

## SECTION 6

### STREETS (ST)

**6-1 STREET CLASSES AND GEOMETRIC REQUIREMENTS** - For purposes of geometric and structural design of all new public streets, streets shall be classified according to the following requirements, the appropriate Standard Details, and details below. Changes to the standards can only be made at the discretion of the City Engineer.

- A. Alley** - A street depressed in the center with a right-of-way and surface width of 20 feet. Alleys are allowed for servicing up to ten (10) residential lots with no expected cut through traffic. If an alley is used to provide Fire Department access, refer to Section 5 of the Design Standards for additional information. A minimum separation of five (5) feet is required between the 20-foot for the alley and any structure, 20-feet if parking in front of garages is allowed.
- B. Residential Streets** - The following standards shall apply to minor and primary residential streets:
  - 1. Minor Residential** - A residential street servicing 100 or fewer lots shall be classified as a minor residential street.
  - 2. Primary Residential** - A residential street servicing more than 100 lots, or along which schools or parks are proposed to front, shall be classified as a primary residential street. Primary residential streets shall have a right-of-way width of 50 feet, and back of curb to back of curb width of 40 feet.
- C. Collector/Industrial** - A street serving an industrial/commercial subdivision, or a residential subdivision along which no home frontage is allowed, shall be classified as a collector/industrial street. Additional right-of-way and pavement shall be provided at intersections for deceleration lanes, bus turnouts, and turn lanes.
- D. Arterial** - Those roads specified in the City's Street System Master Plan as arterials and main thoroughfares as determined by the City Engineer. Additional right-of-way and/or pavement may be required for bus turnouts and at intersections and driveways for acceleration lanes, deceleration lanes, and multiple left turn lanes. Additional right-of-way shall also be provided if sidewalks are not part of a landscape/pedestrian corridor adjacent to the back of curb.
- E. Cul-de-Sac** - The length of cul-de-sac streets as measured from the centerline of the intersecting street to the center of the bulb, shall not exceed 750 feet, unless a secondary emergency vehicle access is provided to the rear of the cul-de-sac bulb area, in which case the length of the cul-de-sac may be increased with the approval of the Fire Chief and the City Engineer. Cul-de-sacs longer than 150 feet shall have increased bulb radii per the standard drawing.

In the case of stub streets associated with phased development, the combined street lengths as measured from the dead-end to the nearest through street shall be in accordance with the requirements for cul-de-sacs. Stub streets shall be terminated with a temporary bulb or a hammerhead conforming to the Standard Details. A barricade conforming to the Standard Details shall be installed at the end of all streets that are proposed for future extension. For cul-de-sacs greater than 150 feet or where the end of the cul-de-sac is not visible from the centerline intersection of cross street, a "NOT A THROUGH STREET" sign shall be installed at the beginning of the cul-de-sac.

- F. Modified Collector Street** - The Grass Valley City Council has adopted modified collector street sections for designated streets within the city.
- 1. Ridge Road** - Refer to the Standard Details for the adopted street section for Ridge Road between Slate Creek Road and Hughes Road.
  - 2. Idaho-Maryland Road** - Refer to the Standard Details for the adopted street section for Idaho-Maryland Road between Highway 20/49 and Brunswick Road.

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**TABLE 6-1  
STREET GEOMETRIC REQUIREMENTS**

<b>CLASS</b>	<b>RIGHT OF WAY WIDTH</b>	<b>BACK TO BACK OF CURB WIDTH</b>	<b>RADIUS OF CURB RETURN @ RIGHT OF WAY / @ BACK OF CURB</b>		<b>NO. OF TRAVEL LANES</b>	<b>MINIMUM CENTERLINE RADIUS FOR HORIZONTAL CURVE</b>
Minor Residential Attached Sidewalk	42 feet	32 feet	21 feet	26 feet	2	200 feet
Minor Residential Detached Sidewalk	32 feet	32 feet	26 feet	26 feet	2	200 feet
Primary Residential Attached Sidewalk	50 feet	40 feet	21 feet	26 feet	2	200 feet
Primary Residential Detached Sidewalk	40 feet	40 feet	26 feet	26 feet	2	200 feet
Collector Attached Sidewalk	58/72 feet	48 feet	26 feet	31 feet	2	500 feet
Collector Detached Sidewalk	48/62 feet	48 feet	31 feet	31 feet	2	500 feet
Arterial Attached Sidewalk	82 feet	72 feet	Residential & Collector 26 feet / 31 feet  Arterial 45 feet / 50 feet		4/5	1000 feet
Arterial Detached Sidewalk	72 feet	72 feet	Residential & Collector 26 feet / 31 feet  Arterial 45 feet / 50 feet		4/5	1000 feet

**6-2 RIGHT-OF-WAY WIDTH** - Right-of-way widths shall be in accordance with these standards for the street classification under consideration or as determined by the City Engineer. No streets shall have a right-of-way width that is less than the street of which it is a continuation. Right-of-way requirements for widening at intersections shall be as specified by the City Engineer.

Building setbacks, landscaping requirements, and parking requirements shall be based on the ultimate right-of-way, regardless of the location of public street improvements.

A minimum 10-foot public utility easement (P.U.E.) shall be dedicated adjacent to all public and private streets and shall include traffic control appurtenances. Additional easement for sewer, water, storm drainage, landscaping, fencing, and all other public utilities shall be provided as required by the utility companies, these Design Standards, and as specified by the City Engineer.

Along the frontage of collector and arterial roadways, the right-of-way dedication shall include the landscape corridor adjacent to parcels zoned single-family residential (SFR).

**6-3 ROADWAY SIGNAGE AND STRIPING** - Signing and striping shall conform to the latest edition of the California Manual of Uniform Traffic Control Devices (CMUTCD), unless modified by these standards, the Construction Standards, or in writing by City Engineer.

**6-4 STRUCTURAL SECTION** - All roads, both public and private, to be constructed within the City of Grass Valley shall be asphalt concrete over aggregate base and, if necessary, aggregate sub-base.

All pavement sections shall be designed on the basis of the resistance R-value as determined in accordance with the State of California, Department of Transportation design method and appropriate traffic indices (TI). If the subgrade has an “R” value of 10 or less, a geotextile fabric or other approved product shall be installed on subgrade prior to placement of AB or ASB material. In addition, the City Engineer may require the installation of edge drains in soils where the “R” value of the subgrade is 10 or less.

Minimum TI values shall be as specified in Table 6-2 or as determined by the City Engineer.

**TABLE 6-2**

STREET CLASSIFICATION	MINIMUM TRAFFIC INDEX	MINIMUM STRUCTURAL SECTION (Assumes R=50)		
		AC	AB	AS
ALLEY-WAY	-	3"	6"	
MINOR RESIDENTIAL	6	3"	8"	
PRIMARY RESIDENTIAL	7	3"	9"	
COLLECTOR / NON-RESIDENTIAL COLLECTOR	8	4"	9"	
INDUSTRIAL	9	4"	7"	6"
ARTERIAL	10	5"	7"	6"

**A. Structural Street Sections at Signalized Intersections** - Pavement sections shall be designed by a Registered Engineer. Where traffic signal loops are anticipated or will be installed, the minimum structural section shall include 4" of AC on the minimum required AB for a length of 100-feet, from the curb return of the arterial street.

**6-5 CURB AND GUTTER REQUIREMENTS** - Curb and/or gutter are required adjacent to all public and private streets. All curb and gutter shall be Portland Cement Concrete, Class “A” mix and shall conform to the Standard Details.

- A. Type 1 Rolled Curb and Gutter** - Type 1 rolled curb and gutter shall be installed adjacent to residential areas or as directed by the City Engineer, poured monolithically with the sidewalk.
- B. Type 2 Vertical Curb and Gutter** -Type 2 vertical curb and gutter shall be installed adjacent to all multiple residential, industrial/commercial developments, school and park sites, poured monolithically with the sidewalk or as approved by City Engineer.
- C. Cross Gutters** - Cross gutters shall not be installed unless the intersection cannot be drained by an underground system. Installation of cross gutters shall be subject to the approval of the City Engineer.

**6-6 SIDEWALK REQUIREMENTS** - Sidewalks shall be constructed adjacent to all public streets. All sidewalks shall be Portland Cement Concrete, Class “A” mix conforming to the provisions of Section 90 of the Caltrans Specifications. All sidewalks shall have a minimum thickness of six inches, and shall meet the following requirements:

- A. Width** - The required width of sidewalks shall be 5-feet unless otherwise approved by the City Engineer. The width of the curb shall not be considered as included in the width of the sidewalk.
- B. Slopes** - Sidewalks shall have a maximum slope in the direction of travel of 5.0 percent unless otherwise approved by the City Engineer. If the longitudinal street grade is greater than 5.0 percent, the slope of the sidewalk shall not exceed the longitudinal slope of the street. Cross slope shall be a minimum of 1.0 percent and maximum of 2.0 percent sloped downwards towards the gutter.
- C. Pedestrian Curb Ramps** - Pedestrian curb ramps shall be provided at all intersections. All curb ramps shall conform to the requirements of these standards and the City’s Construction Standards for slope criteria and standard design. It is the design engineer’s responsibility to ensure that the intersection slopes designated on the improvement plans allow for the construction of pedestrian curb ramps that meet the above criteria. Curb ramps in the downtown area shall be constructed in accordance with the Grass Valley Downtown Streetscapes Standards Manual.
- D. Sidewalk Barricades** - Sidewalk barricades shall be required where satisfactory provisions cannot be made for pedestrians to safely continue beyond the terminus of the sidewalk. Where sidewalks end in fill areas, the fill shall be extended beyond the end of the sidewalk for a minimum distance of six (6) feet.

**6-7 PEDESTRIAN WALKS AND BIKE PATHS** - Pedestrian walks within a development shall have a minimum easement width of eight (8) feet and sidewalk width of five (5) feet. All walks shall conform to the requirements of Title 24. Walks shall be constructed with a minimum thickness of six-inches of Portland Cement Concrete, Class “A” mix.

Bike path design shall conform to “Bikeways” section of these Design Standards. Combined pedestrian/bike paths shall be a minimum of 10 feet wide and be constructed of either Portland Cement Concrete, Class “A” mix, having a minimum thickness of 4-inches or 2-inches of asphalt concrete over 4-inches of aggregate base. If the bikeway is intended or anticipated to support vehicle traffic the structural section shall be increased as determined by the City Engineer.

Pedestrian walks and Class 1A bike paths, if situated between lots, shall be fenced with chain link fencing or other material as approved by the Public Works Department and shall extend from the street right-of-way to the back lot line. These fences shall be 6-feet high from the building setback line to the back lot line and 3-feet high from the building setback line to the street right-of-way line. Collapsible bollards shall be placed at both ends of all these pedestrian walks/Class 1A bike paths.

**6-8 ROADWAY PROFILE STANDARDS** - Roadway profile design shall be based on the Caltrans Highway Design Manual and the following standards:

- A. Grades** - The minimum centerline (longitudinal) grades on new streets and gutter flow lines shall be 0.5 percent. The maximum street grade shall be 10 percent for all arterial and industrial streets and 15 percent for all collector and residential streets. Any deviation for unusually limiting terrain or existing topographical features will require specific approval by the City Engineer.
- B. Cross Slopes** - Standard cross slopes shall be 2.0 percent on all roadways. Certain roadways may require super elevations as directed by the City Engineer. Cross slopes on widened existing streets shall be a minimum of 1.5 percent and maximum of 3.5 percent. Where a street constructed with a super elevation is to be widened, the cross slope shall be as specified by the City Engineer.
- C. Vertical Curves** - The minimum allowable vertical curve length at the intersection of two grades shall be 50 feet; however, vertical curves may be omitted where the algebraic difference in grades does not exceed 2.0 percent. When vertical curves are required, they shall provide for adequate sight distance based on the minimum design speeds specified in Table 6-4. The vertical curve data shall be computed and shown on the plans and shall call out the tangent gradient length of curve, the elevations and stationing points of the beginning of vertical curve (BVC), end of vertical curve (EVC), PI, high and low points, and along 25 foot intervals.

**6-9 INTERSECTIONS** - Street centerlines shall intersect one another at an angle as near to a right angle as is possible. Refer to the Standard Details for required rights-of-way, pavement, taper lengths, etc. for intersections involving minor and major arterials.

- A. Grades** - The maximum grade within intersections is 2 percent. The maximum grade in each direction is 6 percent for a minimum distance of 50 feet for unsignalized intersections and 200 feet for signalized intersections, measured from the curb line of the intersecting street. Any deviation for unusually limiting terrain or existing topographical features will require specific approval by the City Engineer. The centerline of the minor street shall meet the crown slope at the projected lip of gutter. Crown slope shall be reduced to 1.0 percent within the intersection if necessary.
- B. Angles** - Streets must intersect at 90 degree angles whenever possible by tangents not less than 100 feet in length. Where terrain necessitates a lesser angle, an angle of not less than 75 degrees may be permitted with the approval of the City Engineer.

**6-10 OFFSET INTERSECTIONS** - The following requirements apply to all offset intersections. Any variation to these requirements shall be subject to the approval of the City Engineer. **Distances are measured from centerline to centerline.**

- A. Residential Intersecting Residential** - Residential streets intersecting another residential street from opposite sides shall have their centerlines meet, or the offset between intersections shall be a minimum of 150 feet.

- B. Residential Intersecting Collector** - Minor and primary residential streets intersecting collector streets from opposite sides shall have their centerlines meet or the offset between the intersections shall be a minimum of 200 feet.
- C. Residential or Collector Intersecting Arterial** - Minor and primary residential streets and collector/industrial streets intersecting arterial streets from opposite sides shall have their centerlines meet or the offset between the intersections. This condition shall not apply where a raised center median is provided on the major street separating conflicting turning movements.
- D. Arterial Intersecting Arterial** - Intersections between two arterials shall have their centerlines meet, or the offset between the intersections shall be a minimum of 1,320 feet.

**6-11 ELBOW INTERSECTIONS** - Use of expanded corners shall be limited to projected low volume residential, commercial and industrial streets and conditions where conformance to minimum horizontal length of centerline radius is not practical, and shall be subject to approval of the City Engineer.

**6-12 DESIGN SIGHT DISTANCES**

- A. Stopping Sight Distance** - The minimum sight stopping distance over any segment of roadway shall be designed for the vehicle speeds list in Table 6-4 unless specific approval for a lesser design speed is received from the City Engineer. Minimum stopping sight distance shall be consistent with that specified in the latest edition of Caltrans Highway Design Manual, Section 201.

The design stopping sight distance requirement for passenger cars is based on 3.5-foot height of eye and a 6-inch height of object.

- B. Sight Distances at Intersections and Driveways** - The design of all public streets, private streets, and major non-residential driveways shall provide minimum sight distance in accordance with the following requirements. Design speeds shall be as specified in Table 6-4 or as specified by the City Engineer. Minimum design sight distances are specified in Table 6-5A through 6-5D. These requirements were extracted from the “Guidelines for Driveway Design”, published by the Institute of Transportation Engineers. The safe sight distance requirements for passenger cars are based on a 3.5-foot height of eye and 2.0-foot height of object. The distances for semi-trailers are based on a 6-foot height of eye and 2.0-foot height of object, and shall apply to all streets intersecting arterial streets only. All measurements are from a vehicle located ten feet back of the traveled way as illustrated in the figure following Tables 6-5A and 6-5B. Special circumstances may preclude locations from meeting the requirements shown below, but in no case will the City allow the sight distance to be less than the minimum stopping sight distances per the State Highway Design Manual.

**TABLE 6-4  
ROADWAY DESIGN SPEEDS**

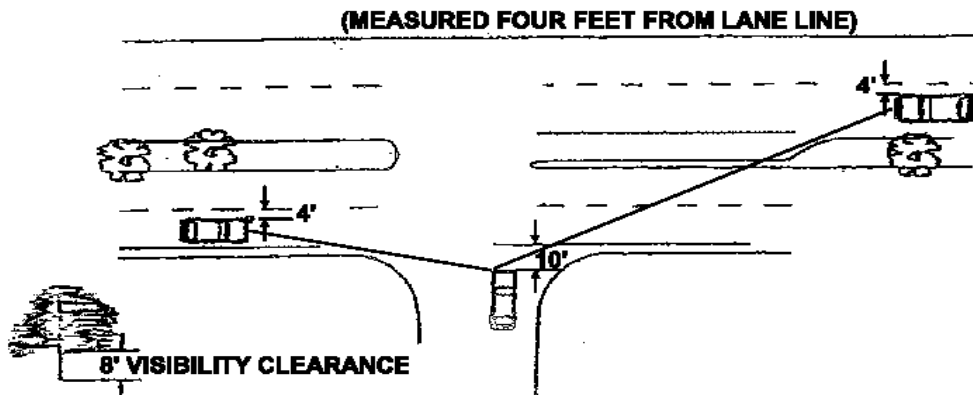
<b>STREET CLASSIFICATION</b>	<b>ROADWAY DESIGN SPEEDS</b>	<b>SIGHT DISTANCE DESIGN SPEED</b>
<b>Minor Residential</b>	<b>25 mph</b>	<b>30 mph</b>
<b>Primary Residential</b>	<b>25 mph</b>	<b>30 mph</b>
<b>Collector</b>	<b>35 mph</b>	<b>40 mph</b>
<b>Arterial</b>	<b>45 mph</b>	<b>50 mph</b>

**TABLE 6-5A**  
**DESIGN SIGHT DISTANCE FOR PASSENGER CARS**  
**EXITING A SIDE STREET ONTO TWO-LANE ROADS**

DESIGN SPEED (MPH)	DESIGN SIGHT DISTANCE - LEFT (FEET)	DESIGN SIGHT DISTANCE - RIGHT (FEET)
20	150	130
25	250	195
30	350	260
35	440	350
40	530	440
45	635	570
50	740	700
60	950	1050

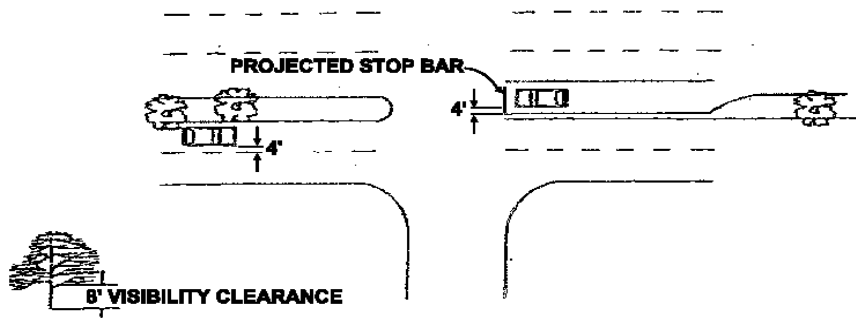
**TABLE 6-5B**  
**DESIGN SIGHT DISTANCE FOR PASSENGER CARS**  
**EXITING A SIDE STREET ONTO FOUR AND SIX-LANE ROADS**

DESIGN SPEED (MPH)	DESIGN SIGHT DISTANCE - LEFT (FEET)	DESIGN SIGHT DISTANCE - RIGHT (FEET)
20	130	130
25	175	195
30	220	260
35	300	350
40	380	440
45	500	570
50	620	700
60	950	1050



**TABLE 6-5C**  
**SIGHT DISTANCE FOR CARS ENTERING DRIVEWAYS/STREETS BY LEFT TURN**

Sight Distance in Feet			
OPERATING SPEED (MPH)	2-LANE (SINGLE LANE)	4-LANE (2 LANES)	6-LANE (3 LANES)
20	150	160	170
25	190	205	220
30	230	250	270
35	300	320	345
40	370	390	420
45	445	470	500
50	520	550	580
60	700	740	780



**TABLE 6-5D**  
**DESIGN SIGHT DISTANCE FOR SEMI-TRAILERS**  
**ENTERING ONTO FOUR AND SIX-LANE ROADS**

DESIGN SPEED (MPH)	DESIGN SIGHT DISTANCE - LEFT (FEET)	DESIGN SIGHT DISTANCE - RIGHT (FEET)
25	400	300
30	500	400
40	850	850
50	1600	1600
60	2500	2500

**6-13 CENTERLINE RADII** - The curve data (delta angle, length, tangent and radius) for all centerline curves shall be computed and shown on the plans. The minimum centerline curve radii shall be as specified in Table 6-1. Special consideration may be given by the City Engineer for unusually difficult alignment problems.

**6-14 DRIVEWAYS** - When driveways are abandoned or relocated, the driveway section shall be removed and replaced with curb, gutter, and sidewalk conforming to these standards. Parking is prohibited within any section driveways. All new driveways shall conform to the following requirements:

**A. Types, Widths and Grades**

1. Single Family Residential and Duplex Driveways shall have a minimum width of 12-feet and maximum width of 20-feet.

Lot pads shall be graded to accommodate driveway slopes of 15 percent from back of right-of-way. Unusual terrain conditions may warrant a driveway slope up to a maximum of 20 percent subject to the approval of the City Engineer. Number of driveways accessing a single parcel is defined in Section 5 “Site Access” of these Design Standards.

2. Multi-Family/Office and Commercial/Industrial Driveway main entrances shall have a minimum width of 15-feet and a maximum width of 35-feet. If a raised median is provided in the driveway throat, the driveway width shall be widened as necessary to accommodate the number of ingress and egress lanes required, with a minimum ingress lane width of 15-feet. The minimum driveway median width shall be 4-feet and the maximum width shall be 10-feet. The nose of the median shall be no less than 7-feet and no more than 15-feet from the gutter flow line.

Driveways located on collector streets shall be standard commercial driveways per the Standard Details.

Driveway slopes shall have a maximum grade of 2 percent from the edge of pavement to a distance of 15-feet within the project. The remainder of the driveway shall have a maximum slope of 10-percent. Unusual terrain condition may warrant waiver of this requirement subject to the approval of the City Engineer.

- B. Location** - All aspects of site access (location of driveways, number of driveways allowed, spacing of driveways, etc.) are addressed in Site Access of these Design Standards.

**6-15 BUS TURNOUTS** - Bus turnouts and shelter pads shall be required at locations specified by the City Engineer. The size and location of bus turnouts and shelter pads, whether existing or proposed, shall be in conformance with the Standard Details and as approved by the City Engineer. Bus stop shelters in the downtown area shall be designed and constructed in accordance with the Grass Valley Downtown Streetscapes Standards Manual.

**6-16 DEVELOPER RESPONSIBILITY FOR IMPROVEMENTS TO STREETS** The following requirements apply to private development projects adjacent to existing and proposed streets.

- A.** The Developer shall be responsible for upgrading streets within, and adjacent to, the developer’s project where the pavement section of an existing street does not meet the structural section and/or the centerline grade and alignment requirements specified in these Design Standards for those streets.

Where the design centerline grade is to be higher than the existing, the Developer shall extend the overlay beyond the centerline of the street and shall neatly conform to the existing surface grade on the other side. The Developer shall also be responsible for overlaying any low areas where the new pavement is proposed to meet the existing pavement to maintain a uniform cross slope.

- B.** When making a connection to an existing stub street, the Developer shall be responsible for removing and reconstructing up to a maximum of twenty feet of the existing roadway to make a satisfactory connection as required by the City Engineer.
- C.** When widening to complete an existing partial street along a development project, or when removing existing curb and gutter, the Developer shall be responsible for saw cutting and removing a narrow strip along the outside portion of the pavement to provide a clean and stable pavement section for constructing against. Grinding of existing pavement (1½-inch minimum) shall be made to the next nearest edge of lane line. The width to be removed shall be determined by the City Engineer. In the case of curb and gutter removal, a minimum width of pavement cut shall be 2-feet.
- D.** All temporary approaches to existing roadways required as a result of the development shall be at the Developer's expense. The temporary approaches shall be paved with the structural section to be determined individually for each situation.
- E.** The Developer shall be responsible for relocating existing traffic signals and streetlights, and installing new traffic signals and street lights as necessary for new street and driveway locations. The Developer shall also be responsible for relocating existing traffic signals and street lights as necessary for the installation of new curbs or new curbs and sidewalks at locations where there are no existing curbs or curbs and sidewalks. Traffic signals must remain operational during all construction within signalized intersections.
- F.** The Developer shall be responsible for constructing or modifying median island curbs where required by these standards, or when required for traffic control as a result of the development, as determined by the City Engineer.
- G.** The Developer is required to provide frontage improvements along existing and proposed roadways at the Developer's expense. Frontage improvements include, but are not limited to, sidewalk, curb and gutter, center median, street pavement (at a minimum to the right-of-way centerline), drainage system, landscaping, soundwalls, street lighting, roadway signing and striping, and all utilities (including traffic signal interconnect if applicable). For minor residential, primary residential, collector and industrial streets, the Developer shall provide the full right-of-way improvements.
- H.** For development within the "infill" areas of the City, the level of improvements to public streets adjacent to the development site shall be determined on a project specific basis at the discretion of the City Engineer.
- I.** The Developer shall be responsible for all drainage facilities (bridges, pipes, culverts, and appurtenances) crossing new streets within or adjacent to the project.
- J.** The Developer shall be responsible for all necessary modifications within the public right-of-way and the project site to comply with state and federal standards for access for disabled, including but not limited to sidewalk ramps.

**6-17 TRENCHING IN EXISTING PAVED ROADWAYS** - All trenching in existing roadways shall conform to the Standard Details and the Construction Standards. The Developer may be required to coordinate trenching work schedules to avoid cutting pavement where repaving is planned by the City. All installations on paved surfaces less than 5-years old shall be by boring and jacking only. If trenching is unavoidable, the entire lane width of the disturbed area shall be slurry sealed.

**6-18 STREET NAMES AND STREET NAME SIGNS** - Street names shall be chosen by the Developer from an approved list established by the City of Grass Valley and in accordance with the Street Naming Standards of the City of Grass Valley Municipal Code. No duplication of names already in use or previously proposed or sound alike names will be permitted.

**A. Sign Requirements** - Street name signs shall be furnished and installed by the Developer. The requirements for location of signs do not apply to signalized intersections since signals will have their own street name signs. Street name signs shall conform to City of Grass Valley Construction Standards and shall consist of white die-cut letters on a green reflective background. Street name signs in the downtown area shall be constructed in accordance with the Grass Valley Downtown Streetscapes Standards Manual. Type "C" letter shall be used until the number of characters and spacing exceeds the capacity of a 30" blank sign. Should more letters be required, all letters shall be type "B".

**B. Location and Number Required** - The required number of street name signs installed and location, depends upon the width of street right-of-way and shall conform to the following:

**1. Case 1** - Two street name sign installations (with four sign plates on each post) are required at each intersection where one or both of the intersecting streets are a collector or arterial street. At a four-way intersection, the installations shall be located on both far right hand corners of the intersection relative to the direction of travel on the street having the greater right-of-way width or on the major street if right-of-way widths are equal.

At a "T" intersection, one sign shall be installed on the far right hand corner of the intersection relative to the direction of travel on the through street and the other shall be installed along the left side of through street relative to the direction of travel at a point directly opposite the centerline of the "T" intersecting street. One sign plate should be omitted from the standard four-plate installation at the "T" intersection sign locations where an approach street does not exist.

Street name signs shall be located adjacent to the major street at the end of the curb return.

**2. Case 2** - One street name sign installation (with four sign plates on each post) is required at each intersection where both intersecting streets are residential streets. At a four-way intersection, the installation shall be located at one of the far right hand corners of the intersection relative to the direction of travel on the street having the greater right-of-way width or on the major street if the right-of-way widths are equal.

At a "T" intersection, the installation shall be located on the far right hand corner relative to the direction of travel on the through street.

Street name sign shall be located at the midpoint of the curb return.

**3. Case 3** - For arterials with frontage roads, the street name sign installations shall be located in the divider strip between the frontage road and the main traveled way of the highway at the near side of the intersection. All other requirements shall be as outlined above, except that only one sign will be required (in the divider strip in line with the centerline of the minor street) when there is no opening in the divider strip for access to a main highway.

**6-19 TRAFFIC SIGNS** - Signs shall be installed per the CMUTCD unless denoted otherwise.

1. Typical signs include the R-73 (CA) series mast arm mounted signs, R3-18 mast arm mounted

signs, R9-3a and R9-3b signs (where crossing the street is restricted), W3-3 Signal Ahead roadside signs (pavement markings are only necessary where visibility of the signal is limited or where the signal may be unexpected by motorists), and R3 series roadside signs on the stem of a "tee" intersection.

2. U-turns shall be restricted where less than 36-feet exists between the left edge of the inside left turn lane to the face of curb for the opposing direction traffic lane, or as required by the City Engineer.

**6-20 STRIPING AND MARKINGS** - All painted traffic stripes, arrows, and pavement markings shall be constructed with thermoplastic material to the specifications set forth in Section 84 of the Caltrans Standard Specifications (latest edition) and shall conform to the CMUTCD.

**A. Fire Hydrant Markers** - At all fire hydrant locations, a blue reflective pavement marker shall be installed one foot off paved centerline or median on the hydrant side of the roadway, recessed into the pavement such that the top of the marker is flush with the pavement surface.

**B. Removal** - All existing traffic stripes and pavement markings shall be completely removed in accordance with the Construction Standards.

**C. Installation** - The following shall apply when installing traffic stripes and pavement markings:

1. In addition to locations shown on the plans, bike lane signs and pavement markings shall be installed at no more than one-half mile intervals and following every break in the bike lane striping. The BIKE LANE legend shall be centered in the lane to ensure the legend does not run into the lane striping.
2. A bicycle detector pavement marking shall be installed in conjunction with each bicycle detector per CMUTCD Figure 9C-7 and shall be placed starting 6-inches back of the crosswalk/stop bar.
3. Unless otherwise specified on the plans, crosswalks shall be ten (10) feet wide, measured from the centerline of the stripe. Longitudinal lines parallel with the direction of traffic may be required as shown on the plans or as directed by the City Engineer.
4. Traffic stripes and pavement markings shall not be placed over utility covers including, but not limited to, manhole covers, utility boxes, hand holes, or water valve covers.
5. STOP legend pavement markings and limit lines are required with stop signs. YIELD legend pavement markings are not required with yield signs. The yield limit line shall be per the CMUTCD (24" by 26" triangles).
6. At signalized intersections with left turn lanes longer than 150 feet the Type II or Type III arrows shall be placed 20-feet behind the limit line. Where there are dual left turn lanes with staggered limit lines, the arrows in the number 1 left turn lane (closest to the median) shall be placed 15-feet behind the limit line, and the arrow in the number 2 left turn lane shall be placed 20-feet behind the limit line. The intent is to have the two arrows line up side by side, even though the limit lines are staggered.
7. All turn lanes shall have a Type II or Type III arrow at the beginning of the turn lane such that the tail of the arrow lines up with the beginning of the Detail 38 striping. All turn lanes 150-feet or longer shall have a minimum of two Type II or Type III arrows (one arrow for every 150-feet of turn lane).

8. All traffic lane striping shall be discontinued through any four way public intersection from crosswalk to crosswalk, marked or unmarked. Striping shall be continuous through private intersections unless there is a striped left turn lane and/or traffic signal. For public "T" intersections, the through and bike lane striping shall be continuous for the non-intersection direction, i.e. "across the top of the T". However, there shall be no striping within the limits of the crosswalk.
9. At locations where bike lane striping is parallel to striping used to channelize traffic, right turn acceleration/deceleration lanes and bus turnouts, both stripes shall be Detail 38. Reflective pavement markers shall be placed to the outside of the bike lane.
10. Bike lane striping shall be continuous except at right turn bay tapers, intersections with City streets, and driveways where the centerline/median is broken. See the Design Standards Details for examples.
11. Lanes designated by the City Engineer as auxiliary shall be striped as directed by the City Engineer. Examples of typical auxiliary lane striping can be seen in the Design Standards Details. Bike lane striping along auxiliary lanes shall be a modified Detail 38 with 4-foot stripes at 10-feet on center.

**6-21 TRAFFIC CONTROL** - Construction area traffic control shall be installed in accordance with the City accepted project specific traffic control plan, the approved improvement plans and specifications, as directed by the City Engineer and as follows:

**A. Restrictions** - Construction that inhibits free flow traffic shall not occur between the hours of 7:00 a.m. and 9:00 a.m., and 4:00 p.m. to 6:00 p.m., Monday through Friday, without prior written approval of the City Engineer. Traffic control lasting more than one hour will be subject to additional time restrictions in order to minimize the impact to the public.

1. At least one lane in each direction shall remain open to traffic unless otherwise approved by the City Engineer.
2. Turning movement restrictions require prior approval of the City. A changeable message sign (CMS) shall be posted in the direction of travel affected by the restriction a minimum of three (3) days prior to the implementation of the traffic control at the Contractor's expense. Wording and placement of the CMS shall be approved by the City Engineer prior to installation.
3. Traffic control hours are subject to limitation by the City.
4. Lane closures that affect traffic flow may require night work, changeable message signs, and/or certified flaggers at the Contractor's expense. The Contractor should consider traffic control included in their cost of work and may contact the City for requirements prior to bidding a job.
5. Approved road closures require 72 hour advance notification to the City, the public and emergency services. CMS's shall be posted in the directions of travel affected by the closure a minimum of 1 week prior to the implementation of the traffic control at the Contractor's expense. Wording and placement of the CMS's shall be approved by the City prior to installation.
6. A request must be submitted to the Public Works Department 48 hours prior to the time the red flash is needed. Allowable hours of flashing operation will be set by the City and will require early morning, evening, or night work unless otherwise approved in writing by the City.

**B. Traffic Control Plans:** All traffic control plans (including signage) shall be per the CMUTCD.

1. The City Engineer shall determine the necessity of a formal Traffic Control Plan (TCP).
2. A TCP submittal will be required in the following situations:
  - a. If traffic control will be complicated (to be determined by the Public Works Inspector)
  - b. If it involves a signalized intersection
  - c. If it will be in effect for longer than 12 hours
  - d. If it's not detailed in the CMUTCD
  - e. If it involves road closures or detours
3. Traffic Control Plans require responsible party contact information, hours of operation (which may be restricted by the City), and duration of work.
4. TCP submittals require the following minimum review times per submittal:

<u>Type of TCP</u>	<u>Min. Review Time</u>
Lane closure	2 days
Intersection Signal Flash	2 days
One-way traffic control	2-4 days
Detour/Road Closure	1-2 weeks

Note that complicated TCP's may require more review time. TCP review time should be included in the contractor's work schedule.

5. The traffic control plan submittal process is as follows:
  - a. Three copies of the TCP must be submitted to the Public Works Inspector.
  - b. The TCP is reviewed by the City and corrections/modifications are made by the contractor as necessary.
  - c. If all corrections/modifications are made to the satisfaction of the City, the TCP will be approved.
  - d. One copy of the approved TCP will be returned to the contractor.
  - e. The contractor must have a copy of the approved TCP on site during the entire time the TCP is in place.
  - f. Any deviation from the TCP must be approved by the Public Works Inspector and may require re-submittal of the TCP for City review. It will be up to the Public Works Inspector to determine whether or not the modified TCP needs to be resubmitted to the City.
  - g. Failure to maintain the TCP may result in shutdown of the project, correction by the City at the Contractors expense, or any combination of the afore mentioned.

**6-22 SURVEY MONUMENTS -**

- A. The Consulting Engineer shall place survey monuments at the following locations:

1. At the intersection of street centerlines.
2. At the center of all cul-de-sacs and elbow points.
3. On street centerlines located such that there will be sight distance between the two monuments within the street right-of-way.
4. At the subdivision boundary corners and at such other locations so as to enable any lot or portion of the improvement to be retraced or located, as directed by the City Engineer.

**B.** The above-described monuments shall be as follows:

1. Subdivision monuments shall not be less than 3/4-inch galvanized iron pipe, a minimum of 18-inches in length, capped and tagged. Monuments in street pavement shall be set in monument wells conforming to the Standard Details.
2. Monument wells, conforming to the Standard Details, shall be placed at all street intersections and centers of street cul-de-sacs.
3. Lot corners shall have a 5/8-inch rebar at rear corners. Front corner and side lot lines shall be projected and marked on back of sidewalk with chisel mark.
4. Permanent survey monuments shall be placed by the Consulting Engineer at all section and quarter corners within the development. The section corner monuments shall be Class "B" concrete, poured in place, with minimum dimensions of 6" diameter x 24" deep, with a brass cap in accordance with Bureau of Land Management Standards.

All such monuments shall be referenced to permanent objects located nearby and all ties shall be furnished to the City Engineer for general public use. Final acceptance of the public improvements will not be made until such ties have furnished to the City Engineer.

The Consulting Engineer shall also place a note on all construction plans stating that the Contractor is responsible for the protection of all existing monuments and other survey markers.

**6-23 BENCHMARKS** - In locations where a new benchmark will be required, as determined by the City Engineer, the Developer's engineer will set in concrete a 3<sup>1</sup>/<sub>4</sub>-inch brass cap and shall then run a second order, class two survey, from an approved City of Grass Valley benchmark to establish the U.S.G.S. elevation of the cap. The level notes will be submitted to the Engineering Division for approval. After approval of the notes, the Developer's engineer will mark on the brass cap the City of Grass Valley benchmark number, the date, and R.C.E. or L.S. number of the person certifying the level notes.

Benchmarks shall be provided where specified by the City Engineer, at all culverts 60-inches or greater, bridge crossings passing a 100 year flow of 250 cfs or greater, and within subdivisions that are greater than 50 lots.

**6-24 DEVIATION FROM STANDARDS** - All new streets, public and private, must meet the City Standards as required by this section. Any revised standard or deviation from the standard must be approved in writing by the City Engineer, the Fire Marshall, and the City Council (if required).