

**COUNTY OF VENTURA  
PUBLIC WORKS AGENCY**

**STANDARD LAND DEVELOPMENT SPECIFICATIONS**



**APPROVED BY THE BOARD OF SUPERVISORS  
2<sup>ND</sup> EDITION  
(Dates As Shown on the Revision Sheets)**



**VENTURA COUNTY STANDARD LAND DEVELOPMENT SPECIFICATIONS - 2<sup>ND</sup> EDITION  
REVISION RECORD  
LATEST DATE INDICATES CURRENTLY ACTIVE REVISION OF PAGE**

PAGE NO.	Dates of Board Approval of Revised Pages							
	REV 0	REV 1	REV 2	REV 3	REV 4	REV 5	REV 6	REV 7
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28	09/09/03	07/22/08						
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30	09/09/03	10/11/11						
31	02/08/11	10/11/11						
32	02/08/11	10/11/11						
33	02/08/11	10/11/11						
34	02/08/11	10/11/11						
35	09/09/03	10/11/11						
36	09/09/03	10/11/11						
37	09/09/03	09/28/04	10/11/11					
38	09/09/03	09/28/04	10/11/11					
39	09/09/03	09/28/04	10/11/11					
40	09/09/03	09/28/04	10/11/11					
41	09/09/03							
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**NOTE:** Pages 31+ before the 02/08/11 revision were renumbered to 35+ but revision dates not changed if there were no revisions.

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PAGE NO.	Dates of Board Approval of Revised Pages							
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**COUNTY OF VENTURA**  
**GUIDE TO ENGINEERS, DEVELOPERS AND CONTRACTORS**

The following publications have been adopted by the County for regulating the design and construction of public improvements constructed by developers; work performed under County or Flood Control District permits; land grading; water systems; and sanitary sewer systems:

1. Ventura County Road Standards (**RdStd**)
2. Ventura County Water Works Manual and Sewerage Manual (**VCWWM & VCSM**).
3. Standard Land Development Specifications (**SLDS**) which adopt, supplement and modify SSPWC.
4. Ventura County Water Works Districts Nos. 1, 16, 17, and 19; Ventura County Service Areas 29 and 30; and Lake Sherwood Community Services District Rules and Regulations (**R&R**).

The following documents are referenced by the above documents:

5. Standard Specifications for Public Works Construction (**SSPWC**).
6. Standard Plans for Public Works Construction (**SPPWC**).
7. State Standard Plans from CALTRANS (**SSP**).
8. CALTRANS Highway Design Manual (**HDM**).

The documents are provided to assure uniform procedures for Land Development projects:

9. Land Development Manual.
10. Standard cover sheets for grading.

The following documents are prepared by the Developer's Engineer for each individual project:

11. Plans and specifications (**P&S**).

The scope of each publication is contained within that publication.

**The publications should be used as follows:**

**Engineers** - Use RdStd, VCWWM and VCSM (also R&R in Districts listed in 5 above) as the general requirements for design. Do not assume contractors have copies of these publications so don't make references to plates or formulas from these documents in the P&S. Material in SLDS, SSPWC, SPPWC, and SSP may be referred to in the P&S as contractors may be assumed to have copies of these publications.

**NOTE:** The Ventura County Standard Designs are no longer being published and should not be used as a reference. Use SPPWC in their place. Where SPPWC does not contain an appropriate design, SSP may be used. If neither have the needed feature, details of the feature must be shown in the P&S.

**Developers & Contractors** -Use SLDS (which adopts and modifies SSPWC); SPPWC and SSP where specified in the P&S; Grading Cover Sheet and P&S.

**FUTURE AMENDMENTS TO**  
**VENTURA COUNTY STANDARD LAND SPECIFICATIONS (SLDS)**

Revisions to these specifications may be adopted by the Board of Supervisors and issued from time to time.

An up to date copy of the SLDS, and other standards and manuals relating to land development, may be read and downloaded from the County's Web Site at:

**<http://www.ventura.org/pwalesd/>**

then "**Ventura County Standards, Manuals & Publications**"

See the "Revision" pages herein that list the latest issue date for each page.

To ascertain the current purchase price and postage charge for the SLDS or to purchase a print copy, contact the Agency at the address shown below. Individual pages may also be purchased at the standard price for Xerox copies.

Agency:                   Public Works Agency  
                                  Engineering Services Department  
                                  County Surveyor's Public Counter  
                                  800 South Victoria Avenue  
                                  Ventura, California 93009-1670

Location                   The County Surveyor's Public Counter is at the Ventura County  
                                  Government Center, Hall of Administration, Third floor, at the  
                                  top of the escalator from the main entrance atrium.

Phone:                     (805) 654-2068

FAX:                       (805) 677-8762

**COUNTY OF VENTURA**  
**STANDARD LAND DEVELOPMENT SPECIFICATIONS**

**0 GENERAL INFORMATION ON SPECIFICATIONS**

**0-1 STANDARD SPECIFICATIONS**

Except as hereinafter provided or as modified by the Special Provisions, the provisions of Parts 2 through 6 of the 2012 edition of the Standard Specifications for Public Works Construction (referred to as SSPWC), published by BNi Building News, Los Angeles, are adopted as the Standard Land Development Specifications for the County of Ventura (SLDS).

**0-2 DELETIONS.** The following portions of SSPWC are hereby deleted:

Sections: 207-11.5.3, 207-13, 301-1.4, and 302-2.3.

**0-3 NUMBERING OF SECTIONS**

The numbering of sections in these SLDS are compatible with the numbering in SSPWC. Numbers used herein are either those not used in SSPWC, or numbers deleted by Section 0-2 hereof. Section numbers with only headings and no other text are included for ease of referencing to SSPWC and are not modifications of SSPWC. References in special conditions or on plans may be made to either SLDS or SSPWC section numbers. Cross references contained in SSPWC to sections deleted by Section 0-2 hereof shall be considered as references to the sections of like numbers contained herein.

**0-4 ADDITIONS.** The sections which follow either replace sections of like number in SSPWC, which were deleted in Subsection 0-2 above, or add material not in SSPWC.

**0-5 OTHER REQUIREMENTS.** In addition to the requirements of these specifications, all state codes, local ordinances, other public regulations and purveyor's requirements shall also be complied with.

## **MODIFICATIONS AND ADDITIONS TO SSPWC**

### **PART 1 - GENERAL PROVISIONS**

#### **SECTION 1 - TERMS, DEFINITIONS, ABBREVIATIONS, UNITS OF MEASURE AND SYMBOLS**

**1-1 TERMS** Unless otherwise stated, the words directed, required, permitted, ordered, instructed, designated, considered necessary, prescribed, approved, acceptable, satisfactory, or words of like import, refer to actions, expressions, and prerogatives of the Engineer.

#### **1-2 DEFINITIONS**

**Acceptance**--The formal written acceptance by the County of Ventura of those public improvements that are specified in the agreement between the County and the Developer to be accepted by the County if constructed in all respects in accordance with the plans and specifications and any modifications thereof previously approved by the County.

**Agreement**--The written agreement with the County of Ventura covering the performance of the Developer's improvement work which shall include and make reference to plans, specifications, and faithful performance bonds; also, any and all supplemental agreements amending or extending the work contemplated and which may be required to complete the work in a substantial and acceptable manner. Supplemental agreements are written agreements covering alterations, amendments or extensions to the agreement and may include contract change orders.

**Agency**--The legal entity issuing the permit, or authorizing the development, for which the Work is required.

**Agreement**--See Contract.

**Base**--A layer of specified material of planned thickness placed immediately below the pavement or surfacing.

**Board**--The governing body of the Agency.

**Bond**--Performance and payment bond or other instrument of security.

**California Test (Cal. Test)**--Test method, specified by number, from CALTRANS "Standard Test Methods", 3 volumes, issued by Transportation Laboratory.

**Change Order**--A written order to the Contractor signed by the Agency directing an addition, deletion or revision in the Work, issued after the effective date of the Contract. A Change Order may or may not also be signed by the Contractor.

**Code**--The terms Government Code, Labor Code, etc. refer to codes of the State of California.

**Consultant**--A professional engineer, architect, landscape architect or other professional who designed the project or performed other services for the Agency on the project.

**Contract**--The written agreement between the Agency and the Contractor covering the Work.

**Contract Documents**--Including but not limited to; the Contract, any Addendum (which pertain to the Contract Documents), the Bonds, the general conditions, permits from other agencies, the Special Provisions, the Plans, the Standard Plans, Standard Specifications, Reference Specifications, and all Modifications issued after the execution of the Contract

## **1-2 DEFINITIONS (Continued)**

**Contractor**--The individual, partnership, corporation, joint venture, or other legal entity having a Contract with the Agency to perform the Work. In the case of Work being done under permit issued by the Agency, the Permittee shall be construed to be the Contractor. "Contractor" shall also mean the Developer.

**County**--The County of Ventura.

**County Sealer**--The Sealer of Weights and Measures of the County in which the measuring device is located

**Days**--Days shall mean consecutive calendar days unless otherwise specified.

**Developer**--The person or persons, firm, partnership, corporation, joint venture, or combination thereof, who have entered into an agreement with the County of Ventura to construct public improvements.

**Developer's Engineer (Supervising Civil Engineer)**--The registered civil engineer retained by the Developer or Permittee who prepares the plans and specifications and supervises construction of improvements referred to in the agreement or Permit.

**Director of Public Works**--The executive officer of the Public Works Agency of the County of Ventura as created by law, also referred to as the Engineer.

**District**--A Ventura County Water Works District, the Ventura County Watershed Protection District or other special districts governed, ex-officio by the Board of Supervisors of Ventura County having jurisdiction over the work. Usually will be synonymous with "Agency".

**Due Notice**--A written notification, given in due time, of a proposed action where such notification is required by the Contract to be given a specified interval of time (usually 48 hours or two Working Days) prior to the commencement of the contemplated action. Notification may be from Engineer to Contractor or from Contractor to Engineer.

**Electrolier**--Street light assembly complete, including foundation, standard, luminaire arm, luminaire, etc.

**Engineer**--The Director of Public Works acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them.

**Field Directive**--A written communication from the Engineer to the Contractor that does not make any Modification to the Contract Documents. It is used only to answer Contractor's questions and to provide decisions as specified in the Contract Documents.

**Geotextile**--Synthetic fiber used in civil engineering applications, serving the primary function of separation and filtration.

**House Connection Sewer**--A sewer, within a public street or right of way, proposed to connect any parcel, lot, or part of a lot with a main line sewer.

**House Sewer**--A sewer, wholly within private property, proposed to connect any building to a house connection sewer.

**Laboratory**--The established laboratory or laboratories authorized and approved by the Ventura County Public Works Agency to specify and conduct sampling and testing procedures.

**Luminaire**--The lamp housing including the optical and socket assemblies (and ballast if so specified).

## **1-2 DEFINITIONS (Continued)**

- Luminaire Arm--The structural member, bracket or mast arm, which, mounted on the standard, supports the luminaire.
- Modification--Includes Change Orders and Supplemental Agreements. A Modification may only be issued after the effective date of the Contract.
- Person--Any individual, firm, association, partnership, corporation, trust, joint venture, or other legal entity.
- Plans--The drawings, profiles, cross sections, working drawings, and supplemental drawings, or reproductions thereof, approved by the Engineer, which show the locations, character, dimensions, or details of the Work.
- Private Contract--Work subject to Agency inspection, control, and approval, involving private funds, not administered by the Agency.
- Prompt--The briefest interval of time required for a considered reply, including time required for approval by a governing body.
- Public Works Agency--The Public Works Agency of the County of Ventura. The County staff that administers contracts for Agency as defined herein.
- Purveyor--A public or private entity providing utility service.
- Referenced Documents--The following documents form a part of these specifications:
- (a) The Development Plans prepared by the Developer's Engineer and approved by the Engineer.
  - (b) The County-Developer Agreements setting forth the requirements for construction of the work shown on the Development Plans.
  - (c) Permits issued by the Agency and by other entities having jurisdiction over the Work.
- Reference Specifications--Those bulletins, standards, rules, methods of analysis or test, codes, and specifications of other agencies, engineering societies, or industrial associations referred to in the Contract Documents. These refer to the latest edition, including amendments in effect and published at the time of entering into the Contract or issuing the permit, unless specifically referred to by edition, volume, or date.
- Roadway--The portion of a street reserved for vehicular use.
- Service Connection--Service connections are all or any portion of the conduit, cable or duct, including meter, between a utility distribution line and an individual consumer.
- Service Lateral Connection--The interface of the House Connection Sewer with the host pipe.
- Sewer--Any conduit intended for the reception and transfer of sewage and fluid industrial waste.
- Special Provisions--Any provisions which supplement or modify the Standard Specifications.
- Specifications--Standard Specifications, Reference Specifications, Standard Special Provisions, and Special Provisions.
- Standard Plans--Details of standard structures, devices, or instructions referred to on the Plans or in the Specifications by title or number.
- Standard Special Provisions-- Special Provisions prepared in standardized form numbered in the series 401 through 499.
- Standard Specifications--Parts 1 through 6 of this document. See Section 0. References to whole sections will be preceded by the word "Section", references to parts of sections will show numbers only, such as "3-2", except at the beginning of a sentence, the word "Section" precedes the number.

## 1-2 DEFINITIONS (Continued)

State--The State of California.

State Standard Plans--Standard Plans prepared by State of California, Business and Transportation Agency, Department of Transportation (CALTRANS).

Storm Drain--Any conduit and appurtenances intended for the reception and transfer of storm water.

Street--Any road, highway, parkway, freeway, alley, walk or way.

Subbase--A layer of specified material of planned thickness between a base and the subgrade.

Subcontractor--An individual, firm or corporation having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work.

Subgrade--For roadways, that portion of the roadbed on which pavement, surfacing, base, subbase, or a layer of other material is placed. For structures, the soil prepared to support a structure.

Supervision--Supervision, where used to indicate supervision by the Engineer, shall mean the performance of obligations, and the exercise of rights, specifically imposed upon and granted to the Agency in becoming a party to the Contract. Except as specifically stated herein, supervision by the Agency shall not mean active and direct superintendence of details of the Work.

Supplemental Agreement--A written amendment of the Contract Documents signed by both parties.

Utility--Tracks, overhead or underground wires, pipelines, conduits, ducts, or structures, sewers or storm drains owned, operated or maintained in or across a public right of way or private easement.

Work--That which is proposed to be constructed or done under the Contract or permit, including the furnishing of all labor, materials, equipment, and services.

## 1-3 ABBREVIATIONS

**1-3.1 General.** The abbreviations herein, together with others in general use, are applicable to these Standard Specifications and to project Plans or other Contract Documents. All abbreviations and symbols used on Plans for structural steel construction shall conform to those given by the "Manual of Steel Construction" published by the AISC.

### 1-3.2 Common Usage

<u>Abbreviation</u>	<u>Word or Words</u>	<u>Abbreviation</u>	<u>Word or Words</u>
Aban	Abandon	l	Liters
Aband	Abandoned	Lab	Laboratory
ABS	Acrylonitrile-butadiene-styrene	Lat	Lateral
AC	Asphalt Concrete	LD	Local depression
ACP	Asbestos cement pipe	LED	Light Emitting Diode
ADA	Americans with Disabilities Act of 1990 (Public Law 101-336, 104 Stat. 1990,42 USC 12101-12213 (as amended))	LH	Lamp hole
Alt	Alternate	LL	Live load
AmerStd	American Standard	LOL	Layout line
APC	Air Placed Concrete	Long	Longitudinal
ARAM	Asphalt Rubber Aggregate Membrane	LP	Lamp post
ARHM	Asphalt Rubber Hot Mix	LPS	Low pressure sodium (Light)
AWG	American Wire Gage (non-ferrous wire)	LS	Lump sum
B/W	Back of wall	LTS	Lime treated soil
BC	Beginning of curve	m	Meters
BCR	Beginning of curb return	Maint	Maintenance
Bdry	Boundary	Max	Maximum
BF	Bottom of footing	MC	Medium curing
BM	Bench mark	MCR	Middle of curb return

<u>Abbreviation</u>	<u>Word or Words</u>	<u>Abbreviation</u>	<u>Word or Words</u>
BMPs	Best Management Practices	Meas	Measure
BVC	Beginning of vertical curve	MH	Manhole, maintenance hole
C&G	Curb & Gutter	Mil Spec	Military specification
C&G	Curb and gutter	Min	Minimum
CAB	Crushed aggregate base	Misc	Miscellaneous
CALOSHA	California Occupational Safety and Health Administration	Mon	Monument
CALTRANS	California Department of Transportation	MSDS	Material Safety Data Sheet
CAP	Corrugated aluminum pipe	Mult	Multiple
CB	Catch Basin	MUTCD	Manual on Uniform Traffic Control Devices
Cb	Curb	MVL	Mercury vapor light
CBP	Catch Basin Connection Pipe	N/A	No applicable
CBR	California Bearing Ratio	NRCP	Nonreinforced concrete pipe
C-C	Center to center	Obs	Obsolete
CCFRPM	Centrifugally Cast Fiberglass Reinforced Plastic Mortar	oc	On center
CCR	California Code of Regulations	OD	Outside diameter
CCTV	Closed Circuit TV	OE	Outer edge
CF	Cubic foot	Opp	Opposite
CF	Curb face	Orig	Original
CFR	Code of Federal Regulations	PAV	Pressure Aging Vessel
CFS	Cubic feet per second	PB	Pull box
CHDPE	Corrugated High Density Polyethylene	PC	Point of curvature
CIP	Cast iron pipe	PCC	Point of compound curvature
CIPP	Cast-in-place pipe	PCC	Portland cement concrete
CIPPC	Cast-in-place Concrete Pipe	PCVC	Point of compound vertical curve
CL	Clearance, center line	PE	Polyethylene
CLF	Chain link fence	PG	Performance Graded
CLSM	Controlled Low Strength Material	PI	Point of intersection
CMB	Crushed miscellaneous base	PL	Property line
CMC	Cement mortar-coated	PLI	Pounds per linear inch
CML	Cement mortar-lined	PMB	Processed miscellaneous base
cms	Cubic meters per second	POC	Point on curve
CO	Cleanout (Sewer)	POT	Point on tangent
Col	Column	PP	Power pole
Conc	Concrete	PRC	Point of reverse curve
Conn	Connection	PRCB	Precast Reinforced Concrete Box
Const	Construct, Construction	PRVC	Point of reverse vertical curve
Coord	Coordinate	PSI	Pounds per square inch
CQS	Cationic Quick-Setting	PT	Point of tangency
CRM	Crumb Rubber Modifier	PVC	Polyvinyl chloride
CRS	Cationic Rapid-Setting	Pvmt	Pavement
CSEP	Confined Space Entry Plan	Pvt R/W	Private right of way
CSP	Corrugated steel pipe	Q	Rate of flow in cms (CFS)
CSPA	Corrugated steel pipe arch	Quad	Quadrangle, Quadrant
CSS	Cationic Slow-Setting	R	Radius or Resistance value
CT	California Test	R&O	Rock and Oil
CTB	Cement treated base	R/W	Right of way
CV	Check valve	RA	Reclaimed Asphalt or Recycling agent
CY	Cubic yard	RAC	Recycled asphalt concrete
D	Depth, Load of pipe	RAP	Reclaimed asphalt pavement
db	Decibels	RBAC	Rubberized asphalt concrete
Dbl	Double	RC	Reinforced concrete or Rapid Curing
DF	Douglas Fir	RCB	Reinforced concrete box
Dia	Diameter	RCE	Registered civil engineer
DIP	Ductile iron pipe	RCP	Reinforced concrete pipe
DL	Dead load	RCV	Remote control valve
DT	Drain tile	Ref	Reference
Dwg	Drawing	Reinf	Reinforced or reinforcement
Dwy Appr	Driveway approach	Res	Reservoir
Dwy	Driveway	RGE	Registered geotechnical engineer
Ea	Each	RPPCC	Reclaimed Plastic Portland Cement Concrete
EC	End of curve	RR	Railroad
ECR	End of curb return	RSE	Registered structural engineer
EF	Each face	RTE	Registered traffic engineer
EG	Edge of gutter	RTFO	Rolling Thin Film Oven
EGL	Energy grade line	RW	Reclaimed Water

<b>Abbreviation</b>	<b>Word or Words</b>	<b>Abbreviation</b>	<b>Word or Words</b>
EI	Elevation	S	Slope
ELC	Electrolier lighting conduit	S/W	Sidewalk
ELT	Extra long ton of slurry	SC	Slow curing
Eng	Engineer, Engineering	SCCP	Steel cylinder concrete pipe
EP	Edge of pavement	SCNs	Supplementary Cementitious Materials
Esmt	Easement	SD	Storm drain
ETB	Emulsion treated base	SDR	Standard dimension ratio
EVC	End of vertical curve	SE	Sand Equivalent
Exc	Excavation	Sec	Section
Exist or Ex	Existing	SF	Square foot
Exp Jt	Expansion joint	SG	Specific gravity
F & C	Frame and cover	SI	International System of Units (Metric)
F & I	Furnish and install	SLC	Service Lateral Connection
F/W	Face of wall	Spec	Specifications
Fab	Fabricate	SR	Standard ratio
FAS	Flashing arrow sign	SS	Sanitary sewer
FD	Floor drain	SSB	Select sub-base
Fdn	Foundation	SSP	Structural steel plate pipe
Fed Spec	Federal Specification	SSPA	Structural steel plate pipe arch
FG	Finished grade	St Hwy	State highway
FL	Flow line	Sta	Station
FS	Finished surface	Std	Standard
ft - lb	foot – pound	Str Gr	Straight grade
Ftg	footing	Str	Straight
FW	Face of wall	Struc	Structural/Structure
Ga	Gauge	SW	Sidewalk
Galv	Galvanized	SWD	Sidewalk drain
GG	Gap graded	SWPPP	Storm Water Pollution Prevention Plan
GIP	Galvanized iron pipe	SY	Square Yard
GL	Ground line or grade line	T/W	Top of wall
GM	Gas meter	Tan	Tangent
GP	Guy pole	TC	Top of curb
Gr	Grade	TCP	Traffic control plan
Grtg	Grating	Tel	Telephone
GSP	Galvanized steel pipe	TF	Top of footing
H	High or height	Topo	Topography
HB	Hose bib	Tr	Tract
HC	House connection	Trans	Transition
HDPE	High density Polyethylene	TRMAC	Tire rubber modified asphalt concrete
HDWL	Headwall	TS	Traffic signal or transition structure
HGL	Hydraulic grade line	TSC	Traffic signal conduit
Hor, Horiz	Horizontal	TSS	Traffic signal standard
Hp	Horsepower	TTC	Temporary traffic control
HPG	High pressure gas	TW	Top of wall
HPS	High pressure sodium (Light)	Typ	Typical
HRWRA	High Range Water Reducing Admixture	U.S.	United States
Hyd, Hydr	Hydraulic	U.S.C.	United States Code
ID	Inside diameter	USA	Underground Service Alert
Incl	Include, Including	Var	Varies, Variable
Insp	Inspection	VB	Valve box
Inv	Invert	VC	Vertical curve
IP	Iron pipe	VCP	Vitrified clay pipe
J	Joules	Vert	Vertical
JC	Junction chamber	Vol	Volume
Jct	Junction	VTCSH	Vehicle Traffic Controls Signal Heads
JS	Junction structure	W	Width or Wider
Jt	Joint	WATCH	Work Area Traffic Control Handbook
kg	Kilograms	WI	Wrought iron
kPa	KiloPascals	WM	Water meter
L	Length	WPJ	Weakened plane joint
		WTAT	Wet Track Abrasion Test
		X Conn	Cross connection
		x (as in 2x4)	by
		X-Sec	Cross section

**1-3.3 Institutions.**

**Abbreviation    Name**

Abbreviation    Word or Words

AAN.....	American Association of Nurserymen
AASHTO .....	American Association of State Highway and Transportation Officials
ACI .....	American Concrete Institute
AGC.....	Associated General Contractors of America
AISC.....	American Institute of Steel Construction
ANSI.....	American National Standards Institute
API.....	American Petroleum Institute
APWA.....	American Public Works Association
AREA.....	American Railway Engineering Association
ASHRAE .....	American Society of Heating, Refrigeration and Air-Conditioning Engineers
ASME .....	American Society of Mechanical Engineers
ASTM .....	American Society for Testing and Materials
AWPA.....	American Wood Preserver's Association
AWS.....	American Welding Society
AWWA .....	American Water Works Association
CBSC .....	California Building Standards Commission
CRSI.....	Concrete Reinforcing Steel Institute
EIA.....	Electronic Industries Association
ETL.....	Electrical Testing Laboratories
FCC.....	Federal Communications Commission
IAPMO.....	International Association of Plumbing and Mechanical Officials
ICC .....	International Code Council
IEEE .....	Institute of Electrical and Electronics Engineers
IMSA.....	International Municipal Signal Association
ITE.....	Institute of Traffic Engineers
NEMA .....	National Electrical Manufacturers Association
NFPA.....	National Fire Protection Association
NOAA .....	National Oceanic and Atmospheric Administration (Department of Commerce)
REA.....	Rural Electrification Administration
UL.....	Underwriters' Laboratories, Inc.
USGS .....	United State Geological Survey
WFCA.....	Western Fire Chiefs Association

**1-3.4 Building Codes**    The Ventura County Building Code (VCBC) and Ventura County Fire Code (VCFC) are applicable to the Work. VCBC and VCFC adopt by reference a number of uniform and national codes. Where such codes are referenced directly in the Specifications, such references shall be to the VCBC or VCFC which adopt and modify certain provisions in the referenced codes.

<b><u>Abbreviation</u></b>	<b><u>Code</u></b>	<b><u>Publisher</u></b>
CBC.....	California Building Code .....	CBSC
DBC.....	Uniform Code for Abatement of Dangerous Building .....	ICBO
UBC.....	Uniform Building Code .....	ICBO
UBC STDS .....	Uniform Building Code Standards .....	ICBO
UFC.....	Uniform Fire Code.....	ICBO and WFCA
UHC.....	Uniform Housing Code.....	ICBO
UMC .....	Uniform Mechanical Code .....	IAPMO
UPC.....	Uniform Plumbing Code.....	IAPMO
NEC.....	National Electrical Code.....	NFPA

**1-3.5 Reference Documents.**

**Abbreviation    Document**

HDM .....	Highway Design Manual of (CALTRANS), Latest Edition
SLDS .....	Ventura County Standard Land Development Specifications (This document)
SPPWC .....	Standard Plans for Public Works Construction, Latest edition, published by BNi,
SSP .....	State Standard Plans, CALTRANS - Latest Edition
SSPWC .....	Standard Specifications for Public Works Construction (See §0-1 for Edition)
SSS .....	State Standard Specifications, CALTRANS - Latest edition

**1-4..... UNITS OF MEASURE**

**1-4.1 General.** The International System of Units, also referred to as SI or the metric system, is the principal measurement system in these Specifications and shall be used for construction, unless otherwise stated in the Contract Documents. U. S. Standard Measure, also called U. S. Customary System, are included in parenthesis. SI units and U. S. Standard Measure in parenthesis may or may not be exactly equivalent. If U. S. Standard Measures are specified for use in the Contract Documents, then all values used for construction shall be U. S. Standard Measures shown in parentheses. However, certain material Specifications and test requirements contained herein use SI units specifically and conversions to U. S. Measures have not been included in these circumstances. When U. S. Standard Measures are not included in parentheses, the SI units shall control.

Reference is also made to ASTM E 380 for definitions of various units of the SI system and a more extensive set of conversion factors.

**1-4.1.1 Units for Work** Where U. S. Standard Measure units are shown on the Plans or are specified, U. S. Standard Measure shall be used for the Work.

## 1-4.2 Units of Measure, Equivalents and Abbreviations

One U.S. Customary Unit	(abbreviation)	Is Equal To	
		#	SI Unit (abbreviation)
mil (=0.001 in)		25.4	micrometers ( $\mu\text{m}$ )
inch	(in)	25.4	millimeter (mm)
inch	(in)	2.54	centimeter (cm)
foot	(ft)	0.3048	meter (m)
yard	(yd)	0.9144	meter (m)
mile		1.6093	kilometer (km)
square foot	(ft <sup>2</sup> )	0.0929	square meter (m <sup>2</sup> )
square yard	(yd <sup>2</sup> )	0.8361	square meter (m <sup>2</sup> )
cubic foot	(ft <sup>3</sup> )	0.0283	cubic meter (m <sup>3</sup> )
cubic yard	(yd <sup>3</sup> )	0.7646	cubic meter (m <sup>3</sup> )
acre (=43,560 ft <sup>2</sup> )		0.4047	hectare (=10,000m <sup>2</sup> ) (ha)
gallon	(gal)	3.7854	Liter (L)
fluid ounce	(fl. oz.)	29.5735	milliliter (mL)
pound mass (avoirdupois)	(lbs)	0.4536	kilogram (kg)
ounce mass	(oz)	0.02835	kilogram (kg)
ounce mass	(oz)	28.35	grams (g)
Ton (=2000 lb avoirdupois)		0.9072	Tonne (= 1000 kg)
Poise		0.10	Pascal-second (Pa-s)
centistoke	(cs)	1.00	square millimeter/sec. (mm <sup>2</sup> /s)
pound force	(lbf)	4.4482	Newton (N)
pound per square inch	(psi)	6.8948	Kilopascal (kPa)
pound force per foot	(lbf/ft)	14.594	Newton per meter (N/M)
foot-pound force	(ft-lbf)	1.3558	Joules (J)
foot-pound force per second	([ft-lbf]/s)	1.3558	Watt (W)
part per million	(ppm)	1.00	milligram/liter (mg/L)
Degree Fahrenheit	(°F)	0.5555	Degree Celsius (°C)

Temperature: Celsius to Fahrenheit	Temperature: Fahrenheit to Celsius
Temperature °F = (1.8 x °C) + 32	Temperature °C = (°F - 32) / 1.8

SI Units Used in Both Systems		
Ampere (A)	second (s)	Candela (cd)
Volt (V)	decibel (db)	Lumen (lm)

Common Metric Prefixes					
kilo (k)	10 <sup>3</sup>	milli (m)	10 <sup>-3</sup>	nano (n)	10 <sup>-9</sup>
centi (c)	10 <sup>-2</sup>	micro ( $\mu$ )	10 <sup>-6</sup>	pico (p)	10 <sup>-12</sup>

### 1-5 SYMBOLS

° Degree	$\underline{P}$ Property line	% Percent
' Feet or minutes	$\underline{S}$ Survey line or station line	# Number
" Inches or seconds	$\underline{C}$ Center line	/ per or of (between words)
$\Delta$ Delta, the central angle or angle between tangents	$\angle$ Angle	

## SECTION 2 - SCOPE AND CONTROL OF THE WORK

**2-1, 2-2, 2-3 & 2-4 No Text**

### **2-5 PLANS AND SPECIFICATIONS**

**2-5.1 General.** The Contractor shall keep at the Work site a copy of the Plans and Specifications, to which the Engineer shall have access at all times.

The Plans, Specifications, and other Contract Documents shall govern the Work. The Contract Documents are intended to be complementary and cooperative. Anything specified in the Specifications and not shown on the Plans, or shown on the Plans and not specified in the Specifications, shall be as though shown or specified in both.

The Plans shall be supplemented by such working drawings and shop drawings as are necessary to adequately control the Work.

Existing improvements visible at the Work site, for which no specific disposition is made on the Plans, but which interfere with the completion of the Work, shall be removed and disposed of by the Contractor.

The Contractor shall, upon discovering any error or omission in the Plans or Specifications, immediately call it to the attention of the Engineer.

**2-5.1.1 Specifications Captions.** Captions accompanying specification parts, sections and paragraphs are for convenience of reference only and do not limit the content of such part, section or paragraph.

The division of the Plans into parts and the division of the Specifications into divisions and sections are for the ease of reference only and does not imply the division of Work between trades or subcontractors.

**2-5.2 Precedence of Contract Documents.** If there is a conflict between documents, the document highest in precedence shall control. The precedence shall be:

First: Permits from other agencies as may be required by law.

Second:..... Special Provisions.

Third: ..... Plans.

Fourth: ..... Standard Plans.

Fifth: ..... Standard Special Provisions.

Sixth: ..... Standard Specifications.

Seventh:..... Reference Specifications.

Change orders, Supplemental Agreements and approved revisions to Plans and Specifications will take precedence over Items 2) through 6) above. Detailed plans shall have precedence over general plans.

## 2-5.3 Shop Drawings and Submittals.

**2-5.3.1 General.** Shop drawings and submittals shall be provided, at the Contractor's expense, when required by the Plans or Specifications, or requested by the Engineer.

Materials shall not be furnished or fabricated, nor any Work done for which shop drawings or submittals are required, before those shop drawings or submittals have been reviewed, as provided in this section. Neither review nor approval of shop drawings or submittals by the Engineer shall relieve the Contractor from the responsibility for errors, omissions, or deviations from the Contract Documents, unless such deviations were specifically called to the attention of the Engineer in the letter of transmittal. The Contractor shall be responsible for the correctness of the submittals and shop drawings, including shop fits, field connections, and the results obtained by use of such drawings.

The Contractor shall allow a minimum of 20 Working Days for review of shop drawings and submittals. Each set of shop drawings or submittals shall be accompanied by a letter of transmittal describing exactly what is being transmitted.

**2-5.3.2 Shop Drawings.** Shop drawings shall be prepared in accordance with current modern engineering practice and shall be of a size and scale to show clearly all necessary details.

Each drawing shall be a good quality transparency, accompanied by six prints. If no change or correction is required, three prints will be returned to the Contractor. If extensive additions or corrections are required, the Engineer will return one marked-up print along with the transparency, for correction and resubmission. Final transparencies will be retained by the Agency.

Shop drawings or other drawings are required for the following:

Item	Feature	Type of Construction
1	Safety Orders	Trench Shoring
2	Joints	Reinforced Concrete Pipe
3	Joints	Vitrified Clay Pipe
4	General	Fabricated Steel Pipe
5	Cofferdams	Structure Excavation and Backfill
6	General	Falsework
7	General	Placing Reinforcing
8	General	Prestressed Concrete Construction
9	Shop Drawings	Structural Steel
10	Falsework Plans	Structural Steel
11	General	Metal Hand Railing
12	General	Jacking Operations
13	General	Tunneling Operations
14	Tunnel Supports	Tunneling Operations
15	Remodeling Existing Sewer Facilities	Polyethylene Liner Installation
16	Microtunneling	Microtunneling operations
17	Controller Cabinet Wiring Diagrams	Traffic Signal Construction

Shop drawings listed above as Items 5, 6, 8, 9,10,12,13, and 14 shall be prepared by a Civil or Structural Engineer registered by the State of California.

**2-5.3.3 Submittals.** Submittals shall consist of the appropriate combination of catalog sheets, material lists, manufacturer's brochures, technical bulletins, specifications, diagrams, or product samples, necessary to describe a system product or item. Submittals for systems shall be bound together and include all manufactured items for the system. Six copies of each submittal shall be transmitted to the Engineer. If no change or correction is required, three copies will be returned to the Contractor.

Submittals are required for irrigation systems, street lighting systems, and traffic signals, and may be required for any product, manufactured item, or system.

**2-6 WORK TO BE DONE.** The Contractor shall perform all Work necessary to complete the Contract in a satisfactory manner. Unless otherwise provided, it shall furnish all materials, equipment, tools, labor and incidentals necessary to complete the Work.

All Work under the Contract shall be performed in accordance with the highest standards prevailing in the trades unless otherwise specified on the Plans or in the Special Provisions. Unless otherwise specified, it is the intent that the Contractor will construct a complete facility ready for use.

**2-6.1 Manufacturer's Recommendations.** Where the manufacturer of any materials or equipment provides written recommendations or instructions for its use or method of installation (including labels, tags, manuals, or trade literature), such recommendations or instructions shall be complied with except where the Contract Documents specifically require deviations.

**2-7 SUBSURFACE DATA.** All soil and test hole data, water table elevations, and soil analyses shown on the drawings or included in the Specifications apply only at the location of the test holes and to the depths indicated. Soil test reports for the test holes which have been drilled are available for inspection at the office of the Developer's Engineer. Any additional subsurface exploration shall be done by the Contractor at its own expense.

The indicated elevation of the water table is that existing at the date the test hole was determined.

It is the Contractor's responsibility to determine and allow for the elevation for groundwater at the date of project construction. A difference in elevation between groundwater shown in soil boring logs and groundwater actually encountered during construction will not be considered as a basis for extra Work.

**2-8 No Text**

**2-9 SURVEYING**

**2-9.1 Permanent Survey Markers.** The Contractor shall notify the Engineer at least 7 Days before starting Work to allow for the preservation of survey monuments, lot stakes (tagged), and bench marks. The Developer's Engineer, or the owner at its cost, shall file a Corner Record Form referencing survey monuments subject to disturbance in the Office of the County Surveyor prior to the start of construction and also prior to the completion of construction for the replacement of survey monuments. The Contractor shall not disturb survey monuments, lot stakes (tagged), or bench marks without the consent of the Engineer or the owner on Private Contracts. The Contractor shall bear the expense of replacing any that may be disturbed without permission. Replacement shall be done only under the direction of the Engineer by a Licensed Land Surveyor or a Registered Civil Engineer authorized to practice land surveying within the State of California.

When a change is made in the finished elevation of the pavement of any roadway in which a permanent survey monument is located, the Contractor shall adjust the monument cover to the new grade within 7 Days of finished paving unless otherwise specified.

**2-9.2 Survey Markers.** Such stakes or marks will be set by the Developer's Engineer as he and the Engineer determine to be necessary to establish the lines and grades required for the completion of the work specified in the Developer's agreement, plans, specifications, and modifications thereto.

**2-9.3 Permanent Survey Monuments.** Monuments of the type, dimensions, and at the locations shown on the recorded tract map shall be furnished and installed by the Developer's Engineer or by a Licensed Land Surveyor.

Concrete used in constructing monuments shall conform to 303.

Metal used in constructing monuments shall conform to 206.

The Developer's Engineer or Licensed Land Surveyor shall provide adequate reference stakes and straddle points and supervise construction for proper installation and alignment of all survey monuments. The Developer's Engineer or Licensed Land Surveyor shall provide permanent reference points and submit a plat map of their location to the County for approval and filing.

**2-10 AUTHORITY OF BOARD AND ENGINEER.** The Board has the final authority in all matters affecting the Work. Within the scope of the Contract, the Engineer has the authority to enforce compliance with the Plans and Specifications. The Contractor shall promptly comply with instructions from the Engineer or its authorized representative.

On all questions relating to the acceptability of material, equipment, or Work, the execution, progress or sequence of Work, and the interpretation of Specifications or drawings, the decision of the Engineer is final and binding, unless otherwise ordered by the Board.

**2-10.1 Authority of Engineer.** The Engineer shall decide all questions which may arise as to the quality or acceptability of materials furnished and work performed; all questions which may arise as to the interpretations of the plans and specifications; all questions as to the acceptable fulfillment of the agreement on the part of the Developer. He shall have the right to cause the Developer to cease construction operations until such time as corrective measures are taken to bring the work so far performed into compliance with the plans and specifications. Such stop work orders, issued in writing, shall not relieve the Developer from completing the work within the time specified in the agreement.

It is the intent of these specifications to have the Agency, through the Engineer, be responsible for conducting inspections, qualitative tests and the determination of the acceptability of the work performed and the materials used.

**2-10.2 Developer's Responsibility.** The responsibility for directing the activity of the construction forces to produce acceptable work is not assumed by the County but shall be the responsibility of the Developer. The construction work is to be performed in compliance with the plans and specifications and the County reserves the right to issue stop work orders when it is obvious to the Engineer that the resultant work will not be acceptable.

**2-10.3 Delegation to Developer's Engineer.** The Engineer delegates, or may delegate, certain responsibilities set forth herein to the Developer's Engineer. These responsibilities appear in these General Provisions, the Construction Materials Sections, the Construction Methods Section, Special Provisions or in written directives issued by the Engineer.

**2-10.4 Approval of Changes.** The Engineer is authorized to approve modification of the technical provisions of these Specifications and Road Standards, not involving the geometrics of streets or rights of way or improvements required as a condition of approval of the tentative map by the Planning Commission, when in his opinion such modification will not adversely affect the quality of the resulting improvements.

**2-10.5 Responsibilities of the Developer and the Developer's Engineer.** The Developer shall retain the services of a Civil Engineer, called the Developer's Engineer, registered in the State of California who shall supervise the construction of the work. If necessary, a Licensed Land Surveyor shall also be employed.

**2-10.6 Duties of Developer's Engineer.** The Developer through the Developer's Engineer shall:

1. Establish and re-establish line and grade to the satisfaction of the County.
2. Report any construction irregularities or conditions contrary to those assumed during the design phase of the improvements. Written inspection reports prepared by the Developer's Engineer will be required only when the work is not being done in compliance with the plans and specifications.
3. If required by the County under the terms of the agreement and these specifications, perform, furnish, or have developer pay for certain soils engineering sampling and testing for the determination of:
  - (a) The structural design of pavements.
  - (b) The stability of cut and fill slopes.
  - (c) Foundation adequacy.
  - (d) Compaction.

Data and reports shall be submitted to the Engineer for review and approval.

4. Following completion and before acceptance of the improvements prepare "Record" plans indicating approved changes made during construction and certify that the work has been constructed in compliance with said plans and specifications.

**2-10.7 Notification of Engineer of New Operations.** The Developer shall notify the Engineer two working days before starting any new operation not previously begun within the developed area.

## **2-11 INSPECTION**

The Work is subject to inspection and approval of the Engineer. The Contractor shall notify the Engineer before noon of the Working Day before inspection is required. Unless otherwise authorized, Work shall be done only in the presence of the Engineer or an authorized representative. Any Work done without proper inspection will be subject to rejection. The Engineer and any authorized representatives shall at all times have access to the Work during its construction at shops and yards as well as the project site. The Contractor shall provide every reasonable facility for ascertaining that the materials and workmanship are in accordance with these Specifications. Inspection of the Work shall not relieve the Contractor of the obligation to fulfill all conditions of the Contract.

**2-11.1 Permit Inspections.** The Contractor shall arrange for code compliance inspections by all agencies issuing permits for the Work. The Work shall not continue beyond mandatory inspection points without clearance from the controlling agency. Each agency involved shall be notified in accordance with the code they enforce or in accordance with their standard operating procedures.

It shall be the Contractor's responsibility to see that any required inspection record card is signed off before proceeding with the next phase of the Work and completely signed off on completion of the Work.

**2-12 SPECIAL NOTICES.** When specified in the Specifications or as directed by the Engineer, any notice required to be given in accordance with this subsection shall be in writing, dated, and signed by the Contractor or the Engineer. Such notices shall be served by any of the following methods:

- a) Personal delivery with proof of delivery which may be made by declaration under penalty of perjury by any person over the age of 18 years. The proof of delivery shall show that delivery was performed in accordance with these provisions. Service shall be effective on the date of delivery. Notices given to the Contractor by personal delivery may be made to the Contractor's authorized representative at the Work site; or
- b) Certified mail addressed to the mailing address of the recipient postage prepaid; return receipt requested. Service shall be effective on the date of the receipt of the mailing.

Simultaneously, the Agency may send the same notice by regular mail. If a notice that is sent by certified mail is returned unsigned, then delivery shall be effective pursuant to regular mail, provided the notice that was sent by regular mail is not returned.

## **SECTION 3 - CHANGES IN WORK**

### **3-1 CHANGES REQUESTED BY THE CONTRACTOR**

Changes in specified methods of construction may be made at the Contractor's request when approved in writing by the Developer's Engineer and the Engineer.

Changes in the Plans and Specifications, requested in writing by the Contractor, which do not materially affect the Work and which are not detrimental to the Work or to the interests of the Agency, may be granted by the Board to facilitate the Work, when approved in writing by the Developer's Engineer and the Engineer.

### **3-2 CHANGES IN THE WORK**

The County reserves the right to require the Developer to make alterations, deviations, additions to or deletions from plans and specifications necessary to bring the improvement construction into conformance with the original intent of the development, where improvement construction plans and specifications have been approved by the County based on information supplied by the Developer, and such alterations, deviations, additions or deletions are necessary because of misinformation, or lack of information, supplied by the Developer.

Where said improvement construction has not been completed within fifteen months, and the Developer requests an extension, it shall be the duty of the Developer to bring to the attention of the County any change in conditions affecting the improvement construction. Failure to do so will be considered misinformation, or lack of information, and subject to the above right of the County to require alterations, deletions, additions to or omissions from plans and specifications.

## SECTION 4 - CONTROL OF MATERIALS

### 4-1 MATERIALS AND WORKMANSHIP

**4-1.1 General.** All materials, parts, and equipment furnished by the Contractor in the Work shall be new, high grade, and free from defects. Workmanship shall be in accordance with the generally accepted standards. Materials and workmanship shall be subject to the Developer's Engineer and the Engineer's approval.

Materials and workmanship not conforming to the requirements of the Specifications shall be considered defective and will be subject to rejection. Defective Work or material, whether in place or not, shall be removed immediately from the site by the Contractor, at its expense, when so directed by the Engineer.

If the Contractor fails to replace any defective or damaged Work or material after reasonable notice, the Engineer may cause such Work or materials to be replaced. The replacement expense shall be paid by the Contractor.

Used or secondhand materials, parts, and equipment may be used only if permitted by the Specifications.

**4-1.2 Protection of Work and Materials.** The Contractor shall provide and maintain storage facilities and employ such measures as will preserve the specified quality and fitness of materials to be used in the Work. Stored materials shall be reasonably accessible for inspection. The Contractor shall also adequately protect new and existing Work and all items of equipment for the duration of its Contract.

The Contractor shall not, without the Agency's consent, assign, sell, mortgage, hypothecate, or remove equipment or materials which have been installed or delivered and which may be necessary for the completion of the Contract.

### **4-1.3 Inspection Requirements**

**4-1.3.1 General.** Unless otherwise specified, inspection is required at the source for such typical materials and fabricated items as bituminous paving mixtures, structural concrete, metal fabrication, metal casting, welding, concrete pipe manufacture, protective coating application, and similar shop or plant operations. Steel pipe in sizes less than 450 MM (18 inches), vitrified clay, asbestos-cement and cast iron pipe in all sizes are acceptable upon certification as to compliance with the Specifications, subject to sampling and testing by the Agency. Standard items of equipment such as electric motors, conveyors, elevators, plumbing fixtures, etc., are subject to inspection at the job site only. Special items of equipment such as designed electrical panel boards, large pumps, sewage plant equipment, etc., are subject to inspection at the source, normally only for performance testing. The Special Provisions may specify inspection at the source for other items not typical of those listed in this section.

**4-1.3.2 Inspection of Materials Not Locally Produced** When the Contractor intends to purchase materials, fabricated products, or equipment from sources located more than 80 km (50 miles) outside the geographical limits of the Agency, an inspector or accredited testing laboratory, approved by the Engineer, shall be engaged by the Contractor at its expense, to inspect the materials, equipment or process. This approval shall be obtained before producing any material or equipment. The inspector or representative of the testing laboratory shall judge the materials by the requirements of the Plans and Specifications. The Contractor shall forward reports required by the Engineer. No materials or equipment shall be shipped nor shall any processing, fabrication or treatment of such materials be done without proper inspection by the approved agent. Approval by said agent shall not relieve the Contractor of responsibility for complying with the Contract requirements.

**4-1.3.3 Inspection by the Agency.** The Agency will provide all inspection and testing laboratory services within 80 km (50 miles) of the geographical limits of the Agency.

**4-1.3.4 Certificates of Compliance.** The Engineer may require certificates of compliance with the specifications for materials or manufactured items produced outside of the job site. Such certificates will not relieve the contractor from the requirements of providing material and manufactured items complying with the specifications even though they have been incorporated into the job.

**4-1.4 Tests of Materials.** Before incorporation in the Work, the Contractor shall submit samples of materials, as the Engineer may require, at no cost to the Agency. The Contractor, at its own expense, shall deliver the materials for testing to the place and at the time designated by the Engineer. The Contractor shall pay for all testing.

The Contractor shall notify the Engineer in writing, at least 15 Days in advance, of its intention to use materials for which tests are specified, to allow sufficient time to perform the tests. The notice shall name the proposed supplier and source of material.

If the notice of intent to use is sent before the materials are available for testing or inspection, or is sent so far in advance that the materials on hand at the time will not last but will be replaced by a new lot prior to use on the Work, it will be the Contractor's responsibility to re-notify the Engineer when samples which are representative may be obtained.

**4-1.5 Certification.** The Engineer may waive materials testing requirements of the Specifications and accept the manufacturer's written certification that the materials to be supplied meet those requirements. Materials test data may be required as part of the certification.

**4-1.6 Trade Names or Equals..** The Engineer shall determine whether the material offered is equivalent to that specified.

The Contractor shall, at its expense, furnish data concerning items offered by it as equivalent to those specified. It shall have the material tested as required by the Engineer to determine that the quality, strength, physical, chemical, or other characteristics, including durability, finish, efficiency, dimensions, service, and suitability are such that the item will fulfill its intended function.

Test methods shall be subject to the approval of the Engineer. Test results shall be reported promptly to the Engineer, who will evaluate the results and determine if the substitute item is equivalent. Its findings shall be final. Installation and use of a substitute item shall not be made until approved by the Engineer.

If a substitute offered by the Contractor is found to be not equal to the specified material, the Contractor shall furnish and install the specified material.

**4-1.6.1 Compatibility with Design.** Where the size, configuration, weight, fastening locations, fastening strength, utility rough-in locations, and utility capacities of equipment or devices offered by the Contractor as equivalents do not conform to those provided for in the Contract Documents or those which are necessary for equipment or devices indicated by brand names, the Contractor shall bear all costs of redesign and changes in construction necessary to adapt the offered equipment or device to the Work.

Equipment or devices will not be considered "equal" where the life cycle cost of operation, utilities and maintenance of the offered alternate is greater than those listed by brand names. Life cycle costs shall mean utility charges (demand and usage charges), maintenance, operating personnel and replacement (equipment, installation and down time expenses) all reduced to an average annual rate using the current interest rate earned on funds invested by the County Treasurer.

**4-1.6.2 Trade Names Listed.** Where products are specified by brand or trade name on the Plans or in the Specifications, or both, this shall not be construed as meaning every product may be used without furnishing shop drawings, without redesign of the facility or without a change in utility rough-in requirements.

Where use of products listed on the Plans or in the Specifications, or both, or where use of a substitute proposed as an "equal" product requires shop drawings, redesign of the facility, or revisions in the size and location of rough-in utility connections, or in connecting work, the Contractor shall provide any necessary shop drawings, or shall cause the preparation of any necessary redesign or revisions to the Plans at its own expense and shall bear the full cost of any necessary additional construction or reconstruction work. No work described in shop drawings, a redesign, or a revision to the Plans shall be undertaken until such shop drawings, redesign, or revisions have been approved by the Developer's Engineer and the Engineer. Any proposed redesign or revision to the Plans shall be accompanied by complete computations and details prepared by an appropriate licensed design professional.

**4-1.7 Weighing Equipment.** All scales used for proportioning materials shall be inspected for accuracy and certified within the past 12 months by the State of California Bureau of Weights and Measures, by the County Director or Sealer of Weights and Measures, or by a Scale Mechanic registered with or licensed by the County.

The accuracy of the work of a scale service agency, except as stated herein, shall meet the standards of the California Business and Professions Code and the California Code of Regulations pertaining to weighing devices. A certificate of compliance shall be presented, prior to operation, to the Engineer for approval and shall be renewed whenever required by the Engineer at no cost to the Agency.

All scales shall be so arranged that they may be read easily from the operator's platform or area. They shall indicate the true net weight without the application of any factor. The figures of the scales shall be clearly legible. Scales shall be accurate to within 1% when tested with the plant shut down. Weighing equipment shall be so insulated against vibration or moving of other operating equipment in the plant area that the error in weighing with the entire plant running will not exceed 2% for any setting nor 1½% for any batch.

**4-1.8 Calibration of Testing Equipment.** Testing equipment, such as, but not limited to, pressure gages, metering devices, hydraulic systems, force (load)-measuring instruments, and strain measuring devices shall be calibrated by a testing agency acceptable to the Engineer at intervals not to exceed 12 months and following repairs, modification, or relocation of the equipment. Calibration certificates shall be provided when requested by the Engineer.

## SECTION 5 - UTILITIES

**5-1 LOCATION.** The Contractor shall search known substructure records.

Where underground main distribution conduits such as water, gas, sewer, electric power, telephone or cable television are shown on the Plans, the Contractor shall assume that every property parcel will be served by a service connection for each type of utility.

As provided in Section 4216 of the California Government Code, at least 2 Working Days prior to commencing any excavation, if the excavation will be conducted in an area which is known, or reasonably should be known, to contain subsurface installations, the Contractor shall contact the regional notification center (Underground Service Alert of Southern California) and obtain an inquiry identification number.

The California Department of Transportation is not required by Section 4216 to become a member of the regional notification center. The Contractor shall contact it for location of its subsurface installations.

The Contractor shall determine the location and depth of all utilities, including service connections, which have been marked by the respective owners and which it believes may affect or be affected by its operations.

**5-2 PROTECTION.** The Contractor shall not interrupt the service function or disturb the support of any utility, such as the base and thrust blocks, without authority from the owner or order from the Agency. All valves, switches, vaults, and meters shall be maintained readily accessible for emergency shutoff.

Where protection is required to insure support of utilities located as shown on the Plans or in accordance with 5-1, the Contractor shall, unless otherwise provided, furnish and place the necessary protection at its expense.

Upon learning of the existence and location of any utility omitted from or shown incorrectly on the Plans, or not properly marked, the Contractor shall immediately notify the Developer's Engineer and the Engineer in writing. Support or protection of the utility shall be at no cost to the Agency.

The Contractor shall immediately notify the Engineer and the utility owner if any utility is disturbed. The Contractor shall bear the costs of repair or replacement of any utility damaged.

When placing concrete around or contiguous to any nonmetallic utility installation, the Contractor shall, at its own expense:

- (1) Furnish and install a 50 mm (two-inch) cushion of expansion joint material or other similar resilient material; or
- (2) Provide a sleeve or other opening which will result in a 50 mm (two-inch) minimum clear annular space between the concrete and the utility; or
- (3) Provide other acceptable means to prevent embedment in or bonding to the concrete. Where concrete is used for backfill or for structures which would result in embedment, or partial embedment, of a metallic utility installation; or where the coating, bedding or other cathodic protection system is exposed or damaged by the Contractor's operations or as may be required by the Work, the Contractor shall notify the Engineer and arrange to secure the advice of the affected utility owner regarding the procedures required to maintain or restore the integrity of the system.

**5-3 REMOVAL.** Unless otherwise specified, the Contractor shall remove all interfering portions of utilities shown on the Plans as "abandoned" or "to be abandoned in place". Before starting removal operations, the Contractor shall ascertain from the utility owner whether the abandonment is complete, and the costs involved in the removal and disposal shall be paid for by the contractor.

## **SECTION 6 - PROSECUTION, PROGRESS AND ACCEPTANCE OF THE WORK**

### **6-1 No Text**

**6-2 PROSECUTION OF WORK.** To minimize public inconvenience and possible hazard and to restore streets and other Work areas to their original condition and former state of usefulness as soon as practicable, the Contractor shall diligently prosecute the Work to completion. If, in the Engineer's opinion, the Contractor fails to prosecute the Work to the extent that the above purposes are not being accomplished, the Contractor shall, upon orders from the Engineer, immediately take the steps necessary to fully accomplish said purposes. All costs of prosecuting the Work as described herein shall be paid for by the Contractor. Should the Contractor fail to take the necessary steps to fully accomplish said purposes, after orders of the Engineer to do so, the Engineer may suspend the Work in whole or in part, until the Contractor takes said steps.

As soon as possible under the provisions of these Specifications, the Contractor shall backfill all excavations and restore to usefulness all improvements existing prior to the start of the Work.

### **6-3 SUSPENSION OF WORK**

**6-3.1 General.** The Work may be suspended in whole or in part when determined by the Engineer that the suspension is necessary in the interest of the Agency. The Contractor shall comply immediately with any written order of the Engineer suspending Work. Such suspension shall be without liability to the Contractor on the part of the Agency.

**6-3.2 Archaeological and Paleontological Discoveries.** If discovery is made of items of archaeological or paleontological interest, the Contractor shall immediately cease excavation in the area of discovery and shall not continue until ordered by the Engineer. When resumed, excavation operations within the area of discovery shall be as directed by the Engineer.

Discoveries which may be encountered may include, but not be limited to, dwelling sites, stone implements or other artifacts, animal bones, human bones and fossils.

**6-3.3 Temporary Suspension of Work.** Should suspension of Work be ordered by reason of the failure of the Contractor to carry out orders or to perform any provisions of the Contract; or by reason of weather conditions being unsuitable for performing any item or items of Work; the Contractor, at its expense, shall do all the work necessary to provide a safe, smooth, and unobstructed passageway through construction for use by public traffic during the period of such suspension. In the event that the Contractor fails to perform the work above specified, the Agency may perform such work and the cost thereof charged to the Contractor.

### **6-4, 6-5, 6-6 & 6-7 No Text**

### **6-8 COMPLETION, ACCEPTANCE, AND GUARANTEE**

**6-8.1 Final Inspection.** The Engineer will make a final inspection in accordance with the procedure adopted by the Board of Supervisors.

**6-8.2 Acceptance of Work.** The acceptance of the work as set forth in the Developer's Agreement with the Agency shall be made in writing after the final inspection has been made, in accordance with the policy and procedure adopted by the Board of Supervisors.

### **6-9 No Text**

**6-10 USE OF IMPROVEMENT DURING CONSTRUCTION.** The Agency reserves the right to take over and utilize all or part of any completed facility or appurtenance. The Contractor will be notified in writing in advance of such action. Such action by the Agency will relieve the Contractor of responsibility for injury or damage to said completed portions of the improvement resulting from use by public traffic or from the action of the elements or from any other cause, except injury or damage resulting from the Contractor's operations or negligence. The Contractor will not be required to reclean such portions of the improvement before field completion, except for cleanup made necessary by its operations. Nothing in this section shall be construed as relieving the Contractor from full responsibility for correcting defective work or materials.

In the event the Agency exercises its right to place into service and utilize all or part of any completed facility or appurtenance, the Agency shall assume the responsibility and liability for injury to persons or property arising out of or resulting from the utilization of the facility or appurtenance so placed into service, except for any willful or negligent act or omission by the Contractor, Subcontractor, their officers, employees or agents.

**6-10.1 Use of Improvements - Exceptions.** The provisions of 6-10 shall not apply to projects for the repair, modification, enlargement or improvement of existing facilities that are to remain in use during construction except where a portion of the project which is completely independent from the rest of the Work can be completed and put into use by the Agency.

On projects on public roads, after satisfactory completion of an isolated section of the Work involving roadway improvements or repairs, when all temporary signs and other temporary Contractor facilities have been removed, the section is not being used as a detour, the section is no longer under the Contractor's control, and the section is opened to public traffic through the end of the contract period, that section of the Work shall be taken over by the Agency as provided in 6-10. The Contractor shall indicate to the Engineer in writing when the conditions of this paragraph have been complied with and shall specify the limits of the section involved. Any taking over of the Work by the Agency shall be effective only when formal written notification is issued by the Agency.

**6-11 DISPUTES.** Notwithstanding statements to the contrary contained in 2-10, 2-11, and elsewhere in the specifications, all decisions of the Engineer may be appealed to the Board before becoming final.

No legal action shall be commenced against the Agency in connection with the contract until any dispute or decision of the Engineer has been appealed and denied. The Board's refusal to consider, or failure to consider a written appeal within 15 calendar days after receipt shall be deemed denial of such appeal.

Prior to submitting any appeal to the Board, the Contractor shall exhaust his administrative remedies by attempting to resolve his dispute with Agency's staff in the following sequence:

Construction Inspector  
Construction Engineer  
Director, applicable Department of the Public Works Agency  
Director of Public Works Agency

Should any of the listed persons fail to consider a request by the Contractor for review of a decision within 3 working days after receiving written request to do so, the Contractor may proceed directly to the next person on the list. At the option of the Agency, the person to whom the request for review is directed may elect to take such request to a higher level and the Contractor's request shall be deemed to be properly submitted to such higher level.

Nothing in this section shall be considered as relieving the Contractor from his duties required by the development agreement.

**6-12 No Text**

**6-13 TIME OF PERFORMING WORK**

All work shall be performed between the hours of 7 a.m. and 7 p.m. on Mondays through Fridays. The Developer may make arrangements with the Agency, at the Agency's sole option, for inspection coverage and for work outside of the hours stated herein. Where the Contractor desires to work in excess of 8 hours in one day or on Saturdays, Sundays or Holidays, he shall arrange for inspection in advance and shall pay the cost of any overtime incurred in making such inspection.

## SECTION 7 - RESPONSIBILITIES OF THE CONTRACTOR

**7-1 CONTRACTOR'S EQUIPMENT AND FACILITIES.** The Contractor shall furnish and maintain in good condition all equipment and facilities as required for the proper execution and inspection of the Work. Such equipment and facilities shall meet all requirements of applicable ordinances and laws.

### 7-2 LABOR

**7-2.1 General.** Only competent workmen shall be employed on the Work. Any person employed, who is found to be incompetent, intemperate, troublesome, disorderly or otherwise objectionable, or who fails or refuses to perform its work properly and acceptably, shall be immediately removed from the work by the Contractor and not be reemployed on the Work.

**7-2.2 Laws.** The Contractor, its agents, and employees shall be bound by and comply with all applicable provisions of the Labor Code and with Federal, State, and local laws related to labor.

The Contractor shall strictly adhere to the provisions of the Labor Code regarding minimum wages, the 8-hour day and the 40-hour week, overtime, Saturday, Sunday, and holiday work, and non-discrimination because of race, color, national origin, or religion. The Contractor shall forfeit to the Agency the penalties prescribed in the Labor Code for violations.

In accordance with the Labor Code, the Board has on file and will publish a schedule of prevailing wage rates for the types of work to be done under these Specifications. The Contractor shall pay not less than these rates.

Each worker shall be paid subsistence and travel as required by the collective bargaining agreements on file with the State of California, Department of Industrial Relations.

The Contractor's attention is directed to Section 1776 of the Labor Code, relating to accurate payroll records, which impose a responsibility upon the Contractor for the maintenance, certification, and availability for inspection of such records for all persons employed by the Contractor or by the Subcontractors in connection with the project. The Contractor shall agree through the Contract to comply with this section and the remaining provisions of the Labor Code.

**7-2.2.1 Apprentices.** Apprentices shall be employed on the Work in accordance with Labor Code Section 1777.5. The Contractor is responsible for compliance with Labor Code Section 1777.5 for all apprenticeable occupations whether employed directly or through subcontractors.

**7-2.2.2 Contractors' Duties Concerning Labor Code Compliance.** Labor Code Sections 1771, 1775, 1776, 1777.5, 1813 and 1815 are required to be included in the contract between the Contractor and subcontractors. The Contractor agrees to comply with these sections and all remaining provisions of the Labor Code.

### 7-3 & 7-4 No Text

**7-5 PERMITS.** The Contractor shall obtain, at its own cost, all encroachment and building permits necessary to perform Contract Work in streets, highways, railways or other rights of way. The Contractor shall obtain and pay for all costs incurred for permits necessitated by its operations such as, but not limited to, those permits required for night Work, overload, blasting and demolition.

The Contractor shall pay all business taxes or license fees that are required for the Work.

**7-5.1 Highway and Railroad Permits.** The Contractor shall obtain all State highway and railroad encroachment permits and pay all inspection fees charged by these agencies.

**7-5.2 Grading Permit** All excavation, filling and grading operations in Ventura County are governed by the Ventura County Building Code Appendix J or City Ordinances, except within the project right of way shown on the Plans.

**7-5.3 Building Permit.** The Contractor shall arrange and pay for all required building and related permits from the Department of Building and Safety and other permit issuing agencies.

**7-5.4 Zoning Permits** Permits required for the Contractor's operations must be obtained by the Contractor. Such permits are required for brush removal, grading, dredging, disposal of material and many other operations within protected zones in the County.

**7-6 THE CONTRACTOR'S REPRESENTATIVE.** Before starting the Work, the Contractor shall designate, in writing, a representative who shall have complete authority to act for it. An alternate representative may be designated. The representative or alternate shall be present at the worksite whenever Work is in progress or whenever actions of the elements necessitate its presence to take measures necessary to protect the Work, persons, public or private property. Any order or communication given to this representative shall be deemed delivered to the Contractor. A joint venture shall designate only one representative and alternate. In the absence of the Contractor or its designated representative, necessary or desirable directions or instructions may be given by the Engineer to the superintendent or person having charge of the specific Work to which the order applies. Such order shall be complied with promptly and referred to the Contractor or its representative.

In order to communicate with the Agency, the Contractor's representative, superintendent, or person having charge of specific Work shall be able to speak, read, and write the English language.

**7-7 COOPERATION AND COLLATERAL WORK.** The Contractor shall be responsible for ascertaining the nature and extent of any simultaneous, collateral and essential Work by others. The Agency, its workers and contractors, and others, shall have the right to operate within or adjacent to the worksite to perform such Work.

The Agency, the Contractor, and each of such workers, contractors, and others shall coordinate their operations and cooperate to minimize interference.

The Contractor shall pay all costs involved in its part as a result of coordinating its Work with others.

## **7-8 PROJECT SITE MAINTENANCE**

**7-8.1 Cleanup and Dust Control.** Throughout all phases of construction, including suspension of work, and until final acceptance of the project, the Contractor shall keep the Work Site clean and free from rubbish and debris. The Contractor shall also abate dust nuisance by cleaning, sweeping, and sprinkling with water, or other means as necessary. The use of water resulting in mud on public streets will not be permitted as a substitute for sweeping or other methods.

The Contractor shall furnish and operate a self-loading motor sweeper with spray nozzles at least once each working day to keep paved areas acceptably clean wherever construction, including restoration, is incomplete.

Materials and equipment shall be removed from the site as soon as they are no longer necessary; and upon completion of the Work and before final inspection the Work site shall be cleared of equipment, unused materials, and rubbish so as to present a satisfactory clean and neat appearance.

Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately and the area cleaned.

Excess excavated material from catch basins or similar structures shall be removed from the site immediately. Sufficient material may remain for use as backfill if permitted by the Specifications. Forms and form lumber shall be removed from the site as soon as practicable after stripping.

Failure of the Contractor to comply with the Engineer's cleanup orders may result in an order to suspend work until the condition is corrected.

**7-8.1.1 Final Clean Up.** Before final inspection of the work, the Developer shall clean the job site, material sites, and all ground occupied by him in connection with the work of all rubbish, excess materials, falsework, temporary structures, and equipment. All parts of the work shall be left in a neat and presentable condition. No final inspection or part thereof shall be conducted until the final clean up is complete to the satisfaction of the Engineer.

**7-8.2 Air Pollution Control.** The Contractor shall not discharge smoke, dust, or any other air contaminants into the atmosphere in such quantity as will violate the regulations of any legally constituted authority.

**7-8.3 Vermin Control.** At the time of Acceptance, structures entirely constructed under the Contract shall be free of rodents, insects, vermin and pests. Necessary extermination Work shall be arranged and paid for by the Contractor as part of the Contract Work and shall be performed by a licensed agency in accordance with requirements of governing authorities. The Contractor shall be liable for injury to persons or property and responsible for the elimination of offensive odors resulting from extermination operations.

**7-8.4 Sanitation.** The Contractor shall provide and maintain enclosed toilets for the use of employees engaged in the Work. These accommodations shall be maintained in a neat and sanitary condition. They shall also comply with all applicable laws, ordinances and regulations pertaining to the public health and sanitation of dwellings and camps.

Sewage flows shall not be interrupted. Should the Contractor disrupt existing sewer facilities, sewage shall be conveyed in closed conduits and disposed of in a sanitary sewer system. Sewage shall not be permitted to flow in trenches or be covered by backfill.

**7-8.5 Temporary Light, Power, and Water.** The Contractor shall at its own expense, furnish, install, maintain, and remove all temporary light, power, and water, including piping, wiring, lamps, and other equipment, necessary for the Work. The Contractor shall not draw water from any fire hydrant, except to extinguish a fire, without first obtaining permission from the water agency concerned.

**7-8.6 Water Pollution Control** The Contractor shall prevent, control, and abate discharges of pollutants from the construction site in order to protect the storm drain system, which includes pipes, channels, streams, waterways, and other bodies of water, by the construction, installation or performance of water pollution control measures as shown on the Stormwater Pollution Control Plan (SWPCP) or Stormwater Pollution Prevention Plan (SWPPP), depending on the total land area affected by the construction activity. The Contractor shall ensure compliance with the current State NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activity (General Construction Permit), NPDES No. CAS000002 and current Ventura County NPDES Municipal Separate Storm Sewer System (MS4) Permit No. CAS004002.

#### **7-8.6.1 Compliance with NPDES General Construction Permit**

**7-8.6.1.1 Size of Work or affected area.** If the Work involves construction activity that results in soil disturbance of one acre or more of total land area, or results in soil disturbances of less than one acre but is a part of a work area larger than one acre, the Contractor shall comply with the requirements of the General Construction Permit NPDES No. CAS000002. Construction activity includes clearing, grading, excavation, stockpiling, and reconstruction of existing facilities involving removal and replacement. Construction activity does not include routine maintenance such as, maintenance of original line and grade, hydraulic capacity, or original purpose of the facility.

The Contractor shall comply with requirements of the General Construction Permit (NPDES No. CAS000002), obtained by the Agency, including a site-specific Storm Water Pollution Prevention Plan (SWPPP) for the Work to be developed by Qualified SWPPP Developer (QSD) and implemented by the Qualified SWPPP Practitioner (QSP). After July 1, 2010, the Agency will electronically file all required Permit Registration Documents (PRDs) through the State Water Board's Stormwater Multi-Application and Report Tracking System (SMARTS) website, as required prior to the commencement of construction activity. PRDs consist of the Notice of Intent (NOI), Risk Assessment, Post-Construction Calculations, a Site Map, the SWPPP, a signed certification statement by the Legally Responsible Party (LRP), and the first annual fee. For the Permit application, the Contractor shall submit to Project Manager the following:

- The completed site-specific Risk Assessment
- Post-construction calculations if applicable for the project, and
- Site-specific SWPPP developed in accordance with applicable Permits.

**7-8.6.1.2 Linear Utility Projects;** Contractor shall comply with the requirements of the General Construction Permit NPDES No. CAS000002 for Linear Underground/Overhead projects (LUPs) one acre or greater.

#### **7-8.6.2 Compliance with NPDES MS4 Permit**

**7-8.6.2.1 Construction Sites Less Than One Acre** The Contractor shall ensure implementation of an effective combination of erosion and sediment control Best Management Practices (BMPs) listed in **Table 6** of the Ventura County NPDES MS4 Permit. The Contractor shall develop and implement a Storm Water Pollution Control Plan (SWPCP).

**7-8.6.2.2 Construction Sites One Acre but Less Than 5 Acres** The Contractor shall ensure implementation of an effective combination of appropriate erosion and sediment control BMPs from **Table 7** (BMPs at Construction sites 1 acre or greater but less than 5 acres) of the Ventura County NPDES MS4 Permit in addition to the ones identified in **Table 6** (BMPs at Construction sites less than 1 acre) to prevent erosion and sediment loss, and the discharge of construction wastes. For all construction sites one acre or greater, the Contractor shall submit the SWPPP to the Agency for review and certification as the Local SWPPP.

**7-8.6.2.3 Construction Sites 5 Acres and Greater** The Contractor shall ensure implementation of an effective combination of the following BMPs in **Tables 8** (BMPs at Construction sites 5 acres or greater) in addition to the ones identified in **Table 6** (BMPs at Construction sites less than 1 acre) and **Table 7** (BMPs at Construction sites 1 acre or greater but less than 5 acres) at all construction sites 5 acres and greater to prevent erosion and sediment loss, and the discharge of construction wastes. For all construction sites one acre or greater, the Contractor shall submit the SWPPP to the Agency for review and certification as the Local SWPPP.

#### **7-8.6.2.4 Enhanced Construction BMP Implementation**

Construction sites located on hillsides, adjacent or directly discharging to CWA 303(d) listed waters for siltation or sediment, and directly adjacent to Environmentally Sensitive Areas are termed “high risk sites.” Contractor shall implement enhanced practices that preclude impacts to water quality posed by the high risk sites.

Contractor shall ensure that high risk sites are inspected by the Qualified SWPPP Developer, Qualified SWPPP Practitioner, or Certified Professionals in Erosion and Sediment Control (CPESC) at the time of BMP installation, at least weekly during the wet season, and at least once each 24 hour period during a storm event that generates runoff from the site, to identify BMPs that need maintenance to operate effectively, that have failed or could fail to operate as intended.

During the wet season, the area of disturbance shall be limited to the area that can be controlled with an effective combination of erosion and sediment control BMPs. Enhanced sediment controls should be used in combination with erosion controls and should target portions of the site that cannot be effectively controlled by standard erosion controls described above. Effective sediment and erosion control BMPs proposed by the Contractor shall include the BMPs listed in Table 9 (Enhanced Construction BMP Implementation) of the NPDES MS4 Permit. The Contractor shall implement the BMPs listed in Table 9 unless shown unnecessary. Also, the Contractor shall retain records of the inspection and a determination and rationale of the BMPs selected to control runoff.

#### **7-8.63 Plan.**

**7-8.6.3.1** The SWPCP, required for construction projects less than one acre, shall be prepared in accordance with the requirements of current Ventura County NPDES MS4 Permit No. CAS004002 and County Ordinance No. 4142.

**7-8.6.3.2** The SWPPP, required for construction projects one acre or greater, shall be prepared in accordance with the requirements of the state’s General Construction Permit NPDES Permit CAS000002, Ventura Countywide Stormwater Quality Management Program, NPDES MS4 Permit No. CAS004002, and County Ordinance No. 4142.

**7-8.6.3.3** The SWPCP/SWPPP shall identify potential pollutant sources on the construction site that may affect the quality of discharges, whether non-stormwater or stormwater, from the site and design the use and placement of water pollution control measures, BMPs, to effectively prohibit the entry of pollutants from the site into the storm drain system during construction. At a minimum, and depending on the size of the project area, the SWPCP/SWPPP will include all appropriate minimum BMPs as required by the Ventura Countywide Stormwater Quality Management Program, NPDES MS4 Permit No. CAS004002 (Tables 6 through 9). The SWPCP/SWPPP must utilize the measures recommended in the California Stormwater Quality Association (CASQA) Stormwater BMPs Handbook for Construction (January 2003 version until July 1, 2010 and 2009 version after July 1, 2010). Starting July 1, 2010 SWPPP shall be prepared by QSD as defined in the NPDES Permit CAS000002. The Contractor shall complete, sign and submit the SWPCP/SWPPP for review and final approval by the Project Engineer, prior to issuance of the Notice to Proceed as provided in 6-7.4.

**7-8.6.3.4** For all construction projects one acre and greater, the Contractor shall submit the SWPPP to the Agency for review and certification as Local SWPPP in accordance with NPDES MS4 Permit No. CAS004002 prior to the Notice to Proceed as provided in 6-7.4.

#### **7-8.6.4 Measures.**

All water pollution control measures shall conform to the requirements of the submitted SWPCP/SWPPP. If circumstances during the course of construction require changes to the original SWPCP/SWPPP, a revised SWPCP/SWPPP shall be promptly submitted to the Project Manager in each instance. The SWPPP shall be amended or revised by QSD. A copy of the current SWPCP/SWPPP including revisions and amendments shall be kept at the site to ensure that field personnel has access to the current document at all times. If measures being taken are inadequate to control water pollution effectively, the Project Manager may direct the Contractor to revise the operations and no further work shall be performed until adequate water pollution control measures are implemented. Effective September 2, 2011, implementation of the SWPPP shall be overseen by the Contractor's QSP as defined in the General Construction Permit NPDES No. CAS000002. All work installed by the Contractor in connection with the SWPCP/SWPPP but not specified to become a permanent part of the Work shall be removed and the site restored in so far as practical to its original condition prior to completion of the Work.

**7-8.6.4.1 Post-Construction Standards;** Contractor shall ensure that applicable post-construction standards are implemented to meet applicable project requirements of the Ventura County NPDES MS4 Permit and General Construction Permit NPDES No. CAS000002 (effective September 2, 2012).

**7-8.6.4.2 Active Treatment Systems;** Contractor shall comply with requirements of the General Construction Permit NPDES No. CAS000002 for active treatment systems as applicable.

#### **7-8.6.5 Monitoring and Reporting**

**7-8.6.5.1 Monitoring;** In accordance with the General Construction Permit NPDES No. CAS000002, the Contractor shall develop and implement monitoring program for Risk Level 2 and 3 sites. In addition at Risk Level 3 sites, contractor shall perform receiving water monitoring to meet Permit requirements.

**7-8.6.5.2 Reporting;** the Contractor shall ensure that all submittals and reports are prepared and submitted to the RWQCB in accordance with the applicable Permits. At minimum the reports will include Annual Report (for applicable projects due September 1<sup>st</sup>), Rain Event Action Plan (due 48 hrs prior to the rain event for the applicable projects), Numeric Action Levels (NAL) Exceedance Report (as required), Numeric Effluent Limitations (NELs) Violation Report (within 24 hours after NEL exceedance is identified). Contractor shall submit required reports to the Project Manager for review and approval prior to submittal to the RWQCB.

**7-8.7 Drainage Control.** The Contractor shall maintain drainage within and through the Work areas. Earth dams will not be permitted in paved areas. Temporary dams of sandbags, asphaltic concrete or other acceptable material will be permitted when necessary to protect the Work, provided their use does not create a hazard or nuisance to the public. Such dams shall be removed from the site as soon as their use is no longer necessary.

**7-8.8 Final Cleaning.** At the completion of the Work, the Contractor shall remove all waste materials and rubbish from and about the project, as well as all tools, construction equipment, temporary facilities, machinery, and surplus materials.

At completion of construction and just prior to final inspection, the Contractor shall thoroughly clean the interior and exterior of the buildings, including hardware, floors, roofs, sills, ledges, glass, or other surfaces where debris, plaster, paint, spots, and dirt or dust may have collected. All glass shall be washed clean and polished. Remove all grease, stains, labels, fingerprints, and other foreign materials from interior and exterior surfaces. Repair, patch, and touch up marred surfaces to match adjacent finishes.

The Contractor shall use only experienced workmen or professional cleaners for final cleaning. It shall use only cleaning materials recommended by the manufacturer of the surface to be cleaned, and use cleaning materials only on surfaces recommended by the cleaning material manufacturer.

It shall broom-clean all paved surfaces and rake-clean other surfaces of grounds.

The Contractor shall replace air conditioning filters if units were operated during construction, and clean all ducts, blowers, and coils if air conditioning units were operated without filters during construction.

After cleaning, the Contractor shall maintain the building in a clean condition until it is accepted by the Agency.

**7-9 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS.** The Contractor shall be responsible for the protection of public and private property adjacent to the Work and shall exercise due caution to avoid damage to such property.

The Contractor shall repair or replace all existing improvements which are damaged or removed as a result of its operations and which are not designated for removal (e.g. curbs, sidewalks, driveways, fences, walls, signs, utility installations, pavements, structures, etc.). Repairs and replacements shall be at least equal to existing improvements, and shall match them in finish and dimension.

Trees, lawns, and shrubbery that are not designated to be removed shall be protected from damage or injury. If damaged or removed because of the Contractor's operations, they shall be restored or replaced in as nearly the original condition and location as is reasonably possible. Lawns shall be reseeded and covered with suitable mulch.

The Contractor shall give reasonable notice to occupants or owners of adjacent property to permit them to salvage or relocate plants, trees, fences, sprinklers and other improvements which are designated for removal and would be destroyed because of the Work.

All costs to the Contractor for protecting, removing, and restoring existing improvements shall be paid for by the Contractor.

In existing buildings, all surfaces, equipment, furniture and other property shall be protected from loss or damage by or as result of the Contractor's operations. The Contractor shall replace damaged property or shall repair and restore it to its previous condition. Patching, painting, replacement of wall, ceiling and floor covering and similar Work shall be done in such a manner that the repaired Work will not be readily noticeable.

## **7-10 PUBLIC CONVENIENCE AND SAFETY**

### **7-10.1 Access.**

**7-10.1.1 General.** The Contractor's operations shall cause no unnecessary inconvenience to the public or businesses in the vicinity of the Work. The Contractor shall have no greater length or quantity of Work under construction than can be properly prosecuted with a minimum of inconvenience to the public and other contractors engaged in adjacent or related work.

The Contractor shall provide continuous and unobstructed access to the adjacent properties unless otherwise specified in the Special Provisions or approved by Engineer. Work requiring traffic lane closures shall only be performed between the hours specified in the Special Provisions or shown on the TCP. Traffic shall be permitted to pass through the Work site, unless otherwise specified in the Special Provisions or shown on the TCP.

**7-10.1.1.1 Vehicular Access.** Vehicular access to residential driveways shall be maintained to the property line except when necessary construction precludes such access. If backfill has been completed to the extent that safe access may be provided and the street is opened to local traffic, the Contractor shall immediately clear the street and driveways and provide and maintain access.

**7-10.1.1.2 Pedestrian Access.** Safe, adequate, and ADA compliant pedestrian access shall be maintained unless otherwise approved by the Engineer. 7-10.2 Work Area Traffic Control.

**7-10.2.1 General.** Work area traffic control shall conform to the California MUTCD, WATCH, or as specified in the Special Provisions. The total length of the traffic control zone shall include a buffer space, advance signing, striping transitions in advance of the Work site, existing striping, signing, and raised medians.

## **7-10.2.2 Traffic Control Plan.**

**7-10.2.2.1 General.** If so specified in the Special Provisions or on the permit, the Contractor shall submit a TCP in accordance with 2-5.3. The sheets of the TCP shall display the title, phase identification, name of the firm preparing the TCP, name and stamp of the Registered Traffic or Civil Engineer, approval block for each jurisdictional agency, north arrow, sheet number, and number of sheets comprising the TCP. General notes and symbol definitions shall be included when required. Adequate dimensioning shall be provided to allow for proper field installation. The TCP shall be drawn to a 1 inch = 40 feet scale on common size sheets, either 8-1/2 inches x 11 inches, 8-11/2 inches x 14 inches, 11 inches x 17 inches, or 2-foot x 3-foot plan sheets as dictated by the length of the Work.

The requirements in the Special Provisions shall govern the design of the proposed TCP.

### **7-10.2.2.2 No Text**

**7-10.3 Haul Routes.** Unless otherwise specified in the Special Provisions, the haul route(s) shall be determined by the Contractor.

## **7-10.4 Safety.**

### **7-10.4.1 Work Site Safety.**

**7-10.4.1.1 General.** The Contractor shall provide safety measures as necessary to protect the public and workers within, or in the vicinity of, the Work site. The Contractor shall ensure that its operations will not create safety hazards. The Contractor shall provide safety equipment, material, and assistance to Agency personnel so that they may properly inspect all phases of the Work. When asbestos is being removed, the requirements of the CCR Title 8, Div. 1, Chapter 4, Subchapter 4 and Subchapter 7 shall be implemented.

**7-10.4.1.2 Work Site Safety Official.** The Contractor shall designate in writing a "Project Safety Official" who shall be at the Work site at all times, and who shall be thoroughly familiar with the Contractor's Injury and Illness Prevention Program (IIPP) and Code of Safe Practices (CSP). The Project Safety Official shall be available at all times to abate any potential safety hazards and shall have the authority and responsibility to shut down an unsafe operation, if necessary.

### **7-10.4.2 Safety Orders.**

**7-10.4.2.1 General.** The Contractor shall have at the Work site, copies or suitable extracts of Construction Safety Orders, Tunnel Safety Orders, and General Industry Safety Orders issued by the State Division of Industrial Safety. Prior to beginning any excavation 5 feet in depth or greater, the Contractor shall submit to the Engineer, the name of the "Competent Person" as defined in CCR, Title 8, Section 1504, in accordance with 2-5.3. The "Competent Person" shall be present at the Work site as required by Cal-OSHA.

**7-10.4.2.2 Shoring Plan.** Before excavating any trench 5 feet (105m) or more in depth, the Contractor shall submit in accordance with 2-5.3 a detailed working drawing (shoring plan) showing the design of the shoring, bracing, sloping, or other provisions used for the workers' protection. If the shoring plan varies from the shoring system standards, the shoring plan shall be prepared by a registered Structural or Civil Engineer. The shoring plan shall accommodate existing underground utilities. No excavation shall start until the Engineer has accepted the shoring plan and the Contractor has obtained a permit from the State Division of Industrial Safety. A copy of the permit shall be submitted to the Engineer in accordance with 2-5.3. If the Contractor fails to submit a shoring plan or fails to comply with an accepted shoring plan, the Contractor shall suspend work at the affected location(s) when directed to do so by the Engineer.

**7-10.4.3 Use of Explosives.** Explosives may be used only when authorized in writing by the Engineer, or as otherwise specified in the Special Provisions.

Explosives shall be handled, used, and stored in accordance with all applicable regulations.

Prior to blasting, the Contactor shall comply with the following requirements:

- a) The jurisdictional law enforcement agency shall be notified 24 hours in advance of blasting.
- b) The jurisdictional fire department shall be notified 24 hours in advance of blasting.
- c) Blasting activities and schedule milestones shall be included in the Contractor's construction schedule per 6-1.

For a Private Contract, specific permission shall be obtained from the Agency in writing, prior to any blasting operations in addition to the above requirements.

The Engineer's approval of the use of explosives shall not relieve the Contractor from liability for claims caused by blasting operations.

**7.10.4.3A Procedures.** When explosives are used, the following measures shall be taken:

- a. Developer/permittee shall retain a registered geophysicists to develop a monitoring plan, monitor the blasting and provide daily and final reports on the blasting.
- b. The geophysicists shall offer to inspect all structures within a 300 ft. minimum of the blasting area before and after the blasting or as recommended by the geophysicists.
- c. The geophysicists shall report on the intensities of the blast measured at locations within and around a 300 ft. radius minimum of the blasting area or as recommended by the geophysicists.
- d. The Development and Inspection Services Division will create and maintain a list of qualified consultants who are capable of conducting independent surveys of structures on privately and publicly owned properties. If a property is located within a 300 ft. radius of any blasting area, as set out in accordance with subparagraph b above, then the Director of Public Works or his designee will randomly select a consultant from the maintained list to perform the structure survey and will provide that information to the developer/permittee prior to the commencement of the public notification process as set out in subparagraph f, below. If a structure survey is requested from a property owner in accordance with subparagraph b above, the developer/permittee will enter into a contract with the selected consultant to perform the work and pay their fees accordingly. The list of qualified consultants will be kept on file within the Development and Inspection Services Division.
- e. All blasting shall be conducted between the hours of 9:00 a.m. and 3:00 p.m.

#### **7.10.4.3A Procedures. (Continued)**

f. Developer/permittee shall be responsible for administering the following public notification process prior to the first blasting event:

(i) A pre-blast neighborhood informational meeting shall be arranged and held to inform residents and businesses within a 2,000 ft. radius of the blasting area about the blasting program. The meeting will be held on a date and at a time recognized as being convenient to residents, at a facility located close to the subject property, and no later than seven calendar days prior to the first permitted blast event.

(ii) Residents and businesses within a 2,000 ft. radius of the blasting area, and the County Development and Inspection Services Division, shall receive written notification of the neighborhood informational meeting no later than seven calendar days prior to the meeting date. Written notification shall specify the date, time, location, and purpose of the meeting, and general information pertaining to the nature, extent, and schedule for the blasting, and a map showing blasting location(s). Owners of privately and publicly owned properties within a 300 ft. radius of any blasting area will also be notified in accordance with subparagraph b above, and their option for a structure survey.

(iii) Representatives of the developer/permittee and the blasting contractor shall be present at the neighborhood informational meeting and shall inform residents and businesses of the nature, extent, and schedule of the proposed blasting. Resident input on the blasting program will be solicited. A copy of all materials provided to the residents and businesses shall be forwarded to the County Development and Inspection Services Division.

(iv) A daytime telephone number of a representative of the applicant who was issued the blasting permit and represents the blasting contractor will be provided to residents and businesses so that they may be contacted with questions or complaints during the blasting event(s).

(v) All residents and businesses of the area within the 2,000 ft. public notification radius shall also receive a reminder notification at least 24 hours prior to each blasting event. For areas within a 1,000 ft. radius of each blasting area, determined by the geophysicists to be sensitive, all residents and businesses shall also be notified one hour before each day's blast to ensure safety.

g. The geophysicists shall develop specific blasting specifications and monitoring for blasting within 1,500 ft. of any dam or water storage facility.

**7-10.4.4 Hazardous Substances.** An MSDS as described in CCR, Title 8, Section 5194, shall be maintained at the Work site for all hazardous material used by the Contractor. Material usage shall be accomplished with strict adherence to California Division of Industrial Safety requirements and all manufacturer warnings and application instructions listed on the MSDS and on the product container label. The Contractor shall notify the Engineer if a specified product cannot be used under safe conditions.

#### **7-10.4.5 Confined Spaces.**

**7-10.4.5.1 Confined Space Entry Program (CSEP).** The Contractor shall be responsible for implementing, administering and maintaining a CSEP in accordance with CCR, Title 8, Sections 5156, 5157 and 5158.

Prior to the start of the Work, the Contractor shall prepare and submit a CSEP in accordance with 2-5.3. The CSEP shall address all potential physical and environmental hazards and contain procedures for safe entry into confined spaces such as the following:

- a) Training of personnel
- b) Purging and cleaning the space of materials and residue
- c) Potential isolation and control of energy and material inflow
- d) Controlled access to the space
- e) Atmospheric testing of the space
- f) Ventilation of the space
- g) Special hazards consideration
- h) Personal protective equipment
- i) Rescue plan provisions

The submittal shall include the names of the Contractor's personnel, including each Subcontractor's personnel, assigned to the Work that will have CSEP responsibilities, their CSEP training, and their specific assignment and responsibility in carrying out the CSEP.

**7-10.4.5.2 Permit-Required Confined Spaces.** Entry into permit-required confined spaces as defined in CCR, Title 8, Section 5157 may be required as a part of the Work. Manholes, tanks, vaults, pipelines, excavations, or other enclosed or partially enclosed spaces shall be considered permitrequired confined spaces until the pre-entry procedures demonstrate otherwise. The Contractor shall implement a permit-required CSEP prior to performing any work in a permit-required confined space. A copy of the permit shall be available at all times for review by the Contractor and the Engineer at the Work site.

#### **7-10.5 Security and Protective Devices.**

**7-10.5.1 General.** Security and protective devices shall consist of fencing, steel plates, or other devices as specified in the Special Provisions to protect open excavations

**7-10.5.2 Security Fencing.** The Contractor shall completely fence open excavations. Security fencing shall conform to 304-3.5. Security fencing shall remain in place unless workers are present and construction operations are in progress during which time the Contractor shall provide equivalent security.

**7-10.5.3 Steel Plate Covers.** The Contractor shall provide steel plate covers as necessary to protect from accidental entry into openings, trenches, and excavations.

**7-10.3 Haul Routes.** Unless otherwise specified in the Special Provisions, the haul route(s) shall be determined by the Contractor.

**7-11 PATENT FEES OR ROYALTIES.** The Contractor shall pay for the patent fees or royalties on any patented article or process which may be furnished or used in the Work. The Contractor shall indemnify and hold the Agency harmless from any legal action that may be brought for infringement of patents.

**7-12 ADVERTISING.** The names of contractors, subcontractors, architects, or engineers, with their addresses and the designation of their particular specialties, may be displayed on removable signs. The size and location of such signs shall be subject to the Engineer's approval.

Commercial advertising matter shall not be attached or painted on the surfaces of buildings, fences, canopies, or barricades.

**7-13 LAWS TO BE OBSERVED.** The Contractor shall keep himself fully informed of State and National laws and County and Municipal ordinances and regulations which in any manner affect those employed in the Work or the materials used in the Work or in any way affect the conduct of the Work. It shall at all times observe and comply with all such laws, ordinances and regulations.

**7-14 NO TEXT**

**7-15 RECYCLABLE CONSTRUCTION & DEMOLITION WASTES.** Ventura County Ordinance Code Section, 4770 et seq., requires that If any recyclable solid wastes or marketable reusable materials will be generated on the site of the Work, the Contractor shall prepare a Construction & Demolition Debris Waste Diversion Plan and submit it to the Ventura County Public Works Agency, Environmental and Energy Resources Department. The Contractor shall prepare and file Construction & Demolition Debris Waste Diversion Reporting Forms as required by the Environmental and Energy Resources Department.

**7-16 NO TEXT**

**7-17 LOSS OR DAMAGE TO THE WORK.** The Contractor is responsible for delivering to the Agency Work completed in accordance with the Contract. Should the Work being constructed be damaged by fire or other causes before Acceptance by the Agency, it shall be replaced in accordance with the requirements of the Plans and Specifications without expense to the Agency. Contractor should arrange for its own insurance to protect its interests.

## **SECTION 8 - NO TEXT**

### **SECTION 9 - MEASUREMENT AND PAYMENT BY DEVELOPER**

The Developer shall relieve the Agency and the Engineer of any responsibility for measuring quantities for use in pay estimates. Any reference made in the specifications to measurement for payment, or payment shall not be considered within the scope of the agreement between the Agency and the Developer.

## **SECTION 10 - DIVERSION AND CONTROL OF WATER**

**10-1 DESCRIPTION.** All permanent construction shall be performed in a site free from water unless otherwise provided for in the special provisions. Construct, maintain and operate all necessary cofferdams, pumps, channels, flumes, drains and/or other temporary diversion and protective works required for diversion and control of all water, whatever its source, during construction.

Inundation of partially completed work due to lack of control during non-working periods will not be permitted and may be cause for requiring removal and replacement of work already completed.

Obtain the use of any property, in addition to that provided for in the plans and specifications, which may be required for the diversion and protective works so as not to create a hazard to persons or property or to interfere with the water rights of others.

**10-2 DIVERSION AND CONTROL WORKS.** All works installed in connection with dewatering, control, and diversion of water but not specified to become a permanent part of the project, shall be removed and the site restored, insofar as practical, to its original condition prior to completion of construction or when directed by the Engineer.

**MODIFICATIONS AND ADDITIONS TO SSPWC**

**PART 2 - CONSTRUCTION MATERIALS**

**SECTION 200 - ROCK MATERIALS**

**200-1 ROCK PRODUCTS**

**200-1.6 Stone for Riprap**

**200-1.6.1A Alternate Stone for Riprap.** As an alternate to the requirements of 200-1.6, the sample may be subject to the following tests:

TESTS	TEST METHOD NO.	REQUIREMENTS
Apparent Specific Gravity	ASTM C 127	2.40 Min.
Resistance to Abrasion	ASTM C 535, Grading 1	35% Max.
Soundness	Section 211-8	10% Max.
Wet and Dry Loss	Section 211-9	5% Max.
Solubility	Section 211-10	No Loss

All rock shall be angular or subangular in shape. Angular shall be defined as having sharp corners and straight planes on all faces, with no evidence of wear caused by wind, water or abrasion. Subangular shall be defined the same as angular except that evidence of wear by wind, water or abrasion may be allowed. Determination of angularity will be made by the Engineer.

**200-1.6.2A Riprap Gradation by Classes.** The individual classes of rock used for riprap shall conform to the following:

Rock Sizes	RIPRAP CLASSES					
	1-Tonne (1-Ton)	½-Tonne (½-Ton)	¼-Tonne (¼-Ton)	Light	Facing	Cobble
	PERCENTAGE LARGER THAN					
2-Tonne (2-Ton)	0-5					
1-Tonne (1-Ton)	50-100	0-5				
½-Tonne (½-Ton)		50-100	0-5			
¼-Tonne (¼-Ton)	90-100		50-100	0-5		
100-kg (200-lb)		90-100		50-100	0-5	
35-kg (75-lb)			90-100	90-100	50-100	0-5
10-kg (25-lb)					90-100	95-100
0.5-kg (1-lb)	100	100	100	100	100	100

The amount of material smaller than the smallest size listed in the table for any class of riprap shall not exceed the percentage limit listed in the table determined on a weight basis.

Compliance with the percentage limit shown in the table for all other sizes of the individual pieces of any class of riprap shall be determined by the ratio of the number of individual pieces larger than the specified size compared to the total number of individual pieces larger than the smallest size listed in the table for that class.

Flat or needle shapes will not be accepted unless the thickness of individual pieces is greater than 1/3 the length.

Before placing in final location, depositing, or stockpiling within the project limits, each individual load of riprap must meet the size requirements of the class specified.

## SECTION 203 - BITUMINOUS MATERIALS

### 203-16 MALTENE EMULSION

**203-16.1 General.** Maltene emulsion shall be composed of a petroleum resin oil base, uniformly emulsified with water.

**203-16.2 Testing Requirements.** The maltene emulsion shall conform to the following requirements:

Specification Designation	Test Method	Requirements
Viscosity, S.F., at 25°C (77°F), sec.	ASTM D 244	15-40
Residue, % Min. (1)	ASTM D 244 (1)	60
Miscibility Test (2)	ASTM D 244 (1)	No Coagulation
Sieve Test, % Max. (3)	ASTM D 244 (1)	0.10
Particle Charge Test	ASTM D 244	Positive
<b>Tests on Residue from ASTM D 244 Modified (1):</b>		
Viscosity, cs., 60°C (140°F)	ASTM D 445	100-200
Asphaltenes, % Max.	ASTM D 2006	0.75
Maltenes Dist. Ratio (4) $(PC + A_1)/(S + A_2)$		

- (1) ASTM D 244 Modified Evaporation Test for percent of residue is made by heating 50 gram (0.11 lb) sample to 150°C (300°F) until foaming ceases, then cool immediately and calculate results.
- (2) Test procedure identical with ASTM D 244 except that 0.02 Normal Calcium Chloride solution shall be used in place of distilled water.
- (3) Test procedure identical with ASTM D 244 except that distilled water shall be used in place of 2% sodium oleate solution.
- (4) In the Maltenes Distribution Ratio Test by ASTM Method D 2006:

PC = Polar Compounds                      S = Saturates  
A<sub>1</sub> = First Acidaffins                      A<sub>2</sub> = Second Acidaffins

The material shall have a record of increasing the ductility and decreasing the viscosity of the asphalt binder in the pavement surface.

**203-16.3 Test Reports and Certification.** Test reports and certifications shall be made in accordance with applicable portions of 203-1.3.

**203-16.4 Temperatures.** Temperature controls for maltene emulsions shall conform to the requirements of 203-3.4.

The temperature at application shall not exceed 54°C (130°F).

**203-16.5 Distributing.** Before spreading, the maltene emulsion shall be cut back at the rate of 1 part water to 2 parts emulsion.

Distribution shall be the same as specified in 302-5.4.1.

## SECTION 206 - MISCELLANEOUS METAL ITEMS

### 206-3 GRAY IRON AND DUCTILE IRON CASTING

#### 206-3.3.2 Manhole Frame and Cover Sets

**206-3.3.2A Selection.** Unless otherwise specified, manhole frames and covers shall be in accordance with the following standard plans contained in the SPPWC:

Clear Opening Diameter mm (In.)	SPPWC Plan No.	Catalog Numbers	
		Alhambra Foundry	Long Beach Iron Works
600 (24)	630-1	A-1495	X-162
675 (27)	631-1	A-1496	X-164
750 (30)	632-1	A-1497	X-163
900 (36)	633-1	A-1498	X-106A

#### 206-5 METAL RAILINGS.

##### 206-5.2 Flexible Metal Guard Rail Materials.

**206-5.2A Flexible Metal Guard Rail Materials; Modification.** The "Construction" grade Douglas Fir for "posts, including blocks" does not have to be "free of heart center".

## SECTION 207 - PIPE

### 207-2 REINFORCED CONCRETE PIPE

#### 207-2.1 General

**207-2.1.1 Class R.C.** Where reinforced concrete pipe is designated by the word Class followed by a Roman numeral, the design D-Load shall be as specified in ASTM C 76 for the class indicated.

#### 207-4 CONCRETE CYLINDER PIPE

##### 207-4.2 Design, Manufacture, and Tests

**207-4.2.1 Steel Cylinder Pipe Manufacture.** Minimum steel cylinder thickness shall be 2.6 mm (U.S. Standard 12 gauge) for 250 mm (10 In.) size pipe and 3.5 mm (U.S. Standard 10 gauge) for pipe sizes 300 mm (12 In.) through 1050 mm (42 In.). Cement shall be Type II.

Pipe shall be rated a minimum of 1035 kPa (150 PSI) working pressure unless otherwise specified.

**207-4.4 Connections.** Only factory installed service or other connections are permitted. No field taps will be allowed on new installations.

### 207-5 REINFORCED CONCRETE PRESSURE PIPE

#### 207-5.2 Manufacture and Tests

**207-5.2.1 Special Requirements.** Minimum steel cylinder thickness shall be 3.5 mm (U.S. Standard 10 gauge). Cement shall be Type II. Pipe shall be rated at 1035 kPa (150 PSI) working pressure unless otherwise specified.

**207-5.3 Connections.** Only factory installed service or other connections are permitted. No field taps will be allowed on new installations.

## **207-9 IRON PIPE AND FITTINGS**

### **207-9.1 General**

**207-9.1.1 Special Requirements.** The pipe shall be centrifugally cast in metal molds. Pipe cast in sand molds shall not be used.

Thickness shall be in accordance with AWWA C101 for cast iron pipe or AWWA C150 for Ductile Iron Pipe

Fittings shall be Class D or better, Los Angeles Standard, with ends to suit the pipe. Pipe and fittings shall be lined with a continuous coat of coal tar lining in accordance with 207-10.4.4.

## **207-10 STEEL PIPE**

### **207-10.2 Fabricated Steel Pipe**

#### **207-10.2.5 Joints**

**207-10.2.5A Special Requirements.** Tapered ends for driven field joints shall not be used. Flexible mechanical couplings shall be installed only in those locations where they are designated on the plans. In welded joints only, full lap weld joints shall be used and shall be in accordance with AWWA C206.

**207-10.2.9 Connections.** Only factory installed service or other connections are permitted. No field taps will be allowed on new installations.

### **207-10.3 Mill-type Steel Water Pipe**

#### **207-10.3.5 Special Sections**

**207-10.3.5A Additional Requirements.** The dimensions of fittings and other special sections shall conform to AWWA C208. Lining of fittings and special sections shall be factory applied epoxy only in accordance with AWWA C213.

### **207-10.4 Protective Lining and Coating for Steel Pipe**

#### **207-10.4.1 General**

**207-10.4.1A Additional Requirements.** Only cement mortar coating and lining or epoxy shall be used. The epoxy lining shall be in accordance with AWWA C213. Except for minor repairs, epoxy lining shall be applied at the manufacturer's plant.

## **207-11 CORRUGATED STEEL PIPE AND PIPE ARCHES**

### **207-11.1 General**

**207-11.1.1 Special Requirements.** Corrugated steel pipe and arches shall be in accordance with HDM §854.3 with Tables and SSP D-88 & D-97, and these specifications.

## **207-15 ABS SOLID WALL PIPE**

### **207-15.1 General**

**207-15.1.1 Special Requirements.** The maximum standard dimension ratio (SDR) shall be 35 except that 100 mm (4 In.) and 150 mm (6 In.) size pipe shall have a maximum SDR of 23.5.

## **207-17 PVC PLASTIC PIPE**

### **207-17.1 General**

**207-17.1.1 Polyvinyl Chloride (PVC) Water Supply Pipe.** PVC pipe and materials used for water supply shall meet the following requirements of:

- a. AWWA C900 for pipe 300 mm (12 In.) or less in diameter.
- b. AWWA C905 for pipe greater than 300 mm (12 In.) in diameter.

## **SECTION 208 - PIPE JOINT TYPES AND MATERIALS**

### **208-2 JOINTS FOR CLAY PIPE**

#### **208-2.1 General**

**208-2.1.1 Limitations.** Vitrified clay pipe joints shall be Type "D" or Type "G".

## **SECTION 210 - PAINT AND PROTECTIVE COATINGS**

### **210-6 STORM DRAIN HARDWARE**

All storm drain hardware, including manhole frames and covers, grates, protection bars, steps, etc., shall be protected from corrosion.

Storm drain hardware made of cast iron shall be protected by painting with, or dipping in, a commercial grade asphalt paint. Storm drain hardware made of steel shall be galvanized.

## **SECTION 211 - SOILS AND AGGREGATE TEST**

### **211-1 COMPACTION TESTS**

**211-1.1.1 Laboratory Maximum Density.** Method 2 shall be used for base and subbase materials.

**211-5 R-VALUE.** Resistance (R-Value) shall be determined by Cal. Test 301 with expansiveness determined by the CBR Method.

**211-6 APPARENT SPECIFIC GRAVITY AND ABSORPTION.** Apparent specific gravity and absorption shall be determined by Cal. Tests 206 through 209, 224, 225, or 308, Method C, where zinc stearate may be substituted for paraffin.

**211-7 LOS ANGELES RATTLER TEST.** Loss in Los Angeles Rattler shall be determined by Cal. Test 211.

**211-8 SOUNDNESS.** For riprap, the soundness shall be determined in accordance with Cal. Test 214 (excluding Sections D, E, G.2.b, and H) and the following:

- a. The test sample shall be prepared by breaking or sawing a representative sampling of riprap into particles passing the 75 mm (3 In.) sieve and retained on the 50 mm (2 In.) sieve. If there are a variety of rock types or degrees of weathering within a rock type, each unique type or condition must meet the loss requirement.
- b. The test sample size shall be 25,000 grams (55 lbs.) plus or minus one percent.
- c. All particles of the test sample which break into three or more pieces during testing shall be discarded. The remaining sample shall be washed on a 4.74 mm (#4) sieve and all particles retained shall be oven dried.
- d. The loss in weight shall be determined by subtracting from the original weight of the test sample the final weight of all particles retained on the 4.75 mm (#4) sieve.

Report the percent loss and the number of pieces affected, classified as to number disintegrating, splitting, crumbling, cracking, flaking, and other deleterious effects.

**211-9 WET AND DRY LOSS.** Wet and dry loss shall be determined as follows:

A sample of rock shall be crushed, screened, oven-dried and 1,000 g (2.2 lbs.) to 1,500 g (3.3 lbs.) of the 19 mm (3/4-In.) to 9.5 mm (3/8-In.) fraction shall be taken for the test.

The crushed and graded sample shall be submerged in tap water for 18 hours at room temperature, after which the sample shall be drained and oven-dried at 78°C (140°F). When dry, the sample shall be cooled to room temperature. This completes one cycle.

After 10 cycles, the percent loss shall be computed as follows:

$$\% \text{ Loss} = \frac{100 \times \text{Weight of Material Passing 4.75 mm (\#4) Sieve}}{\text{Total Weight of Sample}}$$

**211-10 SOLUBILITY.** Approximately 0.5 kg (1 lb.), air-dried samples shall be immersed in local tap water and in Pacific Ocean water (or a 3.5% sodium chloride solution) for 8 hours each at 78°C (140°F). After immersion, the samples shall be washed with tap water, air-dried and reweighed.

**PART 3 - CONSTRUCTION METHODS**  
**SECTION 301 - TREATED SOILS, SUBGRADE PREPARATION**  
**AND PLACEMENT OF BASE MATERIALS**

**301-1 SUBGRADE PREPARATION**

**301-1.3 Relative Compaction**

**301-1.3.1 Definition.** The term "firm, hard and unyielding" as used in 301-1.3 shall mean that when the heaviest construction and hauling equipment used on the project drives over the subgrade, no permanent deformation shall occur either before or during pavement construction.

**301-1.4 Subgrade Tolerances.** Subgrade for pavement, sidewalk, curb and gutter, driveways, or other roadway structures shall not vary more than 15mm (0.05 Ft.) from the specified grade and cross section. Subgrade for subbase or base material shall not vary more than 15 mm (0.05 Ft.) from the specified grade and cross section.

Variations within the above specified tolerances shall be compensating so that the average grade and cross section specified are met.

**301-2 UNTREATED BASE**

**301-2.3 Compacting**

**301-2.3.1** The tolerance requirement in 301-2.3 is modified from 6 mm (0.02 Ft.) to 15 mm (0.05 Ft.).

**SECTION 302 - ROADWAY SURFACING**

**302-5 ASPHALT CONCRETE PAVEMENT**

**302-5.1 General**

**302-5.1.1 Asphalt Concrete Berms.** Asphalt concrete berms shall be constructed of Class III-D-PG70-10 asphalt concrete by mechanical means to conform to the details and locations as shown on the plans.

A tack coat, as provided in 302-5.4, shall be applied to the existing or new pavement preceding the placement of the asphalt concrete berms.

**302-5.4 TACK COAT**

**302-5.4.1 Fog Seal.** When specified, a fog seal consisting of material meeting the requirements of 203-13 shall be applied to the surfaces of all completed asphalt concrete at the rate of 0.36 l/m<sup>2</sup> (0.08 Gal per Sq. Yd.) of the combined emulsion or such lesser rate ordered by the Engineer. Surface to be sealed shall be free from dust, dirt, and other foreign material.

## SECTION 303 - CONCRETE AND MASONRY CONSTRUCTION

### 303-5 CONCRETE CURBS, WALKS, GUTTERS, CROSS GUTTERS, ALLEY INTERSECTIONS, ACCESS RAMPS AND DRIVEWAYS

#### 303-5.1 Requirements

**303-5.1.4 Concrete Substitution.** Class 280-C-14 (470-C-2000) may be used in lieu of Class 310-C-17 (520-C-2500) and Class 280-D-14 (470-D-2000) in lieu of Class 310-D-17 (520-D-2500) as specified in 201-1.1.2 for street surface improvements, excluding concrete pavement, when no class is specified on the plans or in the special provisions.

### 303-9 CONCRETE CONSTRUCTION TOLERANCES FOR FLOOD CONTROL AND DRAINAGE FACILITIES

**303-9.1 Tolerances for Formed Surfaces.** The forms shall be constructed and rigidly braced in place so that the resulting concrete meets the tolerances shown below.

- a) Variation from the plumb in the lines and surfaces of walls, and from the level or grade in floors and slabs, as shown in the drawings:  
Gradual 13 mm ( $\frac{1}{2}$  In.) measured with 1.5 m (5 Ft.) long straight edge.  
Abrupt 6 mm ( $\frac{1}{4}$  In.)
- b) Variation in the size and location of wall and/or floor openings:  
6 mm ( $\frac{1}{4}$  In.)
- c) Variation in thickness of walls and slabs:  
6 mm ( $\frac{1}{4}$  In.) minus  
13 mm ( $\frac{1}{2}$  In.) plus

#### 303-9.2 Tolerances for Unformed Surfaces

- a) Departure from established alignment:

On Tangents	50 mm	(2 In.)
On Curves	100 mm	(4 In.)
- b) Departure from established grade:  
25 mm (1 In.)
- c) Variation in the lines shown in the drawings for channel linings:

Bottom	6 mm ( $\frac{1}{4}$ In.) measured with a 3 m (10 Ft.) long straight edge.
Side Slope	13 mm ( $\frac{1}{2}$ In.) measured with a 3 m (10 Ft.) long straight edge.
All Surfaces	6 mm ( $\frac{1}{4}$ In.) measured with a 3 m (10 Ft.) long straight edge.

## SECTION 306 - UNDERGROUND CONDUIT CONSTRUCTION

### 306-1 OPEN TRENCH OPERATIONS

#### 306-1.1 Trench Excavation

##### 306-1.1.3 Maximum and Minimum Width of Trench

**306-1.1.3A Water Supply and Sewer Lines.** For water supply and sewer lines, the minimum width of trench shall be 300 mm (12 In.) greater than the overall outside diameter of the pipe and the maximum width shall be 450 mm (18 In.) greater than the outside diameter of the pipe as measured at the top of the pipe.

If the Contractor excavates a trench wider than the maximum specified above or does not maintain the trench within the limits specified until the pipe bedding zone backfill is completed, the Engineer may require the pipe to be replaced with stronger pipe or special bedding installed, or both, to maintain the structural integrity of the pipe.

**306-1.1.7 Depth of Pipe.** Unless otherwise shown on the plans, pipe shall be placed with 900 mm (36 In.) of cover or to such greater depth as required to provide 300 mm (12 In.) minimum clearance from obstructions, other utilities, the subgrade for the pavement structural section and as required to comply with water and sewer separation requirements.

#### 306-1.2 Installation of Pipe

##### 306-1.2.1 Bedding

**306-1.2.1.1A Bedding Material.** When native material is allowed for backfill in the bedding zone, no rocks larger than 40 mm (1½ In.) in maximum dimensions shall be included. Material containing ashes, cinders, and type of refuse or other deleterious material shall not be used as bedding.

**306-1.2.1.2A Sewer Pipe Bedding.** Bedding for sewer pipe from 100 mm (4 In.) below the pipe to the spring line (horizontal diameter) of the pipe shall be free draining, granular material with a maximum size of 15 mm (½ In.), unless another bedding method is shown on the plans.

Densification of the bedding material may be by the application of water or by mechanical means. Unless otherwise specified, all bedding material shall be densified to a relative density of 90%. Acceptability of densification in the bedding zone will be determined by visual inspection and probing to determine that no voids exist in the backfill material. In this paragraph, the word "voids" does not include intergranular voids in the soil structure.

**306-1.2.1.3A Flexible Pipe Bedding.** Bedding for flexible drainage and sewer pipe shall be granular material having a sand equivalent of at least 50. The bedding material shall be placed and compacted from 150 mm (6 In.) below the pipe to the top of the bedding as defined in 306-1.2.1.

The bedding, described above, shall be interrupted at intervals of 60 m (200 Ft.) with 1-m (3-Ft.) long sections of low permeability material (50% passing 75 µm (200) sieve), mechanically compacted to 90% relative density.

### **306-1.2.2 Pipe Laying**

**306-1.2.2A Installation of Pipe.** Pipe shall be handled and installed, in accordance with the pipe manufacturer's recommendations as modified herein.

**306-1.2.2B Identification Wire for Non-Metallic Pipe.** Identification wire shall be installed on all non-metallic water supply pipe. The wire shall be 1.6 mm (14 gauge) copper and shall be installed adjacent to the pipe and electrically connected to all valves, boxes, fire hydrants and blowoffs. The wire shall be brought to grade at meter boxes.

Plastic water services shall have an insulated copper identification wire laid adjacent to the service between the main and the meter stop and electrically connected to service connection at main line wire or metallic main and meter stop.

### **306-1.2.4 Installation, Field Jointing and Inspection of Reinforced Concrete Pipe.**

**(f) Placing Grout.** In order to avoid air pockets, the mortar grout specification in 306-1.2.4(d) shall be poured down one side of the pipe only, until it appears at the top of the other side of the pipe.

**306-1.2.14 Cutting Pipe.** The cutting of pipe for fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe cement coating or cement lining and as to leave a smooth end at right angles to the pipe or as recommended by the manufacturer. No cutting by torch will be permitted.

### **306-1.4.5 Water Pressure Test**

**306-1.4.5A Existing System Protection.** Line valves separating an existing water line from a new water line shall remain closed at all times until the new line has been tested, chlorinated, flushed and approved for service.

If water is obtained from the existing line, it shall be by means of separate tie which shall include a closure valve and adequate back flow prevention device.

**306-5.1 Abandoning Valves.** Valves to be abandoned shall be closed and valve box covers shall be removed and salvaged. Valve boxes shall be filled with sand and capped with 100 mm (4 In.) of concrete.

**306-9 DISINFECTION.** All water mains and appurtenances shall be disinfected before being placed in service in accordance with AWWA C651 except as specified herein:

- a. The water mains shall be chlorinated so that a chlorine residual of not less than 20 ppm remains in the water after standing in the pipe for 24 hours.
- b. The Agency will perform sampling and testing of bacteriologic samples. Disinfection shall be repeated until two or more consecutive samples are negative for coliform organisms.

The pressure in the line being chlorinated shall be maintained at least 35 kPa (5 PSI) lower than that existing in any Agency line to which it is connected.

## **306-10 WATER WORKS APPURTENANCES**

### **306-10.1 VALVES.** Valves shall be located as shown on the drawings.

Each valve shall be operated prior to its installation to assure proper functioning. Valves shall be installed plumb and in alignment with the water main. Valves shall be anchored by metal ties to a concrete base. Line valves may be moved to the closest joint upon approval of the Engineer.

**306-10.2 VALVE BOXES.** Each underground valve shall be provided with a valve box. The valve boxes shall be installed plumb and centered over the operating nut of the valve. Valve boxes shall be installed with concrete collars.

Where valve boxes are to be placed in asphaltic type pavement, they shall not be set to grade until after paving has been completed.

Where valve boxes are to be placed in concrete pavement, they shall be set to grade prior to paving operations.

**306-10.3 THRUST DEVICES.** A reaction or thrust device shall be provided on all dead ends, tees, elbows, and bends with more than 5 degrees deflection on pressure pipe lines.

Thrust devices shall be cast-in-place concrete, poured against undisturbed or compacted earth. Thrust devices shall be sized and constructed in accordance with the plans.

Thrust devices and anchor blocks shall be constructed of Class 280-C-14 (420-C-2000) concrete. Thrust devices and anchor blocks shall be cured at least 7 days where Type IP or II cement is used or at least 48 hours where Type III cement is used.

Metal tie-rods or clamps shall be of adequate strength to prevent movement of pipe. All metal shall be coated in accordance with AWWA C110.

### **306-10.4 FIRE HYDRANTS.** Fire Hydrants shall be installed as shown on the plans.

All hydrants shall stand plumb and shall have their nozzles parallel with or at right angles to the curb, with the pumper nozzle facing the curb, except that hydrants having only two hose nozzles 90 degrees apart shall be set with each nozzle facing the curb at an angle of 45 degrees.

In uncurbed public road rights of way, fire hydrants shall be located as far as possible from the traveled way while providing a 1 m (3-Ft.) wide clear space between the fire hydrant and the right of way line. In curbed public road rights of way, fire hydrants shall be installed so that there is 300 mm (12 In.) clear between the face of curb and the fire hydrant.

**306-10.5 FIRE HYDRANT BARRICADES.** Fire hydrant barricades shall consist of 100 mm (4-In.) standard steel pipe, schedule 40, filled with concrete, and having a total length of 2 m (72 In.). They shall be embedded in concrete blocks 300 mm (12 In.) in diameter and 1000 mm (40 In.) deep below ground surface with the barricade pipe embedded to 100 mm (4 In.) above the bottom of the concrete so 1 m (36 In.) extends above ground surface. The steel pipe above ground shall be painted chrome yellow in accordance with AWWA C503.

Barricades shall be installed between the fire hydrant and vehicle traffic paths at locations indicated on the plans or where required by the water purveyor or Fire Department. Barricades shall not be installed within public road rights of way..

Fire hydrant barricades shall not obstruct the hydrant outlets.

## **SECTION 310 - PAINTING**

### **310-5 Painting Various Surfaces**

#### **310-5.6 Painting Traffic Striping, Pavement Markings, and Curb Markings.**

**310-5.6.8A Application of Paint - Two Coats** All painted traffic striping and markings shall be applied in two coats. If bleeding, curling or discoloration occurs following application of the second coat, unsatisfactory areas shall be given an additional coat, or coats, of paint.

**PART 4**

**SECTION 400 - ALTERNATE ROCK PRODUCTS, ASPHALT CONCRETE, PORTLAND CEMENT CONCRETE, AND UNTREATED BASE MATERIAL**

**400A Alternate Rock Material, Portland Cement Concrete and Asphalt Concrete**

Alternate rock material, Type S, as specified in Section 400 may be used on the work.

Suppliers of portland cement concrete and asphalt concrete shall file mix designs as required by 401.1.2.

**400-4 ASPHALT CONCRETE**

**400-4.1 General**

**400-4.1.1 Asphalt Concrete - Alternate Grade.** Unless otherwise specified, III-B3-PG64-10 asphalt concrete shall be used. On roads with P.C.C. curbs, where the width between curbs is 12 m (40 Ft.) or less, III-C3-PG64-10 shall be used.

**STANDARD SPECIAL PROVISIONS**

**SECTION 401 - RIPRAP CONSTRUCTION**

**401-1 RIPRAP, PLAIN AND CONCRETED**

**401-1.1 General.** Riprap shall be constructed to the lines and grades shown on the plan of material as specified in 200-1.6. Unless otherwise specified on the plans or in the Special Provisions, the class of rock to be used will be governed by the thickness of the riprap measured at right angles to the slope as shown on the plans. The class to be used shall be as follows:

Thickness - mm (In.)	Class - Section 200-1.6.2
1200 (48)	1-Tonne (1-Ton)
900 (36)	1/2-Tonne (1/2-Ton)
750 (30)	1/4-Tonne (1/4-Ton)
600 (24)	Light
450 (18)	Facing
375 (15)	Cobble

If no class or thickness is specified, 1-Tonne (1-Ton) class shall be used.

**401-1.2 Placing.** Rocks shall be so placed as to provide a minimum of voids without segregation. The rock may be placed by dumping, except that dumping rock the equivalent of more than 3 m (10 Ft.) in vertical distance will not be permitted, and may be spread in layers by bulldozers or other suitable equipment.

Local surface irregularities shall not vary from the planned grade by more than 0.33 times the specified thickness measured at right angles to the grade.

**401-1.3 Concreted Riprap.** When concreted riprap is called for on the plans or in the Special Provisions, riprap as specified in 200-1.6 shall be concreted as hereafter described. If concreted riprap is specified without class designation or thickness, 1/4-Tonne (1/4-Ton) class shall be used with 750 mm (30 In.) thickness.

The riprap shall be placed as provided in 401-1.2.

**401-1.4 Concrete.** Concrete shall be Class 330-D-14 (560-D-2000). The concrete shall conform to the requirements of 201-1. The water content of the concrete shall be such as to permit gravity flow into the interstices with limited spading and brooming. The amount of water used shall be that designated by the Engineer.

**401-1.5 Concreting.** The surfaces of the rock to be concreted shall be cleaned of adhering dirt and clay and then moistened. The concrete shall be placed in a continuous operation for any day's run at any one location. Concrete shall be brought to the place of final deposit by use of chutes, tubes, or buckets, or may be placed by means of pneumatic equipment or other mechanical methods. In no case shall concrete be permitted to flow on the slope protection a distance in excess of 3 m (10 Ft.).

Immediately after depositing, the concrete shall be spaded and rodded into place with suitable spades, trowels or other approved means until the minimum penetration is that shown below:

Rock Class Section 200-1.6.2	Penetration of Concrete Minimum, mm (In.)
1/2-Tonne (1/2-Ton)	450 (18)
1/4-Tonne (1/4-Ton)	360 (14)
Light	250 (10)
Facing	200 (8)
Cobble	150 (6)

After the concrete has been placed, the rocks shall be thoroughly brushed so that their top surfaces are exposed. The outer rocks shall project 1/3 to 1/4 their diameter above the concreted surface. After completion of any 3-m (10-Ft.) strip, no workman or load shall be permitted on the surface for a period of at least 24 hours.

Concreted riprap shall be cured as provided in 302-6.6.

## **401-2 SACKED RIPRAP**

**401-2.1 General.** Sacked riprap shall be installed at the locations and to the lines and grades shown on the plans.

**401-2.2 Materials.** Units of sacked riprap shall be prepared not more than one-half hour in advance of placing in their final location by filling burlap sacks with concrete as hereinafter described. Concrete shall be Class 270-A-7 (376-A-1000). The aggregate used may be pit-run material, at least 80% of which shall pass a 50 mm (2-In.) sieve. The aggregates need not be separated into primary sizes before batching. Washing will be required only to provide that the cleanness value of the portion passing a 25 mm (1 In.) sieve and retained on a 4.75 mm (No. 4) sieve shall not be less than 50 and the Sand Equivalent of the portion passing a 4.75 mm (No. 4) sieve shall not be less than 50. The relative mortar strength of the portion passing a 4.75 mm (No. 4) sieve shall not be less than 85 percent of the strength developed by Ottawa sand. The Los Angeles Rattler Test and the Soundness Test requirements will not apply.

Mixing water shall be added as required to produce a 75 mm to 125 mm (3 In. to 5 In.) slump. Sacks for concrete shall be made of at least 340 g/m<sup>2</sup> (10-Oz./Sq. Yd.) burlap and shall be approximately 500 mm x 900 mm (19½ In. x 36 In.) measured inside the seams when the sack is laid flat.

The capacity of each sack shall be approximately 0.035 m<sup>3</sup> (1.25 Cu. Ft.). Sound reclaimed sacks may be used. The sacks shall be filled with approximately 0.03 cubic meters (one Cu. Ft.) of concrete loosely placed so as to leave room for folding at the top. The fold shall be just enough to retain the concrete at the time of placing. Immediately after being filled with concrete, the sacks shall be placed and lightly trampled to cause them to conform with the slope and with adjacent sacks in place.

The sacked riprap may be prepared using dry batched concrete, meeting the general requirements above. The sacks will be wetted sufficiently to permit hydration of the cement after placement. No dry, sacked riprap, which has started to set, shall be used.

**401-2.3 Placing.** The sacks shall be placed so that the face coverage per cubic meter (Cu. Yd.) of sacked concrete measured on the slope shall not be more than 3.3 m<sup>2</sup> (27 Sq. Ft.) exclusive of foundations, cut-off stubs, and end returns. The slopes on which the sacked riprap is to be placed shall be finished within 60 mm (0.2 Ft.) of the grade established by the Engineer. The first course shall consist of a double row of stretchers laid in a neatly trimmed trench. The second course shall consist of a single row of headers. The third and remaining courses shall consist of stretchers or headers as shown on the plans and shall be placed in such a manner that joints in succeeding courses are staggered. All dirt and debris shall be removed from the top of the sacks before the next course is laid thereon. Stretchers shall be placed so that the folded ends will not be adjacent. Headers shall be placed with the folds in toward the bank. Not more than 4 vertical courses of sacks shall be placed in any tier until initial set has taken place in the first course of any such tier.

When, in the opinion of the Engineer, there will not be proper bearing or bond for the concrete due to delays in placing succeeding layers of sacks or due to the work having been hampered by storms, or mud, or for any cause, a trench shall be excavated back of the row of sacks already in place, which trench shall be filled with fresh concrete before the next layer of sacks is laid.

Sacked riprap shall be cured as provided in 302-6.6.

At the completion of the work, the footing trench shall be backfilled with excavated material.

## SECTION 410 - SIGNS

### 410-1 Road Name Signs

**410-1.1 Design.** Road signs shall consist of two double face signs and have a positive locking device which will keep the signs mounted at right angles, with road name and block number. The road name shall appear on the sign as shown on the official Record Map. Block numbers will be supplied by the Ventura County Building and Safety Department.

**410-1.2 Size.** Length of sign may be 600 mm, 750 mm, or 900 mm (24 In., 30 In. or 36 In.) as required by length of road name. Maximum width 225 mm (9 In.) at center. Minimum width 170 mm (6¾ In.). Thickness 2.3 mm to 3.2 mm (0.091 In. to 0.125 In.).

**410-1.3 Material.** Signs shall be commercially available signs meeting SSS. Signs and fittings shall be made of aluminum, anodized or processed, to prevent corrosion.

**410-1.4 Finish.** Signs shall have reflective sheeting finish, applied per SSS. Background to be green, letters and numbers to be white.

**410-1.5 Lettering.** Road name letters shall be 100 mm (4 In.) high upper case letters. The letters shall be of the open capital type as set forth by the "Manual of Uniform Traffic Control Devices for Streets and Highways" (latest edition). Road name letters and numbers shall be individually laid out to fit either the 600 mm, 750 mm, or 900 mm (24 In., 30 In. or 36 In.) space. Road signs for private roads shall have the word "Private" under the road name.

**410-1.6 Mounting.** Road name signs shall be mounted on top of a 2.75 m (9 Ft.) long, 2" square 12 ga. galvanized steel tubing, inserted in a 2-1/4" square 12 ga. galvanized steel tubing 600 mm (24 In.) long, cast 525 mm (21 in.) deep in a 225 mm x 225 mm x 600 mm (9 In. x 9 In. x 24 In.) concrete base made of Class 280-C-14 (470-C-2000) PCC. The top of the concrete shall be sloped away from the 2-1/4" tubing. A breakaway pin shall be inserted through the base tubing and the post to secure the post. The posts shall be set at the locations shown on the plans.

**410-1.7 Guarantee.** All road signs shall be guaranteed for seven years against chalking and/or fading due to normal atmospheric corrosion.

## **410-2 Advance Road Name Signs**

**410-2.1 Design.** Signs shall consist of one single face sign with cross road name and arrow, if applicable.

**410-2.2 Size.** Sign panel shall be 450 mm (18 In.) wide and length 300 mm (12 In.) longer than name.

**410-2.3 Material.** Signs shall be manufactured by applying reflective sheeting and letters to sheet aluminum or plywood in conformance with SSS. Aluminum nuts, bolts, and washers may be substituted for galvanized hardware.

**410-2.4 Finish.** Signs shall have reflective sheeting finish per SSS. Background to be green, letters and numerals shall be white.

**410-2.5 Lettering.** Road name letters shall be 150 mm (6 In.) upper case and 100 mm and 115 mm (4 In. and 4½ In.) lower case Type E letters. Letter and border spacing shall conform to SSS.

**410-2.6 Mounting.** Advance road name signs shall be mounted on two 100 mm x 100 mm x 3.4 m (4 In. x 4 In. x 11 Ft.) S4S redwood posts set 1 m (3 Ft.) into the ground. Signs shall be located as shown on the plans.

**410-2.7 Guarantee.** All road signs shall be guaranteed for seven years against chalking and/or fading due to normal atmospheric corrosion.

## SECTION 451 - WATERWORKS MATERIALS

### 451-1 WATER SERVICE CONNECTIONS

**451-1.1 General.** Service installation threads shall conform to the applicable sections of AWWA C800.

**451-1.2 Service Pipelines 50 mm (2 In.) and Less in Size.** Water service pipelines, 50 mm (2 In.) or less in size, shall be either seamless copper tubing or plastic service pipe. Copper tubing shall conform to ASTM B88, Type K.

Plastic service pipe shall be polyethylene plastic tubing Type II, Grade P23, Class C, PE 2305 or PE 2306 conforming to AWWA C901. The pressure class shall not be less than the pressure class of the source watermain or Class 1035 kPa (150 PSI), whichever is greater. The plastic service pipe shall be OD Base conforming with the outside diameter dimensions of copper tubing. There shall be no joints between the main connection and the meter connection. The minimum radius used in construction shall not be less than 600 mm (24 In.) and sufficient slack for expansion and contraction shall be allowed. Service pipelines for single residential services shall be 25 mm (1 In.) O.D. copper or polyethylene tubing.

**451-1.3 Service Pipelines, 75 mm (3 In.) and Larger.** Water service pipelines 75 mm (3 In.) and larger shall be asbestos cement pipe conforming to 207-7, cast iron or ductile iron pipe conforming to 207-9, polyvinyl chloride pipe conforming to 207-16, or steel pipe conforming to 207-10.

**451-1.4 Meter Stops.** All 19 mm (3/4 In.) through 50 mm (2 In.) angle meter stops shall be bronze with inlet for copper or polyethylene water service pipe, and outlet for meter coupling. For 75 mm (3 In.) and larger services, a gate valve shall be used.

**451-1.5 Gate Valves.** For 75 mm (3 In.) and larger services, gate valves shall comply with 451-2.

**451-1.6 Service Saddles.** Service saddles and straps shall be bronze, complete with flat single or double straps and molded rubber gaskets.

Asbestos cement heavy duty tapped couplings containing a Threaded Brass Insert may be used in lieu of service saddles.

**451-1.7 Fittings.** Fittings for copper tubing or polyethylene pipe shall be constructed of bronze or copper. Bronze shall be Grade A and copper shall be type "K".

Compression-type joints may be used if the fitting material is constructed of bronze or copper. Pack joint fittings for polyethylene pipe shall include stainless steel inserts. Flared fittings shall not be used on polyethylene pipe.

### 451-2 VALVES AND APPURTENANCES

**451-2.1 General.** Line valves shall be double disc, solid wedge or resilient seated gate valves or rubber seated butterfly valves. Hub-end valves for use with rubber rings shall be in accordance with AWWA C500 except for the bell which shall be modified for rubber rings. All ferrous body valves shall have an interior cement mortar finish equivalent to the requirement for standard cast iron fittings or a fusion epoxy lining.

**451-2.2 Double Disc and Solid Wedge Gate Valves.** Gate valves shall be cast iron body, all bronze or bronze mounted interior, nonrising stem with O-ring stem seal. Valves shall be for cold water service of 1200 kPa (175 PSI) working pressure conforming to AWWA C500.

Bronze for the interior of gate valves shall be Grade 1 conforming to ASTM B-62 and in no case shall bronze parts of fittings contain more than 2% aluminum or more than 5% zinc.

Bronze for valve stems shall be silicon bronze conforming to ASTM B-98.

**451-2.3 Resilient Seated Gate Valves.** Resilient seated gate valves shall conform to AWWA C509. Bronze shall be Grade A except that the stem shall be Grade B bronze.

**451-2.4 Butterfly Valves.** Butterfly valves shall be rubber seated tight closing, O-ring shaft seal, conforming to the requirements of Class 150B of AWWA C504. All fastenings in the water stream shall be 18-8 stainless steel type 304. Butterfly valves 250 mm (10 In.) and larger shall require a minimum of 30 turns of the wrench to rotate the disc 90°. Valves less than 250 mm (10 In.) shall require a minimum of three turns per 25 mm (inch) of nominal diameter to rotate the disc 90°.

Butterfly valves shall be Dresser Manufacturing Company "450" or Allis-Chalmers "Code 22", or approved equal.

**451-2.5 Valve Boxes and Covers.** Valve boxes shall be installed on all underground valves and shall be equipped with loose covers having a seating depth of at least 50 mm (2 In.).

The valve box shall consist of a cast iron upper portion supported by the pavement and providing a firm seat for the valve box cover. The lower portion of the valve box shall be a plastic or corrugated steel pipe resting on the valve. The completed box shall provide an uninterrupted passage to and centered on the valve operating nut of not less than 135 mm (5¼ In.) inside diameter. It shall be of such design as to allow 150 mm (6 In.) adjustment of the cover elevation when repaving occurs.

All valve box covers shall be marked with the word "water".

**451-2.6 Air and Vacuum Release Valves.** Air and vacuum release valves shall be APCO Heavy Duty, Crispin Universal, or equal.

**451-2.7 Check Valves.** Check valves shall be rubber seated disc swing type lever and weight or lever and spring operated, complying with AWWA C508. The face of the closure element shall be of bronze composition or other non-corrodible material which will seat tightly under all conditions of field use. Bronze composition shall be Grade A.

**451-2.8 Blow-Offs (Flush-outs).** Permanent blow-offs shall be 50 mm (2 In.), 50 mm x 63 mm (2 In. x 2½ In.) angle fire hydrant or 100 mm (4 In.) hydrant, James Jones No. J-344 or approved equal. One hundred fifty mm (six In.) blow-offs shall be wet barrel fire hydrants, as specified in §451-3.

Temporary blow-offs used for construction purposes shall be 50 mm (2 In.) and may be left in place if approved by the Engineer.

**451-3 FIRE HYDRANTS.** Fire hydrants shall be wet barrel type conforming to AWWA C503 with the following options:

- a. Top section and bury shall be cast iron or wrought iron.
- b. Valve stems shall be bronze, Grade A.
- c. Top sections and burys shall have an interior cement lining equivalent to the requirements for standard cast iron fittings or a fusion-bonded epoxy lining.
- d. Asbestos gaskets shall not be used.
- e. Operating and cap nuts shall be standard pentagons measuring 45 mm (1¾ In.) point to flat.
- f. Breakaway bolts shall be used in flanges between top section and bury.
- g. Top section shall be painted chrome yellow.
- h. Outlets shall be N.S. thread hose nozzles of the number and size indicated in the table below for the Type indicated on the plans. If no type is indicated, Type "C" shall be installed. Types are based on number and size of outlets as follows:

Type	Outlets, Number & Size
A	One 100 mm (4 In.), plus one 65 mm (2½ In.)
B	One 100 mm (4 In.), plus two 65 mm (2½ In.)
C	Two 100 mm (4 In.), plus one 65 mm (2½ In.) or Two 100 mm (4 In.), plus two 65 mm (2½ In.)

The water purveyor may designate a specific manufacturer and type of hydrant to match other hydrants in their system to minimize maintenance costs, providing such hydrant meets all of the above requirements.

**451-4 PIPE FITTINGS.** Fittings shall comply with either AWWA Standard C110 (Gray Cast Iron) or C153 (Ductile Iron). Fittings shall be cement-lined in accordance with AWWA C104 or fusion-bonded epoxy-lined in accordance with AWWA C213.

**451-5 PIPE FLANGES AND ADOPTERS**

**451-5.1 Steel Welding Flanges.** Steel welding flanges shall conform with AWWA C207, Class D or better. All flanges shall be smooth faced.

**451-5.2 Cast Iron and Ductile Iron Adapters.** Cast iron and ductile iron adapters shall conform in design with AWWA C110 and protective coating shall be in conformance with AWWA C104.

## SECTION 461 - SEWER FACILITIES

### 461-1 SEWER CONNECTIONS

**461-1.1 General.** The maximum size lateral connection by wye or tee fitting to a larger diameter sewer shall be 150 mm (6 In.). A manhole shall be installed when a 200 mm (8 In.) or larger line is connected to an equal or larger diameter sewer.

**461-1.2 Depth.** Service laterals shall be at the minimum depths shown on the plans.

**461-1.3 Future Connection.** Unused openings shall be tightly sealed and supported in a manner to facilitate their future location and use. Developer's Engineer shall select appropriate service lateral locations and shall instruct contractor to locate lateral according to the design elevations and locations.

**461-1.4 Curb Markings.** The location of all sewer service laterals shall be marked on the curb by an S at completion of construction and shall be shown on the "record" drawing.

**461-1.6 Protection.** Where new sewers are to be connected to a manhole which is in active use, the contractor shall install such protection as is necessary to prevent construction debris from being washed into or entering the active sewers. Plugged inlets or other suitable protection shall be required for the active manhole before beginning manhole modification or sewer cleaning.