

S-10

**GENERAL DESIGN AND CONSTRUCTION  
REQUIREMENTS FOR PUBLIC IMPROVEMENTS  
IN THE CITY OF SANTA MARIA, CA**

**SECTION I. PUBLIC IMPROVEMENTS DESIGN CRITERIA**

All design shall conform to the current standards, specifications, and drawings of the City of Santa Maria, which are on file in the office of the City Engineer. Deviations or departures from such standards, specifications, and drawings require approval by the City Engineer. In descending order of precedence, so too, shall the following be applicable to design: Standard Specifications and Standard Plans, State of California, Department of Transportation; Santa Barbara County Flood Control District Standard Drawings; Los Angeles County Flood Control District Standard Drawings and where referenced the So. California Chapter of APWA Standard Specifications unless specified otherwise herein.

Refer to the Standard Drawing entitled "City Drawing title block" for sheet sizes, title block details and other information.

An electronic copy of all deliverables (i.e. Public Improvement Plans, Grading Plans, Parcel Maps, Final Maps, etc.) in Auto Cad format on compact disc(s) must be submitted prior to City Engineer approval.

**A. STREETS**

1. Profile Slope:

- Min . . . . . 0.25% (0.40% for cross gutters).
- Max . . . . . 10.0% for minor and local streets.  
5.0% for collector, arterial, and principal arterial streets.

2. Horizontal Curves:

- (Minimum Centerline Radius) (unless otherwise established at the time of tentative map, use permit, or development permit approval)
- Minor (36' curb-to-curb) . . . . . 100'.
  - Local (40' curb-to-curb) . . . . . 200'.
  - Collector (44' curb-to-curb) . . . . . 300'.
  - Arterial (64' curb-to-curb) . . . . . 600'.
  - Principal Arterial (divided road) . . . . . 1,000'.
- Indicate Sta./Elev. of critical curve location points plus angle, length, tangent.

3. Vertical Curves:

>1.0% grade change requires vertical curve. The length of the vertical curve shall be determined by utilizing the stopping sight distance standards incorporated within the State of California, Department of Transportation, Highway Design Manual, as last revised. Indicate Sta./Elev. of critical curve location points plus length.

4. Street Section:

Street section design shall be as per City Standard Drawings for residential, commercial, industrial, minor residential street.

5. Cross Slope:

Street cross slope shall be 2% for new construction and shall be 1½-5% for reconstruction or matching existing construction.

6. Curb Return Radii:

Minor street. . . . .	27'
Local street. . . . .	27'
Collector street. . . . .	27'
Arterial street . . . . .	35'
Principal Arterial street . . . . .	35'
Intersection between Arterial or Principal Arterial Street and Minor, Local, or Collector Street . . . . .	35'

Indicate Sta./Elev. of critical curve location points plus angle, length, tangent.

7. Curb Height:

Curb height shall typically be 6" except where other heights are required to match existing curbs or to address storm water runoff hydraulic considerations. Changes in height shall be effected by a smooth transition and not an abrupt discontinuity.

8. Rights-of-Way:

Right-of-way lines at intersections of public streets shall at a minimum be so configured as to provide adequate space to accommodate pedestrian curb ramps in conformance with California Administrative Code, Title 24 requirements (CalTrans STD. DWG. A-88).

9. Cul-De-Sac/Knuckle:  
Per standard Drawings.

10. Street name/Stop Signs:  
Per standard Drawings.

11. Monuments:  
Per Standard Drawing: Locate at centerline/intersections, center of cul-de-sacs, centerline intersections with exterior boundaries, line of sight from monument to monument.

**B. SANITARY SEWER**

1. Design must conform with the City of Santa Maria General Plan.

2. Minimum Size:

Residential. . . . . 6".  
Multi-residential, commercial, and industrial. . . . . 8".

3. Minimum Grade: (Nominal minimum flow rate achieved: 1.8 fps for 6" and 8" lines, 2.0 fps for larger diameter lines)

6" . . . . .	0.38%.	21" . . . . .	0.095%.
8" . . . . .	0.25%.	24" . . . . .	0.080%.
10" . . . . .	0.20%.	27" . . . . .	0.065%.
12" . . . . .	0.18%.	30" . . . . .	0.060%.
15" . . . . .	0.14%.		
18" . . . . .	0.12%.		

Where the use of a larger diameter pipe is desired for the purposes only of achieving a flatter slope in the line (and not for reasons of providing necessary capacity), it must be demonstrated that the pipe will flow half full or fuller under the anticipated ultimate flow conditions.

4. Maximum velocity: (flowing one-half full)

All pipe diameters. . . . . 10.0 f/s.

5. Minimum Cover: 3.0'; (when <3.0 encasement or approved alternate pipe - typically ductile iron pipe is required).

6. M.H. to M.H.: 400' (maximum); M.H. to C.O. 200' (maximum).

7. M.H.'s required at angle points and size changes.

8. T-lock manhole pipe with factory installed PVC liner on 12" and larger sewers.

9. Clearance to water mains: refer to the State of California, Department of Health Services publication "Criteria for the Separation of Water Mains and Sanitary Sewers". Additionally, the following criteria shall also apply:

- a. Cross at 80° to 90° angle.
- b. Horizontal clearance between sewer and water laterals ≥5'.

10. Standard location:  
On the south side of east-west streets and on the west side of north-south streets (refer to City Standard Drawings for residential, commercial, industrial, minor residential streets).
11. Change in Direction:
  - a. When the direction of a sewer main changes more than forty-five degrees (45°), there shall be a drop of one-tenth feet (.10') in the flow line across the manhole.
  - b. Invert of entering sewer line to main/trunk (12" and larger) shall be above spring line of main/trunk.
12. Horizontal deflection shall follow in parallel with the street centerline and meet the pipe manufacturer's installation specifications for deflection.
13. Straight alignment between manholes preferred for maintenance purposes. Curved lines that follow the centerline of road allowed if it would take an excessive number of manholes to achieve straight alignment.
14. Indicate pipe material, size, length and material specification. Submit flow rate and capacity calculations.
15. Show sewer lateral locations by station; tables are NOT acceptable.
16. Extended sewer lines to tract boundary.

C. WATER

1. Design must conform with the City of Santa Maria General Plan.
2. Minimum distribution line size:

Residential . . . . .	6".
Multi-residential, commercial, and industrial . . . . .	8".

3. Minimum cover:

6" through 12" lines . . . . .	>3.0'.
14"+ lines. . . . .	>4.0'.

Anything less than the above-stated minimums requires the use of ductile iron pipe.

4. Clearance to sewer: refer to the State of California, Department of Health Services, publication "Criteria for the Separation of Water Mains and Sanitary Sewers". Additionally, the following criteria shall apply:
  - a. Cross at 80° to 90° angle.
  - b. Horizontal clearance between sewer and water laterals  $\geq 5'$ .

5. The number of valves required at a junction is the No. of legs less one except for transmission lines which require a valve at every leg of tee or cross; max. spacing 700'. RWGV's for 12" and less; BFV's for 14" and larger.
6. Hydrants:
  - Residential . . . . . 400' intervals.
  - Multi-residential, commercial, and  
industrial . . . . . 350' intervals.

On-site hydrants shall be installed as required by Fire Department.
7. A dead end line shall have a hydrant at the dead end and shall not exceed 600' in length.
8. Cul-de-sac: fire hydrant required at terminus.
9. Standard location: on the north side of east-west streets and the east side of north-south streets (refer to City Standard Drawings for residential, commercial, industrial, minor residential streets).
10. Indicate pipe material, size, length and material specification.
11. Show water service locations by station; tables are NOT acceptable.
12. Extend water lines to tract boundary.
13. Dead end; if no fire hydrant, blow off required; long dead end may require automatic flushing device STD. DWG.

D. STORM DRAINAGE

1. Design must conform with the City of Santa Maria General Plan.
2. Design must conform with the City of Santa Maria Grading and Drainage Plan Information handout.
3. Where applicable, design must conform with the Santa Barbara County Flood Control District standards.
4. Maximum spacing between drainage structures (manholes, catch basins, and drop inlets): 500'.
5. Minimum diameter public storm drain line: 18".
6. Minimum headroom under bridges over channels: 6.5'.

7. Standard Location: if located within public streets, on the north side of east-west streets and on the east side of north-south streets (refer to City Standard Drawings for residential, commercial, industrial, minor residential streets).
8. Minimum Slope: the minimum slope of underground storm drain lines shall be that slope required to maintain a velocity of two feet (2') per second, when the line is flowing one-half (½) full.
9. Maximum Slope: the maximum slope of underground storm drain lines shall be that slope which limits velocity to a maximum of twenty feet (20') per second, when the line is flowing one-half (½) full.
10. Additional Criteria to Consider in Design:
  - a. Adequate clearance with other utilities.
  - b. Adequate cover (varies with pipe material and class).
  - c. H.G.L. and E.G.L. (twenty-five year storm).
  - d. The need (if any) for de-silting basins.
11. Indicate pipe material, strength, length, special bedding requirements and material specification.
12. Santa Barbara County Flood Control District review signature block (where applicable).
13. Details: City of Santa Maria; L.A.Co.F.C.D.; S.B.Co.F.C.D. (precast inlets NOTallowed).

#### E. STREET LIGHTS

1. Comply with City of Santa Maria street lighting general plan and STD. Street light DWGS.  
  
It is strongly encouraged that prior to actual layout of a street lighting system, consultation with and direction from the staff in the office of the City Engineer be sought.
2. Street light conduit shown on underground plans. (North or East side of street preferred)
3. Street light locations shown on surface plans and underground plans. Stations, wattage, and arm length (if not 8') to be included on underground plans.
4. Pull boxes on underground plans (maximum 200' spacing).
5. Street lighting circuitry plan (preferably one sheet) showing street and lot configuration, street lights, service points, pull boxes, and proposed circuitry for review and approval by the Streets & Facilities Manager. The following notes shall be included on the circuitry plan:
  - (a) Contractor shall install a white non-reflective marker (Caltrans Type A) on the

face of curb adjacent to service points.

- (b) Service points and pull box shall be installed in sidewalk unless otherwise noted.

- 6. Where and when specifically approved, 100W HPS decorative streetlights shall comply with the details indicated in the City's standard specifications for streetlights.
- 7. The applicant shall send a copy of the approved street light circuitry plan to PG&E prior to issuance of encroachment permit and apply and pay all fees for electrical service if necessary.

#### F. ALLEY LIGHTS

Alley lights shall be located per the following:

All alleys four-hundred feet (400') or fewer in length (curb-to-curb) shall have one (1) light at mid-point. Alleys four-hundred to eight-hundred feet (400 to 800') shall have two (2) lights installed at the quarter points. Refer to City Standard Drawing.

#### G. SIGNING AND STRIPING

Signing and striping shall be designed in conformance with Standard Plans, State of California, Department of Transportation, as last revised.

- 1. Lane Layout, including dimensions.
- 2. Bike Lane location and dimensions.
- 3. Stop Bar and stop sign at all intersections.
- 4. Striping
  - a. Centerlines and lanelines shall be paint patterns with reflective markers per CalTrans standard details.
  - b. All pavement markings (stop bars, arrows, etc.) shall be 2-coat paint, not thermoplastic.
- 5. Channelization.
- 6. Details.
- 7. Legends.
- 8. Sign Locations and pertinent measurements.

## H. PLAN VIEW

1. North Arrow (north oriented to top or left of sheet).
2. Scale for all details.
3. Street names.
4. All existing (dashed) and proposed (solid) utilities.
5. All surface and sub-surface structures.
6. Dimensions
  - a. Right-of-way
  - b. Center line to curb face
  - c. Curb face to curb face
  - d. Curb face to adjacent property line
  - e. Sidewalk width (5.5' standard w/.5' curb. 9.5' commercial w/.5' curb and tree wells. 5' – 8' meandering, 4.0' w/.5' curb for minor street)
7. Elevations
  - a. Flow line at B.C.R., E.C.R.
  - b. Cross gutter intersections
  - c. Drainage pipe invert
8. Typical Street Sections
  - a. Dimensions
  - b. Aggregate base thickness
  - c. Asphaltic concrete thickness
  - d. Chip seal requirement
  - e. Curb type and height

## I. PROFILE VIEW

1. Scale
2. Existing in dashed, proposed in solid
3. Top of curb
4. Center lines
5. Follow lines of pipes and drainage channels

- a. Hydraulic grade line (25 year storm)
  - b. Energy grade line (25 year storm)
  - c. Identify design flow, “n” value, etc.
6. Utilities which cross
7. Water, sewer, and storm drainage. “shade” storm drain pipeline to distinguish from other pipelines in profile.
8. Stationing and Elevations
    - a. Bottom of profile and even 100’ stations
    - b. Equations (if any)
    - c. Grade breaks
    - d. B.C.’s, E.C.’s, B.C.R.’s and E.C.R.’s
    - e. Every 25’ on vertical curves, beginning, end, P.V.I. (point of vertical intersection) stations and elevations.
    - f. All joints with existing improvements
    - g. High points
  9. When widening existing streets show centerline profile and join profile. Submit cross sections as part of Public Improvement Plan, approximately 25’ intervals.

## **SECTION II. GENERAL CONSTRUCTION REQUIREMENTS**

- A. All construction shall conform to the standards, specifications, and drawings as are in effect at the time of actual starting of construction. Notwithstanding the foregoing, in descending order of precedence the following standards, specifications, and drawings shall be conformed with in the course of all construction unless specified otherwise herein:
  1. The approved plans for the project along with approved design Engineer’s Construction Cost Estimate which includes 10% minimum contingency.
  2. City Standard Specifications and Drawings. They can be obtained at the Engineering Division office at 110 S. Pine Street, Suite 221 (mail: Suite 101), Santa Maria, CA 93458-5082 or web site: [www.ci.santa-maria.ca.us](http://www.ci.santa-maria.ca.us).
  3. Standard Specifications and Standard Plans, State of California, Department of Transportation; latest edition.
  4. Los Angeles County Flood Control District Standard Drawings.
  5. Santa Barbara County Flood Control District Standard Drawings.
- B. Plans showing work which is not started within one year after the date of approval must be resubmitted to the City Engineer for review and reapproval.

- C. Contractors on City work must be licensed in accordance with the laws of the State of California and the City of Santa Maria.
- D. The cost of all permits shall be borne by the Contractor.
- E. Horizontal and vertical controls and lines and grades shown on the plans and profiles are believed to be correct for the work shown. Corrections required by errors, omissions, or minor modifications are subject to approval by the City Engineer and shall not relieve the Contractor of responsibility for fulfilling the agreement.
- F. All underground utilities, including water, gas, power, electric service, street lighting, cable T.V., telephone, sewer, and others, including laterals to property lines, shall be installed prior to paving the street in which they occur and shall comply with current City Code when applicable. Locations of underground utilities shall comply with City Standard Drawings for streets and alleys.
- G. Existing subsurface structures are noted from best records available. The Contractor shall be responsible for exposing these structures prior to trenching and shall be responsible for all damage to them and other unknown or unidentified structures.
- H. All excavations or trenches in paved areas shall require sawcutting in a neat and uniform manner.
- I. The Contractor shall practice safety at all times and shall furnish, erect, and maintain such fences, barricades, lights, and signs as are necessary to give adequate warning to the public at all times in conformance with Chapter 5, "Manual of Traffic Controls for Construction and Maintenance Work Zones" of the California Department of Transportation Traffic Manual.
- J. Shoring will be required for safety when necessary in accordance with State of California Safety Orders.
- K. For development initiated projects and their required public improvement plans (PIPs) three verification/certificates need be included in the PIPs;
  - a. Civil Engineer of Record certificate (needs to be signed by owner prior to City Engineer approval).
  - b. Soils Engineer of Record certificate (needs to be signed by owner prior to City Engineer approval).
  - c. Soil/Material Work verification. Soils firm name and soils Engineer of Record with date and registration number shall be submitted to the Engineering Division office at least ten (10) working day prior to the request for release of surety for "faithful performance of improvements."
- L. To design for and effectuate abandonments of waterlines, sanitary sewers and storm

drains, complete removal or partial removal with portions abandoned in place may be required.

For partial removal with the balance of the facilities to be abandoned in place:

1. Appropriately plug all pipe ends including entering/leaving structures.
2. Remove all covers, rings, frames, boxes, tapered sections of structures to a minimum of 3' below finished surface.
3. Backfill all removal areas with structural sand backfill per standard drawing (trench backfill) or two sack slurry to 3' minimum below finished surface.
4. The top 3' minimum may be backfilled with the appropriate materials required for the site of the removals.

For complete removal, backfill per notes no. 3 and 4 above.

### **SECTION III. INSPECTION**

All work shall be done under the inspection of, and performed to the satisfaction of, the City Engineer. Only plans approved and signed by the City Engineer may be used for the construction of Public Improvements.

The Contractor shall at all times maintain safe facilities and provide safe access for inspection by City to all parts of the work and to the shops or places where the work is in progress.

The Contractor shall pay reasonable inspection fees to the City based upon the compensation rate paid Inspectors by the City for overtime. Overtime shall mean and include work prior to 8:00 a.m. and subsequent to 5:00 p.m., whether or not the total time on the work or improvement herein described exceeds eight hours on the date such overtime occurs. Overtime shall also include all work on Saturdays, Sundays, or holidays as defined in California Government Code Section 6700.

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