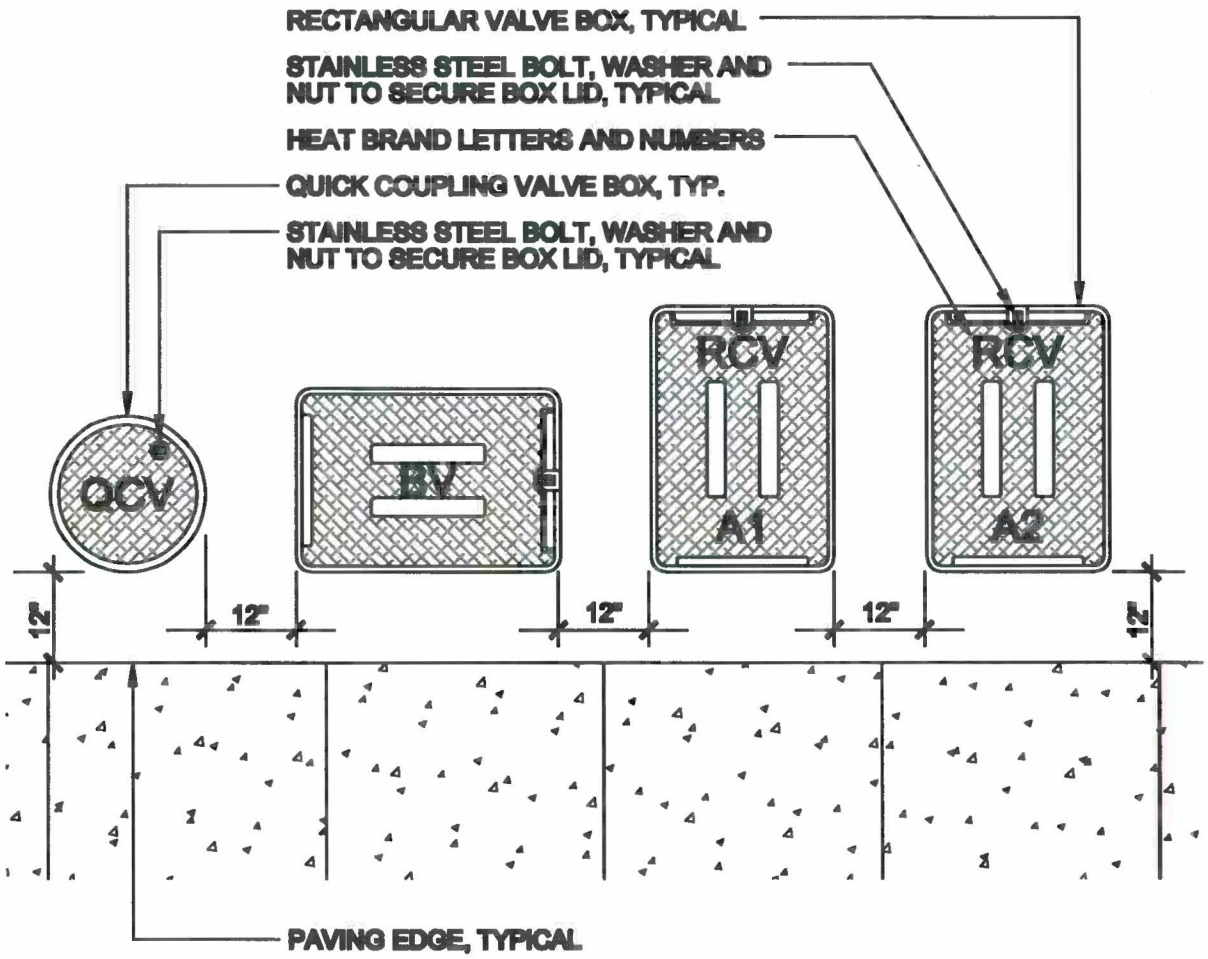
EQUIPMENT SHALL BE INSTALLED SUCH THAT THERE IS NO LEVERAGE OR STRESS ON THE VALVE ASSEMBLY. PIPE SHALL NOT COME INTO CONTACT WITH VALVE BOX.

USE A NON-HARDENING TEFLON PIPE SEALANT ON ALL THREADED CONNECTIONS.

Murrieta	CITY OF MURRIETA	NO SCALE
	REMOTE CONTROL VALVE	SID011
		JANUARY 2014



	CITY OF MURRIETA	NO SCALE
Murrieta	DRIP R.C.V. ASSEMBLY	SID012
		JANUARY 2014



SECTION VIEW - N.T.S.

NOTE:

CENTER VALVE BOX OVER REMOTE CONTROL VALVE TO FACILITATE VALVE MAINTENANCE.

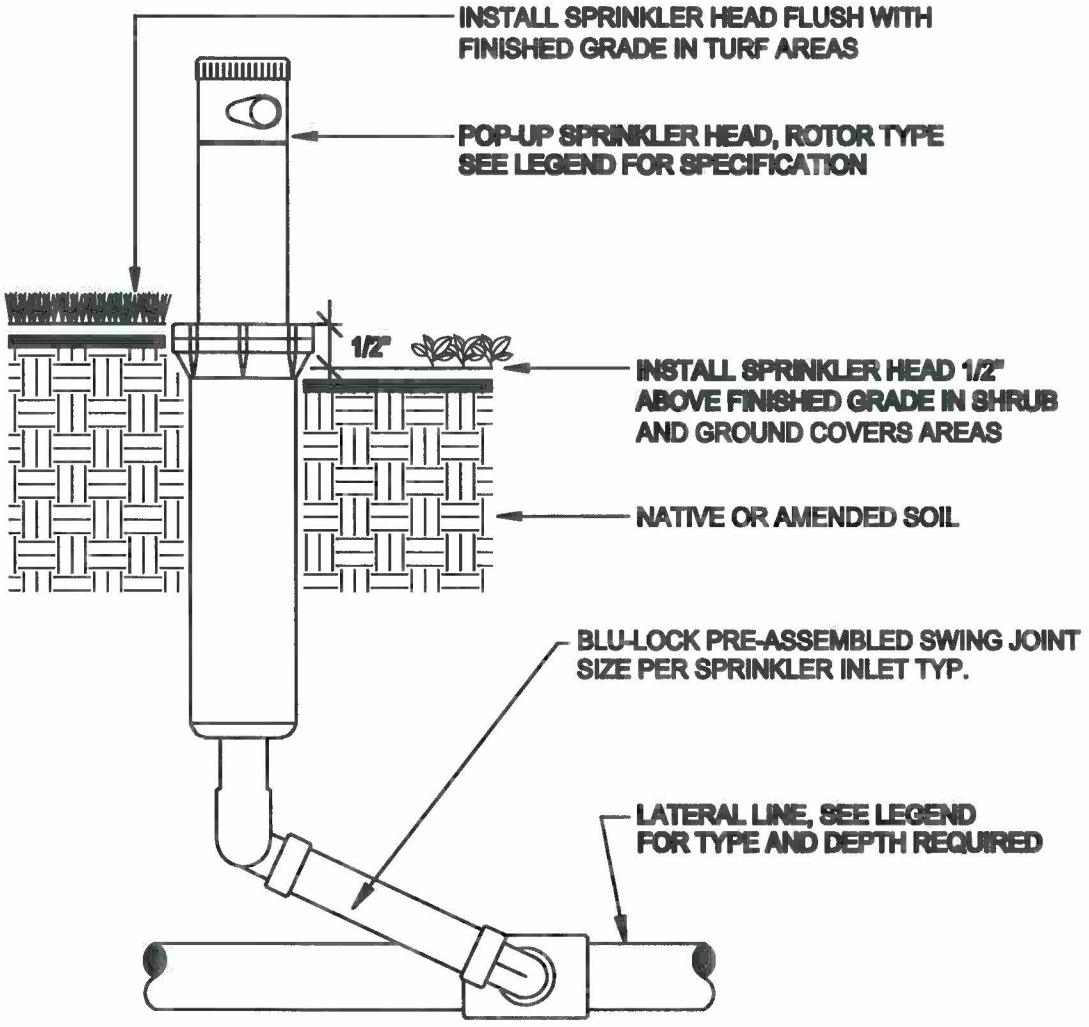
INSTALL VALVE BOXES IN SHRUB AND GROUND-COVER AREAS WHERE POSSIBLE.

INSTALL VALVE BOXES PARALLEL TO EACH OTHER & PERPENDICULAR TO PAVED EDGES.

AVOID HEAVILY COMPACTING SOIL AROUND VALVE BOXES TO PREVENT COLLAPSE AND DEFORMATION OF VALVE BOXES.

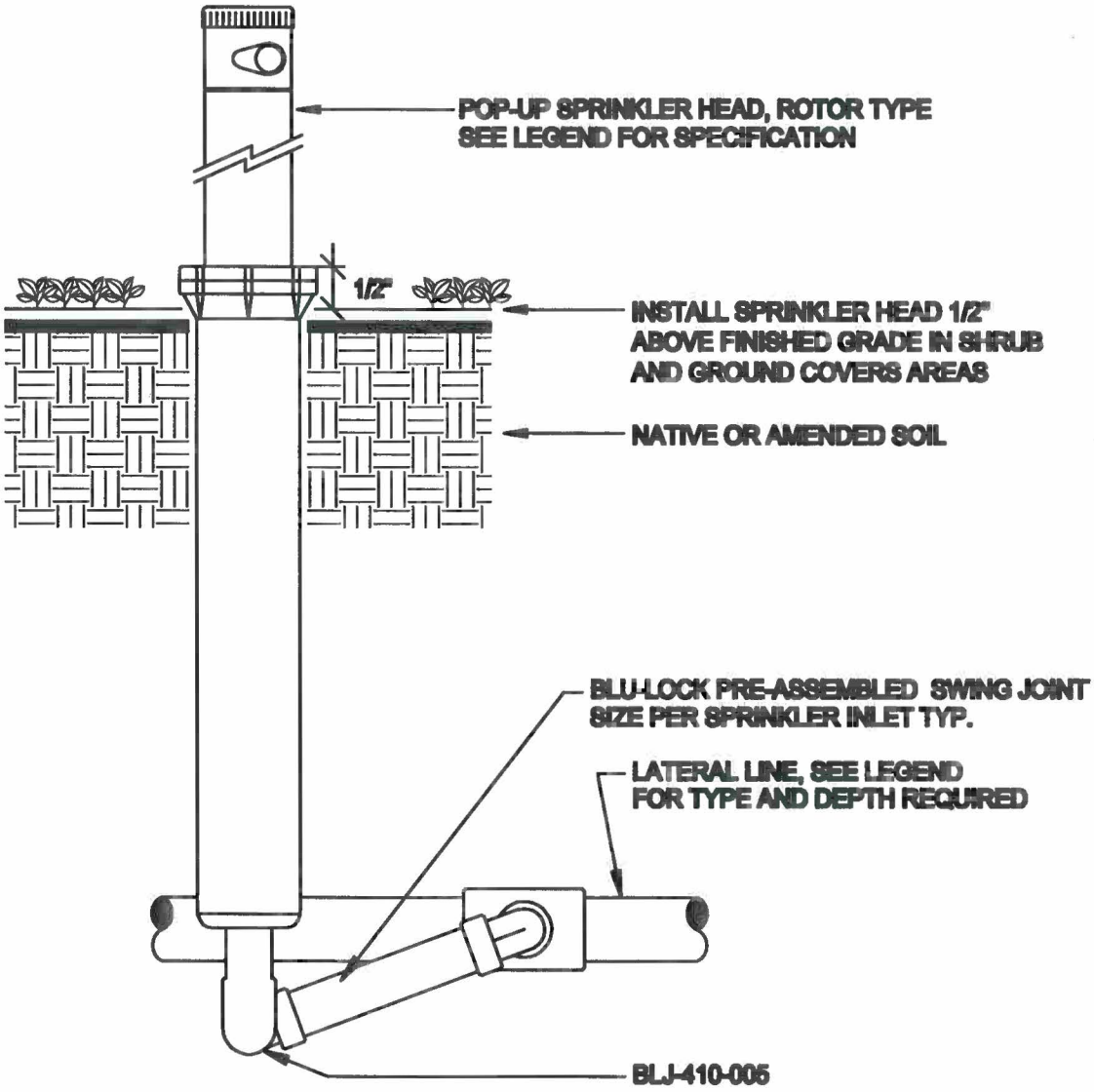
DRIP RCV & WYE STRAINER BOXES IN THE SAME ORIENTATION AS BALL VALVE BOXES.

	CITY OF MURRIETA	NO SCALE
Murrieta	VALVE BOX PLACEMENT	SID013
		JANUARY 2014



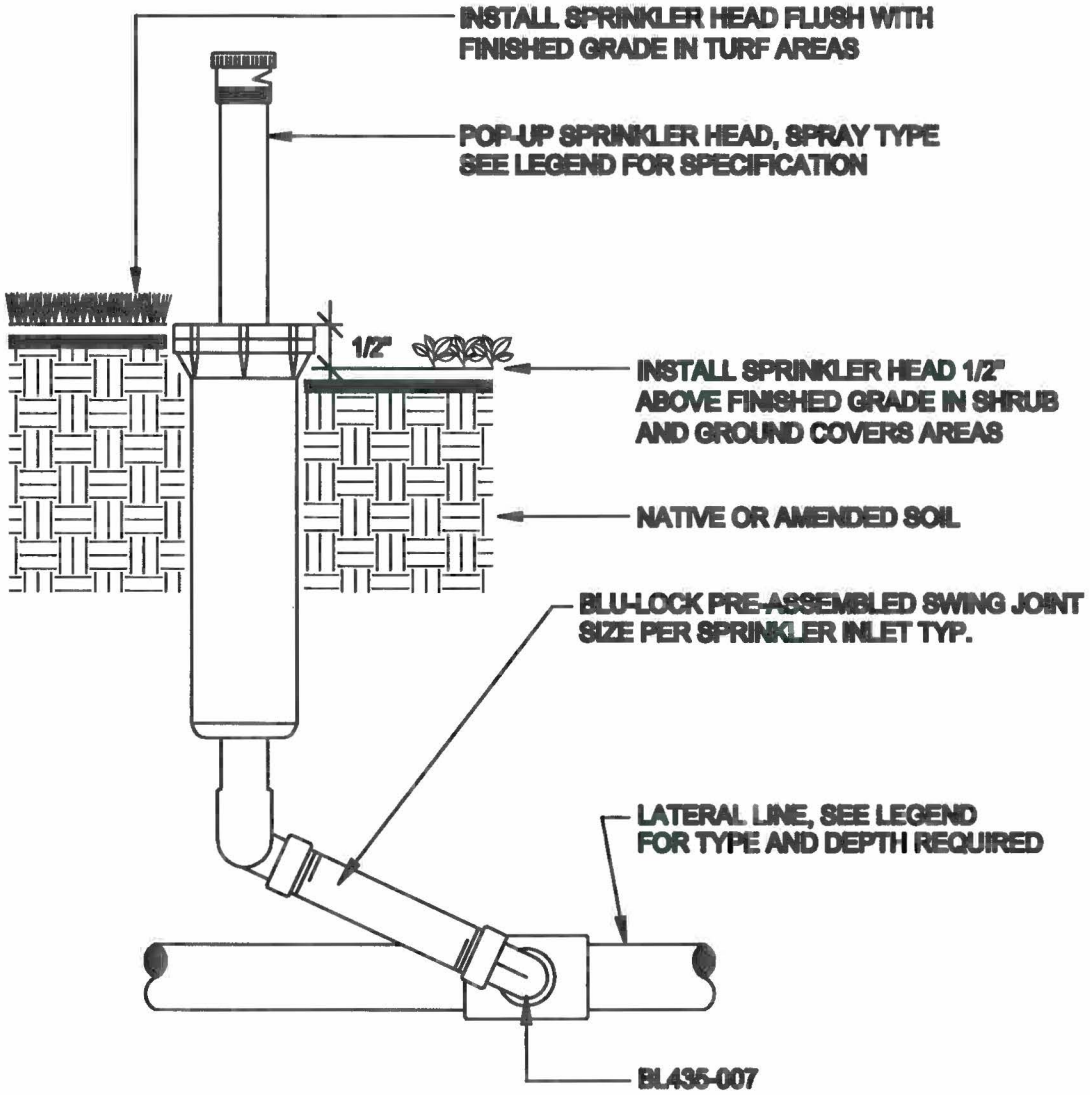
NOTE:
SWING JOINT SHALL BE SIZED TO MATCH THE SPRINKLER INLET. INSTALL SPRINKLER HEADS 6" FROM PAVING EDGE IN GROUND COVER AREAS. INSTALL SPRINKLER HEADS 4" FROM PAVING EDGE IN TURF AREAS. INSTALL SPRINKLER HEADS PLUMB. ADJUST NOZZLE STREAM TO COVER LANDSCAPE AREA WITHOUT OVERSPRAY ONTO PAVING, FENCES, WALLS OR BUILDINGS. USE A NON-HARDENING TEFLON PIPE SEALANT ON ALL THREADED CONNECTIONS.

Murrieta	**CITY OF MURRIETA**	**NO SCALE**
	POP-UP SPRINKLER ROTOR TYPE (4" - 6")	**SID014**
		JANUARY 2014



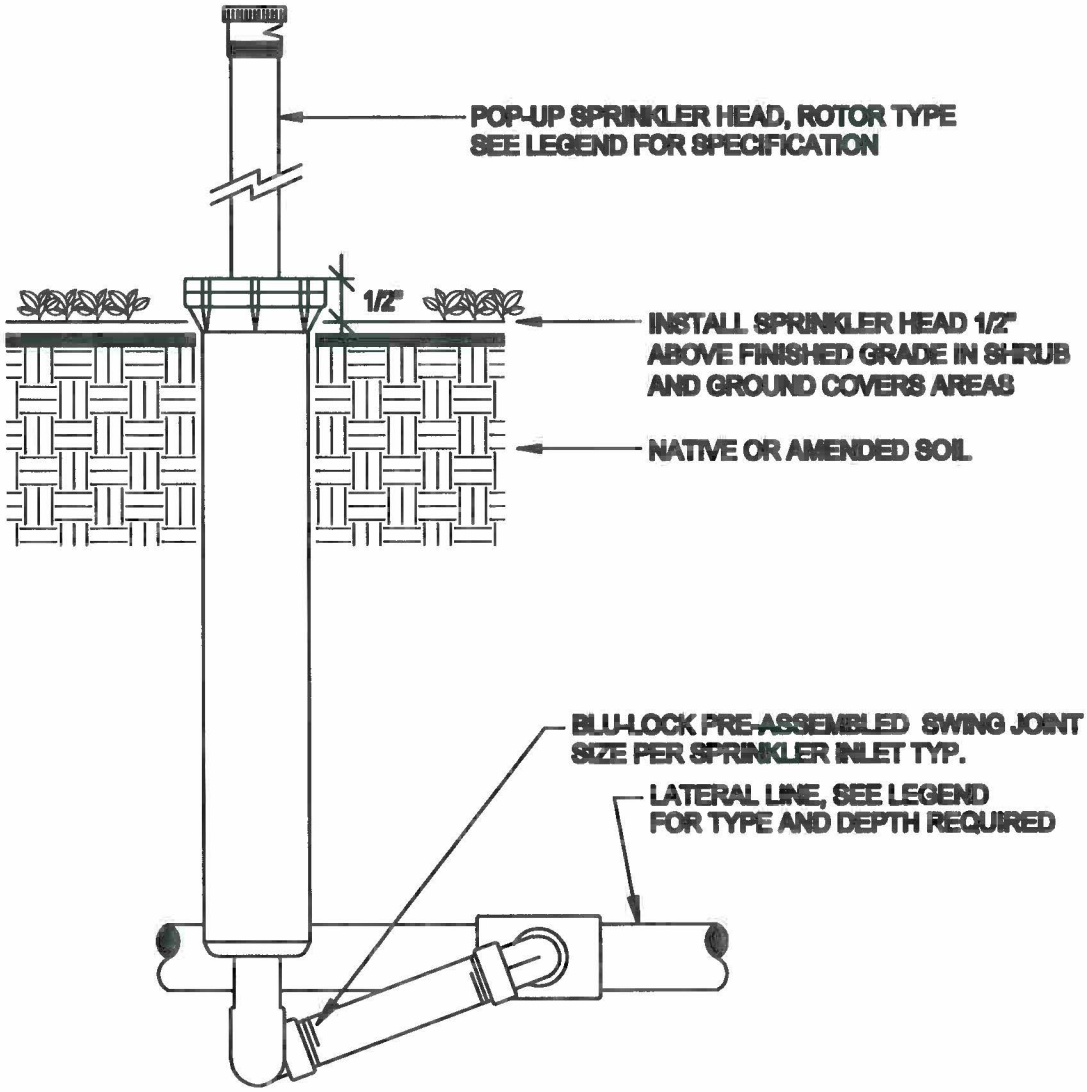
NOTE:
SWING JOINT SHALL BE SIZED TO MATCH THE SPRINKLER INLET. INSTALL SPRINKLER HEADS 6" FROM PAVING EDGE IN GROUND COVER AREAS. INSTALL SPRINKLER HEADS PLUMB. ADJUST NOZZLE STREAM TO COVER LANDSCAPE AREA WITHOUT OVERSPRAY ONTO PAVING, FENCES, WALLS OR BUILDINGS. USE A NON-HARDENING TEFLON PIPE SEALANT ON ALL THREADED CONNECTIONS.

	CITY OF MURRIETA	NO SCALE
Murrieta	POP-UP SPRINKLER ROTOR TYPE (12")	SID015
		JANUARY 2014



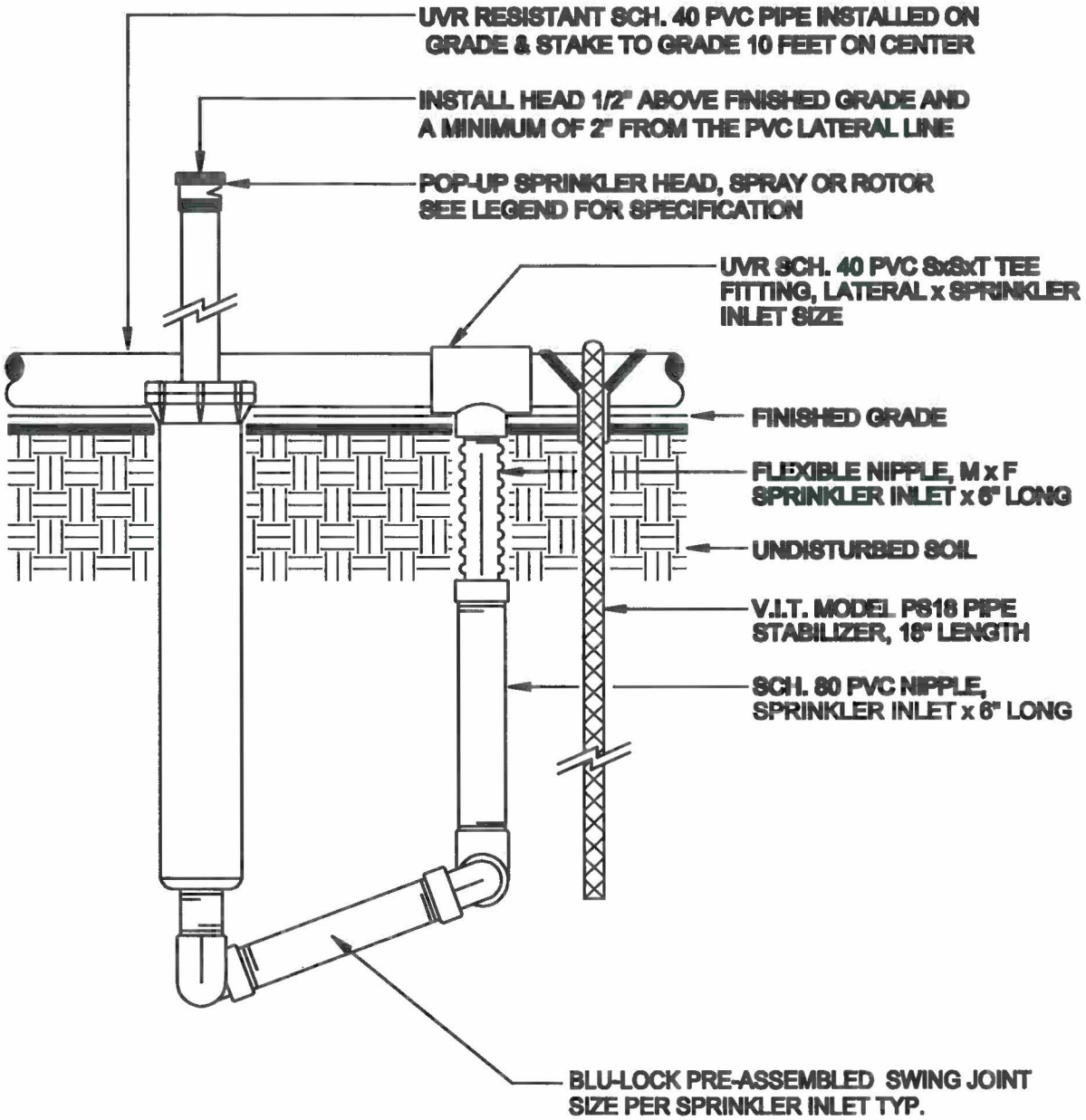
NOTE:
SWING JOINT SHALL BE SIZED TO MATCH THE SPRINKLER INLET. INSTALL SPRINKLER HEADS 6" FROM PAVING EDGE IN GROUND COVER AREAS. INSTALL SPRINKLER HEADS 4" FROM PAVING EDGE IN TURF AREAS. INSTALL SPRINKLER HEADS PLUMB. ADJUST NOZZLE STREAM TO COVER LANDSCAPE AREA WITHOUT OVERSPRAY ONTO PAVING, FENCES, WALLS OR BUILDINGS. USE A NON-HARDENING TEFLON PIPE SEALANT ON ALL THREADED CONNECTIONS.

	CITY OF MURRIETA	NO SCALE
Murrieta	POP-UP SPRINKLER SPRAY TYPE (6")	SID016
		JANUARY 2014



NOTE:
SWING JOINT SHALL BE SIZED TO MATCH THE SPRINKLER INLET. INSTALL SPRINKLER HEADS 6" FROM PAVING EDGE IN GROUND COVER AREAS. INSTALL SPRINKLER HEADS PLUMB. ADJUST NOZZLE STREAM TO COVER LANDSCAPE AREA WITHOUT OVERSPRAY ONTO PAVING, FENCES, WALLS OR BUILDINGS. USE A NON-HARDENING TEFLON PIPE SEALANT ON ALL THREADED CONNECTIONS.

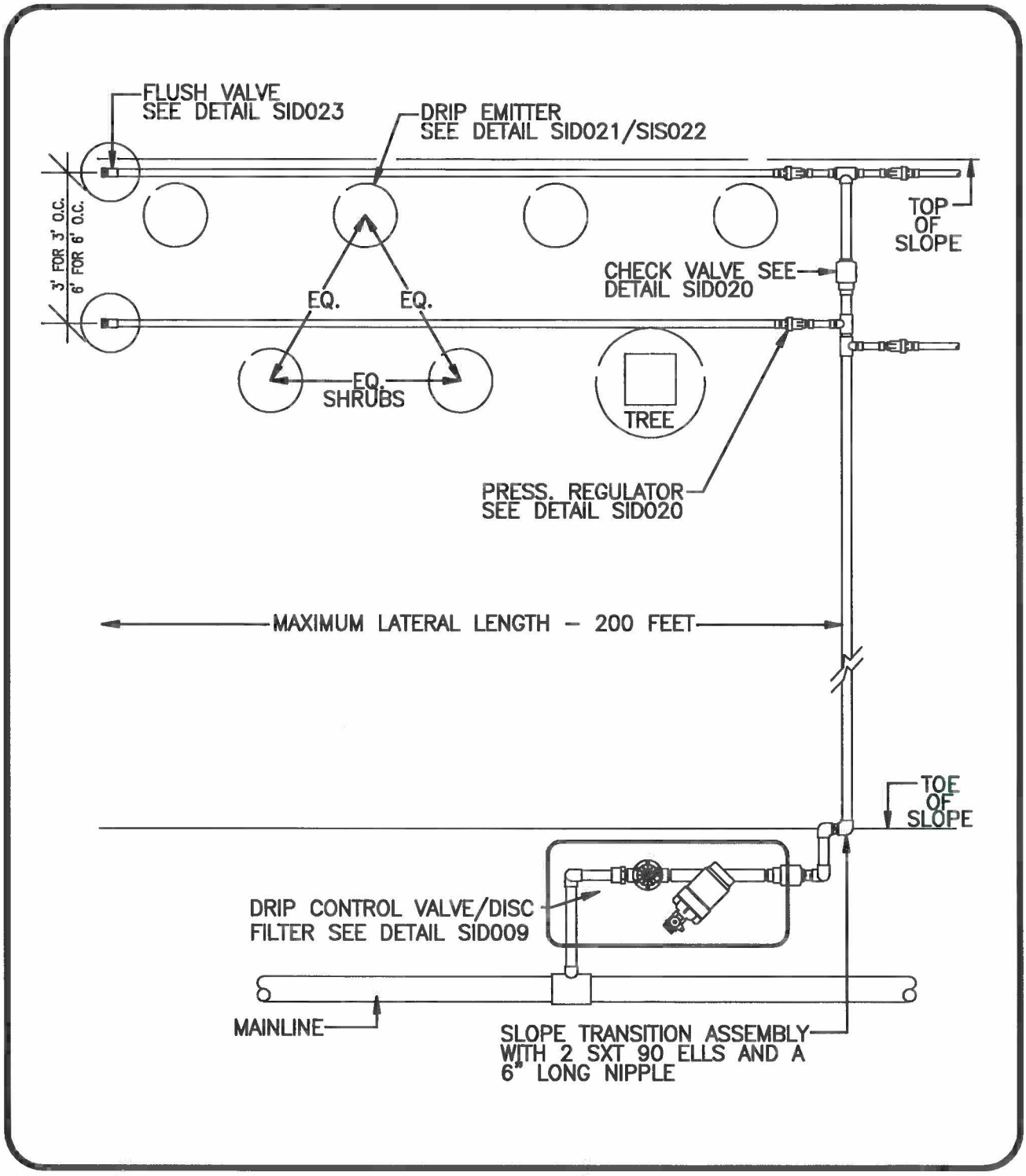
	CITY OF MURRIETA	NO SCALE
Murrieta	POP-UP SPRINKLER SPRAY TYPE (12")	SID017
		JANUARY 2014



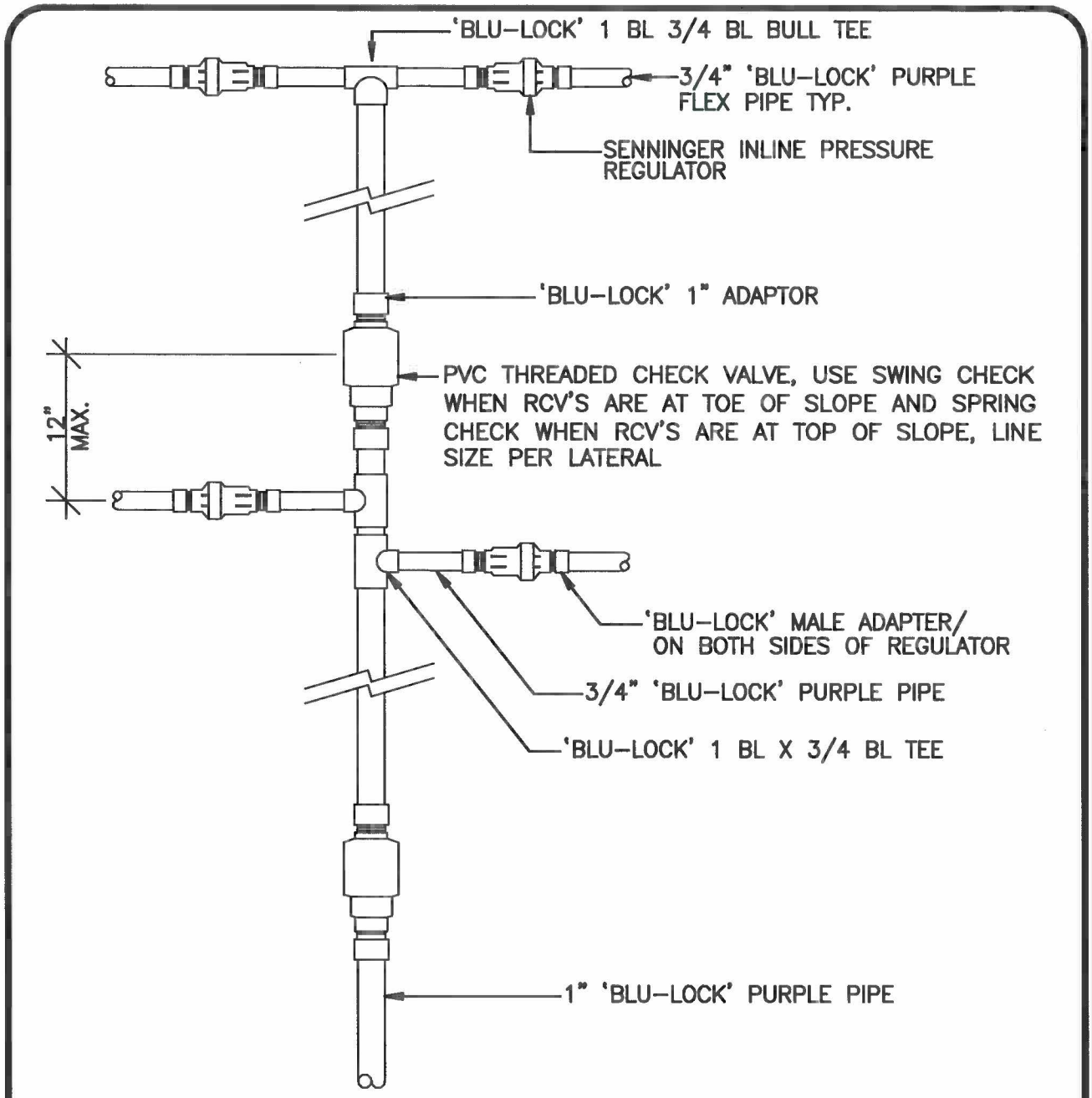
NOTE:

PRE- ASSEMBLED SWING JOINT SHALL BE SIZED TO MATCH THE SPRINKLER INLET.

Murrieta	CITY OF MURRIETA	NO SCALE
	MITIGATION POP-UP SPRINKLER ON GRADE PIPE	SID018
		JANUARY 2014

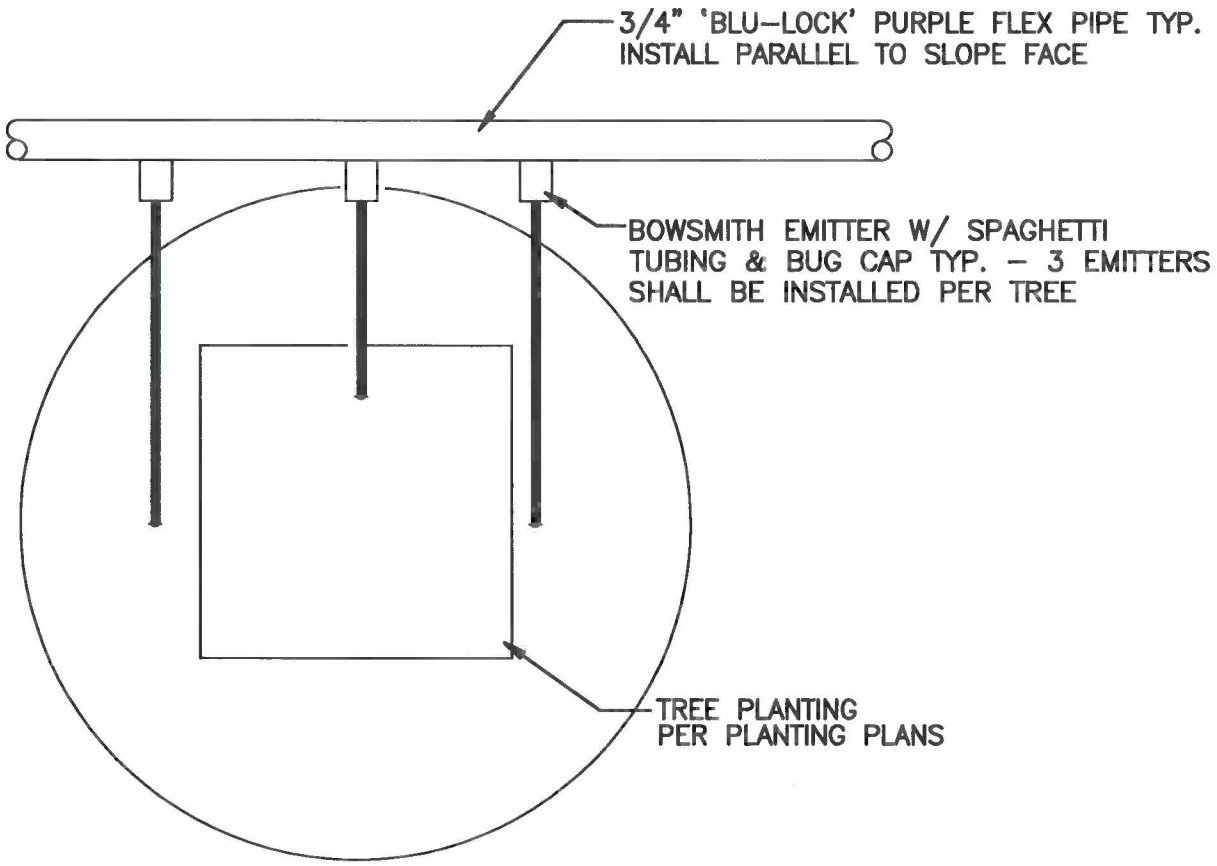


Murrieta	CITY OF MURRIETA	NO SCALE
	POINT TO POINT DRIP IRRIGATION LAYOUT	SID019
		JANUARY 2014



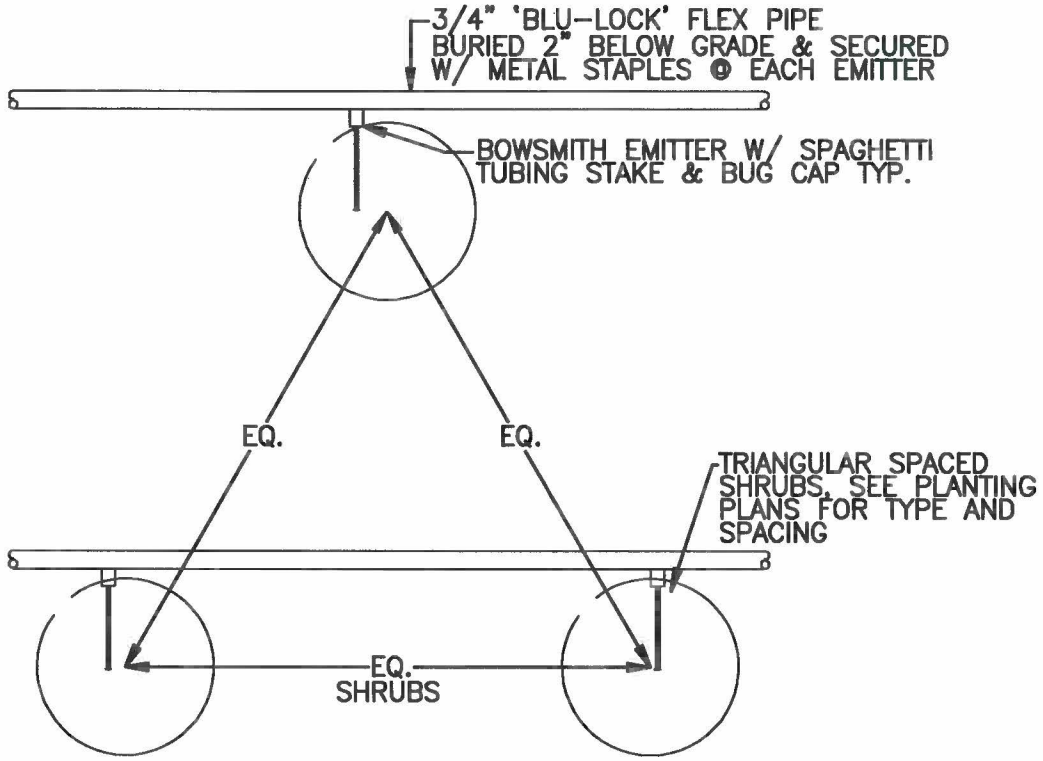
NOTE:
VERTICAL LATERAL LINE SHALL BE COMPLETELY FLUSHED CLEAN WITH WATER PRIOR TO THE INSTALLATION OF THE SENNINGER PRESSURE REGULATING VALVES.

	CITY OF MURRIETA	NO SCALE
Murrieta	DRIP PRESSURE REGULATOR AND CHECK VALVE DETAIL	SID020
		JANUARY 2014



NOTE:
DRIP EMITTERS SHALL BE PLACED TO DRIP DIRECTLY ADJACENT TO TREE ROOTBALL. ALL IRRIGATION SHALL BE COMPLETELY INSTALLED PRIOR TO PLANTING LAYOUT.

	CITY OF MURRIETA	NO SCALE
Murrieta	TREE DRIP LAYOUT	SID021
		JANUARY 2014

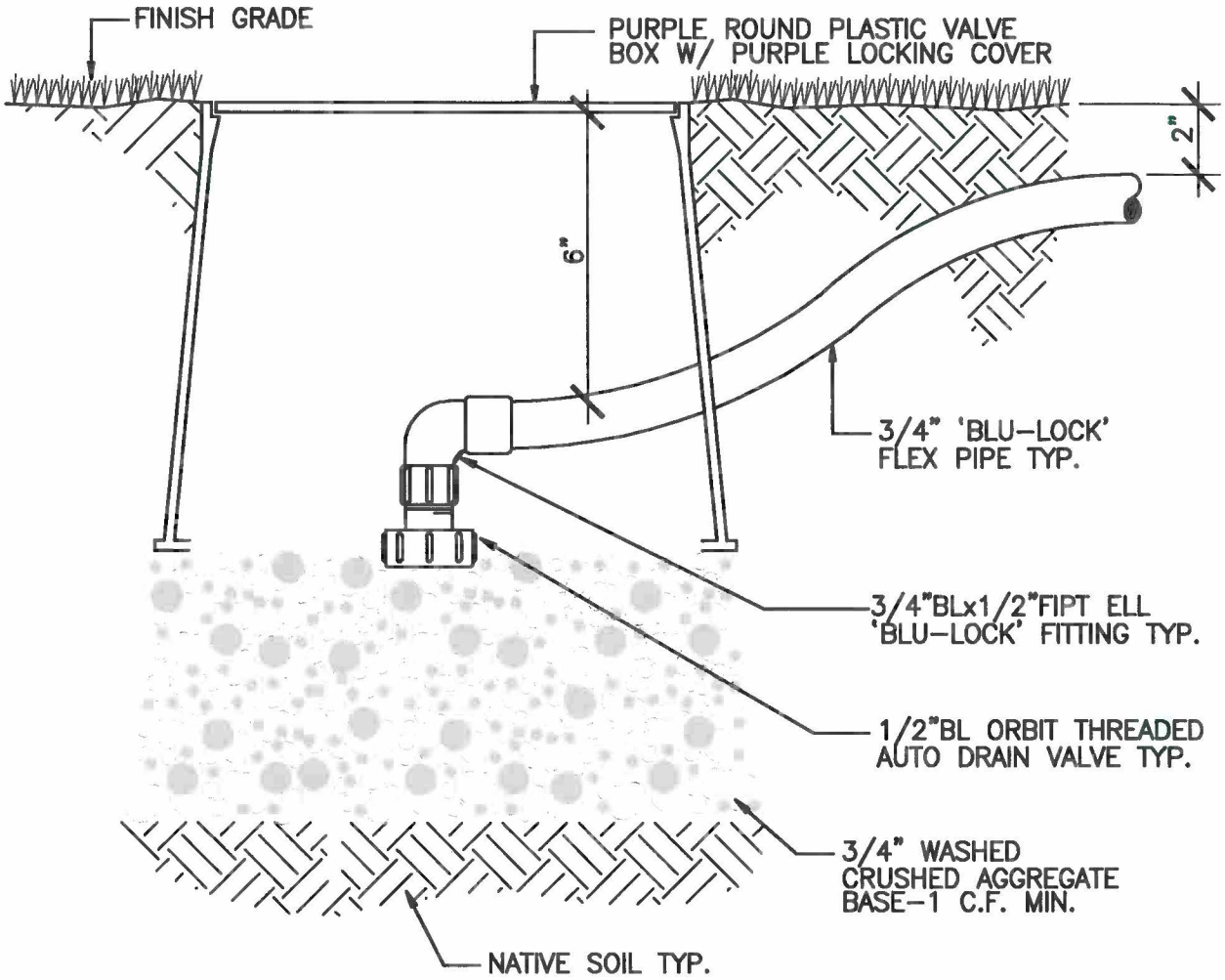


NOTE:
DRIP EMITTER SHALL BE PLACED TO DRIP DIRECTLY ADJACENT ASSEMBLY DETAIL

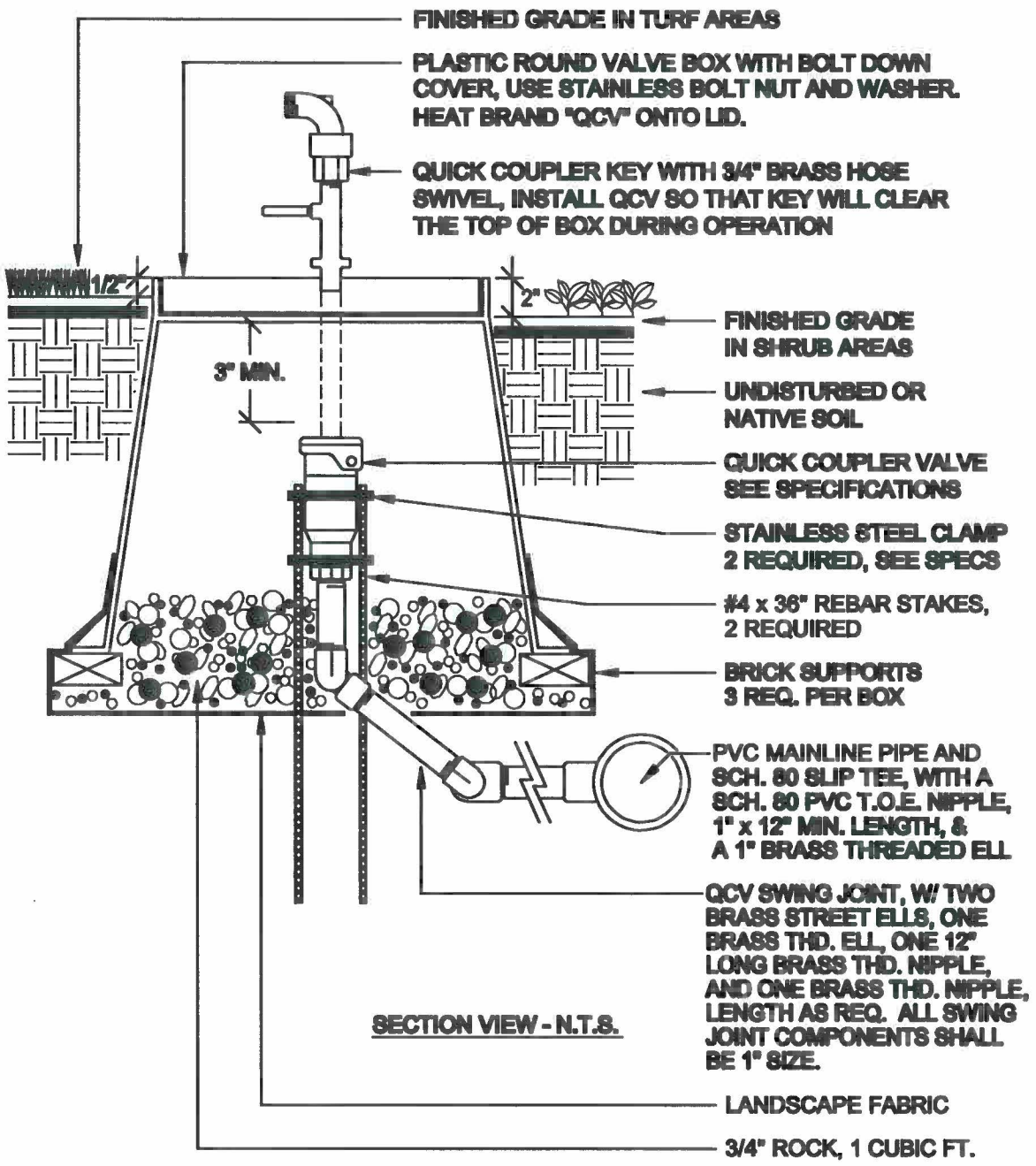
PVC LATERAL SUPPLY LINES SHALL RUN PARALLEL TO SLOPE WITH DRIP EMITTER LINES RUN PERPENDICULAR TO SLOPE AS SHOWN ABOVE.

ALL IRRIGATION SHALL BE COMPLETELY INSTALLED PRIOR TO PLANT LAYOUTS.

Murrieta	CITY OF MURRIETA	NO SCALE
	DRIP EMITTER ASSEMBLY DETAIL	SID022
		JANUARY 2014



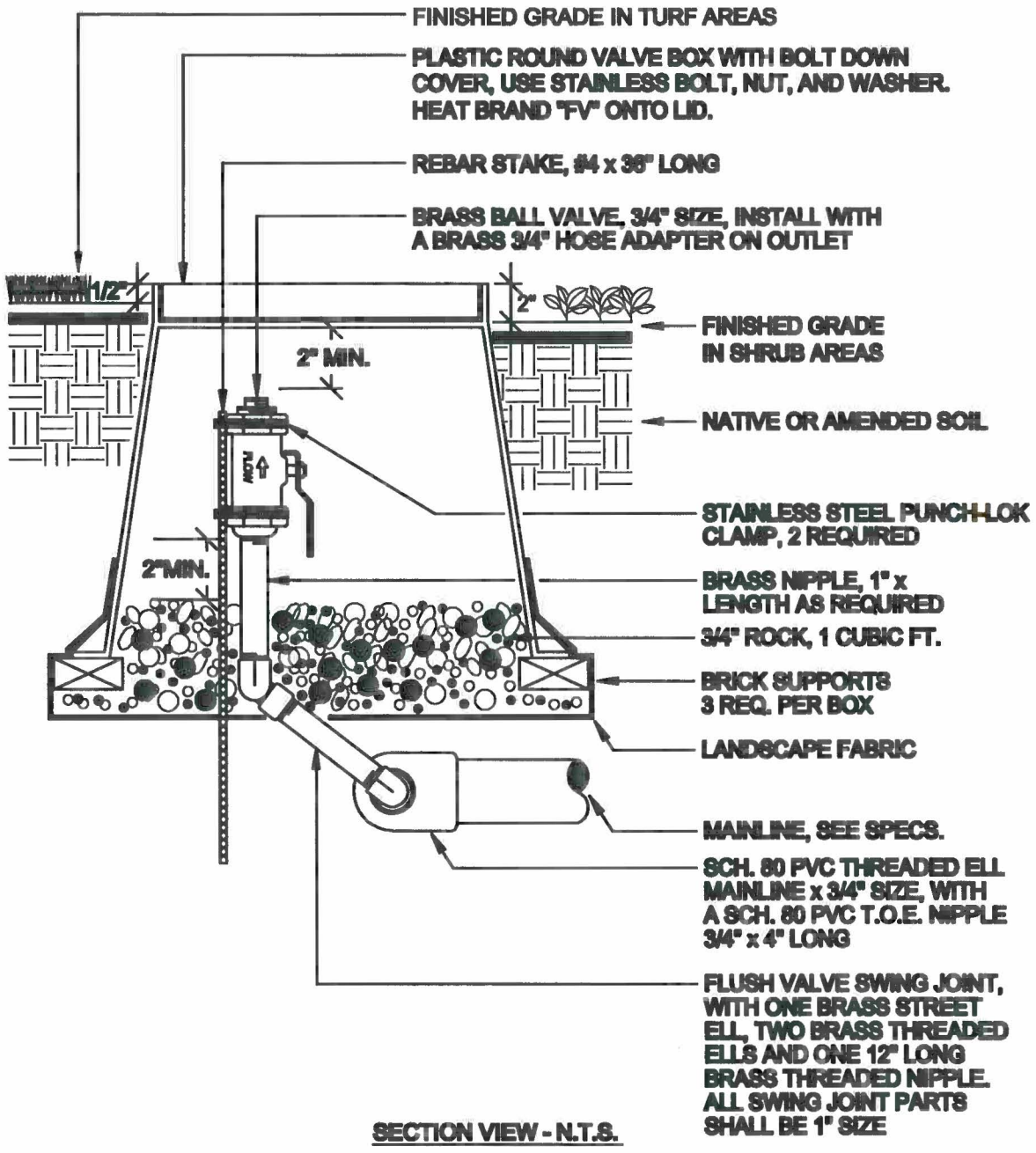
	CITY OF MURRIETA	NO SCALE
Murrieta	END FLUSH CAP	SID023
		JANUARY 2014



NOTE:

USE A NON-HARDENING TEFLON PIPE SEALANT ON ALL THREADED CONNECTIONS.

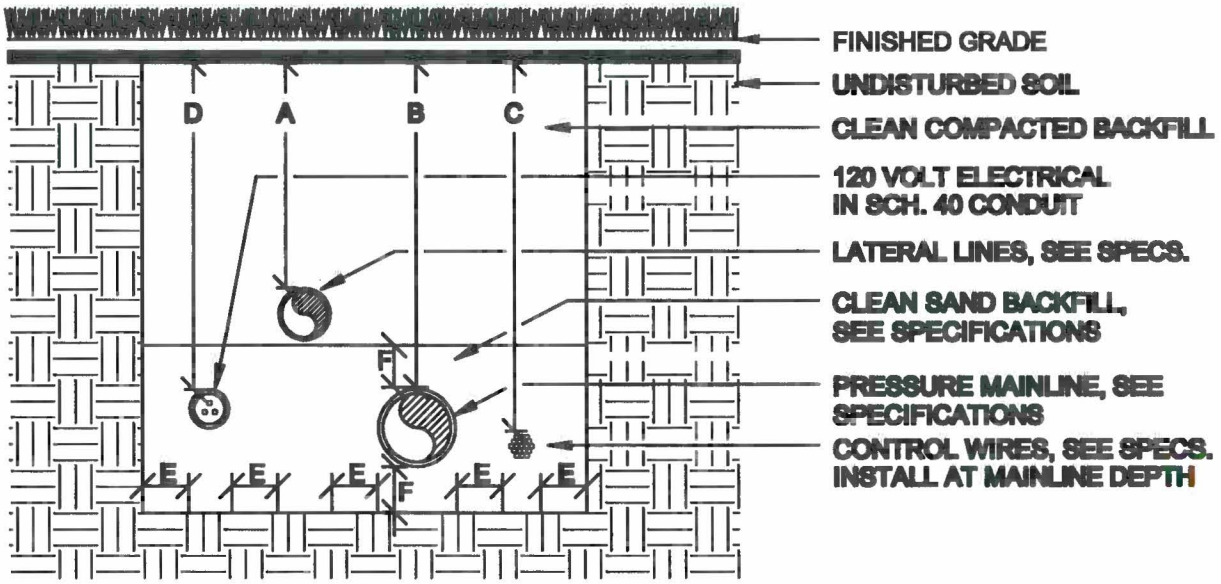
Murrieta	CITY OF MURRIETA	NO SCALE
	QUICK COUPLER VALVE IN VALVE BOX	SID024
		JANUARY 2014



SECTION VIEW - N.T.S.

NOTE:
INSTALL MAINLINE FLUSH VALVE AT END OF IRRIGATION MAINLINE AND PER DRAWINGS.

	CITY OF MURRIETA	NO SCALE
Murrieta	MAINLINE FLUSH VALVE INSTALLED IN BOX	SID025
		JANUARY 2014



SECTION VIEW - N.T.S.

DIMENSION	A	B	C	D	E	F
1/2" TO 1 1/2" SIZE	12"	18"	18"	30"	6"	6"
2" TO 2 1/2" IN SIZE	12"	24"	24"	30"	6"	6"
3" AND LARGER	18"	24"	24"		6"	6"

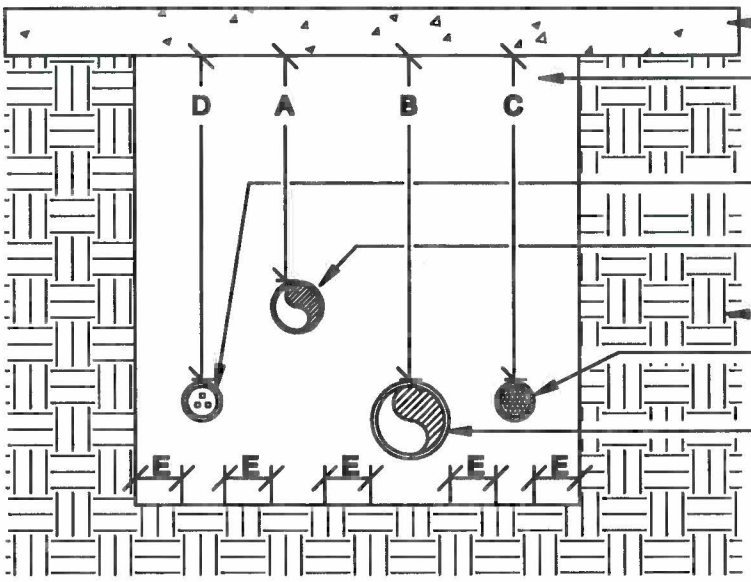
NOTE:

ALL PLASTIC PIPING SHALL BE SNAKED WITHIN TRENCH.

BUNDLE WIRING AND WRAP WITH TAPE AT TEN FOOT INTERVALS.

ALL MAINLINE PIPING TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTALLATION SPECIFICATIONS.

	CITY OF MURRIETA	NO SCALE
Murrieta	PIPE AND WIRE TRENCHING	SID026
		JANUARY 2014



PAVING OR D.G. PATH

SAND BACKFILL COMPACTED TO THE DENSITY OF EXISTING SOIL

120 VOLT ELECTRICAL IN SCH. 40 SLEEVE

LATERAL LINES IN SCH. 40 SLEEVE

UNDISTURBED SOIL

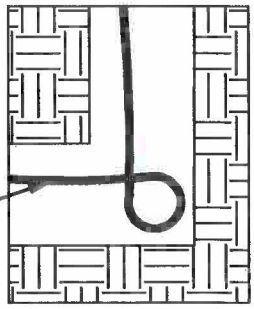
CONTROL WIRES IN SCH. 40 SLEEVE

PRESSURE MAINLINE IN SCH. 40 SLEEVE

PVC SLEEVES TO BE TWICE THE DIAMETER OF THE PIPE OR WIRE BUNDLE CARRIED.

SECTION VIEW - N.T.S.

DIMENSION	A	B	C	D	E
DEPTH BELOW GRADE	24"	24"	24"	36"	6"
		36" @ ROAD CROSSINGS			



TIE A 36" LOOP IN ALL WIRING AT CHANGES OF DIRECTION GREATER THAN 30 DEGREES, UNTIE AFTER ALL CONNECTIONS HAVE BEEN MADE.

PLAN VIEW - N.T.S.

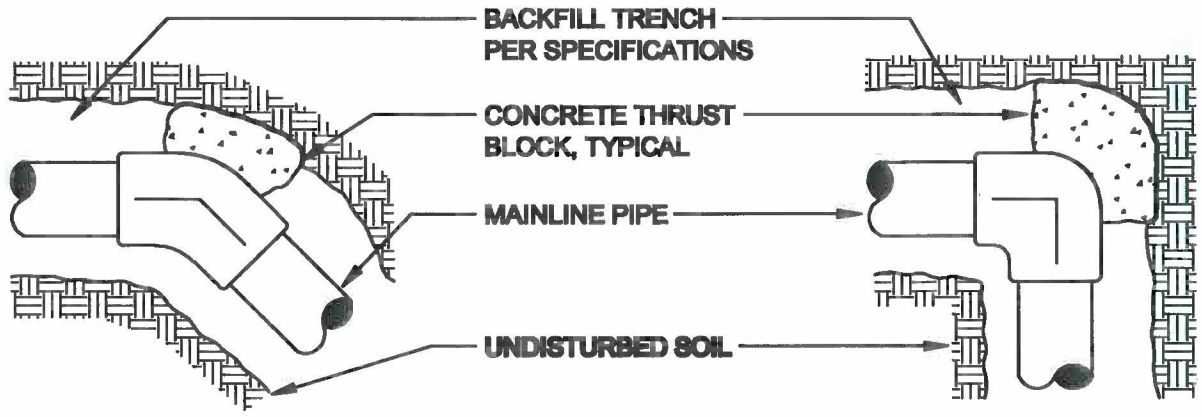
NOTE:

ALL PVC MAINLINE, PVC LATERAL LINES, AND CONTROL WIRES SHALL BE SLEEVED BELOW ALL HARDSCAPE ELEMENTS WITH SCH. 40 PVC, 2 TIMES THE DIAMETER OF THE PIPE OR WIRE BUNDLE WITHIN.

ALL CURBS SHALL BE MARKED WITH A "SCORE" MARK TO DESIGNATE SLEEVE LOCATION.

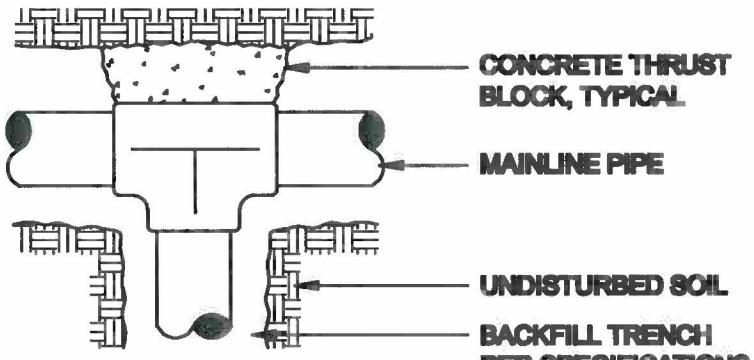
SLEEVE DETAIL SHALL ALSO BE USED FOR INSTALLATION OF PIPE IN ROCK SOIL.

	CITY OF MURRIETA	NO SCALE
Murrieta	SLEEVE TRENCHING	SID027
		JANUARY 2014



45 DEGREE ELL

90 DEGREE ELL



TEE FITTING

ALL SECTION VIEWS - N.T.S.

NOTES:

ALL CONCRETE USED IN THRUST BLOCKS SHALL BE 470-C-2000.

SOLVENT WELD MAINLINE PIPE & FITTINGS SHALL RECEIVE CONCRETE THRUST BLOCKS.

BELL AND GASKET MAINLINE PIPE AND FITTINGS SHALL USE PIPE RESTRAINT SYSTEMS.

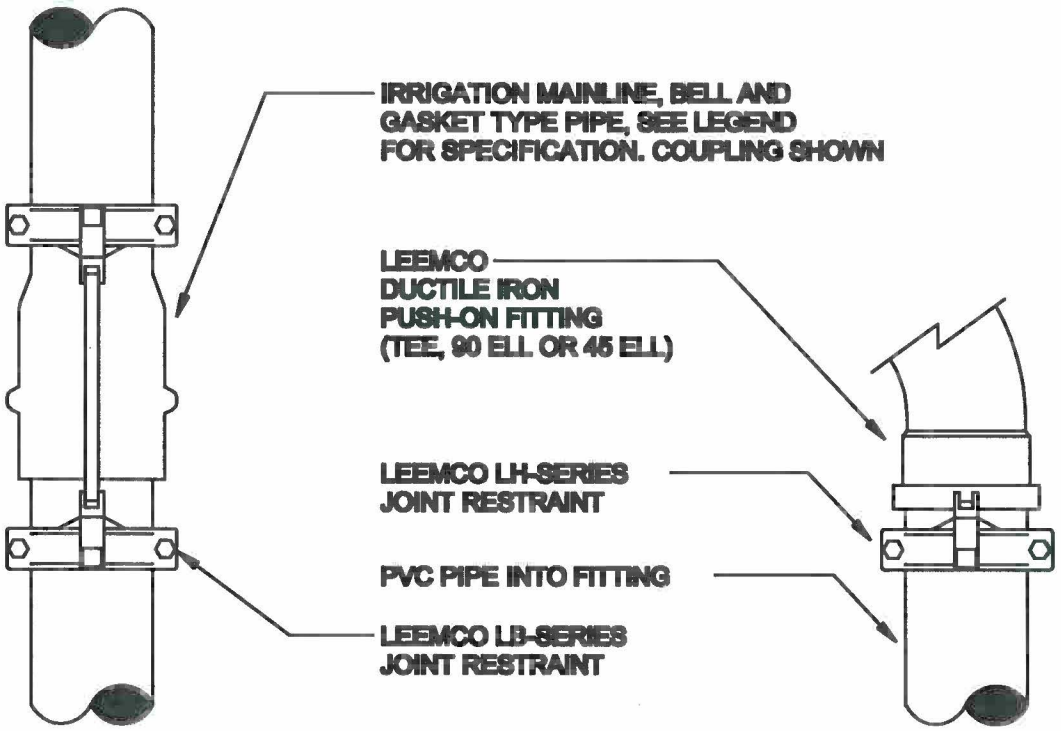
CONCRETE THRUST BLOCKS SHALL BE A MINIMUM OF 1 CUBIC FOOT IN VOLUME. THRUST BLOCKS SHALL NOT ENCASE THE FITTINGS IN CONCRETE.

ALL MAINLINES SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTALLATION RECOMMENDATIONS AND PRESSURE TESTED PER THE SPECIFICATIONS.

ALL TRENCH DEPTH AND WIDTH SHALL BE PER THE SPECIFICATIONS.

WRAP PLASTIC FITTINGS IN CONTACT WITH CONCRETE USING 10 MIL. PIPE WRAP.

	CITY OF MURRIETA	NO SCALE
Murrieta	THRUST BLOCKS	SID028
		JANUARY 2014



SECTION VIEW - N.T.S.

NOTE:

USE JOINT RESTRAINTS ON ALL BELL & GASKET MAINLINE PIPE W/PUSH-ON FITTINGS.

USE THRUST BLOCKS ON ALL SOLVENT WELD MAINLINE PIPE AND FITTINGS.

USE LB SERIES RESTRAINTS FOR BELL AND GASKET "PIPE-TO-PIPE" JOINTS.

USE RESTRAINTS FOR PVC PIPE TO DUCTILE IRON PUSH-ON FITTINGS, INCLUDING 45 ELLS, 90 ELLS, MAINLINE TEES, AND RCV MANIFOLD & QCV STUB OUTS.

WHEN INSTALLING A RCV OR QCV MANIFOLD STUB OUT USE AN LH SERIES RESTRAINT THE MAINLINE (TEE OR ELL) AS WELL AS VALVE STUB OUT SIDE OF THE ASSEMBLY.

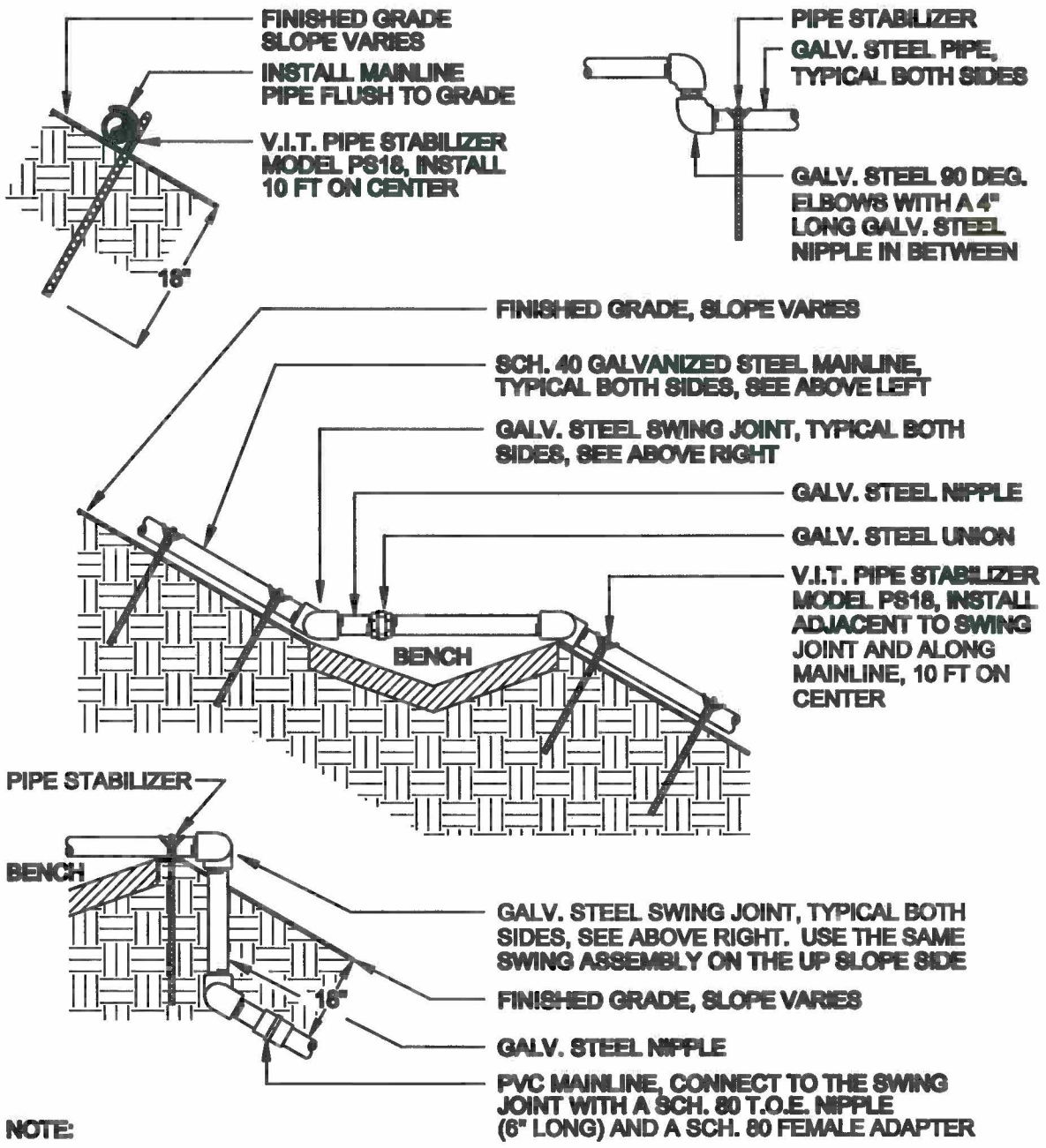
GATE VALVES AND OTHER FLANGED CONNECTIONS TO BELL AND GASKET PIPE SHALL BE MADE USING SR-FB SELF RESTRAINING FLANGE ADAPTERS.

SIZE OF RESTRAINT SHALL BE AS REQUIRED BY THE PIPE AND FITTING USED.

ALL DUCTILE IRON PUSH-ON FITTINGS AND RESTRAINTS SHALL BE LEEMCO.

FITTINGS WITH BUILT IN RESTRAINTS SHALL BE APPROVED BY THE INSPECTOR.

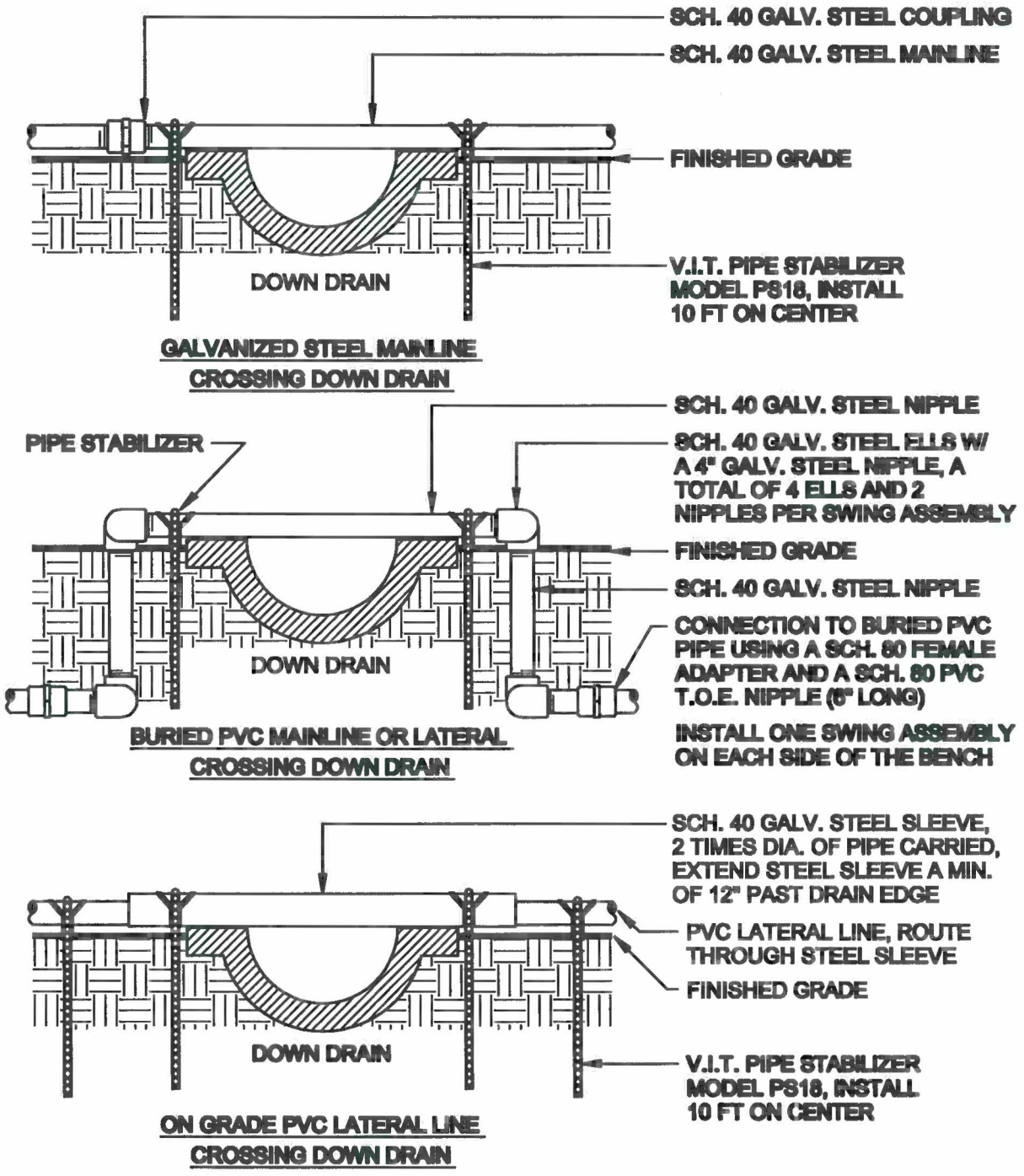
Murrieta	CITY OF MURRIETA	NO SCALE
	PIPE RESTRAINT SYSTEM	SID029
		JANUARY 2014



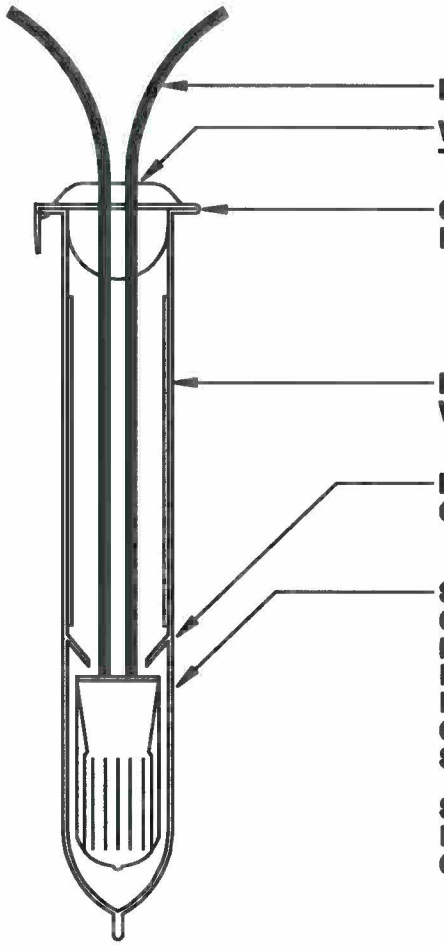
NOTE:

FOR BURIED MAINLINE TRANSITION TO BELOWGRADE PIPE AT SWING JOINT NO PVC PIPE SHALL BE EXPOSED ABOVE GROUND, BURIED GALVANIZED STEEL PIPE AND FITTINGS SHALL BE WRAPPED IN BLACK PLASTIC PIPE WRAP.

Murrieta	CITY OF MURRIETA	NO SCALE
	IRRIGATION MAINLINE CROSSING BENCH DRAIN	SID030
		JANUARY 2014



	CITY OF MURRIETA	NO SCALE
Murrieta	IRRIGATION LINES CROSSING DOWN DRAIN	SID031
		JANUARY 2014



LOW VOLTAGE WIRES, 3 MAXIMUM

WIRES PASS THROUGH GROOVES IN TUBE LID TO ALLOW LID TO CLOSE

CLOSE TUBE LID AFTER WIRE IS INSERTED INTO TUBE

POLY TUBE PRE-FILLED WITH WATERPROOF GEL

LOCK TABS PREVENT WIRE REMOVAL ONCE CONNECTOR IS INSERTED

SCOTCHLOK ELECTRICAL SPRING CONNECTOR. WIRES SHALL BE PRE-STRIPPED OF 1/2" OF THE INSULATION PRIOR TO INSERTION INTO THE CONNECTIOR. TWIST CONNECTOR ONTO WIRES TO SEAT FIRMLY.

SCOTCHLOK CONNECTOR AND WIRES INSERTED INTO TUBE UNTIL THE CONNECTOR PASSES LOCK TABS

SECTION VIEW - N.T.S.

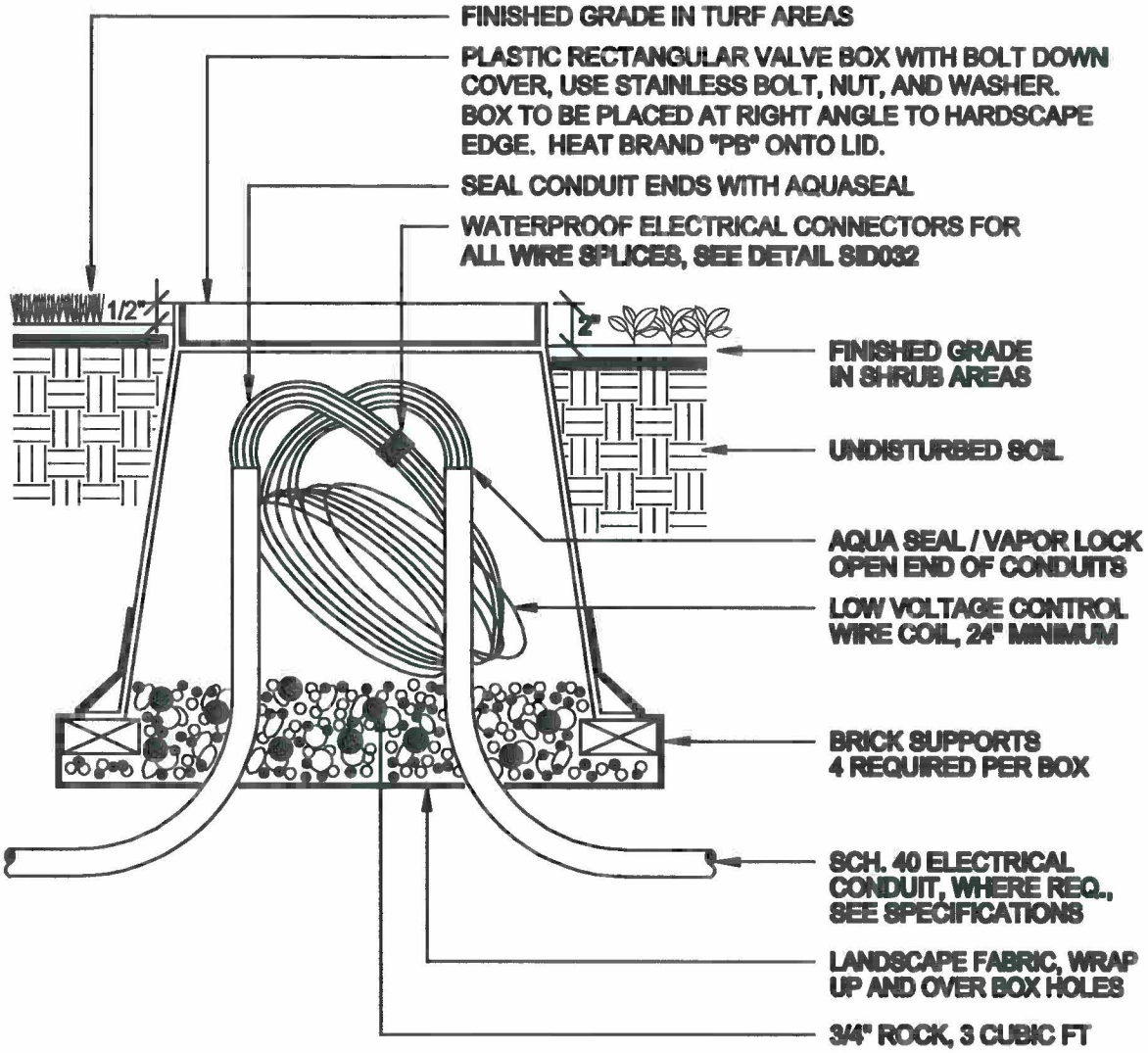
NOTE:

WIRE CONNECTOR SHALL BE A 3M DBY DIRECT BURY SPLICE KIT.

KIT SHALL INCLUDE A SCOTCHLOK SPRING CONNECTOR, A POLYPROPYLENE TUBE AND A WATERPROOF SEALING GEL. TUBE SHALL BE SUPPLIED PREFILLED WITH GEL.

DIRECT BURY SPLICE KIT SHALL BE USED TO ELECTRICALLY CONNECT 2 - 3 #14 OR 2 #12 PRE-STRIPPED COPPER WIRES. LARGER WIRES OR GREATER QUANTITIES OF WIRES SHALL REQUIRE A LARGER APPROVED WIRE CONNECTION.

Murrieta	CITY OF MURRIETA	NO SCALE
	WIRE CONNECTOR	SID032
		JANUARY 2014



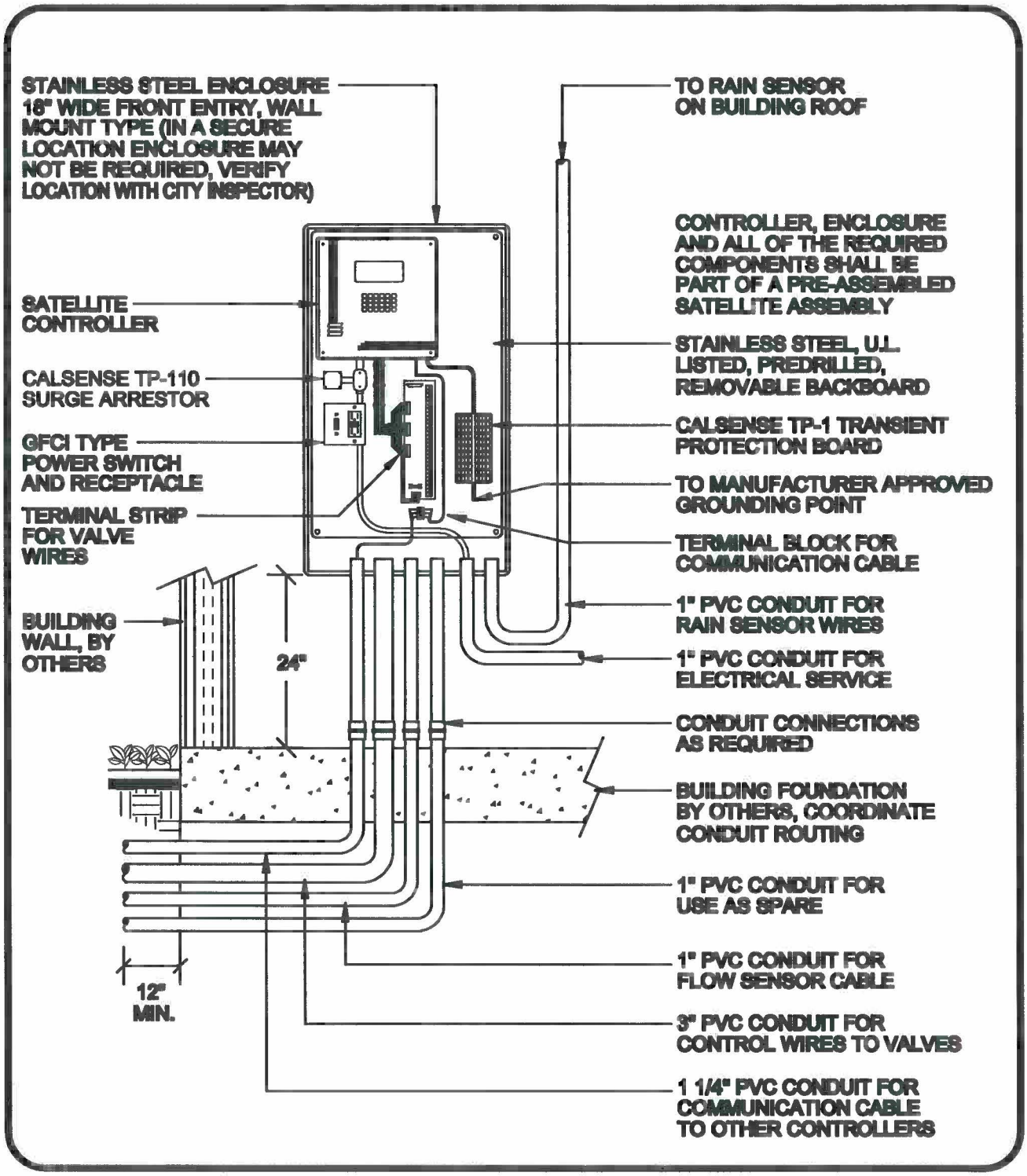
SECTION VIEW - N.T.S.

NOTE:

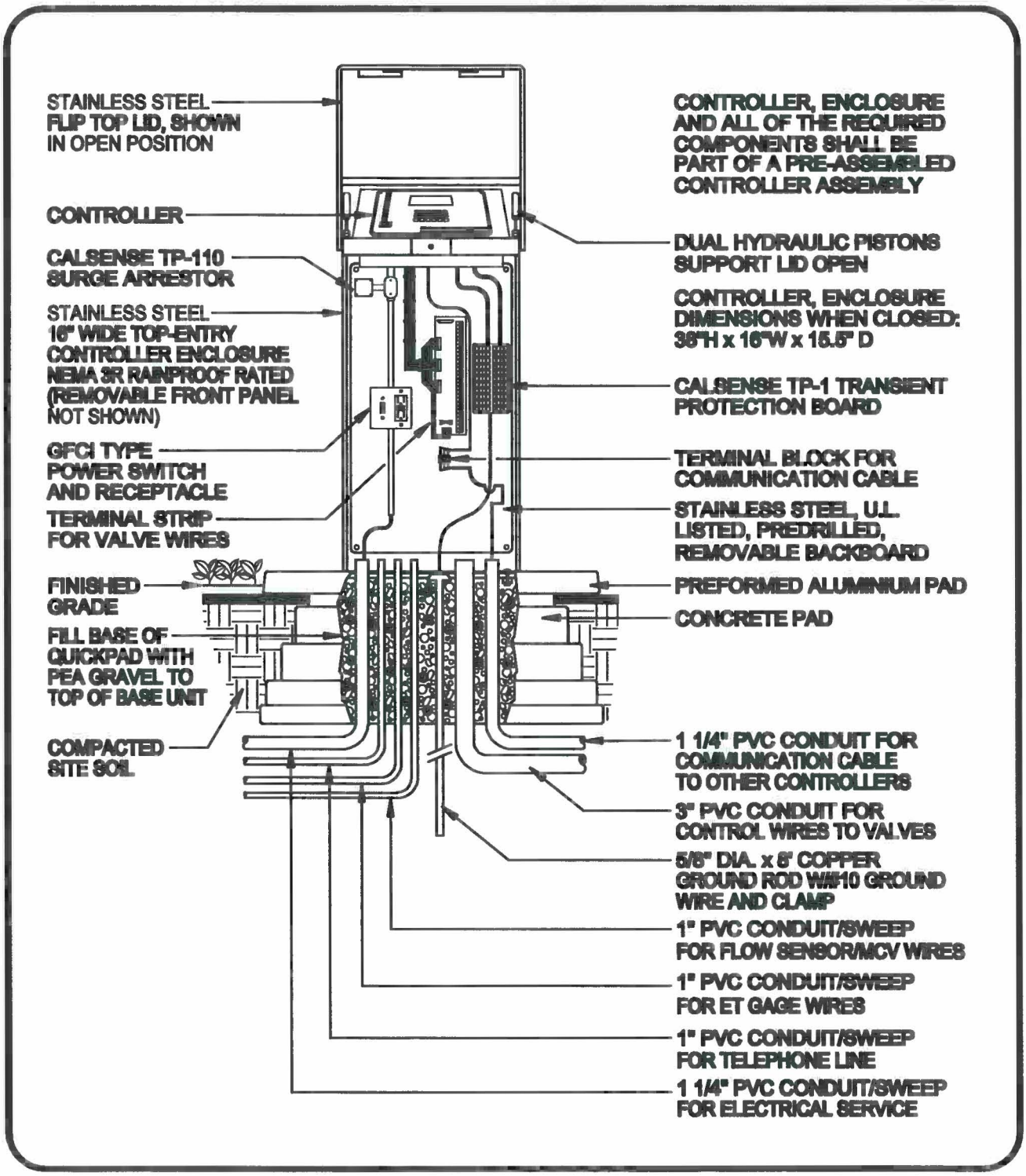
ALL CONTROL WIRE SPLICES SHALL BE INSTALLED INSIDE PULL BOXES.

ALL SPLICES SHALL BE MADE USING WATERPROOF ELECTRICAL CONNECTORS.

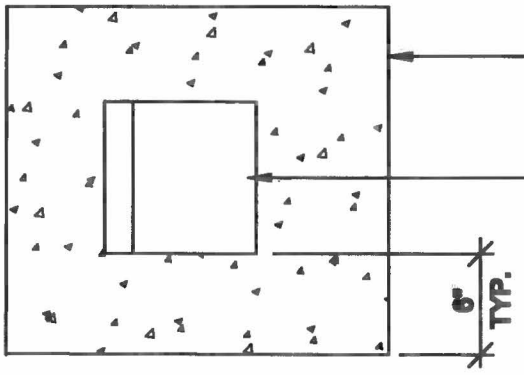
	CITY OF MURRIETA	NO SCALE
Murrieta	CONTROL WIRE PULL BOX	SID033
		JANUARY 2014



Murrieta	CITY OF MURRIETA	NO SCALE
	CALSENSE SATELLITE, INTERIOR INSTALLATION	SID034
		JANUARY 2014



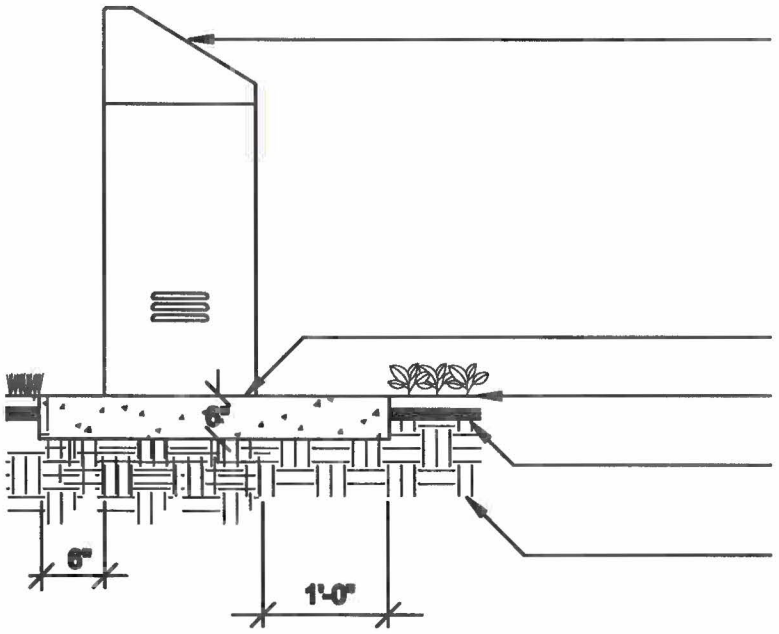
	CITY OF MURRIETA	NO SCALE
Murrieta	CALSENSE SATELLITE, EXTERIOR INSTALLATION	SID035
		JANUARY 2014



CONCRETE ACCESS PAD DETERMINED IN THE FIELD, PAD THICKNESS SHALL BE 6"

TOP ENTRY STYLE CONTROLLER ENCLOSURE

PLAN VIEW - N.T.S.



TOP ENTRY STYLE CONTROLLER ENCLOSURE

CONCRETE PAD

FINISHED GRADE

PAVED AREA (PREFERRED) OR LANDSCAPING AS REQ.

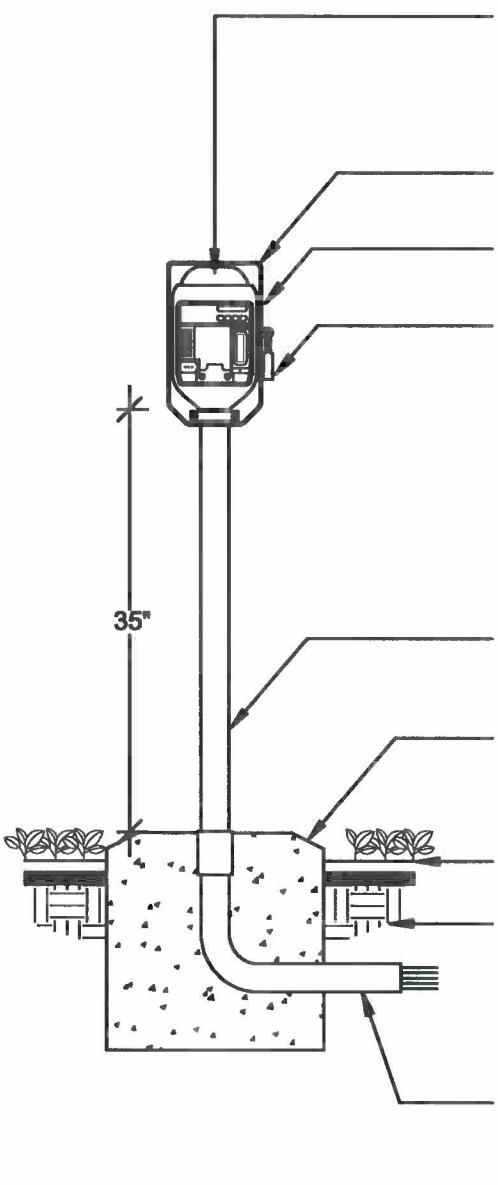
COMPACTED SOIL

SECTION VIEW - N.T.S.

NOTE:

WHERE POSSIBLE ORIENT FRONT OF ACCESS PAD ADJACENT TO SIDEWALK OR PAVING.

Murrieta	CITY OF MURRIETA	NO SCALE
	CONTROLLER ENCLOSURE CONCRETE FOOTING	SID036
		JANUARY 2014



DIRECT SUNLIGHT NOT REQUIRED FOR OPERATION OF CONTROLLER. VERIFY THE FINAL LOCATION OF THE CONTROLLER WITH THE MCSD REPRESENTATIVE PRIOR TO INSTALLATION.

STAINLESS STEEL ENCLOSURE DIG MODEL ENCL-X

DIG LEIT XR LIGHT POWERED IRRIGATION CONTROLLER

PADLOCK, PROVIDE TWO KEYS TO MCSD

DO NOT EXCEED THE MAXIMUM WIRE RUNS ALLOWABLE FOR THE CONTROLLER. WIRE RUN EQUALS THE LENGTH OF THE COMMON WIRE PLUS THE LENGTH OF THE LONGEST PILOT WIRE RUN.

14 AWG	3,000 FT MAX. RUN
12 AWG	4,600 FT MAX. RUN
10 AWG	7,800 FT MAX. RUN

DIG MODEL MCOLXS 35" TALL MOUNTING COLUMN WITH BASE. ALL WIRES ROUTE THROUGH BASE / TUBE.

CONCRETE PAD 18" X 18" X 18" BEVEL EDGES FOR DRAINAGE

FINISHED GRADE

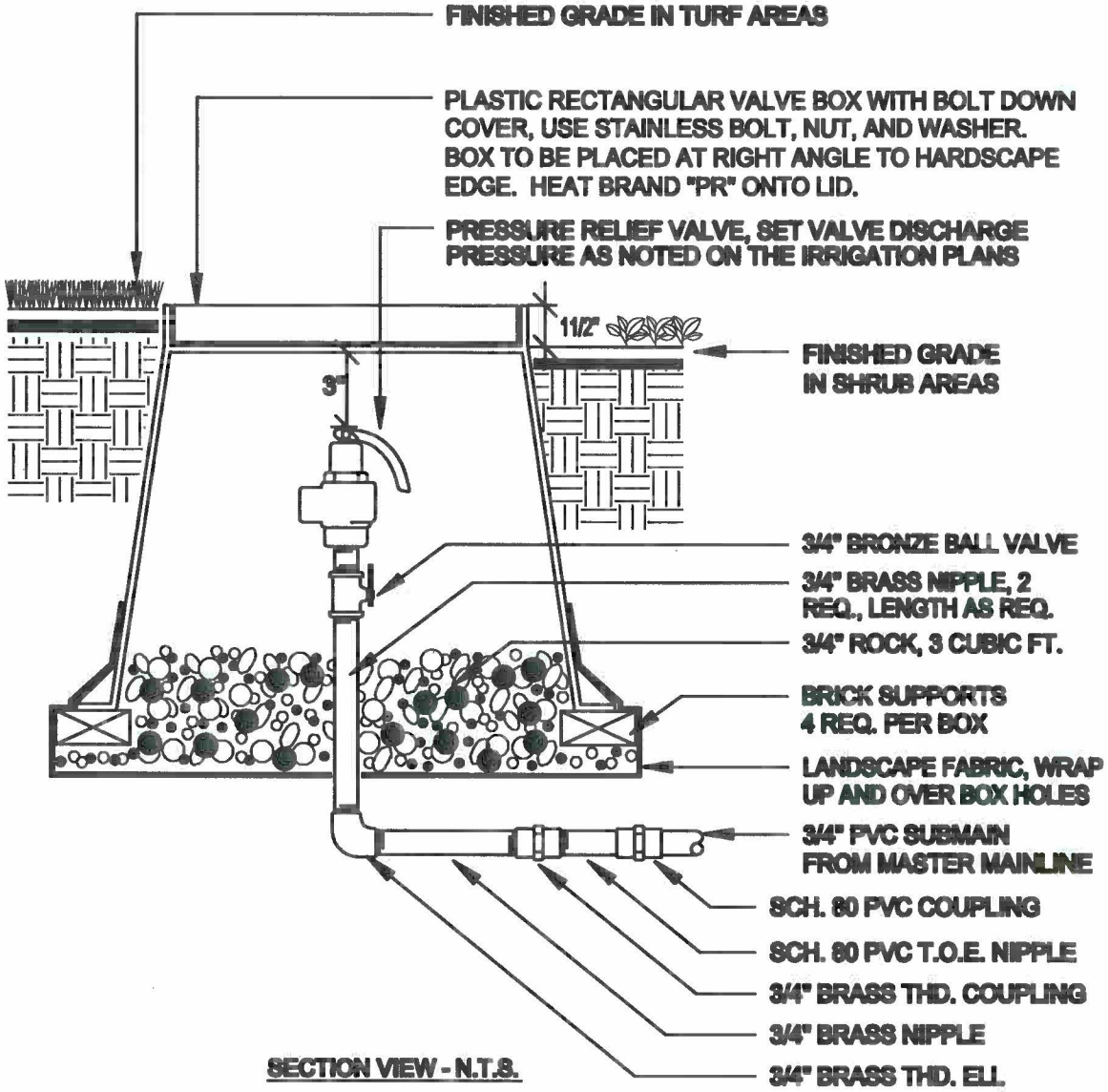
COMPACTED SOIL

DIG MOUNTING BASE/ELECTRICAL SWEEP FOR LOW VOLTAGE CONTROL WIRES SEE TRENCHING DETAIL FOR WIRE DEPTH

NOTE:

ALL REMOTE CONTROL VALVES USED WITH THE DIG CONTROLLER SHALL HAVE THE SOLENOIDS REPLACED WITH THE APPROPRIATE "LEMA MICROPOWER ACTUATORS". EACH BRAND OF RCV USES A SPECIFIC MICROPOWER ACUATORS, SEE THE DIG LEIT CATALOG OR CONSULT THE FACTORY FOR SPECIFICS.

Murrieta	CITY OF MURRIETA	NO SCALE
	LIGHT POWERED CONTROLLER	SID037
		JANUARY 2014



NOTE:
INSTALL PRESSURE RELIEF VALVE ON THE IRRIGATION MAINLINE AS SHOWN ON THE IRRIGATION DRAWINGS. USE 3/4" SUBMAIN FROM IRRIGATION MAINLINE TO ACTUAL PRESSURE RELIEF VALVE LOCATION.

Murrieta	CITY OF MURRIETA	NO SCALE
	PRESSURE RELIEF VALVE	SID038
		JANUARY 2014