THE CITY OF AMERICAN CANYON

DEPARTMENT OF PUBLIC WORKS

ENGINEERING STANDARD PLANS AND SPECIFICATIONS FOR PUBLIC IMPROVEMENTS

MAY 1 , 1995

CITY OF AMERICAN CANYON

ENGINEERING STANDARD PLANS AND SPECIFICATIONS FOR PUBLIC IMPROVEMENTS

Public improvements within the City of American Canyon shall be constructed in accordance with the Standard Plans and Specifications of the State of California, Department of Transportation, Division of Highways, dated July, 1992, and in accordance with the following modifications and revisions of the City of American Canyon Engineering Standard Plans and Specifications.

The combination of these two documents are hereinafter collectively referred to as the Engineering Standard Plans and Specifications of the City of American Canyon.

In the event of discrepancy between the contract documents, the order of precedence from highest to lowest shall be as follows: (1) Contract Change Order, (2) Permits from other agencies, as may be required by law, (3) Special Provisions, (4) Approved Plans, (5) Standard Plans, and (6) Standard Specifications.

Specifications pertaining to the administration of the City contracts will be contained in the Special Provisions for the contract.

References to contract administration, measurement, and payment shall not apply to subdivisions or other private developments.

For development plans within the City of American Canyon such as tentative plans, grading plans, improvement plans, or others, the order of precedence for standards from highest to lowest are as follows:

1. Improvement Plans
2. City of American Canyon
3. State of California

All exceptions to #2 or #3 shall be noted and initialed by the City Engineer on each Improvement Plan.

The City Engineer, from time to time, may revise any and all engineering designs, standards, plans, specifications, and procedures contained within the Engineering Standards. The contractor, developer, builder, etc., has the responsibility to ensure they have the latest revisions to these engineering design standards, plans, specifications, and procedures.

CITY OF AMERICAN CANYON

PUBLIC WORKS DEPARTMENT
ENGINEERING STANDARD PLANS AND SPECIFICATIONS

PRICE: $50.00 (Tax included)

This edition of the City of American Canyon's Engineering Standard Plans and Specifications has been printed in loose leaf form in order than it may be updated on a yearly basis, or as required, to reflect the changing technology and thinking of the engineering profession and the construction industry.

Each and every purchaser of these standards shall be responsible for obtaining the revisions from the City of American Canyon Public Works Department 10 West American Canyon Road, American Canyon, California, 94589.

Interested parties who wish to suggest changes or amendments to these drawings may communicate with the Director of Public Works.

Copies of these drawings may be obtained at 10 West American Canyon Road, American Canyon, California, 94589. There will be an additional charge of $.50 per copy per drawing/page for mail orders to cover postage and handling. Minimum charge is $10.00 per order.

TABLE OF CONTENTS

ENGINEERING DESIGN STANDARDS

STANDARD SPECIFICATIONS

STANDARD PLANS

DISCLAIMER

This manual includes Design and Construction Standards of the City of American Canyon for public and private improvements. It is neither intended as, nor does it establish a legal standard for these functions.

ACKNOWLEDGEMENT

The preparation of these Engineering Standard Plans and Specifications has been facilitated with the help of several people:

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TABLE OF CONTENTS
ENGINEERING DESIGN STANDARDS

PUBLIC WORKS DEPARTMENT

ENGINEERING STANDARD PLANS & SPECIFICATIONS

Addendum 1 – July 23, 1998

The City of American Canyon Public Works Department (PWD) has changed Standard Drawing #7.08 - Installation of Private Fire Protection Services. Due to ongoing maintenance problems with the Ames Double Detector Check Valve assemblies, the Department will no longer allow the installation of Ames backflow prevention devices. Standard Drawing #7.08 is revised as follows:

Notes

1. Backflow prevention devices shall be Febco 806 (Double Check Detector Assembly) with a 5/8" Sensus meter, except where an onsite fire department connection is required by the Fire District or where the City Engineer determines that additional protection is required. In these cases, the backflow prevention device shall be a Febco 826 (Reduced Pressure Detector assembly) with a 5/8" Sensus meter. Sensus meters shall read in increments of 100 cu. ft.

Installation of the Ames backflow prevention device will be allowed only for plans approved prior to July 15, 1998. However, we request the hydraulic calculations for the fire service be reviewed and, if possible, the Ames device be replaced with the appropriate Febco. The PWD has been maintaining the Ames backflow prevention devices at no charge to the property owners. The Department has been able to do this because Ames has been supplying replacement parts to the City at no charge. If in the future the City is charged for replacement parts, this charge will be passed on to the property owner.

Addendum 2 - November 13, 2000

The following changes have been made to City Standard Detail 7.07, "Fire Hydrant Installation, Water Distribution System."

1. Hydrants shall be painted "safety yellow."
2. Concrete pier blocks are required, rather than 2"x8" redwood block.
3. Break-away hydrant bolts are no longer required at the check valve.
4. Long Beach #615 is no longer on the approved list of hydrants.
5. Disregard detail note #5.

Questions about the City's Standard Plans and Specifications may be directed to the Public Works Department at (707) 647-4550.

Addendum No. 3

Please note the following changes, additions and/or clarifications to the City of American Canyon Public Works Department Engineering Standards and Specifications for Public Improvements dated May 1995

Standard Drawing No. 3.06 and 3.07- disregard 2% slope callout in gutter pan.

Standard Drawing No. 3.07 -4 ¾" dimension shown shall be from top of asphalt at gutter lip to top of curb (similar to Standard Drawing 3.06
Standard Drawing No. 3.07 – Polypropylene is not required.

Standard Drawing No. 3.10 – Woven wire is not required in new driveways. Woven wire is required in driveways when replacing an existing driveway.

Standard Drawing No. 3.10 – Residential driveway throat widths; One-car garage 12'; Two-car garage 16'; Three-car garage 24'.

Standard Drawing No. 3.18 – U-bolt type mounting devices are acceptable.

Standard Drawing No. 4.01 – Cover shall be defined as top of pipe to finish grade for water and sewer pipe. Cover shall be defined as top of pipe to subgrade for storm drain pipe and culverts.

Standard Drawing No. 4.01 – For water mains add caution tape and tracer wire per Standard Drawing 7.11 except tracer wire shall be laid on top of pipe not at bottom of trench.

Standard Drawing No. 5.03 - Trash bars are required on all curb inlets.

Standard Drawing No. 5.03, 5.04 and 5.07 - Fossil filters shall be required in all catchbasins unless otherwise noted on the plans.

Standard Drawing No. 7.02 and 7.03 – When meters are not yet installed, curb stops shall be shut off and a cable tie installed in the top of the curb stop; cutting or tampering of the cable tie will constitute a straight tie-in connection, subject to penalties.

Standard Drawing No. 7.07 – Replace 2"x8" redwood blocks with concrete piers
Fire hydrant to be painted safety yellow
Eliminate breakaway hydrant bolts.
Delete note #5 and support bars.
Pipe is 6" ductile iron pipe.
Delete Long Beach #615 fire hydrant option.

Standard Drawing No. 7.11 – Note #3 – tracer wire shall be laid on top of pipe not at bottom of trench.

Standard Drawing No. 7.14 – Valves shall be bolted to crosses and tees.

Standard Drawing No. 8.01 - Hand holes shall be located on the down stream side of the pole in relation to traffic flow

Standard Drawing No. 9.01, 9.02 and 9.03 – Stake stabilizers are required on all tree stakes

Section 71-1.08 Sewer Structures - Add: Sanitary sewer manholes shall be subjected to a vacuum or water testing for ex-filtration.

Standard Drawing 3.06, 3.07 and 3.15 - All concrete surface finishes shall be a Class "A" finish per Section 51.

Section 19-1.03 Grade Tolerance – Add item C: Certification of grading plane by a licensed surveyor or professional engineer of sub-grade, sub-base and base grade shall be provided to the City Engineer for review and approval prior to placing of subsequent layers of material

Section 3.03F Signing, Striping and Barricades – Add 3.03F–6: All required signage and striping shall be installed by the developer and approved by the City Engineer prior to public access to the project site.

Section 19-3.06 Structure Backfill – Change to: Structure backfill material shall be ¾" Class II aggregate base, compacted to 95.

Standard Drawing No. 10.04 - Irrigation piping shall be purple pipe, minimum schedule 40.

Section 99-1.12 Hydrostatic Testing – Add: Irrigation systems shall be subjected to a hydrostatic test of 200 psi for 2 hours prior to connecting to the water main.

SECTION 1 -- GENERAL

1.01 PURPOSE

The purpose of these design standards is to provide certain minimum standards for the design of public works improvements within the City of American Canyon. Any items which are not included in these Standards shall be designed in accordance with the State Planning Manual, State Highway Design Manual, Subdivision Ordinance, or Zoning Ordinance, as defined below or as directed by the City Engineer.

1.02 DEFINITIONS -- In these Standards, the intent and meaning of the terms that are used shall be as defined:

A. City -- Shall mean the City of American Canyon, a municipal corporation.

B. City Engineer -- Shall mean the City Engineer of the City of American Canyon, California, or designee.

C. Consulting Engineer -- Any person or persons, firm, partnership, or corporation legally authorized to practice Civil Engineering in the State of California who prepares or submits improvement plans and specifications to the Department of Public Works of the City of American Canyon for approval.

D. Department of Public Works (Public Works) -- Shall mean the Department of Public Works of the City of American Canyon.

E. Design -- Shall mean street alignment, grade, geometric section, structural section; sanitary sewer alignment, grade, size; water system alignment, grade, size, valving, fire hydrant location; storm drain alignment, grade, size, and miscellaneous improvements as required by the City Engineer.

F. Developer -- Shall mean any person, firm, corporation, partnership, or association engaged in the development of property in part or in whole by the placing of any improvements thereon, whether the property was previously developed in whole, in part, or at all.

G. Director of Public Works -- Shall mean the Director of Public Works of the City of American Canyon.

H. Easement -- Shall mean an easement dedicated to the City or Public Utility which shall be continuing and irrevocable unless formally abandoned.

I. Improvements -- Refers to street work, sidewalk, curb, gutter, driveways, water mains, sanitary sewer, storm drainage, public utilities, landscaping, and fences to be installed by the developer on land to be used for public right-of-way.

J. Manual of Warning Signs -- Shall mean the "Manual of Warning Signs, Lights, and Devices for Use in Performance of Work Upon Highways" of the State of California, Department of Transportation, current edition.

K. Soils Report -- Shall mean a report prepared by any person(s), firm, partnership, or corporation legally licensed to prepare "Soils Reports" in the State of California.

L. Standard Plans and Specifications -- Shall mean the Engineering Standard Plans and Specifications of the City of American Canyon.

M. Standards – Shall mean the Engineering Standard Plans and Specifications of the City of American Canyon.

N. State Highway Design Manual -- Shall mean the State of California, Department of Transportation Highway Design Manual, latest edition, unless otherwise stated.

O. State Materials Manual -- Shall mean the Materials Manual of Testing and Control Procedures of the State of California, Public Transportation Laboratory manual of Tests, Department of Transportation, latest edition, unless otherwise stated.

P. State Planning Manual – Shall mean the Planning Manual of Instructions of the State of California, Department of Public Works, Department of Transportation, Parts 1-8, latest edition, unless otherwise stated.

Q. State Specifications -- Shall mean the Standard Specifications of the State of California, Department of Transportation, latest edition, unless otherwise stated.

R. State Standard Plans -- Shall mean the Standard Plans of the State of California, Department of Transportation, latest edition.

S. Subdivision Ordinance – Shall mean the Subdivision Ordinance as adopted by the City.

T. Zoning Ordinance -- Shall mean the Zoning Ordinance as adopted by the City.

SECTION 2 -- CONSTRUCTION PLANS

2.01 GENERAL

Complete plans and specifications for all proposed improvements including any necessary dedications and easements shall be submitted to the Department of Public Works for approval and must receive the required approval prior to the beginning of construction of any such improvements. This shall apply where it is the intent that maintenance responsibility for any portion of such improvement will be transferred to the City of American Canyon. Such plans shall be prepared under the direction of a Registered Civil Engineer in accordance with the provisions of "Civil Engineer's Act" Chapter 7, Division 3, of the Business and Professions Code, relating to the practice of Civil Engineering.

The City of American Canyon Department of Public Works has provided a list of submittal requirements and guidelines as shown below. In order to reduce review time, each submittal package should be as complete as possible. The information required for a specific project may vary. Therefore, the applicant is encouraged to meet with the Public Works staff for a pre-submittal meeting. A complete submittal of Improvement Plans may include any or all of the following:

- Five (5) sets of signed Improvement Plans to include grading, erosion control, and other improvements as needed for both public and private civil engineering.
- Three (3) sets of hydraulic and hydrologic calculations for the proposed drainage system.
- Three (3) sets of signed engineer's estimate of all work performed establishing public improvements.
- Three (3) sets of signed engineer's estimate of all work performed establishing private civil improvements.
- Payment of 5% cash deposit of the total public engineer's estimate.
- Three (3) sets of Soils Engineer's Report.
- Three (3) sets of hydraulic calculations for the proposed water system.
- Three (3) sets of draft Improvements Agreement for public improvements.
- One (1) complete improvement plan review checklist signed by the Engineer with submittal cover letter.

Improvement Plans shall be approved in its entirety only. Incomplete submittals will delay the processing time and may be returned unprocessed. It is advised that prior to submittal an applicant review all design of improvements with current City standards.

All costs associated with the plan review and construction inspection of the project shall be borne by the Applicant. Complete plans will decrease time of review and reduce review costs.

All improvements must be shown in detail. Examples of items to include in the Improvement Plans may show the complete plans, profiles, and details for all street work; drainage channels and structures; retaining walls or other improvements to support cut slopes and embankments; bridges; the location of underground utilities

which may control the location and elevation of storm drains and culverts; the location of fire hydrants, street monuments, curbs, gutters, and sidewalks, fences, gates, and driveways; if constructed in conjunction with the improvements, show structures and drainage facilities to control slides; location of street lights, sanitary sewers, and other improvements which may be required to complete the work.

All applicable bonds shall be in place prior to the start of the work. Furthermore, all public improvements must have an Improvement Agreement in place prior to acceptance of the project.

Applicable connection fees shall be paid prior to insurance of the building permit or connection of utilities, whichever comes first.

The Director of Public Works reserves the right to require any and all information needed to design and construct the proposed improvement.

Any changes to the City of American Canyon's Standards shall be called out in the submittals. Written prior approval from the City Engineer shall be obtained by the designer. If a set of improvement plans have been signed by the City Engineer and changes by the designer to the City's Standards have not been called out and approved in writing, the developer will be held to meet the City's Standards at no cost to the City.

Right-of-Way Policy

The right-of-way policy requires that all public sewers, water mains, and storm drainage be in easements or rights-of-way granted or dedicated for sewers, mains, and storm drainage, and/or public use. In the case of public right-of-way for streets, further dedication is not necessary.

Easements for public utilities shall meet both of the following width criteria:

1. Minimum width of any easement shall be 20 feet for one utility, with greater widths required for multiple utilities.

2. All easements shall have a minimum width in feet equal to the required trench width according to the Standards for trench backfill plus two (2) additional feet of width for every foot of depth of the pipe as measured from the bottom of the pipe to the finished grade. All utilities shall be centered within their easements.

2.02 PREPARATION

Construction plans and specifications shall be prepared in accordance with the following requirements:

A. Dimensions – Construction plans shall be clearly and legibly drawn in ink on Mylar shell 24" x 36" with a 1 1/2" clear margin on the left edge and 1" margins on all other edges.

B. Scale -- Horizontal scale shall be 1" = 40'; vertical scale shall be 1" = 4'. Other scales shall be approved in writing, in advance, by the City Engineer.

C. Form:

1. Title Sheet:

a. Name and number of subdivision or project.
b. Vicinity map with North arrow.

c. Index of sheets.
d. City Engineer's signature block.
e. Plan view showing the entire street right-of-way layout (Scale: 1" = 100'), proposed water and sewer mains, storm drainage system, lot numbers, street lights, sheet index, flow arrows, and other miscellaneous improvements to be installed.
f. Complete legend.
g. Typical street section for each varying width street.
h. Title block -- located along the lower, right edge of the paper.
i. Temporary and permanent bench marks including their descriptions.
j. General and special notes relating to construction methods.
k. Soils engineer's, developer's, and design engineer's name, address, and telephone number.
l. Date completed.
m. Design engineer signature and seal on all sheet.
n. All lettering or printing shall be 1/8" minimum in height and of such shape and weight as to be readily legible on prints and microfilm reproductions.
o. Minimum pen size shall be "0".

2. Street Plan and Profile

a. Plan view of each street to be improved shall be shown on separate sheets indicating existing improvements and contours/elevations within 100' of the project boundary, proposed improvements and future improvements, if known. Proposed improvements shall include sidewalk, curb, gutter, driveways, sewer mains, water mains, water service and sewer lateral locations, storm drains, manholes, valves, fire hydrants, fencing, barricades, monuments, survey stationing, face of curb data for all curves, and other data as required by the City Engineer. The survey stationing shall read from left to right with the north arrow pointing either to the top or left edge of the sheet. All stationing shall be a continuation of existing improvements where possible.

b. Profile view of each street shall be shown immediately below or above its plan view. The profile shall include existing grade lines, sewer mains, storm drains, water mains, public utility mains, all utility crossings, and top of curb. Discrete elevations shall be shown of top of curb, at grade break points, manhole and catch basin inverts, and water main crossings with other utilities, and at each lot line in plain view or every 100', whichever is less.

3. Site Development Plan

Site development plan shall include building pad, finished floor elevations, individual lot drainage pattern, adjacent land drainage, driveway size and locations, fencing, existing contours, existing trees, wells, ditches, and other landmarks important in the construction of the improvements. In addition, adjacent lot grades shall be shown for a minimum of twenty-five feet (25') from the project boundary. The site development plan shall conform to F.H.A. standards.

4. Street Light Layout

The street light layout plan shall include the location of proposed electroliers, service point(s), pull boxes, the intensity of the proposed Luminare, a location plan of the Conduit Run showing wire size and length,

and the mounting height and arm length of the proposed electrolier/pole assembly. The street light layout plan shall be approved by the City Engineer.

2.03 SUBMISSION

Five (5) sets of construction plans shall be submitted along with five (5) copies of the subdivision final map to the City Engineer for checking to ensure compliance with these Standards and City's Ordinances, along with plan checking fees. Submitted plans shall include specifications, test data, materials list, drainage calculations, sewer calculations, soils report and design, lot closures, easement and right-of-way descriptions, ties to the City of American Canyon Bench Mark and Monument System, special call-out section of plans not meeting the Engineering Standards, and other material as requested by the City Engineer.

A current title report (6 months or less) shall be submitted with the final map. The title report shall include the entire legal boundary of property being divided.

Closure calculations shall be provided at the time of initial map check submittal. All calculated points within the map shall be based upon one common set of coordinates. All information on the map shall be directly verifiable by information shown on the closure calculation print-out. The point(s) of beginning shall be clearly defined and all lot acreage shall be shown and verifiable from information shown on the closure calculation print-out.

Soils Reports shall be submitted in 8 1/2" x 11" bound folders. The analysis must, at a minimum, include a map of the subject area showing proposed and existing streets, contours, and location and type of soils samples obtained. The results of all field data and laboratory tests shall be included. Design for proposed street sections shall be part of the report. Street structural section design shall include recommendations for: natural subgrade, sub-base, base and pavement compaction, and thickness to achieve design strength.

A minimum of fifteen (15) working days shall be allowed for review of Construction Plans and Final Subdivision Maps. Should there be required alterations or revisions to the plans submitted, one copy shall be returned by the City Engineer with the requested clarifications indicated thereon. At such time as the consulting engineer has made the necessary revisions, the plans shall again be submitted (5 copies) for checking. However, plans shall not be considered approved until the City Engineer has signed in the approval block on the plans. There shall be no changes permitted to an approved set of plans unless such changes, corrections, or additions are re-submitted to the City Engineer for approval as previously described for original plans. Excepted from approval are any features of the plans that are contrary to, in conflict with, or do not conform to any California State Law, City's Ordinance or Resolution; even though such errors, omissions, or conflicts may have been overlooked by the Department of Public Works.

After formal approval of the plans by the City Engineer, five (5) copies plus one (1) Mylar (polyester film 3ml) sepia copy (with matte surface up) shall be filed with the City Engineer's office for City records. Three (3) additional copies of reduced improvement plans (11" x 17" or 18" x 26") are required and shall be furnished by the developer or his representative to the City Engineer without cost.

Three (3) copies plus one (1) Mylar of as-built drawings shall also be submitted to the City Engineer's office upon completion of the project. If the record drawings are found to be inadequate in any area, the drawings will be rejected and the developer will be required to re-submit. The warranty period on the project will not begin until approved record drawings are on file with the City Engineer.

Prior to installation, all equipment and materials are to be inspected by the City. The City Engineer reserves the right to have the developer submit manufacturers specifications on any or all equipment and material to be used on the project.

SECTION 3 -- STREET DESIGN

3.01 GENERAL

For purposes of geometric and structural design, streets shall be classified according to the City's adopted General Plan. Any deviation from the following standard shall require the approval of the City Engineer.

	Right of Way	Width Between Curbs	Minimum Traffic	Maximum Grade Rate	Minimum Centerline Radius**	Minimum AC	Minimum Base AB/ASB
CLASS	FEET	FEET	INDEX*	%	Curve Ft	Inches	Inches
Major thoroughfare, arterial	140	80	9.0	10	800	5	14/12
Minor thoroughfare, Type I collector, industrial	74	50	9.0	13	600	4	12/8
Type II Collector	68	44	6.5	15	250	4	10/6
Minor, cul de sacs	64	40	5.0	15	250	4	12/0

Industrial designed and built as collectors.

*May be raised at the discretion of the City Engineer if traffic warrants a higher value.
** Actual design of horizontal curves shall be based on the design speed of the street and approved by the City Engineer.

Street sections shall be calculated based on "R" values obtained from material gathered from the level of the proposed subgrade using the State of California Division of Highways design method. If subgrade has an "R" value of 10 or less, geotextile fabric shall be installed on subgrade prior to placement of AB or ASB material. Aggregate base and sub-base shall conform with the Standard Specifications, Section 25 and 26.

3.02 GEOMETRICS

A. Street centerlines shall intersect at right angles with a variance of plus or minus five degrees (5°). A minimum of 250 feet shall be maintained between street centerline intersections.

B. Curb line radii shall be tabulated on the construction plans. Numbering shall not repeat from sheet to sheet.

C. Gutter flow line grades shall have a minimum slope of 0.005 feet per foot and maximum as determined by the City Engineer.

D. Cross slope on all streets shall be as shown on the Engineering Standard Plans unless a deviation has been previously approved by the City Engineer.

E. The minimum vertical curve length allowable at the intersection of two grades shall be 100 feet. Actual design of the vertical curve shall be based on the design speed of the street and stopping sight distance as determined by the City Engineer. However, vertical curves may be omitted where the algebraic difference in grades does not exceed 1.0 percent.

F. The minimum stopping sight distance over any segment of the roadway on residential, collector, or thoroughfare streets shall conform to the Highway Design Manual.

3.03 APPURTENANCES

A. Driveways

1. No driveway shall be permitted within five feet (5') of a property line on multi-family property and commercial property. Driveway locations for single family property shall not be permitted within five feet (5') of a property line unless a property fronts on a cul-de-sac bulb in which case a driveway may be constructed up to the property line. Special consideration by the City Engineer may be given to major and minor street driveway configurations of an unusual nature.

2. The maximum width for a commercial driveway shall be forty-two feet (42') and for a residential driveway thirty feet (30'). The above widths include transitions at each side of the driveway.

3. The minimum distance between driveways serving the same parcel shall not be less than twenty feet (20') as measured at the face of the curb, including transitions.

4. Not more than forty percent (40%) of the frontage of any parcel shall be devoted to driveways. Lots fronting on a cul-de-sac are exempt from this requirement.

5. All driveways shall conform to the Engineering Standards.

B. Parking

For all single family properties which front on a cul-de-sac bulb, one on-street parking space, eighteen feet (18') in length, shall be provided for each single family lot.

C. Valley Gutters

Valley gutters will not be allowed within the public right-of-way or public easement.

D. Sidewalks, Curbs, and Gutters

1. Sidewalks shall be a minimum of 5.0 feet wide as measured from the face of the curb. Wider and/or separated sidewalks may be required by the City Engineer.

2. Sidewalk, curb, and gutter shall be of the design as shown on the Engineering Standards or as required by the City Engineer.

3. Handicap ramps shall be installed at all street crossings and curb returns.

4. Handicap ramps shall not be used as driveways.

E. Survey Monuments -- Survey monuments shall be installed as follows:

1. On the roadway centerline at intersections.

2. At the beginning and end of each horizontal curve on the centerline.

3. At all locations as required by the City Engineer.

4. A minimum of two (2) monuments shall be installed in all subdivisions with coordinates on the California Coordinate System, Zone III.

5. Lot line extensions shall be clearly marked with a plus ("+") chiseled in the concrete at the top of the curb and tagged per State law.

All monuments set shall be as shown on the Engineering Standards and shall clearly show the registration number of the licensed Civil Engineer or Land Surveyor who prepared the final or parcel map.

F. Signing, Stripping, and Barricades

1. Street names shall require approval by the Planning Commission.

2. Street name, stop signs, and stripping shall be paid for and installed by the developer or subdivider.

3. Other regulatory and warning signs to control traffic, such as speed zone signs, are to be installed by the developer or subdivider.

4. Permanent barricades shall be installed where improvements cover only a portion of the ultimate development or as directed by the City Engineer. The barricade shall be constructed, erected, painted, and signed in accordance with the Engineering Standards.

5. All stripping shall be thermoplastic per Engineering Standards.

G. Easements

Public service, drainage, landscaping, and fence easements shall be located as required by the Utility companies, City Engineer, and as described herein.

SECTION 4 -- STORM DRAINAGE

4.01 GENERAL

All design shall be in conformance with the current Napa County Flood Control and Conservation District Master Plan.

These standards are intended to ensure that watercourse and surface water laws are complied with and that run-off from storms up to the 100-year return frequency are conveyed through storm facilities and disposed of in a manner which protects public and private improvements from flood hazards.

The diversion of natural drainage will be allowed only within the limits of a proposed improvement. All natural drainage must leave the improved area at its original horizontal and vertical alignment unless a special agreement, approved by the City Engineer, has been executed with adjoining property owners.

All storm drainage facilities shall include provisions for future upstream development and no development shall discharge at a rate which exceeds the capacity of any portion of the existing downstream system. Calculations for storm drainage design within a development as well as contributing watershed shall be submitted to the City Engineer for approval. These calculations are to be based upon the ultimate watershed development and shall include:

A. Topographic map showing the relationship between the proposed development and the remainder of the watershed, including acreage of all sub-areas.

B. Map of the proposed development indicating:

1. All applicable existing and proposed improvements.

2. Run-off co-efficients for all areas where run-off was calculated.

3. Time of concentration and intensity of rainfall at each hydraulic structure.

4. The magnitude and direction (indicated by arrow) of flow in each pipe and flow to each structure contributed by its tributary area. All flow rates shall be in cubic feet per second (cfs).

5. Elevation of pipe inverts at structures and the top of structure elevation at each structure.

6. Slopes of all storm water conveyance structures and conduits.

C. Tabulation sheet which includes all of the above information and summarizes the design in a clean, concise, professional format.

D. Construction drawings shall include:

1. Water surface elevation to be called out on profile view at each structure.

2. All flow rates in cubic-feet-per-second called out on profile view for each conduit.

All proposed improvements shall be designed such that, for the design storm, there is no surcharging in any conduit unless written approval is by the City Engineer. In those special cases where surcharging is permitted, the minimum hydraulic grade line shall be 1.25 ft. as measured from the gutter flowline or when applicable, as required by the Federal Emergency Management Agency (FEMA) and the Dept. of Water Resources (DWR) Division of Safety of Dams, whichever is greater.

Containment of flood waters within the public right-of-way is required at all times. Flood waters shall be confined to streets or other approved right-of-ways by grading, levees, or alternative means acceptable to the City Engineer. In no instance shall an improvement be designed such that flood waters can reach a depth of 0.50 feet, as measured from the top-of-curb, before overland release occurs. The design of all bridges, box culverts, levees, detention basins, spillways, and other applicable structures shall comply with the latest FEMA and DWR Division of Safety of Dams regulations.

At intersections of pipes, the downstream pipe shall have a crown elevation which is equal to the crowns of all upstream connecting pipes. Pipe diameters shall not decrease in the downstream direction.

4.02 DESIGN

A. Design Storm

The following table shall be used to determine the required design storm for drainage calculations.

Design Area or Item	Design Method	Design Return	Comments
Less than 640 Ac.	Rational method	10 yr.	Refer to these specifications and details.
Between 640 & 3200 design acres	Rational method or unit hydrograph	25 yr.	Refer to Contra Costs County Hydrology and Drainage Procedure Manual for local hydrograph data.
Greater than 3200 acres	Unit hydrograph	100 yr./24 hr.	Rainfall depths shall be taken from NOAA Atlas 2, Vol. XI, or Table 2.
Detention basin	Unit hydrograph	100 yr./24 hr.	Peak discharge from a detention basin shall not exceed 90% of the undeveloped peak flow from the 24-hour, 100-year event.

B. Capacity

All storm water conveyance structures, unless otherwise stated herein or directed by the City Engineer, shall be designed to function without surcharging for purposes of determining hydraulic capacity.

C. Storm Run-Off

1. Rational Method – Storm run-off areas smaller than 640 acres shall be computed using the Rational method..

2. Unit Hydrograph – Detention basin capacity and storm run-off for areas larger than 3200 acres shall be computed using the Unit Hydrograph Method, as defined by the Contra Costa County Flood Control District.

D. Pipe Materials

The minimum allowable inside diameter of any storm drain pipe shall be twelve inches (12") and designed to flow with a minimum velocity of 2.0 feet per second when flowing full. The pipe materials which may be used for storm drainage improvements within the City and right-of-way and easements are specified in Section 63 and 65 of the Standard Specifications. CMP and CAP will not be allowed.

E. Cover Requirements

All storm drain pipe shall be designed to allow a minimum of two feet (2') of cover as measured from bottom of sub-grade to the top of the pipe. If, for sound engineering reasons, two feet (2') of cover can not be obtained, the pipe shall either be encased in concrete or provided with a concrete cover as approved by the City Engineer.

RCP – The following chart lists the minimum allowable classes of reinforced concrete pipe. For use in this chart, cover is defined as the distance from the top of the pipe to the sub-grade.

Cover in Feet	Minimum Class, RCP
Less than 2.5	Cl V (3000 D)
2.5 -- 7.9	Cl III (1500 D)
8.0 -- 11.9	Cl IV (2000 D)
12.0 -- 17.0	Cl V (3000 D)

No storm drain pipe which lies totally or in part within the structural section of a street will be allowed.

CIPP -- Cast-in-place concrete pipe shall have a minimum cover in conformance with the following:

1. Cast-in-place concrete pipe shall not be used if the sub-grade surface is less than 24 inches above the top of the pipe or a distance less than 1/2 of the outside pipe diameter, whichever is greater.

2. If the sub-grade is twenty-four inches (24") or more above the top of the pipe, backfill shall be placed in accordance with the Standard Specifications for backfill requirements for utility trenches

3. The City Engineer may seasonally or permanently deny the use of cast-in-place concrete pipe if, in his judgement, local conditions make the use of said pipe undesirable.

4. Cast-in-place concrete pipe shall not be backfilled until the 7-day break has been approved.

F. Horizontal Alignment

Storm drainage lines shall be parallel with the centerline of the street. Pipe curvature shall not exceed 80% of the manufacturer's recommendations.

G. Open Channels

For the purposes of these specifications, a ditch shall be classified as an open channel when its capacity exceeds 2.5 cfs. Drainage may not be conveyed through a development in open channels. Open channels shall be designed in accordance with the following:

1. Velocity range shall be between 2.5 and 6.0 feet per second in unlined, open channels and between 3.0 and 12.0 feet per second in lined, open channels.

2. Channel lining shall be either finished concrete, sacked concrete, or doweled and sacked concrete. The minimum weight of sacked concrete shall be determined from Figure 2. For use in this figure, impinging velocities shall be (1.4 x mean velocity) and tangent velocities shall be (.075 x mean velocity). In no case shall an individual sack of concrete weigh less than 60 lbs.

3. All open channels shall be designed to carry the 100-year frequency flood. The hydraulic grade line shall be calculated and plotted on all channel profiles. All computations, including a narrative of the design shall be clearly documented and submitted to the City Engineer for approval.

4. Freeboard shall be a minimum of 3.0 feet and 1.0 feet in channels with or without levees, respectively, for the 100-year event, and comply with the latest FEMA regulations.

5. Side slopes shall be 2 feet horizontal to 1 foot vertical or flatter and the minimum bottom width of the channel shall be twice the channel depth.

6. Profile of existing channel for a minimum of 1000 feet at each end of the development shall be shown on the construction plans to establish an average profile grade.

7. Service roads on both sides will be required. See Sub-paragraph K-2 for service road specifications.

H. Bench Drains and Diversion Ditches

A ditch shall be considered a bench drain or diversion ditch as long as its design capacity does not exceed 2.5 cfs. Any ditch which has a capacity greater than 2.5 cfs shall be considered an open channel and designed in accordance with Section G.

Bench drains and diversion ditches shall be concrete-lined and designed in accordance with the following:

1. Velocity range shall be between 3.0 and 20.0 feet per second.

2. At changes in alignment and at inlets, adequate measures such as banking, circular curves, or energy dissipaters shall be used to confine water to the channel.

3. At locations where, in the opinion of the City Engineer, the overflow of a bench drain or diversion ditch could cause flooding, erosion or other damage, the channel section shall be designed to carry the 100-year runoff.

I. Drainage Structures

1. Manholes and Junction Boxes -- Shall conform to the Engineering Standards. They shall be located at changes in grade or conduit size, at junction points, on curved pipe at the EC or BC of the curve, and at 300-foot intervals along the curve.

2. Catch basins -- Shall conform to the 15-year Standards. Catch basins shall be designed and spaced such that they intercept and fully contain the 15-year storm. Under no circumstance shall the spacing of catch basins exceed 800 feet.

3. Box Culverts -- Shall be required when specified by the City Engineer and designed on an individual basis.

4. Headwalls, Wingwalls, Endwalls, Etc. -- Shall be considered on an individual basis, and in general, designed in accordance with Section 51 of the Standard Specifications.

5. Drainage Pump Stations -- Are not permitted.

6. Temporary Inlets and Outlets -- Shall conform to good engineering practice and shall be specifically designed and detailed on the plans.

7. Gutters -- Storm water runoff in gutters shall be conveyed in underground structures when any one of the following criteria is met:

   a. Gutter runoff exceeds 3.0 cfs.
   b. Length of gutter exceeds 600 feet.
   c. Water depth in gutter reaches the 0.3 feet in depth; spread reaches 4 feet.

J. Easements

Publicly-maintained drainage conduits and channels will not be allowed on private property unless they lie within a dedicated public easement. Where minor improvement of a drainage channel falls on adjacent property (such as daylighting a ditch profile) written permission from the adjacent property owner(s) for such construction shall be required. A copy of the document which grants said approval shall be submitted to the City Engineer prior to the approval of the improvement plans.

Easements for closed conduits shall meet both of the following width criteria:

1. Minimum width of any easement for a closed conduit shall be 20 feet.

2. All easements for closed conduits shall have a minimum width in feet equal to the required trench width according to the Standard Specifications for trench backfill plus two (2) additional feet of width for every foot of depth of pipe as measured from the bottom of the pipe to finished grade.

3. All conduits shall be centered within their easements. Drainage easements for open channels shall have sufficient width to contain the open channel and two 17-foot wide service roads. The toe of a bank shall not be within 17 feet of an easement boundary. Easement boundary lines shall, at changes of alignment, have a 50-foot radius sufficient to provide turning room for vehicles operating on the service road.

K. Miscellaneous Items

1. Fencing -- All open channels shall be enclosed by a chain link fence complying with the Standard Specifications. The fence shall be located six inches (6" inside the required easement lines).

2. Service Road -- Two service roads shall be provided within the boundary of all open channels. They shall be a minimum of 17 feet wide, each graded for vehicular traffic and clear of trees, shrubbery, and other obstructions for its full width. Fourteen feet (14') of the road's width shall be paved or graveled (surface type to be determined by the City Engineer for each case) with a minimum unpaved shoulder width of one foot (1') on each side of the roadway. Service roads are required on both sides of the channel.

TABLE 1

RUNOFF COEFFICIENTS FOR RATIONAL METHOD

Surface or Area Type	Runoff Coefficient, C
Paved areas (asphalt or concrete)	0.95
Industrial areas	0.85
Commercial areas	0.85
Residential areas	
Single family, avg. slope < 2%	0.50
Single family, avg. slope between 2 & 7%	0.55
Single family, avg. slope > 7%	0.65
Multi-family, detached	0.65
Multi-family, attached	0.70
Schools	0.45
Agricultural land	0.45
Undeveloped open spaces, including pasture	
Avg. slope < 2%	0.40
Avg. slope between 2 & 7%	0.47
Avg. slope > 7%	0.55
Oak timber and heavy brush	
Avg. slope < 2%	0.35
Avg. slope between 2 & 7%	0.42
Avg. slope > 7%	0.50

These coefficients are to be used for a return period of 10 years. For return periods of 25 and 100 years, modify the table values as follows:

25-year return	C = Table Value x (1.07)
100-year return	C = Table Value x (1.25)

NOTE: No value of "C" shall be modified beyond 1.0

TABLE 2

RAINFALL INTENSITIES

Time of Concentration In Minutes	Intensity of Rainfall In Inches Per Hour			Time of Concentration In Minutes	Intensity of Rainfall In Inches Per Hour		
5	2.34	2.76	3.42	36	0.83	0.98	1.23
6	2.15	2.50	3.10	37	0.82	0.96	1.20
7	1.97	2.31	2.87	38	0.81	0.95	1.18
8	1.84	2.15	2.66	39	0.79	0.94	1.18
9	1.73	2.03	2.50	40	0.78	0.93	1.16
10	1.65	1.92	2.37	41	0.78	0.91	1.14
11	1.55	1.83	2.24	42	0.76	0.90	1.13
12	1.49	1.75	2.15	43	0.75	0.89	1.12
13	1.43	1.66	2.05	44	0.74	0.89	1.10
14	1.37	1.61	1.99	45	0.73	0.87	1.09
15	1.32	1.56	1.92	46	0.72	0.86	1.08
16	1.28	1.50	1.86	47	0.71	0.86	1.07
17	1.24	1.45	1.80	48	0.71	0.85	1.06
18	1.20	1.40	1.75	49	0.70	0.84	1.04
19	1.17	1.37	1.71	50	0.70	0.83	1.03
20	1.14	1.34	1.67	51	0.69	0.82	1.02
21	1.11	1.30	1.61	52	0.69	0.81	1.01
22	1.09	1.27	1.57	53	0.68	0.80	1.00
23	1.05	1.24	1.54	54	0.67	0.79	0.99
24	1.03	1.21	1.50	55	0.67	0.79	0.98
25	1.01	1.19	1.48	56	0.66	0.78	0.97
26	0.99	1.15	1.45	57	0.65	0.77	0.96
27	0.97	1.13	1.42	58	0.65	0.77	0.96
28	0.94	1.11	1.39	59	0.64	0.76	0.95
29	0.93	1.10	1.37	60	0.64	0.75	0.94
30	0.91	1.08	1.34	70	0.57	0.69	0.87
31	0.90	1.06	1.32	80	0.54	0.65	0.81
32	0.88	1.04	1.30	90	0.51	0.61	0.76
33	0.87	1.03	1.28	100	0.49	0.58	0.73
34	0.86	1.01	1.26	110	0.46	0.55	0.69
35	0.84	0.99	1.24	120	0.44	0.52	0.66

Roof-to-gutter time shall be taken as 9 minutes for residential areas and 5 minutes to on-site facilities for commercial and industrial sites.

The time of concentration shall be derived from a combination of the overland flow travel time from Figure 1 and the channel flow time to the design point.

Rainfall intensities obtained from Table 2 are based on a mean annual precipitation of 12.5 inches. To correct these values for areas with different mean annual precipitation (MAP), apply the following correction to the tabulated intensities:

Corrected intensity = Table Value x Actual MAP / 12.5

FIGURE 1

TRAVEL TIME FOR OVERLAND FLOW

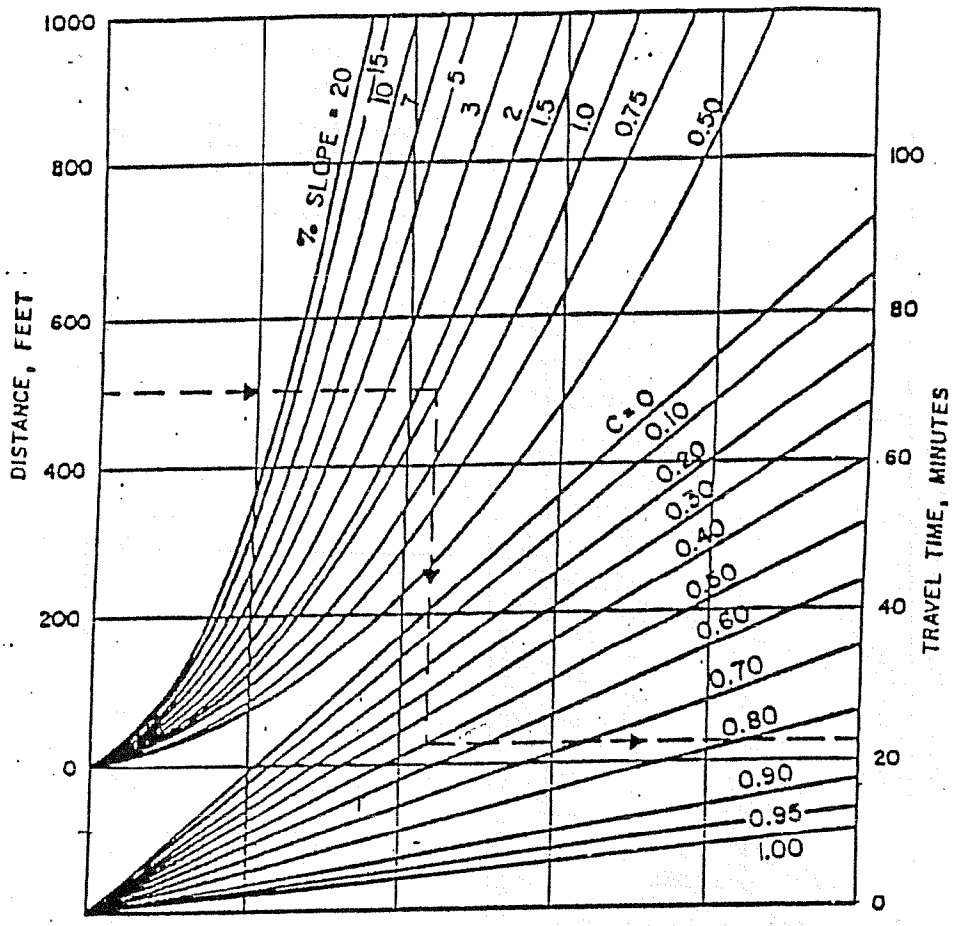
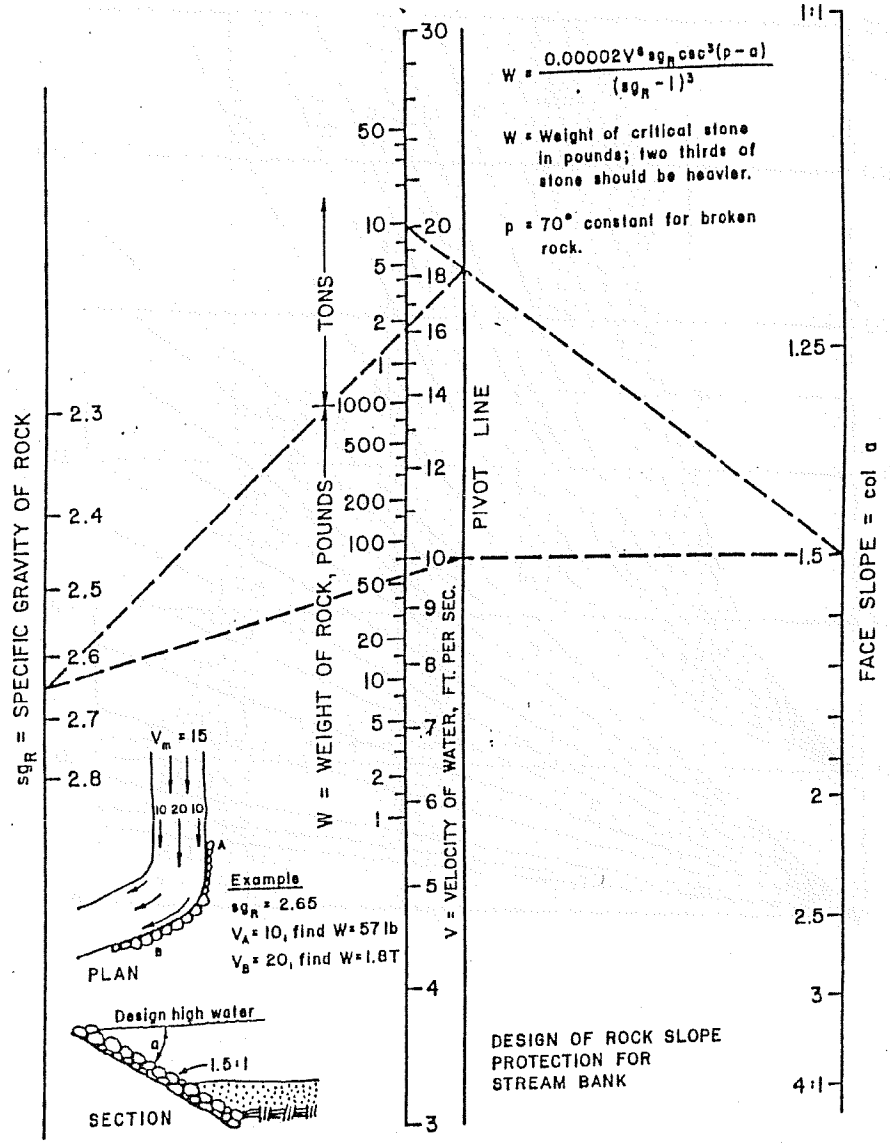


FIGURE 2

BANK AND SHORE PROTECTION



SECTION 5 -- SANITARY SEWER SYSTEM DESIGN STANDARDS

5.01 Purpose:

To provide guidelines for design of projects for the Sewer Utility. These guidelines do not include, but may reference, those additional conditions which may be promulgated by all other pertinent ordinances, codes, and official policies set forth by the Public Works Department, other departments of the City of American Canyon, or other government agencies. These guidelines are intended to impose minimum acceptable design criteria. More stringent requirements may be imposed by the City Engineer based on specific project conditions.

It is the responsibility of the design engineer to initiate written requests for approval of any design concepts that differ with these criteria, to verify additional requirements imposed, to perform any necessary calculations or studies, and to resolve specific problems with the appropriate agency, department, or division.

1. Connection to an existing public sewer:

   A. A proposed sewer design must show a point of connection to an existing public sewer main. It is common for a project on one property to require the construction of sewer on an adjacent property before it can connect to the public sewer. Sewer system designs shall incorporate the design of any off-site sewer that is required for the connection to the public main. Appropriate portions of City-approved designs shall be included in the plans unless the mains have been accepted for maintenance by the City.

   B. Joint use of laterals will not be allowed.

2. Materials:

   A. Gravity sewer mains shall be Polyvinyl Chloride (PVC) SDR35; Vitrified Clay Pipe, Ductile Iron Pipe, or reinforced concrete sewer pipe with plastic lining.

   B. Large diameter gravity mains may be concrete cylinder pipe, vitrified clay pipe, ductile iron pipe, or reinforced concrete pipe with the City Engineer's approval.

   C. If a gravity sewer main is installed outside of a paved roadway, ductile iron pipe is required.

   D. All ductile iron pipe shall be polyethylene encased and cad-welded for cathodic protection.

   E. Use of Asbestos Cement Pipe is not allowed under any circumstances.

   F. Sewer force mains shall conform with the materials requirements for water mains. Non-metallic pipes require tracer wire in accordance with Engineering Standard Plan 7.11.

3. Alignment

   A. Sewer alignment. Where sewer lines are to be installed within street or road right-of-ways, they shall, wherever practical, be designed and installed on the center line of the existing or future roadway. Where

a sewer line can not be designed along the center line of a roadway, it shall be located within the paved area of the street or road, with not less than one (1) foot between the outside surface of the pipe or structure and the nearest lip of the gutter or edge of improved road shoulder. Where practical, all sewer lines within easements or reserves shall be designed and installed on the center line of the sewer easement or reserve. All sewer lines and structures shall be designed and installed well in the clear of all other improvements and utilities. In no case shall a sewer line or structure be nearer than twelve (12) inches vertical or five (5) feet horizontal, to any other improvement or utility.

B. Public sewer mains outside the public street shall be kept to a minimum.

C. Horizontal and vertical curves in gravity sewer mains will not be allowed.

4. Manholes and Cleanouts

A. Locations. Manholes shall be placed at all intersections of sewer lines other than side sewer connections, at all vertical or horizontal angle points, at all points of trunk, and main sewer pipeline size changes and at intervals not greater than three hundred (300) feet in paved areas. Where practical, manholes shall be located at the center of street or road intersections. All manholes, from which future sewer line extensions are anticipated, shall have a pipe stub planned and installed at the grade and the direction of the anticipated sewer extension. Pipe stub size, slope, length, and pipe type shall be shown on the Plans.

B. If a sewer line terminates in an easement with a manhole, said manhole shall be located a minimum of five (5) feet within the last property served. If a manhole is to be installed on the plugged end of an existing sewer main at the terminus of street paving, then the new manhole shall be located and stationed such that no existing pavement will be cut when the manhole is installed.

C. Cleanouts may be installed in lieu of manholes at the end of a sewer main where the distance is less than two hundred (200) feet to the nearest manhole and the main size is eight (8) inches or less.

D. Minimize the number of manholes.

E. Sixty inch (60") diameter manholes are required for mains larger than eighteen inches (18") in diameter, or mains deeper than eight feet (8').

F. Private sewer mains must connect to the public main at a manhole.

G. Provide sufficient drop through the manhole to compensate for energy loss caused by change of alignment. A minimum drop of 0.10 foot is required for deflection angles greater than thirty (30) degrees.

H. When pipe size increases, set inlet crown at least as high as the outlet crown.

I. Line Deflection in Structure -- The angle of deflection between incoming and outgoing lines in a manhole shall not be greater than ninety degrees (90°).

J. Cul-de-sac Requirement -- A standard manhole shall be located at the end of any main line terminating within a cul-de-sac, which has three (3) or more lots or parcels of land fronting on the cul-de-sac. No more than five (5) side sewers shall be connected directly into such a manhole.

5. Accessibility:

A. All-weather vehicle access is required to every manhole.

B. Sewer easements are to be a minimum of twenty feet (20') in width.

C. All access roads must be a minimum of seventeen feet (17') in width.

D. Acceptable types of access roads are:

1) Six inches (6") of blue shale for slopes up to 10%
2) Two inches (2") of AC on six inches (6") of Class II aggregate base for slopes in excess of 10%

E. All access roads longer than one hundred feet (100') must have an approved turn-around.

6. Size:

A. Mains shall be sized to provide adequate capacity and a minimum two feet (2') per second velocity.

B. The minimum public main is eight inches (8") in diameter.

C. The minimum private main is six inches (6") in diameter.

D. The minimum lateral size is four inches (4") with the laterals intended use to serve a single family residence.

E. Location of mains in street right-of-ways shall be five feet (5') from the center line on the south-westerly side.

7. Cover:

A. Minimum cover for all gravity sewers is forty-eight inches (48").

B. Inside of R/W, where cover is less than forty-eight inches (48"), ductile iron pipe must be used.

C. Definition of cover: distance from the top of the pipe to finished grade.

8. Slope:

A. Design all gravity sewers to achieve a minimum velocity of two feet (2') per second. Use n = 0.0.13 for new pipe and n = 0.015 for the existing system.

B. The minimum slope for eight-inch (8") sewers is 0.5% or one-half foot (½') per one hundred feet (100').

C. Maximum slope gravity sewers is 15% or fifteen feet (15') per one hundred feet (100').

9. Sewer Laterals:

Laterals are those portions of the sewer system between the sewer main and the portions of the sewer maintained by the property owner. The usual location of the line of responsibility is the sidewalk cleanout. In all cases, City-maintained sewer lines will lie in a street right-of-way or dedicated public easement. In all new subdivision work, the house lateral line from the sewer to the property line shall be installed at the time the sewer main is constructed. Whenever a sanitary sewer is installed which will serve existing houses or other buildings, a lateral line shall be constructed for each existing individual house or building. Each lateral line shall be referenced to the improvement plan stationing. Each individual on-site building shall be serviced by a separate lateral to the sewer main.

A. All laterals, from property line or edge of easement to the point of conenction with the main line or a manhole shall have an alignment that provides an angle of intersection with the downstream section of the main sewer of no less than 90°.

B. The maximum deflection at any one point in a lateral, not including fittings at saddle or wye connection to main sewer or at angle points haveing cleanouts, shall be 22-½° (1/16 bend) and any two (2) consecutive deflections (bends) shall not be less than two feet (2') apart.

C. Building drains (i.e. floor drains, etc.) shall not be connected to the sanitary sewer system, except in covered trash enclosures.

D. Cleanouts shall be provided on the lateral sewer within the City right-of-way at the back of the sidewalk as shown on the Engineering Standard Plans. Two-way cleanouts may be installed.

E. Laterals connecting houses having a finished floor elevation twelve inches (12") or less above the highest elevation of the nearest upstream structure shall require installation of a backflow prevention device next to the cleanout at the house.

F. Each lot should be served by one lateral.

G. When more than one residential or commercial lot is served by a single lateral, the lateral must meet the public main standards.

H. All laterals must connect to the main with a "Y" connection.

I. Minimum slope of sewer laterals is 2% or ¼" per foot.

J. Backwater Overflow Device. Due to the topographical characteristics of certain areas within the City, there exists the danger of damage to health and property resulting from the possibility of sewage overflow and backflooding on public and private property. It is the purpose of the City to protect the health and safety of the residents of the City and to minimize the possibility of damage to property by requiring,

where topographical conditions warrant it, the installation and maintenance of a protective device approved by the City Engineer.

No person shall maintain a side sewer connection to the City system without an approved backwater overflow device when required.

An approved backwater overflow device shall be installed when the lowest floor level of a house (regardless of plumbing) to be connected to the main sewer is below a point twelve inches (12") above the top of the nearest upstream structure. A gate valve is optional but should be considered for installation for additional protection.

Consideration must be given to the drainage potential to adjacent property by sewage released through a backwater overflow device.

When conditions as prescribed for a backwater overflow device installation exist, and where the sewage can not overflow on the area surrounding such installation without damage to property, a backwater check valve and shutoff system shall be installed.

10. Unusual Design. Special design of sewer mains, non-residential connections, or other unusual features or structures require individual study and approval by the City Engineer.

    All private sewage pump systems, including residential sewage pumps, when proposed, shall be submitted to the City Engineer for determination of circumstances necessitating such pump usage and design thereof. No public force mains or pump systems will be permitted.

11. Hillside and Creek Areas.

    A. Soils report will be required where:

        1) Slopes of hills where sewers are proposed for installation exceed fifteen percent (15%).
        2) Sewers are proposed for installation within fifty feet (50') of creek beds.
        3) Sewers are proposed for installation within the range of influence of a possible landslide from adjacent hill.
        4) Sewers are proposed for installation in historical slide locations.

    B. A geotechnical report prepared by a registered civil engineer practicing in Geotechnical Engineering must be submitted which covers the proposed project.

    C. If the project geotechnical report provided does not cover an off-road sewer alignment, the City Engineer may require a supplementary report. This report, at a minimum, must address the following:

        1) Supplementary geological setting, general soils and bedrock conditions along the proposed sewer alignment and recommended set backs from slides and creeks.
        2) Stability or instability of selected sewer alignment.
        3) Potential ground water problems.
        4) Effect of trenching on slope stability (neg. impacts on slope).
        5) Special backfill, special trenching requirements, or special supports that may be recommended.
        6) Erosion potential of soils around sewer near water courses.

7) Recommended corrections if an instability exists or may develop.

D. Installation of sewers in unrepaired slide areas is to be avoided.

1) If an acceptable gravity route is feasible around the unrepaired slide, the sewer must be installed around the slide.
2) If the only feasible gravity route is through a slide area, a complete study of the slide must be made by a Geotechnical Engineer. The Geotechnical Engineer must propose a solution which is satisfactory to the City Engineer. The normal solution is the repair of the slide.

E. The Geotechnical Report must furnish a map which shows existing creeks or swales which may convey water in the vicinity of any proposed sewer main alignments.

F. Sewers shall not be designed to be located in the bottom of swales or creeks.

G. For sewers which will be parallel to swales or creeks, the sewer must be designed far enough away from the drainageway to eliminate the possibility of future eroding around the sewer. A Geotechnical Engineer shall review the proposed alignment and furnish recommendations regarding long-term erosion potentials.

H. For sewers which cross creeks or swales, the crossing shall be as nearly perpendicular to the drainageway as feasible.

1) Bank and bottom protection shall be designed per the recommendation of a Geotechnical Engineer and shall be installed in the drainageway as part of the overhead or underground crossing.
2) The Geotechnical Report shall pay particular attention to designing adequate support foundations and protection for the foundation.

I. An access easement (minimum width of twenty feet (20')) shall be granted by the Developer from the nearest public street to the creek crossing structure along the route of the sewer main, if possible, for future maintenance.

J. The following design standards shall be used when designing sewers in hillside and/or creek areas:

1) Sewers to be installed across hillside slopes (generally parallel to contours) shall be ductile iron if the cross slope of the hill exceeds twenty-five percent (25%).
2) Sewers to be installed parallel to defined creeks shall be located no closer than twenty feet (20') from the top of the bank if the creek bank is defined; if not, no closer than thirty feet (30') from the center line of the creek, cad-welded with impressed cement.
3) Sewers to be installed parallel to defined creeks from 20-50 feet away from the top of the bank shall be ductile iron (no bedding), cad-welded with impressed cement.
4) Manholes are to be installed on either ends of creek crossings and shall be located no closer than twenty feet (20') from the top of the creek bank.

12. Pipe Selection.

    A. The following standards shall be used for the selection of pipe:
        1) Selection of pipe type, strength, and bedding requirements shall be subject to the City Engineer's approval. All selections shall be indicated on the Construction Plans.
        2) All pipe and pipe joints installed between structures shall be of the same size, type, class, and manufacturer.
        3) All pipe shall be laid to the depth, grade, and alignment as indicated on the approved plans and cut sheets.

    B. Joint Deflections. The deflection in the joint between any two (2) successive pipe sections shall not exceed the maximum deflection as recommended in writing by the pipe manufacturer. Minimum two (2) feet pipe lengths may be supplied and used to install short radius curves providing such installations conform with the joint deflection limitation specified herein. Deviations from standards and number of special couplings shall be shown on the Plans.

15. Sewers to be Installed in Existing Improved Roadways.

    A. Where sewers are being designed for installation in existing improved City roadways, the plans shall be submitted for the proposed work to the City Engineer for location and encroachment approval.

    B. The City approval shall be preceded by the following note: "The following acknowledged public agency has reviewed these Plans and hereby approves the location of the proposed work and agrees to issue all necessary encroachment permits."

16. Sewers to be Installed in or Across Utility or Railroad Rights-of-Way.

    A. Where sewers are to be constructed across or within utility or railroad rights-of-way requiring tunnels, bores, and/or special pipe, the special pipe shall extend the full length of the sewer line within the particular right-of-way. The minimum interior diameter of metal castings, when required, shall be eight (8) inches greater than the maximum outside diameter of the sewer pipe to be installed therein.

17. Plugs for Future Extensions. Where sewer lines are being constructed and expected to be extended in the future, an end cap or plug manufactured by the pipe supplier shall be installed.

18. Pressure Frame and Covers. Pressure (water tight) frames and covers shall be installed where drainage conditions may cause storm waters to inundate sewer structures.

19. Grease and Sand Traps/Grease Interceptors.

    A. All building connections through which liquid waste containing grease, oil, and/or sand may be introduced into City sewer system, shall have a grease and sand trap or grease interceptor installed as specified herein.

        1) Restaurants -- All restaurants and other establishments with common food preparation facilities shall have a grease interceptor. Standards for grease interceptors for restaurants are as follows:

a) The grease interceptor shall be located outside the building so that it is readily and easily accessible for cleaning and inspection.
b) The grease interceptor shall be sized pursuant to Engineering Standards.
c) All drains from the kitchen area shall be connected to the grease interceptor.
d) All restroom facilities shall be plumbed separately and connected to the building side sewer downstream of the grease interceptor.
e) The discharger shall adequately maintain the interceptor so that it is in proper working order at all times.
f) Where the distance from the interceptor to the sewer main is less than 100 feet, the restroom side sewer shall be connected directly to the sewer main.

2) Other Commercial Business -- All other commercial business, including service stations, car washes, and similar establishments as determined by the Public Works Department, shall have a grease and sand trap. The restrooms of such establishments shall be plumbed separately and connected to the building sewer downstream of the trap.

20. Special Structures. Trunk manholes positioned on sewer lines forty-five inches (45") in diameter or larger, metering manholes, siphons, sewage pumping systems, car wash racks, trailer dump stations, all above ground installations, and other unusual structures or features shall require specific design approval by the City Engineer. Force mains will not be allowed.

21. Swimming Pools. No person may discharge the contents of a swimming pool into a sewer without a permit from the Public Works Department. The City Engineer shall fix the terms and conditions of the permit. A swimming pool discharging into a City sewer shall be equipped with a two-inch (2") maximum diameter discharge pipe and an approved air gap separation to prevent the entry of sewage into the swimming pool or piping system. Discharge of water or waste from swimming pools to the sewer shall only be through pumping systems regulated to avoid surcharge at any portion of the sewer system. Only swimming pools with sand filters are allowed.

22. Upgrading. The City Engineer retains the right to require additional upgrading and sizing on all plans in accordance with the most recent Master Plan.

A. Sanitary sewer system design within a developing area must include provisions for size and capacity to adequately convey all domestic and industrial waste that can be reasonably anticipated under conditions of full ultimate development. Engineering calculations to support the sewer system design shall be submitted to the City Engineer for approval. The calculations shall include:

1) Map indicating service area within the sewer system including any future contributing development with projected lang use, zoning, and any physical features contributing to the sewer system design.
2) Sanitary sewer waste volumes either existing or proposed within the service area of the system.
3) Size and slope of each pipe between appurtenant structures.
4) Invert/RIM elevations of each pipe and appurtenant structure.

23. Additional Design Considerations.

A. Flow -- the design sanitary sewer flow shall be computed using the following formula:

QD = QP + I

Where QD = Design flow (gallons per day)

QP = Peak flow (residential only)

I = Infiltration

The peak flow (QP) for residential service areas is defined as three (3) times the average flow with the average flow for the service area being computed from two (2) basic assumptions:

1) 3½ persons per single family dwelling
2) 150 gallons per person per day

Acreage flow estimates for other than residential service areas are as follows:

	Avg. Flow (Gal/Acre/Day)	Peak Flow (Gal/Acre/Day)
Commercial areas	1600	4000
Light industrial areas	2500	4000
Heavy industrial areas	Sewage flow rate shall be considered on a case-by-case basis and may require special design.	

Infiltration and inflow (I & I) shall be computed by using 4000 gallons per inch-diameter-mile per day for sewer mains and laterals. Residential laterals shall be assumed to be a minimum of seventy-five feet (75') in length.

B. Pipe Capacity.

1) Manning's Formular [$Q = A (1.49/n) R^{2/3} S^{1/2}$] shall be used to determine pipe capacity. The "n" value shall be 0.013 or the pipe manufacturer's recommendation, whichever is greater.

2) All main sewers shall be sized to carry the design flow at capacities of 75% for pipes up to twelve inches (12") in diameter and 50% for pipes twelve inches (12") and greater in diameter.

Design capacities for trunk sewers twelve inches (12") and larger shall require approval by the City Engineer.

SECTION 6 -- WATER SYSTEM DESIGN STANDARDS

6.01 PURPOSE:

To provide guidelines for the design of water utilities projects and thereby reduce the time required for processing the plans. These guidelines do not include, but may reference, additional conditions which may be promulgated by all other pertinent ordinances, codes, and official policy set forth by the City Engineer or other government agency. These guidelines are intended to impose minimum acceptable design criteria. More stringent requirements may be imposed at the discretion of the City Engineer based on specific project conditions.

The City Engineer retains the right to require additional upgrading and sizing on all plans in accordance with the most recent Master Plan. All improvements including extensions, replacements, and repairs shall conform to the requirements of the National Board of Fire Underwriters, American Water Works Association Standards, American Canyon Administrative Regulations, the Code of the City of American Canyon, and these Engineering Standards.

It is the responsibility of the design engineer to initiate written requests for approval of any design concepts contrary to these criteria, to verify additional requirements imposed, perform any necessary calculations or studies, and resolve specific design problems with the appropriate agency, department, or division.

6.02 WATER SYSTEM:

A. Materials:

1. Service laterals shall be constructed per applicable City Engineering standards.
2. Eight inch (8") through twelve inch (12") water mains shall be polyvinyl chloride (PVC) C900, Class 200 minimum, or ductile iron pipe, C151, Class 50 minimum.
3. Fourteen inch (14") through eighteen inch (18") diameter water mains shall be ductile iron pipe.
4. Twenty inch (20") and larger water mains shall be wrapped steel pipe or ductile iron pipe.
5. Asbestos cement pipe shall not be allowed under **ANY** circumstances.
6. Ductile iron pipe must be polyethylene encased with 8ml polyethylene and taped with 10ml tape, cad-welded, and have approved cathodic protection (See Section 99-1.02).
7. Mains outside the paved roadway or crossing a delineated fault zone (See Section 99-1.02) must be ductile iron pipe.

B. Alignment:

1. Typical alignment shall be in accordance with the provisions of Engineering Standard Plan 7.14.
2. Public water mains outside the public street are not allowed.
3. Minimum allowable radius for eight-inch (8") diameter water mains is 250 feet and for twelve-inch (12") diameter water mains, 350 feet.
4. New mains must match the grade and centerline offset of existing water mains where possible.
5. Maintain a constant distance from centerline wherever possible.
6. Conform to the State of California Department of Health Services "Criteria for the Separation of Water Mains and Sanitary Sewers" and Engineering Standard Plan 7.14.

7. Install elastomeric material between pipes with one inch (1") or less vertical clearance.
8. Minimum horizontal separation from existing gas, electrical, and telephone lines shall be three feet (3') between pipes.
9. Minimum clear horizontal separation from a metallic pipeline with an induced current shall be five feet (5').
10. Minimum clear horizontal separation from a storm drain shall be five feet (5').
11. Location of lines in streets/right-of-ways shall be as illustrated in Engineering Standard Plan 7.14.

C. Size:

1. Water mains must be sized to meet minimum Fire Code requirements.
2. For residential installations, public and private mains shall be eight inches (8") minimum.
3. For commercial and industrial installations, looped system shall be a minimum of twelve inches (12") in diameter, a dead end system requires a minimum of twelve inch (12") diameter pipe.
4. The City Engineer may require increased pipe size for overall system benefit.

D. Cover:

1. Definition -- Cover is the distance from the top of the pipe to the finished grade.
2. Standard installation shall be in accordance with Standard Specifications, Section 7.00, "Water Line Construction Notes."
3. Where cover is greater than thirty-two inches (32") but less than the standard cover, Class 50 ductile iron pipe is required.
4. The minimum cover for all water main construction is forty-two inches (42").
5. Where cover exceeds eight feet (8'), special permission is required from the City Engineer.
6. Service laterals must have a minimum cover in accordance with the approved standards.

E. Connection to an Existing Main:

1. In most major streets or new streets, the new water main must be bored and jacked into place. Conditions should be verified with the City Engineer to be consistent with the Public Works Department's street cut policy.
2. For connection of two-inch (2") diameter pipes and smaller, use a hot tap.
3. For connections of pipes 4½" in diameter, a hot tap or cut-in tee may be done in conformance with the provisions of Engineering Standard Plan 6.11.
4. Cut-in tee must be used if additional valves are required on the existing main. If the new lateral is larger than the existing main, the tee shall be the size of the new lateral and reduced to the size of the existing main.
5. Size-on-size taps are allowed up to eight inches (8") in accordance with the approved standards.
6. Twelve inch (12") size-on-size taps are allowed only under emergency situations and with the specific approval of the City Engineer.
7. For hot taps, use power seal stainless steel Model #3490 with SS nuts and bolts or JCM 432 tapping sleeve with 304 SS nuts and bolts.

F. Valving:

1. Valving at intersections shall be in accordance with the provisions of Engineering Standard Plan 7.14.
2. Main line valves within 250 feet of an intersection may be considered as part of the intersection.
3. All hydrants must be on separately valved sections of the public main.
4. All valve connections shall be flanged.

G. Service Laterals and Water Meters:

1. The size of the water meter shall be determined by the Public Works Water Division using the current AWWA guidelines.
2. Maintain a minimum of five feet (5') separation from the sewer lateral.
3. Residential (single unit):

    a. One meter per lot.
    b. Individual one-inch (1") services, where practical, for 5/8" meter.
    c. One inch (1") service with 5/8" meter for lots greater than ½ acre.
    d. Where residential fire sprinklers are required, install individual one-inch (1") service for one-inch (1") meter.

4. Apartments (2-6 units):

    a. May be master-metered or each unit may be individually metered.
    b. Individual meters must be clustered and located within the public right-of-way.

5. Apartments (7 or more units) and Mobile Home Parks:

    a. Must be master-metered with the size based on the total demand.
    b. Separate irrigation meters are required.
    c. This may require a combination water service.
    d. Mobile home park owners may sub-meter to the tenants at their own expense.

6. Condominiums:

    a. May be master-metered or individually metered.
    b. Individual meters must be clustered and located within the public right-of-way.
    c. A maximum of six (6) meters per manifold as approved by the City Engineer.
    d. Separate irrigation meters for common areas are required.
    e. Combination of water services may be required.

7. Commercial:

    a. Size of the meter and service are based on calculations by the Water Department in accordance with AWWA standards.
    b. A separate irrigation meter is required.
    c. A minimum one-inch (1") service shall be required for office use.
    d. A minimum two-inch (2") service lateral for a shell building or light industrial if the lot is greater than ½ acre.

e. A minimum eight-inch (8") service for industrial lots and shopping centers on lots of one (1) acre or larger.
f. All commercial installations will require backflow prevention.

8. Combination Service:

a. Eight inch (8") laterals are the minimum required for most installations.
b. In every case, the lateral in the street must exceed the size of the required fire line.
c. Separate services for fire and domestic are required for commercial buildings.

9. Irrigation:

a. Separate irrigation meters must be provided for all commercial users, master-metered condominiums, PUD's, apartment complexes, and mobile home parks.
b. All irrigation services must have reduced pressure backflow devices.
c. Irrigation meter size shall be determined by the maximum flow required at any one control valve.
d. Sizing of irrigation meters shall be coordinated with the Public Works Department.
e. Backflow devices specified on the irrigation plan must conform to Engineering Standard Plan 7.13.

10. Private Fire Systems

a. Before combustible materials may be stored or constructed on site, all fire hydrants must be installed, activated, and the Fire Department must approve the fire flow. Before a fire hydrant may be placed in service, a high velocity flush of the fire hydrant shall be witnessed and approved by the Fire Department personnel.
b. Lateral size must be the same or larger than the size required for the sprinkler system or the private hydrant system.
c. Additional services will require upsizing of common laterals (combination service).
d. All private fire systems require double detector check assemblies in accordance with Engineering Standard Plan 7.08.
e. Fire Department connection location must be approved by Fire Department personnel.
f. The maximum length of a fire hydrant lateral from a private main to the hydrant bury is sixty feet (60').

H. Fire Hydrants:

1. Before combustible materials may be stored or constructed on site, all fire hydrants must be installed, activated, and the Fire Department must approve the fire flow. Before a fire hydrant may be placed in service, a high velocity flush of the fire hydrant shall be witnessed and approved by the Fire Department personnel.

2. Location of fire hydrants must be approved by the Fire Department.

3. Each hydrant must be on a separate valved main line section.

4. Whenever possible, locate hydrants at street intersections.

5. If it is not possible to locate at an intersection, locate the hydrant near a property line or where it will minimize interference with property use.

6. Locate hydrants a minimum of ten feet (10') from roll-down of driveways.

7. Residential areas:

   a. Space fire hydrants every a minimum of 500 feet or as approved by the Fire Marshall.
   b. Evenly distribute hydrants throughout the project.
   c. No building may be more than 250' from the nearest hydrant.
   d. Approximately one fire hydrant is needed for every two acres in a residential development.
   e. Commercial and industrial areas:

      1) General hydrant spacing shall be every 300 feet.
      2) Evenly distribute hydrants throughout the project.
      3) No building may be more than 150' from the nearest hydrant.

   f. Minimum fire flow required at all fire hydrants:

      1) Residential and commercial areas -- 1,500 gallons per minute with a 20PSI residual.
      2) Industrial areas -- 3,500 gallons per minute with a 20PSI residual or as approved by the Fire Marshall.
      3) Location of hydrants shall be at intersecting property lines where possible.

I. Backflow Devices:

1. Backflow devices are required to be installed by the State of California Title 17 and the City.

2. All backflow devices installed must be on the approved USC list.

3. Backflow assemblies must be installed as near as possible to the water meter as shown on Engineering Standard Plans 7.08 and 7.13.

4. Properties with private sewer lift stations must have reduced pressure backflow assemblies on their water systems.

5. All irrigation services require reduced pressure backflow assemblies.

J. Pressure:

1. Maximum allowable main line pressure is 80PSI measured at a fire hydrant.

2. Maximum allowable service pressure measured at a faucet is 80 PSI.

3. Minimum service pressure measured at a faucet is 35 PSI.

4. If the service pressure exceeds the maximum of 80 PSI, an individual pressure regulator will be required on the service line if the pressure booster station will be required on the service line.

5. Fire flows must be calculated in areas of low pressure.

6. For calculating pressures in high level zones, calculate the maximum pressure using the elevation of the bottom of the City's reservoir.

K. Specialty Items:

1. Air relief valves are required at locations in the system that are one pipe diameter or more higher than the remainder of the system, such as over a hilltop.

2. Pressure reducing valves are installed to maintain overall system balance.

3. Surge or pressure relief valves are installed where pressure could potentially reach above the maximum allowable.

L. Special Conditions:

1. The need for cathodic protection will be determined by the City Engineer for each project. This may require soils report or other additional information.

2. Delineated Fault Zone:

   a. Ductile iron pipe must be installed in delineated fault zones and extend to 100' outside each side of the delineated fault boundaries.
   b. Pumper connections or fire hydrants shall be installed approximately 50' outside each side of the delineated fault zone.
   c. Flextend assembly, as manufactured by EBAA Iron, Inc., of Eastland, Texas, or approved alternative, with valve, must be installed adjacent to and on the fault side of the pumper connection or fire hydrant.
   d. A valve must be located between the Flextend assembly and the fire hydrant or pumper connection.

3. Abandoned water mains and services:

   a. For lines one inch (1") or smaller, expose lateral at the main, close the corporation stop, disconnect the lateral, and plug or cap the corporation stop.
   b. For lines one-and-one-half inch (1½") or larger, remove the valve and plug the main.
   c. Valve boxes for abandoned valves must be removed.
   d. Abandoned mains, valves, and risers located within the street structural section must be removed.
   e. All water mains 12" and larger within the public right-of-way must be broken every 50' and filled with sand slurry.

4. Private water mains versus public water mains:

   a. Public water mains may not be constructed outside the street right-of-way.
   b. Fire hydrants required on-site to serve one lot will be private systems.
   c. Fire hydrants required on-site to serve two or more lots or properties will be public systems.

5. Water mains installed at a slope of 15% or greater shall be constructed with restrained joints.

6. Water mains installed outside of the paved roadway must be ductile iron pipe and shall have suitable access.

M. Calculation:

1. Hydraulic calculations shall be submitted to the City Engineer demonstrating that the fire flow and fire prevention requirements are satisfied. These shall include pipeline diagrams and tabulated results for easy reference.

2. Among the results presented shall be the maximum & minimum pressure, critical notes, water velocities, head loss inflows, and outflows.

N. Water System Improvement Plans -- These shall be submitted to the City Engineer for review and approval and shall contain at least:

1. Location and size of fire sprinkler service connections.

2. Location and size of domestic service connections.

3. Location and size of irrigation service connections.

4. Location of fire hydrants.

5. Location of structures with respect to existing public water system improvements, such as mains, meters, etc.

6. Alignment, profile, size, and material of new water mains.

7. Location, size, and material of any off-site water system improvements.

8. Relocation plan and details for any displaced transmission mains or other facilities.

9. Location and size of air reliefs.

10. Location, size, and type of blow-offs.

11. Location of check valve assemblies.

12. Current City of American Canyon water notes and standard drawings as applicable.

13. Location, size, and point of connection to existing water distribution system.

14. Location, size, and type of mainline valves.

O. Landscaping Plans -- These plans shall indicate location and size of all taps, irrigation meters, and backflow devices. Drought-resistant species selection is recommended for all landscaping plans.

P. Fees -- Water service will be provided by the City of American Canyon following completion of the required water system improvement and payment of applicable fees.

Q. Water Mains:

1. All material, workmanship, and construction details shall conform to the Engineering Standards, including all addenda, standard plan revisions, and special provisions.

2. Start excavation by exposing end of existing main to determine its line and grade. Start new main 8-10' from and on the same line and grade as the existing main. Pipe laying shall then be adjusted so the depth of the new main conforms to Note #3.

3. Minimum depth of cover from finished grade shall be 42'. Four-inch (4") and ten-inch (10") mains shall be resilient seat gate. Twelve-inch (12") and larger main line valves shall be butterfly valves.

4. No. 12 insulated copper wire shall be laid on the bottom of and along the entire length of all non-metallic mains and shall be extended to the surface at all valve locations, blow-offs, and meter boxes sufficiently for locator equipment to be attached. Fasten the wire to the center line at the bottom of the pipe so as not to be displaced by backfilling procedure. (See Engineering Standard Plan 7.11)

5. Mains to be constructed within ten feet (10') of sewer pipes require special installation and the design must be specifically approved by the City Engineer.

6. All trenching, backfill, and re-surfacing required for installation of water system facilities shall be per Engineering Standard Plans 4.01 and 4.02.

7. Only City personnel shall operate valves on existing water mains or water services.

8. Service laterals other than those shown or noted on the plans shall not be installed prior to obtaining Engineering approval.

9. Unless otherwise shown on the plans, one-inch (1") water service laterals shall be installed in residential developments and two-inch (2") water service laterals shall be installed in commercial developments.

10. Water and sewer service laterals shall be horizontally separated by a minimum of five feet (5').

11. At the location of each water service lateral, the letter "W" shall be inscribed into the face of the curb. The letter "W" shall be three inches (3") high and completely legible.

12. All copper water service tubing shall be in conformance with the latest AWWA standards as described in ANSI/AWWA C800 of the latest revision, and with ASTM B88 and shall be Type K soft temper tubing for 3/4", 1", and 2" tubing.

13. All meter boxes, vaults, and pits shall be bedded on 3" minimum thick, 3/4" drain rock, or other clean material with typical sand equivalent of

20 minimum, uncontaminated by native soil, against compacted or undisturbed base. The gravel bed shall extend to a four inch (4") minimum beyond all sides of the meter box. The box shall be set flush with the top of the curb, sidewalk, or ground.

14. Meter boxes shall be located out of traffic loading areas whenever possible.

15. Meter boxes and vaults shall be set so that the reading lids are aligned over the meter registers as closely as possible.

16. Unless otherwise approved by the City Engineer, the on-site water line shall be the same size as the water meter.

17. For services larger than one inch (1"), if either the water service lateral or the on-site building line is already existing within the tolerances specified on the Engineering Standard Plans, the last one installed shall be on the same line and grade as the existing one.

18. Items specified on the Standard Plans are approved for use by the City Engineer. All others shall be submitted to the City Engineer for approval.

19. Meter manifolds must be detailed and approved by the City Engineer. In general, manifolds where all fittings are two inches (2") or less, shall be constructed from threaded brass pipe and fittings from the end of the service lateral to the meter connection. No plastic pipe shall be used in constructing manifolds of any size. No more than six (6) meters may be manifolded off of a single water service lateral, with no more than three (3) on either side of the service.

20. Gaskets for flange fittings shall conform to AWWA Standard C115.

21. To abandon a water service, expose and turn-off corporation stop, then sever the lateral connection.

22. There shall be no unmetered connections to the City's water system, including connections bypassing meters for testing on-site plumbing or for obtaining construction water. Pressure testing against valves will not be allowed. When a subdivision water main has been accepted and tied-in, the individual curb stops will be locked off with cable ties. Cutting off or tampering with the cable ties will constitute a straight tie-in connection. Such connections will be severed by the Public Works Department and will result in penalties including payment of fines and estimated water usage fees.

23. The Contractor will install a two-inch (2") temporary reduced pressure check valve on the end of the existing main for construction water or apply for temporary water meter through the Public Works Department.

24. Before combustible materials may be stored or constructed on site, all fire hydrants must be installed, activated, and the Fire Department must approve the fire flow. Before a fire hydrant may be placed in service, a high velocity flush of the fire shall be witnessed and approved by Fire Department personnel. Under Fire Department supervision, the hydrant lateral is flushed until Fire Department personnel are satisfied that the lines are clear of debris.

25. Upon completion of construction, final connection will be made by the Contractor at the developer's expense under inspection by the City Engineer, unless otherwise specified on the plans.

26. When a connection is required to an existing water main, the Contractor shall provide all excavation, shoring, backfill, and trench re-surfacing per Engineering Standard Plans 4.01 and 4.02. Where the connection is to be a "hot tap," the Contractor shall provide and install the tapping valve and sleeve, and any other hardware required. No hot tap shall be made within two feet (2') of a joint (measured from joint to centerline or intersecting pipe). The joint shall be removed and the proposed hot tap shall be replaced with a "cut-in" tee. When a "cut-in" tee and valve(s) assembly is required on the plans, the Contractor shall provide and install the entire assembly (including valves) and any other hardware necessary and shall provide all other work and materials necessary to complete the installation to Engineering Standards.

27. The Contractor shall coordinate all water main connection work with the City Engineering Department (707-647-4360, ext. 153) and shall give notice in accordance with Construction Specifications, prior to commencing work.

28. After a street has been overlaid, all water valve boxes will be marked in blue paint before the close of that work day.

29. Within 48 hours of paving, all water valve boxes will be brought to grade and inspected.

R. Booster Pumps. Booster pump stations will not be permitted.

SECTION 7 -- STREET LIGHTING

7.01 GENERAL:

These specifications shall cover the design and installation of street lights and park trail lights.

The Consultant Engineer shall show the proposed street lighting system or park trail lighting system on the project improvement plans. The plans shall include the following items:

1. Location of electroliers.
2. Location of service point.
3. Location of pull boxes.
4. Intensity of luminaries.
5. Wire size and length.
6. Mounting height and arm length.

The Consultant shall submit two (2) copies of the street light plans to the City Engineer for preliminary review. The Consultant shall then obtain service locations and identification numbers from Pacific Gas & Electric Company (PG&E).

After the Consultant receives the service locations, he/she shall determine the wire size and length of each conduit run. These items may be shown in tabular form or denoted next to each conduit run on the plans. The cost for all PG&E services shall be paid for by the developer or contractor. This shall include the PG&E connection charge for energizing street lights.

7.02 DESIGN

A. Spacing, Intensity, and Mounting Heights

1) Street lights shall have the following maximum spacing, minimum intensity, and mounting heights according to the type of street they are to be installed on.

2) High pressure sodium bulbs shall be used for all street lights. Each bulb should have its own solar switch and each electrolier its own regulator ballast. Minimum wire size shall be #8 wire.

	Spacing (ft)	Luminare Wattage	Mounting Height (Ft-In)
Residential	200-250	70	31-6
Collector	200-250	100	31-6
Thoroughfare	175-185	200	36-6
Industrial	225-275	70	31-6
Park Trail	100-150	70	20-0

Variations to the aforementioned requirements may be approved on an individual basis by the City Engineer.

B. Pole Height and Arm Length.

All poles shall have a single arm except in median islands, where double arm poles shall be used. Type "A" pole height and arm length shall be as shown in the Caltrans Standard Plans ES-6J, ES-6K, ES-6L, ES-6M, and ES-6MA.

Type "B" pole height shall be as shown on American Canyon Engineering Standard Plan 8.02.

C. Location of Street Lights

1. Whenever possible, street lights shall be located on a property line.

2. On streets with meandering sidewalks, street lights shall be located at the front of the sidewalk where the front edge of the sidewalk if 4-6' from the back of the curb. The edge of the pole foundation shall meet the front of the sidewalk.

3. On streets with monolithic curbs, gutters, and sidewalks, street lights shall be located so that the front edge of the pole foundation is 4-6' from the back of the curb. The back edge of the pole foundation shall meet the back of the sidewalk.

4. Where there is only curb and gutter, the front of the street light foundation shall be located 4-6' from the back of the curb.

5. T intersections -- For collector and residential streets, a street light shall be located on the through street along the projected centerline of the intersecting street. For thoroughfares, a street light shall be located at each mid-radius point.

6. Cul-de-sacs -- A street light shall be located at the end of the bulb.

7. 4-way intersection/thoroughfares -- Street lights shall be located at all curb returns.

8. 4-way intersection/thoroughfares and collector streets -- Street lights shall be located at the far right curb returns of the major street in the direction of travel.

9. 4-way intersection/collector and residential streets -- A street light shall be located at one of the returns.

10. Electroliers will normally be staggered on opposite sides of the street. Electroliers shall be placed on the outer edge of curves.

D. Lighting Distribution Pattern

1. All street lighting shall be Type "A" -- Medium Asymmetric Distribution Lighting.

2. All park trail lighting shall be Type "B" -- Symmetric Distribution Lighting.

E. Pull Boxes

1. Pull boxes shall be spaced at a maximum of 200 feet.
2. One pull box shall be located next to neach Electrolier on all streets.
3. One pull box shall be located at each side of all street crossings, at or near the curb return.
4. Pull boxes shall be placed immediately behind the sidewalk in sidewalk areas or 4-6 feet behind the back of the curb in non-sidewalk areas.

SECTION 8 -- PREPARATION OF TRAFFIC STUDIES

8.01 INTRODUCTION

The purpose of this section is to provide a general guide to applicants and/or consulting engineers assessing the potential traffic impacts of new developments proposed within the City or which may result from related changes in zoning and General Plan amendments. The following guidelines have been developed to provide for clear, orderly, and consistent analysis by establishing minimum standards for all traffic impact studies and reports. The Public Works Department will review the traffic studies based on these criteria herein and reject those which are incomplete or inaccurate.

For the purposes of the traffic studies, all land at one location, including existing development or available land for building development under common ownership or control by an applicant, shall be considered when determining if required criteria are met. An applicant shall not avoid the intent of this criteria by submitting partial or segmented applications or approval requests for building permits, development plans, subdivisions, etc. The phrase "at one location" means all adjacent land of the applicant, the property lines of which are contiguous or nearly contiguous at any point, or separated by other land of the applicant, or a public or private street, road, highway, or utility right-of-way or other public or private right-of-way.

8.02 TRAFFIC STUDY ANALYSIS

The traffic study shall identify and analyze all the impacts to the operational conditions of the transportation facilities in the project area in accordance with the 1985 Highway Capacity Manual (HCM). The Operational Methodology of the HCM shall be used for signalized intersections. Signal timings for City signals will be provided by the City. Signal timings for Caltrans-maintained signals shall be provided by Caltrans. Analysis of the following conditions are required: existing; existing plus proposed project; and cumulative plus project conditions. Traffic impact shall be analyzed in terms of acceptable procedures for trip generation, trip distribution, and traffic assignment.

Operational conditions to be considered include, but are not limited to:

- Geometric characteristics of public streets and highways
- Travel patterns and circulation of vehicles, pedestrians, etc.
- Traffic volume and traffic composition
- Traffic control devices
- User progression and user delay
- Transit facilities, routes, and regulations
- On-site parking, parking facilities, and regulations
- Bicycle facilities, routes, and regulations

A cross-section(s) of the street(s) which access to or egress from the proposed project must be included and show all pavement dimensions. In addition, the study shall include a plan view of the streets in the study area from which sight distances can be calculated, the location of surrounding driveways, and the location and description of unusual features that may pose unusual traffic circulation or pedestrian problems.

Data for existing traffic conditions shall be acquired by the applicant using their own resources. Data shall include morning and evening turning movement counts. Daily traffic volumes may also be required for all roadways in the project area. Turning movement counts shall be collected from 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. at 15-minute intervals.

Traffic counts for weekends or other time periods shall be required if the peak hour does not occur on an average weekday. The applicant shall check with the City Engineer to determine if weekend counts are required. Data shall not be collected on holidays, days immediately prior to/after holidays, or during the last two weeks in December.

Traffic counts shall not be used if more than two (2) years old. The use of counts greater than one (1) year old must be approved by the City Engineer. If available, Caltrans or City traffic counts may be used but they must be adjusted to reflect current year traffic volumes and patterns.

The applicant is required to recommend land use and/or appropriate traffic engineering modifications which will mitigate the operational impacts identified by the study and maintain an acceptable level of service on adjacent roadways, intersections, transit, and parking facilities. These may include:

Roadway Improvement

- Optimize location of access point(s) with respect to sight distance
- Addition of through traffic lane(s), right turn lane(s), and left turn lane(s)
- Improvement of sight distances at intersections and driveways to acceptable standards
- Provide grade separation of facilities

Traffic Control Modification (warrants must be met)

- Provide for yield or stop control
- Provide for traffic signal control, including new installation and upgrading and/or modifying phasing of existing signal
- Provide channelized islands
- Restrict turns
- Other engineering improvements

Transit Facilities

- Provide bus turn-outs, park-and-ride lots, bus stops, bicycle and/or pedestrian trails

Parking Facilities

- Design parking facilities to allow free flow access to and from the street
- Provide adequate off-street parking

Bicycle and Pedestrian Circulation

- Provide for access to, from, and through development for bicyclists and pedestrians
- Recommend designating bicycle paths, lanes, and facilities

Land Use Controls

- Reduce density
- Alter proposed land use

TDM

- Flexible working hours
- Institute preferential parking for carpools
- Encourage employees to use carpools and public transportation

8.03 PRESENTATION AND RESULTS OF TRAFFIC STUDIES

Though the extent and content of Traffic Study reports will vary with the needs of the projects being studied, certain guidelines are applicable to all such reports. The following information, when appropriate, shall be included in the report:

- Cover sheet (include name and location of project, developer, engineer, and date)
- Engineer's stamp and wet signature
- Table of Contents
- Scope and Purpose
- Description of proposed development
    - Type of development
    - Size of development
    - Location map, including major streets and study intersections
    - Site plan, including proposed driveways, streets, parking facilities, and internal circulation for vehicles, bicyclists, and pedestrians
    - Quantify traffic generation; if multiple sources exist, provide comparison and use most conservative.
- Setting
    - Describe existing roadway system within project site and surrounding area
    - Describe location and routes of nearest public transit system serving the project
    - Describe location and routes of nearest bicycle facilities serving the project
- Trip Distribution -- Review with the City Engineer for prior approval and provide figure
- Summary of Existing Conditions:
    - Map of study area with ADT of major streets
    - Map of study area with weekday and weekend (if applicable) peak hour turning movements
    - Table of existing AM, PM, and weekend (if applicable) peak hour levels of service
    - Collision diagram; accident rate analysis
    - Signal warrants
- Summary of Existing Plus Project Conditions:
    - Table and/or diagram of trip distribution and assignment
    - Table of trip generation for project
    - Map of study area with weekday and weekend (if applicable) peak hour turning movements (differentiate between existing and project volumes)
    - Table of AM, PM, and weekend (if applicable) peak hour level of service
    - Signal warrants
    - Impacts to CMP network, if applicable
- Summary of Cummulative Plus Project Conditions:
    - Table of cummulative projects
    - Map showing location of cummulative projects (use location map)
    - Table of trip generation for cummulative projects

- Table and/or diagram of trip distribution and assignment
- Map of study area with weekday and weekend (if applicable) peak hour turning movements (differentiate between existing project and cumulative volumes)
- Table of AM, PM, and weekend (if applicable) peak hour levels of service
- Signal warrants
- Impacts to CMP network, if applicable

- Findings and Recommended Mitigation Measures

  - Summary table of AM, PM, and weekend (if applicable) peak hour levels of service
  - Findings for no project impacts
  - Findings for project impacts
  - Findings for cumulative impacts
  - Mitigation measures for project impacts
  - Mitigation measures for cumulative impacts
  - Financing of mitigation measures; project's pro rata costs
  - Scheduling of mitigation measures
  - Implementation responsibility
  - Deficiency plan, if applicable

- Appendices

  - All supporting data
  - Analysis methods, worksheets, and calculations
  - Computer printouts
  - MINUTP disk and printout of CMP impacts, if applicable

TABLE OF CONTENTS

ENGINEERING STANDARD SPECIFICATIONS

MODIFICATIONS AND REVISIONS TO THE STANDARD SPECIFICATIONS

Introduction:

Only those subsections which are modified or revised will be noted herein. The State Standard Specifications numbering sequence will be followed.

Subsections to be modified will be noted as "(Subsection Number) (Title)" followed by the modifications or additional requirements. In case of conflict between the State Standard Specifications and the modification, the modification shall apply.

Subsections to be deleted without modification will be noted as "(Subsection Number) (Title) (Deleted)".

Subsections which are completely revised will be noted as "(Subsection Number) (Title) (The following shall apply in lieu of Section _____)".

An additional section titled "Water Main Construction" has been included to facilitate use of these specifications.

The City Engineer, from time to time, may revise any and all engineering design standards, plans, specifications, and procedures contained within the Standards. The contractor, developer, builder, etc., has the responsibility to ensure they have the latest revisions to these engineering design standards, plans, specifications, and procedures.

SECTION 1 -- DEFINITIONS & TERMS

1-1.01 General. Whenever in these specifications or in any documents or instruments where these specifications govern, the following terms, abbreviations, or definitions are used. The intent and meaning shall be interpreted as provided in this section.

1-1.02 Abbreviations

ACI
ASA
ASCE
Fed. Spec.
IAPMO

1-1.083 City - The City of American Canyon.

1-1.084 City Engineer - The City Engineer of the City of American Canyon.

1-1.13 Department - The Public Works Department.

1-1.15 Director - The Director of Public Works, City Engineer, or authorized agent.

1-1.18 Engineer - The Director of Public Works, City Engineer, or his authorized agent; such agents acting within the scope of the particular duties delegated to them.

1-1.25 Laboratory - Qualified laboratory as may be authorized by the City Engineer to test materials and work involved in the contract.

1-1.29 Plans - The official project plans and standard plans, profiles, typical cross sections, working drawings and supplemental drawings, or reproductions therof approved by the City Engineer, which show the location, character, dimensions, and details of the work to be performed. All such documents are to be considered as a part of the plans whether or not reproduced in the special provisions.

In the above definition, the following terms are defined as follows:

(a) Engineering Standard Plans - The Engineering Standard Plans of the City of American Canyon.

(b) Project Plans - The Project Plans are specific details and dimensions peculiar to the work and are supplemented by the Engineering Standard Plans and Specifications insofar as the same may apply.

SECTION 16 -- CLEARING AND GRUBBING

16-1.01 Description (The following shall apply in lieu of Section 16-1.01). This work shall consist of removing all objectionable material within the limits shown on the plans and as directed by the City Engineer. Clearing and grubbing shall be performed in advance of grading operations and in accordance with the requirements of these specifications.

16-1.02 Preservation of Property. All existing street designation and traffic control signs and posts within the aforementioned limits of work shall be carefully removed, cleaned of excess earth, and delivered to the City Corporation Yard at West American Canyon Road, except those required for traffic control as determined by the City Engineer.

16-1.03 Construction. The area to be cleared and grubbed shall be the area shown on the plans, unless otherwise specified in the Special Provisions.

All stumps, large roots, and other objectionable material shall be removed to a depth of 3 feet below finished grade in the area between curbs, and to a depth of 12 inches below finished grade in the area between curb and property line. The resulting spaces shall be back-filled with suitable material placed and compacted in accordance with the applicable provisions of Section 19-6.02.

Where roots of existing trees are to be pruned, the following procedure shall be followed:

a. All tools shall be clean, sharp, in proper working order, and shall be checked for safety before each job.
b. All roots pruned shall be cut as smooth as possible with the least amount of surface wood exposed or at a 90-degree angle to the root end cut.
c. All root cuts made over one (1) inch in diameter shall be painted to seal with an approved type of tree seal paint.

16-1.04 Removal and Disposal of Materials. Combustible debris shall be disposed of away from the work site. Burning of materials within the limits of the project will not be allowed.

SECTION 19 -- EARTHWORK

19-1.01 Description. Unsuitable material may be removed and replaced, or may be stabilized in accordance with the provisions of Section 19-2.02, "Unsuitable Material."

19-1.03 Grade Tolerance. Immediately prior to placing subsequent layers of material thereon, the grading plane shall conform to one of the following:

a. When asphalt concrete base is to be placed on the grading plane, the grading plane shall not vary more than 0.05 feet above or below the grade established by the City Engineer.
b. When aggregate sub-base or aggregate base are to be placed on the grading plane, the grading plane shall not vary more than 0.05 feet above or 0.1 feet below the grade established by the City Engineer.

19-2.02 Unsuitable Material (The following shall apply in lieu of Section 19-2.02.) Material below the natural ground surface in embankment areas, and basement material below the grading plane in excavation areas, that is determined by the City Engineer to be unsuitable for the planned use, shall be excavated and disposed of or stabilized as directed or approved by the City Engineer.

The removal and disposal of such unsuitable material will be paid for as roadway excavation for the quantities involved.

When unsuitable material is removed and disposed of, the resulting space shall be filled with material suitable for the planned use. Such suitable material shall be placed and compacted in layers as hereinafter specified for constructing embankments.

Stabilization of unsuitable material shall comply with the following provisions:

a. Unsuitable material may be processed in place, may be excavated and placed on the grade or other locations suitable for further processing, or may be partially excavated and partially processed in place.

b. Processing may consist of drying to provide a stable replacement material. Hydrated lime or granular quicklime treatment is not allowed anywhere within the public right-of-way.

c. Stabilized material shall be placed and compacted in layers as hereinafter specified for constructing embankments.

Excavations of material to be stabilized will be paid for at the contract unit price for roadway excavation. Such unit price shall include full payment for all work required to stabilize the unsuitable material.

19-2.08 Measurement. Earthwork operations measured and paid for as roadway excavation for the quantities of material involved shall include excavating unsuitable materials when directed by the City Engineer.

19-2.09 Payment. Payment for roadway excavation shall be in accordance with Sec. 19-2.09 except that overhaul shall not apply and that excess material from excavation which is not used for embankment construction shall become the property of the Contractor and shall be disposed of by him at his expense.

19-3.06 Structure Backfill. Specifications for pipe bedding, trench backfill, and surfacing shall be as shown on Engineering Standard Plan 4.01 "Trench Excavation and Backfill."

Except for structure backfill placed at specific locations described and enumerated in Section 19-3.06, structure backfill material specifications and compaction requirements shall be as follows:

Structure backfill shall have a Sand Equivalent value of not less than 30 and shall conform to the following grading:

Sieve Sizes	Percentage Passing
3"	100
No. 4	40-100

Structure backfill shall be compacted to not less than 90% relative compaction, except that when placed under any road bed, relative compaction shall be not less than 95% within 3 feet of finished grade, as determined by ASTM 1557.

19-5.03 Relative Compaction (95% -- ASTM 1557; the following shall apply in lieu of Sec. 19-5.03.) Relative compaction of not less than 95% shall be obtained for a minimum depth of 0.5-foot below the grading plane for the full width of the traveled way plus 3 feet on each side thereof, whether in excavation or in embankment.

Any area of the sub-grade determined by the City Engineer to be unstable, as evidenced by excessive deflection under the movement of equipment, shall be brought to satisfactory stability by additional rolling, re-working, removal, and replacement of unsuitable material, as directed by the City Engineer.

Relative compaction of not less than 95% shall be obtained for embankment under bridge and retaining wall footings without pile foundations within the limits established by incline planes sloping 1.5:1 out and down from lines one (1) foot outside the bottom edges of the footing.

19-5.04 Relative Compaction. (90% -- ASTM 1557; The following shall apply in lieu of Section 19-5.04.)

Relative compaction of not less than 90% shall be obtained in all materials except as specified herein to be 95%. Material placed in accordance with the provisions of Section 19-2.02, "Unsuitable Material" shall be compacted to not less than 90% relative compaction, or as may be otherwise specified in the contract plans, or in the Engineering Standard Plans and Specifications.

SECTION 26 -- AGGREGATE BASES

26-1.01 Description. Aggregate base shall be Class 2 and the combined aggregate shall conform to either of the gradings specified in Sec. 26-1.02A, "Class 2 Aggregate Base."

26-1.02A Class 2 Aggregate Base. Quality requirements: The minimum sand equivalent value shall be 31 for any individual test.

26-1.05 Compacting. The surface of the finished aggregate base shall be firm and unyielding. Any visible movement vertically or horizontally of the aggregate base under the action of construction equipment or other maximum legal axle loads shall be considered as evidence that the aggregate base does not meet this requirement.

SECTION 39 -- ASPHALT CONCRETE

39-1.01 Description. A minimum of two weeks prior to the placement of any Asphalt Concrete, the Contractor shall notify the Materials Laboratory of which asphalt plant will be used to supply the mix. For any job, Asphalt Concrete shall be supplied from a single plant.

39-2.01 Asphalts. Asphalt binder to be mixed with aggregate for Asphalt Concrete surface, leveling, or Open Graded courses shall be AR-4000 grade paving asphalt.

Asphalt binder to be mixed with aggregate for Asphalt Concrete Base shall be AR-8000 grade paving asphalt.

39-2.02 Aggregate. The aggregate grading of the various types of Asphalt Concrete shall conform to one of the following as directed by the City Engineer:

Surface Course	Type A -- 1/2" maximum, medium or coarse or 3/4" maximum, coarse
Leveling Course	Type A -- 3/4" maximum, medium
Asphalt Concrete Base	Type A or B -- 3/4" maximum, medium
Open Graded	3/8" maximum

39-3.03 Asphalt Content.

1. In no case shall the minimum asphalt content be below 5.3% of the dry aggregate weight.

2. All surface courses of asphalt concrete shall have 1/2" maximum aggregate and a minimum of 5.8% asphalt.

39-4.01 Grade Tolerance. The sub-grade to receive Asphalt Concrete or Asphalt Concrete Base immediately prior to applying prime coat, shall not vary more than 0.05 foot above or below the grade established by the City Engineer.

39-4.02 Prime Coat and Tack Coat. Prime coat shall consist of either SC-70 or MC-70 grade liquid asphalt as directed by the City Engineer and shall be furnished and applied in accordance with the provisions in Section 93, "Liquid Asphalts." Application shall be made when the surface is dry or but slightly damp, and when the air temperature in the shade is above fifty (50) degrees Fahrenheit, unless otherwise permitted by the City Engineer. When approved by the City Engineer, additional thickness of Asphalt Concrete (AC) may be substituted for the prime coat. An additional 0.04 foot would be required if the design thickness of AC is less than 0.25 foot and an additional 0.02 foot if the design thickness of AC is 0.25 foot or greater.

Following application of the prime coat, at least twenty-four (24) hours shall elapse before placing Asphalt Concrete. Any excess asphalt primer shall be blotted up with sand and removed from the grade.

Tack coat shall be diluted SS1 or CSS1, or undiluted RS-1 or CRS-1 type asphalt emulsion.

39-5.00 Hauling Vehicles. Prior to loading Asphalt Concrete, the bed of the haul vehicle shall be clean and free from all soil, sand, gravel, and other deleterious substances.

All haul vehicles shall be equipped with tarps which are in working order. Tarps shall be used on haul vehicles unless prior approval is obtained from the Materials Laboratory.

When spraying diesel or other parting agents in the bed of the haul vehicle, the minimum amount necessary to moisten the surface shall be used. In no instance will the parting agent be allowed to accumulate in the bed of the vehicle.

39-5.01 Spreading Equipment. The Asphalt Concrete shall be deposited from the haul vehicle into the hopper of the paving machine.

The practice of depositing the material on the road bed in a windrow and subsequently using a pick-up machine to deposit the material in the hopper of the asphalt paver will not be allowed.

39-5.02 Compacting Equipment. Compaction rollers shall be either 2-axle steel-tired rollers, pneumatic-tired rollers, or approved double-drum vibratory rollers. Steel-tired static compaction rollers shall weigh not less than 12 tons.

Double-drum vibratory rollers shall be operated at a maximum speed of 135-feet per minute (approximately 1.5 mph). Double drum-vibratory rollers shall have a minimum frequency of 2400 VPM and the amplitude shall be field-adjustable.

All pneumatic-tired rollers shall be equipped with an approved windskirt unless otherwise permitted by the City Engineer. Pneumatic-tired rollers used for compaction of Asphalt Concrete Base shall be so equipped that the air pressure in all tires may be regulated uniformly by the operator while the roller is in motion.

Finish rollers shall be 2-axle steel-tired tandem rollers weighing not less than 8 tons.

39-6.01 General Requirements. Asphalt Concrete shall not be placed on any road bed until all utility construction beneath the road bed has been completed, sewer, and water lines have been tested, and water lines chlorinated. The surface source of Asphalt Concrete shall not be placed until final utility connections have been made.

Asphalt Concrete shall not be placed after thirty (30) minutes before sunset, as established by weather bureau.

Asphalt Concrete or Asphalt Concrete Base shall not be placed during rainy weather or on a wet surface. Asphalt Concrete shall not be placed when the atmospheric temperature is below fifty (50) degrees Fahrenheit or conditions indicate it will drop below fifty (50) degrees Fahrenheit before the material can be satisfactorily compacted. Asphalt Concrete Base shall not be placed when the atmospheric temperature is below forty (40) degrees Fahrenheit or conditions indicate it will drop below forty (40) degrees Fahrenheit before the material can be satisfactorily compacted. Material which can not be placed in compliance with these requirements shall be rejected.

The compacted thickness of Asphalt Concrete layers shall be as directed by the City Engineer. The normal minimum and maximum compacted lift thickness for Asphalt Concrete surfacing are 0.17' and 0.25' respectively. The normal minimum and maximum compacted lift thickness for Asphalt Concrete surfacing are 0.17' and 0.25' respectively. The normal minimum and maximum compacted lift thickness for Asphalt Concrete Base are 0.25' and 0.50' respectively.

39-6.03 Compacting. The temperature of the Asphalt Concrete shall be specified by the City Engineer. Unless lower temperatures are specified by the City Engineer, all mixtures shall be spread, and the first coverage of initial or breakdown compaction shall be performed, when the temperature of the mixture is not less than 250 degrees Fahrenheit at mid-depth, and all breakdown compaction shall be completed before the temperature of the mixture drops below 200 degrees Fahrenheit at mid-depth. Additional rolling equipment shall be required or the rate of spread shall be reduced to permit compliance with this requirement.

A. Asphalt Concrete surface course and leveling courses.

1. Equipment Required: If production in any one hour exceeds the limits set forth below, the Contractor shall cease his paving operation until additional rolling equipment has arrived on the project.

a. 125 tons per hour or more -- The Contractor will be required to furnish a minimum of two (2) approved double-drum vibratory rollers and one (1) 8-ton tandem finish roller for each asphalt paver, with a separate operator for each roller.

A pneumatic roller may be substituted for one of the vibratory rollers if approved by the City Engineer.

b. 50-125 tons per hour -- The required minimum rolling equipment specified above may be reduced to one approved double-drum, vibratory roller and one (1) 8-ton tandem roller for each asphalt payer, with a separate operator for each roller when the compacted thickness is not less than 0.17'.

c. 50 tons, or less, per hour, at any location -- The required minimum rolling equipment specified above may be reduced to one approved, double-drum, vibratory roller, weighing not more than 12 tons, for each paving machine.

2. Compaction Requirements: Compaction rolling shall consist of a minimum of four (4) complete vibratory coverages with an approved double-drum vibratory roller.

   Finish rolling shall consist of one or more coverages with an 8-ton tandem roller immediately following completion of compaction rolling.

B. Asphalt Concrete Base:

1. Equipment Required: The Contractor shall be required to furnish one approved double-drum vibratory roller and a minimum of one pneumatic-tired roller, with a separate operator for each roller.

2. Compaction Requirements: Compaction rolling shall consist of a minimum of two (2) complete vibratory coverages with an approved, double-drum, vibratory roller and two (2) complete coverages with a pneumatic-tired roller. The order of rolling shall be specified by the City Engineer.

   Final rolling shall consist of one (1) coverage with the vibratory units turned off.

   Approval of vibratory rollers: The City Engineer may approve initial use of a double-drum, vibratory roller not previously approved on the basis of tests of other agencies or other information provided by the Contractor.

   Approval for subsequent use of the roller shall be based on cores taken from test sections designated by the City Engineer and compacted with different numbers of coverages.

   Test sections shall be compacted under the following conditions:

   1. Asphalt Concrete temperature at mid-depth shall be between 270 and 280 degrees Fahrenheit at the beginning of rolling. Rolling shall not continue after the mix temperature has dropped to 200 degrees Fahrenheit. The compacted thickness shall be between 2" and 3.5".

   2. The Contractor or manufacturer's representative shall specify the operating conditions of frequency and amplitude.

   The basis for approval shall be the attainment of 97% relative compaction and satisfactory surface condition following final rolling. The number of coverages required shall be the minimum number required to obtain 97% relative compaction.

   The mix will be sampled during paving of the test sections, and the test maximum density will be the average density of specimens compacted in accordance with California Test 304. The in-place density for each test section shall be the average of three (3) core densities. Relative density will be the ratio of in-place density to test maximum density.

39-8.01 Measurement. Asphalt Concrete and Asphalt Concrete Base will be measured horizontally to determine square footage.

39-8.02 Payment. Payment is made for asphalt pavements at the contract unit price per square foot. This price includes full compensation for subgrade preparation, furnishing and placing all materials, labor, equipment, and incidentals including headers, tack coats, and saw cutting joints.

39-9.00 Deep Strength (or Deep Lift) Asphalt Concrete

39-9.01 Description. Where deep strength is specified, it shall be placed on a previously prepared sub-grade as specified in Section 19-5.03 (Relative Compaction) to a tolerance of 0.05 foot above or below the sub-grade established by the City Engineer.

39-9.02 Grades. The final grade of the lift below the surfacing course shall not vary more than 0.05 foot above or below the planned grade for that course. The finished surface grade tolerance shall conform to Section 39-6.03 of the Engineering Standards "Compacting."

39-9.03 Thickness. The thickness of the surface course shall be as specified in the Special Provisions; all other asphalt concrete below this point is considered base course.

39-9.04 Tack Coat. Tack coat paint binder shall be a penetration-type emulsion RS-1 conforming to Section 94 of the Standard Specifications. Tack Coating as covered in Section 39-4.02, Paragraph 6, of the Engineering Standards will be required before placement of the surface course. Tacking between base courses is required at the rate of 0.01-0.03 gallons per square yard. Application in excess of .03 gallons per square yard will be at Contractor's expense.

39-9.05 Where deep strength sections are placed in existing streets with established gutter sections, a continuous wedge shape section of asphalt paving shall be placed against the gutter edge, held below the gutter lip by the amount of the thickness of the surface course, and feathered to sub-grade in a width of not less than three (3) feet before placement of the level course, unless otherwise permitted by the City Engineer.

39-9.06 Upon completion of all portions of the construction, the surface course shall be placed for the entire length of the project to provide a smooth uniform riding surface with a minimum of transverse joints.

Paving shall feather smoothly into existing pavement. Side street construction shall have a section varying from a uniform cross-slope at ends of curb return to variable or parabolic section as required to match the existing street section. Transition shall be smooth and uniform between the points described above.

39-9.07 Material. Asphalt concrete shall be Type B and shall conform to the provisions of Section 39 of the Standard Specifications.The viscosity grade of paving asphalt shall be AR-4000; aggregate shall be three fourths inch (3/4") maximum, medium grading with a minimum of 5.3% asphalt by weight.

39-9.08 Placement and Compaction. The maximum compacted thickness of any one base course of asphalt concrete shall be three inches (3"), the maximum compacted thickness of the surface course of asphalt concrete shall be two inches (2"), and the minimum thickness shall be one inch (1"). Minimum compacted base course shall be two inches (2").

An automatic self-propelled paving machine shall be required for spreading the surface course and any leveling courses required. Machine shall be equipped with a functioning ski to control automatic leveling and lift thickness.

In lieu of the conflicting provisions of Section 39-6.00 of the Standard Specifications, asphalt concrete base courses may be spread and compacted by such mechanical means as will provide a surfacing of uniform smoothness and textured in such a manner as to prevent segregation of materials.

Rolling of the deep lift base courses shall be from the center of the paving pass to the edge.

The Contractor shall use either 10-ton steel wheel tandem roller or a 15-ton pneumatic tired roller.

Tire pressure of the pneumatic tire roller at the time of breakdown rolling shall be 90 PSI unless a lesser tire pressure is permitted by the City Engineer. It is suggested that the pneumatic tire roller have twenty inch (20") rims to help prevent boiling down.

The pneumatic tire roller shall be used to break down the spread on asphalt concrete base and shall operate immediately behind the paver or spreader.

All mixtures shall be spread at a temperature of not less than 250 degrees Fahrenheit . Base material compaction shall be completed before the mix reaches 200° Fahrenheit. There shall be a minimum of twelve (12) hours elapsed time between the placing of successive course in any area.

Roller tires shall be pre-heated and operated hot and dry or have proper spray equipment for use of Roller-Ease to prevent pick-up of hot mix.

Rolling shall continue until ruts are eliminated and the proper degree of compaction is achieved. Final rolling of the surface course shall be accomplished with a steel wheel tandem roller.

39-9.09 Testing

a. The compacted density of each layer of asphalt concrete placed will be tested. Minimum field compaction shall be 95% of maximum laboratory density based upon California Test Method 304. The Contractor shall furnish a certified copy of the above test prior to placing asphalt concrete for the asphalt concrete mix to be used on project along with plotted stability curve with at least one (1) point plot each side of figure established by California Test Method 304. The City Engineer may adjust percent of asphalt based upon curve submitted.

b. Compaction tests shall be made on the asphalt base and surface course while the asphalt concrete is still hot enough to allow compaction to the required densities. All associated costs related to a test failure shall be borne by the Contractor.

c. The Contractor shall be responsible for requesting testing with a minimum notice of 24 hours.

SECTION 63 -- CAST-IN-PLACE CONCRETE PIPE

63-1.02 Materials. Consistency of the concrete shall be determined in accordance with ASTM C-143. Maximum slump shall be two inches (2").

63-1.05A Structures. Where shown on the plans, inlet and outlet structures shall be constructed or installed in connection with cast-in-place concrete pipe. Where such structures are constructed or installed, the ends of pipes shall be placed flush or cut off flush with the structure face, unless otherwise directed by the City Engineer.

A starter section shall be used at the beginning of each run of cast-in-place concrete pipe, and a closing section shall be used where a run can not be completed because of lack of clearance ahead in the trench. Starter sections shall be six feet in length and of the same inside diameter as the cast-in-place concrete pipe. Manhole bases may be formed by opening and troweling the cast-in-place concrete pipe on continuous runs.

Storm drain manholes shall be standard four (4') or five foot (5') diameter precast manholes as detailed in the Engineering Standard Plans. Storm drain manhole barrels and taper sections shall be precast concrete sections using Type II Portland Cement complying with ASTM C-150.

Catch basins shall be constructed as shown in the Engineering Standard Plans. Concrete for cast-in-place catch basins shall be Class A. Bar reinforcing steel shall conform to and be placed in accordance with the provisions of Section 52 of the Standard Specifications.

Connections to existing storm drain structures shall be made with care to avoid unnecessary damage to any existing curb and gutter or sidewalk. Any damaged section of curb and gutter or sidewalk shall be removed and replaced in accordance with the Engineering Standard Plans and Specifications and as approved by the City Engineer. Pipe connections to the existing structures shall be sealed with cement mortar.

NOTE: No backfill shall be placed until 7-day break confirms concrete strength.

SECTION 64 -- ASBESTOS CEMENT PIPE

Asbestos cement pipe is not authorized for use within the City of American Canyon or service area.

SECTION 65 -- REINFORCED CONCRETE PIPE

65-1.01 Description. Reinforced concrete pipe shall be either Class III, Class IV, or Class V, as shown on the plans and shall conform to the provisions of ASTM C-76.

65-1.03 Earthwork. Excavation and backfill shall be as shown on Engineering Standard Plan 4.02 "Trench Excavation and Backfill."

65-1.04 Structures. Storm drain manholes shall be standard four foot (4') or five foot (5') diameter precast manholes as detailed in the Engineering Standard Plans. Storm drain manhole barrels and taper sections shall be precast concrete sections using Type II Portland Cement complying with ASTM C-150.

Catch basins shall be constructed as shown in the Engineering Standard Plans. Concrete for cast-in-place catch basins shall be Class A Bar reinforcing steel shall conform to and be placed in accordance with the provisions of Section 52 of the Standard Specifications.

Connections to existing storm drain structures shall be made with care to avoid unnecessary damage to any existing curb and gutter or sidewalk. Any damaged section will be removed and replaced in accordance with Engineering Standard Plans and Specifications and as approved by the City Engineer. Pipe connections to the existing structures shall be sealed with cement mortar.

65-1.07 Laying Culvert Pipe. No pipe shall be laid which is cracked, checked, spalled, or damaged and which, in the opinion of the City Engineer, is unsuitable for use.

65-1.09 Measurement. (Paragraph 4 deleted)

65-1.10 Payment. (Paragraph 3 deleted; the following shall apply in lieu of Para. 3)

The above prices and payments shall included full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing different sizes and classes of pipe including excavation, backfill, disposal of excess material, and connecting new pipe to existing facilities, complete in place, and replacement of any damaged curb and gutter or sidewalk, as shown on the plans and as specified in these specifications and the Special Provisions and as directed by the City Engineer.

The contract unit price paid for storm drain structures including manholes, catch basins, and inlet and outlet structures, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing the structures, complete as shown on the plans, including excavation, backfill, and disposal of excess material.

SECTION 66 -- CORRUGATED METAL PIPE

Corrugated metal pipe is not authorized for use within the City of American Canyon or within the City's water service area.

SECTION 71 -- SEWERS

71-1.01 Description. This work shall consist of laying sewer pipe and constructing sewer structures as shown on the plans, in accordance with these specifications, the Special Provisions, and as directed by the City Engineer.

The type of sewer pipe and sewer structures will be designated in the improvement plans.

71-1.01A Right-of-Way. All publicly owned and maintained sanitary sewers shall be installed within an easement (20' minimum width) which shall have been dedicated to the City of American Canyon.

71-1.02 Materials. Pipe, fittings, miscellaneous materials, and the most common joint materials are described in this section.

Portland cement used in the production of concrete products set forth in this Section 71-1.02 shall be Type II modified cement, conforming to the provisions in Section 90 of the Standard Specifications, "Portland Cement Concrete".

71-1.02A Reinforced Concrete Sewer Pipe. Reinforced concrete pipe shall conform to ASTM Designation C-76 for the size and classes indicated on the plans.

71-1.02 A(1) Plastic Lining. The full 360° of the interior circumference of all reinforced concrete pipe shall be sealed and protected with a polyvinyl chloride resin lining. Copolymer resins will be permitted.

The plastic liner shall be impermeable to sewage gases and liquids and shall be non-conducive to bacterial or fungus growth. The lining shall be impact resistant, flexible, and shall have an elongation sufficient to bridge up to 1/8" settling cracks which may take place in the pipe or in the joint after installation without damage to the lining.

The lining shall be of a type that is permanently and physically embedded into the concrete pipe wall by a T-lock type mechanism and shall not rely on an adhesive bond between the lining and pipe wall.

The lining at all pipe joints and at all joints between individual sheets or sections of lines shall be continuously heat welded by the use of welding strips of the same kind and equivalent thickness of the material as the lines.

The Contractor shall submit for the City Engineer's consideration, written information as to the type, size, workmanship, and other specifications for the plastic liner he proposes to use on any installation. Approval of this submission by the City Engineer shall be obtained prior to any material being delivered to the job site.

71-1.02B Clay Sewer Pipe. Vitrified clay pipe shall conform to the specifications for extra strength pipe of ASTM Designation C-700 and C-301.

71-1.02C Ductile Iron Pipe. Ductile iron pipe shall comply with ANSI A21.51 (AWWA C151).

71-1.02D Polyvinyl Chloride (PVC) Pipe. All PVC pipe and fittings shall, at a minimum, conform to the requirements of ASTM Designation D3034-73, or the latest revision and IAPMO requirements, as they apply to Type SDR 35 PVC sewer pipe using on Elastomeric Gasket Joint in a bell and spigot assembly system.

71-1.02E Resilient Joint Material. Flexible compression joints in bell and spigot clay pipe and resilient joint materials to be used therein shall conform to the requirements of ASTM Designation C425.

71-1.02F Rubber Gasketed Joints. Rubber gasketed joints shall conform to the provisions in Section 65-1.06B, "Rubber Gasketed Joints" of the Standard Specifications.

71-1.02G Reinforcement. Reinforcement shall conform to the provisions in Section 52 of the Standard Specifications, "Reinforcement".

71-1.02H Concrete. Concrete shall conform to the provisions in Section 51 of the Standard Specifications, "Concrete Structures" and Section 90 of the Standard Specifications, "Portland Cement Concrete".

71-1.03 Excavation and Backfill. Excavation and backfill shall conform to the provisions of the Engineering Standard Plan 4.02. The pipe shall be laid in a trench excavated to the line & grade shown on the approved Plans. The bottom of the trench shall be graded & prepared to provide a firm & uniform bearing surface for the entire length of the pipe barrel.

Suitable excavation shall be made to receive the bell of the pipe and the joint shall not bear upon the bottom of the trench. All adjustment to line and grade shall be made by scraping away or filling in with sand, gravel, or granular material under the body of the pipe and not by wedging or blocking.

Trenches shall not be left open farther than 100 feet in advance of pipe laying operations or 100 feet to the rear thereof. All trenches are to remain open until inspected and approved by the City Engineer.

The excavation shall be supported so that it will be safe and that the ground alongside the excavation will not slide or settle and all existing improvements, either on public or private property, will be fully protected from damage.

All supports shall be removed after construction is completed and shall be withdrawn in a manner that will prevent the caving of the sides of the excavation. All openings caused by the removal of supports shall be filled with suitable material properly compacted.

71-1.04 Bedding and Initial Backfill. Bedding shall be defined as that material supporting, surrounding, and extending to one foot (1') above the top of the pipe. Where it becomes necessary to remove boulders or other interfering objects at subgrade for bedding, any void below such subgrade shall be filled with the bedding material designated on the plans. Where concrete is specified to cover the pipe, the top of the concrete shall be considered as the top of the bedding.

If soft, spongy, unstable, or other similar material is encountered upon which the bedding material or pipe is to be placed, this unsuitable material shall be removed to the depth approved by the City Engineer and replaced with bedding material suitably densified.

Bedding material shall first be placed so that the pipe is supported for the full length of the barrel with full bearing on the bottom segment of the pipe equal to a minimum of 0.25 times the outside diameter of the barrel or four-inch (4") minimum. Densification of bedding for pipe shall be accomplished after the sheeting or shoring has been removed from the bedding zone. Alternate methods of pipe laying which are recommended by the pipe manufacturer may be used if approved by the City Engineer. Bedding material shall be gravel, crushed aggregate, native free-draining granular material having a sand equivalent of not less than fifty (50) as specified on Engineering Standard Plan 4.01, "Trench Excavation and Backfill". Pea gravel is not acceptable. No aggregate shall exceed 3/4".

71-1.05 Pipe Laying. Pipe shall be protected during handing against impact shocks and free fall. Pipe will be carefully inspected in the field before and after laying. If any cause for rejection is discovered in a pipe after it has been laid, it shall be subject to rejection. Any corrective work shall be approved by the City Engineer and shall be at no cost to the City.

When connections are to be made to any existing pipe, conduit, or other appurtenances, the actual elevation or position of which cannot be determined without excavation, the Contractor shall excavate for, and expose, the existing improvement before laying any pipe or conduit. Engineering inspection shall be prior to the connection. When the new facilities interfere with the existing flow of sewage, the Contractor shall provide satisfactory bypass facilities at his expense.

The pipe shall be laid without break upgrade from structure to structure, with bell end upgrade.

All joints shall be cleaned and then sealed with the type of materials approved by the City Engineer. The material shall be recommended by the pipe manufacturer for the purpose intended and approved by the City Engineer, in order to obtain a watertight joint against leakage and infiltration under all conditions of expansion, contraction, and settlement.

Whenever the work ceases for any reason, the end of the pipe shall be securely closed with a tight fitting plug or cover.

Whenever existing pipes are to be cut or abandoned, the open ends of said pipes shall be securely closed by a tight fitting plug or wall of concrete not less than two feet (2') thick, or by a tight brick wall no less than eight inches (8")thick with cement mortar joints.

Where groundwater occurs, the bottom of the trench shall be kept entirely free of water during the pipe laying, filling the joints, and as long thereafter as directed by the City Engineer.

Stoppers for pipes and branches left unconnected shall be made of the same material as the pipe or of resilient joint material conforming to Section 71-1.02E, "Resilient Joint Material" of the Engineering Standards. After placing the stopper, it shall be covered with a layer of sealant. The sealant shall be sufficiently fluid to ensure free flow around the stopper.

Concrete pipe with elliptical reinforcement shall be laid with the minor axis of the reinforcement cage in a vertical position.

Pipe shall be laid true to line and grade. Any pipe which is not in true alignment or shows any undue settlement after laying shall be taken up and re-laid at the Contractor's expense.

Pipe sections shall be laid and joined in such a manner that the offset of the inside of the pipe at any joint will be held to a minimum at the invert. The maximum offset at the invert of pipe shall be one percent (1%) of the inside diameter of the pipe or 3/8 inch (9.5mm), whichever is smaller.

In joining socket and spigot pipe, the spigot pipe, the spigot of each pipe shall be so seated in the socket of the adjacent pipe as to give a maximum of 3/8 inch (9.5mm) annular space all around the pipe in the socket. Unavoidable offsets shall distributed around the circumference of the pipe in such a manner that the minimum offset occurs at the invert.

When pipe is laid in a sheeted trench, all sheeting against which concrete cradle is to be placed shall be faced with at least one thickness of building paper and the sheeting shall be withdrawn without displacing or damaging the cradle.

After the joints have been made, the pipe shall not be disturbed in any manner.

71-1.06 Pipe Joints.

a. Vitrified Clay Pipe -- Either polyvinyl chloride or polyurethane compression joints may be used. Materials shall conform to ASTM Designation C-425.

   Joints shall contain two sealing components, one bonded to the outside of the spigot and the other bonded to the inside of the socket. Sealing components shall be a plasticized polyvinyl chloride compound or polyurethane elastomer bonded to pipes and fittings at the pipe factory, and shall be cured to a uniform hardness and compressibility. The sealing

components shall be shaped, sized, bonded, and cured in such a manner as to form a tight, dense, and homogenous compression coupling when the joint is assembled. Any imperfection in the sealing components will be cause for rejection.

Upon installation, the meeting surfaces shall be wiped clean of dirt and foreign matter, then an approved lubricant shall be applied to the joint surfaces. The spigot shall be positioned inside the socket and the joint shoved home. For large diameter pipe, a lever attachment or bar cushioned with a wooden block shall be used to shove the joint into place.

In no case shall a bar be used on an unprotected joint surface. Mating surfaces shall be in tight contact with each other upon completion of the joint installation.

Polyvinyl chloride joints may be used on curves, provided that the radius of curvature is not less than shown in the following table, unless beveled pipe or shorter lengths are provided.

Pipe Size (Inches)	Maximum Pipe Length (Feet)	Minimum Radius of Curvature	Maximum Deflection
6	5	100	2 °00'
8	5	100	2 °00'
8	6	115	2 °00'
10	5	185	1 °33'
10	6	220	1 °33'
12	6	215	1 °20'
12	6	260	1 °20'
15	5	275	1 °03'
15	5	330	1° 03'

b. Reinforced Concrete Pipe -- All reinforced concrete sanitary sewer pipe shall be joined with rubber gasketed joints.

Rubber gasketed joints shall conform to the requirements of ASTM Designation C443 and shall be flexible and able to withstand expansion, contraction, and settlement.

All rubber gaskets shall be stored in as cool a place as practicable, preferably at 70° or less, and in no case shall the rubber gaskets be exposed to the direct rays of the sun for more than 72 hours. Rubber gaskets, of the type requiring lubrication, shall be lubricated with the lubricant recommended and supplied by the manufacturer of the pipe.

The ends of the pipe shall be so formed that when the pipes are laid together and joined, they shall make a continuous and uniform line of pipe with a smooth and regular surface.

Joints shall be water tight and flexible. Each joint shall contain a solid gasket of rubber or other material approved by the Engineer, which shall be the sole element responsible for water tightness of the joint. This gasket shall be of circular cross section. The length and cross sectional diameter of the gasket, the annular space provided for the gasket, and all other joint details shall be such as to produce a water tight joint. The slope

of the longitudinal gasket contact surfaces of the joint with respect to the longitudinal axis of the pipe shall not exceed two degrees (2°).

Under ordinary laying conditions, the work shall be scheduled so that the socket end of the pipe faces in the direction of laying. Prior to placing the spigot into the socket of the pipe previously laid, the spigot groove, the gasket and the inside of the socket shall be thoroughly cleaned. Then, the spigot groove, the gasket, and the first two inches (2") (50.8mm) of the inside surface of the socket shall be lubricated with a soft vegetable soap compound.

The gasket shall be uniformly stretched when placing it on the spigot so that the gasket is distributed evenly around the circumference. The gasket shall be lubricated as per manufacturer's recommendations.

For pipe in which the inside joints are to be pointed, suitable spacers shall be placed against the inside shoulder of the socket to provide the proper space between abutting ends of the pipe.

After the joint is assembled, a thin metal feeler gauge shall be inserted between the socket and the spigot and the position of the gasket checked around the complete circumference of the pipe. If the gasket is not in the proper position, the pipe shall be withdrawn, the gasket checked to see that it is not cut or damaged, the pipe re-laid, and the gasket position again checked.

c. Cast, Iron, or Ductile Iron Pipe -- Cast and ductile iron pipe joints shall comply with the following requirements for the types shown:

Type of Joint	Specification
Slip-on	ANSI A21.11 (AWWA C111)
Mechanical joint	ANSI A21.11 (AWWA C111)
Flanged joint	ANSI B16.1, B.16.2, and A21.10 (AWWA C110)
Flanged joint (threaded flanges)	ANSI B2.1

All rubber gaskets, push-on, mechanical, and flanged joint fittings for cast iron or ductile iron pipe shall be manufactured in accordance with ANSI A21.10 (AWWA C110). All joints shall be cad-welded.

Slip-On Joint -- The gasket and gasket seal inside the socket shall be wiped clean before the gasket is inserted. A thin film of soft vegetable soap compound shall be applied to the gasket and the outside of the spigot end of the pipe. The spigot shall then be positioned inside the socket and shoved home. Lubricant other than that furnished with the pipe shall not be used.

Mechanical Joints – The outside of the spigot and the inside of the socket shall be thoroughly cleaned of foreign matter. The gland and gasket shall then be slipped onto the spigot end of the pipe. The gasket shall be pressed evenly into the socket only after the spigot is seated in the socket. The gland shall be brought up evenly by tightening alternately the nuts spaced 180 degrees apart. Bolts and nuts shall be coated with mastic following tightening.

Flanged Joints -- Flanged joints shall be firmly and fully bolted with machine bolts of proper size. Full circle reinforced neoprene rubber gaskets 1/16" thick shall be used at all flanged joints. Bolts and nuts shall be coated with mastic following tightening or polyethylene wrapped.

71-1.07 Existing Manholes. Existing manholes shall be adjusted to grade, remodeled, or abandoned as shown on the plans and in accordance with the provisions of Section 15 of the Standard Specifications, "Existing Highway Facilities".

When designated on the plans or directed by the City Engineer, existing manhole frames and covers shall be re-set on new structures. Upon completion of the adjustment of existing manholes to grade, the manhole cover shall conform to the planed surface as specified for the finished asphalt concrete surface, Section 29 of the Standard Specifications.

Unless otherwise specified on the plans, all existing manholes, lamp holes, and terminal clean-out frames and covers that are removed become the property of the City of American Canyon and shall be delivered to the City Corp Yard.

71-1.08 Sewer Structures. New manholes for sewers shall be constructed in accordance with the details shown on the Engineering Standard Plans, as specified in this Section and as directed by the City Engineer.

Precast manholes shall conform to the Engineering Standard Plans and as shown on the plans as well as to the applicable sections in Section 70 of the Standard Specifications "Miscellaneous Facilities" except for measurement and payment.

Manhole frames shall be secured to the manhole structure or riser barrels with full mortar beds or full circle concrete collar that will effectively secure the frame to the manhole structure and provide a uniform bearing for the frame.

Concrete for sewer structures shall be Class A, Type II, as described in Section 90-1.0 of the Standard Specifications.

When the manhole is located in the pavement area, it shall not be constructed to final grade until pavement has been completed.

Where new work is jointed to the surface of unfinished work, the latter shall be thoroughly cleaned.

All joints on the inside of structures and sewers shall be neatly struck and pointed where plastering is not specified on the plans.

The inside bottoms of existing manholes, where new connections are made, and of new manholes shall be shaped to provide channels conforming to the size and shape of the lower portion of the inlets and outlets of the manholes. The channels shall vary uniformly in size and shape from inlet to outlet.

No pipe shall project into a manhole and in no case shall the bell of a pipe be built into the wall of a manhole or structure.

All concrete shall be cured for a period of not less than 10 days after being placed and shall be protected from damage.

71-1.09 Coating Manholes.

General. The interior of all sanitary sewer manholes, where connections have been made to existing manholes, existing manholes, and other structures where the City Engineer determines that hydrogen sulfide gas may be a problem shall receive two (2) coats of chemical treatment for waterproofing and protecting concrete..

Material. Material used shall be a cementitious coating containing catalytic chemicals which migrate into the concrete using moisture present in the concrete as the migrating medium and which causes the moisture and unhydrated cement in the concrete to react causing the growth of non-soluble crystals of dendritic fibers in the voids and capillary tracks of the concrete that allow passage of water, thereby rendering the concret itself waterproof.

Acceptable Products. Xypex concentrate or modified or approved substitute.

Concrete Finish. Concrete surfaces shall have an open capillary system to provide tooth and suction and shall be clean; free from scale, excess form oil, irritance, curing compounds, and any other foreign matter. Smooth surfaces or surfaces covered with excess form oil or other contaminants shall be washed, lightly sandblasted, water blasted, or acid-etched with muratic acid, as required to provide a clean absorbent surface. Horizontal surfaces shall not be troweled and shall be left with a rough float finish or a broom finish. Vertical surfaces may have a sacked finish.

Surface Moisture. Waterproofing shall be applied to "green" concrete as soon as possible after forms have been stripped or to older pours which have thoroughly moistened with clean water prior to application. Free water shall be removed prior to application.

Application. After all repair, patching, and seal strip placement, treat concrete surfaces with first coat scurry mix of crystalline waterproofing compound. Use short bristle brush or broom to work slurry well into the concrete, filling all hairline cracks and surface pores. Apply second coat while first coat is still "green" but after it has reached an initial set, all as recommended by the waterproofing material manufacturer.

Curing. Curing shall begin as soon as the waterproofing materials have set up sufficiently so as not to be damaged by a fine spray. Treated surfaces shall be fog-sprayed three (3) times a day for a 3-day period. Allow material to set 12 days before filling the structure with water.

71-1.10 Trench Re-surfacing. Trenches in existing streets, except streets which are to be closed or abandoned, shall be re-surfaced with the type and thickness of bases, surfacing or pavement shown on the plans or designated by the City Engineer. Trench re-surfacing shall be accomplished in accordance with Engineering Standard Plan 4.02 "Trench Re-surfacing."

The Contractor shall proceed immediately to re-surface any part of any excavation upon notice from the City Engineer without waiting for completion of the full length of the sewer. All trenches shall be backfilled and patched at the end of each working day. Any temporary patching shall be subject to the approval of the City Engineer.

71-1.11 Testing.

71-1.11A Cleaning. Prior to performing tests, the pipe installation shall be thoroughly cleaned. Cleaning shall be performed by the Contractor by means of an inflatable rubber ball. The ball shall be of a size that will inflate to fit snugly into the pipe to be tested. The ball shall be controlled with a tag line. The ball shall be placed in the last manhole on the pipe to be cleaned and water shall be introduced behind it. The ball shall pass through the pipe with only the pressure of the water propelling it. All debris flushed out ahead of the ball shall be removed at the first downstream manhole. In the event cement or wedged debris or a damaged pipe shall stop the ball, the Contractor shall remove the obstruction.

71-1.11B General. All leakage tests shall be completed and approved following the placement and densification of the backfill, but prior to placing of permanent surfacing.

When leakage or infiltration exceeds the amount allowed by the specifications, the Contractor, at his expense, shall locate the leaks and make the necessary repairs or replacements in accordance with the specifications to reduce the leakage or infiltration to the specified limits. Any individually detectable leaks shall be repaired, regardless of the results of the tests. Air pressure tests shall be made on completed pipelines.

71-1.11C Air Pressure Test. The Contractor shall furnish all materials, equipment, and labor for making an air test. Air test equipment shall be approved by the City Engineer.

Each section of sewer shall be tested between successive manholes by plugging and bracing all openings in the main sewer line and the upper ends of all house connection sewers. Prior to any air pressure testing, all pipe plugs shall be checked with a soap solution to detect any air leakage. If any leaks are found, the air pressure shall be released, the leaks eliminated, and the test procedure started over again.

The final leakage test of the sewer main line and branching house connection sewers shall be conducted in the presence of the City Engineer in the following manner:

1. Clean pipe to be tested by propelling snug fitting, inflated rubber ball through the pipe with water.
2. Plug all pipe outlets with suitable test plugs. Brace each plug securely.
3. If the pipe to be tested is submerged in ground water, insert a pipe probe by boring into the backfill material adjacent to the center of the pipe and determine the pressure in the probe when air passes slowly through it. This the back pressure due to ground water submergence over the end of the probe. All gauge pressures in the test should be increased by this amount.
4. Add air slowly to the portion of the pipe installation under test until the internal air pressure is raised to 4.0 PSIG.
5. After an internal pressure of 4.0 PSIG is obtained, allow at least two (2) minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.
6. When pressure decreases to 3.5 PSIG, start stop watch.

MINIMUM HOLDING TIME (IN SECONDS) REQUIRED FOR
PRESSURE TO DROP FROM 3.5 TO 2.5 PSIG

PIPE DIAMETER

	4"	6"	8"	10"	12"	15"	18"	21"	24"	27"	30"	33"	36"	39"
25	4	10	18	28	40	62	89	121	158	200	248	299	356	418
50	9	20	35	55	79	124	178	243	317	401	495	599	713	837
75	13	30	53	83	119	186	267	364	475	601	743	898	1020	1105
100	18	40	70	110	158	248	356	485	634	765	851	935		
125	22	50	88	138	198	309	446	595	680					
150	26	59	106	165	238	371	510							
175	31	69	123	193	277	425								
200	35	79	141	220	317									
225	40	89	158	248	340									
250	44	99	176	275										
275	48	109	194	283										
300	53	119	211											
350	62	139	227											
400	70	158												
450	79	170												
500	88													
559	97													
600	106													
650	113	170	227	283	340	425	510	595	680	765	851	935	1020	1105

NOTE:
1. TO BE USED WHEN TESTING ONE DIAMETER ONLY.
2. The above air pressure test procedure is based on ASTM C828. Any special situations or conditions shall conform to this ASTM Standard.

SAFETY NOTE:
The air test may be dangerous if, because of ignorance or carelessness, a line is improperly prepared. It is extremely important that the various plugs be installed and braced in such a way as to prevent blow outs. Inasmuch as a force of 250 lbs. is exerted on an 8" plug by an internal pipe pressure of 5 PSI, it should be realized that sudden explusion of a poorly installed plug of a plug that is partially deflated before the pipe pressure is released can be dangerous.

As a safety precaution, pressuring equipment should include a regulator set at 6-8 PSI to avoid over pressurizing and damaging an otherwise acceptable line. No one shall be allowed in the manholes during testing.

IF THE TIME LAPSE IS LESS THAN THAT SHOWN IN THE TABLE, THE CONTRACTOR SHALL MAKE THE NECESSARY CORRECTIONS TO REDUCE THE LEAKAGE TO ACCEPTABLE LIMITS.

71-1.11D T.V. Inspection. Prior to acceptance of any sanitary sewer line by the City Engineer, said line shall be inspected internally by television as outlined below. Defects such as high and low spots, joint separations, offset joints, chipped ends, cracked or damaged pipe, infiltration points, and debris in lines shall be corrected by the Contractor. For joint separations, low spots and chipped ends, the following maximum acceptable limits will apply for 6" - 10" piped:

Joint separation	1/2 inch
Low spots	1 inch maximum depth
Chipped ends	1/4 inch

For pipe larger than 10", specific maximum limits will be specified by the City Engineer for each project.

A. The complete job is ready for television inspection when the following work has been completed:

1) All sewer pipelines are installed and backfilled.
2) All structures are in place, all channeling is complete, and pipelines are accessible from structures.
3) All other underground facilities, utility piping, and conduits are installed.
4) Final street subgrading is complete.
5) Pipelines to be inspected have been preliminarily balled, flushed, and the vertical deflection test completed for flexible sewer lines.
6) Final air test has been completed.

B. When the above work is complete, the Contractor shall arrange for the television inspection.

C. The Contractor of the project will notify the City Engineer in writing as to the scheduled date of the television inspection.

D. After conditions A through C as outlined above are met, the entire job will be initially televised.

1) A videotape will be made and defects requiring correction will be noted.
2) If no deficiencies are observed, the work will be considered satisfactory.

E. The Contractor will be notified in writing of any deficiencies revealed by the television inspection that will require repair. If corrective work is indicated and the Contractor wishes to view videotapes, the Contractor shall contact the City Engineer to set a time for the viewing with the Contractor.

F. Corrective work shall be done.

G. Those portions of the pipeline system that have been corrected must be re-televised and re-tested completely.

H. The procedure outlined in conditions "A through G" above will be repeated until all deficiencies observed by television inspection have been corrected to the complete satisfaction of the City Engineer.

SECTION 73 -- CONCRETE CURBS AND SIDEWALKS

73-1.01 Description. This work shall consist of constructing curbs, sidewalks, gutter depressions, island paving, and driveways of the form and dimensions shown on the plans, and as specified in these specifications and the Special Provisions. The co&a-2Hncrete shall attain a minimum compressive strength of 3000 PSI at 28 days and shall contain not less than six (6) sacks of cement per cubic yard. Maximum slump of the concrete shall be 4 inches, as determined in accordance with ASTM C-143.

A pedestrian ramp shall be constructed in all curb returns in accordance with Engineering Standard Plan 3.15, "Sidewalk Ramp."

Reinforcement shall conform to the provisions in Section 52 of the Standard Specifications, "Reinforcement".

73-1.02 Subgrade Preparation. The subgrade shall be constructed true to grade and cross section, as shown in the plans or directed by the City City Engineer. It shall be watered and thoroughly compacted and unsuitable material removed and replaced to provide a stable grade with above optimum moisture content for a minimum depth of 0.5 foot.

Base material under curb and gutter shall comply with the provisions of Engineering Standards, Section 26, "Aggregate Bases" and shall be a minimum of four inches (4") in compacted thickness.

Sidewalk shall be placed on a four-inch (4") thick layer of Class 2 AB. Sidewalks constructed across driveways and driveway ramps constructed between curb and the edge of the sidewalk shall be six (6) inches thick and shall be placed directly on the prepared subgrade.

The completed subgrade shall be tested for grade and cross section by means of a templet supported on the side forms and shall not project into the planned concrete cross section at any point. The subgrade and forms shall be wet immediately in advance of placing concrete.

73-1.05 Curb Construction. Attention is directed to Engineering Standard Plans 3.07, "Curb and Gutter" and 3.08, "Spacing Expansion Joints."

Weakened plane joints shall be constructed at 15-foot intervals, except that when Portland Cement concrete pavement is adjacent thereto, the joints shall coincide with the weakened plane joints in the adjacent pavement. The joints shall be constructed to a minimum depth of 1½ inches by scoring with a tool which will leave the corners rounded with a ¼" radius and insure a free movement of the concrete at the joint.

Expansion joint filler strips shall have the top edge placed and securely held 1/4 inch below the surface. Expansion joints shall be edged with an edging tool having a radius of ¼".

The finished surface of the top of the curb shall not vary more than 0.01 foot above or below the staked grade.

73-1.07 Sidewalk, Gutter Depression, Island Paving, and Driveway Construction. The surface of sidewalks shall be marked into rectangles as shown on Engineering Standard Plan 3.08, "Spacing Expansion Joints".

Weakened plane joints shall be constructed to a minimum depth of 3/4 inch with a tool which will leave the corners rounded with a ¼-inch radius and insure a free movement of concrete at the joint.

Expansion joint filler strips shall have the top edge placed and securely held ¼" below the surface. Expansion joints shall be edged with an edging tool having a radius of ¼". Scoring lines shall be made with jointer tools having a radius of ¼".

73-1.08 Measurement. Curb and gutter will be measured by the linear foot, measured in place along the face of the curb.

Quantities of concrete in sidewalks, island paving, gutter depressions, or driveway areas will be measured by the cubic yard, computed on the basis of measurement of areas of completed work in place and the thickness shown on the plans.

73-1.09 Payment. Curb and gutter will be paid for at the contract price per linear foot which price shall include full compensation for construction of pedestrian ramps for the handicapped.

Quantities of concrete in sidewalks, cutter depressions, island paving, and driveways will be paid for at the contract price:

Sidewalks	Cubic Yard
Curb & gutter	Linear Foot
Islands	Cubic Yard
Driveways	Cubic Yard

SECTION 81 -- MONUMENTS

This work shall consist of furnishing and installing cast-in-place survey monuments at the locations shown on the plans and in accordance with Engineering Standard Plan 3.24, "Brass Survey Marker."

The exact location of the monuments will be established by the City Engineer for City contracts and by the subdivider's Engineer for subdivisions and, upon completion, the monuments will be checked and the center point stamped by the City Engineer or the subdivider's Engineer.

Standard City brass markers shall be furnished by the Contractor. They shall be placed in survey monuments before the concrete block has acquired its initial set and shall be firmly bedded in the concrete. The concrete block shall be so located that when the marker is installed, the reference point will fall within a one-inch circle in the center of the marker.

City monuments will be paid for at the contract unit price each, which price shall include full compensation for furnishing all labor, materials, tools, and equipment and doing all the work involved in constructing monuments complete in place.

SECTION 99 -- WATER MAIN CONSTRUCTION

99-1.01 Description. All water mains and related appurtenances shall be constructed in accordance with the Engineering Standard Plans and Standard Construction Specifications for Public Improvements.

99-1.01 (A) Right-of-Way. All publicly-owned and maintained water systems shall be installed within an easement (20' minimum width) which shall have been dedicated to the City of American Canyon.

99-1.02 Pipe Materials. The pipe, except where specifically specified on the plans, can either be ductile cast iron or polyvinyl chloride (PVC), all in accordance with the following:

A. Ductile iron pipe shall be cement lined, new pipe conforming to A.N.S.I. A21.51 1976 or most recent issue, if any, as sponsored by the American Water Works Association for thickness Class 50 Ductile Iron Pipe. The pipe shall be furnished with either Bell and spigot ends, "Tyton Joints," or mechanical joints except where specifically specified on the plans.

All ductile iron pipe buried underground shall be encased in polyethylene film in tube form. Polyethylene material and installation procedure for the encasement shall conform to A.N.S.I. A21.5 1972 or most recent issue, if any. Installation Method "A" as described in aforementioned specification shall apply.

B. Polyvinyl chloride (PVC) pipe shall be new pipe of the pressure rating specified on the plans and conforming to the requirements of AWWA C900 "Standard for Polyvinyl Chloride Pressure Pipe, 4½" for Water."

Pipe sizes 4" through 12" only: AWWA Class 200 minimum. All Class 200 pipe shall meet the requirements of structural dimensions ratio (SDR) 14 with cast iron O.D.

All pipe shall be suitable for use as a pressure conduit. Provisions shall be made for expansion and contraction at each joint with an "O" ring elastomeric gasket seal meeting the requirements of ASTM D-1869 and F-447. Solvent welded joints will not be permitted. The Bell section shall be designed to be at least as strong as the pipe wall.

Connections between PVC pipe and fittings including ells, tees, valves, and hydrant burys shall be ductile iron of the flange joint type.

Each and every length of pipe and coupling shall be marked with the manufacturer's name, lot number, and the date the pipe was tested.

The pipe shall be tested in accordance with the most recent AWWA Standard Specifications and amendments thereto for the pipe furnished. The testing shall be performed in a State licensed materials testing laboratory where the State's testing standards meet or exceed the State of California's testing standards.

Accompanying or preceding each load of pipe delivered, a certificate shall be furnished to the City certifying that the pipe which is to be delivered has been tested and meets the requirements of the AWWA Standard Specifications. The certificate shall identify the pipe by manufacturer's name, lot number, and date tested by a State certified materials testing laboratory.

99-1.03 Fittings. All fittings shall be ductile iron fittings conforming to ANSI/AWWA C153 of the latest revision and shall have the proper type of ends to match the type of pipe used.

Ductile iron fittings shall be cement mortar lined in accordance with AWWA C104 of the latest revision and shall have a petroleum asphaltic coating

conforming to AWWA C153. Ductile iron fittings shall have a minimum pressure rating of 250 PSI and shall otherwise meet or exceed the pressure rating of the pipe to be installed and shall have a minimum Class 50 thickness rating.

99-1.04 Gate Valves. Gate valves shall conform to AWWA Standard C509 of the latest revision and shall be the resilient seat type with non-rising stem opening counter-clockwise with O-ring stem seal and suitable ends for connections to the type of pipe or fitting used. The working pressure rating of gate valves shall meet or exceed the pressure rating of the pipe specified on the plans.

99-1.05 Butterfly Valves. Butterfly valves shall conform to AWWA Standard C504 of the latest revision and shall be of the rubber seat type. Valve discs shall rotate 90 degrees from the full open position to the tight shut position. The valve seat shall provide a tight shutoff at a pressure differential of 150 PSI upstream and 0 PSI downstream in either direction. The valve operator shall be the traveling nut type. Valve shall open with a counter-clockwise rotation of the operating nut.

99-1.06 Valve Boxes. Each gate valve shall be covered by a precast 8-inch valve box set flush with the street surface with cast iron ring and cover marked "WATER" and with an arrow pointing counter-clockwise indicating "OPEN." The valve boxes are to be Christy G5, G8, or approved equal.

99-1.07 Excavation and Backfill. Excavation and backfill of the pipeline shall be as shown on Engineering Standard Plan 4.01, "Trench Excavation and Backfill."

Excess material from excavation shall become the property of the Contractor and shall be disposed of to the satisfaction of the City Engineer.

Prior to disposal of any materials or operation of any equipment, on sites provided by the Contractor for disposal of excess trench excavation owned by him, the Contractor shall submit to the City Engineer written authorization for such disposal of materials and entry permission signed by the owners of the disposal site and the required permits.

99-1.08 Laying and Handling Pipe Material. Proper implements, tools, and facilities satisfactory to the City Engineer shall be provided and used by the Contractor for safe, convenient, and workmanlike prosecution of the work. All pipe fittings and valves shall be carefully lowered into the trench in such a manner as to prevent damage to pipe coatings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench. Before lowering and while suspended, the pipe shall be inspected for defects and the cast iron pipe rung with a light hammer to detect cracks. Any defective, damaged, or unsound pipe shall be rejected and sound material furnished. Cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to pipe.

All pipe shall be laid and maintained to the required lines and grades, with fittings and valves at required locations and with joint centered and spigot home, and with all valve stems plumb. The pipe shall be brought into true alignment and shall be secured there with bedding material carefully tamped under and on each side of it.

Whenever it is necessary, either in vertical or horizontal plane, to avoid obstructions or when long radius curves are permitted, the amount of deflection shall not exceed the maximum recommended by the pipe manufacturer or that required for satisfactory jointing.

Each length of pipe shall be freed of any visible evidence of contamination, dirt, and foreign material before it is lowered into its position in the trench, and it shall be kept clean by approved means during and after laying. At time when pipe laying is not in progress, the open ends of the pipe which have been laid shall be closed by approved means to prevent the entrance of small animals or foreign material. Trench water shall not be permitted to enter the pipe. The City Engineer shall be the judge of whether a pipe is seriously damaged and any pipe so classified shall be per Engineering Standard Plans and Specifications.

99-1.09 Laying PVC Pipe. Individual pieces of pipe, valves, and fittings shall be joined by placing the rubber rings on the machined ends of the pipe and pulling the couplings, valves, or fittings in accordance with the manufacturer's recommendations. The rings shall be checked to be sure they are in the proper position after the coupling is in place. Care shall be taken to ensure proper seating of the rings, and adapters shall be utilized for connections as required by the manufacturer.

Fittings for PVC pipe shall be either the mechanical joint type or push-on type.

PVC pipe shall be as specified in and installed per AWWA C900 of the latest revision and in accordance with the manufacturer's recommendations.

99-1.10 Laying of Ductile Iron Pipe. The flame cutting of pipe by means of oxyacetylene torch shall not be allowed. Ductile iron pipe shall be as specified in and installed per AWWA C600 of the latest revision and in accordance with the manufacturer's recommendations.

99-1.11 Concrete Anchors and Thrust Blocks. Plain and reinforced concrete anchors for the watermain shall be constructed at the locations shown and as called for on the Engineering Standard Plans. The anchors shall be constructed so as to obtain a full bearing, opposed to axial and lateral thrusts, against solid undisturbed material.

Ground and forms against which concrete is to be placed shall be moistened before placing the concrete. Forms shall be smooth, mortar tight, and of sufficient strength to maintain shape during the placing of the concrete. All concrete shall be rodded and spaded to ensure smooth surfaces and to eliminate rock pockets.

Forms for anchors shall be removed to a depth of at least two feet (2') below the established street or ground surface grade before any backfill material is placed.

Steel reinforcement bars, if required, shall be cleaned of all loose mill and rust scale, mortar, oil, dirt, or other foreign substances; shall be bent to the prescribed dimensions and shall be placed accurately to the dimensions shown on the plans. Where bars are spliced, they shall be lapped thirty (30) bar diameters. All reinforcing bars shall be fully encased in concrete or mortar. Minimum cover shall be three inches (3").

99-1.12 Hydrostatic Test. The test shall be performed after the line has been laid and all backfill placed and compacted as specified elsewhere in these specifications. The Contractor, at their option, may test the line at any time during construction. However, the final test for acceptance shall be made only after all backfill is in place. Each valved section of pipe, or combined sections, as approved by the City Engineer, shall be subjected to a hydrostatic pressure of not less than 50 PSI, above working pressure and not less than 200 PSI at any point on the main. The duration of each pressure test shall be two (2)

hours. Valves on existing mains in service required to be operated in connection with this job shall be operated only by City Engineer. Each valved section of pipe shall be slowly filled with water and the specified test pressure shall be applied by means of a gauge pump connected to the pipe in a satisfactory manner. The pump, pipe connection, and all necessary apparatus except measuring devices shall be furnished by the Contractor. The City Engineer will furnish the measuring devices for the test. The Contractor shall make the taps into the pipe and shall furnish all necessary assistance for conducting the tests. Before applying the test pressure, all air shall be expelled from the pipe. To accomplish this, taps shall be made, if necessary, at the points of the highest elevation, and afterwards tightly plugged.

Suitable means shall be provided to the City Engineer for determining the quantity of water leakage under the test pressure. No pipe installation will be accepted until or unless this leakage is less than 40 U.S. gallons per 24 hours, per mile of pipe, per inch nominal diameter of pipe. Should any test of combined sections of pipe laid disclose leakage per mile of pipe greater than that specified, or if individual sections show leakage greater than the specified limit, the Contractor shall, at their own expense, locate the cause and repair the defect until the leakage is within the specified allowance.

Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved section of it, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled. The City Engineer shall designate the time at which the tests shall be made.

The Contractor shall repair any obvious leaks even though the hydrostatic test results are within the prescribed limits above.

99-1.12A Allowable Leakage -- D.I.P. and PVC Mains. The allowable leakage for "push-on" rubber gasketed joints shall be as described in AWWA C600, Section 4, except the test pressure shall not be less than 200 PSI at the highest point in the pipeline and not less than two (2) hours:

$$L = \frac{SD\sqrt{200\ PSI}}{133{,}200}$$

Where: L = Allowable leakage, in gallons per hour
S = Length of pipe tested, in feet
D = Nominal diameter of the pipe, in inches

99-1.13 Sterilization and Bacteria Testing.

A. Disinfection. Disinfection of all new water mains shall comply with the latest edition of AWWA C651. All labor, materials, and equipment necessary to perform the sterilization of the completed work shall be done by the Contractor. The Contractor shall furnish and place H.T.H. sterilization tablets in each length of pipe as it is placed in the trench. The tablets must be secured to the upper inside surface of each length of pipe by using Permatex No. 1 compound or equal.

The number of 5 gram, 65% free chlorine, calcium hypochlortic tablets required per length of pipe are:

Inside Diameter of Pipe	Number of 5 gram tablets
4"	1
6"	1
8"	2
10"	3
12"	4
14"	5
16"	7
18"	8 (18' joints)
20"	9 (18' joints)
24"	12 (18' joints)

B. Flushing and Sampling. The City Engineer shall take samples to the lab for bacteria testing prior to the Contractor making the final tie-in to the existing system. The Contractor is responsible for flushing the mains prior to sampling.

In the event that the samples taken by the City Engineer result in positive bacteria in the sampled main, the main shall be re-sterilized by the Contractor using a chlorine injection method and supervised by City Engineer. The water main shall again be blown off and re-sampled by the City Engineer. Any re-sterilization and re-sampling will be paid for by the Contractor. Further, if the new main is not tied in within 30 days, then it shall be re-sampled at additional expense to the Contractor.

99-1.14 Connections to Existing Mains. After notification that the new main successfully passed its bacteria test, the Contractor shall tie-in the new water mains to the existing mains, under the supervision of the City Engineer. The Contractor shall complete the tie-in at the locations shown on the drawings and shall do all the excavating, de-watering, and backfill required for tie-ins. The "point of connection" for a hot tap is defined as the down stream side of the tapping valve.

The new main shall be tied-in to the existing system within 30 calendar days following notification of test results. Failure to complete the tie-in within 30 days shall require a re-test for bacteria. All costs for re-sampling and re-testing shall be paid for by the Contractor.

99-1.15 Tie-Ins Involving Shut Down. All fittings, valves, and materials to accomplish all tie-ins shall be on the job, and existing lines exposed and checked for proper fit prior to any shutdown.

Since connections shall result in temporary interruption of service in the area, it shall be essential for the City to give at least two (2) working days of advance notice to the affected consumers. Therefore, the Contractor shall coordinate their scheduling of connections with City activities. In addition, the Contractor may be required to supply bypass connections to maintain service to consumers as directed by the City Engineer. The Contractor shall receive no additional compensation for such bypasses. The connections shall normally be made Tuesday through Thursday. Although there may be times when a connection must be made at night, this shall not normally be the case. The Contractor is advised of this situation and no additional compensation shall be allowed for any costs resulting from such required connections and resultant delays. When requested by the City Engineer, the Contractor shall provide such assistance as may be required in notifying consumers of water service interruption.

99-1.16 Hot Taps. The Contractor is responsible for providing hot taps and installing the tapping sleeve, tapping saddle, tapping valve, and all other materials necessary to perform the tap. Traffic control, excavation, backfill, and completion of the work to finished grade shall be done by the Contractor. The Contractor shall pressure test the tapping sleeve connection, in the presence of the City Engineer, prior to Contractor making the tap. The remaining closure piece between the tapping valve and the previously installed new main shall be inspected by the City Engineer.

99-1.17 Temporary Bypass Pipes. When a shutdown is required that will cause any customer or customers of the City of American Canyon to be deprived of water service for periods of time in excess of six (6) hours during any one day or where so directed by the City Engineer, the Contractor shall install a temporary bypass pipe, generally located on top of the ground. Such temporary bypass pipe shall include the provisions for service outlets to the water customers.

In the event the shutdown involves the interruption of water service to a fire hydrant, the City Engineer shall have the authority to require that the temporary bypass pipe include provision for fire service. In such case, the temporary bypass pipe shall not be less then four inches (4") nor greater than six inches (6") of nominal diamater and the fire service shall be a single four-and-one-half inch (4½") hose connection with a control valve of a type approved by the City Engineer.

99-1.18 Water System Component Reporting. The Contractor shall submit the material type, manufacturer, and model number of all water system components to the City Engineer prior to final testing.

99-1.19 Construction Water. Construction water shall be obtained from the City water system only at the point(s) designated by the City Engineer.

The Contractor must possess a valid Water Use Permit issued by the City Water Utility for each metered construction water connection. A fee and deposit for each meter will be required which is refundable upon removal of the meter by City Engineer, less any charges for water used.

Contractors are prohibited from operating gate valves or fire hydrants on the City system. Acquisition of water through appropriation at unmetered fire hydrants or other facilities is a violation of City Ordinance and State Law.

SECTION 1OO -- STREET OPENING & PAVEMENT RESTORATION REGULATIONS

100-1.01 Memorandum. Permission to excavate in newly re-surfaced streets will not be granted for three (3) years after completion of street re-surfacing. For those streets with chip seal or slurry seal coatings, the moratorium shall be for 18 months. The City Engineer shall determine alternate methods of making necessary repairs to avoid excavating in newly re-surfaced streets. Exceptions to the above are as follows:

A. Emergency which endangers life or property.
B. Interruption of essential utility service.
C. Work that is mandated by City, State, or Federal legislation.

100-1.02 General. The following regulations pertain to street excavations:

100-1.02 A. Permits.

1. Except in extreme emergency, street opening permits must be taken out in advance of excavation work. An extreme emergency is considered to exist only when life or property is endangered or when an essential utility service is interrupted during weekends, holidays, or outside the hours of 7:30 a.m. and 4:00 p.m. of normal working days.

2. A plan showing the approximate location of excavation must be provided. Record drawings shall be submitted prior to acceptance of the project.

3. Permits for street opening shall be valid for a maximum of three (3) months. The estimated date of commencement and completion of work shall be indicated in all permits. Conflicts in the schedules of work under two or more permits shall be resolved by the parties involved.

4. As a condition of the permit to excavate, the applicant must have been provided an inquiry identification number by a regional notification center (USA) pursuant to Section 4216, Chapter 1153 of the California State Law.

5. City Engineer, telephone (707) 647-4360, ext. 153, shall be notified 24 hours in advance of any work.

100-1.03 Excavation

A. All excavated material not suitable for back fill shall be removed from the job site within 24 hours. Excavated material suitable for backfill may be stored on the job site for a maximum of five (5) working days, provided it does not occupy any more street space than the permit allows and provided this material is completely prevented from blowing, washing, or being thrown about at all times.

B. No trench shall be opened on any street which is not backfilled at the end of the day. With prior approval of the City Engineer, the trench may be left open at the end of the day with adequate safety precautions for vehicular and pedestrian traffic.

100-1.04 Backfill

A. Trenches shall be backfilled with Class II AB or suitable approved excavated material. Compaction of backfill shall be in accordance with Engineering Standard Plans 4.01 and 4.02 and these specifications.

B. Where undermining has occurred, remove existing pavement as directed by the City Engineer to compact backfill.

C. Certificates shall be obtained from an independent testing laboratory verifying that compaction meets requirements. The number of tests will be specified by the City Engineer. The intent of these tests is to assure that pavement is properly restored. Tests will generally be required on all excavations. The number of tests required at the City Engineer's opinion will increase if results are poor and decrease if good compaction is consistently obtained.

100-1.05 Paving

A. Trenches shall be paved as shown on Engineering Standard Plan 4.02. Sawcutting of the existing pavement shall be in neat, straight lines. To allow for proper placement of the new pavement section, damaged

pavement outside of the original trench cut lines shall be removed by cutting in lines perpendicular to or parallel to the original trench lines. No diagonal cuts are to be made. Undamaged pavement of three (3) feet or less between two (2) damaged areas shall also be removed.

B. Pavement will be restored using the "T Section" shown on Engineering Standard Plans 4.01 and 4.02. For trenches in moratorium streets parallel to the center line of the street, the entire lane shall be key-cut one-and-one-half (1½") inches deep and re-paved with asphalt concrete. For trenches in moratorium streets with chip seal or slurry seal coatings, the entire lane shall be re-surfaced with these coatings.

C. Trenches in concrete streets shall be paved with concrete pavement. The thickness of the new pavement shall be equal to the thickness of the existing pavement with the minimum thickness to be six inches (6") in the roadway. Dowelling and color matching is required.

D. Trenches in major and minor thoroughfares with asphalt wearing surfaces shall be paved with not less than ten-and-one-half inches (10½") of asphalt concrete wearing surface.

E. Trenches in collector street and cul-de-sac streets shall be paved with one-and-one-half inches (1½") of asphalt wearing surface on five-and-one-half (5½") of asphalt concrete.

F. Pavement shall be restored within fourteen (14) working days from the time the trench is backfilled. For minor excavation such as service installations, the pavement shall be restored within two (2) working days from the time the trench is backfilled. The asphalt concrete wearing surface shall be placed within two (2) working days after placement of asphalt concrete base, weather permitting.

G. Prior to placing asphalt concrete, the existing asphalt concrete shall have a vertical face so that new AC paving can be butt-joined. No feather of new paving to existing paving is allowed. The vertical faces shall be tack coated. In moratorium streets, placement of the final one-and-one-half inches (1½") of AC wearing surface shall be done by a paving machine or spreader box in order to eliminate the uneven, wash-board effect that results from hand spreading. Asphalt concrete shall be delivered and compacted in accordance with the Standard Specifications.

H. Asphalt pavement shall be compacted to obtain a minimum dry compaction of 95% (ASTM 1557). The asphalt concrete wearing surface will be smooth enough so that there is no irregularity greater than five sixteenths (5/16) of an inch in ten feet (10') in any direction.

I. Steel plates shall be used when ordered by the City Engineer to facilitate traffic flow and to protect the excavation until finished pavement is restored. Steel plates used to bridge a street opening shall be ramped to the elevation of the adjacent pavement and secured against movement in any direction. Temporary ramps shall be constructed of asphalt and shall have a gradual slope. On all other streets, temporary asphalt cutback is permitted.

J. Utility trenches shall be color-coded with a four-inch (4") painted mark at the beginning and end of each trench at each intersection when paving is completed for inspection of record drawings. The color assigned to each franchised utility is as follows:

PG&E Electric	Red
PG&E Gas	Yellow
Pacific Bell	Orange
City Water	Blue
City Sewer	White
Street repair	Dark green
Cablevision	Orange

K. Wheelchair ramps shown on Engineering Standard Plan 3.15 shall be constructed where any portion of the curb at a legal pedestrian crosswalk or any portion of the sidewalk in immediate contact with such curb is removed, except where there is an existing wheelchair ramp in the crosswalk or where there is a sub-sidewalk basement behind the crosswalk.

100-1.06 Defects. Depressed trench pavement shall be repaired as follows to twelve inches (12") outside of the perimeter depression:

A. Wearing surface; defects remove, and restore wearing surface.
B. Major defects; excavate, remove, and restore surface and base

The severity of the defect will be determined by the City Engineer.

Work not complying with the above requirements will be rejected, removed, and re-done to the satisfaction of the City Engineer.

Contractor shall be responsible to correct trench defects until such time as the street is re-surfaced.

100-1.07 Miscellaneous. Street excavation signs shall be installed at the project site at least two (2) days in advance or any construction work lasting five (5) days or more. Signs must state name of utility company and Contractor, twenty-four (24) hour telephone number, and type of construction.

Any violation of the above regulation may result in the revocation of the street opening permit and/or subject to a police citation or fine.

ENGINEERING STANDARD PLANS
TABLE OF CONTENTS

	TITLE	DATE
Sanitary Sewer		
6.01	Standard 60" Precast Concrete Manhole	March, 1995
6.02	Standard 48" Precast Concrete Manhole	March, 1995
6.03	Type I Sanitary Sewer Manhole	March, 1995
6.04	Metering Manhole	March, 1995
6.05	Standard Manhole Frame & Cover	March, 1995
6.06	Bolt Down Manhole Frame & Cover	March, 1995
6.07	Main Line Cleanout	March, 1995
6.08	Eight-Inch (8") Lamphole 45° Cast Iron Frame & Cover	March, 1995
6.09	Service Sewer	March, 1995
6.10	Property Line Cleanout to Grade	March, 1995
6.11	Standard Sewer Line Taps	March, 1995
6.12	Sand & Grease Interceptor	March, 1995
6.13	Pipe Crossing Details	March, 1995
Water		
7.01	Service Layout	March, 1995
7.02	Standard ¾" & 1" Water Service Installation	March, 1995
7.03	Standard 1½" & 2" Water Service Installation	March, 1995
7.04	Blow-Off Assembly	March, 1995
7.05	Typical Installation of Air & Vaccum & Air Release Valve	March, 1995
7.06	Valve Box and Riser Extension	March, 1995
7.07	Fire Hydrant Installation	March, 1995
7.08	Installation of Backflor Prevention Devices (Private Fire)	March, 1995
7.09	Typical Water Main Lowering Detail	March, 1995
7.10	Typical Water Main Installation Over Structure	March, 1995
7.11	Locating Wire for Water Mains	March, 1995
7.12	Thrust Block & Anchor Block Details	March, 1995
7.13	Installation of Reduced Pressure Backflow Preventor (¾" - 2")	March, 1995
7.14	Typical Location of Water Mains & Mainline Valves	March, 1995
Street Lighting		
8.01	Standard Street Light Pole & Foundations	March, 1995
8.02	Typical Street Light Luminar Layout	March, 1995
Landscaping		
9.01	Tree Root Control	March, 1995
9.02	Planting Details	March, 1995
9.03	Specimen Tree Planting & Guying Detail	March, 1995
9.04	Non-Irrigated Hillside & Native Plantings Detail	March, 1995
9.05	Shrub Planting Detail	March, 1995
Irrigation		
10.01	Typical Trenching Detail	March, 1995
10.02	Quick Coupler Main Line	March, 1995
10.03	Remote Control Valve Assembly	March, 1995
10.04	Swing Joint & Sprinkler Head Detail	March, 1995
10.05	Flush Valve Detail for Drip Emitter System	March, 1995
10.06	Drip Emitter Assembly	March, 1995
10.07	Isolation Valve Installation Detail	March, 1995

MODIFICATIONS AND REVISIONS TO THE STANDARD PLANS

Introduction:

Only those State Standard Plans which are modified or revised will be noted herein.

The Engineering Standard Plans shown in this section take precedence over the State Standard Plans where there are conflicts. All other State Standard Plans will be valid.

The City Engineer, from time to time, may revise any and all plans, specifications, and procedures herein. The contractor, developer, builder, etc., has the responsibility to ensure they have the latest revisions to these plans, specifications, and procedures.

AB	aggregate base
Abn	abandon
Abut	abutment
AC	asphalt concrete
AC	acres
ACB	asphalt concrete base
ACI	American Concrete Institute
ACP	asphalt concrete pipe
Alt	alternate
ASA	American Standards Association
ASCE	American Society of Civil Engineers
Assy	assembly
ATPB	asphalt treated permeable base
ATPM	asphalt treated peameablematerial
Ave	avenue
BB	beginning of bridge
BC	begin horizontal curve
BCR	begin curb return
Beg	begin
Bit Ctd	bituminous coated
Bk	back
Bkf	backfill
Bldg	building
Blvd	boulevard
BM	bench mark
Br	bridge
BVC	begin vertical curve
BW	barbed wire
CAA	cable anchor assembly
CAP	corrugated asbestos pipe
CAS	construction area sign
C-C	center-to-center
CF	cubic foot
cfs	cubic feet per second
Chnl	channel
CIDH	cast-in-drilled-hole
CIP	cast iron pipe
CIPP	cast-in-place pipe
CIPCP	cast-in-place concrete pipecenter line
CL	chain link
Cl	class
Clr	clear, clearance
CMP	corrugated metal pipe
Co	counly
C.O.	clean out
Col	column
Conc	concrete
Cond	conduit
Conn	connector
Const	construct(ion)
Coord	coordinate
Cr	creek
CRSP	concreted rock slope protection
CSP	corrugated steel pipe
CSPA	corrugated steel pipe arch
CTB	cement treated base
CTPB	cement treated permeable base
CTPM	cement treated permeable material
Culv	culvert
CY	cubic yard
D	depth
Dbl	double
DD	downdrain
Del	delineator
Det	detour or detail
DF	Douglas Fir
Di	drainage inlet
Dia	diameter
Dist	distance
DMBB	double metal beam barrier
Dr	drive
DTBB	double thrie beam barrier
DWR	Department of Water Resources
Dwy	driveway
EA	each
Ease	easement
EB	end of bridge or eastbound
EC	end horizontal curve
ECR	end curve return
ED	edge drain
EDC	edge drain cleanout
EDO	edge drain outlet
EDV	edge drain vent
Elev	elevation
Emb	embankment
EP	edge of pavement
Eq	equation
ES	edge of shoulder
ETW	edge of traveled way
EVC	end vertical curve
EW	endwall
Exc	excavation
Exist	existing

Exp	expressway
Exp Jt	expansion joint
F&C	frame & cover
F&G	frame and grate
Fdn	foundation
FEBT	facing eastbound traffic
Fed Spec	Federal Specifications
FEMA	Fedeart Emergency Management Act
FES	flared end section
FF	filter fabric
FG	finished grade
FH	fire hydrant
FHA	Federal Housing Authority
FL	flow line
FLG	flanged
FNBT	facing northbound traffic
FrRd	frontage road
FSBT	facing southbound traffic
Ft	foot or feet
Ftg	footing
FWBT	facing westbound traffic
Fwy	freeway
Ga	gage
GAL	gallon
Galv	galvanized
GP	grading plane
GR	guard railing
GSP	galvinized steel pipe
H	height
HCM	Highway capacity manual
HD	horizontal drain
Horiz	horizontal
HP	hinge point or horsepower
hr	hour
HS	high strength
HW	headwall
Hwy	highway
IAPMO	Int'l. Assn. of Plumbing Mechanical Officials
IB	imported borrow
ID	inside diameter
Inv	invert
Irr	irrigation
JP	joint pole
JS	joint structure
Jt	joint
L	length
LB	pound
LCB	lean concrete base
LF	linear foot
Loc	location
LOL	layout line
Ln	lane
LS	lump sum
Lt	left
Max	maximum
MB	metal beam
MBB	metal beam barrier
MBGR	metal beam guard railing
Med	median
MH	manhole
Mi	mile(s)
MJ	mechanical joint
Mkr	marker
Min	minimum
Misc	miscellaneous
Mod	modified or modify
Mon	monument
MP	metal plate
Mtl	material
NB	northbound
No	number
NOAA	Nat'l. Oceanic & Atmospheric Assn.
OC	overcrossing
OD	outside diameter
OG	original ground
OGAC	open graded asphalt concrete
OH	overhead
PB	pull box
PC	point of curvature
PCC	point of compound curve or portland cement concrete
PCP	perforated concrete pipe
PCVC	point of compound vertical curve
Ped	pedestrian
PermMtl	permeable material
PG	profile grade
PI	point of intersection

P/L	property line
PL	plate
PM	post mile
PN	paving notch
POC	point on horizontal curve
POT	point on tangent
POVC	point on vertical curve
PP	power pole
PPP	perforated plastic pipe
PRC	point of reverse curve
PRF	pavement reinforcing fabric
PRVC	point of reverse vertical curve
PSI	pounds per square inch
PVC	polyvinyl chloride
Pvmt	pavement
R	radius
RCA	reinforced concrete arch
RCB	reinforced concrete box
RCP	reinforced concrete pipe
RCPA	reinforced concrete pipe arch
R&D	remove and dispose
Rd	road
Reinf	reinforced or reinforcing
Rel	relocate
Ret	retaining
RM	road-mixed
RP	reference point
RR	railroad
R&S	remove and salvage
RSP	rock slope protection
Rt	right
Rte	route
RW	retaining wall
R/W	right-of-way
SAE	structure approach embankment
Salv	salvage
SB	southbound
SC	sand cushion
SD	strorm drain
Sec	section
Sep	separation
SG	subgrade
Shld	shoulder
Sht	sheet
SM	selected material
Spec	special
SPP	slotted plastic pipe
SQFT	square foot
SQYD	square yard
SS	slope stake
St	street
STA	station
Std	standard
Str	structure
Surf	surfacing
SW	sidewalk, sound wall
Swr	sewer
Tbr	timber
TC	top of curb
TCB	traffic control box
Temp	temporary
TG	top of grade
TP	telephone pole
TPB	treated permeable base
TPM	treated permeable material
Trans	transition
TS	traffic signal; tubular steel
Typ	typical
Typ Sec	typical section
UD	underdrain
V	design speed, valve
Var	variable
VC	vertical curve
VCP	vitrified clay pipe
Vert	vertical
Via	viaduct
W	width
WB	westbound
WH	weep hole
WM	wire mesh
WV	water valve
WW	wing wall
Xing	crossing
X Sec	cross section
Yr	year

CITY OF AMERICAN CANYON

AMERICAN CITY OF INCORPORATED 1992 CANYON

DATE	REVISIONS

STANDARD ABBREVIATIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

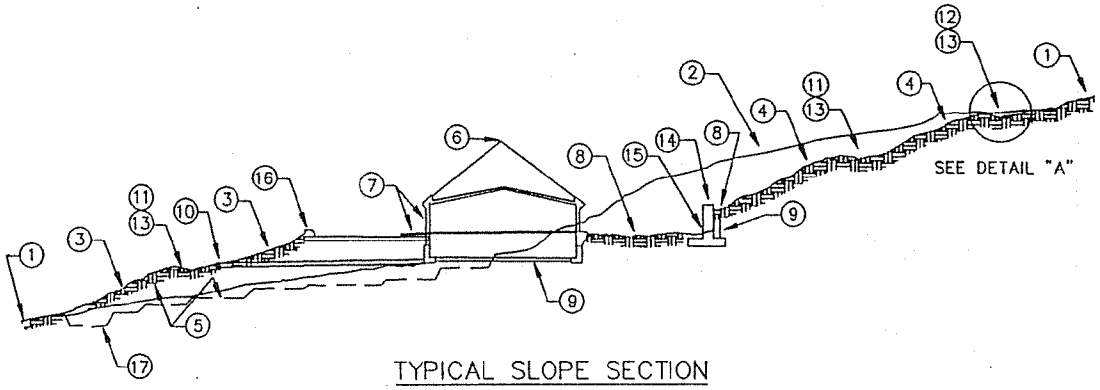
DATE 5/1/95

SCALE NONE

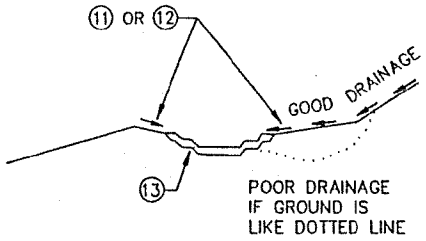
STANDARD DWG. # 1.01

CITY OF AMERICAN CANYON PUBLIC WORKS DEPARTMENT				
APPROVED BY: DIRECTOR OF PUBLIC WORKS DEPARTMENT _____ DATE _____				
PLAN REVISION				
NO.	DESCRIPTION	PAGE	APPROVED BY	DATE

CITY OF AMERICAN CANYON			
DATE	REVISIONS	SIGNATURE BLOCK MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS	DATE 5/1/95 SCALE NONE STANDARD DWG. # 1.02



TYPICAL SLOPE SECTION



DETAIL "A"

NOTES:

(1) NATURAL GROUND SLOPE
(2) ORIGINAL GROUND SLOPE
(3) FILL SLOPE
(4) CUT SLOPE
(5) FILL COMPACTED TO ENGINEERING SPECIFICATIONS AND BENCHED INTO FIRM GROUND
(6) ROOF GUTTER
(7) DOWNSPOUT CONNECTED TO AN UNPERFORATED PIPE OR LINED DITCH WATER COLLECTION SYSTEM
(8) DRAINAGE SWALE OR DITCH
(9) SUBDRAIN (PERFORATED PIPE AND PERMEABLE MATERIAL)
(10) SUBDRAIN DISCHARGE (UNPERFORATED PIPE)
(11) DRAINAGE TERRACE AND DITCH (SEE DETAIL "A", CONSTRUCTED AS APPROVED)
(12) BROW DITCH
(13) LINED DRAINAGE DITCH (SEE DETAIL "A", CONSTRUCTED AS APPROVED)
(14) RETAINING WALL (BUILDING PERMIT REQUIRED)
(15) WEEP-HOLES THROUGH RETAINING WALL
(16) COMPACTED BERM TO DIRECT WATER OFF SLOPE
(17) KEYWAY

AMERICAN CITY OF CANYON INCORPORATED 1992

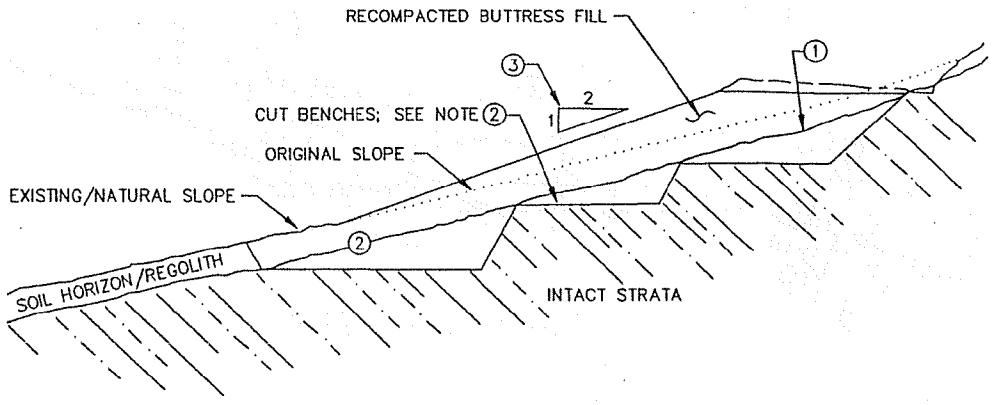
CITY OF AMERICAN CANYON

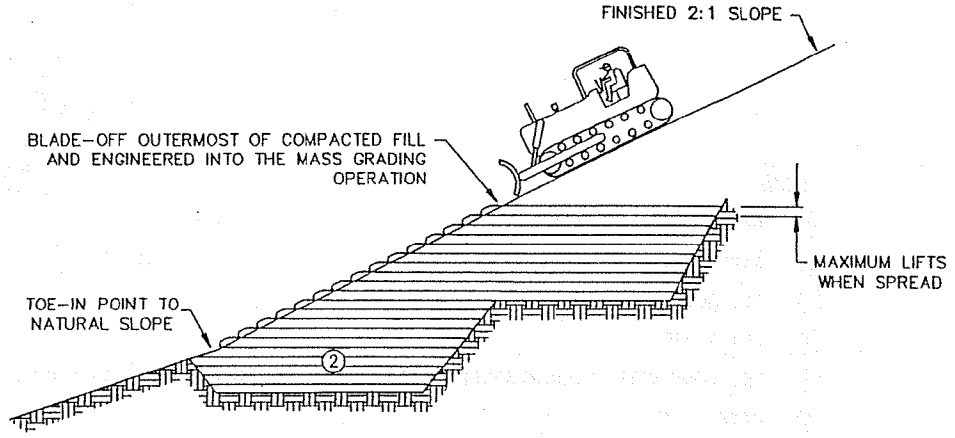
DATE	REVISIONS

STANDARD TERMS
W/HILLSIDE GRADING

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95
SCALE NONE
STANDARD DWG. # 2.01





COMPACTION: ALL STRUCTURAL FILL IS TO BE COMPACTED TO A MINIMUM VALUE OF 90% RELATIVE COMPACTION.

NOTES:

1. GRUB & SCARIFY SLOPE PRIOR TO EARTHWORK ACTIVITIES.
2. BENCHES, KEYING, AND EXCAVATION TO EXTEND BENEATH THE SOIL OR REGOLITH HORIZON AT ALL LOCATIONS. THE REQUIRED DEPTH OF EXCAVATION IS TO BE CONFIRMED IN THE FIELD DURING CONSTRUCTION BY EITHER THE SOILS ENGINEER OR THE ENGINEERING GEOLOGIST.
3. THE MAXIMUM FINISH SLOPE IS TO BE 2:1 (HORIZONTAL TO VERTICAL).
4. SOILS/GEOTECHNICAL REPORTS SHALL BE COMPLETED & APPROVED PRIOR TO ISSUANCE OF GRADING PERMIT.

AMERICAN CANYON — CITY OF — INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

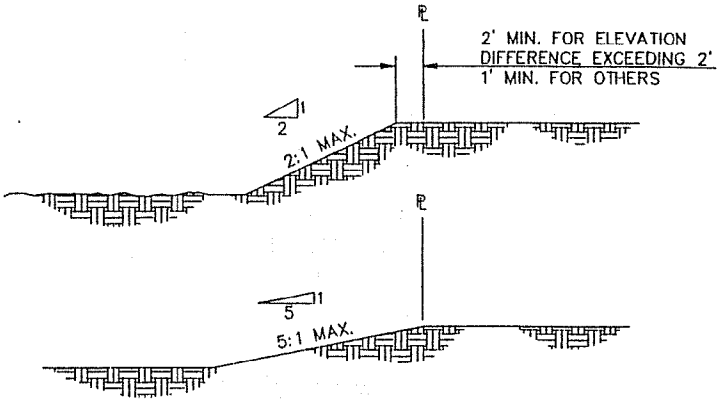
STRUCTURAL FINISH FILL DETAIL

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

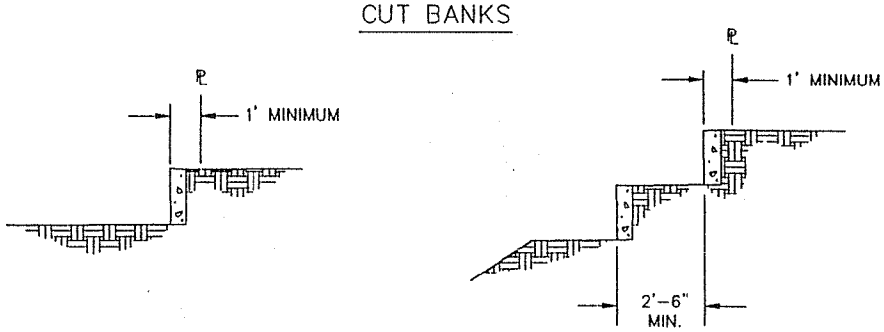
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 2.02

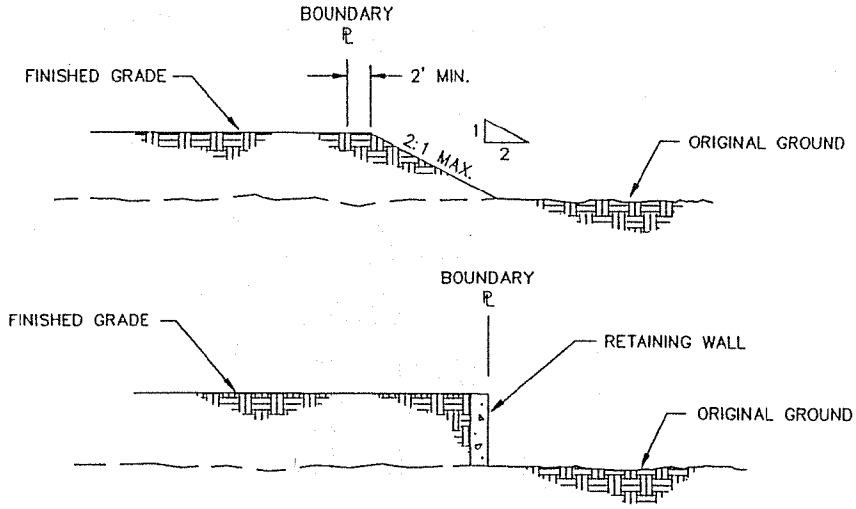


CUT BANKS



RETAINING WALLS

INTERIOR PROPERTY LINE GRADING



EXTERIOR PERIMETER PROPERTY LINE GRADING

NOTES:

1. USE FOR CUTS ADJACENT TO BOUNDARY OR EXTERIOR PERIMETER PROPERTY LINES.
2. RETAINING WALLS HIGHER THAN 1 FOOT SHALL BE CONCRETE. ALL RETAINING WALLS SHALL BE APPROVED BY THE CITY ENGINEER.
3. NO DOUBLE RETAINING WALLS TO BE CONSTRUCTED ON SIDE YARDS FOR LOTS TO BE IN CONFORMANCE TO FHA STANDARDS.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

INTERIOR/EXTERIOR PERIMETER PROPERTY LINE GRADING

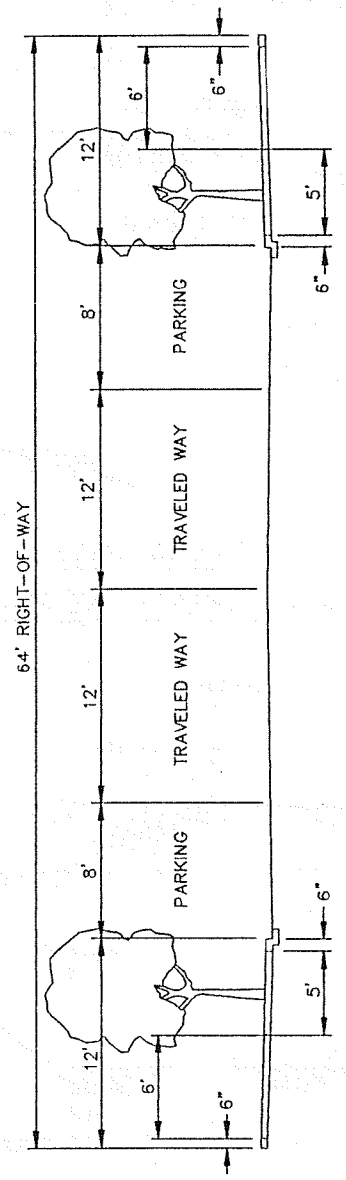
DATE 3/1/95

SCALE NONE

STANDARD DWG. # 2.03

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS



NOTES:

1. SIDEWALKS ARE 5' MINIMUM.
2. POSTED SPEED LIMIT - 30 MPH.

CITY OF AMERICAN CANYON

MINOR WITH PARALLEL STREET PARKING

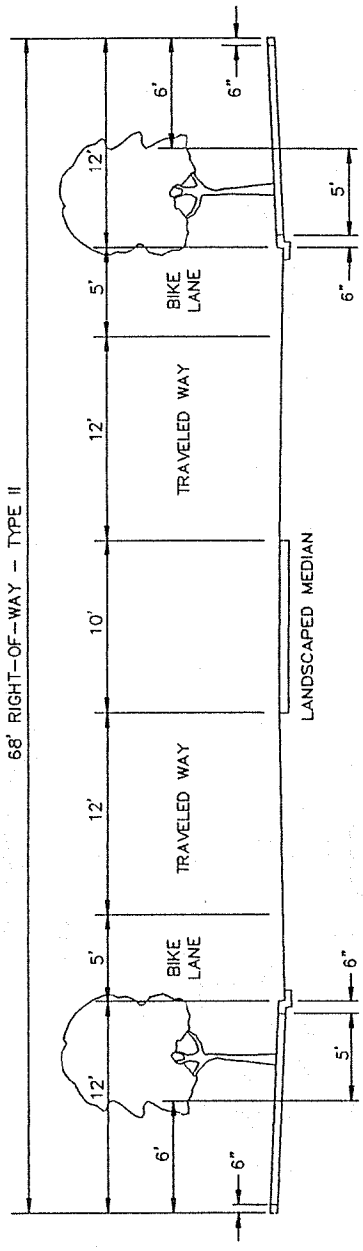
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 3.01A

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS



NOTES:

1. A TEN FOOT LANDSCAPED EASEMENT BEYOND THE PUBLIC RIGHT OF WAY SHOULD BE PROVIDED WHEREVER PROPERTIES BACK ON TO A COLLECTOR STREET.
2. POSTED SPEED LIMIT - 30 MPH.
3. SIDEWALKS ARE 5' MINIMUM.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

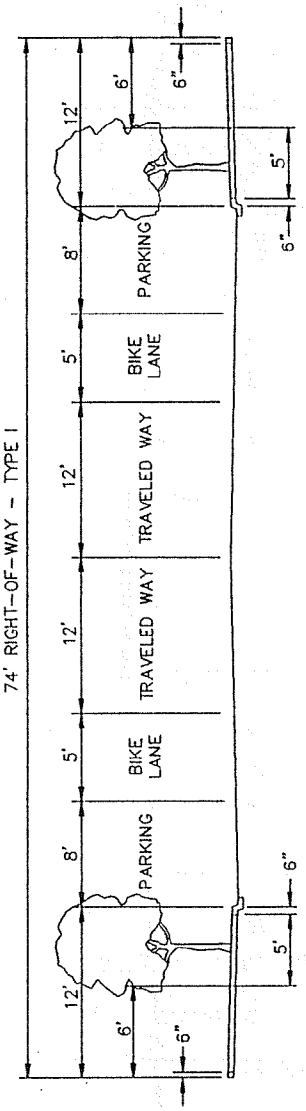
TYPE II COLLECTOR WITHOUT PARKING

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/4/95

SCALE NONE

STANDARD DWG. # 3.01B



NOTES:

1. A TEN FOOT LANDSCAPED EASEMENT BEYOND THE PUBLIC RIGHT OF WAY SHOULD BE PROVIDED WHEREVER PROPERTIES BACK ON TO A COLLECTOR STREET.
2. POSTED SPEED LIMIT - 30 MPH.
3. SIDEWALKS ARE 5' MINIMUM.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

2 LANE TYPE I COLLECTOR WITH PARALLEL STREET PARKING

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

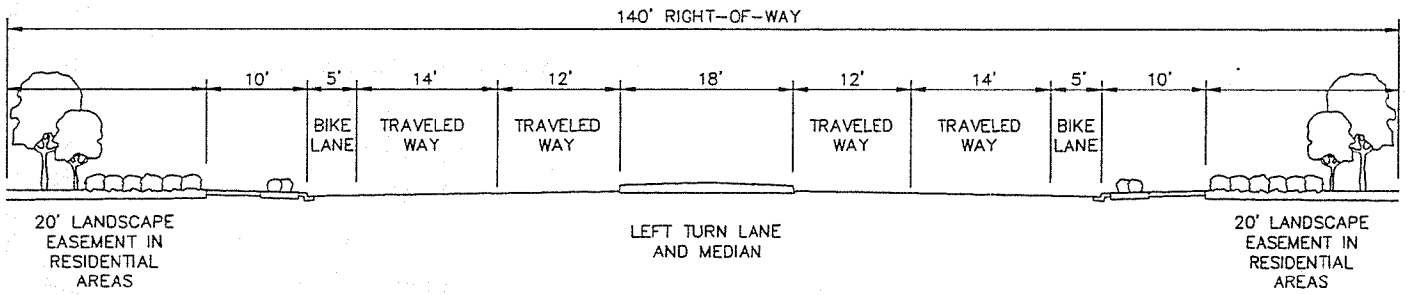
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 3.02A

CITY OF AMERICAN CANYON

4 LANE ARTERIAL WITH MEDIAN



NOTES:

1. 10' P.C.C. SIDEWALK IN COMMERCIAL AREAS. 6' P.C.C. SIDEWALK IN RESIDENTIAL AREAS.
2. POSTED SPEED LIMIT – 45 MPH.
3. SIDEWALKS ARE 5' MINIMUM.

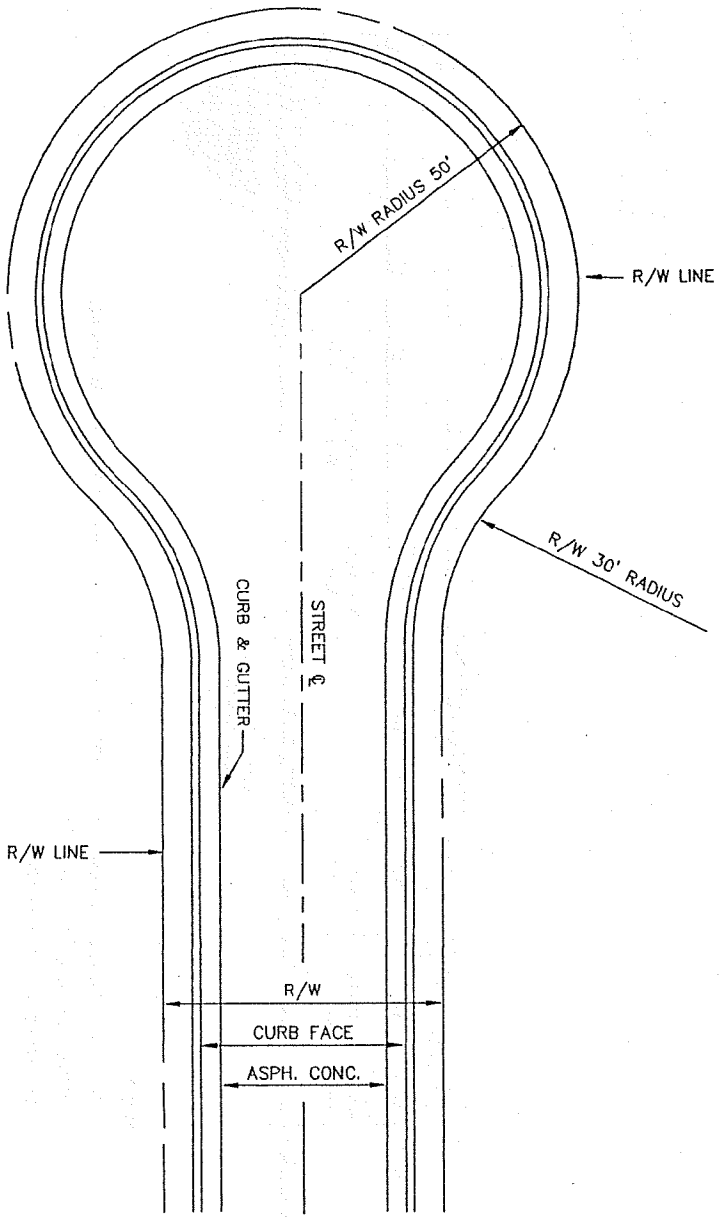
DATE	REVISIONS

MARK GARRISON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 3/15/05

SCALE NONE

STANDARD DWG. # 3.02B



NOTES:

1. A STANDARD CODE W 53 (NOT A THROUGH STREET) SIGN IS TO BE POSTED AT THE ENTRANCE TO ALL CUL-DE-SACS.
2. STREET CENTERLINE FROM CENTER OF CUL-DE-SAC TO R/W OF INTERSECTING STREET SHALL NOT EXCEED 600 FEET.
3. CUL-DE-SACS TO CONFORM TO MINOR WITH PARALLEL STREET PARKING AND 64' RIGHT OF WAYS.

AMERICAN CANYON — CITY OF — INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

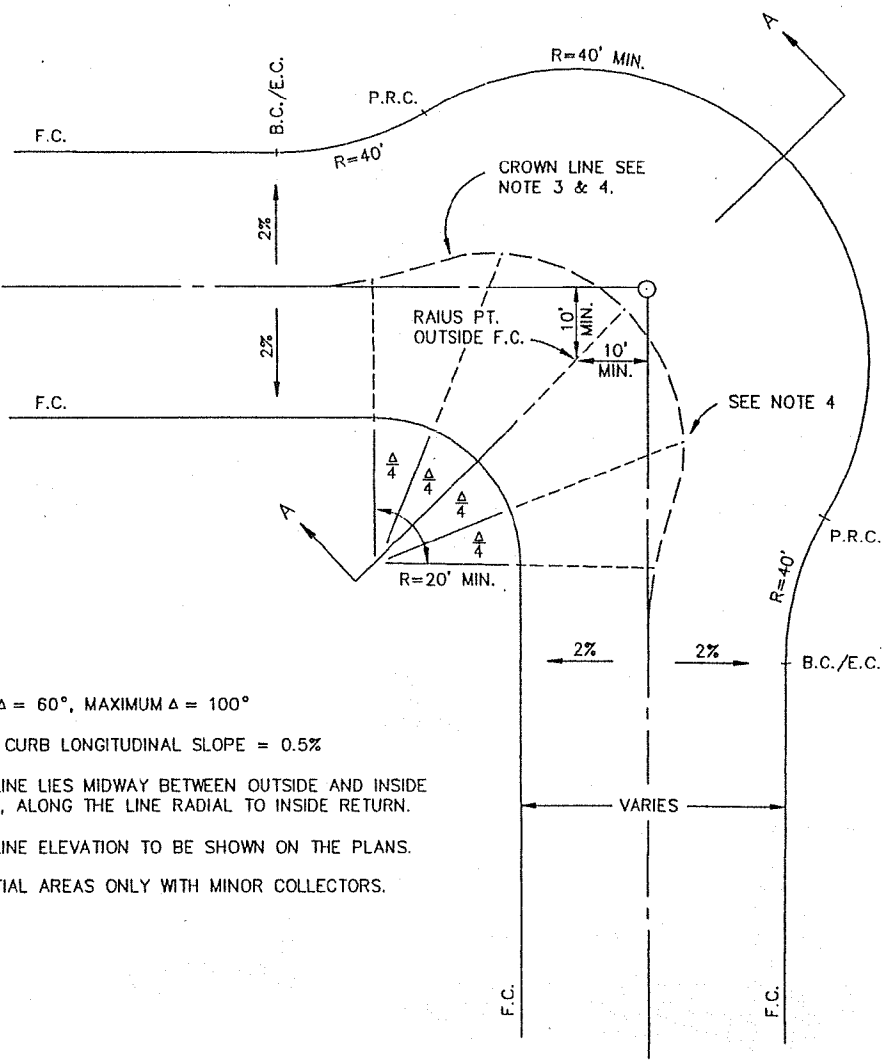
CUL-DE-SAC

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95

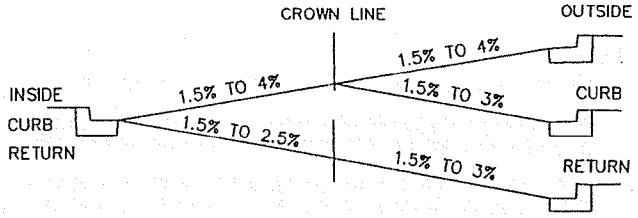
SCALE NONE

STANDARD DWG. # 3.03



NOTES:

1. MINIMUM Δ = 60°, MAXIMUM Δ = 100°
2. MINIMUM CURB LONGITUDINAL SLOPE = 0.5%
3. CROWN LINE LIES MIDWAY BETWEEN OUTSIDE AND INSIDE RETURNS, ALONG THE LINE RADIAL TO INSIDE RETURN.
4. CROWN LINE ELEVATION TO BE SHOWN ON THE PLANS.
5. RESIDENTIAL AREAS ONLY WITH MINOR COLLECTORS.



SECTION A-A

MAXIMUM & MINIMUM CROSS SLOPES

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

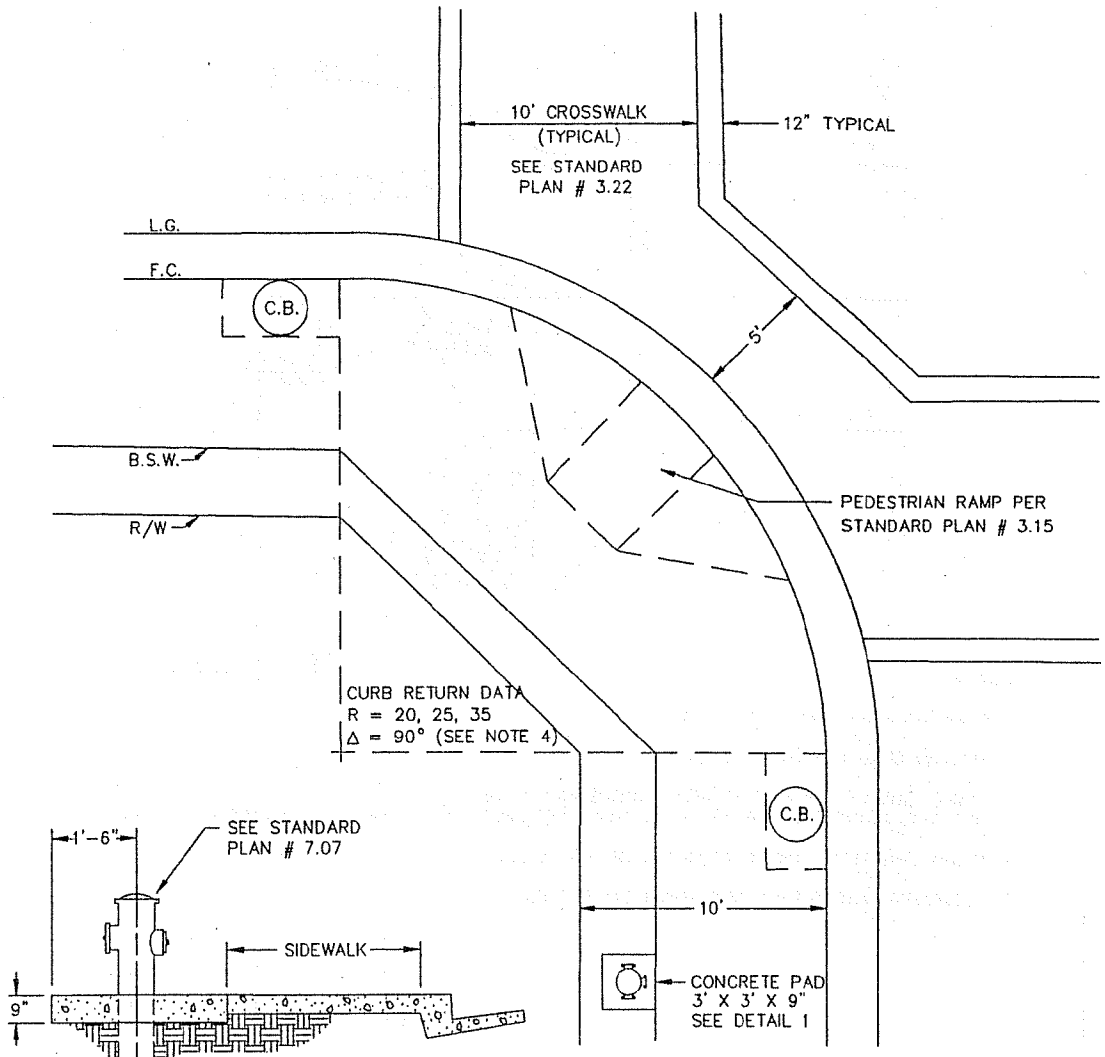
STANDARD STREET
KNUCKLE-RESIDENTIAL
TYPE I AND II COLLECTORS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 3/1/95

SCALE NONE

STANDARD DWG. # 3.04



DETAIL 1

NOTES:

1. TRAFFIC SIGNAL CONTROLLER & SERVICE CABINET BY CITY ENGINEER.
2. THE MINIMUM CURB RETURN RADIUS FOR MAJOR INDUSTRIAL STREETS SHALL BE 35', FOR COLLECTOR STREETS 25', AND FOR MINOR STREETS 20'.
3. FOR RADII GREATER THAN 35' & DELTA ANGLES GREATER THAN 90°, CURB RETURN PLAN DETAILS SHALL BE APPROVED BY THE CITY ENGINEER.
4. FIRE HYDRANT LOCATED 5' FROM BACK OF CURB W/O SIDEWALK; IN BACK OF SIDEWALK WHERE SIDEWALKS ARE USED.
5. PEDESTRIAN RAMP SHALL CONFORM TO AMERICAN DISABILITIES ACT.

AMERICAN CANYON — CITY OF — INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

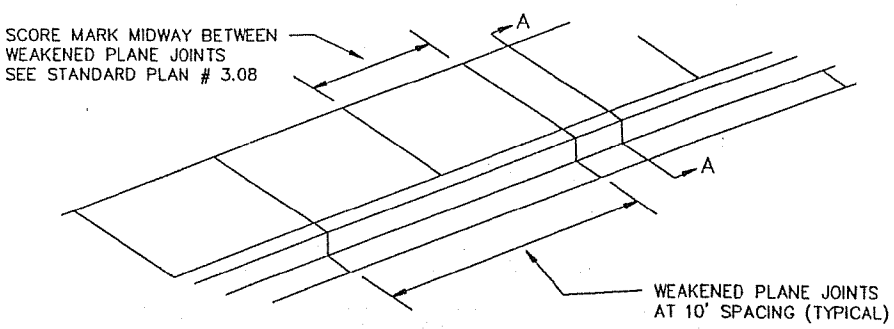
CURB RETURN PLAN DETAIL

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

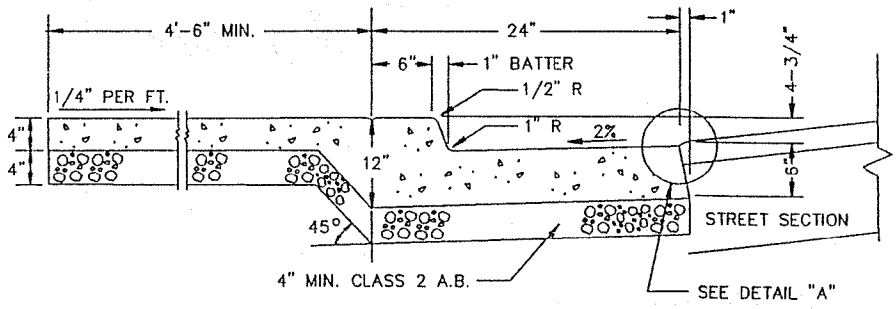
DATE 5/1/95

SCALE NONE

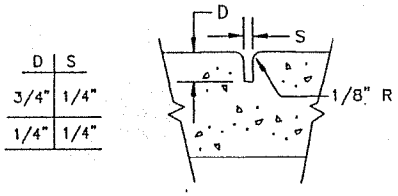
STANDARD DWG. # 3.05



TYPICAL LAYOUT

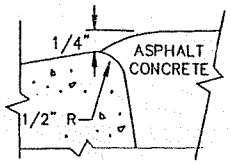


SECTION A-A



D	S
3/4"	1/4"
1/4"	1/4"

WEAKENED PLANE JOINT
SCORE MARK



GUTTER LIP
DETAIL "A"

NOTES:

1. A MINIMUM OF CLASS A PORTLAND CEMENT CONCRETE (6 SACKS PER CU. YD., MAX. AGGREGATE) SHALL BE REQUIRED FOR CONSTRUCTION. APPLY BROOM FINISH TO SURFACE OF WALK AT RIGHT ANGLE TO FACE OF CURB. BROOM FINISH CURB AND GUTTER PARALLEL TO STREET.
2. INSCRIBE A 3" "W" OR "S" ON FACE OF CURB DIRECTLY ABOVE RESPECTIVE WATER AND SEWER SERVICES. EXTENSION OF PROPERTY LINES SHALL BE MARKED WITH A CROSS ON TOP OF CURB.
3. ALL EXPOSED OUTER EDGES SHALL HAVE A 1/2" RADIUS.
4. ALL MONOLITHIC CURB, GUTTER AND SIDEWALK CONSTRUCTION SHALL REQUIRE USE OF FORM BOARD AT GUTTER LIP, RESTORATION OF EXISTING ASPHALT CONCRETE AND BACKFILL OF SOIL BEHIND SIDEWALK. PAVING AT GUTTER LIP SHALL CONFORM TO DETAIL "A", EXCEPT WHERE THE STREET SLOPES AWAY FROM THE CURB, THE PAVING SHALL MATCH THE GUTTER LIP.
5. RESIDENTIAL AND MULTIPLE ZONED SIDEWALK WIDTHS SHALL BE 5'-0" MEASURED FROM FACE OF CURB AND SHALL HAVE METER BOXES, POLES AND FIRE HYDRANTS LOCATED AS SPECIFIED BEHIND THE SIDEWALK.
6. RETAIL BUSINESS AND COMMERCIALLY ZONED SIDEWALK WIDTHS SHALL BE 10'-0" MEASURED FROM FACE OF CURB UNLESS NOTED OTHERWISE ON THE IMPROVEMENT PLANS AND SHALL HAVE METER BOXES, POLES AND FIRE HYDRANTS LOCATED AS REQUIRED BY THESE SPECIFICATIONS.
7. REPLACE WEAKENED PLANE JOINTS WITH EXPANSION JOINTS AT 60' INTERVALS. INSTALL EXPANSION JOINTS AT ALL CURB RETURNS.

AMERICAN CITY OF INCORPORATED 1992 CANYON

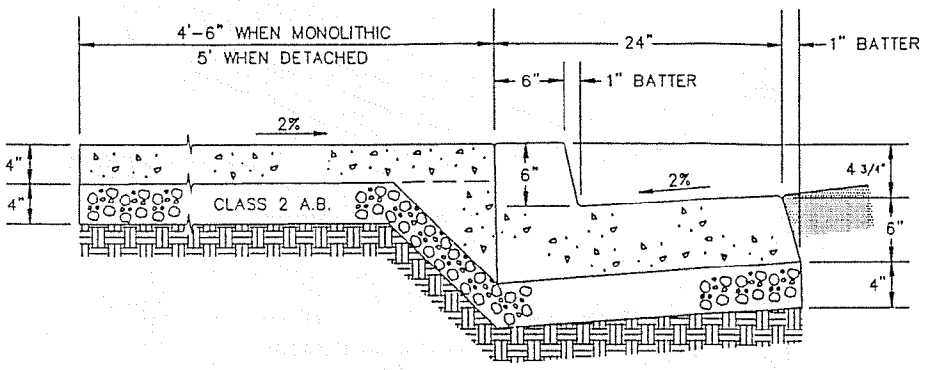
CITY OF AMERICAN CANYON

DATE	REVISIONS

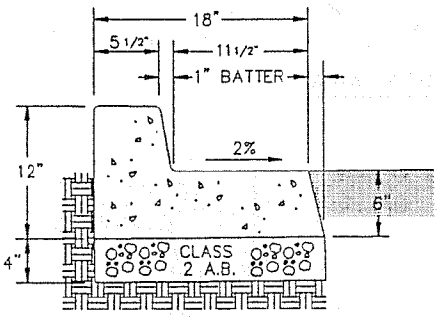
MONOLITHIC SIDEWALK
CURB AND GUTTER

MARK C. ASKSON, P.E., DIRECTOR OF PUBLIC WORKS

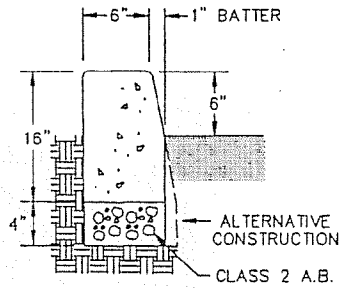
DATE 5/1/95
SCALE NONE
STANDARD DWG. # 3.06



TYPE "A"



TYPE "B"



TYPE "C"

NOTES:

1. ALL CONCRETE SHALL BE CLASS A, 3000 P.S.I. MINIMUM, WITH 1 1/2 LBS. POLYPROPYLENE FIBERS PER CUBIC YARD.
2. ALL CORNERS SHALL BE FINISHED WITH A 1/2 INCH RADIUS.
3. BROOM FINISH WALK AT RIGHT ANGLES TO CURB; CURB AND GUTTER PARALLEL TO STREET.
4. INSCRIBE A 3 INCH HIGH "W" OR "S" ON FACE OF THE CURB DIRECTLY ABOVE THE WATER OR SANITARY SEWER SERVICE.
5. ALL CONCRETE SHALL HAVE A MINIMUM 4" CUSHION OF CLASS 2 A.B. @ 95% RELATIVE COMPACTION (D1557-78) ON COMPACTED SUB-GRADE.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

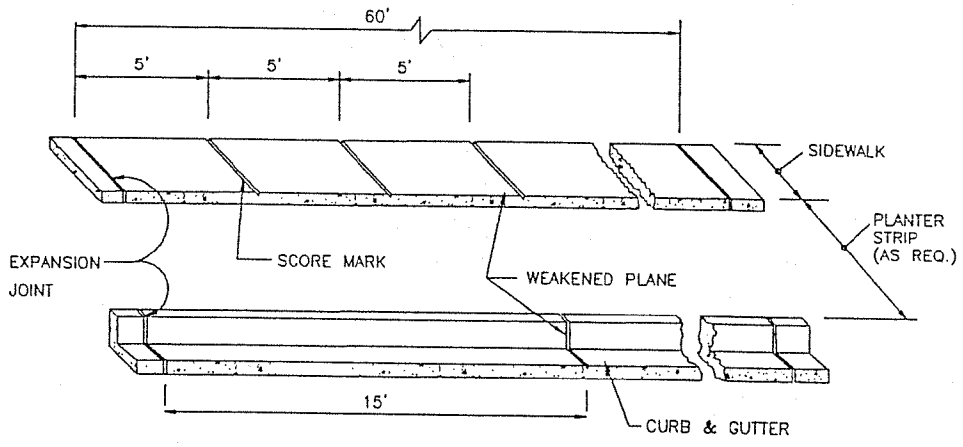
CURB AND GUTTER

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95

SCALE NONE

STANDARD DWG. # 3.07



NOTES:

1. WEAKENED PLANE 1/4" WIDE x 3/4" DEEP IN SIDEWALKS, 1/4" WIDE x 1-1/2" DEEP IN CURB.
2. EXPANSION JOINTS-MATERIAL TO BE 1/4" THICK PREMOLDED JOINT FILLER FULL THICKNESS OF CONCRETE. APPROVED MECHANICAL JOINTS MAY BE USED IN WALKS IN LIEU OF EXPANSION JOINTS.
3. SCORE MARK-FOR SIDEWALKS 6' AND MORE IN WIDTH-LONGITUDINAL SCORE MARK ALONG CENTER OF WALK.
4. EXPANSION JOINTS SHALL BE INSTALLED IN THE CURB AND GUTTER AT ALL CURB RETURNS.
5. EXPANSION JOINTS SHALL BE PLACED IN THE SIDEWALK AT THE SAME LOCATION AS THOSE IN THE CURB AND GUTTER WHEN THE SIDEWALK IS ADJACENT TO THE CURB AND GUTTER.
6. SIDEWALK SHALL HAVE A 4" BASE OF CLASS 2 AB, 4" CONCRETE SLAB AND SLOPE 1/4" PER FOOT TOWARD THE STREET.
7. STANDARD WIDTH OF SIDEWALK IS 5', 6' FOR CONTINUOUS, 10' CONTINUOUS WITH TREE WELLS, AND 5' WITH PLANTER STRIP.

AMERICAN CANYON — CITY OF — INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

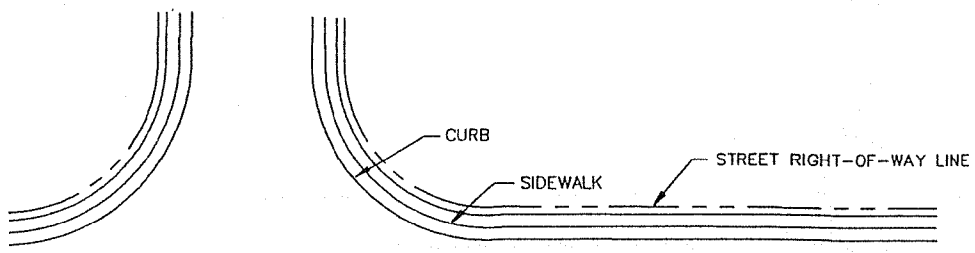
SPACING EXPANSION JOINTS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

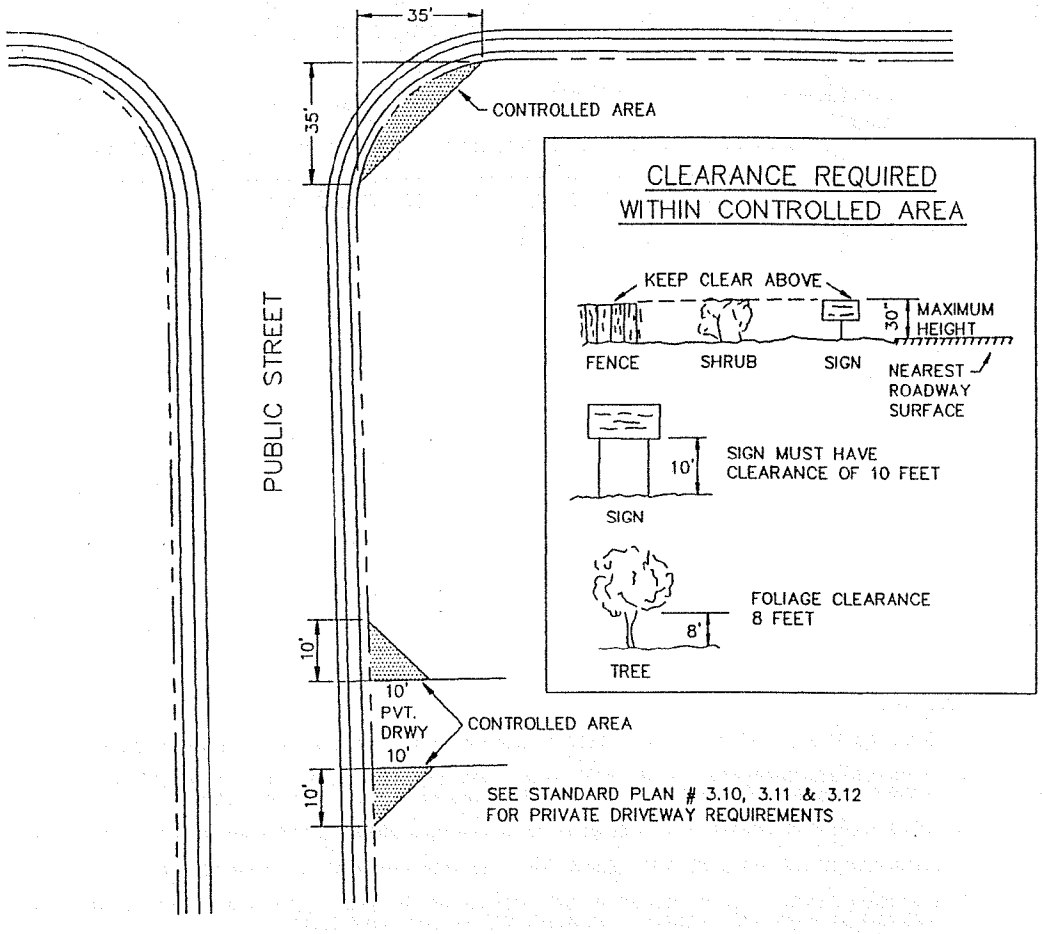
DATE 3/1/95

SCALE NONE

STANDARD DWG. # 3.08



PUBLIC STREET



NOTE:

SEE CITY OF AMERICAN CANYON ZONING ORDINANCE FOR ADDITIONAL REQUIREMENTS.

CITY OF AMERICAN CANYON

VISIBILITY REQUIREMENTS

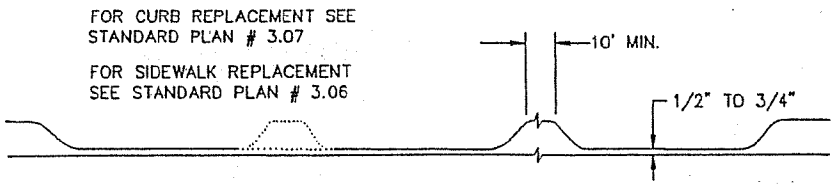
DATE 5/1/95

SCALE NONE

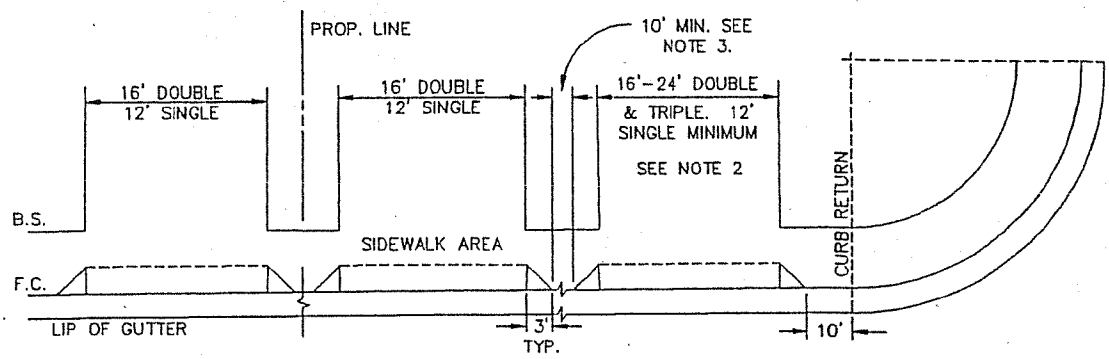
STANDARD DWG. # 3.09

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

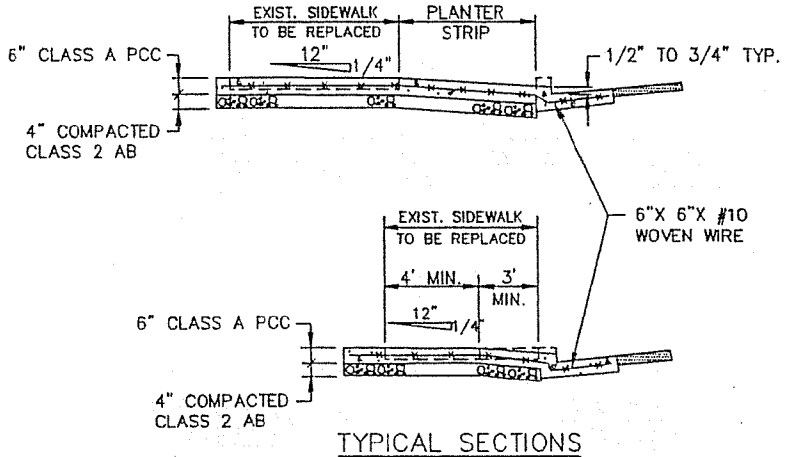
DATE | REVISIONS



ELEVATION



PLAN



TYPICAL SECTIONS

NOTES:

1. MAXIMUM OF ONE CURBCUT PER PARCEL FRONTAGE, EXCEPT AS AUTHORIZED BY CITY ENGINEER.
2. A MAXIMUM OF 24' WILL BE ALLOWED FOR CURBCUTS.
3. CURB ISLANDS BETWEEN DRIVEWAYS SHALL NOT BE LESS THAN 10' AT TOP ON ANY ONE PARCEL FRONTAGE.
4. ALL CONCRETE EDGES SHALL BE FINISHED WITH 1/2" RADIUS.

AMERICAN CANYON CITY OF INCORPORATED 1992

CITY OF AMERICAN CANYON

RESIDENTIAL CURB CUTS & DRIVEWAY REGULATIONS

DATE 3/1/95

SCALE NONE

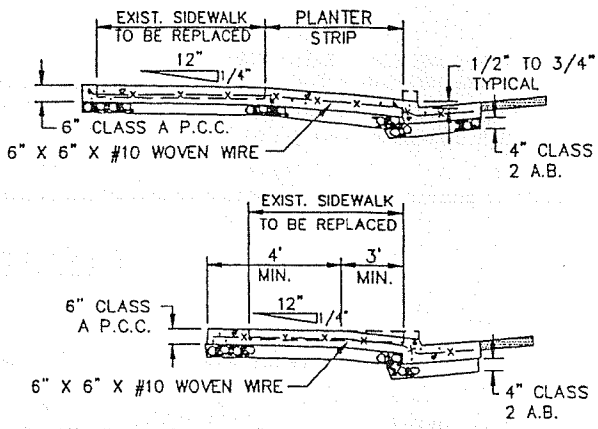
STANDARD DWG. # 3.10

DATE	REVISIONS

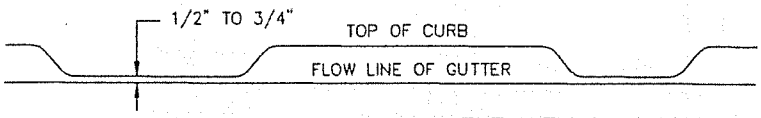
MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

FOR CURB REPLACEMENT SEE STANDARD PLAN # 3.07

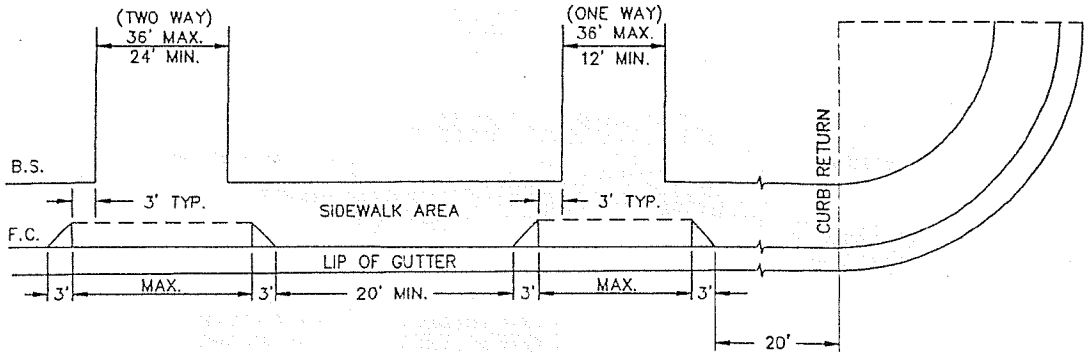
FOR SIDEWALK REPLACEMENT SEE STANDARD PLAN # 3.06



TYPICAL SECTIONS



ELEVATION



PLAN

FRONTAGE (EACH STREET)	MAXIMUM NUMBER OF DRIVEWAYS
45' TO 99'	ONE STD. DRIVEWAY
100' TO 400'	TWO STD. DRIVEWAYS
OVER 400'	THREE DRIVEWAYS

NOTES:

1. 12' TO 36' WIDTH DRIVEWAYS MAY BE APPROVED ON 56' AND 60' STREETS. 20' TO 36' WIDTH DRIVEWAYS MAY BE APPROVED ON 94' AND 120' STREETS.
2. 20' MINIMUM ALLOWABLE DISTANCE BETWEEN DRIVEWAYS FOR LESS THAN 220' FRONTAGE AND 40' MINIMUM ALLOWABLE DISTANCE BETWEEN DRIVEWAYS FOR FRONTAGES OF 220' AND OVER.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

COMMERCIAL CURB CUTS & DRIVEWAY REGULATIONS

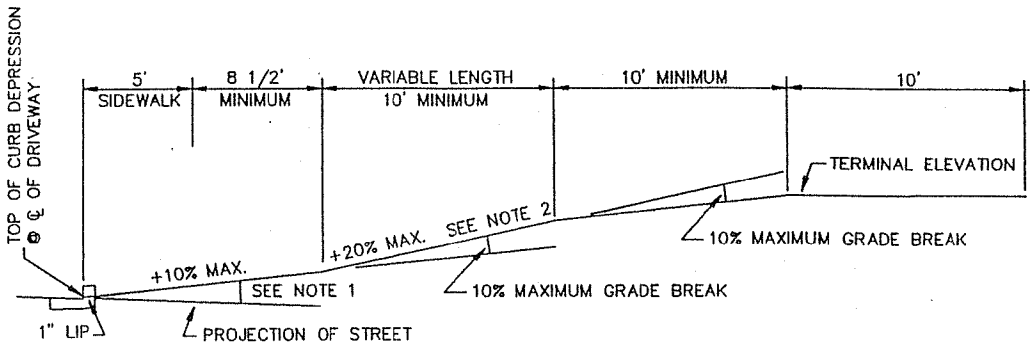
DATE 3/1/95

SCALE NONE

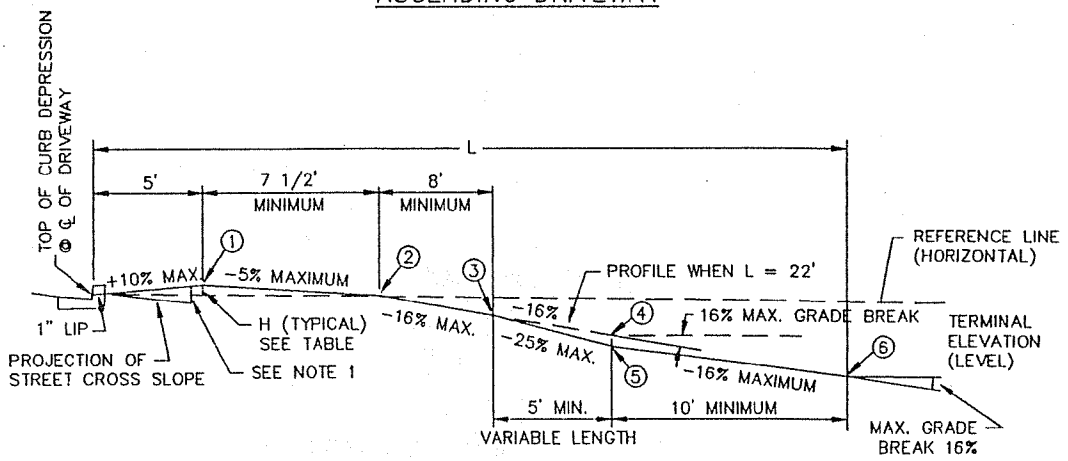
STANDARD DWG. # 3.11

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS



ASCENDING DRIVEWAY



DESCENDING DRIVEWAY

TABLE OF OFFSETS "H" FROM REFERENCE LINE

POINT	L = 22	L = 32	L = 35	L = 40	L = 45 *
1	H = 0.5	H = 0.5	H = 0.5	H = 0.5	H = 0.5
2	H = 0.1	H = 0.1	H = 0.1	H = 0.1	H = 0.1
3	H = 0.7	H = 0.7	H = 0.7	H = 0.7	H = 0.7
4	H = 1.5				
5		H = 2.0	H = 2.7	H = 4.0	H = 5.2
6		H = 3.2	H = 3.9	H = 5.2	H = 6.4

* (L) GREATER THAN 45' WILL BE DEALT WITH ON A CASE BY CASE BASIS.

NOTES:

1. GRADE DIFFERENCE BETWEEN INTERSECTING STREET CROSS SLOPE AND CENTERLINE OF PROPOSED DRIVEWAY IS TO BE NO GREATER THAN 10% FOR 10 FEET STARTING FROM FACE OF CURB OR EDGE OF PAVEMENT. IN NO CASE SHALL GRADE FROM FACE OF CURB OR EDGE OF PAVEMENT BE GREATER THAN 10% WITHIN THE FIRST 10'.

2. IF DRIVEWAY SERVES MORE THAN ONE LOT, MAX. DRIVEWAY GRADE IS 20%. IF DRIVEWAY SERVES ONLY ONE LOT, A 25% MAX. GRADE WILL BE ALLOWED. ADDITIONAL DRIVEWAY LENGTH MUST BE PROVIDED TO ACCOMODATE THE EXCESS GRADE BREAK.

3. CAR DIMENSIONS WERE OBTAINED FROM THE 1977 EDITION OF "PARKING DIMENSIONS," MOTOR VEHICLE MANUFACTURERS ASSOCIATION, 320 NEW CENTER BUILDING, DETROIT, MICHIGAN 48202. THIS DESIGN AND CONSTRUCTION AID IS BASED ON THE MOST UNFAVORABLE DIMENSIONS OF CARS LISTED. FOR UNIQUE OR OVERSIZED CARS, A SPECIAL DESIGN IS REQUIRED.

4. "H" DENOTES DIFFERENCE IN ELEVATION BETWEEN REFERENCE LINE AND DRIVEWAY PLANE AT VARIOUS POINTS.

5. L = VARYING LENGTH OF DRIVEWAY.

AMERICAN CITY OF INCORPORATED 1992 CANYON

CITY OF AMERICAN CANYON

DATE	REVISIONS

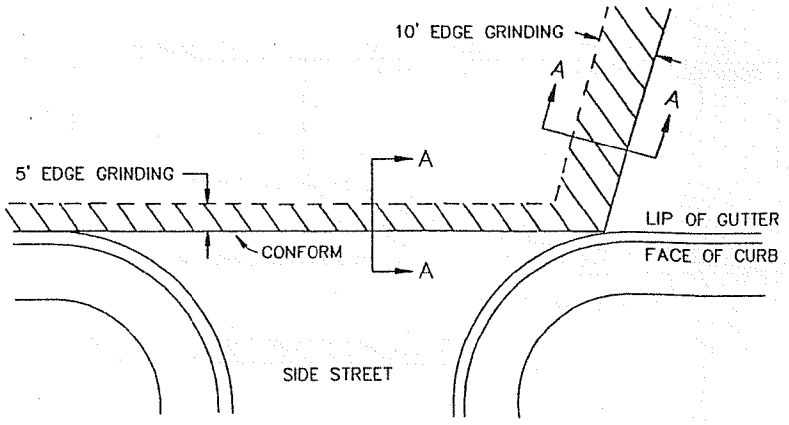
DRIVEWAY PROFILES

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

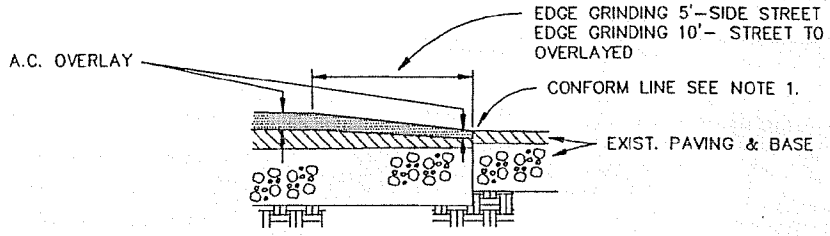
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 3.12

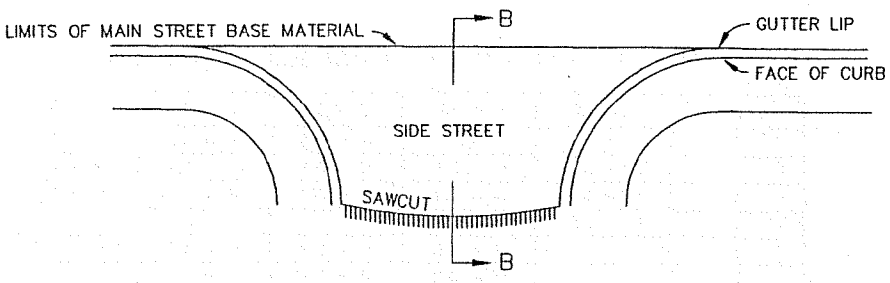


PLAN

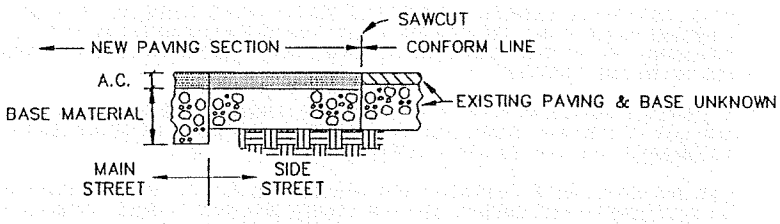


SECTION A-A

MAIN STREET BEING RECONSTRUCTED



PLAN

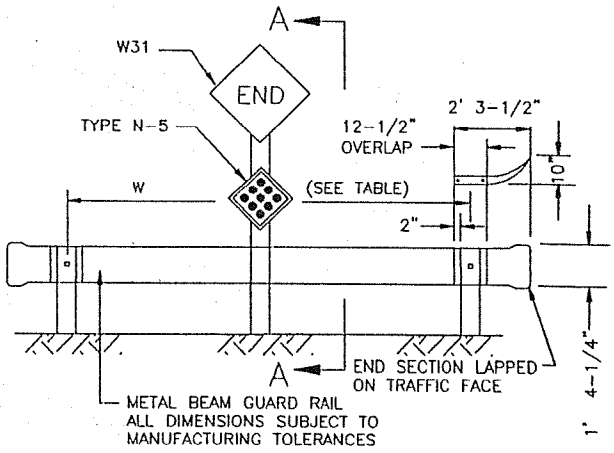


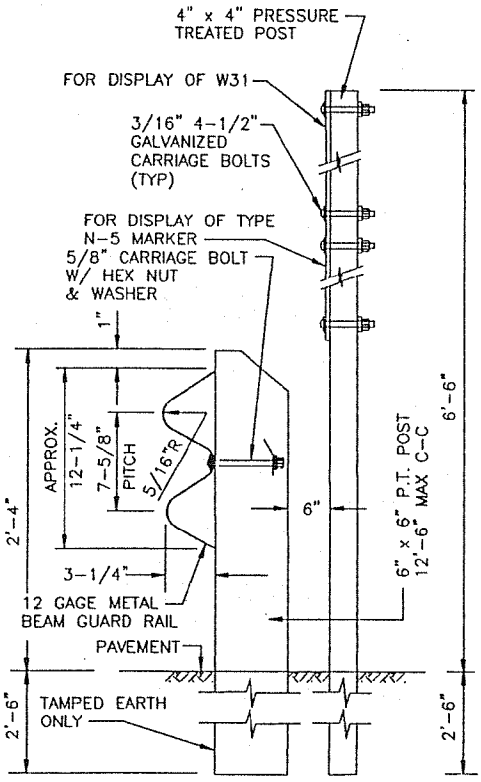
SECTION B-B

NOTES:

1. EDGE GRINDING SHALL BE A MINIMUM OF 1" ± 1/4" BELOW TOP OF GUTTER PAN.
2. SIDE STREET A.C. THICKNESS SHALL MATCH MAIN STREET PAVING SECTION THICKNESS.

AMERICAN CANYON CITY OF INCORPORATED 1992	CITY OF AMERICAN CANYON		
		SIDE STREET & END OF OVERLAY CONFORM	DATE 3/1/95
			SCALE NONE
			STANDARD DWG. # 3.13
DATE	REVISIONS	MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS	





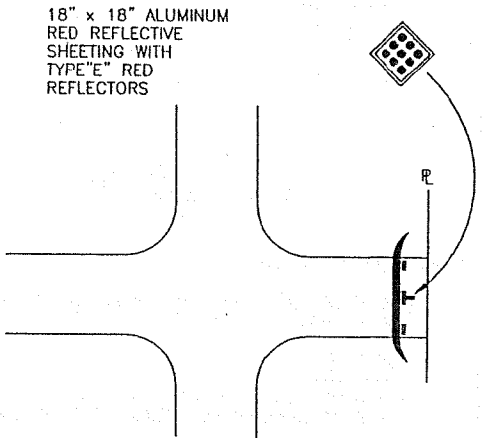
SECTION "A-A"
POST DETAILS

W31

30" x 30" ALUMINUM BLACK LETTERS ON YELLOW REFLECTIVE SHEETING TO BE MOUNTED AS SHOWN IN PLAN

TYPE N-5 MARKER

18" x 18" ALUMINUM RED REFLECTIVE SHEETING WITH TYPE"E" RED REFLECTORS



PLAN

NOTES:

1. ALL METAL ELEMENTS TO BE HOT DIPPED GALVANIZED.

ROADWAY WIDTH	W
32' AND 36'	2 @ 12'-6" = 25'-0"
40'	3 @ 12'-6" = 37'-6"
64'	4 @ 12'-6" = 50'-0"

CITY OF AMERICAN CANYON

STREET BARRICADE

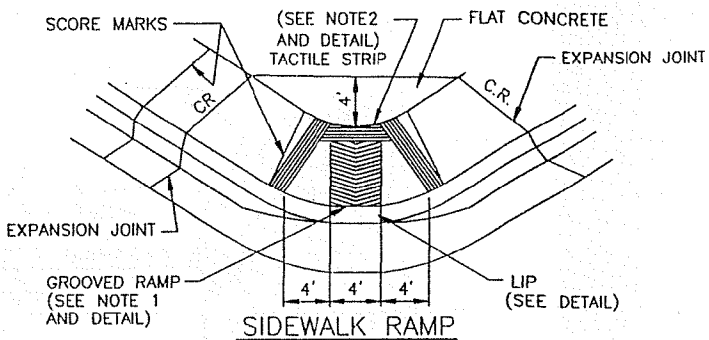
DATE 3/1/95

SCALE NONE

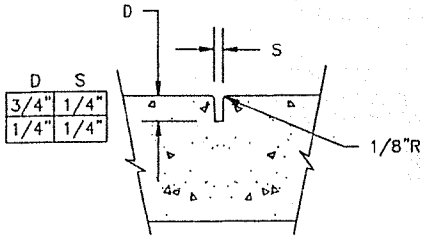
STANDARD DWG. # 3.14

DATE REVISIONS

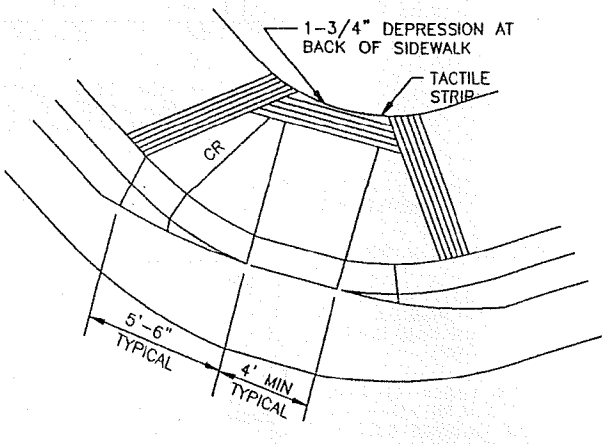
MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS



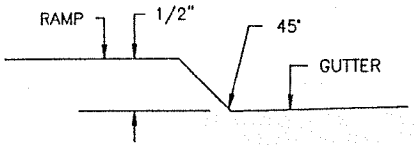
SIDEWALK RAMP
AT CENTER OF CURB RETURN



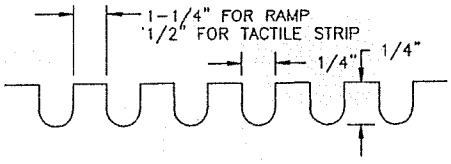
WEAKENED PLANE JOINT
SCORE MARK



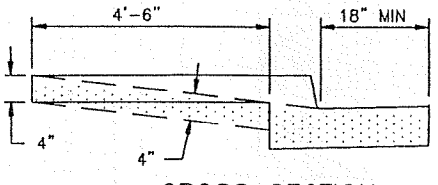
SIDEWALK RAMP
NOT AT CENTER OF CURB RETURN



TYPICAL DETAIL
FOR LIP OF RAMP



TYPICAL DETAIL
FOR GROOVES



CROSS SECTION

✳ SLOPE OF RAMPS

THE SLOPE OF CURB RAMPS SHALL NOT EXCEED 1" VERT. TO 12" HORZ. THE SLOPE OF THE FANNED OR FLARED SIDES OF CURB SHALL NOT EXCEED 1" VERT. TO 8" HORZ.

NOTES:

1. RAMPS LOCATED IN THE CENTER OF CURB RETURNS SHALL BE GROOVED. THE GROOVES SHALL PARALLEL THE CROSSWALKS AND FORM A "V" PATTERN POINTING TOWARDS THE CENTER ON THE INTERSECTION.
2. RAMPS SHALL HAVE A HEAVY BROOM FINISH TRANSVERSE TO THE SLOPE OF THE RAMP AND A TACTILE STRIP 1' (ONE FT.) WIDE ALONG THE PERIMETER.
3. RAMPS TO BE CONSTRUCTED AT THE CENTER OF ALL CURB RETURNS OR AS DIRECTED BY THE CITY ENGINEER TO FIT CROSSWALKS.
4. PLACE EXPANSION JOINTS AT ENDS OF CURB RETURN. PLACE WEAKENED PLANE JOINTS AT EACH OR DRIVEWAY APPROACH.
5. PLACE WEAKENED PLANE JOINTS AT 10' SPACING (TYPICAL). PLACE SCORE MARK MIDWAY BETWEEN WEAKENED PLANE JOINTS AT 60' INTERVALS (MAX.) WITH EXPANSION JOINTS.
6. ALL SIDEWALK RAMPS SHALL CONFORM AT A MINIMUM TO AMERICAN DISABILITIES ACT.

AMERICAN CANYON — CITY OF — INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

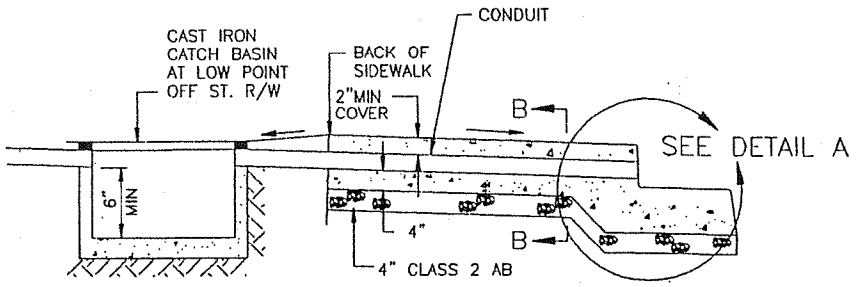
SIDEWALK RAMP

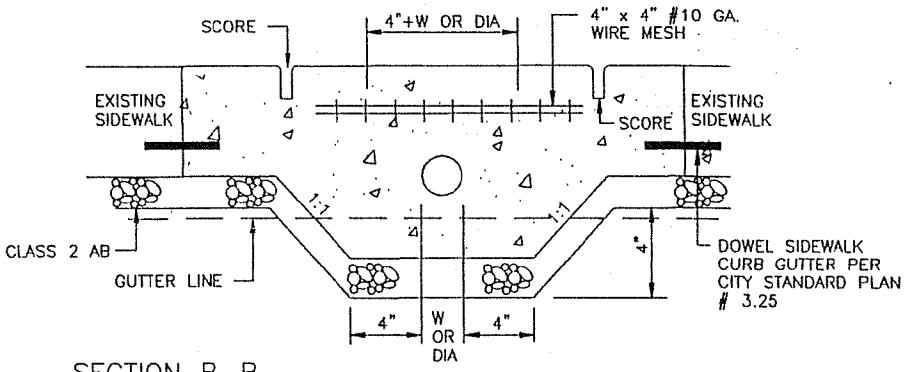
MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95

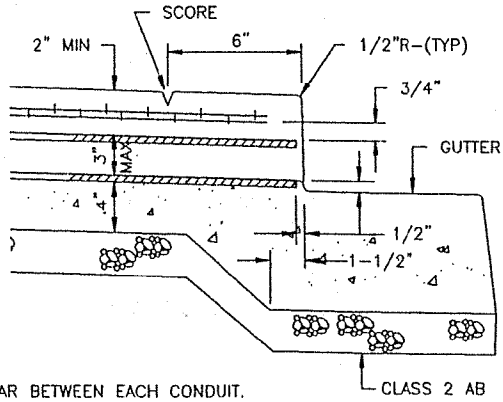
SCALE NONE

STANDARD DWG. # 3.15





SECTION B–B



DETAIL A

GENERAL NOTES:

1. IF MULTIPLE CONDUITS ARE USED SPACE 4" CLEAR BETWEEN EACH CONDUIT.
2. MAXIMUM RECTANGULAR CONDUIT SHALL BE 3" x 6".
3. CONCRETE SHALL BE CL. A 3000.
4. NUMBER & SIZE CONDUITS FOR SPECIFIED DRAINAGE AREA.:

SIZE		3"ø	2–3"ø	3"□	3" x 4"	3" x 5"	3" x 6"
ø AREA DRAINED	PARKING LOT	3,000	4,000	4,000	5,000	6,500	8,000
	RESIDENTIAL	5,000	10,000	6,200	10,000	10,300	16,000

5. CONDUIT SHALL BE 12GA GALV. STEEL OR NON–BELL CAST IRON IN TRAFFIC AREAS & MAY BE 3" PVC SCH 40 (min) IN NON TRAFFIC AREAS AS APPROVED BY THE CITY ENGINEER.
6. CONCRETE CONSTRUCTION SHALL CONFORM TO SECTION 90 OF THE STATE OF CALIFORNIS STANDARD SPECIFICATION.
7. OWNER SHALL BE RESPONSIBLE FOR CLEANING AND MAINTAINING PIPE.
8. ANGLE PIPE SO THAT FLOW IN SIDEWALK DRAINS DOES NOT FLOW INTO GUTTER PERPENDICULAR.
9. EXIST. CURB, GUTTER & SIDEWALK TO BE SAW CUT AND REMOVED AT THE NEAREST WEAKENED PLANE JOINT. OR SCORE LINE.
10. INSTALLATION OF A DRAIN WITHIN A EXISTING SIDEWALK SHALL REQUIRE A CITY ENCROACHMENT PERMIT. REPLACEMENT SIDEWALK AND CURB SHALL CONFORM TO EXISTING AND SHALL BE INSTALLED TO SPECIFICATIONS. (SEE STANDARD PLAN # 3.06 & 3.07)

AMERICAN CITY OF INCORPORATED 1992 CANYON

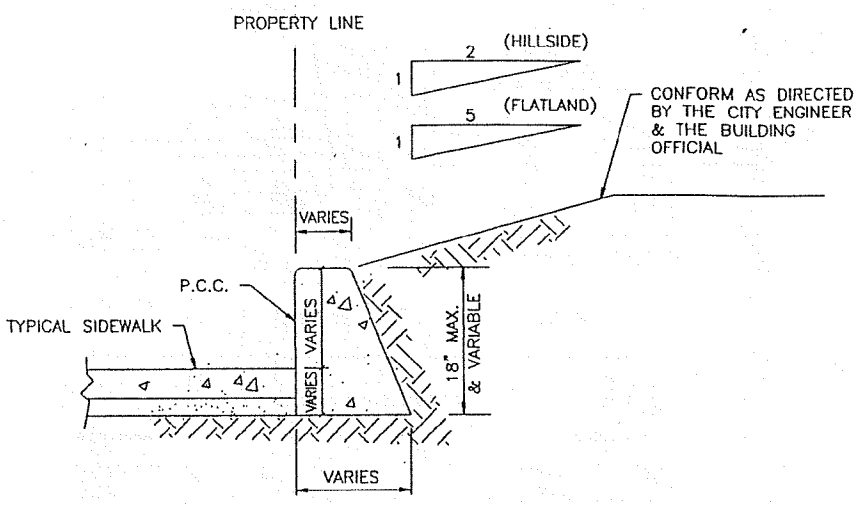
CITY OF AMERICAN CANYON

DATE	REVISIONS

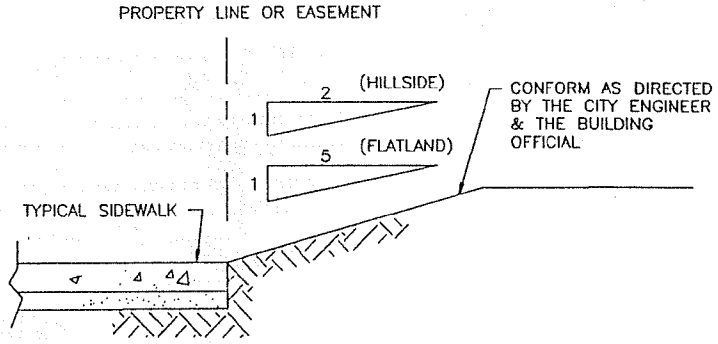
SIDEWALK
UNDERDRAIN

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95
SCALE NONE
STANDARD DWG. # 3.16



WITH RETAINING WALL



WITHOUT RETAINING WALL

NOTES:

1. RETAINING WALL TO BE INSTALLED AS PER DIRECTION OF THE CITY ENGINEER.
2. IN FLATLAND AREAS, MAXIMUM SLOPE OF GROUND TO BE 5:1.
3. IN HILLSIDE AREAS, MAXIMUM SLOPE OF THE GROUND TO BE 2:1.
4. RETAINING WALL (IN HILLSIDES) TO BE DESIGNED TO MEET APPROPRIATE STRUCTURAL REQUIREMENTS.
5. VISION TRAINGLE AT CORNERS OF INTERSECTION TO BE AS PER STANDARD PLAN # 3.09

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

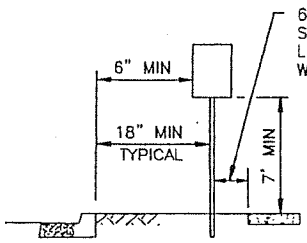
BACK OF SIDEWALK CONFORMS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

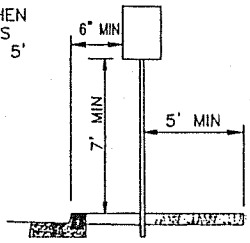
DATE 5/1/95

SCALE NONE

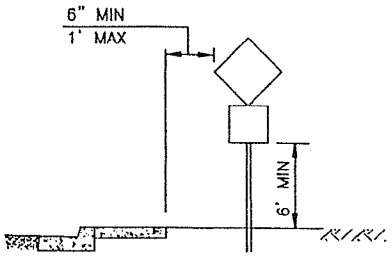
STANDARD DWG. # 3.17



PLANTER STRIP

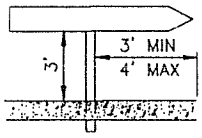


ON SIDEWALK

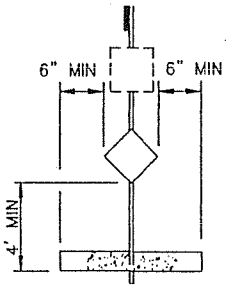


BEHIND SIDEWALK

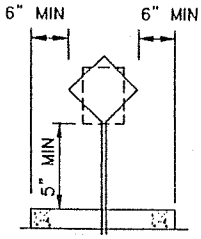
SIDEWALK AREA



R10 ONE-WAY SIGN

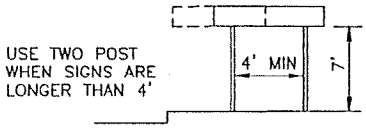


REGULATORY & WARNING SIGN

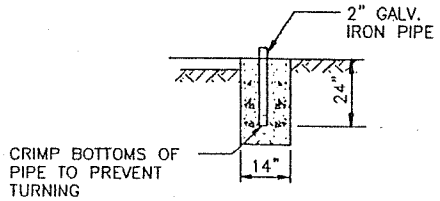


OTHER SIGNS
IN MEDIAN

MEDIAN AREA



GUIDE



POST INSTALLATION DETAIL

NOTES:

1. "U" BOLT TYPE MOUNTING DEVICES ARE NOT ACCEPATABLE. PIPES MUST BE DRILLED AND MOUNTING BOLTS ARE TO BE EXTENDED COMPLETLY THROUGH SIGN AND POST. A 1 1/2" x 4" X 1/8" "SADDLE" BRACE SHALL BE PLACED BETWEEN THE SIGN AND POLE, SIGNS, BANDED TO LUMINAIRE POLES OR SIGNAL POLES SHALL BE MOUNTED WITH "BAND-IT" BRAND TYPE 201 STAINLESS STEEL BAND OR ANOTHER OF EQUAL QUALITY
2. USE 32" SIGN BRACE ON ALL SINGLE-POST SIGNS EXCEEDING FOLOWING DIMENSIONS: 30" DIAMOND SHAPE, 36" OTHER SHAPES, BRACES SHALL BE 3/16" GALVANIZED STEEL.
3. PIPE POST WITH CAPS SHALL BE USED ON ALL SIGN INSTALLATIONS. WOOD POST ARE NOT ACCEPTABLE.
4. SUPPLEMENTAL SIGNS MAY BE MOUNTED BELOW THE 7' MOUNTING HEIGHT OF PRIMARY SIGN, EXCEPT IN SIDEWALK OR PEDESTRIAN PATHWAYS.

AMERICAN CANYON — CITY OF — INCORPORATED 1992

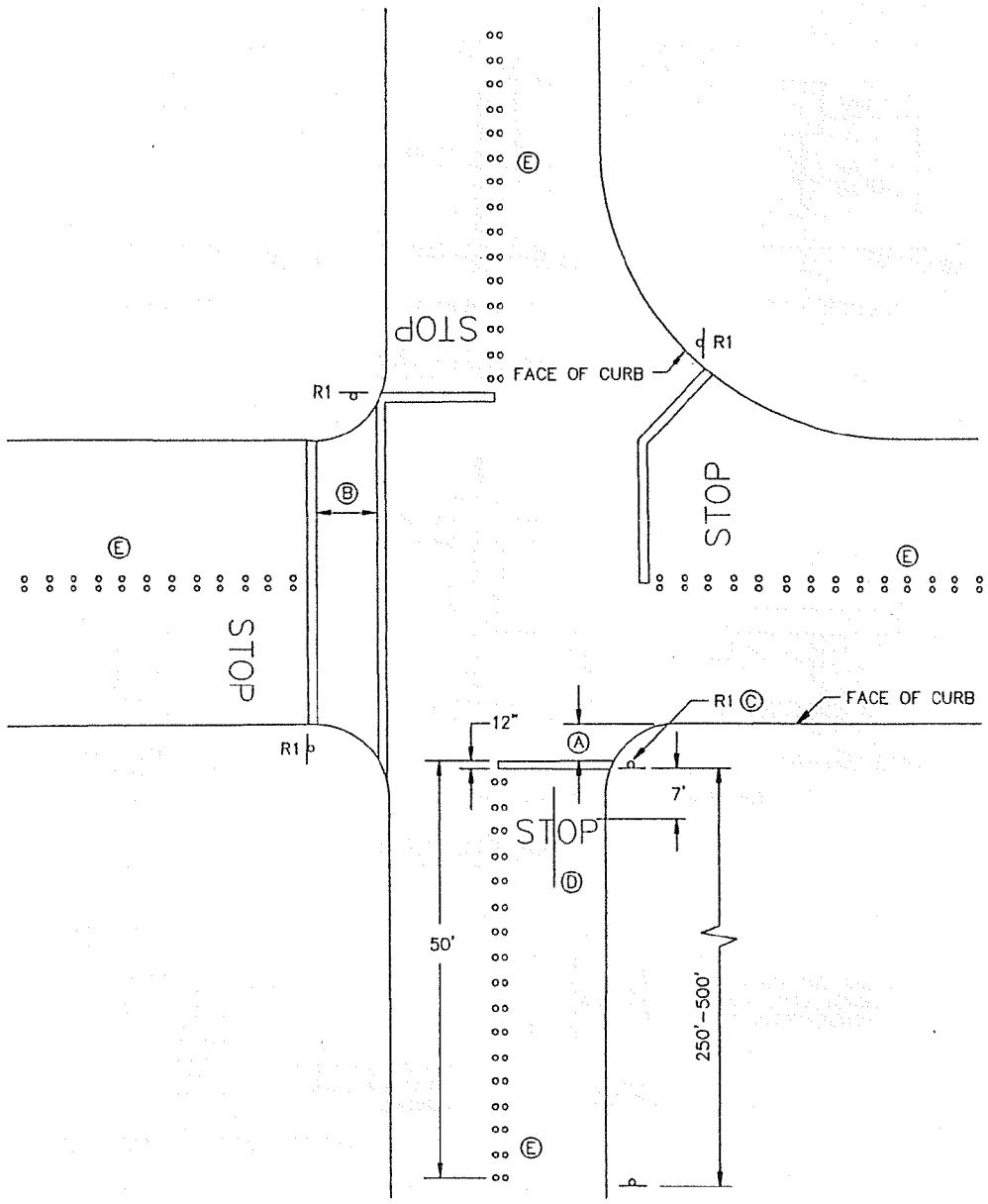
CITY OF AMERICAN CANYON

DATE	REVISIONS

TRAFFIC SIGNS, URBAN
DISTRICT TYPICAL INSTALLATION

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95
SCALE NONE
STANDARD DWG. # 3.18



STOP AHEAD (W17) OR YIELD AHEAD (W28) WHERE SPECIFIED

NOTES:

Ⓐ THE LIMIT LINE SHALL BE PLACED AT THE DESIRED STOPPING POINT. THE LIMIT SHALL NOT BE CLOSER THAN 4' FROM THE CURB LANE, 5' IS TYPICAL. OMIT LIMIT LINE Ⓐ CROSSWALK LOCATIONS.

Ⓑ CROSSWALK WIDTH IS 10 FEET.

Ⓒ R1 STOP SIGN IS TO BE ALIGNED WITH THE LIMIT LINE OR THE NEAR CROSSWALK LINE OR THE POINT OF OPTIMUM VISIBILITY. DISTANCE BETWEEN STOP SIGN AND LIMIT LINE SHALL NOT EXCEED 50'.

Ⓓ STOP PAVEMENT MARKING IS TO BE CENTERED IN LANE AND CONFORM TO STANDARD PLAN # 3.20.

Ⓔ MINIMUM 50' DOUBLE YELLOW REFLECTIVE MARKERS CAL-TRANS STANDARD PLANS JULY 1992 DETAIL #23 PAVEMENT MARKERS AND TRAFFIC LINES.

Ⓕ ALL TRAFFIC STRIPES AND PAVEMENT MARKINGS SHALL BE THERMOPLASTIC AND CONFORM TO CAL-TRANS STANDARD SPEC. 84-2.0.

AMERICAN CITY OF INCORPORATED 1992 CANYON

CITY OF AMERICAN CANYON

DATE	REVISIONS

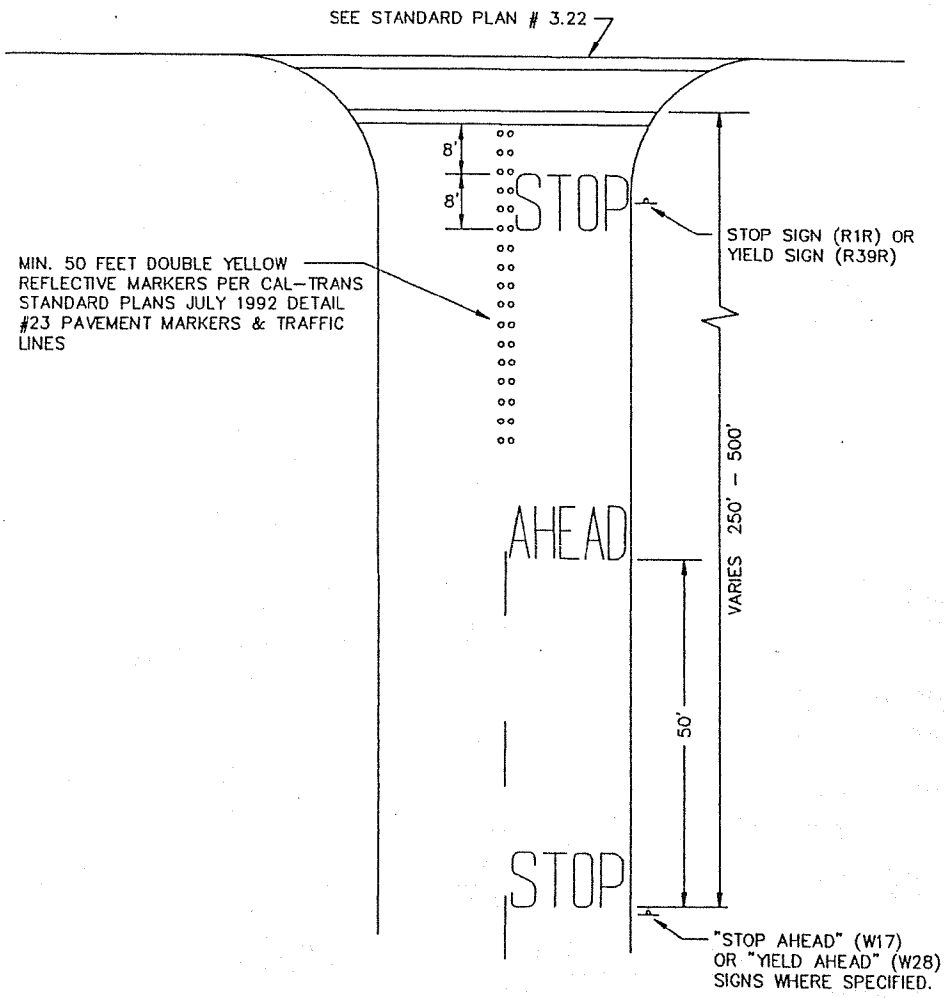
STANDARD STOP SIGN LOCATION

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95

SCALE NONE

STANDARD DWG. # 3.19



NOTES:

1. USE "STOP AHEAD" MARKINGS AT SPECIFIED LOCATIONS ONLY (SUPPLEMENTAL TO W17 SIGN).
2. STOP SIGN NORMALLY LOCATED AT CURB RETURN OR POINT OF OPTIMUM VISIBILITY. DISTANCE BETWEEN STOP SIGN AND LIMIT LINE SHALL NOT EXCEED 50'.
3. OMIT LIMIT LINE AT CROSSWALK LOCATIONS.
4. TO BE USED ON ROADS WITH 25 MPH SPEED LIMIT OR HIGHER.
5. ALL TRAFFIC STRIPES AND PAVEMENT MARKINGS SHALL BE THERMOPLASTIC AND CONFORM TO CAL-TRANS STANDARD SPEC. 84-2.0.

AMERICAN CITY OF INCORPORATED 1992 CANYON

CITY OF AMERICAN CANYON

STOP AND YIELD MARKINGS

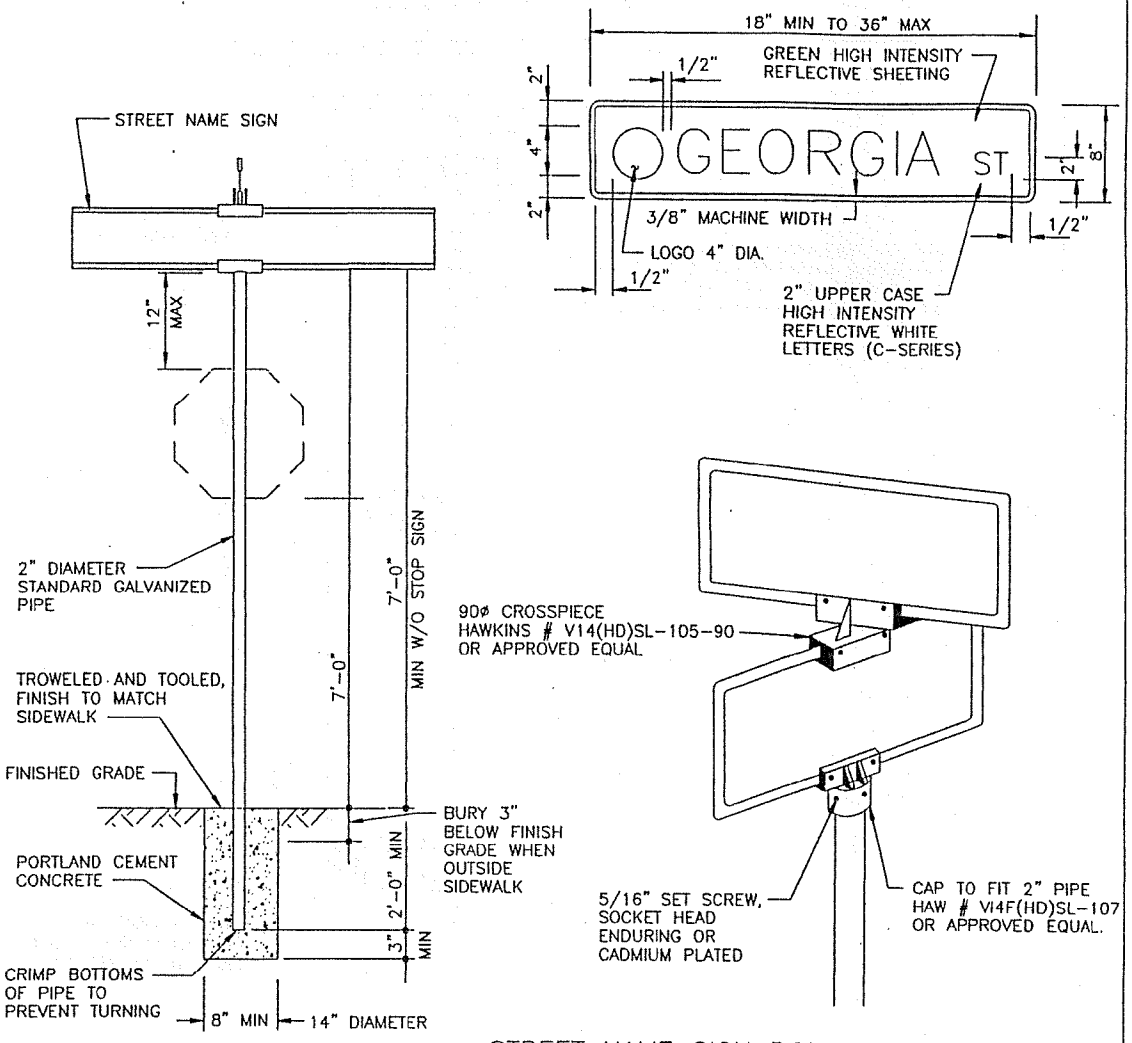
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 3.20

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS



STREET NAME SIGN POLE MOUNTING

NOTES:

1. BLANKS ARE .080" ALUMINUM PER CALTRANS SPECIFICATION
2. SIGNS TO BE DOUBLE FACED.
3. CITY LOGO TO BE SILK-SCREEN, 4" DIAMETER PROVIDED BY THE CITY.
4. SIGN LOCATION TO BE DETERMINED BY THE CITY ENGINEER.
5. NAME AND MOUNTING ASSEMBLES TO MEET THE CITY, STREET SIGN SPECIFICASTIONS.
6. SIGNS TO BE COATED WITH GRAFFETTI PROOF COATING.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

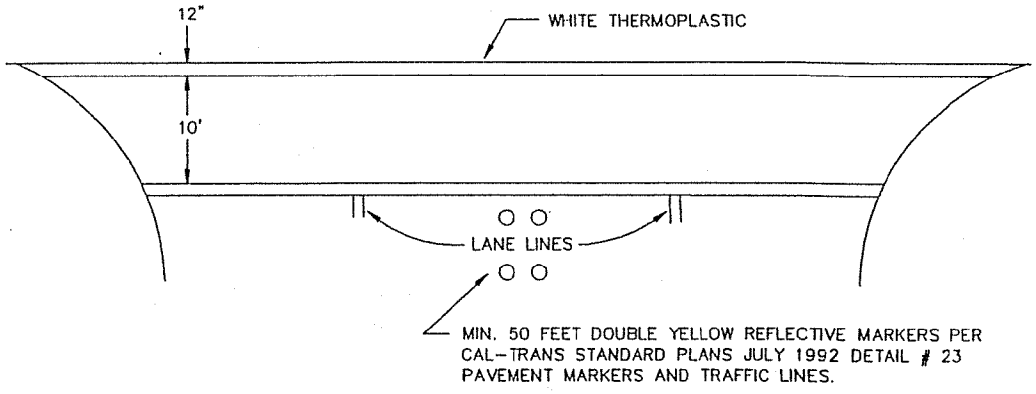
STREET NAME SIGN AND POLE MOUNTING

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

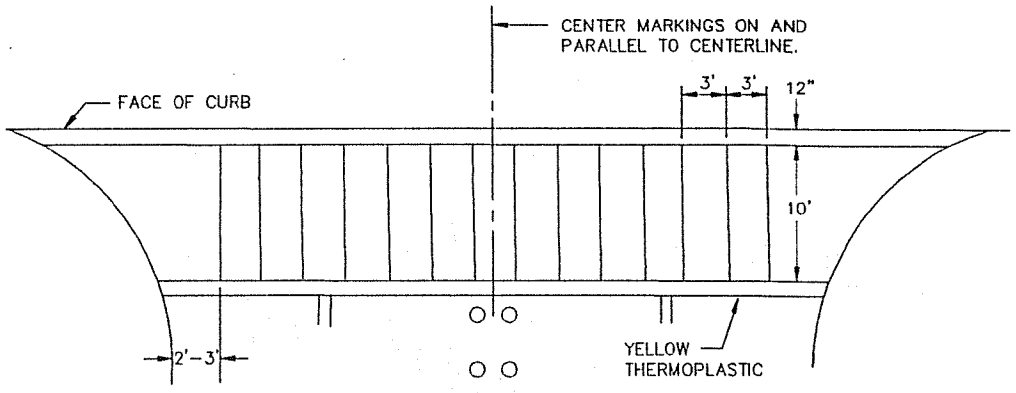
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 3.21



STANDARD X-WALK MARKING



ZEBRA X-WALK MARKING

USE WITHIN 1000 FEET OF SCHOOLS ON SPECIFIED STREETS ONLY.

NOTES:

1. DOUBLE YELLOW REFLECTIVE MARKERS AND LANE LINES TO STOP AT X-WALK.
2. WIDTH OF LINES 12 INCHES STANDARD.
3. WIDTH OF WALK 10 FEET.
4. LANE LINES AS PER CAL-TRANS PAVEMENT MARKINGS STANDARD PLANS.
5. ALL TRAFFIC STRIPES AND PAVEMENT MARKINGS SHALL BE THERMOPLASTIC AND CONFORM TO CAL-TRANS STANDARD SPEC. 84-2.0 (1992).

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

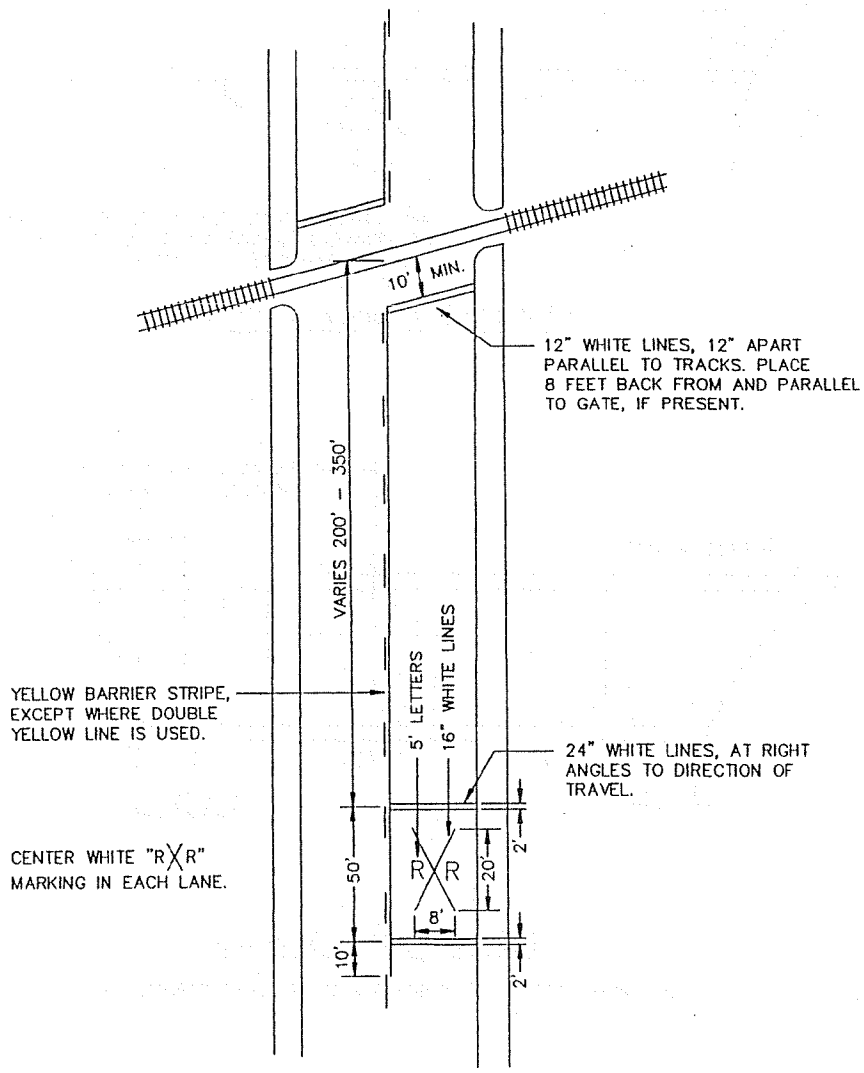
STANDARD X-WALK MARKINGS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95

SCALE NONE

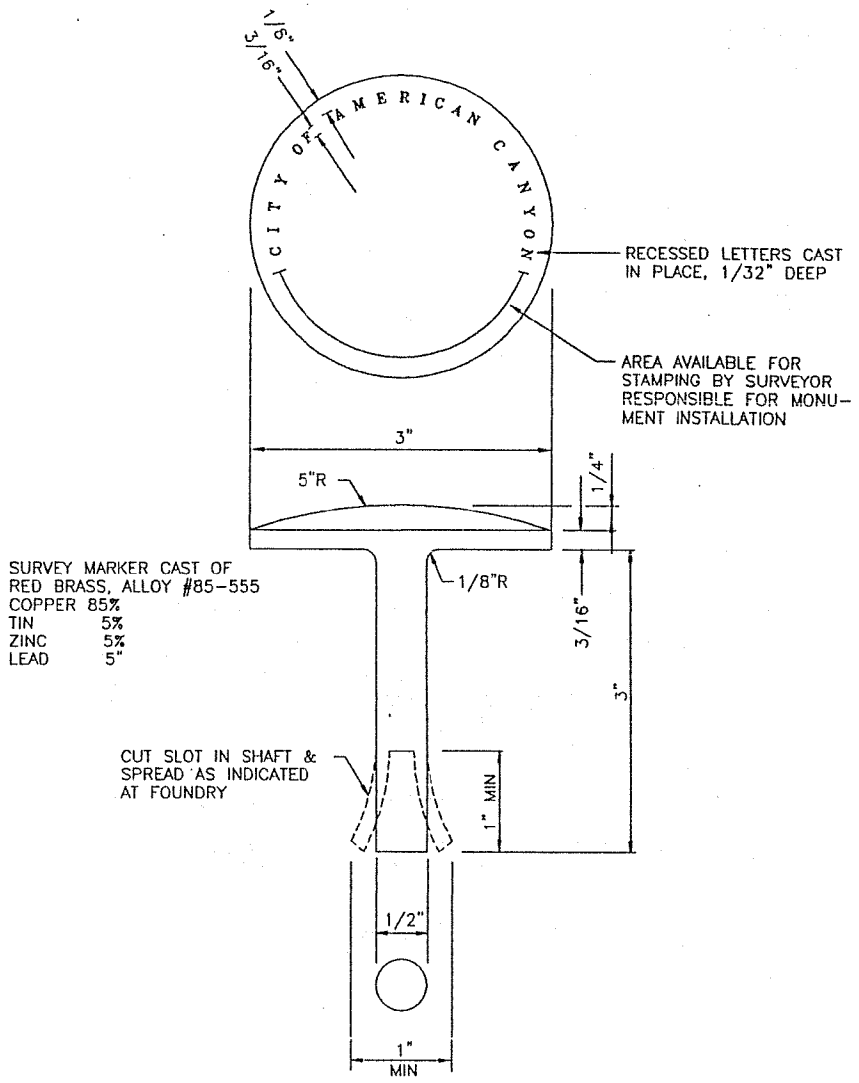
STANDARD DWG. # 3.22



NOTES:

1. ALL TRAFFIC STRIPES & PAVEMENT MARKINGS SHALL BE THERMOPLASTIC AND CONFORM TO CAL-TRANS STANDARD SPEC. 84-2.0

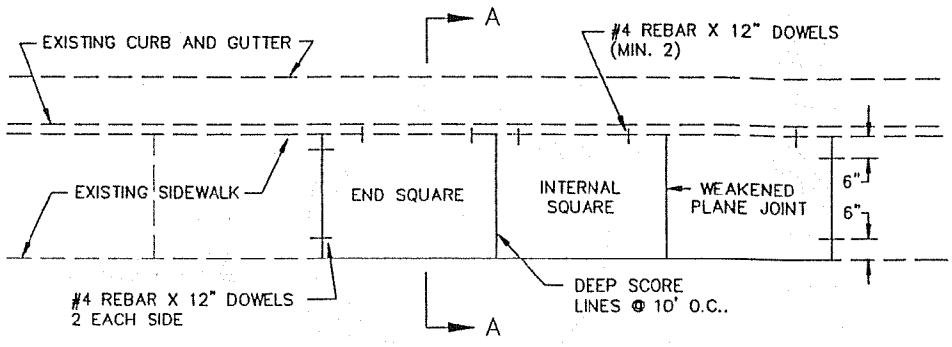
		CITY OF AMERICAN CANYON	
		RAILROAD CROSSING PAVEMENT MARKINGS	DATE 5/1/95
			SCALE NONE
			STANDARD DWG. # 3.23
DATE	REVISIONS	MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS	



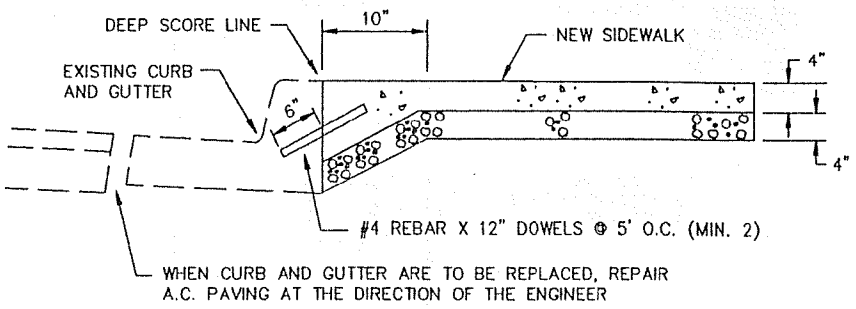
NOTES:

1. BRASS SURVEY MARKERS WILL BE FURNISHED BY THE CONTRACTOR.
2. ONE No.9 REBAR 30" LONG WILL BE CENTERED IN CONCRETE PEDESTAL.
3. CALTRANS TYPE D ALTERNATE No.2 SURVEY MONUMENT SHALL BE USED.

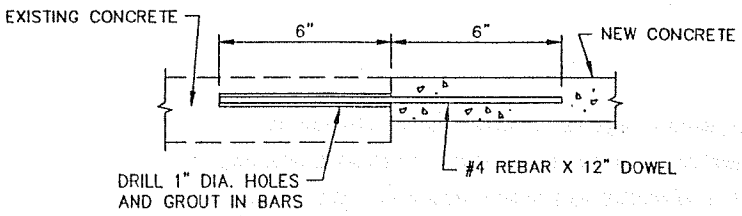
AMERICAN CITY OF CANYON INCORPORATED 1992	CITY OF AMERICAN CANYON		
		BRASS SURVEY MARKER	DATE 5/1/95
			SCALE NONE
			STANDARD DWG. # 3.24
DATE	REVISIONS	MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS	



REPLACEMENT SIDEWALK



SECTION A–A



TYPICAL DOWEL DETAIL

CITY OF AMERICAN CANYON

DATE	REVISIONS

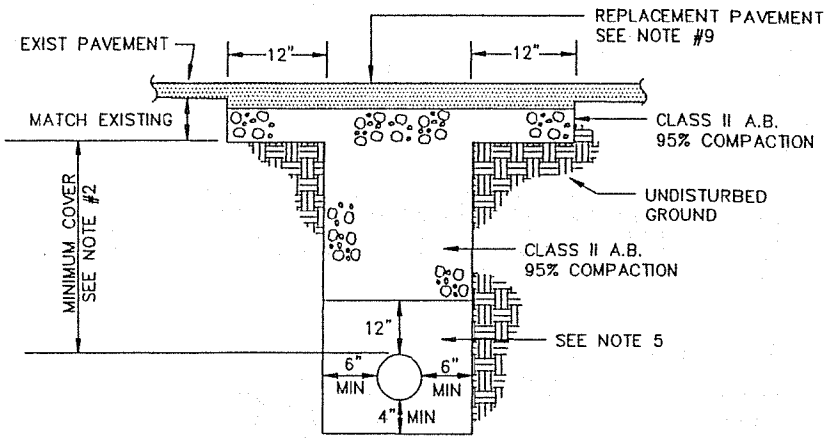
SIDEWALK REPLACEMENT W/ DOWELS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

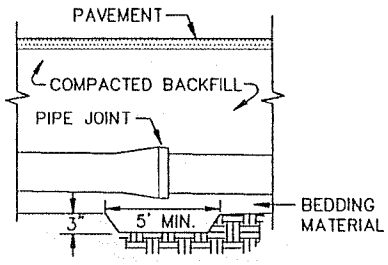
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 3.25



TYPICAL TRENCH SECTION



BELL HOLE DETAIL

NOTE:

1. REPLACEMENT ASPHALT WILL BE EXISTING THICKNESS PLUS 1".
2. MINIMUM COVER – SEWERS 48", WATER 42", STORM 30", CULVERTS 12" FROM FINISHED GRADE.
3. ALL WORK IS TO BE DONE IN ACCORDANCE WITH CAL-TRANS STANDARD SPECIFICATIONS AND OR SPECIAL PROVISIONS.
4. TRENCHES SHALL BE BACKFILLED WITH CLASS II A.B. AND COMPACTED TO 95% RELATIVE COMPACTION (90% BELOW 5' DEPTH) AS TESTED BY CITY APPROVED LAB. NATIVE MATERIAL BACKFILL TO 90% COMPACTION MAY BE USED IN LANDSCAPE AREA.
5. BEDDING – CLASS II A.B.. SAND FOR POLY WRAPPED PVC PIPE.
6. WHEN DISTANCE BETWEEN EDGE OF A.C. CAP AND LIP OF GUTTER IS 4' OR LESS, ASPHALT PAVING SHALL BE REPLACED TO LIP OF GUTTER.
7. PLACEMENT OF BACKFILL SHALL BE IN 6" LIFTS EVENLY PLACED AND MECHANICALLY COMPACTED TO RELATIVE DENSITY AS SPECIFIED.
8. FINAL CUT IN THE STREET PAVEMENT SHALL BE 2 FEET WIDER THAN THE TRENCH WIDTH AS SHOWN IN THE STANDARD DETAILS AND SHALL BE MADE BY SAW CUTTING ONLY.
9. A.C. SHALL BE TYPE B; 1/2" MAX. AND MEDIUM GRADING TO INSURE ADEQUATE BONDING A TACK COAT (SS-1) SHALL BE APPLIED OVER EXISTING A.C. PAVEMENT AND PRIME COAT (MC-250) SHALL BE APPLIED OVER COMPACTED A.B. (SS-1 MAY BE SUBSTITUTED FOR EXISTING STREETS). USE OF MC-250 SHALL COMPLY WITH E.P.A. REGULATIONS.
10. TRAFFIC CONTROL AND WARNING SIGNS SHALL BE PER THE MANUAL OF TRAFFIC CONTROLS: CAL-TRANS PUBLICATION.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

TRENCH EXCAVATION AND BACKFILL

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95

SCALE NONE

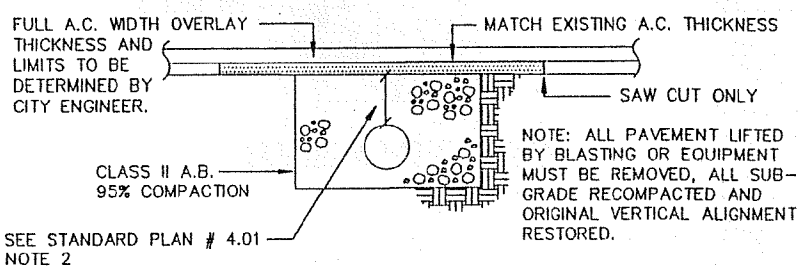
STANDARD DWG. # 4.01

TYPE 1

NEWLY PAVED SURFACES – PRIMARY ARTERIALS WITH HIGH QUALITY RIDING SURFACES BORING & JACKING ONLY. NO PAVEMENT CUTTING PERMITTED.

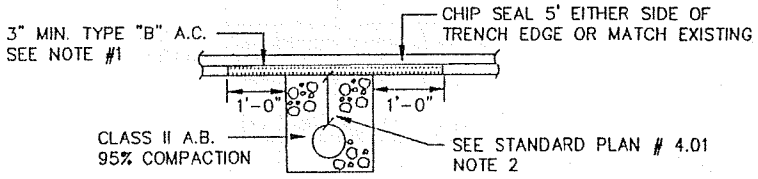
TYPE 2

ROAD QUALITY AS IN TYPE 1. ANY ONE OF THE FOLLOWING CONDTIONS EXISTS: A. EXTENSIVE DISTURBANCE OF PAVING IS MANDATORY B. CONGESTED EXISTING UTILTIY INSTALLATIONS PROHIBIT BORING & JACKING C. SOLID ROCK SUBGRADE REQUIRES BLASTING D. EMERGENCY REPAIRS TO RUPTURED UTILITIES WHICH MAY NOT BE CORRECTED WITHOUT CUTTING SURFACE.



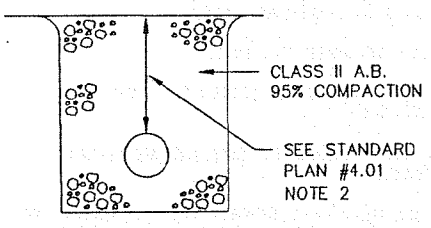
TYPE 3

ANY ROAD SURFACED WITH ASPHALT CONCRETE, CHIP SEAL OR OTHER ASPHALT MATERIAL.



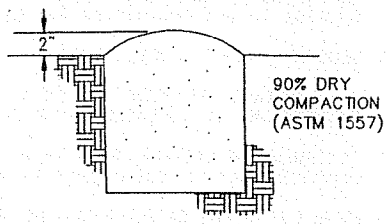
TYPE 4

UNSURFACED ROAD, SHOULDER OR AREA WITHIN TRAVELLED WAY.



TYPE 5

OUTSIDE OF ROADWAY PRISM. NOT SUBJECT TO TRAFFIC.



NOTES:

1. A.C. SHALL BE TYPE "B" 1/2" MAX. AND MEDIUM GRADING TO INSURE ADEQUATE BONDING. A TACK COAT (SS-1) SHALL BE APPLIED OVER EXISTING A.C. PAVEMENT AND A PRIME COAT (MC-250) SHALL BE APPLIED OVER COMPACTED AB (SS-1 MAY BE SUBSTITUTED FOR EXIST. STREETS). USE OF MC-250 SHALL COMPLY WITH E.P.A. REGULATIONS.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

TRENCH, RESURFACING SECTION

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95

SCALE NONE

STANDARD DWG. # 4.02

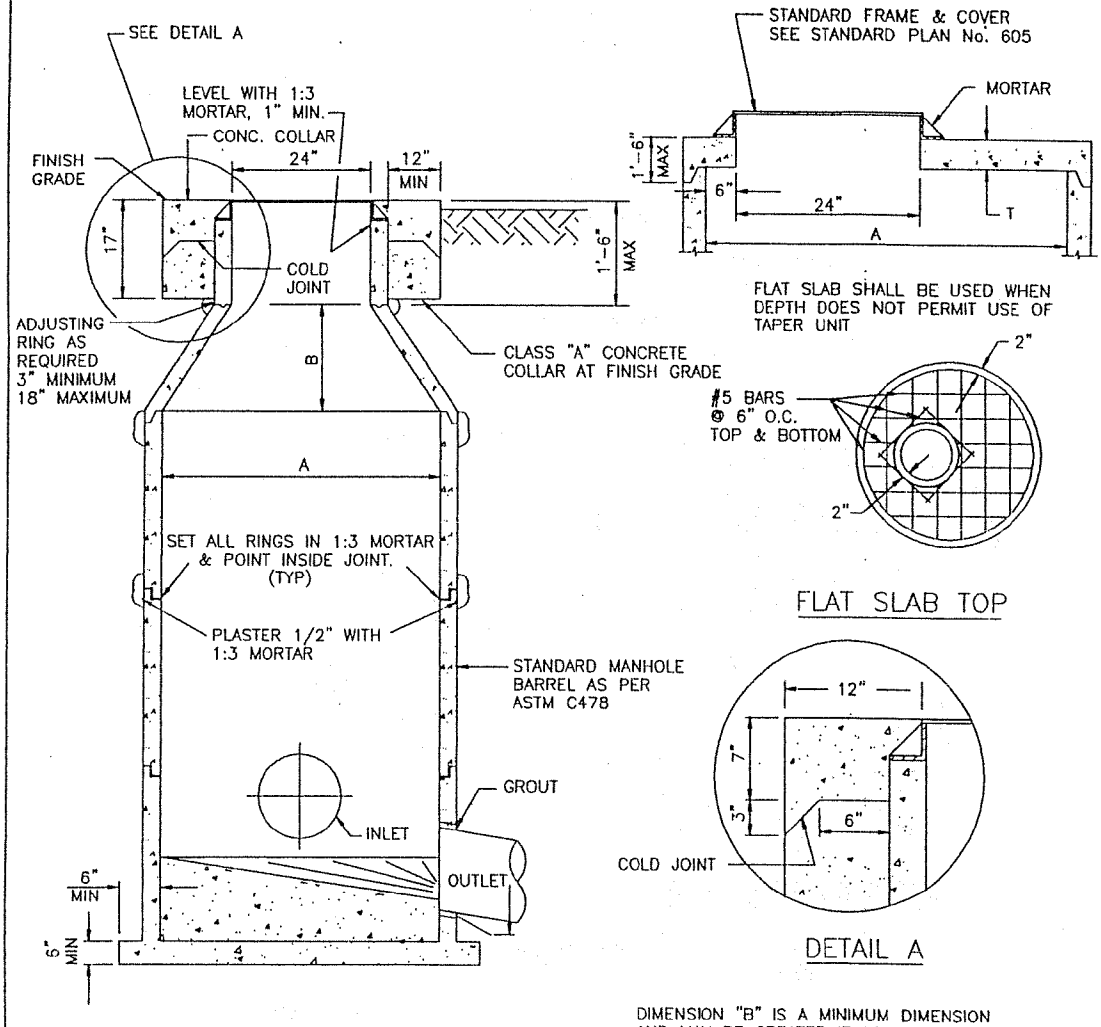


TABLE OF DIMENSIONS

M.H.	A	B	T MIN.
48"	48"	18"	6"
60"	60"	30"	8"
72"	72"	42"	8"

DIMENSION "B" IS A MINIMUM DIMENSION AND MAY BE GREATER IF DEPTH PERMITS.

RISER SECTIONS, CONES, AND ADJUSTING RINGS SHALL CONFORM TO ASTM DESIGNATION C-478.

FRAME SHALL BE SECURED TO RISER OR FLAT SLAB TOP WITH CEMENT MORTAR.

NOTES:

1. ECCENTRIC CONES SHALL BE USED WHERE SPECIFIED ON THE PLANS. JOINTS MAY BE EITHER KEYED OR TONGUE AND GROVE.
2. RAM-NEK OR APPROVED EQUAL MAY BE USED IN JOINTS, ELIMINATING NECESSITY FOR OUTSIDE PLASTERING OF JOINTS.
3. CONE SECTION MAY BE EITHER CONCENTRIC OR ECCENTRIC.
4. LARGER DIAMETER BARRELS MAY BE REQUIRED UNDER SPECIAL CIRCUMSTANCES, SEE TABLE.
5. CONCRETE BLOCK AND BASE SHALL BE A MIN. OF CLASS A/3000 PSI CONCRETE.
6. ALL CONCRETE JOINTS SHALL BE CLEANED, WETTED AND MORTARED PRIOR TO SETTING NEXT JOINT. JOINTS SHALL THEN BE PATCHED, TROWELED AND BRUSED SMOOTH. BASE OF MANHOLE SHALL BE GROUTED AND SACKED.
7. MANHOLE COVER FRAME SHALL BE ADJUSTED TO GROVE AND CROSS-SLOPE OF PAVEMENT PRIOR TO POURING CONCRETE BLOCK.

AMERICAN CITY OF INCORPORATED 1992 CANYON

CITY OF AMERICAN CANYON

STANDARD PRECAST MANHOLE (DRAINAGE)

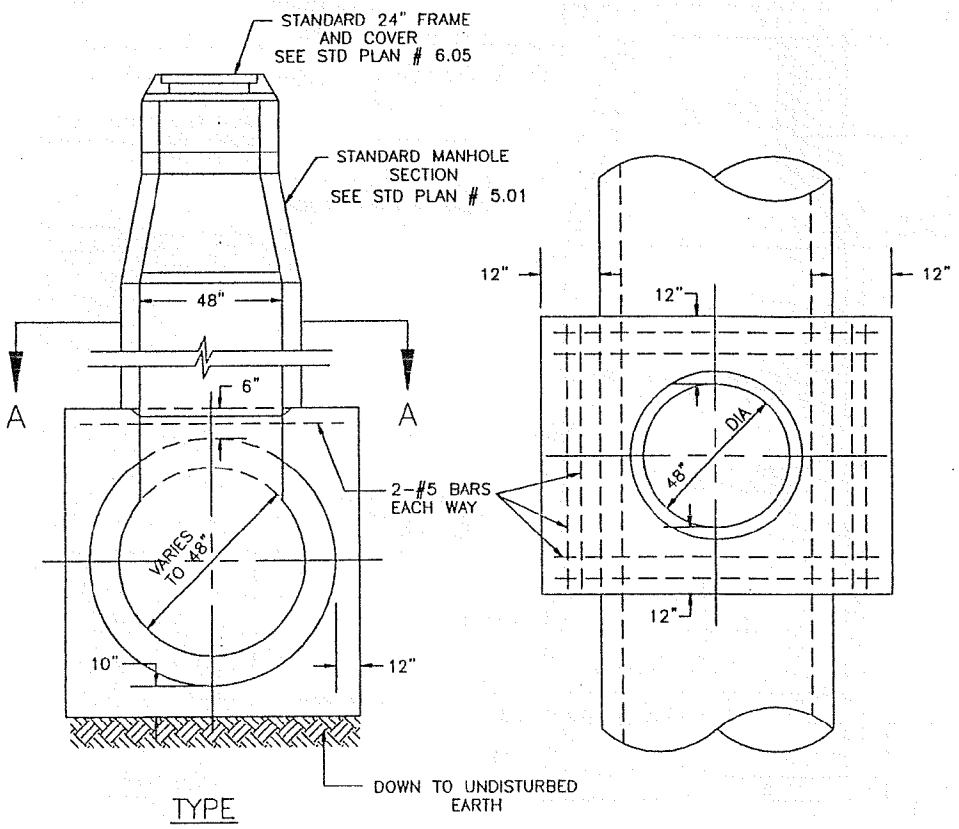
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 5.01

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS



TYPE

SECTION A-A

1. ALL PIPE OTHER THAN CAST-IN-PLACE PIPE
2. CAST-IN-PLACE PIPE LESS THAN 48" DIA.

NOTE:

REMOVE CONCRETE IN MANHOLE OPENING AND CONSTRUCTION RISER BASE WHILE CONCRETE IS STILL FRESH.

PLACE RISER SECTION AFTER CONCRETE HAS SET.

AMERICAN CITY OF CANYON INCORPORATED 1992

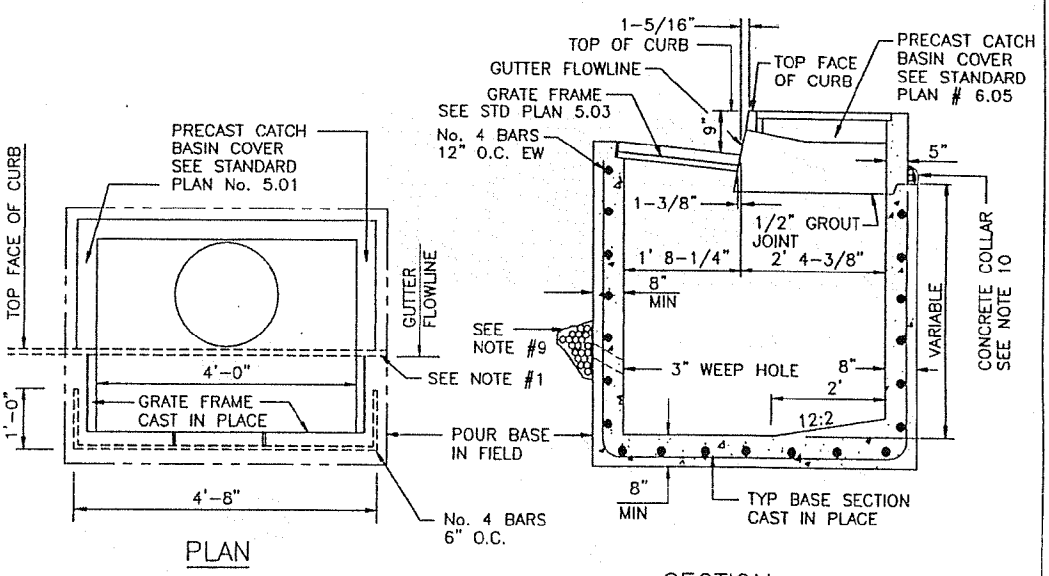
CITY OF AMERICAN CANYON

DATE	REVISIONS

TYPE A
SADDLE MANHOLE (DRAINAGE)

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95
SCALE NONE
STANDARD DWG. # 5.02



NOTES:

1. GRATE FRAME TO BE INSTALLED TIGHT AGAINST NOSING OF CURB INLET.
2. CONNECTION PIPES MAY BE PLACED IN ANY POSITION AROUND THE WALLS PROVIED THEY POINT IN THE PROPER DIRECTION.
3. CURVATURE OF THE LIP AND SIDEWALLS AT GUTTER OPENING SHALL BE FORMED BY CURVED FORMS AND SHALL NOT BE MADE BY PLASTERING.
4. FLOOR OF BASIN SHALL BE TROWELED AND RETROWELED TO PRODUCE A HARD , POLISHED SURFACE OF MAXIMUM DENSITY AND SMOOTHNESS. SLOPE OF FLOOR PARALLEL WITH CURB SHALL BE 12:2 UNLESS OTHERWISE SPECIFIED.
5. INLET AND OUTLET PIPES SHALL BE TRIMMED TO THE FINAL SHAPE AND LENGTH BEFORE CONCRETE IS POURED.
6. SURFACE OF EXPOSED CONCRETE IN BASIN SHALL CONFORM IN SLOPE GRADE, COLOR, FINISH, AND SCORING TO EXISTING OR PROPOSED CURB AND WALK ADJACENT TO THE BASIN.
7. WHEN THE BASIN IS TO BE CONSTRUCTED WITHIN THE LIMITS OF PROPOSED SIDEWALK OR IS CONTIGUOUS TO SUCH A SIDEWALK. THE TOP OF THE BASIN SHALL BE POURED MONOLITHIC WITH THE SIDEWALK USING THE SAME CLASS OF CONCRETE AS IN THE SIDEWALK.
8. KEYS REQUIRED WHEN FLOOR POURED SEPARATE FROM WALLS.
9. INSTALL 3" WEEP HOLES WITH 1.0 CUBIC FOOT OF DRAIN ROCK IN BURLAP SACK OUTSIDE WHEN NECESSARY.

CITY OF AMERICAN CANYON

DATE	REVISIONS

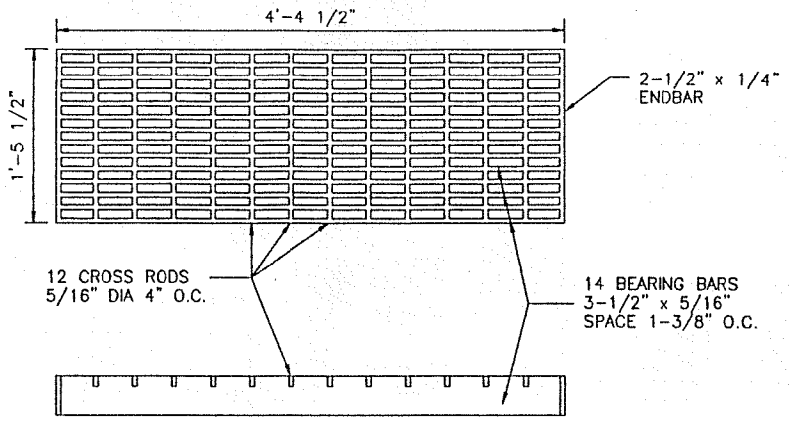
TYPE I CATCH BASIN

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

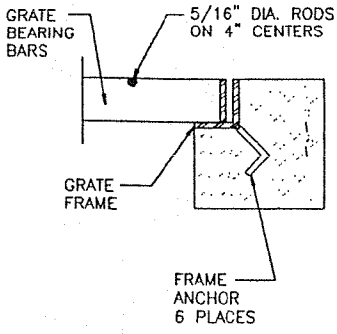
DATE 5/1/95

SCALE NONE

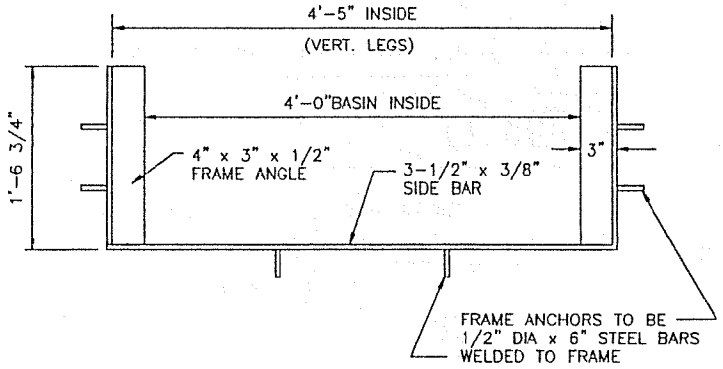
STANDARD DWG. # 5.03

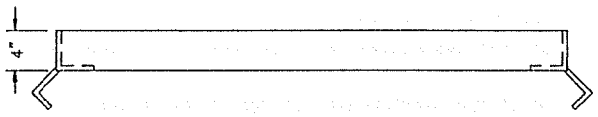


GRATE DETAIL



FRAME ANCHOR DETAIL



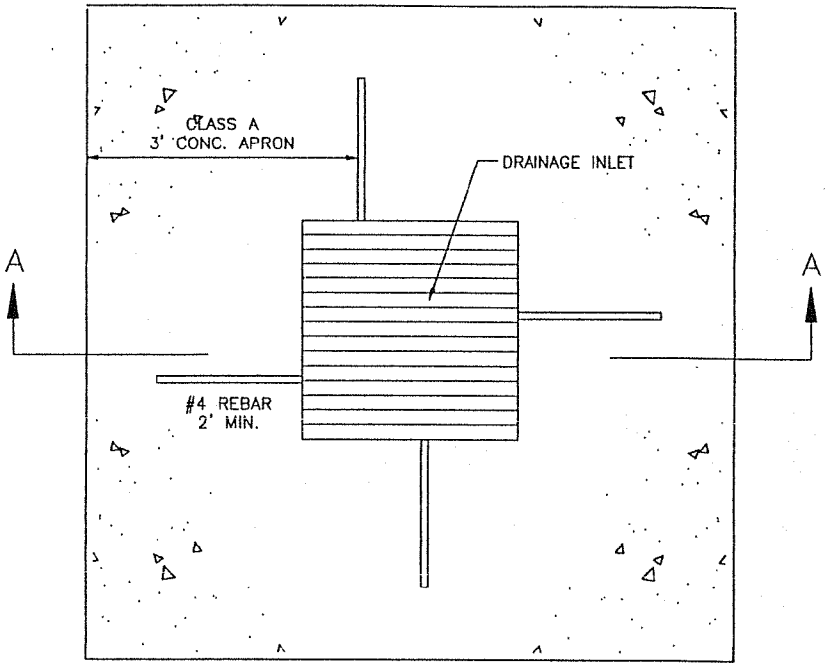


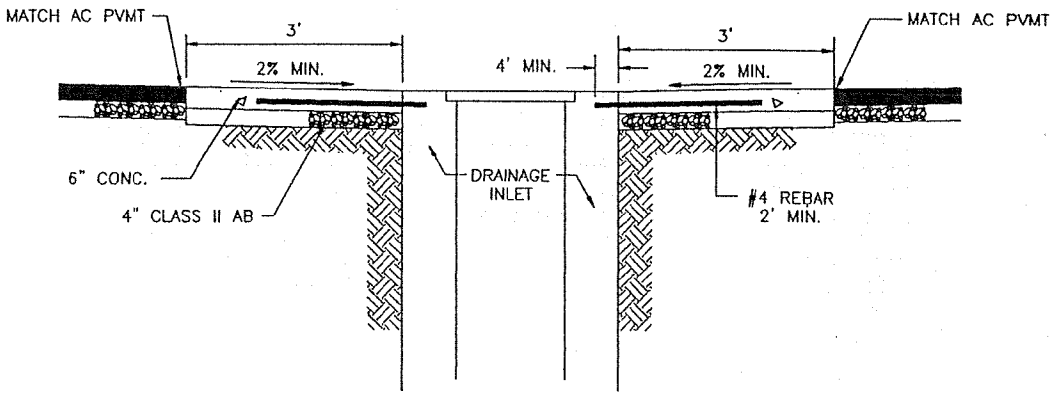
GRATE FRAME DETAIL

NOTES:

1. GRATE AND FRAME FABRICATED FROM DOMESTIC STEEL.
2. GRATE AND FRAME ARE OF ALL WELDED CONSTRUCTION AND MANUFACTURED PER FEDERAL SPECIFICATION RR-G-661a.
3. GRATE AND FRAME HOT DIPPED GALVANIZED AFTER FABRICATION PER ASTM DESIGNATION No. A123.
4. STEEL TO BE A36.

AMERICAN CANYON CITY OF INCORPORATED 1992	CITY OF AMERICAN CANYON		
DATE	REVISIONS	CATCH BASIN – TYPE 1 GRATE DETAIL	DATE 5/1/95
		MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS	SCALE NONE
			STANDARD DWG. # 5.04





SECTION A–A

3' CONCRETE APRON AROUND A DRAINAGE INLET

NTS

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

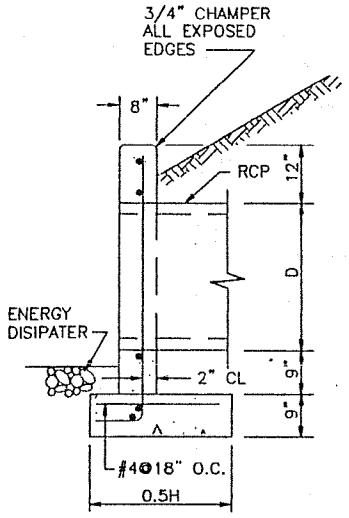
3' CONCRETE APRON

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

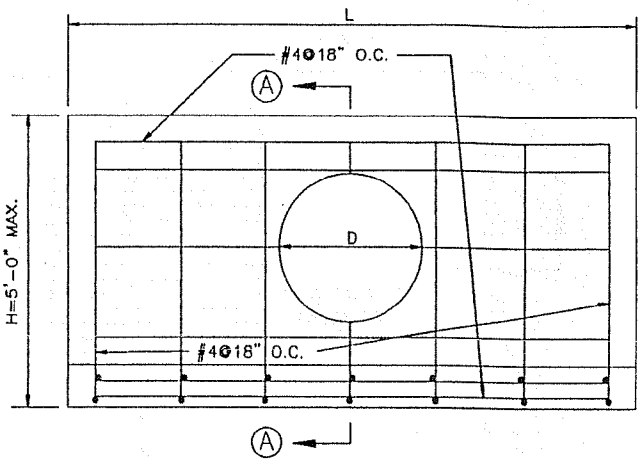
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 5.05

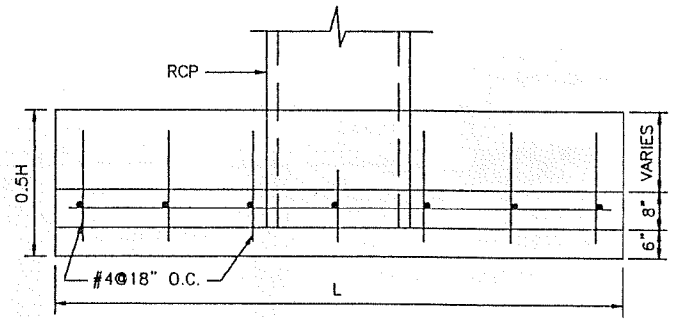


SECTION A–A



FRONT ELEVATION

D	L
12"	5'-0"
15"	6'-0"
18"	7'-0"
21"	7'-6"
24"	8'-6"
30"	10'-0"



PLAN

NOTES:

1. CLEAR DISTANCE TO STEEL SHALL BE 2 INCHES.
2. THE MAX. SIZE PIPE CULVERT TO BE USED SHALL BE 30 DIAMETER. SPECIAL DETAILS REQUIRED FOR LARGER SIZES OF PIPE.
3. STEEL SPACING, AS SHOWN, IS MAX. ALLOWABLE
4. ENERGY DISSIPATOR SIZE AND FINISH TO BE APPROVED BY CITY ENGINEER.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

STRAIGHT HEADWALL

DATE 5/1/95

SCALE NONE

STANDARD DWG. # 5.06

DATE	REVISIONS

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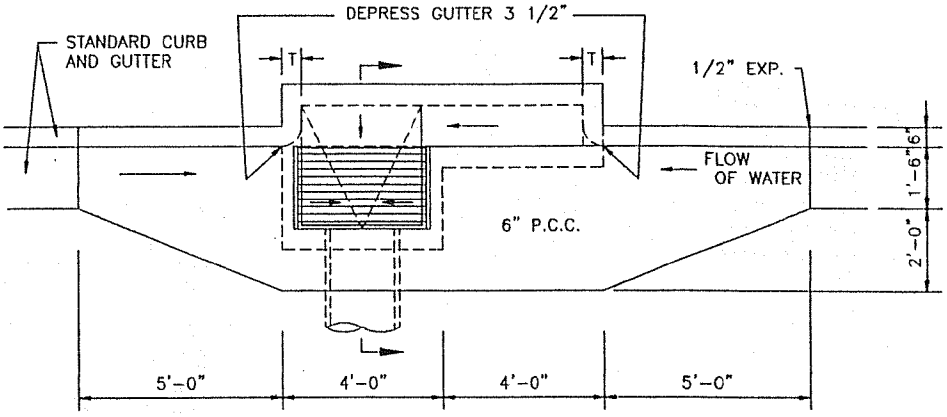
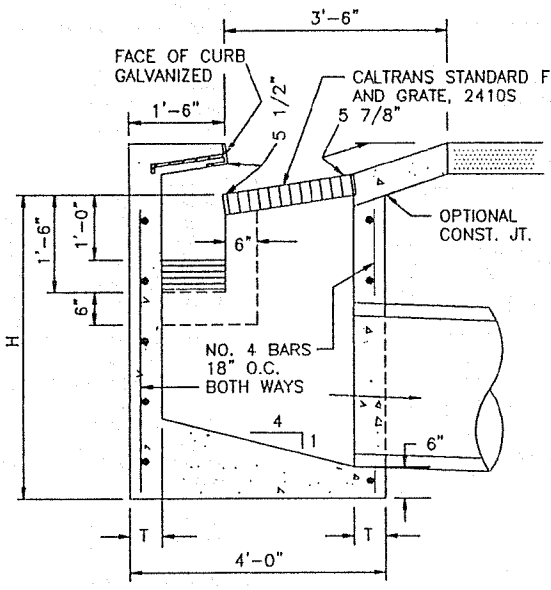


PLAN VIEW

CATCH BASIN WITH GALLERY



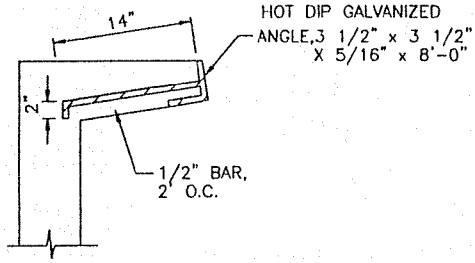
SECTION

NOTE:

T = 6" WHEN H < 8'
T = 8" WHEN H > 8'

* USED WHEN STREET SLOPES ARE 2 1/2% OR GREATER

ALL EXPOSED METAL TO BE HOT DIPPED GALVANIZED.



FACE ANGLE

ANCHOR DETAIL

CITY OF AMERICAN CANYON

GALLARY STORM INLET

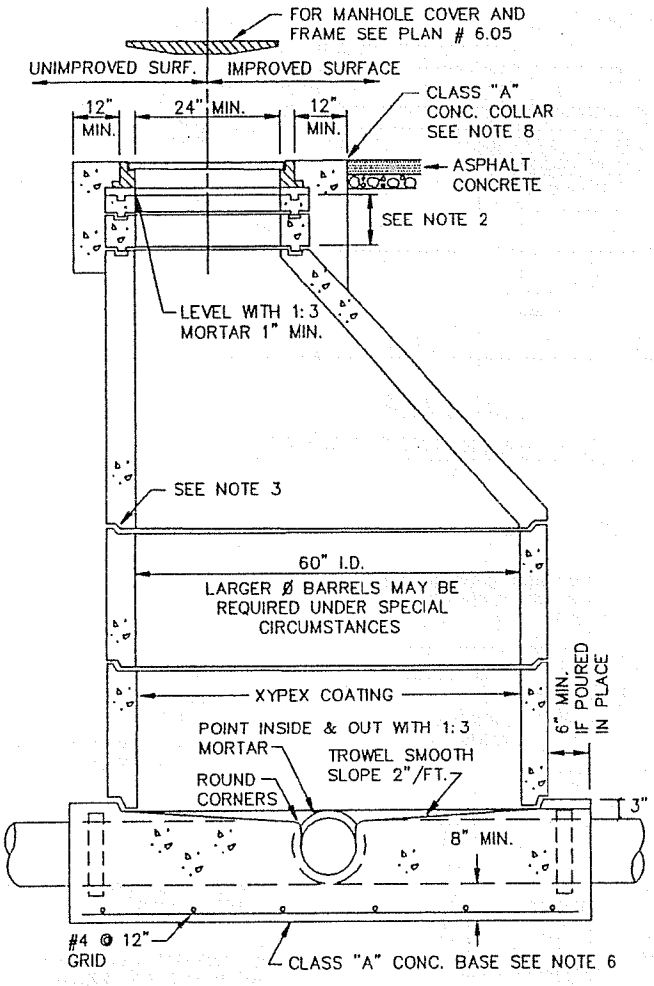
DATE 5/1/95

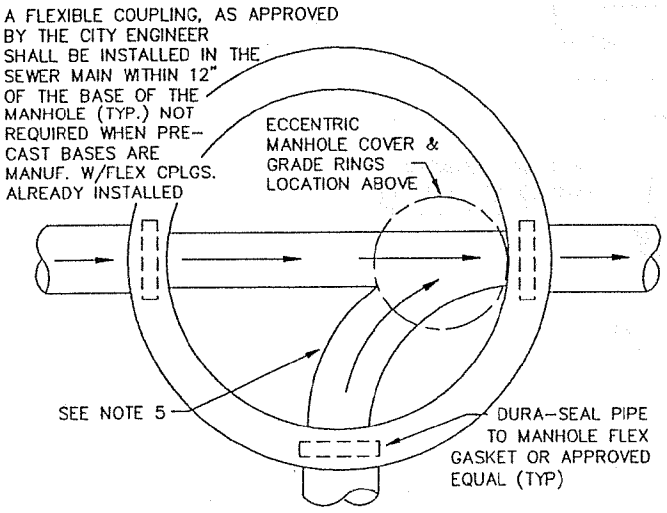
SCALE NONE

STANDARD DWG. # 5.07

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS





MANHOLE BASE

CHANNELIZATION PLAN AND LOCATION OF ECCENTRIC MANHOLE COVER

NOTES:

1. WHEN MANHOLES 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 = 20" ALTERNATELY, CONTRACTOR MAY CAST GRADE ADJUSTMENT RINGS IN PLACE.
3. SET ALL BARREL SECTIONS & TAPER SECTIONS IN PLASTIC GASKET, RAM-NEK OR APPROVED ALTERNATE. TYP. JOINT: 1-1/2" (3/4" X 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER AREAS).
4. CONE SECTION (TAPER) MUST BE ECCENTRIC FOR 60" MANHOLE.
5. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER LOWER RING SECTION IS SET, BREAK OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF M.H. WALL AND CONSTRUCT SHELF AND U-SHAPED CHANNEL MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES.
6. POURED-IN-PLACE BASE SHALL BE POURED FULL THICKNESS TO UNDISTURBED SIDES OF EXCAVATION OR SHALL BE FORMED. JOINT BETWEEN BASE AND BARREL TO BE SEALED W/1-1/2" (3/4" X 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS) OR PLASTER 6" FILLET. 1:3 MORTAR. PRE-CAST BASE TO BE PLACED ON 12" THICK 3/4" DRAIN ROCK SUBBASE INSTALLED AGAINST UNDISTURBED EARTH.
7. JOINT BETWEEN BASE AND BARREL TO BE SEALED W/1-1/2" (3/4" X 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS).
8. CLASS "A" CONC. COLLAR SHALL BE AT FINISHED GRADE.
9. STANDARD MANHOLE BARREL SECTION PER ASTM C478.
10. BARREL AND TAPER SECTIONS MAY BE CAST IN PLACE AS APPROVED AND DIRECTED BY THE CITY ENGINEER.
11. 60" I.D. M.H. TO BE USED FOR ALL TRUNK AND COLLECTOR SEWERS 18" TO 48" OR WHERE DIMENSION FROM FINISHED GRADE TO THE SEWER FLOW LINE IS GREATER THAN 8'-0", AS INDICATED ON THE DESIGN PLANS.
12. MANHOLES ON TRUNK SEWERS LARGER THAN 48" SHALL BE SIZED BY THE CITY ENGINEER.
13. WHEN MANHOLES ARE COMPLETE THEY SHALL BE THOROUGHLY CLEANED INSIDE & THEN GIVEN ONE COAT OF XYPEX WATER PROOFING MATERIAL.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

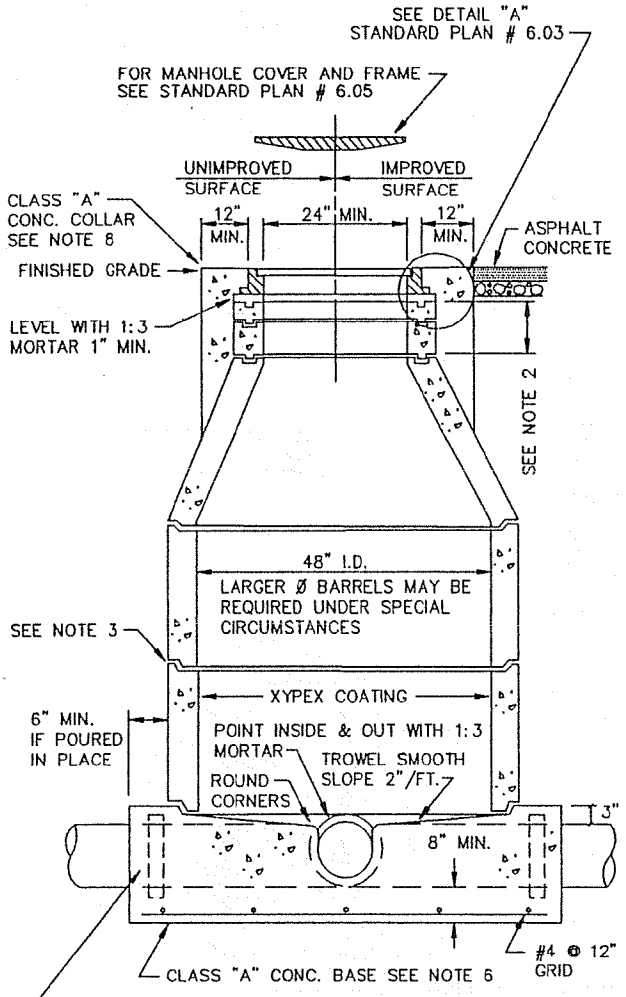
STANDARD 60" Ø PRECAST CONCRETE MANHOLE SANITARY SEWER

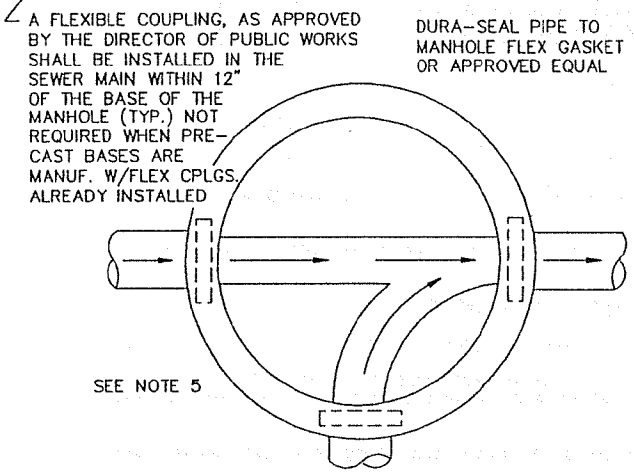
MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95

SCALE NONE

STANDARD DWG. # 6.01





MANHOLE BASE
CHANNELIZATION PLAN

NOTES:

1. WHEN MANHOLES 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 = 20". ALTERNATELY, CONTRACTOR MAY CAST GRADE ADJUSTMENT RINGS IN PLACE.
3. SET ALL BARREL SECTIONS & TAPER SECTIONS IN PLASTIC GASKET, RAM-NEK OR APPROVED ALTERNATE. TYP. JOINT: 1-1/2" (3/4" X 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER AREAS).
4. CONE SECTION (TAPER) MUST BE CONCENTRIC FOR 48" MANHOLE.
5. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER LOWER RING SECTION IS SET, BREAK OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF M.H. WALL AND CONSTRUCT SHELF AND U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES.
6. POURED-IN-PLACE BASE SHALL BE POURED FULL THICKNESS TO UNDISTURBED SIDES OF EXCAVATION OR SHALL BE FORMED. JOINT BETWEEN BASE AND BARREL TO BE SEALED W/1-1/2" (3/4" X 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS) OR PLASTER 6" FILLET. 1:3 MORTAR. PRECAST BASE TO BE PLACED ON 12" THICK 3/4" DRAIN ROCK SUBBASE INSTALLED AGAINST UNDISTURBED EARTH.
7. JOINT BETWEEN BASE AND BARREL TO BE SEALED W/1-1/2" (3/4" X 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS).
8. CLASS "A" CONC. COLLAR SHALL BE AT FINISHED GRADE.
9. STANDARD MANHOLE BARREL SECTION PER ASTM C478.
10. BARREL AND TAPER SECTIONS MAY BE CAST IN PLACE AS APPROVED AND DIRECTED BY THE CITY ENGINEER.
11. 48" I.D. MANHOLE TO BE USED FOR SEWER MAINS LESS THAN 18" DIA. & LESS THAN 8 FT. DEEP FROM FINISHED GRADE.
12. WHEN MANHOLES ARE COMPLETE THEY SHALL BE THOROUGHLY CLEANED INSIDE & THEN GIVEN ONE COAT OF XYPEX WATER PROOFING MATERIAL.
13. ALL INTERIOR JOINTS MUST BE GROUTED AND FLUSHED.

AMERICAN CITY OF CANYON INCORPORATED 1992

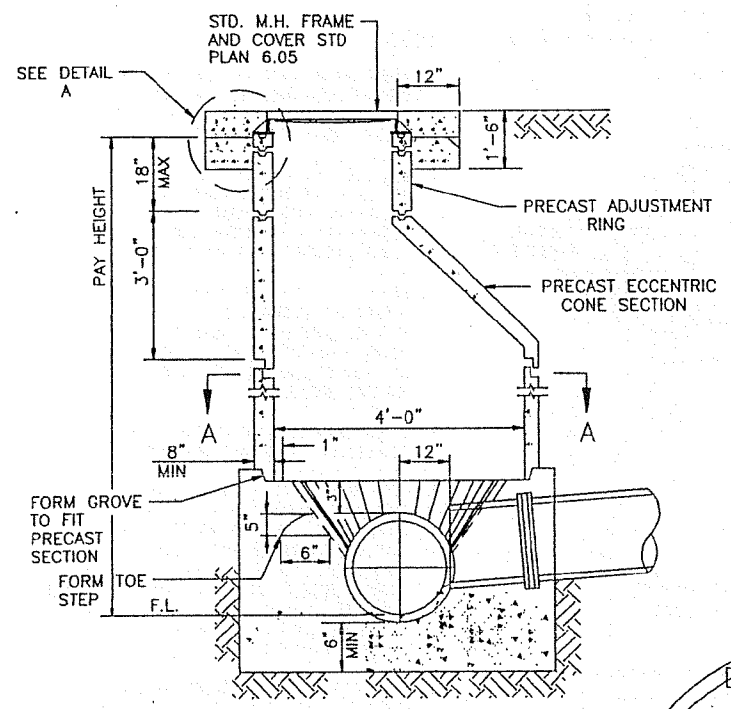
CITY OF AMERICAN CANYON

DATE	REVISIONS

STANDARD 48" Ø PRECAST CONCRETE MANHOLE SANITARY SEWER

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95
SCALE NONE
STANDARD DWG. # 6.02

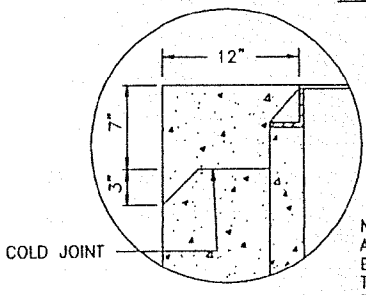


ELEVATION

MINIMUM HEIGHT TYPE "A" MANHOLE

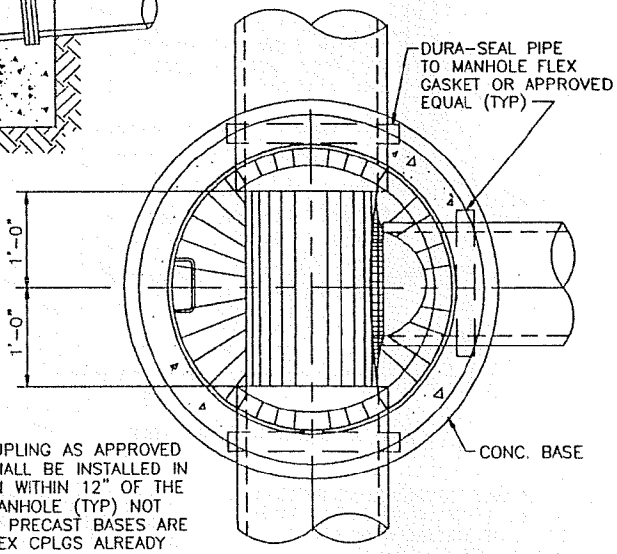
DIA (rcp)	PAY HEIGHT (ft)
12"	5.17'
15"	5.44'
18"	5.71'
21"	6.00'
24"	6.25'
27"	6.52'
30"	6.79'
33"	7.06'
36"	7.33'

FOR HEIGHTS LESS THAN SHOWN ABOVE USE TYPE "B" STANDARD MANHOLE OR SPECIAL; DESIGN



DETAIL A

NOTE:
A FLEXABLE COUPLING AS APPROVED BY ENGINEER SHALL BE INSTALLED IN THE SEWER MAIN WITHIN 12" OF THE BASE OF THE MANHOLE (TYP) NOT REQUIRED WHEN PRECAST BASES ARE MANUF. WITH FLEX CPLGS ALREADY INSTALLED.



SECTION A-A

NOTES:

1. ECCENTRIC CONES SHALL BE USED WHERE SPECIFIED ON THE PLANS. JOINTS MAY BE EITHER KEYED OR TONGUE AND GROVED.
2. RAM-NEK OR APPROVED EQUAL MAY BE USED IN JOINTS ELIMINATING NECESSITY FOR OUTSIDE PLASTERING OF JOINTS.
3. CONE SECTION MAY BE EITHER CONCENTRIC OR ECCENTRIC.
4. CONCRETE BLOCK AND BASE SHALL BE A MIN. OF CLASS A CONC.
5. CONCRETE JOINTS SHALL BE CLEANED, WETTED AND MORTARED PRIOR TO SETTING NEXT JOINT. JOINTS SHALL THEN BE PATCHED, TROWELED AND BRUSHED SMOOTH. BASE OF MANHOLE SHALL BE GROUTED AND SACKED.
6. MANHOLE COVER FRAME SHALL BE ADJUSTED TO GRADE AND CROSS SLOPE OF PAVEMENT PRIOR TO POURING CONCRETE BLOCK.
7. RISER SECTIONS, CONES AND ADJUSTING RINGS SHALL CONFORM TO ASTM C-478.
8. ALL INTERIOR JOINTS MUST BE GROUTED & FLUSHED.

AMERICAN CITY OF INCORPORATED 1992 CANYON

CITY OF AMERICAN CANYON

MANHOLE TYPE I

DATE 5/1/95

SCALE NONE

STANDARD DWG. # 6.03

DATE | REVISIONS

MARK CLABKSON, P.E., DIRECTOR OF PUBLIC WORKS

CITY OF AMERICAN CANYON

DATE	REVISIONS

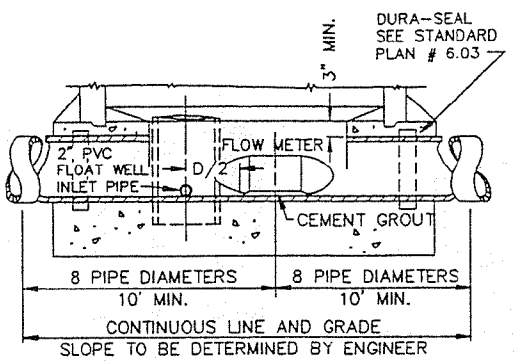
MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

METERING MANHOLE

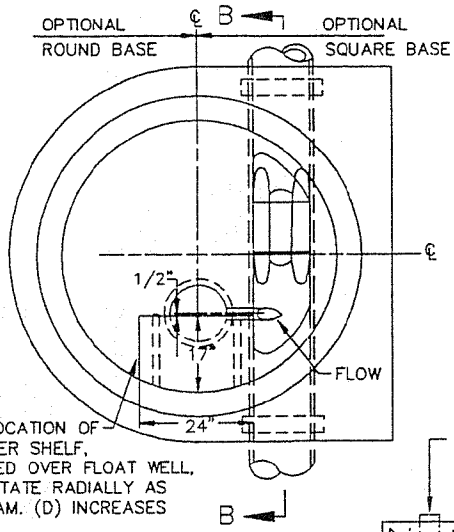
DATE 5/11/95

SCALE NONE

STANDARD DWG. # 6.04



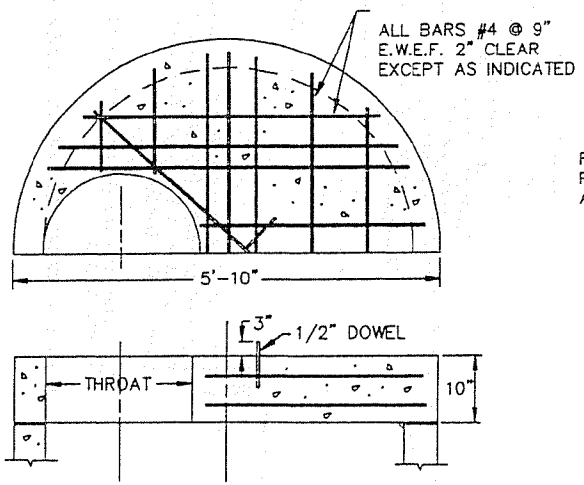
SECTION B-B



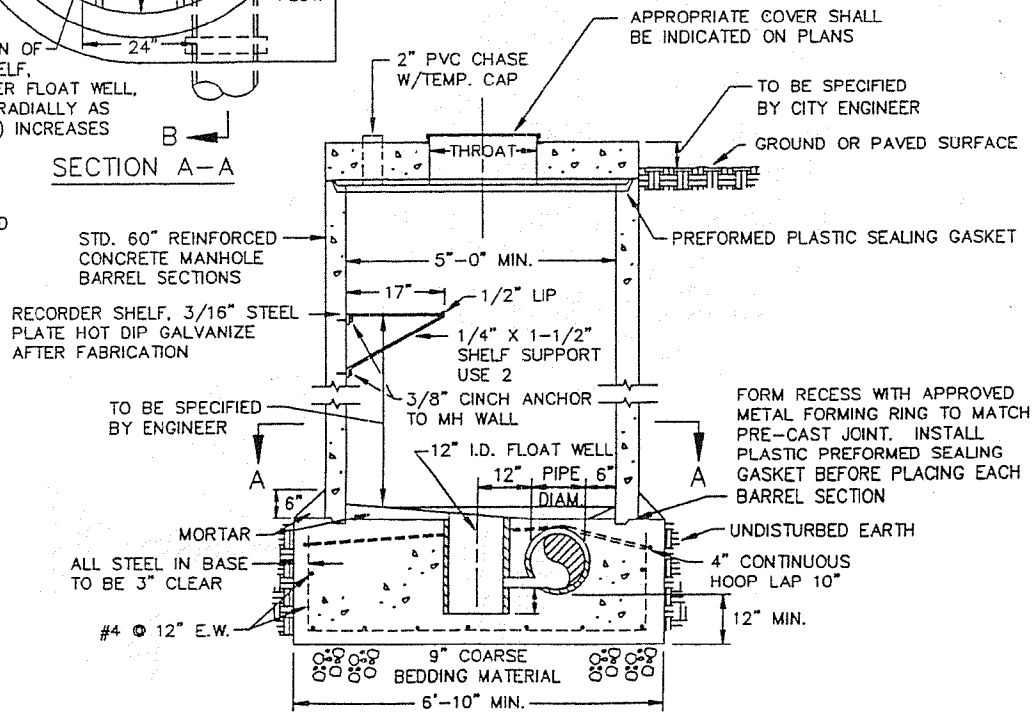
SECTION A-A

NOTES:

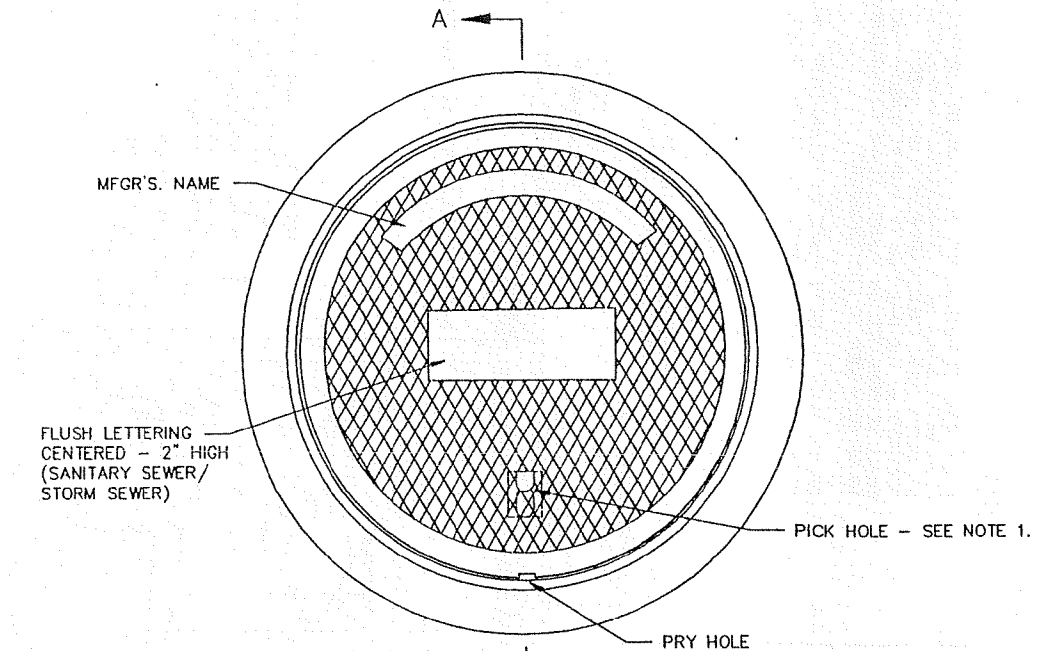
1. FLOW METER FURNISHED AND INSTALLED BY CONTRACTOR. FLOW METER SHALL BE A COMMERCIALLY MANUFACTURED STAINLESS STEEL PALMER-BOWLUS FLUME. SIZE SPECIFIED BY THE DIRECTOR OF PUBLIC WORKS, WHICH SHALL BE INDICATED ON PLANS. FLUME RATING CURVE TO BE FURNISHED TO CITY ENGINEER.
2. SECURE FLOW METER IN PLACE BY FILLING ENTIRE VOID BETWEEN FLUME AND CHANNEL WITH CEMENT GROUT.



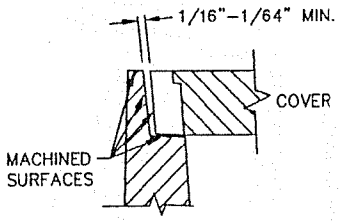
TOP SLAB DETAIL



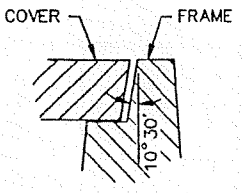
VERTICAL SECTION



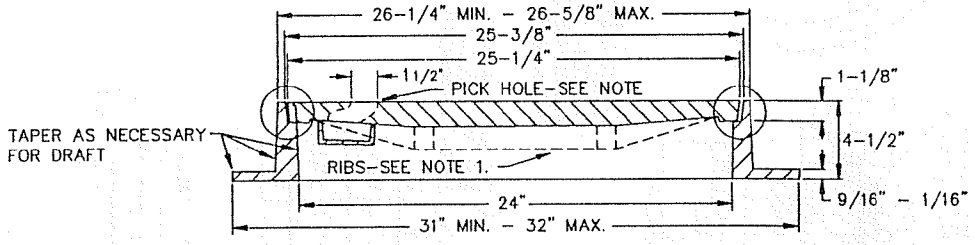
PLAN



PRY HOLE



DETAIL
FRAME AND COVER BEVEL



SECTION A-A

NOTES:

1. COVER MAY BE FURNISHED WITH OR WITHOUT RIBS BUT MUST BE DESIGNED FOR H-20 HIGHWAY LOADING. PICK HOLE SHALL FIT A STANDARD PICK AND BE FORMED OR PROVIDED WITH A CUP OR CHANNEL SECTION BENEATH HOLE SUCH THAT BARS OR STICKS CANNOT FALL THROUGH.
2. ALL MATERIAL USED IN MANUFACTURING SHALL CONFORM TO A.S.T.M. DESIGNATION A-159-G3000.
3. MINIMUM WEIGHT COMPONENTS: COVER - 130 LBS. FRAME - 135 LBS.

AMERICAN CITY OF CANYON INCORPORATED 1992

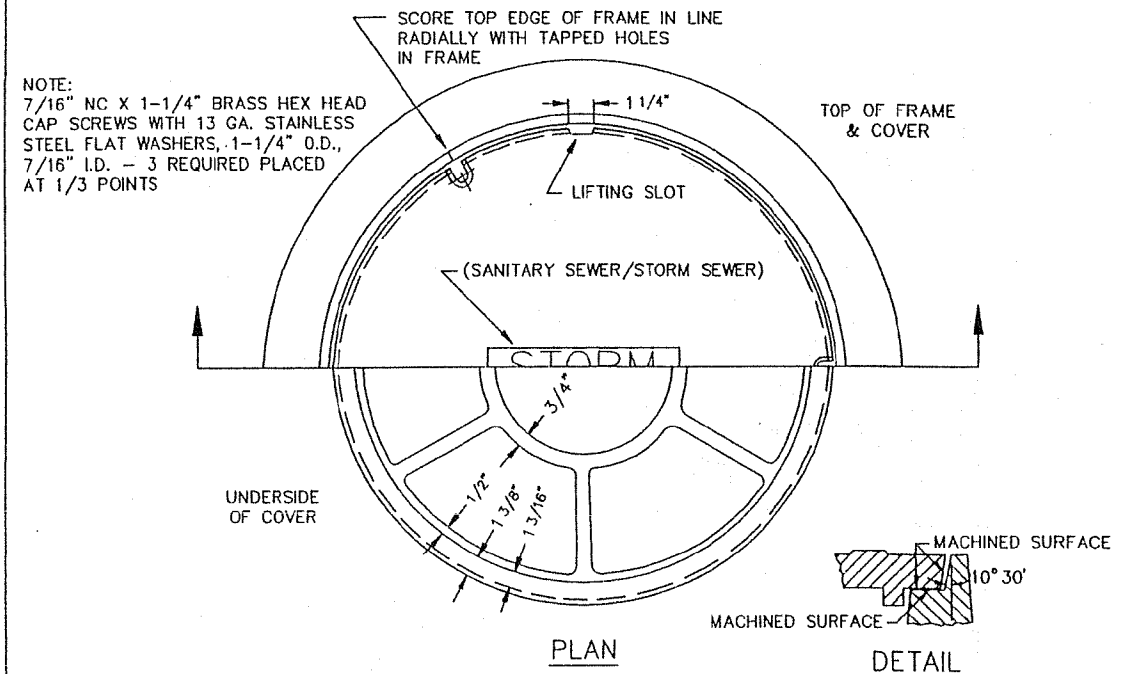
CITY OF AMERICAN CANYON

DATE	REVISIONS

STANDARD MANHOLE
FRAME & COVER

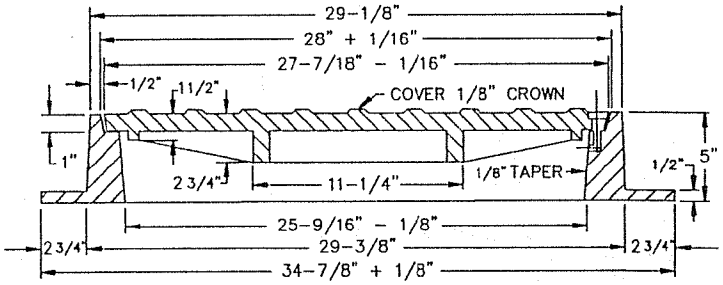
MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95
SCALE NONE
STANDARD DWG. # 6.05

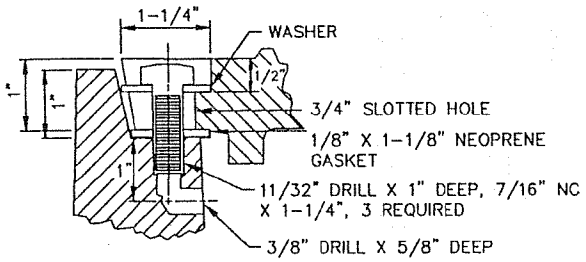


PLAN

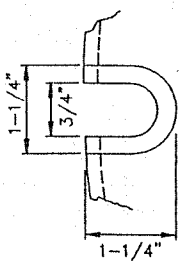
DETAIL
MACHINED SURFACE AND BEVEL



SECTION A-A



DETAIL OF TAPPED
AND SLOTTED HOLES



PLAN
SLOTTED HOLES IN COVER

NOTES:

1. SPECIFY SANITARY SEWER/STORM SEWER WHEN ORDERING
2. ALL MATERIAL USED IN MANUFACTURING SHALL CONFORM TO A.S.T.M. DESIGNATION A-159-G3000

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

BOLT DOWN MANHOLE
FRAME & COVER

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/4/95
SCALE NONE
STANDARD DWG. # 6.06

CITY OF AMERICAN CANYON

DATE	REVISIONS

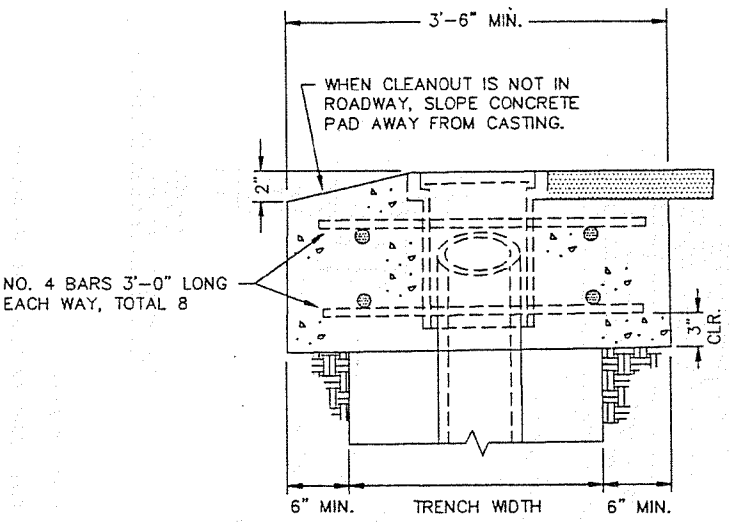
MARK CLARKSON, P.E. DIRECTOR OF PUBLIC WORKS

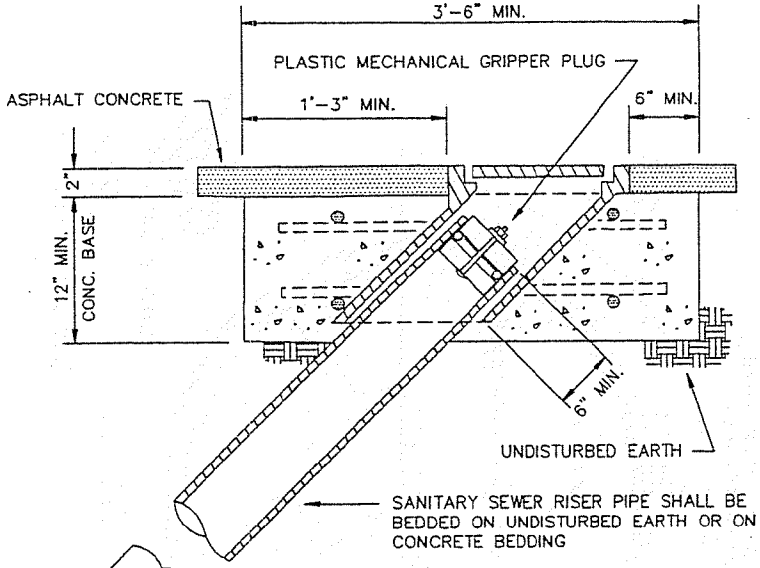
MAINLINE CLEANOUT

DATE 5/1/23

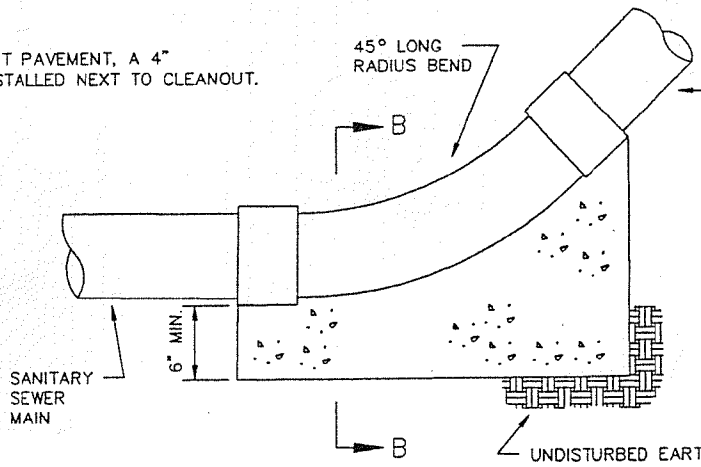
SCALE NONE

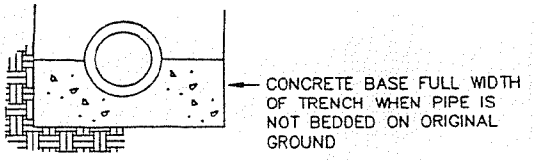
STANDARD DWG. # 6.07



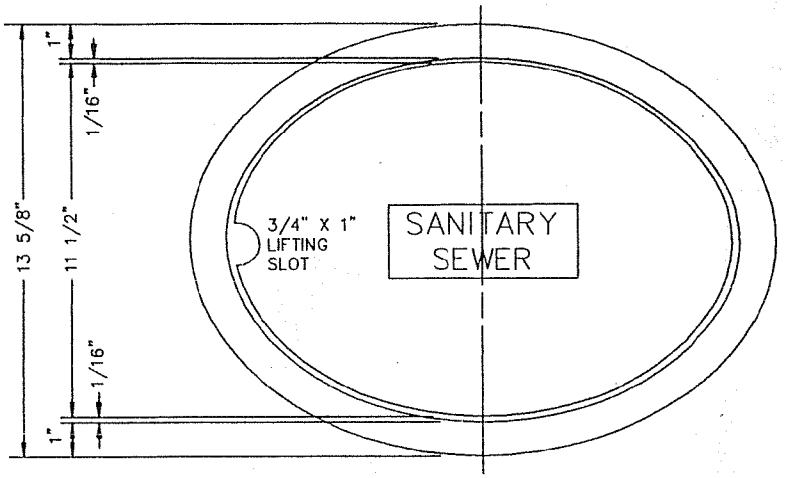


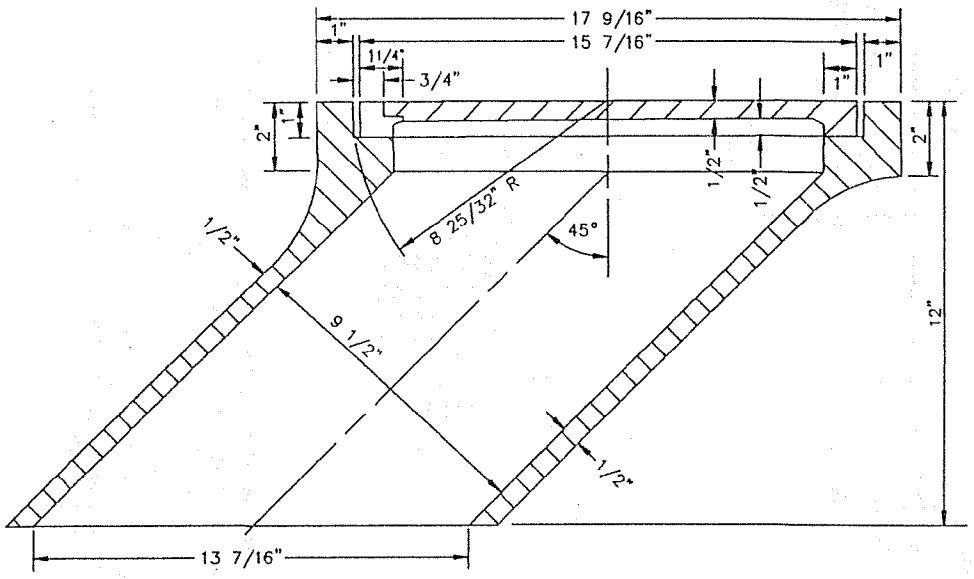
WHERE CLEANOUT DOES NOT ABUT PAVEMENT, A 4" DIAMETER BALLARD SHALL BE INSTALLED NEXT TO CLEANOUT.





SECTION B-B





CITY OF AMERICAN CANYON

DATE	REVISIONS

8" LAMPHOLE 45° CAST IRON FRAME & COVER

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95

SCALE NONE

STANDARD DWG. # 6.08

CITY OF AMERICAN CANYON

INCORPORATED 1992

DATE | REVISIONS

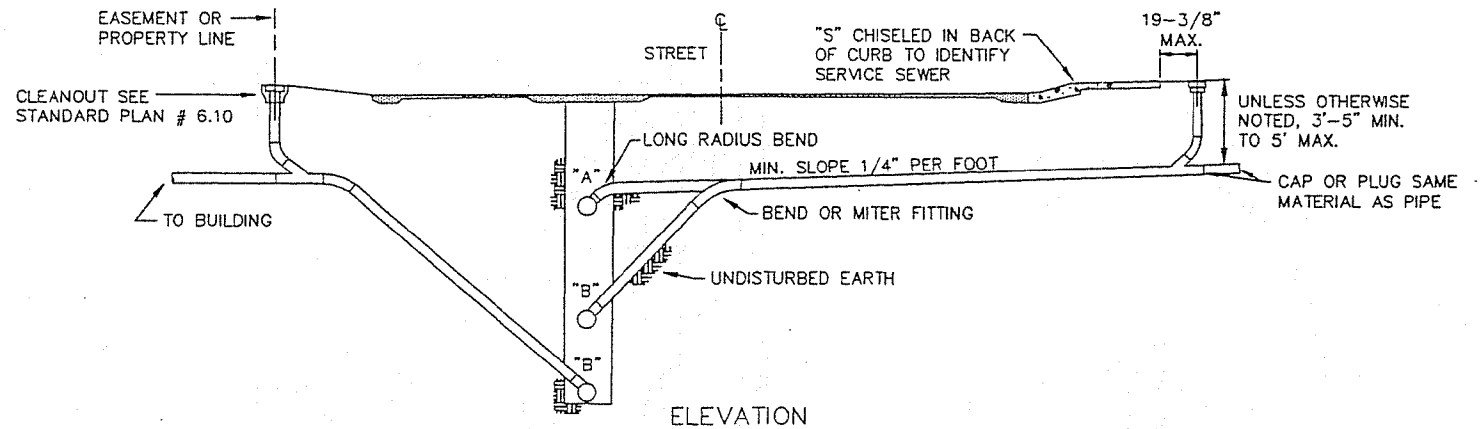
MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

SERVICE SEWERS

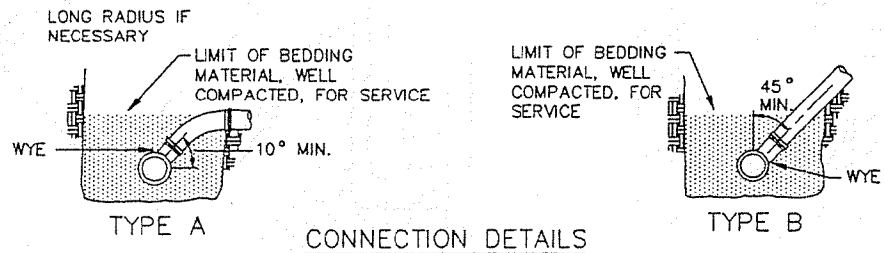
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 6.09



ELEVATION



CONNECTION DETAILS

NOTES:

1. ALL SERVICE LINES SHALL BE 4" INSIDE DIAMETER UNLESS OTHERWISE NOTED.
2. SERVICES SHALL HAVE SAME BEDDING AND BACKFILL AS LATERAL SEWER.
3. CONTRACTOR SHALL USE THE MOST APPROPRIATE TYPE CONNECTION (A,B) FOR THE PARTICULAR SITUATION ENCOUNTERED.
4. SERVICE SEWER SHALL HAVE A MINIMUM 4'-0" COVER AT PROPERTY LINE WHENEVER LATERAL DEPTH AND SERVICE SEWER SLOPE OF 1/4" PER FOOT (MINIMUM) PERMIT.
5. WHEN THE LATERAL SEWER DEPTH IS SUCH THAT MINIMUM COVER AT PROPERTY LINE CANNOT BE MET, THE MINIMUM SLOPE OF 1/4" PER FOOT SHALL GOVERN THE COVER.
6. PLACE CONCRETE 12" WIDE AND OVERLAP LENGTH UNDER THE TEE BRANCH, THE FITTING AND UNSUPPORTED PIPE. WHEN BEDDING MATERIAL IS USED, PLACE ADDITIONAL BEDDING MATERIAL TO TOP OF BEND, THE FULL WIDTH OF THE TRENCH.
7. MINIMUM SPECIFIED COVER AT THE PROPERTY LINE SHALL BE MEASURED FROM EXISTING GROUND SURFACE OR EDGE OF ADJACENT ROADWAY, WHICHEVER IS LOWER.
8. A SPECIFIC ELEVATION AT THE PROPERTY LINE, WHEN SHOWN ON THE PLANS, SHALL GOVERN.
9. MITER FITTING SHALL BE MAX. 45°.

CITY OF AMERICAN CANYON

INCORPORATED 1992

DATE	REVISIONS

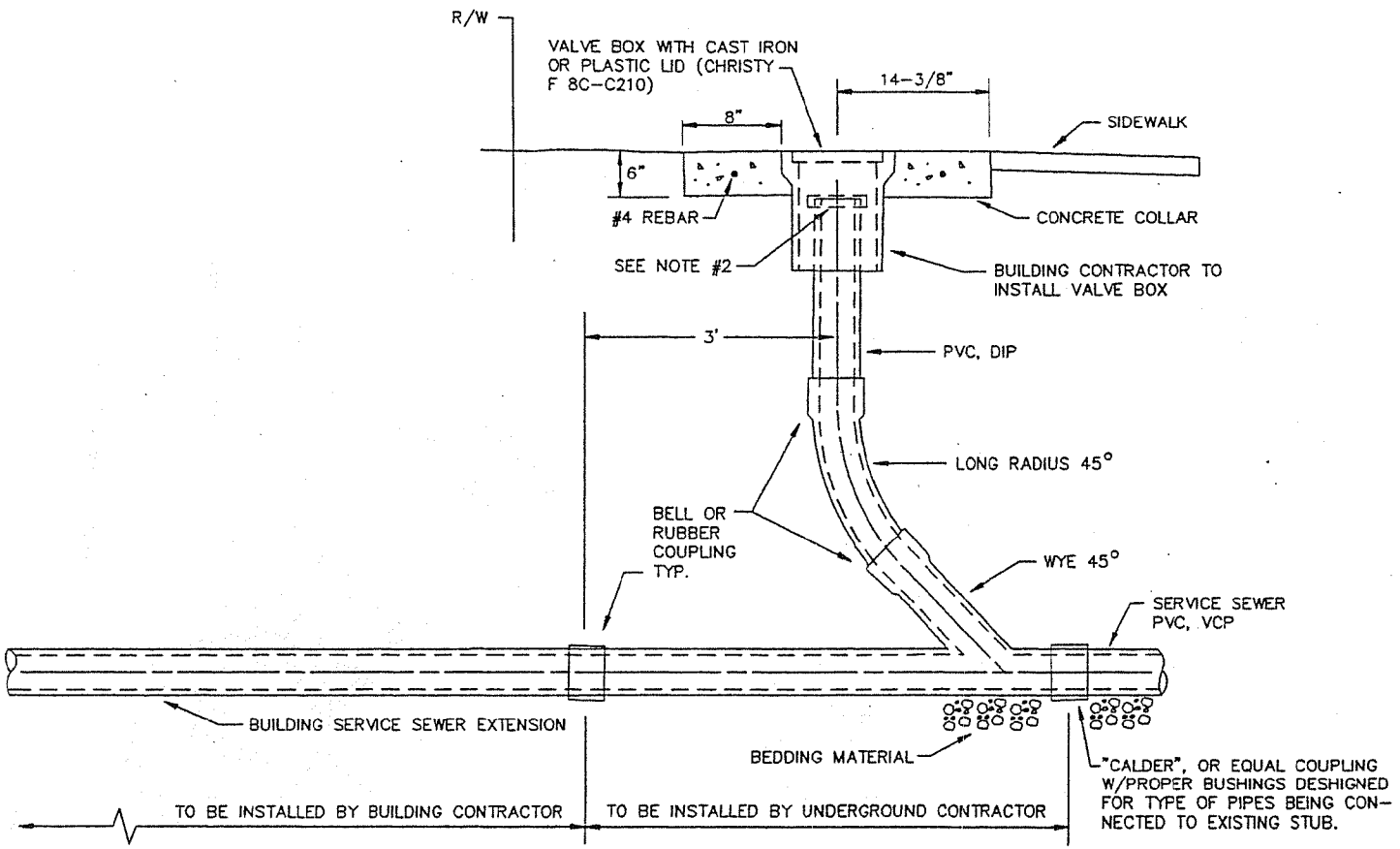
MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

PROPERTY LINE CLEANOUT TO GRADE

DATE 5/16/95

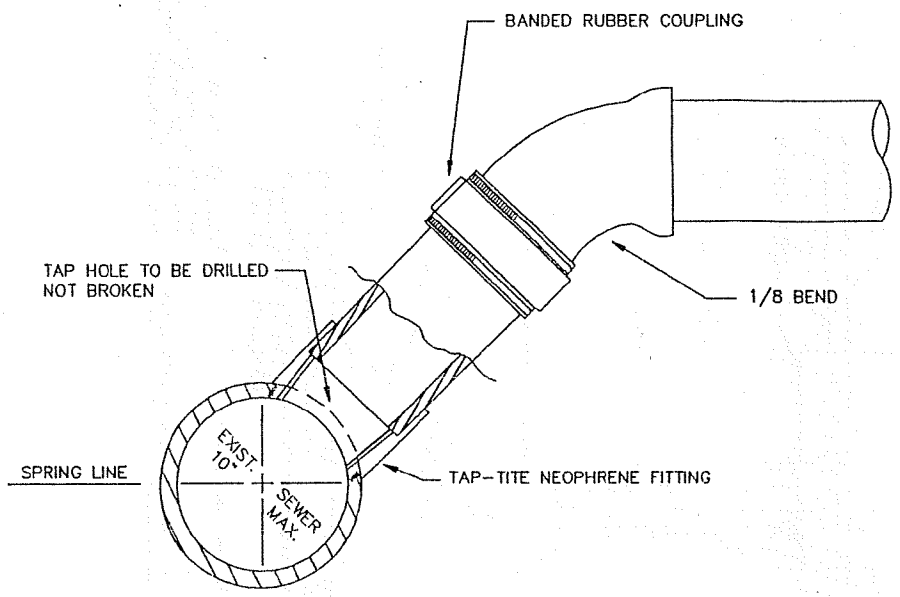
SCALE NONE

STANDARD DWG. # 6.10

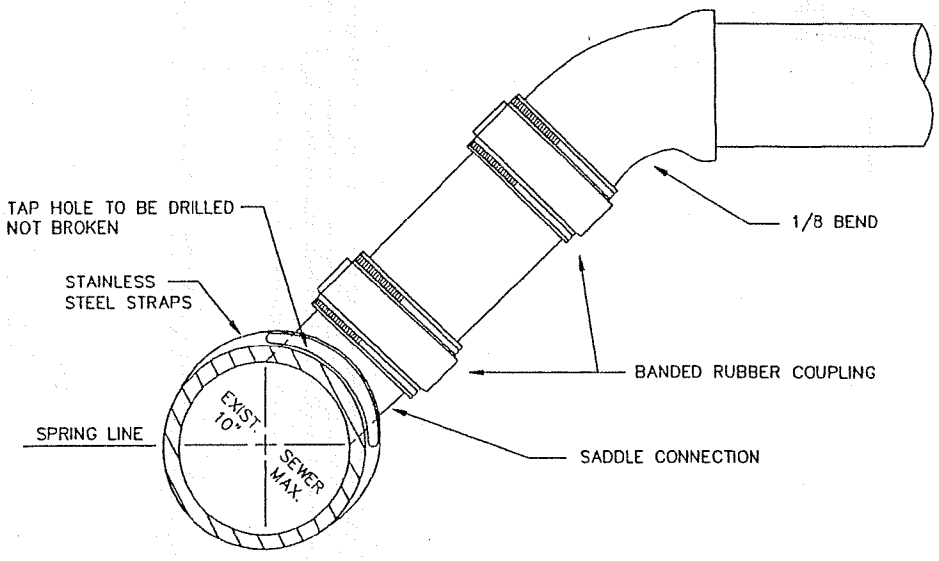


NOTES:

1. ALL CLEANOUT PIPE AND FITTINGS SHALL BE THE SAME SIZE AND MATERIAL AS THE SERVICE SEWER IN WHICH THEY CONNECT.
2. CAP SHALL BE MOULDED RUBBER COMPRESSION COUPLING WITH STAINLESS STEEL CLAMPS OR ABS MALE THREADED CAP.



TAP-TITE CONNECTION



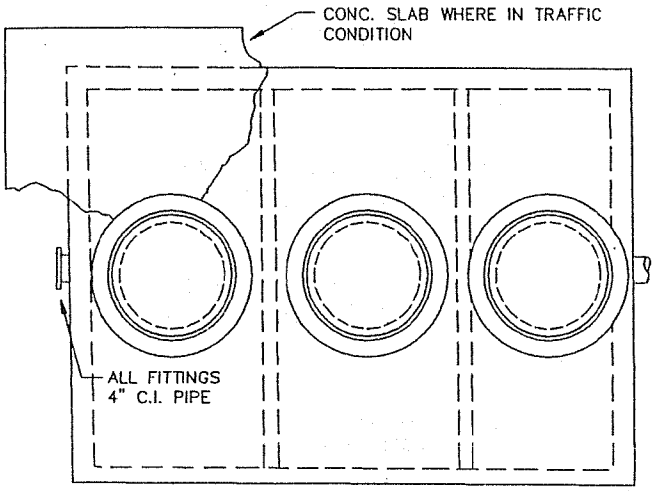
SADDLE CONNECTION

NOTES:

1. NO TAP SHALL BE ALLOWED INTO EXISTING SEWER LESS THAN 6" IN DIAMETER.

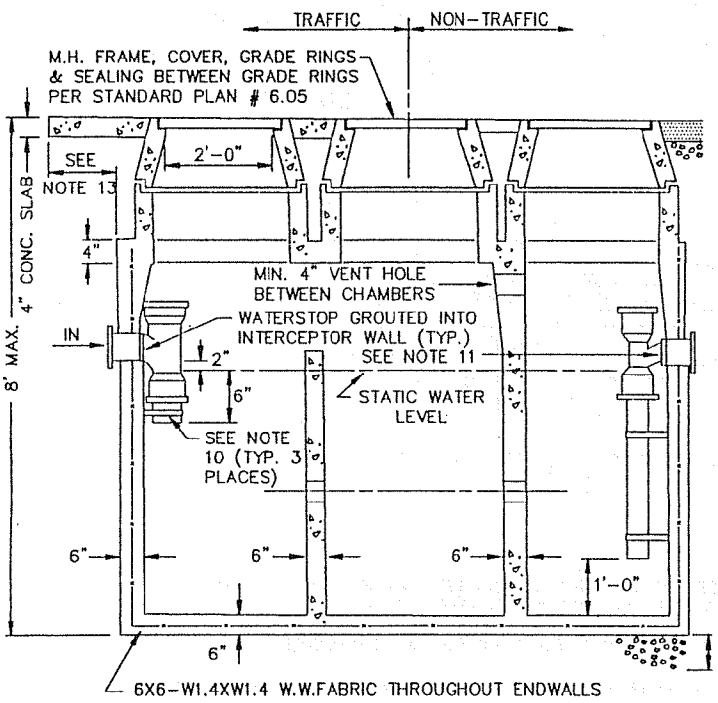
AMERICAN CANYON — CITY OF — INCORPORATED 1992	CITY OF AMERICAN CANYON		
		STANDARD SEWER LINE TAPS	DATE 5/1/95
			SCALE NONE
DATE	REVISIONS	MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS	STANDARD DWG. # 6.11

NOTE: TANK TO BE STENCILED ON UPPER LEFT-HAND CORNER OF INLET END IN WHITE



NOTE: ALL WASTE MUST ENTER THROUGH INLET FITTING ONLY

PLAN



SECTION

NOTES:

1. TANK SHALL BE PRECAST AS MANUFACTURED BY:
   M.C. NOTTINGHAM
   PACIFIC CONCRETE PRODUCTS
   SELVAGE CONCRETE PRODUCTS
   OR CITY ENGINEER APPROVED EQUAL.
2. ALL GREASE INTERCEPTORS SHALL BE LOCATED OUTSIDE PUBLIC RIGHT-OF-WAY.
3. GREASE INTERCEPTORS SHALL BE LOCATED OUTSIDE OF BUILDINGS IN A LOCATION ACCESSIBLE TO WASTEHAULER PUMPER. LOCATION SUBJECT TO THE APPROVAL OF THE CITY ENGINEER.
4. ALTERNATE DESIGN BY A REGISTERED ENGINEER MAY BE SUBSTITUTED FOR REVIEW BY THE CITY ENGINEER.
5. PIPE SHALL BE 6" MAX. DIA. TYPE PER U.P.C.
6. EXCAVATION SHALL BE NEAT LINE TYPICALLY ALL SIDES.
7. HEIGHT OF TANK ABOVE FITTINGS VARIABLE. ONE FT. SECTIONS MAY BE ADDED TO REQUIRED FINISH GRADE.
8. ALL WYES SHALL BE ONE-WAY CLEAN OUT WYES, EXCEPT AS NOTED. TYPE PER U.P.C.
9. INTERCEPTOR TO BE USED IN CONJUNCTION WITH "METERING MANHOLE" PER STANDARD PLAN # 6.04
10. STAINLESS STEEL CLAMP AND BOLTS 3'-0" O.C. MAX. (TYP.) MIN. 2 REQ'D.
11. A WATERSTOP CONSISTING OF A STD. MANHOLE ADAPTER GASKET AS SUPPLIED BY THE PIPE MANUFACTURER SHALL BE GROUTED INTO THE INTERCEPTOR WALL NEAR THE CENTER OF THE WALL.
12. 12" MIN. BEDDING MATERIAL
13. SLAB TO EXTEND MIN. 24" BEYOND ALL SIDES OF TANK. (TRAFFIC AREA)
14. TANK CAPACITY TO BE DETERMINED AT TIME OF INDUSTRIAL WASTE PERMIT APPLICATION.
15. PIPE AND FITTINGS TO BE 4" SCHL. 40 PVC.

MATERIAL SPECIFICATIONS

CONCRETE-MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.

REINFORCING BAR-INTERMEDIATE GRADE ASTM A615-62T & A305-56T

REINFORCING WIRE FABRIC ASTM A185-61T.

AMERICAN CITY OF INCORPORATED 1992 CANYON

CITY OF AMERICAN CANYON

SAND & GREASE INTERCEPTOR

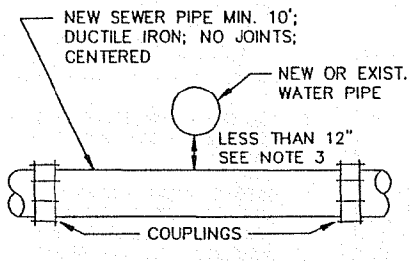
DATE 3/1/95

SCALE NONE

STANDARD DWG. # 6.12

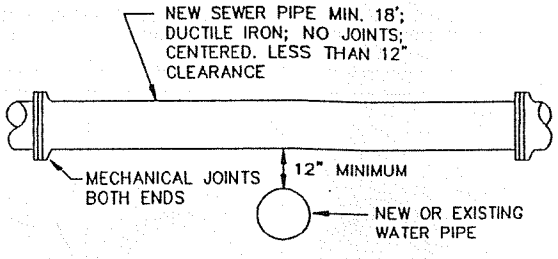
DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS



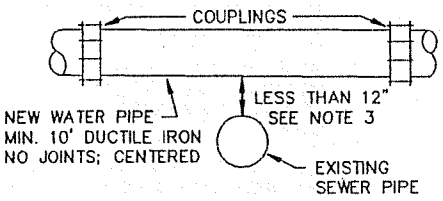
NEW SEWER UNDER
NEW OR EXISTING WATER

CASE 1



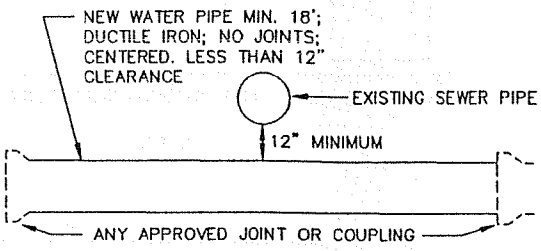
NEW SEWER OVER
NEW OR EXISTING WATER

CASE 2



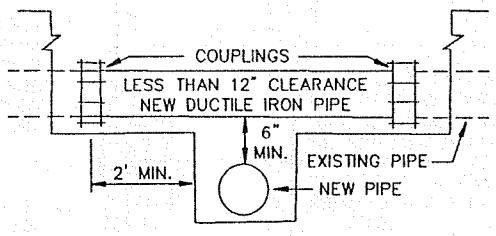
NEW WATER OVER
EXISTING SEWER

CASE 3



NEW WATER UNDER
EXISTING SEWER

CASE 4



NEW PIPE UNDER EXISTING

CASE 5

NOTES:

1. THIS STANDARD APPLIES TO PIPES UP TO AND INCLUDING 16" DIAMETER. ALL CROSSINGS OF LARGER DIAMETER SHALL BE AS APPROVED BY THE DIRECTOR OF PUBLIC WORKS.
2. ALL NEW DUCTILE IRON SHALL BE WRAPPED IN POLYETHELENE AND CADWELDED.
3. WHERE SEWER CROSSES BELOW A WATER MAIN, WITH 1' OR MORE VERTICAL CLEARANCE, NO SPECIAL INSTALLATION IS REQUIRED.
4. "NEW PIPE UNDER EXISTING – CASE 5" SHALL BE USED WHEN THE EXISTING PIPE HAS A JOINT OVER OR WITHIN 2' OF THE NEW TRENCH.
5. ANY PIPE–PIPE CROSSING WITH LESS THAN 6" VERTICAL CLEARANCE SHALL NOT BE INSTALLED.
6. FOR WATER MAIN LOWERING DETAIL, SEE STANDARD PLAN # 7.09

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

PIPE–PIPE
CROSSING DETAILS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95

SCALE NONE

STANDARD DWG. # 6.13

CITY OF AMERICAN CANYON

Gateway to the Napa Valley

July 23, 1998

FIELD(1)

RE: Revision to City of American Canyon Public Works Department Engineering Standard Plans and Specifications dated May 1995 (Engineering Standards)

Dear FIELD(2):

This letter is sent to notify you that the City of American Canyon Public Works Department (PWD) has recently made a change to Standard Drawing # 7.08 - Installation of Private Fire Protection Services. Due to ongoing maintenance problems with the Ames Double Detector Check Valve Assemblies, the PWD will no longer allow the installation of Ames backflow prevention devices. Standard Drawing #7.08 is revised as follows:

Notes

1. Backflow prevention devices shall be Febco 806 (Double Check Detector Assembly) with a 5/8" Sensus meter except where an onsite fire department connection is required by the Fire District or where the City Engineer determines that additional protection is required. In these cases the backflow prevention device shall be a Febco 826 (Reduced Pressure Detector Assembly) with a 5/8" Sensus meter. Sensus meters shall read in increments of 100 cu. feet.

Installation of the Ames backflow prevention device will be allowed only for plans approved prior to July 15, 1998. However, we request the hydraulic calculations for the fire service be reviewed and, if possible, the Ames device be replaced with the appropriate Febco. The PWD has been maintaining the Ames backflow prevention devices at no charge to the property owners. The PWD has been able to do this because Ames has been supplying replacement parts to the City at no charge. If in the future the City is charged for replacement parts, this charge will be passed on to the property owner.

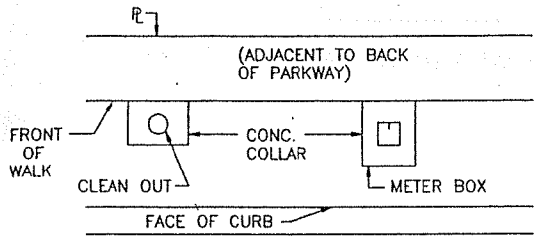
If you have any questions regarding this revision you may contact either myself or Cheryl A. Braulik, Associate Civil Engineer, at (707) 647-4550.

Sincerely yours,

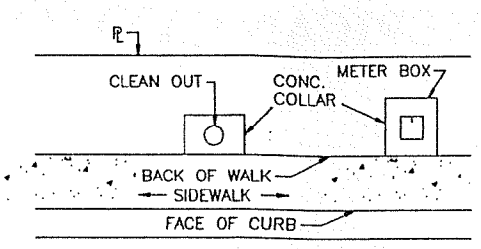
John V. Wankum

John V. Wankum
Public Works Director

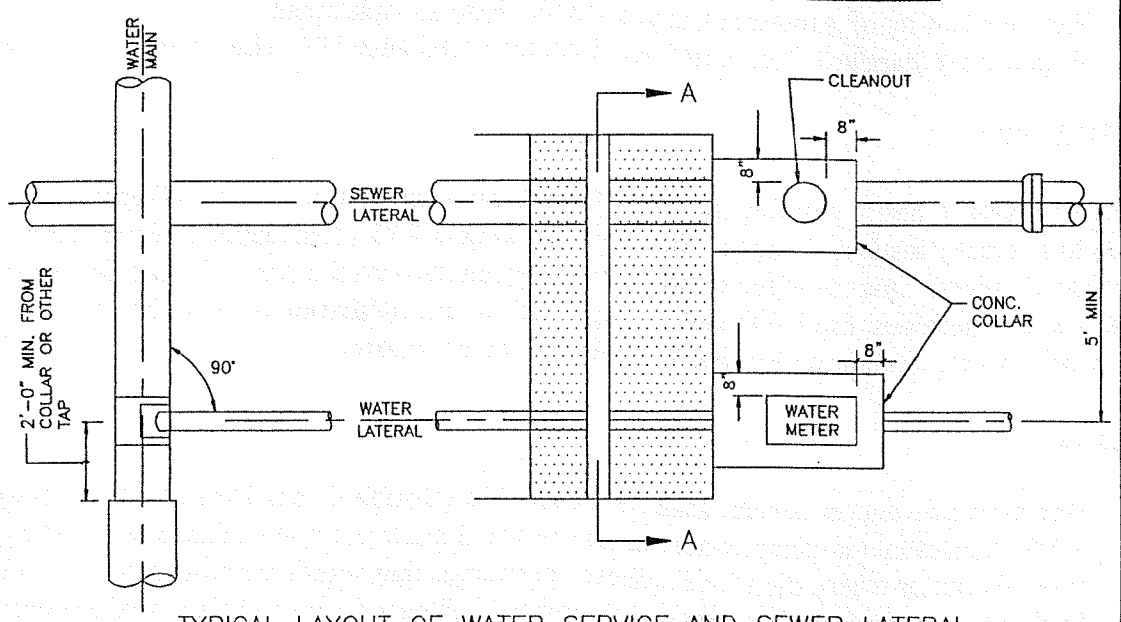
2185 ELLIOTT DRIVE, AMERICAN CANYON, CA 94589-1331 • 707/647-4360 FAX 707/642-1249



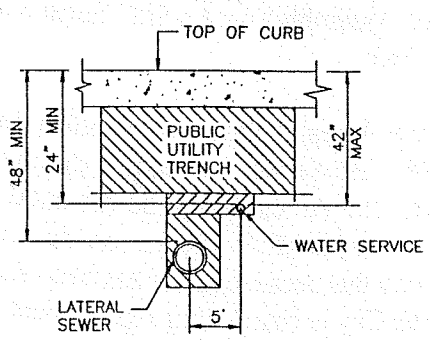
PARKWAY INSTALL.



MONOLITHIC SIDEWALK INSTALLATION



TYPICAL LAYOUT OF WATER SERVICE AND SEWER LATERAL



SECTION A–A

NOTES:

1. MINIMUM DEPTH OF WATER SERVICE SHALL BE 24" FROM TOP OF CURB. THE SEWER LATERAL SHALL BE LOCATED A MINIMUM OF 6" BELOW WATER SERVICE WITH A MINIMUM HORIZONTAL SEPARATION OF 5'. UNDER NO CIRCUMSTANCES SHOULD THE WATER SERVICE BE PLACED LOWER THAN THE SEWER LATERAL WITHOUT ADEQUATE INFILTRATION PROTECTION.
2. WATER SERVICE AND SEWER LATERAL SHALL CLEAR UNDERGROUND UTILITIES AND OBSTRUCTION BY A MINIMUM OF 6".

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

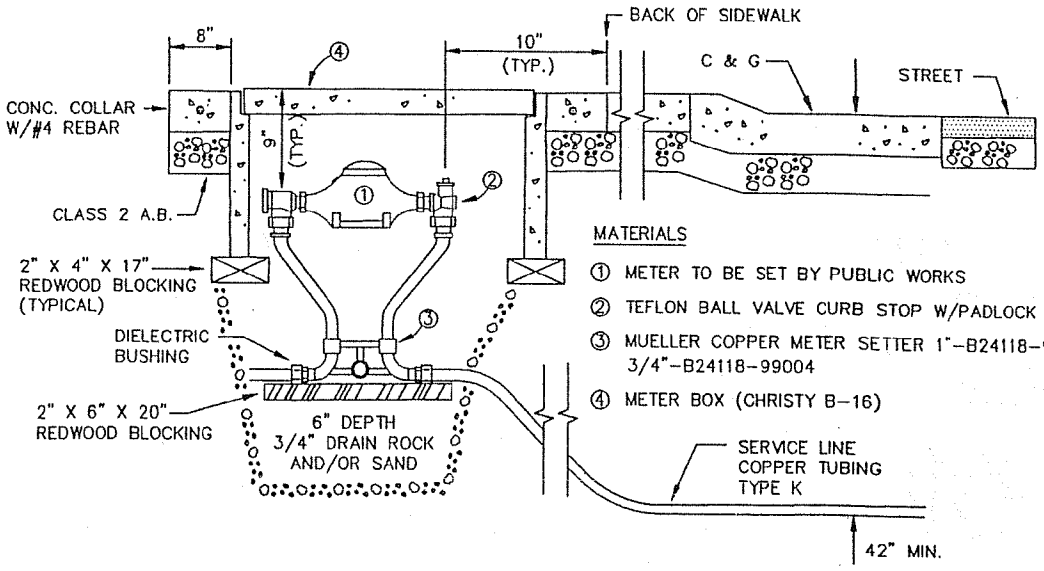
SERVICE LAYOUT

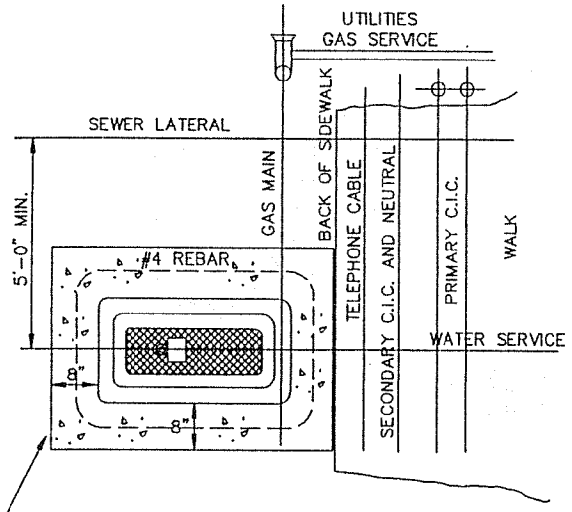
MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

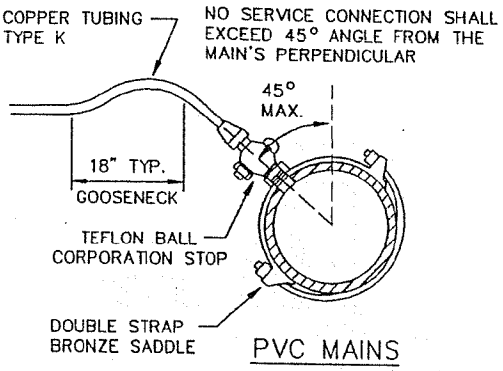
DATE 5/1/95

SCALE NONE

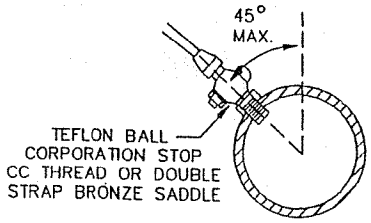
STANDARD DWG. # 7.01







PVC MAINS



DIP MAINS

NOTES:

1. FOR POLYETHYLENE WRAPPED D.I.P. REMOVE A 6" WIDE BAND OF POLYWRAP FROM AROUND THE MAIN. TAPE WRAP BARE PIPE WITH 10 MIL VINYL TAPE, HALF LAPPED TO PROVIDE MINIMUM 20 MILS OF PROTECTION. SEAL OPEN ENDS OF POLYWRAP WITH 2 WRAPS OF TAPE AT TAP LOCATION. CAREFULLY CUT AWAY VINYL TAPE TO ALLOW DIRECT SEALING OF SERVICE SADDLE GASKET ON BARE PIPE. INSTALL SERVICE SADDLE WITHOUT CUTTING OR DAMAGING VINYL TAPE.
2. TAPS SHALL BE SPACED A MINIMUM OF 24" ON CENTER FROM ANOTHER TAP, BELL, SPIGOT OR ANOTHER FITTING.
3. MULTIPLE TAPS INTO PVC MAINS SHALL BE LOCATED IN DIFFERENT POSITIONS TO PREVENT CRACK PROPOGATION.
4. COPPER SERVICE PIPE SHALL BE CONTINUOUS FROM CORPORATION STOP TO CURB STOP; SPLICES ARE NOT PERMITTED EXCEPT WHEN SERVICE RUN EXCEEDS 90'.

AMERICAN CITY OF INCORPORATED 1992 CANYON

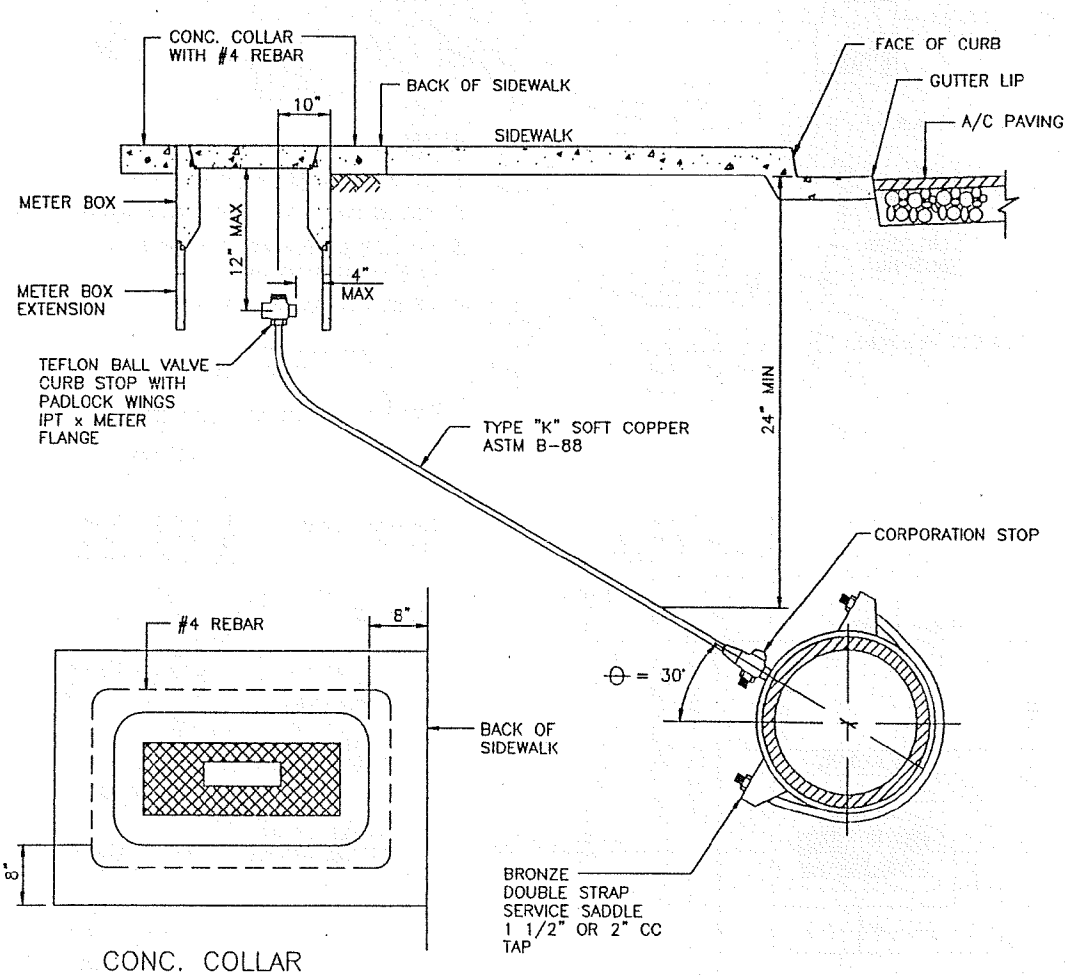
CITY OF AMERICAN CANYON

STANDARD 3/4" & 1" WATER SERVICE INSTALLATION

DATE: 5/1/95
SCALE: NONE
STANDARD DWG. #: 7.02

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS



CONC. COLLAR

NOTES:

1. FOR POLYETHYLENE WRAPPED DIP, REMOVE 6" OF POLYETHYLENE AT SERVICE TAP LOCATION. MAKE TAP TAPE WRAP CIRCUMFERENCE OF PIPE, SEALING OPEN ENDS OF POLYETHYLENE TUBE WITH HALF-LAPPED 10 MIL TAPE. AFTER WRAPPING, REMOVE TAPE AT SERVICE SADDLE GASKET LOCATION. INSTALL SERVICE SADDLE WITH 16 MILS OF POLYETHYLENE. USE 10 MIL VINYL TAPE TO SEAL ALL OPENINGS.
2. THE LOCATION OF THE TAP SHALL BE A MINIMUM OF 24" FROM ANOTHER TAP, BALL, SPIGOT OR OTHER FITTINGS.
3. ANY SERVICE OVER 2" MUST BE APPROVED BY CITY ENGINEER.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

STANDARD 1 1/2" AND 2" WATER SERVICE

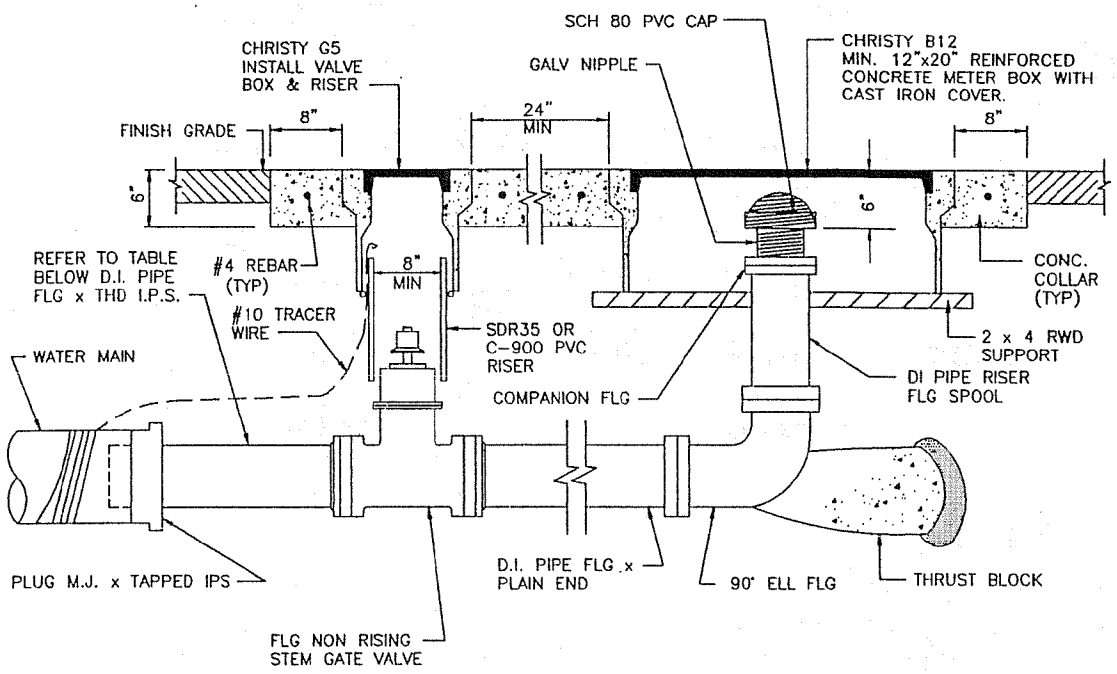
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 7.03

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS



DIAMETER OF MAIN TO BE FLUSHED	REQUIRED BLOWOFF DIAMETER	NUMBER OF OUTLETS
4"	2"	1"
6"	2"	1"
8"	4"	2"
12"	4"	3"
16"	6"	4"
20"	6"	8"

USE 2-1/2" FIRE HOSE AND DISSIPATOR ON EACH OUTLET.

NOTES:

1. BLOW-OFFS WILL BE REQUIRED ON ALL WATER MAINS AND PRIVATE FIRE SERVICES THAT ARE DEAD ENDED.
2. GATE VALVE NUT EXTENSIONS WILL BE REQUIRED FOR DISTANCES GREATER THAN 32" IF EXTENSION IS USED, 12" MIN. AND 18" MAX.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

BLOW-OFF ASSEMBLY

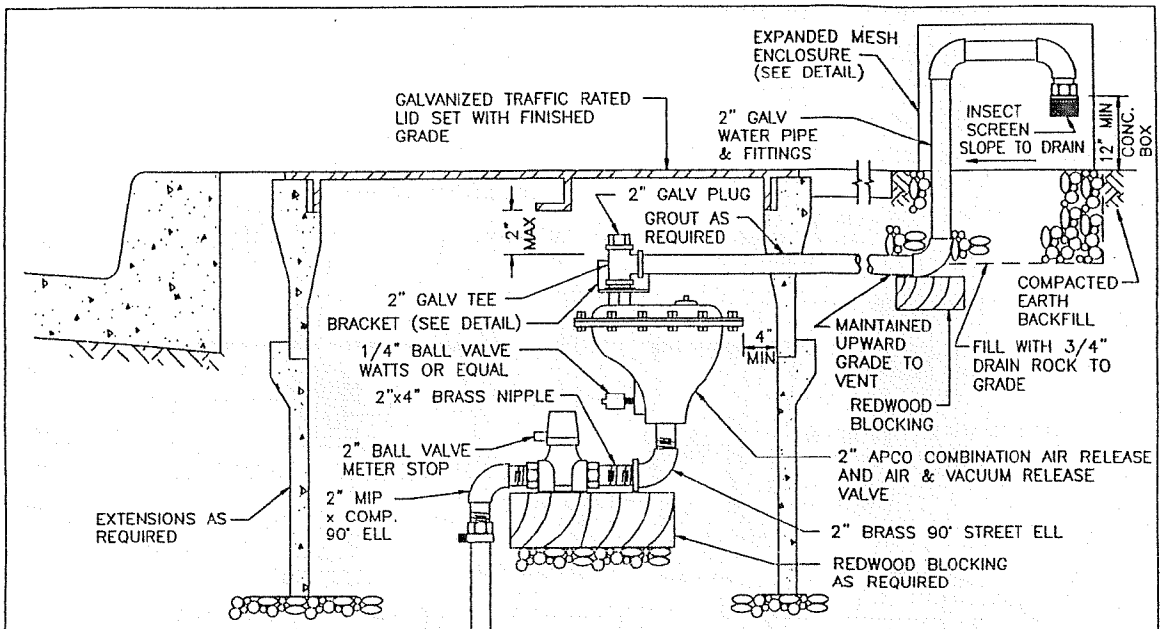
DATE 5/1/95

SCALE NONE

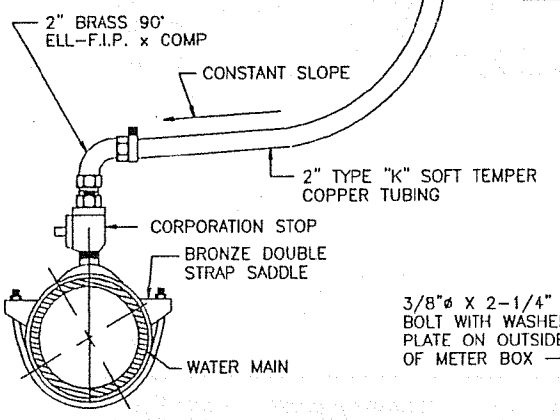
STANDARD DWG. # 7.04

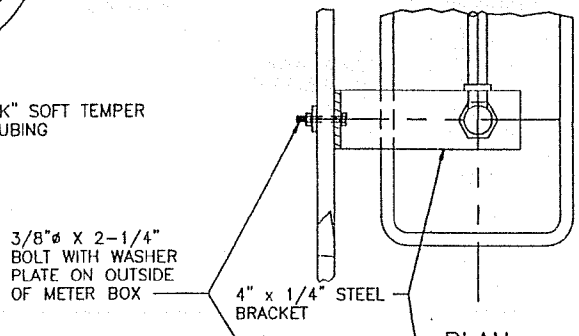
DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

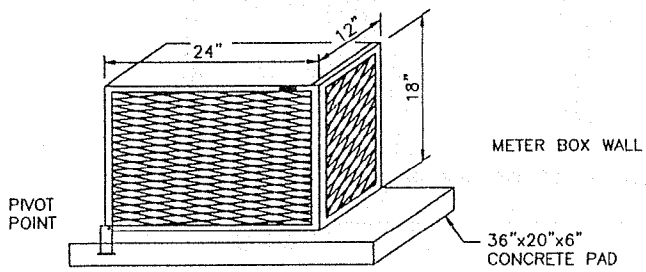


COMBINATION VALVES

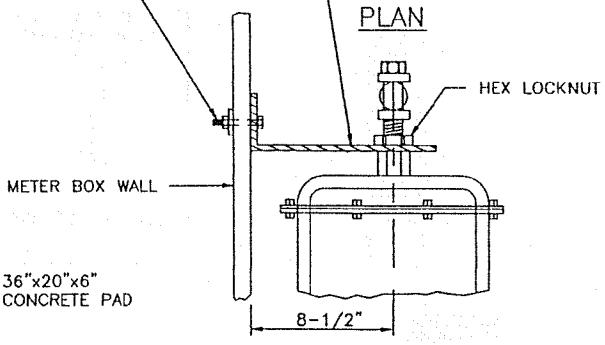




PLAN



ENCLOSURE DETAIL (OPTIONAL)



ELEVATION

DETAIL OF BRACKET

NOTES:

1. AIR RELEASES VALVES SHALL HAVE 2" THREADED INLETS UNLESS OTHERWISE SHOWN ON PLANS.
2. MAINTAIN A GRADE UPWARD FROM TAP TO VENT.
3. TAPE WRAP REDWOOD BLOCKING OR COVER WITH LAYERS OF POLYWRAP
4. INSTALL AT LOCATION DIRECTED BY CITY ENGINEER.

AMERICAN CANYON CITY OF INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

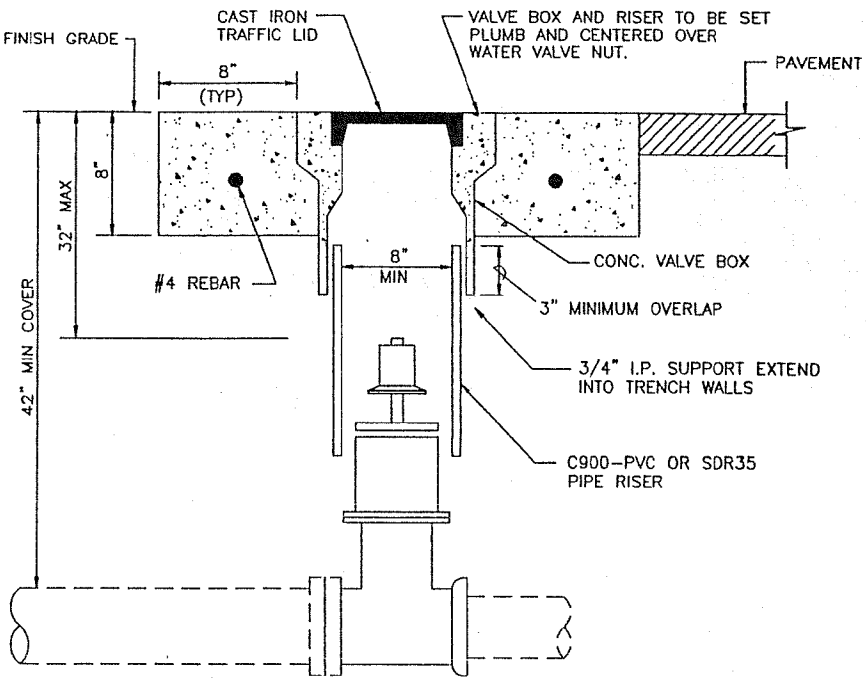
TYPICAL INSTALLATION OF AIR AND VACUUM & AIR RELEASE VALVE

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

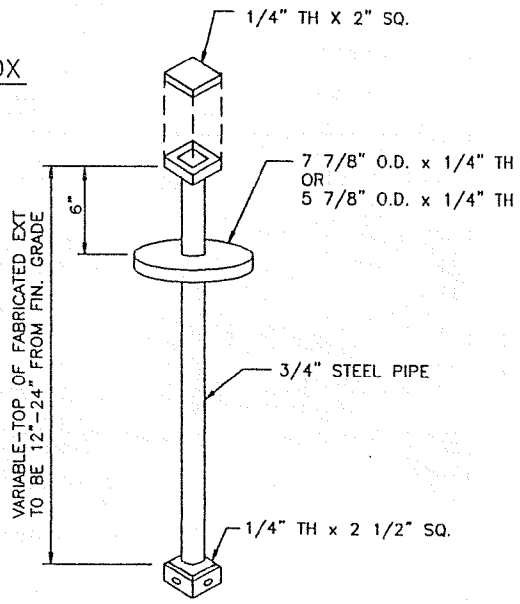
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 7.05



TRAFFIC VALVE BOX



VALVE OPEARATING NUT EXTENTION

TRAFFIC VALVE BOX

REQUIRED WHERE VALVE NUT IS IN EXCESS OF 32" DEEP BELOW FINISH GRADE

NOTES:

1. ALL WELDS TO RISER SHAFT SHALL BE FILLET WELD ALL AROUND.
2. ALL STEEL REQUIRED FOR RISER FABRICATION SHALL BE STRUCTURAL STEEL PER ASTM A36.
3. PRECAST VALVE BOX SET FLUSH WITH STREET SURFACE WITH CAST IRON RING AND MARKED "WATER" VALVE BOXES TO BE CHRISTY G5.

AMERICAN CITY OF INCORPORATED 1992 CANYON

CITY OF AMERICAN CANYON

DATE	REVISIONS

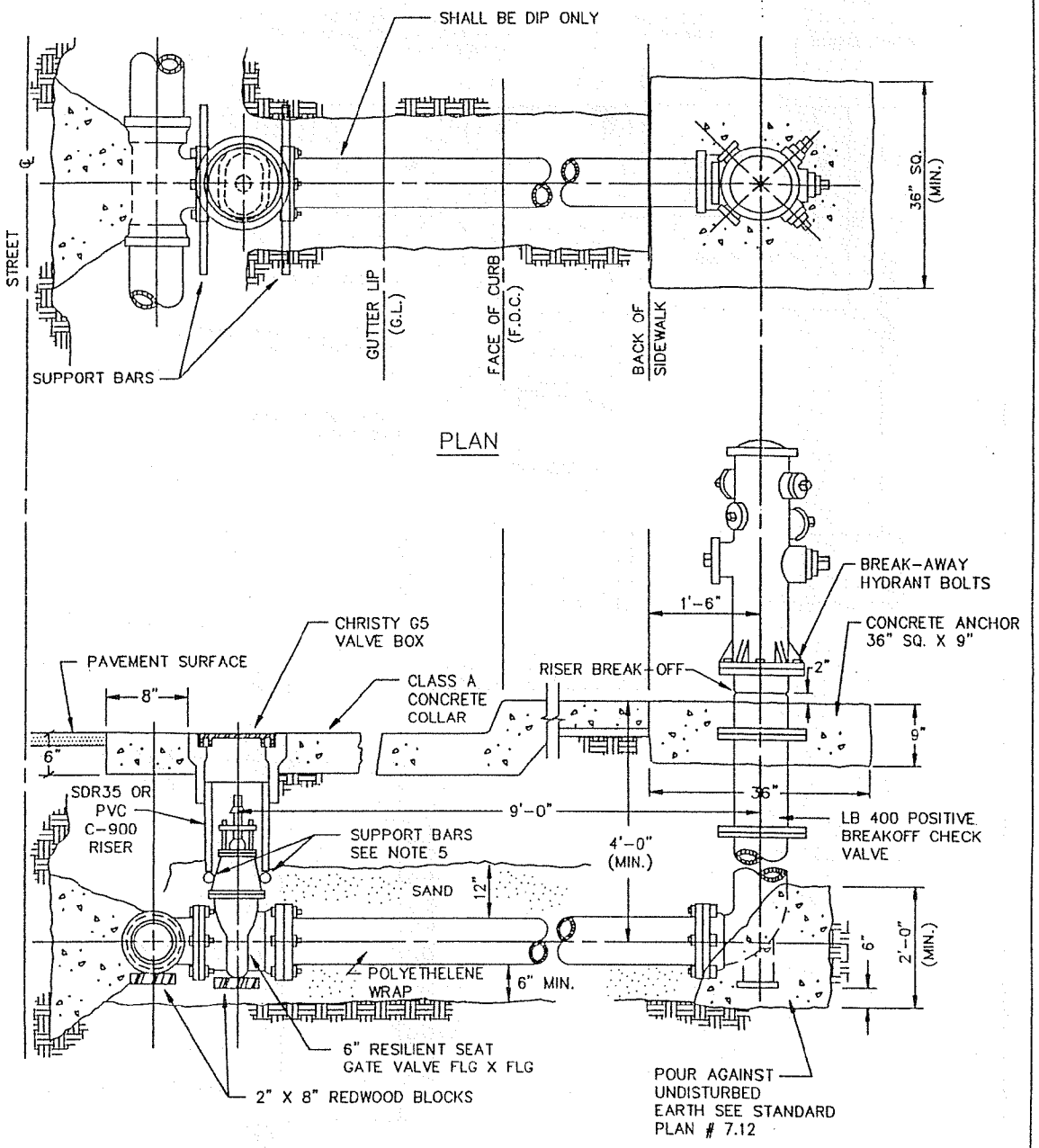
VALVE BOX AND RISER EXTENSION

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95

SCALE NONE

STANDARD DWG. # 7.06



NOTES:

1. A BLUE HYDRANT MARKER OF STIMSONITE 88 OR EQUAL SHALL BE INSTALLED IN THE STREET MARKING THE LOCATION OF EACH HYDRANT (PUBLIC OR PRIVATE) 12" FROM THE CENTERLINE ON THE HYDRANT SIDE.
2. ENCASE ALL METALLIC SURFACES BELOW GROUND WITH POLYETHELENE.
3. FIRE HYDRANT SHALL BE CLOW MODEL #960, MUELLER A481 OR LONG BEACH #615 (TYPE III, 2 2-1/2" & 1 4-1/2" OUTLETS)
4. ALL HOSE OUTLET CAPS SHALL BE ATTACHED TO HYDRANT BY CHAIN.
5. VALVE BOX TO BE SET ON TWO 3/4" G.S. PIPES EXTENDED ACROSS TRENCH AND INTO UNDISTURBED EARTH.

AMERICAN CITY OF CANYON INCORPORATED 1992

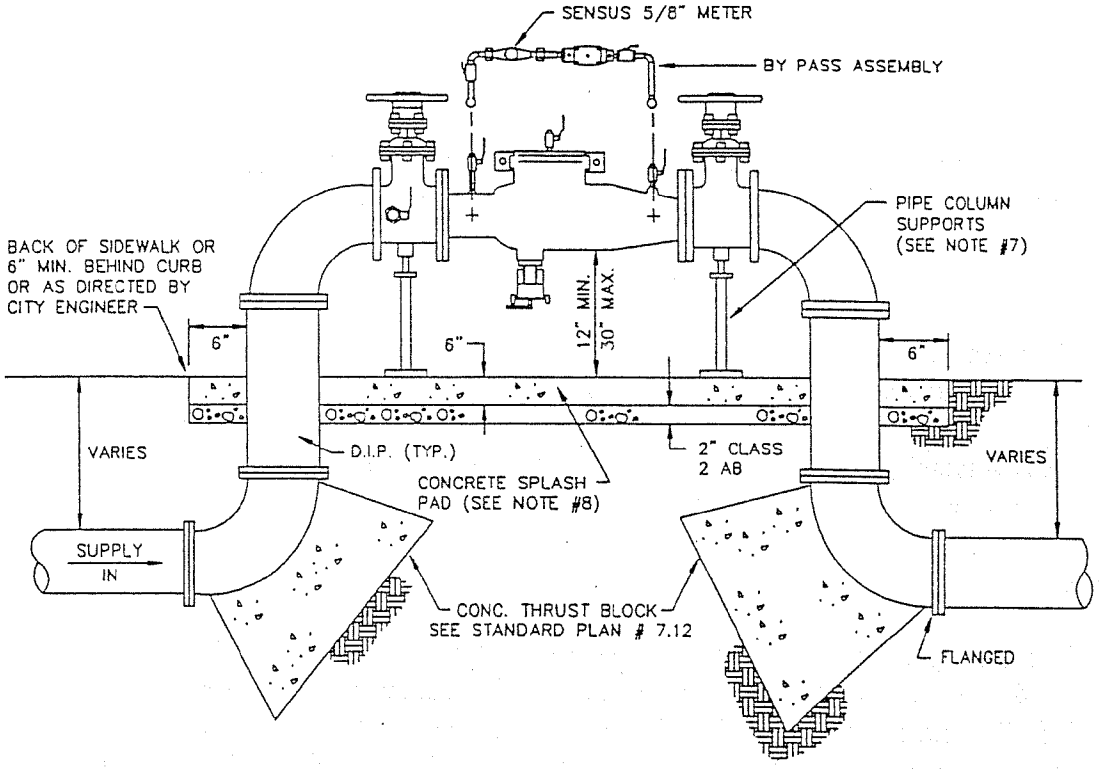
CITY OF AMERICAN CANYON

FIRE HYDRANT INSTALLATION WATER DISTRIBUTION SYSTEM

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95
SCALE NONE
STANDARD DWG. # 7.07



NOTES:

1. BACKFLOW DEVICE TO BE AMES DOUBLE DETECTOR CHECK VALVE ASSEMBLY WITH SENSUS 5/8" METER. (READING IN 100 CU. FEET)
2. BACKFLOW DEVICE SHALL BE INSTALLED PERPENDICULAR TO THE STREET, AT THE BACK OF SIDEWALK.
3. THRUST RESTRAINT DURING HYDROSTATIC TESTING IS THE RESPONSIBLITY OF THE CONTRACTOR. TEMPORARY RESTRAINT SHALL BE REMOVED AS DIRECTED.
4. DEVICE MUST BE PROTECTED FROM TRAFFIC HAZARDS, EITHER BY VIRTUE OF LOCATION OR APPROVED BARRIERS.
5. ALL ABOVE GROUND FITTINGS TO BE FLANGED.
6. A 3/8" HARDEN CHAIN SHALL BE PROVIDED AS PART OF THE INSTALLATION TO LOCK SHUT-OFF VALVES IN THE OPEN POSITION. LOCK TO BE PROVIDED BY THE CITY OF AMERICAN CANYON.
7. PIPE COLUMN SUPPORTS REQUIRED FOR 3" ASSEMBLY & LARGER.
8. CONCRETE SPLASH PAD TO EXTEND 6" PAST INFLOW & OUTFLOW PIPE. PAD WILL BE 30" WIDE CENTERED ON BACKFLOW DEVICE & 6" DEEP. CLASS A CONCRETE.

AMERICAN CITY OF INCORPORATED 1992 CANYON

CITY OF AMERICAN CANYON

DATE	REVISIONS

INSTALLATION OF PRIVATE FIRE PROTECTION SERVICES

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95

SCALE NONE

STANDARD DWG. # 7.08

CITY OF AMERICAN CANYON

Gateway to the Napa Valley

July 23, 1998

FIELD(1)

RE: Revision to City of American Canyon Public Works Department Engineering Standard Plans and Specifications dated May 1995 (Engineering Standards)

Dear FIELD(2):

This letter is sent to notify you that the City of American Canyon Public Works Department (PWD) has recently made a change to Standard Drawing # 7.08 - Installation of Private Fire Protection Services. Due to ongoing maintenance problems with the Ames Double Detector Check Valve Assemblies, the PWD will no longer allow the installation of Ames backflow prevention devices. Standard Drawing #7.08 is revised as follows:

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Installation of the Ames backflow prevention device will be allowed only for plans approved prior to July 15, 1998. However, we request the hydraulic calculations for the fire service be reviewed and, if possible, the Ames device be replaced with the appropriate Febco. The PWD has been maintaining the Ames backflow prevention devices at no charge to the property owners. The PWD has been able to do this because Ames has been supplying replacement parts to the City at no charge. If in the future the City is charged for replacement parts, this charge will be passed on to the property owner.

If you have any questions regarding this revision you may contact either myself or Cheryl A. Braulik, Associate Civil Engineer, at (707) 647-4550.

Sincerely yours,

John V. Wankum

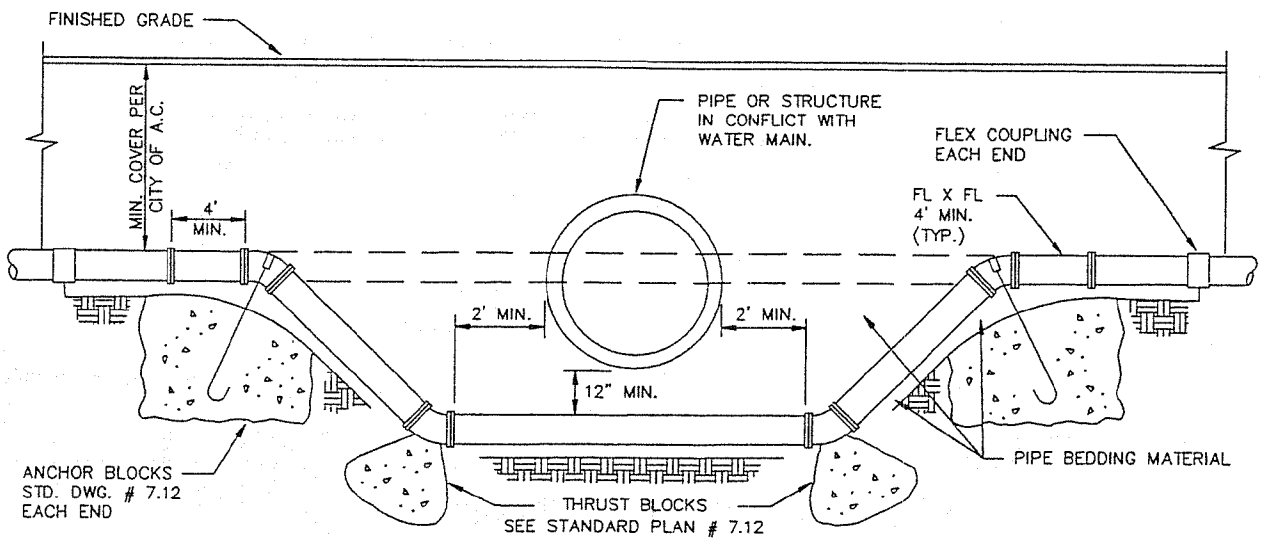
John V. Wankum
Public Works Director

2185 ELLIOTT DRIVE, AMERICAN CANYON, CA 94589-1331 • 707/647-4360 FAX 707/642-1249

CITY OF AMERICAN CANYON

DATE | REVISIONS

TYPICAL WATER MAIN LOWERING DETAIL



NOTES:

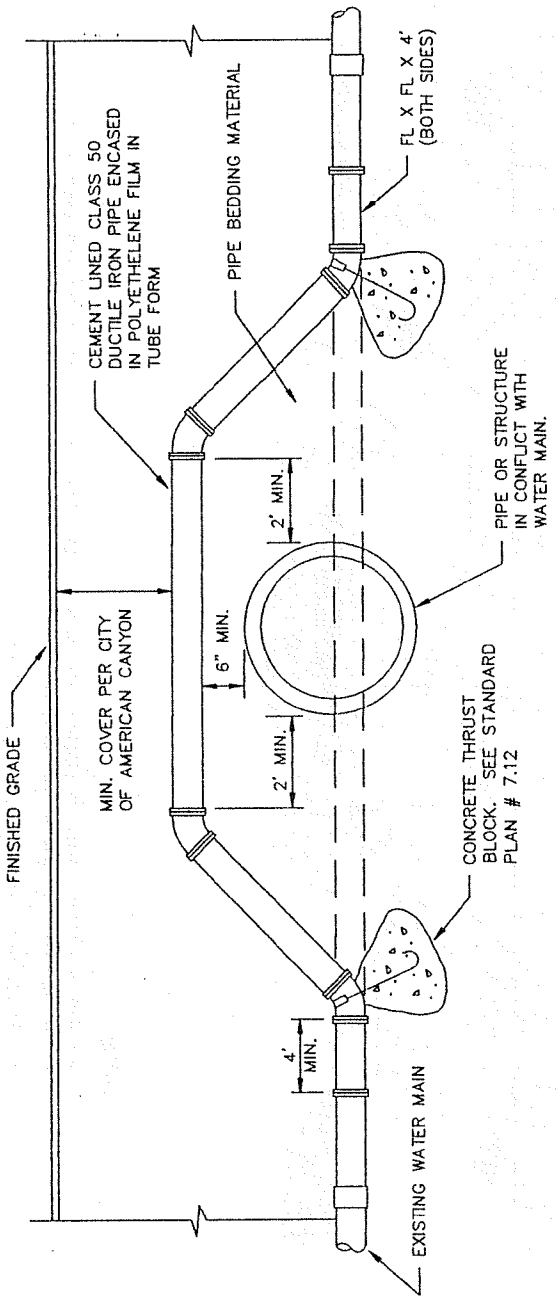
1. ALL PIPE & FITTINGS SHALL BE DUCTILE IRON & SHALL BE WRAPPED IN POLYETHELENE PER ENGINEERING STANDARD CONSTRUCTION SPECIFICATIONS.
2. ALL BENDS SHALL BE 45° OR 22-1/2° FITTINGS.
3. ONLY FLANGED JOINT FITTINGS TO BE USED.

MARK CLARKSON, P.E. DIRECTOR OF PUBLIC WORKS

DATE 3/1/95

SCALE NONE

STANDARD DWG. # 7.09



NOTES:

1. ALL PIPE & FITTINGS SHALL BE DUCTILE IRON & SHALL BE WRAPPED IN POLYETHELENE PER CITY OF AMERICAN CANYON STANDARD CONSTRUCTION SPECIFICATIONS.
2. ALL BENDS SHALL BE 45° OR 22-1/2° FITTINGS – NO 90° BENDS ALLOWED.
3. IF LESS THAN MINIMUM COVERAGE CONSULT WITH CITY ENGINEER.
4. ONLY FLANGED JOINT FITTINGS MAY BE USED.

CITY OF AMERICAN CANYON

DATE	REVISIONS

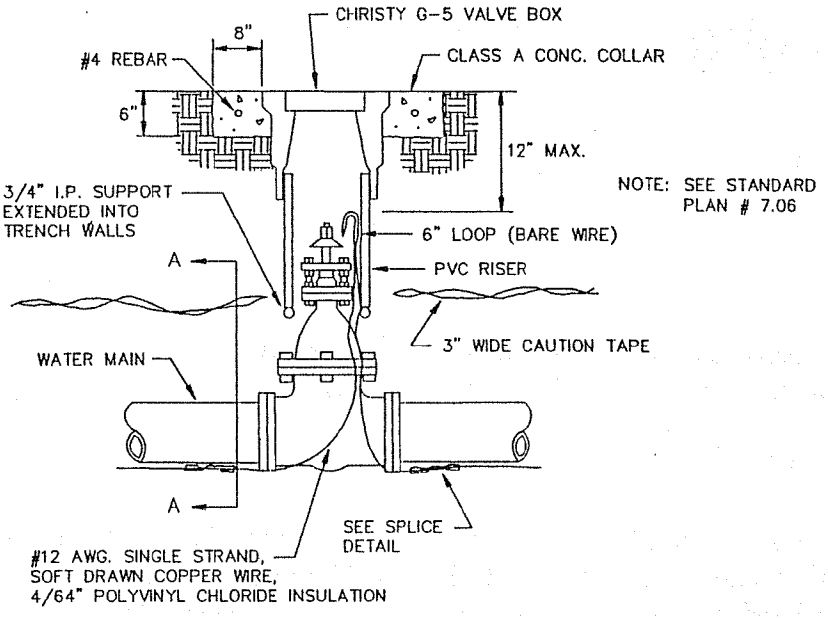
TYPICAL WATER MAIN INSTALLATION OVER STRUCTURE

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

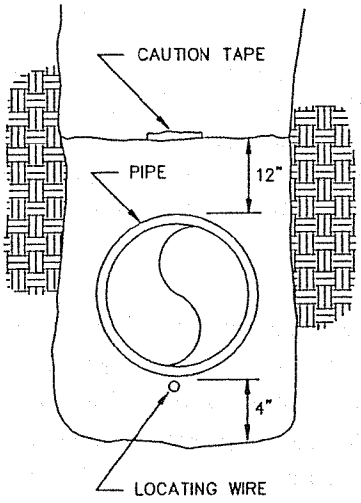
DATE 5/1/95

SCALE NONE

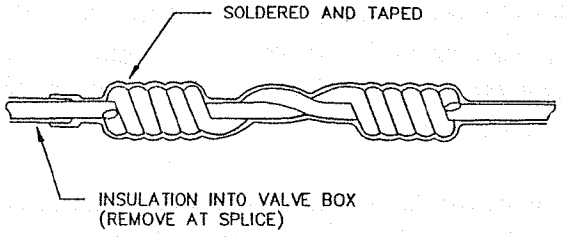
STANDARD DWG. # 7.10



VALVE DETAIL



SECTION A-A



SPLICE DETAIL

NOTES:

1. WIRE TO BE CONTINUOUS BETWEEN VALVE BOXES.
2. BARE WIRE NOT TO TOUCH VALVES OR FITTINGS.
3. LOCATING WIRE TO BE LAID AT BOTTOM OF TRENCH, CENTER OF PIPE.
4. LOCATOR TAPE SHALL BE BLUE PLASTIC TAPE, 3" WIDE MARKED "WATER LINE BURIED BELOW". LAY TAPE 12" ABOVE PIPE.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

LOCATING WIRE FOR WATER MAINS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/4/95

SCALE NONE

STANDARD DWG. # 7.11

CITY OF AMERICAN CANYON

Gateway to the Napa Valley

July 23, 1998

FIELD(1)

RE: Revision to City of American Canyon Public Works Department
Engineering Standard Plans and Specifications dated May 1995 (Engineering Standards)

Dear FIELD(2):

This letter is sent to notify you that the City of American Canyon Public Works Department (PWD) has recently made a change to Standard Drawing # 7.08 - Installation of Private Fire Protection Services. Due to ongoing maintenance problems with the Ames Double Detector Check Valve Assemblies, the PWD will no longer allow the installation of Ames backflow prevention devices. Standard Drawing #7.08 is revised as follows:

Notes

1. Backflow prevention devices shall be Febco 806 (Double Check Detector Assembly) with a 5/8" Sensus meter except where an onsite fire department connection is required by the Fire District or where the City Engineer determines that additional protection is required. In these cases the backflow prevention device shall be a Febco 826 (Reduced Pressure Detector Assembly) with a 5/8" Sensus meter. Sensus meters shall read in increments of 100 cu. feet.

Installation of the Ames backflow prevention device will be allowed only for plans approved prior to July 15, 1998. However, we request the hydraulic calculations for the fire service be reviewed and, if possible, the Ames device be replaced with the appropriate Febco. The PWD has been maintaining the Ames backflow prevention devices at no charge to the property owners. The PWD has been able to do this because Ames has been supplying replacement parts to the City at no charge. If in the future the City is charged for replacement parts, this charge will be passed on to the property owner.

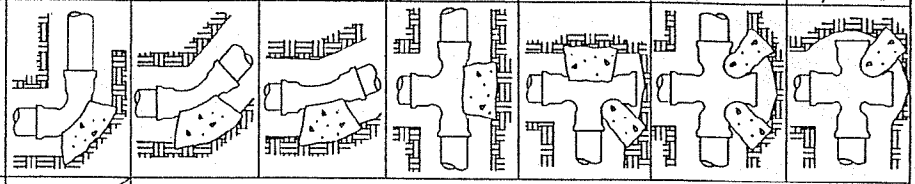
If you have any questions regarding this revision you may contact either myself or Cheryl A. Braulik, Associate Civil Engineer, at (707) 647-4550.

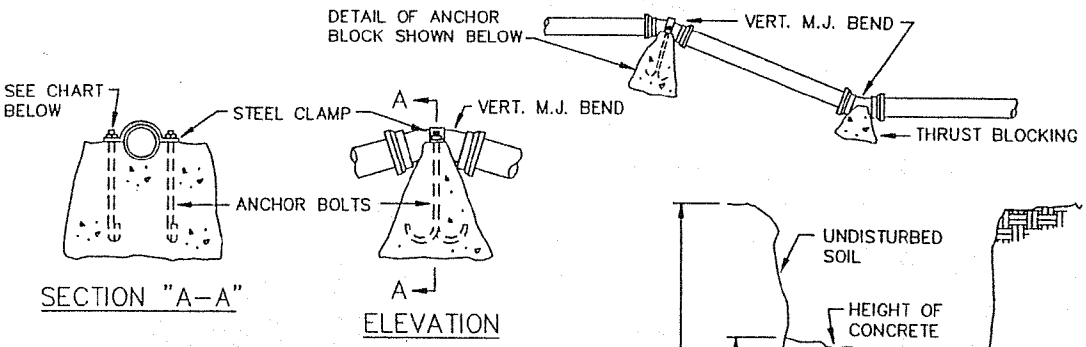
Sincerely yours,

John V. Wankum

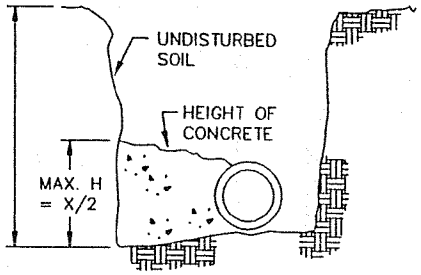
John V. Wankum
Public Works Director

2185 ELLIOTT DRIVE, AMERICAN CANYON, CA 94589-1331 • 707/647-4360 FAX 707/642-1249

	REQUIRED BEARING AREA – TOTAL SQUARE FEET						
TYPE OF FITTING	90° BEND	45° BEND	11 1/4° OR 22 1/2° BEND	TEE OR DEAD END	TEE W/PLUG	CROSS W/PLUG	CROSS W/PLUGS
TYPICAL INSTALLATION							
	4 ← BEARING AREA – TOTAL SQUARE FEET 1.5 ← ANCHOR BLOCK – MINIMUM VOLUME CUBIC YARDS						
SIZE OF FITTING 4"	3 / 0.5	2 / 0.5	1 / 0.3	2 / 0.5	3 / 0.5	4 / –	2 / –
6"	4 / 1.5	2 / 1.0	1 / 0.5	3 / 1.0	4 / 1.0	4 / –	4 / –
8"	7 / 2.5	4 / 2.0	2 / 1.0	5 / 1.5	7 / 1.5	7 / –	7 / –
10"	12 / 4.0	6 / 3.0	3 / 1.5	8 / 2.5	12 / 2.5	12 / –	12 / –
12"	16 / 5.5	10 / 4.0	5 / 2.0	12 / 3.5	16 / 3.5	16 / –	16 / –



PIPE SIZE	TIE RODS	STEEL CLAMPS
6"	5/8"	3" X 1/4"
8"	3/4"	3–1/4" X 1/4"
10"	1"	3–1/2" X 1/2"
12"	1–1/4"	4" X 1/2"



TYPICAL SECTION THRU THRUST BLOCK

NOTES:

1. THRUST BLOCKS AND ANCHOR BLOCKS TO BE CONSTRUCTED OF CLASS B CONCRETE.
2. AREAS GIVEN ARE FOR CLASS 150 PIPE AT TEST PRESSURE OF 150 PSI IN SOIL WITH PSF BEARING CAPACITY. INSTALLATIONS USING DIFFERENT PIPE, TEST PRESSURES AND/OR SOIL TYPES SHOULD ADJUST AREAS ACCORDINGLY, SUBJECT TO APPROVAL OF ENGINEER.
3. BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL. WHERE UNDISTURBED SOIL IS NOT AVAILABLE, SIZE THE THRUST BLOCK ACCORDING TO THE VOLUME OF CONCRETE REQUIRED FOR ANCHOR BLOCK.
4. JOINTS AND FACE OF PLUGS TO BE KEPT CLEAR OF CONCRETE.
5. USE MECHANICAL JOINT RETAINER GLANDS AT ALL ANCHOR BLOCK FITTINGS.
6. POLYWRAP FITTINGS IN ACCORDANCE WITH ENGINEERING STANDARD SPECIFICATIONS.

AMERICAN CITY OF INCORPORATED 1992 CANYON

CITY OF AMERICAN CANYON

THRUST BLOCK & ANCHOR BLOCK DETAILS

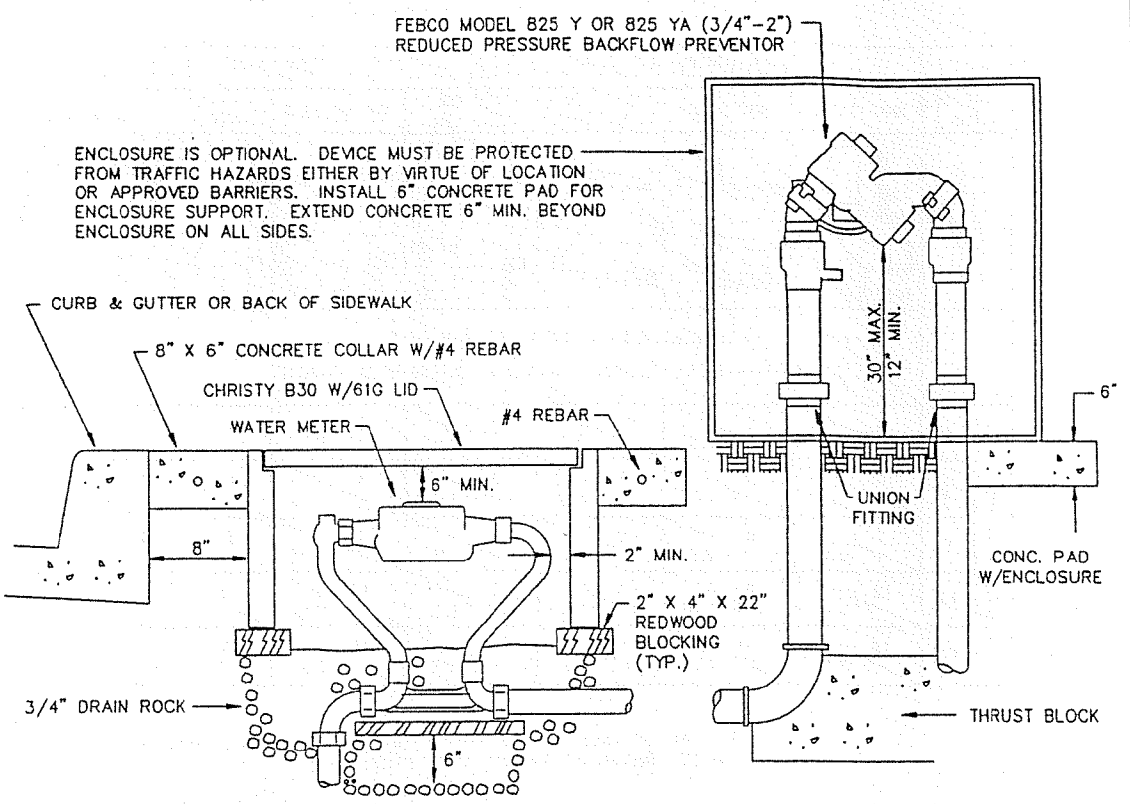
DATE 3/1/95

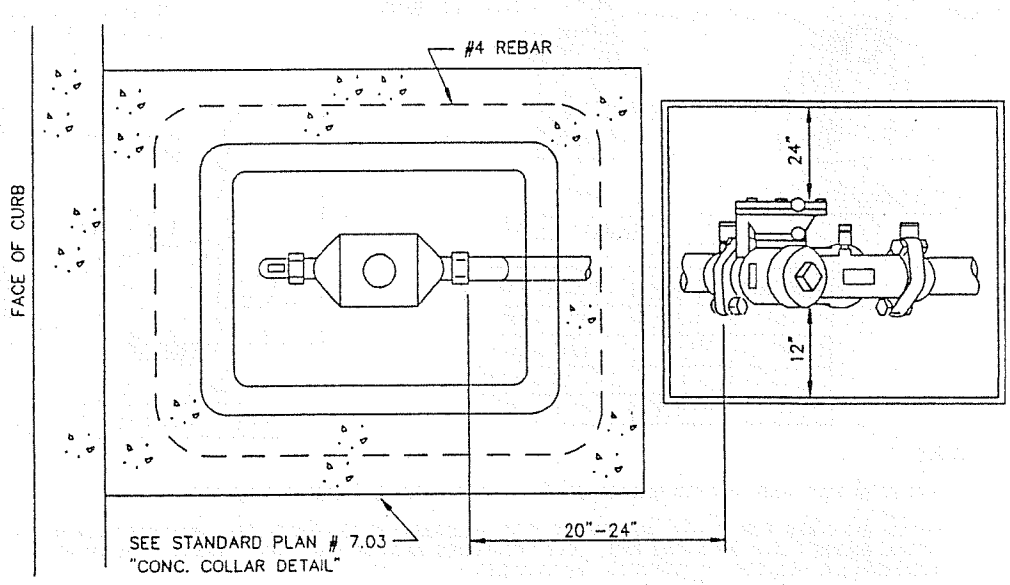
SCALE NONE

STANDARD DWG. # 7.12

DATE | REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS





NOTES:

1. ABOVE GROUND INSTALLATION IS MANDATORY FOR ALL COMMERCIAL & INDUSTRIAL SYSTEMS.
2. LOCATE REDUCED PRESSURE BACKFLOW PREVENTOR AS CLOSE AS PRACTICABLE TO METER.
3. ALL ABOVE GROUND PIPING TO BE BRASS.
4. NO CONNECTIONS SHALL BE MADE BETWEEN METER AND BACKFLOW PREVENTOR.

AMERICAN CANYON — CITY OF — INCORPORATED 1992

CITY OF AMERICAN CANYON

INSTALLATION OF REDUCED PRESSURE BACKFLOW PREVENTOR (3/4"-2")

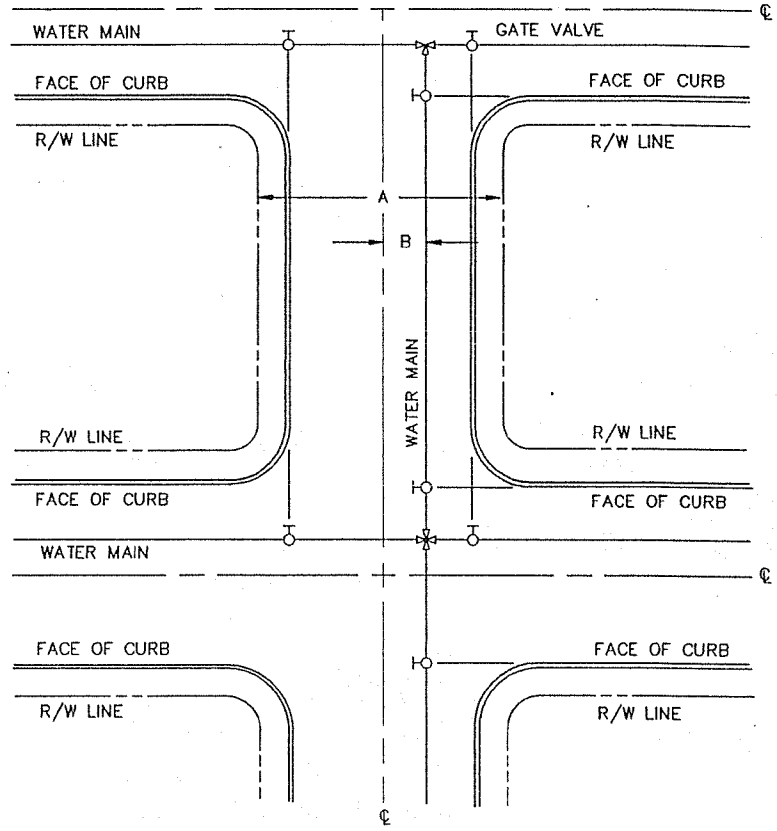
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 7.13

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS



DIMENSIONS IN FEET	
A	B
R/W WIDTH	℄ OFFSET
≤ 40	5
40 – 80	10
> 80	20

NOTES:

1. WATER MAINS SHALL BE LOCATED PARALLEL TO STREET CENTERLINES AT THE OFFSET SHOWN ABOVE
2. MAINLINE VALVES, EXCEPT HYDRANT VALVES & TAPPING VALVES, SHALL BE ON FACE OF CURB EXTENDED WHERE FEASIBLE.
3. A MINIMUM OF THREE (3) MAINLINE VALVES ARE REQUIRED FOR "T" INTERSECTIONS AND FOUR (4) VALVES ARE REQUIRED FOR CROSS INTERSECTIONS.
4. MAINLINE VALVES SHALL BE REQUIRED TO ISOLATE FIRE HYDRANTS, BOTH PUBLIC & PRIVATE, INTO SEPARATELY VALVED MAINLINE SECTIONS.

AMERICAN CANYON — CITY OF — INCORPORATED 1992

CITY OF AMERICAN CANYON

TYPICAL LOCATION OF WATER MAINS AND MAIN LINE VALVES

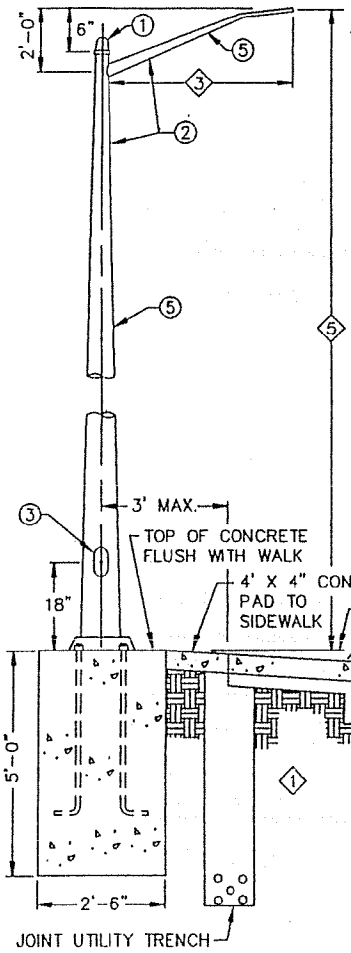
DATE	REVISIONS

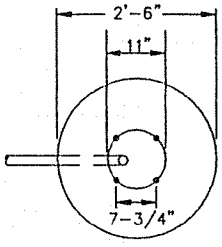
MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

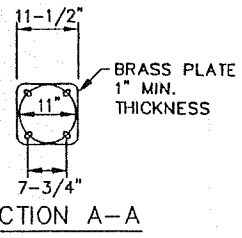
DATE 5/1/95

SCALE NONE

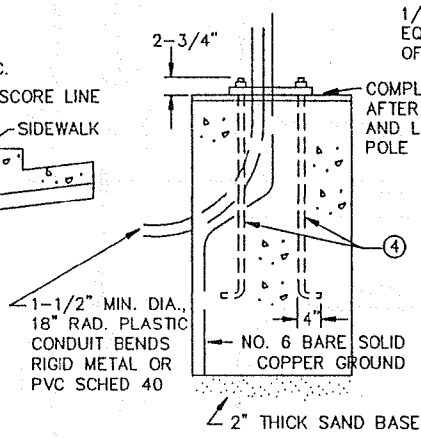
STANDARD DWG. # 7.14



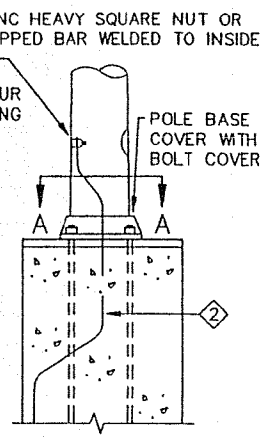




SECTION A–A



CAST–IN–DRILLED–HOLES FOUNDATION DETAILS



BASE DETAILS

SPECIFICATIONS

① CAP: STEEL WITH SET SCREWS

② POLE AND ARM: 11 GAUGE STEEL WITH A YIELD STRENGTH OF 33,000 PSI MINIMUM. THE POLE AND ARM SHALL BE CYLINDRICAL WITH A TAPER OF ABOUT 0.14 INCH PER FOOT. ARM O.D. AT SMALL END TO BE 2.37 INCHES. "OVALIZE" LARGE END TO ABOUT 2.5 INCHES IN THE HORIZONTAL DIMENSION.

③ HANDHOLE: 4" X 6-1/2" WITH A WELDED REINFORCING FRAME. FURNISH A COVER AND MOUNTING HARDWARE.

④ ANCHOR BOLTS: 4 EACH 1" X 36" X 4" WITH 6 INCH MINIMUM THREAD LENGTH. FURNISH 2 HEX NUTS AND 2 ROUND WASHERS WITH EACH BOLT.

⑤ FINISH: GALVANIZE ALL PARTS AFTER ALL CUTTING AND WELDING. POLE AND ARM PER ASTM 123. REMOVABLE PARTS PER ASTM 153.

GENERAL NOTES

◇1 WHEN SETTING POLES IN WIDE SIDEWALKS (GREATER THAN 6' WIDE), SET C OF POLE 2'–0" FROM FACE OF CURB.

◇2 WHEN SETTING POLES PROVIDE A DRAINAGE HOLE UNDER THE STEEL PLATE TO THE CENTER OF THE POLE. FORM HOLE BEFORE CONCRETE SETS USING A PIECE OF WELDING ROD OR EQUIVALENT.

◇3 8–FOOT MAST ARMS FOR RESIDENTIAL STREETS, 10–FOOT MAST ARMS FOR MAJOR COMMERCIAL STREETS.

◇4 INSTALL A NO. 3–1/2 PULLBOX PER CAL–TRANS STANDARD EVERY 200 FEET AND AT EVERY POLE LOCATION.

◇5 MOUNTING HEIGHT FOR RESIDENTIAL OR CUL–DE–SAC SHALL BE 28' ALL OTHERS SHALL BE 32.5'.

AMERICAN CITY OF INCORPORATED 1992 CANYON

CITY OF AMERICAN CANYON

STANDARD STREET LIGHT POLE

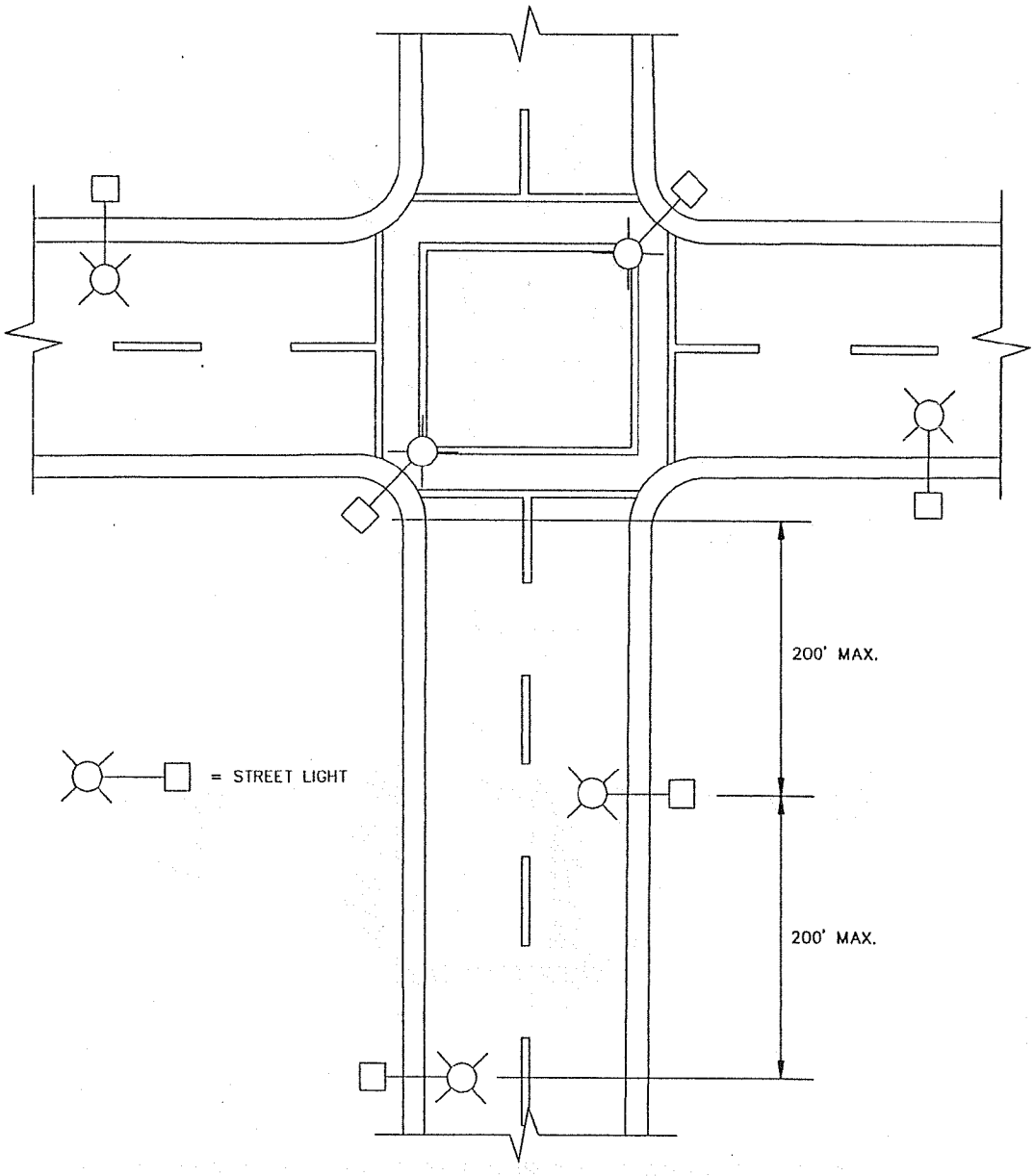
DATE 5/4/95

SCALE NONE

STANDARD DWG. # 8.01

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS



NOTES:

1. OFFSET STREET LIGHTS ALTERNATING FROM SIDE TO SIDE.
2. TYPE II COLLECTOR & MINOR STREETS USE 70 WATT.
3. TYPE I COLLECTOR USES 100 WATT.
4. ARTERIAL USES 200 WATT.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

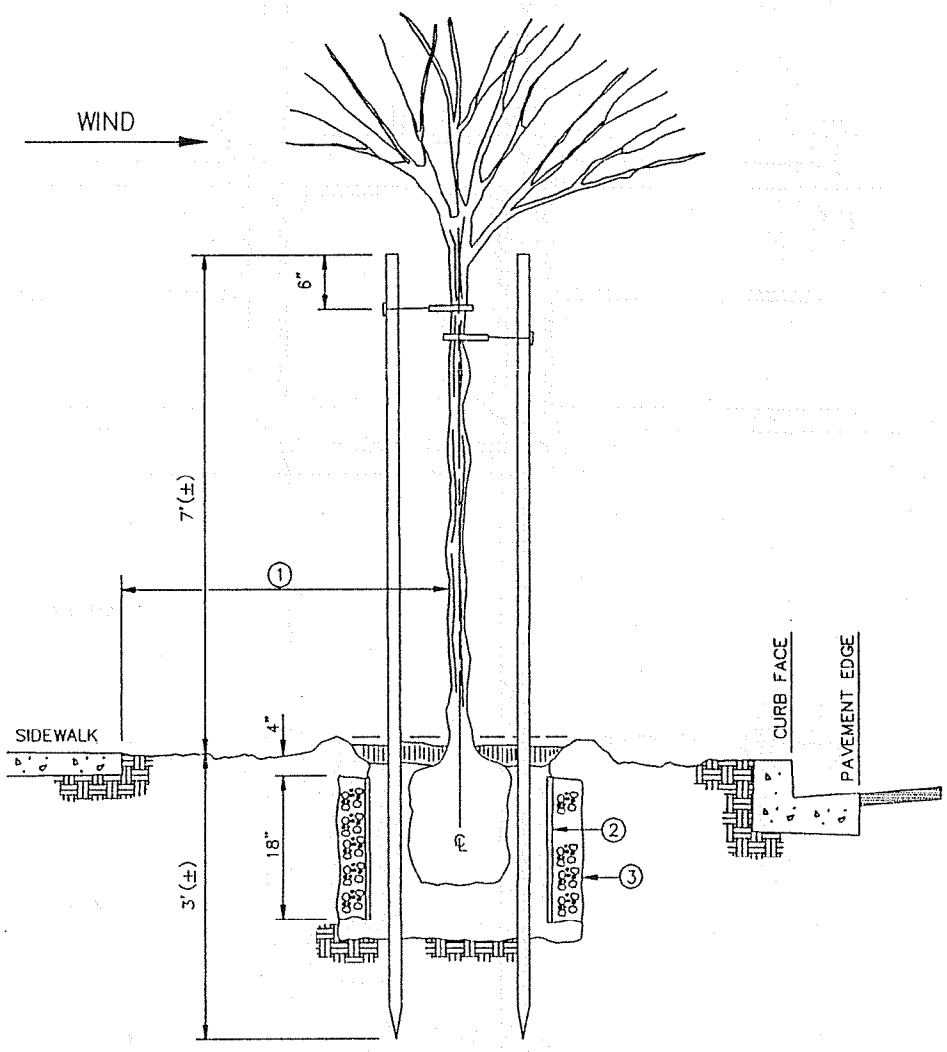
TYPICAL STREET LIGHT
LUMINAR LAYOUT

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95

SCALE NONE

STANDARD DWG. # 8.02



NOTES:

1. TREES SHALL BE LOCATED SO THEY ARE 2'-0" (MIN.) CLEAR OF ALL PEDESTRIAN PATHWAYS AND RIGID PAVEMENT OR GROUND COVER (I.E., CONC. SIDEWALKS, BRICK PAVERS SET IN MORTAR ETC.)

2. PLASTIC OR FIBERGLASS ROOT CONTROL BARRIER MUST BE INSTALLED IF TREE IS TO BE PLANTED WITHIN 5' OF CURB, SIDEWALK OR OTHER RIGID PAVEMENT. ROOT CONTROL BARRIER SHALL BE "DEEP ROOT" MODEL 22-49-18, "CENTURY ROOT CONTROLLER" MODEL RC 24 X 70 OR ANY SIMILAR COMMERCIALLY AVAILABLE PRODUCT SPECIFICALLY INTENDED FOR TREE ROOT CONTROL BY THE MANUFACTURER.

3. 3/4" - 1" RIVER ROCK MUST BE PLACED ALONG OUTSIDE OF ROOT BARRIER

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DATE	REVISIONS

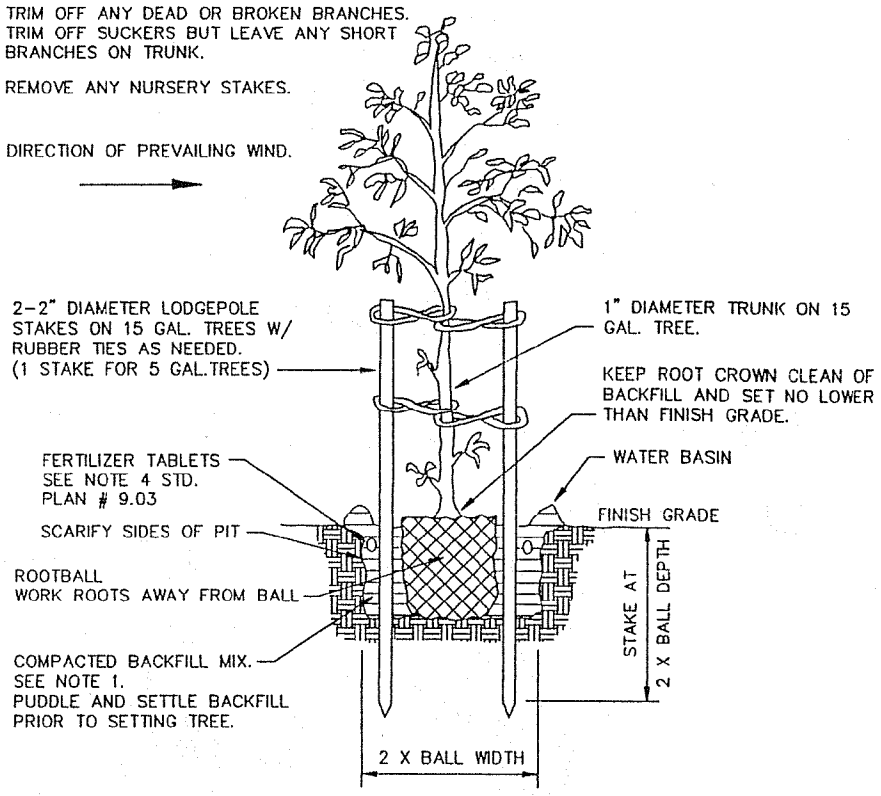
TREE ROOT CONTROL

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

DATE 5/1/95

SCALE NONE

STANDARD DWG. # 9.01



SPECIAL STREET TREE REQUIREMENTS:

1. 15 GALLON CONTAINER STOCK
2. 7 FOOT MINIMUM HEIGHT
3. PLANT 5 FEET FROM BACK OF SIDEWALK OR 9 FEET FROM BACK OF CURB WHERE THERE IS NO SIDEWALK.
4. PLANT WITHIN INDIVIDUAL LOT 5 FEET FROM PROPERTY LINE WHERE POSSIBLE.
5. SPECIMEN TO BE SELECTED FROM APPROVED CITY LIST ONLY.
6. SOME SPECIMENS MAY REQUIRE ROOT BARRIER AND VERTICAL DRAIN.
7. LOCATION AND PLANTING ARE SUBJECT TO CITY ENGINEER INSPECTION.

NOTES:

1. BACKFILL MATERIAL: MIX EXISTING SOIL WITH 1/3 NITRATED REDWOOD SOIL CONDITIONER.
2. DO NOT PLANT WITHIN 6' OF ANY UNDERGROUND UTILITY.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

PLANTING DETAILS

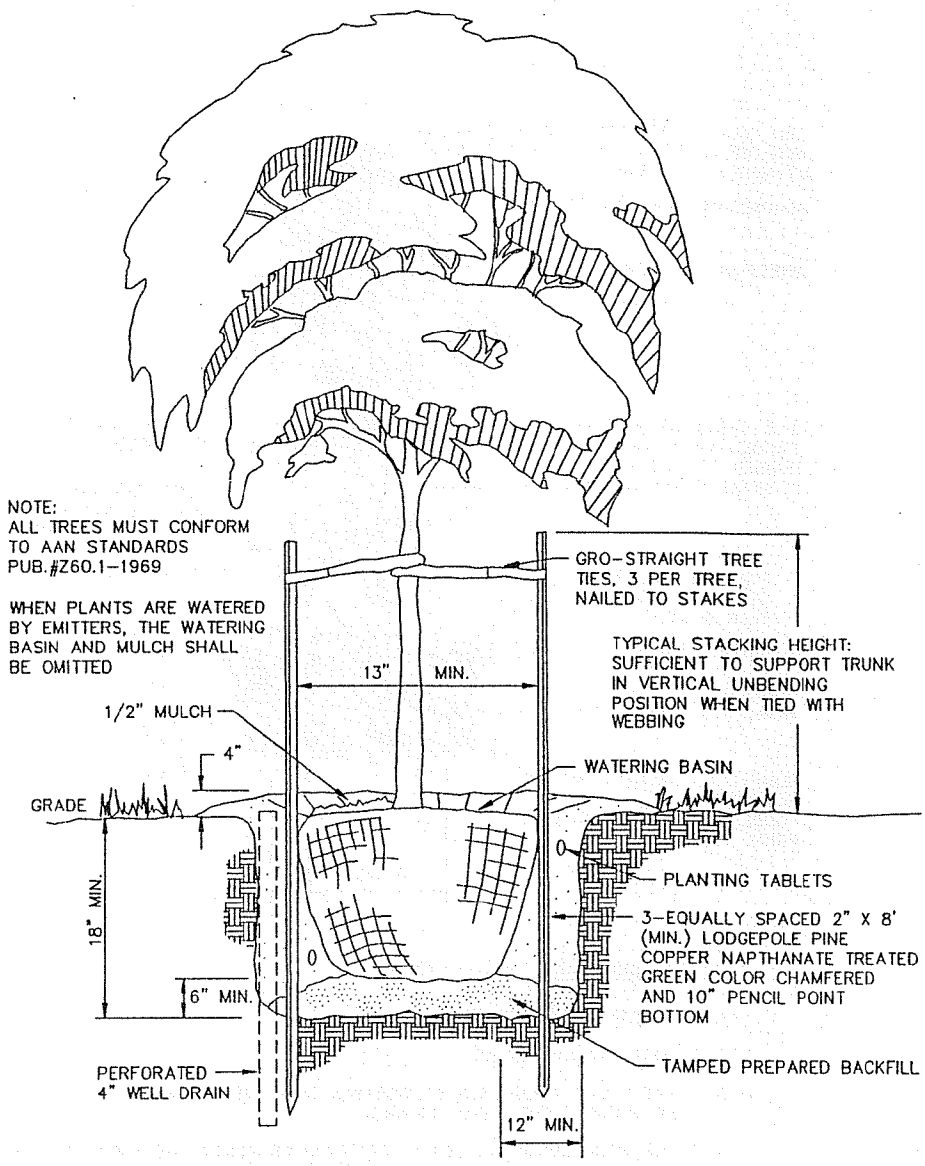
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 9.02

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS



SPECIMEN-TREES-24 BOX & LARGER

NOTES:

1. STAKE DEPTH: FROM BOTTOM OF PLANTING HOLE TO TIP OF STAKE,
2. IN GROUND COVER AREAS, PROVIDE 4" HIGH WATERING BERM AROUND TREES.
3. HOLE SIZE: TWICE AS WIDE AS THE ROOT BALL. SCARIFY SIDES IF AUGER IS USED.
4. FERTILIZER PLANTING TABLETS SHALL BE TIGHTLY COMPRESSED FERTILIZER CHIPS FORMING A TABLET THAT IS INSOLUBLE IN WATER, AND IS DESIGNED TO RELEASE NUTRIENTS FOR AT LEAST 24 MONTHS. TABLETS SHALL CONTAIN THE FOLLOWING MIN. PERCENTAGES, BY WEIGHT, OF FOLLOWING NUTRIENTS: 20% NITROGEN, 10% PHOSPHOROUS, 5% POTASSIUM. PLANTING TABLETS SHALL WEIGH AT LEAST 21 GRAMS EACH. PLACE NEAR ROOT BALL. 6 FOR 24" BOX TREES, 5 FOR 15 GAL. CAN TREES, 4 FOR 5 GAL. CAN TREES.
5. BACKFILL MATERIAL: MIX EXISTING SOIL WITH 1/3 NITRIFIED REDWOOD SOIL CONDITIONER.

AMERICAN CITY OF CANYON INCORPORATED 1992

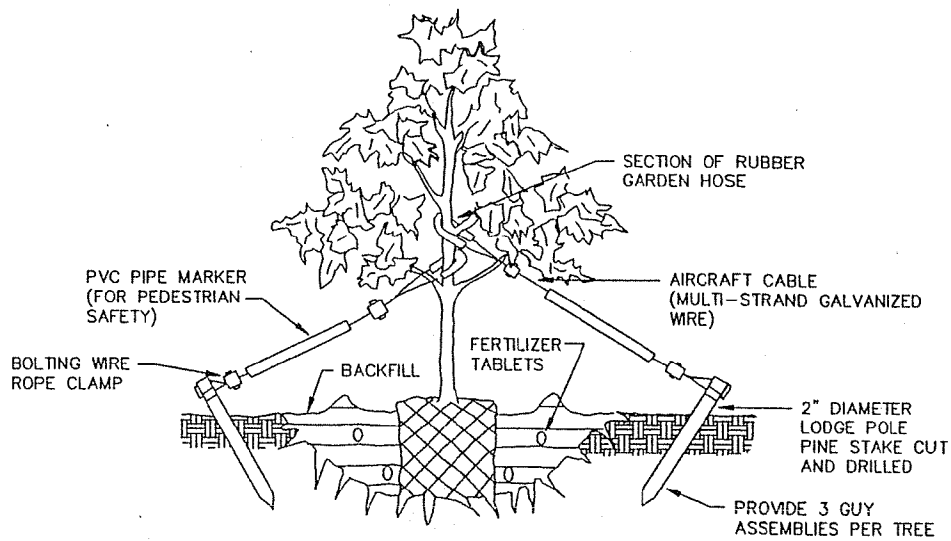
CITY OF AMERICAN CANYON

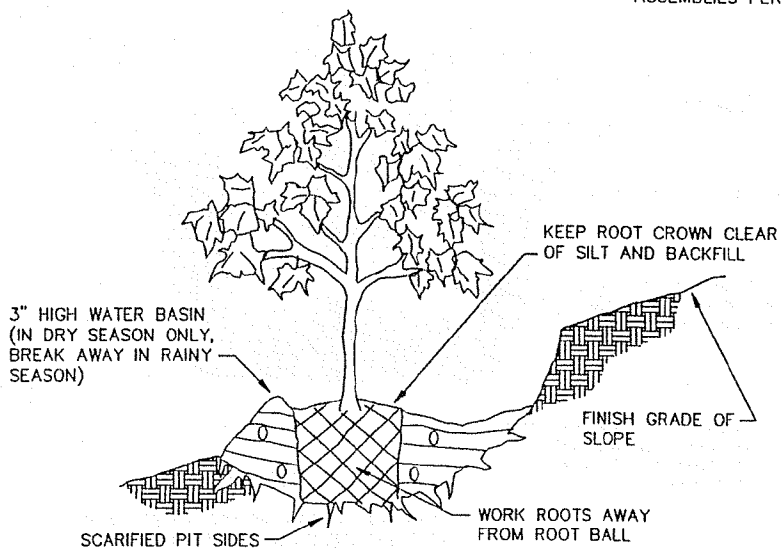
PLANTING & GUYING DETAIL
SPECIMEN TREES

DATE 5/1/95
SCALE NONE
STANDARD DWG. # 9.03

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS





NOTES:

1. DIG A DISH SHAPED PIT FOUR TIMES AS WIDE AS THE ROOT BALL AND ONLY AS DEEP AS THE ROOT BALL. SCARIFY THE SIDES OF THE PIT.
2. BACKFILL TO BE 100% SELECT NATIVE TOPSOIL.
3. ADD 21 GRAM AGRIFORM (OR APPROVED EQUAL) TABLETS AT THE FOLLOWING RATES: 4 PER 15 GAL.; 3 PER 5 GAL.; 2 PER 1 GAL..
4. ADD GRANULATED FERTILIZER WITH AN APPROXIMATE BALANCE OF 3:2:1 AND THE LOWEST AVAILABLE ADJUSTED SALT INDEX AT THE FOLLOWING RATES TO THE BACKFILL: 2-1/2 CUPS PER 15 GAL.; 1-1/2 CUPS PER 5 GAL.; 1/2 CUP PER 1 GAL..
5. FOR NON-IRRIGATED PLANTINGS ADD SYNTHETIC BASED WATER ABSORBENT POLYMER GELS TO THE BACKFILL AT THE MANUFACTURER'S RECOMMENDED RATE.
6. PUDDLE AND SETTLE BACKFILL PRIOR TO SETTING PLANT. DO NOT SET PLANT TOO LOW. WATER WELL AFTER PLANTING.
7. NON-IRRIGATED PLANTINGS WILL REQUIRE TWO FULL RAINY SEASONS AS A MAINTENENCE (WARRANTY) PERIOD.
8. MAINTAIN A WEED FREE UNDERSTORY ZONE A MINIMUM DIAMETER OF THE GUY ASSEMBLY STAKES (FOR TREES) OR THE EDGE OF THE PLANTING PIT (FOR SHRUBS).
9. GUY ASSEMBLIES ARE NOT REQUIRED FOR 1 GALLON TREES. DEADMEN MAY BE SUBSTITUTED FOR STAKES ONLY WHEN DURABLE MATERIALS ARE EMPLOYED.

AMERICAN CITY OF CANYON INCORPORATED 1992

CITY OF AMERICAN CANYON

DETAILS FOR NON-IRRIGATED HILLSIDE AND NATIVE PLANTINGS

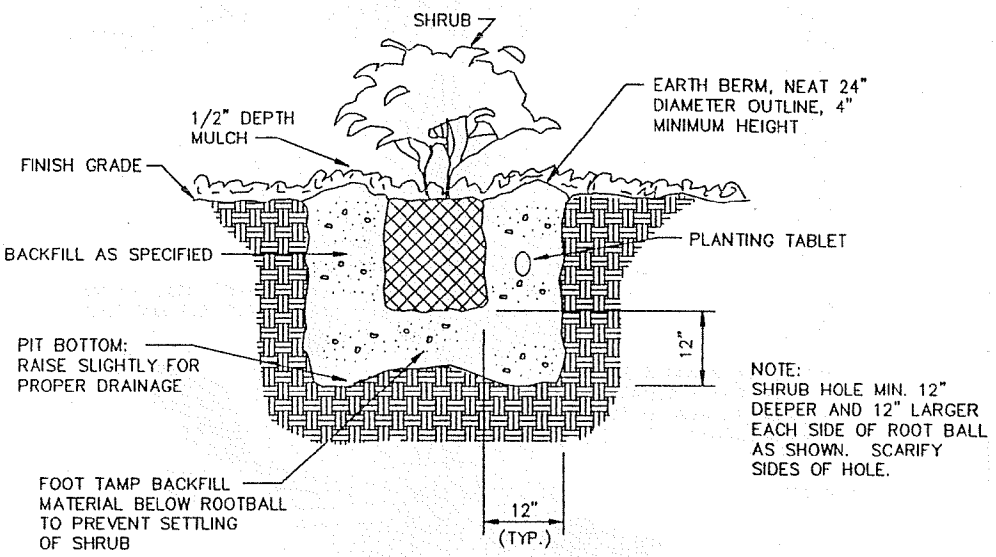
DATE 5/1/95

SCALE NONE

STANDARD DWG. # 9.04

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS



DUST WITH GROW-SAF (ACTIVATED CARBON) AT THE RATE OF 50 LBS./1000 SQ. FT. OR APPROVED EQUAL.

PROVIDE CITY WITH PLANTING MIXTURE SPECIFICATIONS

AMERICAN CANYON CITY OF INCORPORATED 1992

CITY OF AMERICAN CANYON

SHRUB PLANTING DETAILS

DATE 5/1/95

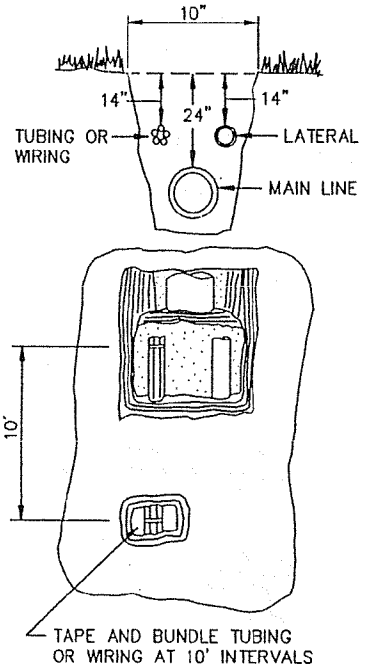
SCALE NONE

STANDARD DWG. # 9.05

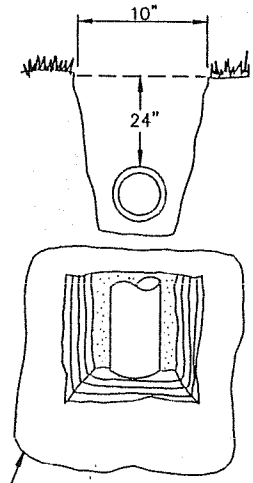
DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS

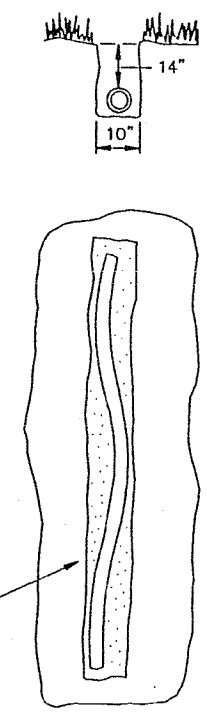
MAIN SUPPLY, LATERAL AND TUBING OR WIRING



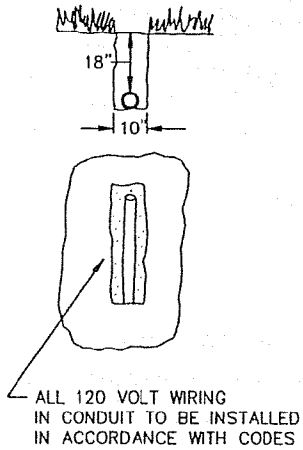
MAIN SUPPLY



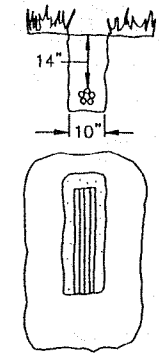
PLASTIC LATERAL



120 VOLT IN CONDUIT



TUBING OR WIRING



NOTE:
ELECTRICAL DETAILS ARE FOR AUTOMATIC SYSTEMS ONLY. DISREGARD ON MANUAL SYSTEMS.

CITY OF AMERICAN CANYON

TYPICAL TRENCHING DETAIL

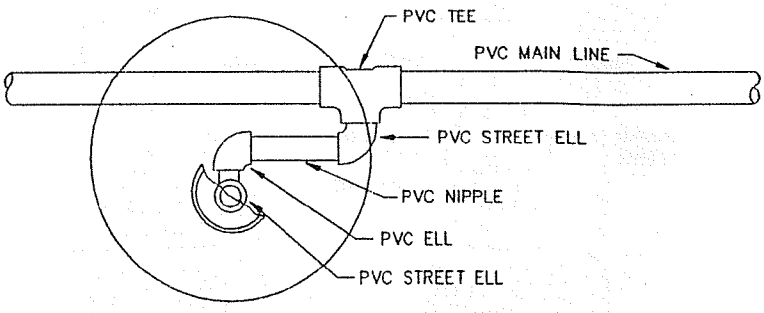
DATE 5/1/95

SCALE NONE

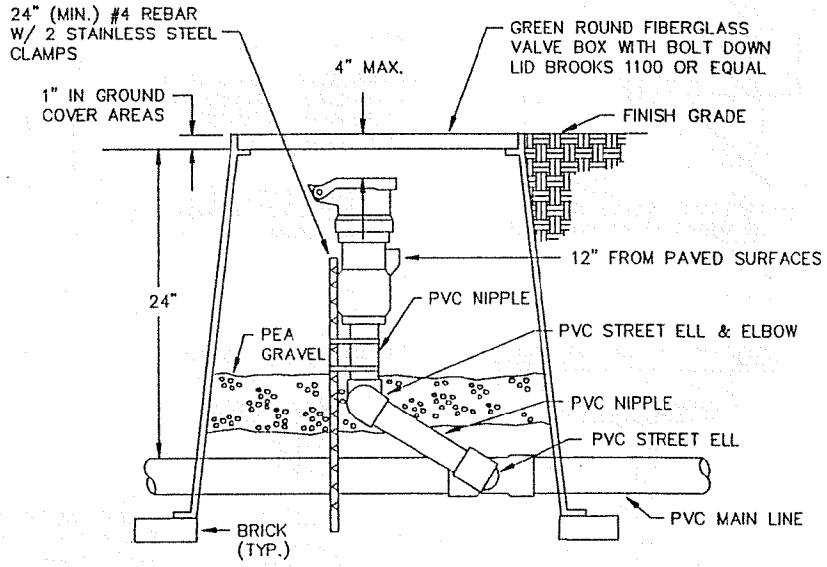
STANDARD DWG. # 10.01

DATE	REVISIONS

MARK CLARKSON, P.E., DIRECTOR OF PUBLIC WORKS



PLAN



ELEVATION

NOTES:

1. TEFLON TAPE REQUIRED ON ALL THREADED FITTINGS.
2. QUICK COUPLER TO BE RAINBIRD 44 NP OR APPROVED EQUAL.
3. ALL FITTINGS AND NIPPLES TO BE SCHEDULE 80.

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DATE	REVISIONS

QUICK COUPLER
MAIN LINE

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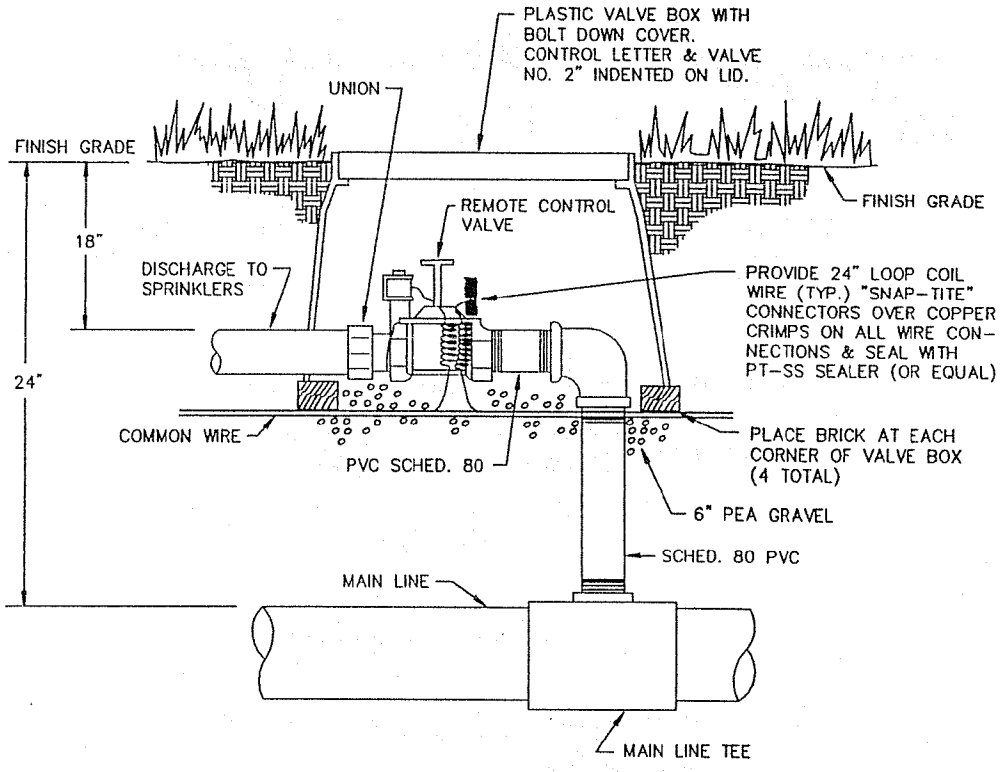
DATE 3/1/95
SCALE NONE
STANDARD DWG. # 10.02



NOTES:

1. INSTALL WIRE PER CODE.
2. TAPE AND BUNDLE WIRE EVERY 10'.
3. PROVIDE EXPANSION COILS AT EACH WIRE CONNECTION IN BOX.
4. COMPACT SOIL ADJACENT TO BOX.

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REMOTE CONTROL VALVE ASSEMBLY DETAIL

DATE 3/1/95

SCALE NONE

STANDARD DWG. # 10.03

DATE	REVISIONS

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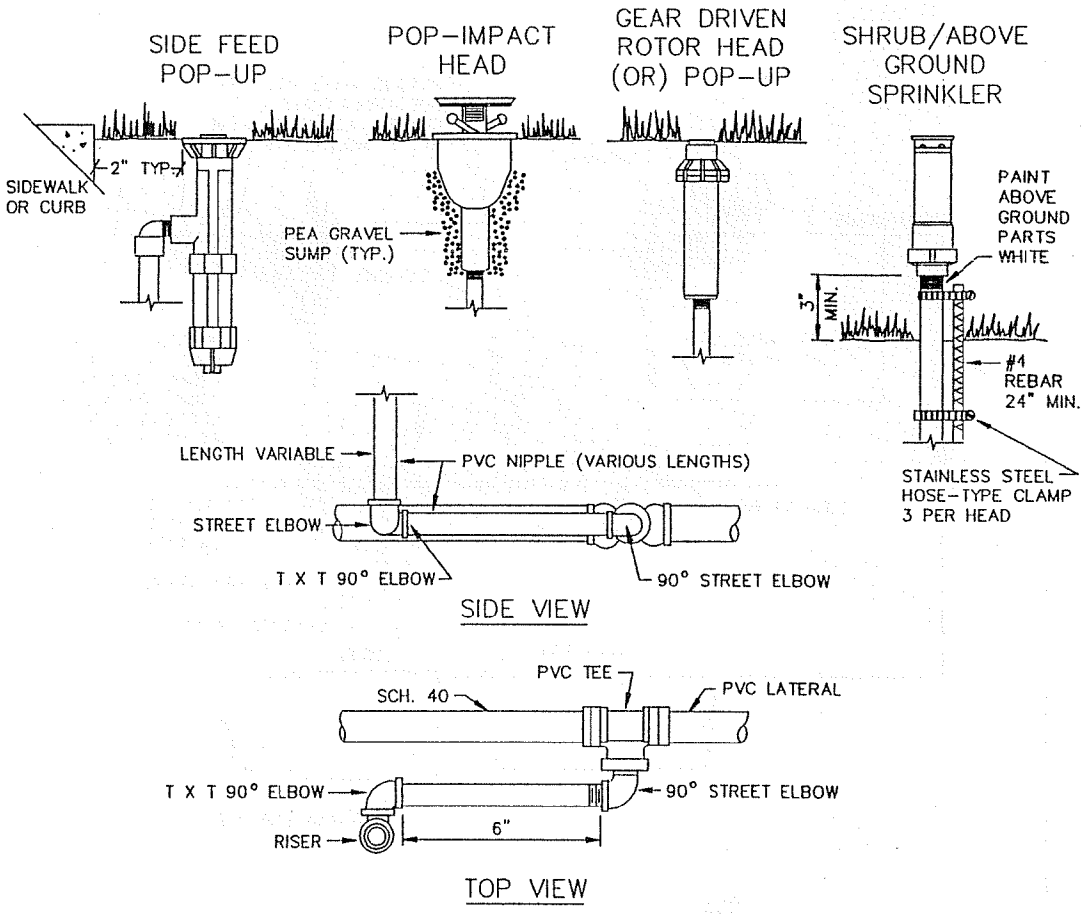

NOTES:

1. COMPACT SOIL TO 90% RELATIVE COMPACTION
2. ALL COMPONENTS FOR THE SWING JOINT SHALL BE PVC SCHEDULE 80 OR MARLEX 90° (STREET) ELBOWS ON LATERAL SWING ASSEMBLIES
3. NO ABOVE GROUND SPRINKLER HEADS SHALL BE PLACED AT CURBSIDE OR OTHER AREAS OF PREDICTABLE PEDESTRIAN OR VEHICLE TRAFFIC

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SWING JOINT & SPRINKLER HEAD DETAILS

DATE 5/1/95

SCALE NONE

STANDARD DWG. # 10.04

DATE	REVISIONS

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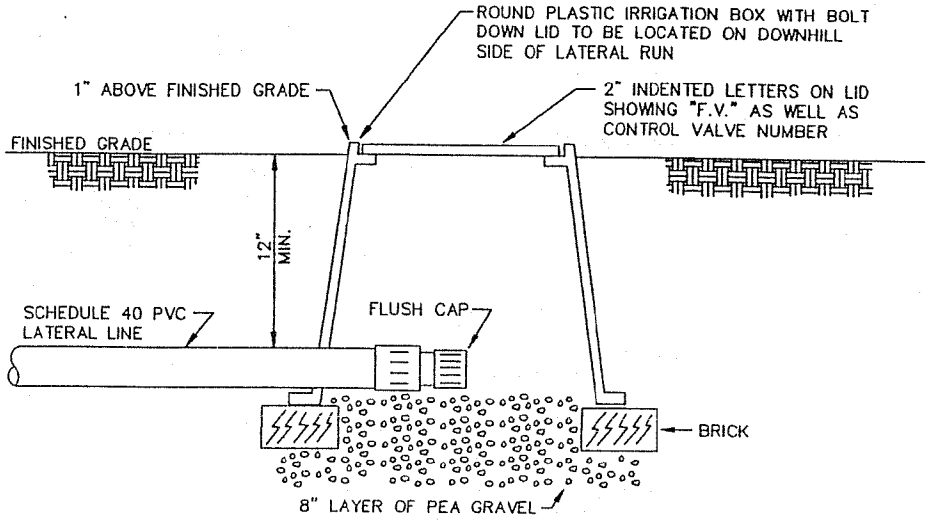
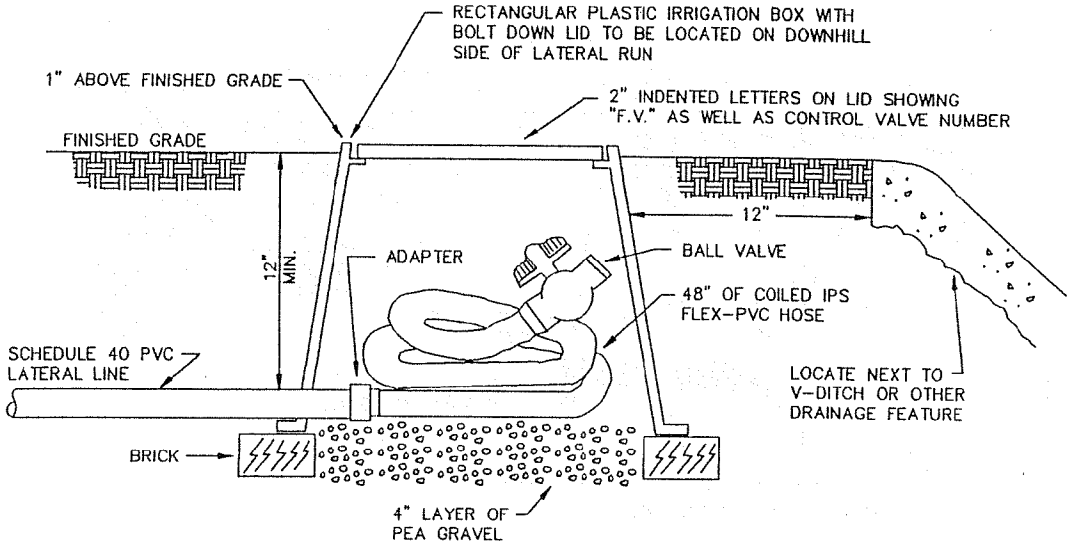


ASSEMBLY TO SERVICE LATERAL
RUNS UNDER 60 FEET



ASSEMBLY TO SERVICE LATERAL
RUNS 60 FEET OR OVER

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DATE	REVISIONS

FLUSH VALVE DETAIL FOR DRIP EMITTER SYSTEMS

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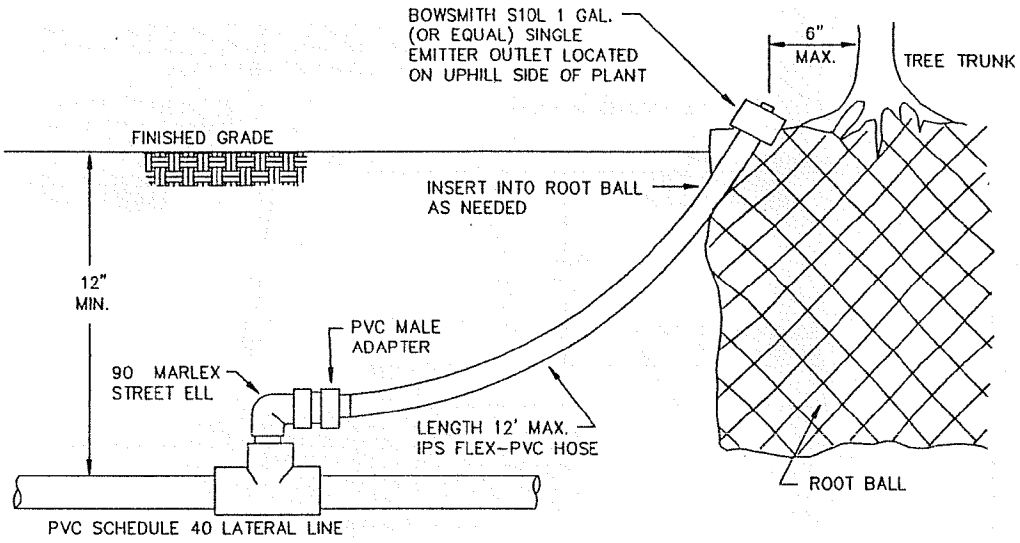
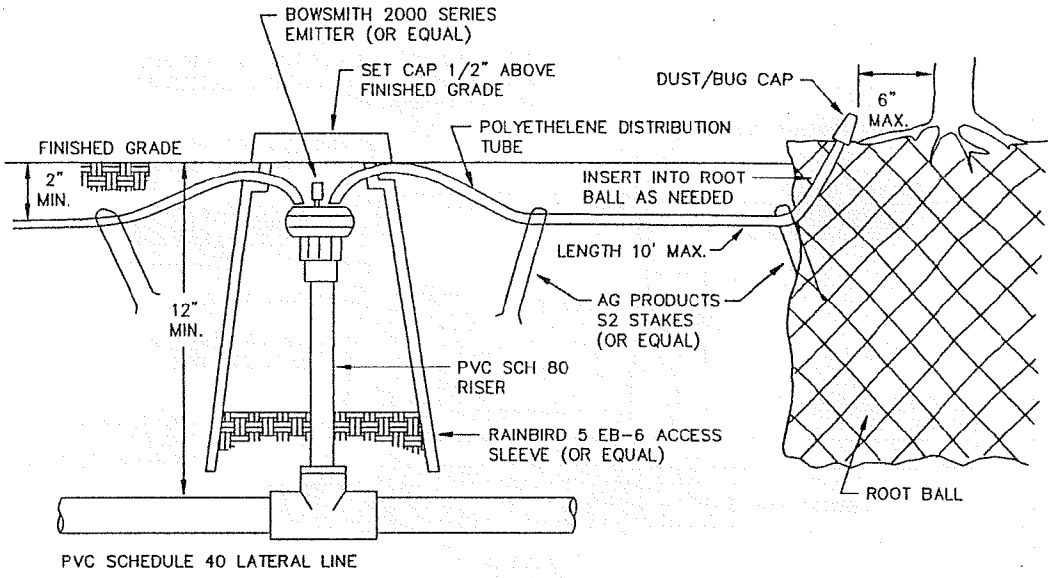
DATE 5/1/95
SCALE NONE
STANDARD DWG. # 10.05



SINGLE EMITTER OUTLET



MULTIPLE EMITTER OUTLET

NOTES:

1. PULL ADDITIONAL EMITTER OUTLETS INTO THE ROOT ZONE TO SATISFY THE SPECIMEN'S WATER CONSUMPTION DEMAND AS ADJUSTED BY THE LOCAL E.T. RATE.
2. OUTLETS ARE TO BE PLACED IN TOP OF TREE WELLS WHERE WELLS ARE REQUIRED.

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DRIP EMITTER ASSEMBLY

DATE 5/1/95

SCALE NONE

STANDARD DWG. # 10.06

DATE	REVISIONS

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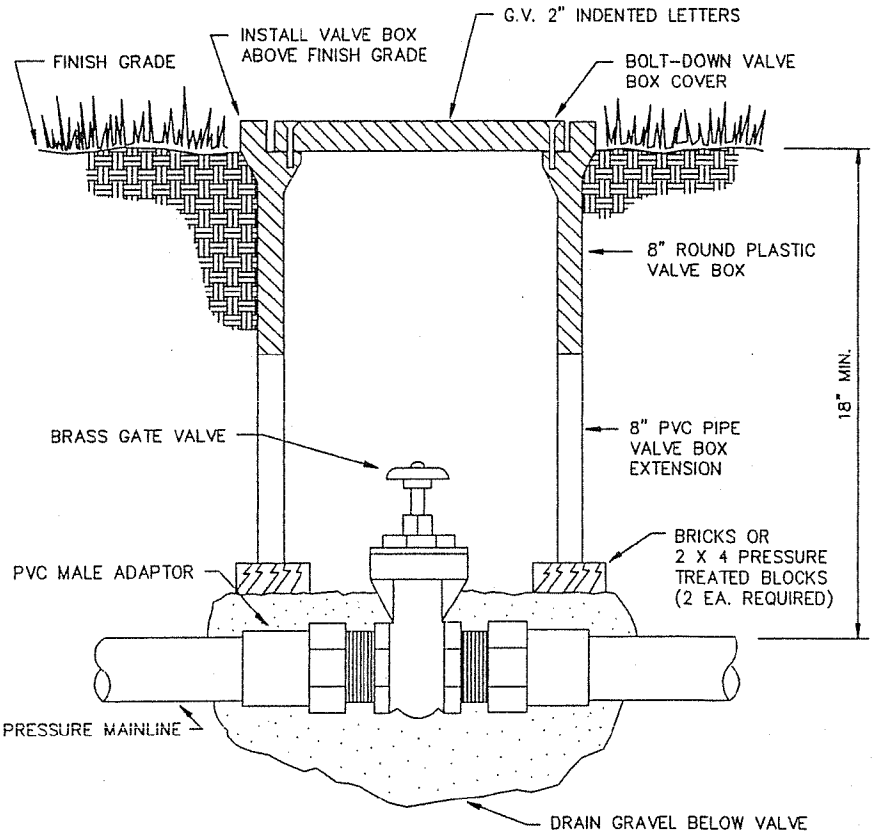

NOTES:

1. VALVE BOX SHALL BE CONSTRUCTED OF GREEN PLASTIC OR FIBERGLASS MATERIAL WITH A BOLT DOWN COVER.
2. VALVE BOX AND PIPE SHALL BE INSTALLED, CENTERED & PLUMB ABOVE VALVE.

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DATE	REVISIONS

ISOLATION VALVE INSTALLATION DETAIL

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DATE 5/1/95

SCALE NONE

STANDARD DWG. # 10.07