Supplemental Engineering Standards

CITY OF POWAY
THE CITY IN THE COUNTRY
Incorporated 1980

2018
Engineering Supplements

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Introduction

The following information consists of specifications, details, and standards that have been adopted by the City of Poway. These details and specifications supplement the San Diego Regional Standard Drawings, 2018 edition; the Standard Specifications for Public Works Construction, 2018 edition (Greenbook) and the associated Regional Supplement Amendments; and Caltrans Standard Plans, 2018.

The Approved Materials List for publicly owned systems, such as potable water, sanitary sewer, and storm systems are included as a guide to materials to be included in the design specifications of either a Public Capital Improvement project, or a private development project that may include one or all of these systems.

Street design indexes and standard sections for street designs are included as amendments to the City of Poway's General Plan for Specific Plans that are located within the City.

These Supplemental Engineering Standards for the City of Poway have been approved and adopted.

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These Supplemental Amendments have been prepared by the City of Poway and adopted by the City Council for use in the City of Poway in conjunction with the Standard Specifications for Public Works Construction, 2018 edition ("Green Book"); and the Regional Supplement Amendments prepared by the San Diego Regional Standards Committee.


These specifications are intended to be used only in the City of Poway.
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CONSTRUCTION MATERIALS

SECTION 200 – ROCK MATERIALS

200-2  UNTREATED BASE MATERIALS.

200-2.1  General. (Delete and replace with the following):

Any base material used for the project work shall be Crushed Aggregate Base per Section 200-2.2 Crushed Aggregate Base or Crushed Miscellaneous Base per section 200-2.4.

SECTION 202 - MASONRY MATERIALS

202-3  MORTAR, GROUT, AND WATER.

202-3.1  Mortar. (Add the following):

Hydrated lime shall conform to Specifications for Hydrated Lime for Masonry Purposes, ASTM C207.

SECTION 203 – BITUMINOUS MATERIALS

203-1  PAVING ASPHALT.

203-1.1  General. (Add the following)

The Contractor shall furnish the Engineer, at least two (2) weeks prior to the start of work, with a list of material sources together with Certificates of Compliance, indicating that materials to be incorporated in the work fulfill the requirements of these Specifications. The Certificates of Compliance shall be signed by the material supplier or representative. The Engineer may permit the use of paving materials, aggregate, anti-strip agents, asphalt, or any combination thereof prior to sampling and testing when accompanied by a Certificate of Compliance.

203-1.2  Testing Requirements. (Add the following):

The paving asphalt for this project shall be PG 64-10.

203-6  ASPHALT CONCRETE.

203-6.1  General. (Add the following):

Asphalt shall contain a maximum Recycled Asphalt Pavement (RAP) of 20%.

203-6.4  Asphalt Concrete Mixtures.

203-6.4.1  Class and Grade. (Add the following):
The class and grade of asphalt concrete mixtures shall be C2-PG 64-10-R20.

203-6.4.4 Composition and Grading. (Add the following):

The aggregate grading to be used shall be Class C-2.

For full depth paving on arterial streets, the top course shall have aggregate grading of Class C-2 and the lower course shall have aggregate grading of Class B.

The Table below shall apply to paving on Poway Road, Pomerado Road, Espola Road, Twin Peaks Road and all roads in the South Poway Business Park.

<table>
<thead>
<tr>
<th>AC Section</th>
<th>AC Top Course Type</th>
<th>AC Lower Course Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 3&quot;</td>
<td>Full Depth - C2</td>
<td>-</td>
</tr>
<tr>
<td>&gt; 3&quot;</td>
<td>Top 2&quot; - C2</td>
<td>Remainder of Section Plus 1&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Greater ThanExisting - B</td>
</tr>
</tbody>
</table>

SECTION 207 – GRAVITY PIPE

207-17 PVC GRAVITY PIPE.

207-17.1 General. (Add the following):

Pipe shall have a minimum SDR of 35. Pipe stored at the worksite shall be protected from direct sunlight. Any pipe showing signs of fading shall be considered damaged and removed from the site.

SECTION 209 – PRESSURE PIPE

209-2 STEEL PIPE AND FITTINGS.

209-2.6 Dielectric Connections. (Add the following subsection):

Insulating bushings shall be molded "Lexan" polycarbonate insulating bushings as approved by the City.

Pipe Wrap shall be as indicated on the Standard Drawing and shall be supplied in four-inch rolls. Prior to application of the pipe wrap, the copper tubing or brass pipe, fittings, valves, or corporation stops within four feet of the main (measured horizontally) shall be thoroughly cleaned of all dirt and grease, and dried. The tape shall then be wrapped tightly around the cleaned copper tubing or brass pipe, fittings, valves, or corporation stops. For each layer, the tape shall be lapped a minimum of 3/8 inch.

209-4 PVC PRESSURE PIPE.

209-4.2 Materials. (Add the following paragraphs):
The class of pipe shall be specified on the Plans and Specifications. All Class 150 pipe shall conform to the requirements of DR18, and Class 200 pipe shall conform to the requirements of DR14.

For 14" - 36" diameter pipes. Minimum acceptable pressure rating (PR) shall be 235 psi.

Compounds used to manufacture PVC pressure pipe fittings and couplings shall conform to the requirements of ASTM 1784.

All pipe, fittings, and couplings shall be clearly marked as follows:

1. Class of pipe

All joints shall be bell and spigot type. Provisions must be made for expansion and contraction at each joint with an elastomeric gasket. Gaskets shall conform to the requirements of ASTM F477. Bells shall be an integral wall section with a solid cross-section gasket.

Fittings shall be either PVC or ductile iron "push-on" type. PVC fittings shall conform to the requirements of Section 207-21. Ductile iron fittings shall be "push-on" type and shall conform to the requirements of ANSI A21.53 (AWWA C153) with a minimum working pressure of 350 psi. Cement lining and gaskets shall conform to ANSI A21.4 (AWWA C104) and ANSI 21.11 (AWWA-C111), respectively.

209-4.3 Protection of Materials. (Add the following subsection):

All pipe stored on site shall be covered in a manner that will protect it from direct sunlight. Any pipe showing discoloration or fading, shall be considered damaged and removed from the site.

SECTION 210 – PAINT AND PROTECTIVE COATINGS

210-2 PLASTIC LINER.

210-2.6 Sewer Manhole Prime Coating and Liner. (Add the following section):

Prior to application of sewer manhole lining, all surfaces shall receive a one (1) to three (3) mil thickness 100% solids non-solvented, moisture tolerant epoxy primer as is manufactured by Sancon Engineering, Inc., Huntington Beach, CA; Zebron Corporation, Reno, NV; LifeLast™ Inc; or equal.

The lining material shall be a two-component, 100% solid, non-solvent hybrid polyurethane coating, with a shore "D" hardness of 57 at 77 degrees Fahrenheit, such as Sancon 100 as manufactured by Sancon Engineering, Inc., Huntington Beach, CA; Zebron as manufactured by Zebron Corporation, Reno, NV; or DuraShield 310 as manufactured by LifeLast™ The material shall be the high-build type capable of application thickness, as specified, without runs or sages, and shall be capable of passing ASTM D-1737 for flexibility, using cylinder mandrel of 0.5 inch (12.7 millimeter). The flash point of the fluid mixture shall be 450 degrees Fahrenheit open Zahn cup.

The lining material shall meet the following resistive specifications:
<table>
<thead>
<tr>
<th>Solution</th>
<th>Concentration*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic Acid</td>
<td>5%</td>
</tr>
<tr>
<td>Sulfuric Acid</td>
<td>20%</td>
</tr>
<tr>
<td>Sodium Hydroxide</td>
<td>5%</td>
</tr>
<tr>
<td>Ammonium Hydroxide</td>
<td>5%</td>
</tr>
<tr>
<td>Nitric Acid</td>
<td>1%</td>
</tr>
<tr>
<td>Ferric Acid</td>
<td>1%</td>
</tr>
<tr>
<td>Soap</td>
<td>0.1%</td>
</tr>
<tr>
<td>Detergent (Linear Alkyl Benzyl Sulfonite or LAS)</td>
<td>0.1%</td>
</tr>
<tr>
<td>Bacteriological</td>
<td>BOD not less than 700 PPM</td>
</tr>
<tr>
<td>Petroleum Oils and Greases</td>
<td>N/A</td>
</tr>
<tr>
<td>Vegetable and Animal Oils</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* Volumetric percentages of concentrated C.P. grade reagents.

The color shall be white or cream. The complete coating shall be impermeable to sewer gases and liquids and nonconductive to bacterial or fungus growth. The lining shall be capable of repair at any time during its life.

Materials specified are those that have been evaluated for the specific service. Elastomeric urethane products of Sancon Engineering, Inc., Zebron Corporation, LifeLast™ or equal are listed to establish a standard of quality. Standard products of manufacturers other than those specified will be accepted when it is proved to the satisfaction of the Project Manager they are equal in composition, durability, usefulness and convenience for the purpose intended. Substitution will be considered provided the following minimum conditions are met:

1. The proposed lining system shall have a dry film thickness equal to or greater than that of the specified system.
2. The proposed lining system shall employ an equal number of coats.
3. The proposed lining system shall employ coating of the same generic type.
4. The proposed lining system shall have been successfully used in 10 similar projects, all at least three years old, where lining has been applied to similar exposure and application.
5. All requests for substitution shall carry full descriptive literature and directions for application, along with complete information generic type, non-volatile content by volume.
6. In the above-mentioned data, if it appears to be in order, the Project Manager may require that the Contractor provide certified laboratory data sheets showing the results of complete spectrographic and durability tests performed on the proposed substitute. Tests shall be performed by an independent testing laboratory satisfactory to the Project Manager and all costs incurred in the testing program shall be borne by the Contractor. The Project Manager shall be sole and final judge of the acceptability of any proposed substitution. Requests for substitution must be approved in writing.
7. The manufacturer of the elastomeric polyurethane shall warrant its lining for five years against any type of failure due to defects in material and application. A copy of the warranty shall be submitted.

SECTION 212 – WATER AND SEWER SYSTEM VALVES AND APPURTE"
Butterfly valves shall be tight closing, rubber seated, conforming to AWWA C504-74. Valves shall be Class 150B with a maximum working differential pressure across the disc of 150 psi and shall be City approved.

Valves 12 inches and larger shall be flanged body unless otherwise indicated on the drawings or specified elsewhere. Valves 10 inches and smaller shall be flanged body, or bell type for asbestos cement or polyvinyl chloride pipe. Flanged end (or ends) shall be provided if so indicated on the drawings. Flanged ends shall conform in dimension and drilling to ANSI B16.1 Class 125 cast iron flanges. All exterior cap screws and bolts on valve body shall be ASTM A276, Type 304 or 316 stainless steel.

Shafts may consist of straight-through one-piece shafts or may be of the "stud shaft" type. Shaft material shall be ASTM A276, Type 304 or 316 stainless steel; or carbon steel with Type 304 or 316 stainless steel journals and static seals to isolate the interior of the disc and the shaft from water.

Discs shall be cast iron conforming to ASTM A48, Class 40; ductile iron conforming to ASTM A536, Grade 65-45-12; or alloy cast iron, conforming to ASTM A436, Type 1. The valve disc shall rotate 90° from fully open to the slightly shut position.

Valve seat retention and fastening devices when furnished for rubber seats, shall be either ASTM A276, Type 304 or 316 stainless steel; or bronze containing not more that 7% zinc nor more than 2% aluminum. Where the rubber seat is applied to the disc, it shall be vulcanized to a stainless steel seat-retaining ring, which is firmly clamped to the disc by stainless steel nylon locking screw fasteners.

Operators shall be of the manual type. The operators shall be of a worm gear, rack and pinion, or traveling-nut type with adjustable stops to limit disc travel and shall be totally enclosed and self-locking. The number of turns to rotate the disc shall vary with the size, but not be less than 2 turns per inch diameter valve size through 8 inches, nor less than 30 turns on 10-inch and larger valves. The operator shall be of the size required for opening and closing the valve at its rated operating pressure for permanent installation and operation in a buried or submerged location and shall be fully gasketed, sealed, and factory packed with grease.

Operators for valves to be buried below ground level shall be equipped with standard AWWA 2-inch square operating nuts. All exterior cap screws shall be ASTM A276, Type 316 or 304 stainless steel.

Operators for valves to be located above ground level or in vaults below ground level shall have a disc position indicator and a handwheel or crank.

Adapters, when required, shall conform to the Standard Drawing for Butterfly Valve Assembly. Cast iron (ductile) adapters shall conform to the requirements of ANSI A21.10, (A21.53) AWWA C110, (AWWA C153). Flanges shall conform to ANSI B16.1, Class 125 unless otherwise specified. The thrust collar adapter (required on 12-inch valves and larger) shall have the collar integrally cast with the adapter or welded to be equal in strength to a cast collar. Interior surface of adapter fittings shall be mortar lined and seal coated in accordance with ANSI A21.4 (AWWA C-104).

Four-inch and Larger Resilient-Seated Valves: Valves shall conform to all sections of AWWA C509 and the following:
Valve bodies shall be iron bodied. The minimum designated water working pressure shall be 200 psi for valves 4 inches through 12 inches, and 150 psi for larger valves.

Copper alloy for internal bronze parts, including stem, shall not contain more than 2% aluminum or more that 5% zinc. Bronze shall be ASTM B62 (85-5-5-5) copper alloy 836, except that stem shall be copper silicon and/or nickel alloy and shall have a minimum yield strength of at least 60,000 psi, a minimum yield strength of at least 30,000 psi, and a minimum of at least 15% elongation in 2 inches. All body bolts shall be stainless steel ASTM A320 Grade B8M and 8M (AISI 316). All valve body interior metal surfaces shall be 12 mil epoxy coated. Valves shall be equipped with operating nuts unless otherwise indicated.

**Valve Boxes:** The lower valve box shall be 6” diameter pipe of material acceptable to the City of Poway.

**Untraveled Areas** - The upper valve box sleeve shall be a 6” ABS or sewer pipe. Valve box covers shall be painted white with 2 coats of traffic marking type paint.

**Traveled Areas** - The valve box and cover shall be SBF 1208.

A concrete ring shall be provided to support upper valve box and cover.

**Valve Stem Extensions:** Where valve operator nut is 5 feet or more below top of valve box, a galvanized steel extension shall be provided.

212-5.6 **Air Release, Air/Vacuum, and Combination Air Valves.** (Delete this section and all subsections and replace with following):

No hydrants are to be used as blow-off assemblies.

**Pipe Sleeves and Covers:** The steel pipe sleeves shall be C-900 PVC pipe. Valve boxes and covers shall be seated flush with the paved surface of the natural ground or paved surface. The topside of the cover shall be painted with two coats of traffic type paint.

Angle Valves shall have bronze bodies conforming to ASTM B62, Copper Alloy 836, rates for 300 psi W.O.B., and brass or bronze handwheel. Discs shall be composition. Stems shall be copper silicon and/or copper nickel alloy. Valve manufacturer shall either guarantee the stem against dezincification for the life of the valve or shall certify that the stem contains not more than 2% aluminum or more than 5% zinc.

212-6 **HYDRANTS.** (Delete this section and all subsections and replace with following):

212-6.1 **Fire Hydrants.**

Bodies shall be cast-bronze with a minimum working pressure rating of 150 psi and shall equal or exceed AWWA C503. Base shall be drilled for six bolts except when 8-hole drilling is specified or shown on the plans. Stems shall have "O" ring packings. Plastic protector caps and chains with fasteners shall be supplied for all outlets. All hose outlets shall have "National Standard Hose Threads" (NFPA Handbook - American National Standard Fire Hose Coupling Screw Threads).
Two-way hydrants shall be provided at all locations where fire hydrants are indicated, unless otherwise shown on the Plans or specified herein. In commercial, industrial, and high-density residential zoned areas, three-way hydrants shall be provided.

Two-way hydrants shall consist of one 2 ½-inch and one 4-inch hose outlets, steamer type.

NOTE: Three-way hydrants with two 2 ½-inch outlets and one 4-inch outlet may be used in commercial areas with the approval of the Fire Marshall.

Three-way hydrants shall consist of one 2 ½-inch and two 4-inch hose outlets, steamer type.

Hydrant Buries shall be heavy cast iron, designed for use at a normal operating pressure of 200 psi, and shall be 6-inch diameter with 6-inch inlet bell and 24-inch or 30-inch flanged riser, consistent with spool and head flange drillings. Bury extensions shall be flanged and of similar design and construction. The interior surfaces of all buries shall be lined with 5/16-inch cement mortar. Exteriors shall be coated with asphalt varnish.

Scored Spools shall be cast iron, flanged both ends. The interior surfaces of all spools shall be lined with 5/16-inch cement mortar. Exteriors shall be coated with asphalt varnish. Spools 12 inches and longer shall be scored on both ends, 3 inches from face of flanges. Spools less than 12 inches long shall be scored in the middle. The score shall be a V-groove, ¼-inch wide, and from 1/8-inch minimum to 3/16 inch deep. The face of the flange shall be at least 4 inches, and more than 8 inches above the splash pad. Where there is no concrete curb, the elevation of the top of the spool shall be determined by the City's representative.

Nuts and Bolts for cast-iron fittings shall be stainless steel. ASTM A320, Grade B8M and BM (AISI 316).

212-10 SERVICE LATERALS, METERS, AND METER BOXES.

212-10.1 Copper Tubing. (Replace the first paragraph with the following):

Copper tubing for air and vacuum valves, manual air release, blow-off valves, backflow prevention for sprinkler systems, and water service assemblies shall conform to the requirements of ASTM B88, Type "K". All tubing shall be soft (annealed). Flare fittings shall consist of bronze threaded fittings with flare seat, and bronze companion flare tailpiece. Flared fittings shall conform to ANSI B16.26. or G70.1. Copper tubing bends shall be made with wrought copper solder fittings, conforming to ANSI B16.18 or B16.22. Solder shall be high grade silver solder (15’ grade) intended for use in high pressure copper tube water lines.

212-10.7 Brass Pipe. (Add the following subsection):

Brass pipe shall be red brass, threaded, conforming to ASTM B43, regular. Fittings for use with brass pipe shall be cast bronze, threaded, 125 pound, conforming to ANSI B16.15.

212-10.8 General. (Add the following subsection):

All nuts and bolts used for fastening any pipe and/or appurtenances to the water system shall be standard hexagonal head machine bolts and hexagonal nuts conforming to ASTM A307, Grade B, except all buried valves, which shall be jointed to connecting pipe or adapter with
ASTM A320 (Grade B8M and M [AISI 316]) stainless steel nuts and bolts. All bolt threads shall be lubricated with graphite or oil prior to installation.

212-13 SEWER MANHOLES. (Add the following section):

212-13.1 General.

Maximum spacing of sewer manholes shall be per the following table.

<table>
<thead>
<tr>
<th>PIPE SLOPE</th>
<th>MAXIMUM DISTANCE BETWEEN MANHOLES (FEET)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3% OR LESS</td>
<td>300</td>
</tr>
<tr>
<td>&gt; 3% - 5%</td>
<td>240</td>
</tr>
<tr>
<td>&gt; 5% - 7%</td>
<td>180</td>
</tr>
<tr>
<td>&gt; 7% - 9%</td>
<td>140</td>
</tr>
<tr>
<td>&gt; 9%</td>
<td>100</td>
</tr>
</tbody>
</table>

The installation of all new sewer manholes shall include installation of primer and manhole lining per sections 210-2.6 and 307-7.7.5.

SECTION 215 – STREET NAME SIGNS

(Add the following section):

215-1 PROPOSED SIGNS.

215-1.1 General.

The street name sign shall comply with Section 2D.43 of the latest edition of the California Manual on Uniform Traffic Control Devices (MUTCD). Contractor must call the Department of Public Works for new signs to match color and finish details unless otherwise instructed by the City Engineer.

The lettering names of streets on Street Name signs shall be composed of a combination of lower-upper case letters with initial upper-case letters. The street name suffix abbreviations are as follows:

- Avenue = Ave
- Court = Ct
- Drive = Dr
- Lane = Ln
- Place = Pl
- Road = Rd
- Street = St
- Terrace = Ter
- Trail = Trail
- Way = Way

215-1.2 Finish.

Signs are to be 0.08” High Intensity Prismatic Reflective Extruded Aluminum double sided and meet ASTM D4956 Type IV retro-reflective sheeting standards. Signs shall me 9” minimum tall BROWN.
215-1.3  **Color.**

The finished color coat shall be BROWN.

215-1.4  **Legend.**

Sign lettering shall be 6” minimum “C” font upper-lower case in accordance with Section 2D.43 “Street Name Signs (D3-1 or D3-1a)” of the latest edition of the California MUTCD. A City logo, 5” wide and 3-1/2” high to be on left side of street name. A 3/4” high “CITY OF POWAY” legend shall be above the City logo. Graphics shall be either printed with translucent inks applied vinyl graphics or opaque and translucent film.

215-1.5  **Mounting Hardware.**

2 NPC2.5  Post Cap 2-1/2” I.D.
2 NPC1  Cross Saddles
2NB20.5  Bolt, 20-1/2” x 5/8” with Nut and Washer (Galvanized)

215-1.6  **Post.**

All posts shall be break-away and meet the following manufacturing requirements:

Steel posts shall conform to the requirements for ASTM A570, Grade 50, for hot rolled carbon sheet steel, structural quality. Yield strength after cold-forming is 60,000 psi minimum. The cross-section of the post shall be square tube form of 14-gauge steel, carefully rolled to size and shall be welded directly in the corner by high frequency resistance welding and externally scarfed to agree with corner radii.

Sign posts shall be manufactured from hot-dipped galvanized steel conforming to ASTM A653, G90, Structural Quality, Grade 50, Class 1. The corner weld is zinc coated after scarfing operation. The steel is also coated with a chromate conversion and a clear organic polymer topcoat. Both the interior and the exterior of the post shall be galvanized.

Posts shall be ten (10) feet in length, with a ¼” tolerance, and be perforated with the following cross-section: 2” x 2”, 14 gauge, 1.99 lbs/foot. Outside corner radius shall be 5/32”. Holes shall be 7/16 inches in diameter on one (1) inch centers on all four sides down the entire length of the post. Holes shall be on centerline of each side in true alignment and opposite each other directly and diagonally.

Finished posts shall be straight and have a smooth, uniform finish. It shall be possible to telescope consecutive sizes of square tubes freely and for not less than ten feet of their length without the necessity of matching any particular face to any other face. All holes and ends shall be free from burrs and ends shall be cut square.

The following tolerances shall apply:

<table>
<thead>
<tr>
<th></th>
<th>±1/4”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>±1/64”</td>
</tr>
<tr>
<td>Hole Diameter</td>
<td>±0.008”</td>
</tr>
<tr>
<td>Nominal Outside Dimensions</td>
<td>±0.008”</td>
</tr>
<tr>
<td>Variation in Wall Thickness</td>
<td>±0.010&quot;, determined at the corner</td>
</tr>
<tr>
<td>Convexity and Concavity</td>
<td>±0.010&quot;, determined at the corner</td>
</tr>
<tr>
<td>Parameter</td>
<td>Specification</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>Squareness</td>
<td>±0.012&quot;, sample shall fail if its sides are not 90° to each other within the squareness tolerance</td>
</tr>
<tr>
<td>Twist Permissible in 3' length</td>
<td>0.062&quot;</td>
</tr>
<tr>
<td>Straightness in 3' length</td>
<td>1/16&quot;</td>
</tr>
<tr>
<td>Corner Radii</td>
<td>±1/64&quot;</td>
</tr>
</tbody>
</table>
PART 3
CONSTRUCTION METHODS

SECTION 300 - EARTHWORK

300-2 UNCLASSIFIED EXCAVATION.

300-2.3 Overshooting. (Add the following):

Blasting: Blasting for excavation will be permitted only after securing approval of the City Engineer, and only when proper precautions are taken for the protection of persons and property. The hours of blasting will be fixed by the City Engineer. Any damage by blasting shall be repaired by the contractor at his expense. The contractor's methods of blasting and procedure shall conform to State laws and local ordinances. Precautions should be taken to post signs warning operators of radio equipment to stop transmitting in any area in which blasting operations are in progress. The contractor shall also obtain permission from the Poway Fire Department prior to commencing blasting operations.

SECTION 302 - ROADWAY SURFACING

302-5 ASPHALT CONCRETE PAVEMENT.

302-5.1 General. (Add the following):

Contractor shall complete the following Asphalt Concrete Quality Control Plan prior to the pre-construction meeting.
### ASPHALT QUALITY CONTROL PLAN

#### Scope

<table>
<thead>
<tr>
<th>Overlay</th>
<th>Deep Patch Repairs</th>
<th>Mill and Fill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilities Raise to Grade</td>
<td>Map of streets</td>
<td>Striping</td>
</tr>
</tbody>
</table>

#### General Project Requirements

- Special Street Requirements
- Work Time Restrictions
- Special Traffic Control Requirements
- Storm Water Requirements

#### Mix Design

- Requirements for Additives
- Set time Requirements
- Special Test on Materials

#### Materials

<table>
<thead>
<tr>
<th>Additives</th>
<th>RAP %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aggregate</th>
<th>Gradation (review fines for surface area differences) (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How old in the mix design aggregate sample? (s)</td>
<td></td>
</tr>
<tr>
<td>Absorption (is the aggregate expected to absorb a lot of the emulsion) (s)</td>
<td>When was the last Asphalt test last completed</td>
</tr>
<tr>
<td>Batch Plant QC/QA Plan</td>
<td></td>
</tr>
</tbody>
</table>

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### Materials on Site

<table>
<thead>
<tr>
<th>De-Bonding Agent (s)</th>
<th>Tack (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel</td>
<td>AC Delivered without Segregation</td>
</tr>
</tbody>
</table>

#### Storm Water BMP’s

<table>
<thead>
<tr>
<th>Inlet Protection</th>
<th>Under all Equipment</th>
</tr>
</thead>
</table>

#### Equipment

<table>
<thead>
<tr>
<th>Screed Heater</th>
<th>RTR Tire Pressure</th>
<th>Tack Truck Calibration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screed Vibrator</td>
<td>Finish Roller Drum</td>
<td></td>
</tr>
<tr>
<td>Screed Straight</td>
<td>10' Straight Edge</td>
<td></td>
</tr>
<tr>
<td>Roller Vibrator</td>
<td>Roll on Boards</td>
<td></td>
</tr>
<tr>
<td>Roller Drum</td>
<td>Rakes</td>
<td></td>
</tr>
</tbody>
</table>

#### Notification

<table>
<thead>
<tr>
<th>Resident Notice Letter (s)</th>
<th>No Parking Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resident Door Hanger (s)</td>
<td></td>
</tr>
</tbody>
</table>

#### Training

<table>
<thead>
<tr>
<th>Employee Training Manual</th>
<th>Industry Training Manual</th>
</tr>
</thead>
</table>

### 302-5.5 Distribution and Spreading

(Add the following):

The Contractor shall protect all building foundations, planters, existing curb and gutter, screens, etc., from splash, roller scrape, or over-spray.

Spraying of oils or solvents on equipment or tools while the equipment or tools are on the newly placed asphalt mat will not be permitted.

The following is a list of Best Management Practices the City’s Inspector will be following during placement of the asphalt concrete.
DO NOT use diesel fuel as a release agent on tools and equipment.

DO NOT spray any release agent on tools and equipment on the newly placed mat.

**RTR Tire Temperature** If the RTR tire temperature cannot be kept within the required range, the contractor shall use wheel skirts to keep the wheels hot.

DO NOT trickle AC into the paver hopper.

DO NOT over rake the edge of the placed asphalt prior to rolling.

DO NOT place puddles of tack. Tack truck last calibrated shall be proven to the project inspector. Verify the tack sprayer has full triple coverage.

DO NOT let the paver hopper go empty

DO NOT pave over spillage from the AC truck

DO NOT park a roller on the mat.

Verify that all transitions are within specification.

**302-5.6 Rolling.**

**302-5.6.2 Density and Smoothness.** (Replace the 1st sentence of the 2nd paragraph with the following):

The compaction after rolling shall be 95 percent of the density obtained by ASTM Test No. D-1560 or ASSHT0 T-246 "Resistance to Deformation of Bituminous Mixtures by Means of Hveem Apparatus".

**SECTION 303 - CONCRETE AND MASONRY CONSTRUCTION**

**303-6 STAMPED CONCRETE.**

(Delete entire section and replace with the following):

**303-6.1 General.** (Add the following):

I. Stamped concrete pattern and color must be approved by the Planning Department before issue of right-of-way permit. Submit: 1) color sample; and 2) patterned drawing.

II. Colored, imprinted concrete shall be bomanite or an approved equal. The concrete shall be integrally colored throughout the concrete mix.
303-6.5  **Line and Grade.** (Add the following subsection):

The configuration of the drive approaches shall conform to the San Diego Regional Standard Drawing G-14 for residential driveways and San Diego Regional Standards. The thickness of the concrete has been increased to 6 ½” (min.) thick. No stamped concrete shall be used for driveway approaches adjacent to concrete sidewalks. The subgrade for the drive approach must be compacted to 90% of the maximum dry density of the soil encountered.

Sidewalks shall conform to G-7 of the San Diego Regional Standard Drawings and the joint locations in the sidewalk shall conform to G-9 of San Diego Regional Standard Drawings. The thickness of the sidewalk shall be increased to 5” (min.). The subgrade of the sidewalk shall be compacted to 90% of the soil's maximum dry density.

303-6.6  **Concrete Mix Design.** (Add the following subsection):

The concrete shall be 560-B-3250 (minimum compressive strength of 3250 psi). Portland cement shall conform to ASTM C150, Type I, II, V depending on soil conditions. Aggregates shall conform to ASTM C33. Mixing water shall be fresh, clean, and potable.

The color of the concrete must be integral to the mix and shall comply with ASTM C309.

303-6.7  **Installation.** (Add the following subsection):

The surface of the stamped concrete shall be covered with a sheet of plastic or visquene before stamping so that the product would be smooth and free of nicks and pot marks. After stamping and removal of visquene, a light trowel/broom finish may be needed, as directed by the Engineer.

303-6.8  **Textures.** (Add the following subsection):

The depth and width of the stamped impressions in the concrete shall not exceed 3/8 inches.

**SECTION 306 – OPEN TRENCH CONDUIT CONSTRUCTION**

306-3  **TRENCH EXCAVATION.**

306-3.1  **General.** (Add the following):

The contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property. Water shall be disposed of in such a manner as not to be a menace to the public health and shall meet N.P.D.E.S. requirements.

306-7  **PREFABRICATED GRAVITY PIPE.**

306-7.7  **Plastic Sewer and Drainage Pipe.**

306-7.7.3  **Acceptance Testing.** (Add the following):

All sanitary sewer lines 6 inches and larger in diameter shall be video inspected prior to their acceptance. The video inspection is to be scheduled after all air, wayne ball, and mandrel
testing has been completed. Any deficiencies found during video inspection shall be corrected by the contractor at his expense. All repairs performed will be subject to further video inspection.

For sewer mains located in streets, the roadway will have compacted subgrade in place, surrounding all sewer manholes. For sewer mains located in easements offsite of roadways, the contractor will provide a 10-foot wide graded access road with a 20-foot wide graded radius around all manholes. In all cases, the manhole frame and cover will be a minimum of 3 inches above grade, and a maximum of 12 inches above grade.

306-7.7.4 Leakage Test for Sewer Manholes. (Add the following subsection):

When air pressure test (Section 306-1.4.4) is used to test sewer mains, all manholes shall be tested by the water exfiltration method (Section 306-1.4.2). All inlets and outlets to the manhole shall be plugged to prevent leakage. The allowable leakage shall be one gallon per hour, for manholes five feet in diameter or smaller. Bolt down lids shall be required in unpaved areas.

306-7.7.5 Sewer Manholes. (Add the following subsection):

Installation of all new manholes shall include installation of both prime coating and manhole lining.

306-7.7.5.1 Sewer Manholes Prime Coating and Lining. (Add the following subsection):

Prior to application of the lining, all surfaces shall receive a one (1) to three (3) mil thickness 100% solids non-solvented, moisture tolerant epoxy primer as is manufactured by Sancon Engineering, Inc., Huntington Beach, CA; Zebron Corporation, Reno, NV; LifeLast™ Inc; or equal.

The lining application shall be performed only by workers approved by the manufacturer as trained and experienced with the specified material. The lining shall be applied by high pressure airless equipment approved by the lining manufacturer. The equipment shall be in good working order to insure correct proportioning and mixing of the components.

All termination points of the lining material to the existing subsurface shall be keyed into the subsurface by mechanically scoring a minimum ¼ inch x ¼ inch (6 mm x 6 mm) keyway. The coating shall be applied to the manhole wall and into the notch in one continuous sheet in order to provide a continuous coating from manhole frame to manhole wall. The coating shall extend down to cover the manhole shelf in its entirety and to overlap joints in the inlet/outlet sewer pipe penetrations. The coating shall not extend into the channel and flowline unless otherwise approved by the City. Prior to the application of the polyurethane, the subsurface shall be primed with the epoxy primer to a thickness of 3 mils minimum to 5 mils maximum. Polyurethane shall be applied to a thickness of 125 mils (3 mm) immediately prior to the epoxy primer becoming tack-free. Lining material shall be uniform in color, fully cured, free of holidays, surface imperfections, blisters, sags and adequately adhered to the subsurface. The lining shall be installed over dry concrete below the water level by using appropriate bypass equipment when appropriate.

During lining application, the Contractor shall take wet gauge thickness readings as required to insure correct lining thickness.
The uniform lining shall be free from porosity, without bubbles or pinholes and uniform in color. All areas in question shall be removed and reworked and patched.

Before accepting the finished product, the Contractor shall make testing with a holiday or porosity detector, and any pinholes found shall be patched.

Application of the lining shall not take place when exposed to rain, fog or high winds. It is the Contractor’s responsibility to ensure protection of the work from the above-mentioned conditions.

306-8   PREFABRICATED PRESSURE PIPE.

306-8.3   Steel Pipe.

306-8.3.4   Cement Mortar Lined Steel Pipe. (Add the following subsection):

306-8.3.4.1   Field Jointing.

Rubber ring joints shall be completed in the trench. The ends of the pipe shall be thoroughly cleaned and positioned for joining. Vegetable soap solution shall be applied to the inside of the bell, and the rubber gasket snapped into the groove on the spigot end. The bell end shall be coated with cement mortar in such a manner and in sufficient quantity to completely fill the recess between the respective linings of the two joined sections of pipe. The spigot end shall then be entered into the bell end of the adjacent pipe section the distance shown on the shop drawings.

The steel jumper rod shall then be welded into place to form an electrical bond between joined pipe sections.

The outside joint recess shall be grouted with cement mortar after a fabric diaper has first been placed around the joint and tightened securely to prevent leakage while the mortar is being poured. The diaper shall be made of heavy-duty polyethylene fabric of sufficiently close weave to prevent cement loss from the mortar. The fabric shall be hemmed on each edge and shall contain a metal strap within each hem sufficiently longer than the circumference of the pipe to allow a secure attachment of the diaper to the pipe. The diaper width will depend on pipe size and design and shall be the width recommended by the manufacturer. Following installation of the diapers, the joints shall be poured and rodded form one side only until the mortar comes up to the top of the diaper on the opposite side. Approximately one hour subsequent to the pouring of the joint, the joint shall be rechecked, and if any settlement, leakage, or shrinkage has taken place, the joint shall be refilled with mortar.

The diaper shall be stripped and the joint inspected all around, repaired if necessary, and given a heavy coating of curing compound at the earliest practicable time after the mortar has hardened sufficiently. Joint mortar shall be protected from direct sunlight for at least 14 days by covering with burlap, heavy paper, or moist backfill material. Water shall not be allowed to enter the pipe until 36 hours after placing joint mortar.

Welded Joints shall be completed in the trench. When the pipe is being laid, both the spigot and the bell ends shall be thoroughly cleaned of all foreign matter; and all protective materials shall be removed from the surfaces that are to be in contact at the joints. Just prior to joining the two ends together, each end of the pipe shall be "buttered" with cement mortar in such a
manner and in sufficient quantity to completely fill the space between the respective mortar linings. After the joining is completed, the pipe interior shall be swabbed to remove all excess mortar by drawing an approved type swab or squeegee through the pipe. For pipe 24 inches in nominal inside diameter and larger, a ½-inch recess between adjacent linings shall be provided and later pointed from the inside with cement mortar and troweled smooth.

All field welding shall conform to AWWA C206 and shall be done by experienced welders qualified in accordance with that standard.

In all hand welding, the metal shall be deposited in successive layers and the minimum number of passes or beads in the completed weld shall be as follows:

<table>
<thead>
<tr>
<th>Steel Cylinder Thickness, Inches</th>
<th>Fillet Weld Minimum Number of Passes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smaller than 3/16</td>
<td>1</td>
</tr>
<tr>
<td>3/16 and ¼</td>
<td>2</td>
</tr>
<tr>
<td>5/16</td>
<td>3</td>
</tr>
<tr>
<td>3/8</td>
<td>3</td>
</tr>
</tbody>
</table>

Where welded joints are designated on the Plans, the pipe may be joined with rubber gaskets as specified above for rubber ring joint in lieu of slip (lap) joints. The outside recess between the bell and spigot shall then be caulked with a rod to facilitate the welding. The weld shall be continuous for the full circumference of the pipe. After the joints have been welded and have cooled, the joint shall be grouted with cement mortar in the same manner as specified for rubber ring joints.

**Butt Strap Closure Joints** shall be completed in the trench after the pipe has been laid to the alignment and the grade shown on the Plans. They shall be field welded to the outside of the pipe along both edges by full circumferential fillet welds or one of the edges may be shop welded and the other field welded. Welding shall be done in the same manner as specified for welded joints. The pipe coupling shall be oriented at the top of the butt strap closure for 16 inches and smaller pipe, and at both sides for large pipe to permit access for mortaring the inside of the joint. After welding and mortaring, the coupling shall be closed with a ferrous plug.

All exposed metal surfaces shall be cleaned by wire brushing.

The interior of the joints shall be filled with stiff plastic consistency cement mortar in accordance with Appendix A of AWWA C205.

Wire fabric, 2" x 4" by 13-gauge, clean and free from rust, shall be applied to the exterior of the joints so that the wire on the 2-inch spacing runs circumferentially around the pipe. The wire on the 4-inch spacing shall be crimped in such a manner that the mesh will be held 3/8 inch from the butt strap metal surface.

The mesh shall be lapped a minimum of 8 inches and shall be securely wired in position. The joint exterior shall then be coated with cement mortar to a thickness of at least 1 ½ inches over all ferrous metals.

Immediately prior to applying mortar to the interior or exterior of the joints, a cement wash shall be applied to the metal surfaces to be coated.
**Flanged Joints**: Steel jumper rods shall be welded to each steel flange to form an electrical bond. Where a cast iron body valve or fitting is located between two steel flanges, the jumper rod shall bridge the valve and form an electrical bond between the steel flanges. Flange faces shall be wire brushed and gaskets shall be thoroughly cleaned just prior to joining. Following the tightening of the bolts, all buried painted and bare metal surfaces including bolts, nuts, jumper rods, and companion flanges shall be cleaned by wire brushing and then washed with cement and encased in cement mortar as specified above for butt strap closure joints. Where pipe coating has been held back to facilitate bolting, the coating shall be built up to at least \( \frac{1}{2} \) inch greater than the required minimum coating thickness for pipe near a flange.

Following application of the mortar encasement, the joint and the adjoining sections of pipe within a distance of two pipe diameters of the joint shall be wrapped with polyethylene film in accordance with AWWA C105.

**Flexible Coupling Joints** shall be completed in the trench after the pipe has been laid to the alignment and grade shown on the plans. Each pipe end for a distance of 6 to 8 inches back from the end shall be thoroughly cleaned to remove oil, dirt, loose scale, rust, and other foreign matter. Flanges, gaskets, and sleeves shall then be assembled on the pipe ends in accordance with the manufacturer's recommendations. Gaskets, pipe ends, and coupling sleeve flares shall be lubricated with a vegetable soap compound to facilitate the joining. Coupling sleeves shall be accurately centered over the pipe ends and one pipe end shall touch the coupling sleeve centering stop if the coupling sleeve is so equipped.

Bolts shall be tightened to the torque recommended by the manufacturer with a torque wrench in the presence of the City's representative.

A steel jumper rod shall be placed around the coupling and welded to each steel cylinder of pipe section being joined through the coupling. It shall also be welded to the coupling itself.

All exposed couplings, bolts, nuts, and pipe metal surfaces shall be cleaned, cement mortar encased, and polyethylene wrapped as specified for flanged joints above.

**Cement Mortar** for encasing, buttering, pointing, and grouting shall comply with the requirements of AWWA C205.

306-8.9 **Pipeline Pressure Testing, Disinfection, and Commissioning.**

306-8.9.2 **Hydrostatic Pressure Test.**

306-8.9.2.3 **Allowable Leakage.** (Amend this section as follows):

\[
L = \text{Maximum allowable leakage in gallons for a four-hour test, for section of pipeline tested.}
\]

306-15 **PAYMENT.**

306-15.7 **Buried Structures.** Add the following):

Payment for the installation of all new manholes shall include surface preparation and installation of both prime coating and manhole lining. Payment shall include all labor, material, equipment, work, coordination and incidentals associated with manhole installation.
SECTION 310 - PAINTING

310-5  PAINTING VARIOUS SURFACES.

310.5.5  Painting Lumber.

310-5.5.1 Paint. (Delete this section and replace with the following):

Exterior wood surfaces shall receive two primer coats and two finish coats. Primer shall be two coats of white undercoat; each applied to a minimum dry film thickness of one mil.

Interior wood surfaces shall receive one primer coat and two finish coats. Primer coat shall be one coat of white undercoat applied to a minimum dry film thickness of one mil.

310-6  PAINTING MASONRY. (Add the following section):

310-6.1 General.

Masonry construction and surface preparation shall conform to Section 303-4. Masonry surfaces shall be painted as follows:

Exterior surfaces shall receive two coats of primer-sealer, and one finish coat. Interior surfaces shall receive one coat of primer-sealer, and one finish coat.

SECTION 315 - STREET NAME SIGNS. (Add the following section):

315-1 EXISTING SIGNS.

315-1.1 General.

The contractor shall be responsible for removal, salvage, and delivery of existing signs to the City Central Supply Warehouse.

Contractor shall verify if existing signs, that are to be removed, are located in concrete and/or dirt. Existing signs shall not be cut off at ground level and hole patched. For signs located in dirt areas, the contractor shall remove the pole foundation, fill hole, and re-compact. For signs located in concrete, the contractor shall remove the pole foundation, fill hole, and replace concrete panel to nearest joint, no concrete patches will be allowed.

Payment for concrete replacement shall be included in the bid line item for sign removal.

315-2 PROPOSED SIGNS.

315-2.1 General.

New signs shall be located at the southeast corner, 7 feet behind the face of curb, and at the curb return or as specified by the Engineer.
PART 4
EXISTING IMPROVEMENTS

SECTION 403 – MANHOLE ADJUSTMENT AND RECONSTRUCTION

403-1  GENERAL. (Add the following):

All concrete or brick surfaces to be lined shall be water blasted or abrasive grit blasted to remove all deteriorated concrete, oil, grease or existing coating to produce a good grade of firm, clean concrete or brick.

Water blasting equipment shall be a minimum pressure of 6,000 psi and shall not include detergent or other chemical cleaning solvents in the process.

All debris produced from the water-blasting or abrasive grit blasting operation shall be removed from the structure prior to coating. No debris shall be allowed to enter the sewer system. The concrete surface shall be allowed to dry prior to application of the prime coating.

The Contractor shall remove all types of ladder rung from the manhole and grout all rungs.

Following surface preparation, the Project Manager or his authorized agent shall inspect the manhole to determine if any additional mortar coating should be provided to cover severely exposed aggregate.

After surface preparation and prior to concrete repair, the Contractor shall stop all leaks in the existing structure. The method of stopping these leaks shall be by injection of chemical grout as approved by the Project Manager. Chemical grout shall be 3M 5610 or equal. Installation of chemical grout shall be in accordance with the manufacturer’s recommendations and instructions.

Where directed by the City, manholes shall receive gunite repair. The gunite shall be as specified in Section 303-2.1.2, Method A. Gunite shall be applied to cleaned concrete to a thickness (minimum two-inch [2"] thickness), which will restore the original manhole surfaces. Gunite shall be allowed to cure twenty-four (24) hours prior to the lining application.

Where designated by the owner, channel and shelf areas shall be brought back to their original dimensions using concrete mortar. Shelves shall be hand-troweled to provide a smooth and uniform surface.

Prior to application of the lining, all surfaces shall receive a one (1) to three (3) mil thickness 100% solids non-solvented, moisture tolerant epoxy primer per section 210-2.6.

Lining material shall be per section 210-2.6. The lining application shall be performed only by workers approved by the manufacturer as trained and experienced with the specified material. The lining shall be applied by high pressure airless equipment approved by the lining manufacturer. The equipment shall be in good working order to insure correct proportioning and mixing of the components.

All termination points of the lining material to the existing subsurface shall be keyed into the subsurface by mechanically scoring a minimum ¼ inch x ¼ inch (6 mm x 6 mm) keyway. The
coating shall be applied to the manhole wall and into the notch in one continuous sheet in order to provide a continuous coating from manhole frame to manhole wall. The coating shall extend down to cover the manhole shelf in its entirety and to overlap joints in the inlet/outlet sewer pipe penetrations. The coating shall not extend into the channel and flowline unless otherwise approved by the City. Prior to the application of the polyurethane, the subsurface shall be primed with the epoxy primer to a thickness of 3 mils minimum to 5 mils maximum. Polyurethane shall be applied to a thickness of 125 mils (3 mm) immediately prior to the epoxy primer becoming tack-free. Lining material shall be uniform in color, fully cured, free of holidays, surface imperfections, blisters, sags and adequately adhered to the subsurface. The lining shall be installed over dry concrete below the water level by using appropriate bypass equipment when appropriate.

During lining application, the Contractor shall take wet gauge thickness readings as required to insure correct lining thickness.

The uniform lining shall be free from porosity, without bubbles or pinholes and uniform in color. All areas in question shall be removed and reworked and patched.

Before accepting the finished product, the Contractor shall make testing with a holiday or porosity detector, and any pinholes found shall be patched.

Application of the lining shall not take place when exposed to rain, fog or high winds. It is the Contractor’s responsibility to ensure protection of the work from the above-mentioned conditions.

403-5 PAYMENT. (Add the following):

Payment for lining existing manholes shall include all labor, material, equipment, work, coordination, and incidentals associated with manhole rehabilitation, chemical grout injection, regrouting grade rings, installation of primer, and liner will be considered as included in the unit price listed in the Bid Schedule and an additional payment will be made.

SECTION 404 – COLD MILLING

404-1 GENERAL. (Add the following):

The entrance and exit of a cold milled area shall be squared up by way of longitudinal header grinding to provide the full depth of a patch uniformly from beginning to end. No ramping of the cold milled area entrance and exit will be permitted.
PART 7
STREET LIGHTING AND TRAFFIC SIGNAL SYSTEMS

SECTION 700 - MATERIALS

700-3 COMMON COMPONENTS.

700-3.2 Anchor Bolts, Nuts, and Washers. (Delete this subsection and replace with following):

Anchor bolts shall be of the type and size as shown on Regional Standard Drawing E-1. Anchor bolts shall conform to the specifications of ASTM A-307, and shall be provided with two nuts and two washers each. Bolts, nuts, and washers shall be galvanized by the hot-dip process conforming to ASTM A-153 or cadmium plated with Type NS coating conforming to ASTM A-165. Direct bury or embedded installation is not allowed.

700-3.3 Standards.

700-3.3.3 Metal Standards.

700-3.3.3.2 Steel Standards. (Add the following):

Steel poles may be used on approved or required basis only. Steel poles shall meet the criteria of the Engineer.

700-3.5 Conduit. (Delete this section and all subsections and replace with the following):

All conduit shall be 2” U.L.-approved heavy wall polyvinyl chloride (PVC Schedule 40) unless a different material or size is required by the Engineer. Conduit of larger size may be used provided that the larger size is used the entire length of the run between pull boxes. Reducing couplings shall not be used. Conduit to be sealed at all ends.

700-3.7 Pull Boxes. (Replace the second paragraph with the following):

State No. 3½ Pull Box (15 3/8” x 10 1/8”) or equivalent shall be installed per Caltrans Standard Drawing ES-8. Pull boxes and covers shall be of concrete. Pull box covers shall be inscribed “STREET LIGHTING.” Covers shall be secured with 3/8-inch bolts, cap screws or studs, and nuts, which shall be of brass, stainless steel, or non-corroding material.

700-4 STREET LIGHTING SYSTEM MATERIALS.

700-4.1 Reinforced Concrete Standards.

700-4.1.1 General. (Replace the first two sentences of the fourth paragraph with the following):

The centrifugal casting process shall produce a center duct throughout the length of the pole. This duct shall be free from sharp projections or edges that might damage the wire or cable. It shall be a minimum of 1⅛ inch in diameter.
Ultimate strength of a pole shall be calculated in accordance with the latest revision of American Concrete Institute (A.C.I.) standard 318. Under working loads (including wind loading), the pole must not be stressed beyond the cracking strength. Wind loads shall be as specified in the last edition of the AASHTO standards.

The American Association of State Highway and Transportation Officials in their publication, “Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signals,” stipulates that poles shall be of sufficient strength to support a single LPS luminaire weighing 90 pounds, 5 feet in length, with an EPA of 4 square feet in an 80 MPH wind zone.

Concrete poles shall be tapered, centrifugally cast, and pre-stressed. They will be round, black and white marble aggregate, or naturally exposed aggregate. Other colors of aggregate may be used with written approval of the Engineer; however, pole shape and color shall be uniform for any one project. Replacement poles shall match existing.

Aggregate shall conform to current requirements ASTM C33, except that abrasion requirements therein shall not apply, and no more than 7% shall pass a #100 mesh sieve. No dye or sealer shall be used without approval of the Engineer.

After exposing the aggregate, the pole shall be coated with a minimum of two coats of flat concrete sealer.

All reinforcing steel shall have a minimum cover of 5/8 inch of concrete.

After curing, the surface of the pole shall be treated to remove cement latency and to develop the surface texture. When finished, poles shall be without cracks or crazing and shall have a uniform surface (without objectionable mold marks) and texture throughout the entire length. Maximum deviation from string line at any point shall not exceed 0.03 inch per foot of length.

**700-4.1.2 Reinforcement.** (Add the following paragraphs):

Pre-stressing steel shall conform to 9 mm diameter ASTM A-421 indented wire with a minimum ultimate strength of 206,000 psi. Reinforcing bar shall conform to ASTM A-615. Wire for cage shall conform to ASTM A-82. Base plate shall conform to ASTM A-36 and shall be galvanized to ASTM A-123. Steel for luminaire arm, when required, shall conform to ASTM A-53, Grade B, and shall be fully galvanized.

The poles shall contain a minimum of 8 strands of 9 mm diameter, solid, indented pre-stressing steel wires to maintain required ultimate strength, pre-stressed to a minimum of 6600# per wire. A mild steel cage consisting of circumferential 12-guage A-82 wire welded to 4 longitudinal 11-guage wires at not more than a 4-inch pitch, shall encapsulate the pre-stressing steel throughout the entire length of the pole. The area of circumferential steel along any three feet of the shaft shall not be less than design. All steel shall be electrically bonded. The cover over the pre-stressing wires shall be no less than \( \frac{1}{2} \)".

**700-4.2 Wire/Conductors.**
700-4.2.2 Conductors for Series Circuits. (Delete this subsection and replace with the following):

Service runs shall be of solid or stranded THW or XHHW copper wire No. 10 minimum. Voltage drop studies will be required to determine proper wire sizes. Stranded THW or XHHW copper wire No. 10 shall be used from the fuse holder at the base of each pole to the luminaire. Copper wire shall conform to the applicable portion of ASTM B-3 and ASTM B-8. Wire connectors shall be of a type approved by the Engineer and be U.L. approved. The installation procedure, including connector size and crimping tools shall conform to the manufacturer's recommendations. Aluminum conductors will not be allowed. THHN and THWN will not be allowed.

700-4.2.4 Color Coding. (Add the following subsection):

700-4.2.4.1 120-Volt Circuits.

Circuits requiring 120 volts, one wire will be black and one will be white, with the black being the hot wire and fused to the pole. The ground wire from the luminaire to the grounding point in the lighting standard shall be green or bare wire.

700-4.2.4.2 240-Volt Circuits.

Circuits that require 240 volts shall have one black wire, one red wire, and one green (ground) wire. Ground wire shall be included in all new 240-vold circuits and shall be connected to a ¾" x 8' copper covered steel ground rod to be installed in the first pull box from the SDG&E service point. Black and red wires shall be fused to the pole. Green wires shall be secured to ground in the pole. The ground wire from the luminaire to the grounding point in the lighting standard shall be green or bare wire.

700-4.2.5 Splicing of Wires. (Add the following subsection):

Splices shall be permitted in pull boxes and lighting standard bases only. All splices shall be waterproof and with epoxy encapsulation or heat-shrinking tubing.

700-4.2.6 Excess Wire in Pull Boxes. (Add the following subsection):

The first pull box from the SDG&E service point shall be considered the City’s beginning of service. At this point, the hot leg(s) of the circuit shall be properly fused. The fuse holders shall be connected to all load sides with a minimum of 15 inches of wire from the conduit end providing ample room for movement. All conductors on the service side of the fuse holder and the white neutral/ground on 120-volt circuits shall terminate with a minimum of 15 feet of appropriate size wire beyond the fuse holder to facilitate connection to the service point.

In pull boxes, wiring from one conduit to another shall be of sufficient length to freely wrap along the entire interior of the pull box. This excess wire should be at least 30 inches.

700-4.3 Splicing Units and Terminal Blocks.

700-4.3.2 Fused Splice Connectors. (Delete the last paragraph and replace with the following paragraphs):
Fuses shall be slow-blow 13/32” x 1 ½” in-line type fuses. The fuses installed in the poles shall be rated at 5 amperes for 120-volt service and 5 amperes for each conductor of 240-volt circuits. Circuit fuses shall be installed in the first pull box from the SDG&E service point and rated at 20 amperes.

Fuses shall be installed in each hot leg of the lighting conductor. Both legs of a 240-volt circuit and only the hot leg of a 120-volt circuit shall be fused. Each light shall be fused inside the pole and accessible from the hand hole.

700-4.3.2.1 Fuse Holders. (Add the following subsection):

Fuse holders shall be completely waterproof and shall grip the fuse in the load side section when the fuse holder is opened. Holders shall also be able to take a 13/23” x 1 ½” fuse and shall have crimp-type tubular terminals of the size designed for the size of wire in the particular streetlight. On 240-volt systems, Bussmann HEXAA waterproof double fuse holders (or approved equal) shall be used.

700-4.5 Lamp Ballasts.

700-4.5.1 General. (Add the following paragraphs):

Low Pressure Sodium Vapor ballasts shall be suitable for use on multiple distribution circuits with 60 Hz, 120 or 240-volt rating.

Ballasts shall be of the component type, consisting of precision wound coils and welded magnetic steel lamination assembled together and impregnated with a baked-on insulating weather proof varnish and a metal cased, hermetically sealed capacitor.

The operating sound pressure noise level shall not exceed the ambient noise level by more than 5 decibels (5db) at a distance of 30 feet when measured by a sound level meter conforming to the American Standard for sound level meters. Where the ambient noise level is below 40 decibels (40db), a minimum of 40 decibels (40db) shall be assumed as ambient.

700-4.7 Photoelectric Controls.

700-4.7.2 Photoelectric Control Units. (Delete the first sentence in the second paragraph and replace with the following three sentences and add the following paragraphs):

The control unit shall have a “TURN-ON” level of 2.6 ± 0.6 foot-candles. The TURN OFF/ON ratio shall be 1.5:1. Turn-off shall have a 2.5 second delay.

The control unit shall contain a cadmium sulfide photoelectric cell with a DC drive circuit and DC coil relay. The unit shall be suitable for operation with a 120-volt or 240-volt line supply and a minimum rated load capacity of 1000W tungsten; 1800 VA ballast type loads with a normal power consumption of not more than 2 watts. The control unit shall include 160 joule, 6500 amp MOV surge protection to prevent damage from sudden voltage surges.

Cover shall be made of high impact resistant, UV stabilized polypropylene. Cover shall be colored black.
PART NIGHT controls shall turn off at the middle of the night. Cover shall be colored green.

700-4.9 Low Pressure Sodium Vapor Lamps. (Add the following subsection):

Low Pressure Sodium Vapor lamps shall have clear glass bulbs and be suitable for use in street lighting applications. The lamp shall be designed to operate in a horizontal position.

The Low Pressure Sodium Vapor lamps shall be manufactured by G.E.C., Osram, or Philips. Use of any other lamp will require the Engineer’s written approval prior to installation.

All Low Pressure Sodium Vapor lamps shall have a rated average life of 18,000 hours or more. The light output shall be 13,500 Lumens for 90-watt lamps and 33,000 Lumens for 180-watt lamps.

SECTION 701 – CONSTRUCTION

701-8 FOUNDATIONS, FOUNDATION CAPS AND SLABS.

701-8.3 Foundation Caps. (Add the following):

Foundation cap is to be poured onto a clean base surface with continuous concrete from base to cap.

701-10 STANDARDS, PEDESTALS AND MAST ARMS.

701-10.1 General. (Add the following):

Installation shall be according to Regional Standard Drawing E-1 and E-2. Streetlight poles shall be installed 7 feet behind the face of curb or berm, unless otherwise approved by the Engineer. Foundation shall be anchor base. Direct burial will not be allowed.

Streetlight Mounting Heights

1. Pole height measuring from ground surface (±2 feet):
   28 feet for 180-watt units
   25 feet for 90-watt units

2. Luminaire mounting height (±1 foot):
   30 feet for the 180-watt units
   27 feet for 90-watt units

701-10.2 Mast Arms. (Add the following):

Poles shall be furnished with a mast arm that provides a minimum of six inches of horizontal straight section at the end of the arm to mount a two-inch I.P.S. slip-fitter type luminaire mount.

The mast arm shall be long enough to give a one-foot minimum curb overhang to the luminaire. The usual length for the arm in a typical installation is eight feet. Changes in configuration of mast arms will be permitted, with prior approval of the Engineer, and if the mounting height and stability are maintained.
Mast arms shall be 2 inches I.P.S. aluminum, with an elliptical cross section. Aluminum arms shall be made of corrosion resistant alloys, such as Aluminum Association wrought alloys 6061, 6062, or 6063, or cast alloys 319, or 356. Mast arms shall be self-supporting, without braces, scrolls, or rods. Mounting shall be perpendicular to the street centerline unless otherwise shown on the plans.

All exposed hardware shall be stainless steel. All protected hardware not visible after installation shall be cast aluminum and/or stainless steel, hot-dipped, galvanized, or cadmium plated steel.

701-11 PULL BOXES.

701-11.1 General. (Add the following):

A pull box shall be installed within three feet of each street lighting standard. A pull box shall also be installed within three feet of the service point unless the lighting standard is within six feet of the service point. In this case, only one pull box shall be required between the light standard and the service point. Pull boxes shall not be spaced more than 200 linear feet apart. When circuits with multiple lights cross roadways, pull boxes shall be installed at both sides of the road crossings. For single light circuits, pull boxes need not be installed at both sides of the roadway, but only on the side of the roadway opposite the light. Pull boxes shall also be installed where the service run changes direction by more than 30 degrees around corners or curves.

Pull boxes shall not be installed in any part of a driveway or other traveled way unless approved by the Engineer. If the pull box is in the traveled way or driveway it shall be provided with a locking metal cover.

(Delete the 5th paragraph and replace with the following):

The bottom of each pull box shall rest firmly on a 6-inch thick bed of 1-inch crushed rock extending 6 inches beyond the outside edges of the pull box. Pull boxes in the vicinity of curbs and/or sidewalks shall be placed adjacent to the back of the curb and/or sidewalk. Pull boxes shall not generally be placed within sidewalk panels.

701-12 CONDUIT.

701-12.1 General. (Add the following):

Conduit laid parallel to the street shall be installed under the sidewalk where new sidewalk is being constructed or directly behind the existing sidewalk.

Conduit shall be laid to a depth of not less than 30 inches and shall be sand-encased with 3-inch minimum over and around all sides. Conduit laid in an open trench shall not be covered nor shall any trench or inspection hole be backfilled until the Engineer has accepted installation. No conduit end shall be within 2 inches of making contact with any part of the pull box.

701-14 SERVICES.

701-14.1 General.
701-14.1.1 San Diego Gas & Electric (SDG&E) Connection. (Add the following subsection):

All service points must be obtained from SDG&E. In rare instances, a new light can be connected to an existing light system, but only after approval of the Engineer. An SDG&E easement is not sufficient for a service point unless SDG&E agrees to extend their facilities to the City right-of-way. Service runs across private property are not acceptable.

For service from a wood power pole, the service point will be a pull box that SDG&E will install, at the Contractor’s expense, at the foot of the pole or in the City’s right-of-way. SDG&E will complete the work when contracted for a service point. The box must be installed before work on the light may begin.

The pull box installed within three feet of the service point (see Section 307-11.1) shall contain waterproof fuse holders and 30-amp fuses on the hot legs. This service point pull box must be in the City’s right-of-way.

Before SDG&E will energize a light circuit, three sets of RECORD DRAWINGS must be submitted to the City by the Contractor. The drawings must clearly show:

1. Wattage and type of light
2. Location of each light denoting specific distance in footage from a given intersection (e.g. Community Road south of Kirkham Way 370” SES, or Colony Drive at Colony Way)
3. Conduit runs and pull boxes
4. Service point. If the service point is a wooden power pole or transformer, show the pole or station number.
5. Size of wire in conduit run and poles
6. Lengths and distances of wire runs
7. Sizes and locations of fuses
8. Voltage of the system
9. Manufacturer and model numbers/names of luminaries, poles, and mast arms
10. Installing Contractor’s name, address, telephone number, and a responsible contact’s name.

701-16 STREET LIGHTING CONSTRUCTION.

701-16.7 Luminaires.

701-16.7.1 Lamp Size and Identification. (Add the following):

Street lighting luminaries shall be completely assembled and furnished with a lamp and an external photoelectric control unit. Luminaries shall be designed for horizontal mounting with a horizontal burning lamp. The optics shall be full cutoff type of standard make and manufactured by a manufacturer of recognized experience and ability who is now regularly engaged in the manufacture of street lighting luminaries. The luminaire shall be die cast aluminum or welded heavy gauge aluminum sheet and furnished with an optical assembly removable without the use of special tools. The luminaire lens shall be glass.
The luminaire shall have a slip-fitted mounting bracket capable of attaching to a two-inch (2") pipe without the need for special mounting parts. Leveling and clamping of the luminaire to the mast arm pipe shall be accomplished by tightening mounting bolts, which are externally or internally accessible. Luminaries shall be installed in a horizontal position unless other installation is approved by the Engineer.

The luminaire shall include an integral twist-lock type receptacle for photoelectric cell control in accordance with the latest EEI-NEMA standards. The receptacle shall be adjustable with respect to North and pre-wired to the terminal board. The luminaire power unit assembly shall be mounted on a separate component of the luminaire to facilitate replacement and shall consist of an integral ballast, capacitor, and heavy-duty terminal block.

The ballast assembly shall be enclosed in a separate compartment from the optical assembly. Both compartments shall be sealed with a heat-resisting gasket. The optical assembly door hinge shall be designed so that when the door is opened, the hinge pins shall prevent the door from falling free. The luminaire shall be constructed and installed in such a manner to provide the required lighting distribution, with the lower edge of the luminaire’s housing below the entire light source and lens. The addition of external shielding to accommodate these criteria is not permissible. The light distribution patterns shall be Type II.

The net weight of the complete operating luminaire shall be no greater than 50 pounds for 90-watt units and 55 pounds for 180-watt units.

701-16.7.2 Photoelectric Units. (Add the following):

The photocell shall be properly oriented with the photocell pointing north.

701-16.7.4 Payment. (Add the following):

All street light installations are to be guaranteed for a period of one year from the date of acceptance of the improvements by the City for maintenance, at no additional cost to the City.
Section 3   Engineering Supplements

Approved Materials List
For Public Works
City of Poway

APPROVED MATERIALS LIST
2018

THESE MATERIALS AND THEIR MANUFACTURERS ARE APPROVED FOR USE IN THE CITY OF POWAY. REQUESTS FOR ALTERNATIVE MATERIALS OR MANUFACTURERS SHALL BE SUBMITTED IN WRITING TO THE DEVELOPMENT SERVICES DEPARTMENT FOR APPROVAL BY THE CITY ENGINEER PRIOR TO INSTALLATION.

Notice of Change to California Law:
No-Lead Brass to be Used in Public Water Systems

Due to changes in California State law enacted in Assembly Bill (AB) – 1953, the State of California is requiring that no-lead brass be used in the construction of a public water system by January 1, 2010.

Because of these changes to the State law, the City of Poway will no longer allow leaded brass to be installed in the construction of public water systems starting on January 1, 2010, in accordance with State law.

Since this requirement, AB-1953, will be in effect, the City of Poway advises contractors and suppliers at this time to begin depleting their on-hand stock of leaded brass and begin restocking as needed with no-lead brass. As of January 1, 2010, there shall be no exceptions granted for leaded brass in public water systems within the City of Poway.
## Approved Materials List - Drainage

**City of Poway**  
**2018**

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<th>ITEM</th>
<th>DESCRIPTION</th>
<th>MANUFACTURER</th>
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<tr>
<td>Chain Like Fence</td>
<td>9 ga. Galvanized fabric &amp; hardware, ASTM A-392 RSD M-5, 6 20</td>
<td>Frontier Fence</td>
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<td>Sentry Fence</td>
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<td>Drainage Structure Grate</td>
<td>Hot dipped galvanized; RSD D-15</td>
<td>Center Steel</td>
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<td>Manhole Cover &amp; Frame</td>
<td>36” dia. cast iron, 2 pc. cover</td>
<td>South Bay Foundry SBF-1325</td>
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<td>Alhambra Foundry</td>
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<td>Manhole Cover &amp; Frame Heavy Duty</td>
<td>24” dia. cast iron</td>
<td>South Bay Foundry SBF-1310</td>
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<td>High Density Polyethylene Pipe (HDPE)</td>
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<td>ADS Inc.</td>
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<td>PVC</td>
<td>8” - 24” ASTM D3034 SDR35, requires approval for street use 12” - 30” HANCOR Hi-Q Sure Lok HDPE</td>
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<td>Schedule 40</td>
<td>GPK</td>
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<td>Fittings PVC</td>
<td>ASTM D-3034, SDR-35</td>
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<td>With City of Poway/Sewer in raised lettering on covers</td>
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<td>ASTM C-700</td>
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<td>Mission Clay</td>
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<td>RSD S-2, 5x3</td>
<td>Marcon</td>
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<td>SBF 1243 Type Clean Outs</td>
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<td>Round Concrete Box w/Cast Iron Lid (w/Sewer on Lid)</td>
<td>J&amp;R “Round” Concrete - 5RT</td>
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<td>J&amp;R “Round” C.I. Lid - 5RT</td>
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<td>Lateral repair</td>
<td>Coupler</td>
<td>Fernco Ferguson Maxadaptor coupling (4”-12”)</td>
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<tr>
<td></td>
<td>Caulder Mil Wrap</td>
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### Approved Materials List - Street Lighting

**City of Poway**

**2018**

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<th>ITEM</th>
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</table>
| **Poles**                           | MBBX7.4 for use with 90W LPS luminaire  
MBBX08 for use with 180W LPS luminaire | Ameron  
Ameron |
| **Luminaires**                      | LPSV                                                                        | Spaulding  
Visionaire Lighting  
Palomar  
Roadway |
| **Photocontrols**                   | D124-2.6-SMBK  
DPN124-2.6-TMGN for part night controls  
6390B-BK | DTL  
DTL  
Ripley |
| **Fuses**                           | FNQ                                                                         | Bussman                           |
| **Fuse Holders**                    | HEX Series                                                                  | Bussman                           |
| **Wire**                            | Type THW  
Type XHHW - 2                                                             |                                   |
<p>| <strong>Decorative Pole Finish (Old Poway Park and Town Center areas)</strong> | Two-part epoxy - RAL 6005 – Moss Green |                                   |</p>
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<td>Caltrans type 332</td>
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<td>USP16-M2100-112CTB-SD-AL</td>
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<td>LED Signal Module - Red</td>
<td>DR6-RTFB-20A</td>
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<td>LED Signal Module - Yellow</td>
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<td>LED Signal Module - Green</td>
<td>DR6-GTFB-20A</td>
<td>Gelcore</td>
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<td>433-2220-001</td>
<td>Dialight</td>
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<td>RG-59/U Coaxial Video Cable</td>
<td>8281</td>
<td>Belden</td>
</tr>
<tr>
<td>Emergency Vehicle Preemption</td>
<td>Detector – 721</td>
<td>GTT</td>
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<tr>
<td></td>
<td>Phase Selector - 752</td>
<td></td>
</tr>
<tr>
<td>Signal Housing</td>
<td>12” - Aluminum</td>
<td>McCain</td>
</tr>
<tr>
<td>Pedestrian Pushbutton</td>
<td>5” x 7”</td>
<td>McCain</td>
</tr>
<tr>
<td></td>
<td>Bulldog III</td>
<td>Polara</td>
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### Approved Materials List - Water Utilities

**City of Poway**  
**2018**

---

All brass parts and fittings shall comply with California State Assembly Bill AB-1953.

---

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>MANUFACTURER</th>
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<tbody>
<tr>
<td>Air Vac Assembly</td>
<td>Cast iron body epoxy coated w/stainless steel internal parts.</td>
<td>Cla-Val</td>
</tr>
<tr>
<td></td>
<td>1&quot; - 2&quot; NPT, manual per PW-1</td>
<td>Vent-O-Matic</td>
</tr>
<tr>
<td></td>
<td>3&quot; - 6&quot; Flanged</td>
<td>Apco</td>
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<tr>
<td></td>
<td></td>
<td>Crispin</td>
</tr>
<tr>
<td>Angle Meter Stop</td>
<td>¾&quot; - 2&quot; brass NL (AB 1953)</td>
<td>Jones ¾&quot; - 1&quot; 1964W</td>
</tr>
<tr>
<td></td>
<td>1½&quot; &amp; 2&quot; 2-bolt flanges</td>
<td>Jones 1½&quot; - 2&quot; J1973W</td>
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<tr>
<td></td>
<td>Ball valves</td>
<td>Ford BA-23, BFA 23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>McDonald 74602B</td>
</tr>
<tr>
<td>Anti-Seize Compound</td>
<td>For use on stainless steel bolts and nuts</td>
<td>Locktite</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Never Seiz</td>
</tr>
<tr>
<td>Backflow Preventers</td>
<td>All backflow devices shall be RP type</td>
<td>Per USC approved materials list</td>
</tr>
<tr>
<td>Bolts &amp; Nuts</td>
<td>Stainless Steel #316</td>
<td>Pacific Coast Bolts</td>
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<tr>
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<td></td>
<td>Tripac Fasteners</td>
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<td></td>
<td>Industrial Thread Prod.</td>
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<tr>
<td>Brass Pipe &amp; Fittings</td>
<td>¾” - 2” red brass per ASTM B43 NL (AB1953)</td>
<td>Jones, Ford, Nibco Lee Merit</td>
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<tr>
<td>Bushing/Insulated</td>
<td>Molded “Lexan” Polycarbonate insulating bushing</td>
<td>Farwest Corrosion Control</td>
</tr>
<tr>
<td>Chlorine</td>
<td>Liquid (gas) or Sodium Hypochlorite solution. For swabbing of potable water parts/pipe during installation. Disinfecting new water lines No pool chlorine</td>
<td></td>
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<tr>
<td>Copper Tubing</td>
<td>ASTM B88, Type “K”, soft/hard</td>
<td>Mueller Streamline Cerro Cambridge Lee</td>
</tr>
<tr>
<td>Copper Fittings</td>
<td>¾” - 2”</td>
<td>EPC, Lee, Nibco Mueller</td>
</tr>
<tr>
<td>Corporation Stop</td>
<td>MIP x Flare ball valves NL (AB 953)</td>
<td>Jones 1929 Mueller B-25025 Ford FB700 McDonald 74704B</td>
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<tr>
<td>Couplings: PVC - C900 4” thru 12” PVC - C900 14” thru 36”</td>
<td>Repair, Transition, Deflection</td>
<td>Certainteed Naco</td>
</tr>
<tr>
<td>ITEM</td>
<td>DESCRIPTION</td>
<td>MANUFACTURER</td>
</tr>
<tr>
<td>------</td>
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</tr>
</tbody>
</table>
| **Couplings:**  
Transmission - Mechanical | Transition from ACP to PVC Pipe  
All bolts/nuts to be 304 or 316  
**All couplings used to transition ACP to PVC need restraints on PVC side. Grease, then in plastic** | Smith-Blair - Quantum or Omni  
Viking Johnson - Maxifit or Maxistep  
Ford FC2W  
Romac XR501, Macro HP, Alpha |
| **Curb Stop**  
Customer Handle | ¾” - 2” brass ball valves NL (AB 1953) | Jones J-1908W, Jones J-1913W  
Ford B13-w/HB34S  
Ford BF13-w/HB67S  
McD 76101MW-SHDLB |
| **Fire Hydrants: 150 psi**  
Residential  
Commercial  
Industrial | ¾” drilled holes  
2½” x 4” **non-painted**  
2” - 2½” x 4” **non-painted**  
1” - 2 ½” x 2” - 4” **non-painted** | Clow – 2050,2060, 2065  
AVK – 2462, 2464, 2468 w/plastic caps |
| **Fire Hydrants: 200 psi**  
Residential  
Commercial  
Industrial | ¾” drilled holes  
2½” x 4” non-painted  
2 - 2½” x 4” non-painted | AVK - 24/70 Residential  
AVK - 24/90 Commercial |
| **Fire Hydrants Old Poway Park** | 2 - 2½” x 4” ports, “0” style, polished brass | |
| **Fire Hydrant - Bury Ell** | Push-on ductile iron short radius 30” barrel | South Bay Foundry  
Clow |
| **Fire Hydrant - Spools** | 6” - 4” thru 20” cement mortar lined and seal coated  
Fire hydrant “breakoff” spool w/groove | Clow  
South Bay Foundry |
<p>| <strong>Fire Hydrant Break-off Check</strong> | Fire Hydrant Break-off Check Valve | Clow #400A |</p>
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>MANUFACTURER</th>
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</thead>
<tbody>
<tr>
<td>Fittings, Cast/Ductile Iron</td>
<td>Flanged or Push-on tees, bends, crosses, reducers adapters, etc. For water lines 4” and larger. Manufactured per AWWA standards.</td>
<td>Sigma, SIP, Star Pipe Products, Tyler</td>
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<tr>
<td>Fire Service Backflow</td>
<td>RPDA</td>
<td>Approval during plan check by Poway Fire Dept and Poway Public Works per USC</td>
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<tr>
<td>Joint Restraint Assembly</td>
<td>360 Wedge devices used for the connection of pipe and its fittings. This device will not replace the use of thrust blocks. 304 or 316 ss bolts/nuts</td>
<td>Sigma PV-Lok, Ford Uniflange 1500, Star 1200 Series, Romac RomaGrip/611</td>
</tr>
<tr>
<td>Gasket</td>
<td>1/8” thick ring. Non-Asbestos Content</td>
<td>Tripac, Calpico, Pacific Coast Bolt</td>
</tr>
<tr>
<td>Grease</td>
<td>For bolt corrosion protection on buried bolts. NO-OX-ID Type</td>
<td>NSF Sachem</td>
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<tr>
<td>Meter Box and Lid</td>
<td>Concrete</td>
<td>J&amp;R</td>
</tr>
<tr>
<td>Monofilament Poly Wrap (Milwrap)</td>
<td>Minimum thickness 10 mil</td>
<td>J&amp;R</td>
</tr>
<tr>
<td>ITEM</td>
<td>DESCRIPTION</td>
<td>MANUFACTURER</td>
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<tr>
<td>------</td>
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<td>--------------</td>
</tr>
<tr>
<td>Mortar - Installation or repair for water steel pipe</td>
<td>Cement based with high compressive and bonding strength</td>
<td>Tamms Speedcrete Blue Line or equivalent</td>
</tr>
<tr>
<td>Pipe, PVC</td>
<td>4” thru 12” 150 &amp; 200, AWWA C900 14” thru 36” C905</td>
<td></td>
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<tr>
<td>Post Indicator</td>
<td>This device is no longer approved for installation. Contact Poway Public Works and Poway Fire for questions. Includes indicator and tamper switch. All devices shall be UL label affixed.</td>
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<tr>
<td>Service Clamp - AC</td>
<td>¾” - 2” FIP threads, brass saddle brass straps and nuts OR SS straps and nuts for AC pipe size</td>
<td>Jones J - 979(D), J-969(D) Romac 101B, 202B, 202BS Ford 2028, 202BS McDonald 3826, 3846</td>
</tr>
<tr>
<td>Service Clamp - PVC</td>
<td>¾” - 2” FIP threads, brass saddle SS straps and nuts ONLY</td>
<td>Ford 101BS, 202BS Jones J696(D) Romac 202BS McDonald 3846</td>
</tr>
<tr>
<td>ITEM</td>
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<td>MANUFACTURER</td>
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<td>--------------</td>
</tr>
<tr>
<td><strong>Tapping Sleeve</strong>&lt;br&gt;For ACP and PVC Epoxy Coated or Stainless Steel</td>
<td>Fabricated Epoxy or SS with stainless steel bolts and nuts for 4” - 12” wet taps. <strong>Check to see that it is the correct application. ACP or PVC Must use #316 stainless nuts/bolts throughout.</strong></td>
<td>Clow F-5205, F-5207&lt;br&gt;Ford FTSC, FAST&lt;br&gt;Dresser 630, 610&lt;br&gt;Mueller 304, 615, 619&lt;br&gt;Romac SSTIII, FTS-420&lt;br&gt;Smith-Blair 665, 664, 622, 664</td>
</tr>
<tr>
<td><strong>Unions</strong></td>
<td>¾” - 2”</td>
<td>Lee&lt;br&gt;Merit</td>
</tr>
<tr>
<td><strong>Valve:</strong>&lt;br&gt;Ball/Angle</td>
<td>¾” - 2” bronze &amp; brass NL (AB 1953)</td>
<td>Jones J190W&lt;br&gt;Ford BA11-777W&lt;br&gt;McDonald 74606BF</td>
</tr>
<tr>
<td><strong>Valve:</strong>&lt;br&gt;Butterfly</td>
<td>12” - 36” cast iron or ductile iron, resilient seated epoxy coated low zinc stem #304, 316 fasteners 200 PSI</td>
<td>Crispin K-Flo 500&lt;br&gt;Dezurik AWWA&lt;br&gt;M &amp; H 1450&lt;br&gt;M &amp; H 4500&lt;br&gt;Mueller Lineseal XP 250&lt;br&gt;Pratt HP250&lt;br&gt;Val-Matic Series 2000</td>
</tr>
<tr>
<td><strong>Valve:</strong>&lt;br&gt;Resilient Wedge</td>
<td>4” - 12”, cast iron or ductile iron, epoxy coated low zinc stem, 12 mil epoxy lined interior #304, 316 fasteners 200 PSI Fl x Fl; PO x PO; Fl x PO</td>
<td>American Flow Control AFC 2500&lt;br&gt;AVK Ser.65&lt;br&gt;Clow M&amp;H Style 76&lt;br&gt;Mueller Ser. 2361</td>
</tr>
<tr>
<td><strong>Valve Cover</strong></td>
<td>Cast iron valve cover &amp; box 8” valve lid 12” AR/BO lid</td>
<td>South Bay Foundry - SBF 1208N&lt;br&gt;South Bay Foundry - SBF 1243</td>
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<tr>
<td><strong>Valve Key Extension</strong></td>
<td>Extension for valve nuts deeper than 60” Square composite extension w/glued on adapters</td>
<td>Ferguson Waterworks</td>
</tr>
</tbody>
</table>
Section 4  Engineering Supplements

Standard Detail Drawings Supplement
To the “2018 Regional Standard Drawings”
Engineering Supplements

Index of Detail Drawings

PS-2.1  MANHOLE 5’ x 3’ DIAMETER
PS-2.2  CONCRETE COLLAR FOR MANHOLE 5’ x 3’
PS-3    END OF LINE SEWER MAIN CLEANOUT
PS-4    PIPE BEDDING AND TRENCH BACKFILL FOR
        SEwers
PS-7    STANDARD SEWER LATERALS
PS-10   CUTOFF WALL
PS-13   SEWER LATERAL (with property line cleanout)
PS-19   METALLIC TAPE LOCATOR FOR NON-METALLIC
        SEWER PIPE
PW-1    1” WATER SERVICE ASSEMBLIES
PW-2.1  1½” AND 2” WATER SERVICE ASSEMBLIES
PW-2.3  MULTIPLE WATER SERVICE ASSEMBLY
PW-3    MANUAL AIR RELEASE ASSEMBLY
PW-4    AIR & VACUUM VALVE ASSEMBLY
PW-5    4” AND 6” AIR AND VACUUM VALVES
PW-6    BLOW-OFF ASSEMBLY 14” DIA AND SMALLER
PW-8    CLASS 300 INSTALLATION FIRE HYDRANT
        ASSEMBLY
PW-10   6” FIRE HYDRANT
PW-11   FIRE HYDRANT LOCATIONS
PW-12   GATE VALVE, FLANGE OUTLET, AND CAP
        ASSEMBLIES
PW-16.1 FIRE HYDRANT PROTECTION POSTS
PW-16.2 FIRE HYDRANT PROTECTION POST DETAIL
PW-17.1 CONCRETE THRUST BLOCKS
PW-17.2 CONCRETE THRUST BLOCKS AND ANCHOR BLOCKS
PW-19.2 CONCRETE ANCHOR BLOCK FOR BUTTERFLY VALVE ASSEMBLY 12” AND LARGER
PW-21 PIPE BEDDING AND TRENCH BACKFILL FOR WATER MAINS
PW-25 METALLIC TAPE LOCATOR FOR NON-METALLIC WATER PIPE
PW-26 REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY
PW-27 3” & LARGER WATER METER / BACKFLOW PREVENTER INSTALLATION
PW-27.1 3” & LARGER WATER METER / BACKFLOW PREVENTER INSTALLATION
PW-28 DIELECTRIC CONNECTION TO STEEL MAIN
PW-29 AIR GAP SEPARATOR ASSEMBLIES
PW-29.1 AIR GAP SEPARATOR ASSEMBLIES NOTES AND DETAILS
PW-30 2” & SMALLER BACKFLOW PREVENTER INSTALLATION
PW 30.1 CONSTRUCTION METER BACKFLOW ASSEMBLY
PW-32 1” WATER SAMPLING ASSEMBLY
PW-33 REDUCED PRINCIPLE DETECTOR BACKFLOW PREVENTOR
PW-34 BACKFLOW PRESSURE TEST STATION
PW-35 POTABLE WATER SERVICE LINE BYPASS DETAIL
NOTES:

1. MANHOLE FRAME AND ALL JOINTS SHALL BE SET IN CLASS "C" MORTAR OR MASTIC.
2. ALL PRECAST COMPONENTS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478.
3. VERTICAL WALL OF CONE SHALL BE ON THE UPSTREAM SIDE OF THE MANHOLE.
4. CONCRETE BASE SHALL BE 560-C-3250.
5. APPROVED WATER STOP REQUIRED FOR PLASTIC PIPE CONNECTORS.
6. PRECAST SECTIONS SHALL BE USED WITHIN DIMENSION "A" AS REQUIRED, IN ORDER OF PREFERENCE LISTED:
   A. CONE (NOTCHED FOR PIPE IF DIMENSION "A" IS LESS THAN 3").
   B. 6" TO 10" OF 3" DIAMETER GRADE RINGS/AND/OR RISERS.
   C. 5" DIAMETER SHAFT VARIABLE HEIGHT.
7. FLEXIBLE PIPE JOINTS SHALL BE REQUIRED WITHIN 12" OF INSIDE FACE OF MANHOLE EXCEPT FOR PLASTIC PIPE.
8. ALL PATCHING WITHIN MANHOLE BASE SHALL BE EPOXY MORTAR.
9. PRIOR APPROVAL OF PRECAST BASE IS REQUIRED BY THE AGENCY.
NOTES:

1. THIS DETAIL TO BE USED ON ALL MANHOLES THAT ARE LOCATED IN A.C. PAVED AREAS.
2. IN AREAS WHERE THERE IS NO A.C. PAVING, POUR CONCRETE COLLAR 12" THICK X 24" WIDE OUTSIDE OF MANHOLE FRAME.
NOTES:

1. GATE CAP SHALL BE LABELED "POWAY SEWER".
2. CLEANOUTS MAY BE USED FOR EITHER V.C.P. OR PLASTIC SEWER MAINS.
3. RISER TO BE SAME DIAMETER AS SEWER MAIN.
4. IN UNPAVED AREAS A PCC COLLAR 6" THICK AND 36" IN DIAMETER IS TO BE POURED AROUND THE LID.
5. 3" AC OVER 6"x24" DIAMETER PCC SLAB (PAVED AREA).
NOTES:

1. FOR TRENCHING RESURFACING IN IMPROVED STREETS, SEE SDRSD G–24A AND G–24B, TYPE A.

2. (*) INDICATES MINIMUM RELATIVE COMPACTION.

3. MINIMUM DEPTH OF COVER FROM THE TOP OF PIPE TO FINISH GRADE FOR ALL SANITARY SEWER INSTALLATIONS SHALL BE 3 FEET. FOR COVER LESS THAN 3 FEET, SEE SDRSD SP–03 FOR CONCRETE ENCASEMENT.

4. SEE TYPE A INSTALLATION DETAILS NOT SHOWN FOR TYPE B AND C.

5. TYPE C INSTALLATION IS FOR PIPE WITH DIAMETER 15" OR LESS.

6. THE UPPER 12 INCHES OF SUBGRADE IN STREETS SHALL BE COMPACTED TO 95%.
NOTES:
1. ALL LATERAL JOINTS SHALL BE MADE WITH APPROVED WELDING SOLVENT PER MANUFACTURER SPECIFICATIONS.
2. SEE PS-13 FOR ADDITIONAL SEWER LATERAL DETAILS.
4. LONG RADIUS BEND SHOWN, SHORT RADIUS BEND MAY BE USED.
8" MIN. TRENCH WIDTH 8" MIN.

PLAN

BLOCKS TO BE LAID OUT AS TIGHTLY AS POSSIBLE TO DOWNSTREAM SIDE OF NOTCH.

8" x 8" x 16" CONCRETE BLOCK.
FILL CORES WITH GROUT

1/2" EXPANSION JOINT MATERIAL AROUND PIPE.

No. 9 WIRE LADDER TYPE REINFORCEMENT IN ALL HORIZONTAL JOINTS.

TRENCH DEPTH

TYPE A

LEGEND ON PLANS

CITY OF POWAY STANDARD DRAWING

CUTOFF WALL

REVISION | BY | APPROVED | DATE
---|---|---|---
| | | |

DRAWING NUMBER PS-10

APPROVED

CITY ENGINEER R.C.E. 41975

DATE

9/16

NOTES:
1. IN NO CASE SHALL A LATERAL CONNECT TO A SEWER MAIN DIRECTLY ON TOP OF THE PIPE.
2. SEWER LATERALS SHALL HAVE A MINIMUM SLOPE OF 2%.
3. ALL JOINTS ON SEWER LATERAL PIPE SHALL BE COMPRESSION TYPE SDR-35.
4. LATERALS SHALL EXTEND TO PROPERTY LINE UNLESS OTHERWISE NOTED ON PLANS.
6" METAL TAPE
INSTALL AT TOP OF PIPE ZONE
OR A MAXIMUM OF 36" DEEP

5'-0" MIN.
VARY

SEWER

SECTION

LATERAL (TYPICAL)

METAL TAPE

CURB LINE

PROPERTY LINE

PLAN

VARY

5'-0" MIN.
NOTES:
1. INSTALL CORPORATION STOP PERPENDICULAR TO PIPE AXIS.
2. COPPER SERVICE SHALL BE NO MORE THAN 3" ABOVE THE MAIN.
3. ALL SOLDER TO BE SILVER SOLDER.
4. STAMP "W" FOR DOMESTIC ON CURB FACE OPPOSITE METER AND "I" FOR RECLAIMED.

| ITEM | NO. | DESCRIPTION | SPEC
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<td>CONC. METER BOX</td>
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<td>2</td>
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<td>BRONZE ANGLE METER STOP W/ LOCKWING</td>
<td>SEE CITY</td>
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<tr>
<td>3</td>
<td>1</td>
<td>COPPER WATER SERVICE TUBE—TYPE K, SOFT ANNEALED</td>
<td>APPROVED</td>
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<tr>
<td>4</td>
<td>1</td>
<td>BRONZE CORP STOP WITH TAIL PIECE</td>
<td>MATERIALS LIST</td>
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<tr>
<td>5</td>
<td>1</td>
<td>BRONZE SERVICE CLAMP, SINGLE FLAT STRAP (A.C. OR P.V.C.)</td>
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<tr>
<td>6</td>
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<td>USE ALL FLARE CONNECTIONS</td>
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CITY OF POWAY STANDARD DRAWING

1" WATER
SERVICE ASSEMBLIES

REVISION BY APPROVED DATE
REDRAWN MR S. CROSBY 03/13
UPDATE TK S. CROSBY 06/16

approved
9/16
CITY ENGINEER R.C.E. 41975
DRAWING NUMBER PW-1
NOTES:
1. SILVER SOLDER RECOMMENDED.
2. INSTALL CORP STOP PERPENDICULAR TO PIPE AXIS.
3. STAMP "W" FOR DOMESTIC SERVICE ON CURB FACE OPPOSITE METER, "I" FOR RECLAIMED.
4. IF SERVICE IS FOR RESIDENTIAL THEN AMS WILL BE 8"-10" ON BOTH 1 1/2" OR 2".

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<th>ITEM</th>
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<td>1</td>
<td>DOUBLE STRAP BRONZE SERVICE CLAMP</td>
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<td>2</td>
<td>1</td>
<td>CORP. STOP WITH TAIL PIECE</td>
<td>SEE CITY</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>COPPER WATER SERVICE TUBE—TYPE K, SOFT ANNEALED</td>
<td>APPROVED</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>BRONZE ANGLE METER STOP W/ LOCKING</td>
<td>MATERIALS LIST</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>CONCRETE METER BOX</td>
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CITY OF POWAY STANDARD DRAWING
1 1/2" AND 2" WATER SERVICE ASSEMBLIES

REVISION BY APPROVED DATE
REDRAWN MR. S. CROSBY 03/13

APPROVED
CITY ENGINEER R.C.E. 41975
DRAWING NUMBER PW-2.1

9/14
3/4" METERS, STOPS, AND BOXES INSTALLED PER PW-1, 1" WATER SERVICES ASSEMBLIES.

FLARED CONNECTIONS

NOTES:
1. SILVER SOLDER REQUIRED.
2. INSTALL CORP. STOP PERPENDICULAR TO PIPE AXIS.
3. APPROVED BY PUBLIC WORKS ONLY

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SIZE FITTING / NO. OF METERS</th>
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<td>2</td>
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</tr>
<tr>
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<tr>
<td>4</td>
<td>3/4&quot;x3/4&quot;x1&quot;</td>
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<td>5</td>
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<tr>
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ITEM NO. DESCRIPTION
1. DOUBLE STRAP BRONZE SERVICE CLAMP
2. CORP. STOP WITH TAIL PIECE
3. COPPER WATER SERVICE, TYPE K, SOFT (ANNEALED)
4. SILVER SOLDER JOINT TEE
5. COPPER WATER SERVICE TUBE, TYPE K, SOFT (ANNEALED)
6. VARI. SILVER SOLDER JOINT RED. TEE
7. VARI. COPPER WATER SERVICE TUBE, TYPE K, SOFT (ANNEALED)
8. VARI. SILVER SOLDER JOINT RED. TEE
9. VARI. COPPER WATER SERVICE TUBE, TYPE K, SOFT (ANNEALED)
10. 1 OR 2 SILVER SOLDER JOINT BEND
11. 0 OR 1 SILVER SOLDER JOINT RED. BEND
12. 1/MTR COPPER WATER SERVICE TUBE RISER, TYPE K, SOFT (ANNEALED)

CITY OF POWAY STANDARD DRAWING
MULTIPLE
WATER SERVICE ASSEMBLY

REVISION BY APPROVED DATE
REDRAWN BY S. CROSBY 03/13
CITY ENGINEER DATE
R.C.E. 41975
DRAWING NUMBER PW-2.3
NOTES:
1. INSTALL CORPORATION STOP PERPENDICULAR TO PIPE AXIS.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>NO.</th>
<th>DESCRIPTION</th>
<th>SPECS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>12” C.I. VALVE BOX AND COVER MARKED &quot;POWAY WATER&quot;</td>
<td>USE FIP X FIP AMS STYLE</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1” BRZ. ANGLE VALVE W/ BRZ. HANDWHEEL &amp; COMP. DISC</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1 1/2” HOSE THREAD CAP W/ CHAIN LUG.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1 1/2” MALE HOSE NIPPLE</td>
<td>SEE CITY</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>1 1/2” x 1” 90’ REDUCING ELBOW</td>
<td>APPROVED</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>1” CLOSE NIPPLE</td>
<td>MATERIALS LIST</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>1” BRONZE COUPLING (FLARE &amp; MALE NPT)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>1” COPPER WATER SERVICE TUBE, TYPE K, (SOFT ANNEALED)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>1” CORP. STOP WITH TAIL PIECE</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>DOUBLE STRAP BRONZE SERVICE CLAMP</td>
<td></td>
</tr>
</tbody>
</table>
3/16" GALV. PL. COVER
25 1/2" DIA.
(6) 1" Holes, Equal Space

1" MIN.
SEE NOTE 1

STEEL PIPE

2 1/2" CLR.

3/4" H.T. UTILITY MFG. CO.

TEST DRAIN VALVE 1/2" I.P.

4" MIN.

12" MAX.

24" MAX.

3/8" GRAVEL

SEE NOTE 1

SLOPE UPWARD
(2% MIN.)

1" MIN.

ROTATE OUTLET 1" MIN. OFF VERT. TO ASSURE UPWARD SLOPE IN PIPE

VERT. 6

NOTES:
1. INSTALL CORPORATION STOP PERPENDICULAR TO PIPE AXIS
2. ASSEMBLIES INSTALLED IN EASEMENTS AND STREETS WITHOUT CURBS, SHALL BE PROTECTED BY PROTECTION POSTS PER STD. DWG. PW-16
3. SILVER SOLDER REQUIRED

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1</td>
<td>24&quot; I.D. x 4&quot; REINFORCED CONCRETE PIPE</td>
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<tr>
<td>2</td>
<td>90° STREET ELLS</td>
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<tr>
<td>3</td>
<td>COMBINATION AIR RELEASE AND AIR VACUUM VALVE</td>
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<tr>
<td>4</td>
<td>90° FLARE X FEMALE NPT ADAPTER</td>
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<tr>
<td>5</td>
<td>90° ELL, SLIP</td>
</tr>
<tr>
<td>6</td>
<td>FLARE X FEMALE NPT ADAPTER</td>
</tr>
<tr>
<td>7</td>
<td>COPPER TUBING</td>
</tr>
<tr>
<td>8</td>
<td>BRONZE CORP STOP AND 1/4 BEND</td>
</tr>
<tr>
<td>9</td>
<td>BRONZE GATE VALVE</td>
</tr>
<tr>
<td>10</td>
<td>BRONZE DOUBLE STRAP SERVICE STRAP</td>
</tr>
<tr>
<td>11</td>
<td>APPROPRIATE CLAMP (PVC OR AC)</td>
</tr>
<tr>
<td>12</td>
<td>BRASS PIPE NIPPLE</td>
</tr>
<tr>
<td>13</td>
<td>FLARE X MIP ADAPTER</td>
</tr>
</tbody>
</table>
1. Flanged outlet, cement lined and coated steel
2. Flanged, 90° ell, cement lined and coated steel
3. Valve
4. Valve well and cap (per PW-12)
5. Steel pipe, cement lined and coated
6. Air and vacuum valve
7. 2-90° ells (not required with above ground metal enclosures)

Type of enclosures and locations to be approved by City Engineer.
3" A.C. OVER 6" x 24" DIA. 560-C-3250 PSI MIN P.C.C. SLAB (PAVED AREAS)

8" - 10" TOP OF HANDLE

6" x 36" DIA. 560-C-3250 PSI MIN P.C.C. SLAB (NON-PAVED AREAS)

12" LENGTH OF 10 GA. BRASS CHAIN

2" MIN OVERLAP

ABS OR SDR PIPE; TOP SHALL BE MIN 6" BELOW GRADE; NO C900 PIPE

NOTES:
1. INSTALL CORPORATION STOP 45° TO PIPE AXIS.
2. ALL SOLDER TO BE SILVER

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SIZE FITTING PER SIZE MAIN</th>
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<tbody>
<tr>
<td>4&quot;</td>
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<tr>
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<td>1&quot;</td>
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<tr>
<td>3</td>
<td>1-1/2&quot;</td>
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<tr>
<td>4</td>
<td>1-1/2&quot;</td>
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<tr>
<td>5</td>
<td>1x1-1/2&quot;</td>
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<tr>
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<td>1x1-1/2&quot;</td>
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<tr>
<td>8</td>
<td>1&quot;</td>
</tr>
<tr>
<td>9</td>
<td>1&quot;</td>
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ITEM NO. DESCRIPTION
1 1 12" C.I. VALVE BOX AND COVER MARKED "POWAY WATER"
2 1 BRZ. ANGLE VALVE W/ BRZ. HANDWHEEL & COMP. DISC
3 1 HOSE THREAD CAP W/ CHAIN LUG.
4 1 MALE HOSE NIPPLE
5 1 90° REDUCING ELBOW
6 1 CLOSE NIPPLE
7 1 1" BRONZE COUPLING (FLARE & MALE NPT)
8 1 COPPER WATER SERVICE TUBE TYPE K, (SOFT ANNEALED)
9 1 CORP. STOP WITH TAIL PIECE
10 1 DOUBLE STRAP BRONZE SERVICE CLAMP (A.C. PIPE)
11 1 MIN. R=12 X (L.D.)² OR COPPER SLIP ELL

REVISION BY DATE
REDRAWN S. CROSBY 03/13
UPDATE S. CROSBY 06/16

CITY OF POWAY STANDARD DRAWING
BLOW-OFF ASSEMBLY
14" DIA AND SMALLER

DRAWING NUMBER PW-6
1. Fire hydrants located in easements or on streets without curbs shall be protected with guard posts per Std. DWG PW-16.1. Position posts 2' in front and 2.5' on each side of hydrant.

2. All flanges shall be 250 P.S.I.

3. All bolts shall be stainless steel.

4. Locate fire hydrant per Std. DWG. PW-11.

5. Valve nut deeper than 60" shall have extension per approved materials.


7. Install blue RPM 6" from centerline of road adjacent to fire hydrant.

8. Top flange of break-off check valve shall be set within the concrete pad. Break off groove, minimum of one, shall be placed above the pad.

9. Valve can lid 1208 N.

10. Steel pipe 24" dia 6" thick 3250 PSI.

---

**ITEM NO.** | **DESCRIPTION** | **REMARKS**
--- | --- | ---
1 | 1 | 6" Fire Hydrant
2 | 1 | 6" FLG Break-Off Check Valve
3 | 1 | Hydrant Spool 6" Cast Iron
4 | 1 | 6" Hydrant Bury Ell
5 | 1 | 6-5/8" O.D. Steel Pipe, 10 Ga. W/ Slip-On Flanges
6 | 1 | 6" Gate Valve – Flange by Flange
7 | 1 | 6" Flanged Outlet
8 | 1 | Pipe Slip Joint, SDR-35 PVC, Valve Box Assembly
9 | 1 | 8" C.I. Valve Box and Cover Marked "POWAY WATER"
10 | 3 | PCC Thrust blocks 2000 PSI
1. FIRE HYDRANT
2. 12" LONG BREAK-OFF SPOOL W/ CHECK VALVE
3. 6" EXTENSION SPOOL
4. 3/4" x 3" HEX. HEAD MACHINE BOLTS AND NUTS, TYPICAL
   ALL BOLTS AND NUTS TO BE STAINLESS STEEL (MARKED 316)
5. 6" HYDRANT ELL – SHORT RADIUS 6" x 30" (LENGTH)
6. 6" STEEL OR PVC PIPE
7. 6" VALVE
8. VALVE WELL INSTALLATION (SEE PW–12)
9. 4" PORT TO FACE HYDRANT VALVE OR PER FIRE DEPT

NOTES:
1. ITEMS 2, 3 & 6 MAY BE CEMENT LINED AND COATED FLANGED STEEL PIPE WHERE
   PERMITTED BY AGENCY
2. VALVE NUT DEEPER THAN 60" SHALL HAVE EXTENSION PER APPROVED MATERIALS
3. BREAK-OFF BOLTS NOT ALLOWED
4. INSTALL BLUE RPM 6" FROM CENTERLINE OF ROAD ADJACENT TO FIRE HYDRANT

LEGEND ON PLANS

CITY OF POWAY STANDARD DRAWING
6" FIRE HYDRANT

DRAWING NUMBER PW–10
1. CONCRETE APRON SHALL BE REQUIRED WHEN HYDRANT IS LOCATED IN UNPAVED AREAS. APRON SHALL BE 6" THICK 520-C-2500 CONCRETE.
2. WHEN DISTANCE FROM HYDRANT TO THE TOP OR TOE OF SLOPE IS LESS THAN 2'0" SPECIAL HYDRANT INSTALLATION WILL BE REQUIRED BY AGENCY.
3. WHERE HYDRANT IS NOT PROTECTED BY A VERTICAL FACE OF CURB, PROTECTION POSTS ARE REQUIRED. SEE STANDARD DRAWING PW-16.1 FOR DETAILS.
4. THE CENTERLINE OF THE HYDRANT SHALL BE LOCATED 5' MINIMUM FROM CURB RETURN AND MINIMUM 3'6" FROM DRIVEWAY OR ANY FIXED OBSTRUCTION.
5. INSTALL BLUE RPM 6" FROM CENTERLINE OF ROAD ADJACENT TO FIRE HYDRANT.
PROTECTION POSTS (PW-16.2) WHEN REQUIRED BY AGENCY (COLOR - TRAFFIC YELLOW) 2 COATS OF PAINT.

NOTE: NUMBER OF POSTS TO BE DETERMINED BY ENGINEER
NOTES:
1. POSTS SHALL BE PAINTED TRAFFIC YELLOW.
2. PROTECTION POSTS ARE REQUIRED FOR ALL FIRE HYDRANTS, FDGS, PIVs, AND ABOVE GROUND STORAGE TANKS LOCATED LESS THAN 4' FROM A CURB.
3. POSTS SHALL BE LOCATED NOT LESS THAN 3' FROM ABOVE GROUND STORAGE TANKS.
4. POSTS SHALL BE LOCATED NOT LESS THAN 2' FROM FDGS AND PIVs.
5. POSTS SHALL BE CONSTRUCTED OF CONCRETE FILLED SCHEDULE 40 STEEL, ±4" IN DIAMETER, WITH CONCRETE CAP. CONCRETE SHALL BE CLASS 500-C-2500.
2. See standard drawing W-18 for bearing areas.
3. Bond breaker is required on dead end blocking and shall be #15 building felt.
4. Tapped caps are not allowed.
5. A minimum of 6" of concrete shall be placed beneath each fitting.
6. All iron is to be wrapped in plastic sheeting minimum 10 mils thick.
NOTES:

1. CONCRETE THRUST BLOCKING SHALL NOT COVER UNDERGROUND SWING CHECK VALVE INSPECTION PORT.
2. INDICATE PIPE TYPE, SIZE, AND DIAMETER.
3. THRUST BLOCKS SHALL BE INSTALLED IN ACCORDANCE WITH SDUSD W-17 & W-18 AND THE CITY OF POWAY SPECIFICATIONS.
4. ALL BOLTS AND NUTS TO BE STAINLESS STEEL (316).
5. ALL UNDERGROUND FITTINGS TO BE WRAPPED IN 10 MIL PLASTIC. PLASTIC SHALL EXTEND 12" ONTO PIPE MATERIAL.
6. ALL MATERIALS SHALL BE FM/UL LISTED AND SHALL BE APPROVED BY THE FIRE MARSHAL PRIOR TO INSTALLATION.
7. ANCHOR BLOCK – CITY OF POWAY APPROVED JOINT RESTRAINT ASSEMBLY REQUIRED.
   A. INCREASE VOLUMES SHOWN IN PROPORTION TO PRESSURES EXISTING WHEN PRESSURE TESTING PIPELINE.
   B. SPECIAL DESIGN REQUIRED.

<table>
<thead>
<tr>
<th>PIPE NOMINAL DIA</th>
<th>CUBIC FT OF CONCRETE REQUIRED PER 100PSI PRESSURE (SEE NOTE 7A)</th>
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<tr>
<td></td>
<td>45'</td>
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<tr>
<td>4</td>
<td>7</td>
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<td>27</td>
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<tr>
<td>10</td>
<td>SEE 7B</td>
</tr>
<tr>
<td>12</td>
<td>SEE 7B</td>
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CONCRETE ANCHOR BLOCK SCHEDULE

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<th>PIPE SIZE</th>
<th>CL 150</th>
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<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>12&quot;</td>
<td>21&quot;</td>
</tr>
<tr>
<td>14&quot;</td>
<td>24&quot;</td>
</tr>
<tr>
<td>16&quot;</td>
<td>24&quot;</td>
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<tr>
<td>18&quot;</td>
<td>24&quot;</td>
</tr>
</tbody>
</table>

NOTES:
1. WRAP ALL IRON WITH 10 MIL THICK PLASTIC SHEETING.
2. THIS DRAWING IS NOT APPLICABLE TO STEEL PIPE INSTALLATIONS.

SECTION A–A

CITY OF POWAY STANDARD DRAWING

CONCRETE ANCHOR BLOCK FOR BUTTERFLY VALVE ASSEMBLY 12-INCH AND LARGER

REVISION DRAWING NUMBER
BY APPROVED DATE
REDRAWN MR S. CROSBY 03/13 PW–19.2
CITY ENGINEER R.C.E. 41975
NOTES
1. FOR TRENCHING ON IMPROVED STREETS SEE SDRS GD-24A (TYPE A) AND G-24B FOR RESURFACING DETAILS. TOP 12" SHALL BE 95% R.C.
2. (*) INDICATES MINIMUM RELATIVE COMPACTION.
3. BEDDING MATERIAL SHALL BE GRANULAR WITH A SAND EQUIVALENT (SE) OF NOT LESS THAN 30 AND AN EXPANSION COEFFICIENT, WHEN SATURATED WITH WATER, OF NOT MORE THAN 0.5 OF ONE PERCENT (0.5%). THE SAND MATERIAL MUST PASS 100% OF #4 SIEVE SIZE

<table>
<thead>
<tr>
<th>SIEVE SIZE</th>
<th>PERCENT PASSING</th>
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<tbody>
<tr>
<td>#4</td>
<td>100</td>
</tr>
<tr>
<td>#8</td>
<td>75 - 100</td>
</tr>
<tr>
<td>#200</td>
<td>0 - 15</td>
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</tbody>
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CITY OF POWAY STANDARD DRAWING
PIPE BEDDING AND TRENCH BACKFILL FOR WATER MAINS

REVISION BY APPROVED DATE
REDRAWN MR. S. CROSBY 03/13
METAL TAPE
INSTALL AT TOP
OF PIPE ZONE OR
A MAXIMUM OF 36"
DEEP.

SECTION

NOTES:
1. ALL TAPE TO BE 3" METALLIC — BLUE IN COLOR
   AND "WATER LINE BELOW" PRINTED CONTINUOUSLY.
2. ADEQUATELY BOND SERVICE TAPE TO ENSURE
   ELECTRICAL CONTINUITY.
3. TAPE SHALL EXTEND INTO SERVICE BOX OR WELL
   CASING TO ALLOW FOR MARK-OUT BY CONTINUITY
   TESTER.

PLAN

CITY OF POWAY STANDARD DRAWING
METALLIC TAPE LOCATOR
FOR NON-METALLIC WATER PIPE

REVISION | BY | APPROVED | DATE
--------- | --- | -------- | ----
REDRAWN  | MR | S. CROSBY | 03/13

APPROVED

CITY ENGINEER
R.C.E. 41975

DRAWING NUMBER
PW-25
SECTION A-A

3/4", 1-1/2" AND 2" ASSEMBLY

SECTION A-A

3", 4" AND 6" ASSEMBLY

EQUIPMENT SCHEDULE

<table>
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<tr>
<th>ITEM</th>
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<th>SPECIFICATIONS</th>
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<tr>
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<td>COPPER ADAPTER, S.J. x MALE N.P.T.</td>
<td>3-0&quot; 3-0&quot; 4-0&quot; 4-0&quot; 6-6&quot; 6-6&quot; 8-8&quot;</td>
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<tr>
<td>2</td>
<td>-</td>
<td>TYPE &quot;R&quot; HARD COPPER TUBE</td>
<td>2-0&quot; 2-0&quot; 2-6&quot; 2-6&quot; 4-0&quot; 4-0&quot; 4-6&quot;</td>
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<td>4</td>
<td>COPPER C X C ELL</td>
<td>1-0&quot; 1-0&quot; 1-0&quot; 1-0&quot; 1-6&quot; 1-6&quot; 2-0&quot;</td>
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<tr>
<td>4</td>
<td>-</td>
<td>BRASS PIPE, THREADED</td>
<td>3&quot; 3-1/2 5-1/2 5-0&quot; 14&quot; 10&quot; 12&quot;</td>
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<tr>
<td>5</td>
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<td>BRASS CLOSE NIPPLE</td>
<td>1-6&quot; 1-6&quot; 1-6&quot; 2-0&quot; 2-0&quot; 2-0&quot; 2-6&quot;</td>
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<tr>
<td>6</td>
<td>1</td>
<td>REDUCED PRESS. BACKFLOW PREVENTER</td>
<td></td>
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<tr>
<td>7</td>
<td>1</td>
<td>TEMPORARY CAP</td>
<td>5 S.F. 5 S.F. 9 S.F.</td>
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<tr>
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<td>ADAPTER, C.I. FIG x R.T.</td>
<td>1-5 3/4&quot; 1&quot; 1-1/2&quot; 2&quot;</td>
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<tr>
<td>9</td>
<td>-</td>
<td>A.C. OR P.V.C. - 150 PIPE</td>
<td>3/4&quot; 1&quot; 1-1/2&quot; 2&quot; 3&quot; 4&quot; 6&quot;</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>90° FIG. x R.T. C.I. BEND</td>
<td>7 3/4&quot; 1&quot; 1-1/2&quot; 2&quot; 4&quot; 4&quot; 6&quot;</td>
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<tr>
<td>11</td>
<td>2</td>
<td>FIG. C.I. SPOOL</td>
<td>8-10 - - - 4&quot; 4&quot; 6&quot;</td>
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<tr>
<td>12</td>
<td>2</td>
<td>90° FIG. C.I. BEND</td>
<td>11&amp;12 - - - 3&quot; 4&quot; 6&quot;</td>
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<tr>
<td>13</td>
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<td>FIG. C.I. REDUCER</td>
<td>13 - - - 4&quot; 3/1 -</td>
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<tr>
<td>14</td>
<td>1</td>
<td>2X 3X 4&quot; CONCRETE SPLASH PAD</td>
<td>SEE TABLE 14 W101+100T W201+200T W202+2001 W200 W300</td>
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CITY OF POWAY STANDARD DRAWING

REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY

REVISED BY APPROVED DATE

S. CROSBY 02/13

CITY ENGINEER

R.C.E. 41975

DRAWING NUMBER PW-26
NOTES:
1. 48" Chain link fence with black epoxy coated finish is optional.
2. Paint as per Poway Standard
3. Flange bolts are to be 316 stainless steel.
4. Locate backflow prevention device in such a manner that will allow the device to be readily accessible for inspection and repair.
5. Testing shall be conducted prior to acceptance by Public Works.
6. Materials shall be selected from the City of Poway’s approved materials list.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>NO.</th>
<th>DESCRIPTION</th>
<th>SPECS</th>
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<tbody>
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<td>WATER METER</td>
<td>Single Read Compound (Supplied by the City of Poway) (Installed by Contractor)</td>
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<td>WEDGE VALVE</td>
<td>RER Approved Materials List</td>
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<td>-</td>
<td>90° ELBOW</td>
<td>CAST IRON</td>
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<tr>
<td>4</td>
<td>-</td>
<td>BACKFLOW PREVENTER</td>
<td>PER Approved Material List</td>
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<tr>
<td>5</td>
<td>-</td>
<td>STRAINER</td>
<td></td>
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<td>6</td>
<td>-</td>
<td>CONCRETE PAD</td>
<td>6&quot; Thick (2,500 PSI)</td>
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<td>7</td>
<td>-</td>
<td>THRUST BLOCK</td>
<td>PW–17.1</td>
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<td>8</td>
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<td>6&quot;</td>
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<td>36&quot; MIN.</td>
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<td>12&quot; MIN., 24&quot; MAX.</td>
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<td>PROTECTION POSTS</td>
<td>PW–16.2</td>
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<tr>
<td>12</td>
<td>-</td>
<td>PUSH–ON 90° ELBOW</td>
<td>CAST IRON (Must be size of service)</td>
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<tr>
<td>13</td>
<td>-</td>
<td>PIPE PENETRATION</td>
<td>WRAP IN 10 MIL VISOQUEEN</td>
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<td>FLXVL REDUCTOR</td>
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<td>20</td>
<td>-</td>
<td>HOSE NOZZLE CAP</td>
<td>CAST IRON</td>
</tr>
</tbody>
</table>
NOTES:
1. IF UNINTERRUPTIBLE SERVICE IS NEEDED, THEN A BYPASS MAY BE INSTALLED WITH CITY APPROVAL.
   BYPASS MUST BE PROTECTED BY BACKFLOW PREVENTER.
2. SEE PW–27.1 FOR ADDITIONAL NOTES AND MATERIALS DATA.
NOTES:
DIELECTRIC CONNECTIONS SHALL BE REQUIRED ON ALL AIR AND VACUUM VALVE ASSEMBLIES, MANUAL AIR RELEASE ASSEMBLIES, BLOW-OFF ASSEMBLIES, AND WATER SERVICE ASSEMBLIES WHERE COPPER TUBING OR BRASS PIPE CONNECTIONS ARE MADE TO STEEL MAINS.

FIELD-APPLIED CEMENT MORTAR ALL AROUND

SECTION A--A

LENGTH OF WRAP ZONE = 4 FEET

TYPICAL WRAP—USE DOUBLE WRAP TAPE. WRAP CORPORATION STOP OR VALVE IN OPEN POSITION UNLESS OTHERWISE DIRECTED.

<table>
<thead>
<tr>
<th>COPPER TUBING</th>
<th>VALVE OR CORP. STOP</th>
<th>STEEL COUPLING</th>
<th>INSULATING BUSHING</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>1&quot;</td>
<td>3/4&quot;x1&quot;</td>
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<td>1&quot;</td>
<td>1&quot;</td>
<td>1-1/2&quot;</td>
<td>1&quot;x1-1/2&quot;</td>
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<tr>
<td>1-1/2&quot;</td>
<td>1-1/2&quot;</td>
<td>2&quot;</td>
<td>1-1/2&quot;x2&quot;</td>
</tr>
<tr>
<td>2&quot;</td>
<td>2&quot;</td>
<td>2-1/2&quot;</td>
<td>2&quot;x2-1/2&quot;</td>
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<table>
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</tr>
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<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1/2 LENGTH OF EXTRA STRONG PIPE COUPLING</td>
<td>SEE CITY APPROVED MATERIALS LIST</td>
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<tr>
<td>2</td>
<td>1</td>
<td>INSULATING BUSHING—NPT</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>CORPORATION STOP—MALE NPT x FLARE NUT</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>CORPORATION STOP FLARE NUT</td>
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</tr>
<tr>
<td>5</td>
<td>1</td>
<td>PVC TAPE (10 MILL, PRESSURE SENSITIVE)</td>
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**SIZES—DIMENSIONS**

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<tr>
<th>REF.</th>
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<tr>
<td>A</td>
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<td>8&quot;</td>
<td>12&quot;</td>
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</tr>
<tr>
<td>B</td>
<td>2&quot;–3&quot;</td>
<td>2&quot;–3&quot;</td>
<td>2'–1&quot;</td>
<td>2'–0&quot;</td>
</tr>
<tr>
<td>1 THRU 7</td>
<td>3/4&quot;</td>
<td>1&quot;</td>
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<td>1&quot;–2 REG</td>
<td>1–1/2&quot; – 2 REG</td>
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<tr>
<td>11</td>
<td>3&quot; SCR.</td>
<td>1&quot; FIG.</td>
<td>1–1/2&quot; FIG</td>
<td>2&quot; FIG.</td>
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<tr>
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<td>1–1/2&quot;</td>
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<tr>
<td>14</td>
<td>1&quot; x 3&quot;</td>
<td>1&quot; x 4&quot;</td>
<td>2&quot; x 6&quot; *</td>
<td>2&quot; x 6&quot;</td>
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<td>15 &amp; 16</td>
<td>3&quot;</td>
<td>4&quot;</td>
<td>6&quot;</td>
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</tr>
<tr>
<td>17 &amp; 19</td>
<td>8&quot;</td>
<td>8&quot;</td>
<td>8&quot;</td>
<td>8&quot;</td>
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<tr>
<td>18, 20, 22</td>
<td>8&quot;</td>
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<td>10&quot;</td>
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<td>8&quot;</td>
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<td>10&quot;x10&quot;x8&quot;</td>
<td>12&quot;x12&quot;x8&quot;</td>
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*WITH 1–1/2" x 2" FLUSH, BRONZE BUSHING*

**EQUIPMENT SCHEDULE**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>REQ.</th>
<th>DESCRIPTION</th>
<th>SPECIFICATIONS</th>
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<tr>
<td>1</td>
<td>2</td>
<td>COPPER ADAPTER, S.J. x MALE N.P.T.</td>
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<tr>
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<td>–</td>
<td>TYPE &quot;K&quot; SOFT COPPER TUBE</td>
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<tr>
<td>3</td>
<td>1</td>
<td>BRONZE 90° SCREWED ELL</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>–</td>
<td>BRASS PIPE, THREADED</td>
<td></td>
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<tr>
<td>5</td>
<td>1</td>
<td>BRONZE UNION, SCREWED</td>
<td></td>
</tr>
<tr>
<td>6 &amp; 10</td>
<td>–</td>
<td>BRASS CLOSE NIPPLE</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>BRONZE GLOBE VALVE, SCREWED</td>
<td>SEE TABLE</td>
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<td>8</td>
<td>–</td>
<td>#150 BRONZE FLANGE, SCREWED</td>
<td>SEE TABLE</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>BRONZE BUSHING, OUTSIDE HEAD—SCREWED</td>
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</tr>
<tr>
<td>11</td>
<td>1</td>
<td>FLOAT VALVE</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>ORIFICE PLATE, PADDLE TYPE</td>
<td>SEE STD. SPECS FOR BORING DIA.</td>
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<tr>
<td>13</td>
<td>1</td>
<td>COPPER ADAPTER, FTG. x MALE N.P.T.</td>
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<tr>
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<td>1</td>
<td>COPPER FTG. ADAPTER, FTG. x S.J.</td>
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<tr>
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<td>COPPER 90° ELL, S.J.</td>
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</tr>
<tr>
<td>16</td>
<td>–</td>
<td>TYPE &quot;K&quot; HARD COPPER TUBE</td>
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<tr>
<td>17 &amp; 18</td>
<td>1</td>
<td>C.I.P. FIG. ONE END</td>
<td></td>
</tr>
<tr>
<td>19 &amp; 20</td>
<td>1</td>
<td>FIG. 90° C.I. BEND</td>
<td></td>
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<tr>
<td>21</td>
<td>1</td>
<td>FIG. C.I. TEE</td>
<td></td>
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<tr>
<td>22</td>
<td>1</td>
<td>FIG. C.I. SPOOL, 12&quot; LONG</td>
<td>INTEGRALLY CAST FLANGES</td>
</tr>
<tr>
<td>23</td>
<td>–</td>
<td>PRECAST CONCRETE VAULT</td>
<td>&quot;QUICKSET&quot; TV–3013</td>
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<tr>
<td>24</td>
<td>–</td>
<td>HINGED COVER, PARKWAY TYPE</td>
<td>&quot;QUICKSET&quot; GPB–3100</td>
</tr>
</tbody>
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**CITY OF POWAY STANDARD DRAWING**

**AIR GAP SEPARATOR ASSEMBLIES**

**NOTES AND DETAILS**

**REVISION BY APPROVED DATE**

<table>
<thead>
<tr>
<th>NEW DWG</th>
<th>MR</th>
<th>S. CROSBY</th>
<th>03/13</th>
</tr>
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**APPROVED BY DATE**

<table>
<thead>
<tr>
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<th>DATE</th>
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**DRAWING NUMBER** PW–29.1

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<td>FIRE HYDRANT</td>
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<td>2</td>
<td>1</td>
<td>CONSTRUCTION WATER METER</td>
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</tr>
<tr>
<td>3</td>
<td>1</td>
<td>MALE FIRE HOSE CONNECTION</td>
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<td>REDUCED PRESSURE BACKFLOW PREVENTER</td>
<td>SUPPLIED BY CUSTOMER</td>
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<td>1</td>
<td>ADJUSTABLE PIPE SUPPORT</td>
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<tr>
<td>6</td>
<td>1</td>
<td>FEMALE FIRE THREAD CONNECTION</td>
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CITY OF POWAY STANDARD DRAWING
CONSTRUCTION METER
BACKFLOW ASSEMBLY

REVISION BY APPROVED DATE
EDIT DS REDRAWN MR S. CROSBY 03/13

APPROVED
CITY ENGINEER R.C.E. 41975
DRAWING NUMBER PW–30.1
NOTES:
1. LOCATE BACKFLOW PREVENTER WITHIN 12" OF WATER METER OR PER ENGINEER'S DIRECTION.
2. ALL METAL JOINTS MUST BE SILVER SOLDERED.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>NO.</th>
<th>DESCRIPTION</th>
<th>SPECS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>BACKFLOW PREVENTER</td>
<td>PER APPROVED MATERIALS LIST</td>
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<td>2</td>
<td></td>
<td>BALL VALVE</td>
<td>PER APPROVED MATERIALS LIST</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>90° ELBOW</td>
<td>BRASS OR COPPER</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>UNION</td>
<td>BRASS OR COPPER</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>CONCRETE PAD</td>
<td>6&quot; THICK (5200-0-2500 PSI); SEE PW-26</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>THRUST BLOCK</td>
<td>PW-17.1 FOR 1 1/2&quot; AND LARGER</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>12&quot; MIN., 24&quot; MAX.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>6&quot;</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>12&quot; MIN.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>RISER</td>
<td>BRASS OR COPPER; WRAPPED WITH PLASTIC TAPE THROUGH CONCRETE</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>SUBGRADE</td>
<td>COMPACTED 90%</td>
</tr>
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CITY OF POWAY STANDARD DRAWING

2" & SMALLER BACKFLOW PREVENTER INSTALLATION

DRAWING NUMBER PW-30

APPROVED
CITY ENGINEER R.C.E. 41975

REVISION BY APPROVED DATE

ADDED NOTE DS

REDRAWN MR S. CROSBY 03/13
1 ALUMINUM HOUSING
2 FLUSH MOUNTED LOCK
3 3/8 INCH COPPER GOOSE NECK
4 1/2 X 3/8 INCH BRASS VALVE
5 1/2 INCH BRASS PIPE NIPPLE
6 LID: SIDE, FRONT AND TOP VIEW

VOID PACKED WITH 3/8 MAX.
CRUSHED ROCK

RISER LOCATED 18" BEHIND
EDGE OF SIDEWALK

3" SQUARE X 4" THICK
520-C-2500 MIN CONCRETE SLAB

BRONZE COPPER FLAREX FEMALE
PIPE THREAD ADAPTER W/ BRUSHING

CRUSHED ROCK MIN. 6" BELOW BOTTOM
OF ALUMINUM HOUSING

STANDARD 3/4" OR 1" COPPER
WATER SERVICE PER PW-1.
GENERAL NOTES:
A. MATERIALS SHALL BE UL LISTED FOR FIRE SERVICE.
B. MATERIALS SHALL BE INSPECTED PRIOR TO INSTALLATION.
C. 316 ST. STEEL NUTS AND BOLTS.
D. LOCATION OF BACKFLOW AND FDC SHALL BE APPROVED BY FIRE DEPARTMENT PRIOR TO PLACEMENT.
E. WRAP BOLTS WITH 10 MIL PLASTIC SHEATHING PRIOR TO PLACEMENT OF THRUST BLOCKS.
F. FOR STREET VALVE INFORMATION SEE POWAY STD. DWG PW-12.
G. ANY MODIFICATION TO FIRE DEPARTMENT REQUIREMENTS MUST HAVE WRITTEN APPROVAL FROM THE FIRE DEPARTMENT.

NOTES:
1. O.S.&Y. GATE VALVE WITH FULL ENCAPSULATED RESILIENT SEAT APPROVED EQUAL CONFORMING TO LATEST EDITION AWWA STANDARD CS09.
2. U.S.C. APPROVED BACKFLOW PREVENTER ASSEMBLY WITH 3/4" NON-VALVED BYPASS METER ASSEMBLY BACKFLOW. SUPPORT ASSEMBLY PER MANUFACTURER'S RECOMMENDATIONS.
3. ALL RISERS AND ABOVE GROUND MAINLINE FITTINGS SHALL BE DUCTILE IRON FLANGE TYPE, EPOXY COATED INSIDE OR CEMENT MORTAR LINED.
4. CONCRETE SLAB, 520–C–2500 PSI MIN. PROTECTION POST MAY BE REQUIRED.
5. PO x FI 90°
6. PCC THRUST BLOCKS, SIZE AS REQUIRED FOR SOIL TYPE. (SEE POWAY STD. DWG. PW–17.1 & 17.2) 450–C–2000 PSI MIN.
CITY OF POWAY STANDARD DRAWING

BACKFLOW PRESSURE TEST STATION

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td>REMOVE EXISTING DEVISE AND CONCRETE</td>
<td>PER APPROVED MATERIALS LIST</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>VALVE BOX</td>
<td>12&quot;X17&quot; PLASTIC</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>FULL SIZE TO 3/4&quot; TEE</td>
<td>COPPER</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>3/4&quot; NIPPLE</td>
<td>COPPER</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>3/4&quot; TO 3/4 THREADED</td>
<td>COPPER</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>3/4&quot; TO 1/8&quot;</td>
<td>COPPER</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>1/8&quot; BALL VALVE OR TEST COCK</td>
<td>BRASS</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>1/8&quot; COMPRESSION FITTING</td>
<td>COPPER</td>
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</table>
Section 5       Engineering Supplements

Decorative Street Lighting Details
1" IP ALUM. PIPE COUPLING

1 1/2" X 3/16" ALUM. STRAP
WELD TO LANTERN TOP (AS SHOWN)

Ø3" X 1/8" ALUM. LANTERN TOP
1 1/2" X 3/16" ALUM. STRAP
1/4"-20 X 1" STAINLESS STL. RHMS

1 1/2" X 3/16" ALUM. STRAP
8-32 X 1" STAINLESS STL. RHMS (2)

8-32 X 1" BRASS THUMBSCREW W/ LOCKING NUT

6" HT. X Ø19" .060 ALUM. SPINNING

27"

12"

PORCELAIN BY22D SOCKET SUITABLE FOR 35/55W LPS LAMP

55W LPS LAMP (BY OTHERS)

Ø12" X 16 1/2" OPAL ACRYLIC LENS
SUITABLE FOR OUTDOOR USE

Penwal

PENWAL INDUSTRIES}

CAST ALUMINUM TO BE DRIED OR BAKED ALUMINUM БУДЕТ ОСУШЕН НА СУШИЛКЕ КАЧЕСТВО БУДЕТ УЗНАНО И ГИГИНАНСТВО
POWAY RD
SPECIFIC PLAN
STREET LIGHTS

ALL HARDWARE TO BE STAINLESS STEEL UNLESS OTHERWISE SPECIFIED

ENVIRONMENTAL LIGHTING FOR ARCHITECTURE

PROJECT: CITY OF POWAY

TYPE: B-10

FINISH: SPECIAL CARDINAL #T091-6N58

QTY: T.B.S. DATE: 11/25/03 (jmbl)
CITY OF POWAY

TRAIL STANDARDS AND SPECIFICATIONS

A. GENERAL REQUIREMENTS

1. Street Crossings

Recreational trails that cross City streets shall receive appropriate signs and pavement markings in accordance with City of Poway and State of California standards. Paving requires approval of City Engineer and Director of Public Works. All concrete paving for trails shall have a heavy broom finish.

2. Owner or Developer shall provide structural soils tests in areas where recreational trails are planned. Based on soil classification and soil report recommendations, trails shall be constructed as noted below.

   2.1 Expansive soil: Excavate to six-inch depth and apply City-approved soil sterilant. Construct six-inch-deep decomposed granite trail.

   2.2 Non-expansive soil: Scarify trail area to a depth of six inches and remove rocks, clods, and other unsuitable material. Apply City-approved herbicide, fine grade, and compact native soil to satisfaction of Director of Public Works.

   2.3 Local trails shall be six to ten feet wide, on average. Regional and Community trails will vary from 15 to 20 feet wide. Trail dimensions shall be determined by Director of Public Works.

   2.4 Landscaped borders adjacent to recreational trails may be used rather than trail fencing, with approval of Department of Public Works Trails Supervisor.

   2.5 Recreational trail fencing shall be constructed in accordance with City standards. Fencing shall occur on both sides of trails unless otherwise approved by Director of Public Works.

   2.6 Concrete footings for posts shall contain at least five cubic feet of Class 470-C-2000 concrete.

   2.7 Wood fence members shall be approved construction grade lodgepole pine, and treated with City-approved wood preservative.
B. TRAIL STANDARDS

1. Recreational Trail Types

<table>
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<tr>
<th>Designation</th>
<th>Width</th>
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<tr>
<td>Regional multi-purpose trails</td>
<td>20 feet</td>
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<tr>
<td>Community trails</td>
<td>15 feet</td>
</tr>
<tr>
<td>Local feeder trails</td>
<td>10 feet</td>
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</tbody>
</table>

2. Trail Classifications: Determined by Development Services Department according to proposed population density.

- Urban
- Rural
- Wilderness

3. Trail Tread Design and Construction Standards

3.1 Trail Clearance

a. Vertical clearance shall be at least ten feet from trail surface with brush, weeds, debris and rocks removed from trail tread.

b. Where topography, right-of-way configuration, grading, and existing vegetation prevent the full width construction of trails as noted above, the Public Works Department or Development Services Department, with input from Public Works, may reduce trail width requirements.

3.2 Trail Grades and Tread Construction

a. Vertical grades:
   - 0-5% optimum
   - 5-10% maximum for distance over 500 feet
   - 10-15% maximum for distances limited to 250 feet
   - 15-20% permitted for short distances less than 100 feet

b. Switch backs: May be required on steep slopes as a special condition.

c. Cross slopes:
   - 1-2% optimum
   - 6% maximum in approved locations only
d. Drainage:

Prevent erosion by proper grading and the use of diversionary devices such as water bars and berms.

e. Culverts:

Culverts, bridges and stream fords shall be installed where trails cross streams.

f. Trailway excavation:

Trail routes may traverse slopes with varying degrees of steepness. City shall review and approve construction techniques and procedures for construction of trail treads.

g. Side slope cuts and fills: 2:1 maximum gradient

Slopes shall be compacted to prevent erosion. Rock retaining walls shall be required if slopes are not compacted, or exceed 2:1.

h. Surfacing:

Native soils, if suitable for construction, and decomposed granite shall be used for trail treads. Trail treads shall be cleared of rocks over one inch in diameter, debris, and roots, then surfaces graded evenly. In poor soil areas, decomposed granite or reclaimed base material, with Public Works approval, shall be furnished and placed.

i. Utilities and concrete drainage ditches:

Above-ground utilities, utility boxes, and concrete drainage ditches shall not be permitted in recreational trail easements.

4. Trail Structure Design and Construction Standards

4.1 General Requirements

a. Fences shall follow grades of trail treads. Posts shall be leveled and in line with one another. Fences shall follow contours of landforms upon which they are constructed. Where fencing is required on both sides of trails, fences shall run parallel and level with one another. Fences shall be constructed on easement lines.

b. Fence post footings shall be concrete, each with at least 80 pounds of dry Portland cement. Footings shall not be visible upon
completion of trail construction. After cutting lodgepole pine fencing, cuts shall be treated with wood preservative. Dark wood preservatives (City-approved) may be used below ground.

4.2 Trail Fencing Standards

a. Urban and rural classifications – regional and community trails.

Approved lodgepole pine fencing shall be provided – two-rail fencing treated with wood preservative.

b. Wilderness trails:

Fencing is not required, except in hazardous areas (for example, if adjacent down slopes exceed 1.5:1). Steep conditions shall require approved lodgepole fencing on down slope sides of trail.

c. Hazardous areas:

Other fencing materials may be required in hazardous areas.

4.3 Off Road Vehicle (ORV) Barriers

ORV barriers shall be constructed where breaks in fences occur that would allow vehicle access onto trails. If trails are dedicated to the City of Poway, the City will provide locks upon completion of trails. ORV barriers shall be at least eight feet and eight inches (8'-8") in width, and attached to ends of fence posts nearest to roads.

4.4 Trail Signs

a. Trail identification signs shall be placed every one-half mile. Trail signs on community and regional trails shall be constructed in accordance with State of California trail design standards.

b. Hazard signs shall be constructed to State trail design standards. Place signs wherever potential safety hazards may be present - for example, steep embankments and 20 percent, or greater, trail grades.

c. Local feeder trails shall be identified with the hazard sign design.
C. TRAIL MAINTENANCE (during Developer’s maintenance period)

1. Contractor shall be responsible for replacing damaged redwood headers on trails. Contractor shall also reposition and maintain headers that have been kicked free from original positioning.

2. Shrubs and trees shall be trimmed along trails to allow safe clearance for trail users. Refer to Section B - Trail Standards, subsection 3.1 - Trail Clearance for required clearances.

3. Contractor shall maintain weed free trails with approved mechanical or chemical methods.

4. Trails shall be dragged and rolled monthly.

5. Holes greater than three inches in diameter shall be filled-in weekly.
TYPICAL SWITCHBACK LOCATION
AND DEVELOPMENT

CROWN LINE
SPILL POINT
TURN SEC.
OUTER SHOULDER
FACE OF EMBANKMENT

RADIUS (X) IS DENOTED BY STAKE MARKINGS AT EACH INDIVIDUAL SITE. RADII FOR SWITCHBACKS MAY RANGE FROM 10' TO 13' DUE TO DIFFERENCE OF GROUND CONDITIONS.

GROUND CONTOUR LINE

TRAIL STANDARDS
AND SPECIFICATIONS

SWITCHBACK CONSTRUCTION DETAILS
ALL LOGS TO BE PRESSURED TREATED

TRAIL STANDARDS AND SPECIFICATIONS

LOG WATER BAR
SEE ATTACHED AMENDMENT
KEY ROCK DAM INTO EACH BANK MINIMUM DEPTH OF 6-INCHES

PREVAILING GRADE SHALL BE 1' ABOVE HIGH WATER MARK ON BOTH BANKS

PLAN VIEW
SHALLOW STREAM FORD

PROFILE VIEW ROCK DAM

CROSS SECTION VIEW

Hand Placed Native Rocks

High Water

Upstream

TRAIL STANDARDS
AND SPECIFICATIONS

TRAILWAY EXCAVATION
SHALLOW STREAM FORD
AND GULLY CROSSINGS
CULVERT SIZE SHALL BE AS SHOWN ON THE STRAIGHT LINE DIAGRAM.

6" MINIMUM COVER

PREPARED PIPE BEDDING

TRAIL SURFACE

FRONT VIEW

D.G. 3" LAYER

SIDE VIEW

TRAIL STANDARDS AND SPECIFICATIONS

TYPICAL CULVERT INSTALLATION
NOTE:
TREAD CONSTRUCTED BY BUILDING OUT, RATHER THAN BY REMOVING MATERIAL FROM THE INNER BANK.
ROUNDRAIL TRAIL FENCE

CCA TREATED POST

6'6" x 51/2" Diameter - Two hole 3 5/8"

4' x 4 1/2" Diameter - Two hole

CCA TREATED RAILS

8' x 3 1/2" Diameter - tapered or non-tapered

* ALL MATERIALS CCA TREATED *
RAILS SHALL BE 3 INCH MINIMUM DIAMETER
LODGEPOLE PINE IN GOOD CONDITION
AND PENTA TREATED

POST SHALL BE 6 INCH MINIMUM DIAMETER PENTA
TREATED LODGEPOLE PINE IN GOOD CONDITION
ALL RAILS TO BE SECURED BY 20P GALV. NAILS
URBAN/REGIONAL TRAIL STANDARDS - LODGEPOLE PINE FENCING
OTHER TRAIL STANDARDS - CABLE FENCING

FRONT VIEW

POST SHALL BE 6" MINIMUM DIAMETER PENTA TREATED LODGEPOLE PINE IN GOOD CONDITION
3/8" X 6" STAINLESS STEEL PIN WITH 1" HEAD

TOP VIEW

DISTANCE TO VARY WITH TRAIL WIDTH

TRAIL STANDARDS AND SPECIFICATIONS

ORV BARRIER CONSTRUCTION
DISTANCES TO BE SUPPLIED BY THE PLANNING DEPT.

TRAIL STANDARDS AND SPECIFICATIONS

TRAIL IDENTIFICATION SIGN
(ADD IF MORE THAN ONE HAZARD IN AREA)

STEEP GRADE AHEAD
USE CAUTION

2" MIN. BORDER

2" X 12" ROUGH REDWOOD

4" X 4" ROUGH REDWOOD

30"

3/8" CARRIAGE BOLT WITH WASHER

12"

80 LB. CEMENT COLLAR PER POST

36"

ALL LETTERS TO BE ROUTED WITH A 1/2" V ROUTER BIT. USE 2" GOTHIC LETTER PAINTED WHITE

THE SIGN AND POSTS SHALL BE PAINTED WITH EXTERIOR PAINT USING THE COLOR "COFFEE"
Section 7    Engineering Supplements

Traffic Index
<table>
<thead>
<tr>
<th>Segment Number</th>
<th>Roadway</th>
<th>Segment</th>
<th>Functional Classification</th>
<th>2030 ADT</th>
<th>T I</th>
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## City of Poway Traffic Index (TI)
(5% TRUCK)

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