Victorville Design Guidelines for Drainage Channels, Basins, and Landscape Areas

APRIL 2024

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FINAL

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Acronyms

AC	Asphalt Concrete
BMP	Best Management Practice
cfs	Cubic feet per second
CWA	Clean Water Act
DCV	Design Capture Volume
DFAD	Drainage Facilities Assessment Districts
fps	feet per second
HOA	Homeowner's Association
IPEMA	International Play Equipment Manufacturers Association
LID	Low Impact Development
LMAD	Land Maintenance Assessment Districts
LRWQCB	Lahontan Regional Water Quality Control Board
MAD	Maintenance Assessment District
MS4	Municipal Stormwater Sewer System
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
PCC	Portland Cement Concrete
PCMP	Post Construction Measures Plan
SWRCB	Stormwater Resources Control Board
TGD	Technical Guidance Document
WSE	Water Surface Elevation

Definitions

- **Best Management Practices (BMP)** – a practice, or combination of practices, that is determined to be an effective and practicable (including technological, economic, and institutional considerations) means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals.

- **Detention Basin** – an area where excess stormwater is stored or held temporarily and then time released back into the storm drain network through an outlet. This area is for stormwater capture temporarily until water can flow into a receiving outlet.

- **Retention Basin** – an area where stormwater volume is stored, being removed from the drainage network permanently. Stormwater from retention basins often remains after a storm has passed or indefinitely if not infiltrated or diverted for recycling.

- **Hydromodification** – the alteration of the natural flow of water through a landscape, and often takes the form of channel modification or channelization.

- **Biotreatment soil media (BSM)** – materials such as mulch and proprietary soil media that is used to reduce pollutant loading in storm water flows. BSM combines minimum contact time with high hydraulic conductivity to optimize removal within minimal BMP footprint requirements.

- **Biofiltration treatment**– is a detention type treatment process by which stormwater runoff is treated through contact with a BSM prior to being re-released into the storm drain network.

- **Bioretention treatment** – is a retention type treatment that utilizes BSM to treat storm water runoff prior to infiltration into the ground.

- **Infiltration** – the process by which stormwater volume that is retained in a basin, can be diverted into the ground instead of back into the storm drain network, often tributary to local aquifers.

- **Low Impact Development (LID)** – refers to systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration, or use of stormwater to protect water quality and associated aquatic habitat. LID is a leading stormwater management strategy that seeks to mitigate the impacts of runoff and stormwater pollution as close to its source as possible.

1. Introduction

The Victorville Design Guidelines for Stormwater Basins, Drainage Channels, and Street Landscape Areas (Design Guidelines) have been created to provide guidance on the design of stormwater basins, drainage channels, and street landscaping for required improvements associated with the various types of developments within the City of Victorville (City). The philosophies, policies, and minimum standards contained herein are not intended to replace or supersede any other design criteria and/or minimum requirements of the governing bodies and/or regulatory bodies. These guidelines are intended to provide a more consistent, uniform approach to the design of stormwater basins, drainage channels, and street landscape areas within the City.

1.1 Intended User

All development project owners are required to use these design guidelines in obtaining necessary approvals for implementation of their projects. Project submittal requirements may vary depending on the size and development type of project as well as whether the project proponent is a private entity or a public agency. Development includes new and redevelopment projects on public or private lands that fall under the planning and permitting authority of the City. Redevelopment is any land disturbing activity that results in the creation, addition, or replacement of exterior impervious surface area onsite where past development has occurred. Redevelopment does not include trenching, excavation, and resurfacing associated with linear underground/overhead projects (utility projects); pavement grinding and resurfacing of existing roadways; construction of new sidewalks, pedestrian ramps, bike lanes on existing roadways; or routine replacement of damaged pavement such as pothole repair or replacement of short, non-contiguous sections of roadway.

1.2 Regulatory Background

The City falls under the Mojave River Watershed jurisdiction and is subject to water quality requirements under the Clean Water Act (CWA), and the Lahontan Regional Water Quality Control Board (LRWQCB) and thus subject to the Phase 2 Small Municipal Separate Storm Sewer System (MS4) Permit of the Mojave River Watershed Group. As part of its responsibility to protect beneficial uses of the waters in the Mojave River Watershed in San Bernardino County, this Phase 2 Small MS4 Permit regulates discharges from Small Municipal Separate Storm Sewer System (Phase 2 MS4) facilities within its jurisdiction. Technical guidance for post construction measure plans and water quality management plans can be found in the following documents:

- Mojave River Watershed Technical Guidance Document (Mojave TGD) for Post Construction Measure Plans
  - https://www.sbcounty.gov/uploads/DPW/docs/MojaveWatershedTechnicalGuidancePostConstructionMeasuresplans.pdf
- Mojave River Watershed Technical Guidance Document (Mojave TGD) for Water Quality Management Plans
  - https://www.sbcounty.gov/uploads/DPW/docs/MojaveWatershedTechnicalGuidanceWaterQualityManagemenPlans.pdf

1.2.1 Stormwater Basins

The expansion of impervious areas from housing development causes peak stormwater runoff to increase compared to runoff under existing conditions since it prevents natural ground from soaking up stormwater runoff. Without proper mitigation, increased runoff may heighten flooding risk downstream of the development. There are also water quality impacts associated with development. Stormwater runoff typically contains high concentrations of trash, sediment, pesticides, nutrients, and bacteria. Pavement runoff typically contains high concentrations of metals and constituents associated with oil and grease as well. For these reasons, stormwater basins are a typical requirement of development projects.

Developers are required to prepare a hydrology report for development projects that shows how the development will address flood risk concerns, according to the City's Preliminary Hydrology Report guidance document, [hydrology requirements] provided by the Engineering Department. The developer must ensure that the following metrics apply:

1. The proposed conditions peak flow rate generated by a 100-year; 1-hour storm event must not exceed the existing conditions peak flow rate leaving the site at any point.
2. The proposed conditions peak flow rate generated by a 10-year; 24-hour storm event must not exceed the existing conditions peak flow rate leaving the site at any point.

Development involving the creation and/or replacement of 2,500 square feet or more of impervious surface is required to comply with the new development and significant redevelopment requirements of the 2013 Phase II Small Municipal Separate Storm Sewer System Permit (Phase II MS4 Permit), adopted by the State Water Resources Control Board (SWRCB). In San Bernardino County, the Phase II MS4 Permit is applicable within the Mojave River Watershed. All land within the City of Victorville is within the Mojave River Watershed, and thus all developers that create and/or replace more than 2,500 square feet are required to prepare either a Post Construction Measures Plan (PCMP) (for impervious surface addition/replacement between 2,500 and 5,000 square feet or for projects above 2,500 square feet that are not part of a larger plan of development) or a Water Quality Management Plan (WQMP) (for impervious surface addition/replacement above 5,000 square feet).

Technical guidance documents for the preparation of PCMPs and WQMPs are available from the San Bernardino County Department of Public Works website under the NPDES (National Pollutant Discharge Elimination System)/Stormwater category. [WQMP Templates and Forms]. Permanent post-construction Best Management Practices (BMPs) must be sized to satisfy the following design criteria:

1. Low Impact Development (LID) performance criteria: BMPs must be sized to capture the Design Capture Volume (DCV). The DCV is typically the 24-hour, 85th percentile storm event, as calculated through the regression equations included in the Mojave River Watershed Technical Guidance Document for the Preparation of WQMPs.
2. Hydromodification performance criteria: BMPs must be sized to ensure the post-development runoff volume, time of concentration, and peak flow velocity for the 10-year frequency storm does not exceed that of the pre-development condition by more than five percent. Additional guidance for Hydromodification can be found in the Mojave TGD.

Drainage basins are typically constructed to mitigate stormwater from developments within the City, and these basins typically handle mitigation for water quality improvement, hydromodification conditions of

concern, and flood protection. These design guidelines for stormwater basins are intended to complement, not supersede, the existing water quality and flood protection requirements of the City, and the standards and guidelines contained herein were developed with these existing regulations in mind.

1.2.2 Drainage Channels (DFAD Improvements)

Residential development frequently requires the improvement or creation of drainage channels. The City is responsible for the protection of property from flooding risk, and so these drainage channels typically become public improvements. The City's Standard Specifications for Public Improvements (2007) list several design criteria for drainage channels, some of which are listed below:

1. Drainage channels and conduit shall have sufficient capacity to contain runoff from a 100-year storm event with no less than two (2) feet of freeboard on channels. * The 100-year storm shall be calculated under the ultimate anticipated development of the watershed area.
2. Soft-bottom channels are allowed for flow velocities of up to 5 feet per second (fps) with side slope protection; velocities of 5 fps to 12 fps require concrete-lined channels.

   *Although the City's Standard Specifications for Public Improvements state the minimum freeboard, designers shall adhere to the City's Master Plan note 3 below for Drainage minimum freeboard length. The City's Master Plan shall supersede the City's Standard Specifications for Public Improvements.

The City's Master Plans for Drainage includes detail where channel would be required for Master Plan facilities. The City's Master Plans for Drainage includes several design criteria for drainage channels, some of which are listed below:

1. Proposed concrete channels will be trapezoidal with 1.5:1 side slope (unless otherwise noted); invert lining will be 8 inches thick and side slope lining 6 inches thick.
2. All improved channels will be fenced for safety.
3. Channel height is the normal depth, based on Manning's equation, plus freeboard, where freeboard is no less than 2.5 feet.
4. Channels with base of 10 feet or more will have a 20-foot access road along each side of the channel.
5. Channels with a base less than 10 feet will have a 20-foot access road along one side of the channel.
6. When proposed alignments parallel existing roadways, channels will generally be offset along the back property lines to reduce construction and access problems. In some cases, open channels may be shown immediately adjacent to roadways where options are limited, or access is not a problem. Proposed alignments and channel sections should be reviewed and may be revised during the design phase of each project to determine to most efficient solution for each facility.

The City defines the maintenance and operating services for Drainage Facility Assessment District (DFAD) regarding channels include but are not limited to the following below:

- Repair, removal, or replacement of any of the improvements.
- Grading, clearing, removing debris, constructing, installing, or paving basins, channels, other hardscape, water, irrigation, or drainage facilities.

- Landscaping, cultivating, irrigating, fertilizing, spraying, and trimming for manicured plants health, growth, and beauty.
- Removal of plant trimmings, debris, trash, and other solid waste.
- Graffiti removal on walls and other improvements by sandblasting, cleaning, and painting.

1.2.3 Landscaping (LMAD Improvements)

The City requires arterial streets, drainage channels, and pocket park areas be screened from residential developments by a buffer zone of landscaping and a masonry wall or fence. These guidelines are intended for developers to use as a framework and establish requirements and standards for landscaping to:

- Enhance the appearance of development projects
- Reduce heat and glare
- Control soil erosion
- Conserve water
- Screen potentially incompatible land uses
- Preserve the integrity of neighborhoods
- Improve air and water quality
- Protect pedestrian and vehicular traffic and safety

1.3 Single-Family Design Guidelines

The City has established Single-Family Design Guidelines within the Development Code. Section 16-3.08.090 of the City of Victorville Municipal Code describes these Single-Family Design Guidelines. The Single-Family Design Guidelines establish several design parameters for stormwater basins, drainage channels, and street landscape areas. The most relevant design parameters to these Design Guidelines are listed below:

1. Stormwater basins and drainage channels shall be utilized as recreational or visual amenity opportunities for the neighborhood in the form of parks and/or trail systems, where feasible.
2. Stormwater basins and drainage channels, when visible from public views, shall be designed with decorative walls/fencing and landscaping to soften the edge where the facility meets the public realm.
3. Open stormwater drainage channels and basins shall provide landscaping a minimum of 10 feet in width when abutting a public street or public trail, excluding channel street crossings. Said landscaping shall be constructed per Land Maintenance Assessment Districts (LMAD) standards and the landscaping standards listed within the Development Code.
4. Neighborhood streets shall be designed with landscaped parkways. Streets with sidewalks adjacent to the curb shall be avoided. Landscape parkways shall also be irrigated and permanently maintained by the owner of the adjoining residential property. See Standard L-013 in Appendix B.

5. Drainage basins, drainage corridors and utility corridors may not be utilized as common open space unless they incorporate a usable community amenity (e.g., park, trail system, etc.), or a unique natural aesthetic benefit.
6. Developments and single-family subdivisions shall provide six-foot high masonry block walls. Decorative masonry walls shall be constructed along the perimeter of all new residential developments and subdivisions, including all interior side and rear project boundaries, and street frontages without front-on units. Walls along the rear or side property lines shall not be required along lot lines that abut a property zoned or used as open space/recreation.

Through the Development Code, the City encourages developers to produce an urban environment of stable, desirable character which is harmonious with existing and future development and is consistent with the goals and policies of the Victorville General Plan.

1.4 Multiple Family Design Guidelines

The City of Victorville has established the Multi-family Design Guidelines in the Development Code **Section 16-3.08.100** of the City of Victorville Municipal Code. The previous section, Single-Family Design Guidelines, establishes several design parameters for stormwater basins, drainage channels, and street landscape areas which can be applied in turn to the Multi-family Design. Additional design parameters from the Multi-family Design Guidelines are listed below.

1. Residential development should integrate water runoff best management practices into site design.
2. Common open spaces or recreational facilities are determined by the number of residential units and can include options like large open lawns where basins can be installed.

As with the Single-Family Design Guidelines the City encourages developers to create livable neighborhoods which are design compatible to the goals and policies of the Victorville General Plan.

1.5 Commercial/Industrial

The City of Victorville has established the Commercial and Industrial Design Guidelines in the Development Code **Title 16 Articles 10 and 11** of the City of Victorville Municipal Code. The most relevant design parameters to these Design Guidelines are listed below:

1. Site grading for commercial projects should retain and incorporate significant natural vegetation, follow natural terrain as much as possible, and optimize water retention.
2. Visual buffers, such as landscaping, can be used between commercial, industrial, and residential developments and transition from development to natural features.

1.6 Purpose

These Design Guidelines for Stormwater Basins, Drainage Channels, and Street Landscape Areas seek to establish best practices to ensure compliance with both the existing regulatory requirements and the existing aesthetic design parameters for drainage channels, basins, and landscape areas. The structure of these Design Guidelines includes fact sheets and information for types of basins, channels, and street landscaping; details for various elements and features that must be included within basin, channel, and

landscaping areas; and a description of operations and maintenance of these elements and features. The construction of all improvements in drainage channels, basins, and landscape areas, that are required as a condition of approval, shall be the responsibility of the developer.

1.7 Disclaimer

The City will review and approve drainage design plans, reports, and contract and construction documents for conformance to these City regulations. This notwithstanding the City assumes no liability for insufficient design or improper construction. Review and approval do not absolve the owner, developer, design engineer, or contractor of liability for inadequate design or poor construction. The design engineer has the responsibility to design drainage facilities that meet standards of practice for the industry and promote public safety. Compliance with regulatory elements and meeting policies and minimum design standards does not guarantee that properties will be free from flooding or flood damage. The City and their officials or employees assume no liability for information, data, or conclusions prepared by private engineers or environmental professionals and make no warranty expressed or implied in their review/approval of drainage projects or studies including water quality submittals.

2. Designs

The design standards of stormwater conveyance systems are intended to increase the lifespan of the system while promoting water quality and flood plain enhancements. The design standards of stormwater basins, drainage channels, and street-adjacent landscaping (included in **Appendix A**) will be used to create an aesthetic integration system between community development and the environment. The designer is required to use the Mojave TGDs from **1.2** for further design technical details and conceptual discussions. The creation of public pathways and recreation trails around the basins and channels along with site considerations, and design and sizing criteria are further discussed in the sections below.

2.1 Basins

The basins outlined below may be designed to meet stormwater volume, flow, and velocity control, water quality treatment for compliance, hydromodification requirements, and/or flood control mitigation. Each system is summarized considering development project size range. Basins can be designed to retain flows permanently, or detain flows temporarily, mitigated to match pre-project conditions. Basins can also utilize different treatment methods, such as biofiltration, or bioretention/infiltration, depending on site specific needs or requirements, and available materials. Also summarized are basins that use a combination of treatment methods and processes, and basins designed as multi-use, multi-benefit systems.

2.1.1 Linear Basins for Residential Developments Less than 20 Acres

For developments of less than 20 acres linear basins are recommended. Linear basins can be placed along the edge of the public right of way and integrate with designated landscape maintenance assessment district areas. Linear basins can be designed as either retention systems, or detention systems, with bio-filtration, bioretention, or infiltration characteristics, depending on site specific conditions. Linear basins have trapezoidal shaped cross-sections with side slopes of 3:1 or flatter and are generally shallow, (9-inch maximum ponding depth). Linear basins can be built to blend with the environment, meandering through hiking/riding paths along the outskirts of a development, adjacent to the public right-of-way. Linear basins can also include shallow excavated areas filled with rock to create subsurface reservoirs for additional storage volume. Freeboard shall be a minimum of 2.5 foot. Check dams can be used to minimize scour erosion along the edges of the basin with higher (>7 fps) velocities. Concrete lining is also an option for the side slopes of linear basins.

Linear basins are highly effective in removing targeted pollutants from stormwater runoff. **Figure 1** shows an example of an existing linear basin system in the City of Anaheim. The picture shows how a linear basin can be integrated within a landscaped area with passive recreation such as a walking trail. Linear basins can provide stormwater runoff flow, volume, and velocity control for both residential developments and the adjacent street improvements. Advantages of implementing linear basins include treatment of stormwater within more compact spaces via linear treatment processes and utilizing spaces with mixed use characteristics such as walking trails, and bioswale treatment.

Figure 1: Example Linear Basin – City of Anaheim

An important design consideration for stormwater basins is overflow by-pass. Typical linear basins are specified for the capture and conveyance of the smaller storms, while larger storm events are allowed to by-pass the system with minimal impacts to pedestrian paths. Linear basins inlets can be designed to double as overflow by-pass as shown in **Figure 2**. Once volume capacity has been reached, additional runoff will by-pass the system via the street gutter provided hydraulic connectivity is considered in the design of the system. Access to maintain linear basins can be provided directly from the street, and heavy equipment is not needed, therefore vehicular access is also not needed.

Figure 2: Inlet/Overflow By-Pass

Inspection and Maintenance

Table 1: Linear Basin Maintenance Activities

Schedule	Inspection or Maintenance Activity
90-Day Plant Establishment Period	➢ Prior to turning over a basin and landscaped area to the City, the developer and/or owner's representative site shall maintain and monitor a 90-day plant establishment period
Every two weeks or as often as necessary to maintain acceptable aesthetics	➢ Maintain adjacent landscaped areas. Remove clippings from landscape maintenance activities ➢ Remove trash and debris
3 days after major storm events	➢ Check for surface ponding. If ponding is only above basin trench reservoir, remove, wash, and replace reservoir rock. May be needed every 5 to 10 years. ➢ Check observation well for ponding. If subgrade reservoir becomes plugged, remove rock materials. Provide a fresh infiltration surface by excavating 2-4 inches of soil. Replace rock materials.
Vehicular Access	➢ Not typically needed.

Design and Sizing Criteria

Table 2: Linear Basin Design Characteristics

Design Parameter	Design Criteria
Design Volume	To be determined from Hydrology / WQMP
Design Drawdown Time	72 hours
Maximum Basin Ponding Depth	9 inches
Maximum Subsurface Depth	4 feet
Width to Depth Ratio	Width must be greater than depth
Reservoir Rock Material	AASHTO #3 or 57 1 to 3-in diameter
Basin Side Slopes	3:1 or flatter
Historic High Groundwater Mark	10 feet or more below bottom of subgrade reservoir
Bedrock/Impermeable Layer setback	5 feet or more below bottom of subgrade reservoir
Tree Setbacks	Outside of mature tree drip line canopy

2.1.1.1 Landscape Amenities for Linear Basins

Landscape amenities along linear basins would typically be trails, or amenities along the trails such as seating, and trash receptacles. Some examples are shown below.

Figure 3: Seating

Figure 4: Trash Receptacles

Figure 5: Walking Trails

2.1.2 Combination Basins for Residential Developments Between 20 and 100 Acres

Combination basins for residential developments less than 100 acres, basins typically occupy a portion of the development, and can operate as a single use basin or a multi-use "pocket park" for passive recreational activities such as a dog park, exercise stations, green spaces, seating with shade structures, or community garden. These basins can operate in either a detention or retention capacity. The volume and size of these basins shall be determined by hydrology and local regulations and may be used as biofiltration or infiltration/bioretention basin provided it meets the recommended regulatory criteria. Biotreatment soil media (BSM) can be used for both the biofiltration and bioretention processes. **Figure 6** shows an example of a multi-use pocket park/basin in Murrietta. This basin was built for a new residential development of less than 20 acres.

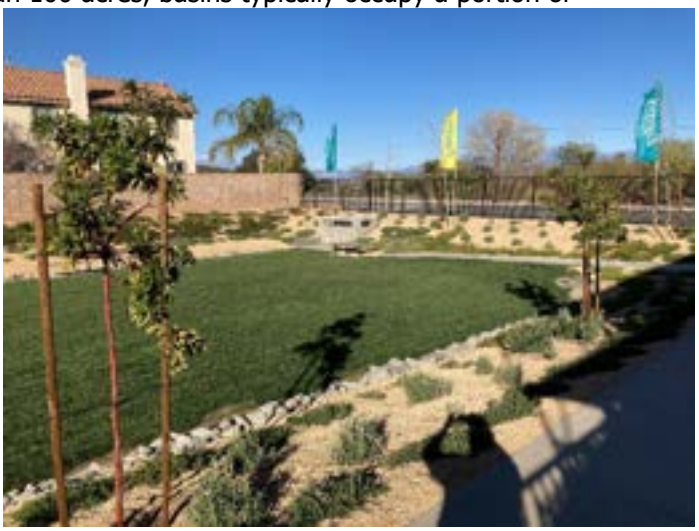


Figure 6: Combination Basin Example

These facilities shall include a 20-foot-wide access path which will serve as maintenance access as well as community access when space is available. Detention/retention basins depth shall not exceed 6 feet. Basin side slopes shall be 3:1 (horizontal to vertical) or flatter with a basin width greater than the basin height. Freeboard during a 10-year event shall not exceed 1 foot, and it is recommended to design the basin to retain the 2-year event, however ponding of greater than 9 inches would require perimeter control such as tubular steel fencing as a safety precaution to the public.

Since this multi-use basin will be open to the public for regular use, landscaping for the basin area is important for the community. These basins can operate as a dog park or a passive recreation area with the addition of benches and turf. The basin floor and side slopes are recommended to be landscaped (of the same vegetation or grass) to blend in together as the community use aspect. For details on types of recreational improvements, see the Additional Considerations, Decorative Elements section below. It can become a multi-use neighborhood "pocket park" depending on the types of landscaping features used.

Figure 7 shows the components of a Combination basin.

Figure 7: Multi-Use Components

General Engineering guidelines for these types of basins include:

1. Surface standing water in the detention/retention basin must be drained within 72 hours after a rainfall event to prevent mosquito development.
2. Basins may be contoured to provide a natural look. The use of gently curving, variable contouring may be used to establish design grades to meet WQMP BMPs, establish storm volume areas and/or encourage a more aesthetically interesting design.
3. Depth shall be measured from adjacent street's gutter flow line (used as datum).
4. Minimum free board = 1.0' from lowest building pad or 0.5' from flowline of curb from closest road, in relation to design storm event.
5. If the basin is open to the public, at least one access shall include ADA accessible concrete ramp down to the bottom of the retention/detention basin (and to the walking paths, if provided). This ramp shall be integrated with access to adjacent street sidewalk and have a landing area at the end of the path for wheelchairs.
6. Separation from Yards – Homes that abut the detention/retention basin shall have block wall separating the yard and detention/retention basin on the property line.

Inspection and Maintenance

Table 3: Combination Basin Maintenance Activities

Schedule	Inspection or Maintenance Activity
90-Day Plant Establishment Period	➢ Prior to turning over a basin and landscaped area to the City, the developer and/or owner's representative site shall maintain and monitor a 90-day plant establishment period
Every two weeks or as often as necessary to maintain acceptable aesthetics	➢ Maintain adjacent landscaped areas. ➢ Remove clippings from landscape maintenance activities. ➢ Remove trash and debris.
3 days after major storm events	➢ Check for surface ponding. If ponding is only above basin trench reservoir, remove, wash, and replace reservoir rock. May be needed every 5 to 10 years.
Semiannual/Annual	➢ Inspect slope stability and presence of burrows. ➢ Trim vegetation to prevent establishment of woody vegetation. ➢ Remove accumulated sediment as necessary. May need to re-grade every 10 years.

Design and Sizing Criteria

Table 4: Combination Basin Design Characteristics

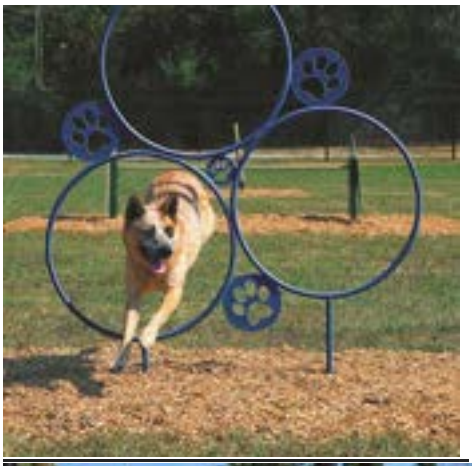
Design Parameter	Design Criteria
Design Volume	To be determined from Hydrology/WQMP
Design Drawdown Time	72 hours
Maximum Basin Ponding Depth	9 inches
Maximum Subsurface Depth	6 feet
Width to Depth Ratio	Width must be greater than depth
Reservoir Rock Material	AASHTO #3 or 57 1 to 3-in diameter
Basin Side Slopes	3:1 or flatter
Historic High Groundwater Mark	10 feet or more below bottom of subgrade reservoir
Bedrock/Impermeable Layer setback	5 feet or more below bottom of subgrade reservoir
Tree Setbacks	Outside of mature tree drip line canopy

2.1.2.1 Landscape Amenities for Basins of Residential Developments between 20 and 100 acres

Some examples of amenities for basins within residential developments are shown below. Includes seating, trash receptacles, and stabilized decomposed walking paths referenced in above section.

Figure 8: Play Areas

Figure 9:Fitness Equipment (Pictures provided by Greenfields Outdoor Fitness)



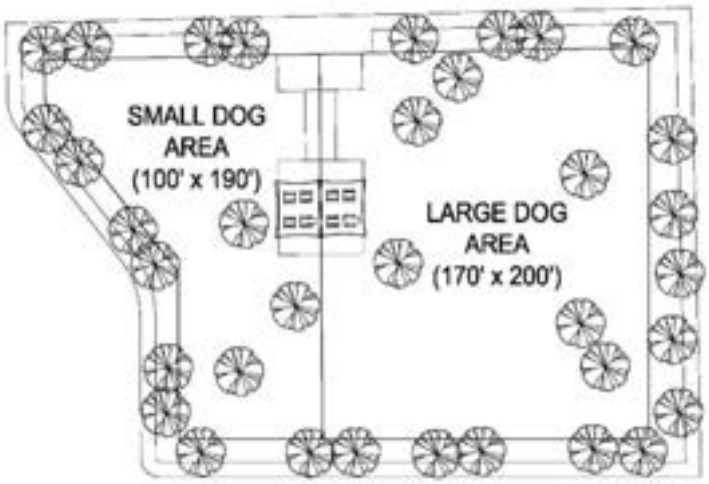


Figure 10: Dog Parks with Separated Entry Areas

Figure 11: Shade Structures (Pictures by Poligon Shade Structures)

Figure 12: Community Garden

2.1.3 Multi-Use Basins for Residential Developments Greater than 100 Acres

For residential developments greater than 100 acres, multi-use detention/retention basins are recommended. These basins will provide retention of smaller storm events to meet requirements in the MS4 permit, and provide flood control mitigation for the larger events, up to the 100-year storm. The volume and size of these basins shall be determined by hydrology and local regulations and may be used as biofiltration or infiltration/bioretention basin provided it meets the recommended regulatory criteria. Biotreatment soil media (BSM) can be used for both the biofiltration and bioretention processes.

These basins shall include a minimum 20-foot-wide Portland Cement Concrete (PCC) or asphalt concrete (AC) berm/perimeter path which will serve as maintenance access as well as community access. If this basin is being used as a secondary containment for a smaller basin, the overflow connection between the basins can be as simple as a gradual, 2-foot sag in the joining perimeter path for water to overflow. Detention/retention basins depth must not exceed 6 feet. Basin side slopes shall be 3:1 (horizontal to vertical) or flatter with a basin width greater than the basin height. Freeboard during a 25-year event shall not exceed 1 foot, and it is recommended this basin system retain the 2-year event, however ponding of greater than 9 inches would require perimeter fencing as a safety precaution to the public.

Since this multi-use basin will be open to the public for regular use, landscaping for the basin area is important for the community. These basins can be seen as a depressed park area with park amenities or open field for sports recreation. The basin floor and side slopes are recommended to be landscaped similarly (of the same vegetation or grass) to blend in together as the community use aspect. The basin can become a multi-use neighborhood park depending on the types of landscaping features used. For detail on types of recreational improvements, see the Additional Considerations, Decorative Elements section below and more detail in **Section 3**.

Stormwater will infiltrate within a period of 72 hours through the sides and bottom of the basin into the surrounding soil. **Figure 13** shows the components of a multi-use basin.

Figure 13: Multi-Use Detention Basin

General Engineering Design Guidelines for multi-use basins include:

1. Informal turf areas and passive vegetation zones may be placed within the average annual storm flood zone (1-yr 85th percentile storm) and up to 10-year storm.
2. Recreational sports fields (e.g. soccer, baseball, softball) shall be placed above the 10-year 24-hr storm event elevation
3. Hard court game surfaces and group picnic areas shall be placed at or above the 50-year storm event.
4. Habitable structures, swimming pools, skate parks, children's playgrounds, and parking lots shall be placed at or above the 100-year storm event.
5. Storm basins may be contoured to provide a natural look. The use of gently curving variable contouring to establish design grades within dual use detention basin is encouraged to provide a more aesthetically interesting design.
6. Side slopes of storm basins shall be 6:1 or flatter to facilitate the ease of mowing. The use of irregular configuration and gentle side slopes is encouraged.
7. Basin bottoms shall have a minimum cross-slope of 2 percent to allow for positive drainage.
8. Contouring within detention facilities is recommended to create internal elevation variations (or tiers) that have differing frequencies and depths of inundation and differing flood risk.

Playground (Tot Lot) Plan:

a. An IPEMA (International Play Equipment Manufacturers Association) certified playground layout plan shall be provided to the City for review. The playground layout plan shall be prepared at a scale of 1" = 10'-0'. The playground play shall clearly identify play element placement. A list of the play components shall be provided on the plan. The play shall also identify the playground color scheme.

b. For parks that are 4 acres or smaller, a single multiple activity play structure may be used. This structure shall include activity elements for children ranging from preschool to elementary age. Within the single unit activities shall be groups relative to the intended skill level. When a park is larger than 4 acres, the playground design shall incorporate two independent play structures with age-appropriate activities. Where multiple play units are used, one structure shall provide skill level activities for preschool age children to children in the early grades of elementary school. A second structure shall have play activities appropriate for elementary age children from the 3rd grade through the 6th grade. The play areas shall be independent of each other but be close enough to allow interaction of the children using them. Playgrounds shall meet the City Specifications pertaining to type and color scheme per the Parks Master Plan.

c. In addition to the play structures, a swing element shall be incorporated into the design. The swing set shall have a minimum of four swings, two of which shall have toddler seats. The play area may, and is encouraged to, have other independent play elements such as spring toys, climbing structures, or other elements as approved by the City.

d. For parks or open space that is 3 acres in size or less, one adult seating area shall be provided at the play area. For parks or open space larger than 3 acres in size, two seating or picnic tables or combination of seating and picnic tables shall be provided adjacent to the play area. All park site furnishings shall meet the City Specifications pertaining to type and color scheme per the Parks Master Plan. In addition to the benches, seat walls shall be incorporated into the playground seating area. Trees shall be placed in a manner adjacent to the playground play area and seating / picnic area to provide shade. Tree planters shall be placed in raised planters at the perimeter of the play area. Perimeter planters shall not intrude into the fall safety zone of play equipment. Play structures shall have roof structures to help with playground shading. Play equipment shall be oriented in a way to maximize shading of slides.

e. When possible, while maintaining ADA compliance, the play area may be tiered. Elementary age skills structures may be placed on one tier while pre-school skill structures may be placed on another, swings and/or other free-standing activities may be on yet another tier.

Inspection and Maintenance

Table 5: Multi-Use Basin Maintenance Activities

Schedule	Inspection or Maintenance Activity
90-Day Plant Establishment Period	➢ Prior to turning over a basin and landscaped area to the City, the developer and/or owner's representative site shall maintain and monitor a 90-day plant establishment period
Every two weeks or as often as necessary to maintain acceptable aesthetics	➢ Maintain adjacent landscaped areas. ➢ Remove clippings from landscape maintenance activities. ➢ Remove trash and debris.
3 days after major storm events	➢ Check for surface ponding. If ponding is only above basin trench reservoir, remove, wash, and replace reservoir rock. May be needed every 5 to 10 years.
Semiannual/Annual	➢ Inspect slope stability and presence of burrows. ➢ Trim vegetation to prevent establishment of woody vegetation. ➢ Remove accumulated sediment as necessary. May need to re-grade every 10 years.

Design and Sizing Criteria

Table 6: Multi-Use Basin Design Characteristics

Design Parameter	Design Criteria
Design Volume	To be determined from Hydrology / WQMP
Design Drawdown Time	72 hours
Maximum Basin Ponding Depth	9 inches
Maximum Subsurface Depth	6 feet
Width to Depth Ratio	Width must be greater than depth
Reservoir Rock Material	AASHTO #3 or 57 1 to 3-in diameter

Design Parameter	Design Criteria
Basin Side Slopes	3:1 or flatter
Historic High Groundwater Mark	10 feet or more below bottom of subgrade reservoir
Bedrock/Impermeable Layer setback	5 feet or more below bottom of subgrade reservoir
Tree Setbacks	Outside of mature tree drip line canopy

2.1.3.1 Landscape Amenities for Multi-use Basins for Residential Developments Greater than 100 Acres

Some examples of amenities that can be found in multi-use basins are shown below. Includes Seating, Trash Receptacles and Stabilized Decomposed Walking Paths, Play Areas, Fitness Equipment, Dog Parks, Shade Structures, and Community Gardens as referenced above)

Figure 14: Sports Fields (i.e. Soccer, Football Fields)

Figure 15: Community Gathering Space

Figure 16: Play Areas (Playgrounds, Splash Pads)

2.1.4 Additional Basin (Typ. All) Considerations

Site Considerations

Location

Using stormwater basins for infiltration may be restricted by concerns over groundwater contamination, soil permeability, and/or the probability of clogging at the site. Where infiltration is proposed, the soil beneath the basin must be thoroughly evaluated in a geotechnical report. Infiltration characteristics of the soil is critical to the performance of an infiltration basin. The following conditions may not be appropriate for infiltration basins:

- Industrial sites or locations where spills of toxic materials can occur.
- Sites with low infiltration rates
- Sites where high groundwater tables or excessively high infiltration rates, where pollutants can affect groundwater quality is evident.
- Sites with unstable soil or construction activity upstream
- On steeply sloping terrain
  - Infiltration basins are relatively flat, and it may be challenging to incorporate them in steeply sloping terrain.

Setbacks

Always consult the geotechnical engineer for site specific recommendations regarding set-back limits for stormwater basins. Recommended setbacks are needed to protect nearby buildings, walls, on-site or near-by wells, streams, and tanks. Setbacks from walls and foundations must be included as part of the geotechnical report. Setbacks shall be determined early in the design process as they impact where and how deep infiltration may occur. In addition to the geotechnical engineer's recommendations, infiltration basins must be set-back:

- 10 feet (vertically) from the historic high groundwater mark
- 5 feet (vertically) from bedrock or impermeable surfaces
- Located outside the drip canopy of mature trees.
- Minimum of 18 feet horizontally from any building structures or highway pavement
- Minimum 100 feet horizontally from wells, tanks, or springs

Sediment Control

Stormwater basins have the risk of becoming clogged over time. It is recommended to remove sediment prior to entering the retention/detention portion of the basin to extend its lifespan. This can be done at the inlet via a forebay for sediment deposit/drop out. A forebay includes a sill to prevent sediment from entering the detention/retention section of the basin. Sediment forebays and sills can be made of concrete or rock and shall include a maintenance schedule for periodic cleaning. If tributary runoff enters the basin via a catch basin, catch basin filters are recommended to intercept sediment prior to entering the basin.

Additional Considerations

Decorative Elements

As part of an existing park design, multi-use basins can be integrated as an open/ball field area such as soccer fields, baseball, or softball fields. Fields can be graded toward a corner of the basin floor which will give ample room to include a designated sports area. The field and basin should have similar landscaping/grasses to mesh with the surrounding park area. Landscaping features such as plants and boulders can be used to line the edges of the multi-use path or entrance into the facility like the smaller basins or the multi-use path can be designed to be a community track. If there is adequate space around the basin to create larger, flat landing areas outside of the multi-use path picnic tabled areas, outdoor gym equipment, public charcoal grills, and/or playground equipment can be placed to encourage public use. Landscaping features and amenities details which are included in Appendix B, can be placed inside these basins as well, provided they are anchored down in flat areas, safe distance away from the inlet and outlet areas, and can withstand being partially submerged for up to 72 hours.

Erosion Control

Although concrete lining is an option on the side slopes of the basins to prevent scouring or erosion of the basin walls, turf reinforcing mats and hydroseeding can also be used to match park aesthetics. Turf reinforcing mats protect from erosion in higher velocities over 7 fps. Erosion protection methods such as lining stone riprap over a filter cloth shall be considered at the outfall of the basins. Consider including energy dissipation in the inlet and outlet design.

Safety Concerns

Tubular steel fencing can border the perimeter of basins when needed for safety; however, the surrounding facility shall be viewed as accessible to the community. Tubular steel fencing shall be detailed by the design engineer. Proper signage can be used to inform the public and deter disturbances to the direct flow-path area. A swing-access gate can be used to prevent other vehicles other than maintenance vehicles from driving along the multi-use paths. Landscaping around the berms, inlet and outlet structures can protect the public and impede access into potentially dangerous areas. Outlet structures or pipes greater than 48-inches shall be protected to prevent human interaction.

Geotechnical Report

A geotechnical report must be included for all infiltration basin designs. Double ring infiltrometer (ASTM D 3385) test and Falling Head Percolation tests and borings can determine if infiltration is feasible for a project site. Setbacks to walls and foundation must also be included in the geotechnical report.

Secondary Overflow

A secondary overflow route is required for basins to bypass stormwater runoff greater than the basin design capture volume. Overflow systems must connect to an acceptable discharge point such as a downstream conveyance system or a roadway designed to convey the larger events within curb-to-curb limits.

Maintenance Access

Normal maintenance includes debris, trash, and sediment removal from forebays and typical park upkeep for additional park amenities. More substantial maintenance may require a vehicle. Vehicle access will be provided as a part of the park amenities. A 20-foot multi-use path will double as a both maintenance access for basin and a hiking/riding trail. These paths shall include ADA access ramps or railing as needed to promote an inclusive community experience. The multi-use path will feature a swing gate at the front entrance before entering the basin area to prevent unauthorized vehicles from driving in. It is also recommended placement of the maintenance access (trails) be such that they are integrated into a larger scaled master planned layout of bike paths/trails planned and implemented by the City, and with existing/established maintenance assessment districts.

2.2 Drainage Channels

Soft Bottom Channels

Soft-bottom channels are used to convey runoff to downstream discharge points. These can be designed to treat runoff by filtering pollutants through vegetation, filtering through a subsoil matrix, and/or infiltrating into the underlying soils. They can serve as aesthetic and potentially inexpensive roadway drainage conveyances as well as urban development improvements. Channels are trapezoidal and designed to convey the required flow per hydrology and local regulations. Channels shall be designed to have a 2.5-foot freeboard for the 100-year storm. **Figure 17** shows an example of a drainage channel with an access road.

Figure 17: Drainage Channel

The channel shall be designed with the current project topography in mind. The design shall use mild slopes along the flow-path, channel roughness shall be chosen to increase time of concentration to reduce velocities, and the use of pervious channel linings to increase infiltration if desired. Channel side

slopes can be up to 2:1 (horizontal to vertical) and rectangular channels are not recommended due to shorter life cycle and higher cost. Where depth is more of an issue than width, the channel may include benches or shelf/steps to increase volume without greater need to go deeper. Grade separation may be necessary to integrate a channel design into an existing community while preventing traffic flow interruption in local streets or transportation pathways.

Hard Scaped-Lined Channels

Hard scaped-lined channels are recommended for channels which may experience higher velocities (greater or equal to 5 fps up to 12 fps). Hard lined side slopes of a channel are beneficial in protecting the channel from erosion potential from these higher velocities. These types of lined channels are durable, relatively impermeable, and hydraulically efficient; however, they may have a higher initial construction cost than the vegetated option. Hard-scaped lining is beneficial to prevent water logging, seepage losses, and a need for maintenance. Different type of material for lining is available including PCC, boulder lining, stone riprap, and recycled concrete. Riprap and other boulder type lining can also help with the roughness inside the channel in slowing down high velocities. See **Figure 18** below for an example of these types of lining.

Figure 18: Hardscaped (Concrete and Riprap) Lined Channels

Vegetated (soft) Side Slope Channels

Vegetated or soft side slopes for channels are the most desirable for new channels because vegetation can stabilize the body and soil mass of the channel while showing a natural aesthetic as shown in **Figure 18**. These are recommended for sites with potential flows less than 5 fps; however, using turf reinforcing mats or including rail and tire revetments can help stabilize the side slopes. These vegetated slopes can include native or drought tolerant plants and landscaping extending beyond the access path, which could provide a safety barrier for the community away from the sloped edges as well as integrating into the community landscape vision.

Figure 19: Vegetative Lined Channel with Reinforcing Mat

Site Considerations

Location

The use of channels may be restricted by concerns over groundwater contamination, soil permeability, and/or the probability of clogging at the site. Where infiltration is proposed, the soil beneath the channel must be thoroughly evaluated in a geotechnical investigation. The following conditions may not be appropriate for channels:

- Industrial sites or locations where spills of toxic materials can occur
- Sites with low infiltration rates
- Sites with high ground water table (less than 10 feet separation from the groundwater table), or excessively high infiltration rates, where pollutants can affect groundwater quality is evident
- Sites with unstable soil or construction activity upstream

Setbacks

Always consult the geotechnical engineer for site specific recommendations regarding set-back limits for channel design. Recommended setbacks are needed to protect nearby buildings, walls, on-site or near-by wells, streams, and tanks. Setbacks from walls and foundations must be included as part of the geotechnical report. Setbacks shall be determined early in the design process as they impact where and how deep infiltration may occur. In addition to the geotechnical engineer's recommendations, infiltration channel must be set-back:

- 10 feet (vertically) from the historic high groundwater mark
- 5 feet (vertically) from bedrock or impermeable surfaces

- Located outside the drip canopy of mature trees
- Minimum 100 feet horizontally from wells, tanks, or springs

Maintenance Access

A dual use access road/trail like the 20-foot multi-use path for the basins can be utilized at the top banks/dikes of the channels. For safety, a split-rail fence and/or landscaping such as vegetation and boulders is recommended between the edge of path and channel slope for channel heights above six feet. These paths can be paved since permeable surfaces like permeable concrete are not recommended; however, a greener, drivable surface such as decomposed granite is preferred. The multi-use path shall have a v-ditch or side-drain area along the path to convey runoff safely from the top of slope area. As with the basin access, the multi-use path can feature a swing gate at the front entrance before entering the basin area to prevent unauthorized vehicles from driving in. These paths can connect to existing sidewalk or bike/trail paths integrating them into the rest of the City's pathways.

Erosion Control

Channel grade shall not exceed 0.5% slope without stabilization such as stone riprap or recycled concrete. To protect the channel slopes, bank treatments shall influence the design of the channel. To prevent bank erosion, the use of armoring, vegetative cover, and flow deflection can keep the channel stable. Boulders, check dams, and vegetation on the channel floor can reduce the flow velocity to prevent erosion along the slopes.

Inspection and Maintenance

Table 7: Drainage Channel Maintenance

Schedule	Inspection or Maintenance Activity
90-Day Plant Establishment Period	➢ Prior to turning over a basin and landscaped area to the City, the developer and/or owner's representative site shall maintain and monitor a 90-day plant establishment period
Every two weeks or as often as necessary to maintain acceptable aesthetics	➢ Maintain adjacent landscaped areas. ➢ Provide weed control if necessary to control invasive species. ➢ Remove trash and debris.
Annual	➢ Inspect and correct any issues erosion problems in sand/soil beds. ➢ Reseed and apply mulch to damaged or bare areas if grass cover is desired. ➢ Remove accumulated sediment as necessary. May need to rototill or cultivate the surface if the draw down is not within 48 hours.

Design and Sizing Criteria

Table 8: Drainage Channel Characteristics

Design Parameter	Design Criteria
Design Volume	To be determined from Hydrology / WQMP
Width to Depth Ratio	Width must be greater than depth
Channel Bottom Rock Material	AASHTO #3 or 57 1 to 3-in diameter
Channel Side Slopes	2:1 or flatter
Channel Grade	Grades greater than 0.5% require stabilization, Max grade of 5%
Channel Free Board	2 feet for the 100-year storm
Historic High Groundwater Mark	10 feet or more below bottom of subgrade reservoir
Tree Setbacks	Outside of mature tree drip line canopy

2.3 Street-Adjacent Landscaping

The following guidelines for Street-Adjacent Landscaping, including parkways, back of sidewalk and medians are intended as a framework for developers. All landscaping shall adhere to the City's Landscaping Standards in **Appendix B**, and all applicable local codes and ordinances, while providing clear lines of site at all intersections. Developers shall be required to submit initial design concepts for any street-adjacent planting within their development as required. Designs for each of the street-adjacent landscape areas will be separated by minimum criteria for the various street section contained with the City's Circulation Plan which include Collector, Arterial, Major Arterial, Residential Arterial and Super Arterial. The intent of this framework is to guide the developer in providing landscape areas that are:

- Attractive and sustainable
- Define the designed streets designated use
- Creates a vibrant street environment that encourages pedestrian activity, and
- Establishes clear circulation patterns for both vehicular and pedestrian traffic.

2.3.1 Parkways

To provide connectivity, access, buffers between pedestrian and the street, clear visibility of both motorists and pedestrians, reduce water use, provide irrigation and storm water infiltration, provide street tree planting, as well as providing the aesthetic benefits of landscaped parkways (**Appendix B**), all parkways shall be:

1. Minimum of 6' with 4' minimum walkway widths.
2. Minimum 75% unpaved with a 3:1 slope to the center of the landscaped area to collect storm and irrigation water.
3. Minimum 50% covered with plant material from the City's Approved Plant Lists.
4. Where unpaved, covered with a permeable natural material, such as decomposed granite, mulch, gravel or stones.

5. Irrigated consistent with the City's Landscape Standards.

2.3.2 Back of Sidewalk Areas

Back of sidewalk areas shall be a minimum of 5-foot wide between the adjacent wall/fencing and sidewalk. This back of sidewalk area is to be landscaped with low-water use shrub beds. Where wide enough to incorporate a 10' or wider area, street trees are to be used and planted ±30 feet on center. Where applicable and/or required by the City, site furnishings such as benches shall be installed. All site furnishing and locations will be approved by the City. Street trees and landscaping shall not obstruct sight distance at street intersections.

2.3.3 Medians

Raised medians function primarily for traffic safety and as a means of beautification; however, they also serve several other purposes. Landscaped medians provide urban cooling, absorb air pollution, provide a reduction of vehicle noise and beautify the streetscape. Median design and plant material will vary depending on the street section.

Criteria that shall be considered for median design shall include appropriate separation of function uses, identification and separation of pedestrian and vehicular traffic, reinforcement of the traffic circulation system with plantings, climactic mitigation, sun protection/urban cooling, traffic noise and hazard mitigation, horticultural limitations as a basis for plant selections, compatibility of ultimate plant size with existing plantings on or adjacent to the site, reducing maintenance effort and costs, maximizing water conservation by using low water use plants and efficient irrigation systems and design.

Aesthetic considerations shall include design compatibility with adjacent land-uses, special lighting, if appropriate and use of planting.

Median type width for each roadway will be determined by the City Engineer.

Every project will be designed with project specific constraints, and project specific design concepts shall be developed. Conceptual landscape designs shall be reviewed by the City. Trees and landscaping shall not obstruct sign distance at street intersections. Refer to Appendix B for Landscape Standards and typical landscape design.

A minimum planting width of 10 feet is preferred for new medians. The overall desired minimum median width shall be 12 feet (+): which includes two (2) – 6-inch-wide curbs, two (2) – 1-foot-wide maintenance strips and the 10-foot planting area (see Standard Design Detail). Where practical, this desired standard shall apply to all future construction of Super Arterials, Residential Arterials, and Major Arterials.

For existing streets incapable of meeting the desired criteria, a 10-foot wide median shall be developed (see City Standard Design Details).

Plant materials should be drought tolerant in nature and conform to the Approved Plant Lists including trees, shrubs and groundcovers. Turfgrass shall not be used in medians. The plant lists are not all inclusive and the project's landscape consultant may suggest the inclusion of other drought-tolerant plant

materials for private areas. All City maintained landscape areas (LMAD and DFAD) shall adhere to the City approved plant list. Plant selection shall be only from the City approved Plant list.

Median Design Criteria for street sections:

A. Residential Arterial 12' Medians – 2 Tree Species
   Concept: See Appendix B Landscape Standards.

B. Major Arterial 14' Medians – 2 Tree Species
   Concept: See Appendix B Landscape Standards.

C. Super Arterial 14' Medians – 3 Tree Species
   Concept: See Appendix B Landscape Standards.

3. Maintenance Assessment Districts

3.1 Background

The City of Victorville, by Council Policy No. CP-88-2, requires arterial streets, drainage, and "pocket park" areas be screened from residential developments by masonry wall and that the area between the wall and adjacent sidewalk be landscaped as shown in an example in **Figure 20**. A method of perpetual maintenance of the wall and landscaping must be adopted by the Home Owner's Association (HOA) or incorporated into a Landscape, Drainage, or Maintenance Assessment District administered by the City.

Figure 20: LMAD Areas

3.2 Special Benefits

When the development of a neighborhood in the community is identified to be a special benefit by certain improvements such as "pocket" park areas, landscaped sidewalks, and paseo walkways and drainage facilities, property owners in the identified special benefit area are assessed to pay the costs of continual maintenance of the special benefit improvements. Each LMAD/DFAD/MAD is formed when a residential or commercial project is first developed pursuant to the Landscaping and Lighting Act of 1972 (the "1972 act"). The "1972 act" allows the City to levy an annual assessment for the continual maintenance of the special benefit improvements to the property owners who reside within a landscape, drainage, or maintenance district and the annual assessment is placed on the property owner's tax bill. The following is a list of special benefits of maintenance assessment districts:

- Improved aesthetic appeal of nearby parcels, medians, paseos, and pocket parks
- Improve dust control and erosion resistance
- Improved drainage and flood control
- Enhanced desirability of properties and property values
- Generally reduced property related crimes such as vandalism

- Moderate temperatures and enhanced noise attenuation from well-maintained landscaping
- Unique identity and character of each community
- Improved access to health and fitness opportunities

3.3 Regulatory Background

The landscape maintenance assessment districts are governed by the legal requirements of Proposition 218 (Article XIIID of the California Constitution) as well as the provisions of the "1972 act". Every year in its role as administrator of the various LMADs/DFADs/MADs, the City levies an assessment on each parcel within each LMAD/DFAD/MAD in accordance with existing law, based upon the special benefit that each such parcel receives from the improvements to be maintained from the parcels of such assessments. Ever since Proposition 218 was approved by the voters in 1996, increased assessment rates cannot be levied without submitting the proposed increases to the property owners within the affected LMAD/DFAD/MAD in an assessment ballot procedure for property owner approval.

3.4 Existing LMAD/DFAD/MAD

Table 9 shows the existing LMAD/DFAD/MADs within the City of Victorville.

Table 9: LMAD/DFAD/MADs

LMAD/DFAD/MAD #	Location
LMAD 1	City Wide
LMAD2	Eagle Ranch
LMAD 3	Brentwood
LMAD 4	Old Town
LMAD 5	Vista Verde
LMAD 6	City Wide II
LMAD 7	Talon Ranch
LMAD 8	West Creek
DFAD 1	City Wide
DFAD 2	Vista Verde
DFAD 3	West Creek
MAD 1	Las Haciendas
MAD 2	Vista Del Valle
MAD 3	Westcreek

3.5 Formation/Annexation Process

There is a three-step process to be completed to establish an LMAD/DFAD/MAD which includes:

- Step 1 – Conditions of Approval
- Step 2 – Establishing/creating or annexing an LMAD/DFAD/MAD
- Step 3 – Design, Construction, and Acceptance of Public Improvements

4. References

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Appendix A

Civil Standards

GENERAL NOTES FOR STORMWATER QUALITY BASIN STANDARD PLANS:

1. THE STANDARD PLANS FOR STORMWATER QUALITY BASINS CONTAINED HEREIN PROVIDE STANDARD DESIGN DETAILS AND SPECIFICATIONS FOR ENGINEERS, WHO ARE EXPECTED TO EXERCISE SOUND JUDGEMENT PERTAINING TO THEIR APPLICATION WHEN DESIGNING AND IMPLEMENTING STORMWATER QUALITY BASINS WITHIN THE CITY OF VICTORVILLE. THESE STANDARD PLANS AND SPECIFICATIONS HEREIN ARE INTENDED TO NEITHER BE USED AS, NOR TO ESTABLISH LEGAL STANDARDS FOR THESE FUNCTIONS.
2. THE CITY ASSUMES NO RESPONSIBILITY FOR THE DESIGN OF FACILITIES ADHERING TO THE STANDARD PLANS CONTAINED HEREIN. REVIEW AND APPROVAL OF STORMWATER DESIGNS BY THE CITY DOES NOT ABSOLVE THE OWNER, DEVELOPER, AND/OR DESIGN ENGINEER OF THEIR DESIGN RESPONSIBILITIES. THE DESIGN ENGINEER HAS THE RESPONSIBILITY TO DESIGN BASIN FACILITIES THAT MEET INDUSTRY STANDARDS OF PRACTICE, MEET WATER QUALITY CONTROL STANDARDS AND REGULATIONS, MEET EXPECTED FACILITY USEFUL LIFE ESTIMATES, AND ARE PROGRAMMATICALLY MAINTAINABLE BY THOSE ULTIMATELY RESPONSIBLE FOR THE OWNERSHIP, OPERATION, AND MAINTENANCE OF THOSE BASIN FACILITIES.
3. THE STANDARD PLANS HEREIN WERE DEVELOPED FOR STORMWATER BASINS OUTLINED AND DISCUSSED IN THE VICTORVILLE DESIGN GUIDELINES FOR DRAINAGE CHANNELS, BASINS, AND LANDSCAPED AREAS.
4. ANY DESIGN DEVIATIONS FROM THE STANDARD PLANS MUST BE APPROVED BY CITY'S PUBLIC WORKS DIRECTOR OR THE CITY ENGINEER, ANY DEVIATIONS FROM THE STANDARD PLANS SHALL BE IDENTIFIED BY A NOTE ON THE PLANS. THESE DEVIATIONS SHALL BE SUMMARIZED ON THE TITLE SHEET OF THE PLANS AND A SIGNATORY SPACE AUTHORIZING SUCH DEVIATION SHALL BE PROVIDED.
5. STANDARD PLANS CONTAINED HEREIN SHALL ONLY BE APPLICABLE TO THOSE BASINS AS DEFINED WITHIN TABLE I – DEFINITION OF BASIN TYPES AND APPLICATIONS ON SW–001, SHEET 2 OF 5.
6. CONSTRUCTION OF STORMWATER BASINS PER THE CITY STANDARD PLANS DOES NOT INFER OWNERSHIP OF SAID BASINS BY THE CITY REGARDLESS OF SIZE OF BASIN TRIBUTARY OR PERCENTAGE OF FLOWS FROM CITY PROPERTY. STORMWATER BASINS THAT ARE BUILT TO COMPLY WITH THE NEW DEVELOPMENT REQUIREMENTS OF THE SAN BERNARDINO COUNTY WATER QUALITY ORDER NO. 2013–0001–DWQ, PHASE 2 SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT REQUIREMENTS SHALL BE OWNED AND MAINTAINED BY THE PROJECT PROPONENT UNTIL OWNERSHIP TRANSFER THROUGH AN OFFICIAL RECORDATION OF OWNERSHIP AND MAINTENANCE RESPONSIBILITY RECORDED WITH THE CITY.
7. ALL WATER QUALITY BASINS DESIGNED, CONSTRUCTED, AND TURNED OVER TO THE CITY SHALL BE CONSTRUCTED WITH MATERIALS AND CONSTRUCTION METHODS THAT COMPLY WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (SSPWC) COMMONLY KNOWN AS THE GREENBOOK.

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	GENERAL NOTES FOR STORMWATER BASIN STANDARD PLANS	**SW-001**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 1 OF 5

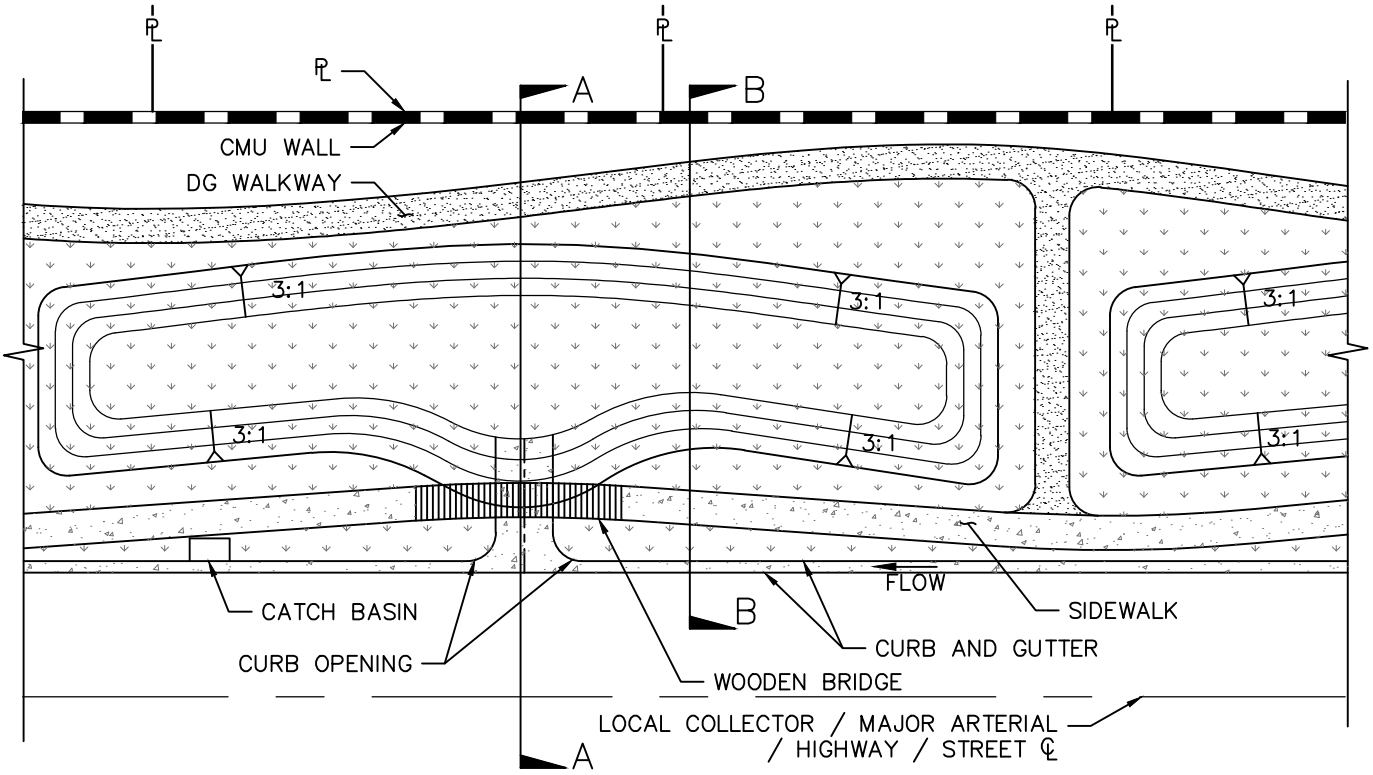
TABLE 1 – DEFINITION OF BASIN TYPES AND APPLICATIONS

BASIN TYPE	PURPOSE	TREATMENT PROCESS	TYPICAL CAPACITY
LINEAR BASIN (DEVELOPMENTS < 20 ACRES)	WATER QUALITY AND HYDROMODIFICATION CONTROL	BIOFILTRATION OR BIORETENTION	CAPACITY <= 2–YEAR EVENT, BY–PASS LARGER EVENTS
COMBINATION BASIN (DEVELOPMENTS BETWEEN 20 – 100 ACRES)	WATER QUALITY AND HYDROMODIFICATION CONTROL	BIOFILTRATION OR BIORETENTION	CAPACITY <= 10–YEAR EVENT, BY–PASS LARGER EVENTS
MULTI–USE BASIN (DEVELOPMENTS BETWEEN 20 – 100 ACRES)	COMBINED FLOOD CONTROL/WATER QUALITY AND HYDROMODIFICATION CONTROL	BIORETENTION OR BIOFILTRATION	CAPACITY <= 100–YEAR EVENT, BY–PASS LARGER EVENTS

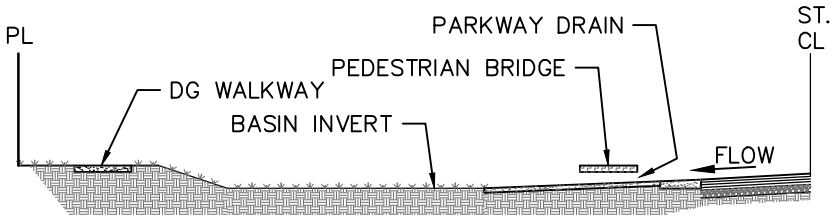
NOTES:

1. DCV – DESIGN CAPTURE VOLUME DETERMINED FROM HYDROLOGY/WATER QUALITY MANAGEMENT PLAN (WQMP)
2. TGD–WQMP – "MOJAVE RIVER WATERSHED TECHNICAL GUIDANCE DOCUMENT FOR WATER QUALITY MANAGEMENT PLANS" (MOJAVE TGD) DATED APRIL 4, 2016 FOR DESIGN CRITERIA OF THESE BASINS.
2. TGD–PCMP – "MOJAVE RIVER WATERSHED TECHNICAL GUIDANCE DOCUMENT FOR POST CONSTRUCTION MEASURES PLANS" (MOJAVE TGD) DATED APRIL 4, 2016 FOR DESIGN CRITERIA OF THESE BASINS.
3. COMBINATION BASIN PERFORMS WATER QUALITY TREATMENT AND FLOOD MITIGATION, WITH FLOOD STORAGE TYPICALLY ABOVE THE WATER QUALITY VOLUME. IN SOME CASES, ADDITIONAL RETENTION VOLUME BEYOND DVC MAY BE PROVIDED.
4. MULTI–USE BASINS DOUBLE AS PARKS OR PLAY FIELDS. THE CONCEPT LAYOUT IS MEANT TO INFORM DESIGN DECISIONS ON USAGE, SIZE, AND APPLICATION.
5. THESE BASIN CONCEPTS ARE FOR REFERENCE ONLY, TO BE USED TO GUIDE AN ENGINEER IN DESIGN DEVELOPMENT, REGARDLESS OF LAND USE TYPE. DESIGN CRITERIA, INCLUDING FLOW RATE, VELOCITY, AND VOLUME SHALL BE IN ACCORDANCE WITH CURRENT CITY / COUNTY DESIGN CRITERIA.
6. THE TREATMENT PROCESS, RETENTION AND DETENTION, ARE AS DEFINED AS: RETENTION IS THE PERMANENT REMOVAL OF FLOWS FROM THE STORM DRAIN NETWORK AND DETENTION REFERS TO THE TEMPORARY REMOVAL AND TIME BASED RELEASE BACK INTO THE STORM DRAIN NETWORK.

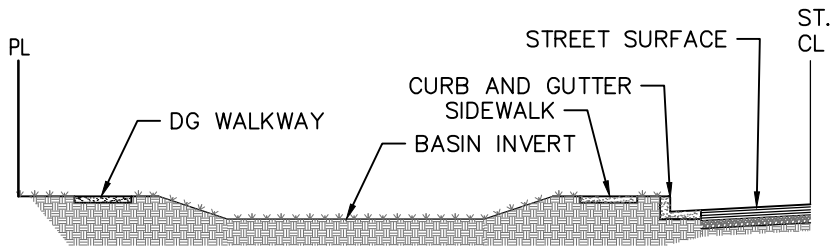
LINEAR BASIN CONCEPTUAL LAYOUT



PLAN VIEW
NOT TO SCALE



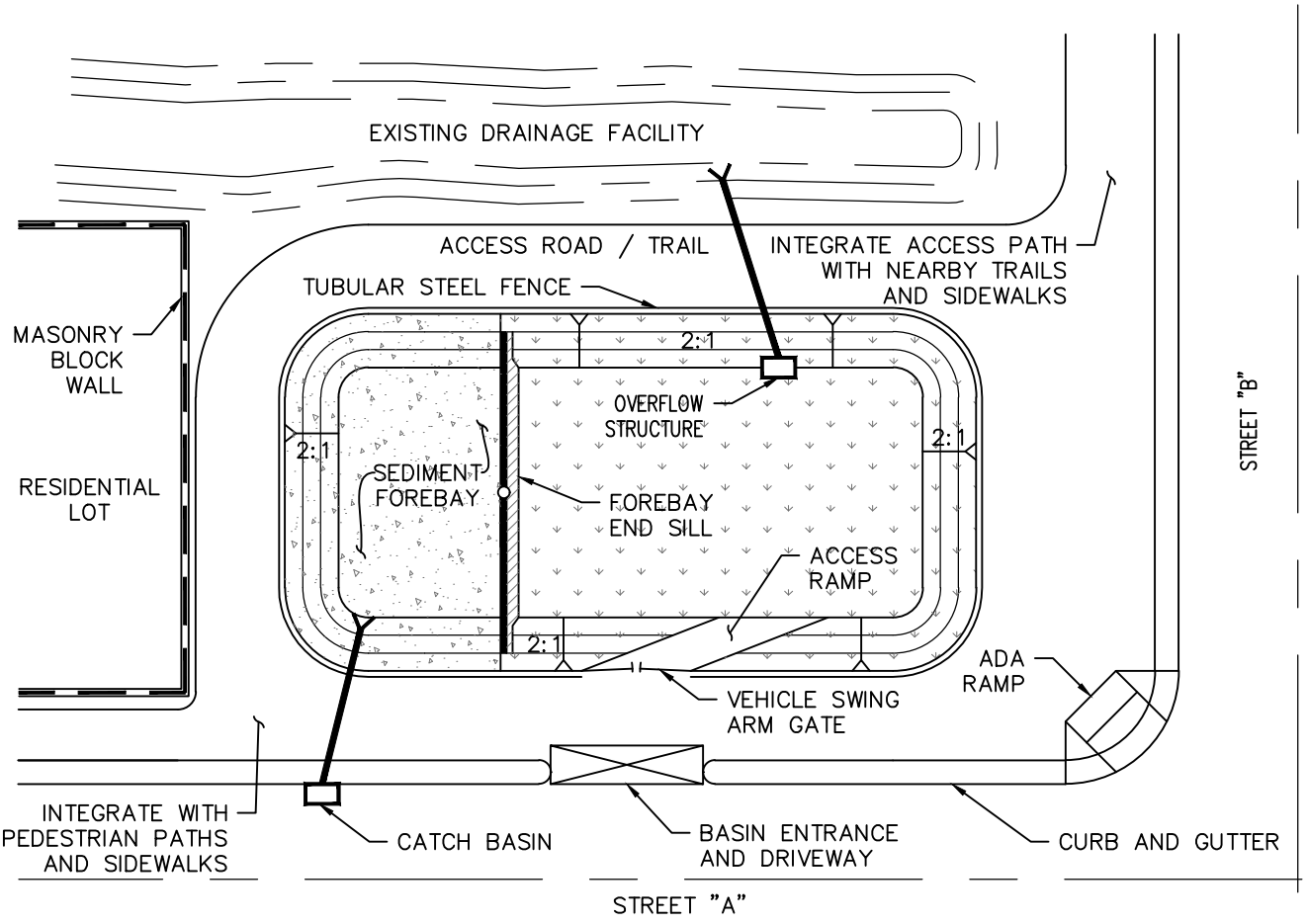
SECTION A–A
NOT TO SCALE



SECTION B–B
NOT TO SCALE

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	LINEAR BASIN CONCEPTUAL LAYOUT	**SW-001**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 3 OF 5

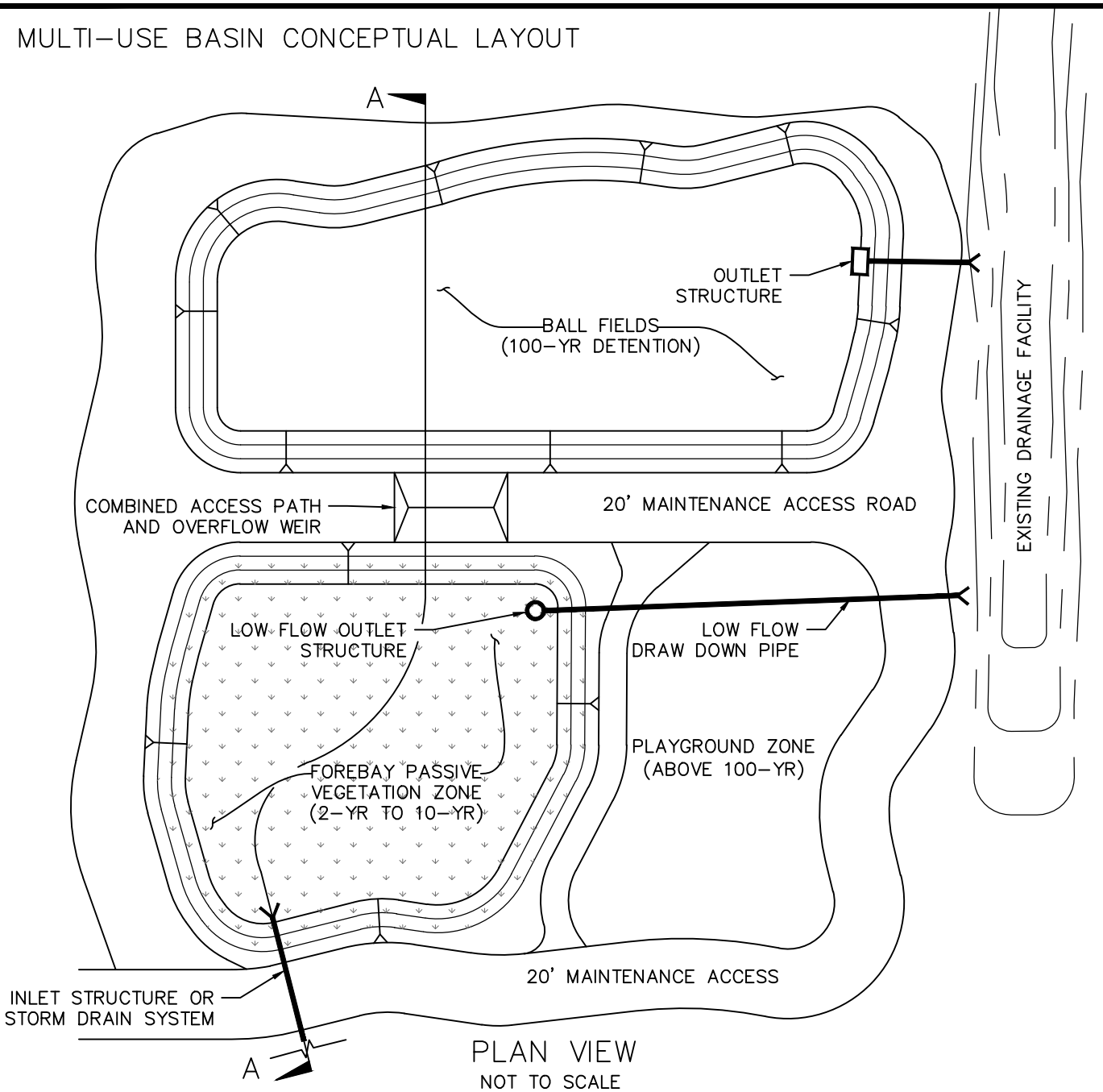
COMBINATION BASIN CONCEPTUAL LAYOUT



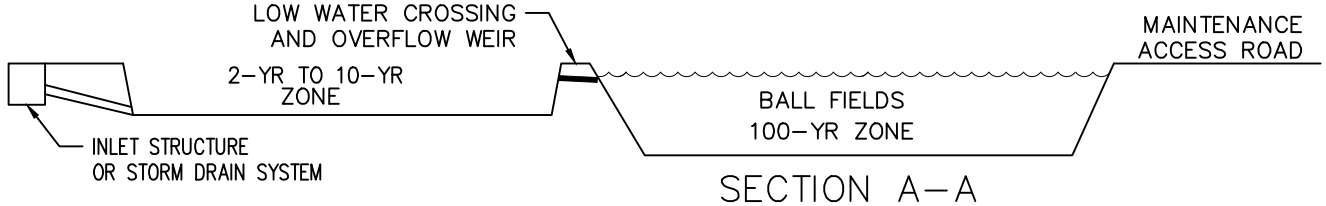
PLAN VIEW
NOT TO SCALE

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	COMBINATION BASIN CONCEPTUAL LAYOUT	**SW-001**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 4 OF 5

MULTI–USE BASIN CONCEPTUAL LAYOUT



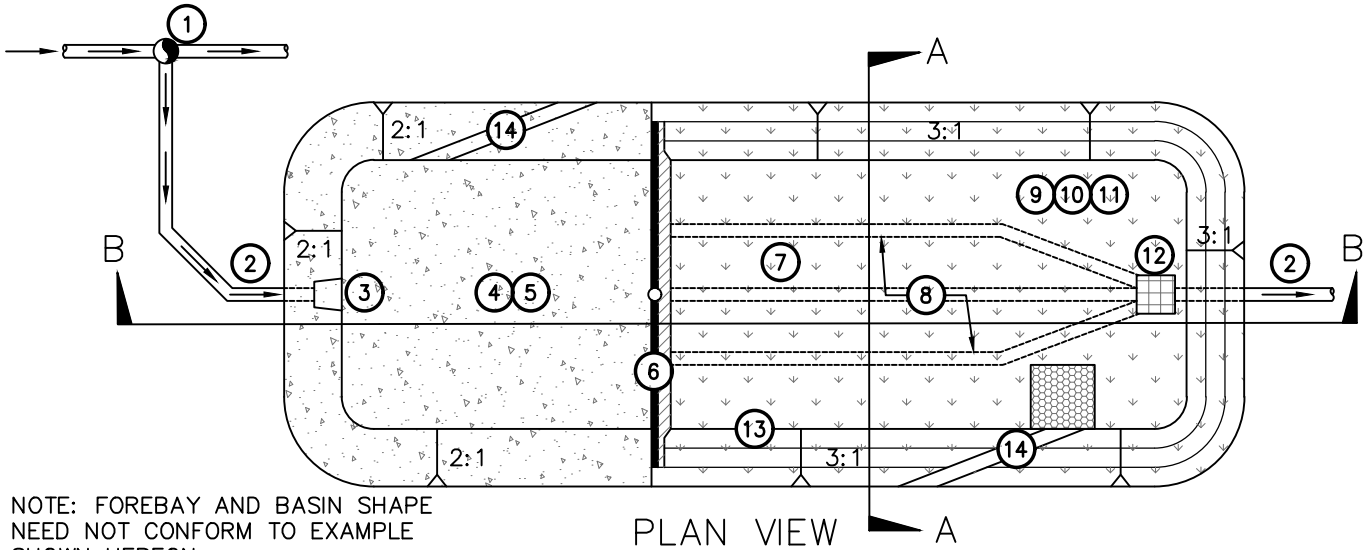
PLAN VIEW
NOT TO SCALE



SECTION A–A
NOT TO SCALE

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	MULTI-USE BASIN CONCEPTUAL LAYOUT	**SW-001**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 5 OF 5

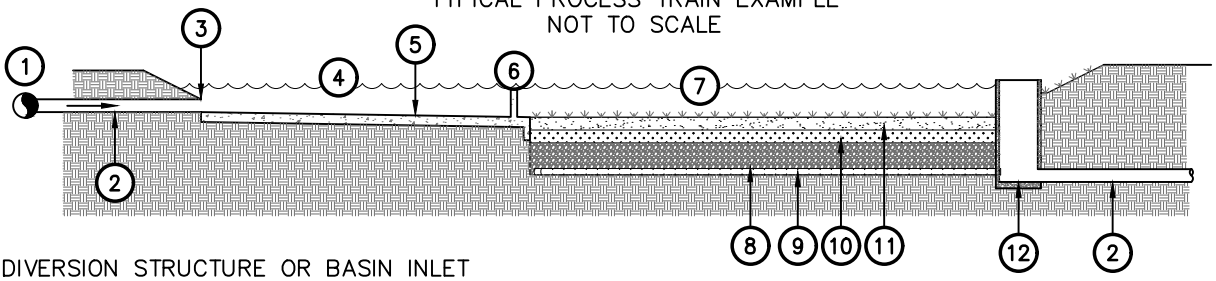
BIOFILTRATION BASIN



NOTE: FOREBAY AND BASIN SHAPE NEED NOT CONFORM TO EXAMPLE SHOWN HEREON

PLAN VIEW

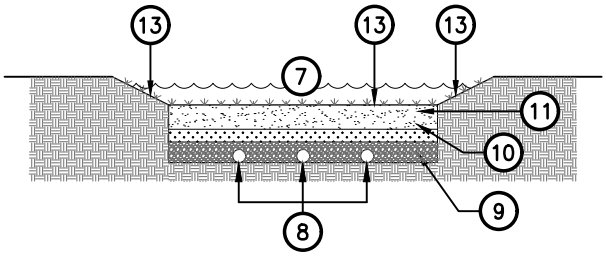
TYPICAL PROCESS TRAIN EXAMPLE
NOT TO SCALE



SECTION B–B

TYPICAL PROCESS TRAIN EXAMPLE
NOT TO SCALE

1. DIVERSION STRUCTURE OR BASIN INLET
2. STORM DRAIN RCP PIPE
3. CONCRETE HEADWALL INLET STRUCTURE
4. PRE–TREATMENT FOREBAY
5. CONCRETE LINING – SLOPE AND INVERT
6. FOREBAY END SILL WALL WITH LOW FLOW NOTCH
7. BIOFILTRATION TREATMENT AREA
8. SLOTTED UNDERDRAIN PIPE WITH CLEANOUTS
9. AGGREGATE LAYER
10. *FILTER COURSE
11. *BIOTREATMENT SOIL MEDIA
12. OVERFLOW TOWER OR STANDPIPE WITH INTAKE GRATE (BIRDCAGE)
13. VEGETATED SIDE SLOPES AND INVERT
14. ACCESS RAMP REQUIRED AT FOREBAY AND BASIN. ADDITIONAL RAMPS MAY BE NECESSARY BASED UPON BASIN SIZE AND CONFIGURATION

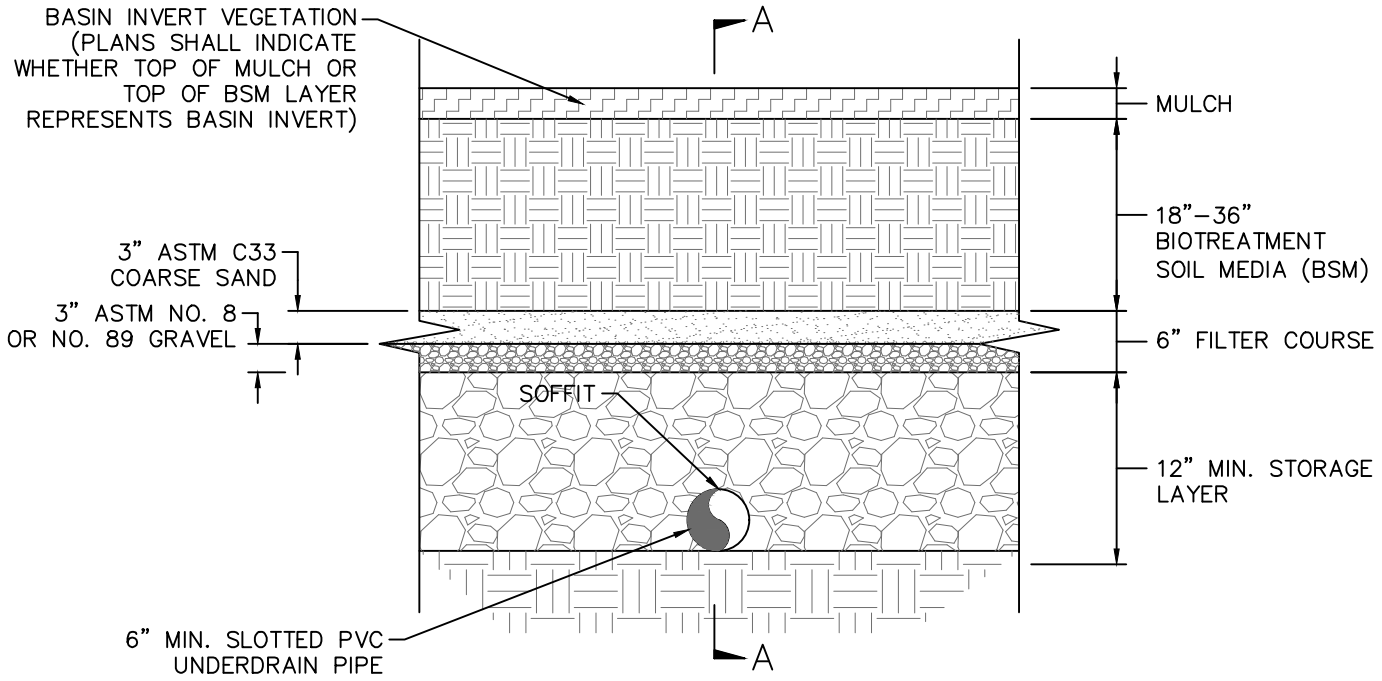


SECTION A–A

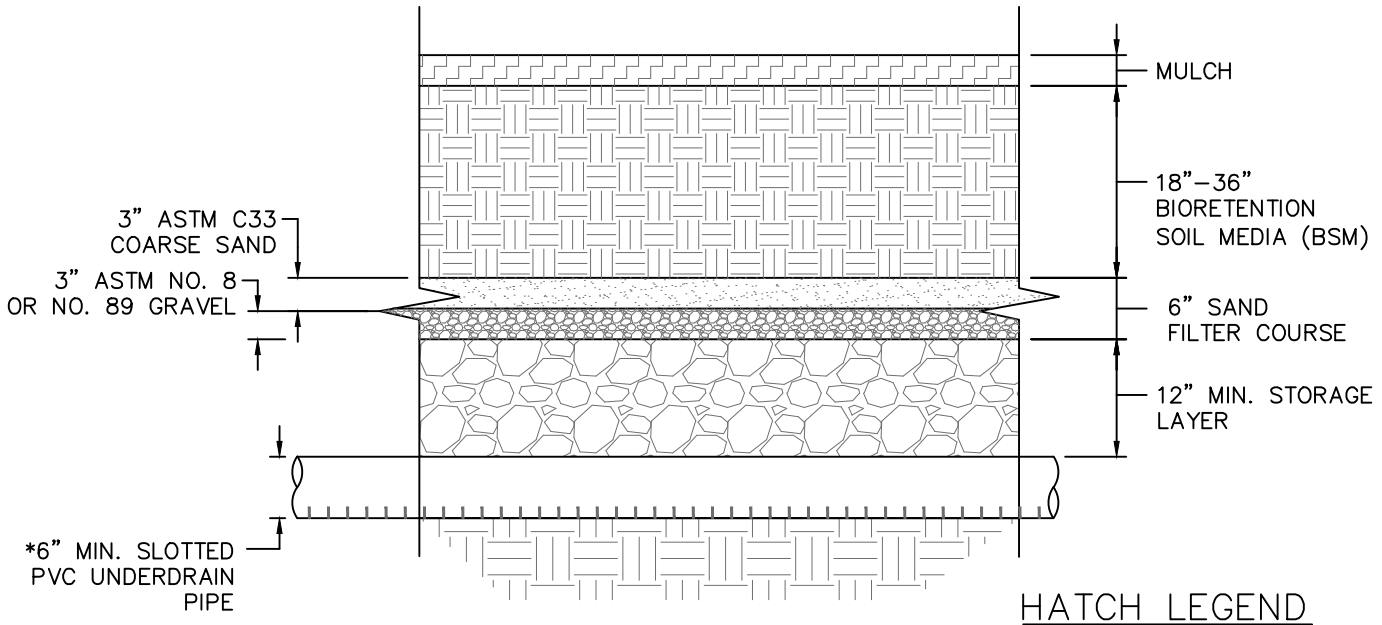
TYPICAL PROCESS TRAIN EXAMPLE
NOT TO SCALE

*SEE SW–002 SHEET 2 FOR PROFILE AND SECTION DETAIL

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	BIO-FILTRATION BASIN STANDARD PLAN	**SW-002**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 1 OF 3



PROFILE VIEW
NOT TO SCALE



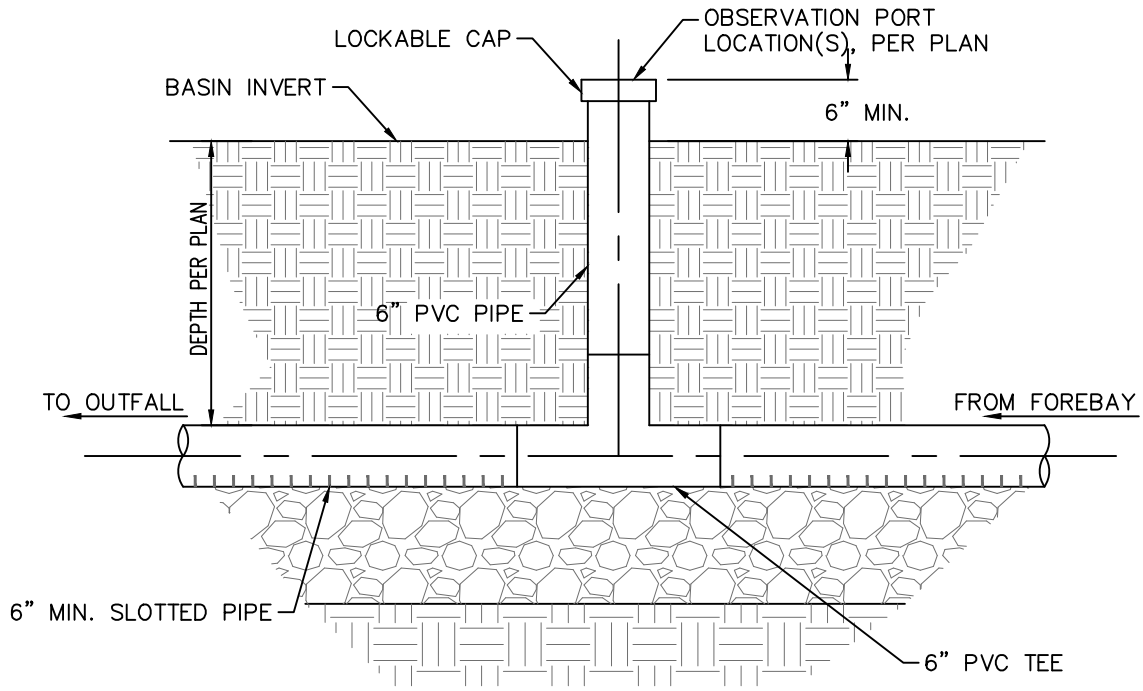
SECTION A–A
NOT TO SCALE

HATCH LEGEND

- MULCH
- BIOTREATMENT SOIL MEDIA (BSM)
- SAND
- CLEAN AGGREGATE

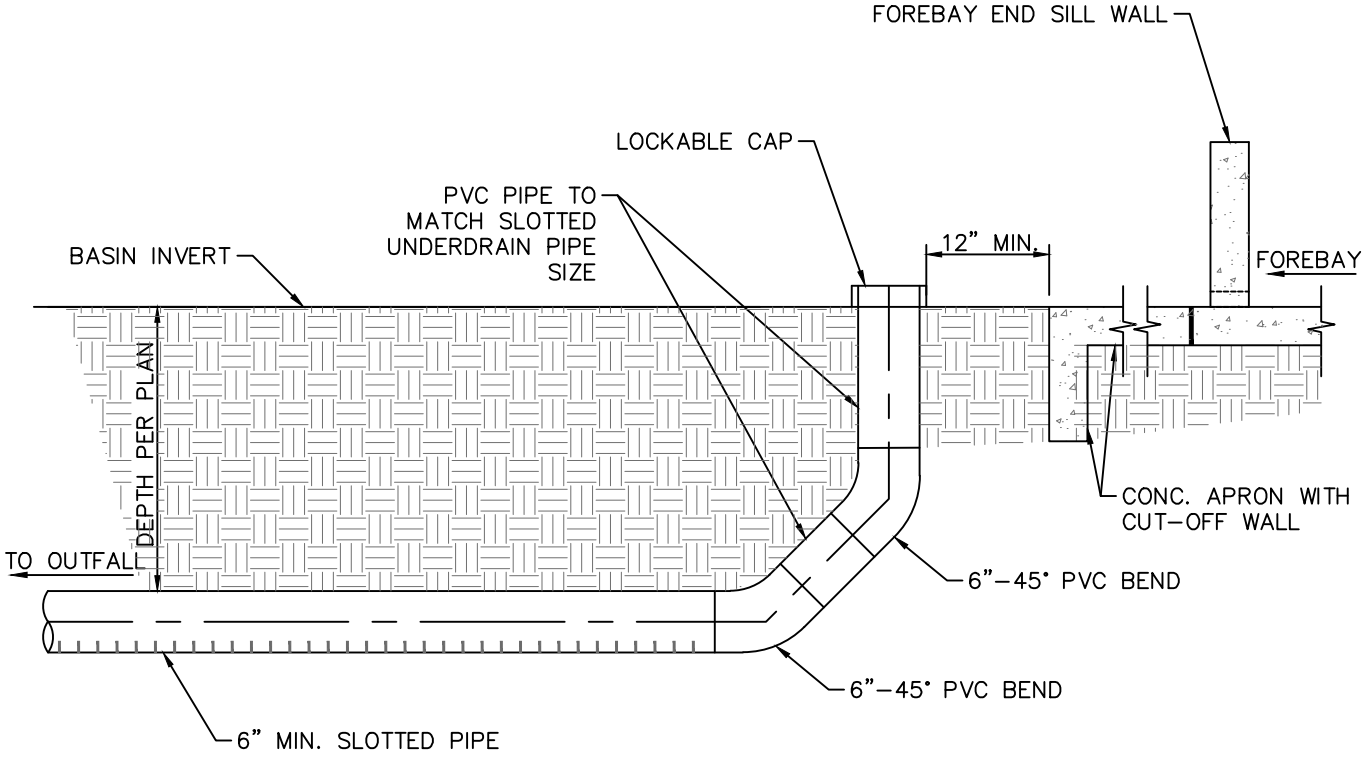
*FOR BIORETENTION DESIGN PLACE SLOTTED PVC UNDERDRAIN PIPE AT HIGHER ELEVATION TO PROVIDE INFILTRATION STORAGE

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	BIOFILTRATION BASIN STANDARD PROFILE	**SW-002**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 2 OF 3



OBSERVATION PORT DETAIL – B

NOT TO SCALE

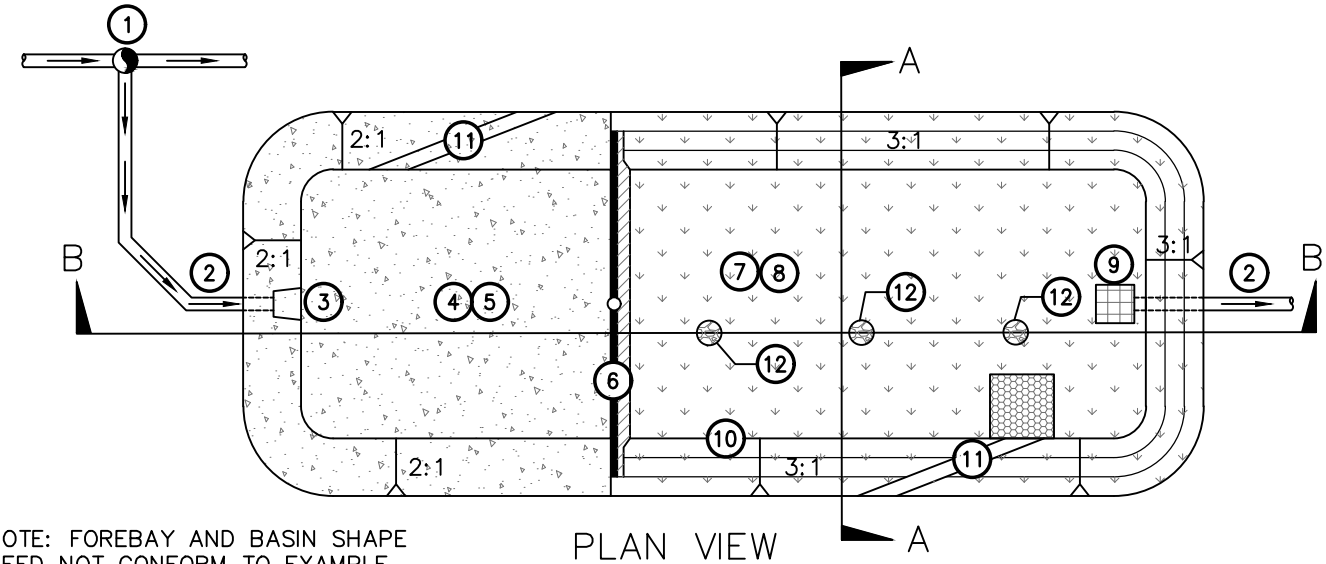


UNDERDRAIN PIPE CLEANOUT DETAIL – A

NOT TO SCALE

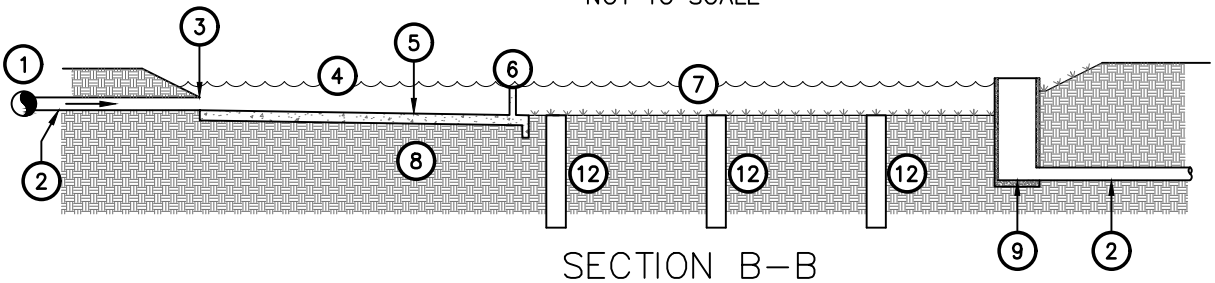
CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	BIOFILTRATION STANDARD DETAIL	**SW-002**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 3 OF 3

INFILTRATION BASIN

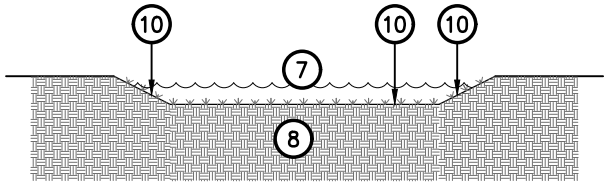


NOTE: FOREBAY AND BASIN SHAPE NEED NOT CONFORM TO EXAMPLE SHOWN HEREON

PLAN VIEW
TYPICAL PROCESS TRAIN EXAMPLE
NOT TO SCALE



SECTION B–B
TYPICAL PROCESS TRAIN EXAMPLE
NOT TO SCALE



SECTION A–A
TYPICAL PROCESS TRAIN EXAMPLE
NOT TO SCALE

(1) DIVERSION STRUCTURE OR BASIN INLET

(2) STORM DRAIN RCP PIPE

(3) CONCRETE HEADWALL INLET STRUCTURE

(4) PRE–TREATMENT FOREBAY

(5) CONCRETE LINING – SLOPE AND INVERT

(6) FOREBAY END SILL WALL WITH LOW FLOW NOTCH

(7) WATER QUALITY BASIN INFILTRATION AND STORAGE AREA

(8) NATIVE SOIL SUITABLE FOR INFILTRATION (PER TGD)

(9) OVERFLOW TOWER OR STANDPIPE WITH INTAKE GRATE

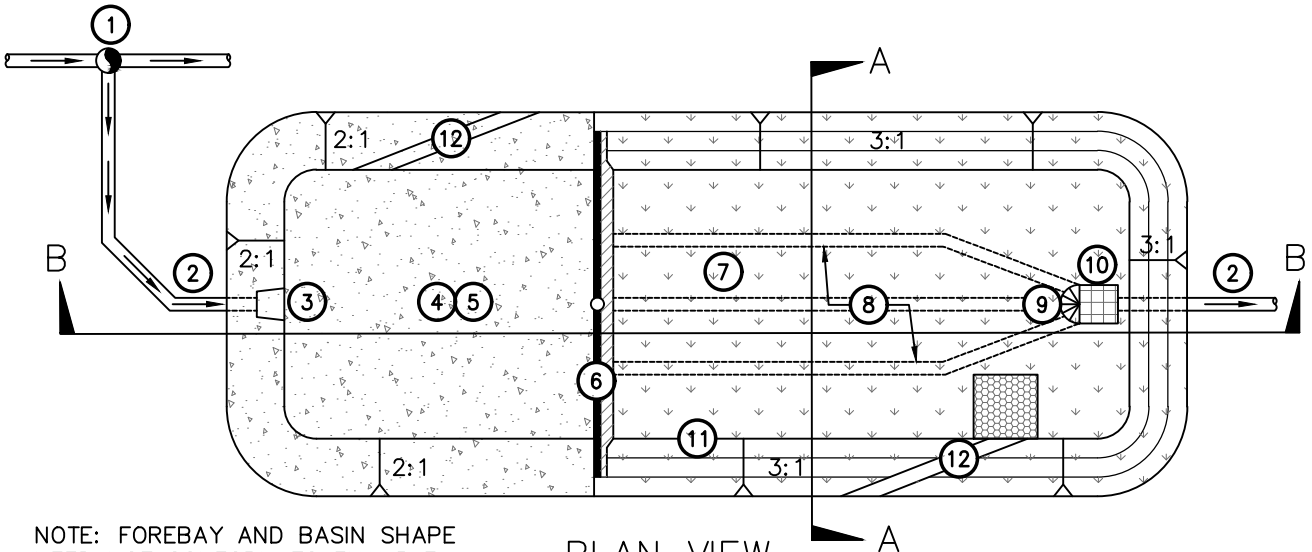
(10) VEGETATED SIDE SLOPES AND INVERT

(11) ACCESS RAMP REQUIRED AT FOREBAY AND BASIN. ADDITIONAL RAMPS MAY BE NECESSARY BASED UPON BASIN SIZE AND CONFIGURATION

(12) OPTIONAL DRYWELLS TO AUGMENT INFILTRATION VOLUME

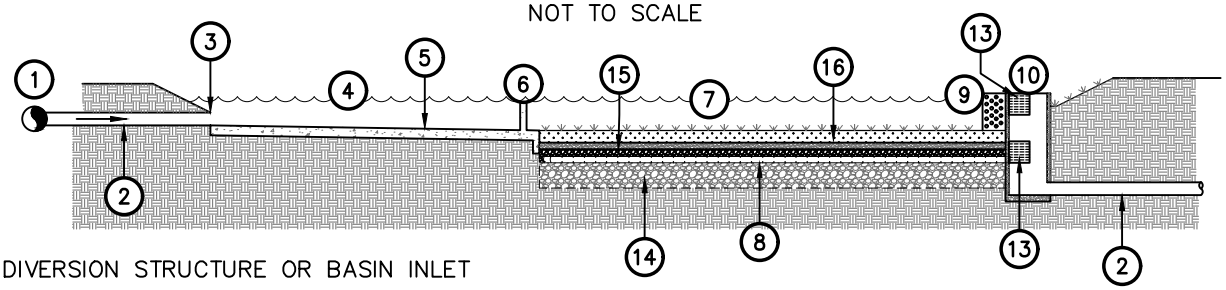
CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	INFILTRATION BASIN STANDARD PLAN	**SW-003**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 1 OF 1

BIORETENTION BASIN

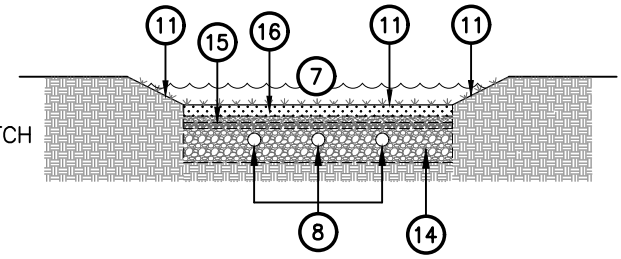


NOTE: FOREBAY AND BASIN SHAPE NEED NOT CONFORM TO EXAMPLE SHOWN HEREON

PLAN VIEW
TYPICAL PROCESS TRAIN EXAMPLE
NOT TO SCALE



SECTION B–B
TYPICAL PROCESS TRAIN EXAMPLE
NOT TO SCALE



SECTION A–A
TYPICAL PROCESS TRAIN EXAMPLE
NOT TO SCALE

1. DIVERSION STRUCTURE OR BASIN INLET
2. STORM DRAIN RCP PIPE
3. CONCRETE HEADWALL INLET STRUCTURE
4. PRE–TREATMENT FOREBAY
5. CONCRETE LINING – SLOPE AND INVERT
6. FOREBAY END SILL WALL WITH LOW FLOW NOTCH
7. BIORETENTION STORAGE AREA
8. *SLOTTED UNDERDRAIN PIPE WITH CLEANOUTS
9. TRASH RACK
10. OUTFLOW CONTROL STRUCTURE
11. VEGETATED SIDE SLOPES AND INVERT
12. ACCESS RAMP REQUIRED AT FOREBAY AND BASIN. ADDITIONAL RAMPS MAY BE NECESSARY BASED UPON BASIN SIZE AND CONFIGURATION
13. OPTIONAL ORIFICE FOR CONTROL
14. INFILTRATION STORAGE GALLERY
15. *FILTER COURSE
16. BIOTREATMENT SOIL MEDIA (BSM)

*SEE SW–002 SHEET 2 AND 3 FOR ADDITIONAL DETAIL

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	BIORETENTION BASIN STANDARD PLAN	**SW-004**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 1 OF 1

NOTES:

1. INFILTRATION IS THE FIRST CHOICE FOR STORMWATER BASIN DESIGN IF INFILTRATION IS FEASIBLE ONSITE.
2. GEOTECHNICAL PERCOLATION AND INFILTRATION TESTING IS RECOMMENDED AT THE ONSET OF PROJECT PLANNING TO INFORM DESIGN DECISIONS FOR STORMATER BASINS.
3. BIOTREATMENT SOIL MEDIA (BSM) AND MULCH LAYERS SHALL BE IN ACCORDANCE WITH THE MOJAVE TGD.
4. BIORETENTION AND INFILTRATION DESIGN IS RECOMMENDED FOR HYDROMODIFICATION CONTROL, IF REQUIRED.
5. FILTER COURSE, GRAVEL LAYER AND SLOTTED UNDERDRAIN PIPE SHALL BE IN ACCORDANCE WITH DETAILS SHOWN ON SW–008 SHEET 1.
6. ACTUAL DIMENSIONS FOR BIOTREATMENT SOIL MEDIA LAYER THICKNESS AND SLOTTED UNDERDRAIN PIPE DIAMETER TO BE SPECIFIED ON PROJECT PLANS BASED ON DESIGN CALCULATIONS. SEE SECTION 4.3.2 OF THE MOJAVE RIVER WATERSHED TECHNICAL GUIDANCE FOR POST CONSTRUCTION MEASURES PLANS FOR SITE DESIGN BMPS.
7. BIOFILTRATION BASIN BED PROFILE BEGINNING AT THE TOP CONSISTS OF (1) MULCH (AS REQUIRED), (2) BSM, (3) FILTER COURSE, AND (4) INFILTRATION STORAGE LAYER.
8. FULL BASIN VOLUME SHOULD BE DESIGNED FOR 48 HOUR DRAWDOWN. DRAWDOWN TIME MAY BE CONTROLLED BY BSM INFILTRATION RATE OR THROTTLED DOWN THROUGH AN OUTLET CONTROL. BSM DESIGN INFILTRATION RATE WILL DEPEND ON DRAWDOWN CONTROL METHOD.
9. WHEN BSM INFILTRATION RATE CONTROLS DRAWDOWN RATE, INFILTRATION RATES FOR THE BSM OF BETWEEN 2.0 TO 4.0 INCHES PER HOUR. TESTING SOIL SHALL BE CONSISTENT WITH TARGET INFILTRATION RATES SHOULD NOT EXCEED 4.0 INCHES PER HOUR FOR ADEQUATE WATER RETENTION.
10. WHEN DRAWDOWN TIME CONTROLLED BY ORIFICE/VALVE ON UNDERDRAIN, BSM INFILTRATION RATE SHOULD BE 20 TO 40 INCHES PER HOUR.
11. INFILTRATION STORAGE LAYER SHALL BE PROTECTED BY FILTER COURSE TO TRAP SEDIMENT FROM CLOGGING. FILTER COURSE PER DETAIL. NO GEOTEXTILE FILTER FABRIC SHALL BE USED.
12. MINIMUM BSM DEPTH IS 18 INCHES, THREE FEET PREFERRED.
13. DEPTH OF THE INFILTRATION STORAGE LAYER BELOW THE UNDERDRAIN ELEVATION MUST BE SUFFICIENT THAT THE "EFFECTIVE STORAGE DEPTH" WILL DRAIN IN 48 HOURS CALCULATED USING THE AVERAGE INFILTRATION RATE OF THE UNDERLYING SOIL. MINIMUM OF 18 INCHES.

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	STORMWATER BASIN STANDARD NOTES	**SW-005**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 1 OF 3

NOTES:

FILTER COURSE AND SLOTTED UNDERDRAIN PIPE DESIGN

1. TO KEEP THE MEDIA PARTICLES FROM MIGRATING INTO THE AGGREGATE GRAVEL LAYER, A FILTER COURSE IS USED. WHILE GEOTEXTILE FILTER FABRICS HAVE BEEN USED IN THE PAST AT THE INTERFACE OF THE SOIL MEDIA AND GRAVEL AGGREGATE LAYERS, EXPERIENCE HAS SHOWN THAT FILTER FABRIC IS A COMMON POINT OF FAILURE IN STORMWATER BMPS, EITHER BY CLOGGING, OR BY ALLOWING MEDIA TO MIGRATE INTO THE UNDERDRAIN SYSTEM. A 'BRIDGING' OR 'CHOKING' LAYER (FILTER COURSE) IS PREFERRED TO SEPARATE THE INFILTRATION STORAGE LAYER AND THE SOIL MEDIA. THIS APPROACH CONSISTS OF PROGRESSIVELY GRADED LAYERS THAT PROGRESS FROM FINER TO COARSER MATERIALS MOVING FROM TOP TO BOTTOM.
2. THIS FILTER COURSE CONSISTS OF A COARSE SAN LAYER, UNDERLAIN BY PEA GRAVEL. THE FILTER COURSE IS UNDERLAIN BY THE INFILTRATION STORAGE LAYER. AS LONG AS THE RECOMMENDATIONS BELOW ARE USED FOR THE FILTER COURSE AND INFILTRATION STORAGE LAYER, THEN NO CALCULATIONS ARE NEEDED TO DEMONSTRATE THE ADEQUACY OF THE FILTER COURSE.

RECOMMENDED FILTER COURSE AND INFILTRATION STORAGE LAYER DESIGN

3. THE RECOMMENDED DESIGN FOR THE FILTER COURSE IS SHOWN BELOW. IT CONSISTS OF 3 INCHES OF ASTM C33 COARSE SAND AT THE BOTTOM OF THE MEDIA LAYER, UNDERLAIN BY 3 INCHES OF ASTM NO. 8 OR NO. 89 GRAVEL. THE DESIGN ASSUMES THAT THE INFILTRATION STORAGE LAYER CONSISTS OF AASHTO NO. 57 GRAVEL. THE GRADATION LIMITS TO MEET THE STANDARD CLASSIFICATIONS ARE SHOWN IN THE TABLES BELOW. IF THE PROJECT PROPOSES SIGNIFICANTLY DIFFERENT GRADATIONS OF ANY LAYER, THEN CALCULATIONS SHOWING THAT THE FILTER COURSE IS ADEQUATE ARE REQUIRED ADEQUACY WILL DEPEND ON THE SIZING CALCULATIONS BY AN ENGINEER FOR EACH PROJECT.

SLOTTED UNDERDRAIN PIPE

4. UNDERDRAINS SHALL BE SLOTTED, SCHEDULE 40 PVC PIPE CONFORMING TO ASTM D 3034 OR EQUIVALENT OR CORRUGATED, HDPE PIPE CONFORMING TO AASHTO 252M OR EQUIVALENT. SCHEDULE 80 PVC PIPE MAY BE REQUIRED AT THE DISCRETION OF THE CITY OF VICTORVILLE.
5. SLOTS SHALL BE 4–6 ROWS CUT PERPENDICULAR TO THE AXIS OF THE PIPE OR RIGHT ANGLES TO THE PITCH OF CORRUGATIONS.
6. SLOTS SHALL BE 00.04 TO 0.1 INCHES WIDE AND 1 TO 1.25 INCHES LONG AND SHALL BE LOCATED WITHIN LOWER THIRD OF PIPE.
7. SLOTS SHALL BE LONGITUDINALLY SPACED SUCH THAT THE PIPE HAS A MINIMUM OF 2 QUARE INCHES OF "SLOT OPEN AREA" IN EACH LINEAL FOOT OF PIPE.
8. SLOT SPACE IS COMPUTED AS THE PRODUCT OF THE LENGTH, WIDTH, NUMBER OF ROWS, AND NUMBER OF SLOTS PER ROW IN 1 FOOT OF PIPE. FOR EXAMPLE, A PIPE CONTAINING 6 ROWS OF 1"X0.067" SLOTS WITH 12 SLOTS PER LINEAL FOOT OF PIPE WOULD HAVE AN OPEN AREA OF 6X12X1"X0.037" = 4.8 SQ–INCH OPEN AREA PER LINEAL FOOT OF PIPE.
9. UNDERDRAIN PIPE MUST BE SIZED USING MINIMUM OF 6 INCH DIAMETER SLOTTED PVC PIPE AND MINIMUM SLOPE OF 0.5 PERCENT. PIPE SHALL CONFORM TO THE DISCRETION OF THE CITY OF VICTORVILLE.
10. UNDERDRAIN PIPES SHALL BE SPACED AS NEEDED FOR HYDRAULIC DESIGN.
11. INSTALL A MINIMUM OF TWO CLEANOUTS ON EACH SUBDRAIN PIPE; ONE CLEANOUT AT THE UPSTREAM END AND ONE AT THE DOWNSTREAM END. OBSERVATION PORT REQUIRED EVERY 100 TO 200 FT.
12. UNDERDRAIN SOFFIT AT THE TOP OF THE INFILTRATION STORAGE LAYER.

GRADATION LIMITS FOR ASTM C33 COARSE SAND

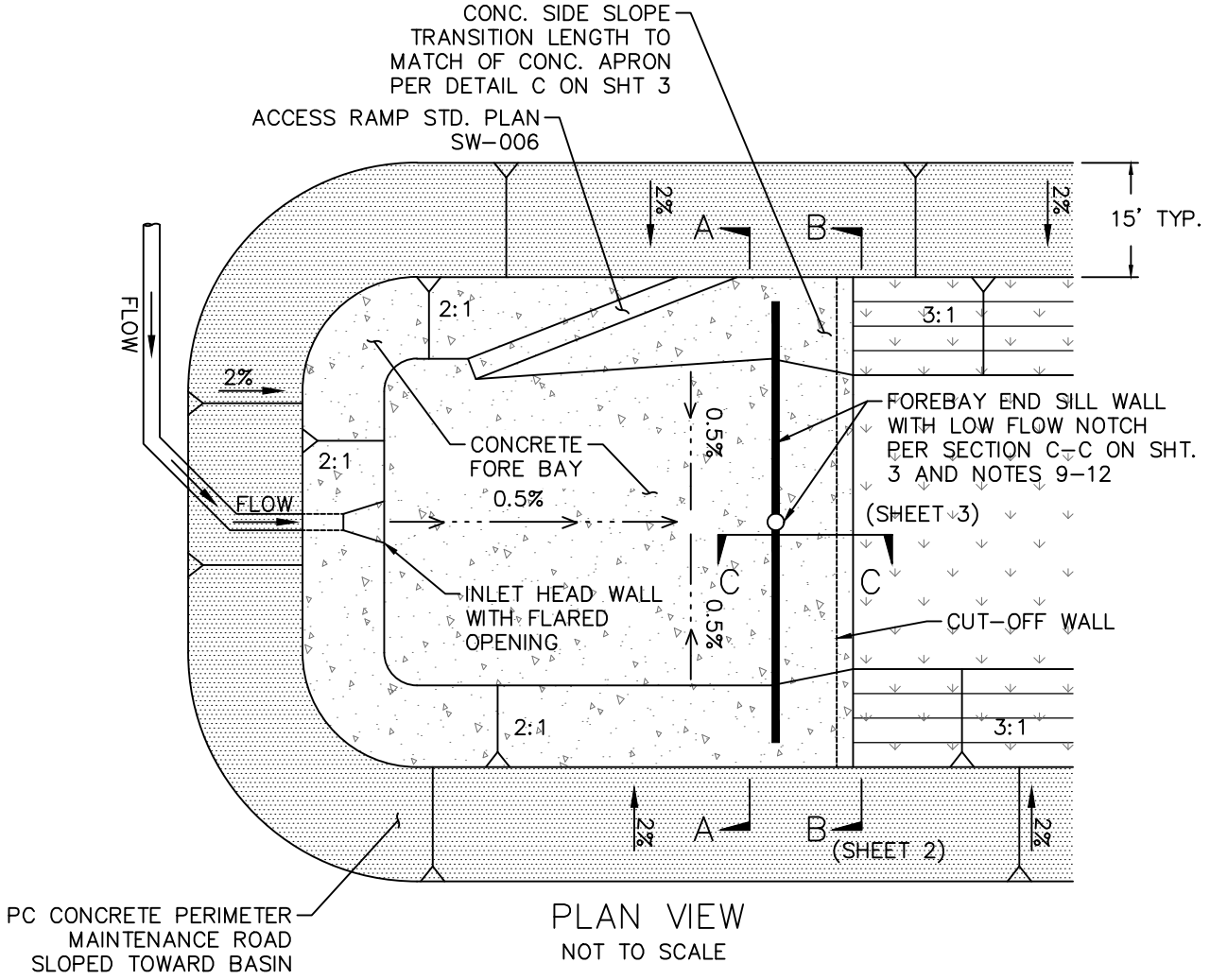
SIEVE SIZE	PERCENT OF PARTICLES SMALLER THAN SIEVE SIZE
⅜ in.	100
No. 4 (0.187 in.)	95–100
No. 8 (0.093 in.)	80–100
No. 16 (0.046 in.)	50–85
No. 30 (0.024 in.)	25–60
No. 50 (0.012 in.)	5–30
No. 100 (0.006 in.)	0–10
No. 200 (0.003 in.)	0 [FINES SHOULD NOT BE PRESENT IN WASHED STONE]

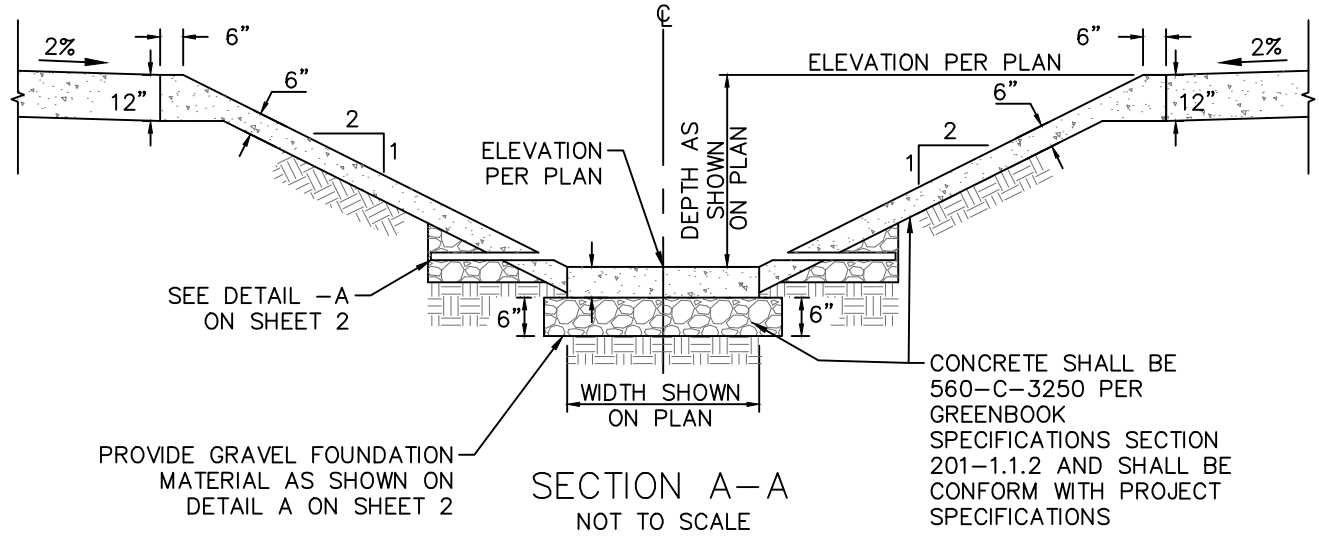
GRADATION LIMITS FOR ASTM NO. 8 PEA GRAVEL OR NO. 89 GRAVEL (AKA ⅜" STONE)

SIEVE SIZE	PERCENT OF PARTICLES SMALLER THAN SIEVE SIZE
½ in.	8
⅜ in.	95–100
No. 4 (0.187 in.)	10–30
No. 8 (0.093 in.)	0–10
No. 16 (0.046 in.)	0–5

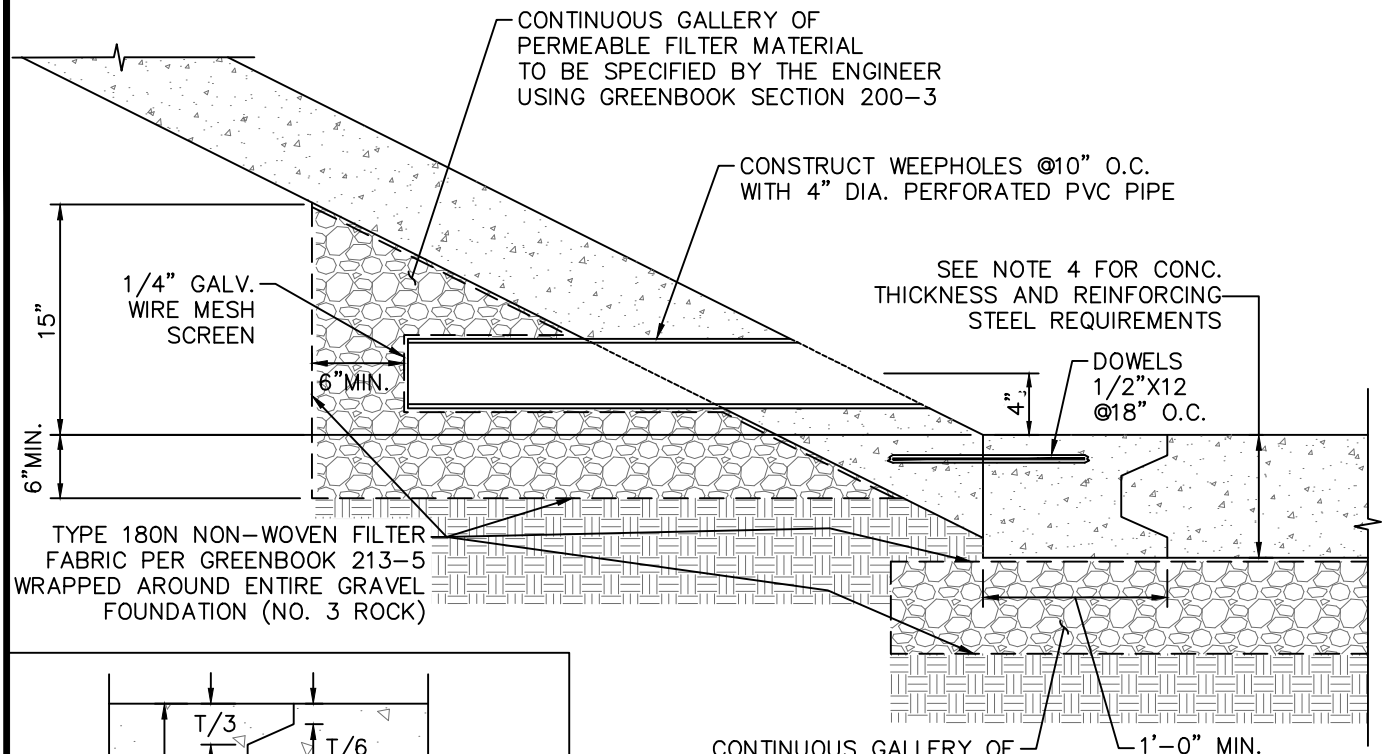
GRADATION LIMITS FOR AASHTO NO. 57 AGGREGATE GRAVEL (AKA ¾" OPEN GRADED BASE)

SIEVE SIZE	PERCENT OF PARTICLES SMALLER THAN SIEVE SIZE
1 ½ in.	100
1 in.	95–100
½ in.	25–60
No. 4 (0.187 in.)	0–10
No. 8 (0.093 in.)	0–5

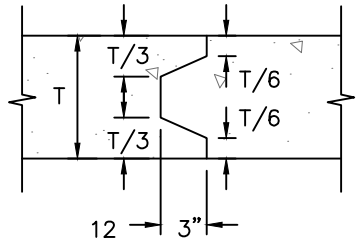




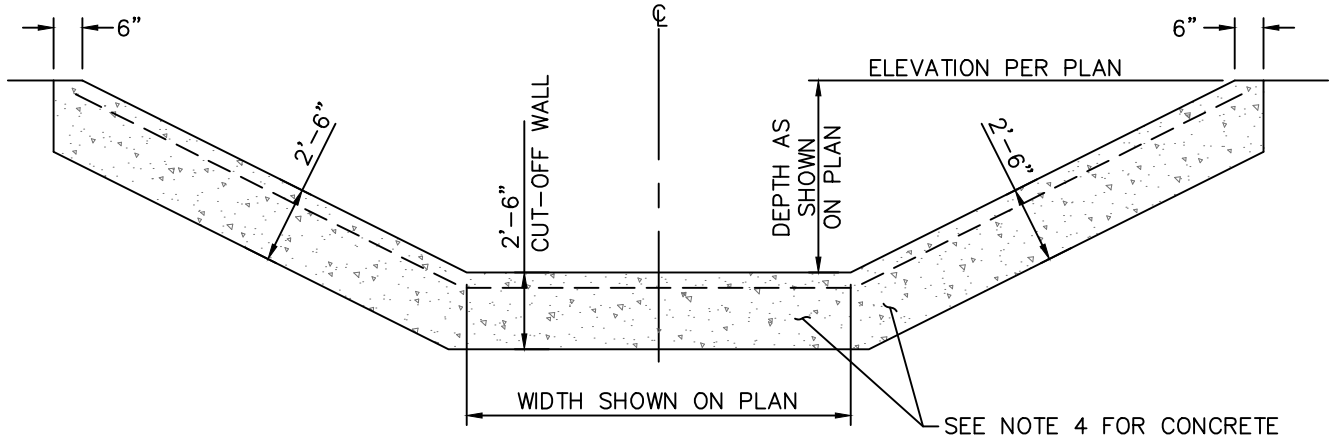
CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	BASIN FOREBAY CONCRETE LINING AND END SILL WALL	**SW-006**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 1 OF 3



DETAIL – A
NOT TO SCALE

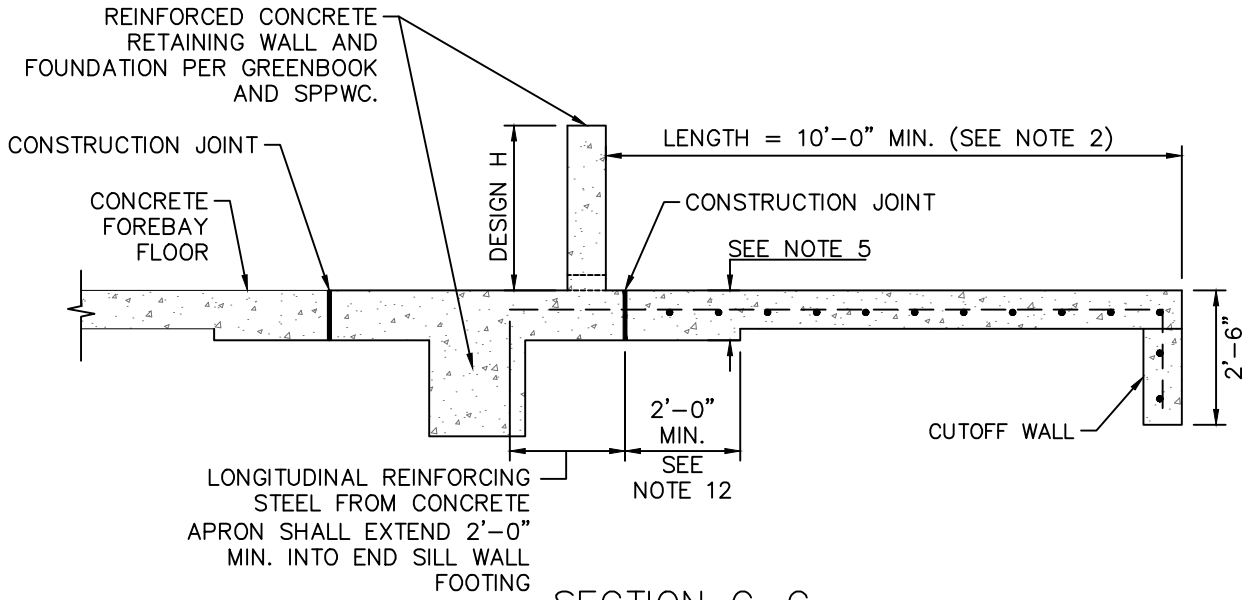


KEYED CONST. JOINT
DETAIL – B
NOT TO SCALE



SECTION B–B
NOT TO SCALE

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	BASIN FOREBAY CONCRETE LINING AND END SILL WALL	**SW-006**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 2 OF 3

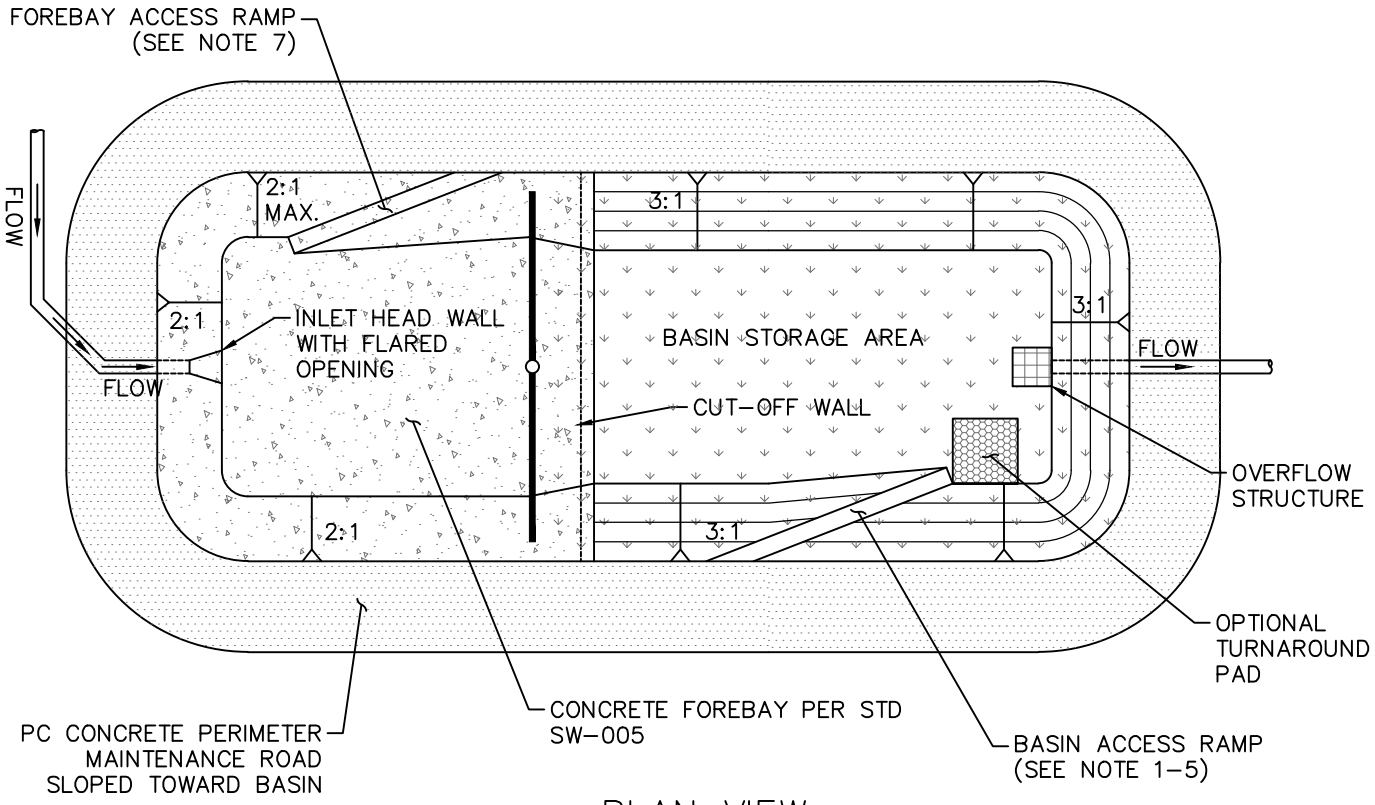


SECTION C–C
CCONCRETE APRON AND
END SILL WALL AT CONCRETE FOREBAY
NOT TO SCALE

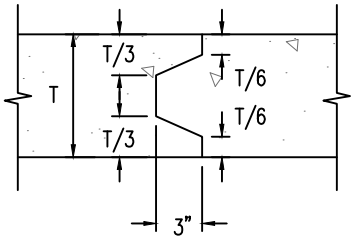
NOTES:

1. CONCRETE LINED FOREBAY SIDE SLOPES SHALL NOT EXCEED 2(H):1(V).
2. LENGTH OF CONCRETE APRON AND SIZE SLOPE TRANSITION DOWNSTREAM OF FOREBAY END SILL WALL SHALL BE TWICE THE DESIGN HEIGHT (H) OF THE END SILL WALL OR A MINIMUM OF 10' (WHICHEVER IS GREATER).
3. CONCRETE FOR FOREBAY SIDE SLOPES AND INVERT, APRON AND SIDE SLOPE TRANSITION SHALL BE 560–C–3250 PER GREENBOOK SPECIFICATIONS SECTION 201–1.1.2.
4. CONCRETE THICKNESS SHALL BE 6" THICK MINIMUM AND REINFORCING STEELBARS SHALL BE #4 @24" O.C.
5. THICKNESS OF CONCRETE APRON SHALL INCREASE TO MATCH THE THICKNESS OF THE END SILL WALL FOOTING (WHERE FOOTING THICKNESS EXCEEDS CONCRETE APRON THICKNESS). CHANGE IN CONCRETE APRON THICKNESS SHALL OCCUR ABRUPTLY AT A DISTANCE NO LESS THAN 2' FROM THE JUNCTION WITH THE END SILL WALL FOOTING.
6. GRAVEL BASE FOUNDATION IS REQUIRED UNDERNEATH BOTTOM INVERT LINING. DEPTH OF FOUNDATION MATERIAL SHALL BE 12" MIN. AND SHALL BE CONFIRMED WITH THE PROJECT GEOTECHNICAL REPORT.
7. WEEPHOLES ARE REQUIRED FOR SUBSURFACE DRAINAGE BEHIND CONCRETE SIDE SLOPES TO PREVENT BUILDUP OF HYDROSTATIC PRESSURE.
8. FOREBAY FLOOR SHALL HAVE LONGITUDINAL SLOPE (0.5% MIN.) TOWARD END SILL WALL.
9. BASIN FOREBAY SHALL BE DESIGNED TO CAPTURE MINIMUM PARTICLE SIZE, DMIN = 0.0625MM, VIA SETTLING. MINIMUM PARTICLE SIZE SHALL SETTLE DISTANCE (HW) BASED ON SETTING VELOCITY (VS) BEFORE IT TRAVELS LENGTH (L) BASED ON VELOCITY (U). DESIGNER SHALL VERIFY FOREBAY SHAPE AND DIMENSIONS ARE COMPATIBLE WITH SEDIMENT CAPTURE. FOREBAY SHAPE NEED NOT CONFORM TO EXAMPLE SHAPE SHOWN HEREON.
10. DESIGNER SHALL PROVIDE CALCULATIONS THAT DEMONSTRATE SUITABILITY OF FOREBAY TO CAPTURE SEDIMENT BASED ON STOKES LAW OR RUBEY'S EQUATION PER MOJAVE TGD.
11. A 4–INCH (TYP.) WIDE NOTCH SHALL BE PROVIDED IN THE CENTER OF THE END SILL WALL TO ALLOW FOR OUTLETS OF LOW–FLOWS IN FOREBAY. NOTCH HEIGHT SHALL BE THE SAME AS END SILL WALL HEIGHT.
12. THICKNESS OF CONCRETE FOREBAY INVERT SHALL INCREASE TO MATCH THE THICKNESS OF THE END SILL WALL FOOTING (WHERE FOOTING THICKNESS EXCEEDS CONCRETE FOREBAY INVERT THICKNESS). CHANGE IN CONCRETE FOREBAY INVERT THICKNESS SHALL OCCUR ABRUPTLY AT A DISTANCE NO LESS THAN 2–FT FROM THE JUNCTION WITH THE END SILL WALL FOOTING.

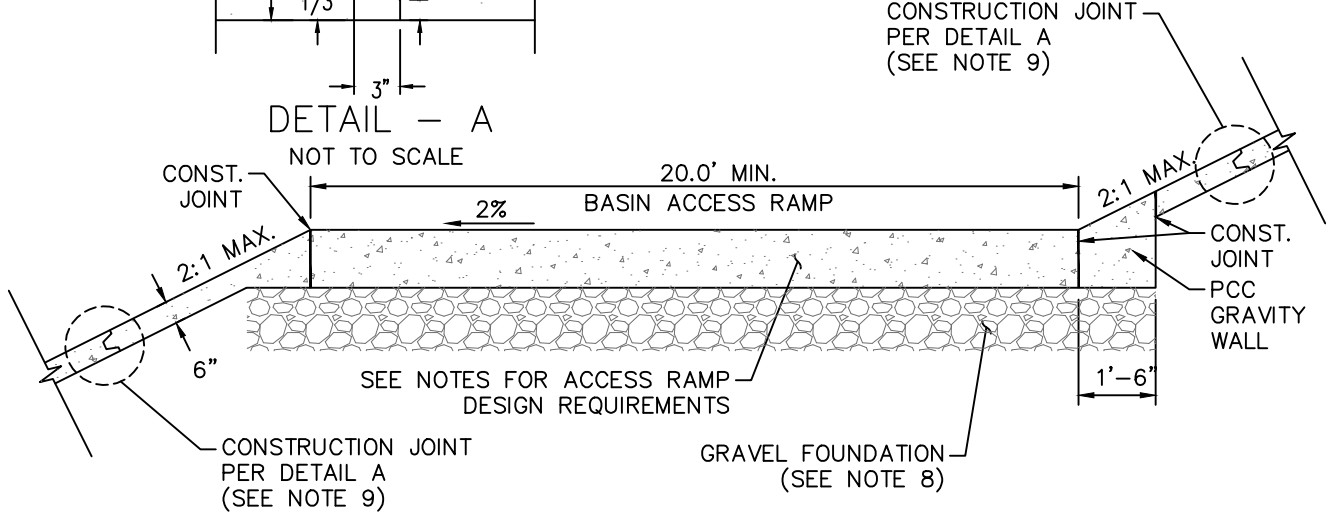
CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	BASIN FOREBAY CONCRETE LINING AND END SILL WALL	**SW-006**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 3 OF 3



PLAN VIEW
NOT TO SCALE

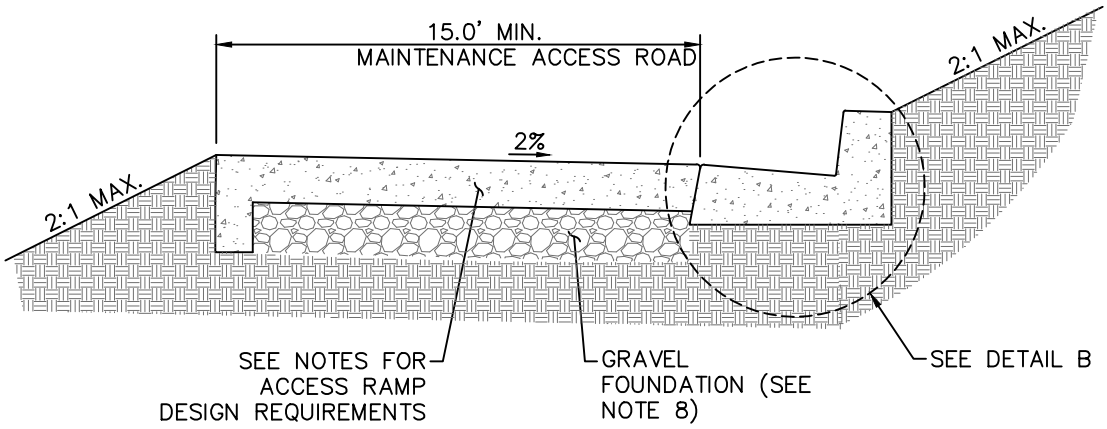


DETAIL - A
NOT TO SCALE

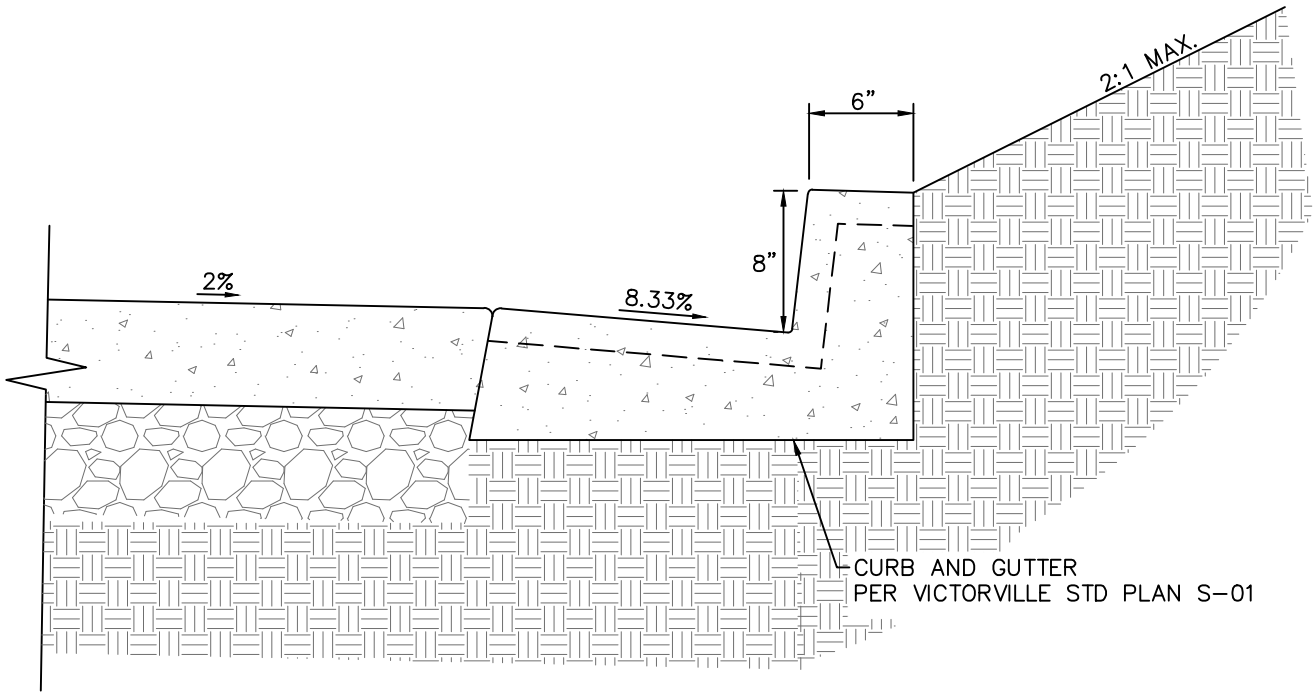


FOREBAY ACCESS RAMP SECTION
NOT TO SCALE

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	BASIN CONCRETE MAINTENANCE RAMP	**SW-007**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 1 OF 3



BASIN ACCESS RAMP SECTION
NOT TO SCALE



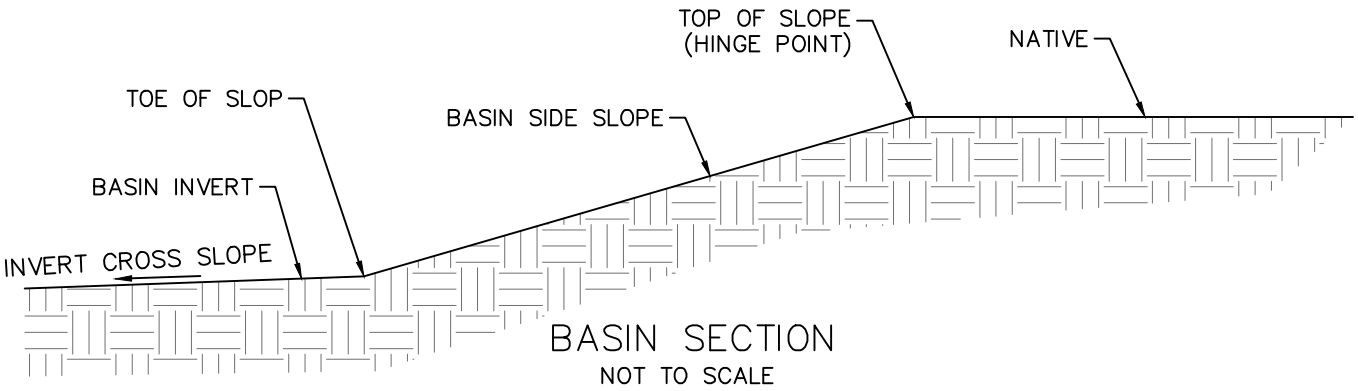
DETAIL – B
NOT TO SCALE

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	BASIN CONCRETE MAINTENANCE RAMP	**SW-007**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 2 OF 3

ACCESS RAMP NOTES:

1. THE MAXIMUM (STEEPNESS) SIDE SLOPE FOR BASIN EMBANKMENTS IS 2H:1V.
2. ONE ACCESS RAMP IS REQUIRED FOR EACH BASIN STORAGE AREA. ADDITIONAL RAMPS MAY BE REQUIRED BASED ON BASIN SIZE/CONFIGURATION. FOR BASINS WITH SLOPES OF 6:1 OR FLATTER, ACCESS RAMPS ARE NOT REQUIRED.
3. ACCESS RAMPS SHALL HAVE A MAXIMUM 10% GRADE AND MINIMUM CROSS–GRADE OF 2%. RAMP SHALL SLOPE AWAY FROM BASIN.
4. CONCRETE FOR ACCESS RAMPS SHALL BE CONSTRUCTED FROM CLASS 560–C–3250 CONCRETE PER SECTION 201–1.1.2 OF THE GREENBOOK SPECIFICATIONS. AND SHALL CONFORM TO THE REQUIREMENTS OF CITY. CONCRETE SURFACE SHALL HAVE A TRANSVERSE RAKED FINISH.
5. CONCRETE THICKNESS SHALL BE NOT LES THAN 6" THICK MINIMUM AND REINFORCING STEEL BARS SHALL BE #4 @24" O.C.
6. REINFORCING STEEL SHALL BE GRADE 60 IN ACCORDANCE WITH ASTM A615.
7. A MINIMUM OF ONE ACCESS RAMP IS REQUIRED IN THE FOREBAY IF SLOPES ARE STEEPER THAN 6:1.
8. GRAVEL BASE FOUNDATION SHALL BE CLASS 1 PERMEABLE MATERIAL PER SPPWC 200–3. (12" MIN. LAYER THICKNESS) WRAPPED IN FABRIC OR EQUIVALENT PER PROJECT GEOTECHNICAL ENGINEER RECOMMENDATION.
9. LOCATION OF CONSTRUCTION JOINTS SHALL BE DETERMINED BY DESIGNER PER STRUCTURAL DESIGN REQUIREMENTS BASED ON ACCESS RAMP THICKNESS.
10. IF RAMPS CANNOT BE CONSTRUCTED, THE MAXIMUM SIDESLOPE OF THE BASIN SHOULD NOT EXCEED A 6:1 SLOPE SO EQUIPMENT CAN ENTER AND EXIT THE BASIN ON ONE SIDE OR END.

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	BASIN CONCRETE MAINTENANCE RAMP	**SW-007**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 3 OF 3



BASIN SECTION

NOT TO SCALE

NOTE:

1. SEE TABLE ON SHEET 4 FOR BASIN REQUIREMENTS

BASIN SIDE SLOPE VEGETATION:

INSTALL A HIGH DESERT NON-INVASIVE SPECIES EROSION CONTROL SEED MIX WITH TACKIFIER (FLEXTERRA HIGH PERFORMANCE – FLEXIBLE GROWTH MEDIUM (HP-FGM) SEED WITH S&S BASIN EROSION CONTROL SEED MIX OR EQUAL). SEED MIX TO BE CONFIRMED BASED ON GEOGRAPHIC LOCATION & CLIMATE ZONE (HABITAT CONSERVATION PLAN SUB-REGION) PRIOR TO APPLICATION. NO MULCH.

BASIN INVERT VEGETATION:

BASIN INVERT VEGETATION TO BE INSTALLED PER OPTION A: LIVE PLANS AND MULCH (SEE SHEET 2), OR OPTION B: SEED (SEE SHEET 3).

BASIN SLOPES & VEGETATION REQUIREMENTS:

1. BASIN SIDE SLOPES VEGETATED TO PROVIDE SOIL STABILIZATION AND EROSION CONTROL AS WELL AS AESTHETICS.
2. BIOINFILTRATION BASIN FLOOR VEGETATED TO PROVIDE BIOLOGICAL UPTAKE FOR POLLUTANT REMOVAL.
3. INFILTRATION BASIN, HYDROMODIFICATION CONTROL BASIN, AND COMBO BASINS VEGETATED ON FLOOR TO STABILIZE SOIL.
4. PLANTING SHALL BE NATIVE VEGETATION SUITABLE FOR BASIN SOIL, HYDROLOGY, AND LOCATION.

BASIN INVERT PLANTING OPTION A: LIVE PLANTINGS WITH MULCH

1. LIVE PLANTS (PLUGS) SHALL BE INSTALLED ON A GRID RECOMMENDED BY THE DESIGNER, BASED ON PLANT SPECIES TO ACHIEVE MAXIMUM MATURE VEGETATED COVERAGE OF THE BASIN INVERT. USE LOCALLY SOURCED PLANTS WHERE AVAILABLE.
2. PLANT PALETTE MAY BE SUBSTITUTED WITH APPROVAL OF CITY.
3. MULCH LAYER TO BE INSTALLED CONTINUOUSLY OVER ENTIRE BASIN INVERT.
4. MULCH TO BE NON-FLOATING HARDWOOD MULCH.
5. PLANT PALETTE DETERMINED BY THE DESIGNER BASED ON PROJECT CLIMATE CONDITIONS.

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	BASIN SLOPE AND VEGETATION REQUIREMENTS	**SW-008**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 1 OF 3

VEGETATION COVERAGE REQUIREMENTS:

VEGETATION GROWTH IS TO BE ESTABLISHED WITH 70%* VEGETATION COVERAGE OF BASIN SIDE SLOPES AND INVERT AT COMPLETION OF WARRANTY PERIOD. THE BASIN BUILDER/SPONSOR MAY ELECT TO PROMOTE GROWTH VIA PERIODIC WATERING (PRIMARILY DURING WINTER AND SPRING). IN THE EVENT THAT NATURAL RAINS DO NOT PROMOTE VEGETATION GROWTH, THE BASIN BUILDER/SPONSOR SHALL MAKE APPROPRIATE PERIODIC "BALD SPOT" SEED REPLACEMENT N BASINS SIDES OR LIVE PLANT REPLACEMENT ON BASIN BOTTOM TO SATISFY THE WARRANTY PERIOD COVERAGE OF 70% IN ORDER TO CONCLUDE THE WARRANTY PERIOD. ESTABLISHMENT OF SEED REQUIRES 70% COVERAGE AND PLANTS NOT EASILY PULLED FROM SOIL.

*COVERAGE STANDARD REFERENCED FROM CONSTRUCTION GENERAL PERMIT REGULATIONS REQUIRING FINAL STABILIZATION ON 70% OF DISTURBED SOILS.

BASIN INVERT PLANTING OPTION B: SEED

BASIN FLOOR MAY BE SEEDED USING SEED, HYDROSEED OR HYDROMULCH WITH SEED. SEED MIX TO BE APPLIED TO 100% OF THE BASIN INVERT.

INSTALL THE FOLLOWING SEED MIX, OR CLIMATE APPROPRIATE EQUIVALENT (EACH ITEM TO BE LISTED IN POUNDS PER ACRE): SEED MIX TO BE CONFIRMED, BASED ON A GEOGRAPHIC SUB REGION OF THE SOUTHWESTERN MOJAVE DESERT KNOWN AS THE VICTOR VALLEY, WITH A HIGH DESERT CLIMATE ZONE, PRIOR TO APPLICATION. USE LOCALLY SOURCED SEED WHERE AVAILABLE.

1. STACHYS BULLATA (3 LBS)
2. AMBROSIA PSILOSTACHY (3 LBS)
3. JUNCUS PATENS (3 LBS)
4. CAREX PRAEGRACILIS (2 LBS)
5. FESTUCA RUBRA (4 LBS)
6. HELIOTROPIUM CURASSAVICUM (2 LBS)
7. PLANTAGO ERECTA (4 LBS)
8. MALVELLA LEPROSA (2 LBS)
9. CRESSA TRUXILLENSIS (2 LBS)

PLANT ESTABLISHMENT PER SPECIFICATION HEREON REQUIRED PRIOR TO BASIN BEING PUT INTO SERVICE

VEGETATION COVERAGE REQUIREMENTS:

VEGETATION GROWTH IS TO BE ESTABLISHED WITH 70%* VEGETATION COVERAGE OF BASIN SIDE SLOPES AND INVERT AT COMPLETION OF WARRANTY PERIOD. THE BASIN BUILDER/SPONSOR MAY ELECT TO PROMOTE GROWTH VIA PERIODIC WATERING (PRIMARILY DURING WINTER AND SPRING). IN THE EVENT THAT NATURAL RAINS DO NOT PROMOTE VEGETATION GROWTH, THE BASIN BUILDER/SPONSOR SHALL MAKE APPROPRIATE PERIODIC "BALD SPOT" SEED REPLACEMENT TO SATISFY THE WARRANTY PERIOD. ESTABLISHMENT OF SEE REQUIRES 70% COVERAGE AND PLANTS NOT EASILY PULLED FROM SOIL.

*PERCENT REFERENCED FROM CONSTRUCTION GENERAL PERMIT REGULATIONS REQUIRING FINAL STABILIZATION ON 70% OF DISTURBED SOILS.

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	BASIN SLOPE AND VEGETATION REQUIREMENTS	**SW-008**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 2 OF 3

DESIGN CRITERIA	BIOINFILTRATION BASIN	INFILTRATION BASIN	HYDROMODIFICATION CONTROL BASIN
BASIN GEOMETRY			
CONCRETE FOREBAY SIDE SLOPES	2(H):1(V) MAX.	2(H):1(V) MAX.	2(H):1(V) MAX.
BASIN SIDE SLOPES	3(H):1(V) MAX.	3(H):1(V) MAX.	3(H):1(V) MAX.
INVERT CROSS SLOPE (MIN)	0%	0%	2% (TOWARD UNDERDRAIN)
INVERT LONG SLOPE (MAX)	0%	0%	1%
UNDERDRAIN	REQUIRED	NOT ALLOWED	OPTIONAL
VEGETATION			
FOREBAY	N/A	N/A	N/A
BASIN SIDE SLOPE	SEE SEED MIX ON SHEET 3	SEE SEED MIX ON SHEET 3	SEE SEED MIX ON SHEET 1
BASIN INVERT	LIVE PLANTINGS (PLUGS) WITH MULCH PER OPTION A ON SHEET 2 OR SEED PER OPTION B ON SHEET 3	SEED PER OPTION B ON SHEET 3 OR APPROVED ALTERNATIVE	SEED PER OPTION B ON SHEET 3 OR APPROVED ALTERNATIVE
IRRIGATION REQUIREMENTS			
BASIN SIDE SLOPE	TEMPORARY (AS-NEEDED FOR VEGETATION ESTABLISHMENT)	TEMPORARY (AS-NEEDED FOR VEGETATION ESTABLISHMENT)	TEMPORARY (AS-NEEDED FOR VEGETATION ESTABLISHMENT)
BASIN INVERT	TEMPORARY (AS-NEEDED FOR VEGETATION ESTABLISHMENT)	TEMPORARY (AS-NEEDED FOR VEGETATION ESTABLISHMENT)	TEMPORARY (AS-NEEDED FOR VEGETATION ESTABLISHMENT)
MULCH (BASIN INVERT ONLY)	NON-FLOATING HARDWOOD MULCH OR SEED PER PLANTING OPTION A OR OPTION B	NOT REQUIRED	NOT REQUIRED

NOTES:

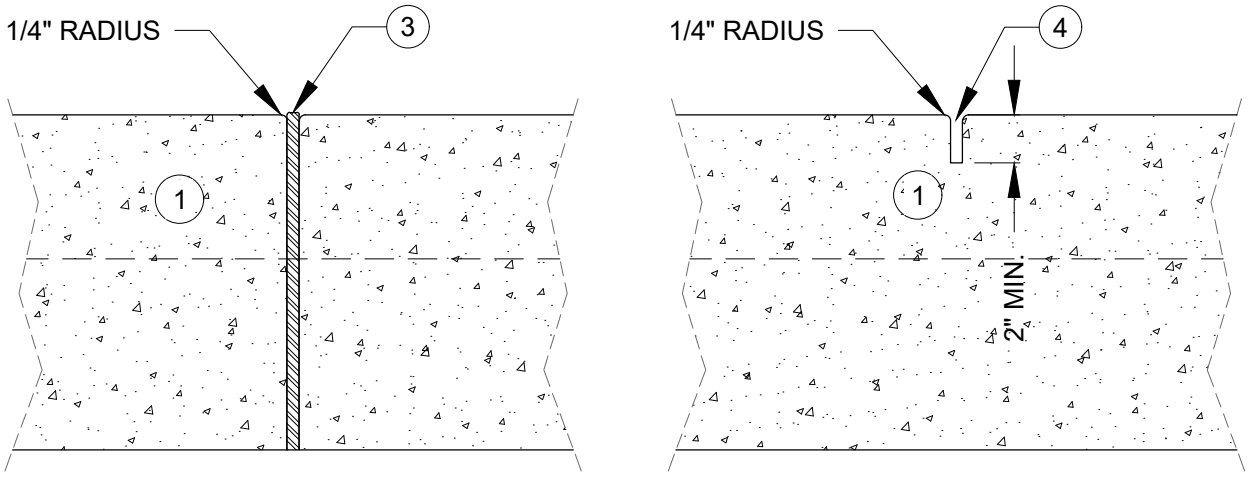
1. VEGETATION MUST MEET COVERAGE REQUIREMENTS PROVIDED ON THIS DETAIL IN THE BASIN CONSTRUCTION SPECIFICATIONS/FINAL INSPECTION DOCUMENT.
2. COMBINATION BASINS ARE AN LID BASIN (BIOINFILTRATION BASIN OR INFILTRATION BASIN) WITH A HYDROMODIFICATION CONTROL FUNCTION. COMBINATION BASIN FEATURES SHOWN ON THIS TABLE WILL BE BASED ON THE LID BASIN TYPE.

CITY OF VICTORVILLE - ENGINEERING DEPARTMENT			
REV. DATE	BY	BASIN SLOPE AND VEGETATION REQUIREMENTS	**SW-008**
04/10/24			
		FREDY A. BONILLA, CITY ENGINEER _____	SHEET 3 OF 3

Appendix B

Landscape Standards

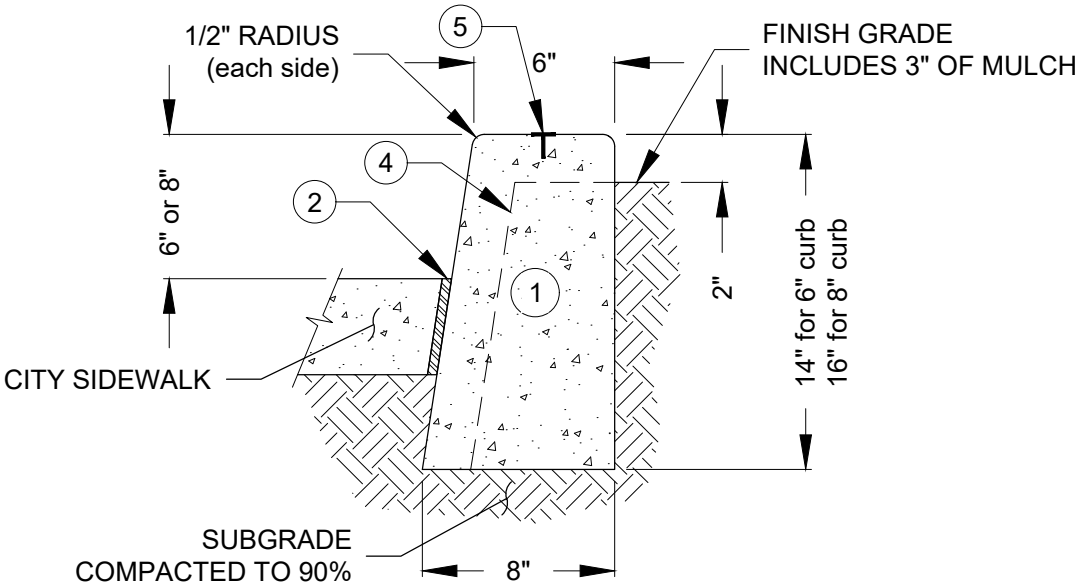
HARDSCAPE STANDARD DETAILS



EXPANSION JOINT

CURB FACE VIEW

WEEKENED PLANE JOINT



CROSS SECTION VIEW

(1) Planter curb constructed of cement concrete containing not less than 550 lbs. of type II portland cement per cubic yard, not less than 4% air entrainment, and 1" max. aggregate grading (min. 2800 psi @ 28 days). Medium broom finish on all exposed surfaces. Concrete to be cured with white pimented curing compound.

(2) Expansion joint with 3/16" fiber material where curb abuts any concrete improvement.

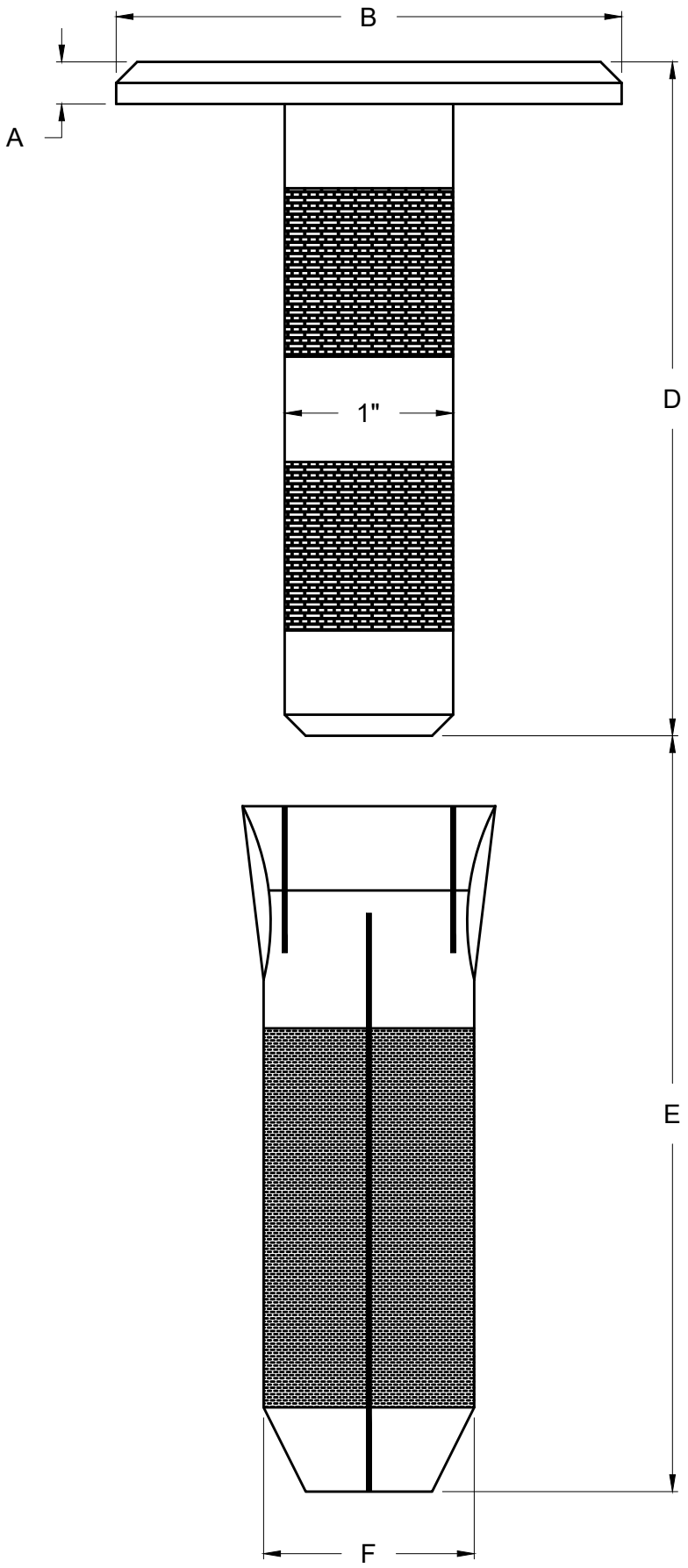
(3) Weekened plane loints 2" deep at 10' intervals

(4) 1/2" wide expansion joint filled with plastic type filler at 60' intervals

(5) Location of utility marker per detail H-02

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	"A" CURB DETAIL	H-01
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1

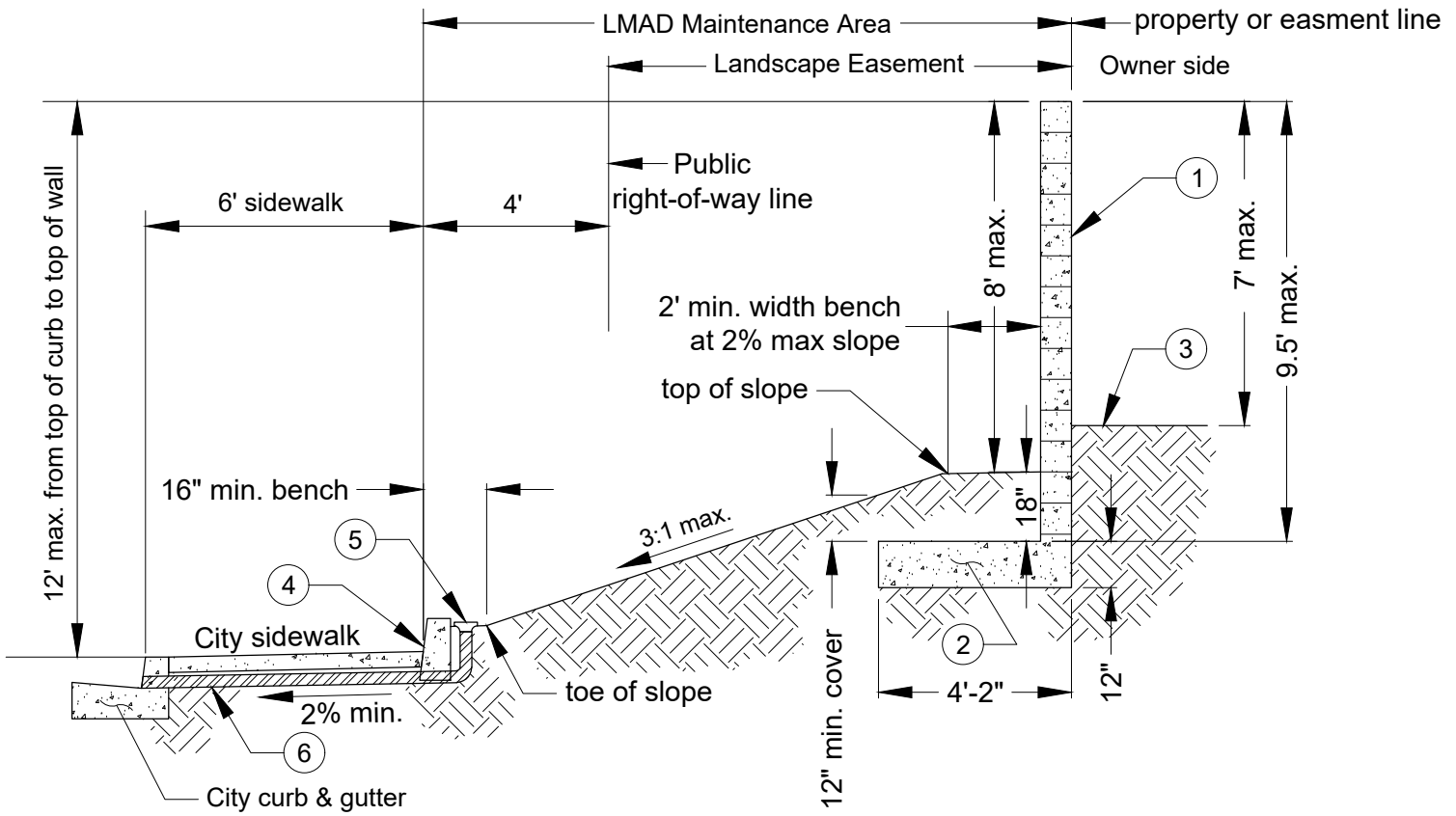


A = 1/8" (3 mm)
B = 1 5/32" (30 mm)
C = 21/64" (8 mm)
D = 1 11/16" (43 mm)
E = 1 7/16" (37 mm)
F = 29/64" (12 mm)

NOTE: The location of the utility marker is to be as shown on standard H-01 and/or as directed by the City Engineer.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	BP UTILITY MARKER WITH ANCHORING PLUG	H-02
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1



Note: All wall surface below ground shall be coated with waterproofing sealant - meet or exceed A.S.T.M. D449 type I

1. 8" split face block wall per LMAD Detail H-04. All cells grout filled. Min. 6' high from finish grade of the higher side (owner or easement); Max. 8' high on street side; Max. 7' on property owner side.
2. Footing per LMAD Standard Wall Detail H-04.
3. Finish surface per precise grading plans.
4. 6" curb per city standard drawing No. H-01 and S- 09
5. Drain grate located within slope bench area, top of grate set 1" below top of curb or wall, (unless otherwise directed by City inspector). Finish grade to be 2" below curb (Finish grade inlcudes 3" of mulch).
6. 3" Ø - sch. 40 PVC rigid drain at 2% grade min. every 100'- 150' max. (though curb as required)

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

LMAD AREA SLOPE & WALL LAYOUT

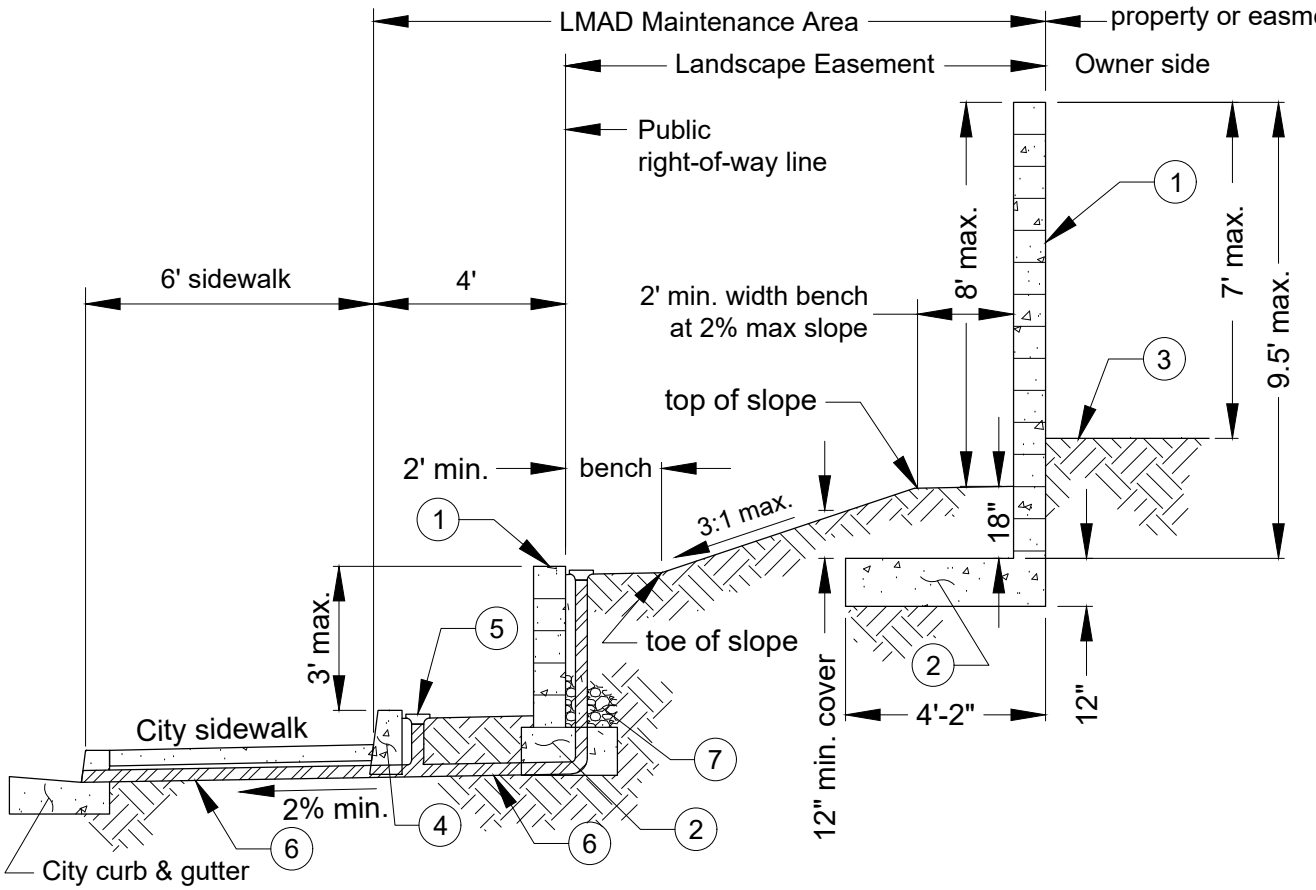
H-03

SHEET 1 0F 1

7/24/2024

NOT TO SCALE

APPROVED BY: FREDY A. BONILLA, CITY ENGINEER



Note: All wall surface below ground shall be coated with waterproofing sealant - meet or exceed A.S.T.M. D449 type I

1. 8" split face block wall per LMAD Detail H-04. All cells grout filled. Min. 6' high from finish grade of the higher side (owner or easement); Max. 8' high on street side; Max. 7' on property owner side.
2. Footing per LMAD Standard Wall Detail H-04.
3. Finish surface per precise grading plans.
4. 6" curb per city standard drawing No. H-01 and S- 09
5. Drain grate located within slope bench area, top of grate set 1" below top of curb or wall, (unless otherwise directed by City inspector). Finish grade to be 2" below curb (Finish grade inlcudes 3" of mulch).
6. 3" Ø - sch. 40 PVC rigid drain at 2% grade min. every 100'- 150' max. (though curb and footing as required)
7. Open head joints or 2" weep holes, with 1 cu. ft. pea gravel behind wall at 20' intervals on center.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

LMAD AREA SLOPE & WALL LAYOUT (VARIANCE)

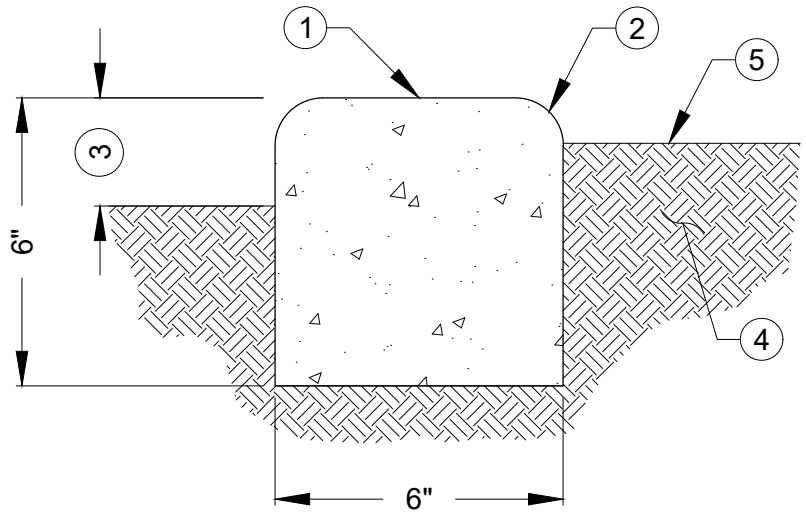
APPROVED BY: FREDY A. BONILLA, CITY ENGINEER

7/24/2024

NOT TO SCALE

H-04

SHEET 1 0F 1



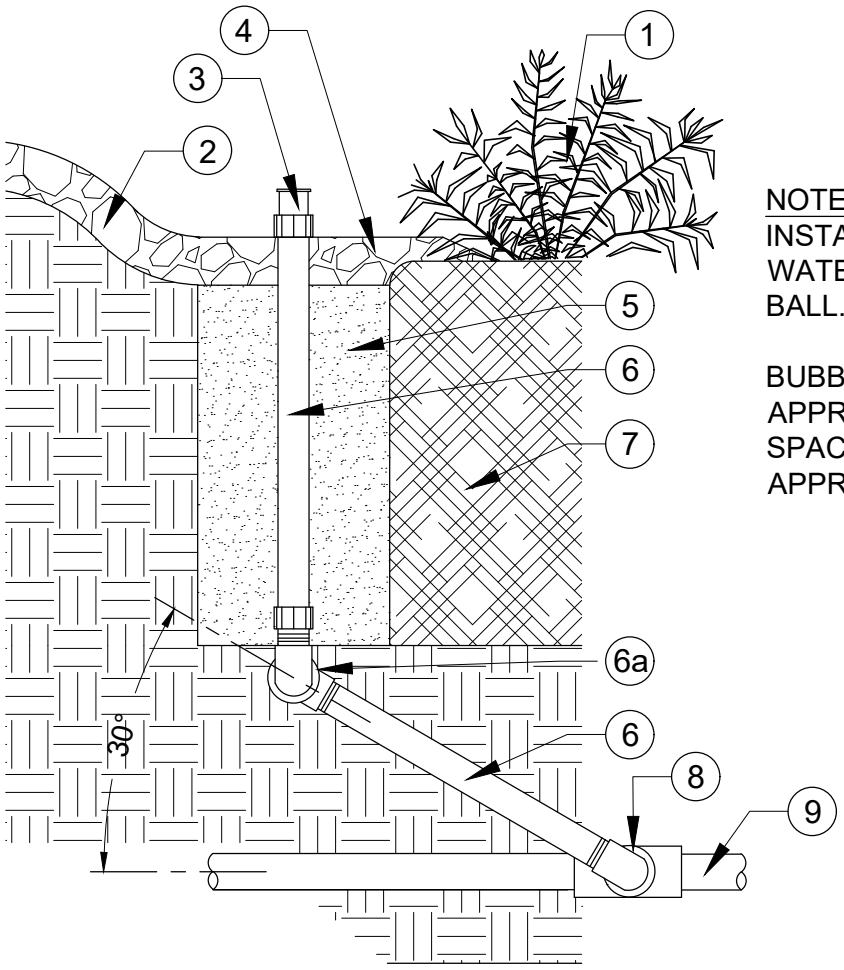
1. Concrete mow edge with light broom finish - provide expansion joints @ 20' intervals max.
2. $\frac{1}{2}$" radius (typical)
3. 3" @ lawn area 3" @ ground cover
4. 95% min. compacted subgrade - under mow strip only
5. Finish grade includes 3" of mulch

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/10/2024	MOW EDGE	H-06
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1

IRRIGATION STANDARD DETAILS



NOTE:
INSTALL BUBBLER INSIDE OF PLANT WATERING BASING ADJACENT TO ROOT BALL.

BUBBLER SPACING SHALL MATCH APPROVED SHRUB OR GROUNDCOVER SPACING. ANY VARIATION MUST BE APPROVED BY CITY STAFF.

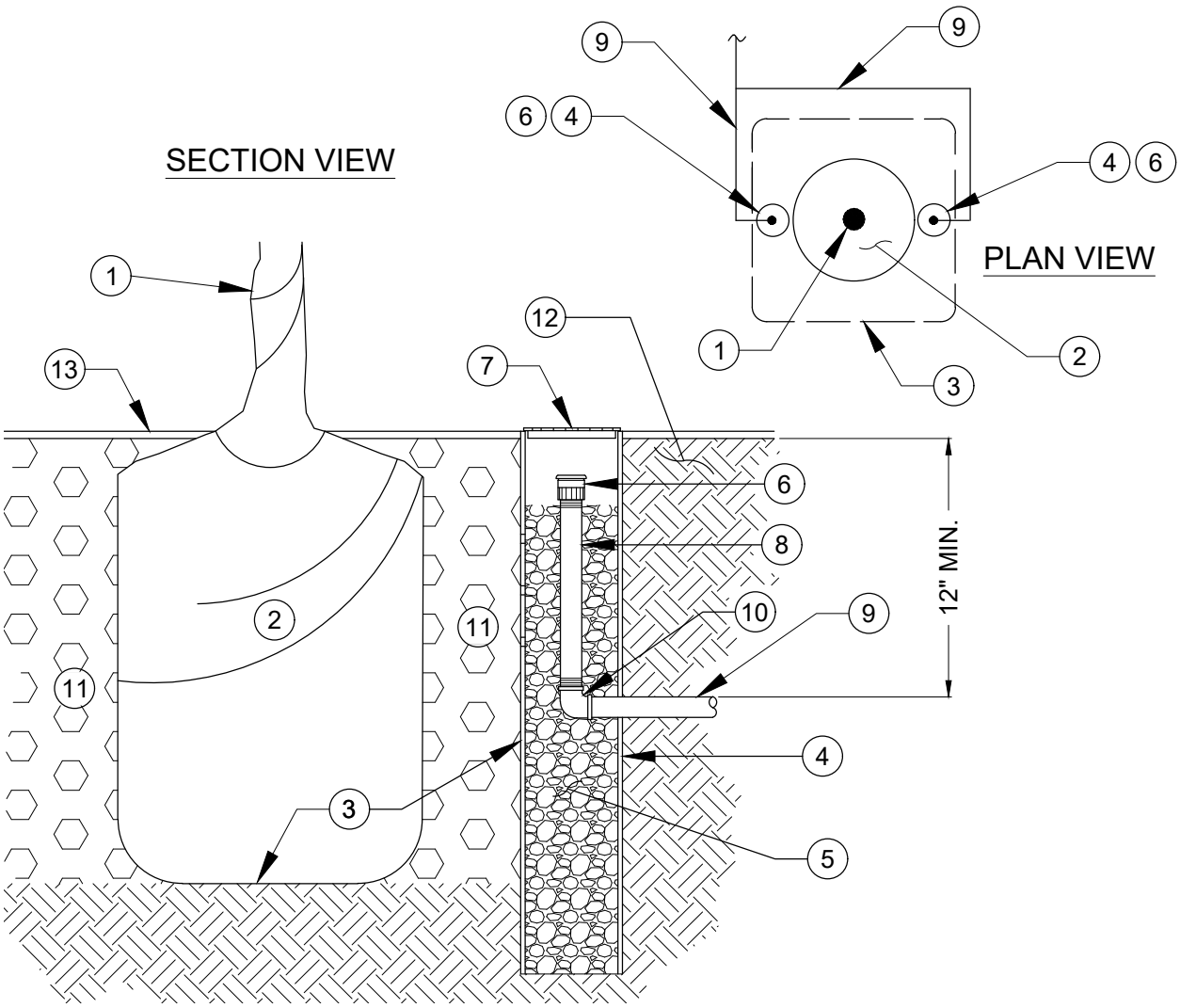
1. SHRUB OR GROUND COVER. REFER TO PLANTING PLAN.
2. PLANT WATERING BASIN
3. BUBBLER WITH ADAPTER AND SCREEN, SEE SPECIFICATIONS. ONE (1) PER PLANT.
4. MULCH PER PLANTING DETAILS
5. AMENDED BACKFILL
6. 1/2" X 12" LONG SCHEDULE 80 PVC NIPPLE.

6a. (1) SCH 40 STREET ELL AND (1) SCH 40 THREADED ELL. ($\frac{1}{2}$" SIZE)

7. PLANT ROOT BALL
8. SCH 40 S x S x T TEE OR ELBOW (LATERAL SIZE x 1/2" FIPT AND (1) SCH 40 STREET ELL. ($\frac{1}{2}$" SIZE)
9. PVC LATERAL LINE.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	BUBBLER & SWING JOINT ASSEMBLY DETAIL	I-01
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 OF 1

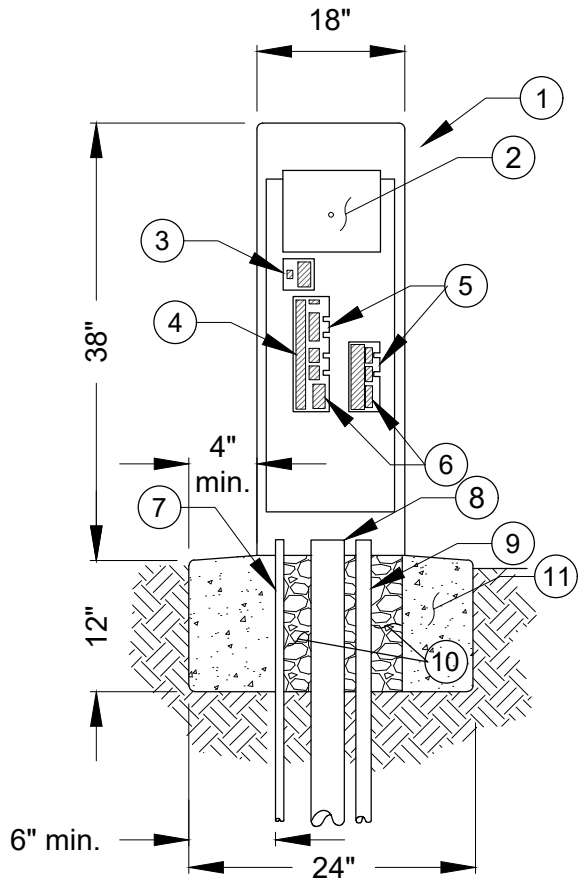


1. Tree trunk.
2. Root ball.
3. Edge of plant pit.
4. Root watering system kit RWS-B-C-1401. (2) per tree.
5. ¾" to 1" ~ pea gravel.
6. Bubble nozzle - included with kit.
7. 4" ~ pvc cap included with kit.
8. PVC sch 80 nipple included with kit.
9. PVC sch 40 lateral.
10. Swing joint included with kit.
11. Back fill mix.
12. Native soil.
13. Finish grade includes 3" of mulch.

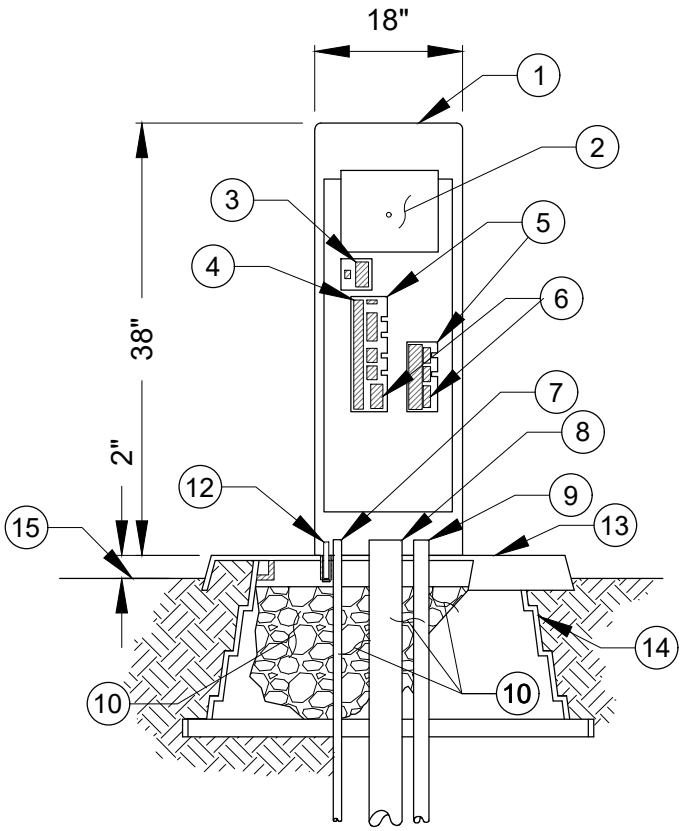
Notes:
1. Position RWS kits adjacent to tree rootball per plan view.
2. See tree planting detail for additional requirements.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	TREE BUBBLER DETAIL	I-02
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1



Imperial Assembly with concrete base



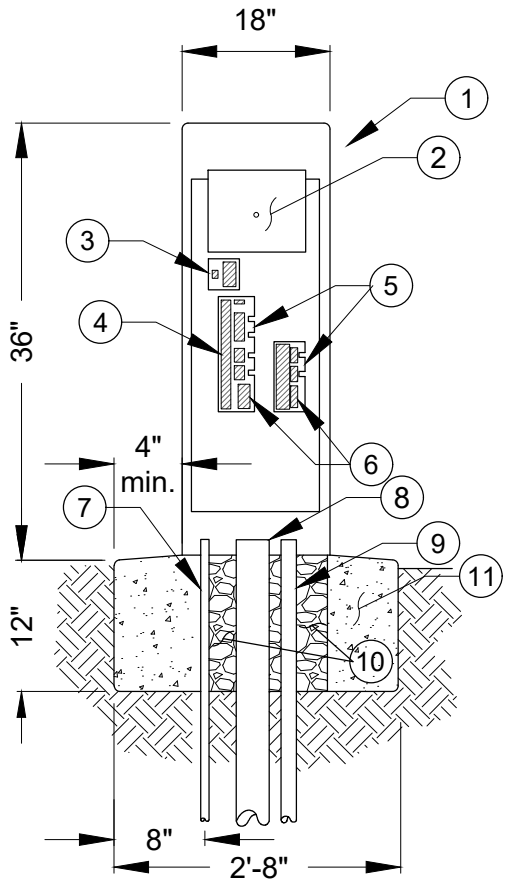
Imperial Assembly with quick pad

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

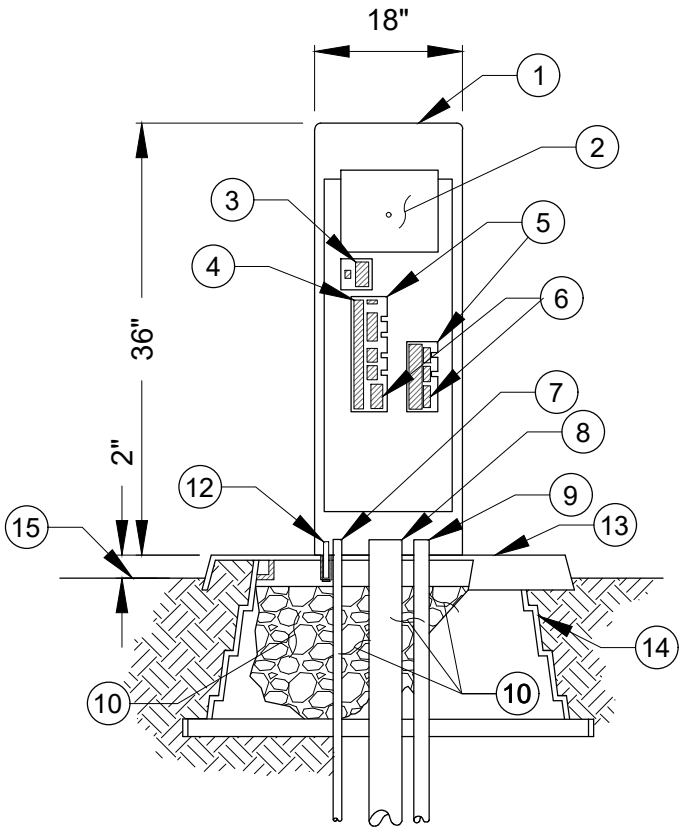
1. Imperial Assemblies 18" front entry Controller Assembly NEMA 3R rain proof enclosure (UL listed)
2. Controller
3. Power switch/GFI receptacle
4. Master valve relay assembly or pump start relay assembly (optional)
5. Terminal board
6. Remote receiver connector
7. 1" PVC conduit for 120 VAC from metered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

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	18"x18" CONTROLLER ASSEMBLY (ICA6 SERIES)	I-03
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1



Imperial Assembly with concrete base



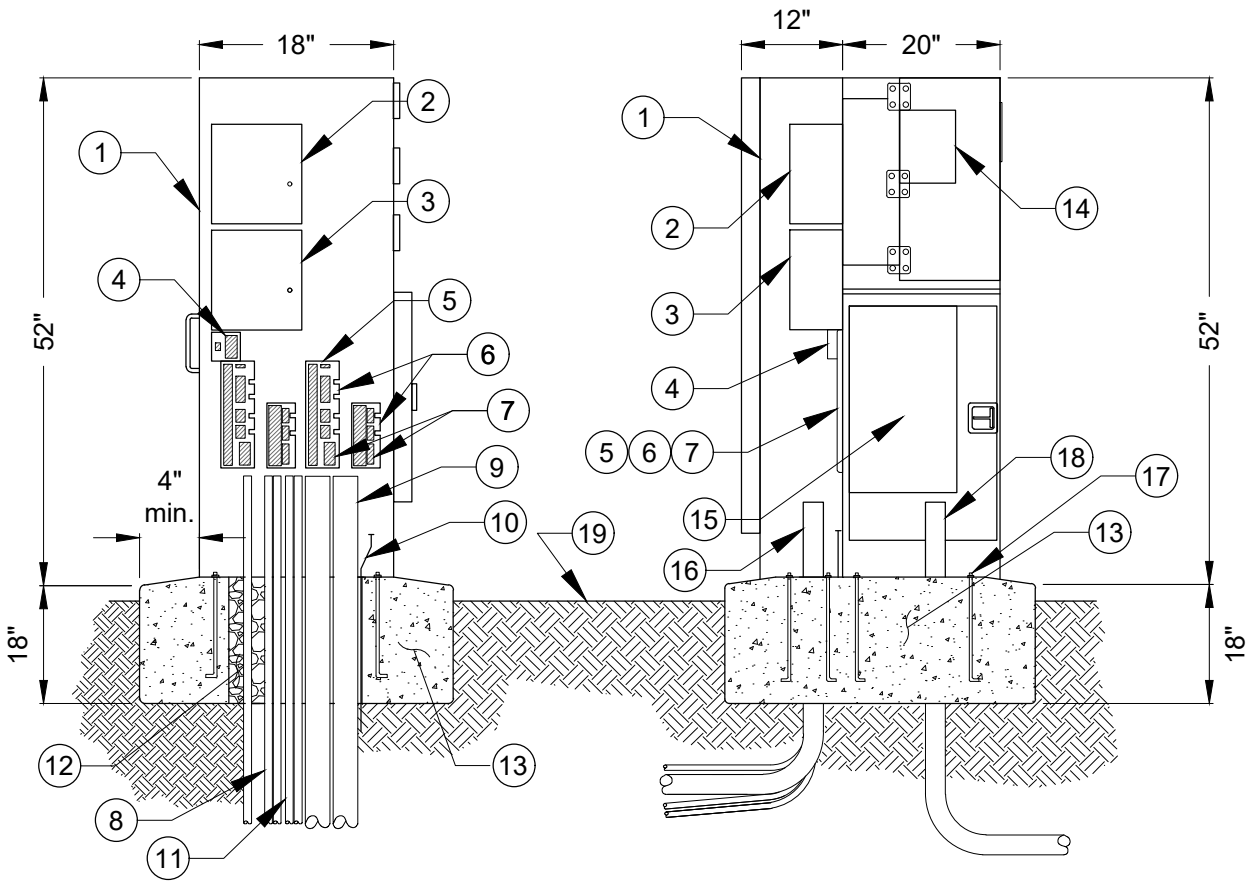
Imperial Assembly with quick pad

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

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. RMPM Remote receiver connector
7. 1" PVC conduit for 120 vac from metered power supply
8. PVC conduit for control wires, size as required.
9. 1" pvc conduit for flow sensor cable Paige cable P-7162-D(if applicable)
10. Fill voids with $\frac{3}{8}$" pea gravel
11. Poured concrete base
12. Mounting pad aluminum power coated performed pad 20"x30"
13. Mounting pad base
14. Mounting pad mounting base
15. Finish grade 2" below top of mounting pad

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	18"x24" CONTROLLER ASSEMBLY (ICA2 SERIES)	I-04
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1



Imperial Assembly with concrete base

Imperial Assembly with quick pad

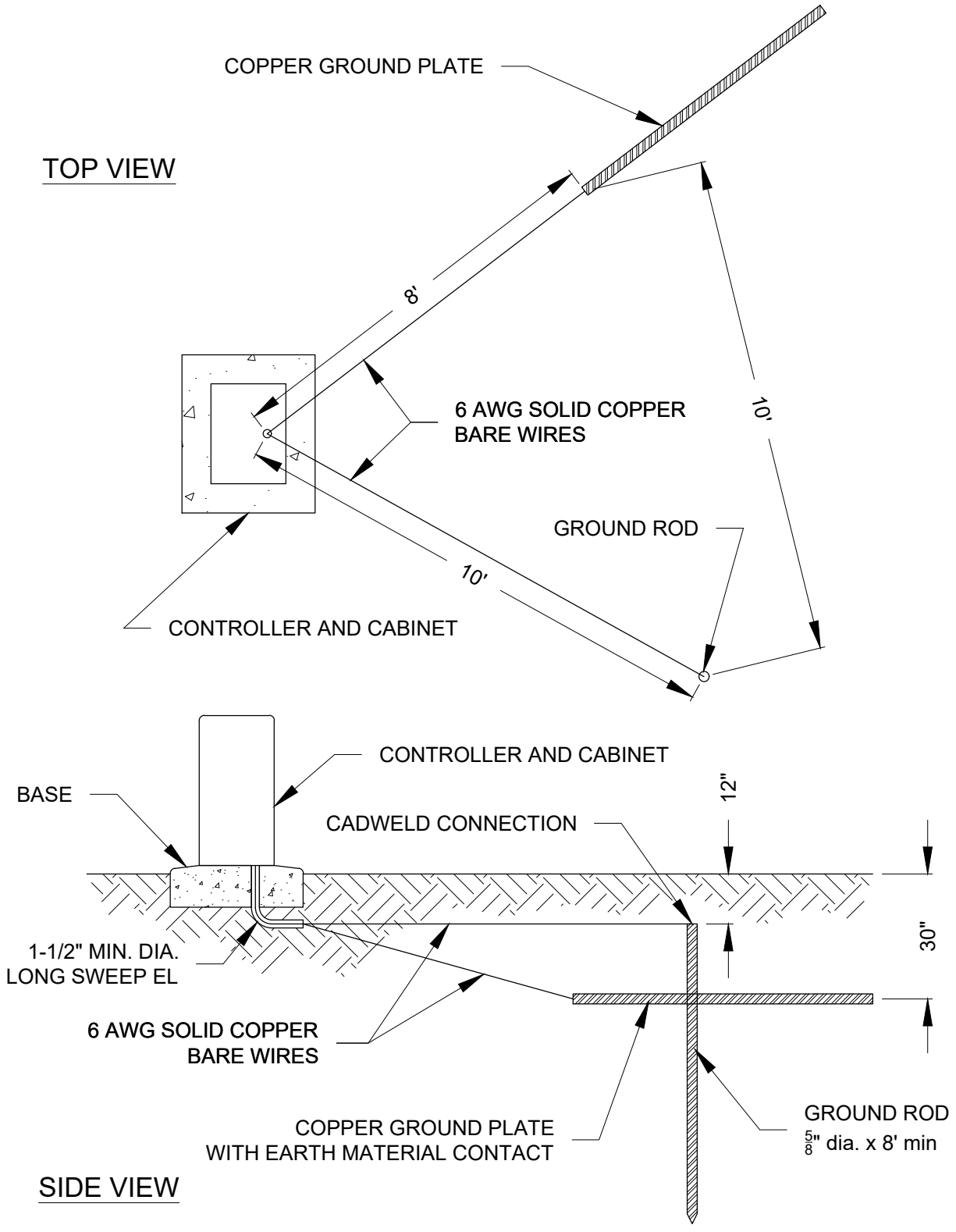
Note: All grounding requirements for controller assemblies shall conform to local electrical codes.

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
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 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, amp size 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 3/8" stainless steel anchor bolts in concrete
18. PVC conduit and electrical power source
19. Finish grade

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

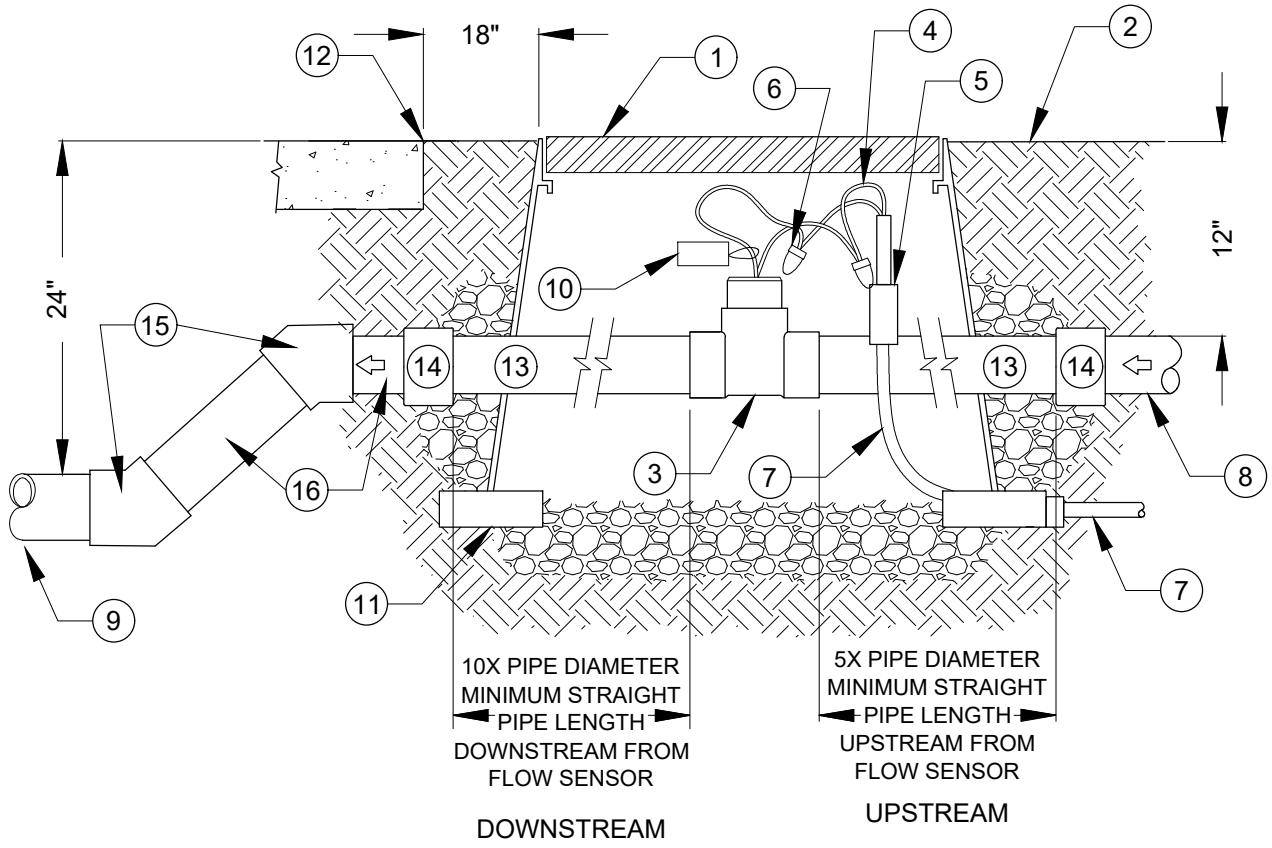
4/9/2024	18"x32" METERED CONTROLLER (ICA5 SERIES)	I-05
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1



CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/9/2024	CONTROLLER GROUNDING DETAIL	I-06
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1

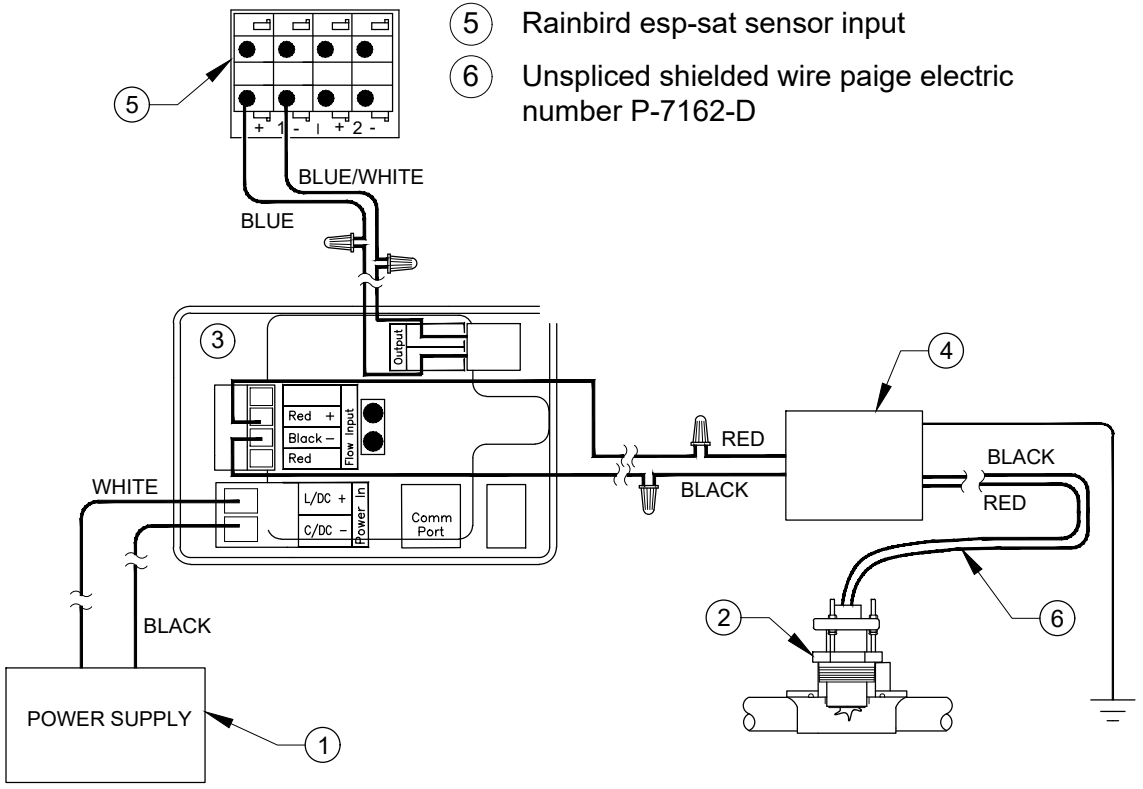


1. Rectangular plastic valve box. Hot brand lid "FS"
2. Finish grade includes 3" of mulch
3. Flow sensor
4. Flow sensor cable P-7162D. Leave 36" length within valve box.
5. Conduit bushing
6. Waterproof dry splice connector 3M DBY
7. 1" electrical conduit and sweep elbow
8. Irrigation mainline from master 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
13. Sch. 80 PVC pipe for slip flow sensor, sch. 80 PVC nipple for threaded flow sensor
14. Sch. 80 PVC pipe coupling (S x T) for threaded sensor, (S x S) for slip sensor
15. (2) Sch. 80 PVC coupling (45 degree) to adjust main line depth as req'd.
16. PVC mainline pipe- solvent weld

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	FLOW SENSOR DETAIL	I-07
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1

1. Power supply (Rainbird #PTPWRSUPP)
2. Flow sensor (Rainbird "FS series
3. Surge protection kit (Rainbird "FSSURKIT")
4. Green wire to ground
5. Rainbird esp-sat sensor input
6. Unspliced shielded wire paige electric number P-7162-D



CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

FLOW SENSOR WIRING DETAIL

I-08

SHEET 1 0F 1

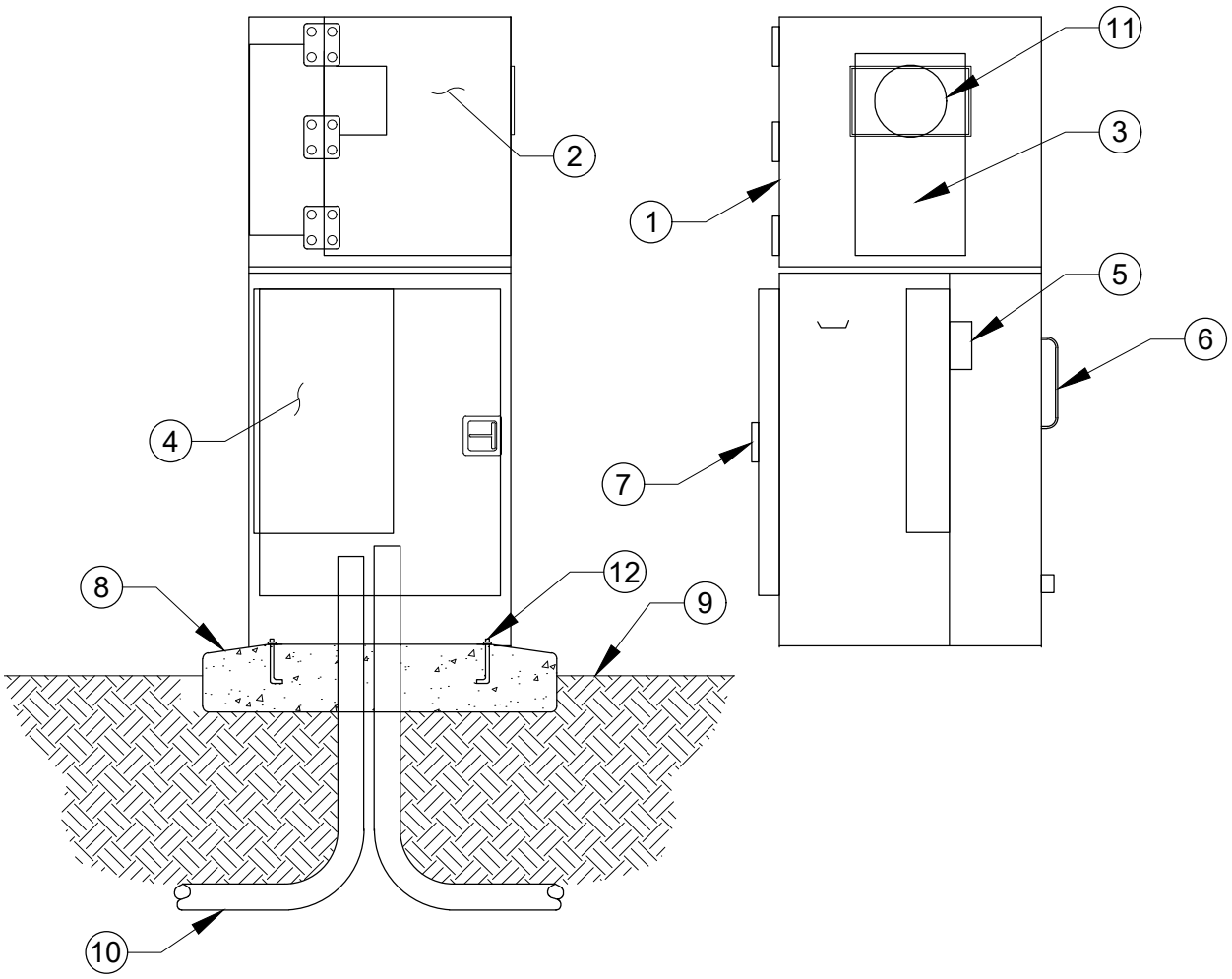
7/24/2024

NOT TO SCALE

APPROVED BY: FREDY A. BONILLA, CITY ENGINEER

SIDE VIEW

FRONT VIEW



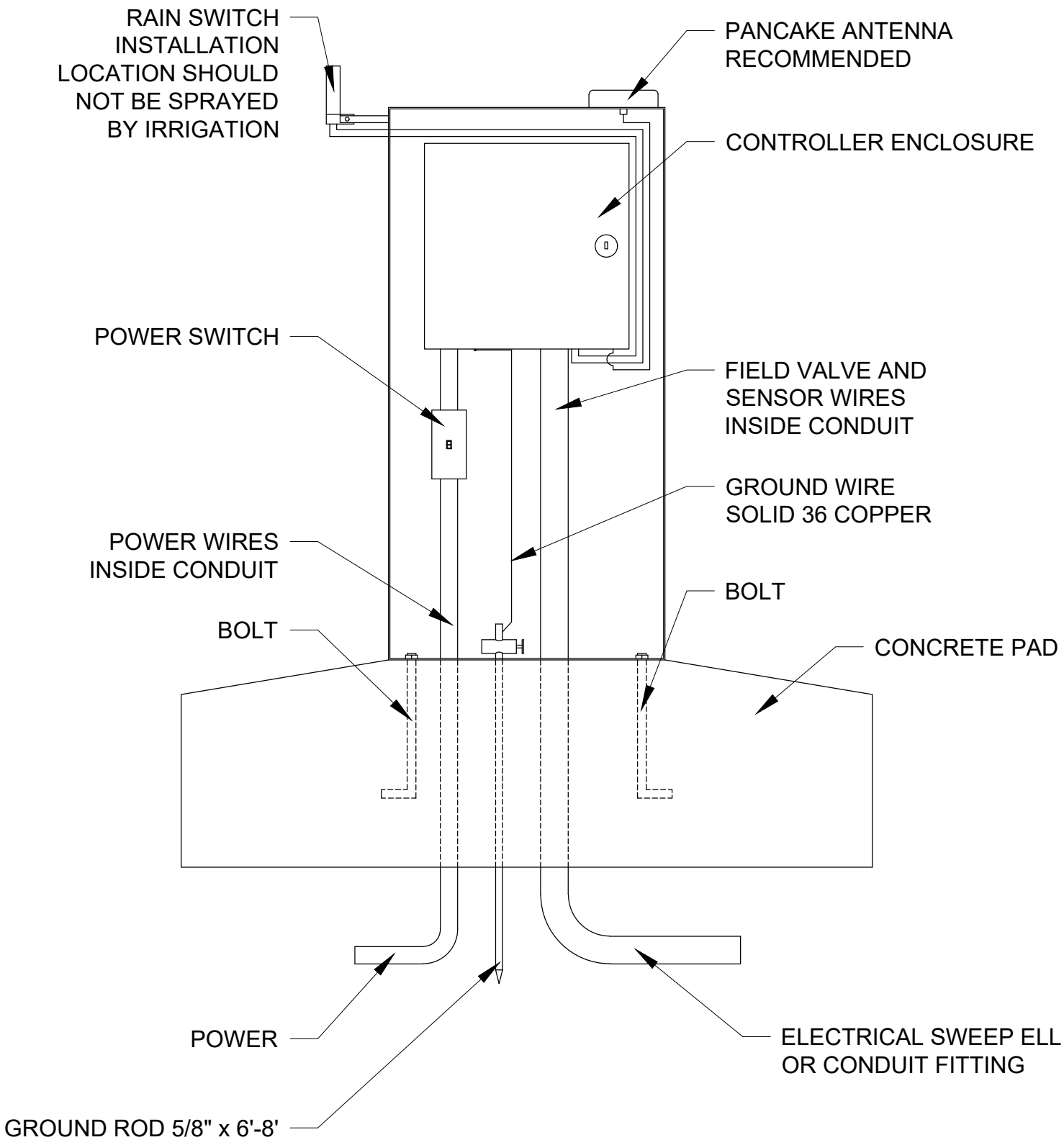
INSTALLATION DETAILS: MODELS MPS-A 16, MPS-B 16, MPS-D 18 100 AMP

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 1/2% slope for drainage
9. Finish grade includes 3" of mulch
10. Underground service
11. Meter viewing window 5" x 10"
12. 3/8" stainless anchor bolts

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

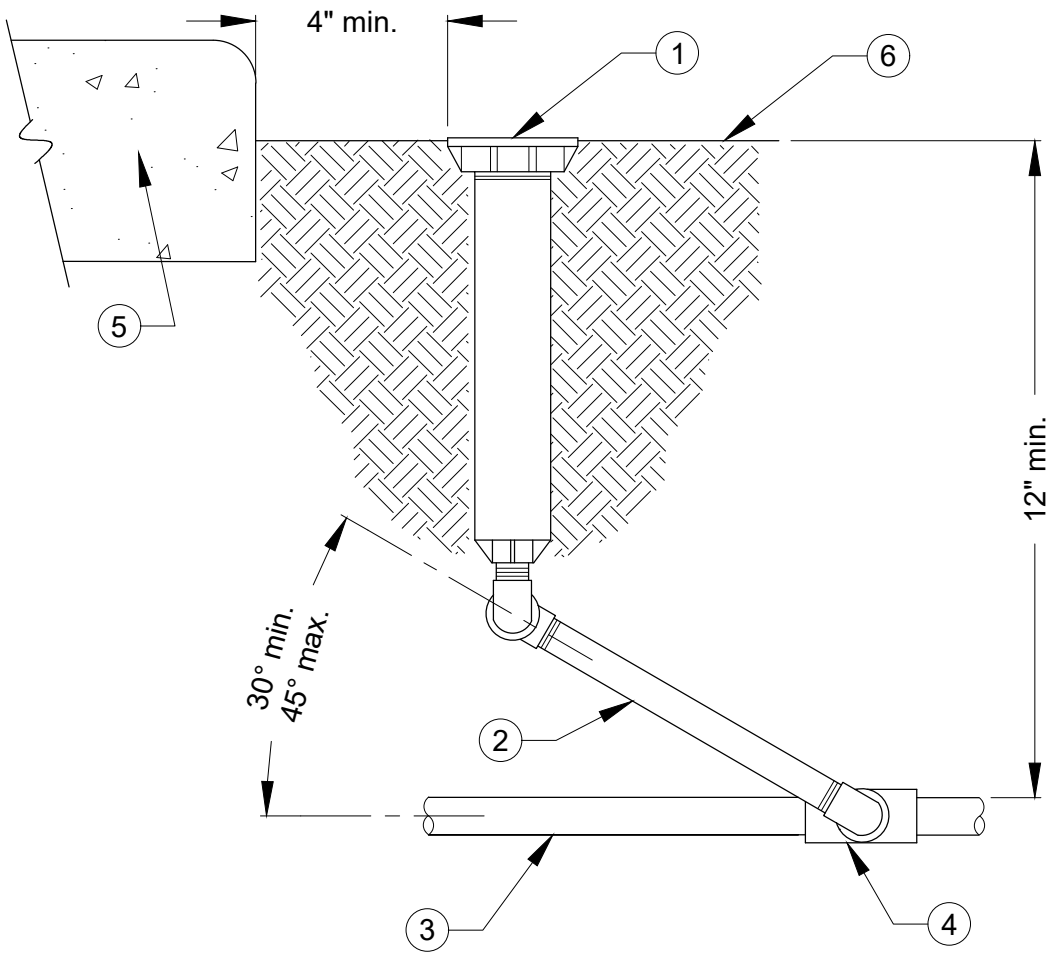
4/9/2024	STAINLESS STEEL METER PEDESTAL DETAIL	I-09
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1



CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/9/2024	CONTROLLER ENCLOSURE INSTALLATION DETAIL	I-10
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1

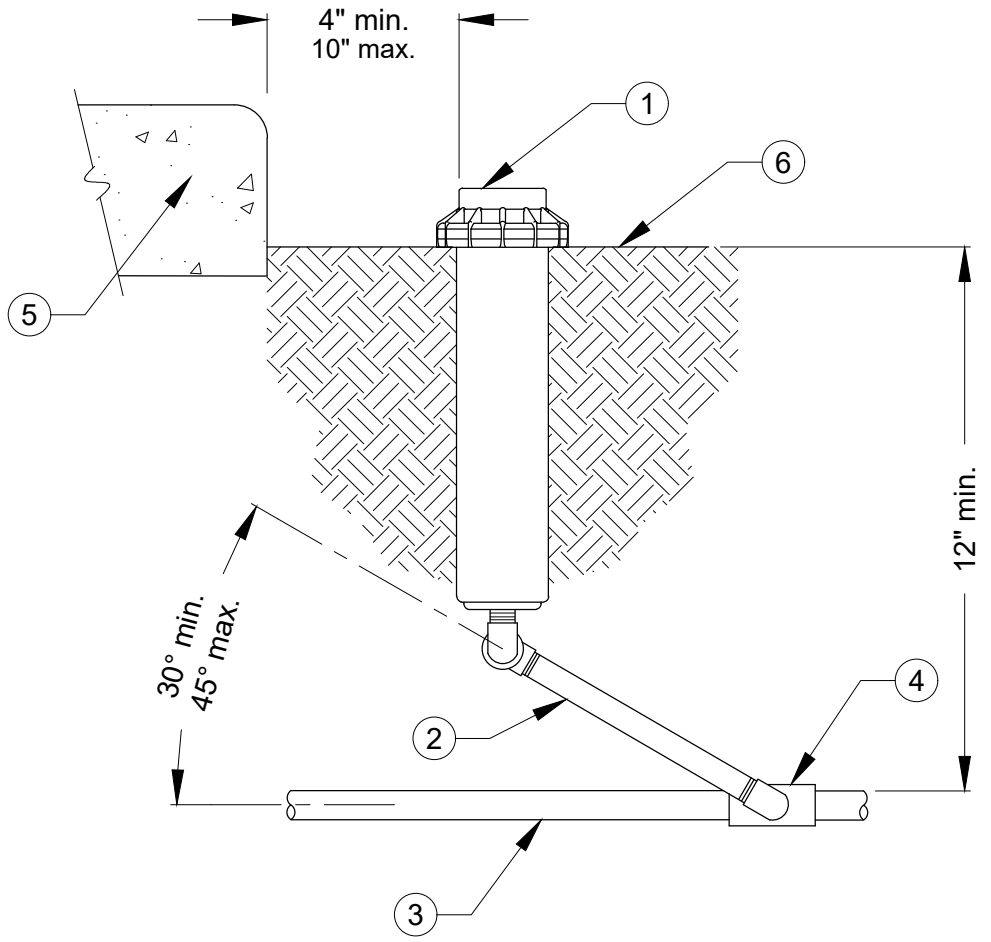


1. Pop up head
2. Fabricate with:
   (3) sch 40 street ell
   (1) SCH 80 12" nipple (or length as required)
3. Lateral line
4. S x S x T tee or S x T ell (pvc sch. 40)
5. Curb, walk, paving, other improvement,
6. Finish grade (includes 3" of mulch)

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.
5. Set sprinkler height 1.5" above finish grade within shrub and ground cover areas.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	POP-UP SPRAY SPRINKLER DETAIL	I-11
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1

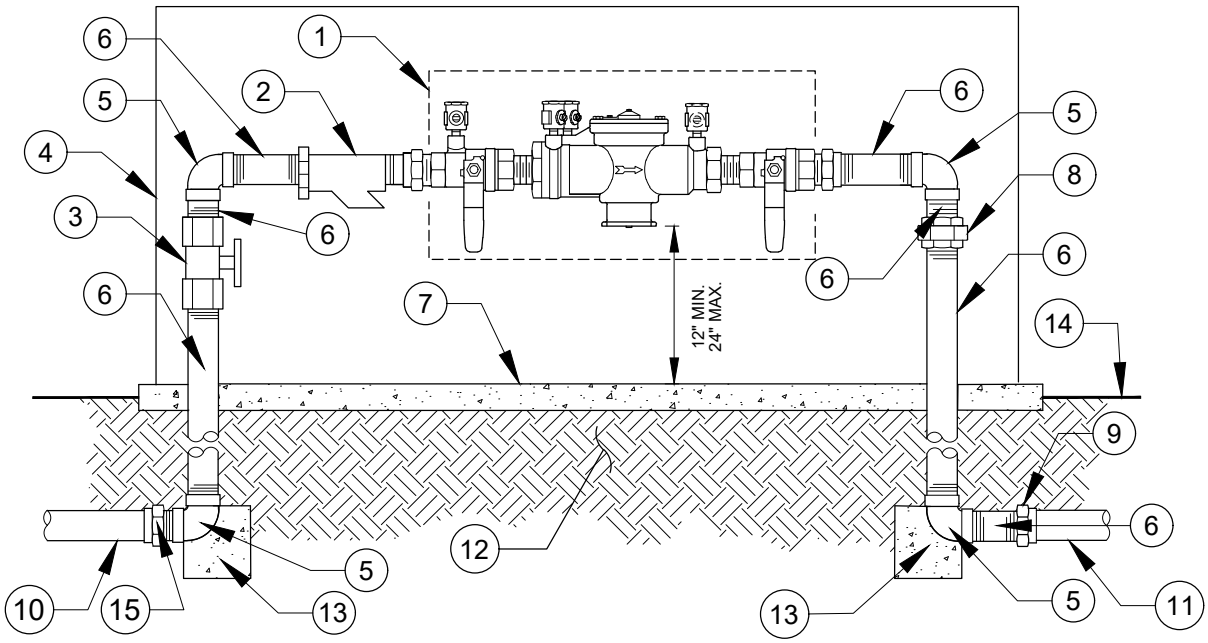


1. Pop up rotor head
2. Fabricate with:
   (3) sch 40 street ell
   (1) sch 80 12" nipple (or length as required)
3. Lateral line
4. S x S x T tee or ell (pvc sch 40)
5. Walk, curb, paving or other improvement
6. Finish grade (includes 3" of mulch)

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 1.5" above grade in newly planted shrub or ground cover areas. Install flush with 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.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	POP-UP ROTOR DETAIL (SMALL RADIUS)	I-12
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1



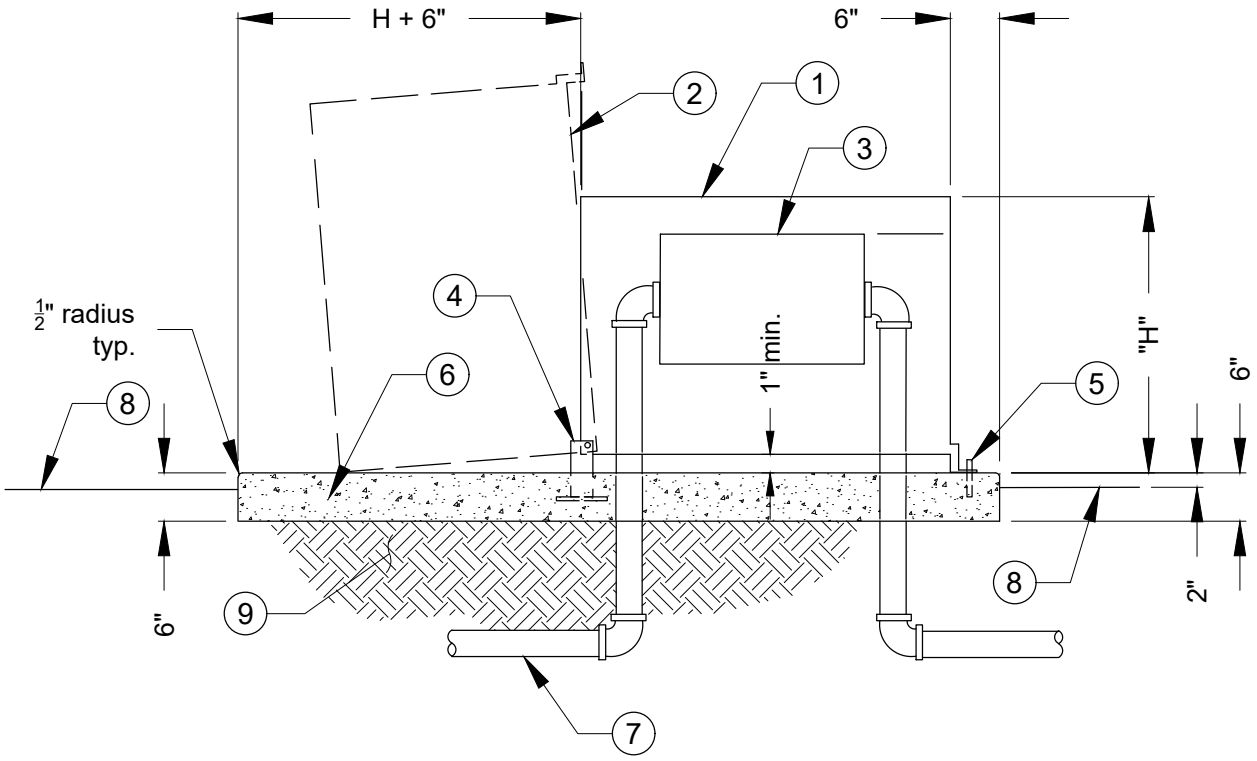
1. Reduced pressure backflow preventer per Engineering Dept. Standard W-39. (825Y shown in detail above).
2. Wye strainer with 150 mesh screen (wilkens # YSBR or equal) Required on all reduced pressures 2" or smaller
3. Brass Ball valve for system shut off
4. Enclosure by "Strongbox" or equal
5. Threaded brass ell (typical) Qty 4
6. Threaded brass pipe (typical)
7. Concrete pad (2800 psi @ 28 days)
8. Brass union
9. PVC sch 80 male adapter
10. Water service line to point of connection
11. PVC mainline (see irrigation legend for size and type) to irrigation system.
12. 90% compacted sub-grade
13. Concrete thrust block (one c.f. min) (typical) formed in undisturbed soil
14. Finish grade includes 3" of mulch
15. Brass fitting, adapt to service line as required

Notes:

1. RPBP shall be FEBCO model no: Wilkins XLB375 for $\frac{3}{4}$" -2" or for 2-$\frac{1}{2}$" or larger (install pipe supports per manufacturer's recommendations).
2. Freeze protection: All brass installed underground or in direct contact with concrete shall be covered with polar blanket or equivalent.
3. RPBP, fittings, strainer, regulator, ball valve, and piping shall match size of meter.
4. Bottom of RPBP to be 12" minimum and 24" maximum above finish grade.
5. No connections of any kind is allowed between meter and backflow assembly.
6. A pressure regulator is to be installed downstream from RPBP when pressure is greater than or equal to 100 psi

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	2" & SMALLER REDUCED PRESSURE BACKFLOW PREVENTER DETAIL	I-13
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1

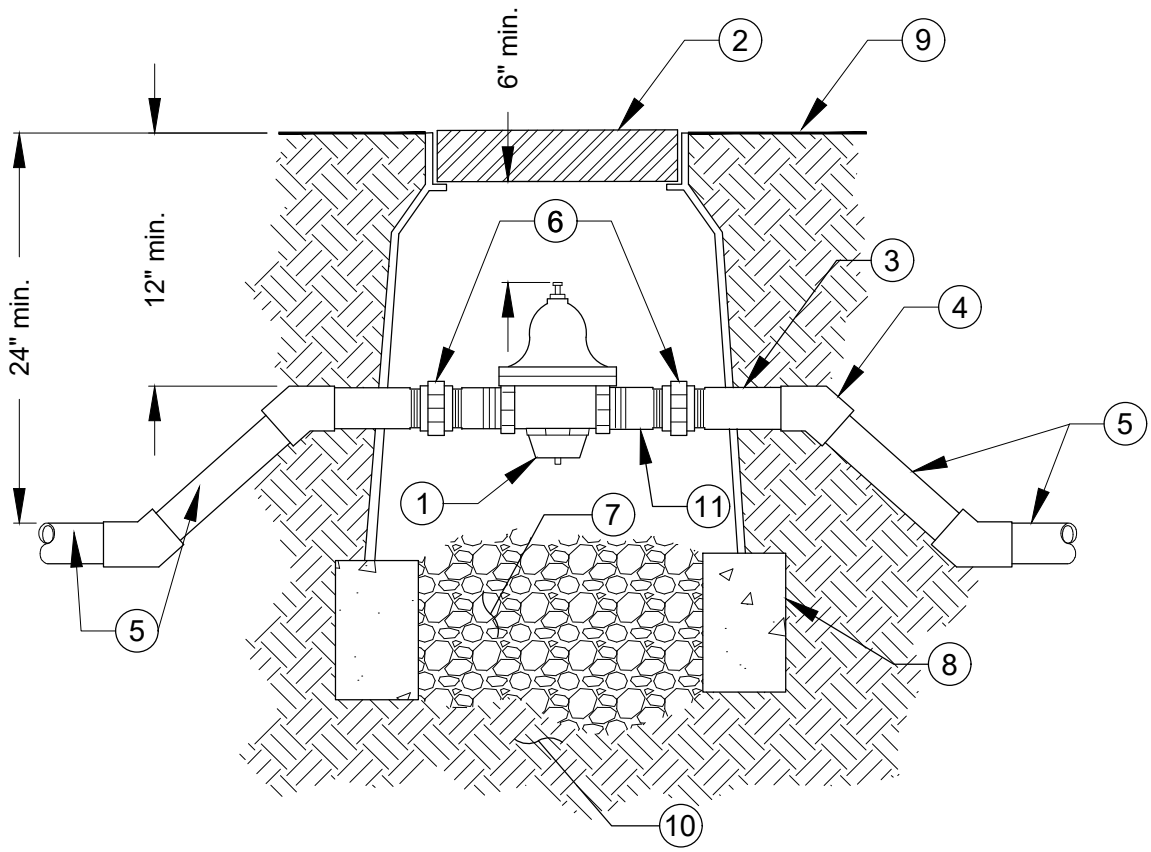


1. Backflow enclosure (closed position), color: solid 'stainless steel', center enclosure over backflow preventer, maintain 1" min. space @ base for drainage
2. Backflow enclosure (open position)
3. Backflow preventer (see detail)
4. Enclosure foot, anchor in concrete
5. U-bolt (stainless steel), anchor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

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/9/2024	BACKFLOW PREVENTER ENCLOSURE DETAIL	I-14
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1



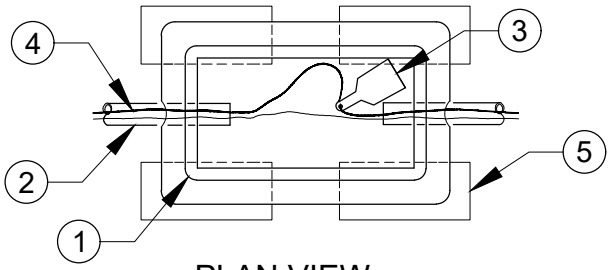
1. Threaded brass pressure reducing valve up to 3" size
2. Rectangular valve box with bolt down cover. Hot brand lid "P R"
3. (2) PVC sch 80 nipple- threaded on one end. Length as req'd to extend beyond box
4. (4) PVC sch 80 coupling (45 degree)(typ.) to adjust mainline depth as req'd.
5. PVC mainline pipe (sch 40)
6. (2) PVC sch 80 union
7. $\frac{3}{4}$" crushed rock or gravel (2 c.f. min.)
8. Common brick (four min. per box)
9. Finish grade includes 3" of mulch
10. 90% compacted subgrade (under box only)
11. 2" long Sch. 80 threaded nipple - two (2)

Notes:

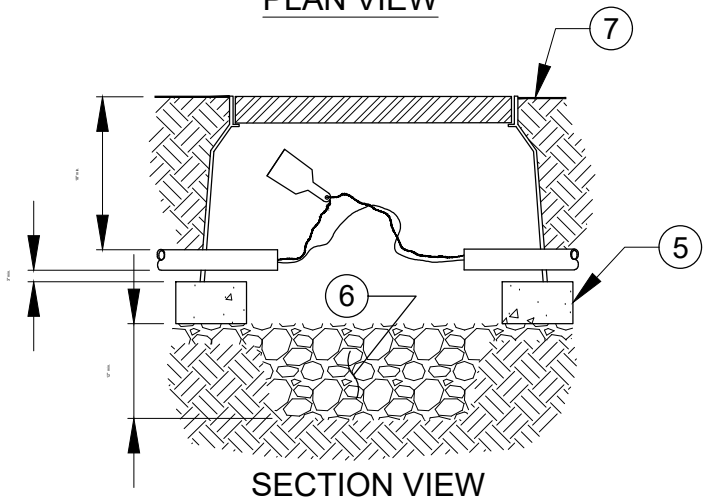
1. Provide thrust block at all 45 degree and 90 degree ells. Wrap pipe with 10 mil polyethylene tape when in direct contact with concrete.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	PRESSURE REGULATOR DETAIL	I-15
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1



PLAN VIEW

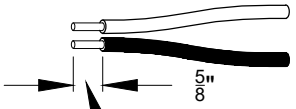


SECTION VIEW

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 ($\frac{1}{4}$"Ø polypropylene); provide 12" slack (typical)
5. Common brick @ corners of box
6. $\frac{3}{4}$"Ø gravel
7. Finish grade includes 3" of mulch

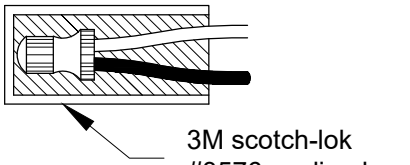
INSTALLATION STEPS:

1. Strip insulation $\frac{5}{8}$" from ends

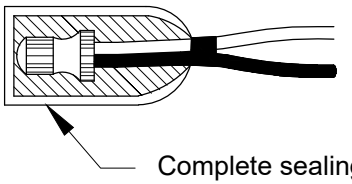


2. Twist wire nut until ends of wire reach bottom.

3. Mix contents of sealing bag per manufacturer. Cut $\frac{1}{2}$" off end of bag and insert wire nut to opposite end.



4. Wrap open end of selling 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 installation)

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

110 VOLT PULL BOX & CONNECTORS DETAIL

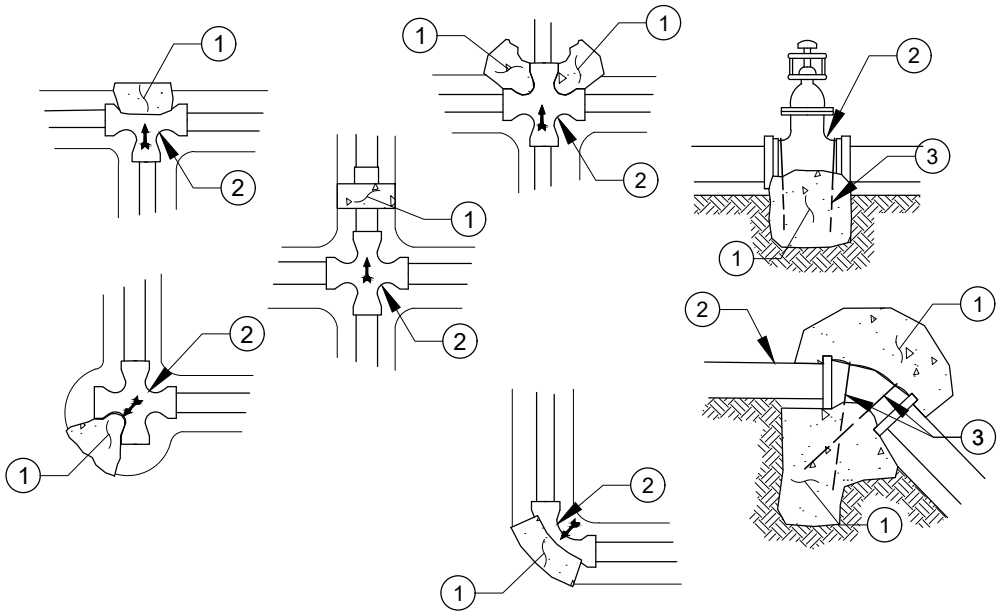
I-16

SHEET 1 OF 1

APPROVED BY: FREDY A. BONILLA, CITY ENGINEER

8/19/2024

NOT TO SCALE



(1) Concrete (typ. 2000psi @ 28 days)

(2) Pipe or fittings (typ.)

(3) #5 rebar w/ 2" min. cover (typ.)

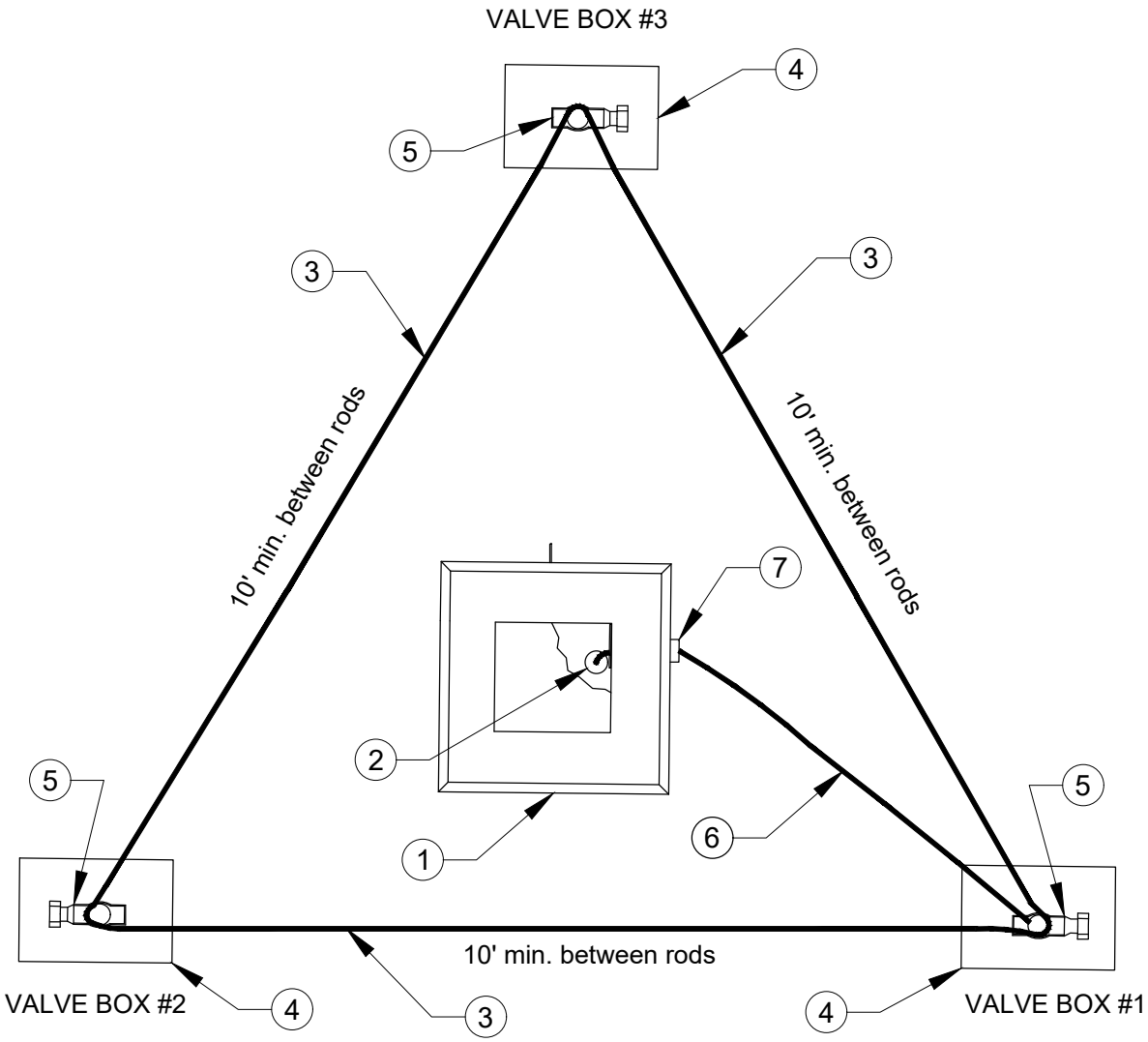
THRUST @ FITTINGS (in pounds @ 100 psi)					THRUST AT FITTINGS (in Pascals at 689 kPa)				
Pipe Size Inches	90° Bends	45° Bends	22-1/2° Bends	Dead Ends & Tees	Pipe Size (mm)	90° Bends	45° Bends	22-1/2° Bends	Dead Ends & Tees
1-1/2"	415	225	115	295	38.1	1848.8	1001.3	511.8	1312.8
2	645	350	180	455	50.8	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. AWWA 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 AWWA table 1008.1.4(b) for the safe bearing load of the soil and divide the total thrust by the safe bearing load.

NOTE:
Wrap pipe with 10 mil polyethylene tape when in direct contact with concrete.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	THRUST BLOCK CONFIGURATIONS DETAIL	I-17
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1

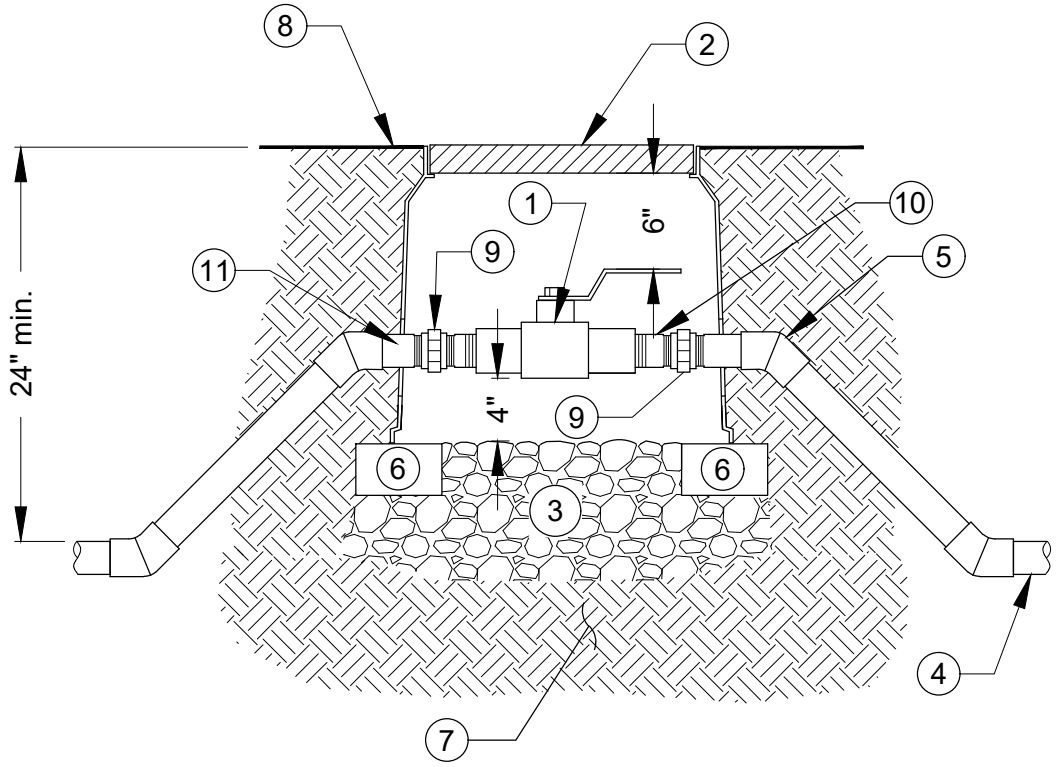


1. Satellite or WS-PRO
2. #10 bare copper wire from grounding terminal lug
3. #10 bare copper wire from valve box held in place with brass clamp (see detail for "grounding wires in grid')
4. Standard valve box with cover (1 of 3)
5. Grounding rod from GK-UL3ROD three rod kit
6. #10 bare copper wire fed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

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

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	TRIANGULAR GRID PLAN VIEW DETAIL	I-18
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1

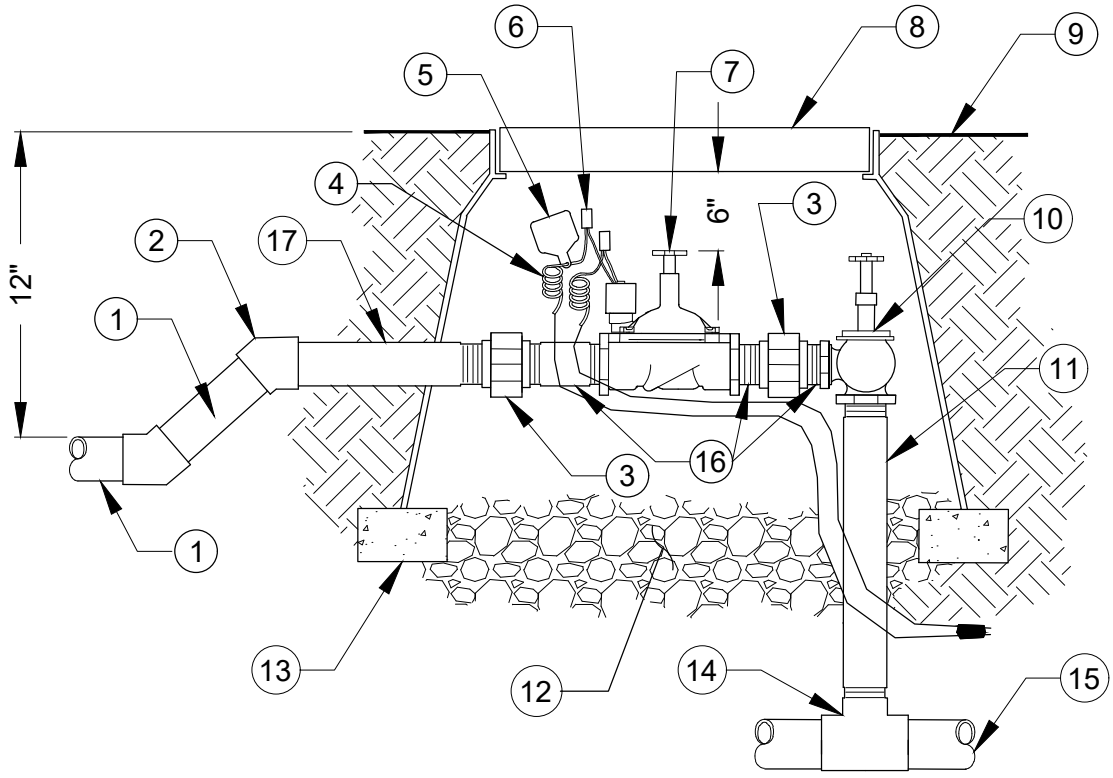


1. Threaded brass ball valve up to 3" (line-size)
2. Rectangular valve box with bolt down cover installed flush with finish grade. Hot brand mark lid "BV".
3. 3/4" pea gravel (two c.f. min.)
4. PVC mainline 3" or smaller
5. PVC sch 80 45° (typ. of 4) slip
6. Common brick (min. 4 per box), set on undisturbed soil.
7. 90% compacted sub grade (under box only)
8. Finish grade includes 3" of mulch
9. Sch. 80 union - two (2)
10. 2" long Sch. 80 threaded nipple - two (2)
11. (2) PVC Sch. 80 nipple - threaded on one end. Length as req'd to extend beyond box

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/9/2024	3" & SMALLER BRASS BALL VALVE DETAIL	I-19
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1



1. PVC sch 40 lateral pipe
2. PVC sch 80 coupling (45°) slip - (2) total to angle pipe to lateral depth (typical)
3. Sch 80 union - (2) total
4. Extra wire coils - 6 to 8 wraps over 1" pipe. Install a total of 3 wires for every valve to have a spare wire.
5. Valve id tag
6. Waterproof connector (24v)
7. Remote control valve
8. Valve box with locking lid (rectangular). Install flush with grade, mark lid "RCV"
9. Finish grade includes 3" of mulch
10. Brass angle valve with ball valve
11. PVC sch 80 riser pipe length varies
12. $\frac{3}{4}$"Ø pea gravel (2 c.f min.)
13. Common brick (typical @ corners)
14. Sch. 80 Tee (S X S X T) or Ell (S X T)
15. PVC mainline pipe
16. 2" long PVC sch. 80 nipple - (3) total
17. (2) PVC Sch. 80 nipple - threaded on one end. Length as req'd to extend beyond

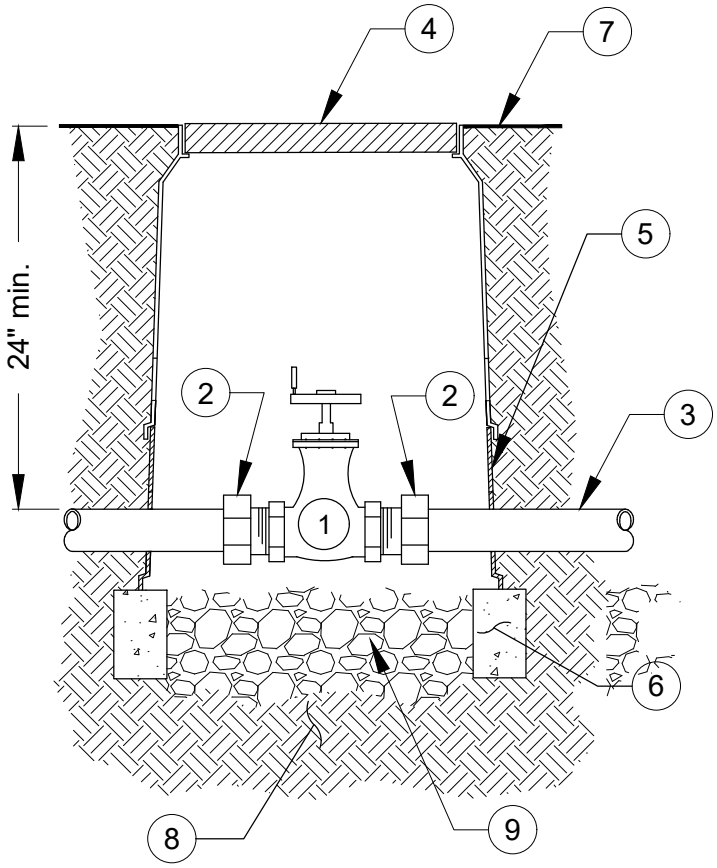
Notes:

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.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/9/2024	REMOTE CONTROL VALVE DETAIL	I-20
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1

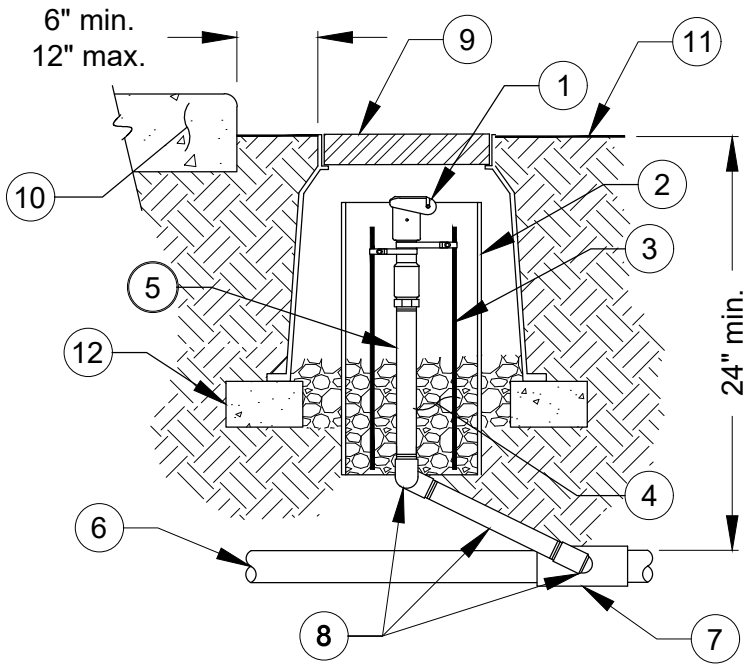


1. Brass threaded gate valve (line - size) non-rising stem by nibco or City approved equal. All valves 4" or larger shall be flanged.
2. PVC sch. 80 nipples, sch. 80 male adapters and sch. 80 unions - (2) each
3. PVC mainline 3" or smaller (mainline larger than 4" dia. shall be class 200 ring-tite).
4. Valve box with locking cover (NDS #1100 or equal) mark lid "G V"' install flush to grade.
5. Valve box extension (length as req'd), extension box shall not rest on pipe.
6. Common brick (min. three per box), set on undisturbed soil.
7. Finish grade includes 3" of mulch.
8. 90% compacted sub-grade
9. $\frac{3}{4}$" pea gravel, (two c.f. min.)

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/9/2024	GATE VALVE DETAIL (3" OR SMALLER)	I-21
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1

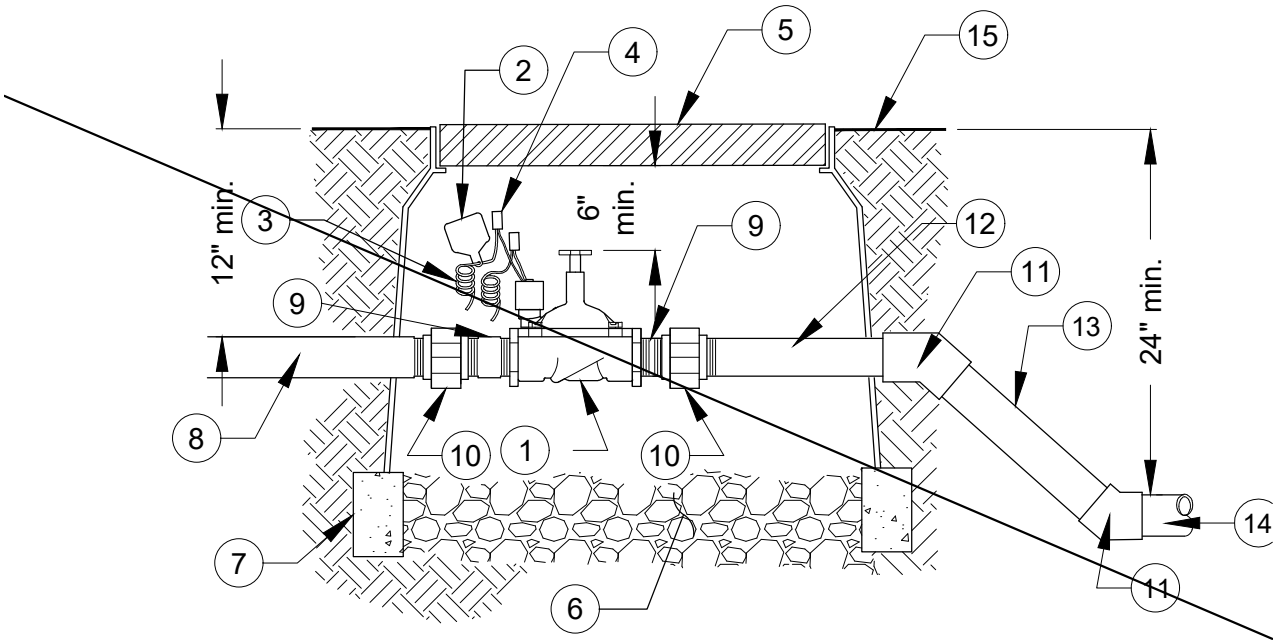


1. Quick-coupling valve (bronze two piece with 1"- inch inlet and locking rubber cover).
2. 8" dia. pipe sleeve, keep sleeve from bearing on riser or pipe.
3. (2) 5/8" x 18" rebar with (2) stainless steel pipe clamps
4. 3/4" to 1" dia. gravel (12" deep)
5. PVC sch 80 brass nipple
6. PVC mainline pipe
7. S x S x T tee or S x T ell (pvc sch. 80)
8. Fabricate with Sch. 80 PVC:
   (2) street ell
   (1) 12" L. nipple
   (1) threaded ell
9. 10" round valve box with locking lid install flush to finsh grade. Hot brand lid "Q C".
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 90% of original dry density.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	QUICK-COUPLING VALVE DETAIL	I-22
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1



1. Remote control valve
2. Valve id tag
3. Extra wire coils - 6 to 8 wraps over 1" pipe. Install a total of 3 wires for every valve to have a spare wire.
4. Waterproof connector (24v)
5. Valve box w/ locking lid (rectangular), install flush with grade. Hot brand lid "RCV" and with valve number.
6. 3/4"Ø gravel (2 c.f. min.)
7. Common brick (one per corner of box)
8. Brass ball valve (line-size) or brass angle valve (angle valve replaces const. note 12) Angle valve to be located within box.
9. PVC sch 80 nipple (typ.)
10. PVC sch 80 union
11. PVC sch 80 SS coupling (45°) to angle pipe to lateral depth (typical)
12. PVC sch 80 ell (for ball valve)
13. PVC sch 80 riser pipe length varies
14. SSS Tee
15. PVC mainline pipe
16. PVC sch 40 lateral pipe
17. Finish grade includes 3" of mulch

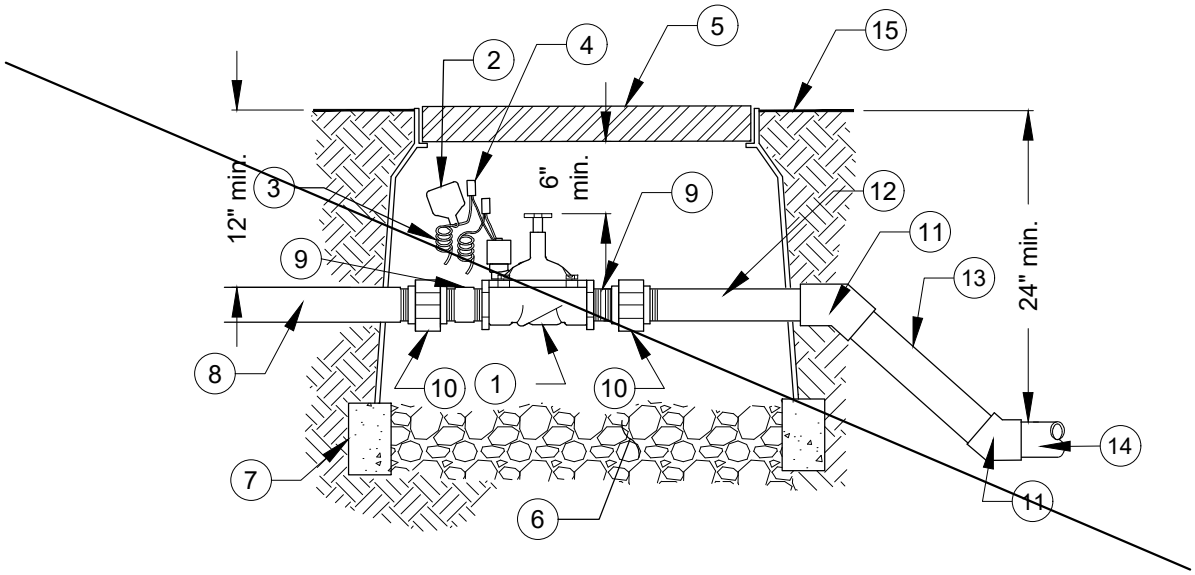
Notes:

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.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/9/2024	REMOTE CONTROL VALVE DETAIL	I-23
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1

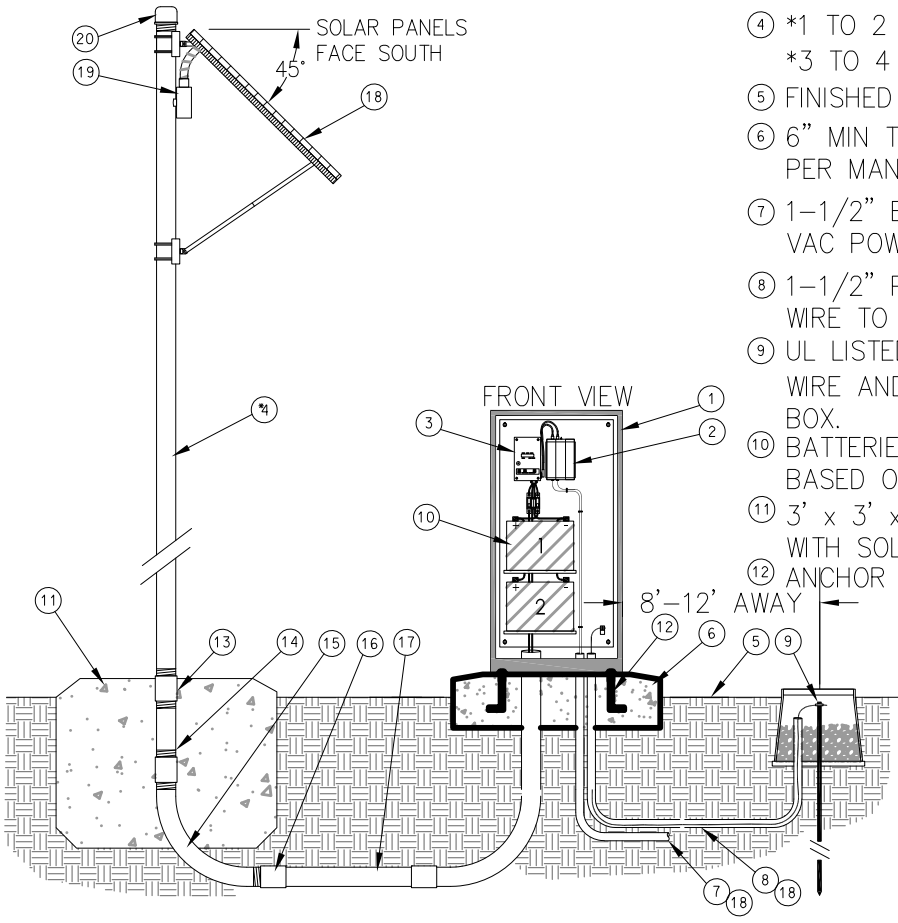


1. Brass threaded Master Control Valve
2. Valve id tag "MCV"
3. Extra wire coils - 6 to 8 wraps over 1" pipe. Wire to associated controller.
4. Waterproof connector (24v)
5. Valve box w/ locking lid (rectangular), install flush with grade. Hot brand lid "MCV".
6. 3/4"Ø gravel (2 c.f. min.)
7. Common brick (one per corner of box)
8. Sch. 80 PVC nipple (length as required) to flow sensor
9. 2" long PVC sch 80 nipple (typ.) - (2) total
10. PVC sch 80 union - (2) total
11. PVC sch 80 threaded coupling (45°) to angle pipe to lateral depth - (2) total
12. PVC sch 80 threaded nipple - length as req'd
13. PVC sch 80 riser pipe length varies
14. PVC mainline pipe from backflow preventer
15. Finish grade includes 3" of mulch

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. Refer to irrigation legend for type of MCV. Normally Open or Normally Closed.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	MASTER CONTROL VALVE DETAIL	I-24
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1



18"W x 36"H, STRONGBOX: SB–18SS OR SB–18DSS
FRONT ENTRY WITH CONCRETE BASE

① STRONGBOX STAINLESS STEEL NEMA 3R RAINPROOF ENCLOSURE AND SOLAR ASSEMBLY BY JDGT.
② POWER INVERTER.
③ CHARGE CONTROLLER.
④ *1 TO 2 PANELS, INSTALL 15' x 3" GALVANIZED POLE. *3 TO 4 PANELS, INSTALL 15' x 4" GALVANIZED POLE.
⑤ FINISHED GRADE.
⑥ 6" MIN THICK, CONCRETE PAD WITH ANCHOR BOLTS PER MANUFACTURER RECOMMENDATIONS.
⑦ 1–1/2" ELECTRICAL CONDUIT AND SWEEP ELL FOR 120 VAC POWER LINE TO CONTROLLER.
⑧ 1–1/2" PVC CONDUIT AND SWEEP ELL WITH #6 GROUND WIRE TO EXTERNAL GROUND ROD LOCATION.
⑨ UL LISTED 5/8" x 8' GROUND ROD WITH #6 GROUND WIRE AND CLAMP INSTALLED INSIDE 10" ROUND VALVE BOX.
⑩ BATTERIES FOR POWER STORAGE. NUMBER OF BATTERIES BASED ON POWER REQUIREMENT.
⑪ 3' x 3' x 3' CONCRETE FOOTING FOR GALVANIZED POLE WITH SOLAR PANELS.
⑫ ANCHOR BOLTS PROVIDED WITH ENCLOSURE.
⑬ GALVANIZED COUPLING. SIZE PER POLE DIAMETER.
⑭ GALVANIZED PIPE AND FITTINGS AS NECESSARY. SIZE PER POLE DIAMETER.
⑮ GALVANIZED SWEEP ELL. SET IN CONCRETE FOOTING. SIZE PER POLE DIAMETER.
⑯ PVC FEMALE ADAPTER OR REDUCING BUSHING TO CONVERT FROM GALVANIZED TO 3" PVC CONDUIT.
⑰ 3" PVC CONDUIT FOR SOLAR POWER CABLES.
⑱ MOUNT SOLAR PANEL ON GALVANIZED POLE WITH BRACKET PROVIDED BY JDGT. POLE NOT INCLUDED.
⑲ WATER PROOF ELECTRICAL JUNCTION BOX ATTACHED TO POLE FOR SOLAR WIRING.
⑳ GALVANIZED END CAP. SIZE PER POLE DIAMETER.

INSTALLATION NOTE:
SOLAR DETAIL IS TO BE USED FOR ILLUSTRATIVE PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL LOCAL CONSTRUCTION AND SAFETY CODES FOR INSTALLATION OF THE SOLAR PANEL.

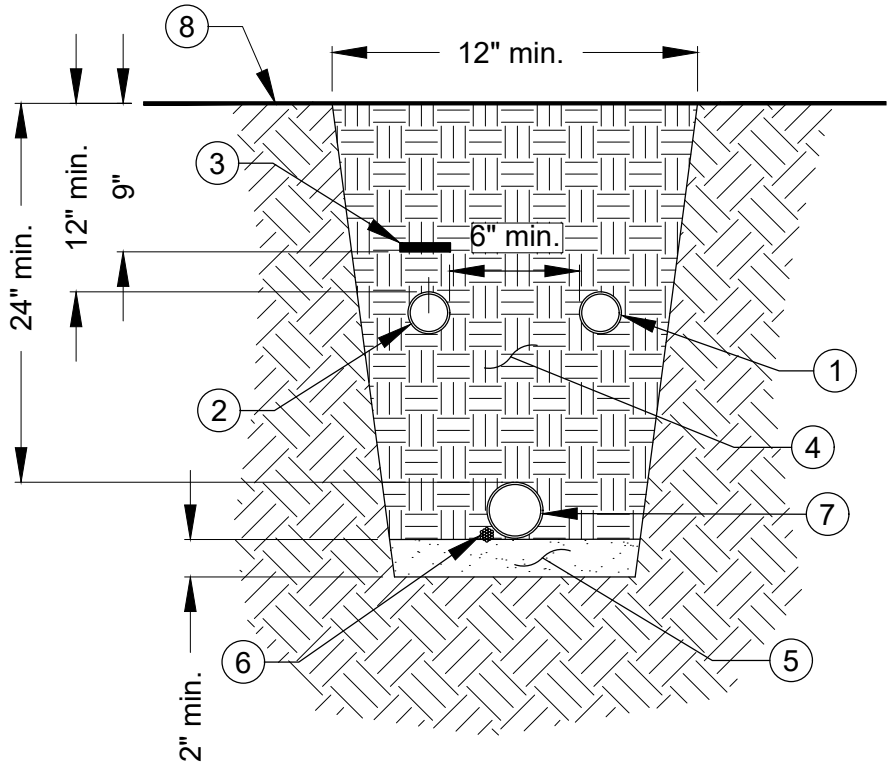
SOLAR PANEL LOCATION NOTE:
THE DISTANCE FROM SOLAR PANEL POLE TO SOLAR ASSEMBLY ENCLOSURE SHALL BE NO GREATER THAN 12'.

CABLE AND WIRE NOTE:
ALL CABLES AND ELECTRICAL WIRES MUST BE RUN IN CONDUIT.

GROUNDING NOTE:
GROUND ROD SHALL BE LOCATED BETWEEN 8'–12' AWAY FROM ENCLOSURE UNLESS OTHERWISE SPECIFIED. A 10" ROUND VALVE BOX SHALL BE INSTALLED OVER THE GROUND ROD FOR LOCATION AND MAINTENANCE PURPOSES.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/7/2022	IRRIGATION SOLAR ASSEMBLY DETAIL	I-25
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER	SHEET 1 0F 1



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

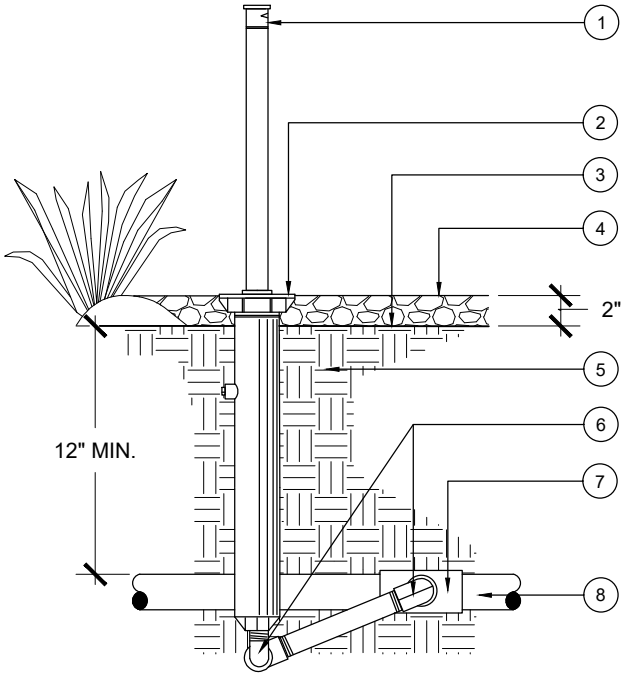
Notes:

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.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/9/2024	TRENCHING REQUIREMENTS	I-26
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1



SECTION VIEW

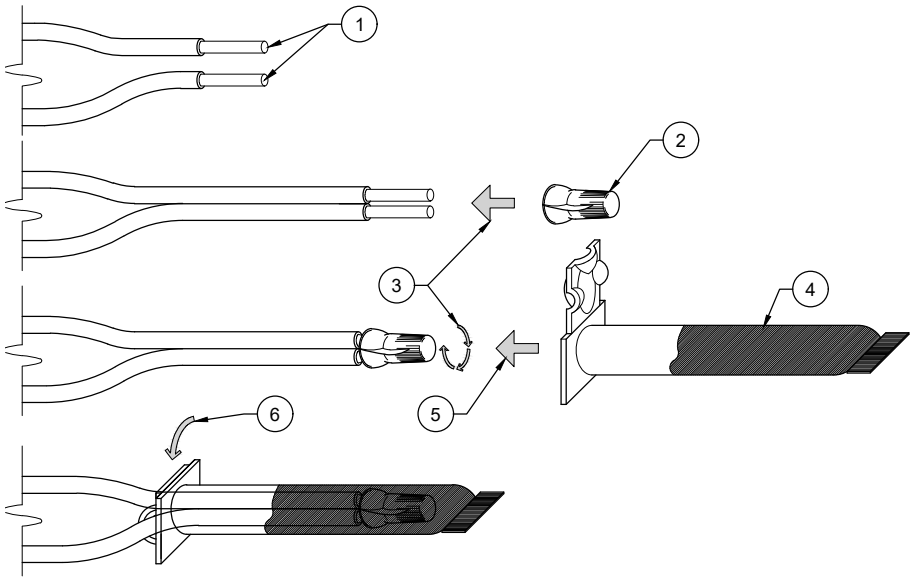
1. NOZZLE PER IRRIGATION LEGEND.
2. 12" POP-UP SPRINKLER HEAD, PER IRRIGATION EQUIPMENT LEGEND AND SPECS. INSTALL HEAD 2" ABOVE FINISH GRADE AT SHRUB AND GROUND- COVER AREAS.
3. FINISH GRADE.
4. LAYER OF MULCH. REFER TO PLANTING PLAN.
5. NATIVE SOIL COMPACTED TO ORIGINAL DENSITY AROUND HEAD.
6. SWING JOINT ASSEMBLY. FABRICATE WITH:
   (3) SCHEDULE 40 STREET ELL
   (1) SCHEDULE 80 12" NIPPLE (OR LENGTH AS REQUIRED).
7. SCH. 40 PVC FITTING. SxSxT (TEE) OR SxT(ELL) AS REQUIRED.
8. PVC NON-PRESSURE LATERAL LINE. SEE LEGEND AND SPECS.

Notes:

1. Use $\frac{3}{4}$" teflon tape for all threaded fittings (1-1/2 to 2 wraps).
2. Install heads perpendicularly plumb to adjacent grade.
3. Adjust nozzles/head to prevent overspray onto paving, walls/fences, buildings, etc.
4. Install heads minimum 4" from all hardscape edges.
5. Swing joint shall be same size as spray head inlet.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	12" POP-UP SPRINKLER DETAIL	I-27
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1

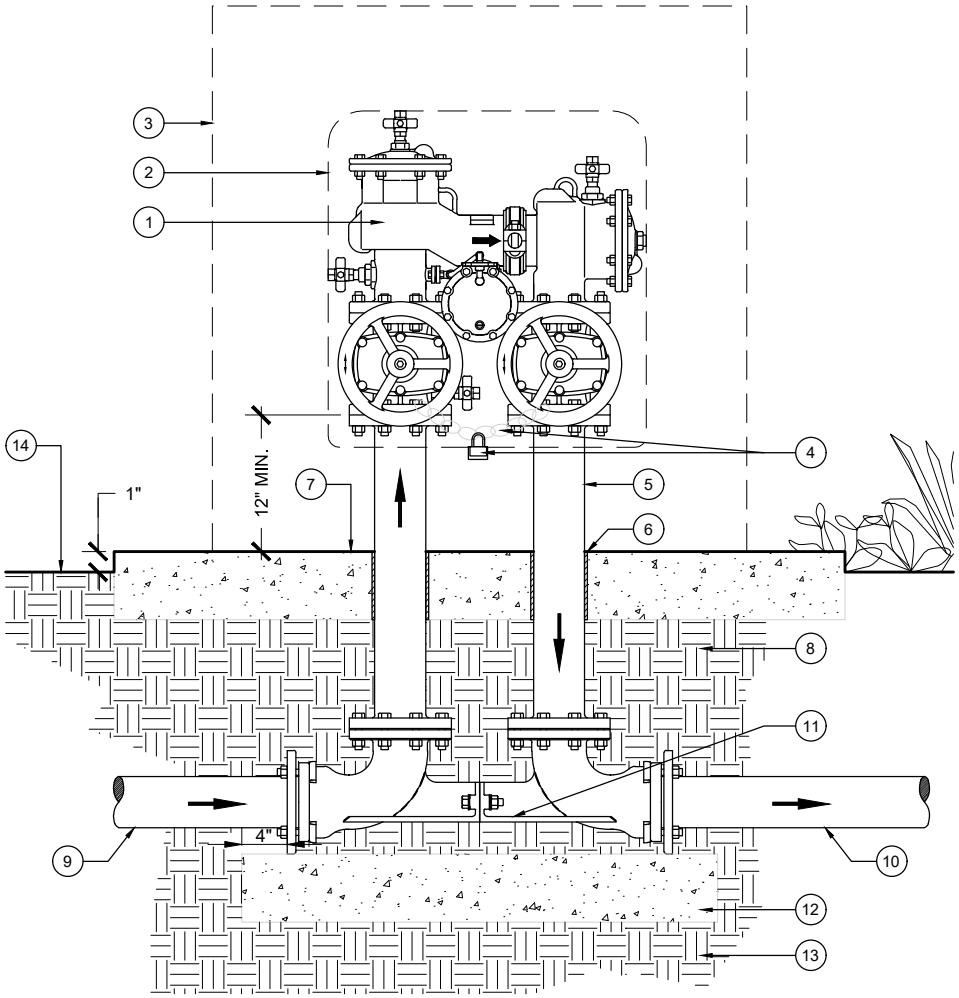


1. STRIP, CLEAN AND DRY WIRES APPROXIMATELY 5/8" FROM END AND INSERT WIRES THROUGH HOLES IN BASE OF BODY.
2. ELECTRICAL CONNECTOR.
3. APPLY ELECTRICAL CONNECTOR AND TWIST CLOCKWISE.
4. GEL-FILLED INSULATOR.
5. INSERT SPLICE INTO GEL-FILLED INSULATOR TUBE. PUSH PAST THE LOCKING FINGERS TO HOLD ELECTRICAL CONNECTOR IN PLACE.
6. POSITION WIRE CHANNELS AND SNAP INSULATOR TUBE COVER CLOSED.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/9/2024	LOW VOLTAGE SPLICE DETAIL	I-28
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1



SECTION ELEVATION
(FRONT VIEW)

1. FLANGED MOUNTED REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER, PER DWGS.
2. BACKFLOW INSULATION BLANKET, PER DWGS
3. BACKFLOW DEVICE ENCLOSURE, PER DWGS. CONTRACTOR TO VERIFY SIZING REQUIREMENTS PRIOR TO PURCHASING.
4. 2-FOOT LONG 3/8" CHAIN WITH PADLOCK
5. FLANGED DUCTILE IRON SPOOL (LENGTH REQUIRED, 1 OF 2)
6. WRAP PIPE AT PENETRATION WITH 1/4" FELT OR SLEEVE WITH CLASS 200 PVC
7. 6" THICK CONCRETE BASE (USE 3,000 PSI CONCRETE)
8. COMPACTED SUBGRADE
9. DUCTILE IRON PIPE FROM WATER METER PER WATER PURVEYOR REQUIREMENTS
10. DUCTILE IRON PIPE, LENGTH AS REQUIRED. TRANSITION TO PVC MAINLINE USING TRANSITION GASKET
11. VALVE SETTER PER SPECS
12. 6" THICK CONCRETE PAD (USE 3,000 PSI CONCRETE)
13. NATIVE SOIL COMPACTED TO ORIGINAL DENSITY
14. FINISH GRADE

NOTES:

1. FURNISH NOMINAL SIZE PIPE AND FITTINGS TO NOMINAL SIZE OF BACKFLOW PREVENTER.
2. INSTALLATION OF BACKFLOW DEVICE SHALL COMPLY WITH ALL APPLICABLE LOCAL, COUNTY, AND STATE CODES.
3. CONTRACTOR MUST PROVIDE BACKFLOW CERTIFICATION.
4. WRAP ALL IRON PIPE IN CONTACT WITH SITE SOIL.
5. CONTRACTOR TO INSTALL DETECTOR CHECK BYPASS LOCK BY SENTRY. PHONE # (877) 716-8071
6. SUBMIT SHOP DRAWINGS SPECIFYING ENCLOSURE SIZE AND SHOWING RELATIVE LAYOUT OF EQUIPMENT.

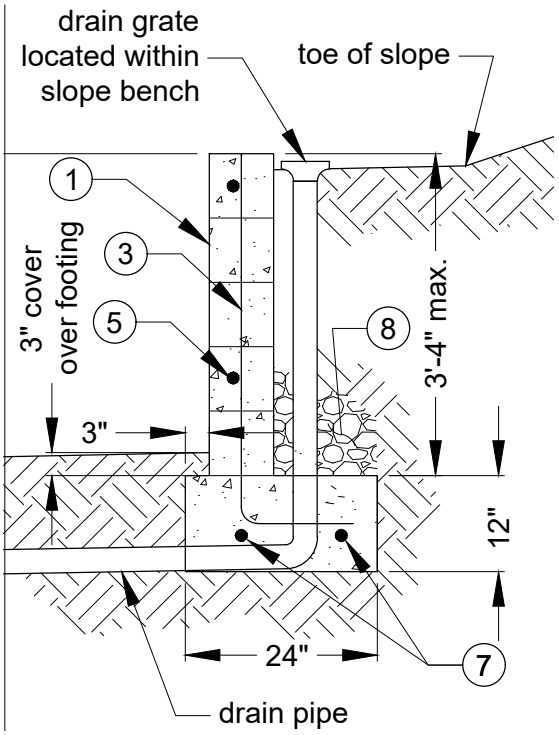
CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

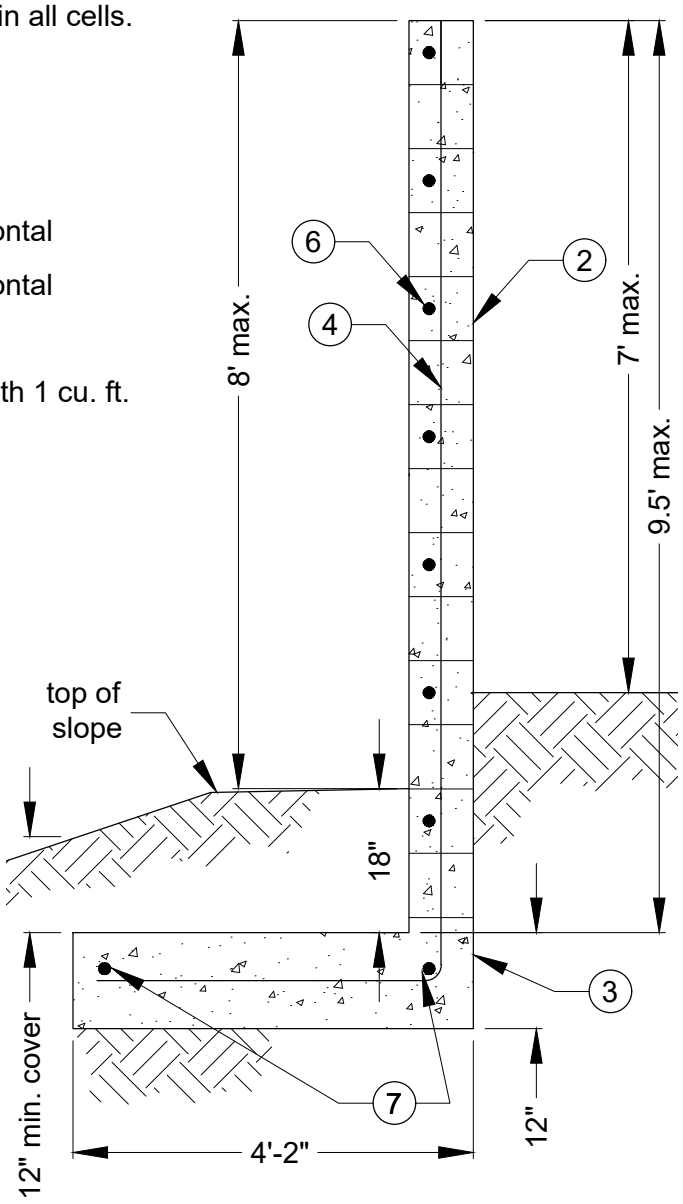
4/9/2024	BACKFLOW DEVICE 2-1/2" & LARGER DETAIL	I-29
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1

LANDSCAPE STANDARD DETAILS

1. 8" split face CMU block wall, solid grout in all cells.
2. 8" CMU, solid grout in all cells.
3. #4 vertical and toe rebar @ 32" o.c.
4. #4 vertical and toe rebar @ 16" o.c.
5. #4 bond beam rebars @ 24" oc horizontal
6. #4 bond beam rebars @ 16" oc horizontal
7. #4 continuous rebar through footing.
8. Open head joints or 2" weep holes, with 1 cu. ft. behind wall at 20' intervals.
9. concrete footing 2500 psi min.

All rebar splices shall be lapped 20" min.





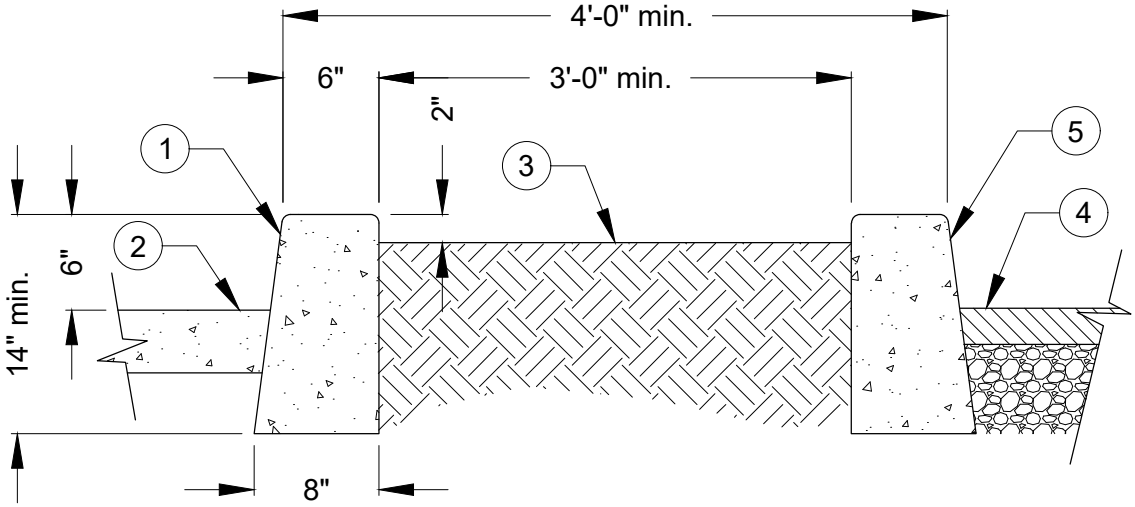
Notes:

- All wall surface below ground shall be coated with waterproofing sealant - meet or exceed A.S.T.M. D449 Type I
- Any proposed modification to wall design or alternate design requires approval from City Building Division and Public Works Department.
- Drain grate must be located within slope bench area. Horizontal portion of drain at 2% from flowline of City curb & gutter requires pipe installation through wall footing.
- Inspection required prior to placing concrete and all grouting.
- Concrete - per 520-c-2500. Grout all cells solid.
- Lap all reinforcement steel a minimum of 40 bar diameter (15" for #3 bar 20" for #4 bar).
- Soil shall have a minimum bearing value of 1,000 p.s.f.
- Maintain 1 bar diameter minimum clearance in wall and 3" minimum clearance in footing.
- All concrete corners to be 1/4" radius.
- Contractor shall submit all necessary structural calcs with shop drawings to obtain necessary permits. contractor shall be responsible for all related costs for structural calcs, shop drawings and no fee permit. developers required to pay the appropriate plan check & permit fees.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/9/2024	STANDARD WALL DETAIL	L-001
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1



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)

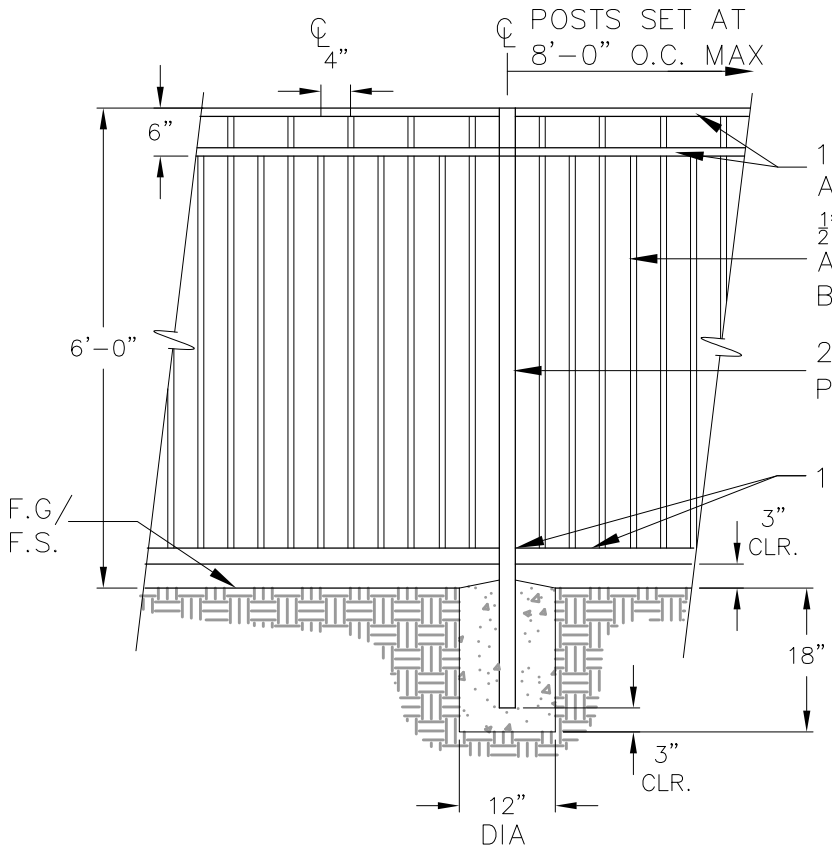
Notes:

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.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/9/2024	PLANTER STRIP AT STREET MEDIANS	L-02
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1



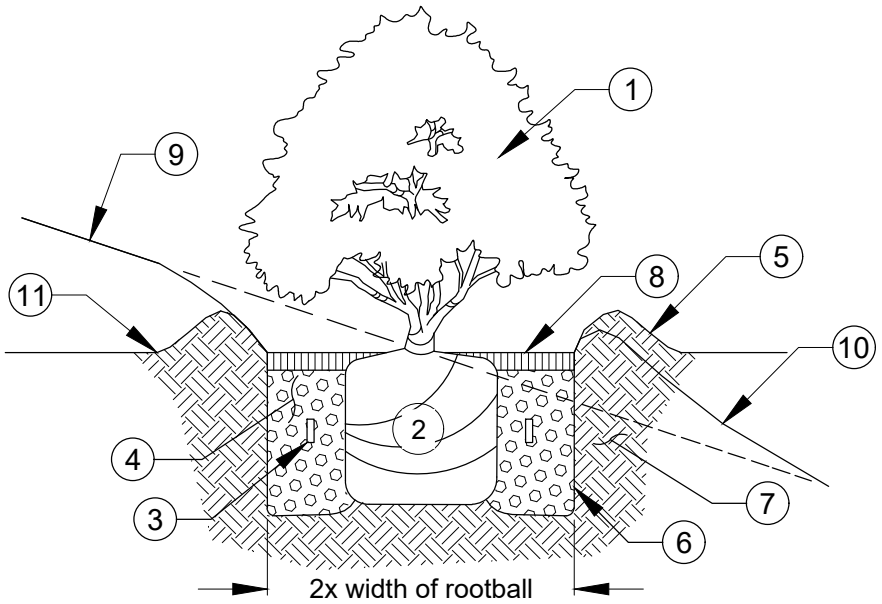
NOTES:

1. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
2. ALL CONNECTIONS ARE TO BE CONTINUOUSLY WELDED. REMOVE ALL SLAG AND SPLATTER AND GRIND SMOOTH. ALL TUBING TO HAVE ENDS CLOSED.
3. FILLET WELD ALL JOINTS.
4. PAINT STEEL WITH (1) COAT OF ZINC CHROMATE PRIMER AND (2) COAST OF ENAMEL PAINT, COLOR 'BLACK'.

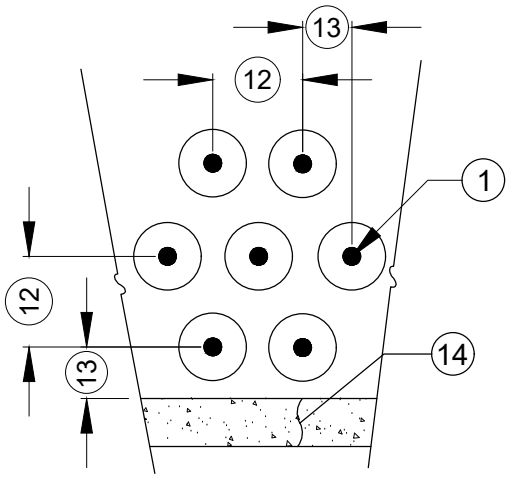
CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

8/8/2023	TUBE STEEL FENCE DETAIL	L-002
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER _____	SHEET 1 0F 1



SECTION VIEW



TRIANGULAR SPACING PLAN

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: 2/3 site soil + 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. 1/2 of on-center spacing (per plan)
14. Curb, hardscape, or other improvement (where occurs on 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	

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

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

SHRUB PLANTING DETAIL

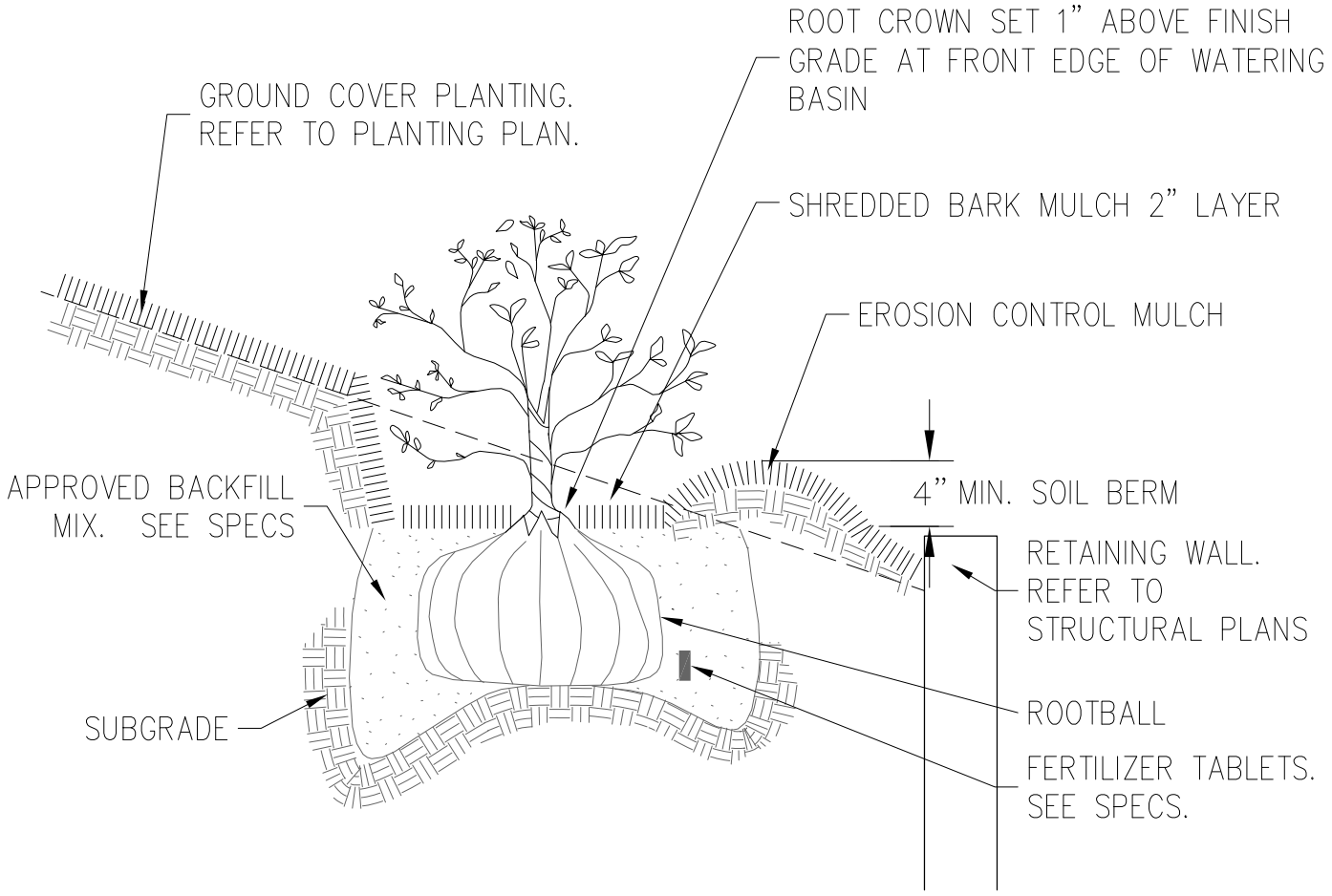
L-03

SHEET 1 0F 1

APPROVED BY: FREDY A. BONILLA, CITY ENGINEER

8/19/2024

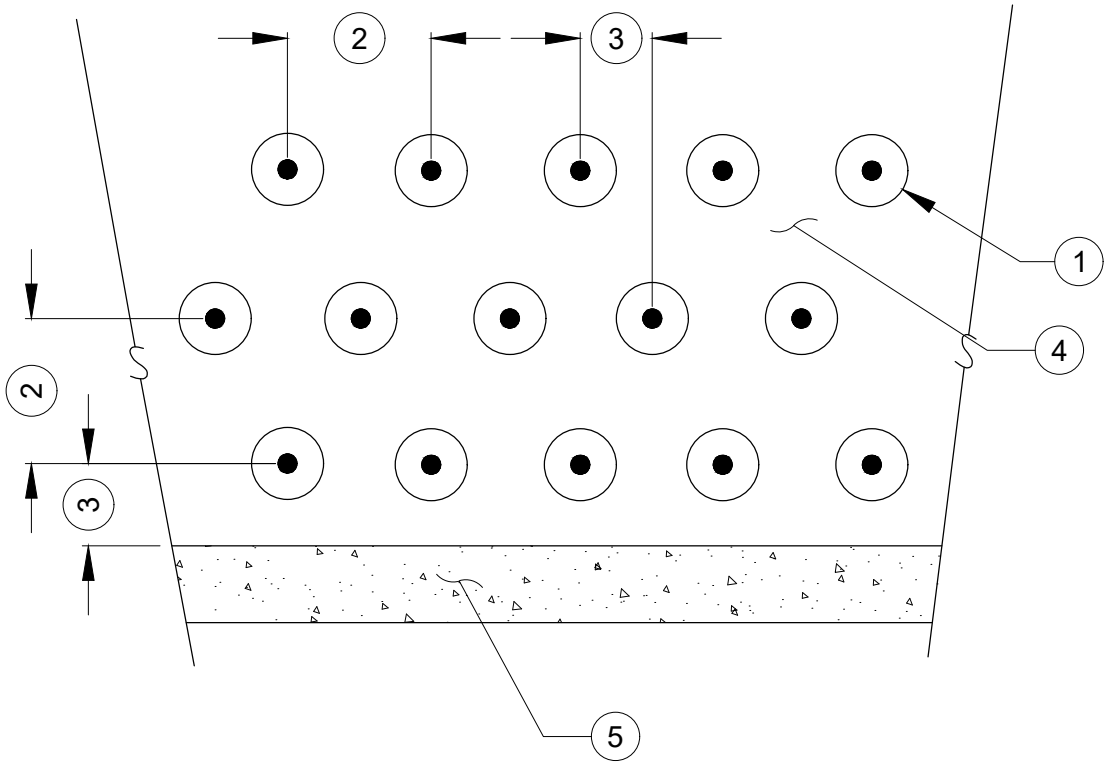
NOT TO SCALE



CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

3/16/2022	SHRUBS ON SLOPE DETAIL	L-003
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER _____	SHEET 1 0F 1



PLAN VIEW

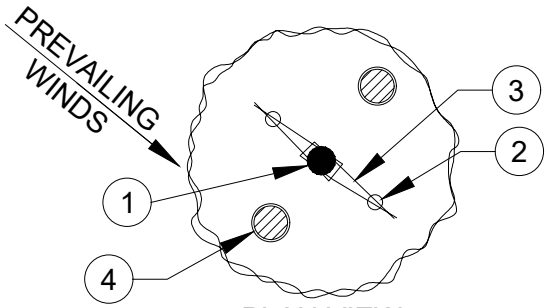
1. Groundcover (set crown @ original height)
2. On- center plant spacing (per plan)
3. 1/2 of on-center spacing (per plan)
4. Shrub or ground cover planting area
5. Curb, hardscape, or other improvement (where occurs per plan)

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	

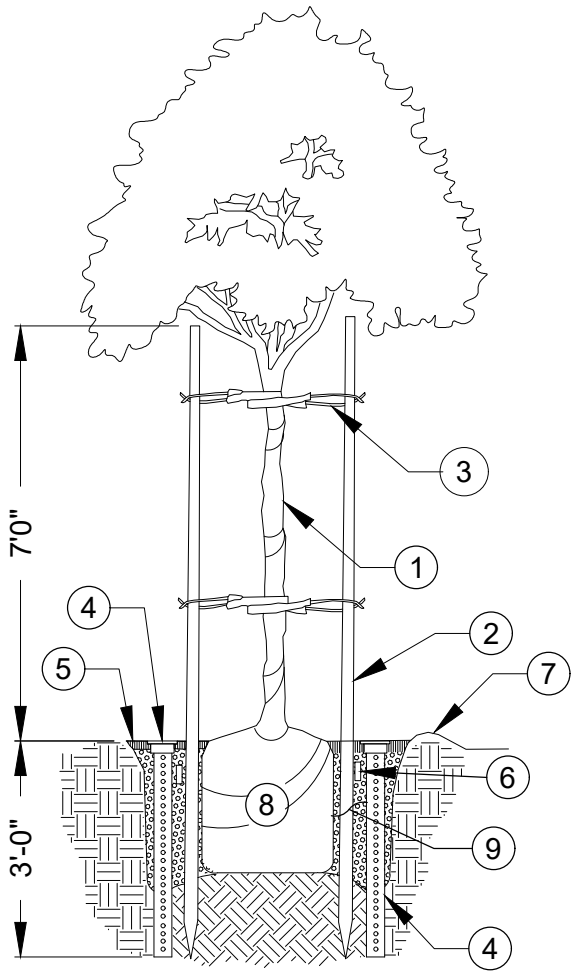
Note:
Erosion control mesh (City approved) shall be installed on all slopes 2:1 or greater.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	GROUND COVER DETAIL	L-004
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1



PLAN VIEW



SECTION VIEW

1. Tree trunk
2. 3" x10' lodge pole pine stakes with green preservative stain
3. (2) 16" v.i.t. twist braces; screw to stakes with 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 with 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	

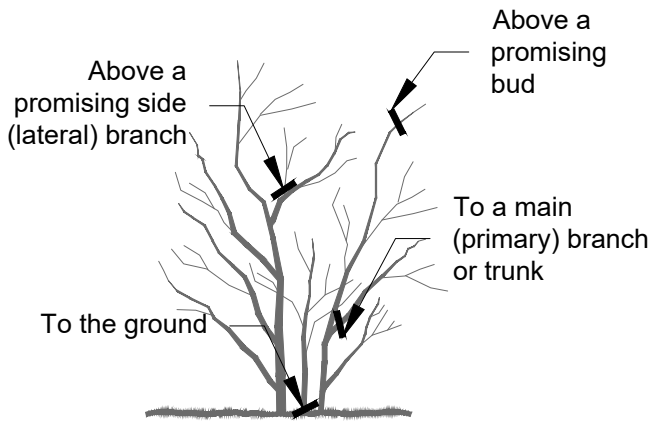
Notes:

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%
4. 24" is the minimum distance of irrigation bubbler to the tree trunk.

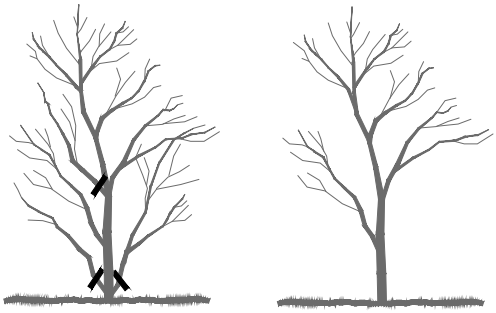
CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

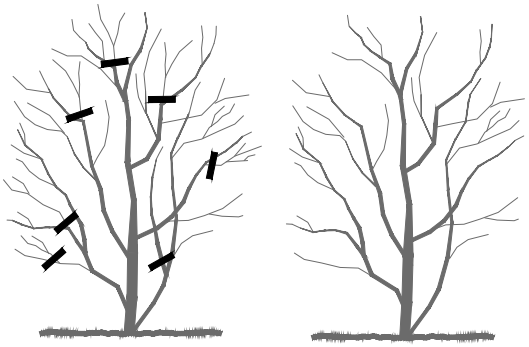
4/9/2024	TREE PLANTING DETAIL	L-04
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1



PRUNING TO SHAPE



THINNING (BEFORE) THINNING (AFTER)



HEADING BACK (BEFORE) HEADING BACK (AFTER)

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)

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:

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:

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.

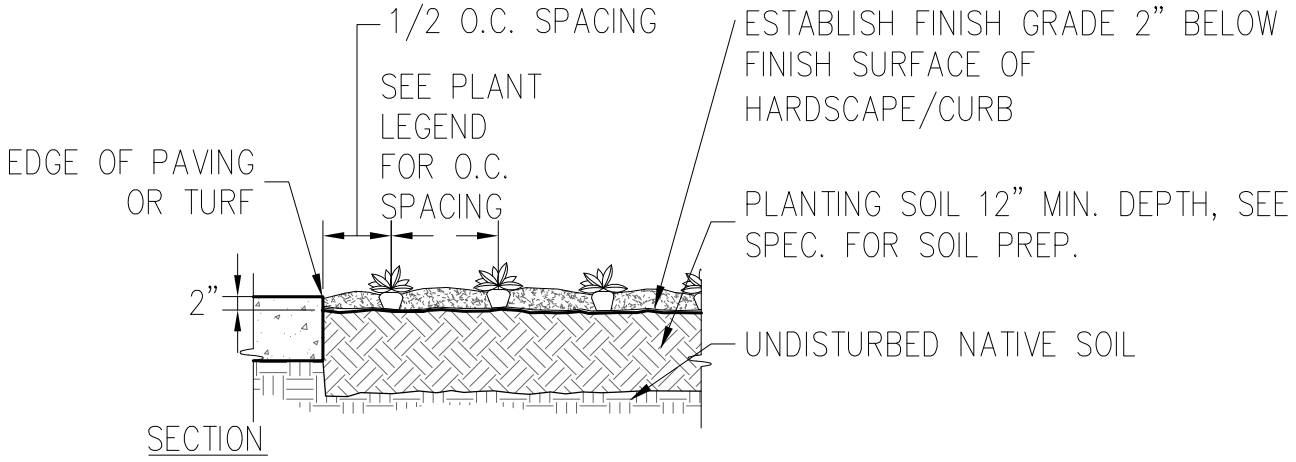
HEADING BACK MAY BE DONE:

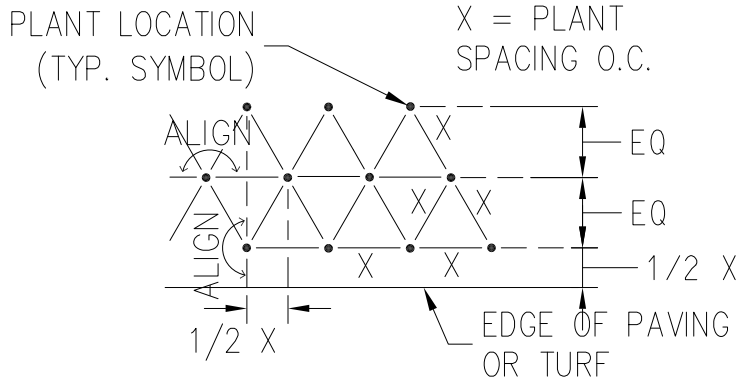
1. To remove weak or unproductive wood.
2. To encourage growth in a desired direction.
3. To prevent growth from continuing in the undesirable direction.
4. To stimulate flower or fruit production by encouraging growth of wood that will produce.
5. To prevent wind or snow damage.
6. To revitalize an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

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/9/2024	TREE PRUNING (DEC. TO FEB.)	L-05
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1





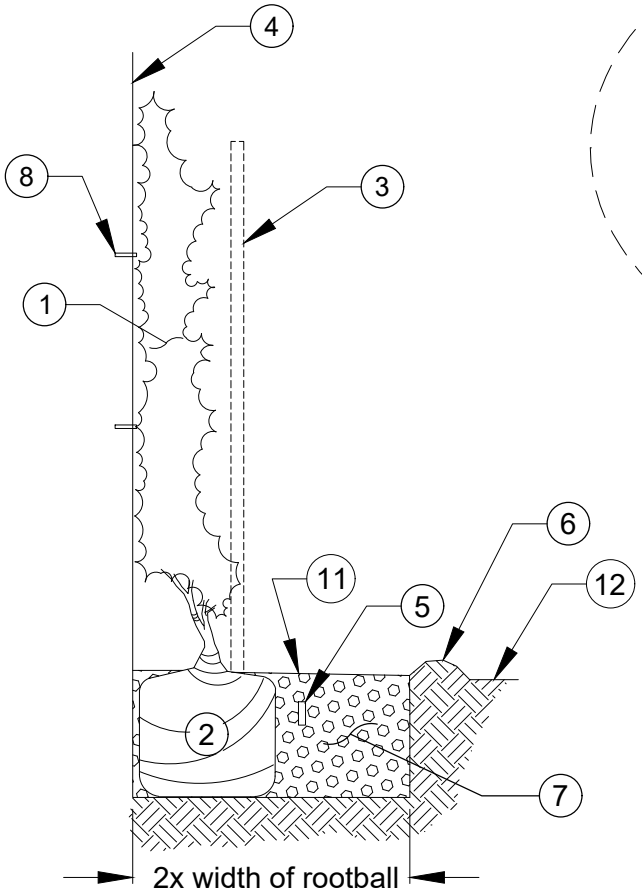
NOTES:

1. BLEND AMENDMENTS INTO NATIVE SOIL TO AVOID ANY DISTINCT SOIL HORIZON (SEE PLANTING SPECS.)
2. SEE PLANT LEGEND FOR SPACING DIMENSIONS

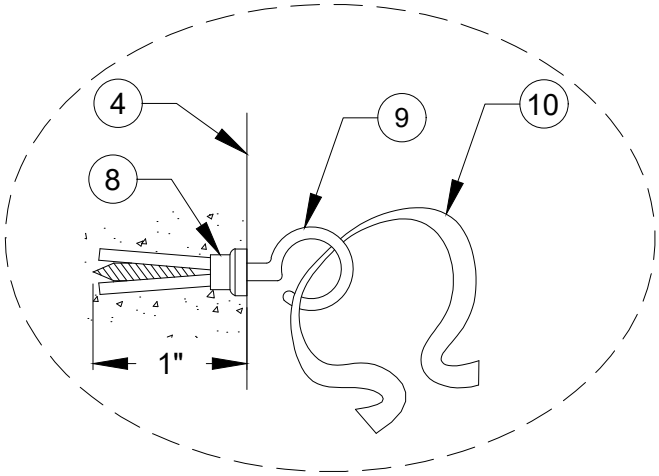
CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

3/16/2022	GROUND COVER ALTERNATIVE DETAIL	L-005
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER _____	SHEET 1 0F 1



SECTION VIEW



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 ftgs). 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 + 1/3 organic backfill mixture (forest humus or equal) + amendments per soil analysis.

(8) Lead expansion anchor (as needed)

(9) 3/16" stainless steel eye-screw

(10) Heavy duty green plastic ribbon tie, 2 ties (min.) per vine (length as required)

(11) Bark mulch (2" deep)

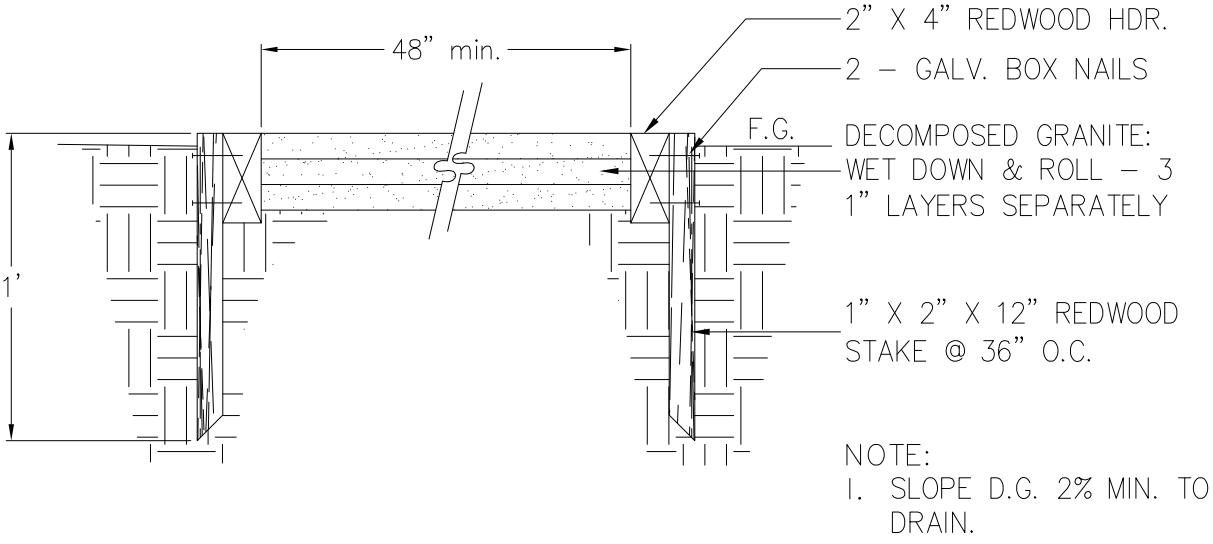
(12) Finish grade includes 3" of mulch

Notes:
1. Plant pit to be min. 3 times the diameter and 1-1/2 times the height of the rootball except for pedestal.
2. Roughen sides and bottom of rootball and plant hole.
3. Plant vine stem as close to wall as possible but allow 6" minimum between wall and plant.

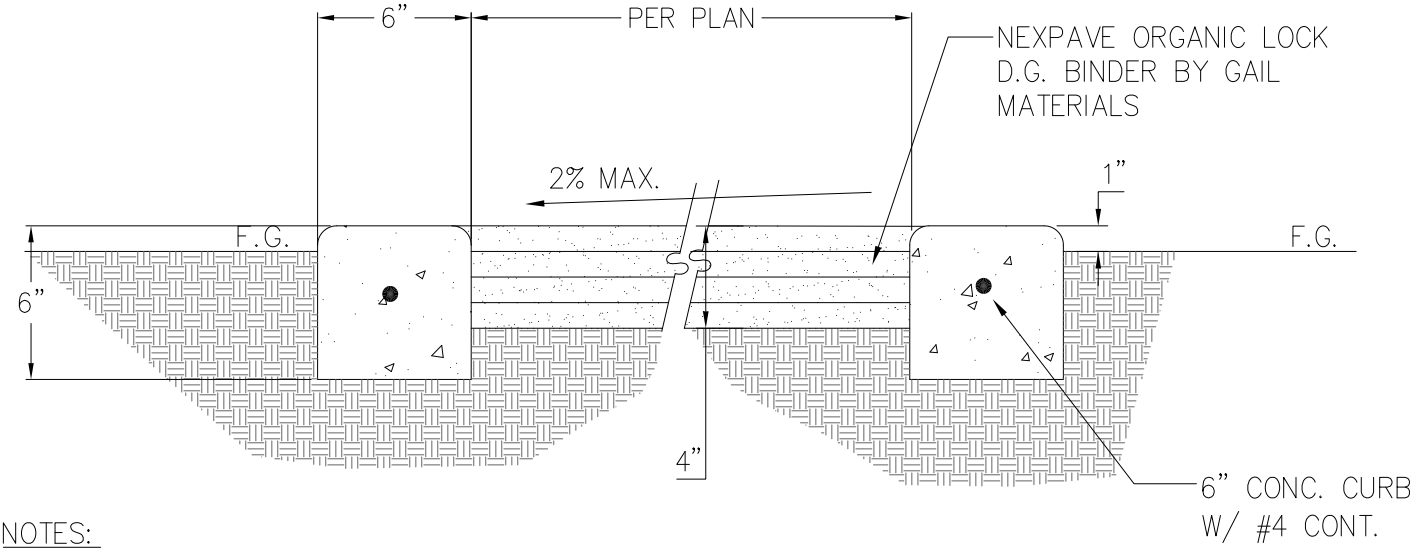
CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	VINE PLANTING DETAIL	L-006
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1

REDWOOD HEADER



CONCRETE CURB



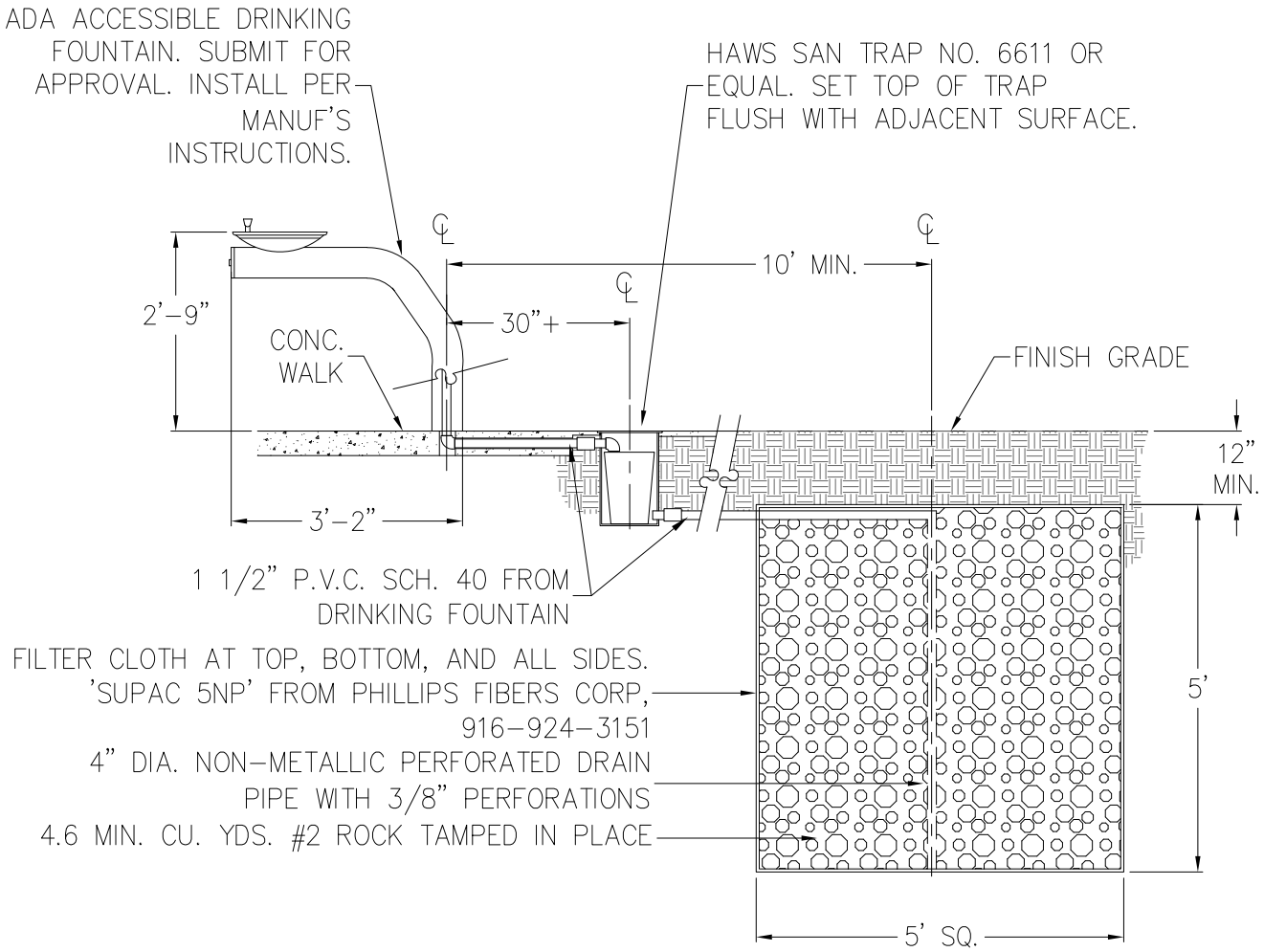
NOTES:

1. INSTALL WITH MIN. 1% TO MAX 2% CROSS SLOPE
2. INSTALLATION SHALL BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. D.G. MANUFACTURER:
   AVAILABLE: GAIL MATERIALS
   CONTACT: (951)667–6106
   TYPE: SELECTED FROM PRE–APPROVED MATERIAL
4. COLOR: TO BE SUBMITTED FOR APPROVAL

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

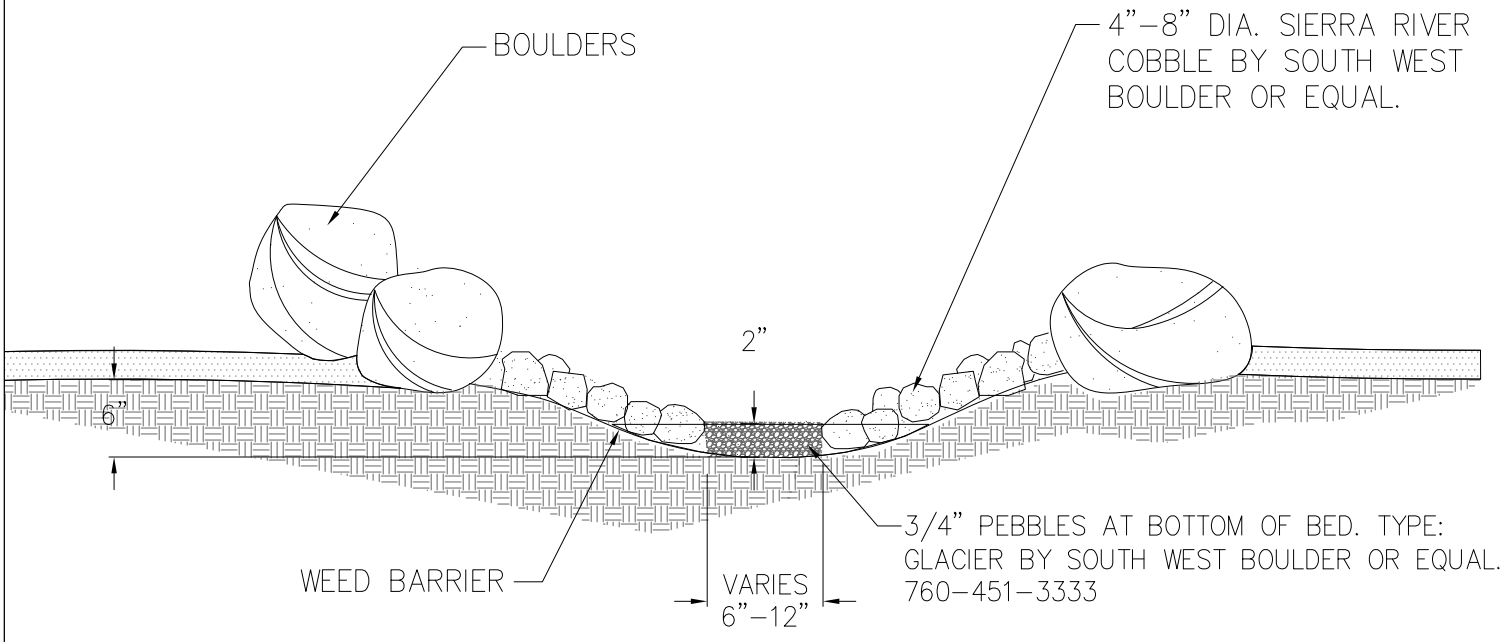
4/7/2022	STABILIZED DECOMPOSED PEDESTRIAN PAVING DETAIL	L-007
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER _____	SHEET 1 0F 1



CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/7/2022	DRINKING FOUNTAIN WITH SUMP DETAIL	L-008
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER _____	SHEET 1 0F 1



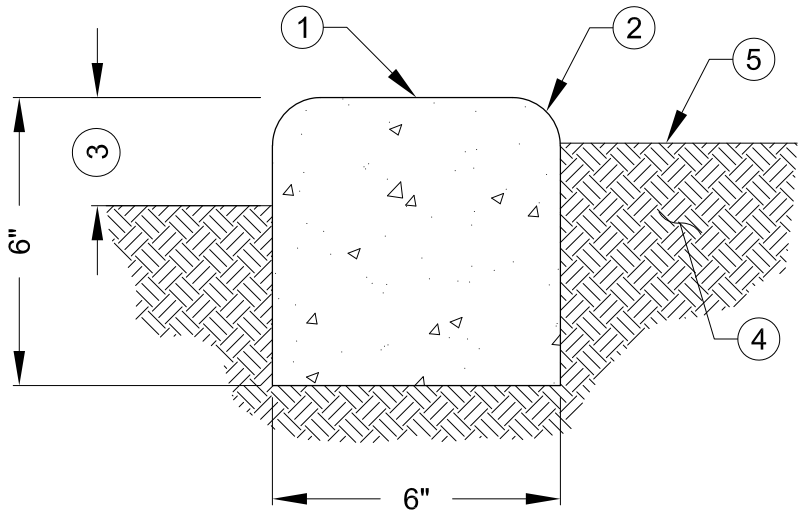
NOTES:

1. CONTRACTOR SHALL LAY OUT CREEK AND GET APPROVAL FROM THE CITY PRIOR TO INSTALLATION.
2. GROUT COBBLE STONES IN PLACE.
3. SET $\frac{3}{4}$" PEBBLES IN CONCRETE BED.
4. GRADE TO DRAIN. INSTALL DRAINAGE AT LOW POINT AND DRAIN OUT TO EXISTING CURB/GUTTER.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

8/8/2023	DRY STREAM AT PLANTING DETAIL	L-009
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER _____	SHEET 1 0F 1

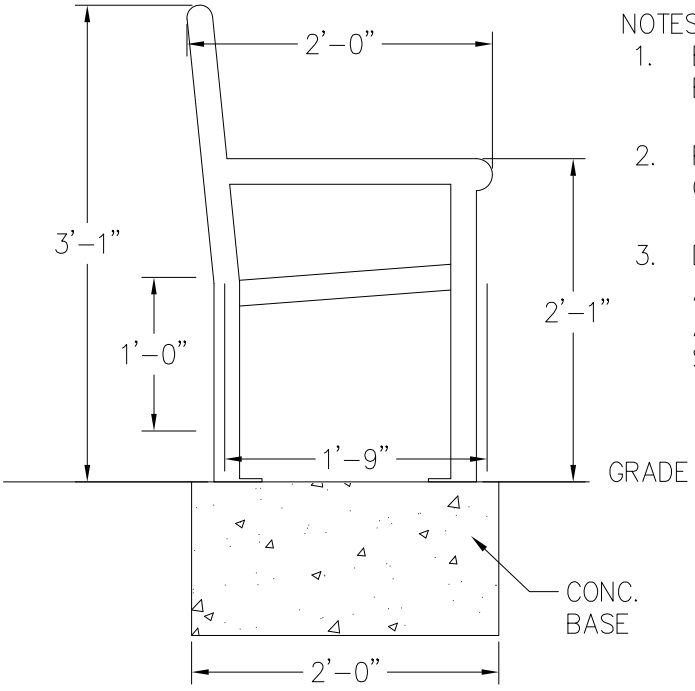


1. Concrete mow edge with light broom finish - provide expansion joints @ 20' intervals max.
2. $\frac{1}{2}$" radius (typical)
3. 3" @ lawn area 3" @ ground cover
4. 95% min. compacted subgrade - under mow strip only
5. Finish grade includes 3" of mulch

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

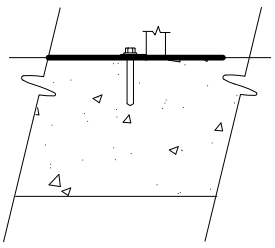
8/8/2023	MOW EDGE	L-010
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER _____	SHEET 1 0F 1



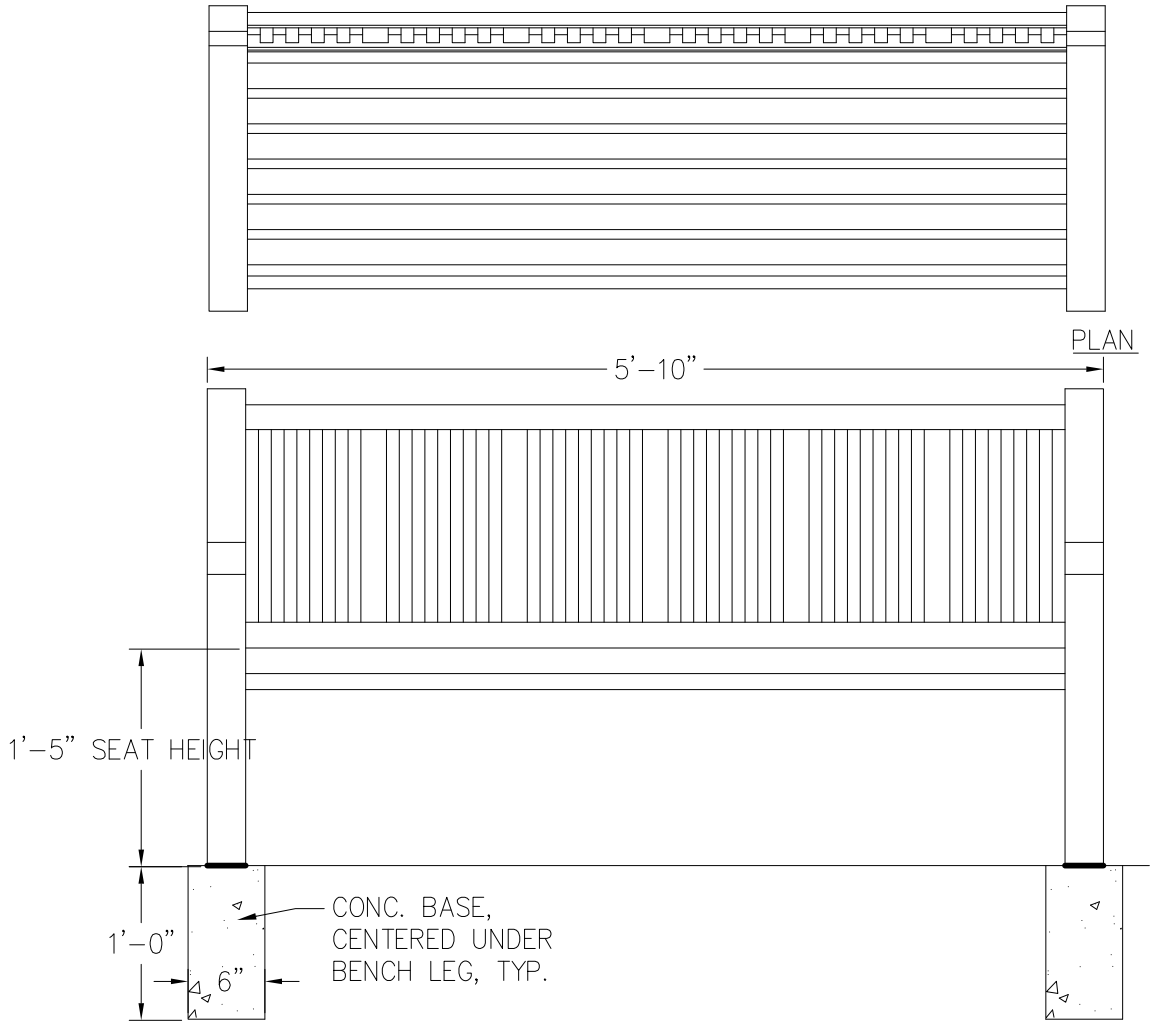
SECTION ELEVATION

NOTES:

1. BENCH TO HAVE METAL FRAME. SUBMIT BENCH MANUF. FOR APPROVAL.
2. PROVIDE 6"X12"X2' LONG CONC. CURB CENTERED UNDER BENCH LEGS.
3. DRILL 1/2" DIAM. HOLE IN CONCRETE BASE AT APPROX 4" DEPTH. INSERT SLEEVE ANCHOR BOLT (1/2" x 4") AND TIGHTEN SECURELY.



SURFACE MOUNT: BOLTED BENCH LEG

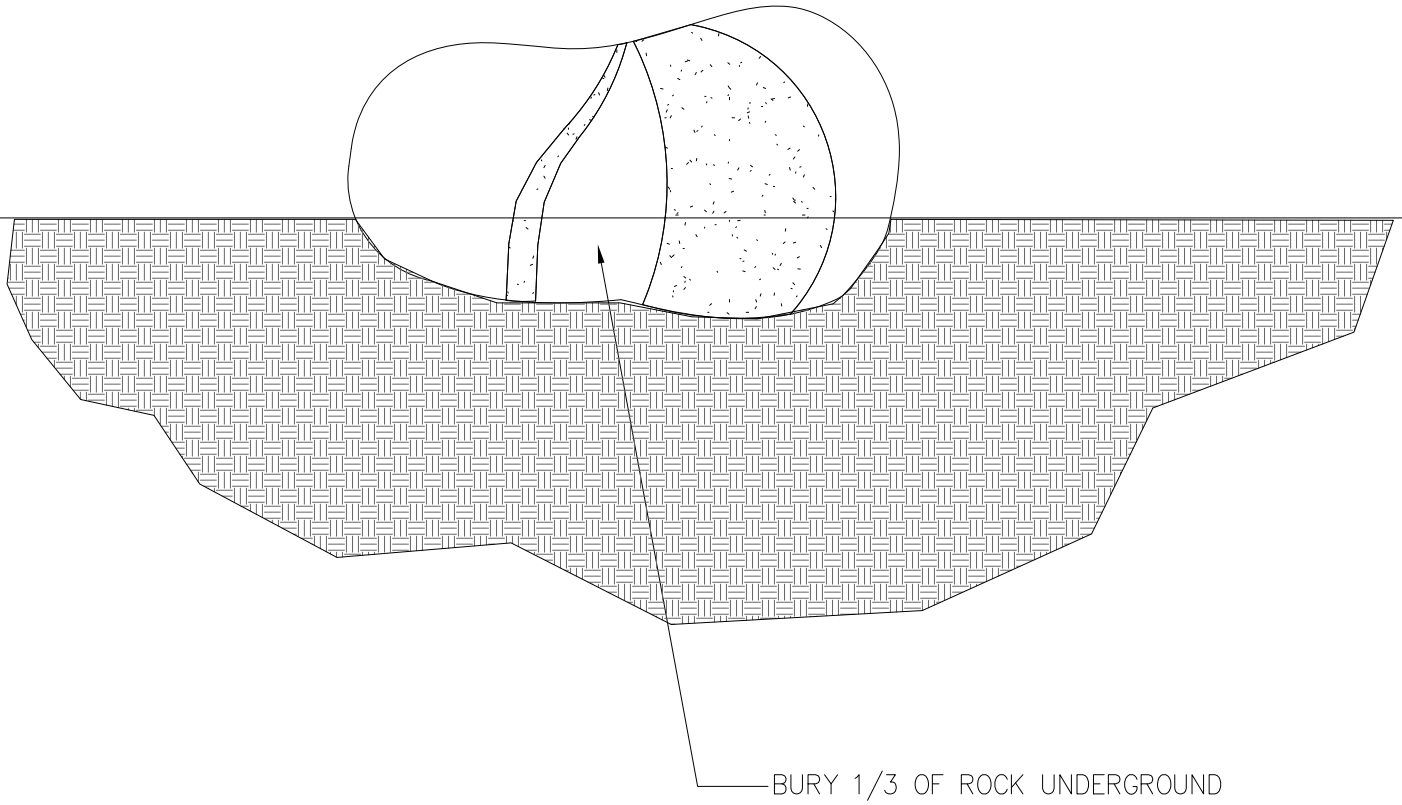


PLAN

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

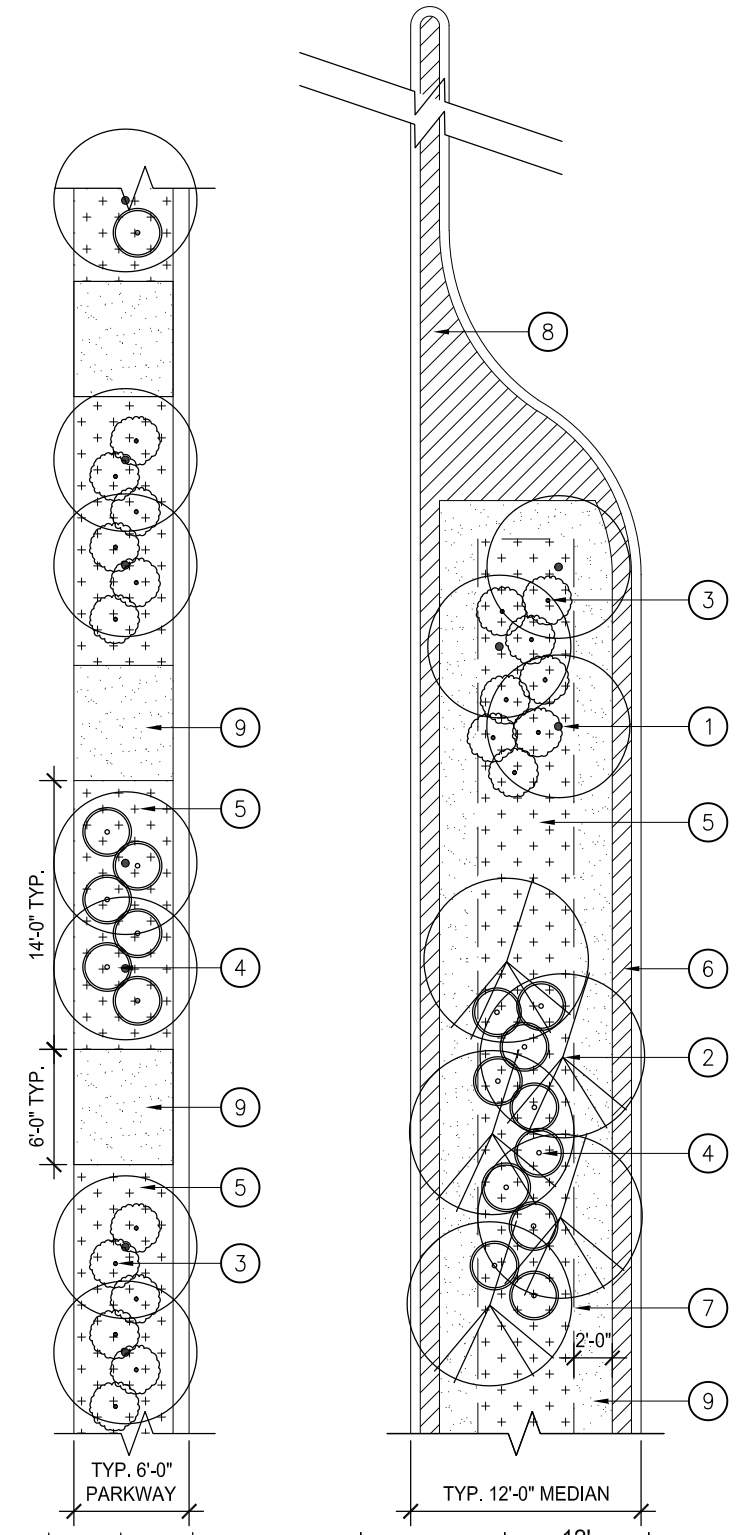
8/8/2023	BENCH INSTALLATION DETAIL	L-011
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER _____	SHEET 1 0F 1



BOULDERS BY SOUTHWEST BOULDER OR EQUAL.
TYPE & SIZE: SUBMIT FOR APPROVAL.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

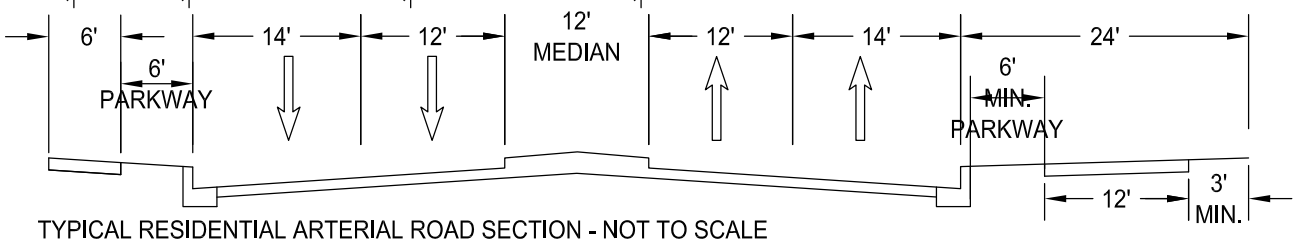
8/8/2023	BOULDER INSTALLATION DETAIL	L-012
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER _____	SHEET 1 0F 1



LEGEND:

1. DESIGNATED STREET TREE. REFER TO APPROVED PLANT PALETTE FOR SPECIES.
2. DESIGNATED STREET TREE. REFER TO APPROVED PLANT PALETTE FOR SPECIES.
3. DESIGNATED (XERISCAPE) ACCENT SHRUBS (INTERESTING FLOWER AND/OR FOLIAGE CHARACTERISTICS): REFER TO APPROVED PLANT PALETTE FOR SPECIES.
4. DESIGNATED (XERISCAPE) EVERGREEN BACKGROUND SHRUBS: REFER TO APPROVED PLANT PALETTE FOR SPECIES.
5. DESIGNATED (XERISCAPE) FLOWERING GROUNDCOVER/SHREDDED BARK MULCH: REFER TO APPROVED PLANT PALETTE FOR SPECIES.
6. 12" WIDE CONCRETE MAINTENANCE BAND.
7. SHRUB SETBACK ZONE (2'-0"). NO SHRUB FOLIAGE SHALL ENCROACH WITHIN THIS ZONE UPON FINAL SHRUB MATURITY. FOR ULTIMATE SHRUB SIZE: REFER TO SUNSET WESTERN GARDEN BOOK - LATEST EDITION.
8. CONCRETE "MEDIAN NOSE" (SOLID - NO PLANTERS).
9. STABILIZED DECOMPOSED GRANITE.

NOTE:
PROVIDE ROOT BARRIERS WHEREVER REQUIRED.
MEDIANS SHALL HAVE A 2% CROSS SLOPE TOWARDS CENTERLINE OF MEDIAN.

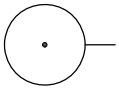
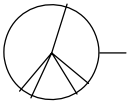
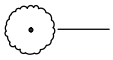
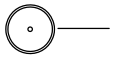
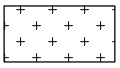
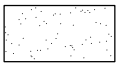


TYPICAL RESIDENTIAL ARTERIAL ROAD SECTION - NOT TO SCALE

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

8/9/2023	RESIDENTIAL ARTERIAL 12' MEDIANS - 2 TREE SPECIES	L-013
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER _____	SHEET 1 0F 1

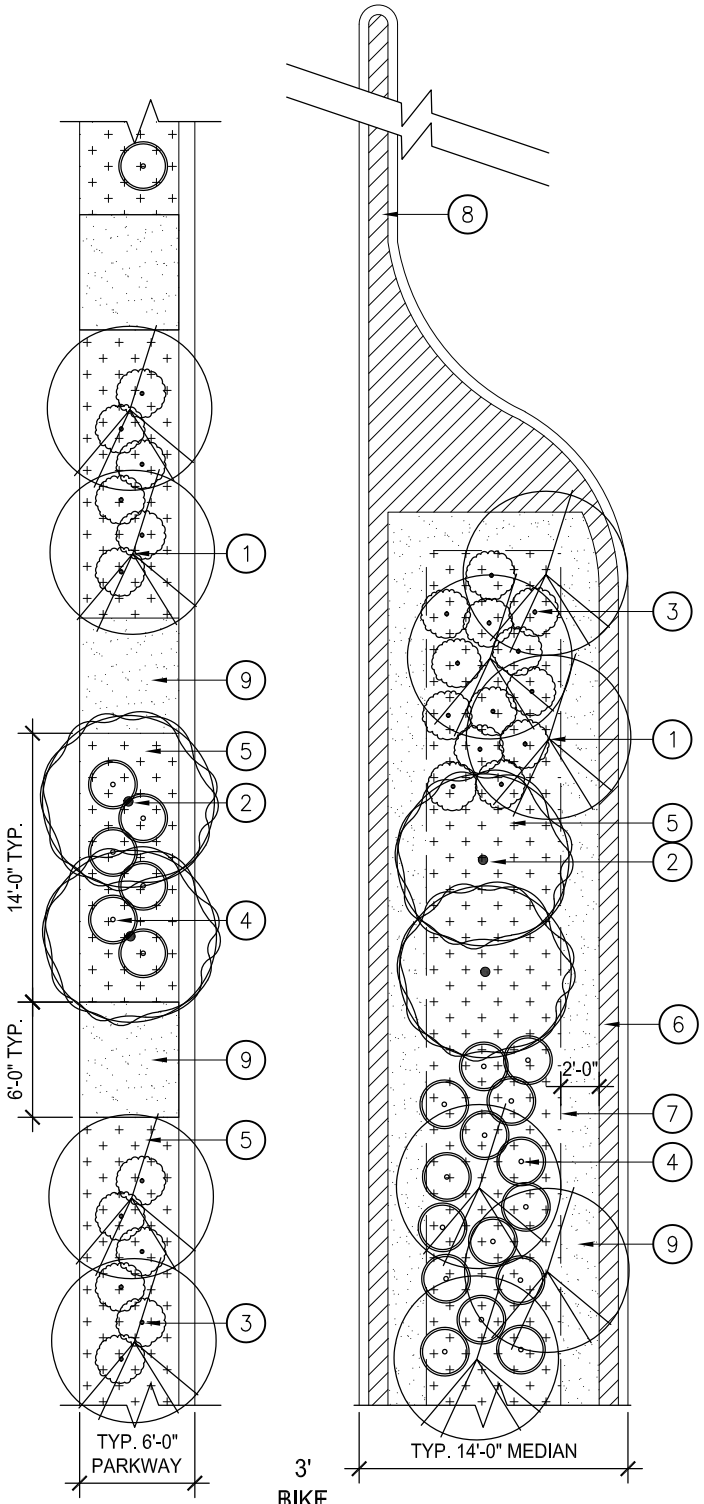
RESIDENTIAL ARTERIAL PLANTING LEGEND*:

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
DESIGNATED PARKWAY STREET TREE			
	LAGERSTROEMIA INDICA	CRAPE MYTRLE	24" BOX
	CHILOPSIS LINEARIS	DESERT WILLOW	24" BOX
RECOMMENDED MEDIAN STREET TREE			
	GEIJERA PARVIFLORA	AUSTRALIAN WILLOW	24" BOX
	LOPHOSTEMON CONFERTUS	TRISTANIA CONFERTA	24" BOX
SHRUBS			
	EPILOBIUM CALIFORNICUM 'CATALINA'	CALIFORNIA FUCHSIA	5 GAL
	CISTUS X PURPUREUS	ORCHID ROCK ROSE	5 GAL
	DASYLIRION WHEELERI	GREY DESERT SPOON	5 GAL
	OLEA EUROPAEA 'LITTLE OLLIE'	LITTLE OLLIE OLIVE	5 GAL
GROUNDCOVER			
	LANTANA CAMARA 'GOLD MOUND'	GOLD MOUND LANTANA	1 GAL
	TEUCRIUM COSSONII	CREEPING GERMANDER	1 GAL
	STABILIZED DECOMPOSED GRANITE		

*TWO OPTIONS ARE PROVIDED FOR EACH DESIGNATED PLANT SYMBOL.
REFER TO CITY'S APPROVED PLANT LIST FOR ADDITIONAL OPTIONS.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

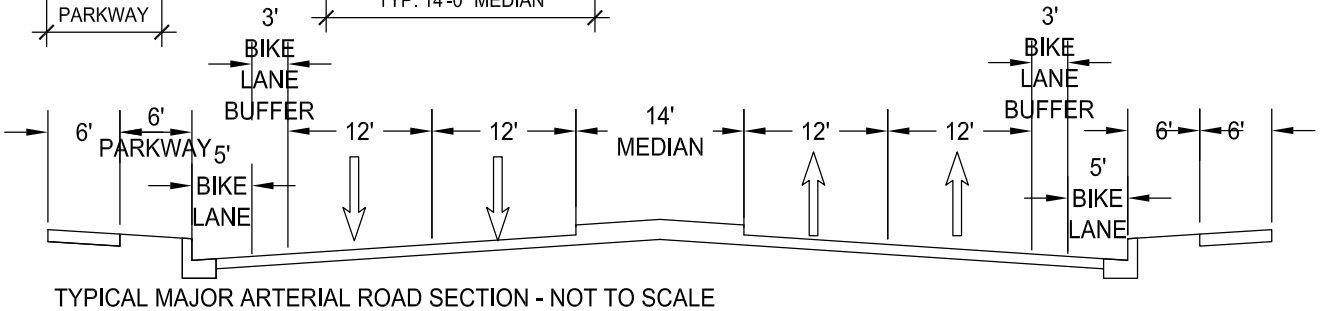
8/9/2023	RESIDENTIAL ARTERIAL 12' MEDIANS - PLANT PALETTE	L-014
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER	SHEET 1 0F 1



LEGEND:

1. DESIGNATED STREET TREE. REFER TO APPROVED PLANT PALETTE FOR SPECIES.
2. DESIGNATED STREET TREE. REFER TO APPROVED PLANT PALETTE FOR SPECIES.
3. DESIGNATED (XERISCAPE) ACCENT SHRUBS (INTERESTING FLOWER AND/OR FOLIAGE CHARACTERISTICS): REFER TO APPROVED PLANT PALETTE FOR SPECIES.
4. DESIGNATED (XERISCAPE) EVERGREEN BACKGROUND SHRUBS: REFER TO APPROVED PLANT PALETTE FOR SPECIES.
5. DESIGNATED (XERISCAPE) FLOWERING GROUNDCOVER/SHREDDED BARK MULCH: REFER TO APPROVED PLANT PALETTE FOR SPECIES.
6. 12" WIDE CONCRETE MAINTENANCE BAND.
7. SHRUB SETBACK ZONE (2'-0"). NO SHRUB FOLIAGE SHALL ENCROACH WITHIN THIS ZONE UPON FINAL SHRUB MATURITY. FOR ULTIMATE SHRUB SIZE: REFER TO SUNSET WESTERN GARDEN BOOK - LATEST EDITION.
8. CONCRETE "MEDIAN NOSE" (SOLID - NO PLANTERS).
9. STABILIZED DECOMPOSED GRANITE.

NOTE:
PROVIDE ROOT BARRIERS WHEREVER REQUIRED. MEDIANS SHALL HAVE A 2% CROSS SLOPE TOWARDS CENTERLINE OF MEDIAN.

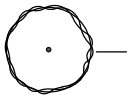
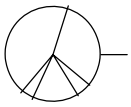
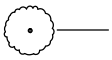
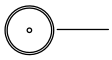
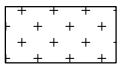
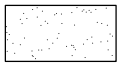


TYPICAL MAJOR ARTERIAL ROAD SECTION - NOT TO SCALE

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

8/9/2023	MAJOR ARTERIAL 14' MEDIANS - 2 TREE SPECIES	L-015
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER _____	SHEET 1 0F 1

MAJOR ARTERIAL PLANTING LEGEND*:

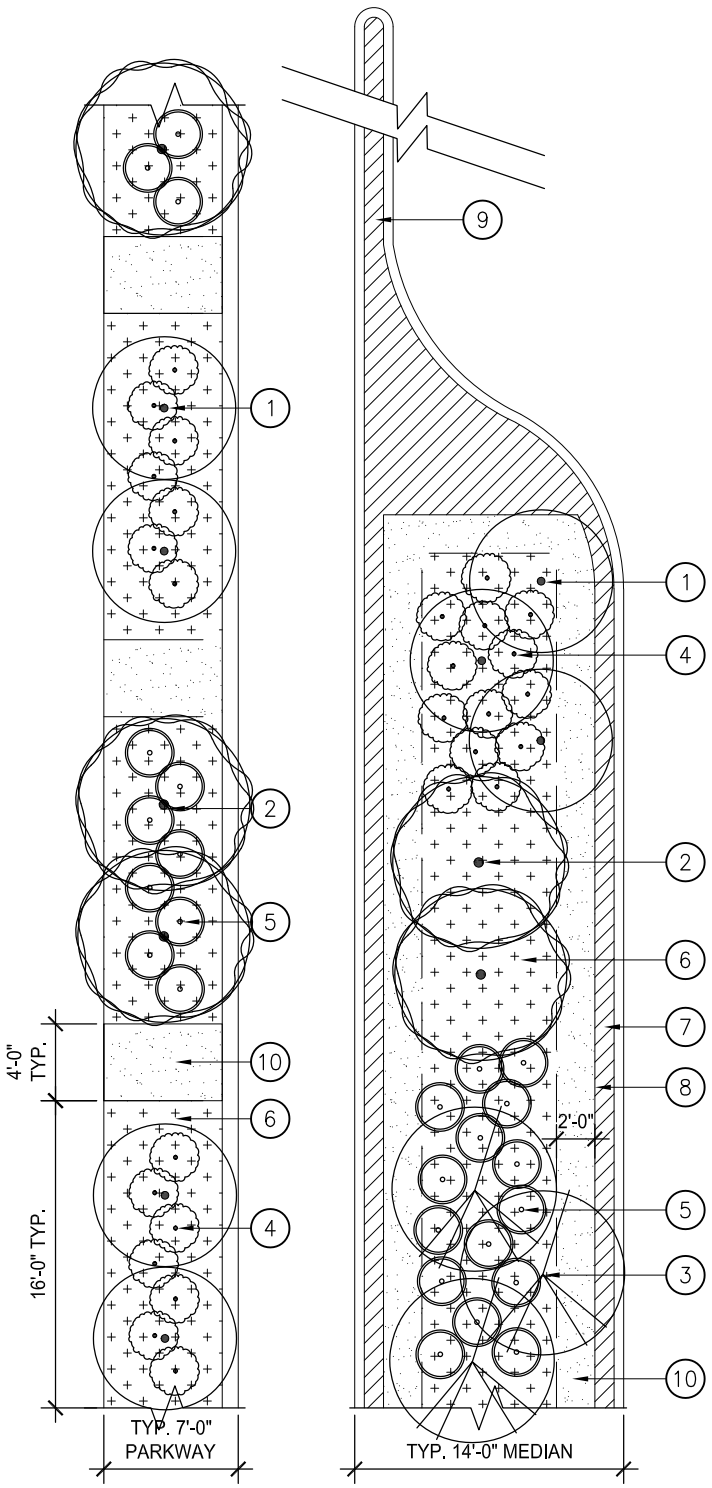
SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
DESIGNATED PARKWAY STREET TREE			
	ACACIA SALICINA	WILLOW ACACIA	24" BOX
	CHITALPA TASHKENTENSIS 'PINK DAWN'	'PINK DAWN' CHITALPA	24" BOX
RECOMMENDED MEDIAN STREET TREE			
	GEIJERA PARVIFLORA	AUSTRALIAN WILLOW	24" BOX
	LOPHOSTEMON CONFERTUS	TRISTANIA CONFERTA	24" BOX
SHRUBS			
	EPILOBIUM CALIFORNICUM 'CATALINA'	CALIFORNIA FUCHSIA	5 GAL
	CISTUS X PURPUREUS	ORCHID ROCK ROSE	5 GAL
	DASYLIRION WHEELERI	GREY DESERT SPOON	5 GAL
	OLEA EUROPAEA 'LITTLE OLLIE'	LITTLE OLLIE OLIVE	5 GAL
GROUNDCOVER			
	LANTANA CAMARA 'GOLD MOUND'	GOLD MOUND LANTANA	1 GAL
	TEUCRIUM COSSONII	CREEPING GERMANDER	1 GAL
	STABILIZED DECOMPOSED GRANITE		

*TWO OPTIONS ARE PROVIDED FOR EACH DESIGNATED PLANT SYMBOL. REFER TO CITY'S APPROVED PLANT LIST FOR ADDITIONAL OPTIONS.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

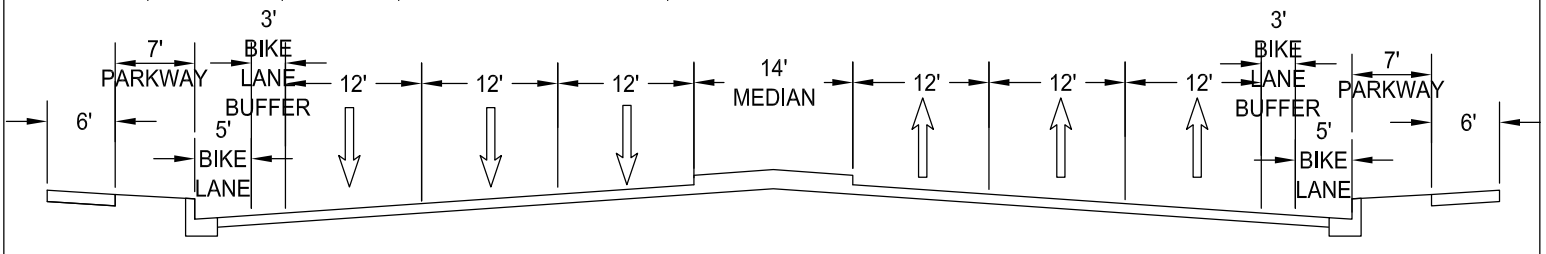
8/9/2023	MAJOR ARTERIAL 14' MEDIANS - PLANT PALETTE	L-016
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER _____	SHEET 1 0F 1



LEGEND:

1. DESIGNATED STREET TREE. REFER TO APPROVED PLANT PALETTE FOR SPECIES.
2. DESIGNATED STREET TREE. REFER TO APPROVED PLANT PALETTE FOR SPECIES.
3. DESIGNATED STREET TREE. REFER TO APPROVED PLANT PALETTE FOR SPECIES.
4. DESIGNATED (XERISCAPE) ACCENT SHRUBS (INTERESTING FLOWER AND/OR FOLIAGE CHARACTERISTICS): REFER TO APPROVED PLANT PALETTE FOR SPECIES.
5. DESIGNATED (XERISCAPE) EVERGREEN BACKGROUND SHRUBS: REFER TO APPROVED PLANT PALETTE FOR SPECIES.
6. DESIGNATED (XERISCAPE) FLOWERING GROUNDCOVER/SHREDDED BARK MULCH: REFER TO APPROVED PLANT PALETTE FOR SPECIES.
7. 12" WIDE CONCRETE MAINTENANCE BAND.
8. SHRUB SETBACK ZONE (2'-0"). NO SHRUB FOLIAGE SHALL ENCROACH WITHIN THIS ZONE UPON FINAL SHRUB MATURITY. FOR ULTIMATE SHRUB SIZE: REFER TO SUNSET WESTERN GARDEN BOOK - LATEST EDITION.
9. CONCRETE "MEDIAN NOSE" (SOLID - NO PLANTERS).
10. STABILIZED DECOMPOSED GRANITE.

NOTE:
PROVIDE ROOT BARRIERS WHEREVER REQUIRED.
MEDIANS SHALL HAVE A 2% CROSS SLOPE TOWARDS CENTERLINE OF MEDIAN.

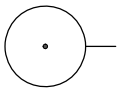
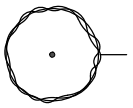
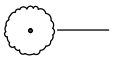
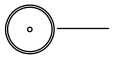
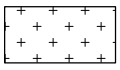
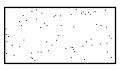


TYPICAL SUPER ARTERIAL ROAD SECTION - NOT TO SCALE

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

8/29/2022	SUPER ARTERIAL 14' MEDIANS - 3 TREE SPECIES	L-017
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER _____	SHEET 1 0F 1

SUPER ARTERIAL PLANTING LEGEND*:

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
DESIGNATED PARKWAY STREET TREE			
	LAGERSTROEMIA INDICA	CRAPE MYTRLE	24" BOX
	CHILOPSIS LINEARIS	DESERT WILLOW	24" BOX
RECOMMENDED MEDIAN STREET TREE			
	TABEBUIA IMPETIGINOSA	PINK TRUMPET TREE	24" BOX
	SCHINUS MOLLE	CALIFORNIA PEPPER TREE	24" BOX
SHRUBS			
	EPILOBIUM CALIFORNICUM 'CATALINA'	CALIFORNIA FUCHSIA	5 GAL
	CISTUS X PURPUREUS	ORCHID ROCK ROSE	5 GAL
	DASYLIRION WHEELERI	GREY DESERT SPOON	5 GAL
	OLEA EUROPAEA 'LITTLE OLLIE'	LITTLE OLLIE OLIVE	5 GAL
GROUNDCOVER			
	LANTANA CAMARA 'GOLD MOUND'	GOLD MOUND LANTANA	1 GAL
	TEUCRIUM COSSONII	CREEPING GERMANDER	1 GAL
	STABILIZED DECOMPOSED GRANITE		

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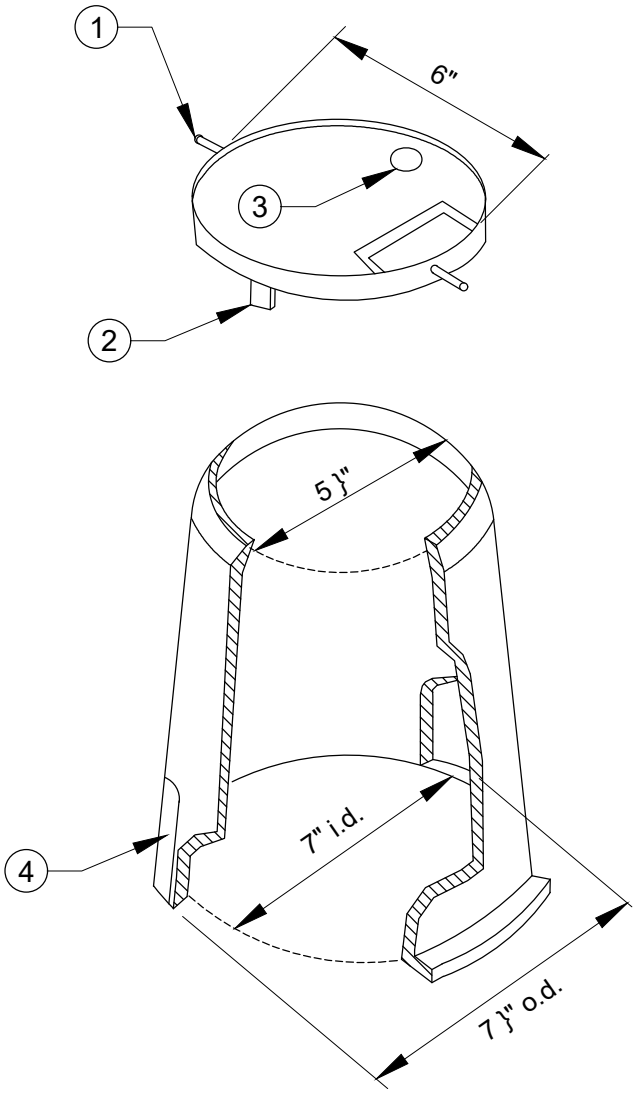
CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

8/29/2022	SUPER ARTERIAL 14' MEDIANS - PLANT PALETTE	L-018
NOT TO SCALE	APPROVED BY: BRIAN GENGLER, CITY ENGINEER _____	SHEET 1 0F 1

REPAIR STANDARD DETAILS

NOT AN OPTION (FOR REPAIR ONLY OF EXISTING SYSTEMS).



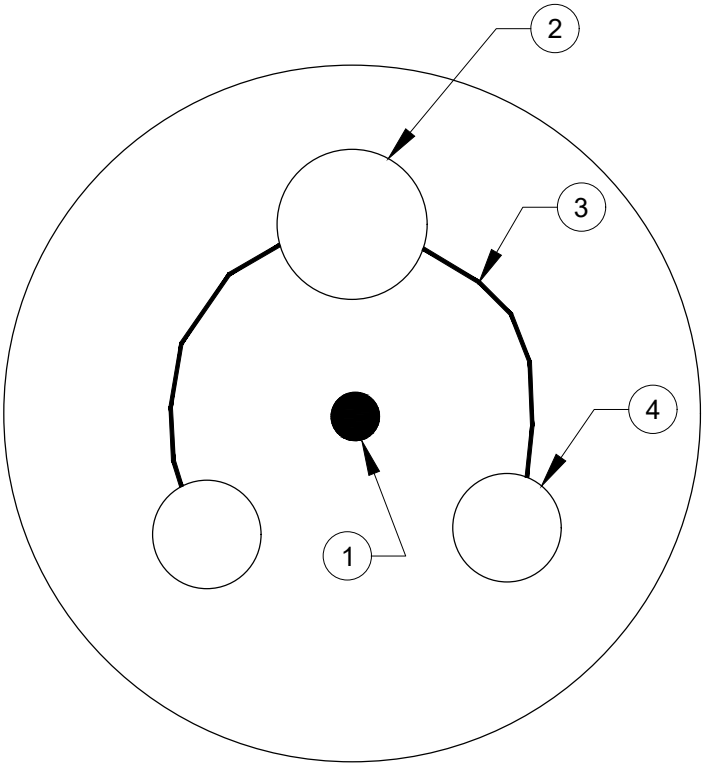
1. Location of #8 screws (see note)
2. "Snap- lock" tab
3. Cover lift hole
4. 2" x 2" pipe slots (2 places)

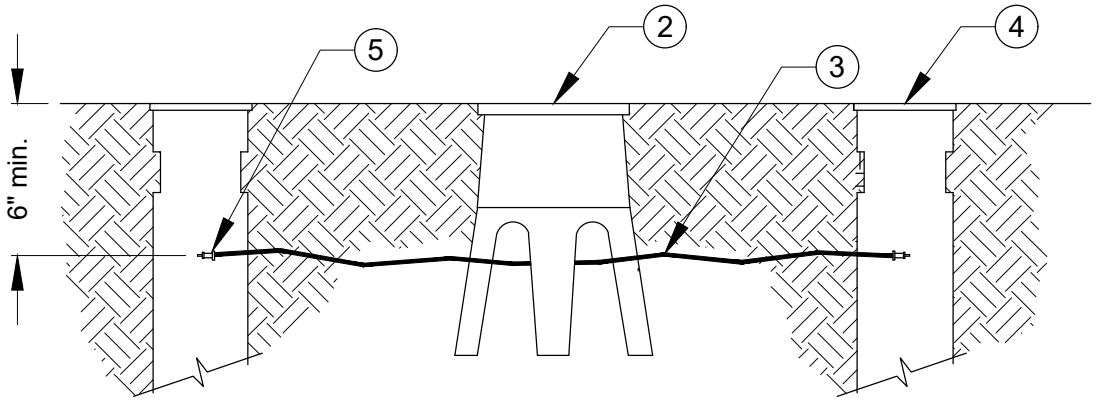
Notes:
1. Use brooks xx series or equal
2. Spanner screw $\frac{3}{8}$" x 2", anti- theft.
3. Cover st. - 5 oz.
4. Body wt. 1 lb. 6 oz

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	SMALL COVER BOX DETAIL	R-01
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1

NOT AN OPTION (FOR REPAIR ONLY OF EXISTING SYSTEMS).
CITY NO LONGER ALLOWS DRIP SYSTEMS.





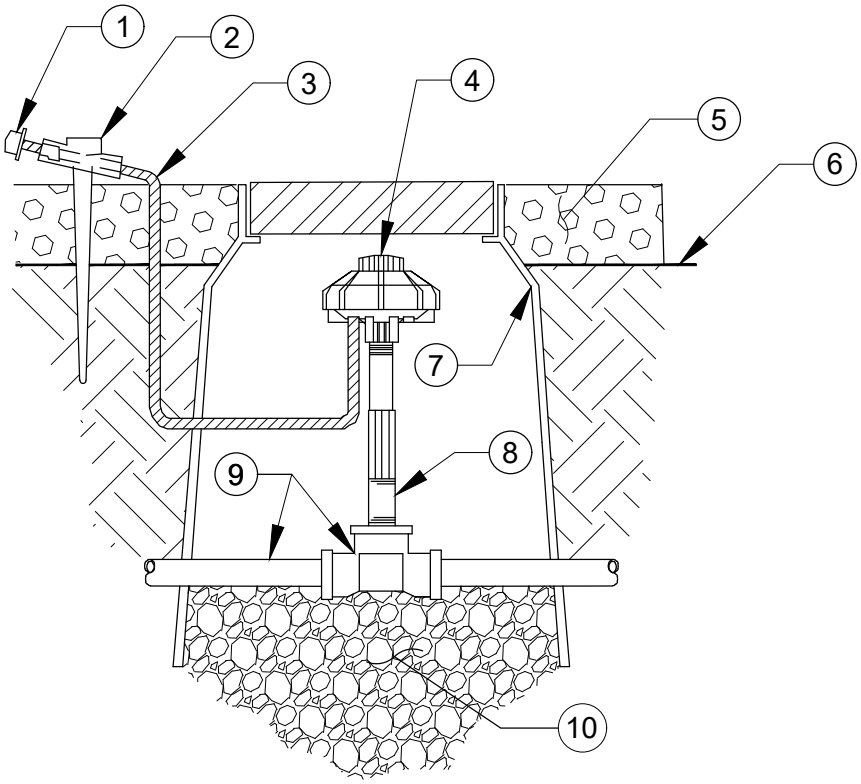
1. Tree
2. Emitter within brooks 70 series box
3. 1/4" distribution tubing
4. 4" perforated pcv pipe (typ.)
5. Diffuser bug cap (typ.)

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

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	DRIP DISTRIBUTION DETAIL	R-02
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1

NOT AN OPTION (FOR REPAIR ONLY OF EXISTING SYSTEMS).

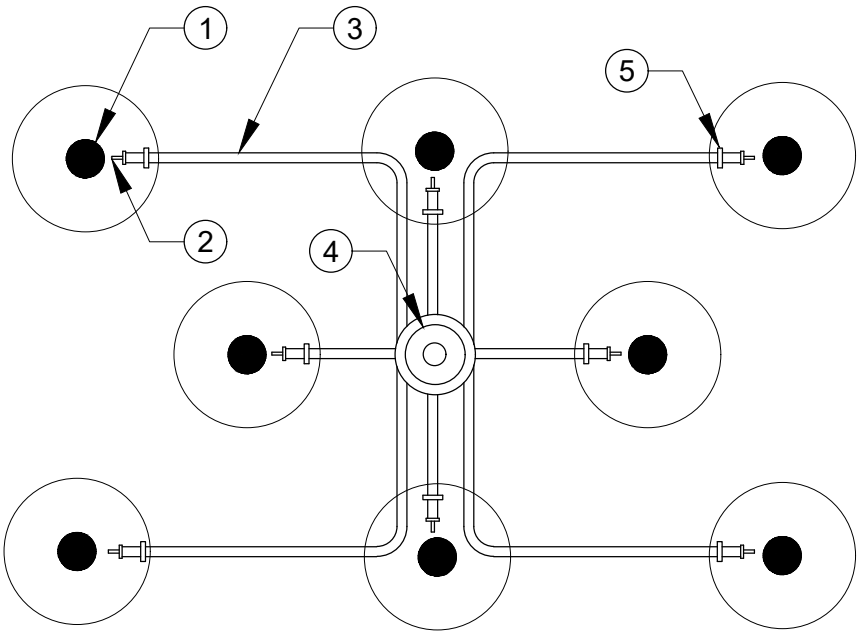


1. Difuser bug cap
2. 1/4" Tubing stake
3. 1/4" distribution tubing max. length not exceed 20 feet
4. Xeri-bird 8 (see irr. legend for gph/port)
5. Mulch bed 3"
6. Finish grade
7. Emitter box (Brooks 70 series)
8. PVC sch 80 riser (length as required)
9. PVC sch 40 pipe and sch. 80 fitting (12" cover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

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	8 PORT EMITTER IN BOX DETAIL	R-03
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1

NOT AN OPTION (FOR REPAIR ONLY OF EXISTING SYSTEMS).



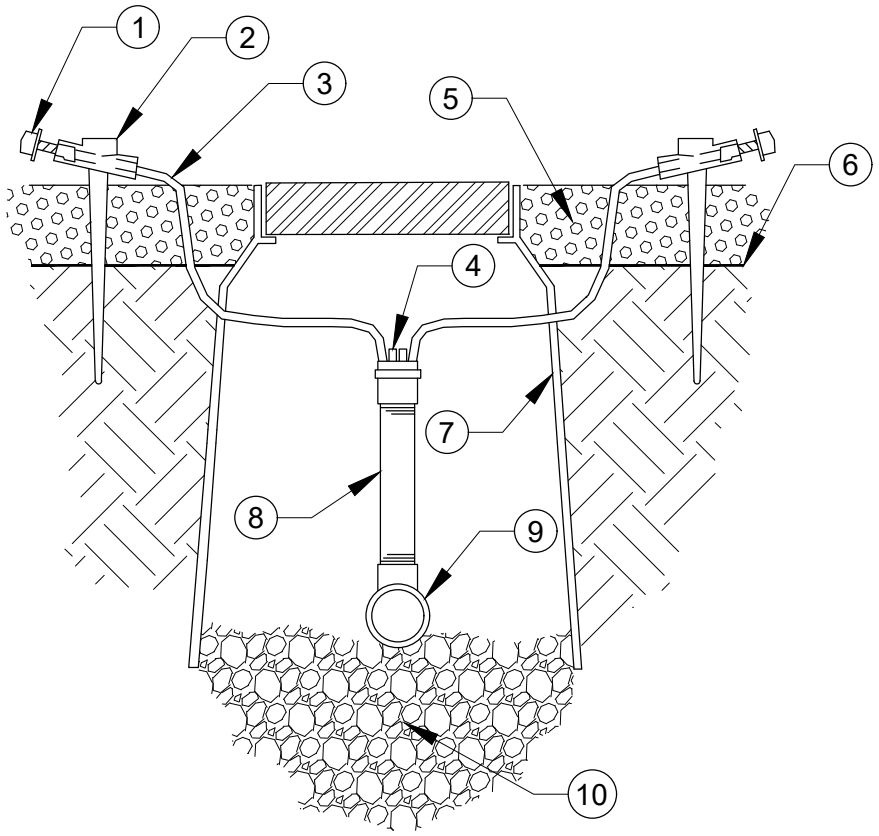
PLAN VIEW

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

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	8 PORT EMITTER LAYOUT DETAIL	R-04
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1

NOT AN OPTION (FOR REPAIR ONLY OF EXISTING SYSTEMS).

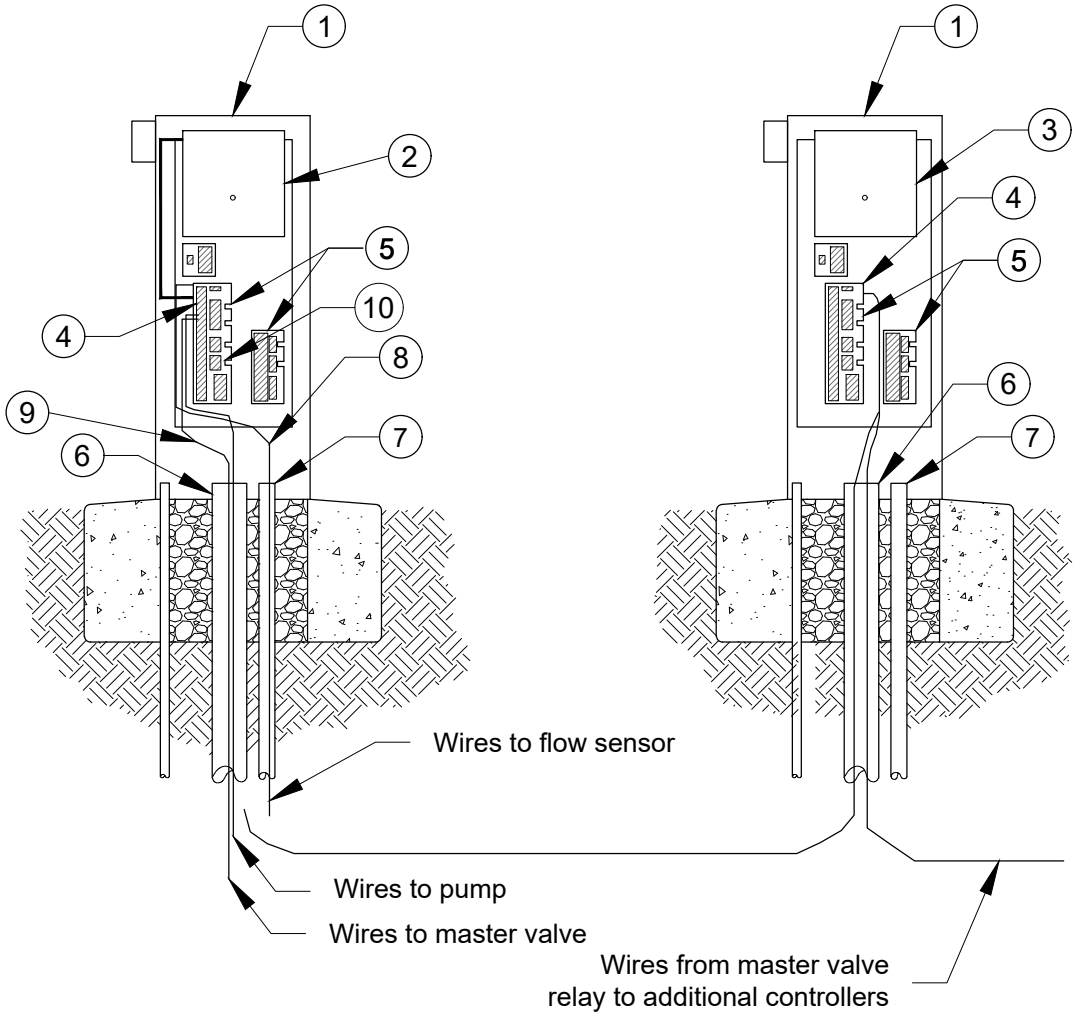


1. Diffuser bug cap
2. 1/4" Tubing stake
3. 1/4" distribution tubing max. length not exceed 20 feet
4. Multi-outlet xeri-bug emitter
5. Mulch bed 3"
6. Finish grade
7. Emitter box (Brooks 30 series)
8. PVC sch 80 riser (length as required)
9. PVC sch 40 pipe and sch. 80 fitting (12" cover min.)
10. 3/4"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

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	MULTI-OUTLET EMITTER IN BOX DETAIL	R-05
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1

NOT AN OPTION (FOR REPAIR ONLY OF EXISTING SYSTEMS).

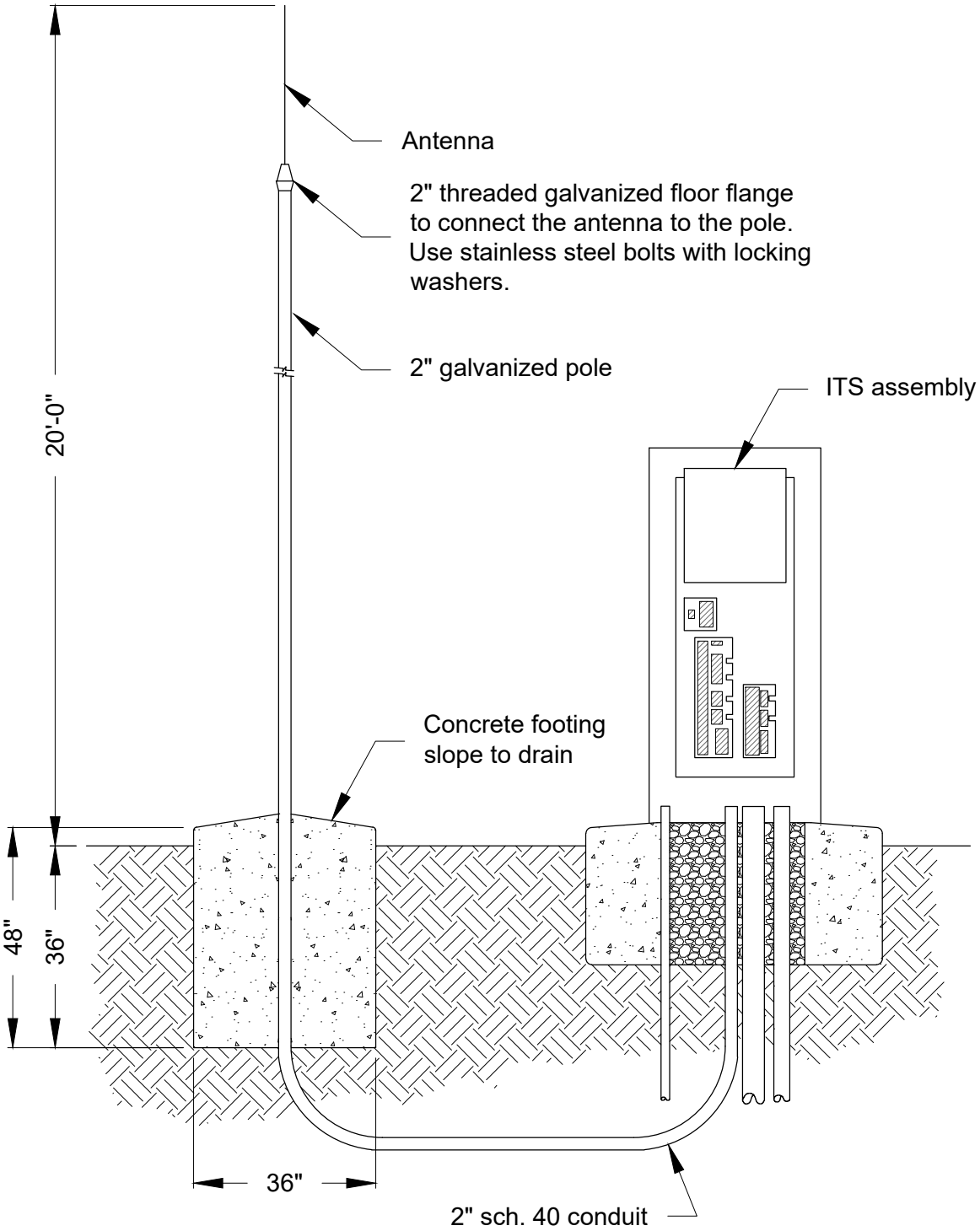


1. Imperial assemblies 18" front entry satellite assembly NEMA 3R rain proof enclosure (UL listed)
2. Controller 1 &/or 2
3. Controller 3 &/or 4
4. Master valve relay assembly or pump start relay assembly (optional)
5. Terminal board
6. PVC conduit for control wires, size as required.
7. 1" PVC conduit 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 - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	MASTER VALVE-FLOW SENSOR, PUMP START, & RAIN SENSOR FOR MULTIPLE CONTROLLERS (CENTRAL CONTROL)	R-06
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1

NOT AN OPTION (FOR REPAIR ONLY OF EXISTING SYSTEMS).

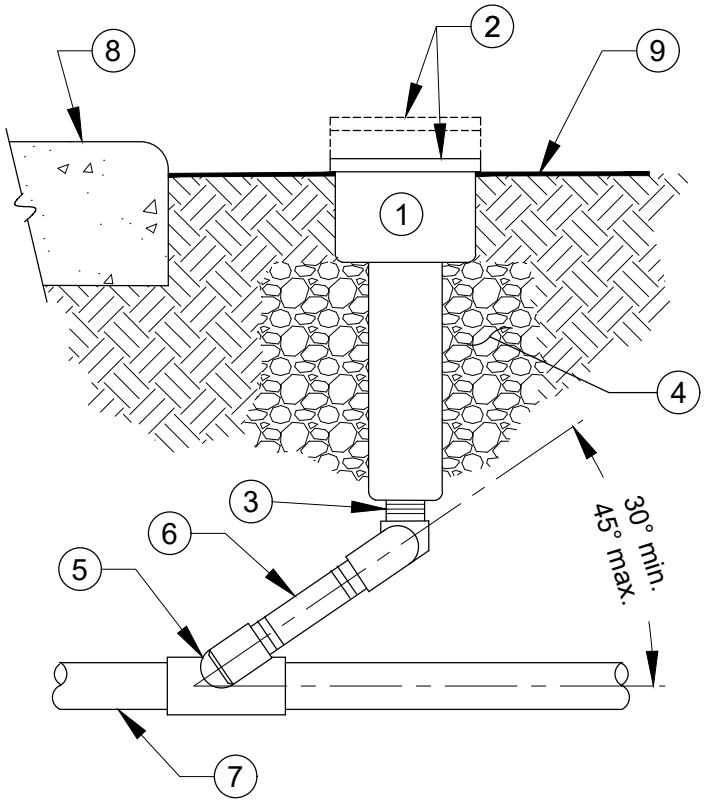


CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT

LANDSCAPING STANDARD DETAILS

4/9/2024	OMNI ANTENNA ON POLE	R-07
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1

NOT AN OPTION (FOR REPAIR ONLY OF EXISTING SYSTEMS).



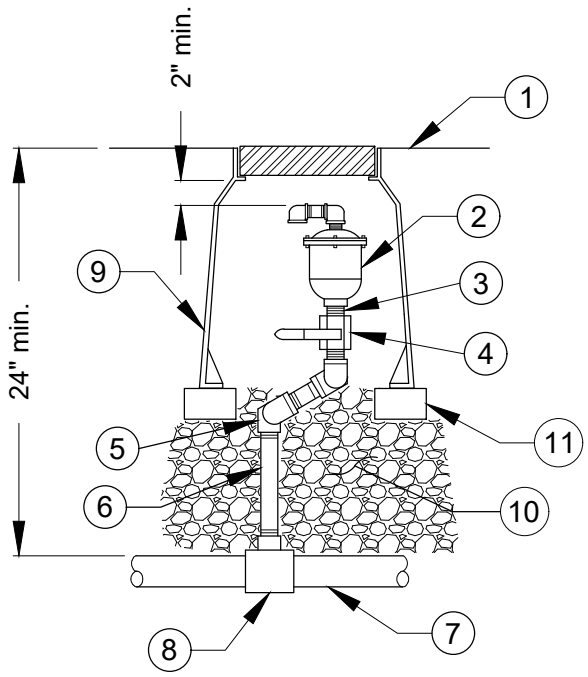
1. Pop up rotor head
2. Install 3" above grade in seeded areas or flush with grade in established turf areas.
3. Fabricate with:
   (3) Street ell
   (1) 12" L. nipple (sch 80)
4. S x S x T tee or ell (pvc sch. 80)
5. Lateral line
6. Walk, curb, paving or other improvement
7. Finish grade includes 3" 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. 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.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	POP-UP ROTOR (LARGE RADIUS THROW)	R-08
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1

NOT AN OPTION (FOR REPAIR ONLY OF EXISTING SYSTEMS).



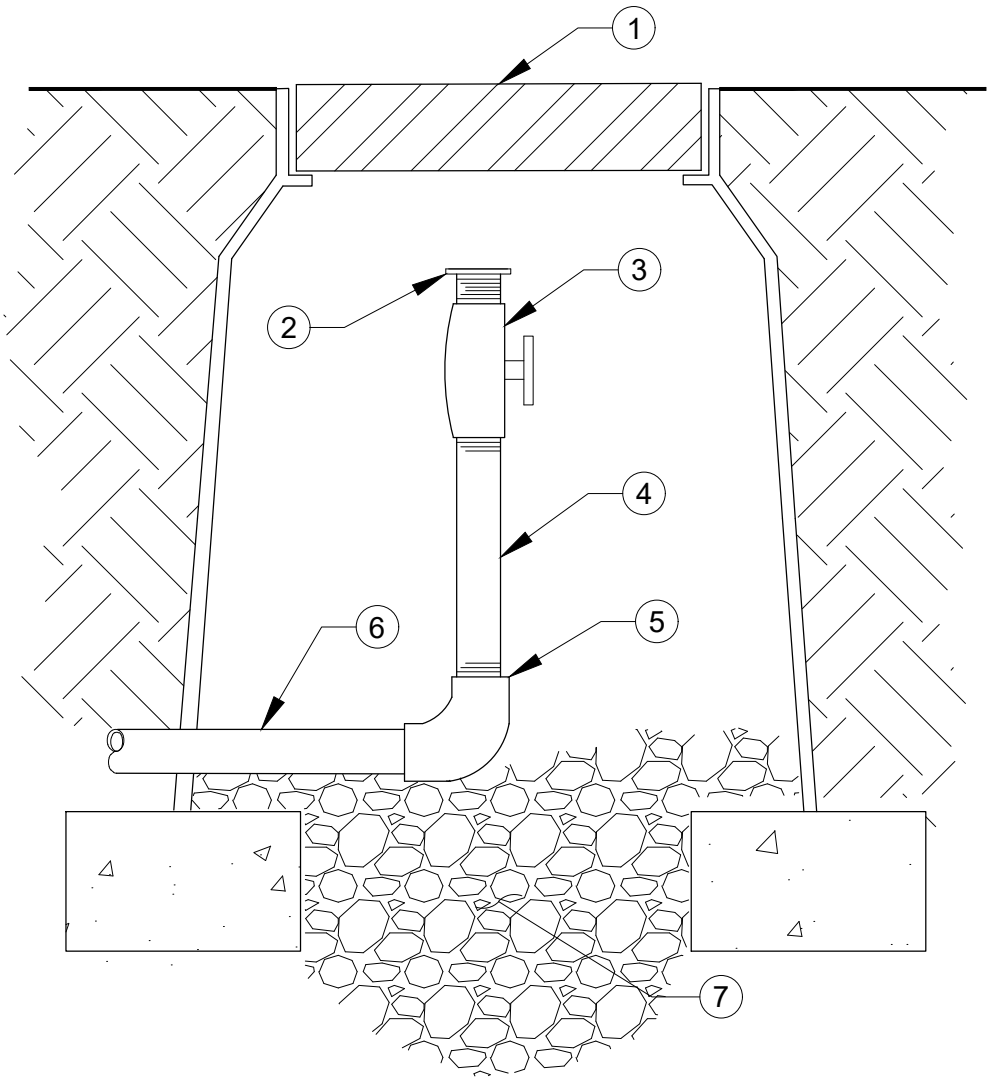
1. Finish grade includes 3" of mulch
2. Combination air valve (cav) with vent drain (galvanized)
3. (2) 2" x 3" L. galvanized steel nipples
4. 2" ball valve (full flow)
5. 2" galvanized steel swing joint 2" includes:
   (4) 90° threaded elbows
   (4) 2" x 4" L threaded nipples
   (2) 2" x 8" L threaded nipples
6. Galvanized steel nipple (length as req'd.)
7. PVC mainline pipe
8. Mainline fitting (ductile iron) tapped coupling or service saddle.
9. Valve box (standard round box with locking lid, install flush to grade. Hot brand lid "CAV"
10. 3/4" crushed rock or gravel install 12"deep
11. 2" red brick at corner

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.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	COMBINATION AIR VALVE	R-09
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1

NOT AN OPTION (FOR REPAIR ONLY OF EXISTING SYSTEMS).

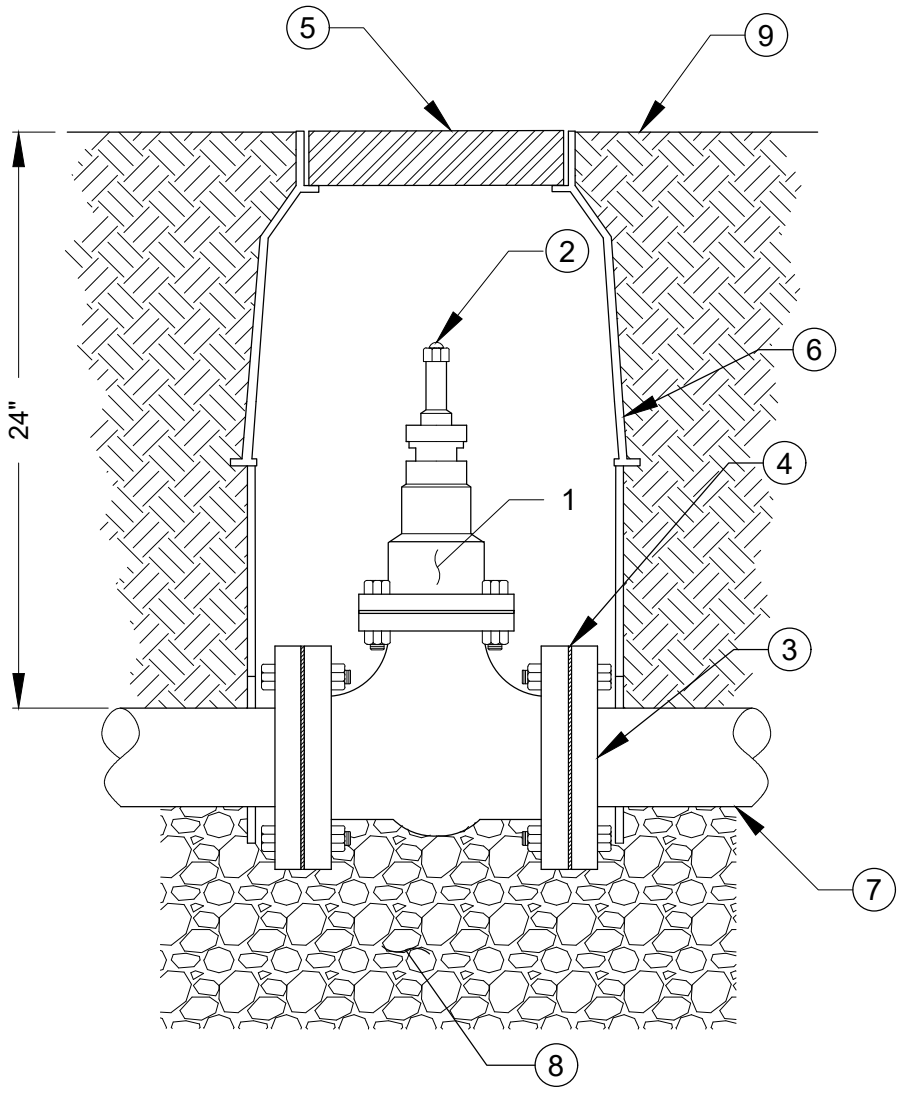


1. Brook 1110 10' round locking valve box. Hot brand lid "FV"
2. Brass hose adapter
3. Flush valve
4. PVC sch. 80 nipple
5. PVC sch. 80 ells s x t
6. PVC sch. 40 lateral main line
7. 3/4" dia. gravel

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	FLUSH VALVE DETAIL	R-10
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1

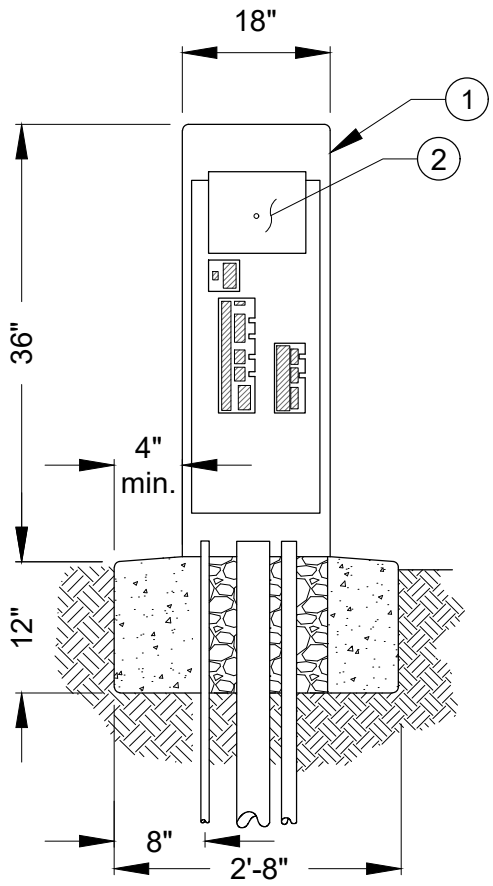
NOT AN OPTION (FOR REPAIR ONLY OF EXISTING SYSTEMS).



1. Gate Valve
2. 2" square operating nut
3. Companion flange (line size)
4. Companion flange gasket (line size)
5. Round valve box with locking cover, install flush with grade. Hot brand lid "GV"
6. 6" pvc sch. 40 pipe extension (length as required) keep inside free of debris.
7. PVC mainline 4" or larger
8. 3/4" pea gravel (two c.f. min.)
9. Finish grade includes 3" of mulch

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	FLANGED GATE VALVE (4" OR LARGER)	R-11
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1



(1) Existing controller assembly rainproof enclosure (UL listed)

(2) **ET Water - 50 Pin Retrofit Panel for Rain Bird ESP Controllers** (see attached installation instructions)

* 110V power to be turned off

* Contractor shall remove exisitng Rain Bird ESP style panel fade-plate and disconnect 50 pin connector from output board.

* Install provided brackets

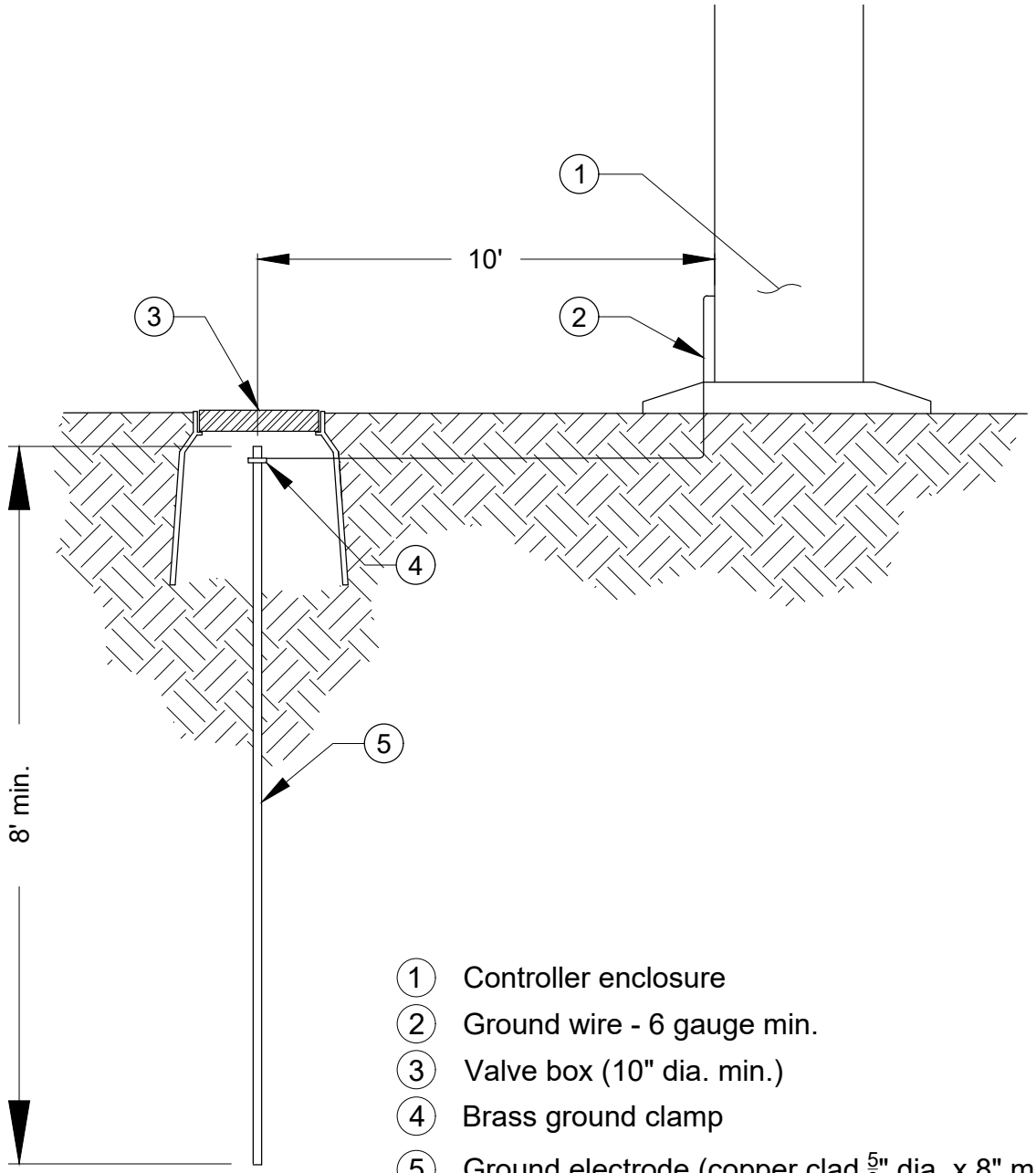
* Install 50 pin ET Water faceplate and connect ribbon cable to exisitng Rain Bird output board.

* Install dome type antenna to enclosure and connect to new ET Water faceplate

* Activate system per instructions

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	RAINBIRD CONTROLLER REPLACEMENT	R-12
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1

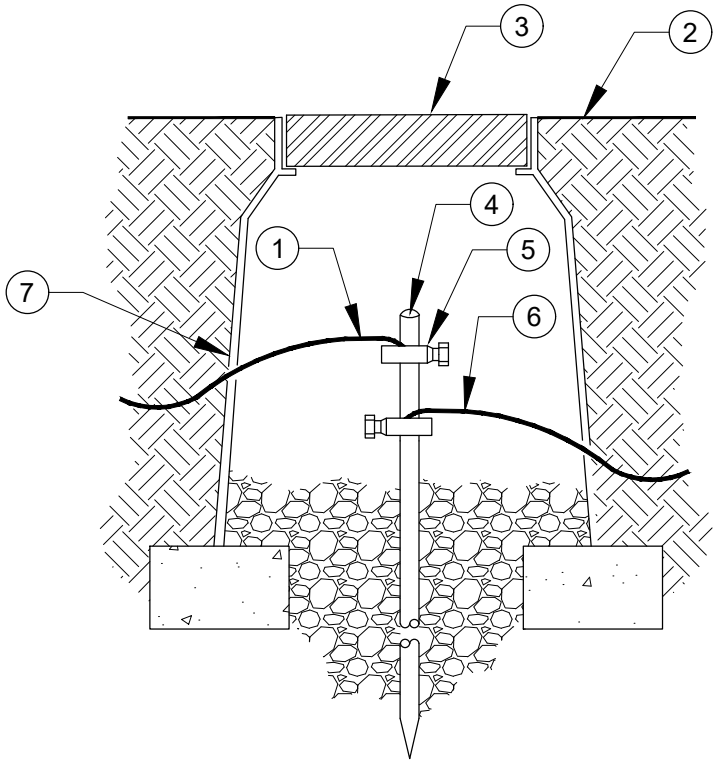


1. Controller enclosure
2. Ground wire - 6 gauge min.
3. Valve box (10" dia. min.)
4. Brass ground clamp
5. Ground electrode (copper clad $\frac{5}{8}$" dia. x 8" min. rod) minimum 10' from control panel

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.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	MINIMUM GROUNDING REQUIREMENTS	R-13
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER_____	SHEET 1 0F 1



1. #6 bare copper wire from previous rod in grid
2. Finish grade includes 3" of mulch
3. Standard valve box with cover, hot brand lid "GR".
4. Grounding rod from GK-UL3ROD three rod kit
5. Brass clamp (1 of 2)
6. #6 bare copper wire to next rod in grid
7. Valve box (10" diam. min.) See Specification Booklet page 20.

NOTE: See grounding rod notes for installation instructions.

CITY OF VICTORVILLE - PUBLIC WORKS DEPARTMENT
LANDSCAPING STANDARD DETAILS

4/9/2024	GROUNDING WIRES IN BOX DETAIL	R-14
NOT TO SCALE	APPROVED BY: FREDY A. BONILLA, CITY ENGINEER	SHEET 1 0F 1

Appendix C

Preferred Plant Palette

Victorville Water District Water-wise Plant Coverage List

Water-wise Plants means plants that perform well in the District's service area and have been selected according to their ability to withstand the extreme hot/cold desert climate and fluctuating temperatures; adaptability to drought conditions; and ability to survive once established with a limited amount of supplemental water.

Many factors determine whether a Water-wise Plant will adapt or perform well, and even though a plant appears on the WWP List, there is no assurance it will adapt or thrive. Therefore, from time to time, the General Manager or his/her designee will amend the WWP List as necessary to add or remove plants.

The Water-wise plant list is a tool for use whether designing a new landscape or converting from traditional turf to a desert wise water efficient landscape. The plant canopy coverage is derived mathematically by multiplying the mature diameter of the plant by a formula to provide the square footage number. Determining the mature width of plants can be tricky. It may take many years or even decades for a plant to reach its ultimate width.

Check out our new Plant Data Base for additional resources on selecting Desert-friendly Plants for Victorville Landscapes by visiting www.victorvilleca.gov/waterconservation/ then scrolling to information.

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Plant Type: Tree								
Mulga Acacia	*Acacia*	*aneura*				20	20	**314**
Guijillo	*Acacia*	*berlandieri*				15	12	**113**
White Thorn Acacia	*Acacia*	*constricta*				10	15	**177**
Leatherleaf Acacia	*Acacia*	*craspedocarpa*				10	8	**50**
Sweet Acacia	*Acacia*	*farnesiana*			*(Acacia smallii,A. minuta)*	25	20	**314**
Cat-claw Acacia	*Acacia*	*greggii*				15	12	**113**
Weeping Acacia	*Acacia*	*pendula*				40	25	**368**
Blackbrush Acacia	*Acacia*	*rigidula*				12	15	**177**
Willow Acacia	*Acacia*	*salicina*				30	20	**314**
Blue Leaf Wattle	*Acacia*	*saligna*				20	20	**314**
Twisted Acacia	*Acacia*	*schaffneri*				20	25	**368**
Shoestring Acacia	*Acacia*	*stenophylla*				30	20	**314**
Palo Blanco	*Acacia*	*willardiana*				20	10	**79**
Silk Tree	*Albizia*	*julibrissin*				40	40	**1,257**
Hong Kong Orchid Tree	*Bauhinia*	*blakeana*				20	20	**314**
White Orchid Tree	*Bauhinia*	*lunarioides*				8	6	**28**
Purple Orchid Tree	*Bauhinia*	*variegata*				25	30	**707**
Bismarck Palm	*Bismarckia*	*nobilis*				30	10	**314**
Bottle Tree	*Brachychiton*	*populneus*				50	20	**314**

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Mexican Blue Palm	*Brahea*	*armata*				15	10	**79**
Pindo Palm	*Butia*	*capitata*				20	20	**314**
Cascalote	*Caesalpinia*	*cacalaco*				15	15	**177**
Weeping Bottle Brush	*Callistemon*	*viminalis*				30	15	**177**
Blue Atlas Cedar	*Cedrus*	*atlantica*		'Glauca'		60	30	**707**
Cedar	*Cedrus*	*deodora*				80	40	**1,257**
Canyon Hackberry	*Celtis*	*reticulata*				25	25	**368**
Chinese Hackberry	*Celtis*	*sinensis*				40	40	**1,257**
Carob Tree	*Ceratonia*	*siliqua*				40	40	**1,257**
Western Redbud	*Cercis*	*occidentalis*				15	15	**177**
Mediterranean Fan Palm	*Chamaerops*	*humilis*				10	8	**50**
Desert Willow	*Chilopsis*	*linearis*				25	20	**314**
Chitalpa	*Chitalpa*	*x tashkentensis*				25	30	**707**
Silk floss Tree, Kapok	*Chorisia*	*speciosa*				40	30	**707**
Smoke Tree	*Cotinus*	*coggygria*				15	15	**177**
Arizona Cypress	*Cupressus*	*arizonica*				40	20	**314**
Italian Cypress	*Cupressus*	*sempervirens*				60	8	**50**
Indian Rosewood	*Dalbergia*	*sisso*				40	30	**707**
Texas Ebony	*Ebenopsis*	*ebano*			*(Pithecellobium flexicaule)*	20	20	**314**
Loquat	*Eriobotyra*	*japonica*				15	15	**177**
Argyle Apple, Silver Dollar Gum	*Eucalyptus*	*cinerea*				25	25	**368**
Coolibah	*Eucalyptus*	*microtheca*				35	25	**368**
Ghost Gum, Blue Ghost Eucalyptus	*Eucalyptus*	*papuana*				30	30	**707**
Silver Dollar Gum	*Eucalyptus*	*polyanthemos*				35	25	**368**
Swamp Mallee	*Eucalyptus*	*spathulata*				25	30	**707**
Kidneywood	*Eysenhardtia*	*orthocarpa*				15	10	**79**
Fig Tree	*Ficus*	*carica*				20	20	**314**
Desert Olive	*Forestiera*	*neomexicana*				12	8	**50**
Littleleaf Ash	*Fraxinus*	*greggii*				10	8	**50**
Raywood Ash	*Fraxinus*	*oxycarpa*		'Raywood'		30	25	**368**
Majestic Beauty Ash	*Fraxinus*	*uhdei*		Majestic Beauty'		60	50	**1,963**
Arizona Ash	*Fraxinus*	*velutina*				25	30	**707**
Modesto Ash	*Fraxinus*	*velutina*		'Modesto'		50	40	**1,257**
Australian Willow	*Geijera*	*parviflora*				25	20	**314**

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Maidenhair Tree	*Ginkgo*	*biloba*				50	40	**1,257**
Honey Locust	*Gleditsia*	*triacanthos inermis*				50	35	**962**
Mexican Ebony	*Havardia*	*mexicana*			*(Pithecellobium mexicanum)*	30	30	**707**
Jacaranda	*Jacaranda*	*mimosifolia*			*(Jacaranda acutifolia)*	40	30	**707**
Goldenrain Tree	*Koereuteria*	*paniculata*				35	35	**962**
Crape Myrtle	*Lagerstroemia*	*indica*				25	20	**314**
Sweet Gum, Liquid Amber Tree	*Liquidambar*	*styraciflua*				60	25	**368**
Feather Tree	*Lysiloma*	*watsonii*	var. *thornberi*		*(Lysiloma microphylla* var. *thornberi)*	20	15	**177**
Crabapple	*Malus*			x 'Prairifire'		20	20	**314**
Cajeput Tree	*Melaleuca*	*quinquenervia*				20	15	**177**
Fruitless Olive	*Olea*	*europaea*				25	30	**707**
Ironwood	*Olneya*	*tesota*				25	30	**707**
Blue Palo Verde	*Parkinsonia*	*florida*			*(Cercidium floridum)*	30	30	**707**
Hybrid Palo Verde	*Parkinsonia*			'Desert Museum'	*(Cercidium hybrid)*	25	25	**368**
Foothills Palo Verde	*Parkinsonia*	*microphylla*			*(Cercidium microphyllum)*	15	15	**177**
Palo Brea	*Parkinsonia*	*praecox*			*(Cercidium praecox)*	25	25	**368**
Canary Island Date Palm	*Phoenix*	*canariensis*				40	30	**7077**
Date Palm	*Phoenix*	*dactylifera*				60	25	**368**
Piñon Pine	*Pinus*	*edulis*				20	15	**177**
Afghan Pine, Mondell Pine	*Pinus*	*eldarica*			*(Pinus brutia eldarica)*	50	25	**368**
Aleppo Pine	*Pinus*	*halepensis*				50	25	**368**
Singleleaf Piñon Pine	*Pinus*	*monophylla*				20	15	**177**
Stone Pine	*Pinus*	*pinea*				60	40	**1,257**
Chir Pine	*Pinus*	*roxburghii*				80	40	**1,257**
Chinese Pistache	*Pistacia*	*chinensis*				40	35	**962**
Mastic Tree	*Pistacia*	*lentiscus*				15	20	**314**
Willow Pittosporum	*Pittosporum*	*phillyraeoides*				25	15	**177**
Sycamore	*Platanus*	*racemosa*				80	50	**1,963**
Yew Pine	*Podocarpus*	*macrophyllus*				20	10	**79**
Fremont Cottonwood, Poplar	*Populus*	*fremontii*				60	30	**707**
South American Hybrid Mesquite	*Prosopis*	*hybrid*				30	30	**707**
Texas Honey Mesquite	*Prosopis*	*glandulosa*	var. glandulosa			30	30	**707**
Screwbean Mesquite	*Prosopis*	*pubescens*				15	30	**314**
Velvet Mesquite	*Prosopis*	*velutina*			*(Prosopis juliflora)*	30	30	**707**

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Purple Leaf Plum	*Prunus*	*cerasifera*		'Atropurpurea'		20	15	**177**
Desert Smoke Tree	*Psorothamnus*	*spinosus*				15	15	**177**
Pomegranate	*Punica*	*granatum*				12	12	**113**
Bradford Pear	*Pyrus*	*calleryana*		'Bradford'		50	35	**962**
California Coastal Live Oak	*Quercus*	*agrifolia*				40	50	**1,963**
Escarpment Live Oak	*Quercus*	*fusiformis*				50	50	**1,963**
Holly Oak	*Quercus*	*ilex*				50	50	**1,963**
California Black Oak	*Quercus*	*kelloggii*				40	40	**1,257**
Valley Oak	*Quercus*	*lobata*				70	80	**5,027**
Chinquapin Oak	*Quercus*	*muehlenbergii*				50	60	**2,827**
Cork Oak	*Quercus*	*suber*				40	40	**1,257**
Live Oak	*Quercus*	*virginiana*		'Heritage'		60	60	**2,827**
Slender Lady Palm	*Rhapis*	*excelsa*				8	10	**79**
African Sumac	*Rhus*	*lancea*				25	40	**1,257**
Common Locust	*Robinia*	*x ambigua*				40	30	**707**
Black Locust	*Robinia*	*pseudoacacia*				75	60	**2,827**
Mountain Laurel	*Sophora*	*secundiflora*				15	15	**177**
Silver Peso Mountain Laurel	*Sophora*	*secundiflora*		'Silver Peso'		15	15	**177**
Queen Palm	*Syagrus*	*romanzoffianum*			*(Arecastrum romanzoffianum)*	40	20	**314**
Tipu Tree	*Tipuana*	*tipu*				30	40	**1,257**
Windmill Palm	*Trachycarpus*	*fortunei*				15	8	**50**
Evergreen Elm	*Ulmus*	*parvifolia*				35	35	**962**
Lacebark Elm, Siberian Elm	*Ulmus*	*pumila*				50	40	**1,257**
Chaste Tree	*Vitex*	*agnus-castus*				20	25	**368**
California Fan Palm	*Washingtonia*	*filifera*				40	15	**177**
Mexican Fan Palm	*Washingtonia*	*robusta*				50	10	**79**
Plant Type: Shrub								
Glossy Abelia	*Abelia*	*x grandiflora*				8	5	**20**
Desert Abutilon, Indian Mallow	*Abutilon*	*palmerii*				4	3	**20**
Pineapple Guava	*Acca*	*sellowiana*			*(Feijoa sellowiana)*	12	10	**79**
Blue Hibiscus	*Alyogyne*	*huegelii*				5	4	**13**
Triangle Leaf Bursage	*Ambrosia*	*deltoidea*				2	2	**3**
Burrobush,White Bursage	*Ambrosia*	*dumosa*				3	3	**7**
Flame Honeysuckle	*Anisacanthus*	*quadrifidus var. wrightii*				3	5	**20**

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Howard McMinn Manzanita	*Arctostaphylos*	*densiflorus*		'Howard McMinn'		6	8	**50**
Powis Castle Wormwood	*Artemisia*			'Powis Castle'		3	6	**28**
Silver Sage	*Artemisia*	*filifolia*				5	5	**20**
Prairie Sagewort, Fringed Sage	*Artemisia*	*frigida*				2	2	**3**
Silver King Artemisia	*Artemisia*	*ludoviciana albula*		'Silver King'		3	3	**7**
Bigleaf Sage	*Artemisia*	*tridentata*				6	5	**20**
Foxtail Fern	*Asparagus*	*densiflorus*		'Myers'		2	3	**7**
Four-Wing Saltbush	*Atriplex*	*canescens*				5	8	**50**
Centennial Broom, Coyote Bush	*Baccharis*			x 'Centennial'		8	6	**28**
Crimson Pygmy Barberry	*Berberis*	*thunbergii*		'Crimson Pygmy'	(Berberis 'Atropurpurea Nana')	2	3	**7**
Butterfly Bush	*Buddleja*	*davidii*			*(Buddleia davidii)*	6	8	**50**
Wooly Butterfly Bush	*Buddleja*	*marrubifolia*				5	5	**20**
Japanese Boxwood	*Buxus*	*microphylla*	var. *japonica*			6	6	**28**
Yellow Bird of Paradise	*Caesalpinia*	*gilliesii*				6	6	**28**
Mexican Bird of Paradise	*Caesalpinia*	*mexicana*				10	10	**79**
Red Bird of Paradise	*Caesalpinia*	*pulcherrima*				6	6	**28**
Baja Fairy Duster	*Calliandra*	*californica*			*(Calliandra peninsularis)*	6	6	**28**
Pink Fairy Duster	*Calliandra*	*eriophylla*				3	3	**7**
Pink Powder Puff	*Calliandra*	*haematocephala*				10	10	**79**
Weeping Bottle Brush	*Callistemon*	*viminalis*		Little John'		3	3	**7**
Natal Plum	*Carissa*	*macrocarpa*			*(Carissa grandiflora)*	8	8	**50**
Desert Hackberry	*Celtis*	*pallida*				8	10	**79**
Curl-leaf Mountain Mahogany	*Cercocarpus*	*ledifolius*				15	10	**79**
Mountain Mahogany	*Cercocarpus*	*montanus*				5	5	**20**
Rabbitbrush	Chrysothamnus	nauseosus				4	4	**13**
Orchid Rock Rose	*Cistus*	*x purpureus*				4	4	**13**
Bladderpod	*Cleome*	*isomeris*			*(Isomeris arborea)*	4	6	**28**
Texas Olive	*Cordia*	*boissieri*				10	10	**79**
Little Leaf Cordia	*Cordia*	*parvifolia*				6	6	**28**
False Heather, Mexican Heather	*Cuphea*	*hyssopifolia*				2	2	**3**
Black Dalea	*Dalea*	*frutescens*				3	4	**13**
Pink Indigo Bush	*Dalea*	*pulchra*				5	5	**20**

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Hopseed Bush	*Dodonaea*	*viscosa*				10	10	**79**
Brittlebush	*Encelia*	*farinosa*				3	4	**13**
Mormon Tea	*Ephedra*	*viridis*				3	3	**7**
Hummingbird Trumpet	*Epilobium*	*canum*			*(Zauschneria californica)*	2	4	**13**
Red Eremophila	*Eremophila*	*maculata*	var. *brevifolia*			4	4	**13**
Turpentine Bush	*Ericameria*	*laricifolia*				2	3	**7**
California Buckwheat	*Eriogonum*	*fasciculatum*	var. *polifolium*			1	2	**3**
Apache Plume	*Fallugia*	*paradoxa*				6	4	**13**
Guayacan	*Guaiacum*	*coulteri*				5	5	**20**
Scarlet Bush, Fire Bush	*Hamelia*	*patens*				5	5	**20**
Toyon	*Heteromeles*	*arbutifolia*				15	15	**177**
Hibiscus	*Hibiscus*	*rosa-sinensis*				10	8	**50**
Desert Lavender	*Hyptis*	*emoryi*				8	8	**50**
Yaupon Holly	*Ilex*	*vomitoria*				15	10	**79**
Juniper	*Juniperus*	*chinensis*		'Torulosa'	(*Juniperus chinensis* 'Kaizuka')	15	10	**79**
Shrimp Plant	*Justicia*	*brandegeana*			*(Beloperone guttata)*	3	3	**7**
Chuparosa	*Justicia*	*californica*				4	6	**28**
Mexican Honeysuckle	*Justicia*	*spicigera*				4	4	**13**
Winterfat	*Krascheninnikovia*	*lanata*			*(Ceratoides lanata)*	3	3	**7**
Creosote Bush	*Larrea*	*tridentata*				6	10	**79**
Violet Silverleaf	*Leucophyllum*	*candidum*		'Thundercloud'		3	3	**7**
Texas Ranger	*Leucophyllum*	*frutescens*				8	8	**50**
Texas Ranger	*Leucophyllum*	*frutescens*		'Compacta'		3	4	**13**
Chihuahuan Sage	*Leucophyllum*	*laevigatum*				4	4	**13**
Cinnamon Sage	*Leucophyllum*	*langmaniae*				5	5	**20**
Wolfberry	*Lycium*	*fremontii*				10	10	**79**
Oregon Grape	*Mahonia*	*aquifolium*				6	5	**20**
Mangle Dulce	*Maytenus*	*phyllanthoides*				10	10	**79**
True Myrtle	*Myrtus*	*communis*				10	10	**79**
Heavenly Bamboo	*Nandina*	*domestica*				6	4	**13**
Oleander	*Nerium*	*oleander*				10	10	**79**
Little Ollie Olive	*Olea*	*europaea*		'Little Ollie'		6	6	**28**

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Redtip Photinia	*Photinia*	*x fraseri*				10	5	**20**
Wheeler's Dwarf	*Pittosporum*	*tobira*		'Wheeler's Dwarf'		2	3	**7**
Golden Arborvitae	*Platycladus*	*orientalis*		'Aureus'		18	10	**79**
White Desert Plumbago	*Plumbago*	*scandens*				3	4	**13**
Lavender Spice	*Poliomintha*	*maderensis*			*(Poliomentha longiflora)*	3	3	**7**
Western Sandcherry	*Prunus*	*pumila*	var. *besseyi*			6	6	**28**
Dwarf Pomegranate	*Punica*	*granatum*		'Nana'		3	3	**7**
Mexican Cliffrose	*Purshia*	*mexicana*			*(Cowania mexicana)*	6	6	**28**
Pyracantha	*Pyracantha*	*crenatoserrata*			*(Pyracantha fortuneata)*	10	10	**79**
Formosa Pyracantha	*Pyracantha*	*koidzumii*				10	6	**28**
Desert Scrub Oak	*Quercus*	*turbinella*				4	6	**28**
Indian Hawthorn	*Rhaphiolepis*	*indica*				8	6	**28**
Flame-leaf Sumac	*Rhus*	*lanceolata*				20	20	**314**
Sugar Bush	*Rhus*	*ovata*				10	10	**79**
Squaw Bush	*Rhus*	*trilobata*				12	12	**113**
Evergreen Sumac	*Rhus*	*virens*				9	9	**64**
Matilija Poppy	*Romneya*	*coulteri*				6	6	**28**
Shrub Rose	*Rosa*	*species*				6	6	**28**
Rosemary	*Rosmarinus*	*officinalis*				3	4	**13**
Ruellia	*Ruellia*	*brittoniana*				4	4	**13**
Ruellia	*Ruellia*	*peninsularis*				2	4	**13**
Chaparral Sage	*Salvia*	*clevelandii*				3	5	**20**
Mojave Desert Sage	*Salvia*	*dorrii*	var. *dorrii*			2	2	**3**
Autumn Sage	*Salvia*	*greggii*				4	3	**7**
Mexican Bush Sage	*Salvia*	*leucantha*				3	4	**13**
Lavender Cotton	*Santolina*	*chamaecyparis*				2	4	**13**
Green Santolina	*Santolina*	*virens*				5	6	**28**
Feathery Senna	*Senna*	*artemisioides*	var. *filifola*		*(Cassia artemisioides)*	6	6	**28**
Shrubby Senna	*Senna*	*wislizenii*			*(Cassia wislizenii)*	8	8	**50**
Jojoba	*Simmondsia*	*chinensis*				8	8	**50**
Tecoma Hybrid	*Tecoma*			'Orange Bells'		10	8	**50**
Yellow Bells	*Tecoma*	*stans*				10	8	**50**

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Cape Honeysuckle	*Tecomaria*	*capensis*	var. *angustata*			10	10	**79**
Silver Germander, Bush Germander	*Teucrium*	*fruticans*			*(Teucrium chamaedrys)*	8	8	**50**
Lucky Nut	*Thevetia*	*peruviana*				10	15	**177**
Mexican Buckeye	*Ungnadia*	*speciosa*				10	8	**50**
Goldeneye	*Viguiera*	*deltoidea*				3	3	**7**
Skeleton Leaf Goldeneye	*Viguiera*	*stenoloba*				2	2	**3**
Arizona Rosewood	*Vauquelinia*	*californica*				10	15	**177**
Skeleton Leaf Goldeneye	*Viguiera*	*stenoloba*				2	2	**3**
Arabian Lilac	*Vitex*	*trifolia*				15	15	**177**
Xylosma	*Xylosma*	*congestum*				8	10	**79**
Gray Thorn	*Zizyphus*	*obtusifolia*				6	6	**28**
Plant Type: Groundcover								
Trailing Acacia	*Acacia*	*redolens*		'Prostrata', 'Desert Carpet'		2	10	**79**
Asparagus Fern	*Asparagus*	*densiflorus*		'Sprengeri'		3	3	**7**
Calylophus, Sundrops	*Calylophus*	*hartweggii*	var. *fendleri*			1	2	**3**
Snow-in-Summer	*Cerastium*	*tomentosum*				1	1	**1**
Damianta	*Chrysactinia*	*mexicana*				2	2	**3**
Bush Morning Glory	*Convolvulus*	*cneorum*				2	3	**7**
Ground Morning Glory	*Convolvulus*	*mauritanicus*				1	2	**3**
Creeping Cotoneaster	*Cotoneaster*	*adpressus*				2	6	**28**
Rock Cotoneaster	*Cotoneaster*	*horizontalis*				3	15	**177**
Sierra Gold Dalea	*Dalea*	*capitata*				1	3	**7**
Prostrate Indigo Bush	*Dalea*	*greggii*				1	15	**177**
Treasure Flower, Gazania	*Gazania*	*linearis*				1	2	**3**
Trailing Gazania	*Gazania*	*rigens*	*leucolaena*			1	2	**3**
Goodding Verbena	*Glandularia*	*gooddingii*			*(Verbena gooddingii)*	1	2	**3**
Moss Verbena	*Glandularia*	*pulchella*			*(Verbena pulchella)*	1	3	**7**
Sandpaper Verbena	*Glandularia*	*rigida*				1	3	**7**
Blue Chip Juniper	*Juniperus*	*horizontalis*		'Blue Chip'		1	6	**28**
Shore Juniper	*Juniperus*	*rigida*	*conferta*			1	6	**28**
Trailing Lantana	*Lantana*	*montevidensis*				1	3	**7**
New Gold Lantana	*Lantana*			'New Gold'		2	3	**7**
Copper Ice Plant	*Malephorea*	*crocea*				1	6	**28**

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Prostrate Myoporum	*Myoporum*	*parvifolium*				1	9	**64**
Mexican Evening Primrose	*Oenothera*	*berlandieri*			*(Oenothera speciosa)*	1	3	**13**
Tufted Evening Primrose	*Oenothera*	*caespitosa*				1	2	**7**
Saltillo Primrose	*Oenothera*	*stubbei*				1	3	**7**
Pyracantha, Firethorn	*Pyracantha*	*koidzumii*		'Santa Cruz'	*('Santa Cruz Prostrata')*	4	4	**13**
Prostrate Rosemary	*Rosmarinus*	*officinalis*		'Prostratus'		2	8	**50**
Lamb's Ear	*Stachys*	*byzantina*				1	3	**7**
Scarlet Betony, Texas Betony	*Stachys*	*coccinea*				1	2	**3**
Creeping Germander	*Teucrium*	*chamaedrys*		'Prostratum'		1	3	**7**
Creeping Thyme	*Thymus*	*serpyllum*				1	3	**7**
Periwinkle	*Vinca*	*major*				1	6	**28**
Vinca,Dwarf Periwinkle	*Vinca*	*minor*				1	4	**13**
Wedelia	*Wedelia*	*texana*			*(Zexmenia hispida)*	3	3	**7**
Yellow Dot	*Wedelia*	*trilobata*				1	6	**28**
Plant Type: Vine								
Coral Vine, Queen's Wreath	*Antigonon*	*leptopus*				15	30	**707**
Bougainvillea	*Bougainvillea*	*species*				15	30	**707**
Trumpet Creeper Vine	*Campsis*	*radicans*				20	25	**368**
Grape Ivy, Arizona Grape Ivy	*Cissus*	*trifoliata*				40	40	**1,257**
Wintercreeper	*Euonymus*	*fortunei*				1	15	**177**
Creeping Fig	*Ficus*	*pumila*				30	30	**707**
Carolina Jessamine	*Gelsemium*	*sempervirens*				20	20	**314**
Lilac Vine	*Hardenbergia*	*violacea*				15	10	**79**
Primrose Jasmine	*Jasminum*	*mesnyi*				10	10	**79**
Hall's Honeysuckle	*Lonicera*	*japonica*		'Halliana'		25	25	**368**
Cat's Claw	*Macfadyena*	*unguis-cati*				30	30	**707**
Yellow Orchid Vine	*Mascagnia*	*macroptera*				15	15	**177**
Merremia	*Merremia*	*aurea*				10	10	**79**
Virginia Creeper	*Parthenocissus*	*quinquefolia*				50	50	**1,963**
Boston Ivy	*Parthenocissus*	*tricuspidata*				50	50	**1,963**
Hacienda Creeper Vine	*Parthenocissus*	*tricuspidata*		'Hacienda Creeper'		25	25	**368**
Passion Flower Vine	*Passiflora*	*x alatocaerulea*				30	30	**707**
Baja Passion Flower vine	*Passiflora*	*foetida*	*longipedunculata*			10	10	**79**
Pink Trumpet Vine	*Podranea*	*ricasoliana*				20	20	**314**
Lady Bank's Rose	*Rosa*	*banksiae*				20	25	**368**

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Potato Vine	*Solanum*	*laxum*				30	10	**79**
Star Jasmine	*Trachelospermum*	*jasminoides*				25	30	**707**
Snail Vine	*Vigna*	*caracalla*			*(Phaseolus caracalla)*	30	30	**707**
Grape Vine	*Vitis*	species				20	20	**314**
Japanese Wisteria	*Wisteria*	*floribunda*				20	20	**314**
Chinese Wisteria	*Wisteria*	*sinensis*				20	20	**314**
Plant Type: Grass-like								
Sideoats Grama	*Bouteloua*	*curtipendula*				2	2	**3**
Blue Grama Grass	*Bouteloua*	*gracilis*				2	2	**3**
Feather Reed Grass	*Calamagrostis*	*acutiflora*		'Karl Forester'		4	2	**3**
Mexican Grass Tree	*Dasylirion*	*longissimum*				5	5	**20**
Canyon Prince Wild Rye	*Elymus*	*condemsatus*		'Canyon Prince'		1	1	**1**
Blue Fescue	*Festuca*	*glauca*				1	1	**1**
Blue Oat Grass	*Helictotrichon*	*sempervirens*				1	2	**3**
Japanese Blood Grass	*Imperata*	*cylindrica*		'Rubra'		2	1	**1**
Japanese Silver Grass	*Miscanthus*	*sinensis*				6	4	**13**
Pink Muhly	*Muhlenbergia*	*capillaris*				3	4	**13**
Bamboo Muhly	*Muhlenbergia*	*dumosa*				5	5	**20**
Bull Grass	*Muhlenbergia*	*emersleyi*				5	4	**13**
Autumn Glow Muhly	*Muhlenbergia*	*lindheimeri*		'Autumn Glow'		5	5	**20**
Deer Grass	*Muhlenbergia*	*rigens*				4	4	**13**
Mexican Feather Grass	*Nasella*	*tenuissima*			*(Stipa tenuissima)*	2	2	**3**
Devil's Shoestring	*Nolina*	*lindheimeriana*				3	3	**7**
Tree Beargrass	*Nolina*	*matapensis*				15	6	**28**
Beargrass	*Nolina*	*microcarpa*				6	8	**50**
Texas Beargrass	*Nolina*	*texana*				3	3	**13**
Switch Grass	*Panicum*	*virgatum*				5	5	**20**
Red Fountain Grass	*Pennisetum*	*setaceum*		'Rubrum'		5	4	**13**
Plant Type: Cacti								
Saguaro	*Carnegiea*	*gigantea*				50	6	**50**
Hildmann's Cereus	*Cereus*	*hildmannianus*			*(Cereus peruvianus)*	15	10	**79**
Buckhorn Cholla	*Cylindropuntia*	*acanthocarpa*			*(Opuntia acanthocarpa)*	4	5	**20**
Staghorn Cholla	*Cylindropuntia*	*versicolor*			*(Opuntia versicolor)*	10	8	**50**
Golden Barrel Cactus	*Echinocactus*	*grusonii*				1	3	**7**

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Strawberry Hedgehog	*Echinocereus*	*engelmannii*				1	2	**3**
Claret Cup	*Echinocereus*	*triglochidiatus*				1	3	**7**
Compass Barrel	*Ferocactus*	*cylindraceus*			*(Ferocactus acanthodes)*	3	2	**3**
Fishhook Barrel	*Ferocactus*	*wislizenii*				3	2	**3**
Senita	*Lophocereus*	*schottii*				10	10	**79**
Totem Pole	*Lophocereus*	*schottii*	*monstrosus*		*(Pachcereus schottii)*	10	10	**79**
Beavertail Cactus	*Opuntia*	*basilaris*				1	4	**13**
Teddy Bear Cholla	*Opuntia*	*bigelovii*				6	3	**7**
Engelmann's Prickly Pear	*Opuntia*	*engelmannii*				4	8	**50**
Texas Prickly Pear	*Opuntia*	*engelmannii*	*lindheimeri*			5	10	**79**
Indian Fig Prickly Pear	*Opuntia*	*ficus-indica*				12	15	**177**
Cow's Tongue Prickly Pear	*Opuntia*	*lindheimeri*	var. *linguiformis*			6	6	**28**
Bunny Ears	*Opuntia*	*microdasys*				3	5	**20**
Prickly Pear	*Opuntia*	*phaeacantha*				3	8	**50**
Giant Prickly Pear	*Opuntia*	*robusta*				10	10	**79**
Purple Prickly Pear	*Opuntia*	*santa-rita*			*(Opuntia violacea santa-rita)*	4	5	**20**
Mexican Fencepost	*Pachycereus*	*marginatus*			*(Stenocereus marginatus)*	10	6	**28**
Organ Pipe Cactus	*Stenocereus*	*thurberi*				10	10	**79**
Spruce Cones	*Tephrocactus*	*articulatus*	*inermis*			1	3	**7**
Argentine Hedgehog	*Trichocereus*	*huascha*				2	3	**7**
Plant Type: Succulent								
Century Plant, American Agave	*Agave*	*americana*				10	12	**113**
Blue Glow Agave	*Agave*			'Blue Glow'		2	3	**7**
Cow's Horn Agave	*Agave*	*bovicornuta*				4	5	**20**
Mescal Ceniza	*Agave*	*colorata*				3	4	**13**
Desert Agave	*Agave*	*deserti*				2	2	**3**
Smooth Agave	*Agave*	*desmettiana*				3	3	**7**
Threadleaf Agave	*Agave*	*filifera*				2	2	**3**
Twin-Flowered Agave	*Agave*	*geminiflora*				3	3	**7**
Harvard Agave	*Agave*	*havardiana*				3	3	**7**
Thorn-Crested Agave, Holly Agave	*Agave*	*lophantha*				3	5	**20**
Murphey's Agave	*Agave*	*murpheyi*				3	3	**7**

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Artichoke Agave	*Agave*	*parryi*				3	3	**7**
Utah Agave	*Agave*	*utahensis*				1	2	**3**
Queen Victoria Agave	*Agave*	*victoria-reginae*				1	2	**3**
Octopus Agave	*Agave*	*vilmoriniana*				4	5	**20**
Weber's Agave	*Agave*	*weberi*				6	5	**20**
Tree Aloe	*Aloe*	*arborescens*				10	6	**28**
Blue Elf Aloe	*Aloe*			'Blue Elf'		2	2	**3**
Ferox Agave	*Aloe*	*ferox*				12	5	**20**
African Aloe	*Aloe*	*saponaria*				1	10	**50**
Variegated Aloe	*Aloe*	*variegata*				1	1	**1**
Aloe Vera	*Aloe*	*vera*			*(Aloe barbadensis)*	2	3	**7**
Threadleaf Milkweed	*Asclepias*	*linearis*				3	3	**7**
Desert Milkweed	*Asclepias*	*subulata*				4	3	**7**
Pony Tail Palm	*Beaucarnea*	*recurvata*				15	10	**79**
Yellow Bulbine	*Bulbine*	*frutescens*				1	2	**3**
Japanese Sago Palm	*Cycas*	*revoluta*				5	5	**20**
Green Desert Spoon	*Dasylirion*	*acrotriche*				6	5	**20**
Desert Spoon	*Dasylirion*	*wheeleri*				6	5	**20**
Crown of Thorns	*Euphorbia*	*milli*				4	2	**3**
Gopher Plant	*Euphorbia*	*rigida*				2	4	**13**
Ocotillo	*Fouquieria*	*splendens*				20	15	**177**
Giant Hesperaloe	*Hesperaloe*	*funifera*				6	6	**28**
Red Yucca	*Hesperaloe*	*parviflora*				3	5	**20**
Our Lord's Candle	*Hesperoyucca*	*whipplei*				2	3	**7**
Madagascar Palm	*Pachypodium*	*lamerei*				15	4	**13**
Lady's Slipper	*Pedilanthus*	*macrocarpus*				3	2	**3**
Elephant's Food	*Portulacaria*	*afra*				3	4	**13**
Spanish Bayonet	*Yucca*	*aloifolia*				10	4	**13**
Banana Yucca	*Yucca*	*baccata*				3	5	**20**
Joshua Tree	*Yucca*	*brevifolia*				30	30	**707**
Soaptree Yucca	*Yucca*	*elata*				20	8	**50**
Adam's Needle	*Yucca*	*filamentosa*				3	4	**13**
Faxon Yucca	*Yucca*	*faxoniana*				15	10	**79**
Soapweed Yucca, Narrowleaf Yucca	*Yucca*	*glauca*				4	4	**13**
Spanish Dagger	*Yucca*	*gloriosa*				10	8	**50**

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
New Mexico Yucca	*Yucca*	*harrimaniae*				1	1	**1**
Pale Leaf Yucca	*Yucca*	*pallida*				2	3	**7**
Weeping Yucca	*Yucca*	*recurvifolia*				6	6	**28**
Blue Yucca	*Yucca*	*rigida*				12	5	**20**
Beaked Yucca, Thompson's Yucca	*Yucca*	*rostrata*			*(Yucca thompsoniana)*	12	10	**79**
Twisted Leaf Yucca	*Yucca*	*rupicola*				2	2	**3**
Mojave Yucca	*Yucca*	*schidigera*				4	3	**7**
Plant Type: Perennial								
Common Yarrow	*Achillea*	*millefolium*				3	2	**3**
Woolly Yarrow	*Achillea*	*tomentosa*				2	2	**3**
Lily of the Nile	*Agapanthus*	*praecox*	*orientalis*			2	2	**3**
Anise Hyssop	*Agastache*	*foeniculum*				3	3	**7**
Hummingbird Mint	*Agastache*	*rupestris*				3	2	**3**
Golden Columbine	*Aquilegia*	*chrysantha*				3	2	**3**
Marguerite	*Argyranthemum*	*frutescens*			*(Chrysanthemum frutescens)*	3	3	**7**
Desert Marigold	*Baileya*	*multiradiata*				1	1	**1**
Chocolate Flower	*Berlandiera*	*lyrata*				1	2	**3**
Dusty Miller	*Centaurea*	*cineraria*				2	2	**3**
Kaffir Lily	*Clivia*	*miniata*				2	2	**3**
Lanceleaf Coreopsis	*Coreopsis*	*lanceolata*				2	2	**3**
Sunray Coreopsis	*Coreopsis*	*verticillata*				1	2	**3**
Bat-faced Cuphea	*Cuphea*	*laevea*				2	3	**7**
Peacock Flower	*Dietes*	*bicolor*				2	2	**3**
Purple Coneflower	*Echinacea*	*purpurea*				4	2	**3**
Green Gold	*Euryops*	*pectinatus*		'Viridis'		4	3	**7**
Blanket Flower	*Gaillardia*	*aristata*			*(Gallardia grandiflora)*	2	2	**3**
Gaura	*Gaura*	*lindheimeri*				1	2	**3**
Gazania	*Gazania*	*splendens*				1	1	**1**
Snakeweed	*Gutierrezia*	*sarothrae*				1	2	**3**
Baby's Breath	*Gypsophila*	*paniculata*				3	3	**7**
Maximilian Sunflower	*Helianthus*	*maximilianii*				10	2	**3**
Daylily	*Hemerocallis*	*hybrid*				2	3	**7**
Coral Bells	*Heuchera*	*sanguinea*				1	1	**1**
Bearded Iris	*Iris*	*germanica*				2	2	**3**

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Red-Hot Poker	*Kniphofia*	*uvaria*				3	3	**7**
English Lavender	*Lavandula*	*angustifolia*		'Munstead'		3	3	**7**
French Lavender	*Lavandula*	*dentata*				3	3	**7**
Blue Lavandin	*Lavandula*	*x intermedia*		'Grosso'		2	3	**7**
Spanish Lavender	*Lavandula*	*stoechas*				4	3	**7**
Shasta Daisy	*Leucanthemum*	*x superbum*			*(Chrysanthemum maximum)*	3	2	**3**
Blackfoot Daisy	*Melampodium*	*leucanthum*				1	2	**3**
Missouri Evening Primrose	*Oenothera*	*macrocarpa*			*(Oenethera missouriensis)*	1	2	**3**
Oregano	*Origanum*	*laevigatum*				2	3	**3**
Oriental Poppy	*Papaver*	*orientale*				3	2	**3**
Rock Penstemon	*Penstemon*	*baccharifolius*				2	3	**7**
Firecracker Penstemon	*Penstemon*	*eatonii*				1	2	**3**
Parry's Penstemon	*Penstemon*	*parryi*				2	2	**3**
Pineleaf Penstemon	*Penstemon*	*pinnifolius*				1	2	**3**
Royal Beardtongue	*Penstemon*	*spectibilis*				1	1	**1**
Coral Penstemon	*Penstemon*	*superbus*				2	3	**7**
Star Flower	*Pentas*	*lanceolata*				3	3	**7**
Russian Sage	*Perovskia*	*atriplicifolia*				3	4	**13**
Jerusalem Sage	*Phlomis*	*fruticosa*				3	3	**7**
Paperflower	*Psilostrophe*	*cooperi*				1	3	**7**
Wooly Paperflower	*Psilostrophe*	*tagetina*				1	3	**7**
Mexican Hat	*Ratibida*	*columnifera*				2	2	**3**
Black-eyed Susan	*Rudbeckia*	*hirta*				3	3	**7**
Dwarf Ruellia, Desert Petunia	*Ruellia*	*brittoniana*		'Katie'		1	1	**1**
Mealy Cup Sage	*Salvia*	*farinacea*				2	2	**3**
Royal Purple Autumn Sage	*Salvia*	*muelleri*				2	2	**3**
Compact Indigo Spires Sage	*Salvia*			'Mystic Spires Blue'		3	3	**7**
Blue Queen Sage	*Salvia*		x *superba*			2	2	**3**
Desert Senna	*Senna*	*covesii*				3	3	**7**
Globe Mallow	*Sphaeralcea*	*ambigua*				3	3	**7**
Mountain Marigold	*Tagetes*	*lemmonii*				5	5	**20**
Licorice Marigold	*Tagetes*	*lucida*				4	4	**13**
Angelita Daisy	*Tetraneuris*	*acaulis*			*(Hymenoxys acaulis)*	1	1	**1**
Golden Dyssodia	*Thymophylla*	*pentachaeta*			*(Dyssodia pentachaeta)*	1	1	**1**
Society Garlic	*Tulbaghia*	*violacea*				1	1	**1**

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Goldeneye	*Viguiera*	*deltoidea*				2	2	**3**
Fairy Lily	*Zephyranthes*	*grandiflora*				1	1	**1**
Desert Zinnia	*Zinnia*	*acerosa*				1	1	**1**
Prairie Zinnia	*Zinnia*	*grandiflora*				1	1	**1**
Plant Type: Annuals	**(NO CANOPY COVERAGE)**							
Desert Sand Verbena	*Abronia*	*vilosa*						
Hollyhock	*Alcea*	*rosea*						
Snapdragon	*Antirrhinum*	*majus*						
Calendula	*Calendula*	*officinalis*						
Periwinkle, Vinca	*Catharanthus*	*roseus*			*(Vinca rosea)*			
Bachelor's Button	*Centaurea*	*cyanthus*						
Garden Chrysanthemum, Mum	*Chrysanthemum*	*x morifolium*						
Southwestern Cosmos	*Cosmos*	*bipinnatus*						
Dianthus, Sweet William	*Dianthus*	*species*						
California Poppy	*Eschscholzia*	*californica*						
Mexican Gold Poppy	*Eschscholzia*	*californica*	*mexicana*					
Blanket Flower	*Gaillardia*	*pulchella*						
Sunflower	*Helianthus*	*annuus*						
Impatiens	*Impatiens*	*species*						
Sweet Pea	*Lathyrus*	*odoratus*						
Tidy-Tips	*Layia*	*platyglossa*	*compestris*					
Red Flax	*Linum*	*grandiflorum*		'Rubrum'				
Blue Flax	*Linum*	*perenne*	*lewisii*					
Lobelia	*Lobelia*	*erinus*						
Sweet Alyssum	*Lobularia*	*maritima*						
Arroyo Lupine	*Lupinus*	*succulentus*						
Texas Bluebonnet	*Lupinus*	*texensis*						
Forget Me Not	*Myosotis*	*sylvatica*						
Owl's Clover	*Orthocarpus*	*purpurascens*			*(Castilleja exertia)*			
Flanders Field Poppy	*Papaver*	*rhoeas*						
Garden Geranium	*Pelargonium*	*x hortorum*						

Common Name	Genus	Species	Variety	Cultivar Name	Other Plant Names	Height (feet)	Width (feet)	Plant Coverage (Sq. Ft)
Petunia	*Petunia*	*hybrid*						
Desert Bluebell	*Phacelia*	*campanularia*						
Scarlet Sage	*Salvia*	*coccinea*						
Catchfly	*Silene*	*armeria*						
Marigold	*Tagetes*	*erecta*						
Mexican Sunflower	*Tithonia*	*rotundifolia*						
Viola	*Viola*	*cornuta*						
Pansy	*Viola*	*x wittrockiana*						
Zinnia	*Zinnia*	*elegans*						

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