City of Grass Valley
City Council
Agenda Action Sheet

Council Meeting Date: January 11, 2011  Date Prepared: January 4, 2011

Prepared by: Timothy M. Kiser, PE, Public Works Director/City Engineer

Title: Improvement Standards Update

Recommended Motion: That Council authorize the Public Works Director/City Engineer to approve the proposed December 2010 updates to the City’s Improvement Standards.

Agenda: Consent

Background Information: The purpose of public improvement standards is to regulate and guide the design and construction of streets, bikeways, traffic signals, drainage facilities, sewage collection facilities, water supply facilities, and related public improvements. The current version of the City of Grass Valley Improvement Standards (Design Standards, Construction Standards, and Standard Details) was adopted in March of 2009, after undergoing a major revision, and was last updated February 23, 2010.

Annual updates to the Standards are needed to continually adapt to the changing standards and practices of the engineering and construction communities. Over the past year, the Engineering Division has kept track of changes and clarifications needed for the Improvement Standards in order to incorporate modifications into one annual update.

A summary table of all updates as well as copies of the modifications are attached. Proposed updated Standards are also available for review in the Engineering Division office at City Hall and on the City’s website. The proposed changes have been routed to the Nevada County Contractors Association, Engineers Association of Nevada County and City departments. Staff originally requested any comments on the proposed revisions to be submitted for consideration by December 23, 2010; however, the review period has been extended through January 10, 2011, to ensure stakeholder’s have sufficient time to provide any comments. Staff will review all requested modifications. If modifications are minor, the Public Works Director/City Engineer will incorporate the changes into those proposed to Council and formally adopt the changes in order to incorporate the new residential fire system requirements recently adopted. If any significant modifications are requested, those changes will be brought back to Council at a later date.

Staff requests that Council authorize the Public Works Director/City Engineer to approve the proposed December 2010 updates to the City’s Improvement Standards.

Funds Available: N/A  Account #: N/A

Reviewed by:

City Administrator

Community Development

Action:

___ Approved
___ Denied

___ Approved with Modifications
___ Other

Attachment: Summary Table of updates, copies of significant changes

G:\DATA\ENG\STANDARDS\Updates\12-2010\AAS 110111 StdUpdate.doc
# City of Grass Valley Improvement Standards
## December 2010 Update

### Design Standards

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages to Replace</th>
<th>Significant Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A Cover Page</td>
<td></td>
<td>• Revision date updated</td>
</tr>
<tr>
<td>N/A Table of Contents Pages 3 through 8</td>
<td></td>
<td>• Pages numbers updated</td>
</tr>
<tr>
<td>5</td>
<td>3-4</td>
<td>• Added section “Fire Apparatus Access Roads” per Appendix D of the CA Fire Code</td>
</tr>
<tr>
<td>6</td>
<td>1-2, 11-12</td>
<td>• Alley section now references Section 5 for fire apparatus access roads • Modified cul-de-sac lengths by 50 feet to match Appendix D of the CA Fire Code • Revised trenching note to allow cutting of 5 year or less pavement if unavoidable but requires slurry</td>
</tr>
<tr>
<td>8</td>
<td>3-6, 9-10</td>
<td>• Corrected max. flow depth to 70% • Removed requirement to install a manhole when a 6” lateral is constructed • Clarified storage in Table 8-3 is for ADWF</td>
</tr>
</tbody>
</table>

### Construction Standards

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages to Replace</th>
<th>Significant Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A Cover Page</td>
<td></td>
<td>• Revision date updated</td>
</tr>
<tr>
<td>N/A Table of Contents Pages 1-2, 5-6</td>
<td></td>
<td>• Pages number corrected • Back Flow Prevention Devices Section added</td>
</tr>
<tr>
<td>3</td>
<td>1-2, 5-8</td>
<td>• Revised trenching note • Justified text • Corrected thickness of commercial concrete driveway in right of way • Deleted epoxy requirement for sidewalk doweling</td>
</tr>
<tr>
<td>5</td>
<td>9-10</td>
<td>• Added Backflow Prevention Device section</td>
</tr>
<tr>
<td>9</td>
<td>7-8</td>
<td>• Corrected HPS specs and luminaries part numbers</td>
</tr>
</tbody>
</table>

### Standard Details

<table>
<thead>
<tr>
<th>Section</th>
<th>Details to Replace</th>
<th>Significant Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>ST-21 and ST-22</td>
<td>• ST-22 Modified cul-de-sac lengths by 50 feet to match Appendix D of the CA Fire Code</td>
</tr>
<tr>
<td>4</td>
<td>W-1 and W-2 W-13 and W-14</td>
<td>• W-1 Modified residential ½” and 1” water meter to allow for fire system connections • W-14 Corrected approving body</td>
</tr>
<tr>
<td>5</td>
<td>SS-3 through SS-7</td>
<td>• Correct printing and eliminate duplicate page</td>
</tr>
</tbody>
</table>
CITY OF GRASS VALLEY

PUBLIC WORKS DEPARTMENT - ENGINEERING DIVISION

DESIGN STANDARDS

Revision: December 2010
5-4 Right Turn Deceleration Lanes for Driveways
   A. Conditions SA 2
5-5 Left Turn Deceleration/Acceleration Lanes for Driveways SA 2
5-6 Minimum Offset for Opposing Driveways
   A. Minor and Primary Residential Streets SA 2
   B. Collector or Arterial Streets SA 2
5-7 Signalized Driveways SA 2
5-8 Grooved Concrete Driveway SA 3
5-9 Vehicle Storage SA 3
5-10 Fire Apparatus Access Roads
   A. Commercial and Industrial Developments SA 3
   B. Single and Duplex Residential Developments SA 3
   C. Multiple-Family Residential Developments SA 3
   D. Road Sections SA 3
   E. Road Locations SA 3
   F. Gates SA 4
   G. Signs SA 4

Section 6
Streets (ST)

6-1 Street Classes and Geometric Requirements ST 1
   A. Alley ST 1
   B. Residential Streets ST 1
   C. Collector/Industrial ST 1
   D. Arterial ST 1
   E. Cul-de-Sac ST 1
   F. Modified Collector Street ST 2
6-2 Right-of-Way Width ST 4
6-3 Roadway Signage and Striping ST 4
6-4 Structural Section ST 4
   A. Structural Street Sections at Signalized Intersections ST 4
6-5 Curb and Gutter Requirements ST 5
   A. Type 1 Rolled Curb and Gutter ST 5
   B. Type 2 Vertical Curb and Gutter ST 5
   C. Cross Gutters ST 5
6-6 Sidewalk Requirements ST 5
   A. Width ST 5
   B. Slopes ST 5
   C. Pedestrian Curb Ramps ST 5
   D. Sidewalk Barricades ST 5
6-7 Pedestrian Walks and Bike Paths ST 5
6-8 Roadway Profile Standards ST 6
   A. Grades ST 6
   B. Cross Slopes ST 6
   C. Vertical Curves ST 6
6-9 Intersections ST 6
   A. Grades ST 6
   B. Angles ST 6
6-10 Offset Intersections ST 6
   A. Residential Intersecting Residential ST 6
   B. Residential Intersecting Collector ST 7
C. Residential or Collector Intersecting Arterial
D. Arterial Intersecting Arterial
6-11 Elbow Intersections
6-12 Design Sight Distances
   A. Stopping Sight Distances
   B. Sight Distances at Intersections and Driveways
6-13 Centerline Radii
6-14 Driveways
   A. Types, Widths and Grades
   B. Location
6-15 Bus Turnouts
6-16 Developer Responsibility for Improvements to Streets
6-17 Trenching in Existing Paved Roadways
6-18 Street Names and Street Name Signs
   A. Sign Requirements
   B. Location and Number Required
6-19 Traffic Signs
6-20 Stripings and Markings
   A. Fire Hydrant Markers
   B. Removal
   C. Installation
6-21 Traffic Control
   A. Restrictions
   B. Traffic Control Plans
6-22 Survey Monuments
6-23 Benchmarks
6-24 Deviation from Standards

Section 7
Water (W)

7-1 Introduction
7-2 Design Criteria
7-3 Current Standards
7-4 Water Supply Quality
7-5 Water Supply Pressure
7-6 Peaking Factors
7-7 Required Fire Flows
7-8 Location in Existing Streets
7-9 Location in Unpaved Areas
7-10 Transmission System Design
   A. Transmission Mains
7-11 Distribution System Design
   A. Hydraulic Analysis
   B. Pipe Sizes
   C. Stubs
7-12 Water Main Location
   A. Location
   B. Vertical Elevation Change
   C. Cover
   D. Dead-End Mains
   E. Public Lines in Commercial Developments
7-13 Valves
A. Locations
B. Removal and Abandonment
C. Valve Extension Stems
D. Air Relief Valves

7-14 Hydrants and Blow-offs
A. Location
B. Spacing
C. Cul-de-Sacs and Dead-end Streets
D. Valves

7-15 Water Services
A. Location
B. Curb Stamp
C. Sizing
D. Spacing
E. Service Taps
F. Water Meters

7-16 Restraint

7-17 Work Near Existing Water Mains
A. Water Mains 16” and Larger

7-18 Water Improvement Plan Requirements
A. Water Study
B. General Requirements
C. Layout Sheet
D. Plan and Profile Sheets
E. Detail Drawings

Section 8
Sanitary Sewer (SS)

8-1 Design Criteria
8-2 Average Flow Determination
8-3 Design Flow
8-4 Pipe Capacity, Slope, Velocity, Size, Depth and Material
A. Main Sizes
B. Slope and Velocity
C. Capacity
D. Hydraulic Grade Line
E. Depth
8-5 Sewer Location and Alignment Requirements
A. General
B. Location in New Streets
C. Location in Existing Streets
D. Location in Unpaved Areas
E. Easement Sewer lines
F. Water Well Clearance
G. Lines in Drainage Swales
H. Alignment
I. Sewer Main Stub
8-6 Trench Backfill
A. Bedding and Initial Backfill
B. Special Pipe Strength Requirements
8-7 Manhole Criteria
A. General
B. Spacing SS 5
C. Invert Elevations SS 5
D. Special Construction Requirements SS 5
E. Manhole Access SS 6
F. Connection City Mains SS 6

8-8 Drop Connection Criteria SS 6
8-9 Sewer Service Design SS 6
A. General SS 6
B. Sizing SS 6
C. Depth SS 6
D. Special Requirements in Developed Areas SS 7
E. Connection to Existing Sewer Stubs SS 7
F. Abandoning Existing Sewer Stubs SS 8
G. Grease Interceptor SS 8
H. Oil/Sand Interceptor SS 8
I. Backflow Prevention Device SS 8
J. Pressure Relief Device SS 8

8-10 Creek Crossing Design SS 8
A. General SS 8
B. Construction and Material SS 8
C. Design SS 8

8-11 Boring and Jacking Requirements SS 8
8-12 Pump Station and Force Main Requirements SS 8
A. Design and Approval SS 9
B. Location and Site Plan SS 9
C. Capacity SS 9
D. System SS 9
E. Station Piping SS 9
F. Odor Control SS 9
G. Force Mains SS 10

8-13 Sewer Improvement Plan Requirements SS 10
A. Sewer Study SS 10
B. General Requirements SS 10
C. Layout Sheet SS 10
D. Plan and Profile Sheets SS 10
E. Detail Drawings SS 11
F. Connection to Facilities Where Stoppage of Existing Flow Will be Required SS 11

8-14 Multi-Parcel Commercial and Industrial Developments SS 11
8-15 Example Sewer Flow Calculations SS 11

Section 9
Strom Drainage (SD)

9-1 General SD 1
9-2 City Policies and Requirements SD 1
9-3 Development in a Floodplain SD 1
9-4 Federal Flood Program SD 2
9-5 Drainage Diversions SD 2
9-6 Drainage Easements SD 2
9-7 Drainage Capacity/Design SD 3
9-8 Design Peak Discharge Methods SD 3
9-9 Hydraulic Standards for Drainage Systems SD 3
   A. Hydraulic Grade Line SD 3

DST
TOC 6 OF 8
B. Manning's Formula
9-10 Street Inundation Requirements
9-11 Closed Conduits
   A. Size and Material
   B. Cover Requirements
   C. Alignment
9-12 Manholes
   A. Saddle Manholes
   B. Covers
   C. Manhole Access
9-13 Inlets
9-14 Junction Boxes
9-15 Inlet and Outlet Structures
   A. Headwalls, Wingwalls, and Endwalls
   B. Trash Racks and Access Control Racks
   C. Flared End Sections
   D. Culvert Outlet
9-16 Cross Culverts and Bridges
   A. Design Storm
   B. Computation of Flow
9-17 Detention and Retention Basins
   A. Hydrologic Criteria
   B. Design
9-18 Stormwater Treatment Devices
   A. Treatment Device Requirements
9-19 Access for Maintenance
9-20 Submittal Requirements for All HEC-1 Studies
   A. HEC-1 Print Out
   B. Computer Model CD
   C. Watershed Map
   D. Summary Sheets

Section 10
Grading (GR)

10-1 Introduction
10-2 Fees and Security
10-3 Preparation
10-4 Finished Grading Plan Requirements
10-5 Design Requirements
   A. Rolling Terrain Grading
   B. Boundary Grading
   C. Interior Grading
   D. Retaining Walls
   E. Stormwater Pollution Prevention plan (SWPPP)
   F. Mitigation Monitoring Requirement
   G. Certifying Pad Elevations
   H. Maintenance of Access to Utility Facilities

Section 11
Traffic Signals and Lighting (SG)

11-1 Design Criteria
11-2 Traffic Signals
# City of Grass Valley Design Standards

## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Vehicle and Pedestrian Signal Types</td>
</tr>
<tr>
<td>B.</td>
<td>Vehicle Signal Alignment</td>
</tr>
<tr>
<td>C.</td>
<td>Signal Phasing</td>
</tr>
<tr>
<td>D.</td>
<td>Protected Left Turn Phasing</td>
</tr>
<tr>
<td>E.</td>
<td>Vehicle Detection</td>
</tr>
<tr>
<td>F.</td>
<td>Traffic Signal Interconnect</td>
</tr>
<tr>
<td>G.</td>
<td>Right Turn Lanes</td>
</tr>
<tr>
<td>H.</td>
<td>City Supplied Equipment</td>
</tr>
<tr>
<td>I.</td>
<td>Contractor Supplied Equipment</td>
</tr>
<tr>
<td>J.</td>
<td>Salvaged Equipment</td>
</tr>
<tr>
<td>K.</td>
<td>Signal Activation</td>
</tr>
<tr>
<td>L.</td>
<td>Trenching Within the Roadway</td>
</tr>
<tr>
<td>11-3</td>
<td>Street Lighting</td>
</tr>
<tr>
<td>A.</td>
<td>Intersections</td>
</tr>
<tr>
<td>B.</td>
<td>Cul-de-sacs</td>
</tr>
<tr>
<td>C.</td>
<td>Spacing</td>
</tr>
<tr>
<td>D.</td>
<td>Location</td>
</tr>
<tr>
<td>E.</td>
<td>Pullboxes</td>
</tr>
<tr>
<td>F.</td>
<td>Conductors</td>
</tr>
<tr>
<td>G.</td>
<td>Conduit</td>
</tr>
<tr>
<td>H.</td>
<td>Electrical Equipment and Work</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-4</td>
<td>Preparation of Plans</td>
</tr>
<tr>
<td>A.</td>
<td>Title Sheet</td>
</tr>
<tr>
<td>B.</td>
<td>Signal and Lighting Sheet</td>
</tr>
<tr>
<td>C.</td>
<td>Interconnect Sheet</td>
</tr>
<tr>
<td>D.</td>
<td>Signing and Striping Sheet</td>
</tr>
<tr>
<td>E.</td>
<td>Photometric Sheet</td>
</tr>
</tbody>
</table>

## Section 12

### Bikeways (BK)

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-1</td>
<td>General</td>
</tr>
<tr>
<td>12-2</td>
<td>Design Criteria</td>
</tr>
<tr>
<td>12-3</td>
<td>Plan Approval</td>
</tr>
<tr>
<td>12-4</td>
<td>Bike Paths in Floodplains</td>
</tr>
<tr>
<td>12-5</td>
<td>Bike Bridges in Floodplains</td>
</tr>
</tbody>
</table>

## Section 13

### Solid Waste (SW)

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-1</td>
<td>Introduction</td>
</tr>
<tr>
<td>13-2</td>
<td>Design Criteria</td>
</tr>
<tr>
<td>A.</td>
<td>General</td>
</tr>
<tr>
<td>B.</td>
<td>Walls</td>
</tr>
<tr>
<td>C.</td>
<td>Gates</td>
</tr>
<tr>
<td>D.</td>
<td>Vehicle Approach and Floor</td>
</tr>
<tr>
<td>E.</td>
<td>Signs and Striping</td>
</tr>
<tr>
<td>F.</td>
<td>Location</td>
</tr>
<tr>
<td>G.</td>
<td>Path of Travel</td>
</tr>
<tr>
<td>H.</td>
<td>Back-up Lengths</td>
</tr>
</tbody>
</table>
5-8 **GROOVED CONCRETE DRIVEWAY** - Any driveway with a grade of ten (10) percent or greater, will be required to provide a grooved concrete surface, unless the requirement is waived by the Fire Department.

5-9 **VEHICLE STORAGE** - Parking facilities must allow for full internal vehicle circulation, delivery/maintenance/business related truck loading/unloading space, sufficient storage capacity for inbound and outbound vehicles, and sufficient storage capacity for drive through facilities.

5-10 **FIRE APPARATUS ACCESS ROADS** – Fire apparatus access roads are required for project sites where fire apparatus access is not provided by an acceptable publicly maintained street. Every facility, building, or addition to a building must be accessible by an approved fire apparatus access road. Fire apparatus access roads must meet the following requirements:

A. **COMMERCIAL AND INDUSTRIAL DEVELOPMENTS** - For driveways on minor and primary residential streets, the minimum offset shall be 100 feet where lot size permits. Buildings exceeding three stories, 30 feet in height, or 62,000 square feet in area are required to have at least two means of fire apparatus access for each structure. However, if projects have a gross building area of up to 124,000 square feet equipped with an approved automatic sprinkler system, a single fire apparatus access road will be acceptable.

B. **SINGLE AND DUPLEX RESIDENTIAL DEVELOPMENTS** – Projects having more than 30 dwelling units shall be equipped with two separate and approved fire apparatus access roads unless all dwelling units are equipped throughout with an approved automatic sprinkler system.

C. **MULTIPLE-FAMILY RESIDENTIAL DEVELOPMENTS** – Projects having more than 100 dwelling units shall be equipped with two separate and approved fire apparatus access roads. However, if projects have up to 200 dwelling units with approved automatic sprinkler systems throughout all buildings, a single approved fire apparatus access road will be acceptable.

D. **ROAD SECTIONS** – Fire apparatus access roads must: 1) meet the Structural Section requirements identified in the Streets section of the Design Standards; 2) have a grade of less than 10 percent, unless approved otherwise by the Fire Chief; 3) have a minimum turning radius of 200 feet; 4) have a minimum road width of 26 feet, exclusive of shoulders, on both sides of fire hydrants and in the immediate vicinity of buildings and facilities over 30 feet in height; 5) not contain any overhead utility and power lines within the roadway to buildings and facilities over 30 feet in height; and 6) meet the requirements in Table 5-1 for dead-ends.

### TABLE 5-1
**REQUIREMENTS FOR DEAD-END FIRE APPARATUS ACCESS ROADS**

<table>
<thead>
<tr>
<th>LENGTH (feet)</th>
<th>WIDTH (feet)</th>
<th>TURNAROUNDS REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-150</td>
<td>20</td>
<td>None required.</td>
</tr>
<tr>
<td>151-500</td>
<td>20</td>
<td>Refer to Figure 5-1.</td>
</tr>
<tr>
<td>501-750</td>
<td>26</td>
<td>Refer to Figure 5-1.</td>
</tr>
<tr>
<td>Over 750</td>
<td>Special approval required.</td>
<td></td>
</tr>
</tbody>
</table>

E. **ROAD LOCATIONS** – Where two fire apparatus access roads are required, they must be placed a distance apart equal to not less than one half the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses. At least one fire apparatus access road to a building 30 feet in height or more must be located within a minimum of 15
feet and a maximum of 30 feet from the building and must be positioned parallel to one entire side of the building.

F. GATES - Gates must: 1) be a minimum of 20 feet in width; 2) be of the swinging or sliding type; 3) be operable manually by a single person; 4) maintained in an operative condition at all times and replaced/repaired when defective; 5) be equipped with a means of opening the gate by the Fire Department for emergency access if electric (emergency opening devices must be approved by the Fire Code Official and be in accordance with UL 325) or be openable by forcible entry tools or a key box containing the key is installed at the gate location if manual; 6) have all locking device specifications approved by the Fire Code Official; and 7) if intended for automatic operation, be designed, constructed and installed to comply with the requirements of ASTM F 2200.

G. SIGNS – Fire apparatus access roads shall be posted on both sides as a fire lane for roads 20 to 26 feet in width and on one side for roads more than 26 feet in width. Signs must meet CA MUTCD requirements. Signs may also be required by the fire code official in additional locations.

FIGURE 5-1
REQUIREMENTS FOR DEAD-END FIRE APPARATUS ACCESS ROADS

96' DIA. CUL-DE-SAC

120' HAMMERHEAD

ACCEPTABLE ALTERNATIVE TO 120' HAMMERHEAD
SECTION 6

STREETS (ST)

6-1 STREET CLASSES AND GEOMETRIC REQUIREMENTS - For purposes of geometric and structural design of all new public streets, streets shall be classified according to the following requirements, the appropriate Standard Details, and details below. Changes to the standards can only be made at the discretion of the City Engineer.

A. Alley - A street depressed in the center with a right-of-way and surface width of 20 feet. Alleys are allowed for servicing up to ten (10) residential lots with no expected cut through traffic. If an alley is used to provide Fire Department access, refer to Section 5 of the Design Standards for additional information. A minimum separation of five (5) feet is required between the 20-feet for the alley and any structure, 20-feet if parking in front of garages is allowed.

B. Residential Streets - The following standards shall apply to minor and primary residential streets:

1. Minor Residential - A residential street servicing 100 or fewer lots shall be classified as a minor residential street.

2. Primary Residential - A residential street servicing more than 100 lots, or along which schools or parks are proposed to front, shall be classified as a primary residential street. Primary residential streets shall have a right-of-way width of 50 feet, and back of curb to back of curb width of 40 feet.

C. Collector/Industrial - A street serving an industrial/commercial subdivision, or a residential subdivision along which no home frontage is allowed, shall be classified as a collector/industrial street. Additional right-of-way and pavement shall be provided at intersections for deceleration lanes, bus turnouts, and turn lanes.

D. Arterial - Those roads specified in the City’s Street System Master Plan as arterials and main thoroughfares as determined by the City Engineer. Additional right-of-way and/or pavement may be required for bus turnouts and at intersections and driveways for acceleration lanes, deceleration lanes, and multiple left turn lanes. Additional right-of-way shall also be provided if sidewalks are not part of a landscape/pedestrian corridor adjacent to the back of curb.

E. Cul-de-Sac - The length of cul-de-sac streets as measured from the centerline of the intersecting street to the center of the bulb, shall not exceed 750 feet, unless a secondary emergency vehicle access is provided to the rear of the cul-de-sac bulb area, in which case the length of the cul-de-sac may be increased with the approval of the Fire Chief and the City Engineer. Cul-de-sacs longer than 150 feet shall have increased bulb radii per the standard drawing.

In the case of stub streets associated with phased development, the combined street lengths as measured from the dead-end to the nearest through street shall be in accordance with the requirements for cul-de-sacs. Stub streets shall be terminated with a temporary bulb or a hammerhead conforming to the Standard Details. A barricade conforming to the Standard Details shall be installed at the end of all streets that are proposed for future extension. For cul-de-sacs greater than 150 feet or where the end of the cul-de-sac is not visible from the centerline intersection of cross street, a “NOT A THROUGH STREET” sign shall be installed at the beginning of the cul-de-sac.
B. When making a connection to an existing stub street, the Developer shall be responsible for removing and reconstructing up to a maximum of twenty feet of the existing roadway to make a satisfactory connection as required by the City Engineer.

C. When widening to complete an existing partial street along a development project, or when removing existing curb and gutter, the Developer shall be responsible for saw cutting and removing a narrow strip along the outside portion of the pavement to provide a clean and stable pavement section for constructing against. Grinding of existing pavement (1½-inch minimum) shall be made to the next nearest edge of lane line. The width to be removed shall be determined by the City Engineer. In the case of curb and gutter removal, a minimum width of pavement cut shall be 2-feet.

D. All temporary approaches to existing roadways required as a result of the development shall be at the Developer’s expense. The temporary approaches shall be paved with the structural section to be determined individually for each situation.

E. The Developer shall be responsible for relocating existing traffic signals and streetlights, and installing new traffic signals and street lights as necessary for new street and driveway locations. The Developer shall also be responsible for relocating existing traffic signals and street lights as necessary for the installation of new curbs or new curbs and sidewalks at locations where there are no existing curbs or curbs and sidewalks. Traffic signals must remain operational during all construction within signalized intersections.

F. The Developer shall be responsible for constructing or modifying median island curbs where required by these standards, or when required for traffic control as a result of the development, as determined by the City Engineer.

G. The Developer is required to provide frontage improvements along existing and proposed roadways at the Developer’s expense. Frontage improvements include, but are not limited to, sidewalk, curb and gutter, center median, street pavement (at a minimum to the right-of-way centerline), drainage system, landscaping, soundwalls, street lighting, roadway signing and striping, and all utilities (including traffic signal interconnect if applicable). For minor residential, primary residential, collector and industrial streets, the Developer shall provide the full right-of-way improvements.

H. For development within the “infill” areas of the City, the level of improvements to public streets adjacent to the development site shall be determined on a project specific basis at the discretion of the City Engineer.

I. The Developer shall be responsible for all drainage facilities (bridges, pipes, culverts, and appurtenances) crossing new streets within or adjacent to the project.

J. The Developer shall be responsible for all necessary modifications within the public right-of-way and the project site to comply with state and federal standards for access for disabled, including but not limited to sidewalk ramps.

6-17 TRENCHING IN EXISTING PAVED ROADWAYS - All trenching in existing roadways shall conform to the Standard Details and the Construction Standards. The Developer may be required to coordinate trenching work schedules to avoid cutting pavement where repaving is planned by the City. All installations on paved surfaces less than 5-years old shall be by boring and jacking only. If trenching is unavoidable, the entire lane width of the disturbed area shall be slurry sealed.
Table 8-2 - Minimum Slopes and Flow Capacities

<table>
<thead>
<tr>
<th>PIPE DIAMETER (IN)</th>
<th>SLOPE (ft/ft)</th>
<th>CAPACITY AT 0.7 DEPTH</th>
<th>CAPACITY FLOWING FULL</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>0.0050</td>
<td>0.22 MGD</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0.0035</td>
<td>0.38 MGD</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0.0025</td>
<td>0.58 MGD</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>0.0020</td>
<td>0.85 MGD</td>
<td>1.00 MGD</td>
</tr>
<tr>
<td>15</td>
<td>0.0015</td>
<td>1.32 MGD</td>
<td>1.60 MGD</td>
</tr>
<tr>
<td>18</td>
<td>0.0012</td>
<td>1.95 MGD</td>
<td>2.35 MGD</td>
</tr>
</tbody>
</table>

2. The maximum depth of flow at design conditions in all laterals shall be 70 percent of pipe diameter.

3. All sanitary sewer pipe shall be designed for a minimum scour velocity of 2-feet per second at peak flows. The volume of wastewater within the pipe system as determined above shall be used when designing pipe slopes.

4. Maximum design velocity shall not exceed 10-feet per second.

C. Capacity - Pipe capacity in all cases, shall be adequate to carry the design flow from the entire tributary shed area even though said area may not be within the project boundaries.

D. Hydraulic Grade Line - The hydraulic grade line shall be determined from the design flows, based upon 100 percent development of the tributary area. Hydraulic grade line calculations must be submitted for the design of all lines 12-inches in diameter or larger.

E. Depth - Sewer mains with service laterals shall not exceed a depth of 15-feet. The system shall be designed to provide a minimum slope for sewer services of ¼-inch per foot with a minimum cover of 24-inches at any buildable location within the properties to be served. Proposed building floor pad elevations shall be a minimum 6-inches above the lowest upstream manhole rim. Where the pad elevation cannot be raised, a backwater valve for the building shall be required. The backwater valve shall be noted on the improvement plans and building plans. Installation shall be made during construction of the underground improvements. Deed restrictions shall be put in place which hold the City harmless for failure of the backwater valves on such lots.

8-5 SEWER LOCATION AND ALIGNMENT REQUIREMENTS - Location and alignment criteria are as follows:
E. Manhole Access - Provisions must be made to prevent vegetation from overgrowing the manholes. An all weather 10-ton vehicular access road shall be provided to each manhole as required by the City Engineer. Turning radii of 30-feet inside and 45-feet outside, and a vertical clearance of 14-feet are required.

F. Connection to City Mains - Improvement plans which require a connection to an existing City of Grass Valley sewer main or structure, shall specify that such connection be performed by City forces on a time and materials basis.

8-8 DROP CONNECTION CRITERIA - Outside drop connections shall be the preferred drop connection, if required. If an elevation difference of less than 3-feet exists, the slope of the incoming line shall be increased to eliminate the need for the drop. Inside drops may be permitted under special conditions with the approval of the City Engineer.

8-9 SEWER SERVICE DESIGN - The design criteria for sewer services are as follows:

A. General - Services shall be designed and constructed perpendicular to the main or as approved by the City Engineer. The service shall extend from the main to the edge of the public right-of-way or easement. A cleanout shall be constructed at the property line per the Construction Standard Details. Services shall extend 2-feet beyond edge of pavement of private roads. Easements of adequate width to accommodate the service shall be obtained. A plan and profile of services shall be supplied to the City Engineer on request.

B. Sizing - The minimum size service for single-family developments shall be 4 inches in diameter. Schools, commercial, industrial and multiple residential properties shall be served by a minimum 6-inch diameter service.

1. Connection to Sewer Mains - Residential services shall connect to the sewer main by means of a factory fitting. Properties with services located at the end of cul-de-sacs shall enter a manhole. Services 8-inches in diameter and larger shall be connected to the main by use of a manhole. Connection to trunk mains shall be approved by the City Engineer. In no case shall a service connection be made with the use of a tee.

2. Connection to Existing Sewer Mains - The Public Works Department will make all sewer service taps onto existing mains upon completion of an application for a permit and payment of the required connection fees. Proposed work by the City shall be performed by City forces and payment made to the City for such work will be on a time and materials basis. A note to this effect shall be placed on the plan sheet which shows a detail of the area that requires such tapping. Connection fees shall be paid prior to submittal of the application. All excavation, backfill, and the installation of the remainder of the sewer service or stub, shall be performed by the Contractor.
A. **Design and Approval** - An Engineering Report is required for all wastewater lift stations. The report shall describe the contributory areas, basis of design and other essential features. In addition, detailed plans and specifications shall be submitted for approval showing the station size, construction details, system design, controls, valves, piping, access, station location, force main location and pertinent elevations.

B. **Location and Site Plan** - The sewer lift station layout shall conform to the Standard Sewer Lift Station Site Plan detail as closely as possible. Any deviations shall be approved by the City Engineer. A block wall and chain link fence with locking gate surrounding the facility shall be required. The pump station and facilities shall maintain a minimum 100-foot separation from existing and proposed residential and commercial structures. Adequate maintenance access shall be provided to the pump station. The access design shall consider requirements for the removal of pump station equipment.

C. **Capacity** - The pump station shall be designed to accommodate ultimate buildout flows as well as initial flows. Allowances for larger or additional pumping equipment must be made for future requirements. If the design capacity is in excess of anticipated initial flow, the effects of the minimum flow condition must be estimated to prevent excessive retention of sewage in the wet well so it will not create a nuisance and the pumping equipment will operate within the manufacturer’s guidelines. Table 8-3 provides planning level criteria for sizing and configuration of pump station and force main facilities.

<table>
<thead>
<tr>
<th>Table 8-3 - Planning Level Criteria for Pump Stations and Force Mains</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pump Stations</strong></td>
</tr>
<tr>
<td>Capacity</td>
</tr>
<tr>
<td>Storage</td>
</tr>
<tr>
<td>Operation</td>
</tr>
<tr>
<td>Maximum Pump Cycles</td>
</tr>
<tr>
<td>Force Mains</td>
</tr>
<tr>
<td>Headloss</td>
</tr>
</tbody>
</table>

D. **System** - Sewer lift stations shall be complete, pre-engineered and pre-fabricated Flygt pump stations or equivalent. Stations shall come fully equipped with pumps, discharge connections and piping, a valve vault with check valves and isolation valves and a control panel. Two sources of power shall be provided for each lift station.

E. **Station Piping** - Suction, discharge, and header piping within the station shall be sized to adequately handle flows. Piping less than 4-inches in diameter shall not be used for conveying sewage. Valves shall be located to allow proper equipment maintenance and operation. The design shall provide a bypass configuration back to the wet well.

F. **Odor Control** - If required, the station shall have equipment and/or space provided for the purpose of introducing odor control chemicals into the wet well, upstream gravity line, and/or force main. Adequate provisions shall be made for the safe handling and storage of chemical containers. The force main shall be designed to maintain a continuous uphill grade, or, as a minimum, be level. All force mains shall have provisions for introduction of either air or odor control chemicals.
CITY OF GRASS VALLEY

PUBLIC WORKS DEPARTMENT - ENGINEERING DIVISION

CONSTRUCTION STANDARDS

AND

STANDARD DETAILS

Revision: December 2010
City of Grass Valley
Construction Standards

Table of Contents

2-5 Requirements for Subdivision Certificate of Completion (C.O.C.)
A. Landscaping
B. Final Inspection
C. Bond
D. Fees
E. Pad Certificates
F. Record Drawings
G. Certificate of Completion

2-6 Warranty and Guarantee
A. Security
B. Repairs
C. Obligations
D. Release of Security

Section 3
Streets (ST)

3-1 General

3-2 Existing Roadway Disturbance
A. Existing Stub Street Connection
B. Street Widening
C. Sawcutting Existing Streets
D. Adjacent Roadway Excavation
E. Pavement Milling Requirements

3-3 Construction Staking

3-4 Utility Relocation

3-5 Trench Work
A. Existing Pavement Trenching
B. Trench T-Cut
C. Weather
D. Water in Trench
E. Unsuitable Trench Bottom
F. Trench Backfill
G. Inspection
H. Temporary Surfacing
I. Steel Plates

3-6 Installation
A. General
B. Subgrade
C. Aggregate Base
D. Concrete
E. Asphalt Concrete Paving
F. Sound and Retaining Walls
G. Survey Monuments
H. Street Barricades
City of Grass Valley
Construction Standards

Table of Contents

5-6 Pipe Installation
A. Pipe Cleanliness
B. Placing Pipe
C. Joining Pipe
D. Manufacturer's Recommendations
E. Markings in Unpaved Areas
F. Ductile Iron Pipe Installation
G. Transitions from Vitrified Clay Pipe
H. Boring
I. Backfill Tape

5-7 Manhole Installation
A. Top of Manhole in Pavement
B. Top of Manhole Off Roadway
C. Frame and Lid
D. Existing Manholes
E. Bases
F. Adjusting Manholes
G. Epoxy Coated Manholes
H. Manhole Backfill

5-8 Service Installation
A. Marking Residential Sewer Services
B. Backflow Prevention

5-9 Testing of Installed Improvements
A. Sewer Mains and Services
B. Manholes

5-10 Punchlist Process

5-11 Abandoning Sewer Stubs and Services

5-12 Materials
A. Sewer Mains and Service Laterals
B. Manholes
C. Appurtenances
D. Back Flow Prevention Devices

STANDARD DETAILS
Attached at end of section

SS-1 STANDARD SEWER MANHOLE
SS-2 SEWER MANHOLE FRAME AND COVER
SS-3 SEWER SERVICES
SS-4 SEWER SERICE CLEANOUT
SS-5 SEWER AND WATER SEPARATION DETAILS
SS-6 STANDARD SEWER LIFT STATION SITE PLAN
SS-7 OUTSIDE DROP CONNECTION

Section 6
Storm Drainage (SD)

6-1 General
6-2 Construction Staking
6-3 Drainage Inlet Installation
6-4 Manhole Installation
A. Bases
B. Cones

CST
TOC 6 OF 11
SECTION 3

STREETS (ST)

3-1 GENERAL - Street surface improvements shall include: barricades, bikeways, bridges, bollards, curbs, gutters, driveways, pavement, curb ramps, sidewalks, signs, traffic stripes, pavement markings and trenches. These improvements shall be installed in accordance with the approved improvement plans, these Construction Standards, the latest edition of Caltrans Standard Specifications, the Grass Valley Downtown Streetscapes Standards Manual and as specified by the City Engineer. No street shall be cut in the City's right of way, nor any public improvement disturbed, until the Developer/Contractor has obtained an Encroachment Permit from the City of Grass Valley.

3-2 EXISTING ROADWAY DISTURBANCE - Removal or disturbance of an existing roadway requires that the following conditions be met:

A. Existing Stub Street Connection - The Developer shall be responsible for removing and reconstructing a portion of the existing roadway to make a satisfactory connection, as required by the City Engineer.

B. Street Widening - When widening is necessary to complete an existing partial street along a development project, the Developer shall be responsible for saw cutting and removing a narrow strip along the outside portion of the pavement to provide a clean and stable section for constructing the new pavement against. The width from centerline shall be shown on the approved plans or as determined in the field, and verified by the Public Works Inspector.

C. Sawcutting Existing Streets - When sawcutting within the street for trenching or other purposes, the Contractor shall grind and remove the pavement to a depth of 1-1/2 inches between the lane lines (from lane stripe to lane stripe, or from gutter lip to lane stripe) and repave the removed section with asphalt concrete in accordance with these Standards. Any delineators removed during the grind shall be re-striped or replaced.

All installations on paved surfaces less than 5-years old shall be by boring and jacking only. If trenching is unavoidable, the entire lane width of the disturbed area shall be slurry sealed.

D. Adjacent Roadway Excavation - Where excavation adjacent to an existing roadway results in an elevation difference of greater than 2 inches, the excavated area shall be filled with compacted 3/4-inch Class 2 aggregate base, flush with the adjacent roadway at a slope not to exceed 4:1 (horizontal to vertical) prior to the end of each workday. Temporary fill with “native” soil may only be used with the approval of the Public Works Inspector. Delineators or cones shall be placed two feet off the edge of pavement.

Where concrete forms are placed within three feet of the existing pavement edge, the preceding requirement may be exempted overnight upon the placement of appropriate delineation and the approval of the Public Works Inspector.

E. Pavement Milling Requirements - All milled edges perpendicular and diagonal to the travel way shall be temporarily transitioned at 30:1 slope with temporary pavement (cut-back).

3-3 CONSTRUCTION STAKING - Construction staking shall be provided by the Developer for all surface improvements. Such staking shall provide the station and offset, as well as the cut to the nearest hundreth
and the observed stability of the resulting subgrade area. If required by the Public Works Inspector, compaction shall be tested and certified by a Geotechnical Engineer, licensed in California and certification shall be provided to the Public Works Inspector prior to the placement of concrete or aggregate base. Soils testing for relative compaction shall reference ASTM D1557-78 test methods.

2. Stability - Subgrade stability for curb, gutter and sidewalk, and asphalt concrete pavement shall be load tested by proof rolling with a loaded, minimum 3,000 gallon water truck (or equipment of equivalent weight as approved by the Public Works Inspector) in the presence of the Public Works Inspector, the Geotechnical Engineer and the Contractor. Deflecting, unstable areas shall be corrected and retested per the recommendation of the Geotechnical Engineer and with the approval of the Public Works Inspector prior to placement of aggregate base, or concrete curb, gutter and sidewalk.

3. Sidewalk Subgrade - Aggregate base is not required in the structural section for concrete sidewalk. 3/4-inch aggregate base may be substituted for a compacted soil subgrade at the Contractor's discretion and shall be processed to 95% relative compaction. Sidewalk subgrade exposed upon removal of existing sidewalk shall remain intact unless it is determined by the Public Works Inspector to be unstable. In this event, it shall be processed per the preceding paragraphs.

C. Aggregate Base - All aggregate base shall be 3/4-inch maximum, Class 2 AB complying with Sections 25 and 26 of the Caltrans Standard Specifications and these requirements.

1. Compaction - Aggregate base shall be moisture conditioned to optimum moisture content and compacted to 95% relative compaction. Aggregate base shall be tested for compaction and approved by a Geotechnical Engineer licensed in California. Compaction tests shall be tested using nuclear testing gauges in accordance with ASTM D-1557, D-2922 and 3017.

2. Stability - Base stability shall be load tested by proof rolling with a loaded, minimum 3,000 gallon water truck (or equipment of equivalent weight as approved by the Public Works Inspector) in the presence of the Public Works Inspector, the Geotechnical Engineer and the Contractor. Deflecting, unstable areas shall be corrected and retested per the recommendation of the Geotechnical Engineer and with the approval of the Public Works Inspector prior to placement of asphalt concrete pavement or concrete curb, gutter and sidewalk, if applicable.

3. Recycled Materials - Aggregate base may contain recycled asphalt concrete pavement and concrete. The recycled material shall be clean and not contain deleterious materials including wood, plastic or metal. The aggregate base shall comply with all of the applicable quality requirements for Class 2 AB. AC Grindings shall not be used directly for aggregate base.

D. Concrete - All concrete curbs and gutters, curb ramps, sidewalks, driveways, bus stop pads and turnouts shall be installed in accordance with Sections 51 and 73 of the Caltrans Standard Specifications, the Standard Details and the following requirements.

1. Certification - All concrete shall contain a minimum of six sacks of cement per cubic yard unless otherwise specified on the approved project improvement plans, where a 28-day minimum compressive strength and/or mix design shall be noted. The concrete shall have a slump of 4” or less and shall yield a minimum compressive strength of 3500psi. The supplier shall provide certification that any concrete furnished conforms to the proper specifications for all proposed
mix designs. The maximum allowable holding time before concrete placement shall be 90-minutes from batch plant to pour.

2. **Thickness** - All residential and commercial sidewalks shall be six inches thick. Across commercial driveways and bus turnouts, the concrete section shall be eight inches thick with grade 60, #4 rebar, 18 inches on center each way, conforming to the Standard Details. Rebar shall be set on 3 inch concrete dobies/rebar supports (including wire ties) at three foot maximum spacing each way.

3. **Finishing** - Concrete shall not be placed or finished in the rain. It shall be the Contractor's responsibility to schedule construction operations accordingly.

   All gutters shall be flow tested with water during the pour to assure proper drainage. Following concrete finishing, no water shall pond in the gutter pan.

   All concrete surfaces shall be completed with a medium broom finish unless otherwise specified. Surfaces to be used by pedestrian traffic shall be broomed transversely to the direction of travel. Blemishes and alignment tolerances, not conforming to the Caltrans Standard Specifications, shall be cause for rejection of the work. No stamps advertising construction companies or other private concerns shall be placed in the concrete.

4. **Curb Ramps** – See the Standard Details for curb ramp specifications. Other ramp configurations in the Caltrans Standard Plans may be permitted with approval of the City Engineer if site conditions prohibit the use of the standard ramps.

   A detectable warning surface panel (raised truncated dome) shall be placed at the back of curb line, immediately behind the curb and gutter, centered in the opening to the street at every curb ramp. Warning surfaces shall be pre-fabricated, yellow panels, except in the downtown area, where the panels shall be gray granite or brick red in color, in accordance with the Grass Valley Downtown Streetscapes Standards Manual.

   Any runoff water standing behind the curb on the panel, or concrete voids under the panel shall be cause for replacement of the panel.

5. **Joints and score marks** - Expansion joints, consisting of ½-inch wide asphalt impregnated felt shall be placed to full depth at both sides of driveway approaches, at ends of curb returns and at 40 foot intervals in all curb, gutter, valley gutter and sidewalk sections. The concrete adjacent to expansion joints shall be finished with an edger tool.

   Deep tool joints, 2-inches deep, shall be placed at 10-foot intervals in all curb, gutter, valley gutter and sidewalk sections. During final finishing the joint shall be readdressed/finished with a 3/8-inch joint tool. A deep tool joint shall be placed at the back of the curb for the total length of all monolithic curb, gutter, and sidewalk. The use of sawcutting in lieu of deep tool joints is not acceptable.

   Score marks, 3/8” deep, shall be placed at 5-foot intervals in all sidewalks, regardless of width. Alternate score mark configurations in the downtown area may be approved by the City Engineer in accordance with the Grass Valley Downtown Streetscapes Standards Manual.
6. **Slopes** - All sidewalks (including portions through driveways and curb ramps) shall be constructed with a minimum cross slope of 1% and a maximum of 2%. The maximum grade in the direction of travel shall be 5% if the street grade allows.

   For all curb ramps the maximum longitudinal slope is 8.33%. For a street with a steeper longitudinal grade, (where the ramp on the higher side of the landing must be lengthened to achieve the maximum 8.33% grade), 20 feet shall be the maximum length transition required, with the City Engineer’s approval.

7. **Monolithic sidewalk, curb and gutter** - Adjoining sidewalk, curb and gutter shall be poured monolithically whenever possible.

8. **Curb and gutter installation in an existing street** - In an existing street, a minimum width of 24 inches of existing asphalt concrete paving shall be removed outside the proposed gutter lip and the lip poured against a form board. The resulting asphalt concrete patch between the gutter lip and the existing pavement shall be four inches thick minimum, or the thickness of the existing pavement, whichever is greater.

9. **Curb, Gutter and Sidewalk Patching** - The Public Works Inspector shall determine if damage to concrete curb, gutter or sidewalk warrants patching. Generally, any conspicuous damage shall be patched. Any spall extending more than one inch into the gutter pan from the vertical face of the gutter lip shall be patched at a minimum. The patch shall be flush and of a similar finish to the existing concrete.

10. **Joining New Concrete to Existing** - Whenever new concrete curb, gutter and sidewalk adjoins existing, the existing concrete vertical face shall be doweled 4-inches deep with 12 inch long, grade 60, #4 rebar. Abutting sidewalk shall be doweled mid-section with a minimum of two dowels. Abutting curb and gutter ends shall be doweled twice, 18 inches apart, centered on the curb and gutter section.

   Expansion joint material shall also be placed between all adjoining sections of new to existing curb, gutter and sidewalk.

11. **Section Replacement** - Replaced sections of curb, gutter and sidewalk shall be removed back to expansion joints or deep tool joints; or at the discretion of the Public Works Inspector.

   If the existing edge is damaged during removal, the concrete shall be sawcut again with the Public Works Inspector's approval.

12. **Concrete and Asphalt Concrete Saw Cutting** - Residue from sawcutting shall be removed by vacuum method and disposed of conforming to local environmental and Stormwater Pollution Prevention Plan requirements. Downstream drain inlets shall be protected. In no case shall the residual be allowed to enter the storm drain system or any water of the United States.

13. **Concrete Cure** - Newly placed concrete shall be cured in accordance with the provisions in Section 90-7.0113 of the State Standard Specifications and these Construction Standards. Unless otherwise approved by the Public Works Inspector, exposed surfaces of all concrete sidewalk, curb and gutter, driveways, bus turnouts and curb ramps shall be coated with a non-pigmented curing compound immediately following surface finishing, prior to the moisture sheen disappearing from the surface.
49' BOC RADIUS (TYP.)
ALL STREETS

"NOT A THROUGH STREET SIGN." SEE NOTE 3

NOTES:

1. BACK OF CURB RADIUS FOR BULB SHALL BE AS FOLLOWS:

<table>
<thead>
<tr>
<th>STREET</th>
<th>LENGTH</th>
<th>B.O.C. RADIUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESIDENTIAL</td>
<td>&lt;150'</td>
<td>39'</td>
</tr>
<tr>
<td>RESIDENTIAL</td>
<td>&gt;150'</td>
<td>50'</td>
</tr>
<tr>
<td>COMM. / ARTERIAL</td>
<td>N/A</td>
<td>50'</td>
</tr>
</tbody>
</table>

2. INSTALL "NOT A THROUGH STREET" (CALTRANS W-53) SIGN ON STREET LIGHT POLE WHEN END OF CUL-DE-SAC IS NOT VISIBLE FROM ADJACENT STREET.
CURB STAMPED "W" AT SERVICE LOCATION

SIDEWALK

FINISH GRADE

SEE SADDLE DETAIL

1-1/2" POLY WATER SERVICE LINE

TRACING WIRE

TO FIRE SYSTEM CONNECTION

12" MIN

TO DOMESTIC CONNECTION

PLAN VIEW

LEGEND:
1. CHRISTY B-16 UTILITY BOX WITH B-16P LID FOR 3/4" METER / CHRISTY B-30 UTILITY BOX WITH B-300 LID FOR 1" METER (OR APPROVED EQUAL).
2. WATER METER.
3. 90° BRASS CURB STOP.
4. GATE OR BALL VALVE ON CUSTOMER SIDE.
5. CEMENT BOARD END PLATE (TYP.)
6. PRESSURE TREATED WOOD BOTTOM
7. BRASS INSTATTITE COUPLING WITH POLY PIPE SERVICE.
8. REDUCED PRESSURE ZONE BACK FLOW VALVE (RP) (PRIVATE), ABOVE GROUND.
9. TEE.
10. IN-LINE BRASS CURB STOP.

NOTES:
1. WATER METERS SHALL BE PURCHASED THROUGH THE CITY. PURCHASE INCLUDES INSTALLATION.
2. ALL PIPE AND FITTINGS SHALL BE BRASS, WITH THE EXCEPTION OF THE SERVICE LINES.
3. BURIED BRASS PIPE AND FITTINGS SHALL BE WRAPPED WITH 8 MIL POLYETHYLENE OR APPROVED EQUAL.
4. DOUBLE METER SERVICE REQUIRES SPECIFIC APPROVAL FROM THE CITY ENGINEER AND INSTALLATION OF A MIN 1" SERVICE LINE.
APPLICATION:

- WHERE 30° < H < 36°, USE DIP ONLY
- WHERE 20° < H < 30°
  - WITH SERVICES, USE DIP AND CONCRETE CAP
  - WITHOUT SERVICES, USE DIP AND CONCRETE ENCASE
    (WRAP DIP IN FOAM PRIOR TO ENCASEMENT)
- WHERE H < 20°, REDESIGN WATERLINE

NOTE:

THIS DETAIL SHALL BE USED ON A CASE-BY-CASE BASIS WITH THE APPROVAL OF THE CITY ENGINEER. IN MOST CASES, THE 36" MINIMUM COVER SHALL PREVAIL.
2. Manhole Frame and Cover
   a. D&L Foundry, or approved equal.

3. Precast Bottom
   a. Teichert precast 6"- two way, #PBC 602, or approved equal.
   b. Teichert precast 8"- two way, #PBC 082, or approved equal.
   c. Teichert precast 6"- 90 degree left, #PBC 065, or approved equal.
   d. Teichert precast 6"- 90 degree right, # PBC 066, or approved equal.
   e. Teichert precast 90 degree left or right, #PBC 085, 086, or approved equal.
   f. Teichert precast 10"- two way, # PBC 102, or approved equal.
   g. Teichert precast 12"- two way, #PBC 122, or approved equal.

C. Appurtenances
   1. Concrete Joint Sealant - Ram-Nek, or approved equal.
   2. Epoxy Coating - Hydro Pox 204, or approved equal.
   3. Flange Gaskets - All flange gaskets to be neoprene rubber or red rubber, USSO Standard B.16.21 insulation flange kits-Calpico Type E full-face gasket with two-side insulation.
   4. Location Stakes - Carsonite CUM 375 with anchor barb kit, or approved equal.
   5. Mortar - Non-shrink grout during manhole vacuum testing and as specified. Standard mortar mix for all other applications.
   6. Polyurethane Sealant - Sikaflex, or approved equal.
   7. Silicone - 100 percent silicone with a 25-year life, or approved equal.

D. Back Flow Prevention Devices
   1. Approved backflow prevention device manufacturers include: Clean Check, Inc., Rectorseal, and Oatey, or approved equals.
9-17 STREET LIGHT POLES - All street light poles shall be galvanized steel or aluminum, painted black or as shown on the plans. Antique style aluminum poles shall be used in the downtown area or where required by the City Engineer.

A. Galvanized Steel Poles - Type “A” street lights shall use the “A” series poles as shown in the Street Light Pole Details. Galvanizing shall be as provided in the Standard Specifications.

B. Aluminum Poles - Antique style aluminum poles shall be Antique Street Lamps number PX/CH16/16/S4/ANBK, with aluminum roadway arm BHC45/1/ANBK, or approved equal.

9-18 STREET LIGHT SERVICE - All street light systems shall have underground service provided. Service points shall be provided within a utility easement immediately adjacent to, or within, the right-of-way, and shall be open and easily accessible to the street frontage.

A. Direct Service - A direct underground service consists of one (1) or two (2) lights being served from a single service point. The service point may be in the form of a pull box installed by the developer or a service pedestal provided by the utility district.

B. Multiple Service - Multiple service is three (3) or more lights being served from a single service point. The service point shall be a pull box. Multiple systems shall have a service cabinet normally located adjacent to the service point between the service point and the light system.

9-19 LUMINAIRES - Luminaires shall be either 250-watt high pressure sodium (HPS) or antique style luminaires as shown on the plans. Antique, octagonal shaped lamps shall be used in the downtown area or where required by the City Engineer.

A. HPS Specifications - High pressure sodium luminaires shall conform to the following specifications:

1. Medium, cutoff, Type II or III lighting distribution (MSII or MSIII).

2. 120 volt ballast with lag-type magnetic regulator.

3. Power door ballast assembly & plug in starter.

4. Photo eye receptacle with shorting cap.

5. Flat glass lens.

6. Polyester fiber gasket breathing seal.

7. Voltage tap connection.

B. Antique Luminaires - Antique style luminaires shall be Antique Street Lamps Number HLT30/150S/ACS/GR3/TB3/ANBK/PEB1 or TR30/150S/MOG/ACS/GR3/120/ANBK/PEB1 or approved equal.

C. Photoelectric Controls - Photoelectric controls shall be Type II and shall be pole top mounted.

D. Shielding - Shielding shall be required on the mast arm side of all luminaires installed on same side of the street as residential properties.