CITY OF WILLIAMS

DESIGN STANDARDS AND SPECIFICATIONS

DEPARTMENT OF PUBLIC WORKS
NOVEMBER, 2007
# TABLE OF CONTENTS

2. Street Design Standards.
3. Storm Drain Design Standards
4. Sanitary Sewer Design Standards
5. Water Design Standards
6. Miscellaneous Requirements
7. Standard Plans:

## A. Streets

<table>
<thead>
<tr>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Street Sections</td>
<td>101</td>
</tr>
<tr>
<td>Street Sections</td>
<td>102</td>
</tr>
<tr>
<td>Street Sections</td>
<td>103</td>
</tr>
<tr>
<td>Street Sections</td>
<td>104</td>
</tr>
<tr>
<td>Street Sections</td>
<td>105</td>
</tr>
<tr>
<td>Cul-de-sac Turn around</td>
<td>106</td>
</tr>
<tr>
<td>Cul-de-sac Turn Around</td>
<td>107</td>
</tr>
<tr>
<td>Two Legged Intersection Constraint on One Side</td>
<td>108</td>
</tr>
<tr>
<td>Two Legged Intersection Constraint on One Side</td>
<td>109</td>
</tr>
<tr>
<td>Two Legged Intersection</td>
<td>110</td>
</tr>
<tr>
<td>Two legged intersection</td>
<td>111</td>
</tr>
<tr>
<td>Turn Around Access Road</td>
<td>112</td>
</tr>
<tr>
<td>Typical Utility Layout</td>
<td>113</td>
</tr>
<tr>
<td>Curb and Gutter</td>
<td>114</td>
</tr>
<tr>
<td>Curb and Gutter Replacement in Existing Streets</td>
<td>115</td>
</tr>
<tr>
<td>Monolithic Sidewalk</td>
<td>116</td>
</tr>
</tbody>
</table>


B. Storm Drain

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precast Manhole</td>
<td>201</td>
</tr>
<tr>
<td>Drop Inlet Catch Basin Private Property Only</td>
<td>202</td>
</tr>
<tr>
<td>Yard Drain – Through Curb</td>
<td>203</td>
</tr>
<tr>
<td>Standard Manhole Channelization</td>
<td>204</td>
</tr>
<tr>
<td>Manhole Connection Detail</td>
<td>205</td>
</tr>
<tr>
<td>Standard Field Inlet (24”x36”)</td>
<td>206</td>
</tr>
<tr>
<td>Standard 18”x36” Curb Inlet Frame and Grate</td>
<td>207</td>
</tr>
<tr>
<td>Curb Opening Catch Basin</td>
<td>208</td>
</tr>
<tr>
<td>Curb Opening Catch Basin Cover</td>
<td>209</td>
</tr>
<tr>
<td>Temporary Redwood Box Field Drain</td>
<td>210</td>
</tr>
<tr>
<td>Thru Curb Drain</td>
<td>211</td>
</tr>
<tr>
<td>Alternative Curb Drain</td>
<td>212</td>
</tr>
<tr>
<td>PCC Collar Pipe Connection</td>
<td>213</td>
</tr>
<tr>
<td>Storm Drain Pipe Requirements</td>
<td>214</td>
</tr>
<tr>
<td>Alternative Storm Drain Manhole</td>
<td>215</td>
</tr>
<tr>
<td>Standard Community Detention Basin</td>
<td>216</td>
</tr>
<tr>
<td>Erosion Control Pipe Discharge</td>
<td>217</td>
</tr>
<tr>
<td>Chain Link Fence</td>
<td>218</td>
</tr>
</tbody>
</table>

C. Sanitary Sewer

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard 48” Manhole</td>
<td>301</td>
</tr>
<tr>
<td>Standard 60” Manhole</td>
<td>302</td>
</tr>
<tr>
<td>Drop Manhole</td>
<td>303</td>
</tr>
<tr>
<td>New Manhole / Existing Sewer</td>
<td>304</td>
</tr>
</tbody>
</table>
Manhole Ring and Cover 305
Standard Concrete Manhole Reducer 306
Industrial Waste Monitoring Station 307
Industrial Waste Monitoring Station Box 308
Sewer Test Manhole 309
Plastic Sewer Pipe Deflection Mandalal 310
Abandoned Manhole Detail 311
Abandoned Pipe Plug detail 312
Sewer Service Trench Detail 313
Typical Service / Sewer Connection Detail 314
Backwater Check Valve Installation 315
Pipe / Structure Crossing Detail 316
Side / Sewer Later Connection to Existing Mains 317
Sewer Lateral 318
PVC Sanitary Sewer 319
Sewer Lateral Abandonment 320
Typical Grease Interceptor 321
Typical Sand / Oil Interceptor 322
Sampling Manhole 323
General Requirements for Grease, Sand, and Oil Interceptors 324
General Requirements for Grease, Sand, and Oil Interceptors 325
Sanitary Sewer Cleanout 326

D. Water

Gate Valve Installation 401
Valve Stem Extension 402
Concrete Thrust Blocking
Double Detector Check Assembly
Reduced Pressure Backflow Preventer
2'' Blow-Off
Air Valve Assembly
Standard Fire Hydrant
Fire Hydrant Placement
Fire Riser Detail
Fire Hydrant Location Marker
Typical ½'' Residential Service Installation
Typical 2'' Service Installation
Double Water Service Connection
4'' Water Service and Meter
Standard Trench Detail
Standard Trench Detail Notes
Standard Trench Detail Notes
Bacteriological Sampling Tap
Bacteriological Sampling Tap Section
Bacteriological Sampling Tap Detail

8. Appendix

Appendix A - General Notes
Appendix B - Improvement Plan Check List
Appendix C - Duration and Frequency Chart
Appendix D - Curb Return Radius Chart
WILLIAMS STANDARD PLANS OUTLINE

GENERAL

1. Purpose and Intent:

The purpose and intent of this document is to clarify and consolidate present design criteria in the City of Williams. These standards are understood to be the minimum acceptable and more rigorous standards may be required depending on the nature of the development.

2. Scope:

The design standard as hereinafter specified shall be used as the basis of design for all development within the jurisdiction of the City of Williams.

3. Design:

The design of each development is in itself a special case and these Design Standards shall not be construed to be the maximum required design on all or any separate phase of the construction. Under certain conditions, any or all phases of the development may be required to exceed these specifications. It is also recognized that there may be developments where it is impossible to meet these Design Standards. It is suggested that these cases be reviewed with the City Engineer early in the design process to minimize reworking plans where division is not permitted.

4. Final Authority:

The City Engineer shall be the final authority on all questions which may arise as to the interpretation of these standards. The City Engineer’s decision shall be final and he shall have authority to enforce and make effective such decision.

5. General Notes:

The typical General Notes required for all off-site improvement plans have been included as Appendix “A” of these Design Standards

6. Check List:

A checklist has been included in Appendix “B” of these Design Standards in order to familiarize the development engineer with some of the items checked by the City to insure compliance and completeness of the improvement plans.
STREET DESIGN STANDARDS:

1. General:

All streets shall be designed in accordance with accepted engineering principles and shall conform to these Design Specifications.

2. Street Right-Of-Way:

The right-of-way widths and typical sections for the various streets shall conform to the City of Williams Standard Plans.

Cul-de-sac streets shall have a turn-around at the end with a minimum radius on the right-of-way of 50 feet. The reversing curves at the beginning of the turn around shall also be 50 feet radius, see Standard Plan 107.

In the case where a specific plan for an area has been established such plan may supersede these standards. Right-of-way and street widths shall be in accordance with Standard Plans 102 thru 105.

3. Structural Section:

Subgrade: The subgrade shall be per the recommendations of a Registered Soils Engineer, and approved by the City Engineer.

Pavement: The pavement shall be designed in accordance with the procedure contained in the State of California Department of Transportation Highway Design Manual and shall adhere to the recommendations of a registered soils engineer as to the thickness of asphalt concrete, aggregate base and sub-base (if required).

The Traffic Index shall be determined in the traffic report or as required by the City Engineer.

4. Subdivision Boundaries:

Subdivision boundary lines should follow lot lines where possible and should cross streets perpendicular to street centerlines.
5. **Street Improvements:**

Streets shall be improved full width within subdivision boundaries.

Off-site streets improvements may be required.

6. **Horizontal Alignment:**

**Intersection Angle:** Streets shall intersect at right angles if possible. With approval of the City Engineer, 5° degrees from right angle will be allowed. Curved streets shall have at least 50 feet of centerline tangent from the project curb line of the intersecting streets.

**Opposing Streets:** All streets shall have centerlines directly opposite each other, or be separated by at least 150 feet. The minimum distance between streets entering a restricted access street shall be as provided by a Specific Plan adopted by the Planning Commission and the City Counsel of the City of Williams.

**Street Curvature:** Design of curved arterial and collector streets shall be based on criteria in the Caltrans Highway Design Manual. The minimum radius of curvature of centerline for all streets shall be per the following table:

**Minimum Horizontal Curve Radius**

<table>
<thead>
<tr>
<th>Street Classification</th>
<th>Design Speed</th>
<th>Radius</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor Residential</td>
<td>25</td>
<td>220</td>
<td>1</td>
</tr>
<tr>
<td>Standard Residential</td>
<td>30</td>
<td>250</td>
<td>1</td>
</tr>
<tr>
<td>Minor Collector</td>
<td>35</td>
<td>500</td>
<td>1</td>
</tr>
<tr>
<td>Major Collector / Industrial</td>
<td>40</td>
<td>550</td>
<td>1</td>
</tr>
<tr>
<td>Secondary Arterial</td>
<td>50</td>
<td>850</td>
<td>1, 2</td>
</tr>
<tr>
<td>Minor Arterial</td>
<td>55</td>
<td>1000</td>
<td>1, 2</td>
</tr>
<tr>
<td>Major Arterial</td>
<td>60</td>
<td>1150</td>
<td>1, 2</td>
</tr>
</tbody>
</table>

Notes:

1. Minimum radius is below that indicated in Caltrans Highway Design Manual Figure 203.2 “Comfortable Speed on Horizontal Curves” for the standard cross slope. While this is acceptable on residential and industrial streets, larger radii, superelevation or reduced design speed should be considered on collector and arterial streets.

2. Minimum radius assumes no sight obstructions, Figure 201.6 “Stopping Sight Distance on Horizontal Curves” of the above referenced should be checked when walls or other obstructions are planned within 20 ft. of the right-of-way.
7. Curb Return Radii:

Curb return radii for various street types shall be as shown on Appendix D

8. Minor Streets:

Minor streets shall be so designed that their use by through traffic will be discouraged.

9. Block Lengths:

Block Lengths shall not exceed 600 feet.

10. Vertical Control:

Flow Line Grades: Grades shall not be less than 0.0025. Where matching existing controls, the minimum grade may be reduced with the approval of the City Engineer.

A minimum flow line elevation of 1 foot above the hydraulic grade line shall be maintained.

Grades on opposite sides of the street shall be the same whenever practical except on super elevated streets.

Curb Returns: The minimum fall around returns shall be 0.20 feet.

Cross Slopes: The standard cross slope of the street shall be 2%. Where necessary when matching existing facilities, the cross slope may vary between 1% and 4%.

Vertical Curves: Where the algebraic difference in slope exceeds 1%, a vertical curve shall be used. The length of vertical curve shall be approved by the City Engineer. Elevations and Stations shall be shown at the BC and EC as well as 25 feet intervals of the vertical curve.

Vertical Control: All vertical control shall be based upon current City, County, or U.S.G.S. datum. Placement of new bench marks as required by the City Engineer shall be based upon City datum.

11. Curb, Gutter, and Sidewalk:

Curb, gutter, and sidewalk shall be installed in conformance with the City of Williams Construction Specifications and Standard Plans.

Curb and Gutter: Curb and gutter shall be installed along all frontages.
Sidewalk: The minimum widths of sidewalks shall be 4.5 feet minimum in residential areas. Sidewalk requirements in other areas shall be established on an individual subdivision basis and shall be approved by the City Engineer.

Pedestrian Ramp for the Handicapped: Pedestrian ramps for the handicapped shall be installed in all curb returns and shall conform to the City of Williams Standard Plans 122 thru 125 and the California Access Code Title 24.

12. Driveways:

The following driveway standards are not applicable to the controlled access highways where access is limited by deed restrictions or other controls.

The number and width of permitted driveways is regulated by the Public Works Department and shall be based on the needs of the parcel served. They shall not be detrimental to the abutting street capacity, safety, and / or efficiency.

Driveway width is measured at the curb line, and includes only the widths of the fully depressed section.

The City Engineer may modify any of the following standards in order to provide better traffic movements or because of special or unusual conditions.

Width:

Maximum: See Standard No. 118.

Minimum: See Standard No. 118.

Distance from Curb Returns:

a. Intersecting Streets: The driveway transition shall not be permitted closer than 50 feet from the projected curb line of the intersection street and no closer than 25 feet from the nearest BCR or ECR.

Commercial and industrial driveways on arterials may be prohibited within 100 feet from the projected right-of-way line of the intersecting street where the intersection is presently or is planned for signalization, or intersection capacity is critical.

b. Alley: The driveway transition shall be permitted no closer than 10 feet from the projected intersecting alley curb face, and no closer than 2 feet from the nearest alley BCR and ECR.
**Distance from Utility or Safety Devices:** The driveway transition shall clear all public facilities such as electroliers, traffic signal standards, utility poles, fire hydrants, and street trees, by a minimum of 3 feet. Any clearance shall be at the expense of the owner who is installing the driveway.

**Distance between Driveways:** A minimum of 8 feet of full curb height shall be maintained between the transitions of adjoining residential driveways.

**Common use Driveways:** Common use driveways may be submitted in special cases.

**Parking Lots:** Design shall conform to Standard Plans 134 and 135.

**Replacement and Repair:** Where the existing curb, gutter, sidewalk, and driveways do not meet the current City Standards and are in need of repairs, it shall be the developer’s responsibility to remove and replace the necessary curb, gutter, and sidewalk. Where curb, gutter, sidewalk and/or driveways are removed, the concrete shall be removed to the nearest expansion, weakened plane or construction joint, or sawed at the nearest score line to the minimum depth of 1 ½ inches.
STORM DRAIN DESIGN STANDARDS

GENERAL:

All drainage facilities shall be designed in accordance with accepted Engineering principles, and shall conform to these Design Standards.

These Standards do not cover all the applicable City, State, and Federal requirements for storm quality and monitoring.

SUBMITTAL OF DRAINAGE CALCULATIONS:

Drainage calculations are required for any new subdivision or development. Submittal of drainage calculations shall include the following items:

a. Hydrology with hydraulic calculations together with assumptions, charts, tables, references, and methods used.

b. A plan preferably 1”-100’ scale, showing proposed street system, existing and proposed drainage system, tributary sub-areas (including offsite drainage), and peak flow of all pipes.

c. A plan showing the hydraulic grade line (HGL), the proposed storm drain including slopes and sizes and top of curb in profile. Elevations should be shown at all changes in slope of the HGL, proposed storm drain and top of curb.

DESIGN FLOW:

The rational Method (Q=CaA) shall be used to determine the quantity of runoff (Q) in designing a storm drain system.

Minimum values for the coefficient of runoff (C) and the time of concentration are as follows:

<table>
<thead>
<tr>
<th>Land Use</th>
<th>C Factor</th>
<th>Tc (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parks</td>
<td>0.20</td>
<td>30</td>
</tr>
<tr>
<td>R-1 and R-2 (Residential)</td>
<td>0.40</td>
<td>25</td>
</tr>
<tr>
<td>R-GA, R-MD, and R-HID (Apartments)</td>
<td>0.50</td>
<td>20</td>
</tr>
<tr>
<td>Schools and Churches</td>
<td>0.50</td>
<td>20</td>
</tr>
<tr>
<td>Commercial</td>
<td>0.80</td>
<td>10</td>
</tr>
<tr>
<td>Industrial</td>
<td>0.90</td>
<td>10</td>
</tr>
</tbody>
</table>

Surface:

Pavement                          | 0.95     |              |
Roofs 0.80
Compacted earth 0.75
Lawn and Open Area 0.20

Values for rainfall intensity (i) for corresponding time of concentration shall be taken from Appendix C. A maximum roof to gutter time of 25 minutes should be used for parcels under 1 acre.

The area (A) shall be the tributary drainage area in acres. Manning’s formula shall be used to determine the relation of design flow, slope, velocity, and pipe diameter. The friction factor “N” shall be 0.013 for all types of pipe.

The storm frequency to be used in drainage system design will be the storm frequency applicable for the design point under consideration. The following guidelines give a general rule for determining applicable design storm frequency. The actual storm frequency used will be specified at the discretion of the City Engineer.

a. 10 year storm:

The drainage system for the 10 year storm is to be designed to minimize inconvenience, protect against minor damage, and reduce maintenance costs. Improvements to be designed for the 10 year storm shall generally include local drainage facilities for residential, commercial, office, and industrial development. This will almost always include all closed conduit design and minor channel sections.

b. 100 Year Storms:

The drainage system for the 100 year storms are to be designed to protect against loss of life or substantial property damage. Improvements requiring 100 year design capacity are open channels and detention basins. Minor channels and closed conduit systems shall also meet the requirements for the 100 year storm as specified in these standards.

HYDRAULIC GRADE LINE:

All storm drains shall be designed for the maximum storm water entering the drain at the point of concentration and shall have a minimum of 1 foot of freeboard between the flow line and the hydraulic grade line.

VERTICAL ALIGNMENT:

The minimum cover on main line storm drains shall be 4 feet in residential streets and 3 ½ feet in all other streets.
A minimum vertical clearance of 3 inches shall be maintained between underground utility.

At points of convergence of pipes of various sizes, the tops of the pipe elevations shall match unless specifically approved by the City Engineer. This does not apply to catch basin laterals.

HORIZONTAL ALIGNMENT:

Storm drains shall be placed within street right-of-way as shown on Standard Plan No. 141 unless placement in an easement is specifically approved by the City Engineer. Required clearances to water mains shall be the same as wastewater lines. In existing streets and non-residential streets the alignment may vary from Standard Plan with approval of the City Engineer. Curved storm drains are allowed in curved streets when curvature does not exceed the pipe manufacturer’s recommendation.

SLOPE:

Storm drains shall have minimum slopes equal to that necessary to maintain a velocity of 2.0 ft/sec. when flowing half full regardless of the slope of the hydraulic grade line. Pipes with lower velocities shall use available fall and have the specific approval of the City Engineer.

Storm drains shall be designed with uniform slope between manholes. Maximum velocity shall not exceed 10 ft/sec.

Catch basin laterals have a minimum fall of 0.10 foot between catch basin and manhole. Desirable fall is 0.30 foot or more.

PIPE:

The minimum size for storm pipe shall be 12 inch diameter. All catch basin laterals shall have a minimum diameter of 12 inches.

The following standard pipe materials shall be used for storm drain construction and shall conform to the appropriate American Society of Testing and Materials (ASTM) and American Water Works Association (AWWA) specifications (latest revision):

<table>
<thead>
<tr>
<th>Pipe Material</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Pipe</td>
<td>ASTM C14</td>
</tr>
<tr>
<td>Reinforced concrete pipe</td>
<td>ASTM C76</td>
</tr>
</tbody>
</table>
Cast-in-place concrete pipe, 30 inches and larger, may be used when specifically approved by the City Engineer. Cast-in-place pipe will not be permitted in streets.

Storm drain lines shall pass the same leakage tests as wastewater lines.

Storm drain joints shall be designed and installed to minimize infiltration and to prevent the entrance of roots throughout the life of the system.

Joints for concrete pipe shall be rubber gasketed joints per ASTM C443. Mortar joints shall be used only when specifically approved by the City Engineer.

Joining of pipe sections of unlike materials shall be accomplished using approved flexible band seals. Other joining methods shall not be used unless approved by the City Engineer.

**MANHOLES:**

Manholes shall be placed at the intersection of all storm drains, at all locations where there is a change in size, change in horizontal or vertical alignment and at the ends of all permanent lines.

Manhole spacing shall conform to the following limits:

<table>
<thead>
<tr>
<th>DIAMETER</th>
<th>MAXIMUM SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>12” to 33”</td>
<td>500 feet</td>
</tr>
<tr>
<td>36” and over</td>
<td>750 feet</td>
</tr>
</tbody>
</table>

All storm drain manholes shall be constructed in conformance with Standard Plan 201 unless otherwise approved by the City Engineer.

**CATCH BASINS:**

Side inlet catch basin shall be located at all low points and shall be spaced in such a manner that design flows will not encroach into the travel lanes.

The total gutter run contributing to any catch basin shall not exceed 1000 feet. It is desirable to locate catch basins on the BCR and ECR which will intercept the most runoff and keep the main pedestrian crossing as dry as possible.

Side inlet catch basins shall be constructed in conformance with Standard Plan 208.
Drop inlet catch basins shall be constructed only in alleys or as temporary installations on unimproved streets where curb and gutter has not yet been installed.

**SIPHONS:**

Inverted siphons will not be permitted.

**VALLEY GUTTERS:**

Valley gutters will be allowed only at intersections of cul-de-sac streets which provide access to less than 10 lots. Valley gutters shall be constructed in conformance with Standard Plan126.

**PRIVATE STORM DRAIN CONNECTIONS:**

The minimum size for private storm drain connections shall be 12 inch diameter.

The pipe shall conform to the storm drain pipe specifications. A reasonably accessible structure shall be provided on the private storm drain connection within 10 feet of the street of alley right-of-way.

Private storm drain connections shall be tied into alley or street catch basin or manholes.

**CONTRIBUTING DRAINAGE AREAS:**

Areas not shown as future development in the general plan shall be considered as undeveloped.

**DETENTION BASINS:**

Detention basins on private or public property shall be designed using the following criteria:

(a) A 24 hour, 100 year storm, total rainfall of 4.79 inches shall be used if a reasonable outlet is provided.
(b) The maximum water surface of the basin shall be 1 foot below the elevation of the flow line at the lowest catch basin inlet within the tributary area.
(c) Fencing with gates shall be provided around all basins.
(d) Adequate “all weather” access shall be provided.
(e) The tributary drainage system shall be designed to connect to the City’s storm drainage system.
(f) The maximum slope ratio for turf or landscaped side slopes shall be 4:1.
SANITARY SEWER DESIGN STANDARDS

GENERAL:

a. Sanitary sewers shall be designed in accordance with accepted engineering principals and shall conform to these Design Standards and the Standard Details.

b. Engineering calculations shall be submitted to the City Engineer for the design of all proposed sewer systems. The calculations shall include the following items:

1. A plan preferably 1’-100’ scale, showing the proposed street system, tributary sub-areas, existing and future tributary areas outside the project limits, zoning, projected land use, and any features affecting the system design.
2. Design flows at major junction points including flows coming from outside the project limits.
3. Size, length, slope, and invert elevations of all proposed lines and locations of manholes.

c. Storm water shall not be connected or discharged into a sanitary sewer. Industrial waste maybe be connected or discharged into a sanitary sewer with approval of the City Engineer. All installations shall be made in conformance with Construction Specifications approved by the City Engineer.

d. Flows used in design of sewers shall be based on the following formula:

\[ QD = QA \times PF \]

\[ QD = \text{DESIGN FLOW} \]
\[ QA = \text{AVERAGE FLOW} \]
\[ PF = \text{PEAK FACTOR} \]

Manning’s formula shall be used to determine the relation of design flow, slope, velocity, and pipe diameter. The friction factor, “N” shall be 0.013 for all types of pipe.

AVERAGE FLOWS:

Average flows shall be computed on a per capita basis for residential and / or a per acre basis on commercial / industrial. Exact density shall be used where possible. Where exact density is not known, the Zoning Map and General Plan shall be used to determine the average flows.

Average flow for residential shall be 300 gal/day/dwelling unit.
Average flows for Commercial / Industrial shall be 2000 gal/day/acre.

PEAK FLOWS:

To compute the peak flow from the average flow, a peaking factor of 3.0 shall be used. This peaking factor includes an allowance for infiltration.

VERTICAL ALIGNMENT:

The minimum cover on a sanitary sewer line shall be 3.5 feet. If minimum cover can not be met, DIP shall be required.

When crossing a water main, it is desirable that the sanitary sewer be installed below the water main with a clearance of 12 inches. When a crossing is necessary, State Health Department Standards shall be adhered to.

At points of convergence of pipes of various sizes, the tops of the pipe elevation shall match within a manhole structure.

HORIZONTAL ALIGNMENT:

Sanitary sewers shall be placed within street right-of-way unless placement in an easement is specifically approved by the City Engineer.

Alignment shall be parallel to the street centerline wherever possible.

Curved sewers are allowed at the discretion of the City Engineer. The manufacturers specifications and recommendations shall be submitted and adhered to.

Sanitary sewers shall not be constructed within 50 feet of any existing or proposed well site.

SLOPE:

Minimum velocity for any sanitary sewer shall be two (2) feet per second for pipes flowing full or half full. Design velocities for sanitary sewers shall be computed using Manning’s formula with a constant “n” value of 0.013 for all pipe materials. Maximum velocities shall not exceed 10 fps at peak flow. Sewers shall be designed with uniform slope between manholes.
PIPES:

The following standard pipe materials shall be used for gravity flow wastewater line construction and shall conform to the appropriate American Society of Testing and Materials (ASTM) and American Water Works Associates (AWWA) specifications (latest revisions):

<table>
<thead>
<tr>
<th>Material</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ductile Iron Pipe with</td>
<td>ASTM A746</td>
</tr>
<tr>
<td>Polyethylene lining and</td>
<td>ASTM D1248, class C, 30 mil thickness</td>
</tr>
<tr>
<td>Polyethylene encasement*</td>
<td>AWWA C105</td>
</tr>
<tr>
<td>PVC sewer pipe and fittings</td>
<td>ASTM D303 SDR 35</td>
</tr>
</tbody>
</table>

*polyethylene encasement may be omitted if a corrosivity soils report provided per Appendix A of AWWA C105 indicates encasement is not needed. Alternate linings may be approved on a case-by-case basis.

Joints and fittings shall be selected and installed to minimize infiltration and to prevent the entrance of roots throughout the life of the system. Ductile Iron pipe joints and fittings shall conform to AWWA C110 or other approved joint for wastewater applications. Joints for PVC pipe shall be flexible elastomeric type conforming to ASTM D3212. Solvent welded joints for PVC pipe are not permitted.

Joining of pipe sections of unlike materials shall be accomplished using approved flexible band seals. Other joining methods shall not be used unless approved by the City Engineer.

HOUSE SERVICE:

The minimum house service shall be 4 inch and shall be installed in conformance with Standard Plan 314.

MANHOLES:

Manholes shall be placed at the intersection of all sanitary sewers, at all locations where there is a change in size, grade, direction, and at the end of lines.
Manhole spacing shall be 500 feet maximum unless approved by the City Engineer.

Manhole spacing on curved alignment shall be 300 feet maximum and shall not exceed manufacturer specifications.

Manholes shall be constructed at all service lateral connections where the main line is not 1 1/2 times the size of the lateral.

Sanitary sewer manholes shall be constructed in conformance with Standard Plan 301.

LIFT STATIONS AND FORCE MAINS:

a. Requirements:

Where extreme hardship conditions prevail, and a substantial area cannot be serviced by gravity sewers in accordance with these standards, a sewage pumping station may be installed. No sewer design shall rely on a pumping facility without prior approval of the City Engineer.

b. Lift Station Design:

Lift station, where allowed, shall incorporate the following features:

1. Pumps or other devices shall be duplex. Minimum desirable size is 4 inches. Maximum velocity in suction is 5 ft/sec. Pumps shall be capable of passing 3 inch solids.

2. Capacity shall be provided to handle ultimate peak flow from the tributary area with the largest pump out of service. Stage installation of pumps is allowed providing space is provided for future installations. Where slide mount submersible pumps are used, a duplex installation of 100% design capacity may be used if a spare pump assembly is supplied to the City complete.

3. Access to pump station and to wet well shall be provided with locks keyed to City Master.

4. A lifting loop over each pump/motor or similar provisions for removal of pump shall be provided.

5. Pump Station and wet well shall be lighted.

6. The wet well rim electrical panel shall be above the 100-year flood elevation.
7. Pump curves, operating voltage and phasing, horsepower, etc., shall be in accordance with approved submittal per section 74-1.04 of Caltrans Standard Specifications.

8. Submersible pumps shall be capable of running in air without damage. Moisture sensing circuit breakers in terminal changer shall be incorporated into submersible pumps.

9. A NEMA weatherproof outdoor enclosure shall be provided for controls. Electrical service shall be provided by underground conduit to the utility service pedestal.

10. Controls shall be solid state programmable controller such as Tesco Liquitronic III Model 36-663 (or equal) with CB612 sensor (or equal) with LED digital readout with purge and clean capacities and automatic pump altering. A standby battery and charger shall be supplied. The battery is to be able to operate the controller for two weeks with the external power source removed. An adjustable time delay before any restart shall be incorporated which allows delays from 1 to 10 minutes. Bubbler type controls will not be accepted. Switches for manually operating the pumps shall be included.

11. An on site alarm with exterior lights and horn with battery backup, including switchable power failure, and low water and high water sensors shall be provided.

12. An automatic telephone dialer and message capability for all alarms shall be installed.

13. Each sewer pump shall have a gate valve and check valve on the discharge piping.

14. Access and work area of pump stations shall be paved with minimum 2” AC on 4” AB.

15. A 6 foot (6’) high chain link fence approved by the City Engineer shall be constructed to enclose the pump station.

16. A means of dewatering force mains shall be provided.

17. The lift station shall not be in City road right-of-ways except with permission from the City Engineer.

18. The interior of the structure, all machinery, piping, and exterior below grade shall be painted.
19. The City shall be provided with three (3) complete sets of manufacturer's brochures, technical data, O & M manuals, schematics, wiring diagrams, etc., for all equipment and controls.


21. All lift stations shall include an emergency generator solely dedicated to the lift station operation.

c. Structural:

Structures shall be reinforced concrete, fiberglass, fusion epoxy coated or galvanized steel. In residential areas, structures shall be below ground. Provide a hatch suitable for the removal and replacement of major equipment components. Hatches shall be spring loaded (Bilco type) with metal provided.

d. Mechanical and Piping:

All design shall satisfy the minimum requirements of the State Health Code. A reduced pressure principle device is required on all domestic water connections. A 1 inch metered connection is to be provided adjacent to the station. Provide an automatic air blower system to exchange air every 6 minutes minimum. Provide an automatic sump pump (slope floor to sump) with check valve in discharge pipe to wet well. Provide standby pumping capacity equal to the largest single unit. Make provisions for standby emergency power connection for use during power outages. Sump pumps and air blowers shall be easily removable for maintenance.

e. Electrical:

All electrical installations shall comply with the National Electrical Code and Division of Industrial Safety requirements, and the City code. Use enclosed prefabricated electrical panels mounted above ground level outside the pump station. Provide running time meters for all motors (use reset type). Provide explosion-proof electrical appurtenances below ground or an approved type disconnect and time delay. Provide separate blower system within all electrical panels located below ground. Provide an approved type alternator and float switches. A manual switch adjacent to the motor which will override the control panel shall be provided. Switch shall be mounted at motor height. Adequate lighting and electrical outlets shall be provided.
Outlets shall be mounted at motor height. Color code all wiring and piping (National Standard Coding).

f. Force Main Design:

Force mains shall be designed in accordance with good engineering practice. Maximum velocity shall be 10 ft/sec. Minimum velocity shall be 2 ft/sec.

OFFSITE IMPROVEMENTS:

The sub-divider may be required to build improvements or to pay a fee established by the City for the development of sewage disposal facilities or for the improvement of any existing sewage disposal system and the construction of transmission lines from the proposed improvements to the site of disposal.

CLEANING AND TESTING:

Sanitary sewers shall be flushed with an approved sewer ball and shall pass a leakage test approved by the City prior to final acceptance by the City of Williams.

REIMBURSEMENT AGREEMENTS:

Agreement may be made upon approval of the City Council for reimbursement by future developers for facilities required by the City to the extent that such facilities are in excess of sizes, lengths, and locations needed to serve the subdivision involved. Requests for reimbursement shall be made in writing at the time of submitting the final map.
WATER DESIGN STANDARDS

GENERAL:

Water facilities shall be designed in accordance with accepted engineering principles and shall conform to these Design Standards.

All materials shall conform to current American Water Works Association Standards (AWWA).

All installations shall conform to regulations prescribed by the California State Department of Public Health.

All installations shall be made in conformance with the City of Williams requirements.

VERTICAL ALIGNMENT:

The minimum cover on water mains shall be 4 feet. When crossing a sanitary sewer or storm line it is desirable that the water main be installed above with a minimum clearance of 12 inches.

All high points within the system shall be located at fire hydrant locations where practicable. When not practical, a blow off shall be installed at the high point.

HORIZONTAL ALIGNMENT:

Water mains shall be installed within street rights-of-way unless an easement installation is specifically approved by the City Engineer. Alignment shall be parallel to the street centerline wherever possible. In the new developments the horizontal alignment of water mains shall be as shown on the Standard Plan 142. In existing streets and non-residential streets the alignment may vary from Standard Plan with approval of the City Engineer but in no case shall there be less than 10 feet horizontal clearance to a sanitary sewer or to a storm drain or industrial waste line. Curved water mains are allowed in curved streets when curvature does not exceed manufacturer’s recommendations.

PIPE:

The minimum size pipe used for water mains shall have a nominal diameter of 8 inches. Large sizes will be required as designated by the City Engineer. An 8 inch minimum line shall be required in industrial and school areas.
Permanent dead-end runs shall be no longer than 250 feet unless specifically approved by the City Engineer. 8 inch mains shall be used on dead end runs which serve fire hydrants. Looping of water mains will be required; the maximum unsupported length of a main is 1300 feet. All pipe shall be Johns Manville, Blue Brute or approved equal and shall conform to AWWA Standard C900, DR18 (Class 150) minimum.

**WATER SERVICE:**

The minimum size service is ¾ inch and shall be installed in conformance with Standard Plan 412. 2 inch service shall be installed in conformance with Standard Plan 413. Larger service connections shall be approved on an individual basis.

**FIRE HYDRANTS:**

Fire hydrants shall be supplied from the largest available main.

Fire hydrants shall be fed from two directions unless specifically approved by the City Engineer and Fire Chief.

Fire hydrant spacing and distribution shall be determined as follows:

1. The maximum hose lay shall be 200 feet in high density, commercial, industrial zoning or high-value districts, with a maximum spacing of 400 feet.
2. The maximum hose lay shall be 250 feet in residential areas with maximum spacing of 500 feet.
3. On divided streets, planned divided streets or highways, the above spacing shall apply to both sides of the street.
4. A fire hydrant shall be located within 200 feet of the radius point of all cul-de-sacs.
5. Distribution main, fire hydrants and fire flow requirements shall conform to the recommended Standards of Insurance Service Office. Refer to “Guide for Determination of Required Fire Flow” published by the Insurance Service Office.
6. On-site hydrants may also be required by the City Engineer or Fire Chief.

Fire flow and fire hydrant distribution, including the number of hydrants required and specific locations, shall be approved by the City Engineer and the Fire Chief.

Fire hydrants shall be installed in conformance with Standard Plan 408, 409 and 411.
VALVES:

Valves shall be spaced and located in conformance with the following criteria:

1. 400 foot maximum spacing in high value districts.
2. 600 foot maximum spacing in residential districts.
3. Water mains shall be valved on each side and outside State Highway and canal right-of-way crossing.
4. At “tees” valves will be required as follows:
   a. 2 valves where one leg is less than 8 inches with one of the valves being on the smaller legs.
   b. 3 valves where all legs are 8 inches or larger
5. At “crosses”, valves will be required as follows:
   a. 3 valves where one or more legs is less than 8 inches with valves on each of the smaller legs.
   b. 4 valves where all legs are 8 inches or larger.
6. At locations so that future tie-ins will not interrupt service.

The above valve spacing requirements assume small lot sizes and numerous connections and may be reduced where there are a minimal number of connections between valves.

BLOW-OFFS:

Blow-offs shall be constructed at the end of all dead-end runs in conformance with Standard Plan 406.

THRUST BLOCKS:

Thrust blocks shall be installed in conformance with Standard Plans 403.

WATER LINE ACCEPTANCE:

Water lines shall be pressure tested, disinfected, flushed and tested for bacteria in conformance with the City of Williams requirements prior to final acceptance by the City.
CONNECTIONS TO EXISTING WATER MAINS:

General Requirements:

Under no circumstances shall anyone other than a representative of the City of Williams Public Works Department open or close any valve in the existing City water system. Requests for valve operation shall be made to the Public Works Director at least 24 hours in advance. In cases where customers will be interrupted, the request shall be made at least 48 hours in advance and the Contractor shall make satisfactory preparation for the planned work to minimize the interruption.

CONNECTION DETAILS:

One connection shall be installed with a contractor-furnished bypass for disinfecting the new main and for providing construction water. All other connections shall also conform to City Standards, but without the bypass. Upon request, the City will open its valve to the subdivision after the mains and services have been installed and backfilled and thrust blocks have cured for 48 hours.

WATER MAIN ACCEPTANCE TESTS:

Official test for acceptance shall normally be conducted after compaction for curb, gutter and sidewalk has been completed.

PRESSURE TEST:

All piping shall be tested to a pressure of 150 pounds per square inch. All material, equipment, and labor for testing shall be approved by the City prior to testing and shall be furnished without cost to the City of Williams. The system will be tested as directed by the Engineer as a unit or in sections not to exceed 1,000 lineal feet. Each unit tested shall successfully meet the requirements herein specified. The water services shall be considered as part of the main for test purposes and no allowance for additional leakage shall be made.

Unless otherwise directed by the City Engineer, testing shall be accomplished by opening hydrants and service line cocks at the high points of the system and blow-offs at all dead-ends. The valve controlling the admission of water, into the section of pipe to be tested should be opened slowly and fully before closing the hydrants or blow-offs. After the system has been filled with water and all air expelled, all the valves controlling the section to be tested shall be closed, and the line remain in this condition for a period of not less than 24 hours.
The pipe shall then be refilled, if necessary, and subjected to a maintained pressure of not less than 150 pounds per square inch for a period of two hours.

Allowable leakage shall not exceed the following:

<table>
<thead>
<tr>
<th>PIPE DIAMETER IN INCHES</th>
<th>GALLONS PER 100 COUPLINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>6”</td>
<td>1.84</td>
</tr>
<tr>
<td>8”</td>
<td>2.45</td>
</tr>
<tr>
<td>10”</td>
<td>3.07</td>
</tr>
<tr>
<td>12”</td>
<td>3.68</td>
</tr>
</tbody>
</table>

All leaks that are found shall be immediately corrected and the system again subjected to the same test.

All repairs of any damage to the pipes and their appurtenances, or to any other structures, resulting from or caused by these tests shall be performed by the Contractor as the City Engineer may direct, all without cost to the City of Williams.

**BACTERIOLOGICAL TEST:**

After the successful completion of the pressure tests*, bacteriologic samples shall then be taken at locations specified by the Water and Sewer Supervisor. The City will take these tests. Results of tests will take at least 5 days. Repeat tests, if needed, will be at the Contractor’s expense. The Contractor may have the samples collected and tested by a State certified laboratory, with results delivered to the Water and Sewer Supervisor.

**FINAL CONNECTIONS TO EXISTING MAINS:**

After notification of passing bacteriological tests, the connections to the existing mains shall be completed by the Contractor.

Requests for City valve operation shall be made to the Director of Public Works. As each connection is made, the main shall be flushed such that the flow is away from the existing water system. Each connection shall be flushed in this manner until the entire new water system is flushed, all under the direction of the City Engineer. Burlap wrapping shall be removed from all hydrants. At this point, the City will take over operation of the water system. The contractor shall be responsible for the cost of repairing any damage to the system until acceptance by the City Council. Onsite water lines may not be tied to the services until the sanitary sewer is acceptable for maintenance.
*The line shall be flushed until the chlorine residual is less than 0.02 parts per million.
MISCELLANEOUS REQUIREMENTS

MAPS AND EASEMENTS:

Maps:

Final Maps and Parcel Maps shall be prepared in conformance with State Law and City ordinances. Applicable certificates and statements shall conform to the appropriate Standard Plan. Final Maps shall be submitted to the City Engineer for checking prior to recording with Colusa County. Parcel Maps shall be submitted to the City Engineer for checking and processing.

Record of Survey shall be prepared in conformance with State laws and shall be submitted to the City Engineer for checking and processing.

Initial submittal of maps and surveys shall include legal descriptions and title reports along with closures and applicable documents to establish the legitimacy of all easements and to establish ownership of land.

Survey Monuments shall be provided at all new lots/subdivisions per the following:

Rear or Interior Lot Corners
Front Lot Corner
Street Right-of-way
Street Centerlines (to include intersections of new and existing streets, end of cul-de-sac, beginning and end of curves)
Subdivision Boundary

The above are minimum requirements and are not intended to restrict or otherwise interfere with the judgment of Professional Engineers and Licensed Land Surveyors.

Easements:

Public Utility Easements (P.U.E.) shall be shown on all maps as required in these Standards and as part of development approval. If no map is involved or where specifically approved by the City Engineer, the easement may be granted by separate instrument.

The width of all public utility easements shall be as determined by the appropriate utility. For wastewater, storm, and water lines, the minimum width is 10 feet unless approved by the City Engineer. Additional width will be required for:

a) Lines larger than 15 inches.
b) Lines deeper than 5 feet  
c) Locations where the easement is not entirely on one lot  
d) Locations where multiple lines are installed within the easement.

Appropriate easements and temporary construction easements and/or limitations and conditions shall be shown on the plans. Particular attention should be given to trench excavations and existing trees and improvements to remain and future build.

**IMPROVEMENT PLANS AND SPECIFICATIONS**

All public improvements shall be shown on plans prepared by or under the directions of a Registered Civil Engineer except for minor work done under an Encroachment Permit or other circumstances approved by the City Engineer. Privately owned improvements may be shown for information, and in some cases, may be required to be shown to avoid conflicts. Distinction between public and private improvements shall be clearly indicated.

The design engineer shall contact electric, telephone, gas, cable TV and any other applicable agencies for locations of existing utilities which shall be shown on the plans. Plans for existing underground City water, wastewater, storm and traffic facilities shall be obtained from the office of the City Engineer. The design engineer shall field verify location and elevation of any existing facility affecting the design of the new improvements.

Plans shall be drawn on 24”x36” velum for final submittal. Prior to final submittal bond 24”x36” will be acceptable. A Plan Submittal Checklist indicates required items on plans which must be included.

Since the plans will refer to City Construction Specifications, it is not required that the design engineer prepare additional specification. However, in cases where the work is not adequately covered by the City Specifications, the plans shall provide the additional information necessary. If separate specifications are prepared, they shall be submitted for review and approval.

The design engineer is responsible for the design and accuracy of the plans. The City check and approval does not relieve the owner/developer from changed or unforeseen conditions, errors contained in the plans or from complying with City, State, Federal or other agency requirements that may be determined to apply during the course of construction. In addition, owner/developer shall comply with any changes required by the City Engineer during the course of work that are necessary or required to complete work in conformance with City Standards.
Rights-of-way, P.U.E.'s and construction easements shall be shown on the plans. The developer/owner is responsible for obtaining such rights-of-way and easements subject to the provisions of 66462.5 of the Subdivision Map Act. For work in the right-of-way of other agencies, the design engineer/owner shall obtain the permit or furnish the necessary information in order for the City to make the application if so required by the agency. The appropriate permit conditions shall be included in the design. The plans shall include a requirement that the Contractor obtain a right-of-entry from the agency under the terms of the permit.

Required utility relocations shall be shown or referenced on the plans as appropriate. Notes requiring the Contractor to arrange for utility relocations are discouraged since this generally delays the project.

Items to be salvaged and either reused or delivered to the City shall be clearly identified on the plans. Generally, any reusable sign, casting, metal barricade, or other item determined by the City Engineer shall be salvaged and delivered to the City per the Construction Specifications unless they are approved for reuse in the project.

Completed Colusa County well and septic tank abandonment permits shall be submitted prior to City approval of the plans and/or map. This requirement may be deferred upon specific approval of the City Engineer if the facilities are in use and are needed during construction.

The plans shall include a requirement for project/job-site signing on projects over 2 acres in size or as required by the City Engineer on projects involving significant disruption of roadways. The sign shall include the names and telephone numbers of the contractor, project engineer/manager and developer/owner.

It is recommended that a pre-construction conference be conducted on all but minor projects. A City representative(s) will attend and the City will provide a meeting room upon request.

**As-Built Plans and Certifications:**

The developer's engineer shall submit the following certifications, plans and other information prior to acceptance of the project:

1) Certification that all monuments have been set as shown on the Final Map or Parcel Map.
2) Certifications that all public wastewater, storm, and water lines located in public utility easements were placed within the limits of the easement as shown on the plans.
3) Survey notes from a leveling survey of all benchmarks placed within the project. The survey shall start and close on the benchmark used in the design of the subdivision and shall close within 0.02 feet.

4) As-built plans showing elevations of utilities and top of curb at all locations designed for future extension.

In addition, where construction problems or other indications exist that improvements are not located within the right-of-way as shown on the plans, the City Engineer may require a topographic or other survey.

The above certifications shall consist of a City Engineer approved letter, map, or other form, signed and stamped by the responsible Registered Civil Engineer or Licensed Land Surveyor, as appropriate.

Traffic Control:

Applicable traffic control requirements shall be included in all plans. References to City and State of California Department of Transportation (Caltrans) specifications and standards are acceptable where the work is primarily not located within the traveled way of existing streets.

Street and lane closures will require specific details to be shown on the plans. Such details may include restrictions on the time of day and duration of work.

Soils Reports:

Soils reports shall be provided for all improvements related to Final Subdivision Maps and may be required for other projects depending on the nature of the project and its location. The report shall include the following as applicable:

1) Location map showing test locations and street layout.
2) Statement regarding presence of critically expansive soils or other adverse soil conditions, which if not corrected, would lead to structural defects. Additional analytical work may be required depending on the initial findings.
3) R-value per Caltrans test method 301, one test per 600 feet of street or at locations of visible changes in material, with a statement that the depth of the sample is consistent with final subgrade depth based on the grading plan.
4) Optimum moisture and dry density per Caltrans methods 216 and 226 at each R-value test location.
5) Soil corrosivity test as appropriate where buried steel structures are proposed (such as lift stations) or per Appendix A of AWWA C104 where use of ductile iron pipe is proposed.
6) Trench design values and recommendations.
7) Applicable information required per Chapter 70 of the Uniform Building Code.
8) Grading recommendations and specifications if more restrictive than these standards.

The soils report shall be signed by a Registered Geotechnical Engineer and referenced on the plans and Map (if any) and appropriate measures incorporated into the design.

**GRADING AND EARTHWORK**

**Grading Plans:**

Grading plans shall show existing and proposed contours (at 0.5 foot maximum intervals) including sufficient information on adjacent property and improvements to review the adequacy of the design. A summary of earthwork calculations shall be provided upon request.

The design shall comply with the appropriate street cross section, vertical alignment, minimum flow line and driveway slope standards. As required by the Community Development Department, on-site low points (drop inlet catch basins) shall be a minimum of 12 inches above the calculated hydraulic grade line or the design maximum water surface of the Master Plan Storm Drainage Basin to which the project is tributary, whichever is higher.

Concrete, concrete block or other approved permanent retaining walls/curbs shall be provided where the difference in grade at the property line exceeds 6 inches. At a minimum, cut and fill requirements of the Uniform Building Code, Chapter 70 shall apply.

**Dust Control:**

Dust control measures shall be addressed on the plans. The owner/developer is responsible for dust control throughout the project.

**Erosion Control:**

Erosion control measures shall be address on the plans. The owner/developer is responsible for erosion control throughout the project. A Storm Water Pollution Prevention Plan (SWPPP) is required for all projects
in excess of 1 acre. All Best Management Practices (BMP) shall be shown on the submitted set of plans and adhered to during construction.
NOTE: Traffic indexes (T.I.) shown on street sections are minimums. All structural sections shall be based on a 20 year design life as determined by existing R-value and T.I. which shall include anticipated traffic as well as existing traffic conditions. Structural sections are per a qualified Soils Engineer’s report and subject to the City Engineer’s approval.
4–Lane Undivided Arterial

T.I. = 8.0 Minimum  
Design Speed = 45 M.P.H.  
No Parking

4–Lane Divided Arterial

T.I. = 8.0 Minimum  
Design Speed = 45 M.P.H.  
No Parking

6–Lane Divided Arterial

T.I. = 8.0 Minimum  
Design Speed = 45 M.P.H.  
No Parking

* A higher T.I. may be required at the discretion of the City Engineer.
4-Lane Expressway

T.I. = 8.0 Minimum
Design Speed = 55 M.P.H.
No Parking

6-Lane Expressway

T.I. = 8.0 Minimum
Design Speed = 55 M.P.H.
No Parking

Frontage Road

( ) Industrial Standard
T.P.E. = Tree Planting Easement
P.U.E. = Public Use Easement

Alternative Local Street

NOTE:
1. THIS ALTERNATIVE REQUIRES APPROVAL OF THE CITY ENGINEER.
2. THIS DESIGN REQUIRES MONOLITHIC SIDEWALK OR NO SIDEWALK.
Industrial Cul-De-Sac
Standard Local Cul-De-Sac

Alternative Local Cul-De-Sac

NOTE:
1. THIS ALTERNATIVE REQUIRES APPROVAL OF THE CITY ENGINEER.
2. THIS DESIGN REQUIRES MONOLITHIC SIDEWALK OR NO SIDEWALK.
TWO LEGGED INTERSECTION CONSTRAINT ON ONE SIDE

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN NO. 109
A Primary Access Roadway

B Secondary Access Roadway

C Cul-De-Sac

D Temporary Access Roadway

LEGEN Driveable area shall be kept free and clear of any obstacles at all times. Curbs painted red if parking is not provided.
PLAN: LOT UTILITY LOCATION

- Residence
- 1% Min. Property Line
- 1/2" Plug End
- 5' Min. from P
- 5' Min. Separation
- S/W
- R/W
- C & G
- D/W
- 3/4" Water Service
- W
- W
- 4" Sanitary Sewer Lateral
- SS

TYPICAL UTILITY LAYOUT

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

NO. REVISION DATE BY

DRAWN BY: EK
CHECKED BY: CD
SCALE: NONE
DATE: 11/2007

APPROVED BY:
CECIL DILLON NOV. 2007
CITY ENGINEER
RCF 25835
STANDARD PLAN NO. 113
Typical Section

NOTE:
1. Expansion joints shall be placed as follows:
   a. On each side of driveway.
   b. On each end of radius.
   c. At a maximum distance of 60 feet.
2. A 1 1/4" deep weakened plane joint shall be placed every 10 feet.
Replace sidewalk per standard detail 116 OR 117

(3) 1/2"x8" dowels

(3) 1/2"x8" dowels

4' Min.
Joint to Joint

(3) 1/2"x8" dowels

Existing curb & gutter

Varies (18" Min.)

Replace curb & gutter per standard detail 115

 PLAN:

(3) 1/2"x8" dowels

City Std. C & G

1/4" above lip of gutter

4"

Varies 18" Min.

Existing A.C. pavement and agg. base

Match existing A.C. and agg. base unless directed otherwise by City Engineer.

SECTION A-A
NOTES:

1. Expansion joints shall be placed as follows:
   a. On each side of driveway.
   b. At a maximum distance of 60 feet.

2. A 1 1/4" Weakened plane joint shall be placed every 10' and at each side of water meter box.

3. When gutter and sidewalk are poured separately use one 8" length of #4 bar each 24" of curb as dowelling.

SECTION A-A
NOTES:

1. Expansion joints shall be placed as follows:
   a. On each side of driveway.
   b. At a maximum distance of 60 feet.

2. A 1/4" weakened plane joint shall be placed every 10' and at each side of water meter box.

DETAIL: EXPANSION JOINT

DETAIL: WEAKENED PLANE JOINT

SECTION: SEPARATED SIDEWALK

SEPARATED SIDEWALK

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

NO. REVISION DATE BY

DRAWN BY: EK
CHECKED BY: CD
SCALE: NONE
DATE: 1/2/2007

APPROVED BY:
CECEL DILLON NOV. 2007
CITY ENGINEER
RCE 25835
STANDARD PLAN NO. 117
NOTE:
When gutter and approach are poured separately, use one 8” length of #4 bar each 24” of curb as doweling.

ISOMETRIC PLAN: DRIVEWAY APPROACH

DETAIL: EXPANSION JOINT

WEAKENED PLANE JOINT

SECTION: DRIVEWAY APPROACH
NOTES: 1. When driveway and gutter approach are poured separately, use one 8" length of #4 bar each 24" of curb as doweling.
2. See curb & gutter detail 114 for placement of expansion joints and weakened plane joints.

ISOMETRIC PLAN: DRIVEWAY APPROACH

DETAIL: EXPANSION JOINT

WEAKENED PLANE JOINT

SECTION: DRIVEWAY APPROACH

COMMERCIAL AND INDUSTRIAL
DRIVEWAY WITH SEPARATED SIDEWALK

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

NO. REVISION DATE B"\

DRAWN BY: EK
CHECKED BY: CD
SCALE: NONE
DATE: 11/2007

COMMERCIAL AND INDUSTRIAL
DRIVEWAY WITH SEPARATED SIDEWALK

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

APPROVED BY: CECIL DILLON NOV. 2007
CITY ENGINEER RCE 25833
DATE STANDARD PLAN NO. 119
NOTES:

1. When driveway and gutter approach are poured separately, use one 8" length of #4 bar each 24" of curb as doweling.

2. See curb & gutter detail 114 for placement of expansion joints and weakened plane joints.

ISOMETRIC PLAN: DRIVEWAY APPROACH

SECTION: DRIVEWAY APPROACH

DETAIL: EXPANSION JOINT

WEAKENED PLANE JOINT
NOTES:
1. When driveway and gutter approach poured separately, use one 8" length of #4 bar each 5' of curb as doweling.
2. See Curb & Gutter Std. 114 for placement of expansion joints and weakend plane joints.
NOTE:
1. The 12" border shall not be a part of ramp surface but shall be sloped uniformly with the sidewalk.
2. The flared sides of all ramps shall have a medium broom finish.
3. The surface of all ramps shall have a medium broom finish.
4. The 12" border shall have a medium broom finish.

Plan view

Section A-A

NOTE:
1. Desired slope of ramp may not be increased except with the written permission of the City Engineer.
2. When gutter and sidewalk are poured separately use 8" of #4 rebar 24" O.C. as doweling.

Typical Groove Detail

DETAIL: EXPANSION JOINT
12" wide border with 1/4"X1/4" grooves @ 1 1/2" O.C. (see Note #1)

NOTE:
1. The 12" border shall not be a part of the ramp surface but shall be sloped uniformly with the sidewalk.
2. The flared sides of all ramps shall have a medium broom finish.
3. The surface of all ramps shall have a medium broom finish.
4. The 12" border shall have a medium broom finish.

Plan view

Section A-A

NOTE:
1. Desired slope of ramp may not be increased except with the written permission of the City Engineer.
2. When gutter and sidewalk are poured separately use 8" of #4 rebar 24" O.C. as doweling.

Typical Groove Detail

WEAKENED PLANE JOINT

HANDICAP RAMP DETAIL
SEPARATED SIDEWALK

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

NO. REVISION DATE BY

DRAWN BY:  EK
CHECKED BY:  CD
SCALE:  NONE
DATE:  11/2007

APPROVED BY:
CECEL DILLON NOV. 2007
CITY ENGINEER
RCE 25835
DATE

STANDARD PLAN NO. 123
NOTES:
1. The 12" border shall not be a part of the ramp surface, but shall be sloped uniformly with the sidewalk.
2. The flared sides of all ramps shall have a medium broom finish.
3. The surface of all ramps shall have a medium broom finish.
4. The 12" border shall have a medium broom finish.

Section A-A

1. Desired slope of ramp may not be increased except with the written permission of the City Engineer.
2. When gutter and sidewalk are poured separately use 6" of #4 rebar 24" O.C. as doweling.

Typical Groove Detail

WEAKENED PLANE JOINT

DETAIL: EXPANSION JOINT
SECTION A–A

GROOVE DETAIL

12" Wide border with 1/4"x1/4" grooves @ 1 1/2" O.C.

NOTE:
1. Desired slope of ramp shall not be increased except with written permission from City Engineer.
NOTE:
1. VALLEY GUTTERS ALLOWED BY SPECIAL PERMISSION ONLY
2. LAP ALL REINFORCING STEEL 30 TIMES DIAMETERS.
NOTES:

1. Stop signs shall be MUTCD (MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES CALIFORNIA SUPPLEMENT) Standard R1-1 (30" by 30" sign)

2. Street-side edge of sign shall be not less than 12" from face of curb.

3. All signs are to be installed using theft-proof hardware such as Hawkins & Hawkins M2G-C2B-TP or approved equal.

PLAN: SIGN & LIMIT LINE LOCATION
STREET SIGN PLACEMENT

NOTE: Street signs shall be placed at the N\W and S\E corners as shown unless otherwise directed by the City Engineer.

SPECIFICATIONS
1) Sign plates shall be "Scotchlite" reflective sheeting applied to degreased and etched FB 118, .080 aluminum by 3M Co. or equal. Plates shall have silver No. 2270, 3M scotchite letters on green No. 2277 Engineer Grade background, without borders, both colors reflectorized.
2) Street name to be in 4" upper case Series C letters with 3" high Series C upper case letters for AVE., BLVD., CT., DR., PL., RD., ST., LANE and WAY not to be abbreviated.
3) Assembly hardware for 4-way sign installation shall be Hawkins–Hawkins Co. No. V14E–(S)PL–2C2P.
4) Street name signs shall be located on N/W and S/E corners as directed above.

NOTE:
When stop sign or any other sign are to be installed on street sign pole, height of sign shall have precedence. A 7'-0" minimum clearance from bottom of sign to top of ground shall be required.
NOTES:

1. Install 6"x8' redwood or pressure treated douglas fir or redwood posts no more than 6'-3" apart and no less than 3' into the ground.

2. Pour a 12" diameter concrete collar around each post to a depth of 12" above the post base.

3. Crossbars shall be 2"x6" douglas fir select, with a minimum length of 16'.

4. Attach crossbar with 1/2"x8" galvanized bolts. 2 minimum at each post. Use 4 bolts at splice.

5. Paint with no less than 2 coats of outside white Hi-Gloss enamel paint.

6. Install 3-18" (Type N-1) Reflectors with . Install 1-W31 as shown. Mount signs on 18"x18"x3/4" plywood backing also painted with 2 coats of outside white enamel. Additional reflector signs may be required for wide streets.

7. Barricade to extend to back of sidewalk when sidewalk present.

8. At the direction of the City, install 24"x36" reflectorized sign with 4" black letters on white background stating "FUTURE THROUGH STREET SUBJECT TO INCREASED TRAFFIC"
Corner Sight Distance
(7-1/2 Second Criteria)

<table>
<thead>
<tr>
<th>Design Speed (mph)</th>
<th>Corner Sight Distance (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>330</td>
</tr>
<tr>
<td>40</td>
<td>440</td>
</tr>
<tr>
<td>50</td>
<td>550</td>
</tr>
<tr>
<td>60</td>
<td>660</td>
</tr>
<tr>
<td>70</td>
<td>770</td>
</tr>
</tbody>
</table>

NOTES:

1. Sight distance values given in the Corner Sight Distance Table are to be used at unsignalized road intersections. These values allow 7-1/2 seconds for the driver on the crossroad to turn left while the approaching vehical travels at the assumed design speed.

2. Setback for the driver on the crossroad assumes 10 feet to the stop bar, 1 foot for the width of the stop bar, and 8 feet from the bumper to driver. If the stop bar is more than 10 feet from the traveled way, additional allowance should be considered. Corner sight distance is measured from a 3.5 foot height at the location of the driver on the minor road to a 4.25 foot object height in the center of the approaching travel lane of the major road.
HARDSCAPE MEDIAN AREA
ROUND CROWN ALONG CENTERLINE
OF MEDI AN & SLOPE TO CURB

18" WIDE MIN. B AND V ARI ES WHERE
SHOWN ON PLANS. SLOPE AWAY
FROM PLANTING AREA

FULL WIDTH VARIES, SEE PLANS

#3 BAR 12" O.C. EACH WAY

1% Min

4"

CLASS 2 AGG. BASE OR SAND
COMPACT 90%

4"

PLANTING AREA

4" TYP

CONCRETE CURB
AND ADJACENT
PAVING, SEE
CIVIL PLANS

NOTE:
1. STAMPED CONCRETE PATTERN: STACKED BOND BRICK

STAMPED CONCRETE

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN NO. 133
MINIMUM PARKING LOT STANDARDS

<table>
<thead>
<tr>
<th>PARKING ANGLE</th>
<th><strong>A</strong></th>
<th><strong>B</strong></th>
<th><strong>C</strong></th>
<th><strong>D</strong></th>
<th><strong>E</strong></th>
<th><strong>F</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>PARALLEL PARKING</td>
<td>10</td>
<td>24</td>
<td>14</td>
<td>10</td>
<td>.3</td>
<td>SEE NOTE #3</td>
</tr>
<tr>
<td>45°</td>
<td>9</td>
<td>12.7</td>
<td>15</td>
<td>20.5</td>
<td>1.8</td>
<td>17</td>
</tr>
<tr>
<td>10</td>
<td>13.4</td>
<td>14</td>
<td>20.8</td>
<td>1.8</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>9.5</td>
<td>14.2</td>
<td>14</td>
<td>21.2</td>
<td>1.6</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>9.5</td>
<td>10.5</td>
<td>19</td>
<td>21.8</td>
<td>2.2</td>
<td>14</td>
</tr>
<tr>
<td>10</td>
<td>11.0</td>
<td>18</td>
<td>22.1</td>
<td>2.2</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>10.6</td>
<td>18</td>
<td>22.3</td>
<td>2.2</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90°</td>
<td>9</td>
<td>9</td>
<td>24</td>
<td>20</td>
<td>2.5</td>
<td>14</td>
</tr>
<tr>
<td>9.5</td>
<td>9.5</td>
<td>25</td>
<td>20</td>
<td>2.5</td>
<td>14</td>
<td></td>
</tr>
<tr>
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<td>10</td>
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<td>20</td>
<td>2.5</td>
<td>14</td>
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<tr>
<td>24</td>
<td>20</td>
<td>2.5</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- DIMENSIONS FOR OTHER PARKING ANGLES MUST BE EVALUATED SEPARATELY FOR APPROVAL.
- HANDICAPPED STALLS SHALL BE A MINIMUM OF 12 FEET WIDE AND END STALLS SHALL BE A MINIMUM OF ONE FOOT WIDER THAN ALL OTHER STALLS.
- FOR TWO-WAY TRAFFIC MINIMUM IS 24 FEET.
PARKING STANDARD NOTES

1. A MINIMUM NUMBER OF PARKING SPACES REQUIRED IS ESTABLISHED BY THE CITY OF WILLIAMS ZONING ORDINANCE.
2. ALL PARKING STALLS SHALL BE MARKED IN A ACCEPTABLE MANNER.
3. LOTS DESIGNED FOR MORE THAN FOUR CARS MUST HAVE TWO-WAY ACCESS.
4. WHERE TWO PARKING ANGLES ARE TO BE USED IN A SINGLE LOT, THEY SHALL BE LOCATED IN SEPARATE AREAS OF THE LOT (EXCEPT AS SHOWN ON LAYOUT).
5. ANY PARKING LAYOUT NECESSITATING A CUL-DE-SAC OR SIMILAR TYPE OF TURNING FACILITY FOR REVERSING DIRECTION OF TRAVEL IN ORDER TO EXIT FROM THE AREA OR ANY PARKING SPACES WILL GENERALLY BE DISCOURAGED, AND IT SHOULD BE APPROVED BY THE CITY STAFF PRIOR TO THE INCORPORATION INTO THE PLAN.
6. RESIDENTIAL PARKING FOR MORE THAN FOUR CARS AND PARKING IN COMMERCIAL AND INDUSTRIAL AREAS SHALL NOT BE DESIGNED TO REQUIRE BACKING OUT ONTO ANY PUBLIC STREET RIGHT-OF-WAY.
7. TWO-WAY TRAFFIC AISLES SHALL BE A MINIMUM OF 24 FEET WIDE.
8. PARKING OR BACKING AREA WITHIN A PARKING LOT SHALL NOT EXTEND INTO THE PUBLIC RIGHT-OF-WAY.
9. WHEN A LONG DRIVEWAY HAVING ONLY A SINGLE INGRESS IS NECESSARY WITHIN A DEVELOPMENT, PROVISIONS SHOULD BE MADE FOR THE MANEUVERING OF EMERGENCY VEHICLES AND THE ARRANGEMENT APPROVED BY CITY STAFF PRIOR TO ITS INCORPORATION INTO THE PLAN.
10. ALL PARKING LOTS SHALL HAVE AN ADEQUATE STRUCTURAL SECTION AND SHALL BE PAVED WITH A MINIMUM OF TWO INCHES OF ASPHALT CONCRETE.
11. ALL UNSUSABLE AREAS SHALL BE LANDSCAPED WHERE PRACTICAL.
12. LANDSCAPED AREAS WITHIN OR ADJACENT TO THE PARKING AREA SHALL PROVIDE FOR A MINIMUM OF ONE SHADE TREE FOR EVERY FOUR PARKING STALLS. DEPENDING ON TYPE AND SIZE OF SHADE TREE, REQUIREMENTS MAY BE MODIFIED BY THE CITY SITE PLAN.
13. SIX-INCH HIGH CONCRETE CURBS SHALL SEPARATE ALL PAVED AND LANDSCAPED AREAS.
14. THE CONCRETE CURBING SHALL BE USED AS WHEEL STOPS WHERE POSSIBLE. THE USE OF BUMPER BLOCKS IS DISCOURAGED.
15. LANDSCAPED AREAS SHALL BE PROVIDED BETWEEN ASPHALT AREAS AND ALL BUILDING STRUCTURES AND FENCES AND PROPERTY LINES. HARDSCAPING MAY BE USED WHERE PEDESTRIAN ACCESS IS A NECESSITY AS DETERMINED BY THE CITY SITE PLAN.
16. LANDSCAPING SHALL CONFORM TO THE CITY OF WILLIAMS.
17. END STALLS SHOULD BE PROTECTED FROM THE TURNING MOVEMENT OF OTHER VEHICLES.
18. HANDICAPPED STALLS SHALL BE A MINIMUM OF NINE FEET WIDE PLUS AN ADJACENT FIVE FOOT MINIMUM ACCESS ZONE, PER TITLE 24, CHAPTER 2-7102, CALIFORNIA ADMINISTRATIVE CODE.
19. END STALLS ADJACENT TO CURBINGS SHALL BE A MINIMUM OF TEN FEET WIDE.
20. DEAD END 90° PARKING SHALL BE PROVIDED WITH ADEQUATE TURNING ROOM.
21. PARKING REQUIREMENTS FOR THE INTERIOR OF PARKING LOTS ON INDUSTRIAL LOTS SURROUNDED SOLELY BY HEAVY INDUSTRIALLY ZONED PROPERTIES MAY BE MODIFIED BY THE SITE PLAN.
22. ALL OFF-STREET PARKING STALLS SHALL BE PAVED.
23. ALL LANDSCAPED AREAS TO BE WITHOUT LAWN AND IRRIGATION TO BE SOLAR PANELED PROGRAMMABLE TIMERS WITH POP-UPS AND EMITTERS.
NOTES:

1. One in every eight accessible spaces, but not less than one, shall be served by an access aisle 8’ wide minimum and shall be designated van accessible.

2. Each parking space reserved for persons with physical disabilities shall be identified by a reflectorized sign in accordance with State Standard Sign R99. Van accessible parking spaces shall be identified by reflective signs in accordance with State Standard Sign R99 and R99a. Signs shall be posted at a minimum height of 80 inches from the bottom of the sign to the parking space finish grade.

3. Pavement symbol shall be per MUTCD California Edition.

4. An additional sign (17”x22”) shall be installed at each entrance to the parking lot. The sign shall read as follows: "Unauthorized vehicles parked in designated accessible spaces not displaying distinguishing placards or license plates issued for persons with disabilities may be towed away at owner’s expense. Towed vehicles may be reclaimed by telephoning the City of Williams Police Department”

5. If overhang encroaches onto a pedestrian area, pedestrian area shall have a minimum 4’-0” clear width.

- PARKING STALL SHALL BE 20’-0” LONG IF 2’-6” CURB OVERHANG IS NOT PROVIDED.
TRE♡TIE DETAI♡

2" DIA. x 8' MIN. LODGEPOLE PINE STAKE, SEE NOTE 6
STD. NO. 138 (TYP.)

35" ±

15 GAL. TREE MIN.
SEE NOTE 1 STD.
NO. 138 (TYP.)

DEEP ROOT PLANTER BOX,
SEE NOTE 2 STD. NO. 138 (TYP.)

4"x2" PERFORATED PLASTIC WATERING PIPE, SEE NOTE 4
STD. NO. 138 (TYP.)

BACKFILL MATERIAL
SEE NOTE 5 STD.
NO. 138 (TYP.)

HIGH IMPACT PLASTIC
"DEEP ROOT" OR EQUAL
SEE NOTE 8 STD. NO. 138
(TYP.)

HIGH IMPACT PLASTIC
"DEEP ROOT" OR EQUAL
SEE NOTE 8 STD. NO. 138
(TYP.)

DIMENSIONS SHOWN
ARE MINIMUMS

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

STANDARD
PLAN NO. 137

NO. REVISION DATE BY

DRAWN BY: EK
CHECKED BY: CD
SCALE: NONE
DATE: 11/2007

APPROVED BY:
CECEL DILLON NOV. 2007
CITY ENGINEER
RCE 25835
DATE

TRE♡PLANTING
GENERAL NOTES:

1. TREES SHALL BE A SIZE NOT LESS THAN 8 FT. IN HEIGHT NOR LESS THAN 1 INCH CALIPER. A TREE MAY BE REJECTED IF IT IS NOT OF A SHAPE OR CONDITION ACCEPTABLE TO THE CITY OF WILLIAMS.

2. THE TREE SHALL BE PLANTED IN DEEP ROOT PLANTER BOX. THE PLANTER BOX MUST BE A MINIMUM OF 22 INCHES AT THE TOP, 29 INCHES AT THE BOTTOM AND 18 INCHES DEEP.

3. THE TREE SHALL BE PLANTED IN A HOLE 40 INCHES SQUARE BY 36 INCHES DEEP.

4. INSTALL TWO 24" DEEP WATERING PERFORATED PLASTIC PIPES AS SHOWN. FILL PIPES WITH 3/4 INCH CLEAN DRAIN ROCK.

5. TREES SHALL BE PLANTED IN A MIXTURE OF 1/2 NATIVE SOIL AND 1/2 LEAF MOLD OR REDWOOD MULCH.

6. TREES SHALL BE STAKED WITH TWO 2 INCH BY 8 FT. MINIMUM LODGE POLE PINE STAKES OR EQUAL. STAKES SHALL BE COATED WITH GREEN PRESERVATIVE STAIN. TREES SHALL BE TIED WITH "GRO STRAIT" TREE TIES, OR SIMILAR.

7. TREES SHALL BE PLANTED A MINIMUM OF 20 FT. APART TO A MAXIMUM OF 50 FT. APART DEPENDING ON THE TYPE OF THE TREE. TREES SHALL BE PLANTED A MINIMUM OF 20 FT. FROM CURB RETURNS, 15 FT. FROM STREET LIGHTS AND 6 FT. FROM DRIVEWAYS, SEWER LATERALS AND WATER SERVICES OR AS OTHERWISE APPROVED BY THE CITY OF WILLIAMS.

8. DEEP ROOT PLANTER SHALL BE FABRICATED FROM A HIGH DENSITY AND HIGH IMPACT PLASTIC SUCH AS POLYVINYL CHLORIDE, ABS OR POLYETHYLENE AND HAVE A MINIMUM THICKNESS OF 0.06 INCH. THE PLASTIC SHALL HAVE 1/2 INCH HIGH RAISED VERTICAL RIBS ON THE INNER SURFACE SPACED NOT MORE THAN SIX (6) INCHES APART.
STREETS:
- CALTRANS CLASS 'A' CONCRETE
- CALTRANS CLASS 'B' CONCRETE
- CALTRANS CLASS '2' AGGREGATE BASE
- CALTRANS CLASS '3' AGGREGATE SUB BASE
- CALTRANS TYPE 'B' ASPHALT CONCRETE
- CALTRANS TYPE 'C' CONCRETE
- CALTRANS 'B' CONCRETE
- CALTRANS 'C' CONCRETE
- TYPE 'B' MINERAL AGGREGATE
- AR1000 TACK COAT
- SS-1 TACK COAT
- PINKERTON FRAME (A586) AND COVER (A587)
- PINKERTON FRAME TYPE 18-10 GRADE AND FRAME
- STEEL, Ductile Iron 5C40 PVC, OR ABS CURB DRAIN PIPE
- REINFORCED CONCRETE PIPE (R.C.P.) BELL AND SPIGOT JOINTS WITH O-RING GASKET
- CAST-IN-PLACE (C.I.P.) PIPE
- PRE-CAST MANHOLE PER ASTM C-476 TESCO LIQUIDTRONIC III MODEL 36-3663 CONTROLLER
- TESCO CB612 LIQUID LEVEL DETECTION
- "BORDEN W/B" TYPE 8 DECK GRATING

DRIVEWAYS:
- CALTRANS CLASS 'A' CONCRETE
- CALTRANS CLASS 'B' CONCRETE
- CALTRANS CLASS '2' AGGREGATE BASE
- CALTRANS CLASS '3' AGGREGATE SUB BASE
- HUNTS HB 100 BONDING EPOXY

SIDEWALKS, CURBS AND GUTTER:
- CALTRANS CLASS 'A' CONCRETE
- CALTRANS CLASS 'B' CONCRETE
- CALTRANS CLASS '2' AGGREGATE BASE
- CALTRANS CLASS '3' AGGREGATE BASE
- BAUER TRAFFIC GRADE PAINT (#24646A-WHITE)
- BAUER TRAFFIC GRADE PAINT (#2378A9-BLACK)

TRENCHING:
- CALTRANS TYPE 'B' ASPHALT CONCRETE
- CALTRANS CLASS '2' AGGREGATE BASE
- CALTRANS CLASS 'A' CONCRETE
- CALTRANS CLASS 'C' STRUCTURAL BACKFILL

SEWER SYSTEM:
- CALTRANS CLASS 'B' CONCRETE
- RAMONE JOINT SEALANT
- PRECAST CONCRETE PER ASTM C-478
- RELINER--DURAN MANHOLE DROP BOWL
- ASTM A-48 CLASS 30 FRAME AND COVER
- C-594 SEWER REPAIR COUPLING
- ASTM D3034--DD (SDR--35) SEWER LATERAL PIPE
- CLASS 50 DUCTILE IRON PIPE
- CB90/CLASS 200 PIPING
- CHRISTY VI DRAIN BOX
- C-594 SEWER REPAIR COUPLINGS
- POLYVINYL CHLORIDE (PVC) PIPE
- TESCO LIQUIDTRONICS III MODEL NO. 36-633 SOLID STATE CONTROLLER
- CHRISTY "R" SERIWE PRE--CAST PIT
- PRE-CAST FLAT TOP MANHOLE (ASTM C-497)
- PRE-CAST MANHOLE SECTION (ASTM C-478)
- CUTLER-HAMMER TRANSFER SWITCH (#24763) AND NEMA 3R ENCLOSURE
- APPLETON PIN AND SLEEVE (#ACR1034RS)

STORM DRAIN SYSTEM:
- LAW STEEL -- TYPE A GRADE WITH ONE PIECE FRAMES AND HOOD
- DAIL SUPPLY CO. -- I-3532 (HOOD), I-3533 (FRAME AND "L" GRADE)
- NEENAH FOUNDRY -- R-3040 GRADE WITH ONE PIECE FRAME AND HOOD

WATER SYSTEM:
- CLOW "Y--960" FIRE HYDRANT
- LONG BEACH IRON WORKS "LB400" BREAK--OFF CHECK VALVE
- CHRISTY G4 TRAFFIC VALVE BOX WITH G5C CAST IRON LID
- CHRISTY G4 TRAFFIC VALVE BOX WITH G4C CAST IRON LID
- BADGER "RECORDALL" DISK METER
- FORD METER VALVE (BA43-444)
- FORD CORPORATION STOP (FB1000 OR F1000) TYPE K COPPER
- FORD METER VALVE (FV43-866, 1-1/2")
- FORD METER VALVE (FV43-777, 2")
- CHRISTY B-16 BOX AND C-30 LID
- FORD BLOW OFF VALVE (B41-777)
- CAST IRON PIPE (C.I.)
- DUCTILE IRON PIPE (D.I.)
- SAND CEMENT GROUT (8-SACK MIX)
- BENTONITE/CEMENT GROUT
- CALTRANS CLASS 'B' CONCRETE
- EMCO WHEATON MONITORING WELL VAULT (A0721-101)
- BROOKS UTILITY BOX (W-500) WITH STEEL COVER
- DRESSEL "450" OR Pratt "GROUNDHOG" VALVES
- POLYVINYL CHLORIDE (PVC) WATER MAIN PIPE
- SEE W-32 FOR APPROVED WATER METER SERVICE BOXES
- BADGER RECORDALL DISC METER
- BACKFLOW PREVENTION DEVICE INCLOCUSES

STREET LIGHTING STANDARD:
- GENERAL ELECTRIC FIXTURE (M-250A OR M-400A)
- BUSSMAN FUSEHOLDER (HLR)
- #6 ALUMINUM THN--TW CONDUCTOR
- #8 COPPER THN--TW CONDUCTOR
- SCHEDULE 40 AND 80 VC CONDUCT
- TESCO 26--000 SERVICE PEDESTAL
- SQUARE D "TYPE GO" CIRCUIT BREAKER
- STERNBERG MODEL ABB2R "AUBURN" LIGHT
- STERNBERG TAPERED POLE
- STERNBURG LIGHT POLE BASE "RICHMOND" 3912-T (12' HEIGHT) OR "BIRMINGHAM" 7718-T (16' HEIGHT)
BIKEWAYS
BURKE KEYED KOLD JOINT
CALTRANS CLASS "B" CONCRETE
CALTRANS CLASS "2" AGGREGATE BASE
CALTRANS TYPE "A" OR "B" ASPHALT CONCRETE
GALVANIZED STEEL PIPE

LANDSCAPING
AGIFORM PELLETS

TRAFFIC CONTROL
12 GAUGE TUBE POSTS, SLEEVES AND ANCHORS
3M "SCOTCHLITE" STREET NAME SIGN PLATE
HAWKINS V14F (HD) SL-2C2P STREET NAME SIGN HARDWARE
CALTRANS CLASS "A" CONCRETE
CALTRANS CLASS "B" CONCRETE
CALTRANS CLASS "2" AGGREGATE BASE
ALUMINUM WING BRACKET
ALUMINUM .080 GAUGE 6061-T6 ALLOY SIGN
WESTERN HIGHWAY PRODUCTS
REDWOOD CLEAR OR PRESSURE TREATED POSTS
THERMOPLASTIC PAVEMENT MARKINGS

MISCELLANEOUS
CALTRANS CLASS "B" CONCRETE
GALVANIZED PIPE
PINKERTON FOUNDRY A-257 VALVE COVER ASSEMBLY
MONROE CASTING 9277M MONUMENT COVER
NOTES:

1. ANY DEVIATION FROM THE STANDARD LOCATION SHALL BE APPROVED BY THE CITY ENGINEER.
2. THIS STANDARD SHALL APPLY TO NEW DEVELOPMENTS.
3. FRANCHISE UTILITIES TELEPHONE, GAS, ELECTRICAL, TELEVISION CABLE, ETC. SHALL BE LOCATED IN BETWEEN SIDEWALK & P.U.E. AREA.
## DESIGN AND OPERATIONAL CHARACTERISTICS
FOR TWO ROUNDABOUT CATEGORIES

<table>
<thead>
<tr>
<th>DESIGN ELEMENT</th>
<th>URBAN SINGLE-LANE</th>
<th>URBAN DOUBLE-LANE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RECOMMENDED MAXIMUM ENTRY DESIGN SPEED (MILES/HOUR)</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>MAXIMUM NUMBER OF ENTERING LANES PER APPROACH</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>TYPICAL INScribed CIRCLE DIAMETER (FEET) (1)</td>
<td>100–130</td>
<td>150–180</td>
</tr>
<tr>
<td>SPLITTER ISLAND TREATMENT</td>
<td>RAISED WITH CROSSWALK CUT</td>
<td>RAISED WITH CROSSWALK CUT</td>
</tr>
<tr>
<td>TYPICAL DAILY SERVICE VOLUMES ON 4-LEG ROUNDABOUT (VEHICLES/DAY)</td>
<td>20,000</td>
<td>VARIES (2)</td>
</tr>
</tbody>
</table>

**NOTES:**

1. ROUNDABOUT WILL BE REQUIRED WHERE TWO COLLECTOR STREETS INTERSECT AND THE ULTIMATE COMBINED ENTERING TRAFFIC VOLUMES EXCEED 2,000 VEHICLES DAILY. A TRAFFIC SIGNAL MAY BE REQUIRED IN LIEU OF A ROUNDABOUT AT THE DISCRETION OF THE CITY ENGINEER.


3. DRAWING 143 SHOWS TYPICAL DIMENSIONS TO ACCOMODATE A WB–50 VEHICLE WITHIN A SINGLE LANE ROUNDABOUT.

4. ASSUME 90-DEGREE ENTRIES AND NO MORE THAN FOUR LEGS.

5. SIGNAGE SHALL CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."

6. ROUNDABOUT DESIGN SHALL BE APPROVED BY THE CITY ENGINEER BASED ON ENGINEERING ANALYSIS.
NOTES:

1. GALVANIZED RIGID STEEL CONDUIT SHALL BE USED FOR ALL INSTALLATIONS BETWEEN LOTS, STREET CROSSINGS BEND SEGMENTS AND POLE RISERS 10' ABOVE GROUND LEVEL.

2. CONDUIT MINIMUM DEPTH SHALL BE 12" UNDER SIDEWALK, 18" BACK OF WALK AND 30" FOR STREET CROSSINGS, UNLESS OTHERWISE SPECIFIED ON PLANS.

3. ALL LIGHTS INSTALLED ON CURVED ALIGNMENT SHALL BE PERPENDICULAR WITH CENTERLINE OF STREET.

4. CITY INSPECTION REQUIRED PRIOR TO PLACEMENT OF ANY CONCRETE.

5. SHIMMING THE POLE BASE WILL NOT BE ALLOWED.

6. CONCRETE BASES SHALL CURE FOR 7 DAYS (MINIMUM) PRIOR TO ERECTING POLES.
SEE STD. DTL 305
FILL FLUSH WITH MORTAR

INSIDE FACE OF MANHOLE WALL

TO BE FABRICATED OF 3/4"
STEEL ROD & GALVANIZED
STEPS NOT REQUIRED UNLESS SPECIFIED IN SPECIAL PROVISIONS

MANHOLE STEP DETAIL

PRECAST MANHOLE AND BOTTOM

<table>
<thead>
<tr>
<th>M.H. SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIAMETER</td>
<td>36&quot;</td>
<td>3  1/2&quot;</td>
<td>12&quot;</td>
<td>55&quot;</td>
</tr>
<tr>
<td>DIAMETER</td>
<td>42&quot;</td>
<td>4&quot;</td>
<td>24&quot;</td>
<td>62&quot;</td>
</tr>
<tr>
<td>DIAMETER</td>
<td>48&quot;</td>
<td>5&quot;</td>
<td>30&quot;</td>
<td>70&quot;</td>
</tr>
</tbody>
</table>

TABLE OF DIMENSIONS

SECTION OF PIPE CONTINUOUS THROUGH M.H.

JUNCTION MH. BETWEEN DIFF. PIPE SIZES

SHAPING BOTTOM OF MANHOLE

PRECAST MANHOLE

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
CECIL DILLON NOV. 2007
CITY ENGINEER
STANDARD PLAN NO. 201
CAST IRON RING & GRATE
CONFORMING TO ASTM A-48-30

NOTE:
CONCRETE, 2500 PSI AT 28 DAYS
4" SLUMP
1 1/2" MAX. AGGR
LIGHT BROOM FINISH
IMPERVIOUS MEMBRANE CURB

CONC TO BE PLACED
AGAINST NEAT
EXCAVATION

12" DIA
MIN.

0.10% MIN

12"

6" 16" DIA
MIN.

6" 6"

30" MIN.
1. SEE STD. PLAN 114, 116 AND 117 FOR CURB GUTTER AND SIDEWALK DETAILS
NOTE:
Precast bases are acceptable.

TYPICAL M.H. AT PIPELINE ANGLE

TYPICAL M.H. WITH 2 BRANCHES

TYPICAL M.H. 1 BRANCH

TYPICAL STRAIGHT THROUGH M.H.

LEGEND

- Indicates shelf

Trowelled smooth curve to fit

City standard diameter manhole

City standard diameter manhole
Typical standard manhole

Intersecting mains (storm or sanitary) should match soffet

Shape smooth channel

Pour concrete collar around R.C.P. penetration on all storm drain laterals

Make smooth grout finish around pipe end and interior wall.

SECTION A–A

Shape and trowel smooth channel

PCC Base

Connecting main or lateral

PLAN

NO.  REVISION  DATE    BY

MANHOLE CONNECTION
DETAIL

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN NO. 205

APPROVED BY:
CECIL DILLON NOV. 2007
CITY ENGINEER RCY 25835

DRAWN BY: FK
CHECKED BY: CD
SCALE: NONE
DATE: 11/2007
NOTE:
Reinforcing steel shall be required in walls of drop inlets which are greater than 6' in depth. Horizontal and vertical bars shall be #4, spaced 12" O.C. and placed between 1 1/2" and 2 1/2" from surface of inside wall.

2' AC apron on 6" CL. II agg. base. Compact sub-grade and agg. base to 90% relative compaction.

PLAN

SECTION A-A

SECTION B-B
NOTES:

1. Place grate bars parallel to flow.
2. All miscellaneous iron and steel to be galvanized after fabrication.
3. 5/8" O Rivets to be placed @ 5" O.C.
4. Open area to equal 79.8% min.
5. Frame and grate to be Phoenix Iron Works model #P-6301 or equal.

SECTION A-A

STANDARD 18"x36" CURB INLET FRAME AND GRATE

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

NO. REVISION DATE BY

DRAWN BY: EK
CHECKED BY: CD
SCALE: NONE
DATE: 11/2007

STANDARD PLAN NO. 207

APPROVED BY:
CECIL DILLON NOV. 2007
CITY ENGINEER RCE 25835
DATE
NOTES:
1. IF PIPE INTO OR OUT OF THE CATCH BASIN IS LARGER THAN 24", UNIT SHALL BE TAILOR MADE BY SUPPLIER, OR ENGINEERED PLANS SHOWING FIELD FABRICATION SHALL BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
2. APPROVED ALTERNATES FOR CURB INLET BASE SECTIONS: SANTA ROSA CAST PRODUCTS BASE SECTION MODEL 4A; PHOENIX PRECAST CONC. PRODUCTS BASE SECTION MODEL D14,2 OR EQUAL.
3. ALL HOOD, BASE, AND PIPE CONNECTIONS SHALL BE GROUTED.
4. 3/4" GALVANIZED STEEL GUARD ROD MUST BE INSTALLED AT CENTER OF OPENINGS IN EXCESS OF 9" INCHES IN HEIGHT.
NOTES:
1. ALL METAL PARTS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123.
2. CONCRETE SHALL TEST 3000 PSI AT 28 DAYS.
3. ALL REINFORCING SHALL BE 4" X 4" – 6-6 MESH.
4. WEIGHT OF UNIT COMPLETE = 1500± LBS. COVER ONLY = 100± LBS.
5. 3/4" GALVANIZED STEEL GUARD ROD FOR OPENINGS IN EXCESS OF 9".
6. BASE MAY BE PRECAST OR CAST IN PLACE TO SUIT.

SECTION A-A
SANTA ROSA CAST PRODUCTS MODEL 4AC
PHEONIX PRECAST CONC. PRODUCTS MODEL P-2448-C
NOTES:
1. 3" MAXIMUM PIPE DIAMETER IN 6" HIGH CURB.
2. MAXIMUM OF TWO PIPES MAY BE USED AT ONE LOCATION, MAINTAINING A MINIMUM OF 2" BETWEEN EACH PIPE. A MAXIMUM OF TWO 3"x6" RECTANGULAR TUBES MAY BE USED IN LIEU OF PIPE.
3. PIPE MATERIALS: STEEL, DUCTILE IRON, SCHED. 40 PVC, OR ABS PIPE.
4. CONTRACTOR CAN BORE THROUGH CURB (3" DIA. MAX.) AND GROUT, AS AN ALTERNATE.
5. U.B.C. SECTION 1506.5 REQUIRES CURB DRAIN FOR ROOF DRAINAGE, EXCEPT ON A SINGLE FAMILY OR DUPLEX LOT.
6. CURB DRAIN MAY ALSO BE REQUIRED PURSUANT TO ON-SITE DRAINAGE ACROSS SIDEWALK IS NOT ALLOWED.
8. CURB DRAIN CONSTRUCTION DOES REQUIRE AN ENCROACHMENT PERMIT.
SECTION A–A

SECTION B–B

SECTION– INLET
(FOR PIPE LARGER THAN 4" DIA.)

PLAN

PROFILE

STEEL LIST

<table>
<thead>
<tr>
<th>S</th>
<th>B</th>
<th>GALVANIZED STEEL ANGLE</th>
<th>ANCHOR</th>
<th>SPACING</th>
<th>LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;-0&quot;</td>
<td>3&quot;</td>
<td>2 1/1 x 2&quot; x 3/8&quot;</td>
<td>2</td>
<td>7&quot;</td>
<td>1&quot;-9&quot;</td>
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<td>2 1/1 x 2&quot; x 3/8&quot;</td>
<td>2</td>
<td>7&quot;</td>
<td>1&quot;-9&quot;</td>
</tr>
<tr>
<td>2&quot;-0&quot;</td>
<td></td>
<td>2 1/1 x 2&quot; x 3/8&quot;</td>
<td>3</td>
<td>3&quot;</td>
<td>1&quot;-9&quot;</td>
</tr>
<tr>
<td>2&quot;-6&quot;</td>
<td></td>
<td>2 1/1 x 2&quot; x 3/8&quot;</td>
<td>3</td>
<td>3&quot;</td>
<td>1&quot;-9&quot;</td>
</tr>
<tr>
<td>3&quot;-0&quot;</td>
<td></td>
<td>2 1/1 x 2&quot; x 3/8&quot;</td>
<td>3</td>
<td>3&quot;</td>
<td>1&quot;-9&quot;</td>
</tr>
</tbody>
</table>

NOTES:
1. FLOOR OF BOX TO BE TROWELED SMOOTH.
2. TOP OF INLET STRUCTURE TO BE FLUSH WITH ADJACENT
3. SURFACE WHERE PRACTICABLE.
4. A HEADED STEEL ROD 1/2" x 6" WITH 1" DIA. HEAD
   ATTACHED BY A FULL PENETRATION BUTT WELD MAY BE
   USED AS AN ALTERNATE ANCHOR.
   NORMAL CURB FACE AT POINT M & Q, B+5" AT POINTS P & N.

ALTERNATIVE CURB DRAIN

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN NO. 212

CECIL DILLON NOV. 2007
CITY ENGINEER DATE
RCE 25835

NO. REVISION DATE BY

DRAWN BY: EK
CHECKED BY: CD
SCALE: NONE
DATE: 11/2007
PCC COLLAR PIPE CONNECTION

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

PRECAST CONCRETE PIPE TO PRECAST CONCRETE PIPE

STANDARD C.M.P. BAND COUPLER AT LEAST ONE SIZE LARGER THAN THE C.M.P.

Pipes of dissimilar materials

NO. 3 HOOPS &
NO. 3 @ 18" o.c.
W/ CONC. DOBIES.

CONCRETE COLLAR

CONCRETE PIPE OR C.M.P.

PRECAST CONCRETE PIPE TO PRECAST CONCRETE PIPE WITHOUT STANDARD JOINT

CONCRETE PIPE OR C.M.P.

TO EXISTING STRUCTURE

NO. 3 HOOPS &
NO. 3 @ 18" o.c.
W/ CONC. DOBIES.

CONCRETE COLAR

INSIDE FACE

APPROVED BY:
CECEL DILLON NOV. 2007
CITY ENGINEER
RCF 28835

STANDARD PLAN NO. 213

DRAWN BY: EK
CHECKED BY: CD
SCALE: NONE
DATE: 11/2007
1. Bell & spigot type joint with O-ring gasket shall be used for all irrigation or storm drain pipeline and siphons within the City R/W.

2. Tongue and groove type joint shall be centrifugally case using mastic packing (Ramnek, Kent Seal or equal). "Packer Joint" pipe shall use mortar joints.

GENERAL NOTES

1. Maximum spacing of storm drain manholes shall be 500 feet.
2. Pipe Class design shall be submitted for approval by City Engineer.
3. Submittals for polymer pipe may be considered, based on material, design and use.
SECTION A–A

DIMENSIONS

<table>
<thead>
<tr>
<th>PIPE DIA.</th>
<th>IN.</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
<th>54 &amp; GREATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>IN.</td>
<td>26</td>
<td>32</td>
<td>38</td>
<td>40</td>
<td>44</td>
</tr>
</tbody>
</table>

NOTES:

1. PRECAST PIPE, ADJUSTING RINGS AND TOP SECTION SHALL BE CONSTRUCTED IN ACCORDANCE WITH A.S.T.M. C-478, USING TYPE II CEMENT.

2. ALL JOINTS BETWEEN PRECAST SECTION SHALL BE MORTARED.

3. MANHOLE SHALL HAVE A TROWELED FINISH ON JOINTS.

4. FOR REINFORCED CONCRETE PIPES, CUT AND BEND STEEL REINFORCEMENT INTO CAST–IN–PLACE MANHOLE BASE.

5. FOR Poured IN PLACE PIPE, USE NO. 4 BARS AT 18" O.C.

6. MANHOLE FLAT TOP CONE AND RISER MATERIAL SHALL BE REINFORCED CONCRETE PER ASTM C-478.

ALTERNATIVE STORM DRAIN MANHOLE

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
CECIL DILLON NOV. 2007
CITY ENGINEER
DATE
RCF 25835

STANDARD PLAN NO. 215

NO. REVISION DATE BY

DRAWN BY: EK
CHECKED BY: CD
SCALE: NONE
DATE: 11/2007
NOTES:

* 8:1 SIDE SLOPES ARE REQUIRED FOR DETENTION BASINS
  THAT DOUBLE AS PARK FACILITIES
* GRAVITY DISCHARGE IS DESIRABLE AND THE DESIGN MUST
  SUBMITTED FOR APPROVAL
* DUMP STATIONS ARE ALLOWABLE ONLY WITH APPROVAL OF
  THE CITY ENGINEER

Fence

SECTION A–A

10’

4:1 max.

2%

4” AB

6’ chain link fence with plastic slats

A

10' min.

Erosion control pipe discharge
See Std. 217

15' Radius, typ.

GRADE TO CHANNEL
1% MAX

LOW FLOW CHANNEL AS NECESSARY

INLET

4:1 max.

4:1 max.

R/W

20’ min.

Double gates

Min. opening 12’

Sidewalk

Drain system

DRIVEWAY PER STD 118

Manhole

Street

NOTE:
Size of basin and depth to be determined by hydraulic calculation

STANDARD COMMUNITY DETENTION BASIN

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN NO. 216

APPROVED BY:
CECIL DILLON NOV. 2007
CITY ENGINEER
RCE 25875

DATE: 11/2007
**SECTION A-A**

- 1" wire mesh
- 6" wall
- 6" 4"

**SECTION B-B**

- 1" wire mesh
- 6" wall

**FRONT VIEW**

- W

**TOP VIEW**

- Construct cut-off wall around the entire perimeter
- Toe of channel slope
- Miter cut pipe to fit flush with slope
- Match channel side slope
- 6'-0" toe of channel slope

**SECTION C-C**

- 1'-6" min.
- 6" wire mesh
- \( W = 6' - 0" \) minimum
- \( W = 2 \times \) pipe dia. (3' to 6')

**NOTE:**

1. Use class "B" concrete or grouted cobbles as specified.
2. 6x6x10 ga. wire mesh throughout concrete
END AND CORNER POST ASSEMBLY

Footings depth
2"-6" for fabric less than 60" high
3'-0" for fabric 60" and over

Fabric outside of fence

NOTE: Offset to be 2'-0" at monument locations measured at right angles to R/W lines. Taper to achieve offset to be at least 20" long.

FENCE LOCATION

Brace to be removed after all other fence construction is completed unless otherwise directed by the Engineer.

Line posts of 1000' max. intervals braced and braced in both directions except that this bracing and bracing may be omitted when the fabric is stretched by equipment.

TYPICAL MEMBER DIMENSIONS (See Notes)

<table>
<thead>
<tr>
<th>Fence Height</th>
<th>Line Posts</th>
<th>End, Latch &amp; Corner Posts</th>
<th>Braces</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Round (ID)</td>
<td>Roll Formed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>H</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Round (ID)</td>
<td>Roll Formed</td>
</tr>
<tr>
<td>6&quot; and less</td>
<td>1 1/2 &quot;</td>
<td>1 7/8 x 1 5/8</td>
<td>1 7/8 x 1 5/8</td>
</tr>
<tr>
<td>Over 6'</td>
<td>2</td>
<td>2 1/4 x 2</td>
<td>2 1/4 x 3 1/4</td>
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</table>

NOTE: Post dimensions and weights are minimums. Larger sizes may be used on approval of Engineer.

Typical Fabric Mounting Details

GATE POST

<table>
<thead>
<tr>
<th>Fence Height</th>
<th>Gate Width</th>
<th>Nominal I.D.</th>
<th>Weight per Foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 6' thru 6'</td>
<td>1 1/2 &quot;</td>
<td>2 1/2 &quot;</td>
<td>4.95</td>
</tr>
<tr>
<td>Over 6' thru 12'</td>
<td>4 &quot;</td>
<td>10.79</td>
<td></td>
</tr>
<tr>
<td>Over 12' thru 18'</td>
<td>5 &quot;</td>
<td>14.62</td>
<td></td>
</tr>
<tr>
<td>Over 18' to 24' Max.</td>
<td>6 &quot;</td>
<td>18.97</td>
<td></td>
</tr>
<tr>
<td>Over 6&quot; thru 6'</td>
<td>3 &quot;</td>
<td>7.58</td>
<td></td>
</tr>
<tr>
<td>Over 6&quot; thru 12'</td>
<td>5 &quot;</td>
<td>14.62</td>
<td></td>
</tr>
<tr>
<td>Over 12&quot; thru 18&quot;</td>
<td>6 &quot;</td>
<td>18.97</td>
<td></td>
</tr>
<tr>
<td>Over 18&quot; to 24&quot; Max.</td>
<td>8&quot;</td>
<td>28.55</td>
<td></td>
</tr>
</tbody>
</table>

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

CHAINLINK FENCE

STANDARD PLAN NO. 218
NOTES:

1. WHEN MANHOLE AREAS ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MIN. OF 1 FOOT ABOVE ADJACENT FINISHED GRADE.

2. MIN. OF ONE 3" AND ONE 6" GRADE ADJUSTMENT RINGS. MAX. HEIGHT OF GRADE ADJUSTMENT RINGS.

3. SET ALL BARREL SECTIONS & TAPER SECTIONS IN PLASTIC GASKET, RAM-NEK OR APPROVED ALTERNATE TYP JOINT 1-1/2" (3/4"x2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS).

4. JOINT BETWEEN BASE AND BARREL TO BE SEALED W/1-1/2" (3/4"x2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS). AND PLASTER 6" FILLET. 1:3 MORTAR.

5. CLASS "A" CONC. COLLAR SHALL BE 2" BELOW FINISHED GRADE.

6. STANDARD MANHOLE BARREL SECTION PER ASTM C478.

7. 48" I.D. MANHOLE TO BE USED ONLY FOR SEWER MAINS LESS THAN 18" DIAMETER AND LESS THAN 8 FT. DEEP FROM FINISHED GRADE. 60" I.D. MANHOLES PER STD. 301 FOR ALL OTHER APPLICATIONS.

8. ALL SECTIONS OF MANHOLE MUST BE IDENTICAL MAKE AND MANUFACTURER.

9. MANHOLE TO BE Dewatered AND DRY PRIOR TO INSPECTION.

10. FOR DROP CONNECTION SEE DTL 303.

A FLEXIBLE COUPLING, AS APPROVED BY THE CITY ENGINEER, SHALL BE INSTALLED IN THE SEWER MAIN WITHIN 12" OF THE BASE OF THE MANHOLE. (TYP.) NOT REQUIRED WHEN PRECAST BASES ARE MANUF. W/FLEX. CPLGS. ALREADY INSTALLED.
NOTES:

1. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF COVER SHALL BE A MIN. OF 1 FOOT ABOVE ADJACENT FINISHED GRADE.

2. MIN. OF ONE 3" AND ONE 6" GRADE ADJUSTMENT RINGS. MAX. HEIGHT OF GRADE ADJUSTMENT RINGS = 20".

3. SET ALL BARREL SECTIONS IN PLASTIC GASKET, RAM-NEK OR APPROVED ALTERNATE TYP. JOINT 1-1/2" (3/4"x2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS).

4. JOINT BETWEEN BASE AND BARREL SHALL BE SEALED W/1-1/2"(3/4"x2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS), AND PLASTER 8" FILLET, 1:3 MORTAR.

5. CLASS "A" CONC. COLLAR SHALL BE 2" BELOW FINISHED GRADE.

6. STANDARD MANHOLE BARREL SECTION PER ASTM C478.

7. 60" I.D.MANHOLE TO BE USED FOR ALL TRUNK AND COLLECTOR SEWERS 18" TO 30" OR WHERE DIMENSION FROM FINISHED GRADE TO THE SEWER FLOW LINE IS GREATER THAN 8'-0" AS INDICATED ON THE DESIGN PLANS.

8. MANHOLES ON TRUNK SEWERS LARGER THAN 30" SHALL BE SIZED BY THE CITY ENGINEER.

9. ALL SECTIONS OF MANHOLE MUST BE OF IDENTICAL MAKE AND MANUFACTURER.

10. MANHOLE TO BE DWATERED AND DRY PRIOR TO INSPECTION.

11. CHANNELIZATION PER STD. 301.
DROP MANHOLE SHALL BE USED ONLY WHEN SLOPE OF LINE WOULD OTHERWISE EXCEED 2%.
NEW MANHOLE/ EXISTING SEWER

SECTION A-A

CONCRETE (CLASS B) COLLAR
ADD LAMPEBACK TO COLLAR

PLAN

REINFORCED CONCRETE
SECTION

RAM-NEK (OR APPROVED EQUAL) ALL JOINTS

REINFORCED CONCRETE

NOTES:
2. INTERIOR OF THE MANHOLE SHALL HAVE A SMOOTH TROWELED FINISH.
3. FOR REINFORCED CONCRETE PIPES CUT AND BEND STEEL INTO MANHOLE BASE.
4. FOR FURTHER DETAILS REGARDING MANHOLES SEE DETAIL 301

SECTION B-B

POURED IN PLACE CONCRETE

24" DIA. GRADE RINGS

STANDARD PLAN NO. 304

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

CECIL DILLON NOV. 2007

CITY ENGINEER

RCF 25835

DATE

DRAWN BY: EK

CHECKED BY: CD

SCALE: NONE

DATE: 11/2007
Notes:
1. Frame and cover shall be cast iron and conform to ASTM A-48-30, or approved equal dipped in asphalt paint.
2. Specify "SANITARY SEWER" or "STORM WATER" when placing order.
3. Set weight:
   Cover 136 lbs.
   Frame 140 lbs.
   Total 276 lbs.
4. Specify side pickhole.

Sanitary Sewer

Machined to fit

Dimensions:
- Diameter: 26 1/4" to 25 3/8"
- Depth: 7 1/16" to 1 1/64"
- Side Pickhole: 1 1/8" x 1 1/2" x 1 3/8"
- Width: 24" to 31 1/2"

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

MANHOLE RING AND COVER

NO. REVISION DATE BY

DRAWN BY: EK
CHECKED BY: CD
SCALE: NONE
DATE: 11/2007

APPROVED BY:
CECIL DILLON NOV. 2007
CITY ENGINEER RCE. 25835

STANDARD PLAN NO. 305
SLAB PLAN

LEVEL WITH 1:3 MORTAR, 1" MIN.

MIN. OF ONE 3" & ONE 6"
GRADE ADJUSTMENT RINGS. ALTERNATELY MAY BE CAST IN PLACE.
4x4 - W6x6 WELDED WIRE MESH AT TOP AND AROUND SIDES

2'-0" MAX.

8" MIN.

8" MIN.

2'-1/2" MIN.

2'-1/2"

NOTES:

1. FOR DETAILS AND SPECIFICATIONS OF BASE AND BARREL SECTIONS, SEE CITY STD 301

2. #2 BARS BENT UP AND SPACED 6" O.C. AROUND 24" OPENING.
HORIZONTAL LEGS TO FAN OUT EQUALLY SPACED, TO 2'-1/2" CLEAR AT EDGE OF SLAB.

3. CLASS "A" CONC. COLLAR.

STANDARD PRECAST CONCRETE MANHOLE REDUCER SLAB FOR SANITARY SEWER

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
CECEL DILLON NOV. 2007
CITY ENGINEER DATE
RCE 25835

STANDARD PLAN NO. 306
SECTION A–A

(1) MANHOLE TYPE MONITORING STATION AND FLUME TO BE USED WITH DEEP LATERALS OR IN TRAFFIC LOADED AREAS.

(2) FLUME SHALL BE PALMER BOWLUS INVERT TYPE OR PERMANENT TYPE WITH TRANSDUCER MOUNTING BRACKET. FLUME SHALL BE MANNING PBF, OR EQUAL. SIZE TO BE DETERMINED BY VOLUME OF FLOW TO BE MEASURED. SET FLUME LEVEL AT DOWN STREAM END OF PIPE AND GROUT IN PLACE WITH TRANSDUCER BRACKET ATTACHED. USE END BULKHEADS TO MATCH THE SMALLER FLUME WHEN THE PIPE SIZE IS LARGER THAN THE FLUME.

(3) A DETAILED SUBMITTAL INDICATING EXACT EQUIPMENT TO BE FURNISHED MUST BE PROVIDED FOR CITY REVIEW AND APPROVAL.

(4) MINIMUM VERTICAL CLEARANCE MUST BE VERIFIED PRIOR TO INSTALLATION OF FLUME AND MONITORING EQUIPMENT.

(5) INSTALLATION SHALL BE FREE OF BACKWATER CONDITIONS.
(1) ACCESS BOX TYPE MONITORING STATION AND FLUME TO BE USED WITH SHALLOW LATERALS IN NON-TRAFFIC LOADED AREAS.

(2) ACCESS BOX SHALL BE 5' x 4' PRE-CAST CONCRETE WITH 2 PIECE GALVANIZED STEEL LID, PARKWAY TYPE, HINGED, SPRING LOADED, SCREW DOWN TYPE.

(3) BOX AND COVER SHALL BE CHRISTY CONCRETE PRODUCTS, "R" SERIES PRE-CAST PIT, OR EQUAL.

(4) FLUME SHALL BE PALMER BOWLUS INVERT TYPE OR PERMANENT TYPE WITH TRANSOMER MOUNTING BRACKET. FLUME SHALL BE MANNING PBF, OR EQUAL, SIZE TO BE DETERMINED BY VOLUME OF FLOW TO BE MEASURED. SET FLUME LEVEL AT DOWNSTREAM END OF PIPE AND GROUT IN PLACE WITH TRANSOMER BRACKET ATTACHED. USE END BULKHEADS TO MATCH THE SMALLER FLUME WHEN THE PIPE SIZE IS LARGER THAN THE FLUME.

(5) A DETAILED SUBMITTAL INDICATING EXACT EQUIPMENT TO BE FURNISHED, MUST BE PROVIDED FOR CITY REVIEW AND APPROVAL.

(6) MINIMUM VERTICAL CLEARANCE MUST BE VERIFIED PRIOR TO INSTALLATION OF FLUME AND MONITORING EQUIPMENT.

(7) INSTALLATION SHALL BE FREE OF BACK WATER CONDITIONS.
SECTION A-A

5% DEFLECTION
ABS ASTM D 2751
PVC ASTM D 3034

<table>
<thead>
<tr>
<th>NOM. DIA.</th>
<th>L</th>
<th>D1**</th>
<th>D2***</th>
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<tr>
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<td>6&quot;</td>
<td>5.629</td>
<td>4.629</td>
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<td>8&quot;</td>
<td>8&quot;</td>
<td>7.537</td>
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** 1. MANHOLE DIA. HAS BEEN CALCULATED TO CORRECT CHORD LENGTH ERROR "E".

*** 2. MIN. PLATE DIAMETER

3. A PROVING RING OF THE SPECIFIED DIAMETER (D1) SHALL BE SUPPLIED WITH EACH DEFLECTION MANDREL.

NOTES:

1. MARK ALL MANDRELS WITH ASTM SPECIFICATION NUMBER, SDR NUMBER AND DEFLECTION.

2. THE 1/2" BAR STOCK ON EDGE PROVIDES CLEARANCE TO PASS SMALL AMOUNTS OF SOIL WHICH MAY BE IN PIPE.
NOTES:
1. REMOVE FRAME, COVER, TAPER AND BARREL SECTIONS.

2. AFTER PLUGGING ALL PIPES IN MANHOLE, THE REMAINING PORTION
   OF THE BARREL SECTION AND ALL Voids CREATED BY THE
   REMOVAL OF THE UPPER PORTIONS OF THE MANHOLE, SHALL BE
   BACKFILLED AND COMPACTED TO 90% RELATIVE DENSITY.
   USE TRENCH BACKFILL OR PIPE BEDDING MATERIAL.
NOTES:
1. PIPE PLUGS SHALL BE INSTALLED TO THE SATISFACTION OF THE CITY ENGINEER.
2. ABANDONED PIPES, 12" AND LARGER, SHALL BE BROKEN INTO EVERY 50' AND SHALL BE FILLED COMPLETELY WITH SAND SLURRY.
NOTES:

PIPE BEDDING AND TRENCH BACKFILL MATERIAL SHALL BE A WELL GRADED MATERIAL AND SHALL HAVE A MINIMUM SAND EQUIVALENT VALUE OF 30 AND SHALL CONFORM TO THE FOLLOWING GRADINGS:

<table>
<thead>
<tr>
<th>Percent Passing</th>
<th>3&quot;</th>
<th>3/4&quot;</th>
<th>3/8&quot;</th>
<th>No. 4</th>
<th>No. 16</th>
<th>No. 200</th>
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<td>100</td>
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<td>10-50</td>
<td>5-30</td>
<td>0-4</td>
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<td>NATIVE MATERIAL</td>
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</table>


12" MIN.

FILTER FABRIC

2" MINIMUM OVER BELLS OR COUPLINGS

TAPE OR TRACER WIRE (#10 COPPER BARE WIRE)

4" MIN. TYP

3/4" MIN. BELOW BELLS OR COUPLINGS

IMPORT BACKFILL MATERIAL OPTIONAL ON PRIVATE PROPERTY. WITHIN PUBLIC ROADS, CONFORM TO THE REQUIREMENTS OF THE CITY OF WILLIAMS WHERE APPLICABLE

3/4" CRUSHED/WASHED

UNDISTURBED EARTH (REMOVE ALL LOOSE MATERIAL BEFORE PLACING BEDDING MATERIAL)

3/4" CL II AB

3/4" CRUSHED/WASHED

NO.  REVISION DATE  BY

DRAWN BY: EK
CHECKED BY: CD
SCALE: NONE
DATE: 11/2007

SEWER SERVICE TRENCH DETAIL

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
CECIL DILLON NOV. 2007
CITY ENGINEER
RCF 25835
DATE
STANDARD PLAN NO. 313
NOTE: WHERE BUILDING SEWERS ARE LOCATED UNDER DRIVEWAYS, CAST IRON OR DUCTILE IRON SEWER PIPE BE USED.

EXISTING MAIN SEWER

FLOW

CLEANOUT AT BACK OF WALK

4" LATERAL SEWER (NEW OR EXISTING)

PROPERTY LINE OR P.I. E. WHICHEVER IS FURTHEST FROM STREET

4" BUILDING SEWER

BUILDING

BUILDING DRAIN

PLAN
NOTES:

(1) THIS INSTALLATION IS REQUIRED WHEREVER THE LOWEST FINISHED FLOOR ELEVATION IS TWELVE (12") INCHES, OR LESS ABOVE THE TOP ELEVATION OF THE NEAREST UPSTREAM MANHOLE OR CLEANOUT.

(2) IF THE LID IS SUBJECT TO VEHICULAR TRAFFIC, USE LID DESIGNED FOR H-20 TRAFFIC LOADINGS.

(3) BACKWATER VALVE SHALL BE CAST IRON OR CAST BRONZE. VALVE SHALL BE APPROVED BY THE CITY ENGINEER.
NEW PIPE UNDER EXISTING
TYPE A

NOTES:

1. THIS STD. APPLIES TO PIPES UP TO AND INCLUDING 16" DIAMETER. ALL CROSSINGS INVOLVING PIPES OF LARGER DIAMETER SHALL BE AS APPROVED BY THE CITY ENGINEER.

2. WHEN PIPES CROSS WITHIN THE DIMENSIONS SHOWN, A NEW DUCTILE IRON PIPE SECTION SHALL BE INSTALLED AS DETAILED.

3. ALL DUCTILE IRON PIPE SHALL BE ENCASED IN POLYETHYLENE FILM IN TUBE FORM.

4. ANY TYPE "A" INSTALLATION REQUIRING MORE THAN ONE LENGTH OF PIPE SHALL BE ENCASED.

NEW STRUCTURE UNDER EXIST.
TYPE C

NEW STRUCTURE OVER EXISTING
TYPE B
FACTORY MADE WYE OR TEE CONNECTION

SYNTHETIC RUBBER WEDGE INSERT TEE
(TAP-TITE OR APPROVED EQUAL)

RCP SEWER MAIN TAP
NOTES:

1. All house laterals shall be a 4" minimum diameter unless otherwise noted. Except as otherwise noted below, house laterals shall be ASTM D3034-00 (SDR-35).

2. Laterals shall have same bedding and backfill as sewer main.

3. Sewer services shall have minimum 2’ cover at property line whenever lateral depth and service slope of 1/4” per foot (min.) permit.

4. When the sewer lateral does not meet a minimum 2’ cover at gutter flowline, it must either be encased in concrete (Case II, Zone D), or pipe material must be Ductile Iron Pipe Class 50 within the traveled way.

5. Well compacted bedding material shall be placed under the wye branch, the fitting, and unsupported pipe. Additional bedding material shall be placed to top of bend, the full width of the trench.

6. Miter fittings shall not be used.

7. See details of special construction for water, sewer crossings.

8. Sewer laterals which cannot be installed under water main shall be constructed with a minimum 20’ section of either Class 50 D.I.P. or C900/Class 200 PVC centered over the water main.

9. The lateral shall be installed at a minimum slope of 1/4” per foot. A 90° sweep shall be installed 2 feet behind the property line. The vertical line shall have a threaded cleanout plug and terminate into a Christy V1 Drain box (or equal), which shall be flush with the surface.

10. Water service and sewer lateral shall have a 10-foot separation within the public right-of-way.
Polyvinyl chloride (PVC) pipe and fittings of 8-inch, 10-inch, 12-inch and 15-inch diameter for mains and 4-inch and 6-inch for services conforming to ASTM D3034-81 may be used under this standard with installation conforming to ASTM recommended practice D2321; ASTM D3034-81 and D2321 are subject to City Standards for trenching and backfill and the modifications below:

1. Elastomeric gasket joints are required (ASTM F477).
2. A minimum SDR value of 35 is required.
3. The sewer main shall be proved with mandrel before streets are paved and at the end of the warranty period.
4. Maximum allowable deflections for installed sewer main pipe is 5 percent of average inside diameter as follows:

<table>
<thead>
<tr>
<th>Nominal</th>
<th>SDR-35 Average</th>
<th>Minimum Mandrel Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-inch</td>
<td>7.891</td>
<td>7.496</td>
</tr>
<tr>
<td>10-inch</td>
<td>9.864</td>
<td>9.371</td>
</tr>
<tr>
<td>12-inch</td>
<td>11.737</td>
<td>11.150</td>
</tr>
<tr>
<td>15-inch</td>
<td>14.374</td>
<td>13.655</td>
</tr>
</tbody>
</table>

The Contractor shall take the necessary precautions required to prevent excavated or other foreign material from getting into the pipe during the laying operation. At all times, when laying operations are not in progress, at the close of the day’s work, or whenever the workmen are absent from the job, close and block the open end of the last section of pipe placed to prevent entry of foreign material or creep of the gasketed joints.

Stubouts from manholes and for future connection by others shall be plugged or closed off with temporary plugs.

The Contractor shall take all precautions necessary to prevent the “uplift” or floating of the line prior to the completion of the backfilling operation.

A standard pipe joint shall be located not more than 1.5 feet from the outside edge of the structure or manhole on each pipe connection to a structure or manhole.

PVC pipe is only allowed where sewer will carry flow from residential developments. Neither PVC pipe, nor any other flexible pipe accepted by City for particular applications, shall be utilized in horizontal and/or vertical curve sections. These types of pipe are only allowed where entire length, between two manholes, is straight.

Sewer mains for industrial and commercial development shall be cement lined, epoxy coated, DIP.
PERMANENT ABANDONMENT – LATERAL CAP AT MAIN

Approved stopper or plug w/neoprene or rubber seal – no concrete allowed.

Notes:
1. If lateral is orangburg material or is in poor condition, saddle or cap must be installed at main.
2. If lateral material is cast iron or vcp with neoprene seals, the cap may be installed at property line.

TEMPORARY ABANDONMENT – LATERAL CAP AT PROPERTY LINE

P/L
Remove existing sewer line to property line.

Approved plug w/neoprene or rubber seal – no concrete allowed.

Notes:
1. Cap at property line will be allowed if the lateral is in good condition and if it will be used in the immediate future on an active project.
2. Sketch of capped lateral with measurements from street centerline and from nearest manhole shall be provided to city engineer.
3. Notes 1 and 2 for permanent abandonments apply for temporary abandonments also.
NOTES

1. DIMENSIONS SHOWN ARE FOR A MINIMUM SIZE (800 GALLON) INTERCEPTOR.
2. EACH UNIT SHALL BE DESIGNED BY A REGISTERED CIVIL ENGINEER AND APPROVED BY
   THE CITY ENGINEER IF A LARGER SIZE IS REQUIRED.
3. TOILETS, URINALS, AND OTHER SIMILAR FIXTURES SHALL NOT WASTE THROUGH THE INTERCEPTOR.
4. CONCRETE SHALL BE MINIMUM 3000 PSI AT 28 DAYS.
5. COVERS SHALL BE STEEL AND SHALL BE GAS TIGHT, SUBJECT TO THE APPROVAL OF THE CITY ENGINEER.
6. REINFORCEMENT SHALL BE ADEQUATE FOR TRAFFIC CONDITIONS IF NECESSARY.

SECTION A-A

TYPICAL GREASE INTERCEPTOR

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

NO. 321
NOTES

1. CONCRETE SHALL BE MINIMUM 3000 PSI AT 28 DAYS.
2. COVERS SHALL BE STEEL AND SHALL BE GAS TIGHT. COVERS SHALL BE
   SUBJECT TO THE APPROVAL OF THE CITY ENGINEER.
3. REINFORCEMENT SHALL BE ADEQUATE FOR TRAFFIC CONDITIONS IN AREA

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

TYPICAL SAND OIL INTERCEPTOR

STANDARD
PLAN NO. 322

APPROVED BY:  
CECIL DILLON  NOV. 2007
CITY ENGINEER  DATE
RCP 25835
NOTES

1. SAMPLING MH TO BE LOCATED OUTSIDE OF PUBLIC RIGHT-OF-WAY EXCEPT WITH WRITTEN APPROVAL OF THE CITY ENGINEER.
2. AN ALTERNATE DESIGN BY A REGISTERED ENGINEER MAY BE SUBMITTED FOR REVIEW.
3. LOCATION SUBJECT TO THE APPROVAL OF THE CITY ENGINEER.
4. ALL SURFACE WATER MUST DRAIN AWAY FROM SAMPLING MANHOLE.
5. A WATERSTOP CONSISTING OF A STD. MANHOLE ADAPTER GASKET AS SUPPLIED BY THE PIPE MFR. TO BE GROUTED INTO THE BOX WALL NEAR THE CENTER OF THE WALL.
GENERAL NOTES

1. Dimensions shown are normal for minimum size (750 gallon) interceptor.

2. Tank shall be precast as manufactured by:
   a. Casey Concrete
      4200 Lester Road
      Denair, Ca. 95316
      (209) 667-0161
   b. P & L Concrete Products
      1900 Roosevelt Avenue
      Escalon, Ca. 95320
      (209) 521-6171 or
      (209) 838-1448
   c. M.C. Nottingham Co.
      4922 Irwindale Avenue
      Irwindale, Ca. 91706
      (800) 654-6469

   or approved equal.

3. Alternate design by a registered Engineer requires review by the City Engineer.

4. All waste shall enter interceptor through the inlet pipe only.

5. Sampling manhole may be eliminated depending on use with approval of the City Engineer.

6. Tank capacity to be determined at time of permit application, and shall be subject to approval
   by the City Engineer.

7. Grease interceptor is required for all commercial food preparation such as:
   a. Restaurant
   b. Bakery
   c. Donut and Coffee Shop
   d. Cafeteria (School and Hospitals included)
   e. Mini Marts
   f. Any use where the Health Department requires a 3 compartment sink

8. Sand and Oil interceptor required for all:
   a. Auto - Maintenance Facility
   b. Car wash facility
   c. Paint - Body repair shop
   d. Facility handling flammable and/or oily liquid

9. All grease, sand and oil interceptors shall be located outside public right-of-way except with
   written approval of the City Engineer. Interceptors shall be so located as to prevent the entrance
   of foreign materials, to be easily accessible for cleaning and inspection, and to pose no hazard
   to public health and safety.

10. Inlet/outlet pipe shall be per U.P.C.

11. All surface water must drain away from manhole.
12. Prohibited and/or restricted equipment:

   a. The installation and use of garbage grinders (disposals) in Commercial food establishments is prohibited except in the case where a 1,000 gallon plus interceptor is in use.
   b. The use of enzymes or bacterial cultures designed to disperse grease is prohibited unless specifically approved in writing by the City Engineer.

13. Equipment to be connected to an interceptor:

   a. Mop and Scullery sinks  
   b. Pots and pans sink  
   c. Soup kettles and floor drains in kitchen and washing areas.  
   d. Pre-wash rinses  
   e. Dishwashers  
   f. 3-compartment sinks

14. Restroom waste shall not be routed through interceptor.
Iron body cleanout with raised head, threaded brass, standard cleanout plug or approved equal. Other approved soil pipe to be same I.D. as sewer lateral.

NOTES:

1. Box shall be Christy #61 sewer cleanout box. Lid shall be Christy P213 for 4" risers; 4F36 box and C230 lid for 6" risers; G12 box for 8" risers; or approved equals.

2. Backfill for cleanout shall be compacted by acceptable methods. Jetting is not permitted.

3. Cleanout maintenance and replacement of defective or broken parts shall be at the property owner’s expense.

4. Locate Cleanout conveniently within City Right of Way.
NOTES:
1. City standard valve shall be MUELLER Resilient Wedge A–2360.
or approved equal.
2. See STANDARD SPECIFICATIONS for ductile iron fittings and pipe class.
3. Valve stem extension shall be required when valve operating nut is 3’ or
greater from finish grade. See City Standard Detail 402.
Pre-cast concrete box with cast iron ring seat and lid marked "WATER" CHRISTY G-5 OR APPROVED EQUAL.

Finish grade AC Pavement

2" AC

12" PCC collar

Class II Agg. Base Design Section Balance

36"

Steel valve stem extension or approved equal *

* Steel Only. Too Much Flex with Fiberglass on Deep Valves

City standard valve

Water main
TYPICAL CONC. BLOCKING
SHOWN IN PERSPECTIVE

NOTES:
1. SAFE BEARING LOAD OF SOIL FOR HORIZONTAL THRUST SHALL NOT BE EXCEEDED.
2. CONCRETE BLOCKING, CAST-IN-PLACE, TO EXTEND FROM BELLS OF FITTINGS TO
   UNDISTURBED SOIL AND ENTIRE BEARING AREA MUST BE AGAINST UNDISTURBED SOIL.
3. IN USING THE THRUST BLOCKING TABLE BELOW, ASSUME 2000 P.S.F. BEARING
   CAPACITY UNLESS OTHERWISE SHOWN ON THE PLANS. THE DESIGN ENGINEER SHALL
   SPECIFY THRUST BLOCKING REQUIREMENTS FOR ALL OTHER SOIL BEARING CONDITIONS.
4. RESTRAINT SYSTEMS FOR VERTICAL PIPE BENDS SHALL BE APPROVED BY THE CITY.

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>SOIL BEARING CAPACITY</th>
<th>HARNESS BLOCKS</th>
<th>TEES &amp; DEAD ENDS</th>
<th>90° BENDS</th>
<th>45° BENDS</th>
<th>22 1/2° BENDS</th>
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<td>21</td>
<td>14</td>
<td>7</td>
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</table>

* MULTIPLY NO. IN TABLE BY TEST PRESSURE & DIVIDE BY 100
GENERAL NOTES:

1. Location of DEVICE shall be approved prior to installation.
2. Resilient seat gate valves and test cocks are required.
3. Water supply—no connections or tees will be allowed between meter and device.
4. Protection from freeze damage is recommended in exposed areas.
5. Device must be accessible for testing and maintenance.
6. Bypass meter to read in gallons.
7. D.C.D.V. to be painted Forest Green (Kelly–Moore Gloss Alkyd Rust Inhibitive Enamel #51) or approved equal.
   (Alternative colors to be approved by the City Engineer)
8. Provide copies of backflow tests by approved tester to the City of Williams Public Works Department.
9. D.C.D.A. braces are optional for 6" and smaller devices upon the requirement of the City Engineer.
Reduced Pressure Backflow Prevention Device, FEBCO Series 825Y or Approved Equal.

Notes:
1. Reduced-pressure type backflow prevention devices shall be required for any use where toxic materials are used or where positive protection for the public water supply is required. Typical applications include: irrigation services, commercial services, industrial services, hospitals, laboratories, mortuaries, or as determined by the City. (Title 17 Calif. Administration Code)

2. Connections between the City main and the RP device shall be at the discretion of the City Engineer.

3. Backflow prevention devices shall be installed adjacent to and on the property side of sidewalk where applicable. The assembly shall be installed as close to the water meter location as practical.

4. Device to be same size or larger than service meter.

5. Landscaping or other screening around the backflow device shall be as shown on approved plans.

6. Protection from freeze damage is recommended in exposed areas.

Piping, valves, nipples, etc., shall be threaded brass for sizes 2" or less, and shall be flanged ductile iron for sizes 3" or greater.

Tee with 1" Brass Plug (Typ)
12" Min., 30" Max.
6" Min.
3" Thick P.C.C. Pad
Min. 2'-0" Wide
Concrete Thrust Block not shown
Thrust block not required for 2" or smaller
12" Brass Nipple
Bldg. Connect
Brass or Copper Line

Sidewalk
Meter and Vault—Approved by City
2" BLOW-OFF

MUELLER #H-15526
quarter bend or
approved equal

Concrete anchor block

2" Galvanized
iron pipe

2" Ball curb
valve—Mueller
#B-25172 with
brass plug or
approved equal

Common brick for
support under perimeter of box.

36"

crushed rock
(12" min.)

MJ fitting or Cap
with 2" NPT
threaded opening

Water main

Christy precast concrete
utility box model B12—
(B10x17 in traffic areas)
or approved equal

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS
STANDARD PLAN NO. 406

APPROVED BY:
CECIL DILLON NOV. 2007
CITY ENGINEER
DATE

DRAWN BY: EK/BC
CHECKED BY: CD/BG
SCALE: NONE
DATE: NOV. 2007
Christy B36 utility box or approved equal (B17X30 for traffic applications)

2" Crispin "UNIVERSAL" Air and Vacuum Relief Valve or approved equal.

If not installed in roadway, 1' from back of SW. If no SW, 1' from back of curb.

2" Elbows—See note 3

Air gap 4" min

22"

12" min Gravel for Drainage

2" Ball Curb Valve, MUELLER #B-25172 or approved equal

2" CLR

22"

36" min

90° bend shall be either MUELLER H-15526 or approved equal (typ)

2" Type K Copper Tubing or galvanized pipe

2" Corporation Stop shall be MUELLER H-15023 or approved equal

2" Service Saddle shall be MUELLER #BR2B Series w/ F.I.P.T. or approved equal

WATER MAIN

NOTES:
1. The exact locations of the air valve assemblies will be determined in the field by the Engineer.
2. Before installing Compression Fittings, remove burr from inside and re-round pipe.
3. Attach small mesh screen with a stainless steel hose clamp over opening.
NOTE:

1.) Hydrants shall be CLOW 960 wet barrel, drain plugged, painted enamel safety yellow. Paint shall be KEL-GUARD #1700-63 paint inhibitive enamel by KELLY-MOORE.

2.) New or existing hydrants shall be painted for final acceptance of project.

3.) A keyed gate valve shall be provided for each hydrant in an accessible location. Valves shall not be located in parking stalls.

4.) The lowest operating nut shall be a minimum of 18" above grade and the hydrant flange shall be a minimum of 2" above finish grade.
NOTES:

1.) 3’ clearance shall be provided on all sides of the hydrant.

2.) Hydrants shall not be obstructed by landscaping.

3.) 3’ Concrete slab around hydrant.
FIRE Hydrant near return

6" Typical

BLUE REFLECTIVE MARKER (HAWKINS V16C-88AB Stimsonite or equal.

6" Typ.

Fire Hydrant

Fire Hydrant at mid block

*Commercial
Note: Before installing compression fitting, remove burr from inside and round pipe.

3/4" Corporation stop shall be MUELLER H-15008 or approved equal

3/4" Angle stop shall be MUELLER B-2425B or approved equal

3/4" Type "K" soft copper

NOTE:
1. A direct tap or a double strap bronze saddle tap may be used to connect to the main line.
2. Parts for a saddle installation:
   to connect to the main line.
   
   A. Saddle to be a MUELLER-BR2B OR approved equal
   B. Corporation Stop to be a MUELLER-H-15028 or approved equal
Note: Before installing compression fitting, remove burr from inside and round pipe.

2" Corrugated stop shall be MUELLER H-15023 or an approved equal compression fitting, tap at Q of pipe.

MUELLER 2" service saddle w/F.I.P.T. BR28 series or approved equal

Quarter bend shall be MUELLER H-15526 or approved equal

TYPICAL 2" SERVICE INSTALLATION

CITY OF WILLIAMS DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN NO. 413

APPROVED BY: CECIL DILLON NOV. 2007
CITY ENGINEER RCF 25835 DATE

NO. REVISION DATE BY

DRAWN BY: FK/BG
CHECKED BY: CD/BG
SCALE: NONE
DATE: NOV. 2007

36" Min.
DISTANCE MAY VARY WITH OTHER UTILITIES

BACK OF SIDEWALK

SEE STANDARD 412 FOR METER AND BOX SPECIFICATIONS

POLYETHYLENE PIPE WITH PROPER FITTING (BRASS COMPRESSION)
1 1/4" DOUBLE SERVICE

WATER MAIN

CORPORATION STOP MUELLER OR APPROVED EQUAL

SERVICE SADDLE MUELLER OR APPROVED EQUAL

DOUBLE WATER SERVICE CONNECTION

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
CECIL DILLON NOV. 2007
CITY ENGINEER
RCE 25833

STANDARD PLAN NO. 414
**STANDARD TRENCH DETAIL**

**CITY OF WILLIAMS**
DEPARTMENT OF PUBLIC WORKS

**DRAWN BY:** FK/BG
**CHECKED BY:** CD/BG
**SCALE:** NONE
**DATE:** NOV. 2007

**NO.** 416

---

**NOTES:**
1. 1/4 IN. O.D. OR 4" MIN. WHEN EXCAVATION IS IN ROCKY GROUND.
2. PIPE DIAMETER 18" OR LESS: 6" MIN., 3" MAX.
   PIPE DIAMETER GREATER THAN 18", 9" MIN., 12" MAX.
3. RELATIVE COMPACTION DESIGNATED R.C.
4. THE STREET STRUCTURAL SECTION SHALL BE A MIN. OF 3" A.C. ON 12" A.B. OR MATCH EXISTING PAVEMENT THICKNESS PLUS 1" A.C., WHICHEVER IS THICKER OR AS SPECIFIED ON PLANS.
5. NEATLY CUT PAVEMENT SIX INCHES FROM EDGE OF TRENCH AFTER TRENCH IS BACKFILLED.

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**FINISH GRADE**

---

**TYPE A**
EXISTING STREET

---

**TYPE B**
SHOULDER AREAS

---

**TYPE C**
STREETS UNDER CONSTRUCTION

---

**TYPE D**
PUBLIC UTILITY EASEMENTS (OUTSIDE STREET AREA)

---

**TYPE E**
PUBLIC UTILITY EASEMENTS (UNDEVELOPED AREAS)

---

**TRENCH BACKFILL AND SURFACING**

---

**STABLE TRENCH**

---

**UNSTABLE TRENCH**

---

**PIECE BEDDING**

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**NOTE 2.**

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**NOTE 3.**

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**FINISH GRADE**
MATERIAL SPECIFICATION

DRAIN ROCK SHALL BE EITHER OF THE NOMINAL SIZES DESIGNATED AS 1–1/2” BY 3/4” OR 2–1/2” BY 1–1/2”.

PIPE BEDDING AND TRENCH BACKFILL MATERIAL SHALL BE A WELL GRADED GRAVEL/SAND MATERIAL AND SHALL HAVE A MINIMUM SAND EQUIVALENT VALUE OF 30 AND SHALL CONFORM TO THE FOLLOWING GRADINGS:

PERCENT PASSING

<table>
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<tr>
<th></th>
<th>3”</th>
<th>3/4”</th>
<th>3/8”</th>
<th>NO. 4</th>
<th>NO. 16</th>
<th>NO. 200</th>
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<tr>
<td>PIPE BEDDING</td>
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<td>80–100</td>
<td>10–50</td>
<td>5–30</td>
<td>0–4</td>
<td></td>
</tr>
<tr>
<td>TRENCH BACKFILL</td>
<td>100</td>
<td>100</td>
<td>80–100</td>
<td>30–70</td>
<td>5–40</td>
<td>30–70</td>
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</tbody>
</table>


AGGREGATE BASE SHALL BE CLASS 2 AND SHALL CONFORM TO THE PROVISIONS OF SECTION 26, "AGGREGATE BASE", OF THE CALTRANS STANDARD SPECIFICATIONS, LATEST EDITION.

COMPACCTION REQUIREMENTS: (AS SHOWN ON SHEET 1 AND IN THE FOLLOWING MODIFICATIONS)

DRAIN ROCK SHALL BE CONSOLIDATED WITH A SURFACE VIBRATOR.

PIPE BEDDING MATERIAL USED TO GRADE THE TRENCH SHALL BE CONSOLIDATED WITH A SURFACE VIBRATOR WHEN IT IS PLACED OVER DRAIN ROCK OR WHEN DEPTH IS GREATER THAN 12”.

PIPE BEDDING MATERIAL SHALL EITHER BE HAND TAMPERED UNDER AND AT THE SIDES OF THE PIPE IN LIFTS NOT GREATER THAN 6” OR SHAPED AND COMPACTED PRIOR TO PIPE INSTALLATION.
GENERAL: THE COMPACTION REQUIREMENTS SHALL BE ACHIEVED UTILIZING METHODS AND EQUIPMENT APPROVED BY THE CITY. ANY METHOD OF COMPACTION WHICH FAILS TO UNIFORMLY ACHIEVE THE REQUIRED LEVELS OF COMPACTION THROUGHOUT THE LENGTH AND DEPTH OF TRENCHES SHALL BE DISCONTINUED. COMPACTION METHODS AND EQUIPMENT SHALL BE SUCH AS NOT TO DAMAGE THE INSTALLED PIPE, EXCEED ITS LOADING CAPACITY, OR DISTURB ITS ALIGNMENT. FLOODING, PONDING, OR THE USE OF DROP HAMMER TYPE COMPACTION EQUIPMENT WILL NOT BE ALLOWED.

MECHANICAL COMPACTION: TRENCH BACKFILL SHALL BE PLACED IN UNIFORM, HORIZONTAL LAYERS NOT EXCEEDING EIGHT (8) INCHES IN THICKNESS BEFORE COMPACTION. EACH LAYER SHALL BE COMPACTED, USING MECHANICAL MEANS, TO THE SPECIFIED DENSITY SHOWN ON THE PLANS.

THE CONTRACTOR MAY, AT HIS SOLE OPTION AND AT HIS SOLE EXPENSE, CONSTRUCT A TEST TRENCH SECTION WHICH DEMONSTRATES METHODS, EQUIPMENT, OR MATERIALS WHICH WILL RELIABLY ACHIEVE THE REQUIRED COMPACTION IN LIFTS GREATER THAN 8 INCHES. AT ITS SOLE DISCRETION, THE CITY MAY INCREASE THE MAXIMUM ALLOWABLE LIFT THICKNESS PERMITTED BASED UPON THE RESULTS DEMONSTRATED BY THE TEST TRENCH SECTION. SHOULD SUBSEQUENT TESTING DEMONSTRATE THAT THE REQUIRED COMPACTION IS NOT BEING RELIABLY ACHIEVED, THE CITY MAY, AT ITS SOLE DISCRETION, REDUCE THE MAXIMUM LIFT THICKNESS TO ITS ORIGINAL VALUE OF 8 INCHES.

NATIVE MATERIAL MAY NOT BE COMPACTED BY JETTING.
Sampler Housing: Position sampler housing so door opening is towards street. Sampler is to be located 18" behind sidewalk or 6' behind curb or edge of pavement where no sidewalk.
Concrete footing, non reinforced min. 2000 psi concrete

1/8" thick steel base plate at bottom of door

1/16" Typ. both sides

1 1/2"

1/4"± inside dia. sized for #5 "Master Lock" shank (padlock not shown)

Flat butt steel hinge running the length of the door. 1/4" pin, 1/8" casing and bracket.

Sampler housing 10" nominal diameter steel pipe (10.75" o.d. 10.25" i.d., 0.25" wall thickness).

NOTES:
1. Interior and exterior shall be spray painted with CR-1 coating prior to installation. Color shall be silver and approved by the Engineer. One exterior finish coat shall be applied after installation.
2. Contractor shall provide one padlock for each sampling tap as approved by the owner.
3. Alternate sampler housings may be used with the approval of the city engineer.
Slope concrete away from sampler on all sides.

1/2"Ø drain hole

3/4"-1/4 turn pvc ball valve, 150 psi rating

1/2" gravel loosely packed

3/4" corporation stop. to be compatible w/saddle tap.

Bedding/backfill

3/4" sch. 80 pvc pipe

Double strap saddle tap for 3/4" tap.

Water distribution main (size and location varies)
Gooseneck liquid dispensing assembly, 3/8" pvc sch. 80 gooseneck, 3/8" - 1/4 turn Bal valve, pvc, 150 psi rating, 1/2" pipe threaded entrance end

Ground all outside edges smooth

1/4" Thick steel top plate

Door (open position)

1/2" union

Sampler housing

1/2" x 3/4" reducer

1/8" thk. base plate

Lock nut

3/4" sch. 80 pvc pipe

BACTERIOLOGICAL SAMPLING TAP DETAIL

CITY OF WILLIAMS
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN NO. 417B
APPENDIX A

The following are a compilation of notes which may or may not apply to all projects. The Engineer may delete the notes that are deemed non-applicable as well as add additional notes that are necessary.

General Notes:

1. Owner Developer: (Insert name, address and phone number)
2. Civil Engineer: (Insert name, address and phone number)
3. Soils Engineer: (Insert name, address and phone number)
4. Soils Report: (Insert Report information, date etc.)
5. Bench Mark: (Insert Benchmark information)
6. Basis of Bearings (Insert Basis of Bearings information)
7. All work shall conform to the City of Williams Specifications and Standard Plans.
8. The following City of Williams Standard Plans are hereby made a part of these plans:
   a. (insert all plans that are applicable)
9. Refer to Final Map of this subdivision for all centerline and property line data.
10. The existing underground utilities are plotted from available records. The Contractor shall take precautionary measures to protect these utilities. The Contractor shall not do excavation until all utility agencies have been notified and have been given the opportunity to mark their facilities in the field.
11. The Civil Engineer assumes no responsibility beyond the adequacy of his design contained herein.
12. Construction Contractor agrees that in accordance with generally accepted construction practices, Construction Contractor shall be required to assume sole and complete responsibility for job site conditions during the course of construction of the project, including safety of all persons and property; that this requirement shall be made to apply continuously and not be limited to normal working hours, and Construction Contractor further agrees to defend, indemnify and hold Design Civil Engineer Harmless from any and all liability, real or
alleged, in connection with the performance of work on this project, excepting liability arising from the sole negligence of Civil Engineer.

13. Contractor shall post emergency telephone numbers at the job site for Public Works, Ambulance, Police, and Fire Departments.

14. Should it appear that the work to be done, or any matter relative thereto, is not sufficiently detailed or explained on these plans, the contractor shall contact the Design Engineer (Insert name, and Phone number)

15. Contractor shall provide proper shoring in all trenches deeper than five (5) feet. Any damage resulting from lack of shoring shall be the responsibility of the Contractor.

16. The Contractor shall comply with the rules and regulations of the State Construction Safety Order.

17. The Contractor’s attention is directed to the requirements of the Division of Industrial Safety pertaining to “Confined Spaces”. Any manhole, culvert, drop inlet, or trench (which could contain air), that is not readily ventilated, may be considered a “Confined Space”.

18. Encroachment Permits required for work within existing public right-of-way shall be obtained by the Contractor.

19. The Owner’s Civil Engineer will provide construction stakes. The number and location of stakes shall be determined before the construction begins. All staking requests should be directed to the Engineer a minimum of 48 hours prior to actual need. Any additional staking or restaking will only be done as directed and authorized by the Owner or his Authorized Agent.

20. All construction staking for curb, gutter, sidewalk, sanitary sewers, storm drains, and water lines shall be done by a Registered Civil Engineer, or Licensed Land Surveyor.

21. All existing elevations shown are as measured in the field unless otherwise noted.

22. Obstructions indicated are for information only. It is the Contractor’s responsibility to verify the location and depth with the appropriate agencies. The Contractor shall notify Underground Service Alert (U.S.A.) for utility locations prior to any construction. Phone 1-800-227-2600. Neither the Owner nor the Civil Engineer assumes responsibility that the obstructions indicated will be the obstructions encountered.

23. It shall be the Contractor’s Responsibility to notify the Civil Engineer of any differences in locations of existing utilities shown, or any conflicts with the
design that become apparent during construction before continuing with work in that area.

24. The Contractor shall verify the flowline elevation of the existing sanitary sewer and storm drain connection points and notify the Civil Engineer immediately if more than 0.10 foot of difference exists from this plan.

25. The Contractor shall coordinate the sewer, water, and storm drain construction in a manner to prevent any conflicts where utility lines cross each other. The Contractor shall be responsible for obtaining plans for all other utilities for this project and shall familiarize himself therewith, and shall notify the Civil Engineer immediately of any conflict with this plan prior to the start of construction.

26. The Contractor shall provide adequate cover for the protection of all proposed and existing utilities during the construction of this project.

27. The contractor shall not disturb or destroy any permanent survey points without the consent of the City Engineer. Any permanent monuments or points disturbed or destroyed shall be replaced by a Licensed Engineer or Surveyor at the Contractors expense.

28. Prior to commencement of any work on adjacent property, the Owner shall obtain written permission from affected Property Owner.

29. All cut and fill slopes at the boundary lines shall be constructed in such a manner that adjacent fences will not be damaged.

30. All grading operation shall be continuously observed by a Soils Engineer. Contractor must notify Soils Engineer two (2) working days in advance.

31. All grades shown are finished grades, unless otherwise noted.

32. All graded slopes are two (2) feet horizontal to one (1) foot vertical unless otherwise authorized by the Soils Engineer and approved by the City Engineer, or as shown on these plans.

33. The Contractor is responsible for matching existing streets surrounding landscaping and other improvements with a smooth transition in paving, curbs, gutters, sidewalks, grading, etc., and to avoid the creation of any low spots or hazardous conditions or any abrupt or apparent changes in appearance, grades, or cross slopes.

34. The Civil Engineer assumes no responsibility for final grade of concrete.

35. If there are any existing water wells on the property, the Contractor shall contact the Department of Health Services, Environmental Health Division prior to any
36. If paving and storm drain improvements are not completed by October 15, temporary silt and drainage control facilities shall be installed to control and contain erosion caused silt deposits and to provide for the safe discharge of storm waters into existing storm water facilities. See grading plans for details.

37. The Contractor shall fulfill all of the S.W.P.P.P. obligations prior to commencement of construction.

38. All sanitary sewer and storm drain construction shall proceed from the downstream connection to the upstream terminus.

39. All storm drain pipe 24 inch and less shall be RCP or HDPE. All storm drain pipe greater than 24 inch shall be RCP. Cast-In-Place concrete pipe may be used as approved by the City Engineer.

40. Contractor shall submit for review and approval a full set of specifications and notes for the design of any Cast-In-Place pipe prior to construction.

41. All catch basins shall be city standard unless otherwise noted.

42. All sewer pipe shall be PVC SDR 35 unless otherwise approved by the City Engineer.

43. All water pipe shall be C900 DR18 Class 150 unless otherwise approved by the City Engineer.

44. All manholes (SS&SD) over 6 feet deep shall be provided with steps. The steps shall be integrally cast into the wall of the structure whether pre-cast or field cast. Align all sanitary sewer eccentric cones so that the center of the manhole cover is as far from the street centerline as possible. Avoid conflict with street monuments.

45. All valves and fittings to be wrapped with visqueen, burlap or other approved material.

46. All valve risers to be C900 pipe.

47. House services, fire hydrant laterals, and street light conduit shall be installed prior to curb, gutter and sidewalk construction. All underground utilities within the street area, including gas and telephone lines shall be installed prior to paving.

48. All existing irrigation lines within the right-of-way shall be removed.
49. All sanitary sewers shall be balled and flushed, pressure tested, mandrelled and t.v. inspected.

50. All off-site water lines shall be pressure tested, disinfected, flushed, and tested for bacteria in conformance with the City of Williams requirements prior to final acceptance by the City.

51. Install water valve extensions on all drops deeper than 5’.

52. Fire Hydrants to be painted “safety yellow”.

53. Install blue reflectors at street centerline for all fire hydrant locations.
APPENDIX B

Improvement Plan Checklist

General, all sheets:

☐ Standard 24"x36" sheet including a City Engineer signature block.
☐ *RCE signature, stamp and expiration date
☐ North arrow (to top or right as appropriate)
☐ Scale (1" - 20', 1" - 40' or as needed for details and sections)
☐ Legend including all abbreviations and symbols.
☐ Existing topography (including signs and striping) in project work area, field checked and accurately shown including the side of the street opposite the work to the curb (or right-of-way if no curb)
☐ Detail drawings as appropriate, particularly if conditions do not fit Standard Plans
☐ Repeated information consistent between sheets
☐ Grades shown consistently in percent or decimal form
☐ *"USA Call Before You Dig"
☐ "Construct," "install," "existing" and "future" items consistently noted
☐ *The phrase "work by others" is not to be used. The appropriate party should be identified and the limits of such work clearly shown
☐ Distinction between public and private improvements clearly noted.

Key/Title Sheet

☐ General Notes
☐ Vicinity Map:
  ☐ site location with major streets noted
  ☐ north arrow
☐ Typical Cross Sections (drawn looking up-station)
  ☐ street sections or table w/street name and stationing limits
  ☐ pavement structural section including compaction
  ☐ street names noted
  ☐ back-of-walk to R/W treatment shown
  ☐ trench sections
☐ Miscellaneous
  ☐ table of street segment, design R-value and traffic index
  ☐ submittal listing
  ☐ "Special Conditions" notes
  ☐ dust control provisions
  ☐ salvage items identified
Civil - Street Profile

- Original ground grades shown
- Flowline grades shown
- Edge of pavement, street centerline and R/W grades shown if matching existing pavement
- Flowline profile line
- Symbols at grade break & beginning and end of curves.
- Elevations shown at grade break, beginning & end of curb return, and point of intersection
- Vertical curve data

Underground Utilities Plan (General)

- Horizontal alignment of main dimensioned
- Main size and direction-of-flow between manholes shown
- Radius and stationing at main noted if not concentric with street centerline
- Services shown
- Pipe markers installed at dead-ends or in fields
- Manholes are concentric or noted if eccentric (show orientation)

Underground Utilities Profile - General

- Main:
  - length and size between manholes noted.
  - direction-of-flow arrows with slope shown and invert elevations noted
- Station, length, invert @ property line and size of laterals larger than minimum noted
- Pipe invert elevations shown at manholes, grade breaks, catch basins and ends of lines
- Existing utilities shown or approximated with note "verify depth and/or location in field before start of construction
- Crossings and horizontal alignment in accordance with City of Williams Specifications and California State Health Standards.
- Size, length and elevation of stubs noted
- Manholes:
  - station
  - size and type noted if other than standard diameter barrel
  - top of manhole elevation noted
  - "adjust to grade" for existing structures noted

Wastewater - Miscellaneous

- Monitoring structures shown where required
- Sand/grease traps shown where required
Storm Drain - Miscellaneous

- Drainage flow transition from project boundaries to existing flowline shown
- Sand/oil trap provided for on-site drainage per City requirements
- Catch basins installed at lot lines and 18" from curb returns

Water - Miscellaneous

- Blind flanges with stubs at cross and tee for future extensions noted
- Valve on main provided no closer than 15 feet from temporary blow-off
- No services between last valve and temporary blow-off
- No services within 15 feet permanent dead-end blow-off
- Fire Hydrants:
  - Fire hydrant assembly or components itemization consistently shown
  - Lateral and valve oriented perpendicular to or parallel to face of curb
  - Elevations at top-of-curb or back-of-walk provided
  - Guard posts shown, if required

Grading

- All existing grades.
  - Design Grades
    - At all lot corners
    - At high points and low points
    - B/C & E/C
    - Inv & rim elevation at storm drain manhole
    - All length and slopes along main lines
- Show catch basin locations
- Drainage swales
- Ponds as per Standards
- Typical lot detail
- Cross sections where necessary
APPENDIX C

INTENSITY DURATION FREQUENCY CURVES FOR 1940 – 1974
CITY OF WILLIAMS, COLUSA COUNTY, CALIFORNIA
STATION A00 9677 0
SEC 13, T15N. R03W. MOUNT DIABLO BASE AND MERIDIAN
LAT 39.150 LONG 1212.150
ELEV. 90
COEFFICIENT OF DETERMINATION = 0.396

NOTE: THESE CURVES REPRESENT ANALYSIS OF DATA DURATIONS
OF 5 MIN TO 3 HOURS BASED UPON PEARSON TYPE III DISTRIBUTION
### APPENDIX D

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<th>INTERSECTION OF</th>
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<th>MAJOR COL.</th>
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<th>ARTERIAL</th>
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