



**CITY OF VICTORVILLE  
DEPARTMENT OF COMMUNITY SERVICES**

**PARKS  
SPECIFICATIONS AND DETAIL BOOKLET**

**REVISED February 2016**

## **CITY OF VICTORVILLE - DEPARTMENT OF COMMUNITY SERVICES**

### **PARKS SPECIFICATIONS AND DETAIL BOOKLET**

This booklet contains the procedures, requirements and guidelines for Parks. Any substitutions or changes from the requirements in this booklet will require written approval from the Community Services Department – Parks Manager or his/her designee. These specifications must be made part of the landscape and irrigation plans and followed. Any deviation from these guidelines may cause delays in the processing and/or construction of the Park.

#### **I. PROCEDURES**

##### **A. ESTABLISHMENT**

###### **1. Parks**

- a. Shall be designed per the Community Services Master Plan

##### **B. PLAN CHECK SUBMITTAL**

- a. All plan checks must be submitted to the Building Department. The Building Department will route the plans to all Departments within the City: Planning, Engineering, Fire, Community Services – Golf & Grounds, and Fire as required.
- b. Plans not submitted to the Building Department will not be plan checked thus resulting in a delay in receiving permits for the project.
- c. Prior to construction of a park schedule a pre-construction meeting with the Community Services Parks Division at (760) 955-5271.
- d. Prior to, during and after construction contact Imperial Technical services for controller installation information and certification at (714) 863-0442.

##### **C. CONSTRUCTION INSPECTION**

- a. All inspections shall be called into the Building Department Inspection Hotline at (760) 955-5103.

#### **II. PLAN CHECK**

##### **A. REQUIREMENTS**

1. Irrigation plans – 5 copies shall be submitted, drawn neatly and accurately to an engineer's scale, no smaller than 1" = 40' with the following information:
  - a. An irrigation legend with symbols, item description, manufacturer, model number, and performance criteria.
  - b. The available water pressure (minimum) and GPM (maximum) required at the point of connection shall be indicated.
  - c. A calculation of the worst-case pressure loss characteristics for the system shall be shown on the plans.

- d. The remote control valve identification shall include controller station number, valve size, and flow demand.
  - e. The water meter size and water district.
  - f. Location of controller, backflow, and electrical pedestal.
  - g. Show by either note or symbol those areas, which are sloped.
  - h. City approved details and equipment
2. Landscape plans – 5 copies shall be submitted, drawn neatly and accurately to an engineer’s scale no smaller than 1” x 40’ with the following information:
  - a. The planting legend shall include symbols, type, size, height, spread and dimensions apart.
  - b. Trees shall not be planted in areas that are less than 10’ wide.
  - c. Show by either note or symbol those areas that are sloped.
  - d. City approved plant material.
  - e. City approved plant details.
  - f. Location of wall with approved Grading Plan Number.
3. Wall Plans – 5 copies of the wall plan shall be submitted, drawn neatly and accurately using an engineer’s scale with the following information:
  - a. City approved wall detail
  - b. Location
  - c. Engineer’s wet stamp
4. Obtain a permit from the City’s Water Department prior to obtaining the construction permit.
5. Install the appropriate flow sensors, master valve, CCU 28, pigtails, phone connections, remote controller and antenna so the system will be utilized using Rain Bird Maxi-Com, with radio modem kit (RMK) system and radio remote controllers.

## B. PROCESS

1. Submit five (5) sets of plans to the Building Department. A set of plans will be forwarded to the appropriate Departments. Any comments will be provided to the Developer/Contractor to incorporate into the plans.
2. Submit five (5) sets of plans to the Building Department once all corrections have been incorporated onto the plans. If there are no further corrections, the plans shall be approved. The Developer/Contractor will obtain a permit from the Building Department and will receive two (2) sets of plans, one to be used as the construction set and one as a file set.
3. This booklet shall become a part of the approved landscape and irrigation plans. Any discrepancies on the plan shall be held to the contents herein.

4. Approved plans and specifications shall not be changed or altered without approval of the Parks Manager or his/her designee. Prior to start of construction, a copy of the approved plans must be sent to the Community Services Department (Parks Division) at 14343 Civic Drive, Victorville, CA 92392. At this time the Contractor is required to send to Community Services (Parks Division) the Performance, Labor and Materials Bonds for the construction of the park.
5. Approved landscape and irrigation plans and specifications are valid for 180 days from the date of approval. If construction is not completed within this time, a request for an extension must be submitted in writing to the Building Department prior to the expiration or plans must be resubmitted for re-review to the Building Department. Plan extension approvals can only be extended once for a period of up to six months. Any policies or requirements which have been implemented during the 180-day period must be included on the plans prior to any extension period approval.
6. The Community Services Department, the Building Department, the Engineering Department and the Water Department will individually inspect different phases of the project. The Engineering Department will inspect all trenches across public rights-of-way for depth, backfill, and compaction requirements. The Building Department will inspect the electrical service pedestal, the backflow device and the irrigation installation. The Water Department will install and inspect the water meter(s) and backflows. The landscape installation will be inspected by the Community Services Department (Parks Division). The Building Department can be contacted at (760) 955-5103 to schedule all inspections.
7. The Community Services Department will inspect the plant material prior to installation/ placement into the maintenance period and at the end of the 90-day maintenance period.
8. Inspections to be called for at (760) 955-5103 are required at each of the following steps:
  - a. Upon completion of fine grading and A-curb installation and prior to commencement of soil preparation for acceptance of fine grading work.
  - b. Inspection of mainline trench depth, size, controller wires, valves, and pressure test. This inspection may not be combined with any other inspection.
  - c. Inspection of lateral lines, depth, size, heads, and coverage.
  - d. Inspection of plant material.
  - e. Depth of holes for planting of shrubs, vines, groundcover, and trees with amendment, tablets, and fertilizer.
  - f. Inspection of completed finish grading work following soil amendment work.
  - g. Inspection of backflow prevention device.
  - h. Inspection of controller and electrical pedestal.
  - i. Application of pre-emergent chemical.

### **III. CONSTRUCTION – GENERAL**

#### **A. DEVELOPER/CONTRACTOR RESPONSIBILITIES**

1. The Developer/Contractor will provide two (2) copies of the finalized plans to the Community Services Department (Parks) and shall perform his/her work to conform to the

plans and specification as well as all applicable regulatory requirements, including but not limited to the Uniformed Plumbing Code, Uniformed Electrical Code, and County, City and Water Department ordinances and regulations.

2. The Developer/Contractor shall follow the Manufacturer's directions and detailed drawings in conjunction with the plans and specifications. The manufacturer warranties shall not relieve the Contractor of any liabilities. Such warranties shall only supplement the Contractor's guarantees as specified in this booklet.
3. Due to the scale of the drawings, it is not possible to indicate all offsets, fittings, sleeves, and the like, which may be required. The Contractor shall carefully investigate the structural and finished conditions affecting all of his work, plan for work accordingly, and furnish such fittings as may be required to meet such conditions. Drawings are diagrammatic and indicative of the work to be installed. The work shall be installed in such manner as to avoid conflicts between irrigation systems, plantings, and architectural features.
4. The Contractor shall not willfully install the irrigation system as shown on the drawings when it is obvious in the field that unknown obstructions, grade differences or discrepancies in area dimensions exist that might not have been considered in engineering.
5. Such obstructions or differences should be brought to the attention of the City's Authorized Representative. In the event notification is not given, the Developer/Contractor shall assume full responsibility for any revisions that become necessary.
6. The Developer/Contractor shall exercise extreme care in excavating and working near existing utilities. The Developer/Contractor shall be responsible for any damage to utilities that are caused by his operations or neglect. Check existing utility drawings and call Underground Service Alert (USA) at 1-800-227-2600.
7. The Developer/Contractor shall furnish equipment, materials or processes, specified by name in the Drawings and Specifications.
8. All plant material installed shall be guaranteed against any and all poor, inadequate, or inferior materials and/or workmanship for a period of one year. During the one-year period, any plant material in poor condition, with dead or missing plant the Developer/Contractor shall replace material, within 10 days of written notification. The City's Authorized Representative shall be the sole judge as to the condition of the material. Replacement shall be made in accordance with the specifications and plan.
9. The Developer/Contractor at no additional cost shall provide material and labor involved in replacing plant material to the City.
10. Plant material shall be installed as to not obstruct the vision of drivers and/or pedestrians.

## B. SUBSTITUTIONS

1. The City's Authorized Representative will permit no substitutions without prior written approval. Materials or equipment installed or furnished without prior written approval will be at the Developer/Contractor's own expense.
2. Changes in location of irrigation, including water or electrical meters, or plant material, requires prior written approval by the City's Authorized Representative from the Community Services Department (Parks Division).

## C. PRODUCT DELIVERY, STORAGE AND HANDLING

1. All products shall be delivered, stored, and handled with the utmost care. All materials shall be inspected by the City's Authorized Representative prior to installation. Any material deemed unsatisfactory shall be replaced at the Contractor's expense.

## IV. IRRIGATION

### A. PVC PRESSURE MAIN LINE AND FITTINGS

1. Pressure main line (buried) piping for sizes 1" – 3-1/2" shall be PVC schedule 40; with solvent welded joints; 4" and larger shall be P.R. 200 IPS (SDR 21) integral gasketed bell one end (factory installed gasket) conforms to ASTM D 2241.
2. The minimum main line size shall be 1" and the minimum water meter size shall be 1.5".
3. Pipe shall be made from an NSF approved type 1, grade 1, PVC compound conforming to ASTM resin specification D1784. All pipes must meet requirement as set forth in Federal Specifications PS-22-70, with an appropriate standard dimension (S.D.R. Solvent Welded Pipe).
4. 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. National Sanitation Foundation (NSF) approval; and
  - f. Date of extrusion.
5. Solvent cement and primer for PVC solvent weld pipe and fittings shall be of type and installation methods prescribed by the manufacturer. Evidence of primer application must be visible to inspector.

6. All fittings shall be PVC Schedule 80, NSF approved, conforming to ASTM D1464 and D2467 and bear the manufacturer's name or trademark, material designation, size, applicable I.P.S. schedule, and NSF seal of approval.
7. All main line fittings shall be non-threaded (slip-type) solvent welded type. All tees shall be perpendicular to the bottom of the trench. All capping required for the performance of pressure test shall be solvent welded. All threaded fittings shall be schedule 80. All threaded pipe shall be PVC Schedule 80 and have only factory cut threads.
8. Pipe and fittings between water meter and backflow preventer shall be consistent with materials (copper) used between the water meter and City's water service. Materials to be verified with the City's Water Department and Park District Representatives.
9. Pipe and fittings 1-1/2" to 4" diameter and larger between the water meter and the backflow preventer shall be schedule 40 steel (minimum), type K copper or ductile iron. Welded steel or class 50/51 ductile iron pipe may be used for the line sizes 4" and larger. Fittings 4" and larger shall be class 250 (minimum) ductile iron. All metal fittings and pipe shall be coated to retard corrosion with City approved materials.

#### B. PVC NON-PRESSURE LATERAL LINE PIPING

1. Non-pressure (buried) lateral line piping shall be PVC Schedule 40 with solvent weld joints.
2. Pipe shall be made from NSF approved type 1, grade 11 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. All requirements for non-pressure lateral line pipe and fittings shall be the same as for PVC pressure main line and fittings, solvent weld, as set forth in the U.P.C., 1994 Edition.
3. 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. National Sanitation Foundation (NSF) approval;
  - f. Date of extrusion.
4. All fittings shall be PVC Schedule 80, NSF approved, conforming to ASTM D1464 and D2467 and bear the manufacturer's name or trademark, material designation, size, applicable I.P.S. schedule, and NSF seal of approval.

#### C. THRUST BLOCKS

1. Thrust blocks are required at all backflow prevention devices and on all main lines whenever there is a change in direction.
2. Concrete thrust block type, location, and installation shall be per the Uniform Building Code.

3. Prevent concrete from contacting the pipe. Wrap that section of pipe that will contact concrete with 10 mil black tape.

#### D. PIPE AND FITTING

1. Use red brass screwed pipe conforming to Federal Specification WW-P-351. Fittings shall be red brass conforming to Federal Specification WW-P-460.
  - a. All PVC pipe threaded into brass shall be schedule 80 minimum.
  - b. Copper pipe shall be type "K" hard tempered ASTM B 88 and fittings shall be wrought solder joint type in accordance with ASNI B-16-22.
  - c. All joints shall be soldered with silver solder, 45% silver, 15% copper, 16% zinc, 24% cadmium, and soldered at 1,125° F conforming to ASTM B 206 and personal specification QQB 00655.
2. Galvanized pipe and fittings shall not be permitted.

#### E. BACKFLOW PREVENTION UNITS

1. All backflow preventers (BFP) 2-1/2" and larger shall be of the reduced pressure (RP) principle type. They shall be of bronze and stainless steel construction and shall incorporate two NRS resilient seat wedge type gate valves. All test ports shall be equipped with a ball valve test cock. The backflow preventer shall be equipped with a separate wye strainer. Install per prevailing local codes. Support backflow device as per manufacturer's recommendation.
2. All backflow preventers (BFP) 2" and smaller shall be of the reduced pressure (RP) principle type. They shall be of bronze and stainless steel construction and shall incorporate two ball valve shutoffs. All test ports shall also be equipped with ball valve test cocks. The backflow preventer assembly shall be equipped with a separate wye strainer. Install per prevailing local codes. Support backflow device as per manufacturer's recommendation.
3. Backflow prevention units shall be of size and type indicated on the irrigation plans. Install backflow prevention units in accordance with irrigation construction details and per uniform plumbing code and local codes. The location and placement of backflow preventers to be determined prior to construction by a Community Services Department (Parks Division) representative and will not be placed any closer than 30 feet from a corner.
4. Wye strainers at backflow prevention units shall have a bronze screwed body with 100 mesh monel screen and shall be similar to BAILEY #100B or approved equal.
5. Install all backflow preventers in a lockable protective enclosure. Enclosure shall be constructed from stainless steel. Enclosure shall be mounted on a level concrete pad 4" thick with a minimum rate of 2,500 PSI with a medium broom finish extended 6" beyond each edge of the enclosure and 6" plus the height of the enclosure at the end that opens. Freeze protection is mandatory for all BFP; method of freeze protection is subject to City approval.

6. Provide the City with an approved Certificate of Inspection by an authorized Backflow Preventor Inspector.

F. GATE VALVES / BALL VALVES (to be installed per installation details at each valve)

1. Gate valves 2” and smaller shall be 150 lbs. WOG brass class gate valve with screw-in bonnet, non-rising stem with solid wedge disk. All shall have threaded ends and shall be equipped with a bronze cross-handle. Use only those as manufactured by NIBCO or approved equal.
2. Ball valves 2” and smaller shall be 20PSI SWP bronze ball valve with a stainless steel ball and handle. All shall have threaded ends and shall be similar to those manufactured by Hammond Valve Company or the approved equivalent.
3. All mainline isolation valves, 2-1/2” and larger, shall be ductile iron, epoxy coated inside and out, utilize a non-rising stem, and a resilient seat wedge. Valve ends to be threaded, flanged, or mechanical jointed. These valves shall be rated to 250 PSI minimum.
4. All PVC pipe threaded into gate valves or ball valves shall be PVC Schedule 80 minimum.

G. QUICK COUPLER VALVES

1. To be installed ever 100 feet of landscaped length and within 50’ of every corner.
2. Quick coupler valves shall have a 1” inlet, a brass two-piece body designed for working pressure of 150 PSI, operable with key, size and type shown on drawings.
3. Cover shall be a rubber or vinyl locking cover, purple in color and state “DO NOT DRINK THIS WATER” in English and Spanish (non-potable). Install quick coupling valves in a 10” round valve box with locking lid. Lid shall be green in color and shall be marked as to type of device (QC).

H. CHECK VALVES

1. Swing check valves 2” and smaller shall be of 200 lb. WOG, bronze construction, with replaceable composition, neoprene or rubber disk and shall meet or exceed Federal Specification WW-V-51D, Class A, Type IV.
2. Anti-drain valves shall be heavy-duty virgin PVC construction with female internal pipe threaded inlet and outlet. Internal part shall be stainless steel and neoprene. Anti-drain valve shall be field adjustable against draw-out from 5 to 40 feet of head. Anti-drain valve shall be similar to the VALCON “ADV” or approved equal.

I. MASTER VALVES

1. The master valve shall be brass embodied in globe configuration.
2. All master valves shall have a manual flow adjustment

#### J. FLOW SENSORS

1. The flow sensors send data to the central control or stand alone control system for precise and accurate flow sensing.
2. All flow sensors are to be of brass and pre-installed in tee type mounted insert configuration.
3. Flow sensor will be connected to pulse transmitter using an unspliced shielded wire in 1” conduit minimum.

#### K. REMOTE CONTROL VALVE / PRESSURE REGULATING RCV

1. All remote control valves (RCV) shall have a manual flow adjustment.
2. All electric remote control valves with or without pressure regulation shall be plastic, globe type, and shall have threaded inlet and outlet.
  - a. Each remote control valve will be accompanied with a non-rising stem (NRS) isolation gate valve or an angle valve. All angle and gate valves shall be rated at 150 WOG minimum.
3. Pressure regulating remote control valve (PRV) shall have an integral pressure regulator. There shall be no external tubing on the valve assembly.
  - a. Any irrigation circuit using pressure regulation and/or drip/trickle irrigation components shall be equipped with a serviceable wye strainer with blowout. The wye filter shall be of brass and stainless steel construction.
  - b. Each RCV and PRV shall be equipped with a line size union of brass or schedule 80 construction located on the non-pressure side of the control valve.
  - c. All RCV and PRV valves shall be installed in rectangular plastic valve boxes with locking covers. All devices within valve box shall provide enough room to allow either repair or replacement of the device. The cover shall be green and shall be marked as to device type and station number “RCV XX”.
4. Separate pressure regulators may be used with remote control valves on drip/trickle circuits or those circuits operating bubblers. The pressure regulator shall be installed up-stream of the remote control valve and wye strainer.
5. Install where shown on drawings and details. When grouped together, allow at least 12” between valves. Install each remote control valve in separate valve box. All devices shall be at least three inches above its gravel or crushed rock bed which shall be at least six inches deep and be of an area equivalent to the valve box.
6. All PVC pipe threaded into RCV’s and PRV’s shall be PVC Schedule 80 minimum.

## 7. Assemblies

- a. Routing of sprinkler irrigation lines as indicated on the drawings is diagrammatic. Install lines (and various assemblies) in such a manner as to conform to the details per drawings.
- b. Do not install multiple assemblies on PVC lines. Provide each assembly with its own outlet.
- c. Install all assemblies specified herein in accordance with respective detail. In absence of detailed drawings or specifications pertaining to specific items required to complete work, perform such work in accordance with the best standard practice with prior approval of the City.
- d. PVC pipe and fittings shall be thoroughly cleaned of dirt, dust, and moisture before installation. Installation and solvent welding methods shall be recommended by the pipe and fitting manufacturer.
- e. PVC to metal connections, the Contractor shall work the metal connections first. Teflon tape or approved equal shall be used on all threaded PVC to PVC, and on all threaded PVC to metal joints. When using wrenches to tighten plastic fitting **DO NOT OVER-TIGHTEN**.
- f. When making a connection of unlike metal pipes such as copper to galvanized or brass to galvanized pipe, Contractor shall use special fittings manufactured to prevent electrolysis.

## J. CONTROL VALVE BOXES

1. All valve boxes, housing remote control valves, shut-off valves, quick coupling valves, etc., shall be installed at the toe of any slope adjacent to the curb, walk, or drive.
2. See manufacturers list on Page 19.
3. All boxes to be marked either Q.C. (Quick Coupler) or Valve # (A-1, A-2, etc.). Method to be as approved by City Authorized Representative.

## K. CONTROL WIRE

1. Connections between the automatic controllers and the electric control valves shall be made with direct burial copper wire Type UF, 600 volt. Pilot wires shall be a different color wires for each automatic controller and be a minimum of 14 AWG.
2. All 24-volt valve control wire shall be 14 AWG minimum. The 24-volt common shall be a 14 AWG (minimum) white wire. All wire shall be Type UF 600 volt rated for direct burial and numbered (see approved product list) at controller for each valve.
3. Install and label one extra 24-volt red wire equal in wire size to the “common wire” size in the mainline trench between the controller and the most distant remote control valves in all directions. The extra wire shall terminate in a small 10’ coil of wire in a pull box and looped in each RCV box. Tape the wire coil to restrain it.

## L. AUTOMATIC CONTROLLER

1. Remote control valves shall be connected to controller in numeric sequence as shown on the drawings.
2. All controllers shall be mounted in a separate protective stainless steel enclosure provided by the manufacturer.
3. If a CCU 28 is required, then the enclosure shall be equipped with an approved telephone connection of a phone cable/modem and demarcation jack. The conduit and sweep ell for the telephone cable shall conform to the following specifications:
  - a. Two-inch conduit (NEMA TC-10 or equivalent) shall be placed from the irrigation controller enclosure to a point of connection designated by the telephone purveyor. Conduit shall be 24" below finish grade.
  - b. Conduit shall be stubbed 6" into enclosure, 1" from backboard wall and 6" from the enclosure's wall.
  - c. Conduit is to be equipped with a telephone cable.
  - d. There shall be no more than two 90° turns in a 100' conduit run. 90° sweeps shall be no less than 4' radius minimum.
  - e. Exposed ends shall be capped to prevent dirt and debris from accumulating into conduit.
  - f. Conduit shall be inspected by the City's Authorized Representative prior to backfilling trench.
4. The controller shall be fitted with CCU 28 - RMK, receiver card, antenna, remote transmitter, and rain switch assembly.

## M. ELECTRIC METER

1. The electric meter shall be installed in a stainless steel enclosure as per prevailing electric company or local code.
2. All 120 VAC conductors shall be installed in PVC Schedule 40 PVC conduit between power source (meter) and the controller enclosure.
3. All 120 VAC power wire shall be two conductors with ground, per prevailing local codes. Upon installation, the earth ground must be properly installed per manufacturer's instructions. If three separate conductors are used, the grounding wire shall be #4 AWG bare copper, if within enclosure, and #4 AWG armored if externally routed.
4. Grounding electrode shall be 5/8" copper clad rod 8 feet long driven into the ground. Ground conductor shall be mechanically fastened as per prevailing code. If more than one grounding electrode is used, they shall be separated by 10 feet.
5. All 120 VAC conductors and conduit, if installed in the mainline pipe trench, shall be covered by 24" of soil. The conductors/conduit shall be installed on the opposite side of the

trench form any 24-volt wire. The communication cable shall be separated by 12” (minimum) of compacted soil. From conductors, a warning tape stating, “**Caution: Electrical Line Buried Below**”, shall be placed 3” above directly over the conduit.

6. High voltage wiring for automatic controller.
  - a. The 120-volt power connection to the automatic controller pedestal shall be provided and installed by a qualified electrician and to be included as a part of the contract of the irrigation Contractor.
  - b. All electrical work shall conform to local codes, ordinances, and union authorities having jurisdiction.

#### N. PIPING UNDER EXISTING WALKS

1. Piping under existing walks shall be sleeved and constructed by a method approved by the City (i.e., jacking, boring, or hydraulic driving) prior to construction beginning. Where any cutting or breaking of sidewalks and/or concrete is necessary, the concrete shall be removed and replaced as per City standards by the Contractor as part of the contract cost. No hydraulic driving shall be permitted under concrete paving.

#### O. SPRINKLER HEADS (IF APPROVED)

1. Install the sprinkler heads as designated on the drawings and 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.
2. Spacing of heads shall not exceed the 75% of the maximum throw indicated in the manufacturer’s specifications.
3. Spray heads shall have a screw adjustment and not allowed on fixed risers.
4. Riser units shall be fabricated in accordance with the details shown on the drawings. Riser nipples for all sprinkler heads shall be the same size as the riser opening in the sprinkler body.
5. Spray sprinkler systems may not be used in roadway medians. Use bubblers in these locations.
6. Bubblers will be used for all plants and trees for water conservation.

#### P. INSTALLATION

1. Trenching
  - a. Contractor is responsible for contacting Underground Service Alert (USA) 48 hours prior to any trenching. Contractor shall also contact the City of Victorville for any known on-site utility lines. Contractor shall be responsible for the repair of any and all damage.

- b. 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 by the City's Authorized Representative.
  - c. Provide for a minimum of 24" to cover all pressure main line pipes and a minimum of 12" for all non-pressure lateral lines.
  - d. Provide for a minimum of 18" for all control wire.
2. Line Clearance is to be a minimum of 6" from each other and from lines of other trades.
3. Backfilling
- a. The trenches shall not be backfilled until all required tests are performed and inspections have been completed.
  - b. Trenches shall be carefully backfilled with the excavated materials approved for backfilling, consisting of earth, loam, sandy loam, clay, sand, or other approved materials, free from large clods of earth, rocks or stones.
  - c. Backfill shall be mechanically compacted in landscaped areas to a dry density equal to adjacent undisturbed soil in planting areas. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities.
  - d. A fine granular material backfill will be initially placed on all lines. No foreign matter larger than ½ inch in size will be permitted in the initial backfill.
  - e. Flooding of trenches will not be permitted.
  - f. If settlement occurs and subsequent adjustment in pipe, valves, sprinkler heads, lawn or planting, or other construction is necessary, the Contractor shall make all required adjustments without any additional cost to the City.
4. Trenching and Backfilling over Paving
- a. All pressure main line and non-pressure lateral lines under paved areas shall be placed in a PVC Schedule 40 PVC sleeve measuring twice the diameter of the designated pipe.
  - b. Trenches located under areas where paving, asphalt or concrete will be installed, shall be backfilled with sand (a layer six inches below the pipe and three inches above the pipe) and compacted in layers to 95% compaction, using manual or mechanical tamping devices. Trenches for piping shall be compacted to equal the compaction of the existing adjacent undisturbed soil and shall be left in a firm unyielding condition. All trenches shall be left flush with the adjoining grade.
  - c. The irrigation contractor shall set in place; cap and pressure test all piping under paving, prior to the paving work.
5. Drain Ditch Crossing
- a. All drainage ditch crossings shall be galvanized steel pipe ASA schedule 40 mild steel screwed pipe. Pipe shall be strapped parallel to a 4" x 4" redwood or cedar wood member for support. Absolutely no PVC pipe will be permitted at ditch crossings.

## Q. FLUSHING OF SYSTEM

1. After all new water lines and risers are in place and connected, all necessary diversion work has been completed, and prior to installation of bubblers, the control valves shall be opened and a full head of water used to flush out the system.
2. The sprinklers (Parks) and bubblers shall be installed only after system flushing has been accomplished to the complete satisfaction of the City.
3. The Contractor shall flush and install all sprinklers (Parks), bubblers or drip devices for optimum performance and to prevent overflow onto walks, roadways, walls, buildings, and other structural elements, as much as possible.

#### R. TEMPORARY REPAIRS

1. The City reserves the right to make temporary repairs as necessary to keep the system equipment in operating condition. The exercise of this right by the City shall not relieve the Contractor of his responsibilities under the terms of the guarantee as herein specified.

#### S. EXISTING TREES

1. Where it is necessary to excavate adjacent to existing trees the Contractor shall use all possible care to avoid injury to trees and tree roots.
2. Excavation shall be by hand in areas where two-inch and larger roots occur.
3. All roots two inches or larger in diameter, except in the path of pipe or conduit, shall be tunneled under and shall be heavily wrapped with burlap to prevent scaring or excessive drying.
4. Where a trenching machine is run close to trees having roots smaller than two inches in diameter, the wall of the trench adjacent to the tree shall be hand trimmed, making clean cuts through.
5. Roots one inch and larger in diameter shall be painted with two coats of Tree Seal or equal.
6. Trenches adjacent to trees should be closed within twenty-four hours, and where this is not possible, the sides of the trench adjacent to the tree shall be kept shaded and moist with burlap or canvas.

#### T. FIELD QUALITY OF SYSTEM

1. If it is determined that adjustments in the irrigation equipment will provide proper and more adequate coverage due to plant blockage, architectural feature interference or other unforeseen design conflict, the Contractor shall make such adjustments prior to planting.

2. Adjustment, considered a normal function under this contract, may include, but shall not be limited to changes in nozzle, anti-drain valves, addition and/or deletion of heads. Fogging due to high pressure shall be corrected.
3. Lowering raised bubbler or sprinkler (Parks) heads by the Contractor shall be accomplished within 10 working days after notification by the City.
4. All bubbler or sprinkler (Parks) heads; drip emitters and boxes shall be set perpendicular to finished grades unless otherwise designated on the drawings.

## U. UNUSUAL FIELD CONDITIONS

1. Wind
  - a. The contractor shall make such adjustments as necessary, in location of sprinkler heads, nozzle size, nozzle type, or degree of arc, as required to compensate for localized breeze, or obstructions or wind conditions that may cause over-spray or improper spray patterns.
2. Variable Pressure
  - a. The Contractor shall observe and record water pressure and available flow in gallons per minute (GPM) at point of connection, every one hour for forty-eight hour period, to determine if existing water characteristics differ from the design pressure and available GPM data as supplied by the Water Department.
  - b. The Contractor shall notify the City, in writing, immediately prior to beginning the system installation. Failure to notify the City, the Contractor assumes all responsibility for corrections at no additional cost to the City.
3. Pressure Regulator
  - a. For pressure over 100 PSI, the Contractor shall install a pressure regulator at point of connection prior to backflow device, factory present to design pressure.
4. Pressure Compensating Nozzles
  - a. Installation of pressure compensating nozzles to prevent fogging shall be considered as a normal adjustment to system.
5. Anti-Drain Units

- a. Anti-drain valve units shall be installed on all heads in system that demonstrates drain-down when the system is in the off position, and shall be considered as a normal adjustment to the system.

## V. LANDSCAPING

### A. MATERIALS

1. See the City approved Plant Material List included in these specifications for plant materials. Substitutions of plant material not included on the approved list will be considered upon written request to the City's Authorized Representative.
2. Soil Analysis
  - a. Two copies of soil test performed by an approved agronomic soils testing laboratory shall be submitted to the City. All soil samples shall be taken in the field by a qualified soils technician in the presence of the City's Authorized Representative, unless otherwise approved prior to the commencement of any work. The test shall include fertility, salinity, and a suitability analysis with written recommendations given for soil amendment.
3. Planting Tablets are to be equal to "Gro-Power" or approved equivalent.
4. Commercial Fertilizer
  - a. Shall bear the manufacturer's statement of guarantee of analysis and shall meet the following minimum requirements: 9% nitrogen; 9% phosphoric acid; and 9% potassium.
5. Organic Soil Amendment
  - a. Shall consist of nitrogen fortified redwood, cedar or fir sawdust and shall contain minimum 1% available nitrogen.
  - b. Material containing manure, pipe, or other material shall not be accepted.
6. Mulch
  - a. Mulch shall be nitrogen fortified redwood chips and shall contain minimum 10% available nitrogen. A minimum of 3 inches of mulch shall be installed throughout the planter area.
7. Seed

- a. All seed used for lawn areas shall be labeled and shall be furnished in sealed standard containers.
- b. Seed that has become wet, moldy, or otherwise damaged in transit or storage will not be accepted.
- c. Turf Seed Mix – “Grande” Rhizomatous” Tall Fescue Seed Mix with a seeding rate of 522 pounds per acre (12 pounds per 1,000 square feet).

#### 8. Plants

- a. Plants shall be true to name and one of each bundle or lot shall be tagged with the name and size of plants in accordance with the standard of practice recommended by the American Association of Nurserymen.
- b. The root condition of plants furnished in containers shall be determined by removal of earth from the roots of not less than two plants nor more than 2% of the total number of plants of each species or variety except when container-grown plants are from several different sources; in which case, the roots of not less than two plants of each species or variety from each source shall be checked at the option of the City’s Authorized Representative.
- c. The selection of plants to be checked will be made by the City Authorized Representative.
- d. All plants rendered unsuitable for planting shall be considered as samples, and replacements shall be provided at no additional cost to the City. In case the sample plants are found to be defective, the entire lot or lots of plants represented by the defective samples shall be rejected.
- e. All trees and shrubs supplied by the Developer/Contractor shall be of the specified standard height and diameter set by the can Standard for Nursery Stock or as determined by the City. The height of the trees shall be measured from the root crown to the last division of the terminal leader and the diameter shall be measured five feet above the crown roots.
- f. The trees shall stand erect without support.
- g. Flatted Plants – ground cover plants and other plants shall be grown and remain in the flats until transplanted at the site. The soil and spacing of the plants in the flat shall ensure the minimum disturbance of the root system at time of transplanting.
- h. All plants should go through at least one growth cycle before acceptance by the City.

#### 9. Backfill Material

- a. All soil backfill shall be bulk mixed, not individually mixed at each plant pit.
- b. Topsoil shall be free of noxious weed seed and shall be of a loam characteristic, fertile and friable.
- c. Wood shavings shall be leached nitrogen fortified and shall be free of foreign matter.
- d. Soil used for backfill of planting pits shall be enriched using the following blend per cubic yard: 70% site soil or approved import; and 30% organic amendment.

#### 10. Stakes and Ties

- a. Tree stakes shall be a diameter of 2” X 10’ long and shall be free of knots, checks, splits, or disfigurements.

- b. Tree ties shall be 24” “Twist Brace Tips” or equal as approved by the City prior to installation.

#### 11. Iron Chlorosis

- a. After planting and during the plant establishment period in the event that trees exhibit iron chlorosis symptoms, apply FE 138 Geigy or equivalent at manufacturer’s recommended rates.

#### 12. Topsoil

- a. Topsoil shall consist of natural, fertile, friable, sandy loam soil possessing the characteristics of representative soils in the vicinity of which produce heavy growth of crops, grasses, or other vegetation and shall be obtained from natural well drained areas. Before removal of the topsoil, the surface at the source of supply is to be stripped to a depth of 2” in order to remove weed seeds, roots, clay lumps, and stones larger than 1” in size, noxious weeds, sticks, brush, litter, and other deleterious substances. In no case shall there be more than 5% by volume of stones larger than 1”, coarse sand, and small clay lumps.
- b. The soil shall be free from insoluble carbonates and shall have the following analysis, which shall be verified by a soil analysis made at the Contractor/Developer’s expense:
  - pH = Maximum of 7.0: Minimum of 6.0
  - EC<sub>o</sub> = Zero to Three Maximum (electrical conductivity)
  - ESP = Zero to Twelve Maximum (exchangeable sodium percentage)

### B. CONSTRUCTION

#### 1. Landscape Grading

- a. The Contractor/Developer shall cross rip all planted areas except slopes exceeding 3:1 to a minimum depth of 12” then complete preliminary grading filled as needed or removing surplus dirt, removing rocks and debris over 1” in diameter to a 6” minimum depth, bringing all areas to be landscaped within .1” of finish grade.

#### 2. Weed Control Measures

- a. Upon completion of all fine grading work and prior to soil preparation, perform weed control measures.
- b. Apply a pre-emergent (Roundstar G or approved equivalent) at a minimum rate of 150 lbs. Per acre.
- c. Irrigate all areas designated to be planted on which pre-emergent is applied for a minimum of 10 minutes per setting, two settings per application.

#### 3. Finish Grading

- a. After completion of all soil preparation work, the Contractor/Developer shall finish grade all planting areas filling as needed or removing surplus dirt, removing rocks and debris over 1 inch in diameter, and floating to a smooth uniform grade.
- b. All areas shall slope to drain. Flow lines shall be established to existing road curbs and/or sidewalk as shown on the Engineer's plans and as directed.

#### 4. Tree Planting

- a. For trees, plant holes shall be dug to size as indicated in the drawings.
- b. Before trees are set in the holes, a water test should be made.
- c. Trees are to be planted only in areas 10' in width or wider in the center of the planting areas.
- d. Trees are to be located a minimum of 25' from any streetlights and 10' from any power pedestals.
- e. Trees planted in approved areas and within 5' of any hardscape or infrastructure (buildings, curb and gutter, sidewalk, walls, etc.) are to have root barriers installed 24 inches deep and twice the diameter of the root-ball.
- f. All plant holes shall be filled to the brim with water and allowed to drain before any planting is done. If water does not drain out of the hole within 24 hours, this fact must be brought to the attention of the Landscape Architect so that corrections can be made. Correctional work shall be considered as an extra and shall be an additional expense to the Contractor/Developer.
- g. Soil surrounding the planting pit shall be in a friable condition and moist to a depth of 8".
- h. Backfill using specified soil mix to within 8" of finish grade. At this depth, place the plant fertilizer tablets, "Gro-Power", and quantities as directed in the drawing details.
- i. Trees shall be planted at such a depth that the crown roots bear the same relative position to finish grade as they did to the soils where they were grown. Backfill after planting shall be compacted carefully into place without injuring the roots of the tree or breaking up the ball (rootball) of earth surrounding the roots.

#### 5. Ground Cover Planting

- a. Soil preparation and fine grading shall be completed prior to ground cover planting.
- b. Mulch and fertilize ground cover areas using 1 cubic yard of wood shavings and 5 pounds of 16-16-8 fertilizer per 1,000 square feet.
- c. All ground cover and bare dirt areas that are not to be hydro-seeded are to be treated with a pre-emergent chemical (subject to approval by the landscape Architect prior to application). Chemicals are to be applied by a licensed Pest Control Agent. This treatment shall be applied at the times recommended by the manufacturer. The City's Authorized Representative shall be given a minimum of 48 hours (two working days) notice prior to each application. All chemicals must be applied in the presence of the inspector.
- d. Ground cover shall be planted in moist soil and spaced as indicated on the Plans.
- e. Each plant shall be planted with its proportionate amount of flat soil to minimize root disturbance. Soil moisture shall be such that the soil does not crumble when removing plants.

- f. Following planting, ground cover and shrub areas shall be regraded to restore smooth finish grade and to ensure proper surface drainage. A 1-inch layer of Type 1, 2, 3, or 4 amendments shall be spread over the planted areas. Watering shall begin immediately following the application of amendment.
  - g. When necessary to prevent plant damage from pedestrian traffic during the initial growing stage, the Contractor shall erect temporary protective fencing to be removed at the end of the plant establishment period.
- 6. Tree Staking - No metal wire shall circle any part of any tree.
- 7. Watering
  - a. It shall be the responsibility of the Contractor/Developer to maintain a balanced watering program to ensure proper growth until final acceptance of the work.
  - b. Immediately after planting, apply water to each tree or shrub. Apply water in moderate stream in the planting hole until the material around the roots is completely saturated from the bottom of the hole to the top of the ground.
  - c. Apply water in sufficient quantities and as often as seasonal conditions required to keep the planted areas moist at all times, well below the root system of the plants.
- 8. Start of Plant Establishment
  - a. The plant establishment period shall not start until all elements of the project that impact the landscaping are completed in accordance with the contract documents. If the project is segmented into phases, all plant material and amenities are to be established prior to each phase's placement into a 90-day maintenance period.
  - b. The plant establishment period for the project shall not begin until after the first mowing of all newly planted turf areas. New turf shall not be mowed until attaining a minimum height of 1-1/2 inches. Turf shall be maintained at a mowing height of 2 inches. Turf shall be rotary mowed at least once a week.
  - c. Any planting areas that do not show a prompt establishment of plant material shall be replanted at 10-day intervals until the plant material is established. If a good rate of growth has not been demonstrated within 30 days of first planting/hydro seeding, the Contractor/Developer shall be responsible to determine the appropriate horticultural practices necessary to obtain good growth.
  - d. The Contractor/Developer shall obtain agronomic soils testing of all areas not showing good growth and shall provide copies of the test results to the City to verify the appropriateness of all maintenance work performed. If additional fertilizers are needed, up to a maximum 25% beyond the amount specified, such amendments shall be provided by the Contractor at no additional cost to the City.
- 9. Permanent power to remote controllers shall be established and written acceptance from the City must be obtained prior to the start of the maintenance period.
- 10. Record As-Built Drawings

- a. The Developer/Contractor shall provide and keep up to date a complete as-built record set of blue line ozlid prints which shall be corrected daily and show every change from the original Drawings and Specifications, and the exact as-built locations, sizes and kinds of equipment. This set of Drawings shall be kept on site and shall be used only as a record set.
  - b. These Record Drawings shall also serve as work progress sheets, and the Developer/Contractor shall make neat and legible annotations thereon daily as the work proceeds, showing the work actually installed. These Drawings shall be available at all times for inspection and shall be kept in a location designated by the City's Authorized Representative.
  - c. Before the date of the final inspection, the Developer/Contractor shall transfer all information from the as-built prints to Auto CADD 2000 or equal and placed on a CD to be provided the City.
  - d. The Contractor/Developer shall dimension from two permanent points of reference, building corners, sidewalks, or road intersections, and the like of the locations of the following items:
    - 1. Connection of existing water lines.
    - 2. Connection of existing electrical power/telephone.
    - 3. Gate valves.
    - 4. Routing of sprinkler (Parks) or bubbler pressure lines (dimension maximum 100' along route, including all street crossings).
    - 5. Bubbler or sprinkler (Parks) control valves.
    - 6. Routing of control valves.
    - 7. Quick coupler valves and hose bibs.
    - 8. Other related equipment.
  - e. On or before the date of the final inspection, the Developer/Contractor shall deliver the corrected and completed Mylar's and CD to the City's Authorized Representative. Delivery of the Mylar's shall not indicate that the City has approved the as-builts as true and correct until verified and approved in writing.
  - f. Two 11" x 17" copies at a readable scale (as approved by the City) showing the irrigation layout, including controller(s), valves, wiring, the lateral per valve, etc. These sheets shall be laminated on both sides with a minimum of 10 mil plastic on each side (drawings may be shown on both sides of sheet). One additional copy to be enclosed in protective enclosure for each controller. Each station shall be highlighted with a different color.
  - g. The Developer/Contractor shall provide a complete list of take-offs; listing manufacturer and number of controllers, valves and sprinkler heads used.
11. All valves, RCVs, Quick Couplers, and junction boxes shall be marked with 3" domed survey markers placed on the A-curb (centered). Distances, valve type and number to all devices shall be clearly marked and an arrow shall be stamped on the marker indicating the device's direction.

## 12. Equipment to be Furnished

- a. Two sets of special tools required for removing, disassembling, and adjusting each type of sprinkler, valve supplied on this project and screws on valve boxes.

- b. Two 5' valve keys for operation of gate valves.
- c. Two keys for each automatic controller.
- d. One quick coupler key and matching hose swivel for each of the six quick coupling valves installed.
- e. One TRC Commander remote control for each controller installed.

### 13. Controller Charts

- a. The City's Authorized Representative shall approve as-built Drawings before controller charts are prepared.
- b. The charts (11" x 17" in size) shall show the area controlled by the automatic controller. This chart will show with different colors what areas each clock covers. It will have a minimum of two reference points – "streets, buildings, etc." and a directional indicator.
- c. The chart is to be a reduced drawing of the actual as-built mylers. It shall be permissible to use both sides of the chart for drawings.
- d. The chart in the protective enclosure shall show a different color highlighter for each station to indicate the area of coverage for each station. It will have a minimum of two reference points – "streets, buildings, etc." and a directional indicator.
- e. When completed and approved, the chart shall be hermetically sealed between two pieces of plastic, each piece being a minimum of 10 mil thick or 20 mil totals.
- f. These charts shall be completed and approved prior to final inspection of the irrigation system.

## C. MAINTENANCE

1. All areas landscaped by Contractor/Developer under this establishment period shall not be less than ninety days from the date of written acceptance for start of the plant establishment period.
2. Maintenance Tasks
  - a. During the contract period provide all watering, weeding, fertilizing, cultivation, and spraying necessary to keep the plants and turf in a healthy growing condition.
  - b. Keep the plant areas neat, edged, and attractive.
  - c. All trees and shrubs planted under the contract shall be pinched and pruned as necessary to encourage new growth and to eliminate sucker growth.
  - d. Old wilted flowers and dead foliage shall be immediately pinched or cut off.
  - e. Do not prune trees without written approval of the City's Authorized Representative.
3. The Contractor/Developer shall apply fertilizer ("Gro-Power") to all turf areas at a rate of 25 pounds per 1,000 square feet and all ground cover areas at a rate of 25 pounds per 1,000 square feet, at 30-day intervals, for three applications as a minimum, beyond the original soil preparation application.

4. During the plant establishment period, all flow lines shall be maintained to allow for free flow of surface water. Displaced material which interferes with drainage shall be removed and placed as directed. Low spots and pockets shall be graded to drain properly.
5. City approved erosion control netting shall be installed at flow lines and other locations where erosion is evident, when directed by the inspector.
6. Damage to planting areas shall be repaired immediately and throughout the plant establishment period.
7. Depressions caused by vehicles, bicycles, or foot traffic shall be filled and leveled. Replant damaged areas.
8. If any plant appears to be weak for any reason, during the maintenance period, that plant shall be replaced immediately with a new, healthy plant. At the end of the maintenance period, all plant materials shall be in a healthy growing condition and spaced as indicated on the plant plans.
9. All paved areas shall be washed and maintained in a neat and clean condition at all times.
10. Debris and trash shall be removed from the site every five days at a minimum.
11. All subsurface drains shall be periodically flushed with clear water to avoid build-up of silt and debris. Keep all drain inlets clear of leaves, trash, and other debris. Throughout the maintenance period, all plants shall be maintained in a disease and pest free condition. A licensed pest control operator shall be retained by the Contractor/Developer to recommend and apply all pesticides, herbicides, and fungicides. Eliminate gophers, moles, and all other animals or rodents and repair any damage.

**NOTES TO BE INCLUDED ON**  
**PARK PLANS**

## **STANDARD ENGINEERING AND COMMUNITY SERVICES REQUIREMENTS**

1. All work shall conform in accordance with the landscape maintenance assessment district standard specifications and requirements of the City of Victorville.
2. Before beginning construction, the contractor/developer must obtain all necessary permits from the city of Victorville.
3. The contractor/developer shall be responsible for contacting the underground service alert (USA) at 800-422-4133 at least two (2) working days prior to any excavation or trenching for exact underground utility locations.
4. It shall be the responsibility of the contractor/developer to protect all existing utilities from damage during construction, whether shown on this plan or not.
5. At least forty-eight (48) hours notice shall be given to the City of Victorville prior to all inspections. All inspections are scheduled through the Building Department by calling 760-955-5103.
6. It shall be the responsibility of the contractor/developer to protect surveying monuments in place. The contractor/developer shall be financially responsible for resetting any damaged or destroyed monuments.
7. All street crossings shall be installed in conduit as approved by the City Engineer (Schedule 40 PVC) with minimum cover to finish pavement grade of twenty-four (24) inches.
8. All excavations shall be backfilled at the end of each working day and roads shall be open to vehicular traffic.
9. A City Authorized Representative shall inspect all trench backfills. A Certification Of Compaction signed by a registered Civil Engineer shall be submitted for all trench backfills upon request.
10. The contractor/developer shall furnish the city with as-built drawings of all irrigation pipes, mains, valves and appurtenances.
11. The following as-built drawings are to be submitted to, and approved by, the city prior to accepting the site:
  - a. One CD of AS BUILTS drawn on Auto CADD 2000 or better.
  - b. Complete set of plans with as-builts.
  - c. Two laminated (10 mil) 11"x17" controller charts with each valve color-coded.  
The sheets should be scaled at 1"=40' or greater
12. Provide domed survey markers for all valves, RCV, quick couplers, and junction boxes. Place markers centered on top of the a-curb. Distances to the valves or devices shall be clearly marked with an arrow indicating direction of the device.
13. All backflow devices shall be tested and approved by a Certified Backflow Device Tester prior to the site being accepted by the City and a copy of the approved inspection report must be given to the City's Authorized Representative.
14. All irrigation controllers and CCU devices shall be tested and certified by Imperial Technical Services and a copy of the inspection report must be given to the City's Authorized Representative from the Community Services Parks Department.

## **MAINTENANCE PERIOD REQUIREMENTS**

1. Maintenance requirements
  - a. Upon written approval of the community services department, the maintenance period shall commence upon completion of all phases of the planting and irrigation installation. The maintenance period shall be for a period of ninety calendar days from the date of written approval by the city unless a longer period has been determined in advance.
  - b. If the assessment district landscaping and irrigation is unacceptable at the stipulated time period, the maintenance period will be extended until all corrections have been repaired to the satisfaction of the City Authorized Representative.
2. Maintenance procedures
  - a. The general care and maintenance of all areas shall consist of the proper watering, fertilizing, weeding, and clean up.
  - b. Cultivate and weed not less than once every ten days. During the course of the maintenance work, the contractor/developer shall remove surplus materials and debris from the site and shall keep the premises in a neat and clean condition at all times.
  - c. Approximately thirty days after the initial planting, apply 25 pounds of “Gro-Power”, or equal per 1,000 square feet and irrigate thoroughly. A second application shall be applied within 90 days of the initial planting.
  - d. The contractor/developer shall maintain the irrigation systems in a like new, operating condition, adjusting head heights, throw and spray arcs as necessary. The contractor/developer is responsible for proper watering of all plant areas and shall replace any material damaged due to improper irrigation.
  - e. Any concentrated development of weed growth that may appear in planting areas during the maintenance period shall be removed. The contractor/developer may elect to remove such concentrations of weeds manually or by an approved herbicide program.
  - f. During the maintenance period, the contractor/developer shall be responsible for maintaining adequate protection for all planting areas. Any damaged areas shall be repaired at the expense of the contractor/developer.
  - g. Pruning, when necessary, shall be performed as per city standards or upon direction of the City Authorized Representative.
  - h. During the maintenance period, the contractor/developer shall replace any dead or marginal plant material as deemed necessary by the City’s Authorized Representative.
3. Failure to maintain the assessment district to city standards may result in the suspicion of the maintenance period. Prior to re-entering the maintenance period, all corrections noted shall be completed to the city’s satisfaction.
4. All work and material will be guaranteed by the contractor/developer for a period of one year from the acceptance date.
5. Apply Ronstar G to bed planting at a rate of 150 pounds per acre or a city approved pre-emergent at the beginning and ending of the maintenance period in the presence of the City authorized representative

# **PLANT LIST FOR PARKS**

**CITY OF VICTORVILLE  
DEPARTMENT OF COMMUNITY SERVICES**

**APPROVED PLANT LIST FOR PARKS**

Note: Only plants on this may be used in the construction of parks and LMAD's. Prior written authorization must be obtained from the Golf Course and Grounds Manager or his/her designee in order to substitute other types of planting material.

**VINES FOR BLOCK WALLS**

NAME	TYPE	MAX. HEIGHT	MAX SPREAD
Hedera helix	ENGLISH IVY	6'	10'
Parthenocissus tricuspidata	BOSTON IVY	6'	10'

**VINES**

NAME	TYPE	MAX. HEIGHT	MAX SPREAD
Ampelopsis brevipedunculata	Blueberry climber	24'	20'
Hardenbergia violacea	NCN	2'	10'
Lonicera japonica "Halliana"	Hall's Honeysuckle	3'	3'-50'
Lonicera semperverens	Trumpet honeysuckle	3'	12'
Vinca major	Greater periwinkle	1.5'	10'+
Vinca minor	Dwarf periwinkle	1'	5'

**GROUNDCOVER**

NAME	TYPE	MAX. HEIGHT	MAX SPREAD
Atemisia caucasica	Silver Spreader	3"-6"	2'
Atemisia dracunculoides	True Tarragon	1'-2'	1'-2'
Atemisia frigida	Fringed Wormwood	1'-1.5'	1'-1.5'
Atemisia lactiflora	White Mugwort	4'-5'	
Atemisia pycnocephala	Sandhill Sage	1'-2'	
Baccharis pilularis	Twin Peaks/Dwarf Coyote Bush	8"-2'	6'+
Chamaemelum nobile	Chamomile	4'	1.5'
Coreopsis auriculata	Nana	5"-6"	2'
Coreopsis grandiflora	Coreopsis	1'-2'	3'
Coreopsis lanceolata	Lance Coreopsis	1'-2'	3'
Cotoneaster adpressus	Creeping Cotoneaster	1'	6'
Cotoneaster adpressus praecox	Early Cotoneaster	1.5'	6'
Cotoneaster congestus	Pyrenees Cotoneaster	3'	
Cotoneaster dammeri	Bearberry Cotoneaster	3"-6"	10'
Cotoneaster horizontalis	Rock Cotoneaster	2'-3'	15'
Euonymus fortunei	Winter Creeper	12-24"	20'+
Hemerocallis fulva	Tawney Daylily	6'	12'
Hemerocallis hybrids		1'-6'	2'-12'
Hemerocallis lilioasphodelus	Lemon Daylily	3'	6'

**GROUNDCOVER CONT'D**

NAME	TYPE	MAX. HEIGHT	MAX SPREAD
Hippocrepis comosa	NCN	3"	3'

Hypericum calycinum	Aarons Beard	1'	3'
Juniperus chinensis "Alba"	Variegated prostrata	1.5'	4-5'
Juniperus chinensis "Parsonii"	Prosrata Juniper	1.5'	8'
Juniperus chinensis "San Jose"	NCN	2'	6'
Juniperus chinensis procumbens	Japanese garden	2'	6'
Juniperus chinensis procumbens	Nana	1'	4'-5'
Juniperus chinensis sargentii	Sargent, Shimpaku	1'	10'
Juniperus horizontalis "Blue Chip"	NCN	1'	4-6'
Juniperus horizontalis "Douglasii"	Waukegan	1'	10'
Juniperus horizontalis "Emerald Spreader"	NCN	6"	--
Juniperus horizontalis "Hughes"	NCN	6"	--
Juniperus horizontalis "Plumosa"	NCN	1.5'	10'
Juniperus horizontalis "Prince of Whales"	NCN	8"	--
Juniperus horizontalis "Turquoise Spreader"	NCN	6"	--
Juniperus horizontalis "Wiltonii"	Blue Carpet	4"	8'-10'
Juniperus horizontalis "Yukon Belle"	NCN	6"	--
Juniperus sabina "Arcadia"	NCN	1'	10'
Juniperus sabina "Blue Danube"	NCN	1.5'	5'
Juniperus sabina Broadmoore"	NCN	14"	10'
Juniperus sabina "Buffalo"	NCN	8"-12"	8'
Juniperus scopulorum "White's silver king"	NCN	6'	8'
Juniperus squamata "Blue Carpet"	NCN	2'	5'
Juniperus virginiana "Silver spreader"	NCN	1.5'	6'-8'
Lonicera japonica "Halliana"	Hall's honeysuckle	15'	3'-50'
Rosmarinus officinallis "Huntington Blue"	Collingwood Ingram	2'-2.5'	4'+
Rosmarinus officinallis "Prostratus"	Dwarf Rosemary	1.5'	--
	Dwarf Rosemary	2	4'-8'
Salvia argentea	Silver Sage	1'	1'
Salvia argentea	Mealy-cup Sage	3'	3'

#### SHRUBS FOR PLANTERS LESS THAN 6' WIDE

NAME	TYPE	MAX. HEIGHT	MAX SPREAD
Abelia grandiflora	Glossy Abelia	8'+	5'+
Abelia grandiflora "Edward Goucher"	NCN	5'	4'
Cotoneaster "Hybrid Pendulus"	NCN	6'	5'
Euonymus japonica	Evergreen Euonymus	8'-10'	6'
Genista hispanica	Spanish Broom	1'-2'	2'-4'
Hypericum calycinum	Aaron's Beard	1'-3''	3'-4'
Juniperus chinensis "Ames"	NCN	6'	5'
Juniperus chinensis "Armstrongii"	Armstrong	4'	4'
Juniperus chinensis "Fruitland"	NCN	3'	6'
Juniperus chinensis "Gold Coast"	NCN	4'	4'
Juniperus chinensis "Golden Armstrong"	NCN	4'	4'
Juniperus chinensis "Mint Julep"	NCN	4'	6'
Juniperus chinensis "Phitzerana"	Nick's compact	2'	6'
Juniperus chinensis "Phitzerana"	Mordigan Aurea	3'	5'
Juniperus chinensis "Phitzerana"	Old Gold	4'	4'

#### SHRUBS FOR PLANTERS LESS THAN 6' WIDE

NAME	TYPE	MAX. HEIGHT	MAX SPREAD
Juniperus Sabina "Varigated"	Hoarfrost	3-4'	6'

Juniperus squamata "Blue Star"	NCN	2'	5'
Leucophyllum frutescens	Texas Ranger	5'-12'	3'-5'
Ligustrum japonicum "Rotundiflorum"	Japanese Privet	4'-5'	5'
Mahonia aquifolium	Oregon Grape	5'	5'
Mahonia bealei	Leatherleaf	6'	6'
Mahonia fremontii	Desert	3'-12'	6'
Mahonia repens	Creeping	1'	6'
Nandina domestica	Heavenly Bamboo	1.5'-6'	6'
Photinia fraseri	NCN	10'	6'
Rhaphiolepis indica	Indian Hawthorn	2'-5'	3'-5'
Salvia clevelandii	NCN	4'	4'
Salvia greggii	NCN	3'-4'	3'-4'
Salvia leucantha	Mexican Bush Sage	3'-4'	4'-5'
Salvia leucophylla	Purple Sage	3'-4'	2'-6'
Xylosma congestum "Compacta"	NCN	4'-5'	4'-5'

### SHRUBS FOR PLANTERS (6' WIDE OR WIDER)

Any of the above may be used in conjunction with the following list for planters 6 feet or larger in width.

NAME	TYPE	MAX. HEIGHT	MAX SPREAD
Abelia grandiflora "Francis Mason"	NCN	6'	10'
Berberis thunbergii	Japanese Barberry	6'	10'
Cotoneaster apiculatus	Cranberry cotoneaster	4'	6'-8'
Euonymus europaea	European spindle tree	25'	15'
Fallugia paradoxa	Apache plume	3'-8'	10'
Genista pilosa "Vancouver Gold"	NCN	1'-1.5'	7'
Juniperus chinensis "Fruitland"	NCN	3'	6'
Juniperus chinensis "Mint Julep"	NCN	4'-6'	6'
Juniperus chinensis "Phitzerana Glauca"	NCN	5'-6'	10'-15'
Juniperus chinensis "Sea Green"	NCN	6'-8'	4'-8'
Juniperus sabina "Moor-Dense"	NCN	1.5'	8'
Juniperus sabina "Variegated"	Hoarfrost	3'-4'	6'
Juniperus scopulorum "Table Top Blue"	NCN	6'	8'
Leucophyllum frutescens	Texas Ranger	5'-12'	4'-6'
Ligustrum japonicum	Waxleaf privet	10'-12'	8'
Ligustrum japonicum "Silver star"	NCN	6'-9'	6'-9'
Ligustrum japonicum "Texanum"	NCN	10'	8'
Mahonia bealei	Leatherleaf	6'	6'
Pittosporum tobira	Mock orange	6'-15'	2'-10'
Xylosma congestum	NCN	8'-25'	10'

### TREES FOR AREAS 5' to 8'

NOTE: Root barriers must be installed within 10' of any hardscape. Each tree is to be irrigated with two Rain Bird 1402 bubblers in perforated pipe. Two lodge poles with two twist braces nailed into stakes to support the tree. See the City approved Specifications and Details for exact types of materials and placements.

NAME	TYPE	MAX. HEIGHT	MAX SPREAD
Celtis pallida	Desert hackberry	18'	10'-15'
Celtis reticulata	Western hackberry	25'-30'	20'
Celtis sinensis	Chinese hackberry	30'-40'	20'-30'
Cercis canadensis	Eastern redbud	25'-35'	15'-25'
Cercis chinensis	Chinese redbud	10'-20'	10'
Cercis occidentalis	Western redbud	10'-18'	10'-15'

Cotinus coggygria	Smoke tree	25'	15'-20'
Crateagus ambigua	Russian hawthorn	15'-20'	10'-15'
Crateagus laevigata	English hawthorn	18'-25'	15'-20'
Dalea spinosa	Smoke tree	12'-30'	10'-15'
Fraxinus ornus "Raywood"	Raywood ash	25'-35'	25'
Koelreuteria bipinnata	Chinese flame	20'-30'	20'-30'
Koelreuteria paniculata	Goldenrain	20'-35'	20'-30'
Pistacia chinensis	Chinese Pistache	20'-40'	20'
Prunus cerasifera "Atopurpurea"	Purple leaf plum	25'-30'	15'-25'
Pyrus Bradford	Bradford Pear	25'-50'	20'-30'
Tilia cordata	Little Leaf Linden	30'-40'	15'-30'
Tilia tomentosa	Silver Linden	40'-50'	20'-50'
Velutina "Modesto"	Modesto Ash	40'-50'	20'-30'
Velutina	Arizona Ash	40'-50'	20'-30'

### TREES FOR AREAS 8' OR WIDER

NOTE: Root barriers must be installed within 10' of any hardscape. Each tree is to be irrigated with two Rain Bird 1402 bubblers in perforated pipe. Two lodge poles with two twist braces nailed into stakes to support the tree. See the City approved Specifications and Details for exact types of materials and placements.

NAME	TYPE	MAX. HEIGHT	MAX SPREAD
Cercidium microphyllum	Little Leaf Palo Verde	30'	20'
Juniperus osteoperada	Utah	30'	5'-10'
Parkinsonia aculeata	Mexican Palo Verde	15'-30'	15'-25'
Pinus eldarica	Mondell Pine	30'-80'	15'-30'
Pinus eldarica	Afghan Pine	30'-80'	15'-30'
Pinus halepensis	Aleppo Pine	30'-60'	30'-50'
Pinus pinea	Italian Stone Pine	40'-80'	30'-50'
Tilia Americana	American Linden	40'-60'	20'-25'
Zelkova serrata	Sawleaf	60'	40'-60'

## RABBIT RESISTANT PLANTS FOR ZONE 10

<u>NAME</u>	<u>BOTANICAL NAME</u>
ARTEMISIA (Sage)	ARTEMISIA spp.
ASH	FAXINUS spp.
BARBERRY	BERBERIS spp.
BEARD TONGUE	PENSTEMON spp.
BLACK DALEA	DALEA FRUTESCENS
BLUE EUPHORBIA	EUPHORBIA RIGIDA
BOXWOOD	BUXUS spp.
BUTTERFLY BUSH	BUDDLEIA spp.
CINQUEFOIL	POTENTILLA spp.
COLUMBINE	AQUILEGIA spp.
COREOPIS	COREOPIS spp.
COTONEASTER	COTONEASTER spp.
DAHLIA	DAHLIA HYBRIDS
TRAILING DALEA	DLEA GREGGII
DALEA	DALEA spp.
DAPHNE	DAPHNE spp.
DAYLILY	HEMERROCALLIS spp.
EUPHORBIA	EUPHORBIA spp.

**FAIRY DUSTER**

**FLOWERING QUINCE**

**GLOSSY ABELIA**

**HEAVENLY BAMBOO**

**HESPERALOE**

**JUNIPER**

**KERRIA JAPONICA**

**TEXAS RANGER**

**MOST DASYLIRION**

**OREGON GRAPE**

**PINK FAIRY DUSTER**

**REDBUD**

**ROSEMARY**

**SAGE**

**SALVIAS**

**SUMAC, AROMATIC**

**THYME**

**COYOTE BRUSH**

**VERBENAS**

**WOOLLY BUTTERFLY BUSH**

**YARROW**

**CALLIANDRA spp.**

**CHAENOMELES spp.**

**ABELIA GRADIFLORA**

**NANDIAN DOMESTICA**

**HESPERALOE spp.**

**JUNIPERS spp.**

**KERRIA JAPONICA**

**LEUCOPHYLLUM spp.**

**DASYLIRION spp.**

**MAHONIA spp.**

**CALLIANDRA ERIOPHYLLA**

**CERCIS spp.**

**ROSMARINUS OFFICINALIS**

**SALVIA spp.**

**SALVIA spp.**

**RHUS spp.**

**THYMUS spp.**

**BACCHARIS**

**VERBENA spp.**

**BUDDLEIA MARRUBIFOLA**

**ACHILLEA spp.**

# **MATERIALS LISTS FOR PARKS**

City of Victorville  
Community Services – Golf and Grounds Division  
**APPROVED PRODUCT LIST FOR PARKS, LMAD'S AND DFAD'S**

**1. Backflow Preventer, Reduced Pressure Principle**

- a. ¾" through 2" diameter, with wye strainer and ball shut-off  
FEBCO 825Y-BV-S OR EQUAL
- b. 2-1/2" through 10" diameter, without wye strainer, with resilient seat, NRS gate valves  
FEBCO 825Y-RW OR EQUAL
- c. 2-1/2" through 10", with wye strainer, 150# flange connections with blow-out port  
WILKINS 975 OR EQUAL

**2. Backflow Enclosures**

- a. Aluminum alloy, vented with locking mechanism  
TSP"STRONG BOX" SERIES SBBC-AL OR EQUAL
- b. Aluminum alloy, vented, insulated for cold weather protection with locking mechanism  
TSP"STRONG BOX" SERIES SBBC-AL1 OR EQUAL
- c. R-30 insulation blanket is required on backflows 2" or smaller. Best choice is USA or equivalent.

**3. Gate Valves**

- a. 2" and smaller – threaded bronze body, NRS, star or cross handle  
NICO T-113K FOR 150 WOG OR HAMMOND IB645 OR EQUAL
- b. 2-1/2" and larger – threaded ductile iron body, NRS, 2" square top stem, resilient seat wedge, epoxy coated inside and out  
WATEROUS 500 SERIES OR EQUAL
- c. 2-1/2" and larger – mechanical/flange joint body, NRS, 2" square top stem, resilient seat wedge, epoxy coated inside and out  
WATEROUS 500 SERIES WITH APPROPRIATE GASKETS OR EQUAL

**4. Ball Valves**

- a. Brass body, threaded with handle  
HAMMOND 8204 OR NIBCO 580 OR EQUAL

**5. Angle Valves**

- a. 2" and smaller (without union) – bronze body cross handle, threaded ends  
HAMMOND 1B643 OR NIBCO T-311 OR EQUAL

**6. Quick Coupling Valves**

- a. Two piece body with locking rubber lid, 1" inlet  
RAINBIRD 44NP OR EQUAL
- b. ¾"x1" single slot couplet key  
RAINBIRD 44K OR EQUAL
- c. 1"x¾" swivel ell

City of Victorville  
Community Services – Golf and Grounds Division  
**APPROVED PRODUCT LIST FOR PARKS, LMAD'S AND DFAD'S**

- RAINBIRD SH-1 OR EQUAL  
d. 1"x1" swivel ell  
RAINBIRD SH-2 OR EQUAL

**7. Remote Control Valves**

- a. Plastic body, globe pattern, threaded ends, flow control stem with cross handle, electric solenoid  
RAINBIRD PEB-PRS-D OR EQUAL

**8. Pressure Regulator**

- a. Bronze body, threaded ends, adjustable stem with locking feature and internal filter screen, 50 to 200 psi range, 300 psi inlet, 25 psi to 75 psi range  
1" through 3" - WILKINS 600 SERIES OR EQUAL  
1" through 3" - WILKINS 500 SERIES OR EQUAL

**9. Central Control System (RainBird Maxi-Com)**

- a. Master Valve – 3" diameter or larger  
BERMAD OR EQUAL 710P
- b. Master Valve – 2" diameter or smaller  
RAINBIRD GB SERIES BRASS VALVE OR EQUAL
- c. Flow Sensor – 4" diameter or smaller  
RAINBIRD LFS SERIES BRASS OR EQUAL installed with an unspliced shielded cable in 1-1/4" conduit. Paige electric cable # P-7162-D or EQUAL.
- d. Larger than 4" diameter  
SATTLE WITH INSERT TYPE SENSOR
- e. Cluster Control Unit (CCU) 28 - RMK  
Outside – RAINBIRD CCU 28 - RMK  
In a Building – RAINBIRD CCU 28W – RMK

**10. Sprinklers**

- a. 4" pop-up with seal-a-matic check valve in head, pressure-regulating stem as required, 1/2" inlet  
RAINBIRD 1804-SAM OR EQUAL
- b. 12" pop-up with seal-a-matic check valve in head, pressure-regulating stem as required, 1/2" inlet  
RAINBIRD 1812-SAM OR EQUAL
- c. Plastic nozzles should be specified on the plans, if they are to be used, to fit RainBird 1800 and 600 series, fixed arc spray nozzles  
RAINBIRD 1800-B MPR SERIES OR EQUAL
- d. Fixed arc, to fit RainBird 1800 and 600 series  
RAINBIRD B-SS SERIES OR EQUAL
- e. Variable arc nozzle 0-330 degree, spray type, plastic body, to fit RainBird 1800 and 600 series  
RAINBIRD X-VAN OR EQUAL ("x" denotes the spacing)
- f. Impacts – Stainless steel, full or part circle, plastic nozzles with distance control.  
RAINBIRD 5000 - SAM, RAINBIRD FALCON 6504 OR EQUAL

**City of Victorville**  
**Community Services – Golf and Grounds Division**  
**APPROVED PRODUCT LIST FOR PARKS, LMAD'S AND DFAD'S**

**11. Bubblers**

- a. All full circle, pressure compensating, ½" inlet, plastic body, nonadjustable  
RAINBIRD 1401 SERIES
- b. All full circle, pressure compensating, ½" inlet, plastic body, nonadjustable, on pop-up body  
PA-80 ADAPTER

**12. Boxes**

- a. Green plastic boxes for all valves and wires with two # 8 stainless steel metal fasteners, 1" length round head and spanner drive.
- b. Supply 2 spanner screwdrivers per ten valve boxes.  
BROOKS OR EQUAL

**13. Valve Markers**

- a. 3" diameter domed head valve survey markers, solid brass with 2" shank, stamped with ¼" lettering with each valve type and it's number.  
BEN MEADOWS CO. 101328 OR EQUAL

**14. Booster Pump Assembly**

- a. A simplex water pressure booster system as designed and fabricated by Barrett Engineered Pumps and provided by Imperial Technical Services (714) 792-2920. The system shall be a completely prefabricated system with pump, piping, electrical and structural elements. The entire booster pump assembly shall be UL listed and approved.
- b. Pump shall be :
  - 1) (GA Series) Single stage end suction close coupled centrifugal, cast iron bronze fitted construction, equipped with mechanical shaft seal, back pullout design. Impeller shall be threaded directly to the end of the shaft. Pump shaft shall be stainless steel with no sleeve. Pump shall be directly coupled to a C-face electric motor.
  - 2) (C### Series) single stage end suction close coupled centrifugal, cast iron bronze fitted construction, equipped with mechanical shaft seal, back pullout design. Impeller shall be keyed and locked to the shaft with a hex head impeller nut and washer. Pump shaft shall be high strength S.A.E. 1045 carbon steel protected in the stuffing box area by a replaceable bronze shaft sleeve. Pump shall be directly coupled to a C-face electric motor.
  - 3) (CR Series) Vertical Multi-Stage Centrifugal. Pump construction shall be cast iron stainless fitted with cast iron casing, stainless steel impellers and bowls. Pump shall be equipped with tungsten carbide mechanical seal. Pump shall be directly coupled to a C-face electric motor.

**City of Victorville**  
**Community Services – Golf and Grounds Division**  
**APPROVED PRODUCT LIST FOR PARKS, LMAD'S AND DFAD'S**

- c. Electric motor shall be of the squirrel cage induction type suitable for full voltage starting. Motor shall be ODP to aid in cooling. Electric motor shall be rated for continuous service. The motor shall have horsepower ratings such that the motor will carry the maximum possible load to be developed under the designed pumping conditions and not overload the motor beyond the nameplate rating of the motor. Motor shall have a 1.15 service factor. The motor shall conform to the latest NEMA Standards for motor design and construction.
- d. Pump Control Panel shall have a NEMA 4X plain front non-metallic enclosure with padlock latches. This includes power and control re-settable thermal circuit breakers, heavy duty magnetic starter with adjustable overload protection, Hand-off-auto switch to select mode of operation, and heavy duty numbered terminal strips for power and control wiring lead terminations.
- e. Metal oxide varistor protected pump start relay(s) incorporated in panel to start pump with signal from each irrigation controller.
- f. All system piping shall be type "L" copper. All fittings shall be copper or brass, with unions or flanges to allow for system disassembly or major component removal. System shall incorporate an integral full size bypass line with isolation valve to allow for pump removal and repair without disrupting water supply to system.
- g. Isolation valves shall be all brass quarter turn ball valves with hard chrome ball on lines 2" and less. Isolation valves shall be lug style butterfly valves with Buna-N elastomeric seats, ductile iron nickel coated disc, and stainless steel stem with handle and 10 position galvanized memory plate on lines 2' 1/2" and greater.
- h. Gauges shall be 2-1/2" diameter face, glycerin filled with stainless casing and brass internals.
- i. Flow activated paddle style magnetically coupled flow switch, sensitive to flows as low as 1 fps, mounted on piping and interconnected to time delay relay to shut down pump on no-flow conditions, time delay relay adjustable from 0 to 5 minutes.
- j. Pump system shall be mounted on a structural aluminum skid with mounting flanges on front and back to allow for mounting of skid to concrete pad. Skid equipped with pipe support on suction and discharge piping. All nuts and bolts and washers to be heavy zinc coated steel on skid and piping. Skid shall include mounting hardware for integral aluminum enclosure.
- k. The system enclosure shall be vandal and weather resistant, marine grade aluminum alloy 5052-H32 construction with rectangular punch-outs for viewing and heat dissipation. The enclosure shall be low profile hinged top design with padlock provision. The cover shall be secured to the concrete pad with stainless steel hardware.
- l. Pump Assembly shall include the following option(s):
  - 1) (VFD) Where specified by the System Design Parameters, a Variable Frequency Drive system to convert incoming 1 phase power to 3 phase power for the motor.

City of Victorville  
Community Services – Golf and Grounds Division  
**APPROVED PRODUCT LIST FOR PARKS, LMAD'S AND DFAD'S**

VFD system to receive feedback signal from system mounted stainless steel pressure transducer, and in conjunction with internal software driven PID control loop maintain customer adjustable constant system discharge pressure by varying the speed of the pump in response to varying system load.

- m. The services of a factory representative or trained service professional shall be made available on the job site to check installation and perform the startup and instruct the operating personnel. A startup report containing voltage and amperage readings, suction and discharge pressure readings, estimated flow conditions, and general operating characteristics shall be submitted to the owner.
- n. Four sets of operating and maintenance manuals shall be provided to the owner after startup and shall include parts manuals for major components, performance curve for pump, general sequence of operations, and electrical schematic for control panel.

**15. Products**

**a. Conduit**

All communication cable interconnect conduit and conduit fittings shall be 1-1/2" Schedule 40 PVC pipe, unless otherwise noted.

**b. Conductors**

- 1) Communication Path – Link Radio communication for the irrigation interconnect as required from the Cluster Control Unit(s) (CCU) to the satellite unit(s) shall be 2 watt, 450 MHz Data radio/modem unit(s) with RS-232 cable from Cluster Control Unit and satellite unit to radio/modem unit (9 pin only), RG-58 antenna cable, antenna (as specified).
- 2) The flow sensor wire shall be a two conductor of ICEA class B, 16 AWG 7 strand, conforming to ASTM B-3 and B-8, aluminum shield with drain wire, and shall have a jacket of 0.50 sunlight and moisture resistant PVC as manufactured by Paige Electric, Inc. (product # P7162D).
- 3) Flow sensor wire may be extended to a maximum distance of 2,000 feet from the location of the assembly to which it is connected. Wire shall be installed in a 1" PVC Schedule 40 pipe.
- 4) All conductors shall be the same type and shall be of the sizes shown on the drawings as required for proper operation of the systems.

**c. Wire Splices**

- 1) Conductors shall be installed with no underground splices, unless absolutely necessary and unavoidable. Any and all underground splices that are required to

City of Victorville  
Community Services – Golf and Grounds Division  
**APPROVED PRODUCT LIST FOR PARKS, LMAD'S AND DFAD'S**

be made, must be approved by the Architect, and shall be placed in a suitable type valve box for easy access.

- 2) Wire splices on the two conductor cable communication wires shall be made with 3M DBY splice kit.

**16. Controller**

**a. Automatic Controller(s) and Related Equipment**

- 1) Controller(s) shall be as indicated on the drawings, and will be manufactured by Rain Bird Sprinkler Manufacturing Corp. Controller shall be installed per manufacturer's specifications, as shown on the drawings, and as specified herein. All controllers shall be Rain Bird Model # ESP-SAT-XX.
- 2) The irrigation system controller shall be of a hybrid type that combines electromechanical and microprocessor based circuitry capable of fully automatic, semi-automatic, and manual operation. The controller will be housed in a weatherproof, lockable 16 gauge seamless steel cabinet suitable for wall mounting or free standing pedestal mounting.
- 3) The controller shall operate on a 117 VAC "10% at 60 Hz and be capable of actuating up to two 24 VAC, 7 VA, solenoids per station plus a master valve or pump start relay. The controller shall operate two (up to nine) stations plus the master valve simultaneously. Controller output and input shall be protected against severe electrical surge.
- 4) The controller shall have four separate irrigation programs (A, B, C & D) which may have different start times, watering days and station timing. Each program shall be capable of up to 8 starts times per day.
- 5) The controller shall have 12, 16, 24, 28, 32, 36 or 40 stations, each capable of an operating time of 0 to 2 hours in one minute increments. Stations assigned to the Drip program shall be capable of an operating time of 0 to 59 minutes in 1 minute increments and 1 to 12 hours in 10 minute increments. The controller shall be capable of automatic sequential stacking to avoid overlapping operation, except for the Drip program, which will operate concurrently with the other programs.
- 6) The controller shall provide a separate water budget feature for each of the A, B, and C programs. Water budget shall allow simultaneous adjustment for all stations on a program from zero % of set running time to 200% of set running time. Adjustments shall be in 10% increments.

**City of Victorville**  
**Community Services – Golf and Grounds Division**  
**APPROVED PRODUCT LIST FOR PARKS, LMAD'S AND DFAD'S**

- 7) The controller shall have a 365-day calendar with day-of-the-month OFF feature. Programs will run on an ODD/EVEN day cycle, day-of-the-week ON/OFF cycle or in cycles from 1 to 99 days. In addition, the controller shall have a programmable rain shut down from 1 to 99 days.
- 8) The controller shall have a master valve/pump start circuit for use with a master valve to pressurize the system when the irrigation cycle starts, or to activate a remote pump start relay to run the pump during the irrigation cycle. The master valve/pump start circuit shall be ON/OFF programmable by station.
- 9) The controller shall be capable of being operated manually at any time. A manual single station, a group of stations or a program can be selected to run for a programmed time or a new time setting without affecting the normal program.
- 10) The controller shall be capable of operating a variable test program without affecting the controller's normal program station times. The variable test program shall be from 1-9 minutes. This feature shall be functional even during rain shutdown.
- 11) The controller shall have Cycle + Soak water management feature that is capable of operating each station for a maximum cycle time and a minimum soak time to reduce water run-off and puddling. The maximum cycle time shall not be extended by water budgeting.
- 12) The controller shall have internal non-volatile memory capable of program memory retention for a minimum of 10 years without power. The controller shall include a NiCad 9 VDC rechargeable battery and recharging circuit which will maintain and run the time of day operation during power outages of up to 48 hours. Recharging circuit shall also be used for counting down the program-in-progress during a power outage and allow programming of the controller when disconnected from the main power supply.
- 13) There shall be status indicator lights for each station plus the master valve circuit. Each station plus the master valve will be protected by a diagnostic circuit breaker which will allow that station to be bypassed during the program. These lights will indicate station operation and circuit integrity.
- 14) An indicator for sensor status will be on the front panel along with a switch to suspend sensor operation. This indicator and override will work with a sensor wired to the controller's sensor terminals.
- 15) During operation the unit shall provide a monitoring readout indicating station in operation and time remaining. The satellite shall have a 12 hour AM/PM or 24 hour clock.

City of Victorville  
Community Services – Golf and Grounds Division  
**APPROVED PRODUCT LIST FOR PARKS, LMAD'S AND DFAD'S**

- 16) Under all normal operation, all station timing of the satellite unit shall be done by the central control computer through the CCU and not according to the times programmed at the satellite. The programming on the satellite unit itself shall only be functional in case of emergency, should the communication link between the satellite and the CCU is lost. It shall be strictly for a stand-by operation of the satellite in case of emergency. The change over to the stand-by program and/or back to the central control status shall take place automatically and not require a trip to the field to set each satellite unit to the back-up mode or the central mode.
- 17) The controller, when operated by the CCU shall be capable of random access or operation of the individual stations and is not required to be operated in numerical sequence. Any of the stations may be repeated anywhere within the scheduled cycle of operation as often as desired and for a different amount of time on each repeat, if so desired. It shall also be possible to place any individual station in as many different scheduled cycles as may be desired. There shall be no limit or restrictions as to the number of individual scheduled cycles a given station may be scheduled in at any one time.
- 18) In local field control and operation, the controller shall be capable of being manually operated on any one of the stations for single-station operation, any portion of a cycle or a complete cycle manually started, as desired. This shall be possible without moving the central control— independent station control satellite switches from the central control position. When the central control-independent station controller satellite switch is in the independent station controller satellite position, the satellite unit will ignore all central control communications and programming and respond only to its own programming as to start days, start times, and individual station timing, operating the stations as programmed and performing all functions as normal stand-alone controller.
- 19) The controller shall have two internal jumpers to allow the operator the opportunity to choose from either a factory default or no default and from an electronic style backup verses mechanical style backup.
- 20) Each controller unit shall be capable of being programmed in the field (at the time of installation) to respond to one of 28 different signals (or channels) from the CCU. The unit shall be capable of being reprogrammed to a different signal (channel) at any time. Satellites of 32 or 40 stations shall use 2 different signals (or channels).

**17. Cluster Control Unit Assembly**

- a. The number and location of the cluster control unit(s) shall be shown on the drawing and shall be as manufactured by Rain bird Sprinkler Manufacturing Corporation.

- 1) CCU shall be no less than twenty eight channels (CCU-28).

City of Victorville  
Community Services – Golf and Grounds Division  
**APPROVED PRODUCT LIST FOR PARKS, LMAD'S AND DFAD'S**

- b. Each cluster control unit shall have a separate two-wire path to the satellite controllers under its control. This wire link shall be of the wire type, installed and herein specified. Through Link Radio communication, the CCU shall have a separate radio path to the satellite controllers under its control. The radio link shall be of the type, installed and herein specified.
- c. The cluster control unit shall connect directly to the telephone company lines via standard connector Model RJ11C, in full compliance with part 68, FCC docket 19528 or local telephone company standards.
- d. The cluster control unit assembly shall be pre-assembled by Imperial Technical Services (ITS) in a "Strong Box" stainless steel weatherproof, vandal resistant, lockable enclosure with flush mounted handle as manufactured by V.I.T. products, Inc., per article 2.7. The complete assembly shall be listed with Underwriters Laboratories, Inc., with a 3R rating.
- e. The cluster control unit assembly (product # ISA series) shall consist of a stainless steel enclosure with a removable backboard, key operated on/off switch, ground fault circuit interrupter duplex receptacle and ground rod, wire and clamp. This assembly shall also include a 117 volt line primary protection (product #SP).
- f. The cluster control unit assembly group shall include a rain gauge roof or pole mounted assembly (Link Radio product # LSRG or LSRGP) as shown on the drawings to be properly located to avoid interference from trees and buildings and connected to the nearest cluster control unit. This assembly shall consist of a rain gauge pulse decoder and mounting bracket.
- g. The cluster control unit assembly shall be covered by a five-year limited warranty. Warranty service shall be performed in the field on the site where the equipment is located.
- h. All components shall be properly wired to the appropriate terminal strip.

**18. Satellite controller and/or Cluster Control Unit(s) (CCU) Enclosure(s)**

- a. The enclosure shall be of a vandal and weather resistant nature manufactured entirely of 304 grade stainless steel. The main housing shall be louvered upper and lower body to allow for cross-flow ventilation. A stainless steel backboard shall be provided for the purpose of mounting electronic and various other types of equipment. The backboard shall be mounted on four stainless steel bolts that will allow for removal of the backboard. The required enclosure types shall be one of the following: 16" top entry, 18" X 52" electrical meter/controller, or 18" double-wide front entry.
- b. The inside door area shall provide adequate storage for plans, operating instructions and scheduling information.
- c. The enclosure door shall have a continuous stainless steel piano hinge, carriage bolted on one side and a three point locking mechanism on the other side. The handle controlling the locking mechanism shall be located at the base of the door and be concealed within the surface of the

**City of Victorville**  
**Community Services – Golf and Grounds Division**  
**APPROVED PRODUCT LIST FOR PARKS, LMAD'S AND DEAD'S**

door. A stainless steel cam style lock shall be mounted in the door and a provision for a padlock shall be included within the locking mechanism.

- d. The enclosure shall be manufactured with a continuous drainage channel which mates with a teardrop shaped, hollow center, water-tight, thermoplastic door seal. The above described product shall be a NEMA 3R Rain-proof enclosure as listed by the Underwriter Laboratories, Inc.
- e. Controller enclosures shall be "Strong Box" manufactured by V.I.T. Products Inc.
- f. Controller number(s) and remote control access number(s) shall be neatly stenciled onto outside of enclosure door in 2" high letters using paint designed for direct application onto stainless steel.

**19. Satellite Controller/Enclosure Assembly**

- a. The number and location of the satellites shall be as shown on the drawings.
- b. All satellite assemblies shall be linked to a CCU via link radio.
- c. The satellite assembly shall be pre-assembled by ITS in a Strongbox stainless steel weatherproof vandal resistant lockable enclosure with flush mounted handle as manufactured by V.I.T. Products, Inc., per article # 18. The complete assembly shall be listed by Underwriters Laboratories Inc., with a 3R rating.
- d. The satellite assembly (product # ISA series) shall consist of a stainless steel enclosure, stainless steel removable backboard, terminal interface board with radio remote receptacle, key operated on/off switch, a ground fault circuit interrupter duplex receptacle. Ground rod, wire and clamp shall be provided with two or multi-conductors paths only.
- e. The satellite assembly shall include a 117 volt line primary protection assembly (product #SP).
- f. The satellite assembly shall have a master valve relay assembly (product #MVR) when more than one satellite is connected to the same master valve. This assembly shall consist of a 24 volt relay and socket.
- g. The satellite assembly shall have a Flow Sensing Assembly and shall consist of a pulse transmitter and a tee mounted sensor only (product #LFS series).
- h. The satellite assembly shall be covered by a five-year warranty. Warranty service shall be performed in the field on the site where equipment is located.

**20. Radio Remote Control Equipment**

- a. Remote control components shall be as manufactured by Remote Control Technologies, WA. as provided by ITS.

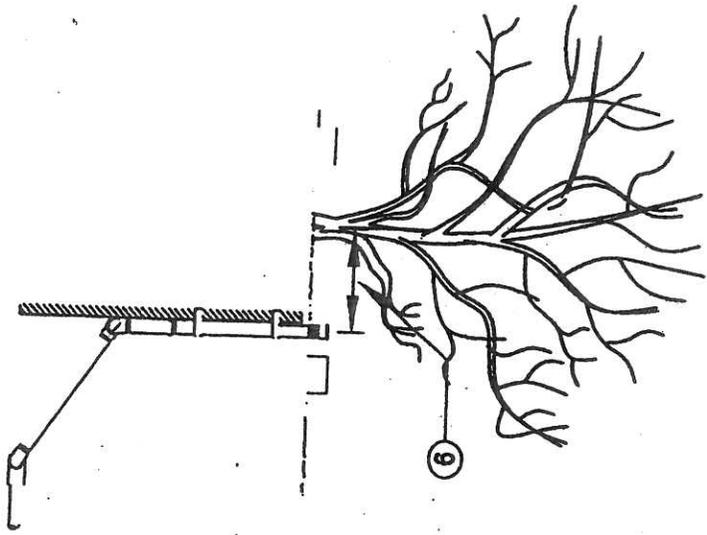
**City of Victorville**  
**Community Services – Golf and Grounds Division**  
**APPROVED PRODUCT LIST FOR PARKS, LMAD'S AND DFAD'S**

- b. Remote control receiver cards shall be a RCA permanent controller mount unit(s).
  - 1) TRC shall be compatible with all electromechanical slid state and hybrid controllers.
  - 2) Output 24 VAC to pump start or master valve.
  - 3) Activate up to 7 valves plus pump start or master valve at once.
  - 4) Programmable operating time of two (2) minutes to two (2) hours.
  - 5) 20 minute default shut-off time.
  - 6) Power is 24 VAC from controller.
  
- c. Remote control transmitter (RCX) kit(s) shall include a hand-held remote control transmitter with belt clip, battery charge/transformer 115 to 15 VDC, 11 volt NiCad battery and flexible antenna with BNC connection to unit. Transmitter shall have an effective range of one mile.

**21. Data Collection**

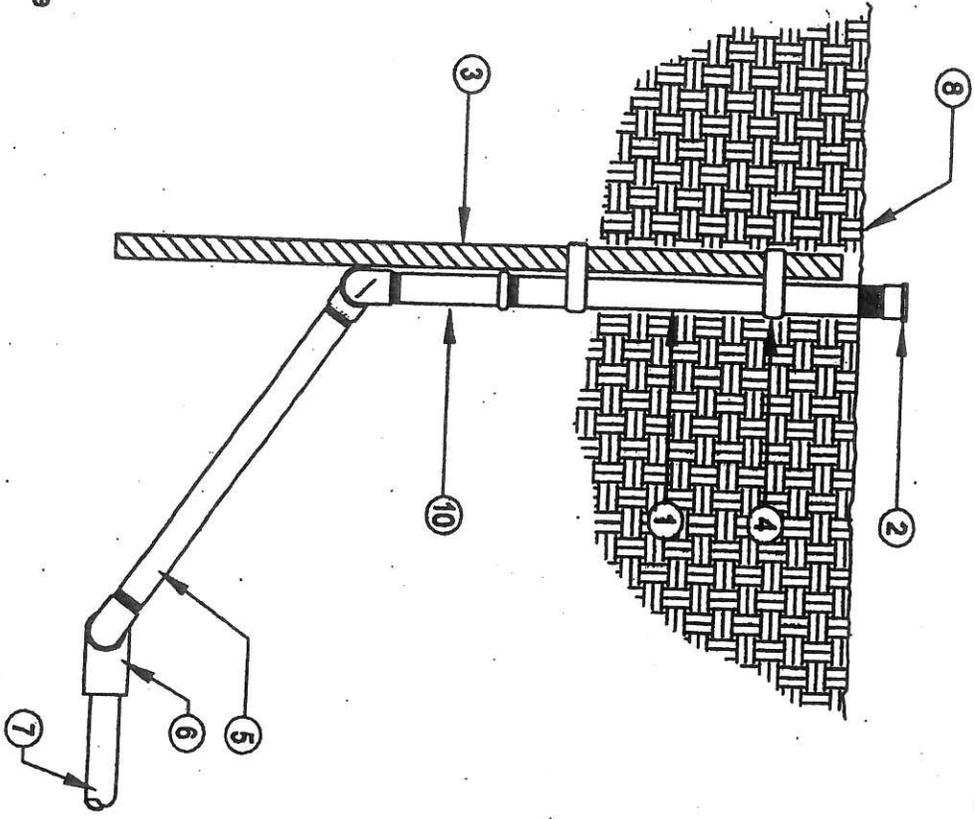
- a. Each controller shall also include data collection (#DAT Series).
  
- b. The data collection shall be represented by the # of stations on the specified controller (12-40 stations).
  - 1) The satellite assembly shall include #DATXX for the purpose of MAXICOM data collection for a XX station ESP satellite controller. This data collection is for the purpose of inputting collected field data such as station locations and types, flow data and precipitation rates (per manufacturers catalog), into a MAXICOM central computer and software for creating irrigation schedules.

# **DETAILS FOR PARKS**



**LEGEND:**

- ① 6" SCH 80 Nipple
- ② 1401 Rain Bird .25 Bubbler
- ③ 18" - #5 Rebar
- ④ (2) SS Hose Clamps
- ⑤ Prefabricated pvc sch. 80 Swing joint assembly (360°) or fabricated with:
- ⑥ 3 - street ell
- ⑦ 1 - 6" sch. 80 nipple
- ⑧ SCH 80 S x T90
- ⑨ ½" PVC Lateral Line
- ⑩ Finish Grade includes 3" of mulch
- ⑪ Spacing between bubbler & shrub 6"- 10"
- ⑫ KBI CV - 500 - FF Check Valve



**NOTES:**

1. All threaded fittings shall be wrapped with teflon tape (2 wraps)
2. Flush pipes prior to installing sprinklers
3. Install bubble head 1" above finish grade
4. Swing joint shall be same size as bubble head inlet.

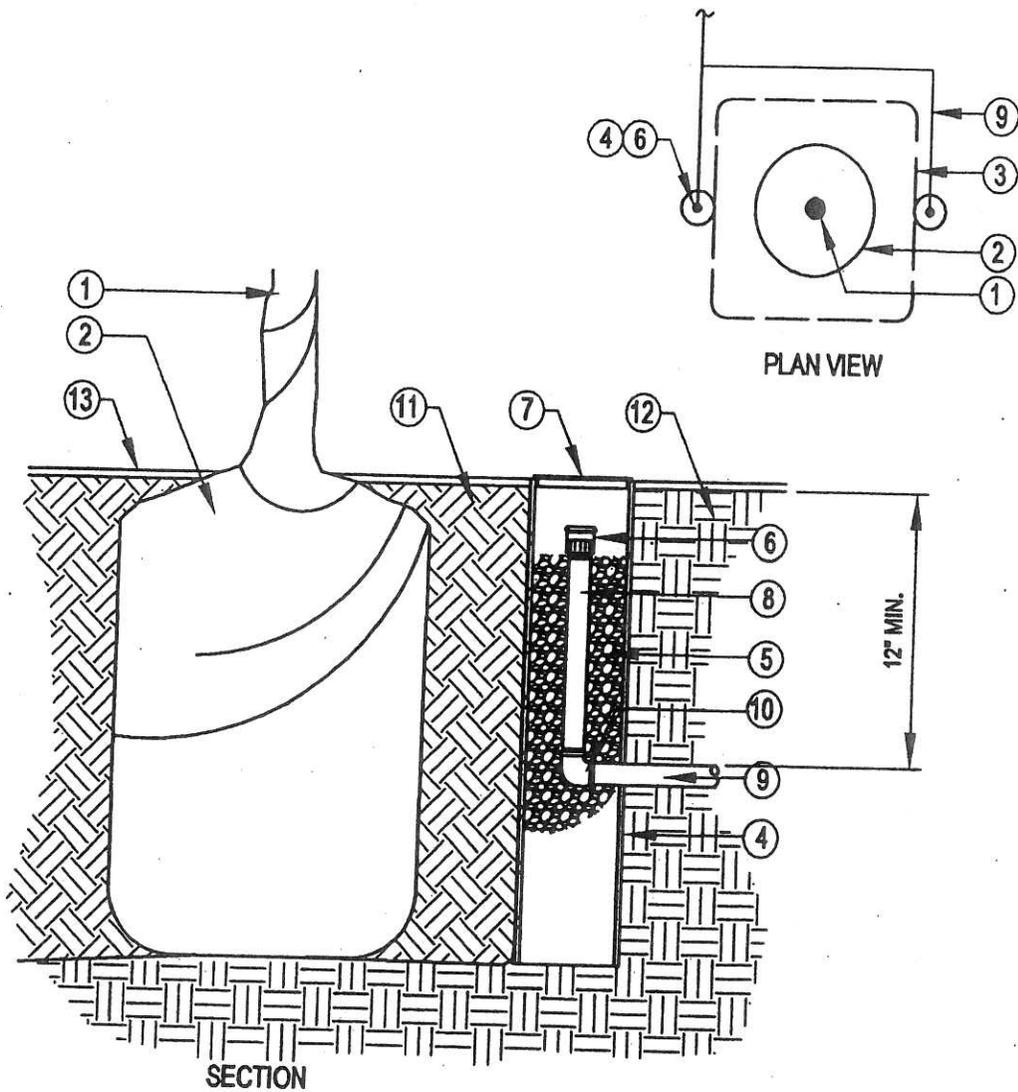


**CITY OF VICTORVILLE**  
 14343 CMVC DRIVE, VICTORVILLE, CA 92393  
**COMMUNITY SERVICES DEPARTMENT**

**PROJECT TITLE:**  
**BUBBLER & SWING JOINT ASSEMBLY**

DATE: 06/08/2008    SCALE: NTS    DRAWN BY: P. Tarnish

PLANNING	
BUILDING	
COMM. SERVICES	
ENGINEERING	
PAGE NO.	1



- ① Tree trunk
- ② Root ball
- ③ Edge of plant pit
- ④ Rigid PVC perforated pipe (4" ~ x depth of plant pit)
- ⑤ ¾ to 1" ~ pea gravel
- ⑥ Bubble nozzle
- ⑦ 4" ~ pvc cap or valve cover
- ⑧ PVC sch 80 nipple
- ⑨ PVC sch 40 lateral
- ⑩ PVC sch 80 S x T ell
- ⑪ Back fill mix
- ⑫ Native soil
- ⑬ Finish grade includes 3" of mulch

Notes:  
 1. Position perforated pipe on outside edge of plant pit wall. Face holes in pipe toward rootball.  
 2. See tree planting detail for additional requirements.

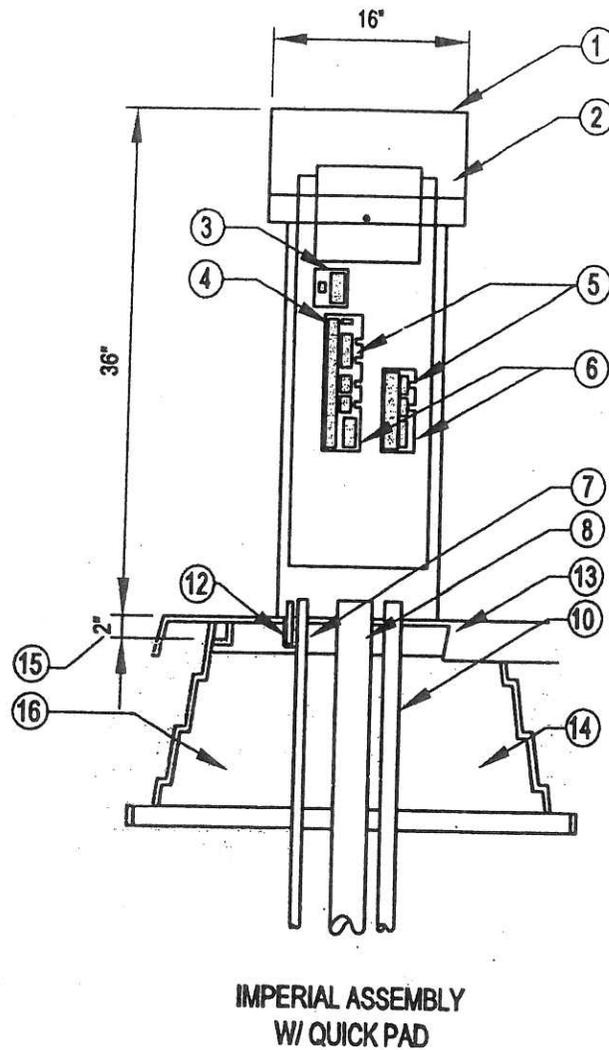
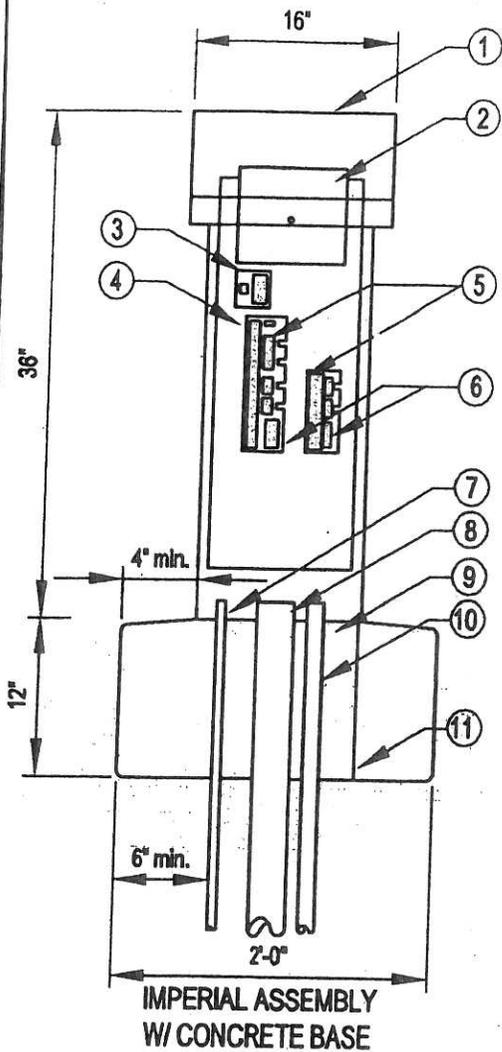


**CITY OF VICTORVILLE**  
 14343 CMC DRIVE, VICTORVILLE, CA 92383  
**COMMUNITY SERVICES**  
**DEPARTMENT**

PROJECT TITLE:  
**BUBBLER IN SLEEVE**

PLANNING
BUILDING
COMM. SERVICES
ENGINEERING
PAGE NO. 2

DATE: 12/14/2006    SCALE: NTS    DRAWN BY:



- ① Imperial assemblies 16" top entry controller assembly NEMA 3R rain proof enclosure (UL listed)
- ② Controller
- ③ Power switch/GFI receptacle
- ④ Master valve relay assembly or pump start relay assembly (optional)
- ⑤ Terminal board
- ⑥ Remote receiver connector (optional)
- ⑦ 1" PVC conduit for 120 vac from metered power supply
- ⑧ PVC conduit for control wires, size as required.
- ⑨ Fill voids with  $\frac{3}{8}$ " pea gravel
- ⑩ 1" pvc conduit for flow sensor cable palge cable P-7162-D( if applicable)
- ⑪ Poured concrete base
- ⑫ Mounting pad aluminum power coated performed pad 20" x 30"
- ⑬ Mounting pad base
- ⑭ Mounting pad mounting brace
- ⑮ Finish grade 2" below top of mounting pad
- ⑯ Fill voids with  $\frac{3}{8}$ " pea gravel

Note: All grounding requirements for controller assemblies shall conform to local electrical codes.

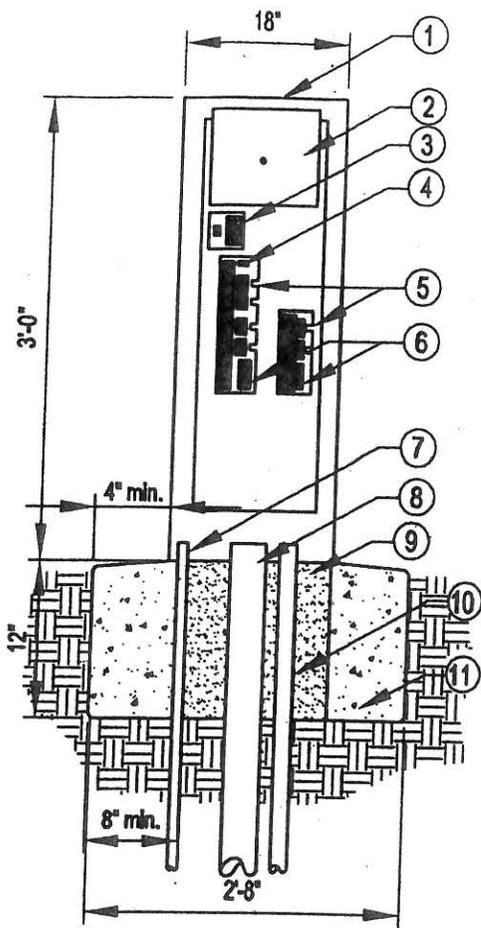


**CITY OF VICTORVILLE**  
14343 CMVC DRIVE, VICTORVILLE, CA 92393  
**COMMUNITY SERVICES  
DEPARTMENT**

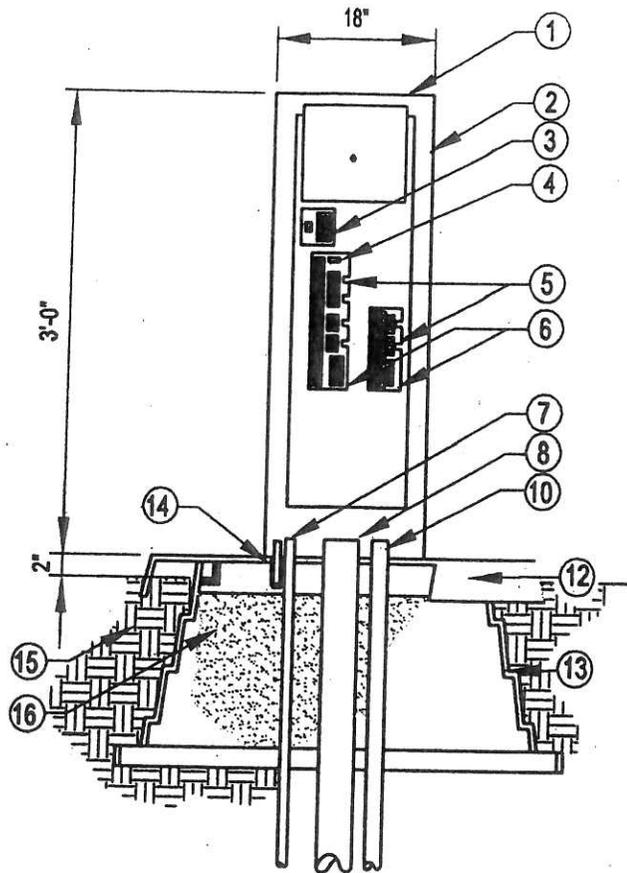
PROJECT TITLE:  
**16" X 16" TOP ENTRY CONTROLLER  
ASSEMBLY (ICA6 SERIES)**

DATE: 01/04/07    SCALE: NTS    DRAWN BY: P. Tamisin

PLANNING	
BUILDING	
COMM. SERVICES	
ENGINEERING	
PAGE NO.	3



**IMPERIAL ASSEMBLY  
W/ CONCRETE BASE**



**IMPERIAL ASSEMBLY  
W/ QUICK PAD**

- ① Imperial assemblies 18" top entry controller assembly NEMA 3R rain proof enclosure (UL listed)
- ② Controller
- ③ Power switch/GFI receptacle
- ④ Master valve relay assembly or pump start relay assembly (optional)
- ⑤ Terminal board
- ⑥ Remote receiver connector (optional)
- ⑦ 1" PVC conduit for 120 vac from metered power supply
- ⑧ PVC conduit for control wires, sizes are required.
- ⑨ Fill voids with  $\frac{3}{8}$ " pea gravel
- ⑩ 1" PVC conduit for flow sensor cable Paige cable P-7162- D (if applicable)
- ⑪ Poured concrete base
- ⑫ Mounted pad aluminum power coated performed pad 20" x 30"
- ⑬ Mounted pad base
- ⑭ Mounted pad mounting brace
- ⑮ Finish grad 2" below top of mounting pad
- ⑯ Fill voids with  $\frac{3}{8}$ " pea gravel

Note:

All grounding requirements for controller assemblies shall conform to local electrical codes.



**CITY OF VICTORVILLE**  
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**COMMUNITY SERVICES  
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PROJECT TITLE:

**18" X 24" CONTOLLER  
ASSEMBLY (ICA2 SERIES)**

DATE: 01/04/07

SCALE: NTS

DRAWN BY:

PLANNING

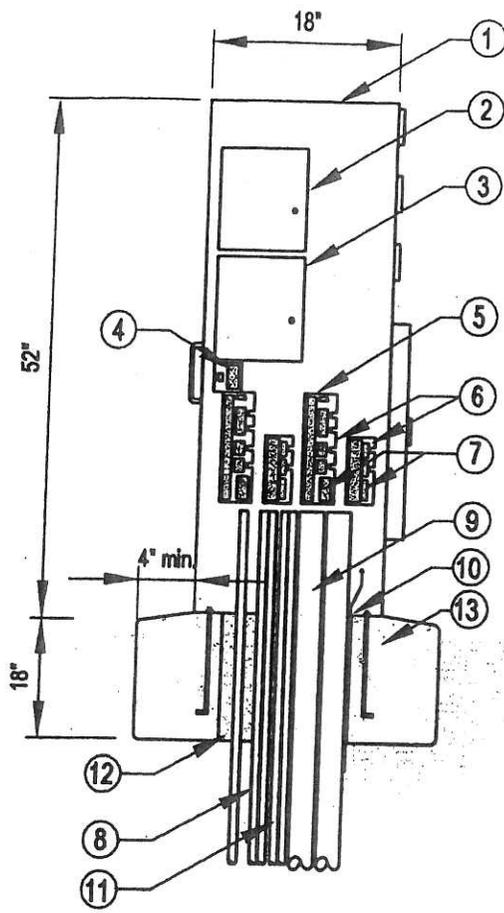
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SERVICES

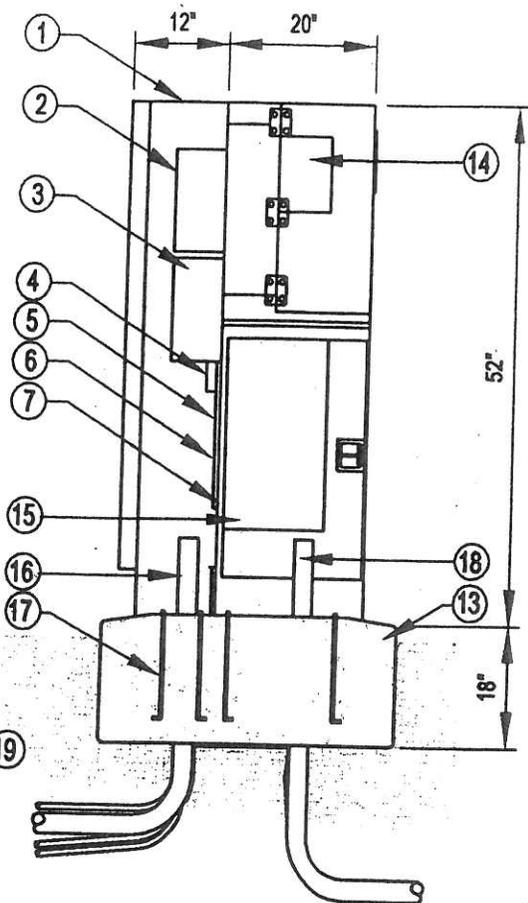
ENGINEERING

PAGE NO.

4



**IMPERIAL ASSEMBLY  
W/ CONCRETE BASE**



**IMPERIAL ASSEMBLY  
W/ QUICK PAD**

- ① Imperial assemblies metered controller assembly NEMA 3R rain proof enclosure (UL listed)
- ② Controller
- ③ Second controller
- ④ Power switch/GFI receptacle
- ⑤ Master valve relay assembly or pump start relay assembly (optional)
- ⑥ Terminal board
- ⑦ Remote receiver connector (optional)
- ⑧ 1" PVC conduit for 120 vac from metered power supply
- ⑨ PVC conduit for control wires, size as required.
- ⑩ #10 ground wire to ground lugs on the backboard.

- ⑪ 1" pvc conduit for flow sensor cable Paige cable P-7162-D( if applicable)
- ⑫ Fill voids with  $\frac{3}{8}$ " pea gravel
- ⑬ Poured concrete base
- ⑭ Meter socket with test blocks
- ⑮ Load center compartment, see model number for phase type, voltage, size of amp, size of amp for load center and the number of circuits.
- ⑯ PVC conduits for control wires, electrical, and flow sensing, size as required.
- ⑰ Stainless steel mounting base with  $\frac{3}{8}$ " stainless steel bolts anchor bolts in the concrete
- ⑱ PVC conduit and electrical power source
- ⑲ Finish grade

Note: All grounding requirements for controller assemblies shall conform to local electrical codes.

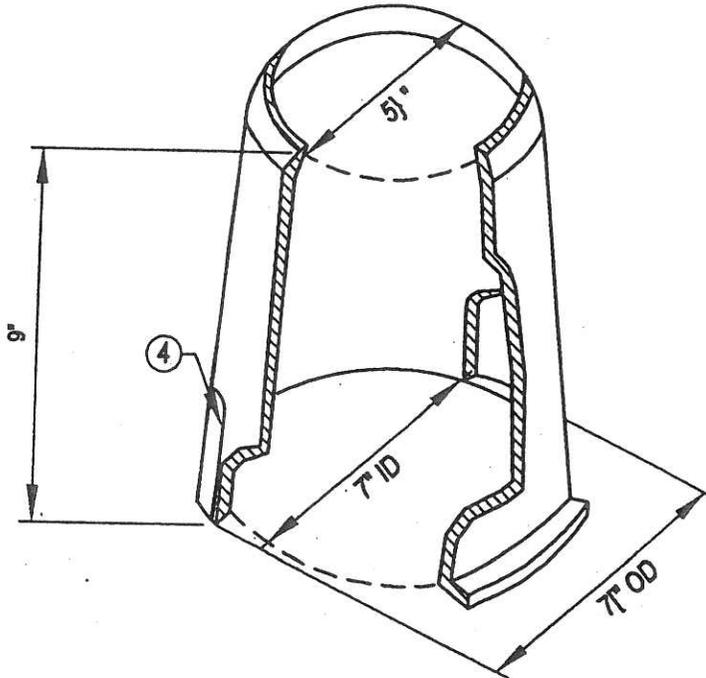
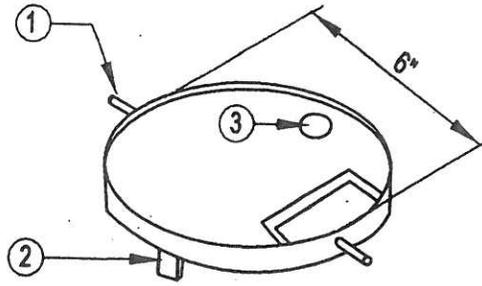


**CITY OF VICTORVILLE**  
14343 CIVIC DRIVE, VICTORVILLE, CA 92393  
**COMMUNITY SERVICES  
DEPARTMENT**

PROJECT TITLE:  
**18" X 32" METERED CONTROLLER  
ASSEMBLY (ICA5 SERIES)**

DATE: 01/16/07    SCALE: NTS    DRAWN BY: P. Tamishin

PLANNING	
BUILDING	
COMM. SERVICES	
ENGINEERING	
PAGE NO.	5



- ① Location of #8 screws (see note)
- ② "Snap- lock" tab
- ③ Cover lift hole
- ④ 2" x 2" pipe slots (2 places)

Notes:

- 1. Use brooks xx series or equal
- 2. Spanner screw  $\frac{3}{8}$ " - 2", anti- theft.
- 3. Cover st. - 5 oz.
- 4. Body wt. 1 lb. 6 oz



**CITY OF VICTORVILLE**  
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**COMMUNITY SERVICES  
DEPARTMENT**

PROJECT TITLE:

**SMALL COVER BOX DETAIL**

PLANNING

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SERVICES

ENGINEERING

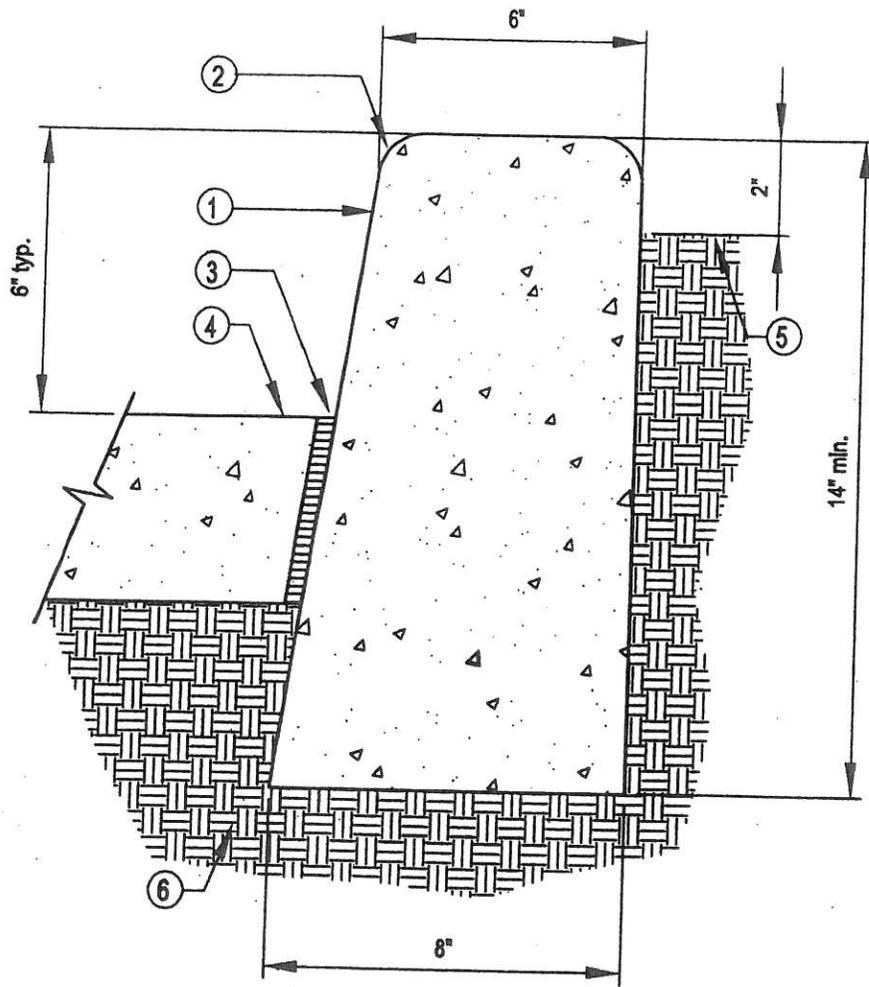
DATE: 12/18/06

SCALE: NTS

DRAWN BY: P. Tarnishin

PAGE NO.

6



SECTION

- ① Concrete planter curb (2800 psi @ 28 days w/ medium broom finish all exposed surfaces). Provide control joints @ 20' o.c. & expansion joints @ 120' o.c.
- ② 1/2" radius (typical)
- ③ Expansion joint (3/8" thk. fiber material). Install where concrete strip abuts any concrete improvement
- ④ City sidewalk - approved Engineering Department
- ⑤ Finish grade includes 3" of mulch
- ⑥ 90% compacted subgrade



**CITY OF VICTORVILLE**  
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**COMMUNITY SERVICES  
DEPARTMENT**

PROJECT TITLE:

**"A" CURB DETAIL**

PLANNING

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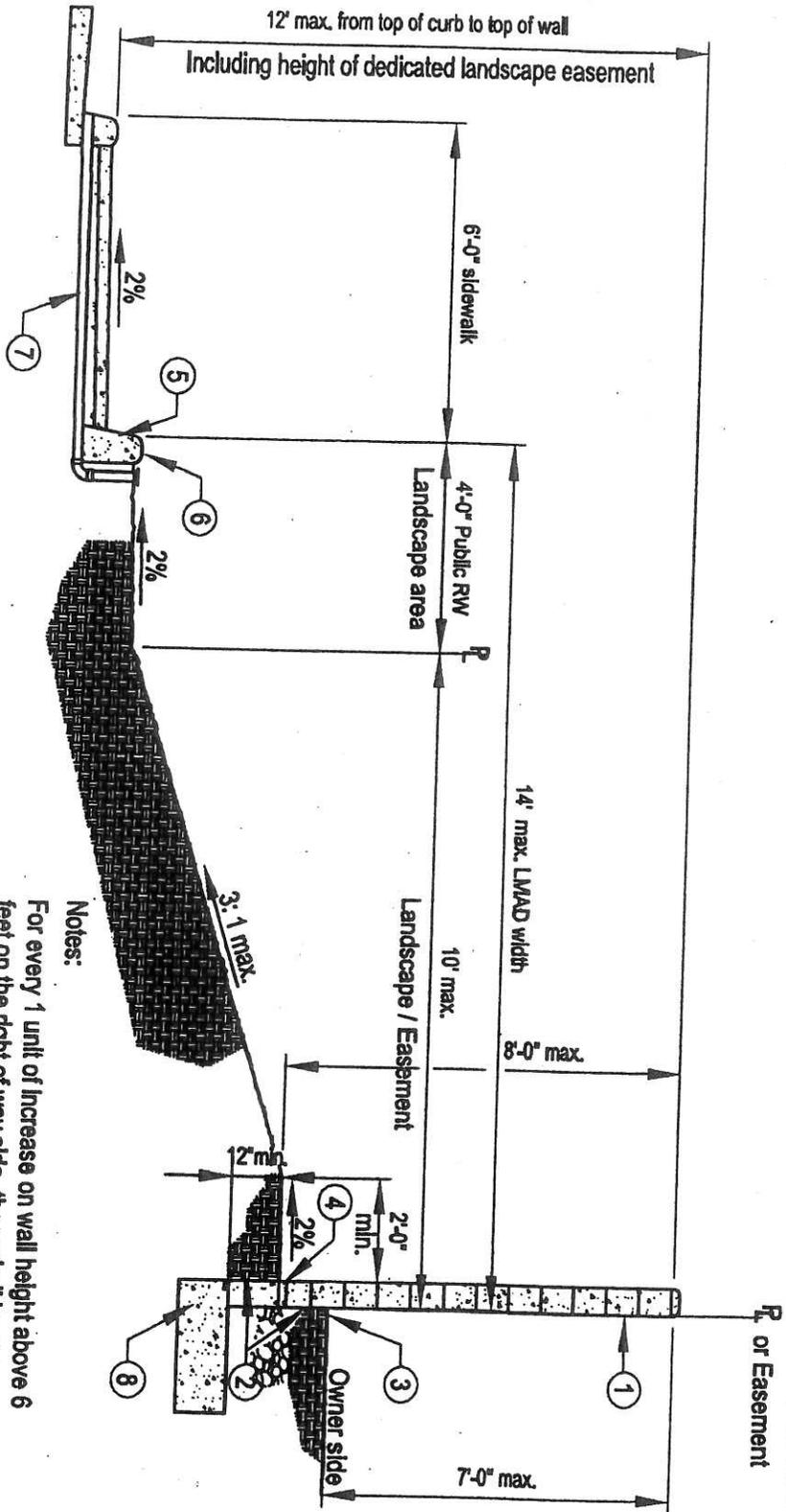
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PAGE NO.

7



**Notes:**

For every 1 unit of increase on wall height above 6 feet on the right of way side, there shall be an additional 2 unit increase in landscape easement width behind the RW line.

- ① 6" or 8" split face block wall w/ solid grout in all cells - min. 6" high from finish grade of higher side (regardless if it is LMAD or property owner side.) - Max. 8' on street side & max. 7' on property owner side. (No proto II type walls allowed.)
- ② Waterproofing - meet or exceed A.S.T.M. D449 type I (typical on retaining portion of wall)
- ③ Pad elevation
- ④ Open head joints or 2" - weep holes with 1 cu. ft. pea gravel behind wall @ 20' on center.
- ⑤ 6" curb per city standard drawing # S-09

- ⑥ Provide 1 inch from top of soil to top of drain grate and from top of drain grate to top of curb (unless otherwise approved on site by city inspector)
- ⑦ 3" Ø - sch. 40 PVC rigid drain every 100' - 150' max. Ensure min. 2% fall for proper drainage per LMAD spec. & detail booklet.
- ⑧ Footing design varies. It will need Building Department review and approval.

LMAD - Landscape Maintenance Assessment District  
RW - Right of way



**CITY OF VICTORVILLE**  
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PROJECT TITLE:

**LMAD CURB/WALL DETAIL**

PLANNING

BUILDING

COMM. SERVICES

ENGINEERING

DATE: 1/16/2007

SCALE: NTS

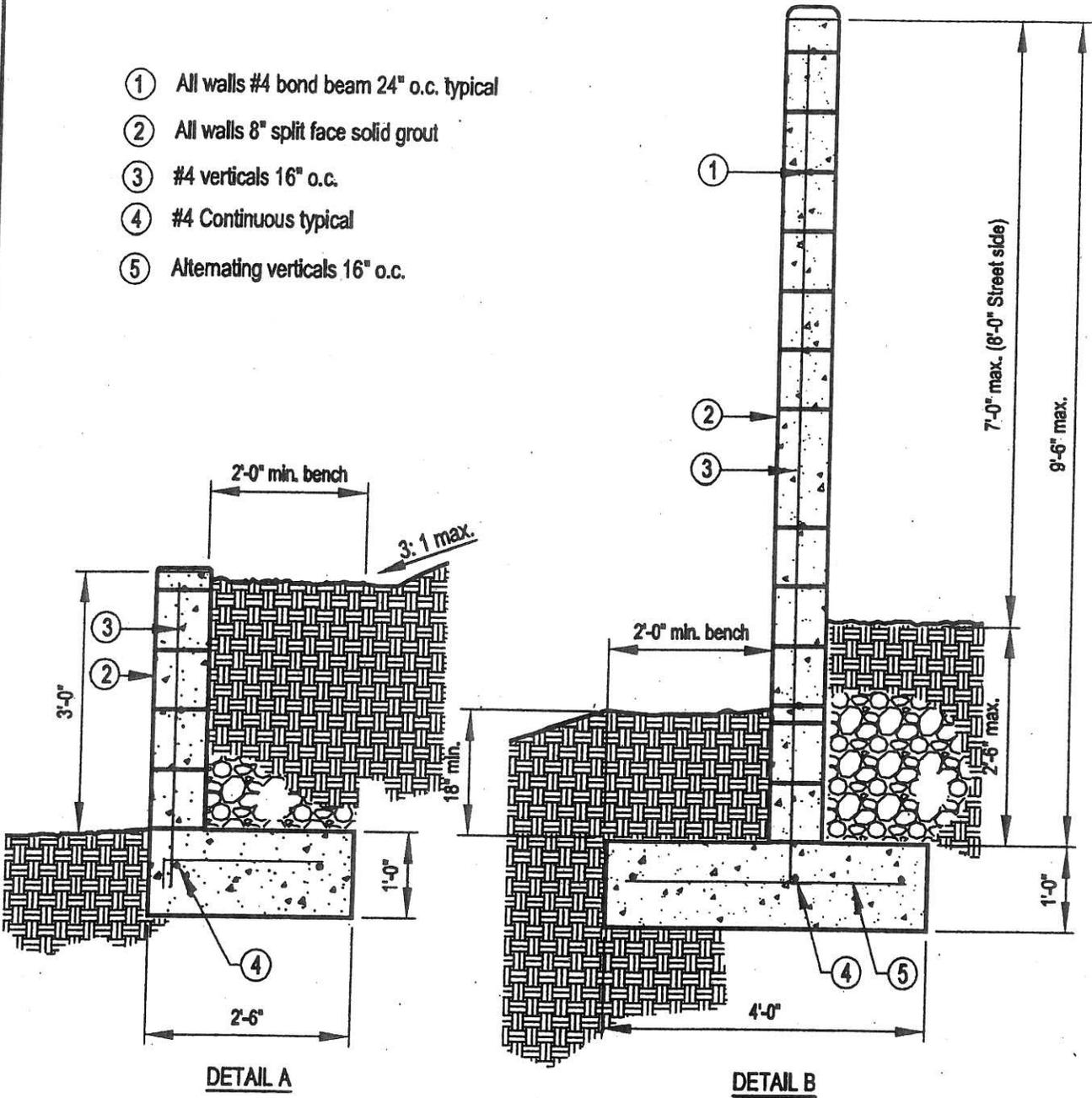
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PAGE NO.

8



- ① All walls #4 bond beam 24" o.c. typical
- ② All walls 8" split face solid grout
- ③ #4 verticals 16" o.c.
- ④ #4 Continuous typical
- ⑤ Alternating verticals 16" o.c.



SEE COMMUNITY SERVICES DETAIL FOR FURTHER INFORMATION

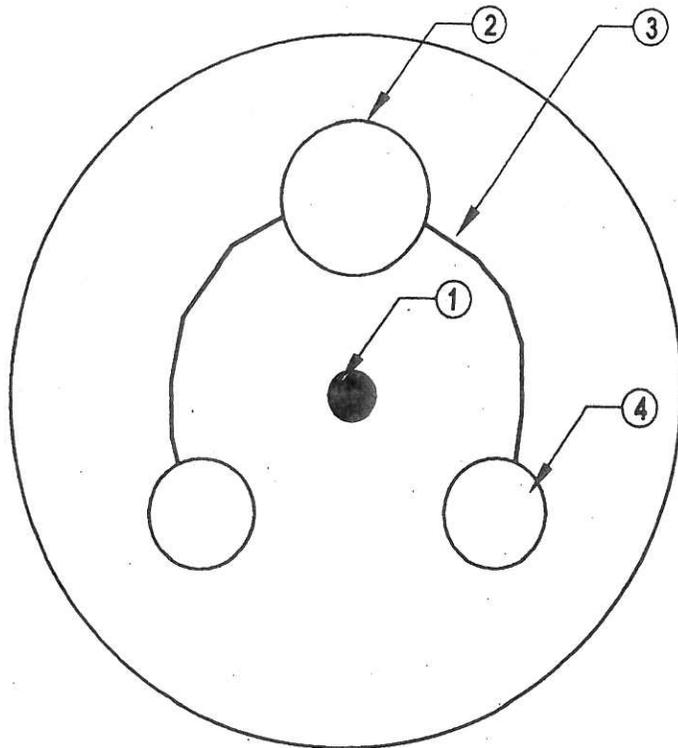


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**COMMUNITY SERVICES DEPARTMENT**

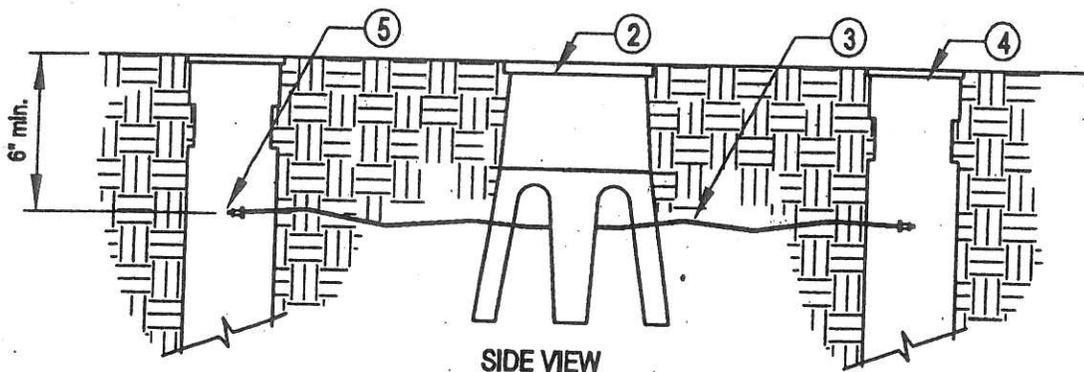
PROJECT TITLE:  
**LMAD STANDARD WALL DETAIL**

PLANNING
BUILDING
COMM. SERVICES
ENGINEERING
PAGE NO. 10

DATE: 1/16/2007    SCALE: NTS    DRAWN BY: P. Tamish



PLAN VIEW



SIDE VIEW

- ① Tree
- ② Emitter within brooks 70 series box
- ③  $\frac{1}{2}$ " distribution tubing
- ④ 4" perforated pcv pipe (typ.)
- ⑤ Diffuser bug cap (typ.)

Note: See irrigation legend for type and size of emitter.



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**COMMUNITY SERVICES  
DEPARTMENT**

PROJECT TITLE:

**DRIP DISTRIBUTION DETAIL**

PLANNING

BUILDING

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SERVICES

ENGINEERING

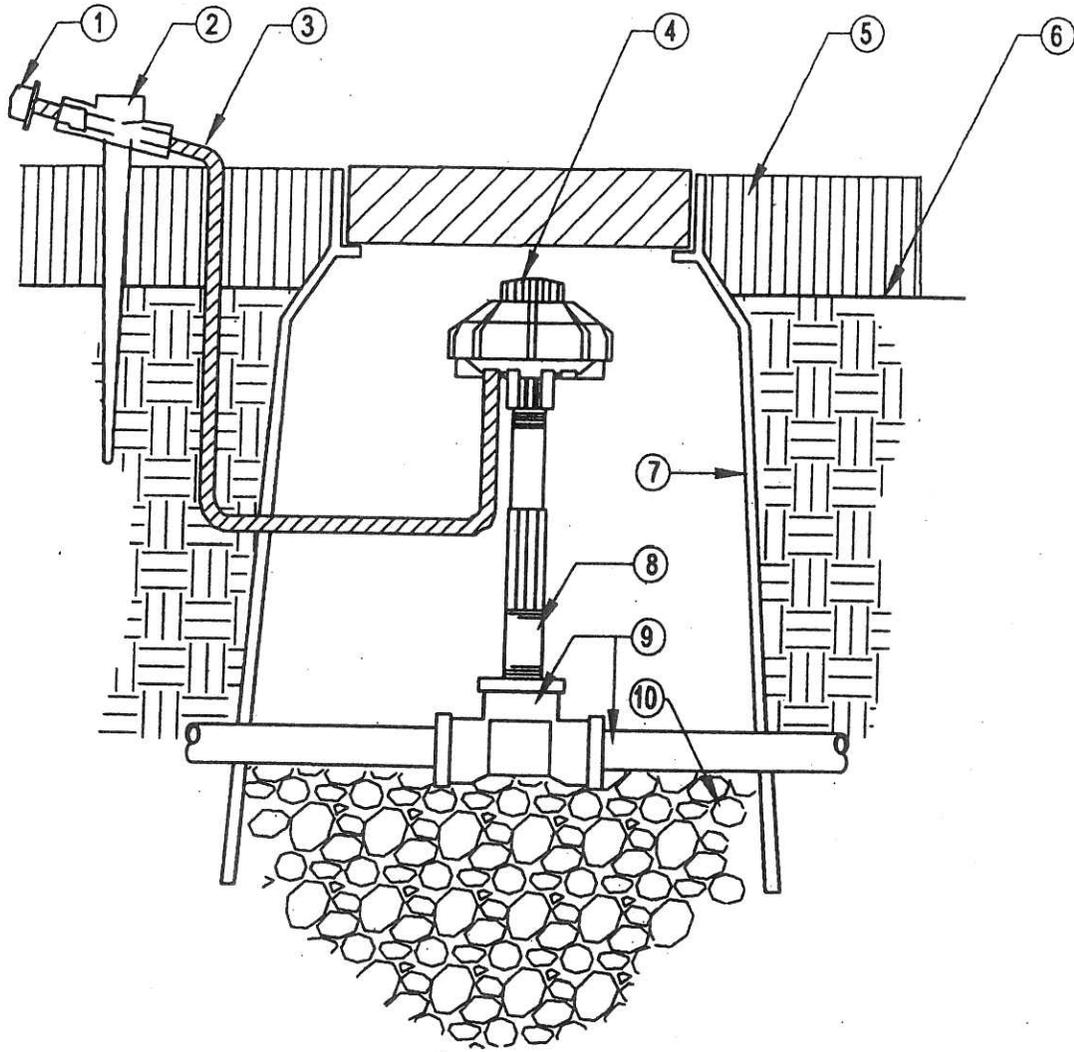
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PAGE NO.

11



- ① Difuser bug cap
- ② 1/4" Tubing stake
- ③ 1/4" distribution tubing max. length not exceed 20 feet
- ④ Xeri-bird 8 (see irr. legend for gph/port)
- ⑤ Mulch bed 3"
- ⑥ Finish grade
- ⑦ Emitter box (Brooks 70 series)
- ⑧ PVC sch 80 riser (length as required)
- ⑨ PVC sch 40 pipe and sch. 80 fitting (12" cover min.)
- ⑩ 3/4" crushed rock



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 COMMUNITY SERVICES  
 DEPARTMENT

PROJECT TITLE:

**8 PORT EMITTER  
 IN BOX DETAIL**

DATE: 12/21/06

SCALE: NTS

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PLANNING

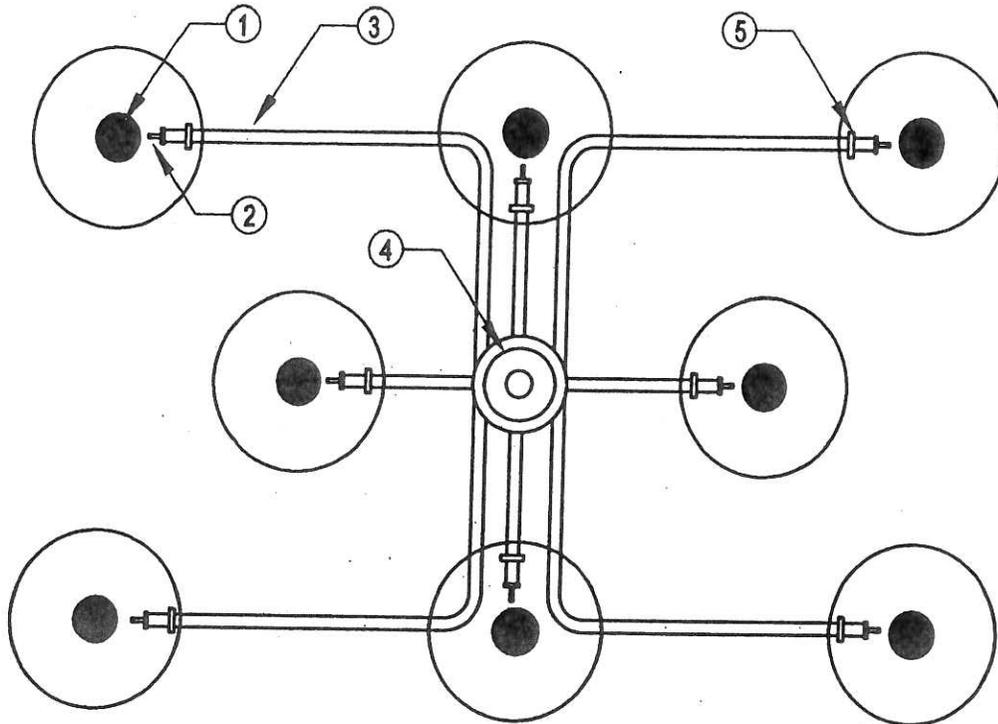
BUILDING

COMM.  
SERVICES

ENGINEERING

PAGE NO.

12



PLAN

- ① Plant material (typ.)
- ② Diffuser bug cap (typ.)
- ③  $\frac{1}{4}$ " distribution tubing max. length not to exceed 20 ft.
- ④ Xerl-bird 8 multi-outlet emission device gph flow/ port per irrigation legend
- ⑤ Tubing stake (typ.)



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**COMMUNITY SERVICES  
DEPARTMENT**

PROJECT TITLE:

**8 PORT EMITTER  
LAYOUT DETAIL**

DATE: 12/21/06

SCALE: NTS

DRAWN BY:

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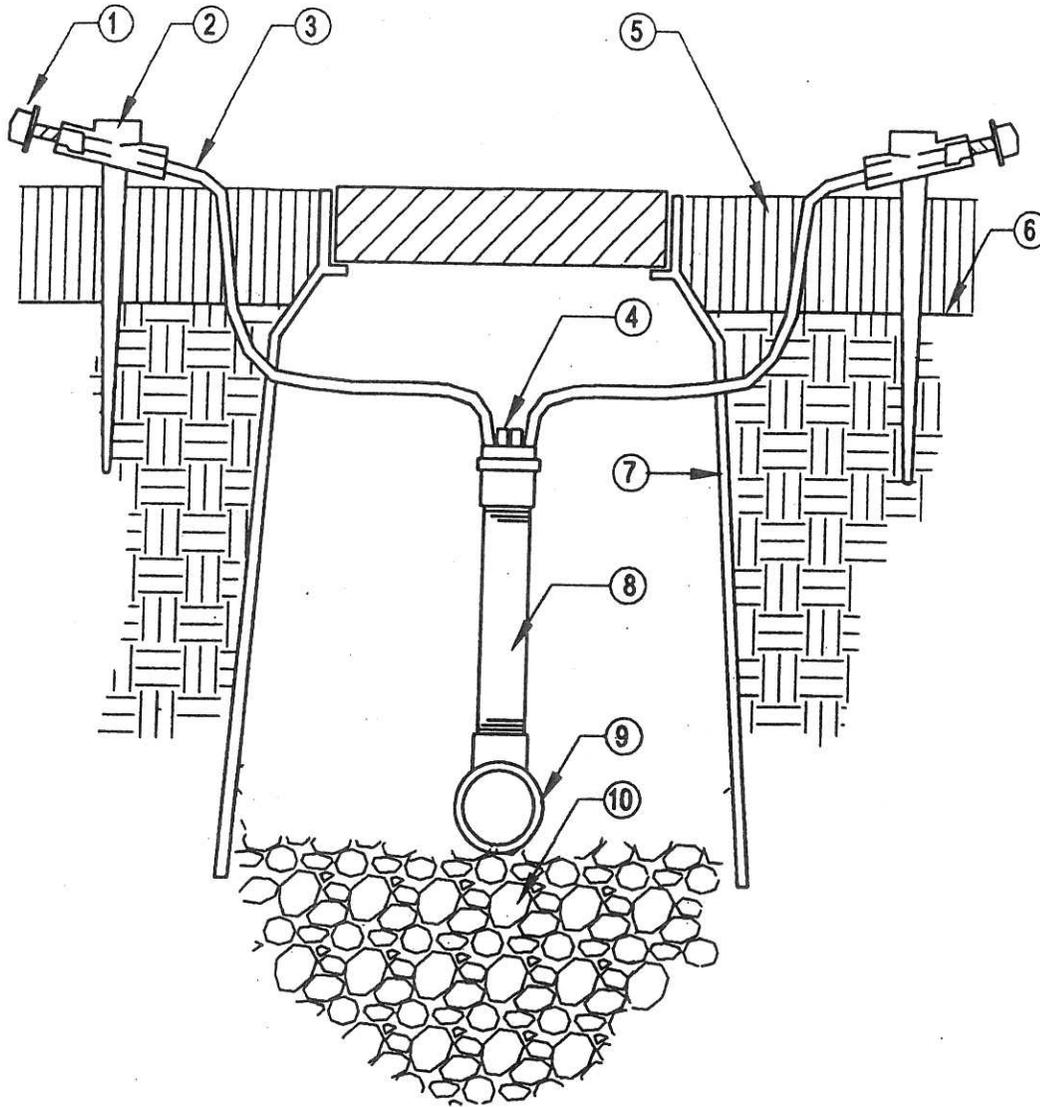
BUILDING

COMM.  
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ENGINEERING

PAGE NO.

13



- |   |  |
|---|--|
| ① Diffuser bug cap  | ⑥ Finish grade   |
| ② 1/4" Tubing stake                                       | ⑦ Emitter box (Brooks 30 series)                       |
| ③ 1/4" distribution tubing max. length not exceed 20 feet | ⑧ PVC sch 80 riser (length as required)                |
| ④ Multi-outlet xeribug emitter                            | ⑨ PVC sch 40 pipe and sch. 80 fitting (12" cover min.) |
| ⑤ Mulch bed 3"  | ⑩ 3/4" crushed rock                                    |



**CITY OF VICTORVILLE**  
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 COMMUNITY SERVICES  
 DEPARTMENT

PROJECT TITLE:

**MULTI - OUTLET EMITTER  
 IN BOX DETAIL**

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 SERVICES

ENGINEERING

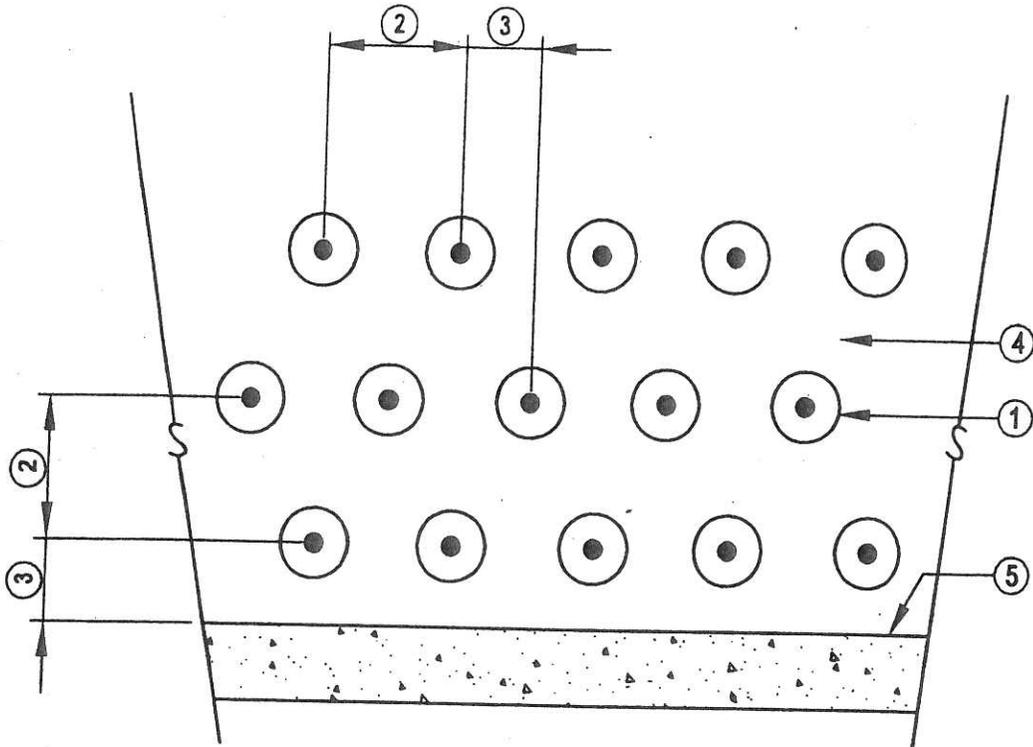
DATE: 12/21/06

SCALE: NTS

DRAWN BY: P. Tamisin

PAGE NO.

14



PLAN

- ① Groundcover (set crown @ original height)
- ② On- center plant spacing (per plan)
- ③  $\frac{1}{2}$  of on-center spacing (per plan)
- ④ Shrub or ground cover planting area
- ⑤ Curb, hardscape, or other improvement (where occurs per plan)

PLANTING TABLET TABLE	
Size of plant	No. of tablets
Flat Plant	(1) - 7 oz
1 gallon	2-3
Planting tablets shall be gro- power or equal	

Note:

Erosion control mesh (city approved) shall be installed on all slopes 2:1 or greater.



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PROJECT TITLE:

GROUND COVER DETAIL

PLANNING

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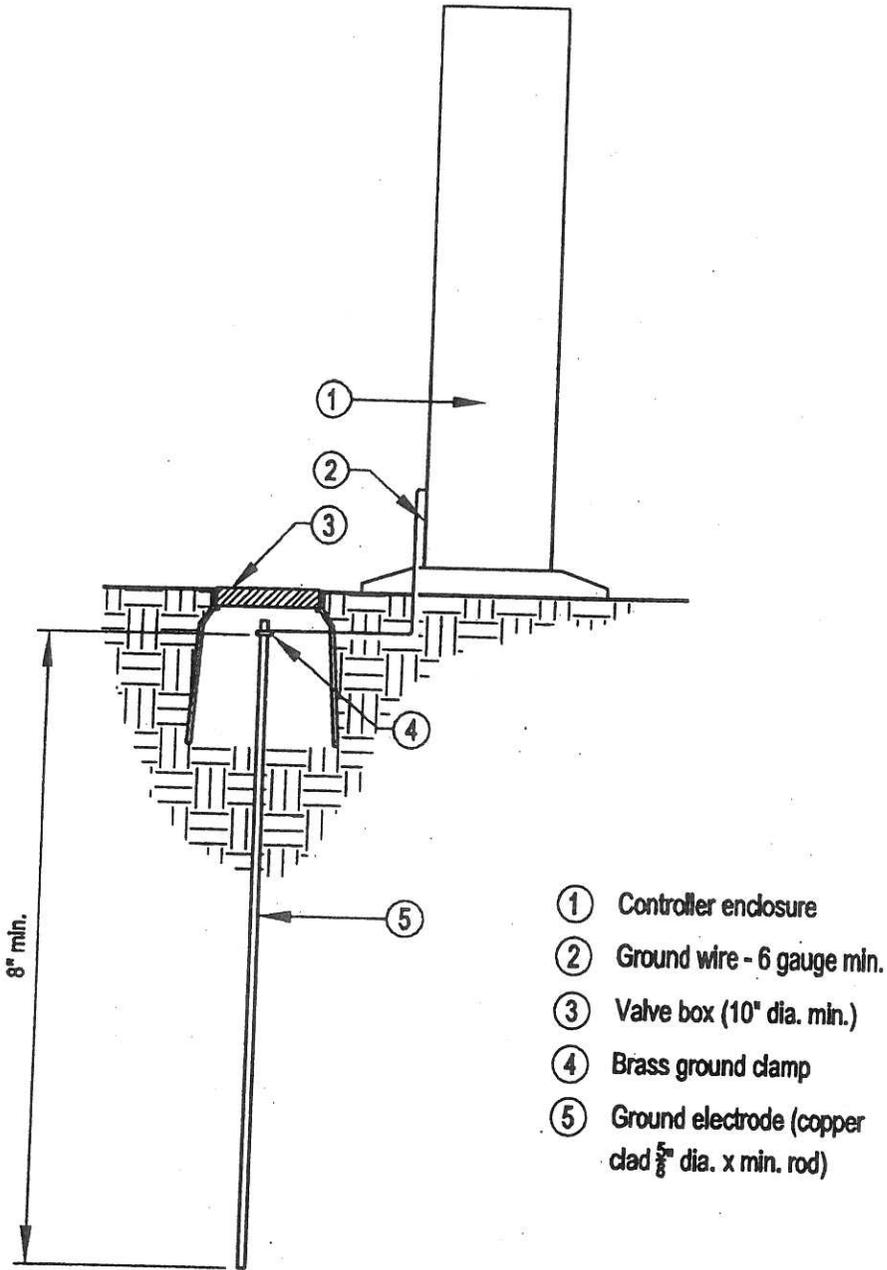
DATE: 12/21/06

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PAGE NO.

15



- ① Controller enclosure
- ② Ground wire - 6 gauge min.
- ③ Valve box (10" dia. min.)
- ④ Brass ground clamp
- ⑤ Ground electrode (copper clad  $\frac{5}{8}$ " dia. x min. rod)

**Note:**

Ground conductor shall be the shortest length possible with no sharp bends, kinks, or coils in the wire. Exposed wire shall be in an approved conduit or armored cable.



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**COMMUNITY SERVICES DEPARTMENT**

PROJECT TITLE:

**MINIMUM GROUNDING REQUIREMENTS**

DATE:12/21/06

SCALE: NTS

DRAWN BY: P. Tamisin

PLANNING

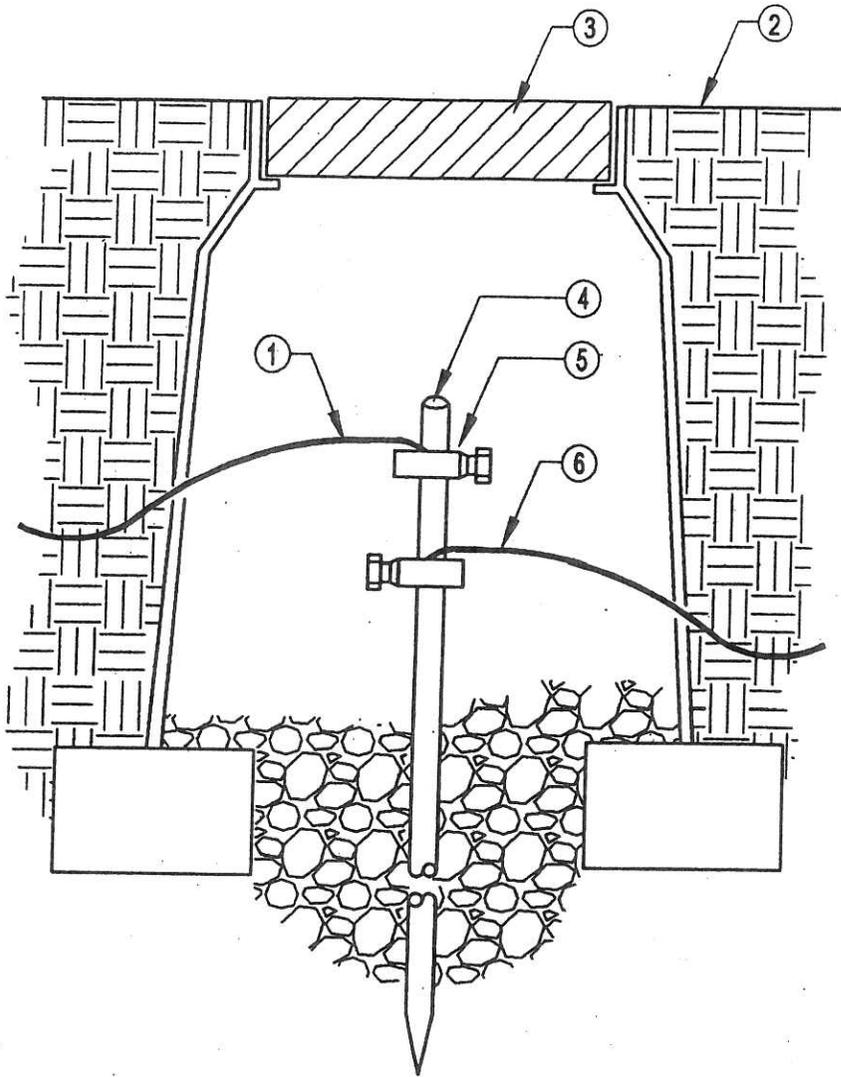
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ENGINEERING

PAGE NO.

16



- ① #10 bare copper wire from previous rod in grid
- ② Finish grade includes 3" of mulch
- ③ Standard valve box with cover
- ④ Grounding rod from GK-UL3ROD three rod kit
- ⑤ Brass clamp (1 of 2)
- ⑥ #10 bare copper wire to next rod in grid

**Notes:**

- 1. See grounding rod notes for installation instructions.
- 2. Hot Brand Lid "GR"



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 DEPARTMENT**

PROJECT TITLE:

**GROUNDING WIRES IN  
 GRID DETAIL**

DATE: 12/18/06

SCALE: NTS

DRAWN BY:

PLANNING

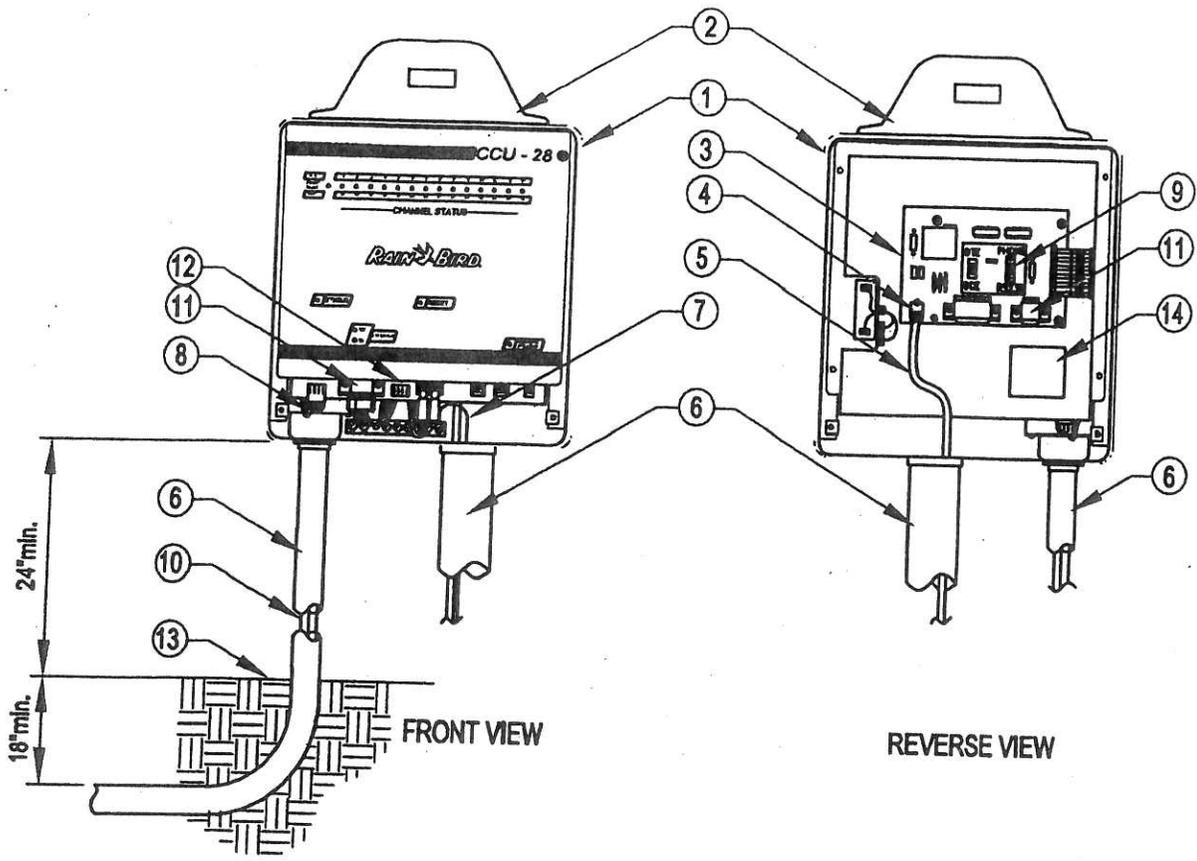
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ENGINEERING

PAGE NO.

17



- ① Cluster control unit (CCU) - rainbird (wall mount unit)
- ② Maxilink omni antenna mounted on 2"x20' galvanized pole-connect to Rainbird radio modem kit (RMK) w/polyphaser #IS-IE50LN-C1 antenna surge protection.
- ③ Modern board
- ④ RJ-11 phone jack
- ⑤ Telephone communication cable to RJ-11 jack
- ⑥ PVC conduit (size as req'd.)
- ⑦ CCU grounding buss bar supply
- ⑧ 120 Volt 60 cycle power-refer to local electric code for connections, provide Inermatic AG2401 or triplite isobar surge protection.
- ⑨ Switch (set to "phone")
- ⑩ #10 Copper ground wire from CCU grounding buss bar to grounding grid (see grounding grid detail)
- ⑪ 9 pin cable connection to Rainbird radio modem kit
- ⑫ S4 CCU ID link switch (set by distributor)
- ⑬ Finish grade Includes 3" of mulch
- ⑭ Radio modem kit (RMK)

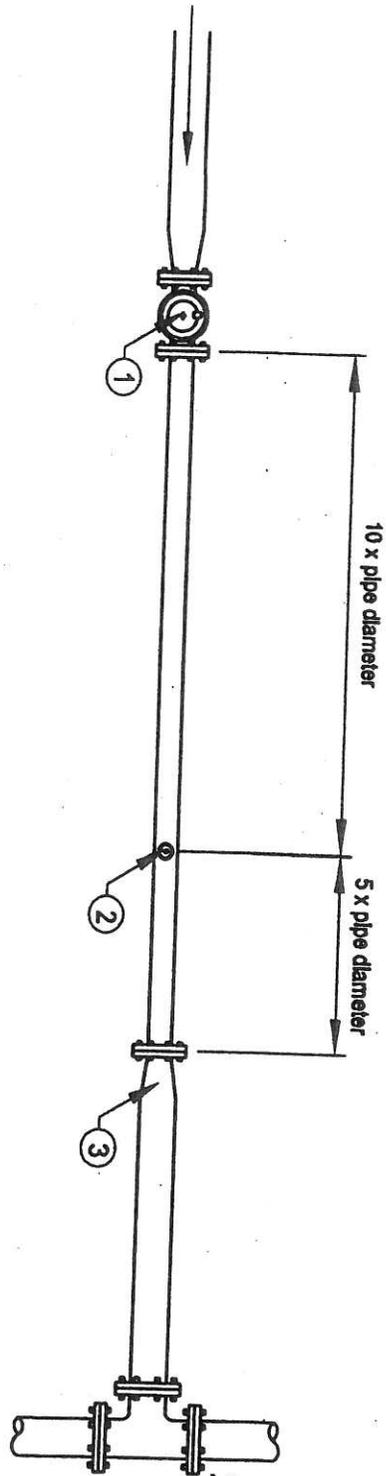
**Note:**  
 Rainbird warranty requires proper surge protection on electrical and antenna connections.



**CITY OF VICTORVILLE**  
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PROJECT TITLE:  
**MAXICOM CCU (WALL MOUNT)**  
 DATE:12/18/06 SCALE: NTS DRAWN BY: P. Tamisin

PLANNING	
BUILDING	
COMM. SERVICES	
ENGINEERING	
PAGE NO.	18



- ① Pressure reducing normally closed master valve (size as required).  
Wire to master valve circuit on nearest satellite.
- ② Rainbird FS series flow sensor. Wire to Rainbird PT 1502 or PT 322 pulse transmitter.
- ③ Reducer



**CITY OF VICTORVILLE**  
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PROJECT TITLE:

**MAXICOM DUAL FLOW  
 SENSORS DETAIL**

DATE: 12/18/06

SCALE: NTS

DRAWN BY: P. Tamisin

PLANNING

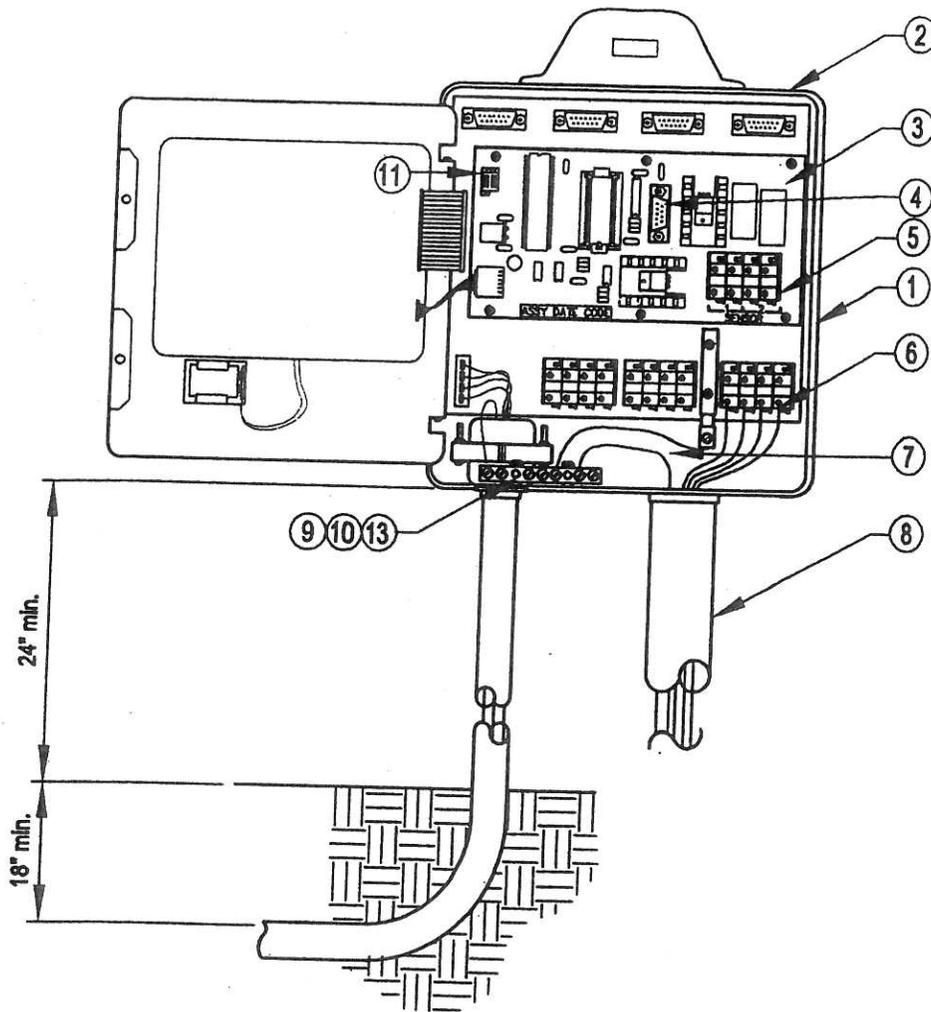
BUILDING

COMM. SERVICES

ENGINEERING

PAGE NO.

19



- ① Field satellite controller-Rainbird ESP-SAT (wall mounted)
- ② Maxi link antenna
- ③ ESP-SAT maxi link interface board (MIB) with radio modem kit (RMK)
- ④ 9 Pin cable connection to link radio (not shown)
- ⑤ ESP-SAT sensor input
- ⑥ Wire terminal connectors to remote control valves
- ⑦ #10 copper ground wire from grounding buss bar to grounding grid (see grounding grid detail)
- ⑧ PVC conduit (size as req'd)
- ⑨ 120 volt 60 cycle power- refer to local electric code for connections. Provide Inermatic AG2401 or Triplite Isobar surge protection.
- ⑩ Controller grounding buss bar
- ⑪ Remote control card

**Note:**

Rainbird warranty requires proper surge protection on electrical and antenna connections.



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14343 CMVC DRIVE, VICTORVILLE, CA 92393

**COMMUNITY SERVICES  
DEPARTMENT**

PROJECT TITLE:

**MAXICOM ESP-SAT  
FIELD SATELLETE CONTROLLER**

DATE:12/18/06

SCALE: NTS

DRAWN BY: P. Tamisin

PLANNING

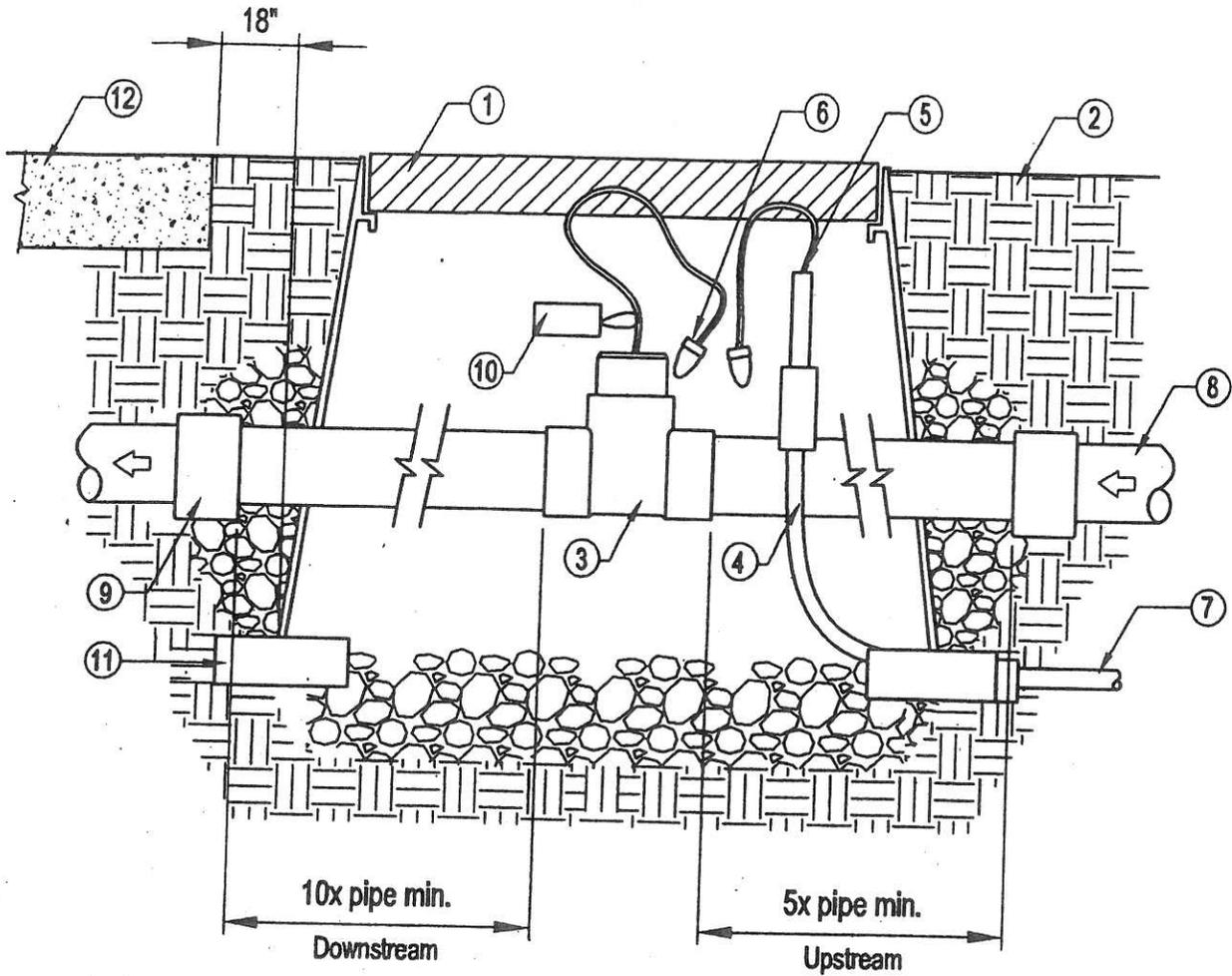
BUILDING

COMM.  
SERVICES

ENGINEERING

PAGE NO.

20



- ① Rectangular plastic valve box
- ② Finish grade includes 3" of mulch
- ③ Flow sensor
- ④ Flow sensor cable P-7162D
- ⑤ Conduit bushing
- ⑥ Waterproof dry splice connector 3M DBY
- ⑦ 1" electrical conduit and sweep elbow
- ⑧ Irrigation mainline from master valve
- ⑨ Mainline to the rcv's
- ⑩ Christy's tag #ID-Max- P2-RCIP2
- ⑪ Quantity of (4) - brick for stabilization
- ⑫ Edge of paving header or building wall

Noet: Hot Brand Lid "FS"



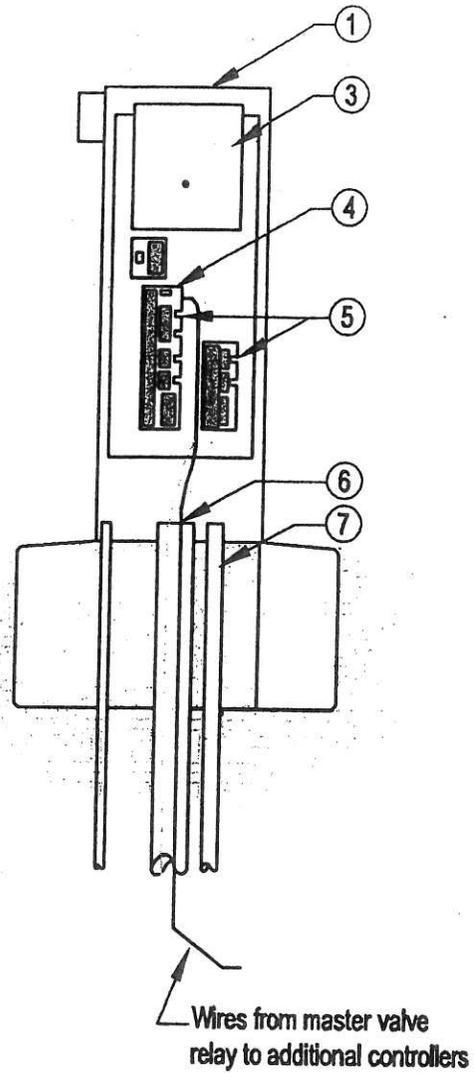
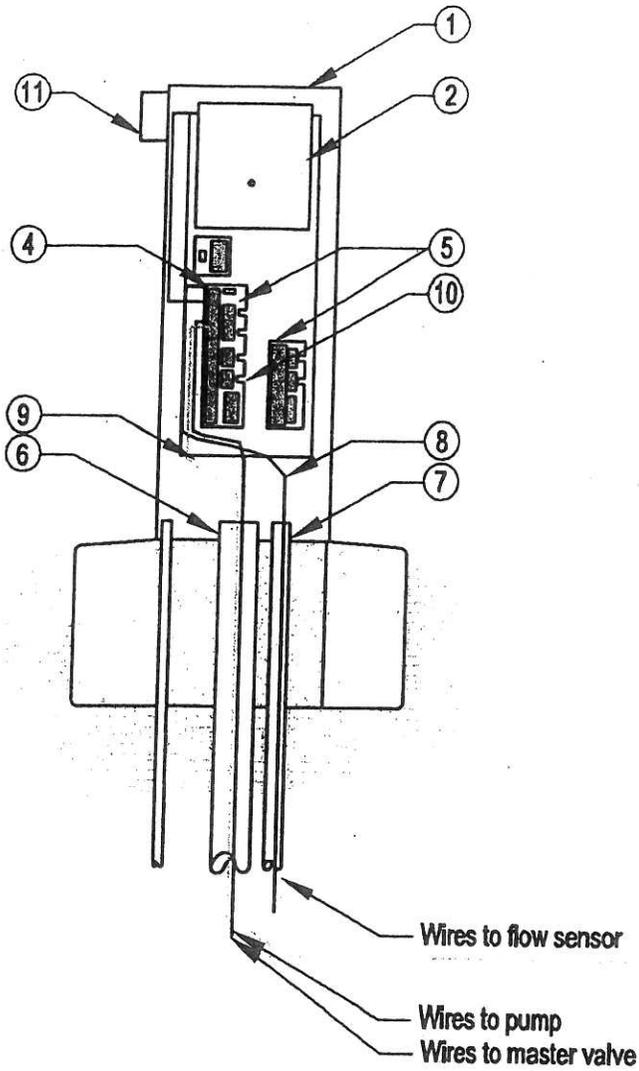
**CITY OF VICTORVILLE**  
 14343 CIVIC DRIVE, VICTORVILLE, CA 92393  
**COMMUNITY SERVICES DEPARTMENT**

PROJECT TITLE:  
**FLOW SENSOR**

DATE: 1/17/07    SCALE: NTS    DRAWN BY: P. Tarrisin

PLANNING	
BUILDING	
COMM. SERVICES	
ENGINEERING	
PAGE NO.	21





- ① Imperial assemblies 18" front entry satellite assembly NEMA 3R rain proof enclosure (UL listed)
- ② Controller 1 &/or 2
- ③ Controller 3 &/or 4
- ④ Master valve relay assembly or pump start relay assembly (optional)
- ⑤ Terminal board
- ⑥ PVC conduit for control wires, size as required.

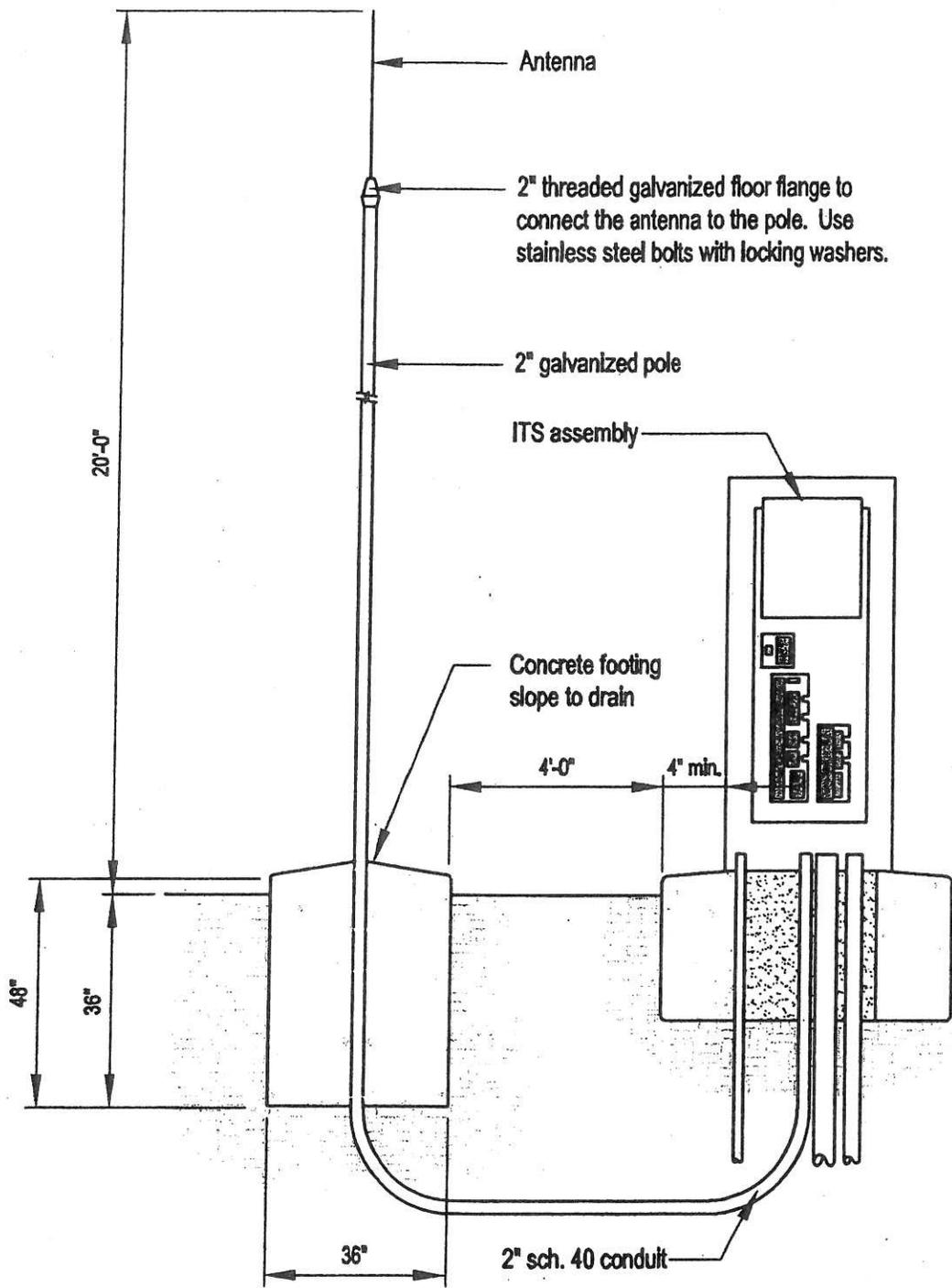
- ⑦ 1" PVC conduit for flow sensor cable
- ⑧ Flow sensor cable Paige Cable P-7162- D to flow sensor
- ⑨ Master valve two (2) wires Paige cable P-7001D- REV5 to the master valve
- ⑩ Three (3) Paige cable P-7001D-REV5 wires from the master valve relay/pump start relay to the controller 3 and 4
- ⑪ Rain shut-off device with enclosure wired to the terminal board



**CITY OF VICTORVILLE**  
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**COMMUNITY SERVICES DEPARTMENT**

PROJECT TITLE:  
**MASTER VALVE-FLOW SENSOR, PUMP START, & RAIN SENSOR FOR MULTIPLE CONTROLLERS (CENTRAL CONTROL)**

PLANNING
BUILDING
COMM. SERVICES
ENGINEERING

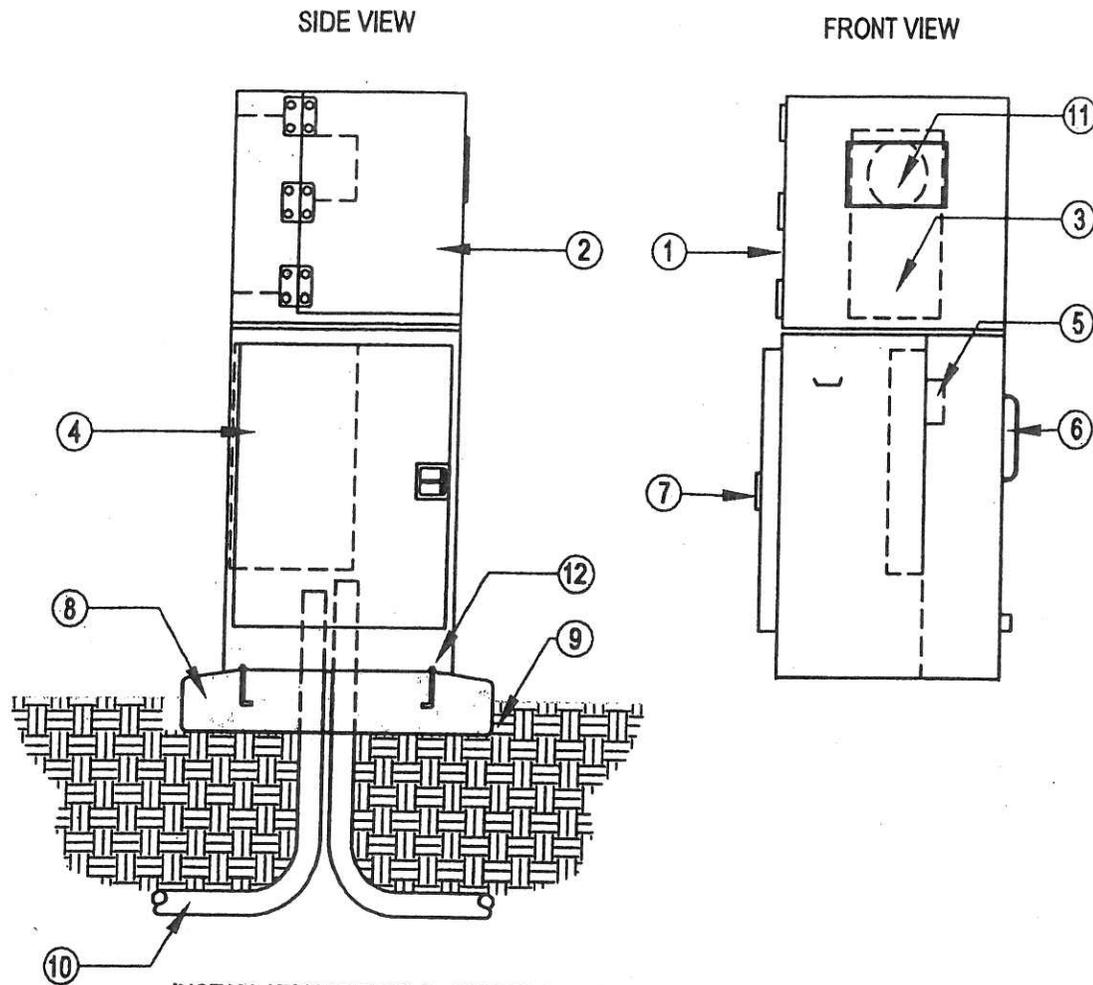


**CITY OF VICTORVILLE**  
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**COMMUNITY SERVICES DEPARTMENT**

PROJECT TITLE:  
**OMNI ANTENNA ON A POLE**

DATE: 01/04/07    SCALE: NTS    DRAWN BY: P. Tamisin

PLANNING	
BUILDING	
COMM. SERVICES	
ENGINEERING	
PAGE NO.	24



INSTALLATION DETAILS: MODELS MPS-A 16, MPS-B 16, MPS-D 18 100AMP

- ① Strong box metered enclosure, stainless steel, NEMA Type 3R - 18" x 20" x 52" #MPS-XXX-XX
- ② Hinged removable lid
- ③ Meter socket with test blocks
- ④ Load Center
- ⑤ Landing Lugs
- ⑥ Landing lug compartment
- ⑦ Load center compartment
- ⑧ Poured concrete base - 6" min. thickness - extend 6" beyond outside dimensions of enclosure with  $\frac{1}{2}\%$  slope for drainage
- ⑨ Finish grade includes 3" of mulch
- ⑩ Underground service
- ⑪ Meter viewing window 5" x 10"
- ⑫  $\frac{3}{8}$ " stainless anchor bolts



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 DEPARTMENT**

PROJECT TITLE:

**STAINLESS STEEL  
 METER PEDESTAL**

PLANNING

BUILDING

COMM.  
 SERVICES

ENGINEERING

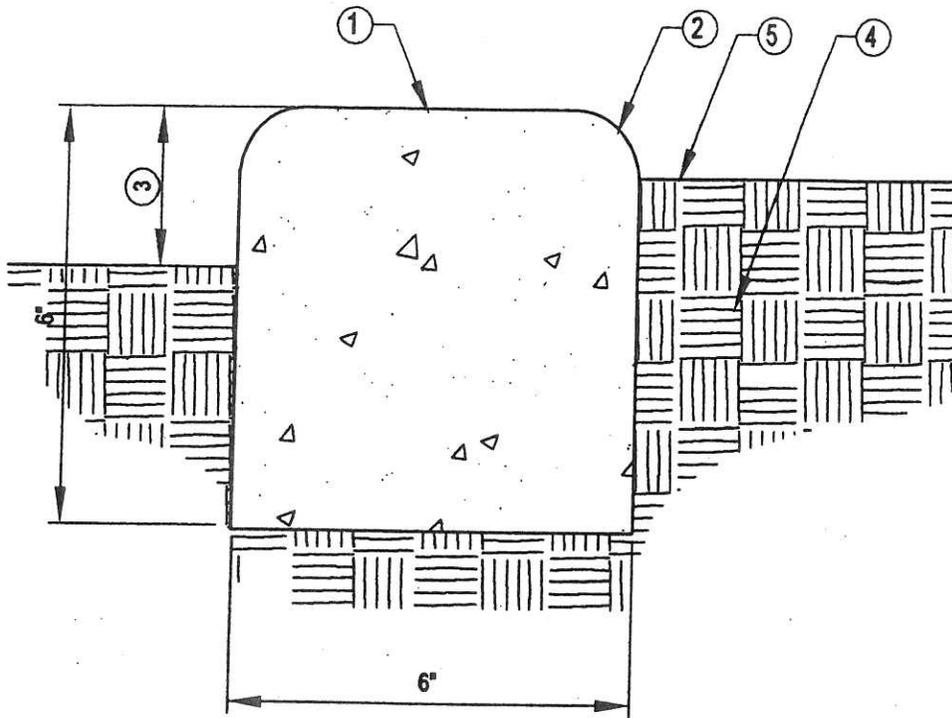
DATE: 01/16/07

SCALE: NTS

DRAWN BY: P. Tamisin

PAGE NO.

25



- ① Concrete mow edge w/ light broom finish - provide expansion joints @ 20' o.c. max.
- ② 1/2" radius (typical)
- ③ 1" @ lawn area 2" @ ground cover
- ④ 95% min. compacted subgrade - under mow strip only
- ⑤ Finish grade includes 3" of mulch

Note: Provide mow curb at end of limit or where planted area changes and to separate LMAD/DFAD area from private property.



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**COMMUNITY SERVICES  
DEPARTMENT**

PROJECT TITLE:

**MOW EDGE**

PLANNING

BUILDING

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SERVICES

ENGINEERING

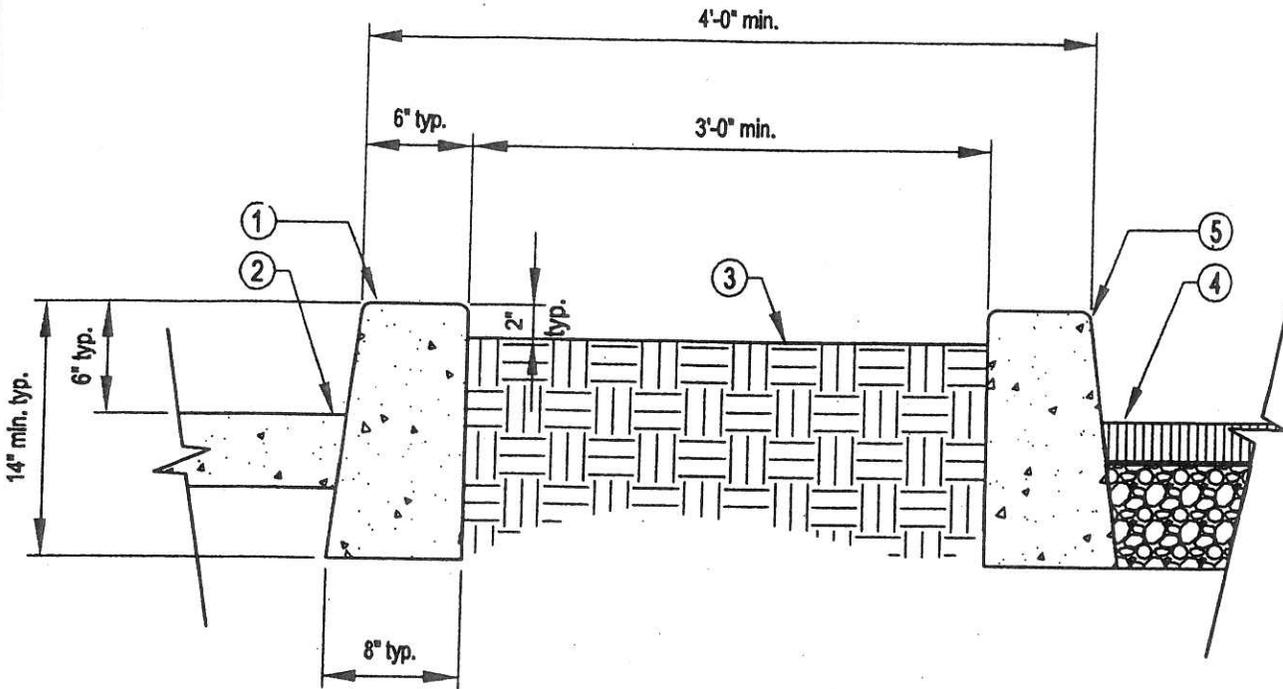
DATE: 12/18/06

SCALE: NTS

DRAWN BY: P. Tarnish

PAGE NO.

26



- ① Concrete planter curb, 2800 psi @ 28 days (min.)
- ② Finish grade at sidewalk or parking lot
- ③ Finish grade includes 3" of mulch
- ④ Street paving on base (depth per Engineer's requirements)
- ⑤ Concrete curb "A" (city standard drawing #S-09)

**Notes:**

1. Provide planter strip with concrete curb "A" along the entire property adjacent to a dedicated street, excluding drive approaches.
2. Omit concrete planter curb when turf is planted in strip. Finish grade at turf shall be flush with sidewalk.



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**COMMUNITY SERVICES  
 DEPARTMENT**

PROJECT TITLE:

**PLANTER STRIP  
 AT STREET MEDIANS**

DATE: 12/18/06

SCALE: NTS

DRAWN BY: P. Tamisin

PLANNING

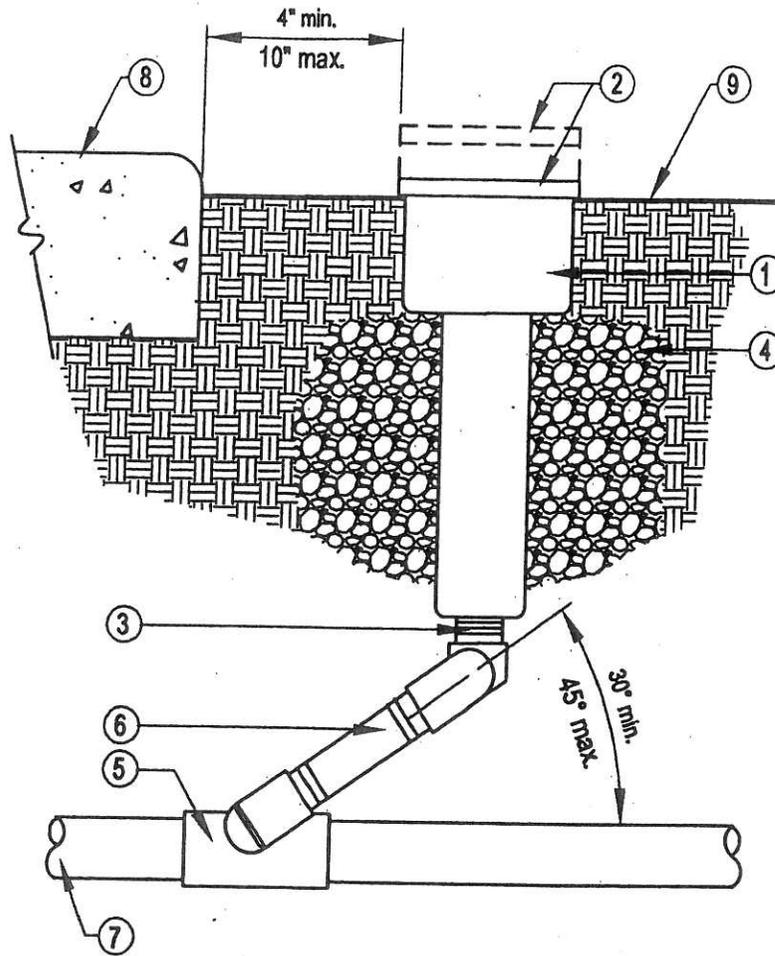
BUILDING

COMM.  
 SERVICES

ENGINEERING

PAGE NO.

27



- ① Pop up rotor head
- ② Install 3" above grade in seeded areas or flush w/ grade in established turf areas.
- ③ PVC sch 80 threaded nipple (length as req'd.)
- ④ (~ pea gravel (one c.f.)
- ⑤ S x S x T tee or ell (pvc sch. 80)
- ⑥ Prefabricated pvc sch. 80 swing joint assembly (360°) or fabricate with:  
 (1) street ell  
 (1) 12" L. nipple  
 (2) street ells
- ⑦ Lateral line
- ⑧ Walk, curb, paving or other improvement
- ⑨ Finish grade includes 3" of mulch

**Notes:**

1. All threaded fittings shall be wrapped with teflon tape (1-1/2 to 2 wraps)
2. Flush pipes prior to installing sprinklers on swing joint.
3. Pop up spray head install above grade. Install heads-up marking flag to each spray head. Reset to grade in established turf areas. Compact backfill around spray head & swing joint assembly.
4. Swing joint shall be same size as spray head inlet.



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PROJECT TITLE:

**POP - UP ROTOR  
 (LARGE RADIUS THROW)**

DATE: 12/21/06

SCALE: NTS

DRAWN BY: P. Tamkin

PLANNING

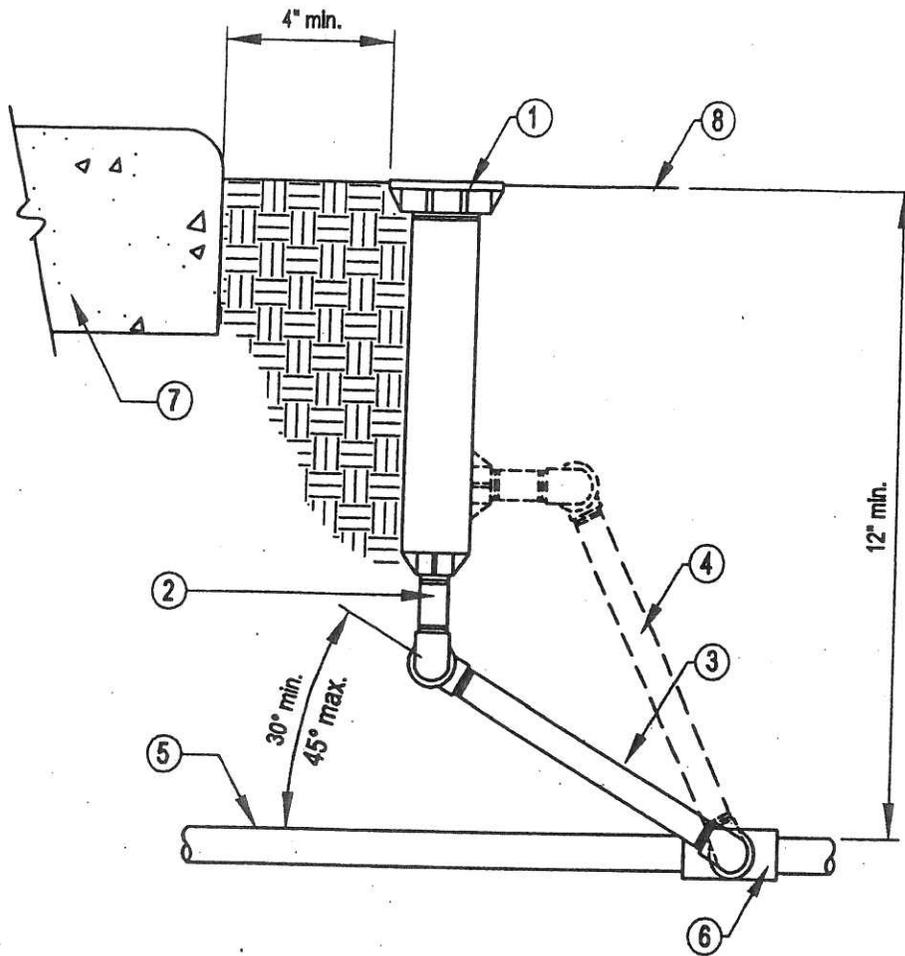
BUILDING

COMM.  
SERVICES

ENGINEERING

PAGE NO.

28



- ① Pop up head
- ② PVC sch. 80 threaded nipple (length as req.'d.)
- ③ Prefabricated pvc sch. 80 swing joint assembly (360°) or fabricate with:
  - (1) street ell
  - (1) 12" L. nipple
  - (2) street ells
- ④ Alternate installation for side inlet
- ⑤ Lateral line
- ⑥ S x S x T tee or S x T ell (pvc sch. 80)
- ⑦ 'A' curb, walk, paving, other improvement, etc.
- ⑧ Finish grade includes 3" of mulch

- Notes:
1. All threaded fittings shall be wrapped with Teflon tape (1-1/2 to 2 wraps)
  2. Flush pipes prior to installing sprinklers on swing joint.
  3. Install heads-up marking flag to each spray head. Reset to grade in established turf areas. Compact back fill around spray head & swing joint assembly.
  4. Swing joint shall be same size as spray head inlet.



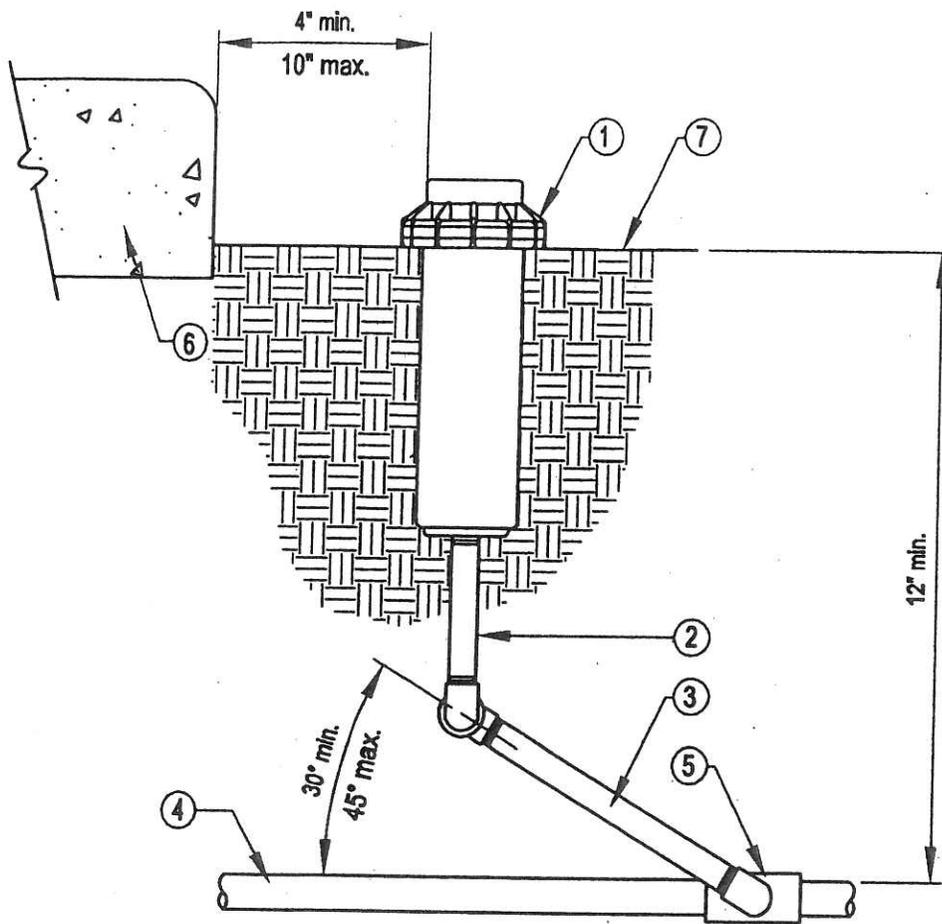
**CITY OF VICTORVILLE**  
 14343 CIVIC DRIVE, VICTORVILLE, CA 92393  
**COMMUNITY SERVICES**  
**DEPARTMENT**

PROJECT TITLE:

**POP- UP SPRAY SPRINKLER**

PLANNING	
BUILDING	
COMM. SERVICES	
ENGINEERING	
PAGE NO.	29

DATE: 12/18/2006    SCALE: NTS    DRAWN BY: P. Tamisin



- ① Pop up rotor head
- ② PVC sch 80 threaded nipple (length as req'd.)
- ③ Prefabricated pvc sch. 80 swing joint assembly (360°) or fabricate with:
  - (1) street ell
  - (2) 12" L. nipple
  - (2) street ells
- ④ Lateral line
- ⑤ S x S x T tee or ell (pvc sch. 80)
- ⑥ Walk, curb, paving or other improvement
- ⑦ Finish grade includes 3" of mulch

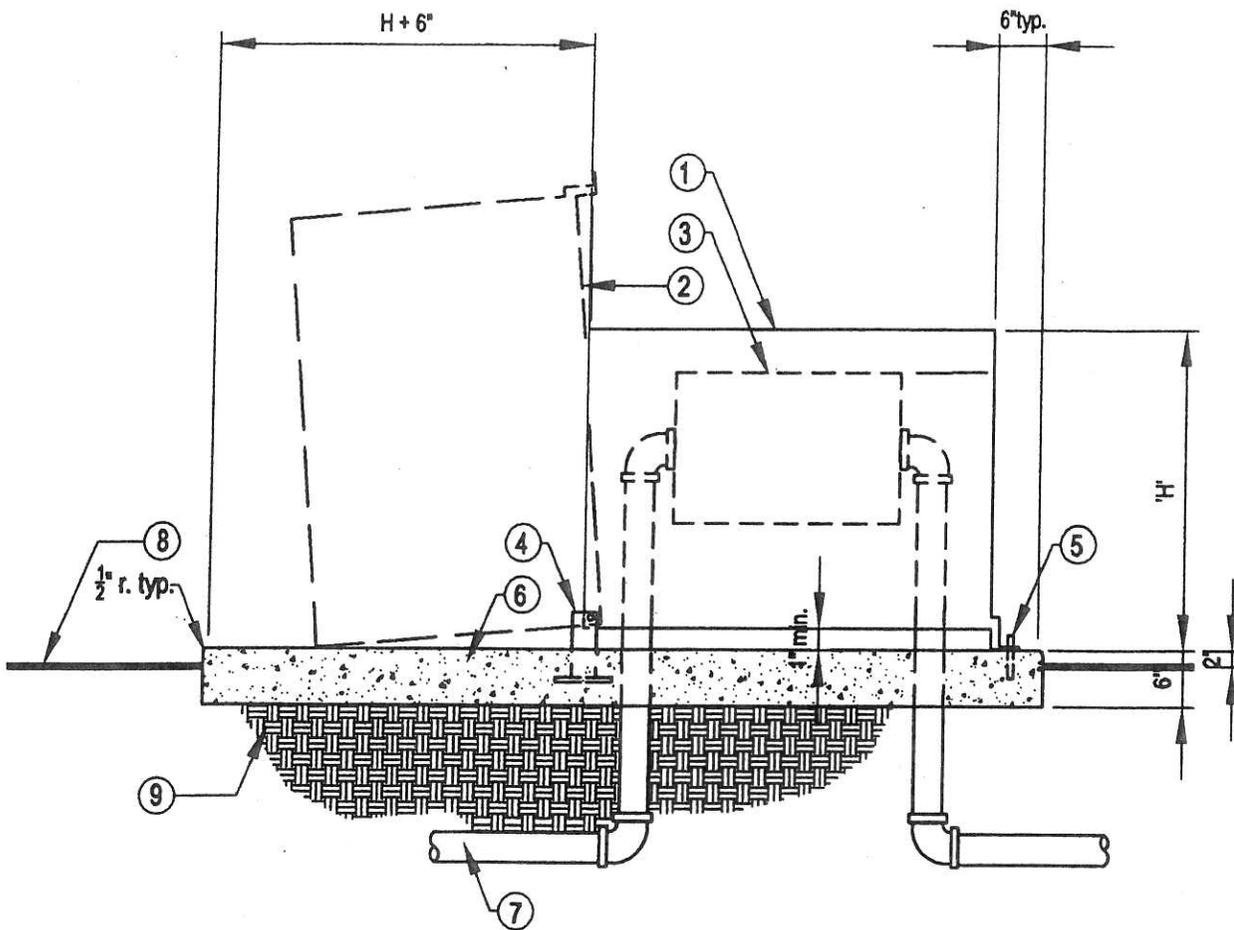
**Notes:**

1. All threaded fittings shall be wrapped with teflon tape (1-1/2 to 2 wraps)
2. Flush pipes prior to installing sprinklers on swing joint.
3. Pop up spray head install above grade in newly planted shrub or ground cover areas. Install flush w/ grade in lawn areas. Install heads-up marking flag to each spray head. Reset to grade in established turf areas. Compact backfill around spray head & swing joint assembly.
4. Swing joint shall be same size as spray head inlet.
5. 3" mulch cover (see V A6)



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**COMMUNITY SERVICES**  
**DEPARTMENT**

PROJECT TITLE:		PLANNING
<b>POP - UP ROTOR SPRINKLER (SMALL RADIUS)</b>		BUILDING
		COMM. SERVICES
		ENGINEERING
DATE: 12/19/2006	SCALE: NTS	DRAWN BY: P. Tamisin
		PAGE NO. 30



- ① Backflow enclosure (closed position), color: 'stainless steel', center enclosure over backflow preventer, maintain 1" min. space @ base for drainage
- ② Backflow enclosure (open position)
- ③ Backflow preventer (see detail)
- ④ Enclosure foot, anchor in concrete
- ⑤ U-bolt (stainless steel), anchor in concrete, provide lock & (2) keys.
- ⑥ Concrete slab, 2800 psl @ 28 days (slope 2% min. for drainage)
- ⑦ Irrigation pressure pipe
- ⑧ Finish grade includes 3" of mulch
- ⑨ 90% compacted subgrade



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**COMMUNITY SERVICES  
 DEPARTMENT**

PROJECT TITLE:

**BACKFLOW PREVENTER  
 ENCLOSURE**

PLANNING

BUILDING

COMM.  
 SERVICES

ENGINEERING

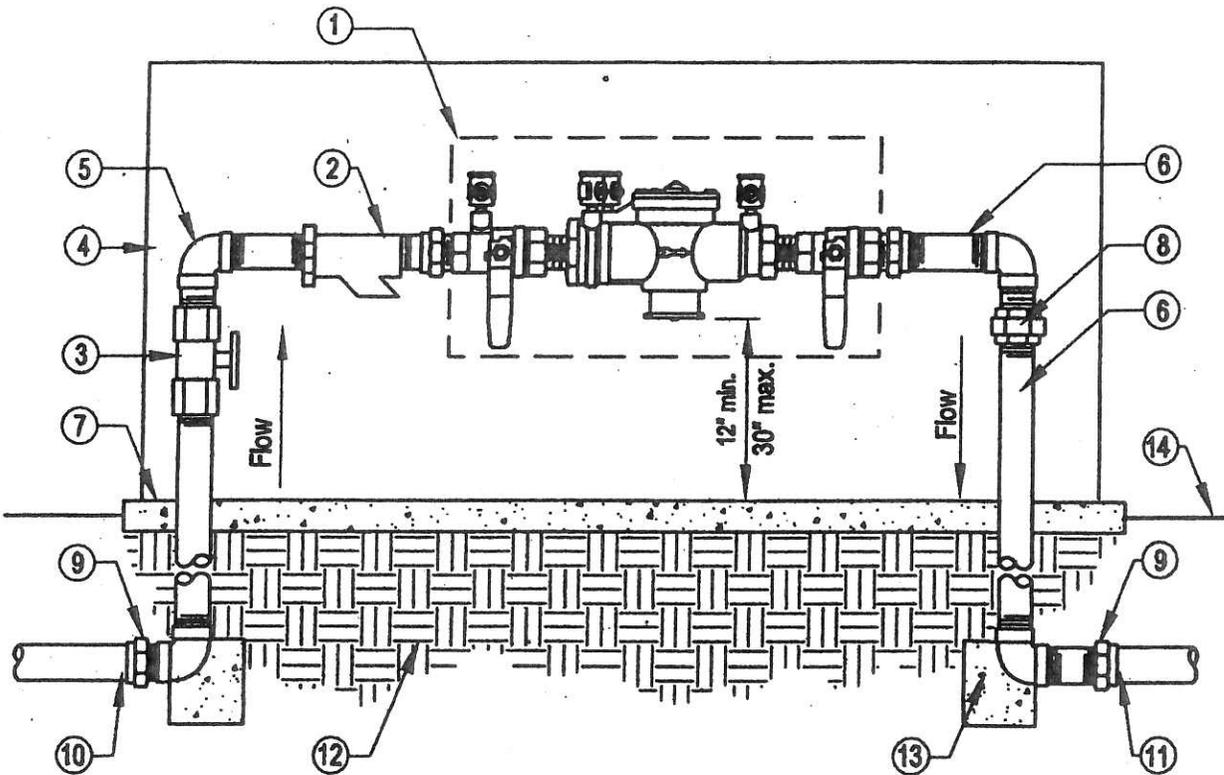
DATE: 12/22/06

SCALE: NTS

DRAWN BY: P. Tamisin

PAGE NO.

31



- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>① Reduced pressure backflow preventer (factory assembled)</li> <li>② Wye strainer w/ 150 mesh screen (wilkens # YSBR or equal)</li> <li>③ Ball valve</li> <li>④ Enclosure by TSI "Strongbox" or equal</li> <li>⑤ Flanged ell (typical)</li> <li>⑥ Threaded pipe (typical)</li> <li>⑦ Concrete pad (2800 psi at 28 days)</li> </ul> | <ul style="list-style-type: none"> <li>⑧ Union</li> <li>⑨ PVC sch 80 male adapter</li> <li>⑩ Water service line to point of connection</li> <li>⑪ PVC mainline (see irrigation legend for size and type) to irrigation system.</li> <li>⑫ 90% compacted sub-grade</li> <li>⑬ Concrete thrust block (one c.f. min.) (typical) form in undisturbed soil</li> <li>⑭ Finish grade includes 3" of mulch</li> </ul> |
|---|---|

**Notes:**

1. Valves shall be FEBCO model no: 825Y -BV-S or 825YA-BV-S for  $\frac{3}{4}$ " -2" or 825YD for 2- $\frac{1}{2}$ " or larger (install pipe supports per manufacturer's recommendations)
2. All brass installed underground or in direct contact with concrete shall be single wrapped (with 50% overlap) with 10 mil polyethylene tape.
3. Freeze protection:  $\frac{1}{2}$ " thick x 2" wide closed cell polyurethane or pvc foam tape. Single wrap foam tape w/ 10 mil polyethylene tape with 50% overlap. Backflows 2" or smaller R-30 blanket type insulation.



**CITY OF VICTORVILLE**  
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**COMMUNITY SERVICES  
 DEPARTMENT**

PROJECT TITLE:

**REDUCED PRESSURE  
 BACKFLOW PREVENTER**

DATE: 12/18/06

SCALE: NTS

DRAWN BY: P. Tarrish

PLANNING

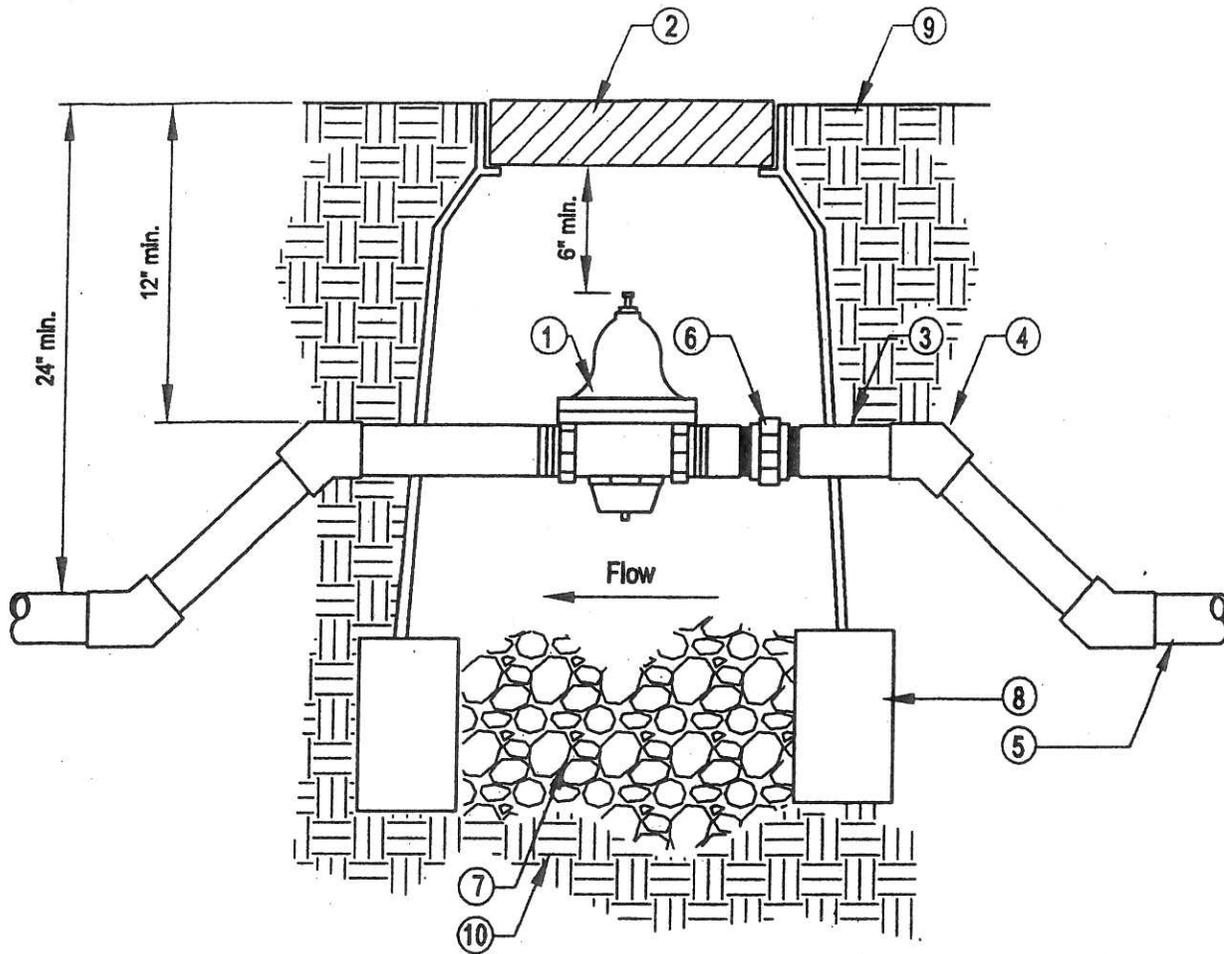
BUILDING

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 SERVICES

ENGINEERING

PAGE NO.

32



- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>① Pressure reduced valve</li> <li>② Plastic valve box with locking lid (10" dia. round) mark lid "pressure regulator"</li> <li>③ PVC sch 80 nipple- threaded on one end. Length as req'd to extend beyond box</li> <li>④ PVC sch 80 coupling (45 degree)(typ.) to adjust mainline depth as req'd.</li> </ul> | <ul style="list-style-type: none"> <li>⑤ PVC mainline pipe (typ.)</li> <li>⑥ PVC sch 80 union</li> <li>⑦ ¾" crushed rock or gravel (2 c.f. min.)</li> <li>⑧ Common brick (three min. per box)</li> <li>⑨ Finish grade includes 3" of mulch</li> <li>⑩ 90% compacted subgrade (under box only)</li> </ul> |
|---|--|

**Notes:**

1. Provide thrust block at all 45 degree and 90 degree ells. Wrap pipe with 10 mill polyethylene tape when in direct contact with concrete.
2. Hot Brand mark lid "PR".



**CITY OF VICTORVILLE**  
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**COMMUNITY SERVICES  
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PROJECT TITLE:

**PRESSURE REGULATOR**

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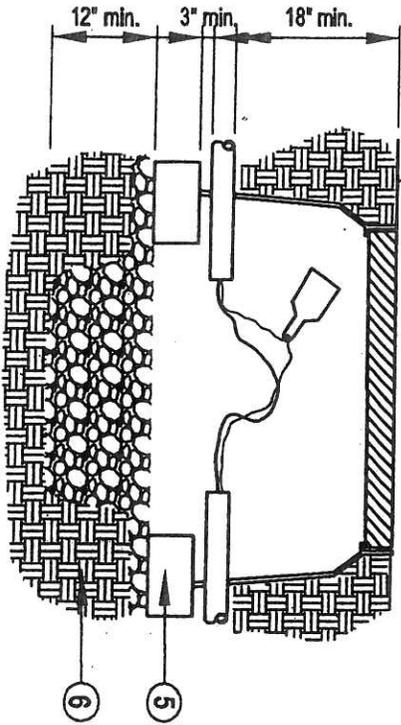
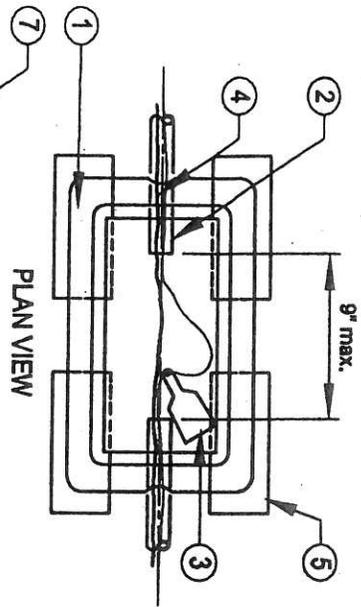
DATE:12/18/06

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PAGE NO.

33



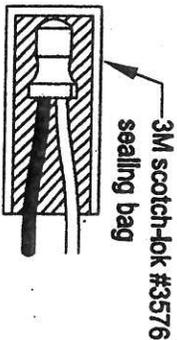
- ① Plastic box with locking lid (rectangular), mark lid "electrical", install flush to grade.
- ② PVC sch. 40 conduit
- ③ Identification tag; secure to pull rope
- ④ Pull rope (1/2"Ø polypropylene); provide 12" slack (typical)
- ⑤ Common brick @ corners of box
- ⑥ 3/4"Ø gravel
- ⑦ Finish grade includes 3" of mulch

**INSTALLATION STEPS:**

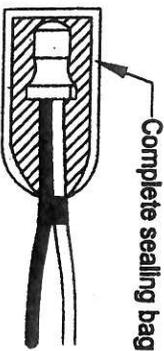
- ① Strip insulation 5/8" from ends
- ② Twist wire nut until ends of wire reach bottom.



- ③ Mix contents of sealing bag per manufacturer. Cut 1/2" off end of bag and insert wire nut to opposite end.



- ④ Wrap open end of sealing bag with tape. Leave taped end in raised position until resin sets.



**CONNECTOR FOR 110 VAC WIRES**  
(All splices to be approved by city prior to inhalation)



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**COMMUNITY SERVICES DEPARTMENT**

PROJECT TITLE:

**PULL BOX & CONNECTORS**

PLANNING

BUILDING

COMM. SERVICES

ENGINEERING

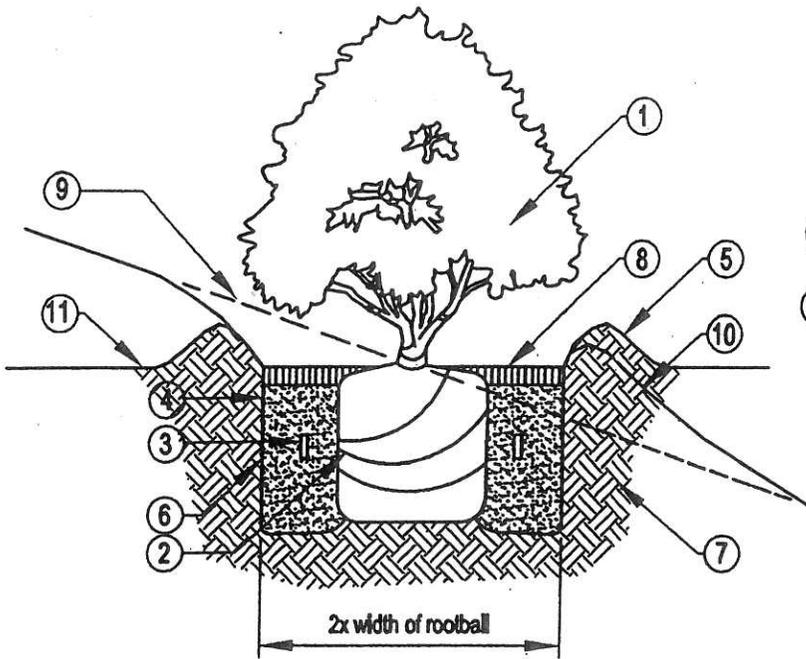
PAGE NO.

34

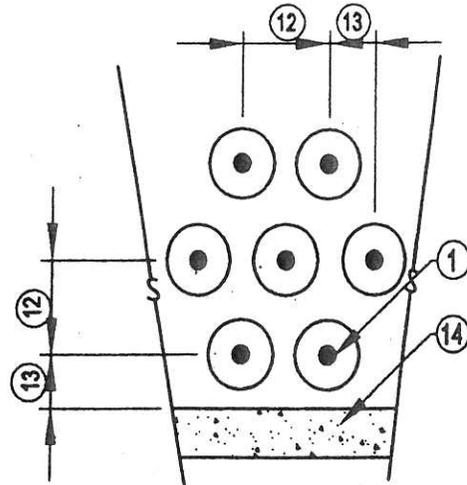
DATE: 1/19/07

SCALE: NTS

DRAWN BY: P. Tamish



SECTION



TRIANGULAR SPACING PLAN

PLANTING TABLET TABLE	
Size of plant	No. of tablets
1 GALLON	2-3
3 GALLON	3-6
5 GALLON	6-9
7 GALLON	8-10
10 GALLON	10-12
15 GALLON	12-15
Planting tablets shall be gro- power or equal	

- ① Shrub, see plan for spacing (set crown at original height)
- ② Rootball - set on undisturbed soil
- ③ Planting tablets (typ.) (see table for quantity)
- ④ Amended backfill:  $\frac{2}{3}$  site soil +  $\frac{1}{3}$  organic backfill mixture (forest humus or equal) + amendments per soil analysis
- ⑤ Soil berm (on the downhill side of plant pit if on slope)
- ⑥ Plant pit - rougher sides
- ⑦ Undisturbed soil
- ⑧ Bark mulch

- ⑨ Slope @ original grade
- ⑩ Slope @ proposed grade
- ⑪ Finish grade includes 3" of mulch
- ⑫ On- center plant spacing (per plan)
- ⑬  $\frac{1}{2}$  of on-center spacing (per plan)
- ⑭ Curb, hardscape, or other improvement (where occurs on plan)

Notes:

- 1. Erosion control matting or jute mesh (city approved) shall be installed on all slopes 2:1 or greater.



**CITY OF VICTORVILLE**  
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**COMMUNITY SERVICES DEPARTMENT**

PROJECT TITLE:

**SHRUB PLANTING DETAIL**

DATE: 12/14/2006

SCALE: NTS

DRAWN BY: P. Tamisin

PLANNING

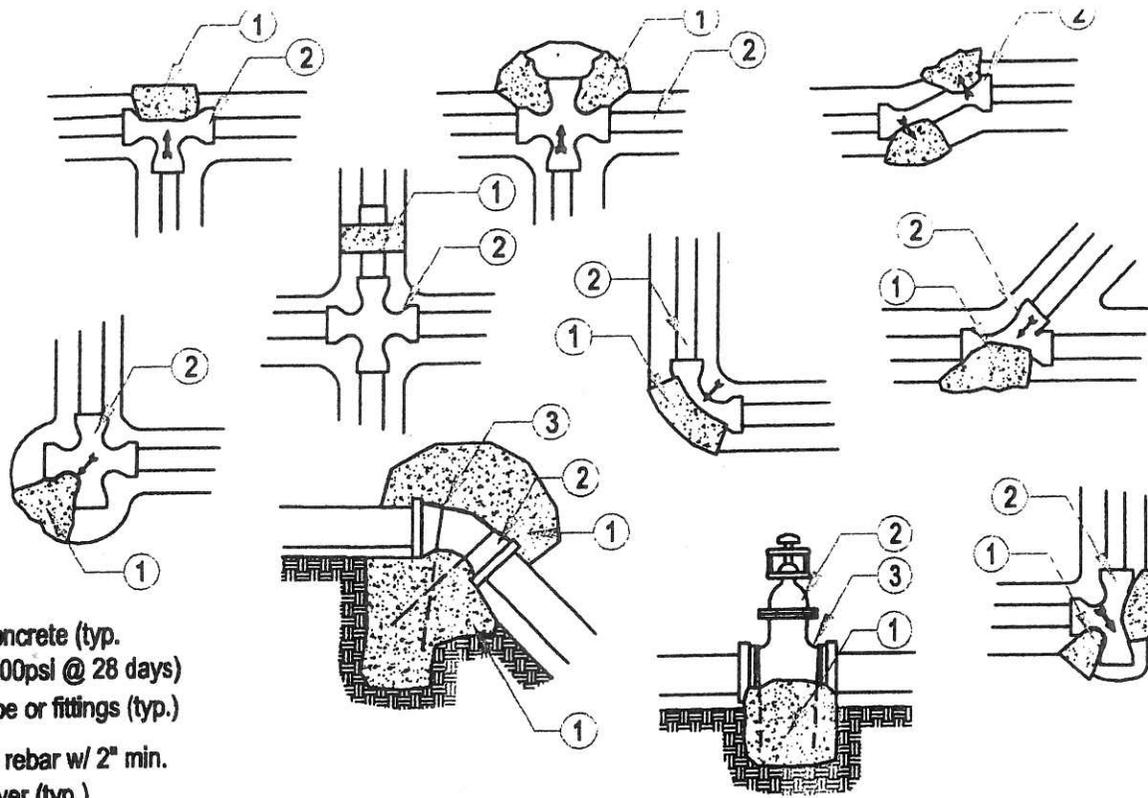
BUILDING

COMM. SERVICES

ENGINEERING

PAGE NO.

35



- ① Concrete (typ. 2000psi @ 28 days)
- ② Pipe or fittings (typ.)
- ③ #5 rebar w/ 2" min. cover (typ.)

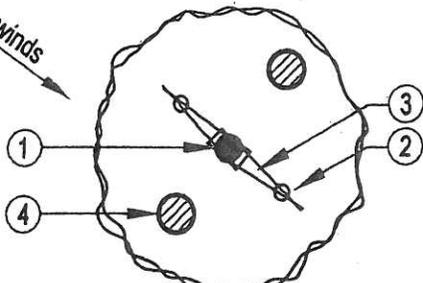
THRUST @ FITTINGS (in pounds @ 100 psi)					THRUST AT FITTINGS (in Pascals at 689 kPa)				
Pipe Size Inches	90° Bends	45° Bends	22-1/2° Bends	Dead Ends & Tees	Pipe Size (mm)	90° Bends	45° Bends	22-1/2° Bends	Dead Ends & Tees
1-1/2"	415	225	115	295	38.1	1848.8	1001.3	511.8	1312.8
2	645	350	180	455	50.8	2870.3	1557.5	801	2024.8
2-1/2	935	510	260	660	63.5	4160.8	2269.5	1157	3937
3	1,395	755	385	985	76.2	6207.8	3359.8	1713.3	4383.3
3-1/2	1,780	962	495	1,260	86.9	7921	4280.9	2202.8	5607
4	2,295	1,245	635	1,620	101.6	10212.8	5540.3	2815.8	7209
5	3,500	1,900	975	2,490	127	15575	8455	4338.8	11080.5
6	4,950	2,710	1,385	3,550	152.4	22027.5	12059.5	6163.3	15979.5
8	8,300	4,500	2,290	5,860	203.2	36935	20025	10190.5	26077
10	12,800	6,900	3,540	9,050	254	56960	30705	15753	40272.5
12	18,100	9,800	5,000	12,800	304.8	80545	43610	22250	56960

**EXAMPLE:** A PRESSURE OF 150 psi (1933.5 kPa) ON A 4-INCH (101.6mm) TEE, TABLE 1008.1.4(a) INDICATES 1,620 pounds(7209 N) FOR 100 psi (689 kPa). THEREFORE, TOTAL THRUST FOR 150 psi (10335 kPa) WILL EQUAL 1-1/2 TIMES 1,620 POUNDS (7209 N) FOR A TOTAL THRUST OF 2,430 pounds (10810 N). TO DETERMINE THE BEARING AREA OF THRUST BLOCKS, REFER TO TABLE 1008.1.4(b) FOR THE SAFE BEARING LOAD OF THE SOIL AND DIVIDE THE TOTAL THRUST BY THE SAFE BEARING LOAD.

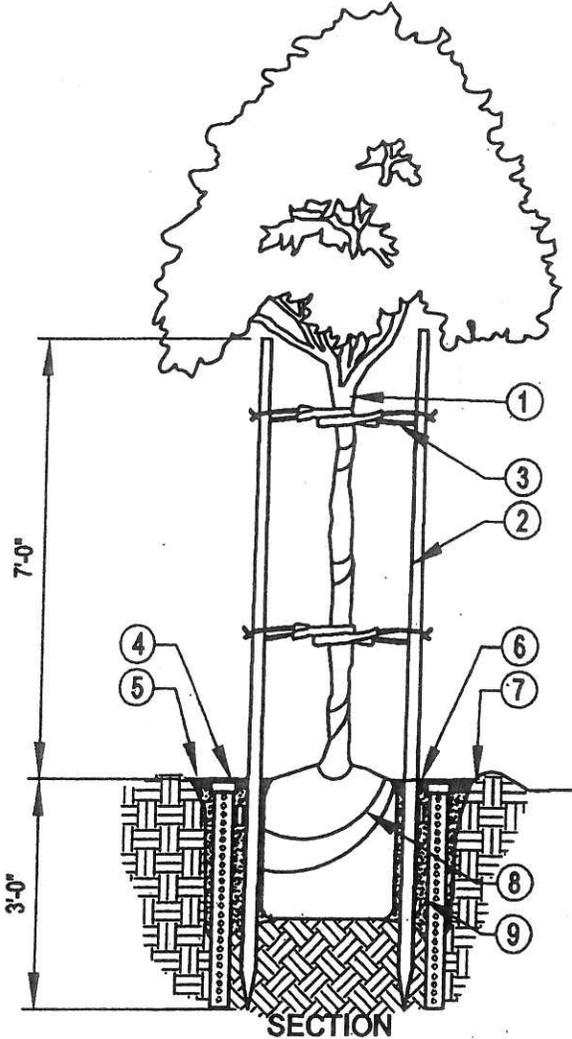


PROJECT TITLE:		PLANNING	
THRUST BLOCK CONFIGURATIONS		BUILDING	
		COMM. SERVICES	
DATE: 12/22/06		ENGINEERING	
		SCALE: NTS	PAGE NO. 36
DRAWN BY: P. Tarrish			

Prevailing winds



PLAN VIEW



SECTION

- ① TREE TRUNK
- ② 2"Ø x10' LODGE POLE PINE STAKES W/ GREEN PRESERVATIVE STAIN
- ③ (2) 16" V.I.T. TWIST BRACES; SCREW TO STAKES W/ 1" INCH DRY WALL SCREWS.
- ④ 4" DIA. x 36"L. PERFORATED PVC PIPE W/ PVC CAP, FILL WITH 3/4" DIA. PEA GRAVEL, (INSTALL 90 DEG. FROM STAKES) TOP OF PIPE SHALL BE FLUSH W/ GRADE IN BASIN
- ⑤ BARK MULCH (FOREST HUMUS); UP TO, BUT NOT COVERING CROWN
- ⑥ PLANTING TABLETS (SEE TABLE)
- ⑦ SOIL BERM
- ⑧ ROOTBALL
- ⑨ AMENDED BACKFILL: SITE SOIL + 1/3 ORGANIC BACKFILL MIXTURE (FOREST HUMUS OR EQUAL) + AMENDMENTS PER SOIL ANALYSES

PLANTING TABLET TABLE	
Size of plant	No. of tablets
1 GALLON	2-3
3 GALLON	3-6
5 GALLON	6-9
7 GALLON	8-10
10 GALLON	10-12
15 GALLON	12-15
24" BOX	18-21
36" BOX	21-24

Planting tablets shall be gro- power or equal

Notes:

1. Root barriers (2' deep x twice the rootball diameter) shall be required where a tree is 5' or less from any hardscape or infrastructure.
2. Tree shall not be planted in LMAD's 9' wide or less.
3. Cut turf away from trunk 4" in diameter. Slope soil away from rootball in all directions a maximum of 4%



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PROJECT TITLE:

TREE PLANTNG DETAIL

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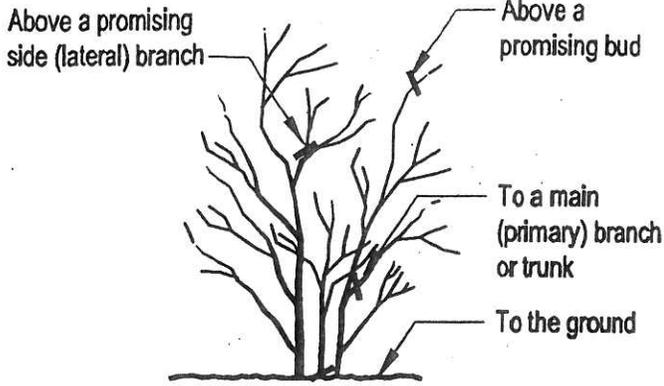
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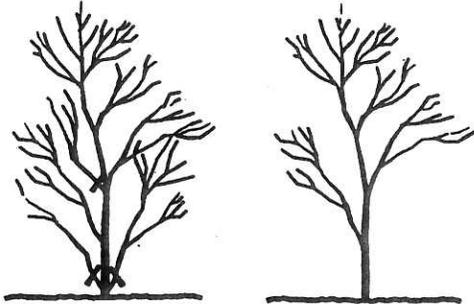
37



PRUNING TO SHAPE

**PRUNING TO SHAPE:**

Pruning to shape is a concept in which the artistic side of pruning determines your concept of what the right shape of a plant should be. Every plant has a "natural" shape where the growth tends to conform to a natural pattern. Observe what a plant's natural shape is, and then prune the plant in a manner that will allow the natural form to continue to develop. Remove excess growth that obscures the basic pattern or any errant growth that departs from the natural form.

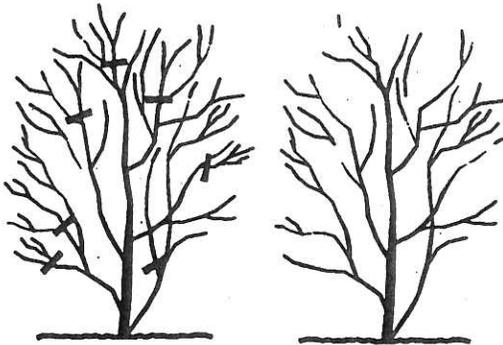


THINNING (BEFORE)

THINNING (AFTER)

**THINNING:**

Thinning is the extreme of heading back, instead of removing parts of stems, entire stems, limbs, or branches are removed. Reasons for thinning are essentially the same as for heading back. It opens up a plant by simplifying its structure, removing old and unproductive growth, or limbs that are growing in directions that detract from the plant's attractiveness. Rose pruning, removing entire canes to the plant's base.



HEADING BACK (BEFORE)

HEADING BACK (AFTER)

**HEADING BACK:**

Heading back (also called cutting back), uses the same growth principle as pinching, that growth elongates in one direction until it is stopped. The difference is that in heading back, lengths of stem already grown are cut off rather than removing growth before it forms stems. In heading back, stems are cut down to side branches or lateral buds that will grow in the direction desired. The annual ritual of rose pruning probably is the most familiar example of heading back. During heading back, decisions are made regarding which growth to remove and to leave, thereby controlling and directing a plant's growth.

HEADING BACK MAY BE DONE BETWEEN DECEMBER THROUGH FEBRUARY AND INCLUDE:

1. Cut out dead or broken branches & limbs
2. Cut off sucker growth.
3. Cut out crossing or inward growing branches.
4. Cut up to 25% of growth (to upward-facing bud)

**HEADING BACK MAY BE DONE:**

1. To remove weak or unproductive wood.
2. To encourage growth in a desired direction.
3. To prevent growth from continuing in the undesirable direction.
4. To stimulate flower or fruit production by encouraging growth of wood that will produce.
5. To prevent wind or snow damage.
6. To revitalize an old plant.



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PROJECT TITLE:

TREE PRUNING  
(DEC. TO FEB.)

PLANNING

BUILDING

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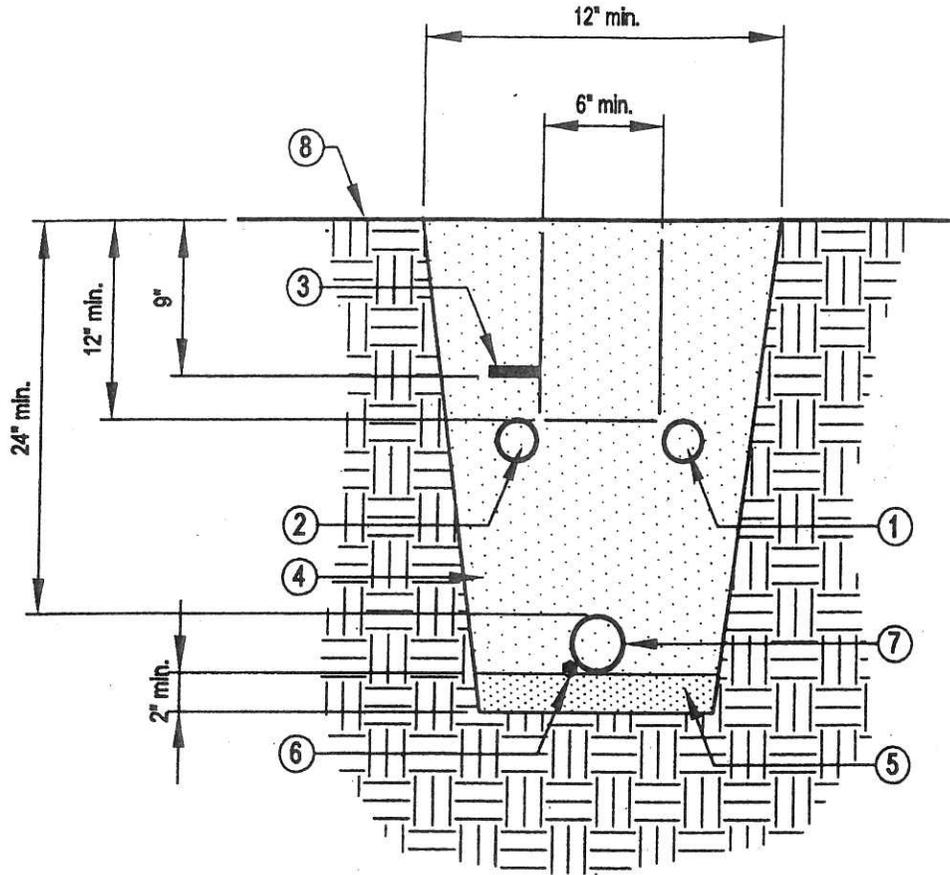
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PAGE NO.

38



- ① Non-pressure lateral pipe
- ② EMT conduit or equal for 110v wires
- ③ Trench marker - continuous plastic tape labeled "caution- electrical" directly above conduit
- ④ Backfill
- ⑤ Sand or approved bedding material
- ⑥ Irrigation controller wire bundle (24v), tape @ 10' o.c. provide 10' -15' coil at every turn and valve
- ⑦ Mainline pressure pipe
- ⑧ Finish grade includes 3" of mulch

**Notes:**

1. Two or more laterals (r main lines) in the same trench shall be placed side by side with 6" min. backfill between pipes both horizontally and vertically.
2. Sleeve all laterals, mainline, and electrical under concrete and asphalt surfaces
3. All measurements shall be from finish grade to top of pipe.



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**COMMUNITY SERVICES  
 DEPARTMENT**

PROJECT TITLE:

**TRENCHING REQUIREMENTS**

PLANNING

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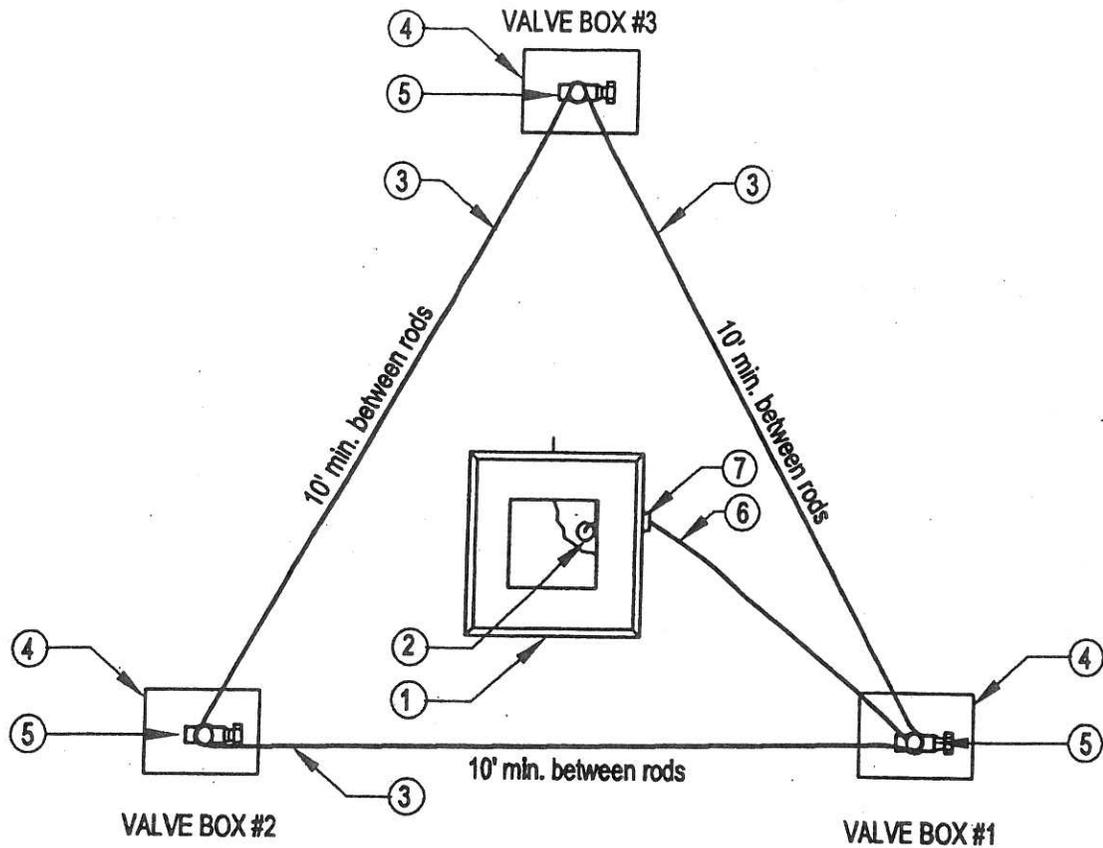
DATE: 12/18/06

SCALE: NTS

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PAGE NO.

39



- ① Satellite or WS-PRO
- ② #10 bare copper wire from grounding terminal lug
- ③ #10 bare copper wire from valve box held in place with brass clamp (see detail for "grounding wires in grid")
- ④ Standard valve box with cover (1 of 3)
- ⑤ Grounding rod from GK-UL3ROD three rod kit
- ⑥ #10 bare copper wire fed through conduit from satellite to grounding rod
- ⑦ Conduit from satellite

Note:  
Plan view for layout only. See grounding rod notes for installation instructions.



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**COMMUNITY SERVICES DEPARTMENT**

PROJECT TITLE:

**TRIANGULAR GRID  
PLAN VIEW DETAIL**

DATE: 1/19/07

SCALE: NTS

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PLANNING

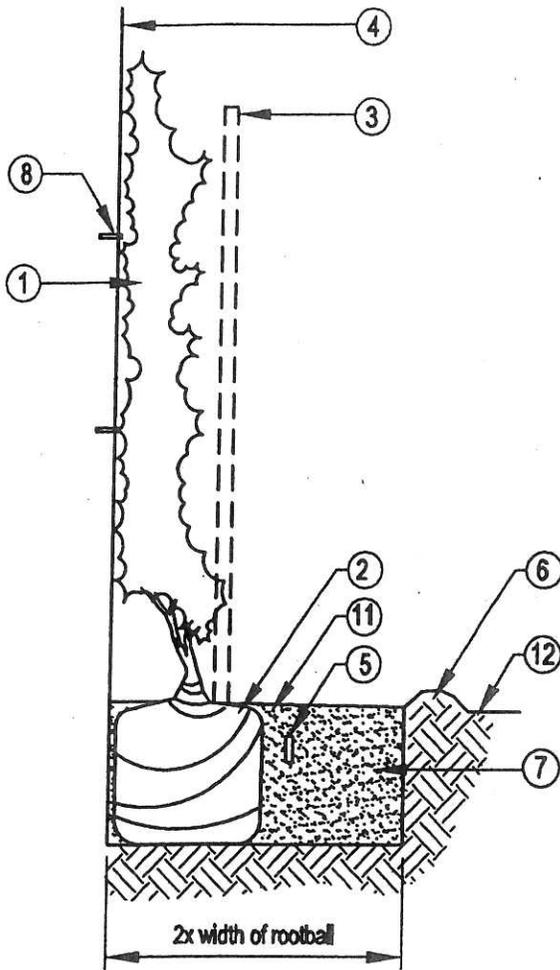
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COMM. SERVICES

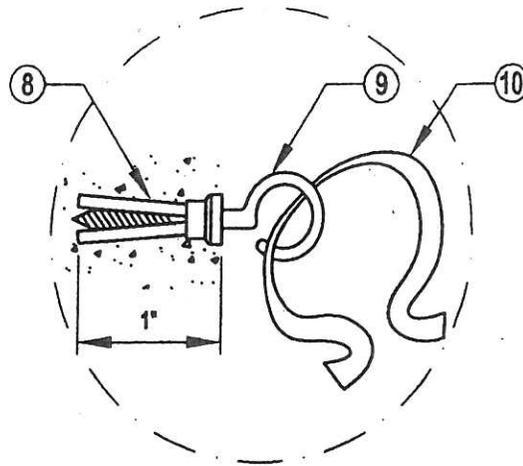
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PAGE NO.

40



SECTION



WALL ATTACHMENT DETAIL

PLANTING TABLET TABLE	
Size of plant	No. of tablets
1 GALLON	2-3
3 GALLON	3-6
5 GALLON	6-9
7 GALLON	8-10
10 GALLON	10-12
15 GALLON	12-15
Planting tablets shall be gro- power or equal	

- ① Vine (espalier on wall)
- ② Rootball (set tight to figs). Remove excess concrete to accommodate planting hole
- ③ Nursery stake (do not damage plant or rootball). Attach vine to fence, wall, overhead, or other adjacent vertical surface.
- ④ Wall, fence or post
- ⑤ Planting tablets (see table for quantity)
- ⑥ 4" watering berm
- ⑦ Amended backfill: site soil +  $\frac{1}{3}$  organic backfill mixture (forest humus or equal) + amendments per soil analysis.
- ⑧ Lead expansion anchor (as needed)
- ⑨  $\frac{3}{16}$ " stainless steel eye-screw
- ⑩ Heavy duty green plastic ribbon tie, 2 ties (min.) per vine (length as req'd.'d)
- ⑪ Bark mulch (2" deep)
- ⑫ Finish grade includes 3" of mulch



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PROJECT TITLE:

**VINE PLANTING DETAIL**

PLANNING

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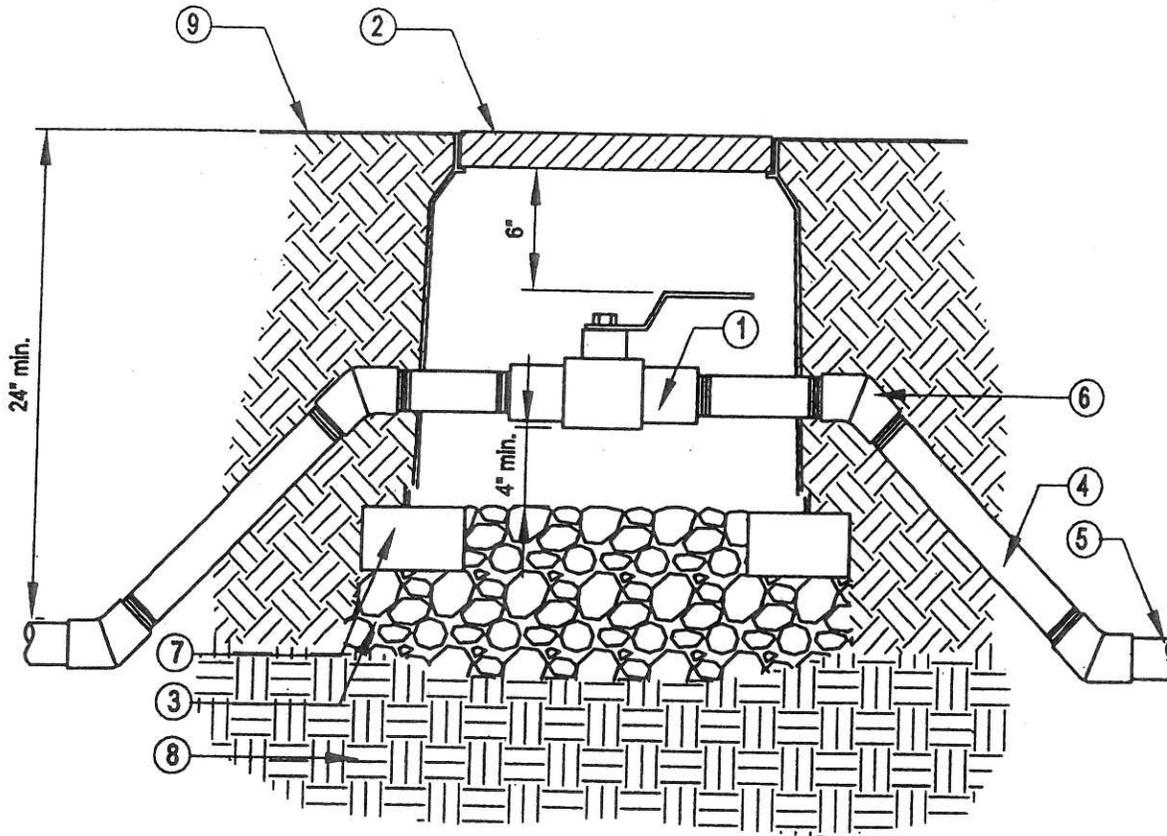
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PAGE NO.

41



- ① Ball valve (line-size)
- ② Valve box with locking cover (NDS #1100 or equal). Mark lid "ball valve", install flush to grade
- ③  $\frac{3}{4}$ " pea gravel (one c.f. min.)
- ④ PVC sch 80 threaded nipple (length as req'd.)

- ⑤ PVC mainline
- ⑥ PVC sch 80 union elbow (typ. of 4)
- ⑦ Common brick (min. 3 per box), set on undisturbed soil.
- ⑧ 90% compacted sub grade (under box only)
- ⑨ Finish grade includes 3" of mulch

Note: Hot brand mark lid "BV".



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PROJECT TITLE:

**BALL VALVE**

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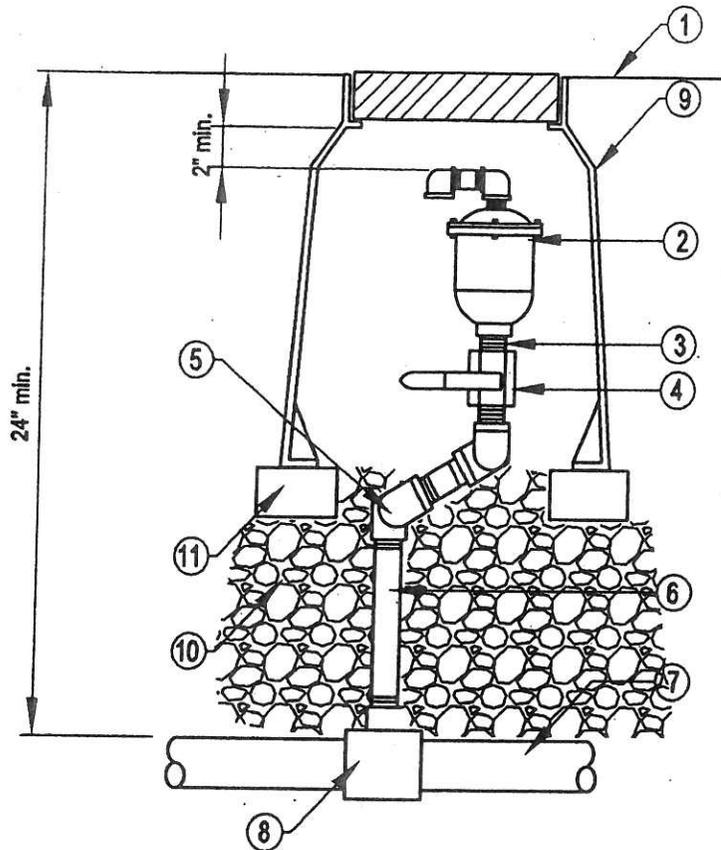
BUILDING

COMM.  
SERVICES

ENGINEERING

PAGE NO.

42



- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>① Finish grade includes 3" of mulch</li> <li>② Combination air valve (cav) with vent drain (galvanized)</li> <li>③ (2) 2" x 3" L. galvanized steel nipples</li> <li>④ 2" ball valve (full flow)</li> <li>⑤ 2" galvanized steel swing joint 2" includes:             <ul style="list-style-type: none"> <li>(4) 90° threaded elbows</li> <li>(4) 2" x 4" L threaded nipples</li> <li>(2) 2" x 8" L threaded nipples</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>⑥ Galvanized steel nipple (length as req'd.)</li> <li>⑦ PVC mainline pipe</li> <li>⑧ Mainline fitting (ductile iron) tapped coupling or service saddle.</li> <li>⑨ Valve box (standard round box w/ locking lid, install flush to grade)</li> <li>⑩ ¾" crushed rock or gravel install 12" deep</li> <li>⑪ 2" red brick at corner</li> </ul> |
|--|--|

**Notes:**

1. Flush pipes prior to installing valve.
2. Paint all galvanized steel items with 2 coats of a corrosion resistant material.
3. Compact soils around valve box to 90%-95% of original dry density.
4. Wrap all threads with teflon tape, 1 to 2 wraps maximum
5. Install heads-up marking flag on valve box lid. Contractor to maintain flagging until project is complete
6. Hot brand mark lid "CAV"



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**DEPARTMENT**

PROJECT TITLE:

**COMBINATION AIR VALVE**

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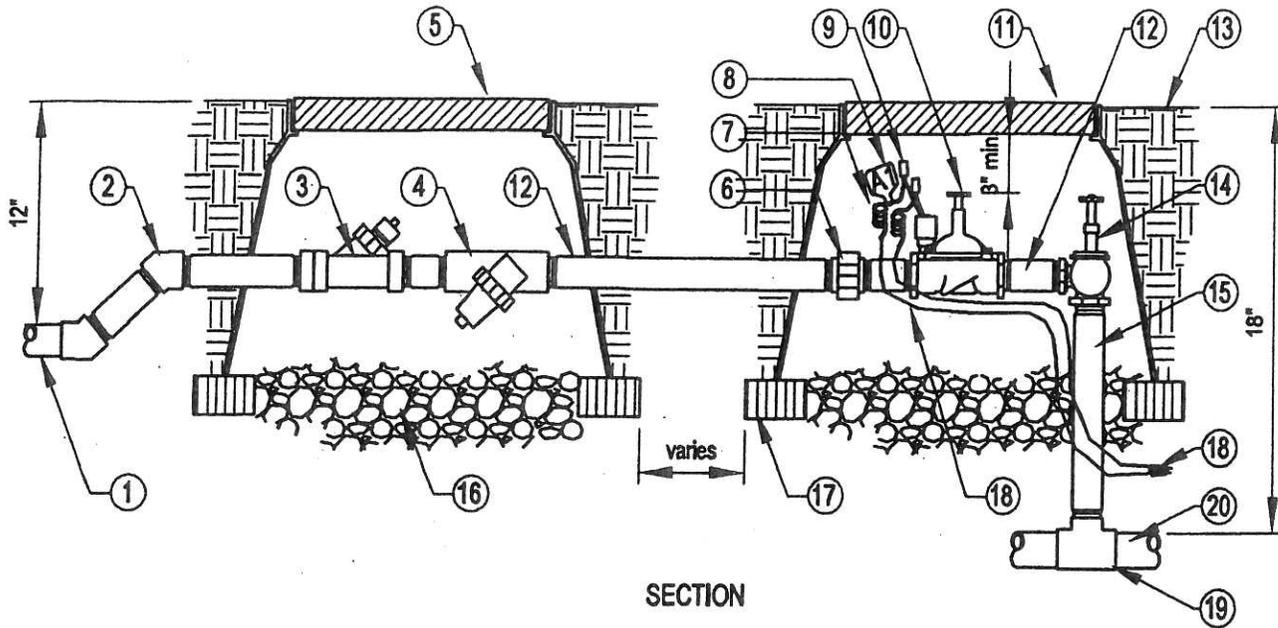
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COMM. SERVICES

ENGINEERING

PAGE NO.

43



SECTION

- ① PVC sch 40 lateral pipe
- ② PVC sch 80 coupling (45°) to angle pipe to lateral depth (typical)
- ③ Pressure regulator
- ④ Flush valve (plastic) w/ 'y' filter (155 mesh)
- ⑤ Valve box w/ locking lid (rectangular), install flush w/ grade, mark lid "F & R"
- ⑥ Sch 80 or brass union
- ⑦ Extra wire coils - 6 to 8 wraps over 1" pipe
- ⑧ Valve id tag
- ⑨ Waterproof connector (24v)
- ⑩ Remote control valve
- ⑪ Valve box w/ locking lid (rectangular). Install flush w/ grade, mark lid "RCV"
- ⑫ PVC sch 80 nipple (typ.)
- ⑬ Finish grade includes 3" of mulch
- ⑭ Bronze angle valve with cross handle or globe valve
- ⑮ PVC sch 80 riser pipe length varies
- ⑯ 3/4" Ø gravel (2 c.f min.)
- ⑰ Common brick (typical @ corner)
- ⑱ Tape wrap 24v wires every 10 feet (typ.)
- ⑲ SSS Tee
- ⑳ PVC mainline pipe

- Notes:
1. Flush all pipe lines prior to installing valve
  2. Wrap all threads with teflon tape (2 wraps maximum.)
  3. Compact soils around valve box to 90% of original dry density
  4. Install heads-up marking flag on valve box lid. Contractor to maintain marking flag locations until project is complete.
  5. Hot brand mark lid "F & R".
  6. Hot brand mark lid "RVC"

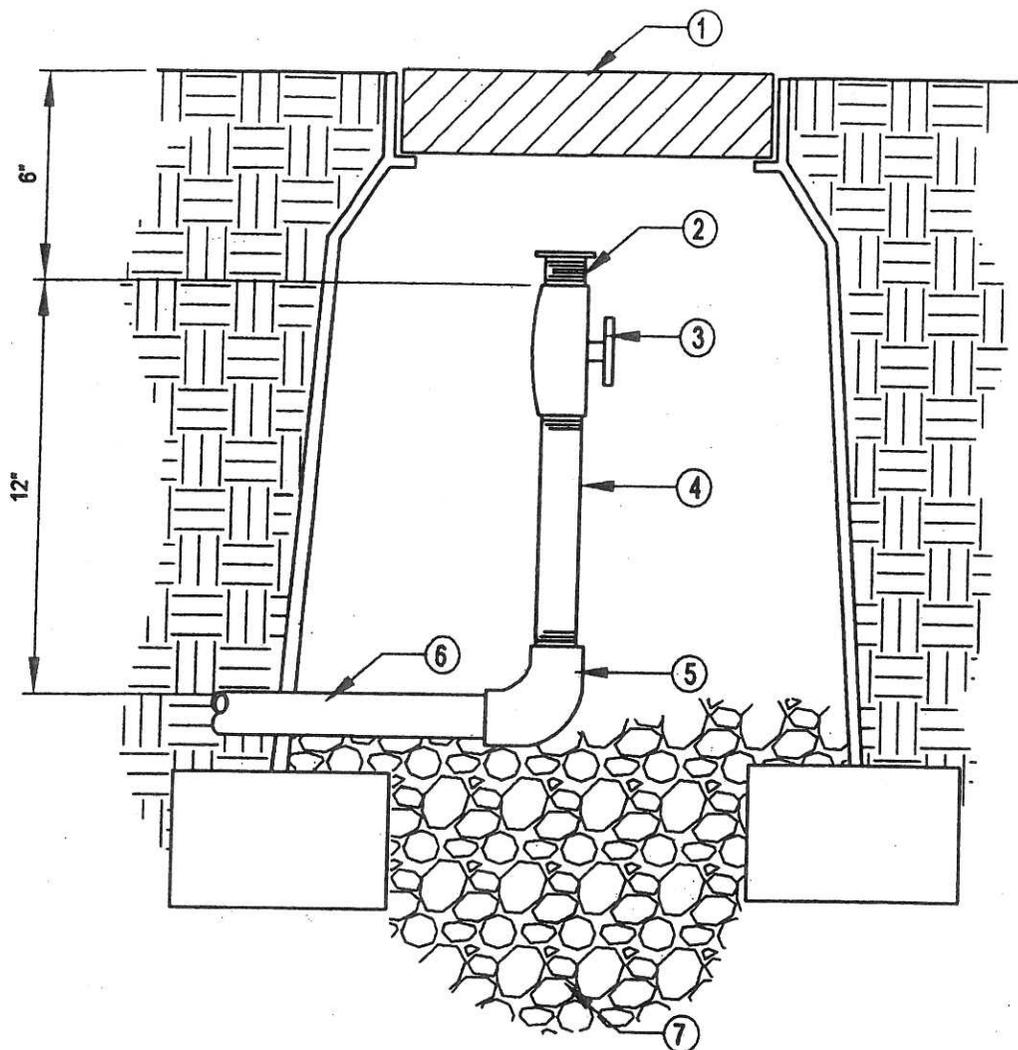


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PROJECT TITLE:  
**ASSEMBLY DETAIL**  
**DRIP REMOTE CONTROL VALVE**

DATE: 12/18/06    SCALE: NTS    DRAWN BY: P. Tamisin

PLANNING
BUILDING
COMM. SERVICES
ENGINEERING
PAGE NO.      44



- ① Brook 1110 10' round locking valve box. Mark as "flush valve"
- ② Brass hose adapter
- ③ Flush valve
- ④ PVC sch. 80 nipple
- ⑤ PVC sch. 80 ell's s x t
- ⑥ PVC sch. 40 lateral
- ⑦ 1 Cubic foot coarse gravel sump

Note: Hot brand mark as "FV"



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PROJECT TITLE:

**FLUSH VALVE DETAIL**

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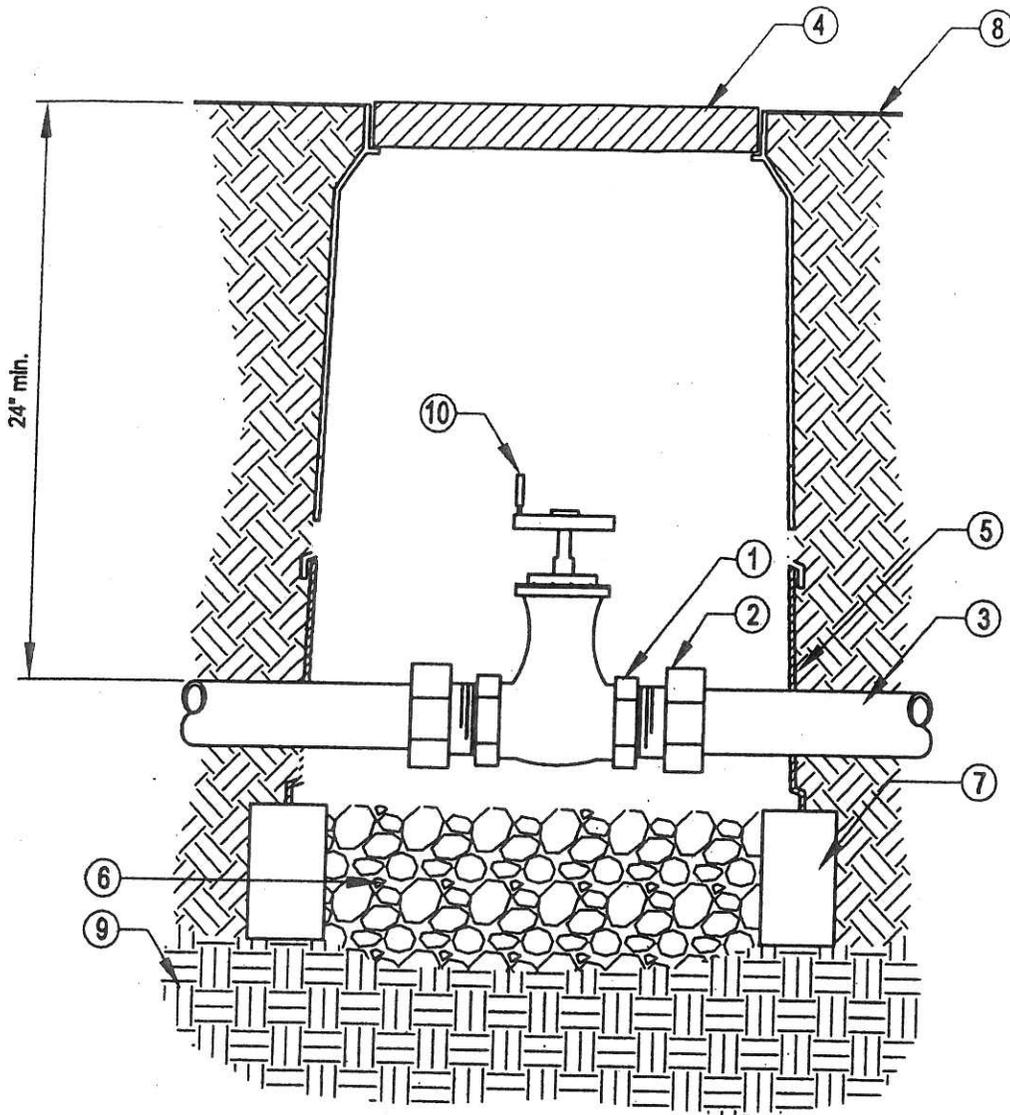
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PAGE NO.

45



- ① Brass gate valve (line - size) w/ non-rising stem by nibco or city approved equal. All valves 2" or larger shall be flanged.
- ② PVC sch. 80 male adapters (typical of 2)
- ③ PVC mainline (3" or smaller), mainline larger than 3" dia. shall be class 200 ring-tite.
- ④ Valve box with locking cover (NDS #1100 or equal) mark lid "gate valve" install flush to grade.

- ⑤ Valve box extension (length as req'd), extension box shall not rest on pipe.
- ⑥  $\frac{3}{4}$ " dia. pea gravel (one c.f. min.)
- ⑦ Common brick (min. three per box), set on undisturbed soil.
- ⑧ Finish grade includes 3" of mulch.
- ⑨ 90% compacted sub-grade
- ⑩ Knuckle valve



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PROJECT TITLE:

**GATE VALVE  
 (3" OR SMALLER)**

DATE: 1/19/07

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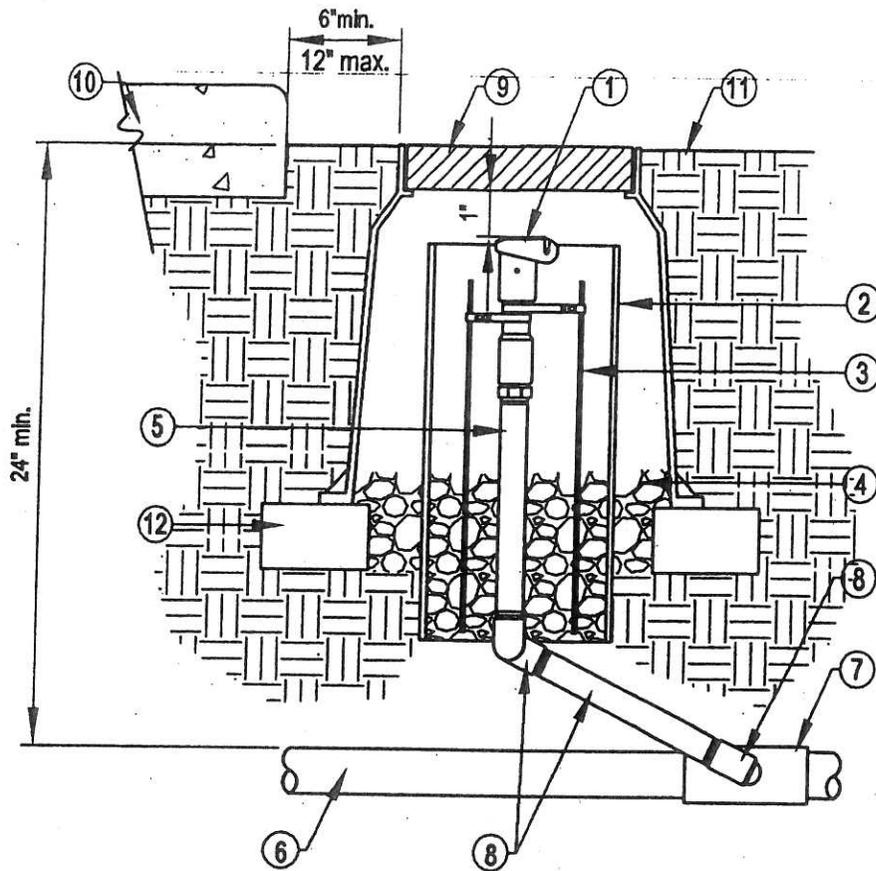
BUILDING

COMM.  
 SERVICES

ENGINEERING

PAGE NO.

46



- ① Quick-coupling valve (bronze two piece w/ 1"-inch inlet and locking rubber cover.
- ② 8" dia. pipe sleeve, keep sleeve from bearing on riser or pipe.
- ③ (2)  $\frac{5}{8}$ " x 18" rebar w/ (2) stainless steel pipe clamps
- ④  $\frac{3}{4}$ " to 1" gravel; (12" deep)
- ⑤ PVC sch 80 nipple
- ⑥ PVC mainline pipe
- ⑦ S x S x T tee or S x T ell (pvc sch. 40)
- ⑧ Prefabricated pvc sch. 80 swing joint assembly (360°) or fabricate with:  
(3) street ell  
(1) 12" L nipple
- ⑨ 10" round valve box with locking lid  
Install flush to grade, mark lid "QC" 1"  
In groundcover/ shrub area
- ⑩ Walk curb, paving or other improvement
- ⑪ Finish grade includes 3" of mulch
- ⑫ Common brick (typical of 3 per box)

**Notes:**

1. All threaded fittings shall be wrapped with teflon tape (2 wraps min.)
2. Flush pipes prior to installing quick coupling valve on swing joint.
3. Install heads-up marking flag on valve box lid. Contractor to maintain marking until project is complete
4. Furnish fittings and piping nominally sized identical to nominal quick coupling valve inlet size.
5. Compact soils around valve box to 80% of original dry density.
6. Hot brand mark lid "QC"



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**COMMUNITY SERVICES  
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PROJECT TITLE:

**QUICK - COUPLING VALVE**

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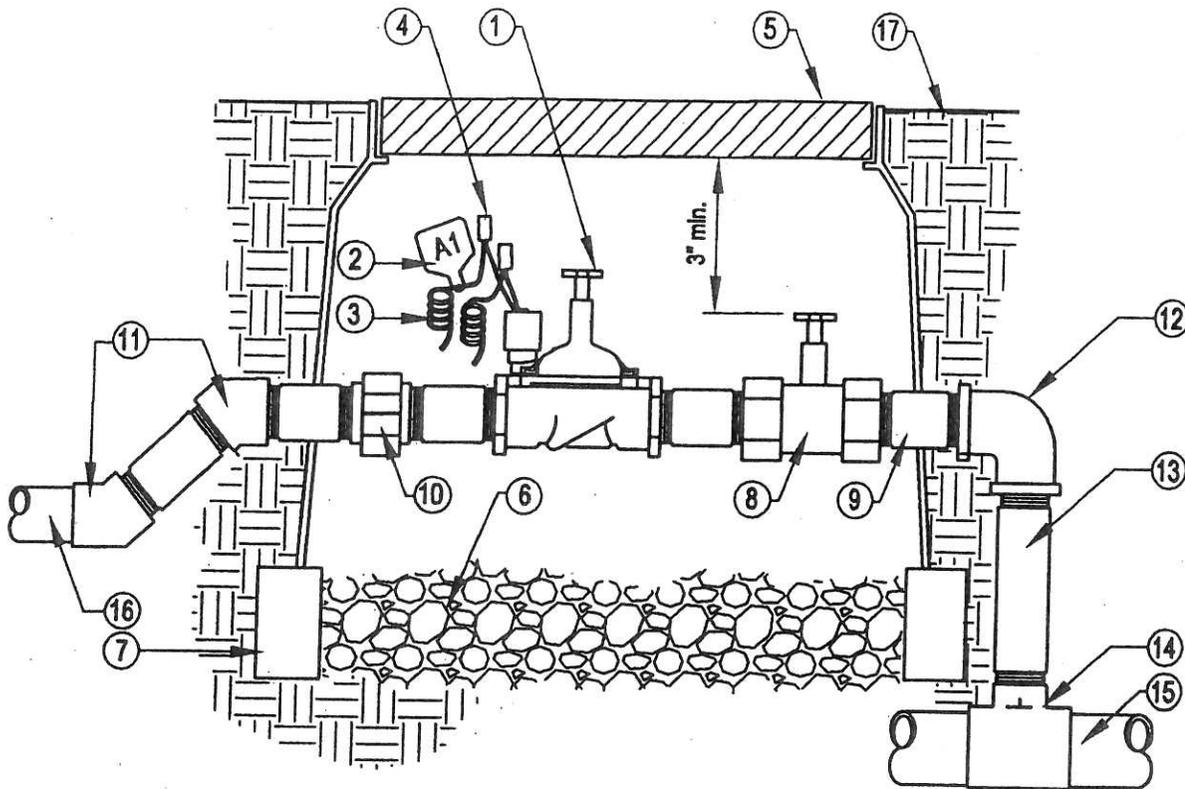
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PAGE NO.

48



- |   |   |
|---|---|
| ① Remote control valve  | ⑩ PVC sch 80 union  |
| ② Valve lid tag   | ⑪ PVC sch 80 SS coupling (45°) to angle pipe to lateral depth (typical) |
| ③ Extra wire coils - 6 to 8 wraps over 1" pipe  | ⑫ PVC sch 80 ell  |
| ④ Waterproof connector (24v)  | ⑬ PVC sch 80 riser pipe length varies                                   |
| ⑤ Valve box w/ locking lid (rectangular), install flush w/ grade, mark lid "RCV" and numbers. | ⑭ SSS Tee   |
| ⑥ 3/4" Ø gravel (2 c.f. min.)   | ⑮ PVC mainline pipe   |
| ⑦ Common brick (one per corner of box)  | ⑯ PVC sch 40 lateral pipe   |
| ⑧ Ball valve (brass, line-size)   | ⑰ Finish grade includes 3" of mulch                                     |
| ⑨ PVC sch 80 nipple (typ.)  |   |

**Notes:**

1. Flush all pipe lines prior to installing valve
2. Wrap all threads with teflon tape (2 wraps maximum.)
3. Compact soils around valve box to 90% of original dry density
4. Install heads-up marking flag on valve box lid. Contractor to maintain marking flag locations until project is complete.
5. Install (4) 1-5/8 inch long dry wall screws; each corner of the lid to the box.
6. Hot brand mark lid "RCV" and numbers.



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**COMMUNITY SERVICES  
DEPARTMENT**

PROJECT TITLE:

**REMOTE CONTROL VALVE**

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PAGE NO.

49