STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS

CITY OF VICTORVILLE
INCORPORATED SEPT 21, 1962
HOME OF THE SAN BERNARDINO COUNTY FAIR
CALIFORNIA

CITY OF VICTORVILLE

ENGINEERING DEPARTMENT

STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS

All public improvements constructed by or under the inspection of the City of Victorville shall conform to these specifications and the references contained herein. The design and construction standards used for any project should equal or exceed the minimum given in these Standard Specifications to the maximum extent feasible. The design and construction standards that are set herein are to provide a guide for the engineers and contractors to exercise sound judgment in applying standards with the approval of the City Engineer.

Public improvements undertaken by the City of Victorville may deviate from these specifications with plan and specification approval by the City Engineer. In the event of conflicts between any provision contained in these Standard Specifications and the references contained herein, these Standard Specifications shall govern, unless they conflict with State or Federal regulations.

Date: June 5, 2007

John A. McGlade, P.E., City Engineer
R.C.E. 40935, Expires 3/31/09

RESOLUTION NO. 07-159

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF VICTORVILLE AMENDING STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS WITHIN THE CITY AND RESCINDING RESOLUTION NO. 76-027

WHEREAS, the Victorville Subdivision Ordinance No. 458, makes reference to and authorizes the establishment of certain standard specifications for public improvements within the City of Victorville; and

WHEREAS, such standards have been established for the purpose of avoiding excessive maintenance to the City of Victorville and to protect the health, safety and welfare of the general public.

WHEREAS, this resolution supersedes Resolution No. 76-27, which was passed, approved, and adopted on the 19th day of April, 1976.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF VICTORVILLE DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. That the amended Standard Specifications for Public Improvements dated January 8, 2007, and entitled “City of Victorville Engineering Department Standard Specifications for Public Improvements” are hereby adopted.

SECTION 2. That said Standard Specifications for Public Improvements shall apply to the construction of all public improvements within the City of Victorville insofar as they shall apply.

PASSED, APPROVED AND ADOPTED this 5th day of June 2007.

Terry E. Caldwell
MAYOR OF THE CITY OF VICTORVILLE

ATTEST:

Carolee Bates
CITY CLERK

APPROVED AS TO FORM:

ASSISTANT CITY ATTORNEY

I, CAROLEE BATES, City Clerk of the City of Victorville and ex-officio Clerk to the City Council of said City, DO HEREBY CERTIFY that the foregoing is a true and correct copy of Resolution No. 07-159 and was adopted at a meeting held on the 5th day of June 2007, by the following roll call vote, to wit:

AYES: Councilmembers Almond, Cabriales, Hunter and Rothschild

NOES: None

ABSENT: Mayor Caldwell

ABSTAIN: None

Carolee Bates
CITY CLERK OF THE CITY OF VICTORVILLE

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STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS

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There is more information available online.

Use the link below to download from the Engineering Department's pages of the City Website.

https://www.victorvilleca.gov/government/city-departments/engineering

- City of Victorville Standard Drawings for Public Improvements
- Victorville Water District's Approved Materials List
- Storm Water Management Plan
- and other design manuals and guidelines

STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS

PART I – DESIGN

1. General

All public works shall conform to the design criteria set forth in Part I of these Specifications and the Standard Drawings included as part of these Specifications.

2. Drainage

Drainage facilities shall be designed to carry a one-hundred (100) year frequency of return storm with ultimate anticipated development of the watershed without the depth of water in streets exceeding the top of curbs by more than three inches, but in no case shall such water level reach the finished pad grade elevation where a building may be located. In areas where the natural relief of the ground does not preclude the possibility of the backwater elevation exceeding existing or future building floor elevations, the capacity of the drainage system shall be sufficient to insure that the backwater resulting from a 100-year return storm shall be below building floor elevations

Cross gutters may be used to carry water across minor or collector streets at intersections only. Where it is necessary to carry local drainage across a minor or collector street in the middle of a block, and upon approval by the City Engineer, it shall be carried in a pipe with a capacity to accommodate a ten-year frequency of return storm, and shall be combined with a properly engineered dip to accommodate the one-hundred (100) year frequency of return storm within the design parameters set forth herein.

Where it is necessary to carry local drainage across an arterial street in the middle of a block, it shall be carried in pipe with a capacity to accommodate the one-hundred (100) year frequency of return storm within the design parameters set forth herein.

Where a street must cross a major wash, the standard wash crossing (D-01A) as set forth herein in the Standard Drawings shall be utilized. The pipe culverts shown shall be adequate to carry the ten-year storm (beneath), and 100-year (with dip) frequency of occurrence flood flow for minor and collector streets and a 100-year storm (beneath) frequency of occurrence flood flow for arterial streets. The wash crossing shall have sufficient capacity to pass the 100-year frequency of occurrence flood flow as a dip crossing when acting with the culvert (local and collector streets).

In no case shall any pipe installed for drainage purposes within the highway be less than 18 inches in inside diameter or other than reinforced concrete pipe construction.

A soft-bottom channel will be permitted for flow velocities of up to 5 FPS, (feet per second) with side slope protection; however, velocities of 5 FPS to 12 FPS requires a concrete lining.

Drainage channels and conduit shall have sufficient capacity to contain a 100- year frequency

of occurrence runoff with two feet of freeboard on channels and 0.75 feet of freeboard between design water surface elevation inside catch basin and gutter at catch basin inlet. In no case however, shall the 100-year frequency of return storm under ultimate anticipated development of the watershed area result in depth of water in streets exceeding the top of curbs by more than three inches. The maintenance of freeboard between the design water surface elevation and the gutter at catch basin inlet is not required for the 100-year frequency of return storm in the design of minor conduits.

3. Streets

The structural section of streets shall be designed using the method set forth in the current California Department of Transportation "Highway Design Manual," latest version, and shall be based upon soil tests of representative soil samples. At least one set of results of California Test Method No. 301 and 217 must be submitted with subdivision improvement plans to substantiate the street structural section design for each 500 lineal feet or fraction thereof of street shown on the plans. The minimum thickness of asphalt concrete for locals, collectors, arterials, major arterials and super arterials shall be in accordance with Standard Drawing S-25 entitled "Street Design Standards" contained within these Standard Specifications. Also, the minimum base shall be eight inches of Class 2 Base (per Caltrans Std. Sec. 26-1.02 A, see Page 14 within this document).

Vertical curve lengths shall provide adequate passing and stopping sight distance. Stopping sight distance must be provided in all cases of design. Reference is made to the American Association of State Highway Officials' publication, "A Policy on Design of Urban Highways and Arterial Streets," for minimum lengths of vertical curves. Minimum design speed for residential streets shall be 30 miles per hour. See Standard Drawing S-25, "Street Design Standards" for additional information. Reference is made to the AASHTO publication, "Geometric Design of Highways and Streets" for general design guide parameters.

Cul-de-sacs shall have a property line radius of fifty (50) feet and a face of curb radius of forty-three (43) feet. Cul-de-sac streets shall have a maximum length of four-hundred (400) feet except that a maximum length of five-hundred (500) feet may be permitted provided said street fronts on no more than sixteen (16) lots, excluding corner lots.

Minimum centerline radii for local streets shall be not less than three-hundred (300) feet. For collector streets, the minimum centerline radius shall be not less than six-hundred (600) feet (see S-25). The minimum centerline radius for major and secondary arterials shall be based upon design speed considerations for the particular street and the design charts set forth in the California Division of Highways "Highway Design Manual of Instruction."

Grade of streets shall be not less than .4% and shall be no greater than 10% for local streets and 7% for arterial and collector streets unless otherwise approved by the City Engineer. Grades in excess of this may be approved based upon the length of such grades and/or other design considerations which will not compromise basic highway design standards referenced herein.

4. Bike Routes

General

Attention is directed to Chapter 1000, "Bikeway Planning and Design" of the California Department of Transportation "Highway Design Manual," latest version.

Definitions

- **Shared Route** – A Shared Route is a street identified as a bicycle facility by "Bike Route" guide signing only. There are no special lane markings and bicycle traffic shares the roadway with motor vehicles.
- **Bike Lane** – A bike lane is a lane specifically delineated for use by bicycles on the paved area of a road. It is usually located along the edge of the paved area or between the parking lane and the first motor vehicle lane provided sufficient room exists to allow operation of the bicycle in this area without undue hazard to the cyclist. Bike lane facilities are utilized along arterials and parkways where on-street parking is not required and where traffic volumes will allow safe joint use of the paved street area. Bike lanes shall be located only upon streets where traffic volumes during peak hours do not require full use of the roadway and parking is: 1) not required, or 2) restricted. On such streets where bike lanes are installed, it may be necessary to eliminate parking on the side of the street where the bike lane is located.
- **Bike Path** – A bike path is a special pathway facility for the exclusive use of bicycles, which is separated from motor vehicle facilities by a space or a physical barrier. The bike path may be on a portion of the motorized network right-of-way or on a special right-of-way not related to the motor vehicle facility. It may be grade separated or have street crossings at designated locations. It is identified with guide signing and also may have pavement markings. These pathways are designed to serve major transportation corridors and are proposed as a joint use within drainage and utility easements.

STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS

PART II – CONSTRUCTION SPECIFICATIONS
GENERAL PROVISIONS

1. General

The Standard Specifications referred to herein shall mean the California Department of Transportation Standard Specifications, current version. The technical provisions of said Standard Specifications relating to materials and methods of construction are hereby adopted and shall have the same force and effect as though set forth fully herein except to the extent that said Standard Specifications are modified by the provisions of these Standard Specifications for Public Improvements.

In the event of a conflict between these Construction Specifications and said Standard Specifications, these Construction Specifications shall govern.

In the event there is a conflict between these Construction Specifications and the Special Provisions and/or Plans which are approved by the City Council for any work undertaken by the City under contract, the approved Special Provisions and Plans, in that order, shall govern.

All references to the APWA "Green Book" shall mean the American Public Works Association, Standard Specifications for Public Works Construction, latest edition.

Work of public improvement, which is done under the inspection of the City of Victorville shall conform to these Construction Specifications and the technical provisions of the Standard Specifications as modified herein.

2. Definitions

Wherever in these Construction Specifications or the applicable portions of the Standard Specifications the following terms are used, the intended meaning shall be as follows:

- **State**: Department of Transportation (Caltrans)
- **City, or owner**: City of Victorville
- **Director**: The City Engineer of the City of Victorville
- **Engineer**: Whenever not qualified, shall mean the City Engineer of the City of Victorville, California, acting either directly or through his properly authorized agents; each agent acting within the scope of the authority delegated to him.
- **Contractor**: The party of the second part entering into a contract with the City of Victorville, California, for furnishing of material and the performance of work required by the approved plans and special provisions, including his duly authorized agents acting severally within the scope of their authorities. Where works of subdivision improvement are being constructed under the inspection of the City of Victorville, the

term "Contractor" shall mean subdivider as set subdivision agreement for the construction associated with the particular subdivision. In forth in the applicable of public improvements the case of other public improvements, "Contractor" shall mean the permittee to whom a permit has been issued for construction within the public right-of-way or easement.

- Definitions which apply to the technical provisions of the Standard Specifications shall be as set forth in said Standard Specifications.

3. Conformance with Laws and Regulations

Contractor shall conform to all laws and regulations of the various State and local agencies having jurisdiction.

4. Payment Provisions of Standard Specifications

References to payment in the Standard Specifications shall, with respect to construction performed by contract by the City of Victorville, apply only insofar as said references are or are not modified by the construction contract applying to that particular work or improvement.

When these Specifications and the Standard Specifications are applied to work which is being performed under the inspection of the City of Victorville, but which is being paid for by a third party, those provisions of the Standard Specifications relating to measurement and payment shall not apply.

STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS

PART III – CONSTRUCTION SPECIFICATIONS DETAILS

Section I - Asphalt Concrete (A.C.)

1. General

Asphalt Concrete material shall conform to Section 203, entitled "Bituminous Material" of the Standard Specifications for Public Works Construction by the American Public Works Association, latest edition.

Asphalt Concrete placement and construction methods shall conform to Section 302-5, entitled "Asphalt Concrete Pavement" of the Standard Specifications for Public Works Construction by the American Public Works Association, latest edition.

2. Type

Asphalt Concrete base course shall be B-PG 64-10.

Asphalt Concrete paving shall be C2-PG 64-10.

3. Spreading and Compacting

The depositing, distributing, and spreading of the Asphalt accomplished in a single, continuous operation by means Concrete shall be of a self-propelled mechanical spreading and finishing machine designed especially for that purpose. The machine shall be equipped with a suitable full-width compacting screed capable of being accurately regulated and adjusted to distribute a layer of the material to a definite predetermined thickness. When paving is of a size or in a location that use of a self-propelled machine is impractical, the City Engineer may waive the self-propelled requirement.

Asphalt Concrete shall be placed in layers not exceeding 3" or less than 1" in compacted thickness.

At the time of delivery to the job site, the temperature of the Asphalt Concrete mixture shall not be lower than 285-degrees Fahrenheit or higher than 350- degrees Fahrenheit; the lower limit to be approached in warm weather and the higher in cold weather. Asphalt Concrete shall be spread and the first coverage of initial or breakdown compaction shall be performed when the temperature of the mixture is not less than 250-degrees Fahrenheit, and all breakdown compaction shall be completed before the temperature of the mixture drops below 200-degrees Fahrenheit.

Longitudinal joints in the top layer shall correspond with the edge of the proposed traffic lanes. Longitudinal joints in all other layers shall be offset not less than 6" alternatively each

side of the edge of traffic lanes.

Asphalt Concrete shall not be placed if the atmospheric temperature is not at least 50-degrees Fahrenheit and rising, or there is unsuitable weather.

Asphalt Concrete shall not be placed when underlying layer or surface is frozen.

4. Smoothness

Upon completion, the pavement shall be true to grade and cross section. When a 10-ft. straightedge is laid on the finished surface parallel to the centerline of the roadway, the surface shall not vary from the edge of the straightedge more than 1/8", except at intersections or at changes of grade. Any areas that are not within this tolerance shall be brought to grade immediately following the initial rolling. If the paving material has cooled below the lower limits of the spreading temperatures, the top lift of paving material in the area to be repaired shall be removed by a method approved by the City Engineer. Repairs shall not be made to pavement surface by feather-edging at the join lines.

5. Density

The compaction after rolling shall be 95% of the density obtained with the California Kneading Compactor per California Test 304.

Paved areas not to be subject to vehicular traffic shall be compacted to 90% of California Test 304.

Section II - Concrete Curb and Gutter, Cross Gutters, Spandrels, Sidewalks, Driveway Approaches and Driveways

1. General

Attention is directed to the provisions of the Standard Specifications referring to "Concrete Curbs and Sidewalks" Section 73, and the provisions of the Standard Specifications referring to Section 90 "Portland Cement Concrete." Portland Cement concrete for construction of the improvements referred to in this Section shall contain not less than 550 pounds of cementitious material per cubic yard with four percent air entrainment and conforming with the applicable provisions of the Standard Specifications.

2. Driveway Locations

The bottom edge of the curb depression at residential driveway approaches near road intersections shall be at least forty (40) feet from the prolongation of the curb face of the intersecting street. The bottom edge of the curb depression at residential driveway approaches shall extend no closer than five feet to side lot lines. A single driveway approach serving two single-family residential properties shall not be permitted.

The centerline of new commercial driveway approaches near road intersections shall be at least one hundred fifty (150) feet from the prolongation of the curb face of the intersecting street. The minimum length of full height curb between commercial driveway approaches shall be one hundred (100) feet.

3. Construction Methods

The surface of concrete shall not vary more than 0.02 feet from a ten-foot straight edge, except at grade changes and the finished surface shall be free from blemishes.

Expansion joints one-half inch wide shall be constructed at all returns. Weakened plane joints shall be constructed at intervals of ten feet. Expansion joint filler material shall be shaped to fit the concrete that is being placed and shall conform to the standard specifications.

Whenever standard curb and sidewalk are being constructed and the sidewalk is being placed contiguous to the standard curb, the standard curb and sidewalk shall not be poured monolithically.

Score lines in sidewalks shall be transverse at a spacing of five feet. When placing new sidewalk adjacent to existing sidewalk, score lines shall be placed in line with and match those existing.

Concrete shall not be placed on anything frozen or ice-coated, including but not limited to ground, sub-grade, base, forms, reinforcing steel, structural steel, conduits, pre-cast members or construction joints.

Concrete shall be maintained at a temperature of not less than 40-degrees Fahrenheit for 72 hours after placing. If the Contractor chooses to place concrete when there is a

possibility of the ambient temperature falling below 40-degrees Fahrenheit, the Contractor shall submit a written outline of the proposed method for protecting the concrete for the Engineer's approval.

Under conditions of precipitation, placing of concrete shall be stopped before the quantity of surface water is sufficient to damage surface mortar or cause a flow or wash on the concrete surface, unless the Contractor provides adequate protection against damage.

Concrete that has been frozen, rained on or damaged by other causes, as determined by the Engineer, shall be removed and replaced by the Contractor at the Contractor's expense.

Curing of concrete shall be in accordance with the provisions of Caltrans Standard Specifications, Section 90-7, "Curing Concrete."

4. Base Material

Base material for cross gutters and spandrels shall conform to the requirements for base material per Section 26-1.02A, Class 2 Aggregate Base of the State of California Department of Transportation Standard Specifications, latest edition.

Base material and forms for concrete curbs, curb and gutter, driveways, sidewalks, cross gutters and spandrels shall be watered and thoroughly compacted before placing concrete. Relative compaction and minimum thickness of base material for the various concrete facilities shall be as follows:

Improvement Types	Relative Compaction	Min. Thickness
Concrete curbs and curb and gutter	95% relative compaction	4" thickness (Typical)
Sidewalk	90% relative compaction	4" thickness
Residential Driveways	95% relative compaction	6" thickness
Commercial Driveways	95% relative compaction	8" thickness
Cross gutters and Spandrels	95% relative compaction	8" thickness

Section III - Concrete Structures

1. General

Attention is directed to the provisions of the Sections entitled “Concrete Structures” and “Portland Cement Concrete” of the Standard Specifications. Portland Cement Concrete for construction of concrete structures shall be Class 1. Class 1 concrete shall contain not less than 675 pounds of cementitious material per cubic yard, with or without air entrainment, as set forth on the applicable standard drawing and as directed by the engineer.

Section IV - Concrete Block Retaining Walls and Garden Walls

1. General

Concrete block walls shall be constructed per the City of Victorville Development Department/Building Division standards for retaining walls and garden walls, or engineered plans shall be submitted to the Building Division for review and approval.

2. Footings for Concrete Block Walls

Footings shall conform to the provisions of the Section entitled “Concrete Structures” of the Standard Specifications. Footings shall be formed in all cases, except where the natural angle of repose of the material against which the footings are being placed is satisfactory in the opinion of the engineer, to permit pouring of concrete directly against the existing soil material without detrimental effect to the design stability and structural integrity of the wall. Concrete for footings shall be Class 2 and shall contain not less than 590 pounds of cementitious material per cubic yard. Excavation and backfill for footings shall conform to the appropriate section of the Standard Specifications.

Section V - Chain Link Fencing

1. General

Chain link fencing shall conform to the appropriate provisions of the Standard Specifications.

Section VI - Earthwork

1. General

Attention is directed to the provisions of Section 19 entitled “Earthwork” of the Standard Specifications.

2. Compaction

Attention is directed to the provisions of Section 19-5 entitled “Compaction” of the Standard Specifications. All compaction shall be at optimum moisture content and determined in accordance with the American Society for Testing and Materials (ASTM 1557). Other methods may be required for special circumstances as required by the Engineer.

Relative compaction of not less than 90% for sub-grade material for the right-of-way improvements shall be obtained for a minimum depth of twelve inches below the grading plane and for the width of the improvements.

Relative compaction of not less than 95% shall be obtained for embankment under bridge and retaining wall footings without pile foundation within the limits established by incline planes sloping one and one-half to one (1½:1) out and down from lines one-foot outside the bottom edges of the footing.

3. Structure Excavation and Backfill

Structure excavation and backfill shall conform to the appropriate provisions of the Standard Specifications.

Section VII - Aggregate Bases

1. General

Attention is directed to the provisions of Section 26-1.02A, entitled "Class 2 Aggregate Base of State of California, Department of Transportation," dated May 2006, as follows:

26-1.02A Class 2 Aggregate Base

Aggregate for Class 2 aggregate base shall be free from organic matter and other deleterious substances, and shall be of such nature that it can be compacted readily under watering and rolling to form a firm, stable base. Aggregate may include material processed from reclaimed asphalt concrete, Portland cement concrete, lean concrete base, cement treated base or a combination of any of these materials. The amount of reclaimed material shall not exceed 50 percent of the total volume of the aggregate used.

Aggregate shall conform to the grading and quality requirements shown in the following tables. At the option of the Contractor, the grading for either the 1½- inch maximum or ¾-inch maximum shall be used, except that once a grading is selected, the grading shall not be changed without the Engineer's written approval.

AGGREGATE GRADING REQUIREMENTS

	Percent Passing			
	1 ½" Maximum		**¾" Maximum**	
Sieve Sizes	**Operating Range**	**Contract Compliance**	**Operating Range**	**Contract Compliance**
2"	100	100	---	---
1 ½"	90-100	87-100	---	---
1"	---	---	100	100
¾"	50-85	45-90	90-100	87-100
No. 4	25-45	20-50	35-60	30-65
No. 30	10-25	6-29	10-30	5-35
No. 200	2-9	0-12	2-9	0-12

QUALITY REQUIREMENTS

Test	Operating Range	Contract Compliance
Resistance (R-value)	---	78 Min.
Sand Equivalent	25 Min.	22 Min.
Durability Index	---	35 Min.

The aggregate shall not be treated with lime, cement or other chemical material before the Durability Index test is performed. Untreated reclaimed asphalt concrete and Portland cement concrete will not be considered to be treated with lime, cement or other chemical material for purposes of performing the Durability Index test.

If the results of either or both the aggregate grading and Sand Equivalent tests do not meet the requirements specified for "Operating Range" but meet the "Contract Compliance" requirements, placement of the aggregate base may be continued for the remainder of that day. However, another day's work may not be started until tests, or other information, indicate to the satisfaction of the Engineer that the next material to be used in the work will comply with the requirements specified for "Operating Range."

If the results of either or both the aggregate grading and Sand Equivalent tests do not meet the requirements specified for "Contract Compliance," the aggregate base which is represented by these tests shall be removed.

No single aggregate grading or Sand Equivalent test shall represent more than 500 cubic yards or one day's production, whichever is smaller.

When aggregate base is to be measured by the ton, the weight will be converted to volume for the purpose of the above paragraphs. Factors for converting tons to cubic yards will be determined by the Engineer.

Section VIII - Sewers

1. General

Sanitary sewers and appurtenances shall be constructed as shown on the Plans in accordance with these Standard Specifications and Drawings and the Standard Specifications for Public Works Construction and Section 64630, Title 22, of California Administrative Code regarding water and sewer separation (most current revision).

* In case of conflict between COV Standards and Title 22 Code, the most stringent of the two takes precedent.

2. Materials

- **Concrete** – Concrete for manhole bases, sewer saddles, etc. shall be Class 1 with a compressive strength of 3250 PSI.
- **Sewer Pipe** – Sewer pipe and fittings shall conform to the standards set forth by ASTM. Sewer pipe and fittings shall be extra strength Vitrified Clay Pipe (VCP) per ASTM Standard C-700 or Polyvinyl Chloride Pipe (PVC) per one of these ASTM Standards; D-2680, D-3034 and F-679, with an SDR value not more than 35 or F-949. Pipe lengths shall not exceed 20 feet. Joints shall be push-on type bell and spigot with Elastomeric Ring Gaskets, per ASTM Standard Specifications F-477 and D-3212.
- **Manholes** – Manholes shall be constructed from pre-cast concrete sections per Standard Drawing SS-01.
- **Frames and Covers** – Frames and covers shall be cast-iron painted with a black bituminous paint. Manhole frame and cover shall be per Standard Drawing SS-02 and have a 24-inch diameter clear opening and shall be inscribed “Victorville” or “City of Victorville” and “Sewer.” Clean out frame and cover shall have a ten-inch diameter clear opening and be inscribed “Sewer.” All lettering shall be a minimum of one-inch in height.

3. Construction

Mainline sanitary sewers shall be eight-inch diameter minimum and shall be constructed in the street with centerline sewer pipe, five-feet minimum from street centerline. Typically, centerline sewer pipe is installed five-feet off centerline street. Residential laterals shall be four-inch diameter minimum and commercial laterals shall be six-inch diameter minimum. Lateral shall be spaced at five-foot centers minimum and five feet clear of manholes, per Standard Drawing SS-03. Cover on mainline sewer is five-feet minimum unless concrete encased or special pipe approved by the engineer is used, then three-feet minimum. Laterals shall have four-foot minimum cover unless concrete encased or special pipe approved by the engineer is used, then three-foot minimum.

Note: On shallow mainline sewer laterals, it may be impossible to construct due to cover requirements.

Sewer pipe shall be installed on straight line and straight grade. Flowline grade on mainline

sewer shall be 0.5 percent minimum unless special conditions warrant, then flowline grade may be reduced to 0.4 percent with City Engineer's approval. Mainline in all cul-de-sacs and end of line with 24 or fewer lateral connections shall have a minimum flow line grade of 0.5 percent. Lateral shall have one percent minimum grade on six-inch diameter pipe and two percent minimum on four-inch diameter pipe. Sewer lines shall be designed to maintain two-feet per second flow velocity, assuming three-quarter full on trunk lines and one-half full on mainline. Pipe bedding shall be per Standard Drawings SS-05.

Sewer lines shall be installed below and as far from water mains as possible. Provide a minimum of ten-feet horizontal separation and one-foot vertical separation between sewer mains and laterals and water distribution lines. If the horizontal separation between sewer and water main must be less than ten-feet and the sewer is more than one-foot below the water main, special construction as approved by the City Engineer is required.

Backflow preventors shall be installed on all laterals if such lateral is connected to a ten-inch or larger mainline.

Manholes shall be constructed per Standard Drawing SS-01 and shall be spaced at 350-foot center maximum. A manhole shall be constructed for joining any lateral eight-inches diameter or larger to the mainline. Cleanouts may be used at the end for mainline sewer runs less than 175-feet per Standard Drawing SS-04. Invert elevations shall provide 0.10-foot fall through manhole on straight runs and 0.20-foot fall for side runs except if downstream pipe is a larger diameter; then match overt elevations.

Trunk line sewers are defined as those having a minimum capacity of 1.5 MGD when depth of flow divided by pipe diameter is equal to 0.75 ft., which are identified in the latest Sewer Master Plan. Cover on trunk line sewer is a minimum of eight feet.

4. Testing

After the sewer mainline cleaning (balling) to remove dirt and debris and a minimum of 14 days following completion of construction, the maximum deflection allowed on PVC pipe shall be checked by pulling a rigid nine-sided mandrel with a minimum diameter as specified in Section 306-1.2.12 of the Standard Specifications for Public Works Construction. Then a leakage air pressure test shall be run for all mainline and trunk sewers per Section 306-1.4.4 of the Standard Specifications for Public Works Construction. Any failures of these tests shall be corrected prior to the next test and final acceptance by the City.

STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS

PART IV - MAP STANDARDS

1. General

These standards are to supplement and clarify the provisions of Title 17 of the Victorville Municipal Code.

2. Basis for Standards

Standards contained in this part are based on the following:

A. Manual of Surveying instructions for the Survey of the Public Lands of the United States, prepared and published by the Bureau of Land Management.

B. Title 7, Division 2, Subdivisions of the Government Code referred to herein as the Subdivision Map Act.

C. The Land Surveyors Act and Administrative Rules, State of California.

D. Title 17 of the Victorville Municipal Code.

E. San Bernardino County Surveyor's Office Final Map and Parcel Map Standards.

3. Monuments

A. Lead and Surveyor's tags set in concrete shall be considered a permanent monument or reference point.

B. Standards:

(1) Two-inch I.D. (minimum) iron pipe shall be used at all section corners, quarter corners and boundaries of subdivisions requiring a final map.

One-inch I.D. (minimum) iron pipe shall be installed on the boundaries of subdivisions requiring a parcel map on street centerlines and the intersection of street centerlines.

(2) For centerline intersection monuments, section corners and quarter corners, the surveyor or engineer shall provide the City of Victorville a copy of field notes showing a sufficient number (normally four) of durable, distinctive reference points. Such reference points may be lead and tack in sidewalks or curbs, iron pipes, or such substitutes, as not likely to be disturbed.

(3) In asphalt concrete or cement concrete pavement, the top of the pipe with brass tag shall be set one-quarter inch below the finished pavement surface. Plastic survey monument markers (plastic plugs) will not be accepted.

C. For lot corners, a nail and brass tag stamped "License No." shall be set in concrete curb on the prolongation of the side lot line in lieu of the front lot corners. A 1" iron pipe with brass tag or plastic plug stamped "License No." shall be set at rear lot corner unless otherwise noted. Where rear lot corners abut an arterial street with a screen wall in a landscape easement, or a screen wall is installed, a nail and brass tag stamped "License No." shall be set on top of the wall on the side lot line in lieu of the rear lot corner.

D. (1) Government corners shall be replaced when necessary with a two- inch iron pipe with brass plate or brass cap as shown on Standard Drawing S-14.

(2) The following shall apply to section corners wherever set:

a. Two-inch iron pipe with brass plate or brass cap at section corners. Two-inch I.D. (minimum) iron pipe with brass plate or brass cap shall be set at quarter corners. One-inch I.D. (minimum) iron pipe with brass plate or tag shall be set at one-sixteenth corners.

b. All section and quarter corners directly used in the subdivision of a section will be marked with a permanent durable monument as specified above. One-sixteenth corners will be so marked when pertinent to the survey.

E. Control boundary monuments shall be set and are subject to inspection prior to recordation of final map or parcel map. If proposed grading conditions prohibit the setting of monuments as noted above, a letter of deferment shall be obtained from the City Engineer for each such subdivision. The top of all lot stakes will be set three to four inches above surface of ground.

F. Diagrams of centerline tie standards. Standard drawings S-16 and S-17 show approved methods of tying out P.I.'s (Point of Intersection), B.C. (Begin Curve), E.C. (End Curve) and midpoints. Any three ties, as shown on the diagram, shall suffice.

G. Basis of Bearings means the bearing in degrees, minutes and seconds, or equivalent, of a line between two (2) found controlling monuments which serves as the reference bearing for all other lines on the survey.

A clearly stated "Basis of Bearings" is referencing the bearing between two (2) found controlling monuments which are the same monuments shown on an existing map of record with the same bearing and which were physically existing at the time the property was surveyed.

4. Soil Tests

A. The preliminary soils report for subdivisions requiring a final map shall accompany the application for approval by the City Council of said map unless

required by the Planning Commission to be submitted with the tentative map.

A note is required on the map stating the date of the report and the name of the engineer making the report.

For example: *A soils report was prepared for this tract by NAME , (RCE) or (GE) NUMBER of COMPANY dated DATE and is on file with the City of Victorville Engineering Department.*

B. The preliminary soil report for subdivisions requiring a parcel map, if such report has been required, shall accompany the original map submitted for acceptance by the City.

5. Owners' Statement (Basic Format)

A. Final Maps:

(1) We hereby state that we are all of the parties having any record title interest in the land subdivided as shown on the annexed (tract/parcel) map and that we are the only persons whose consent is necessary to pass title to said land, and we consent to the preparation and recordation of said map and subdivision as shown within the subdivision boundary line, and we hereby dedicate to the City of Victorville for public use, all the streets shown on said (tract/parcel) map within said subdivision;

(2) We also hereby grant to the City of Victorville, in fee simple, Lot LETTER for open space, basin, landscaping and drainage detention purposes shown on said map within said subdivision;

(3) We further hereby dedicate to the City of Victorville, all rights of vehicular ingress to and egress from (name of street), over and across the southerly lines of Lots (_____) and Lots (_____) through (_____), coincident with the right-of-way of STREET NAME Street and the easterly lines of Lots (_____) through (_____), coincident with the right-of-way of STREET NAME Avenue shown on said map within said subdivision as "Non-Vehicular Access" or "N.V.A.";

(4) In addition, we hereby dedicate to the City of Victorville, Landscape Easements for the construction, installation and maintenance of landscaping, irrigation systems, slopes and walls shown on said map as "Landscape Easement" or "L.E.";

(5) We also hereby grant to the City of Victorville, in fee simple, Lot (_____) and Lot (_____) for Open Space and Landscaping Purposes including the construction, installation and maintenance of landscaping, irrigation systems, slopes and walls shown on said map within said subdivision;

(6) Further, we hereby dedicate to the City of Victorville for the use and benefit of the several public utility companies which are authorized to serve in said subdivision an easement for public utility purposes, delineated on said tract/parcel map as "Public Utility Easement," or "PUE", but reserving to ourselves, our heirs and assigns the right to use the underlying land, provided said use shall not interfere with said utility companies use thereof;

(7) Furthermore, we hereby reserve to ourselves, our heirs, assigns and others for the use and benefit of present and future owners of lots/parcels and a Non-Exclusive Reciprocal Access easement for ingress to and egress from said lots/parcels by vehicular and pedestrian traffic, delineated on said map within said subdivision as "Reciprocal Access Easement".

(8) We also hereby dedicate to the City of Victorville, for public use, easements for the construction, installation and maintenance of drainage systems and sanitary sewer systems, shown on said map as "Drainage Easement" and "Sanitary Sewer Easement;"

And further, by recordation of this final/parcel map, we hereby _____ and we further hereby _____.

By:_____ By: _____

(Type in name and position or title of person signing) (Type in name of position or title of person signing)

6. City Engineer's Statement

A. Final Maps:

I hereby state that I have examined the annexed tract/parcel map, that the subdivision shown thereon is substantially the same as it appeared on the tentative tract/parcel map and any approved alterations thereof, and that all the provisions of Chapter 2 of the Subdivision Map Act and Title 17 of the Victorville Municipal Code have been complied with and I am satisfied that this final/parcel map is technically correct.

Dated: _____ _____

City Engineer
City of Victorville, California
RCE No._____ Exp. _____
or LS No._____ Exp. _____

(LEAVE SPACE FOR CITY ENGINEER'S STAMP)

7. Signature Omissions

Pursuant to the provisions of Section 66436 of the Subdivision Map Act of the State of California, the signatures of the following owners/holders of easements and/or other interests recorded in San Bernardino County have been omitted:

The signatures of the United States of America, the owner of a reservation subject to any vested and accrued water rights for mining, agricultural, manufacturing or other purposes, and reservations to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by the local customs, laws and decisions of courts, and a right-of- way reserved for ditches or canals constructed by the authority of the United States" as disclosed by Patent No._____ recorded *DATE* in book _____, of Patents, Deeds, Official Records, page _____, in the offices of the San Bernardino County Recorder, State of California. Said rights and reservations cover _____ being subdivided and not shown herein.

Southern California Utility Company and West Communications of California, the owners of a ten-foot wide grant of easement and right-of-way for the construction, maintenance and operation of overhead and underground electric and telecommunication systems as disclosed by Document No. 20-_____, recorded *DATE*, Official Records of San Bernardino County. Said easement is shown herein. Said easement cannot be located per the record.

8. Surveyor's (or) Engineer's Statement

A. Final Maps:

I hereby state that I am a Registered Civil Engineer (or Licensed Land Surveyor) in the State of California and that this tract/parcel map consisting of sheets is a true and complete representation of a field survey made (by me or under my direction) in conformance with the requirements of the Subdivision Map Act and local ordinance at the request of (name of the actual person requesting the survey) in (month and year) and that all the monuments shown hereon are of the character and occupy the positions indicated, or will be set in such position on or before (month and year), in compliance with Sections 66495 and 66496 of the Subdivision Map Act and are, or will be, sufficient to enable the survey to be retraced. I hereby state that this final map substantially conforms to the conditionally approved tentative tract/parcel map.

Dated: _____ _____

LS No. _____ Exp. _____

(FOR PARCEL MAPS ONLY – ADD THE FOLLOWING STATEMENT ON THE TITLE SHEET)

9. City Engineer's Statement of Required Improvements

A. Parcel Maps:

The following requirements for the construction of off-site and on-site

improvements along the street frontages of each parcel created by this subdivision are a condition of the approval of this parcel map. In accordance with the provisions of Sections 66411.1 of the Subdivision Map Act, the improvements shall be installed at such time as a permit or other grant of approval for development of any or all parcels created by this subdivision is issued by the City of Victorville.

(1) The subdivider or any successor in interest of any of the parcels to be created by this subdivision shall be responsible for any cost incurred in the relocation of existing utility facilities where such facilities conflict with the improvements required when said improvements are installed and for the undergrounding of all existing overhead utilities.

(2) The subdivider or any successor in interest of any of the parcels to be created by this subdivision shall be required to provide underground electrical, telephone and communications cable to each parcel created by this subdivision.

(3) The subdivider or any successor in interest of any of the parcels to be created by this subdivision shall provide sanitary sewer service to each parcel created by this subdivision in accordance with the requirements of the City Engineer.

(4) The subdivider or any successor in interest of any of the parcels to be created by this subdivision shall install street lights along the street frontages in accordance with the requirements of the master street lighting plans of the City of Victorville, the Southern California Edison Company and as required by the City Engineer.

(5) The subdivider or any successor in interest of any of the parcels to be created by this subdivision shall provide water service to each parcel created by this subdivision in accordance with the requirements of the City of Victorville Water District and the City Engineer.

(6) The subdivider or any successor in interest of any of the parcels to be created by this subdivision shall install fire hydrants and on-site fire protection to serve each parcel created by this subdivision in accordance with the requirements of the Victorville Fire Department and the City Engineer.

(7) The subdivider or any successor in interest of any of the parcels to be created by this subdivision shall install curbs, gutters, sidewalks, drive approaches, asphalt pavement and drainage facilities along the street frontages for this subdivision in accordance with the Standard Specifications of Public Improvements of the City of Victorville.

(8) The subdivider or any successor in interest of any of the parcels to be created by this subdivision shall provide gas service to each parcel

created by this subdivision.

(9) The subdivider or any successor in interest of any of the parcels to be created by this subdivision shall install residential or commercial curb ramps at all intersections.

Dated: _____ _____

City Engineer
City of Victorville, California
RCE No._____ Exp. _____
or LS No._____ Exp. _____

(LEAVE SPACE FOR CITY ENGINEER'S STAMP)

10. City Council's Acceptance Certificate

A. For Parcel Maps:

I hereby certify that the City Council of the City of Victorville by Resolution No. 76-15, adopted on the 17th day of February, 1976, has authorized me, acting on their behalf, to acknowledge the foregoing offers of dedication, and to accept all streets, alleys or other public ways or places and drainage easements subject to their improvement in accordance with City of Victorville Standards.

B. For Tract Maps:

I hereby certify that the City Council of the City of Victorville, by a motion duly seconded and passed, approved the annexed tract map on the day of _____, 20____, and acknowledged the foregoing offers of dedication and accepted all streets, drainage easements, landscape easements, and lots and in fee simple, subject to their improvement in accordance with City of Victorville Standards. The City of Victorville also accepted the "Non-Vehicular Access" rights.

Dated: _____ _____

City Clerk of the City of Victorville
State of California

By: _____
Deputy

11. City Council's Abandonment Certificate

I hereby certify that, pursuant to Sections 66434(g) and 66499.20-1/2 of the Subdivision Map Act, the recordation of this tract map constitutes abandonment by Victorville's City Council of the (east) _____ feet of that _____ foot wide offer of dedication to the City of Victorville per _____, also known as "_____Street" and said _____ are/is within the subdivision boundary line of this final map and not shown herein.

Dated: _____

_____
(Name of Current City Clerk)
State of California

By: _____
Deputy

12. Auditor's Certificate

I hereby certify that according to the records of this office, as of this date, there are no liens against the real property shown upon the annexed map for unpaid State, County, Municipal or local taxes or special assessments collected as taxes, except taxes or special assessments not yet payable, estimated to be $ _____.

Dated: _____

_____
(Name of Current County Auditor/
Controller Recorder)
County Auditor/Controller-Recorder
County of San Bernardino, California

13. Board of Supervisors' Certificate

I hereby certify that a bond in the sum of $ _____ has been executed and filed with the Board of Supervisors of the County of San Bernardino, State of California, conditioned upon the payment of all taxes, State, County, Municipal or local, and all special assessments, collected as taxes, which at the time of the filing of the annexed map with the County Recorder are a lien against said property, but not yet payable and that the subdivider has filed with me a certificate by the proper officer giving his estimate of the amount of said taxes and special assessments, and said bond is hereby accepted.

Dated: _____

_____
(Name of Current City Clerk)
State of California

By: _____
Deputy

14. San Bernardino County Recorder's Certificate*

This map has been filed under Document Number _____, O.R. this _____ day of _____, 20____, at _____am/pm, in Book _____ of _____at pages _____, at the Request of _____ in the amount of $_____.

Dated: _____

_____
(Name of Current County Auditor/
Controller Recorder)
County Auditor/Controller-Recorder
County of San Bernardino, California

*Note: The Recorder's Certificate can be placed at lower or upper right of map title sheet.

15. Amending Maps

The amending map may be a reproduction on linen or polyester base film of the original map to be amended. Space shall be provided for the Recorder's stamp in accordance with the requirements of the San Bernardino County Recorder. The words "Amending Map" shall appear prominently on each sheet of the map near the Tract Map number or Parcel Map number. The following certificate will be added to the original title sheet:

CITY ENGINEER'S STATEMENT (Amending Map)

I hereby state that I have examined the annexed amending tract/parcel map and that the only changes made are those set forth in Section 66469 of the Subdivision Map Act and I am satisfied that this map is technically correct.

Dated: _____

_____
City Engineer
City of Victorville, California
RCE No._____ Exp. _____
or LS No._____ Exp. _____

PART V - WATER FACILITIES

1. GENERAL INFORMATION AND DEVELOPMENT

1.1 Victorville Water District

The Victorville Water District (District or VWD) is authorized by the Local Agency Formation Commissions of California (LAFCO) to provide the following function: water and sewer. Sewage treatment and disposal is provided by contract with the Victor Valley Wastewater Reclamation Authority (VVWRA) as well as through its operation of its plant at Southern California Logistics Airport (SCLA). The district is a self-governed subsidiary district of the City of Victorville (City), the city council is the ex-officio board of directors of the district. The District is a component unit of the City. The District provides services to a population of 115,903.

This manual and additional information regarding VWD can be found on the VWD website at http://www.victorvilleca.gov/.

General project facility design requirements are presented in the following paragraphs:

1.2 Development and Design General Information

This Development Design guidance provides general procedural and technical requirements for the planning, design and construction of VWD service infrastructure required for new development.

1.3 General Project Design Requirements Design

- **Design**

Under the direction of a licensed California Professional Civil Engineer, the developer shall prepare detailed construction plans and specifications (plans) for the VWD service infrastructure, in accordance with the City of Victorville design standards. All plans and specifications prepared by the developer's engineer shall be subject to review and written approval by the City Engineer prior to bidding for construction. The plans must conform to all applicable federal, state and local governmental rules, ordinances and regulations and all applicable environmental protection laws in effect at that time.

- **Water Supply Assessments and Water Feasibility Studies**

The District requires that all proposed residential development of more than 50 dwelling units and less than 500 dwelling units, or any commercial development perform a **Water Feasibility Study (WFS)** and report, which includes a hydraulic analysis. This study is primarily concerned with establishing that sufficient fire flow shall be available for the proposed development. Specific procedures are found in Section 2 of these Standards.

Developments larger than 500 dwelling units (or equivalent criteria set forth in the Section 10910 of the California Water Code) will require a **Water Supply Assessment (WSA)** to be done, in accordance with the criteria set forth in Section 2 of these standards (California Water Code Section 10912 and 66473.7). This report includes specific information to demonstrate that sufficient water supply is available to serve a very large subdivision or commercial project1, such as a residential development of more than 500 dwelling units, or a hotel having more than 500 rooms. Specific procedures are found in *Section 2.3 Demand Criteria* of these Standards.

➢ **Right-of-Way**

All new VWD service infrastructure is required to be installed within the public *right-of-way* (ROW) or *public utility easement* (PUE), which can also include:

- Land which the City/District has fee title
- Easement-dedicated to the City or the District on the final map or by separate instrument

The District in its sole and absolute discretion shall determine whether a PUE dedication may be relied upon for installation of VWD service infrastructure.

1.4 Agreements, Fees and Credits

➢ **Fees and Credits**

For a listing of current water fees, please refer to the Water Rates section at the City of Victorville website http://www.victorvilleca.gov/

The developer is responsible for payment and installation of infrastructure to serve its development (Required Facilities). If VWD requires Developer's Required Facilities to be Oversized, then Developer shall construct and install the Oversized Facilities and VWD shall be responsible to pay the difference between the Required Facilities and the Oversized Facilities. This difference in cost is not creditable.

➢ **Out-of Area Service Agreement**

Out-of-Area service requests are request for VWD service outside of the district's service area boundary, typically when (for various reasons) a property cannot be served by whichever entity has jurisdiction over said property. Since the particulars of the situation may vary, these requests will be handled on a case-by-case basis. *There is no guarantee that VWD will be able to provide the requested services to the property*. In all cases, The District shall *not* initiate the agreement process and shall bear no costs associated with the agreement. The agreement requires approval by LAFCO, and *the process should be initiated by the property owner* through LAFCO.

[1] Senate Bills 610 (SB610) and 221 (SB221), which were enacted in 2001 and became effective on January 1, 2002, require that cities and counties prepare both a Water Supply Assessment (WSA) and a Water Supply Verification (WSV). For further details, refer also to: *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001 to assist water suppliers, cities, and counties in integrating water and land use planning Prepared by the California Department of Water Resources*. Available online at www.water.ca.gov

- **Water Line Extensions**

In some instances a water main may not exist adjacent to a property needing service. Any owner of one or more lots or parcels of land, or subdivider of a tract of land, desiring the extension of one or more water mains to service such property shall make a written application therefore to the district, per *Victorville municipal code Chapter 10.04.040u* (accessible online at http://www.victorvilleca.gov/)

1.5 Development Process

This section identifies the process for obtaining a *Will Serve Letter*. Before a new water service connection is authorized for installation, on-site addition, or on-site expansion to an existing service, a water commitment, in the form of a water *Will Serve Letter*, must be obtained from the District. Compliance with District standards does not create a right or guarantee to water service.

The following sections describe the Development Project Review and Approval Process in general terms.

- **Plan Submittal**

General Requirements

All plans submitted to the City for review will meet the minimum requirements identified herein, and additional requirements may be established by the City for digital submissions. The following will be included in a submittal:

1. Two copies of a hydraulic or system analysis for flow and pressure, when required by the City (unless previously approved).
2. A legal map or legal property description of the parcel(s) to be served.
3. Two complete sets of the civil improvement plans indicating all water details up to and for the property to be served. The only acceptable size of the submitted drawings shall be 24" x 36" with a horizontal scale between 1"=10' and 1"=50'. All lettering shall be clear, legible, and sized to meet the minimum requirement of the City. (See City's AutoCAD standards and submittal requirements for lettering sizing.)
4. One copy of any miscellaneous drawings (i.e., architectural, floor plan, etc.)
5. One copy of an overall master plan showing the area to be developed and any other adjoining proposed developments by the builder.
6. A digital copy of the above documents may be required in accordance with City procedures.

Water Plan Drawing Submittal Requirements

The following are the requirements for drawings submitted to the City:

1. Project (Drawing) name
2. Engineer of Record's name
3. Engineer of Record's valid California P.E. stamp with wet signature
4. Standard Notes
5. Number of lots/units
6. Legend
7. North arrow(s)
8. Scale(s) (horizontal and vertical)
9. Signature block for City approval
10. Vicinity map
11. Master utility plan
12. 24" x 36" sheets (oversized drawings will not be accepted)
13. Profiles will be provided for all mains being installed in an unimproved area and for all mains 16 inches and larger in diameter, providing invert elevations at 50 foot intervals, changes in grade, and at all fittings. In addition, profiles are required for utility crossings. Additional profiles may be required by the City.
14. Benchmark data and identification of a tie between existing or proposed survey monuments and the submitted easement documents
15. Curve data on deflected water mains
16. Driveway locations
17. ROW, easement(s), and property lines
18. Street names and ROW dimensions
19. Show all existing mains, laterals, valves, hydrants, etc.
20. Show all proposed mains, stubs, valves, bends, reducers etc., dimensioned from existing stationary markers (street light, sign, hydrant, etc.), and surveyed controls (street intersections, centerlines, property lines, etc.)
21. Show proposed service(s)
22. All new mains shall be drawn true to scale with no break lines
23. Layout should show the adjacent area and the relationship between the new facilities and the existing facilities, (i.e., surface grading, etc.)
24. Identify all other utilities, existing and proposed (i.e., gas, sewer, etc.)
25. Locate all existing or proposed obstructions such as utility vaults, catch basins, traffic islands, etc.

26. Quantity estimates
27. Building information and fire flow requirements for each structure, and location of all existing fire hydrants supporting the project
28. Fire Department approval
29. Notes as required by these Standards
30. Identify Caltrans ROW on drawings, if applicable

Subdivision Water Plan Additional Drawing Requirements

In addition to the general water plan drawing requirements, the following will be required on subdivision water plans:

1. Lot and block numbers on all sheets
2. Total number of lots to be served
3. An overview map; e.g., copy of Assessor's Parcel Map, with Assessor Parcel outlines prior to the subdivision under review.
4. Identify lots with static pressure > 80 psi.
5. Identify finished floor elevation for all proposed structures.
6. Provide meter box location detail as required clearly identifying the construction of the meter box outside of driveways and other traffic areas.

Above-Ground Structures Additional Drawing Requirements

Above-ground structures and above-ground electrical and mechanical equipment shall be protected against physical damage due to a *one-hundred year storm event*. Booster pumping stations shall remain fully operational and accessible during a *twenty-five year storm event*. When required by the City, a flood study verifying these requirements must be submitted with the design drawings.

1.6 Approval Requirements

- **Preliminary Approval**

Preliminary plan technical approval may be obtained after submitting the water plans for plan check, and making all the required changes as requested by the City. The preliminary approval will state:

> *"This project water plan complies with the City's technical requirements. However, this water plan is NOT APPROVED FOR CONSTRUCTION at this time and this signature does not provide or imply a water commitment."*

Final project approval must be obtained before construction is initiated.

- **Final Approval**

1. All plans submitted to the City must be signed and have the stamp of the Engineer of Record, a Professional Engineer duly licensed in the State of California, in accordance with California Code of Regulations, Title 16, Division 5 §§ 400-476.
2. The Developer's Engineer will submit the original plans for City approval. A duplicate original set must be submitted at the time of approval for all subdivisions, water main extensions, or service connections within Caltrans ROW. The City will retain this set.
3. Prior to City water plan approval, all executed permits, fees, and required easements must be submitted and approved by the City.
4. Signature approval of the Fire Department having jurisdiction must be obtained PRIOR to the City's approving the final water plan.
5. All signatures required prior to the City approving the final water plan must be less than one (1) year old.
6. All plans submitted to VWD must be signed and have the wet-stamp and signature of a Civil Engineer who is licensed within the State of California. Final approved plans must be submitted to the City on Mylar, to be signed for approval by the City Engineer, before any construction activity can begin.
7. The Developer's Engineer shall submit the original plans for VWD approval. A Mylar copy must be submitted at the time of approval for all subdivisions, water main extensions, or service connections. VWD will retain this Mylar copy. A digital submission of the utility plan is also required. Standards for this submission are established in Section 4.0.
8. Prior to City water plan approval, applications, fees, and required easements must be submitted and accepted by VWD.
9. Approval of the San Bernardino County Fire Department having jurisdiction must be obtained PRIOR to City's approving the final water plan.

1.7 Construction

Construction must commence within one year of the approval date shown on the plans, and must be diligently pursued to completion or the project may be subject to cancellation and must then be resubmitted for review and approval in accordance with VWD's Service Rules and requirements.

If more than one year has elapsed since approved plans, the developer/engineer shall resubmit the plans for review and approval.

- **State department of transportation (CALTRANS) permits**

A *State Highway Encroachment Permit* is required when working within the right-of-way of any State owned or maintained road. The Developer or Engineer will apply to the State for an Encroachment permit on behalf of VWD prior to obtaining approved water plans, and a check made payable to the State of California Department of Transportation (Caltrans) for the application fee.

An easement for the Agency should be obtained from any underlying fee owner in the event Caltrans does not own the full fee simple interest in the right-of-way. Prior to performing any work within the right-of-way, approval by the State must be received.

The following note shall appear on the drawing:

"State of California Department of Transportation (Caltrans) permit required"

An approved *Caltrans Occupancy Permit* shall be obtained through VWD *prior* to any construction within Caltrans right-of-way. Plans showing work in Caltrans right-of-way must show Caltrans stationing. The developer assumes all liability for work conducted under VWD obtained permit through warranty expiration.

- **Acceptance of Improvements**

After all water system improvements have been disinfected and successfully passed the *District's pressure test* and *bacteriological screening*, they may be accepted into the District for use. This will also allow the project to utilize the water system for fire protection during building construction.

When final paving is complete, all punch-list items must be corrected and the developer must provide the City with a copy of the *Covenants, Conditions & Restrictions* (CC&Rs) for the project. Upon final acceptance by the City, the developer will file a Certificate of Completion and Final Acceptance with the County, conveying the improvements to the City. At this point, the twelve (12) month warranty period begins.

2. Design Criteria Domestic Water Facilities

2.1 Background

The Domestic Water System design/construction standards and regulations for service are governed by the following documents:

- City of Victorville Municipal Code
- City of Victorville Water District Water Standards
- Green Book (Latest edition)
- AWWA Standards
- Title 22, California Code of Regulations California Regulations Related to Drinking Water
- Victorville Water District (VWD) Ordinance #VWD-005 Cross Connection Control

VWD has developed a Domestic Water System Hydraulic Model of the entire water supply and distribution system. This model will be utilized by VWD staff and/or a VWD consultant to size the domestic water system facilities required for each development at the developers cost.

2.2 Pressure Zones

VWD Domestic Water System includes approximately-different operating pressure zones. These zones operate nominally within a static pressure range between 40 to 120 pounds per square inch (psi). If static pressure exceeds 80 psi, an individual PRV is required.

Water pressure zone information is available from the Engineering Department. The domestic water drawings must identify the existing or proposed pressure zone (s) serving the development and the static water pressure.

2.3 Demand Criteria

The VWD Domestic Water System provides potable water for industrial, commercial and residential use and fire protection. For some projects, a detailed analysis of domestic and fire flow demands utilizing VWD's Domestic Water System Hydraulic Model may be required to properly define requirements for system design.

VWD requires new developments to install domestic water system infrastructure that supports VWD's Domestic Water System Master Plan. On-site and off-site domestic water infrastructure shall be sized to meet the *Peak Hour Demand* (PHD) of the proposed development in accordance with the following design criteria (See Table 2-1).

The City's staff reserves the right to determine criteria for each water system or sub- system based upon conditions that may exist for that particular location, anticipated level of development, planned use or other criteria. In general, however, water pipelines, tanks, pump stations, pressure reducing stations and appurtenances shall be sized to handle the highest demand on the system within the sphere of influence and shall provide capacity for the

following conditions:

- The peak hour demand.
- The maximum daily demand plus fire flow.
- Tank refill, if required.

Average day domestic demand shall be 200 gallons per capita per day (gpcd) on annual average, with 3.8 residents per house for 1140 gpd/unit. Assume maximum daily flow of 175% of average day flow and maximum hour flow of 300% of average day flow.

Fire flow requirements shall be in accordance with the specification of the Fire Protection Agency having jurisdiction, e.g. San Bernardino County or City of Victorville.

Any proposed residential development of more than 50 dwelling units and less than 500 dwelling units, or any commercial development, requires a *Water Feasibility Study* (WFS) to be done, in accordance with the criteria set forth in the following parts of this section. Commercial and industrial development proposed use and demand requirements should be reviewed and approved by The City prior to any system analysis being performed.

Table 2-1 Domestic Water Pipeline Design Criteria

Design Parameter	Criteria
ADD (Average Daily Demand)	$0.50\ \frac{gpm}{unit}\ \ or\ \ 720\ \frac{gpd}{unit}$
MDD (Max Daily Demand)	$1.00\ \frac{gpm}{unit}\ \ or\ \ 1440\ \frac{gpd}{unit}$
PHD (Peak Hour Demand)	$1.50\ \frac{gpm}{unit}\ \ or\ \ 2550\ \frac{gpd}{unit}$
MDD/ADD	➢ 2.0 $0.50 * 2.0 = 1.00\ \frac{gpm}{unit}$
PHD/ADD	➢ 3.0 $0.50 * 3.0 = 1.50\ \frac{gpm}{unit}$
Storage Volume	$\mathbf{V} = [0.5 * MDD(Diurnal) + 0.5 * MDD(Emergency)] * (No.\ of\ units) * 1440\frac{min}{day} + fire\ flow$ • $MDD = 1.00\ \frac{gpm}{unit}$ • $fireflow =$ _____ $gpm *$ _____ $hours * 60\ \frac{min}{hour}$ (determined by Fire Marshall)

<table>
<tr><td>Pipelines</td><td colspan="2">Designed to transmit the greater of the following:
• Peak Hourly Demand (PHD)
• Maximum Day Demand (MDD) + Fire Flow

12" and smaller: Max velocity $= 7.5\ \frac{ft}{sec}$
18" and larger: Max HLMax HL $= \frac{1\ psi}{1000\ ft\ of\ pipeline}$</td></tr>
<tr><td>Pump Stations</td><td colspan="2">MDD w/ largest unit out of service
Hydropneumatic systems include fire flow</td></tr>
<tr><td>PRVs</td><td colspan="2">MDD w/ largest unit out of service</td></tr>
<tr><td>Treatment Facilities</td><td colspan="2">MDD w/ largest unit out of service</td></tr>
<tr><td>Well Capacity</td><td colspan="2">$No.of\ Wells = \frac{(1.00\ gpm * no.of\ units * 1.2)}{1800\ \frac{gpm}{well}}$
• average well capacity = 1,800 gpm
• 1.2 Factor of Safetr maintenance or emergency approximately one well for every 1,500 units</td></tr>
<tr><td rowspan="2">Well Sites</td><td>Less than 90 acres</td><td>None</td></tr>
<tr><td>Greater than 90 acres</td><td>1 per 90 acres or major portion thereof, major portion being 45 or more acres.</td></tr>
</table>

Water pipelines to all service areas shall be looped to provide dual direction supply and system flexibility. Dead end mains are undesirable, but can be considered on a case-by-case basis.

2.4 System Analysis

The proposed water system shall be analyzed for the following three conditions (Reference: CALIFORNIA CODE OF REGULATIONS §64602. Minimum Pressure):

Peak hour demands with wells/booster pumping plants on. For the peak hour demand flow analysis, the pressure at each node shall be a minimum of 40 psi and a maximum of 120 psi.

Maximum day demand plus fire flow with wells/booster pumping plants off.

For the maximum day demand plus fire flow analysis, fire flow should be selected for the worst-case scenario (typically the hydrant furthest from the connection(s) to the City's distribution system, at the highest system elevation) and as directed by The City's staff. The pressure at each node shall be a minimum of 20 psi and the maximum velocity in the pipelines shall be 7.5 feet per second, (certain exceptions may apply), 2 hours worth of flow (min).

Minimum hour demands (10% of maximum day demand) with wells/boosters on.

For the minimum hour demand analysis, the maximum velocity in the pipelines shall be 5.0 feet per second and the maximum pressure at each node shall be 120 psi.

The Developer's engineer will be required to submit an analysis of anticipated flow demands; average, maximum hour flow, and maximum day plus fire flow. The City shall accept or request modifications to the submitted analysis.

2.5 Pipeline Materials

Refer to the City of Victorville Water District Approved Products List (latest revision) *Appendix A*.

2.6 Pipeline Sizing Criteria

Minimum size water pipeline is 8-inch nominal diameter

10", 14", and 20" pipelines are no longer utilized by the City.

For maximum hourly flow; pipeline should be sized to provide head losses not to exceed 3.5 feet per 1000 feet of water pipeline.

For maximum daily flow plus fire flow; pipeline should be sized to provide head losses not to exceed 5 feet per 1000 feet of water pipeline.

For all cases, mainline velocities are not to exceed 10 feet per second.

Use a "C" valve of 130 for polyvinyl chloride pipe and 120 for cement mortar lined steel pipe in the Hazen-Williams formula.

Provide a minimum of 40-psi pressure at a meter to each and every customer service using the pad elevation of the water tank, at half-full, serving the area as the starting hydraulic grade line. Fire hydrants are to have 20-psi minimum residual pressure at design capacities.

If any service at a meter is proposed to be less than 50 psi Engineer shall submit calculations demonstrating actual pressure at all fixtures being supplied by that meter. Services less than 40 psi at the meter will require a low pressure service agreement.

Commercial and industrial developments are to be analyzed by Developer's Engineer for review by the City's staff. The City's staff shall accept or modify the proposed pipe sizing.

The City's staff reserves the right to specify sizing of any water pipeline.

Due to master planning, the City's staff may require a larger size pipeline than normally required for a particular project to satisfy the City's design standards for system distribution requirement purposes. The Board of Directors may authorize participation and payment of increased cost of such water pipeline in accordance with the City's criteria.

Table 2.2 provides the domestic water pipeline design criteria to be utilized for all hydraulic analyses.

Table 2.2 Pipeline Design Criteria for Hydraulic Analysis

Design Criteria	Maximum Velocity
12" and smaller	$7.5 \frac{ft}{sec}$
Cul-de-sac/Dead end Pipelines	$10 \frac{ft}{sec}$

Design Criteria	Maximum Head loss
18" and larger	$\frac{1\ psi}{1000\ ft\ of\ pipeline}$

Design Criteria	Minimum Pressure
Static	60 psi
Fire	20 psi

2.7 Water Main Location

Main extensions should be located within a dedicated right- of-way. If a dedicated right-of-way is not available, the main may be located elsewhere upon Victorville Water District (VWD) approval and upon the granting of an easement to VWD. The easement shall be 20 feet or greater in width unless otherwise approved by VWD (subject to approval by VWD). Waterlines shall be designed to be a minimum of 10 feet from the property line or easement edge or as specified by VWD for the entire water main length. Other utilities may be located in the same easement if all Title 22 separation requirements are met.

** In case of conflict between COV Standards and Title 22 Code, the most stringent of the two takes precedent.*

Where street curbs are present, mains will be located in the street a minimum of 7 feet from the back of curb. In areas without curb and gutter, the mains will be located a minimum of 14 feet from the right-of-way edge unless established otherwise by VWD.

Mains should be located at a distance no less than 3 feet horizontally (pipewall to pipewall) from any gas line, 10 feet horizontally (pipewall to pipewall) from any non potable waterline (reclaimed) or sewer line (sanitary or storm), and 12 inches vertically above any non-potable waterline or sewer line. Location of other utilities in the easements should be coordinated with the Agency on an individual basis.

If the vertical distance of 18 inches between the waterline installed over a non-potable waterline or sanitary or storm sewer line cannot be maintained, the criteria for water/non-potable waterline or sewer main separations in Title 22 must be complied with.

Dead-end mains shall be minimized by looping mains whenever practical.

Mains installed in a cul-de-sac shall run the full street length ending approximately 15 feet from the property's front edge at the end of the cul-de-sac, unless they are looped.

Table 2.2 Minimum Horizontal Separation - Domestic Water Pipeline

Horizontal Separation from Domestic Water Pipeline	Minimum Separation (Outside to Outside)
Sewer Pipeline[1]	10 feet
Sanitation landfill, wastewater disposal pond, hazardous waste disposal site.	100 feet
Cesspool, Septic Tank, sewage leach field, seepage pit, underground hazardous material storage tank, or groundwater recharge project site	25 feet
Non-Potable Pipeline[1]	10 feet
Storm Water Pipeline[1]	10 feet
Curb (Lip of gutter)/Edge of Pavement 12 inch and Smaller Domestic Water Pipelines	3 feet
Curb (Lip of gutter)/Edge of Pavement 18 inch and Larger Domestic Water Pipelines	6 feet
Horizontal Separation from Domestic Water Service Line	10 feet
Sewer Laterals	10 feet
Sewer Manhole	10 feet
Domestic Water Main Fittings and Bends	2 feet
Fire Hydrant Run	4 feet
Catch Basin	4 feet
Separation between Domestic Service Runs	2 feet

[1]The 10' separating distance is measured between the outside edge (including bells) of the pipes. If the sum of the inside diameters of the two pipes is 24" or less, then the centerline (CL) distance between the two pipes shall be 12'.

This will aid in layout and plan checking. If the sum of the diameters is greater than 24", then the separating distance between the outside edge (including bells) shall be 10'.

Note: This is not an all-inclusive list, see Title 22 Code of Regulation, Section §64572 Water Main Separation.

2.8 Full Frontal Extension

Waterlines shall be required along the entire length of at least one property line frontage of the property to be served, whenever future line extension is possible. The property line frontage is that portion of the property along the public right-of- way. The minimum pipe diameter required in the frontage street shall be 8 inch or as required by VWD.

2.9 Water Main Joint Deflection

The maximum allowable water main joint deflection for ductile iron pipe materials and lengths is listed in the following table. If these offsets conflict with the pipe manufacturer's recommendation, the more stringent requirement shall apply. Requirements in excess of these deflections identified shall require installation of fittings.

- **Polyvinyl Chloride (PVC) Pressure Pipe**

PVC pipe shall be deflected uniformly throughout each length. Deflection shall be accomplished by staking the pipe on both sides of the joint, so joint deflection is minimized. The maximum allowable pipe deflection for factory belled PVC pipe shall be as follows:

Pipe Size (Inches)	Maximum Offset (Inches)	Minimum Radius of Curvature for 20' Lengths (Feet)
6"	17"	145 feet
8"	12"	190 feet
10"	11"	230 feet
12"	9"	270 feet

- **Ductile Iron Pipe (DIP)**

The maximum allowable joint deflection for push-on type joint and mechanical-type joint pipe shall be as follows:

Push-On Type DIP Joint

Pipe Size (Inches)	Deflection Angle (Degrees)	Maximum Offset (Inches)		Minimum Radius of Curvature (Feet)	
		18' Length	20' Length	18' Length	20' Length
4"-12"	2.5°	9"	10"	415'	460
14"-24"	1.5°	6"	6"	690'	765'

Mechanical Type DIP Joint					
Pipe Size (Inches)	Deflection Angle (Degrees)	Maximum Offset (Inches)		Minimum Radius of Curvature (Feet)	
		18' Length	20' Length	18' Length	20' Length
4"-12"	2.5°	9"	10"	415'	460
14"-24"	1.5°	6"	6"	690'	765'

Pipe sizes not shown shall be in strict conformance with the manufacturer's standards most stringent standards.

2.10 Depth of Cover

The minimum depth of cover shall be maintained for all pipe unless otherwise specified. Vehicle traffic over the water mains may be restricted until the minimum depth of cover is obtained. Unless authorized by VWD, a thirty-six (36) inch minimum depth of cover must be maintained from top of pipe to finish grade in paved areas, and 42 inch minimum in unpaved areas.

2.11 Pipe Casing

Pipe casings are required on all pipe installed using boring methods or where required to meet specific Railroad and/or Caltrans or any other governing agency requirements, to provide structural support, or as required under other special conditions. Cathodic protection may be required, to be determined by soils report. Casing material used shall be a minimum of one-quarter (1/4) inch thick steel (design calculations must be submitted by the developer's engineer), and conform to ASTM A283, Grade B, C, or D. All welding shall be performed in

accordance with AWWA C201, "AWWA Standard for Fabricated Electrically Welded Steel Water Pipe". Coatings for steel casing are not required. The pipe casing shall be laid true to line and grade with no bends or changed in grade for the full casing length. The pipe shall be symmetrically supported about its centerline inside the casing at each joint end with either redwood skids or pipe spacers approved by District engineer, banded to the pipe as follows (minimum):

Installed Water Main Diameter	Number of Skids (spacers)
6" through 12"	4
14" through 16"	5
18" through 24"	6

2.12 Valves

➢ Valve Location

Sufficient valves shall be provided on water mains to minimize inconvenience, degradation of fire protection, and sanitary hazards during repairs. Valves shall be generally located as follows, unless otherwise approved by VWD:

- At minimum intervals of one thousand (1,000) feet or whenever there is an intersection; for transmission mains in commercially/ industrially zoned areas, and residential off-site water mains.
- At every Tees and Crosses.
- Valves shall not be located in street gutters, valley gutters, or in driveways.
- A valve is required at the end of all temporarily dead-end mains. The valve location is to be a minimum of ten (10) feet upstream of the cap or blow off assembly.

Valved outlet(s) (i.e., stub-out) are no longer permitted.

** Existing stub-outs installed ahead of time does **NOT** constitute a water commitment.*

A shut off valve shall be provided for all service laterals per VWD Standard Drawings, and for all fire hydrant laterals.

VWD may require additional valves depending upon the project design.

➢ Gate Valves

- Gate valves may be used on all water main diameters up to, and including, 8 inches, (Exception: Tapping valves of any size)
- Gate valves shall be installed in the vertical position with non-rising stems in all locations,

except vaults.

- All gate valves shall be resilient seat unless otherwise specified by VWD.

➢ **Butterfly Valves**

- Butterfly valves may be used on water mains 12 inches in diameter and larger; unless a tapping (gate) valve is required, or as required by VWD.

➢ **Valve Stem Extensions**

Valve stem extensions are required within 2 feet of finished grade where the distance from the top of the valve box to the top of the operating nut exceeds 5 feet.

➢ **Valve Cans**

Adjustable valve boxes shall be provided for all buried valves. Valve cans shall be installed in accordance with Standard Drawings W-18 and W-19.

➢ **Special Valves**

- Air relief or combination air/vacuum relief valves will be required on pipelines' high points and changes in grade, depending on the main size and terrain, in accordance with Standard Drawings W-24, W-25, W-26, and W-27.
- Blow-off valves are required on all permanent dead-end pipe runs and may be required at stub-out locations. Blow-off valves for these locations shall be installed in accordance with Standard Drawing W-16 & W-17. Manual blow-off assemblies shall be sized and calculations submitted to the VWD Engineer for approval for all pipeline diameters twelve (12) inches and greater. Any services near a dead-end main shall be installed on the end cap or plug where appropriate.
- Backflow Prevention Assembly requirements are identified in Section 2.21 - Backflow.

2.13 Thrust and Anchor Blocks (aka “Kickers”)

Thrust blocks are only required for hot taps or in special cases as approved by the Engineer.

2.14 Mechanically-Restrained Joints

Mechanically restrained joints shall be used on all DIP & PVC fittings. The length of restrained joints should be clearly identified on drawings. For pipe sizes greater than 16 inches, calculations shall be submitted justifying the restrained lengths.

2.15 Service Laterals

➢ **Location**

All service laterals shall be installed in the right-of-way unless other provisions have been approved by VWD.

The full service lateral length between a water main and water meter shall be installed at 90 degrees to the water main horizontal alignment unless otherwise approved by VWD.

For service laterals 2 inches in diameter and smaller, service saddles shall not be closer than 18 inches from the end of the main, nor closer than 18 inches to any other service saddle or pipe joint.

The sewer and water laterals leading into the property shall be separated horizontally by a minimum of 5 feet, the sewer lateral must be a minimum of 1 foot lower than the water lateral, and the laterals shall be located in separate trenches, per State and local health requirements (See Section 2.14).

All service laterals shall be located a minimum of 10 feet from septic tanks, and a minimum of 25 feet from leach beds and/or seepage pits.

- **Lateral Installation**

Service saddles shall be installed in accordance with VWD's approved materials list for the type of pipe used.

Corporation stops shall be male iron pipe thread by compression or flared connection. A corporation stop shall be installed at the water main for all service laterals 2 inches and smaller.

All service laterals 2 inches and smaller shall have a minimum lateral diameter equal to the service size but in no case shall the lateral diameter be less than 1 inch (i.e., a 1" diameter service lateral is required for 3/4" and 1").

A separate copper service lateral shall be installed for each water meter. **Under no circumstances will a "Swing" tee or "dog leg" type connection be made for a separate service onto an existing service line.**

All services 3 inches and larger shall include valves as shown on VWD's service standard drawings.

- **Lateral Removal ("Service Kills")**

When abandoning existing water service assemblies sized 2 inches and smaller, the following note shall appear on the drawing:

ABANDONMENT OF EXISTING SERVICE LATERALS (2" and smaller)

The Contractor may then begin removal procedures for the affected service as follows:

Existing service laterals to be abandoned from existing water mains shall have the corporation stops turned off at the main, a minimum of twelve (12) inches of the lateral cut out near the corporation stops, and a brass cap or plug installed on the corporation stop. If the corporation stop is damaged beyond repair or

pulled from the existing water main, the main shall be repaired at the Contractor's expense in a manner approved by VWD. If it is discovered the corporation stop is not water tight, through no fault of the Contractor, the Contractor shall notify VWD for further direction. The VWD may require reusable components (meters, etc.) to be delivered to VWD.

For existing water service assemblies three (3) inches and larger that are to be abandoned, the following note shall appear on the drawing:

ABANDONMENT OF EXISTING SERVICE LATERALS (3" and larger)

The Contractor shall notify VWD two (2) full business days prior to the requested removal time to allow VWD to take the final service reading and to notify VWD's Inspector of the impending work. The Contractor may then begin removal procedures for the affected service as follows:

All valves to be abandoned shall be abandoned in the closed position; unless shown otherwise directed. Remove entire valve can and riser assembly, and backfill and compact per VWD standard or as directed by engineer.

If the valve is to be abandoned in the closed position, the lateral must be capped. Where a joint or coupling in the existing pipe is uncovered at the cut and cap locations, the installation of a restrained plug may be permitted with VWD approval. The Contractor shall install a concrete thrust block in accordance with the provisions of the VWD Standard Drawing W-41 at all cap or plug locations.

The Contractor shall then remove and/or backfill the abandoned vault with select material and restore all damaged surface features as directed by VWD.

- **Lateral Relocation**

All existing laterals that are to be relocated must first be disconnected from the existing pipeline following abandonment procedures (see Section 2.15). The relocated service installation shall comply with VWD's Standard Drawing W-01 & W- 03.

If box relocation is required, Section 2.17 shall apply.

All polyethylene or PVC tubing service laterals must be fully replaced, in lieu of extension or splicing, to VWD's current standards.

2.16 Meters

- **Size**

The final meter to be installed will be based on size and service requirements. The final meter selection must be approved by VWD.

All commercial development shall install irrigation meters separately from other domestic-use. There may be an exception for a drip irrigation.

Residential single-family homes within the City boundary can be ¾" minimum. In San

Bernardino County areas within the City, water meters need to be 1" minimum.

The size for all domestic services shall be based on continuous flow meter capacities when utilizing Peak Hour Demand. Maximum meter flow capacities may be used for maximum domestic demands, when calculated utilizing the applicable plumbing code or other applicable criteria, and fire flow conditions when associated pressure losses are accounted for in the system design.

- **Agency Provided Meters**

All meters 2 inches and smaller are provided by VWD and remain VWD's property.

All meters 3 inches and larger shall be provided by the developer and must meet the requirements of, be approved by, and remain the property of VWD. The VWD may elect to provide any size meter at the Developer's expense.

- **Installation**

All services shall be installed in accordance with VWD Standard Drawings and Specifications. Meters will not be allowed at locations not contiguous to the property served.

- **Installation of Meter and Vault**

The meter(s) and vault(s) with traffic/non-traffic bearing cover(s) shall be installed in accordance with the Standard Drawings and Specifications. Pre-cast concrete vaults approved by VWD shall be used. The designation of pre-cast must be made prior to plan approval.

Any block wall or other fence material shall be designed and constructed around the outside of the easement(s), to allow VWD direct access to the vault(s) and inlet piping from the adjacent right-of- way.

All easements shall be clearly marked or staked prior to the start of construction.

2.17 Meter Boxes

All meter boxes shall be located in the sidewalk, sidewalk area, or within a designated easement, or meter box placement in accordance with the Standard Drawing W-10. Meter boxes shall not be located in driveways or streets.

All meters 4 inches and smaller shall be installed in an approved meter box, sized per the corresponding Standard Drawing W-01, W-03. W-04 & W-05.

All meters 6 inches and larger shall be housed in a vault. Refer to Standard Drawings W-06 for dimension and construction details.

Provisions for remote reading devices for all vaults may be required when vault or meter box access has restrictions or as required by VWD.

2.18 Fire Systems/Backflow Requirements

All developer plans showing fire system connections shall provide information on the type of fire system that is being installed for the development (e.g. wet-pipe fire sprinkler systems, deluge fire sprinkler systems and dry pipe and preaction fire systems). The developer's engineer shall fill out and check the appropriate fire system box on the VWD Plan Check checklist for domestic water

VWD Standards *only* allows ***Reduced Pressure Detector Assembly (RPDA)*** for *all new construction* on fire services.

- **Wet-Pipe Fire Sprinkler Systems**

Wet-pipe systems are the most common type of fire sprinkler systems. A wet-pipe system is one in which the fire sprinkler piping is constantly charged by a direct connection to the public water supply. When a fire sprinkler activates, water is immediately discharged.

- **Deluge Fire Sprinkler Systems**

Deluge fire sprinkler system (system) is a dry-pipe, non-pressurized fire suppression system that are open to atmosphere.

- **Dry Pipe and Preaction Fire Sprinkler Systems**

Dry pipe and preaction fire sprinkler systems are similar in design. A dry-pipe pressurized system is typically pressurized with air or nitrogen, whereas a preaction system may or may not be pressurized.

- **Residential Fire Systems**

Residential fire systems are required for all new residential constructions in all of California.

- **Other Fire System Hazards Requiring Backflow Protection**

Reduced Pressure Detector Assembly (RPDA) shall be installed:

- All private fire system. If the private fire system has a looped system w/ multiple (2 or more) connections, the same number of RPDA shall be installed at each and every connections of the system.
- The fire system has an interconnection with auxiliary supplies, such as pumps pumping from reservoirs exposed to contamination, rivers, ponds, wells or industrial water systems, or where antifreeze or other additives are used.

2.19 Fire Flow Calculations + Hydraulic Modeling

VWD has a hydraulic model of the existing domestic water system. The domestic water daily demands and fire flow requirements must be verified by the hydraulic model by coordinating with the VWD Engineering Department. Please refer to *Appendix C*, Plan Check Submittal Application, Hydraulic Modeling checklist.

2.20 Private Wells

➢ Private Wells to Remain In Service

The following note shall appear on the drawing:

EXISTING PRIVATE WELLS TO REMAIN IN SERVICE

If the existing private well is to remain in service, District-approved backflow prevention assembly shall be installed immediately downstream of District water meter in accordance with Standard Drawing W-30 & W-39. The new service shall not be activated until the backflow prevention assembly has been successfully tested by District.

➢ Private Wells to Be Removed From Service

The following note shall appear on the drawing:

PRIVATE WELLS TO BE REMOVED FROM SERVICE

If the existing private well is to be abandoned, the installation of a backflow prevention assembly will not be required; however, VWD water service will remain in the off position and locked out until the well has been abandoned. An inspection of the on-site system will be made by District Inspector to verify the well has been disconnected from the on-site system and the well is no longer functional.

2.21 Backflow

Any connection to VWD's distribution system shall be made in a manner that protects the public potable water supply from contamination or pollution. Containment shall be achieved by the use of VWD approved backflow assembly that isolates, within the customer's internal distribution system(s) or the customer's private water system(s), such contaminants or pollutants that could backflow into the public water system.

No water service connection to any premises shall be approved, installed, or maintained by VWD unless the water supply is protected as required by State laws, State regulations, and VWD Standards. Water service to any premises shall not be activated by VWD if VWD determines the water service requires a backflow assembly and any of the following conditions prevail:

- The backflow assembly is not installed or has been removed after installation.
- The backflow assembly has been by-passed.
- The backflow assembly is in any way altered.
- Any cross-connection exists or possibility of cross-connection exists.

Facilities shall be evaluated by VWD for backflow prevention requirements on a case-by-case basis. For all commercial domestic water services, *reduced pressure* backflow prevention

assemblies (RP) shall be installed in compliance with VWD's Standard Drawing W-30 & W-39.

Any backflow prevention assembly required herein shall be a model and size approved by VWD. The term "Approved Backflow Prevention Assembly" shall mean an assembly meeting VWD's Standard Specifications and Drawings.

When backflow prevention assemblies are required, their installation design shall take into consideration pressure loss across the device and maintenance requirements for critical services. Parallel assembly use should be considered to prevent service disruption during scheduled maintenance.

2.22 Fire Hydrants

➢ Location, Spacing, Testing

All fire hydrants, permanent or temporary, will be installed in accordance with VWD's Standard Drawing S-12, W-11 & W-13.

At the District's discretion, one or two new fire hydrants in a tract will have a fire flow test performed by the developer under the inspection of the VWD in accordance with the AWWA M17 test procedure. Flow data (GPM) at 20 psi will be submitted to the VWD along with required pitot, static, residual, flowed opening, location information, and an 8h" X 11" map with both flowed and gauged hydrant information. The VWD Principal Engineer has the discretion to limit the number of tests for water conservation purposes.

Hydrant spacing and location are ultimately determined by the City of Victorville Fire Department or San Bernardino County Fire Department, whichever department has jurisdiction.

Fire hydrants shall be short side and shall be located as specified by VWD and shall not be located in the following locations:

- Within 6 feet of driveway, power pole, light standard, or any obstruction.
- Within 3 feet of any block wall or fence.

➢ Relocation/Abandonment

1. If a hydrant lateral needs to be lengthened, continuing further back in the same direction, and at the same depth as the original lateral, the hydrant assembly may be disconnected, the lateral lengthened and the assembly reconnected. The following note shall appear on the drawing:

RELOCATION OF FIRE HYDRANTS (Extension of Existing Lateral)

The Contractor shall remove and relocate both the upper and lower barrels of the existing fire hydrant(s) where shown, extend the existing lateral as required, and reinstall such hydrant (s) at the new location(s) indicated. Fire Hydrants shall be tested prior to and after relocation under the direction of VWD to ensure quality. Installation shall be in accordance with Standard Drawing W-11 and W-13.

Laterals made of unapproved materials shall be replaced from the main to the fire hydrant.

2. If the fire hydrant is to be abandoned, the following note shall appear on the drawing:

FIRE HYDRANT AND LATERAL ABANDONMENT

Where shown on the drawing, the Contractor shall abandon the existing fire hydrant(s) by removing both the upper and lower fire hydrant barrels and lateral of the fire hydrant to the fire hydrant valve adjacent to the main. The existing hydrant may be delivered to the VWD at the VWD's own discretion. The existing lateral shall be cut within three (3) feet of the abandoned valve, or as shown on plans, and capped. The existing concrete hydrant pad shall be removed.

Vertical Adjustment

Where grades are changed which affect fire hydrants, the Contractor shall make adjustments as necessary to bring the fire hydrant into compliance with Standard Drawings W-11 and W-13.

2.23 Fire Department Approval

Approval by the City of Victorville Fire Department or San Bernardino County Fire Department, whichever department having jurisdiction is required PRIOR to obtaining final water plan approval from the Agency.

2.24 Crossings and Clearances

- **Parallel Separations (Mains)**

The separations required by *Title 22 State of California Department of Public Health* (most current version) must be maintained between all storm and sanitary sewer lines, which parallel waterlines.

A minimum of twelve (12) inches of separation is allowed with special provisions according to Title 22 must be maintained between all storm and sanitary sewer mains, which cross water mains.

- **Service Lateral Crossings and Clearances**

For purposes of this section "service laterals" are those sewer and waterlines extending from a main and terminating on-site. They are generally of smaller diameters (water: 1" to 4"; sewer: 4" to 6").

- **Parallel Separations (Service Laterals)**

Water and sewer service laterals shall be installed a minimum of ten (10) ft apart in separate trenches. Water laterals shall be a minimum of twelve (12) inches above the sewer lateral (Ref.: "Plumbing Code").

For maintenance purposes, service laterals shall be installed a minimum of ten (10) feet from the exterior of the manholes.

- **Crossings (Service Laterals)**

Where a water service lateral crosses a sewer main or sewer lateral, it shall be above the sewer with a vertical separation of at least eighteen (12) inches. Any relocation of existing water laterals to achieve this clearance must be performed with the approval of and in accordance with the procedures and standards of VWD.

When a sewer main or sewer lateral must cross over or under a water lateral or water main with less than eighteen (18) inches clearance, the provisions of Section 4.19.1 through Section 4.19.3 shall apply.

2.25 Hot Taps

- **Identification**

The steel cylinder thickness, as well as the mortar lining and coating thickness, must be noted on all project plans where CML/CMC WSP mains are to be tapped.

- **General Requirements**

Easements, *where identified and allowed by VWD*, are required whenever the water main, service lateral, meter or any associated appurtenances are not located in a public right-of-way. All easement locations shall be identified on the water plan, as well as any area(s) dedicated as public utility easements to be occupied by water facilities, to facilitate field verification.

Trees, shrubs, or decorative rocks, and any block wall or other fence material, shall be designed and constructed around the easement(s) to allow VWD direct access to the appurtenances and piping from the adjacent right-of-way.

The area within the easement shall be graded to provide drainage away from any vault and/or backflow assembly(ies) to prevent vault flooding and provide access for maintenance.

The area within the easement shall not contain any grades or materials such as large rocks (greater than two inches) that would hinder or restrict maintenance of the facilities.

The final grade within the easement shall be at an elevation equal to back of sidewalk/right-of-way to allow safe ingress/egress to facilities. Retaining walls shall be provided when required, and a minimum distance of three (3) feet will be provided from the edge of the pad(s) or vault to any fence or wall.

VWD may identify other specific requirements or limitations for easements.

- **Size**

The easement size for a water main shall be twenty (20) feet or greater in width, centered on pipe, to accommodate large diameter pipe or other utilities in the same easement. Or as

directed by the District.

2.26 Survey & Control

- **Monumentation**

<UNDER CONSTRUCTION>

2.27 Victorville Water General Notes (Rev. 4/21/2008)

To be placed on all water improvement plans.

Standards and Specifications

1. Contractor shall comply with all Federal, State of California and Local Regulations, including safety regulations.
2. All work and material shall conform to the higher standard in the latest edition of either Victorville Water District's (hereafter referred to as "the City") General Notes or Standard Drawings. The Contractor is responsible for securing copies of the City's latest Water General Notes and Standard Drawings prior to start of construction.
3. Any construction and/or materials not covered in the City's Water Notes and Standards are subject to approval by the City.
4. All materials, testing and inspection of pipe shall be in conformity with the requirements of the City's Water Standards and American Water Works Association standards. Failure to meet any of these specifications will be cause for rejection.

Contractor Responsibilities

5. The Contractor shall have a current California Class A and/or C34 Pipeline Contractors License.
6. The Contractor shall verify the elevations of all existing water mains at points of connection and crossings prior to any construction of facilities. Any necessary changes of water line depth or alignment during construction shall be immediately reported to the City for review and approval prior to continuance of construction.
7. Approval of these plans by the City does not guarantee the accuracy or existence of any existing underground facilities, whether or not said facilities are shown on these plans. The Contractor shall be fully responsible for locating and protecting from damage all existing utilities and improvements whether or not shown on these plans. Any Contractor performing work on this project shall familiarize their self with the site and shall be held solely responsible for any damage to existing facilities resulting directly, or indirectly, from their operations, whether or not said facilities are shown on these plans.
8. The Contractor is responsible for protecting in place all survey monuments; any survey monuments disturbed during the course of construction shall be replaced at the

Contractor's expense.

9. Contractor agrees that he shall assume sole responsibility for the job site conditions during the course of this project, including the safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours. The Contractor shall defend, indemnify and hold the City harmless from any and all liability, real or alleged, in conjunction with the performance of work on this project.

Permits & Notices

10. The Contractor shall be required to obtain the necessary permits from the City and appropriate local agencies prior to any construction within any street, right-of-way, or easement. No work shall be performed on the water system until a Water Inspection Permit has been issued and the City has received copies of the construction drawings. An approved set of plans shall be available on-site at all times during construction.
11. The Contractor must notify the City at least one (1) week prior to beginning work.
12. The Contractor shall notify the City at least 4 working days prior to any tie-ins to existing waterlines. All tie-ins must be witnessed and approved by the Public Works Inspector.
13. The Contractor shall notify Underground Service Alert (1-800-422-4133) at least two (2) working days (48 hours) prior to any excavation.
14. The Contractor shall give at least two (2) working days (48 hours) notice for inspection requests.

General Construction Requirements

15. Curb and gutter shall be placed prior to the installation of the water main, service lines, meters and fire services.
16. All work shall be inspected by City Public Works, or it's duly authorized agent. Contractor shall not backfill trench until all of the fittings and pipes have passed inspection by the City.
17. When a construction conflict arises, the affected portion will be put on hold until a resolution is reached between the City and the Owner. The Contractor must obtain authorization from City Engineering prior to any field changes. The City reserves the right to relocate portions of the proposed work in order to avoid existing utilities, at no expense to the City.
18. Concrete stabilizing blocks shall be provided at fire hydrant risers, vault outlets, and hot taps larger than 4-inches. A polyethylene bond breaker shall be used between concrete and any water facilities.
19. Additional valves, hydrants, air-vacs, blow-offs, and restrained joints may be required at any dead end lines resulting from phase breaks, whether marked on plans or not. Installation and materials required for phase breaks shall be the responsibility of the Contractor and are subject to approval by the Public Works Inspector.

20. Backfill, compaction and re-surfacing in existing streets shall conform to requirements of latest City or County permit specifications.

21. Any existing air-vacs, fire hydrants, valve cans, etc., affected by the project must be adjusted by the Contractor in elevation and/or location as directed by Public Works Inspector.

22. The Contractor shall replace in kind, any paving, curb and gutter, or other improvements cut, removed or damaged by this project.

23. All water facilities to be removed shall be disposed by the Contractor.

Water Main & Valves

24. Standard water main location is 7 feet from curb face; other locations must be approved by the City.

25. Water mains shall be 8-inch diameter minimum or as shown on the drawings.

26. Water main shall be installed to the grades shown on the drawings, with a minimum of 36" of cover from top of pipe to final grade.

27. Main line valve sizes 6-in to 10-in shall be gate valves and valves 12-inch and larger shall be butterfly valves, with the exception of tapping valves. Butterfly valves must have Flange x Flange outlets. All valves shall be flanged directly to a fitting.

28. All valve operations deeper than 6 feet shall have powder coated steel operator extensions to raise the operator to a depth of 3 feet below ground surface. The Contractor shall adjust all valve covers to grade before final paving.

29. The Contractor shall install pipe and fittings with restrained joints at changes of direction and grade whether or not shown on the plans. Restrained joint calculations shall be performed by the Engineer using these parameters as a minimum: soil type SM; safety factor 1.5 to 1; type 5 trench; 3.5 ft depth of cover unless otherwise shown on the plans; 225 psi test pressure. Restraints are also required on curves with a radius less than 380 feet.

30. Pipe delivered to the site shall be protected by the Contractor from dust or other contamination prior to placing in trench; pipe ends shall be covered or plugged at all times. At the end of each day's work, the Contractor shall ensure that all openings into the pipeline are securely plugged and stopped.

31. Pipe shall be handled so as to protect pipe joints, lining and coating, and carefully bedded to provide continuous bearing and prevent settlement. Pipe shall be protected against floatation at all times.

32. Pipe joints shall not be deflected at an angle greater than the maximum angle recommended by the pipe manufacturer. Minimum pipe segment length for C-900 and C-909 shall be 3-feet or as recommended by manufacturer.

33. Imported sand (100 percent #30 sand or better) shall be used for pipe bedding (minimum

of 6-inches deep) and backfill to a depth of 12-inches above pipe. Bedding must be inspected by Public Works Inspector before pipe is installed.

34. No pipeline shall be installed on fill material without first meeting in-place density tests, if required by Public Works Inspector. Compaction in intermediate zone shall be compacted to 90% relative compaction.

35. Provide required vertical and horizontal separations between water and sewer or storm drain mains and laterals per the latest version of *Title 22 State of California Department of Public Health*. When a waterline crosses under a sewer or storm drain, the City requires special construction; see Standard Drawings for under-crossings. Horizontal separation less than 10-feet must be approved by the City.

36. Insulated copper wire is to be laid on top of all pipe with conducting connections to all above ground facilities and secured to the water main at 6 foot intervals. 3-inch wide water alarm tape shall be installed 1-foot above pipe.

37. All below ground nuts and bolts shall have a bituminous coating applied to inhibit material corrosion.

Fire Hydrants & Air Vacs

38. Fire hydrants shall be spaced as approved by the Fire Department. Hydrants shall be placed a minimum of 5 feet from any obstruction. Center of hydrant shall be placed on a lot line when possible. All fire hydrant locations must be approved by the Victorville Water District.

39. Fire hydrants at intersections shall be located per City of Victorville Standard S-12.

40. A maximum of one extension may be used to adjust a fire hydrant to proper elevation.

41. All fire hydrants to be bagged at the time of installation. Bag shall not be removed until instructed by Public Works Inspector.

42. An air release valve shall be installed at every high point in the system, whether or not shown on the plans.

Services & Meters

43. All commercial and industrial water meter services shall have a Department of Drinking Water approved Reduced Pressure Backflow Assembly installed and tested prior to activation of water service.

44. All homes with fire sprinklers that contain antifreeze shall have a Department of Health Services approved Reduced Pressure Backflow Assembly installed and tested prior to activation of water service.

45. Meter boxes shall be located to clear driveways, whether or not shown on the plan. Service locations shall be coordinated with the Public Works Inspector. The Contractor shall adjust meter boxes to sidewalk grade before sidewalks are poured.

46. Meter boxes located near light poles shall have a four (4) foot separation from light pole to angle stop.

Testing & Disinfection

47. Prior to the activation of any newly constructed water lines, or any connections to existing systems, the Contractor shall chlorinate by gas or liquid injection of the new pipeline to 100 ppm. All chlorination of new water mains shall hold a minimum of 25 ppm for a 24-hour period. After a 25 ppm residual has been maintained for 24 hours, the Contractor shall flush the pipeline until a chlorine residual between 0.8 ppm and 0.4 ppm is obtained. The chlorine residual can only drop a minimum of 0.2 ppm in a 24 hour period, and never drop below 0.2 ppm. If the residual is not maintained, the pipeline shall be re-flushed and sampled after an additional 24 hour period. Once this requirement is met, a bacteria sample may be taken. Flushing, De-Chlorination and testing shall be coordinated with the Public Works Inspector. The Hyper-Chlorinated disinfection water shall be disposed of in a manner consistent with current regulations.

48. Water main shall be hydro-tested at 225 p.s.i. for a minimum of 2 hours at the highest point in the piping system. Following the hydrostatic test, the pipe shall be leak-tested at 150 p.s.i. for a minimum of 2 hours. There shall be zero pressure loss during the leak test. All testing shall be verified by the Public Works Inspector. The use of bulk heads for testing must have prior approval of the City.

Water Activation

1. Water will not be turned on to the project until all work is complete and approved by the Public Works Inspector and all financial paperwork has been submitted.

2. Prior to installation of water meters, the Contractor must complete punch list items for the entire job, obtain a Will Serve letter (allow 3 weeks for approval), and pay connection fees for the desired meters. Allow 2 weeks for meter installation on an existing service; allow 6 weeks for installation of a meter and service line.

3. Prior to meter installation, the Contractor shall also return a legible and clean set of “As-Built” drawings to the City.