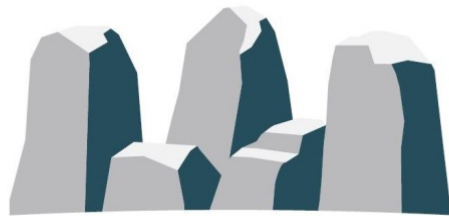


**CITY OF ROCKLIN**  
**IMPROVEMENT STANDARDS**



**ROCKLIN**  
CALIFORNIA

November 2016

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## SECTION 1

### **PURPOSE AND DEFINITIONS**

#### **1-1 PURPOSE**

The purpose of these Improvement Standards is to provide direction in the application of improvements and private works to be dedicated to the public and accepted by the City for maintenance or operation, and to provide for coordinated development of those facilities to be used by and for the protection of the public. This includes certain private works, as well as improvements to be installed within existing City rights-of-way and easements. These Standards shall apply to regulate and guide the design and preparation of plans for construction of streets, highways, alleys, drainage, street lighting facilities and related public improvements, and to set guidelines for all private works which involve drainage, grading, trees, and related improvements.

#### **1-2 DESIGN PRACTICE**

It is recognized that it is not possible to anticipate all situations that may arise or to prescribe standards applicable to every situation. Therefore, any items or situations not included in these Improvement Standards shall be designed in accordance with accepted engineering practice, the City of Rocklin Standard Construction Specifications, the State of California "Highway Design Manual", the "Manual on Uniform Traffic Control Devices", and as required by the City Engineer.

#### **1-3 DEFINITIONS**

Whenever the following terms or titles are used in these standards or in any document or instrument where these standards govern, the intent and meaning shall be as specified in the City of Rocklin Standard Construction Specifications, the Rocklin Municipal Code, and as herein defined:

Construction Inspector - Shall mean the person appointed by the Director to oversee the construction of that portion of the project that is of importance to the City.

Consulting Engineer - Shall mean any person or persons, firm, partnerships or corporation legally authorized to practice civil, mechanical or electrical engineering in the State of California who prepares or submits improvement plans and specifications to the City of Rocklin Community Development Department Engineering Division for approval.

Developer - Shall mean any person or persons, firm, partnership, corporation, or combination thereof, financially responsible for the work involved.

Development - Shall mean the act or process of any construction on properties as well as subdivision improvements.

Director - Shall mean the City Engineer of the City of Rocklin acting either directly or through others in the Engineering Division or his authorized representatives. Director shall also mean the Director of Public Services where specified.

Laboratory - Shall mean any testing agency or testing firm which has been approved by the Department of Public Services.

MUTCD - Shall mean the latest edition of the Federal Manual on Uniform Traffic Control Devices and the MUTCD California supplement.

Placer County Water Agency - (PCWA) shall mean the agency that generally maintains and owns water facilities within the City of Rocklin.

South Placer Municipal Utility District - (SPMUD) shall mean the agency that generally owns and maintains sewer conveyance facilities within the City of Rocklin.

Standard Construction Specifications - Shall mean the latest standard construction specifications adopted by the City Council governing the construction of roads, streets, storm drainage, concrete structures, traffic signals, street lighting and other facilities within the City of Rocklin to provide for proper development.

Standard Drawings - Shall mean the standard drawings as set forth herein, approved by the Director with his signature thereon, and as modified, revised, or added.

State - As used in the State Specifications, shall mean City of Rocklin.

State Standard Plans - Shall mean the Standard Plans of the State of California, Department of Transportation (Latest Edition).

Traffic Control Device - Shall mean a sign, signal, marking, or other device used to regulate, warn, or guide traffic, placed on, over, or adjacent to a street, highway, pedestrian facility, or shared-use path by authority of a public agency having jurisdiction.

Urban Area - Shall mean the area within the boundary as defined by the Federal Highway Administration.

## SECTION 2

### **GENERAL REQUIREMENTS**

#### **2-1 PLANS BY AN APPROPRIATE ENGINEER**

All plans and specifications for improvements, private and public (including private onsite drainage and grading), which are to be accepted for maintenance by the City shall be prepared by a Consulting Engineer of the appropriate branch of engineering covering the work submitted.

#### **2-2 APPROVED PLANS**

Complete plans and specifications for all proposed streets, bikeways, grading, drainage facilities, street lighting, industrial developments, commercial developments, and subdivisions, including any necessary dedications, easements, and rights of entry, shall be submitted to the Engineering Division for approval. This approval must be substantiated by the signature of the City Engineer or his authorized representatives prior to the beginning of construction of any such improvements. The City Engineer or his representative shall order any Contractor to cease work on any project if said Contractor does not have properly approved plans in his possession.

#### **2-3 REFERENCE TO CITY SPECIFICATIONS AND STANDARDS**

The General Notes and Special Provisions of all plans shall include the following note:

All construction and materials shall be in accordance with the latest edition of the City of Rocklin Standard Construction Specifications, Improvement Standards and Standard Drawings.

#### **2-4 WORK IN CITY RIGHTS OF WAY, EASEMENTS AND WATERWAYS**

Possession of a complete set of City-approved engineered plans and an Encroachment Permit obtained from the Department of Public Services shall allow a contractor duly licensed by the State of California to perform work specified on the plans in City rights of way, easements and waterways. The contractor shall be bonded as required in the City of Rocklin Municipal Code.

In lieu of the above required plans, minor work within City rights of way, easements and waterways may be performed in accordance with the following:

- A. Minor work within street rights of way and easements may be performed with an encroachment permit.

Minor work generally consists of such items as widening or constructing sidewalks adjacent to the existing roadside curb and gutter, constructing driveways in existing curb and gutter, constructing asphalt concrete driveways, installing driveway culverts, regular utility work, and work which requires cutting the road surface.



The encroachment permit shall be issued in accordance with the City of Rocklin Municipal Code Section 12.04.

- B. Work within street rights of way and easements consisting of street light installations and minor work described above may be performed with an encroachment permit.

**2-5 IMPROVEMENT PLAN SUBMITTAL**

The initial submittal of improvement plans to the Engineering Division shall consist of the following:

- A. Six (6) sets of plans (seven (7) sets if landscaping plans are included) complete and in accordance with these Improvement Standards and the Standard Construction Specifications, along with any required specifications, computation, test data, and other material requested by the City Engineer.
- B. Two copies of the watershed map and drainage calculations in accordance with Section 5.
- C. An itemized opinion of probable costs. The improvements to be included on the estimate are as follows:
  - 1. All public facilities, excluding trunk drainage defined in Section [5](#). (Public facilities include all improvements within the street right of way and public improvements outside of the right of way which are to be maintained by the City, including but not limited to street lights, traffic signals, and fire hydrants.)
  - 2. All onsite underground storm drainage systems.
  - 3. Earth excavation quantities.
  - 4. Retaining and sound walls.
- D. 50% of the plan check fee in accordance with Section [2-7](#).
- E. The name, address and telephone number of the developer.
- F. Utility letters in accordance with Section [2-17](#).
- G. Two copies of the soils report.

Should there be required alterations or revisions to the plans as submitted, the City Engineer will return one copy with the corrections marked or indicated thereon. If the plans submitted are not prepared in accordance with these Improvement Standards and the Standard Construction Specifications or not in

keeping with the standards of the profession, the City Engineer may return them unmarked and unapproved.

**2-6 IMPROVEMENT PLAN RESUBMITTAL**

Plans being resubmitted shall consist of four (4) complete sets of plans and written response to comments and an updated itemized opinion of probable costs. Plans which involve trunk drainage, as defined by Section 5, shall consist of five (5) sets. Additional sets may be required by the City Engineer.

Plans being resubmitted that contain revisions or alternations other than those required by the City Engineer on previously corrected plans shall require the Consulting engineer to bring those revisions or alternations to the attention of the City Engineer and additional sets may be required.

**2-7 PLAN CHECK AND INSPECTION FEE**

When improvement plans are initially submitted to the Engineering Division for checking, 50% of the total plan check fee for the development will be required as a deposit to initiate checking of the plans.

Should the development not be carried to completion, any portion of the required deposit over and above the accumulated costs expended by the Department on the development will be refunded to the developer. Any City costs incurred over and above the deposit will be charged to the developer.

The Engineering Division shall be notified of any change of billing address.

**2-8 PLAN APPROVAL**

No plans will be approved nor construction authorized until such time as the City Engineer signifies his approval by his signature on the set of plans. At such time as the Consulting Engineer preparing the plans has made the necessary revisions and paid the remainder of the total plan check and inspection fee, as provided under the provisions of the City Code and amendments thereto, the City Engineer will sign the drawings in the space provided, after the Consulting Engineer has signed them. The City Engineer approval is valid for a period of 12 months. Should work not commence within the 12 month period, the plans shall be resubmitted for re-approval.

**2-9 FINAL PLANS REQUIRED**

The Consulting Engineer shall deliver the following number of sets of prints from the approved drawings to the City Engineer:

- 2 complete sets of full-size plans.
- 2 complete sets of half-size (11"X17") plans.

Electronic files of complete sets of plans.

One additional set of plans shall be delivered when trunk drainage facilities are shown on the plans. Additional copies of improvement plans may be requested by the City Engineer at his discretion, and these shall be furnished to the City without cost.

**2-10 IMPROVEMENT PLAN REVISIONS DURING CONSTRUCTION**

Should changes become necessary during construction, the Consulting Engineer shall first obtain the consent of the City Engineer and shall then resubmit the title sheet and the plan sheets affected for approval. The changes on the plans shall be made in the following manner:

- A. The original proposal shall not be eradicated from the plans but shall be lined out. All sheets originally signed by the director shall remain a part of the plan set. Substitution of sheets will be allowed with replacement sheets being numbered as: 7b, 7c, etc.
- B. In the event that eradicating the original proposal is necessary to maintain clarity of the plans, approval must first be obtained from the City Engineer.
- C. The changes shall be clearly shown on the plans with the changes and approval noted on a revision signature block, conforming to the Standard Drawing.
- D. The changes shall be identified by the revision number on a triangle delineated on the plans adjacent to the change and on the revision signature block.
- E. A fee established annually by City Council will be charged to process all revisions.

Minor changes which do not affect the basic design or contract may be made upon the authorization of the, City Engineer but said changes must be shown on "Record Drawing" plans when the contract is completed.

The City Engineer may order changes in the plans in order to complete the necessary facilities. Changes in the plans ordered by the City Engineer shall conform to all of the above.

**2-11 RECORD DRAWINGS**

The Consulting Engineer shall keep accurate records of all approved deviations from the plans and shall provide 2 sets of plans. The Inspector will compare the submitted plans to his set and provide the Engineer a set of "redline" drawings. The Engineer shall add the Inspector's corrections or deviations to the original plans and submit 2 sets of full-size, 2 sets of half-size, and a CD or USB drive with PDF's. The standard record drawing block will be used and the block will be signed by the consulting engineer on each sheet of the plan set at time of preparation.

**2-12 PAD CERTIFICATION**

2 sets of full-size, 2 sets of half-size, and a CDF with PDF's certified by the Consulting Engineer of the finished pad elevations of subdivision lots shall be required prior to

issuance of a building permit and final approval of the subdivision improvements. Certification shall be in accordance with Section [9-7](#). See City Standard Drawing 1-11.

**2-13 [CONFLICTS, ERRORS AND OMISSIONS](#)**

Excepted from approval are any features of the plans that are contrary to, in conflict with, or do not conform to any California State Law, City of Rocklin Municipal Code or Resolution, conditions of approval, or generally accepted good engineering practice, in keeping with the standards of the profession, even though such errors, omissions or conflicts may have been overlooked in the Engineering Division's review of the plans.

**2-14 [CHANGE IN CONSULTING ENGINEER](#)**

If the developer elects to have a registered civil engineer or licensed land surveyor other than the engineer who prepared the plans provide the record drawings, he shall provide the City Engineer in writing the name of the individual or firm one week prior to beginning construction. The Developer shall then be responsible for providing all professional engineering services which may be required during construction, the preparation of revised plans for construction changes, and the preparation of record drawing plans upon completion of the construction.

In the Developer's notification of a change in the firm providing record drawing, he shall acknowledge that he accepts responsibility for design changes and record drawing information as noted above.

**2-15 [SPMUD AND PCWA SUBMITTALS](#)**

The Consulting Engineer shall submit to SPMUD and PCWA for approval and signature on improvement plans of sanitary sewer and water plans, respectfully, for improvements which are within the City of Rocklin prior to the City Engineer's signature on the improvement plans. Both City of Rocklin and Agency approval is required for such plans.

**2-16 [TUNNEL SAFETY REQUIREMENTS](#)**

Any boring or jacking operation of 100 feet or greater length and involving an opening greater than 30" in diameter is subject to the State of California Department of Industrial Relations tunnel safety requirements. The Contractor shall submit to the Department of Industrial Relations plans and specifications applicable to the tunnel operation, with a letter requesting tunnel classification. This procedure is also recommended to avoid project delay if there is the possibility of any personnel entering the tunnel, regardless of diameter and length. The letter should identify the Public Works agency responsible for the project, and the agency's mailing address. The plans shall identify underground utilities and tanks or areas for storing fuel and toxic gases in the vicinity of the tunnel site. The request for classification should be submitted allowing ample time for the Department of Industrial Relations review in order that any special requirements can be included in the project plans and specifications. The Contractor shall also attend the required preconstruction meeting.

**2-17** **EXISTING UTILITIES** All existing utilities are to be shown on the plans. In addition, the Consulting Engineer shall submit prints of the preliminary and approved plans to the utility companies involved. This is necessary for the utilities to properly plan their relocation projects and needed additional facilities. Copies of the transmittal letters to the utility companies shall be provided to the City Engineer. The transmittal letters shall indicate all utility pole conflicts which require relocation. The conflict shall be referenced to stationing and distance from centerline. In addition, the following note shall appear on the first page of the plans: No pavement work will occur within the road right of way prior to completion of utility pole relocation.

**2-18** **PARTIAL PLANS**  
Where the improvement plans submitted cover only a portion of ultimate development, the plans submitted shall be accompanied by the approved tentative plan or a study plan if there is no approved tentative plan showing topographic features of the ultimate development at an adequate scale to clearly show the proposed improvements.

**2-19** **OTHER AGENCY NOTIFICATIONS**  
The Contractor is responsible for obtaining the approval and necessary permits of governmental or municipal agencies when their facilities are involved.

**2-20** **INSPECTION REQUIREMENTS**  
Any improvement constructed to the Standard Construction Specifications for which it is intended that the City will assume maintenance responsibility, shall be inspected during construction by the Construction Inspector. Each phase of construction shall be inspected and approved prior to proceeding to subsequent phases.

Private on-site grading and drainage shall be inspected during construction by the Construction Inspector.

Any improvements constructed without inspection as provided above or constructed contrary to the order or instructions of the City Engineer will be deemed as not complying with Standard Construction Specifications and will not be accepted by City of Rocklin for maintenance purposes.

Within 10 days after receiving the request for final inspection, the Construction Inspector shall inspect the work. The Contractor, Consulting Engineer, and Developer will be notified in writing as to any particular defects or deficiencies to be remedied. The Contractor shall proceed to correct any such defects or deficiencies at the earliest possible date. At such time as the work has been completed, a second inspection shall be made by the Director to determine if the previously mentioned defects have been repaired, altered, and completed in accordance with the plans. At such time as the Construction Inspector approves the work and accepts the work for the City of Rocklin, the Contractor, Consulting Engineer and Developer will be notified in writing as to the date of final approval and acceptance.

On publicly funded districts and projects where the City of Rocklin participates in the costs thereof, quantities will be verified to the satisfaction of the Director, Consulting Engineer, and Contractor, and witnessed accordingly.

## SECTION 3

### PLAN SHEET REQUIREMENTS

#### 3-1 PAPER DETAILS

All improvement plans shall be prepared on plan and profile sheets 24" x 36", Plate "A" plan and profile paper, or special consulting engineer's sheets which have been accepted by the City. Scales: Horizontal 1" = 20', 40', or 50'; Vertical 1' = 2', 4', or 5', but only the scale, horizontal or vertical, for which the sheet was intended shall be used.

#### 3-2 DRAFTING STANDARDS

Certain drafting standards have become necessary to produce legible film and subsequent prints. All line work must be clear, sharp and heavy. Letters and numerals must be 1/8" minimum height, well-formed and sharp. Numerals showing profile elevations shall not be bisected by station grid lines. Dimension lines shall be terminated by sharp solid arrowheads.

#### 3-3 TITLE SHEET

On subdivision or improvement plans exceeding three sheets in a set, a title sheet shall be prepared showing the following:

- \* A. The entire subdivision or parcel and project
- B. Public funded district limits
- C. City limits
- D. Street names and widths
- E. Adjacent subdivisions, including names, lot lines and lot numbers
- F. Property lines
- G. Public easements
- \* H. Location map
- I. Scale of drawings
- \* J. Index of sheets
- K. Legend of symbols
- \* L. Signature block conforming to Standard Drawing 1-1 and situated at the lower right hand corner of the sheet
- M. Earthwork quantities
- N. Assessor's Parcel Number
- O. City Planning Reference Number
- P. Waste Discharger Identification Number (WDID#)

\*Shall be shown on the front sheet of encroachment plans and plans consisting of three or less sheets.

#### 3-4 TITLE BLOCK

Each sheet within the set of drawings shall have an approved title block showing the sheet title, number, date, scale, and the Consulting Engineer's name, signature and

license number; City of Rocklin, and the name of the subdivision or public funded district and City Planning Reference Number.

The preferred location is across the right hand end of the sheets. This will facilitate the common method of plan storage by allowing the plan information to be viewed with the plans rolled up.

**3-5 DRAINAGE, SEWER, WATER AND GRADING LAYOUT**

On all plans, the storm drainage, sanitary sewer and domestic water systems shall be shown on an overall plan layout. In addition, the storm drainage and sanitary sewer systems shall be shown on the street plans. Separate grading plans will be required for all subdivisions. On all other plans, an overall plan layout will not be required but the above facilities shall be shown within the development and on the street plans.

**3-6 PLAN DETAILS**

In addition to the other requirements of these Improvement Standards, the following details shall be shown on plans submitted for approval. This does not in any way exempt the Consulting Engineer preparing plans from the responsibility of preparing neat, accurate and comprehensive plans in keeping with the standards of the profession.

- A. Right of Way - Right of way lines, the boundaries of lots fronting on the street, drainage easements, utility easements, planting easements, section lines and corners, land grant lines and temporary construction easements, both existing and proposed, shall be shown on the plans. All right of way and easement lines shall be properly dimensioned.
- B. Topography - All pertinent topographic features shall be shown, such as street lines, medians, driveways (on both sides of the street when within 40 ft of the median ending), curbs sidewalks, shoulders, location and size of storm and sanitary sewer lines, high water and frequent inundation levels, water lines, gas lines, telephone conduits, other underground utilities, existing structures, houses, trees (9 in. and larger) and other foliage, traffic signals, street lights and pullboxes, underground electrical conduits, walls, masonry structures, and all other features of the area which may affect the design requirements for the area. When a potential utility conflict exists, record drawing elevations of the utilities shall be verified by the Consulting Engineer.
- C. Contours and Elevations - Existing contours or supporting elevations shall be shown on all plans submitted for subdivision, commercial improvements, or planned unit developments.
- D. Profiles - The plans shall show, when appropriate, the existing profile of all roadway centerline, edges of pavement, curb and gutter flow lines, drainage ditches, storm and sanitary sewers. All profiles of proposed improvements shall state centerline elevations at 50 ft intervals and rate of grades, vertical curves



and other vertical alignment data. When curb and gutters are designed for reconstructed City roads, elevations shall be shown at the edge of the outside travelled way, or if the road has a full paved section, shall also be shown 2 ft from the proposed lip of gutter. Any warped surface and vertical curve shall set elevations at 25' intervals.

The plans shall show the existing ground profile for a minimum distance of 200' beyond temporary street endings to facilitate setting proper vertical alignment within the proposed improvement limits. The 200' minimum shall be increased when requested by the Director.

- E. Stationing and Orientation - The stationing on plan and profile shall read from left of right. Stationing shall increase from south to north or from west to east. Plans shall be so arranged that the north arrow points toward the top or upper 180 degrees, insofar as practical.
- F. Bench Marks - The bench marks and datum shall be clearly delineated on the plans both as to location, description and elevations. For all projects, Consulting Engineers shall contact the City for location and elevation of the nearest and most current official City bench mark information.
- G. California State Plane Coordinate System - The Director may require that the proposed improvements be tied into the California State Plane Coordinate System if monumented coordinate points are available within a reasonable distance (200' or less) of said improvement as determined by the Director.
- H. Typical Sections - A typical section for each type of facility within the improvement, setting out the structural features, shall be a part of the plans.
- I. Cross Sections - Cross sections shall be included in the plans, where determined necessary by the Director. When, in limited areas, unusual topographic features or special conditions occur that would affect the work, individual cross sections may be shown on the pertinent plan sheet.
- J. Special Notes - Special notes shall be clearly indicated, and it shall be conspicuously noted on the plans that all construction work and installations shall conform to the City of Rocklin Standard Construction Specifications and that all work is subject to the approval of the Director. Notes shall contain a statement regarding obtaining encroachment permits from other agencies when applicable.
- K. Project Conditions

### **3-7 REQUIRED NOTES**

A list of City required General Notes shown in the Standard Drawing 1-2 through 1-9 shall be attached to the original drawings for all development plans submitted to the City for approval. In addition to the general notes the Consulting Engineer shall be

responsible for advising the Contractor to give the following notices and have in his possession the following permits and plans:

- A. Contractor shall be in receipt of City approved plans prior to construction.
- B. Contractor shall notify all utility companies involved in the development prior to beginning of work.
- C. Contractor shall notify "Underground Service alert" at 811 (phone 800-227-2600) or through the website at <http://usanorth811.org> 48 hours in advance before any digging.
- D. Contractor shall be responsible for the protection of all existing monuments and/or other survey monuments and shall notify City of Rocklin Department of Public Services of any damaged or removed City, State or Bureau monuments. Contractor shall restore any damaged or destroyed survey markings per California Business and Professions Code 8759-8774.5.
- E. Contractor shall notify Department of Public Services upon application for permit and payment of required fees.
- F. The Contractor shall verify all street names and their correct spelling with the Fire Department and Building Division before ordering street signs.
- G. Contractor shall be responsible for conducting his operation entirely outside of any floodplain boundaries. Floodplain boundaries shall be clearly delineated in the field prior to construction.
- H. Contractor shall be responsible for conducting his operation entirely outside of any no grading area. These areas shall be clearly delineated in the field prior to construction.
- I. Where work is being done in an offsite easement the Contractor shall notify the property owner 48 hours prior to commencing work.

## SECTION 4

### **STREETS**

#### **4-1 STREET TYPES**

The standard approved street types for City of Rocklin are as follows: (Refer to the Standard Drawing 3-1 through 3-7).

- A. Alley - A street depressed in the center of a right of way and surface width of 20'. An alley will be accepted by City of Rocklin as a public alley only when it is constructed of 6" thick Portland cement concrete, on 4" AB, or 3" AC over 6" AB or per an approved R value in accordance with Standard Drawing 3-21 and with the specific approval of the City Engineer.
- B. 42' Street - A cul-de-sac residential street with a right of way width of 42', a back to back of curb width of 34', and 4' sidewalks. See Standard Drawing 3-1.
- C. 46' Street - A minor residential street with a right of way width of 46' and back to back of curb width of 38' and 4' sidewalks. See Standard Drawing 3-1.
- D. 50' Street - A residential collector street with a right of way width of 50', a back to back of curb width of 42', and 4' sidewalks. See Standard Drawing 3-2.
- E. 60' Street - A residential collector with bike lanes with a right of way width of 60', a back to back of curb width of 52', and 4' sidewalks. See Standard Drawing 3-2.
- F. 60' Street - An Industrial/Commercial street with a right of way width of 60', a back to back of curb width of 48', and 6' sidewalks. See Standard Drawing 3-3.

60' streets are required in commercial and industrial developments and are normally used in the vicinity of parks, schools and other public facilities.

- G. 62' Street - A collector approach street with a right of way width of 62', a back to back of curb width of 54', and 4' sidewalks. See Standard Drawing 3-3.

62' streets shall be used as approach streets providing access onto 80', 90' and 120' streets. The 62' street approach shall be provided for a distance of 180' from the cross street right of way line with a 40' taper. See Standard Drawing 3-11.

- H. 66' Street - A collector approach street with a right of way width of 66', a back to back of curb width of 54', and 6' sidewalks. See Standard Drawing 3-3.

66' streets shall be used as approach streets providing access onto 80', 90' and 120' streets. The 66' street approach shall be provided for a distance of 180'

from the cross street right of way line with a 40' taper. See Standard Drawing 3-11.

- I. 90' Street - A minor arterial street with a right of way width of 90', a back to back of curb width of 78' and 6' sidewalks. See Standard Drawing 3-4.
- J. 120' Street - A primary arterial street with a right of way width of 120', a back to back of curb width of 104', and 6' sidewalks. See Standard Drawing 3-5.
- K. Partial Street - A street for which the full right of way cannot be dedicated or the complete street cannot be constructed. Partial streets shall be in accordance with Section [4-5](#).

#### 4-2 [STREET CLASS](#)

The standard approved street classes of City of Rocklin are as follows:

Class "A" Streets - Class "A" street improvements shall be in accordance with Standard Drawing 3-1 through 3-5 and shall consist of the following:

- A. "Asphalt" concrete pavement over an aggregate base, and aggregate sub-base as required.
- B. Concrete curb and gutter and sidewalks.
- C. Side slopes not steeper than 1½:1" cuts or 2:1" fills, or a reinforced concrete retaining wall beginning at the right-of-way line.

Semi-Rural Semi Rural streets require special approval by City Council. Improvements shall be in accordance with Standard Drawing 3-6A and shall consist of the following:

- A. Asphalt concrete pavement over an aggregate base.
- B. Intersection widening at 80', 90' and 120' streets shall be in accordance with Standard Drawing 3-11.

#### 4-3 [STRUCTURAL SECTIONS](#)

The following standards for the design of structural sections for proposed improvements shall govern the preparation of plans for such improvements.

All of the following street sections shall include reinforcing fabric prior to the placement of aggregate base.

- A. It will be required that the pavement be designed on the basis of the resistance R-value as determined in accordance with the State of California, Department of Transportation, California Bearing Ratio, or other approved method.

The thickness of the various structural components will be determined by the tables, charts, formulas and procedures contained in the State Design Manual, or as directed by the Director. Under no circumstances shall the Director approve a structural section design that is less than those specified in this section.

Traffic index shall be determined by the Developer's Engineer for each project, and approved by the Director.

- B. The minimum allowable thickness of roadbed section shall be as follows:
1. 3" asphalt concrete and 8" aggregate base on 42' streets.
  2. 3" asphalt concrete and 8" aggregate base on 46' and 50' streets.
  3. 3" asphalt concrete and 8" aggregate base on 60', 62', to 66' streets.
  4. 4" asphalt concrete, 6" aggregate base and 8" aggregate sub-base on 80', 90' and 120' streets.
  5. The structural section for industrial/commercial streets shall be 4" asphalt concrete and 8" aggregate base unless otherwise specified by the Director.
  6. Class "A" streets, including the shoulders, shall have 3" asphalt concrete, 6" aggregate base structural section.
  7. In transition areas from one street width to another street width, the heavier structural section shall be used in the transition area.
  8. As an alternative to the preceding structural sections, total asphaltic concrete structural sections may be specified to be following minimum thicknesses:
    - a. 6" of asphaltic concrete equals 3" of asphaltic concrete and 6" of aggregate base.
    - b. 6" of asphaltic concrete equals 3" of asphaltic concrete and 6" of aggregate base.
    - c. 9" of asphaltic concrete equals 3" of asphaltic concrete, 6" of aggregate base and 6" of aggregate subbase.

Total asphaltic concrete sections must receive the specific approval of the Director.

#### 4-4 PROFILE STANDARDS

The following standards for the design of profiles for proposed improvements shall govern the preparation of plans for such improvements (see Section 3).

- A. The minimum grade on new streets shall be 0.35% except that the minimum curb and gutter grade around intersection corner roundings shall be 0.50%. Curb and gutter elevations on crest and sag vertical curves shall be adjusted to meet the 0.35% minimum grade.
- B. The maximum grade on new streets shall be 12.0% unless otherwise approved by the City Engineer.
- C. Standard cross slope on new streets shall be 2.0% except where superelevation of a curve is required, then Caltrans manual will be followed.
- D. The minimum cross slope on widening shall be 1.5% and the maximum cross slope shall be 3.0%. The cross slope of the widening shall favor the cross slope of the existing pavement whenever possible.
- E. When two streets intersect, neither street shall have a grade greater than 3.0% for a minimum distance of 40' measured from the curb line of the intersecting street, except in unusually rough terrain, as determined by the City Engineer. The centerline of the lesser intersecting street shall meet the crown slope at the projected lip of the gutter. Crown slope may be reduced to 1.0% within the intersection, if necessary.

The minimum vertical curve length allowable at the intersection of two grades shall be 50' or as determined by the City Engineer. Vertical curves on residential and collector street may be omitted where the algebraic difference in grades does not exceed 2.0%. The minimum vertical curve data to be computed and shown on the plans shall consist of the point of intersection elevation, the tangent gradients, the middle ordinate and the length of curve and the sag or highpoint station and elevation.

- F. The design speed and minimum stopping sight distance over any segment of roadway shall be as follows unless specific approval for a lesser design speed is received from the City Engineer:

<b><u>Street Type</u></b>	<b><u>Recommended Design Speed</u></b>	<b><u>Minimum Stopping</u></b>
42' R/W	25 MPH	150'
46' R/W	30 MPH	250'
50' R/W	30 MPH	300'
60' R/W	40 MPH	300'
62' R/W	40 MPH	300'
66' R/W	40 MPH	300'
80' R/W	50 MPH	430'
90' R/W	55 MPH	500'
120' R/W	60 MPH	500'

**4-5 PARTIAL STREETS**

Partial streets may be permitted by the City Engineer along the boundary of a subdivision or property of the developer where the full right of way cannot be dedicated or where the complete street cannot be constructed.

Partial streets shall be constructed to a complete geometric and structural section for a minimum paving width specified by the following:

- A. One half ultimate right of way width plus 10' past centerline as required.
- B. When paving partial construction of an ultimate street development, the edges of the current pavement are to be protected by use of 2" x 6" approved headers, construction grade, or by placing a minimum of 1' additional width of aggregate base material beyond the edge of pavement to the grade and depth of the adjacent structural section.

**4-6 OFFSET INTERSECTION**

Streets intersecting any given street from opposite sides shall have their centerlines meet or the offset between intersections shall be a minimum of 120' for residential streets and at least 150' for all other streets.

**4-7 CUL-DE-SAC**

Cul-de-sac streets shall be terminated with a bulb which shall have a right of way and back of curb radius dimensions conforming to the Standard Drawing 3-7 and the following:

<b><u>Approach Street</u></b>	<b><u>R/W Radius</u></b>	<b><u>Back of Curb Radius</u></b>
42' street	42'	38'
46' street	46'	42'
50' street	50'	46'
60' street	60'	56'

No cul-de-sac shall exceed 600' in length, unless an emergency vehicle access is provided to the satisfaction of the Fire Chief.

**4-8 ELBOW INTERSECTION**

Right angle elbow intersections shall be designed in accordance with the Standard Drawing 3-8.

**4-9 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 radius curve for 42' streets shall be 200'.

The minimum radius curve to 46' and 50' streets shall be 350' with the exception that 50' streets exceeding 1,000' in length and serving as collectors connecting to 80', 90' or 120' streets shall have a minimum radius curve of 500'.

The minimum radius curve for 60', 62' and 66' streets shall be 500'.

The minimum radius curve for 80', 90' and 120' streets shall be 1,000'.

Special consideration by the Director will be given to unusually difficult alignment problems.

**4-10 SIGHT DISTANCE AT INTERSECTIONS**

Streets shall not be designed with intersections on the inside of curves or at any locations in general where sight distance will be inadequate for drivers to tell if they can safely enter the traffic flow or cross the street, an Exhibit may be required by the City Engineer. Exceptions may be made by the City Engineer for especially difficult design circumstances. In lieu of visibility easements, additional street right of way may be dedicated. Minimum intersection design sight distances standards shall be as follows:

**MINIMUM SIGHT DISTANCE**

Type Street <u>Being Entered</u>	Recommended <u>Design Speed (MPH)</u>	<u>Minimum Sight Distance*</u>
42' R/W	25 MPH	200'
46' R/W	30 MPH	200'
50' R/W	35 MPH	200'
60' R/W	40 MPH	250'
62' R/W	40 MPH	300'
66' R/W	40 MPH	350'
80' R/W	50 MPH	400'
90' R/W	55 MPH	500'
120' R/W	60 MPH	500'

\* Distance measured from an entering driver's eye position to the position of the closest approaching vehicle's far front corner.



The entering driver's eye position shall be assumed 3' to the right of the entering street's centerline and 11' clear of the nearest vehicle lane on the street being entered.

The position of the closest approaching vehicle's far front corner shall be assumed 3' from the edge of the nearest approaching vehicle lane for each direction of travel.

The Standard Drawing 3-12 through 3-14 show details of the areas which must be controlled for adequate intersection sight distance on 80', 90' and 120' streets. Other street types and alignments require individual designs based on the minimum sight distance standards given above.

Visibility easements or additional street right of way shall describe an area to be maintained clear of any and all obstructions to a clear view from the adjacent streets. No sign, hedge, structure, natural growth, fence, or other obstruction of any kind whatsoever to a clear view, higher than 2" and 6" above the nearest pavement surface (or travelled area where no pavement exists) shall be installed or maintained or shall be permitted to be installed or maintained within the easement area.

Additional visibility requirements not subject to the above shall conform to Standard Drawing 3-14.

**4-11 RIGHT OF WAY RADII**

Minimum right of way radii for intersection corner roundings shall be in accordance with the Standard Drawings and the following:

<u>Street Type</u>	<u>R/W Radius-Minimum</u>
42'	20'
46'	20'
50'	20'

**4-12 RIGHT OF WAY WIDTHS**

Right of way widths shall be in accordance with these standards for the type of street under consideration, and the Standard Drawing 3-1 through 3-7, or as required by the City Engineer.

In no instance, without specific approval of the City Engineer, shall a street have a right of way width which is less than that of the street for which it is a continuation.

Right of way widths at 90' and 120' street intersections shall be in accordance with the Standard Drawings 3-4 and 3-5 as applicable or as required by the City Engineer.

Right of way widths on a 60' street at sections where the right of way width or the continuation of the street beyond the intersection increases and at intersections that have unusually high traffic volumes shall be widened to a 62' or 66' right of way in accordance with the Standard Drawing 3-3 and as determined by the City Engineer.

**4-13 BUS TURNOUTS**

Bus stop turnouts shall be required at the intersection of two 80 or 90 ft streets, an 80' or 90' and a 120' street, and two 120' streets in accordance with Standard Drawing 3-10.

Bus turnouts shall be required on 80' or 90' and 120' streets at collector street intersections which have or will need traffic signals as determined by the City Engineer.

Bus stop turnouts may be required at other locations as determined by the City Engineer.

Sidewalks shall be 8 ft wide at bus turnouts as shown on the Standard Drawing 3-10.

**4-14 INTERSECTION WIDENING**

Pavement widening at intersections shall be in accordance with the Standard Drawing 3-11 and as determined by the City Engineer:

**4-15 PARTIAL PAVEMENT WIDENING**

Partial pavement widening shall be terminated in accordance with the following:

- A. Partial pavement widening shall be terminated with the end of the pavement perpendicular to the street unless modified below. A 2" x 6" redwood header board shall be required at the pavement ending.
- B. Partial pavement widenings that terminate adjacent to an intersection or driveway shall be tapered 45° to the street if right of way is available.
- C. Partial pavement widenings that terminate a travelled lane shall be tapered 1' per 1' of pavement offset per 5 MPH increment of design speed. The design speed used in determining the taper shall be that given in the table in Section [4-4\(F\)](#).
- D. Pavement tapers for the termination of partial street widening different from the above may be required by the City Engineer.

**4-16 PAVEMENT CORNER RADII**

The minimum edge of pavement radii for intersection corner roundings shall be in accordance with the Standard Drawings and the following:

**CLASS "A" STREETS**

<u>Street Type</u>	<u>E.P. (C&amp;G Lip) Radius</u>
50'	27'
*50'	32'
	32'(4' sidewalks)
	34'(6' sidewalks)

\*When two streets of different widths intersect, the radius for the Narrower street shall apply, except that when a 50' street intersects a wider street the radius for the wider street shall apply.

### **PARTIAL STREETS**

All intersection pavement edges on partial streets shall have a minimum radius of 13't.

#### **4-17 DEVELOPER'S PAVEMENT, SIGNAL, AND STREET LIGHT RESPONSIBILITY**

The developer shall be responsible for the following:

- A. Where the existing pavement section does not generally meet the current standard and/or the centerline grade and alignment are not satisfactory to the City Engineer, the Developer shall be responsible for the pavement section to the centerline on all streets within, adjacent, and contiguous to his project.

The Developer shall grind and overlay any areas beyond the centerline where the design centerline grade deviates from the existing. The Developer shall also be responsible for overlaying any low areas where the new pavement meets the existing pavement to maintain a uniform cross slope.

The City will pay for any pavement necessary where the full structural section is replaced beyond the centerline if the City Engineer elects to adjust the grade and/or alignment of the existing street.

- B. When making a connection to an existing street end, the Developer shall be responsible for removing and reconstructing up to a maximum of 20 ft of the existing roadway to make a satisfactory connection as required by the City Engineer.
- C. The Developer shall be responsible for all of the structural section and pavement on all new streets within, adjacent, and contiguous to his project. If the street is to be paved under a future City contract, the City Engineer may require a bond or cash deposit for the roadway and related work and include the work in the City contract.
- D. All temporary approaches to the existing roadway 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 street lights as necessary for new street and driveway locations.
- F. The Developer shall be responsible for constructing curbed median islands when required by the City Engineer if the street is to be paved under a future City

contractor, the City Engineer may require a bond or cash deposit for the roadway and related work and include the work in the City contract.

- G. The Developer shall be responsible for bus turnouts as shown on the Standard Drawing 3-10 and 3-11 and in accordance with Section [4-13](#) of these Standards.
- H. The Developer shall be responsible for all drainage facilities (bridges, pipes, culverts, and appurtenances) crossing new streets within, adjacent, and contiguous to the project. Section [4-19](#) states developer responsibility and City participation in drainage facilities on existing improved streets.

#### **4-18 [CITY COST PARTICIPATION](#)**

With the submittal of improvement plans for checking, the Engineer shall include a letter request for City cooperation in the proposed work if City participation is proposed for the improvement. This application shall show the items of work and the estimated quantities.

The City will notify the Consulting Engineer by letter as to the acceptance and the extent of cooperation.

The Consulting Engineer is to submit the City proposal to the Developer for his approval prior to the final approval of the improvement plans.

Should the Developer not approve the City proposal, time will be allowed for negotiation between the Developer and the City to arrive at a mutually acceptable price or a separate course of action prior to final approval of the improvement plans.

Any portion of work shown on the Consulting Engineer's plans, for which the City has agreed to cooperate, shall not be segregated by note or legend, but shall be included in the general contract. The City will reimburse the Developer for these cooperative items, after acceptance by the City Engineer and final payment of plan check and inspection fees, if these fees were direct billed.

Final quantities will be determined by field measurement, observed jointly by the City Inspector, the Contractor, and the Developer; or his designated agent.

Unit prices prepared for fee and bond calculation and authorized by the City shall be used as a guideline for cooperative work. The City Engineer may negotiate unit or lump sum prices for items not usually encountered, or for unusual field conditions.

#### **4-19 [REPLACING CULVERTS](#)**

The City will cooperate in the replacement of roadways cross culverts for the same length as the existing culvert as follows (see Section [4-18](#)):

- A. The entire cost for inflowing cross culverts to the property under development that must be replaced.

- B. The entire cost for outflowing cross culverts if the existing culvert is of unsatisfactory size and has unsatisfactory grade.
- C. If the existing outflowing cross culvert is to satisfactory grade but unsatisfactory size, the City will pay for the cost of the pipe only.
- D. If the existing outflowing cross culvert is of satisfactory size, the City will not participate in the cost to replace the culvert.
- E. Major trunk and collector drainage facilities being constructed by agreement with the City will be replaced for the entire right of way width in acceptance with the foregoing and in conformance to these Improvement Standards.

**4-20 TRENCHING IN EXISTING PAVED ROADWAYS**

Crossings other than perpendicular crossings of existing roadways and all trenching in high traffic locations shall provide for select backfill material and increased structural section depth over the standard for that particular roadway.

**4-21 TESTING OF MATERIAL**

Testing of materials to be utilized in work performed under the Standard Construction Specifications shall be performed in accordance with the methods of the Laboratory of the State of California, Department of Transportation. Signed copies of the test results, as required, shall be submitted to the City Engineer. Test results shall show clearly the name of the individual and firm performing the tests, as well as the name of the project, the date of sampling, and the date of testing.

The tests indicated in the Standard Construction Specifications will be the minimum required. In large developments or those developments presenting special problems, a more comprehensive and extensive testing program may be required. Such conditions will be evaluated and an appropriate testing program prescribed on an individual basis.

**4-22 STREET NAMES**

All roads and streets within an improvement shall be named by the owner or subdivider subject to the approval of the City Engineer and the Fire Department. No duplication of names already in use or previously proposed will be permitted. Sound-alike names are not acceptable.

Street name signs shall be furnished and erected by the Contractor. Street name signs shall conform to requirements of the Standard Construction Specifications and these Improvement Standards.

Street names and street name sign locations shall appear on plans submitted for approval. Sign details shall be as shown on the Standard Drawing 3-28.

#### **4-23 STREET SIGN LOCATIONS**

Street sign locations shall conform to the following:

- A. Two street name sign installations (with four sign plates on each post) are required at each intersection where on or both of the intersecting streets has a right of way width of 80 ft or greater. At a four-way intersection, the installations shall be located on both far right-hand corners of the intersection relative to the street having the greater right of way width or relative to the more important street if right of way widths are equal.

At a "Tee" intersection, the first installation shall be located on the far right-hand corner of the intersection, relative to the through street, and the second installation shall be located adjacent to the through street at a point in line with the centerline of the terminating street. One sign plate should be omitted from the standard four-plate installation at the "Tee" intersection sign locations where an approach street does not exist.

- B. One street name sign installation (with four sign plates on each post) is required at each intersection where both intersecting streets have a right of way width of less than 80 ft. At a four-way intersection, the installation shall be located on one of the far right-hand corners of the intersection relative to the street having the greater right of way width or relative to the more important street if the right of way widths are equal. At a "Tee" intersection, the installation shall be located on the far right-hand corner relative to the through street.
- C. For highways with frontage roads, the street name sign installations shall be located in the divider strip between the frontage road and the main travelled lanes of the highway. 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 the main highway.
- D. The Standard Drawing show placement details for street name signs. On streets having a right of way width of 80' or greater, the street name sign installations are to be located adjacent to the more important street, at the end of the curb return. On streets with right of way widths less than 80', the street name sign installations are to be located at the midpoint of the curb return.
- E. Street name signs shall be placed on street light poles wherever possible, in accordance with the Standard Drawings 3-29 and 3-30.

#### **4-24 PERMANENT BARRICADES**

Where improvements are temporarily terminated on a street proposed to be extended in the future, the improvements shall include a permanent type barricade at the end of the street extending completely across the right of way to serve as a warning to the public. The barricade shall be constructed, erected, painted, and signed in accordance

with the Standard Drawing 3-25. When necessary, barricades may be lengthened by making the 2" x 12" plank continuous with splicing at the posts.

Gates may be required where streets stub into public park areas or like areas.

Timber barricades with W 31 signs in accordance with the Standard Drawing 3-25 shall be required where partial street widening terminates at the far end of the widening in the direction of traffic.

Sidewalk barricades shall be constructed at the end of sidewalks where pedestrians cannot safely continue beyond the end of the sidewalk. Sidewalk barricades shall conform to the Standard Drawing 3-24.

#### 4-25 **TREES**

All trees removed from within the ultimate right of way shall be replaced with trees from the approved list. Trees shall not be planted any closer than 6' from the back of sidewalks adjacent to City streets. Where 4' minimum planters are required adjacent to the sidewalks, they may be widened to accommodate the planting of trees. Approved trees for planting in City rights of way and public easements are listed as follows (desired trees not listed may be planted with the approval of the Director):

##### **DECIDUOUS TREES**

<b>BOTANICAL NAME</b>	<b>COMMON NAME</b>
Acer platanoides	Norway Maple
Aesculus carnea "Briotii"	Red Horse-Chestnut
Crataegus phaenopyrum	Washington Thorn
Gleditsia triacanthos inermis: "Sunburst" Moraine "Imperial" Shademaster	Thornless Honey Locust
Koelreuteria paniculata	Golden Rain Tree
Lagerstroemia indica	Crape Myrtle
Liriodendron tulipifera	Tulip Tree
Pistacia chinensis	Chinese Pistache
Prunus: Cerasifera "Thundercloud" "Krauter-Vesuvius", "Atripurpurea"	Flowering Plums and Cherries
Tilia cordata	Cherry Plum Variety Littleleaf Linden

##### **BROAD-LEAVED EVERGREEN TREES**

<b>BOTANICAL NAME</b>	Magnolia grandiflora
Ceratonia siliqua	Quercus agrifolia
Cinnamomum camphora	
Laurus nobilis	

**COMMON NAME**

Carob Tree  
 Camphor Tree  
 Ulmus parvifolia

Grecian Laurel  
 Southern Magnolia  
 California Coast Live Oak  
 Chinese Elm

**CONIFERS****BOTANICAL NAME**

Ginkgo biloba:  
 "Autumn Gold"  
 "Fairmont"

**COMMON NAME**

Maidenhair Tree

Permission to remove any tree in City right of way or easements shall be obtained from the Director in advance.

See Sections [3-6\(B\)](#), and [9-6](#) for additional requirements regarding trees.

## Right of Way Approved Plant List

<b>BOTANICAL NAME/COMMON NAME</b>	<b>SIZE</b>
<b>TREES</b>	
Quercus lobate/Valley Oak	15 GAL.
Acer rubrum/Red Sunset	15 GAL.
Koelreuteria Bipinnata/Chinese Flame Tree	15 GAL.
Vitex Agnus-Castus/Chaste Tree	15 GAL.
Prunus Serrulata 'Kwanzan'/Japanese Flowering Cherry	15 GAL.
Pyrus Chanticleer	15 GAL.
Quercus Rubra/Red Oak	15 GAL.
Koelreuteria Paniculata/Golden Rain Tree	15 GAL.
Strawberry	15 GAL.
Cedrus Deodara/Deodar Cedar	15 GAL.
Coast Live/Quercus agrifolia	15 GAL.
Acer Rebrum xfreeman Columnar Maple	15 GAL.
Zelkova Serrata/Saw Leaf Zelkova	15 GAL.
Pisacia Chinensis/Chinese Pistache	15 GAL.
Acer Buergeranun/Trident Maple	15 GAL.



#### **4-26 COMMERCIAL, INDUSTRIAL, AND MULTI FAMILY DRIVEWAYS**

Driveways shall be in accordance with the following:

- A. No driveway will be allowed within 5' of a side property line on a commercial development. Exceptions may be approved by the City Engineer for joint driveways or in unusual cases.
- B. All commercial and multiple family developments shall install driveways in accordance with the Standard Drawing 3-23 or 3-19 as determined by the City Engineer. The standard multiple family and commercial driveway width shall be 45' on 120', 90' and 80' street, and 35' on streets less than 66' in width. Lesser widths for development on 60' and 50' streets may be approved by the City Engineer. Minimum driveway widths shall be 25'.
- C. The standard driveway for industrial developments shall be as shown on the Standard Drawing 3-19 or 3-23 as determined by the City Engineer.
- D. When driveways are abandoned or relocated, the driveway sections must be removed and replaced with matching curb and gutter, sidewalk and planters.
- E. When street frontage improvements are existing with Type 1A, or Type 2 curb and gutter, driveways shall be installed per Standard Drawing 3-19.
- F. Driveways entering commercial property on all roads shall have a slope not exceeding 5% for a minimum distance of 20', measured from the edge of existing pavement. Driveways normally used by vehicles towing house or boat trailers shall have special requirements to be determined on an individual basis by the Director.
- G. The nearest edge of driveways shall not be closer than 40' to the end of traffic medians. Medians shall be reconstructed and/or lengthened to conform to this section if necessary.
- H. Visibility requirements shall be in accordance with the Standard Drawing 3-14.

#### **4-27 PEDESTRIAN LANES**

Pedestrian lanes within a development shall be constructed with a minimum of 6" of Portland cement concrete, Class 'B', if traffic lane, use Class "A" for the full width of the easement.

The maximum grade for pedestrian lanes shall meet the most current ADA guideline design.

Pedestrian lanes, where situated between lots, shall be fenced with chain link fencing from the street right of way to the back lot line. These fences shall be 6' high from the

building setback line to the back lot line and 36" high from the building setback line to the street right of way line.

Cross fencing to control access shall be placed at the street ends of all pedestrian lanes in accordance with the Standard Drawing 3-27.

All pedestrian lanes shall have lighting installed in accordance with Section [8-6\(C\)](#).

**4-28 [SIDEWALK RAMPS](#)**

Ramps for individuals with disabilities shall be constructed at all street intersections in accordance with the most current State ADA Standards, and at other locations where required by the City Engineer. Any retrofits to existing ramps must comply with the requirements of the California Building Code.

**4-29 [CURB AND GUTTER](#)**

Curb and gutter shall be installed adjacent to all developments in accordance with the Standard Drawing 3-15 and 3-15A, and the following:

- A. Type 1A curb and gutter: 42', 46' and 50' streets in residential developments and all developments not included in B or C, or as required by the City Engineer.
- B. Type 2 curb and gutter or valley gutter: Industrial subdivisions. See detail 3-15A
- C. Type 2 curb and gutter: Frontage roads; parks; unfenced schools; open space areas; public facilities; 60', 66', 80', 90' and 120' streets with commercial and multi-family (not duplex) developments.

**4-30 [BARRIER CURB](#)**

Barrier curbs shall be in accordance with these standards and the Standard Drawing 3-15. See Standard Drawing 3-17 for planter and barrier curb details.

**4-31 [SIDEWALKS](#)**

Sidewalks shall be in accordance with these standards and Standard Drawing 3-15.

Where utility poles and other obstructions are situated within streetside sidewalks, a minimum of 4' of clear uninterrupted sidewalk area shall be provided. Where it is necessary to widen the sidewalk beyond its standard width to attain the 4' clearance, the widened area shall extend a minimum of 5' beyond each side of the obstruction and a 10' taper on each side of the widening shall be required.

All school bus turnouts shall have 8' sidewalks along all frontages except fenced play areas where no access is provided, as determined by the City Engineer.

Where sidewalks end in fill areas, the fill shall be extended beyond the end of the sidewalk for a minimum distance of 5'. As an alternate, a cut-off wall may be constructed at the end of the sidewalk.

All sidewalks adjacent to commercial developments shall be 6' wide.

Sidewalks shall be 8' wide at bus turnouts as shown on the Standard Drawing 3-10. New development shall be responsible to repair existing damaged sidewalk.

**4-32 FENCES**

The normal location for fences or walls along public streets is at the right of way line, on the private property side or at the edge of the visibility easement required by Section [4-10](#).

All fences and walls are subject to the visibility requirements of these standards. See Standard Drawing 3-14.

On backup lots adjacent to 80', 90' and 120' streets, fences or walls shall be placed at the property line or outside of and at the edge of the visibility control area shown on Standard Drawing 3-12 and 3-13.

Fences and walls may require modification to accommodate street light poles and/or foundations.

**4-33 PRIVATELY OWNED BRIDGES**

Bridges intended for the sole use of the occupants of a multifamily type development or any bridge on a private road shall be designed to withstand an H-20 load, unless specifically approved by the City Engineer for a lesser loading. Other design features of the bridge, including but not limited to widths, railings, clearances and materials shall be in conformance with City and State Standards. A soils report prepared by a qualified soils engineer will be required. Design calculations signed by the consulting Engineer and including the registration number shall be required.

**4-34 RESIDENTIAL STREET NAME SIGN**

See Standard Drawing 3-28

- A. The sign shall consist of two (2) single faced blades per street name.
- B. The sign shall be on an 8" high blade made of .080 gage aluminum with 1/2" radius corners.
- C. Finish shall be high intensity prismatic (HIP) background with electronic cuttable green film sheeting.
- D. All letters and numbers over 2" in height shall have radius corners inside and outside.
- E. The "City of Rocklin" shall be in 1" letters centered across the top of the blade.

- F. The "street name" shall be in 4" upper case letters and 3" lower case. (latest edition MUTCD Standard Sec. 2D.43)
- G. The suffix of the street name (Way, Ave., St., Ct., etc.) shall be in 2" letters at the top of the end of the name.
- H. The length of the blades which will be together on one post shall be the same. EXAMPLE: If one street name sign were to require a blade 12" long and the other street name at the intersection were to only require and 8" long blade, both street names would be placed on 12" blades.
- I. Traffic Control Devices. All traffic control devices shall comply with the latest edition MUTCD, unless approved by the Director of Public Services.

**4-35 MAJOR STREET INTERSECTIONS STREET NAME SIGNS**

Major street intersection street name signs shall be installed at four locations of the intersections. The signs shall be attached where the mast arm meets the pole, using the banding method.

Sign panels shall be aluminum, 18" high, and have green reflectorized sheeting on both sides. Letters shall be series C, 8" upper case and 6 in. lower case and white reflectorized (high intensity) street names shall be on one side of each panel. (New MUTCD Sec. 2D.43)

Streets with different names on the same intersection, the plate shall show the name on both streets on one panel with directional arrow on the plate.

**4-36 OVERHEAD STREET NAME SIGNS**

12" upper case 9" lower case. (See CA MUTCD Sec. 2D. 43 paragraph 7.)

**4-37 TRAFFIC STRIPES AND PAVING MARKINGS**

Traffic stripes and pavement markings shall be as shown on the Plans and shall conform to the most recent addition of the City of Rocklin Construction Specifications, Caltrans Specifications, and California MUTCD).

The traffic stripes and pavement markings shall conform to the standards, dimensions and details as specified in the latest edition of the California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD as amended for use in California).

**4-38 PAINTED TRAFFIC STRIPES AND PAVEMENT MARKINGS**

Self-sticking traffic marking tape, vinyl or otherwise, developed for such use shall be used for temporary striping as required, unless otherwise shown or specified in the contract.

**4-39** **PREFORMED TRAFFIC STRIPES AND PAVEMENT MARKINGS**

The completed traffic stripes and markings shall have clean, well-defined edges, without deformations and be free of tears or other disfigurements. Improperly placed, defective or disfigured traffic stripes and markings shall, at the Contractor's expense, be immediately removed from the pavement surface by methods approved by the Agency. Completed traffic stripes shall be uniform, straight on tangent alignment and on a true arc on curved alignment.

## **SECTION 5**

### **DRAINAGE**

#### **5-1 GENERAL**

Drainage improvements are to include: culverts, drop inlets, lined channels, turf reinforcement matting, manholes, stormwater quality control measures, outlet and inlet structures and storm drain pipe. These improvements shall be installed in accordance with the approved improvement plans, these Construction Standards, the Stormwater Quality Design Manual for the Sacramento and South Placer Regions, the latest edition of the State of California Department of Transportation Standard Specifications and if applicable, the City of Rocklin Post Construction/Low Impact Development Manual. These Standards shall apply to the public right-of-way and easements and private on-site drainage improvements. Several items within this section shall apply to on-site improvements and in conformance to stormwater quality requirements.

The City of Rocklin has also adopted Stormwater quality design standards to reduce water pollution generated by urban runoff. These design standards are detailed in the City of Rocklin Post Construction/Low Impact Development (LID) Manual. This manual is available on-line at the City of Rocklin website: <http://www.rocklin.ca.us/LID>.

The City of Rocklin has also adopted a Post Construction/Low Impact Development (LID) Manual as required by the Regional Water Quality Control Board. This manual is available online at [www.rocklin.ca.us/LID](http://www.rocklin.ca.us/LID).

#### **5-1 (a) DRAINAGE CLASSIFICATION**

Drainage systems shall be classified as follows:

- A. Lateral - Drainage conduits receiving drainage from areas of less than 30 acres shall be called a lateral system.
- B. Trunk - Drainage conduits receiving drainage from areas of 30 acres or more shall be called a trunk system.
- C. Onsite Drainage - Drainage facilities required to carry storm runoff within the development, excluding trunk drainage conduits, facilities draining public streets, and facilities draining concentrated flow from other properties.

#### **5-2 DRAINAGE CAPACITY DESIGN**

Special provisions must be made within the drainage system to insure that the inlet invert elevations and the capacity of the drainage system will accommodate the ultimate development of the watershed. This shall include the entire upstream watershed, regardless of the existing conditions and shall conform to the Placer County Stormwater Management Manual (PCSWMM).

**5-3 DRAINAGE ALIGNMENT DESIGN**

The diversion of natural drainage will be allowed only within the limits of the proposed improvement. All natural drainage must enter and leave the improved area at its original horizontal and vertical alignment unless an agreement, approved by the Director, has been executed with the adjoining property owners. See (PCSWMM).

**5-4 DRAINAGE PROFILES**

A plan and profile shall be shown for all drainage systems which carry natural drainage that originates upstream of the limits of the development. Onsite drainage may be shown in plain view only, unless requested by the Director. See Section [5-12](#) for extending profiles offsite.

**5-5 PIPE RADII CRITERIA**

All pipe placed on curves shall meet manufacturer's recommendations for curved alignment. All curves, radii, length of pipe joints, and types of pipe shall be shown on the plans.

**5-6 PIPELINE ALIGNMENT REQUIREMENTS**

Drainage pipelines shall be located in the street whenever possible. The location of storm drainage pipelines in new streets shall be 6' north or west of and parallel with centerline of the street. All new pipes and channels shall be placed a minimum of 100' from existing and proposed water wells. Meandering and unnecessary angular changes of pipelines shall be avoided. Angular changes when necessary shall not exceed 7.5%

All pipes shall be constructed with a minimum cover of 2' over the top of pipe unless other utilities or grade conditions prohibit. In no case shall minimum pipe cover be less than specified on the Standard Drawings 5-1 and 5-2.

**5-6 (a) CONSTRUCTION STAKING**

The Developer for all drainage improvements shall provide Construction staking. Such staking shall provide the station and offset, as well as the cut to the nearest hundredth of a foot (0.01 feet). Stakes shall be provided at a minimum of every 50' in tangent sections and every 25' in curved sections. Cut sheets shall be on-site and shall be furnished to the City's Construction Inspector upon request.

**5-7 PIPELINE ACCEPTANCE CRITERIA**

A mandrel test shall be conducted on all non-rigid storm drain pipes less than 24" in diameter, following completion of subgrade processing and compaction for curb, gutter and sidewalk and prior to placement of asphalt concrete pavement. Placement of curb, gutter and sidewalk and asphalt concrete pavement (and related aggregate base) shall not occur until the Construction Inspector has approved the mandrel test, and who shall be present through the duration of the mandrel testing.

The allowable deflection for all non-rigid pipes shall be 7.5% maximum. The deflection shall be tested by pulling a mandrel which is 92.5% of the inside pipe diameter through all installed pipe. The mandrel shall be the "go/no-go" type and shall be pulled without

mechanical assistance. Prior to the mandrel test, the pipe shall be thoroughly flushed and cleaned. At each location in which the mandrel cannot pass, the cause shall be ascertained. If it is determined that the deflection exceeds 7.5%, that a gasket has been mis-installed or that the pipe has been damaged due to trenching for another utility, the respective section of pipe shall be excavated, replaced using water tight repair couplings, rebedded and backfilled. A passing mandrel retest is required after backfill and subgrade compaction, line and grade have been reestablished.

Any sections of non-rigid pipe not passing the mandrel test shall be televised to ascertain the problem.

Additionally, all diameters of non-rigid storm drain pipe shall be televised to ascertain the integrity of the installed pipe. Any deficiencies noted during the televised inspection shall be reviewed and repaired, as specified for mandrel-tested pipe. A passing televised retest is required after backfill, compaction, and subgrade line and grade have been reestablished.

Pipeline and associated stormwater structures (sand/oil separators, LID units, filters, etc.) shall be flushed and vactored at completion of project and before final acceptance.

Systems shall be flushed and vactored prior to final televised inspection. Televised inspection will not be performed until all manholes and drain inlets are installed and grouted.

## **5-8 DRAINAGE EASEMENTS**

Drainage easement requirements are as follows:

- A. All drainage facilities shall be located in one of the following:
  - 1. Public street or alley
  - 2. Public utility easement, specifically dedicated to include drainage facilities
  - 3. Private or dedicated drainage easement

Drainage easements shall also be required for any drainage water discharging onto offsite private property where that drainage water does not discharge into a continuous pipeline or watercourse. Dedication of easements shall be completed and submitted to the Director for approval.

- B. Closed Conduits - Easements for closed conduits shall meet the following requirements:
  - 1. Minimum width of 10' with the centerline of the pipe at quarter point; pipe may reverse sides at angle points.



2. Provide access and working space rights.
  3. For pipes exceeding 24" in diameter or trenches exceeding 5' in depth, the easement shall have additional width to provide ample working space as required by the Director.
- C. Open Channels - Easements for open channels shall have sufficient width to contain the open channel with side slopes, fencing where required, and one 15' service road when required by the Director. Suitable ramps must be provided for access to the bottom when bottom is used for maintenance.

## 5-9 HYDRAULIC DESIGN CRITERIA

- A. Pipe Criteria - Pipe criteria shall be as follows:
1. Minimum pipe diameter allowable on any storm drain shall be 12" except for onsite drainage where the minimum size shall be 8" or as approved by the Director.
  2. Driveway culverts shall be approved by the City for size, grade, alignment and type and shall be shown on improvement plans. See Standard Drawing 3-20. Contractor shall contact City for encroachment permits. Driveway culverts for residential property shall not exceed length necessary for 24' maximum driveway width, and for commercial and industrial shall not exceed length necessary for 45' maximum driveway width.
  3. Minimum velocity in closed conduits shall be 2.0 fps when flowing full.
  4. The profile for closed conduits shall include upstream and downstream profile for a distance of 500' or until an average profile is established.
- B. Cross Culvert Criteria - The design of cross culverts shall be as follows:
1. Cross culvert size shall be determined on the basis of runoff as specified in Placer County Stormwater Management Manual.
  2. Cross culvert profile will be determined by an examination of the overall profile of the channel for a minimum distance of 500' each side of the installation or until an average profile is established.
- C. Open Channels - Open channels shall consist of concrete lined channels, asphalt concrete lined bottom channels, grouted cobble lined bottom channels or natural earth channels.

Criteria for open channels shall be as follows:

1. Minimum and maximum velocities for open channels shall conform to the Placer County Stormwater Management Manual.
  2. Freeboard requirements shall conform to the Placer County Stormwater Management Manual.
- D. Design Computation - The design computation for drainage shall include the following information which shall be submitted before the plans will be accepted for checking.
1. Watershed map.
  2. Drainage area in acres.
  3. The flow rate cubic feet per second (cfs) in each pipe or channel reach.
  4. Invert elevations of each pipe or channel reach.
  5. Top of structure elevation or top of channel lining elevation.
  6. Hydraulic grade line elevation.
  7. Hydraulic gradient.
  8. Pipe, size, class, length and gradient. Items 6 and 7 are not required when design is based on hydraulic grade line inside conduit.
  9. Channel dimensions and water surface profile computations.
  10. Show all proposed 100 year overland release points.
- E. Hydraulic Grade Line - Hydraulic grade line shall be a minimum of 0.50' below the elevation of inlet grates and manhole covers of all structures of the upstream system.

Hydraulic grade line shall be shown on the pipe systems when the hydraulic grade line is above the top of the pipe.

#### **5-10 DRAINAGE STRUCTURES**

Drainage structure criteria shall be as follows:

- A. Closed Conduits - The requirements for closed conduits are as follows:
1. Closed conduits shall be either cast-in-place concrete pipe, precast reinforced concrete pipe, vitrified clay pipe, or HDPE or PVC as defined in the

Standard Construction Specifications with exception of HDPE which shall conform to State Specifications 64-1.

2. The specific type of pipe or alternate pipes to be used in the development shall be shown on the plans.
3. Cover requirements are shown on the Standard Drawings 5-1 and 5-2. At locations where the minimum cover requirements cannot feasibly be obtained, the conduit will be either encased in concrete or provided with a concrete cover or other method of pipe protection as specified by the City Engineer.

B. Manholes - Requirements for manholes are as follows:

1. Standard precast concrete or saddle type manholes shall be located at junction points, angle points greater than 15°, changes in gradient, and changes in conduit size. When cases arise where special manholes or junction boxes are required, the design must be approved by the Director.
2. Spacing of manholes, or junction boxes of such size as to be enterable for maintenance, shall not exceed 400' for drains 24" and smaller in diameter and 600' for pipes greater than 24" in diameter, except under special approved conditions. The spacing of manholes shall be nearly equal whenever possible.
3. All manholes and junction boxes other than inlets shall have standard manhole covers as shown in the Standard Drawing. Manhole covers greater than 24" shall have 2 piece lids. Manholes will not be allowed in the gutter flow line.
4. A reinforced concrete flat top as shown on the Standard Drawing 4-8 shall be required when the depth does not permit use of a taper unit.
5. Slotted manhole covers may be used to pick up minor drainage in non-traffic areas, including onsite drainage on residential lots.
6. Water quality treatment structures, or Low Impact Development (LID) measures, shall be provided onsite prior to connection with public drainage system or prior to the final point of discharge to the City Engineer's satisfaction.

C. Manholes - Installation

1. Bases Precast: Precast bases shall be placed on a foundation of 1/2" or 3/4" minus crushed rock, a minimum of 4" thick, compacted to ninety percent (90%) relative compaction. Elevation differentials of inlets and outlets shall

conform to the approved improvement plans. Openings in the base shall align true with all inlet and outlet pipes. Stub-out or couplings provided in precast bases shall be of the same material as the pipe to which they connect, unless otherwise approved by the City's Construction Inspector.

2. Bases Cast-in-Place: The cast-in-place base portion shall not be placed higher than 6" above the outside tops of the main incoming and outgoing pipes. Precast manhole penetrations will be cored and booted for appropriate pipe size.

The wall thicknesses for the top of the cast-in-place base sections shall conform to the following table:

Manhole Diameter	Minimum Wall Thickness
48"	5"
60"	6"
72"	7"
84"	8"
96"	9"

Inside diameters of cast-in-place base portions shall equal the inside diameter of the manhole specified. Standard precast manhole riser sections and/or cones shall be placed above cast-in-place section to bring the manhole rim to finish grade. Upon pouring the concrete base, the top surface of the cast-in-place base barrel shall be stamped with a rigid impression ring in order to match it up with the above, precast barrel section. As an alternate, a maximum 1' barrel section may be stacked when it is determined that the concrete for the base is adequately stiff.

A 24-hour minimum curing time is required before manhole stacking is allowed.

All inlets and outlets with a 30" inside diameter or smaller, connecting to existing manholes, shall be core bored.

Concrete in the cast-in-place portion shall be placed against undisturbed earth or upon a base of crushed rock or sand. All loose material shall be removed from the excavation prior to installation.

3. Cones: Cone tops shall be placed within seven to eighteen inches (7"-18") of final street grade. Where depth is insufficient for cones, flat slab tops shall be used. Lifting rings in precast cones shall be plugged with dry packed mortar.

4. Joints: Joints in precast manhole sections shall be made with mortar and plastic sealing compound.
  - a. Mortar Application – All joint surfaces and the face of the manhole base should be thoroughly cleaned and wetted before applying mortar. Both the inside and outside of mortared joints shall be plastered with mortar, and the inside surfaces brushed to a smooth finish with a wet brush. Special precautions shall be taken to ensure that the entire joint space is filled with mortar and is water tight.
  - b. Plastic Sealing Compound Application – All joint surfaces and the face of the manhole base shall be thoroughly cleaned before applying plastic sealing compound. The sealing compound shall be protected from dirt during application. Ends of the compound shall be joined end-to-end and not joined by overlapping. Sufficient compound shall be used to cause a visual “squeeze-out” of the compound material when adjacent sections are seated.

Squeeze-out material on the inside of the manhole shall be neatly trimmed flush with the inside surface.

5. Connections: Pipe connections to drainage manholes shall be made so that the pipe is flush with the inside face of the manhole. These connections shall be finished so that entrances are smooth. Unless the manhole is cast around the pipe, connections shall be made with dry packed cement mortar. Pipe connections shall not be made into the cone section of the manhole unless shown on the approved plans.
6. Grade Rings: Grade adjustments shall be made using precast grade rings. Precast rings shall be a minimum of 2” in height. The total height of the grade rings, frame and cover casting shall not exceed 18”. If connections are booted they need to be grouted or mortared smooth.
7. Frames and Covers: The tops of frames and covers shall be set 1/8” below finish grade pavement in the street and 6” above finish grade in landscape areas and 12” in unimproved, isolated areas unless otherwise shown on the approved plans. Per the Construction Standard Details, a 12” x 12” wide concrete collar shall be placed around the casting, covered by 2” of asphalt concrete paving in a street area. The concrete collar shall be in conformance to “Minor Concrete” section. All joints between the frame, grade rings, dome, barrels and base shall be sealed with non-shrink mortar or an approved plastic sealing material. Inside the manhole, all joints where the sealing material is not flush with the inside wall shall be grouted with non-shrink mortar and finished/wetbrushed. Frames and Covers shall all be of American made steel.

8. Adjusting Existing Manhole Frames: The frame shall be supported above the grade ring or dome by spacers or by suspending with timber and wires. After the concrete collar is poured, any space between the frame and grade ring and dome shall be filled with non-shrink mortar and the inside of the riser finished/wet-brushed.
9. Compaction: Compaction around storm drain manholes shall conform to Standard Drawing 5-1 and 5-3.

D. Drop Inlets - Requirements for drop inlets are as follows:

1. Inlets shall be placed so that the length of flow in the gutter does not exceed 500'. The depth of flow in the gutter at the inlet shall not exceed 0.35', as determined by the charts on the Standard Drawing 4-6 and 4-7. The runoff flow used to check the depth shall include any flow that may bypass upstream grates. Special grates to prevent bypass may be required by the City Engineer.
2. Inlets at sag points where bypass flow from upstream grates is possible shall be Type B. The outfall pipe from the inlet shall be sized to accommodate the design runoff taking into consideration bypass flow from upstream inlets.
3. Type B inlets shall be used on all arterial streets including commercial and industrial areas.
4. Type F inlets shall be used in unimproved medians, and may be used in roadside ditches away from driveway locations.
5. Drop inlets in streets shall be placed at lot lines in residential subdivisions, except at intersections where they shall be placed at the beginning or end of the curb return.
6. The maximum area draining into one inlet shall be 2 acres for onsite systems.

All inlets for onsite use that are not shown in the Improvement Standards shall be clearly dimensioned on the plans. All grates shall be designed to provide adequate safety for automobile traffic, bicycles and pedestrians.

7. Type A or B inlets may be used as junction boxes. When used as junction boxes where pipe is changing directions, the inside dimension requirements for junction boxes shall be met. Inlets shall not be used as junction boxes in sag points.
8. Drop inlets draining public streets may be connected directly to a collector or trunk line 36" in diameter or larger by means of a lateral not exceeding

15" in diameter and 20' in length and having a slope not exceeding 30%. At sag points the drop inlets shall be connected to a manhole.

9. All drop inlets over 48" in overall height will be reinforced with #4 rebar at 8" O.C.

E. Junction Boxes - The requirements for junction boxes are as follows:

1. Junction boxes shall be constructed of reinforced concrete or fabricated from reinforced concrete pipe sections where size limitations permit, except when standard inlets are used as junction boxes as specified in [Section 5-10\(C\)8](#).
2. Minimum wall thickness for reinforced concrete junction boxes shall be 6".
3. The inside dimension of junction boxes shall be such as to provide a minimum of 3" clearance on the outside diameter of the largest pipe in each face. All junction boxes shall be rectangular in shape unless otherwise approved by the City Engineer. Junction boxes deeper than 4' shall have a minimum dimension of 48".

F. Headwalls, Wingwalls, Endwalls, Trash Racks and Railings - The requirements for these facilities are as follows:

1. All headwalls, wingwalls, and endwalls shall be considered individually and shall be, in general, designed in accordance with the Standards and Specifications of the California Department of Transportation.
2. Trash racks will be provided to prevent clogging of culverts and storm drains and eliminate hazards. The trash racks shall be designed in conformance to the design shown in the Standard Drawings 4-15 and 4-16. Temporary trash racks will be allowed where pipe will be extended in the near future, at the discretion of the City of Engineer.
3. On cross culvert drains, pre-formed end sections conforming to the California Transportation Standard Specification 70-5 and California Transportation Standard Plans D94A and D94B.
4. Metal beam guard rail, chain link or wrought iron fencing may be required by the Director at culverts, headwalls and box culverts and on steep side slopes. When so required, the railing shall be installed in accordance with the Standard Construction Specifications.

G. Cross Culverts - The requirements for cross culverts shall be as follows:

1. Cross culverts may be of reinforced concrete pipe or SDR-35 pipe meeting the requirements of the Standard Construction Specifications and the following criteria.
2. When specified by the City Engineer, reinforced concrete box culverts or structural plate arch culverts shall be installed.
3. Crossings of major creeks may require special aesthetic considerations as determined by the City Engineer.
4. Crossings of major creeks shall be designed for 100-year storm event and shall not raise the upstream water by more than 0.5' the current FEMA regulations.

H. Water quality elements per NPDES requirements.

#### **5-11 TEMPORARY DRAINAGE DIVERSIONS**

The requirements for temporary drainage diversions are as follows:

- A. Temporary drainage diversions, such as dams and pipe plugs, shall be located and constructed in such a fashion as to permit their removal during adverse weather.
- B. Locations and removal procedures for temporary drainage installations shall be approved by Public Services, and these installations shall be removed when necessary to prevent damage to adjoining property.

#### **5-12 CHANNELS AND OUTFALL DESIGN**

The design of channels and outfalls shall be as follows:

- A. Open Channels - Requirements for open channels are as follows:
  1. Drainage may be conducted through an improvement in open channels under the following criteria and if approved by the City Engineer.
    - a. The quantity of flow is such that it will exceed the capacity of a 72" pipe.
    - b. The outfall point is such an elevation that minimum cover cannot be obtained over the pipe.
  2. All channels to be reconstructed shall be built to a typical cross section as approved by the City Engineer.

Fully lined and bottom lined channels shall have a minimum bottom width of 6' and shall have an access ramp for maintenance equipment.



3. For all channels, either realigned or natural, the following items shall be shown on improved plans in addition to information heretofore required.
    - a. Typical sections and cross sections.
    - b. Profile of the existing channel and top of bank profile for a minimum of 50' each side of the development in order to establish an average profile grade through the development.
  4. All open channels to be maintained by the City shall require the recordation of a drainage easement.
- B. Interceptor Ditches - Interceptor ditches or approved alternates shall be placed at the top of the cut or bank where deemed necessary by the City Engineer to prevent erosion of the channel bank.
- C. Upstream and Downstream Profiles - The requirements for these profiles are as follows:
1. All drainage outfalls shall be shown both in plan and profile on the improvement plans until a definite "daylight" condition is established.

All drainage ditches upstream of the improvement shall be shown on the plans and profile until an average profile grade through the improvement is established.

The profiles shall include ditch flowline and top of bank elevations.
  2. When improvements have more than one unit, the drainage outfall shall be shown as extending to the property boundary, and beyond if required, although it may not be constructed with the current unit development. All temporary outfalls shall be shown both in plan and profile on the improvement plans.
- D. Detention and Retention Basins - If detention or retention basins are required for peak flow reduction, the design of the basin must conform to the latest addition of the Placer County Flood Control District's Stormwater Management Manual. The basin layout and design shall minimize its maintenance time and cost. The basin should be designed to allow for the two (2) year storm event flows to bypass the basin. This will be key factor in the approval of the basin's O&M Plan by the Engineering Division.
- E. Access for Maintenance - These facilities may include, but are not limited to bridges, culverts, headwalls, lined and unlined channels/ditches, sand/oil separators, manholes, retention basins and drain inlets. The access way shall be a minimum of 12' wide and include 6" of 3/4" aggregate basis (95% relative

compaction) over 6" of processed, native soil (95% RC). Upon the City Engineer's request, 4" of asphalt concrete shall be added to the section and/or a cul-de-sac with a minimum diameter of 75'. Changes/additions to the plans resulting from the City Engineer's review shall be integrated and included in a subsequent plan check submittal for the Engineering Division's consideration.

### 5-13 PIPE INSTALLATION

All drainage improvements shall conform to the following requirements:

- A. Excavation: Pipeline excavation shall be open-cut trenches, unless otherwise specified on the approved improvement plans. All excavations shall adhere to all applicable Federal and State safety requirements. All work shall be conducted in such a manner as to prevent damage to new and existing facilities or adjoining property.

Wherever the trench bottom is unstable, the area shall be excavated and an adequate amount of 1/2" or 3/4" crushed rock shall be compacted in place to provide a stable base for the pipe. Pipe bedding material, per approved plans, will be placed on top of stabilized trench bottom.

- B. Trench Width: A minimum clearance of 6" shall be maintained between the pipe and the trench wall for reinforced concrete pipe and ductile iron pipe. See Detail TB-2 for trench widths for non-rigid pipe.
- C. Pipe Bedding - Pipes shall be placed on a firm bed of imported granular material conforming to Standard Drawings 5-1 and 5-3. Unless unstable pipe bedding subgrade needs to be removed, pipe bedding shall only be placed on native, undisturbed soil. Prior to placing pipe bedding, the trench bottom shall be free of any loose material.
- D. Laying Pipe: The pipe shall be laid up-stream with the bell end of the pipe placed up-stream. The interior of the pipe shall be kept clean as the work progresses. There shall not be a change in pipe material between storm drain structures.
  - 1. Handling, Laying and Backfill of polyvinyl Chloride (PVC), High Density Polyethylene Pipe (HDPE) and Steel Reinforced High Density Polyethylene Pipe (SRHDPE) – the pipe shall be handled in accordance with the manufacturer's published recommendations. Laying and backfill shall conform to the most current Caltrans Standard Specifications, the manufacturer's recommendations, and ASTM D-2321 Standard Practice, with the following modifications:
    - a. Due to the lightweight characteristic of the pipe, extreme care shall be taken to avoid displacing the pipe during the backfilling operation. Following placement of the pipe on the required bedding and to the required grade, the pipe shall be stabilized in place with ballast. At a

minimum, this shall be accomplished by loading the pipe down slowly and carefully with small piles of embedment material to a minimum of 1' above the pipe on each joint and midway on each length. The pipe shall be kept centered in the trench during this operation. Every precaution shall be taken to avoid flooding the trench prior to placing backfill. The City's Construction Inspector may require dewatering the trench to confirm pipe grade and to retest the integrity of the pipe following trench flooding.

- b. The trench shall be backfilled with embedment material 6" – 12" above the pipe, prior to continuing with the trench backfill.
  - c. Pipe material shall not change between manhole structures or between the last structure and the discharge/inlet opening.
  - d. The pipe run between the last structure and the discharge/inlet opening shall be reinforced concrete. Pipe stub runs from storm drain mains into commercial sites shall also be reinforced concrete.
  - e. No pipe, conduit or any other appurtenance shall be located within any existing or newly constructed storm drainpipe or culvert. Each run of storm drainpipe and culvert shall also be 100% and unobstructed the total length.
- E. Non Rigid (PVC/HDPE/SRHDPE) Pipe Testing: A mandrel test shall be conducted following completion of subgrade processing and compaction for curb gutter and sidewalk and asphalt concrete pavement. Placement of curb, gutter and sidewalk and asphalt concrete pavement (and related aggregate base) shall not occur until the Public Works Inspector has approved the mandrel test. The City's Construction Inspector shall be present through the duration of the mandrel testing.

The allowable deflection (reduction in vertical inside diameter) for all non-rigid pipes shall be seven and a half percent (7.5%) maximum. The deflection shall be tested by pulling a mandrel which is ninety-two and a half percent (92.5%) of the inside pipe diameter through all installed pipe. The mandrel shall be on the "go/no-go" type and shall be pulled per the manufacturer's recommendations without mechanical assistance. Prior to the mandrel test, the pipe shall be thoroughly flushed and cleaned (see Subsection "J" below). Obstacles in the pipe shall be removed. At each location in which the mandrel cannot pass, the cause shall be ascertained. If it is found the deflection exceeds seven and a half percent (7.5%) or that a gasket has been mis-installed or that the pipe has been damaged due to construction activities, then the respective section of pipe shall be repaired and retested. Pipe section repair operations may require rebidding pipe, replacing pipe, or both as needed to properly repair pipe section.

Watertight repair couplings shall be used in repair. A passing mandrel retest is required.

At the Contractor's discretion, any sections of non-rigid pipe not passing the mandrel test may be televised to evaluate the problem.

- F. Pipe Laying Tolerances: The pipes shall be laid true to line and grade with allowed tolerances of 0.03' above or below the design grade and 0.10' left or right of the design alignment.
- G. Trench Backfill: Initial backfill material shall be placed immediately after pipe joints have been completed, inspected and passed by the City's Construction Inspector.

The material shall be carefully placed so as not to disturb or damage the pipe and shall be brought up evenly on both sides. Trench backfill will be placed in accordance with these Construction Standards.

- H. Cast-in-Place Concrete Pipe: Cast-in-place concrete pipe shall conform to provisions in Section 63 of the Caltrans Standard Specifications. Where excavations for other utilities undermine installed cast-in-place pipe, that excavation shall be backfilled to the spring line of the cast-in-place pipe with two-sack slurry per these Standards.
- I. Pavement Cutting and Repaving: When the trench line is in an existing pavement area, the pavement shall be sawed or scored and broken ahead of trenching operations.

The proper tools and equipment shall be used in marking and removal of the pavement such that it is cut accurately to a neat and parallel line on either side of the trench width required, in conformance with the Trench Cut Ordinance. All cuts in Portland cement concrete pavements shall be saw cut with equipment approved by the City's Construction Inspector. See "Trench Backfill" section of these Standards.

- J. Cleaning of Storm Drain System: The storm drain system shall be cleaned to the satisfaction of the City's Construction Inspector upon completion. If flushing is utilized, then the discharge shall not be routed into the existing City system. The downstream manhole shall be plugged and the discharge fluid shall be disposed of in a manner satisfactory to the City's Construction Inspector. Flushing shall comply with requirements of these Standards.

#### **5-14 CHANNEL LINING INSTALLATIONS**

Channel lining installations shall conform to Improvement Standard [4-13](#), [4-14](#) and [4-17](#) and to the following specifications:

- A. Surface Preparation: The surfaces of the areas to be lined shall be evenly graded to the lines and grade and sections as indicated on the approved plans. The surfaces shall be moistened thoroughly to prevent moisture from being drawn from the freshly placed lining.

All surfaces on which lining is to be placed shall be free from water, mud and debris and shall be firm enough to prevent contamination of the fresh lining by earth or other foreign material. Prior to placing any lining, the Contractor shall verify line and grade of the excavated channel.

- B. Reinforcement: Welded wire fabric shall be embedded in the concrete so that it will be a minimum of 1" clear from either face of the concrete, unless otherwise noted.

- C. Joints:

1. Construction Joints: Shall be square and edged with a 1/4" radius-edging tool. The edge shall be thoroughly wetted before the next section of lining is placed. Construction joints shall be constructed whenever the operation is halted for a period exceeding thirty (30) minutes. Welded wire fabric reinforcing shall extend through the construction joint.

2. Deep Tool Joints: Transverse deep tool joints shall be constructed at ten (10) foot intervals. The aggregate shall be separated with the joint tool a minimum of 2" deep. Immediately following application of the deep tool, a 1/4" grooving tool shall be applied to the surface to seal the joint.

- D. Weep Holes: On channels with side lining extending more than 18" vertically above the channel toe, weep holes shall be constructed at intervals of 10', midway between contraction joints on each side of the channel. The weep hole elevation shall be 12" above the adjacent toe of slope.

The holes shall be backed by a minimum of one (1) cubic foot of aggregate material tied in a burlap bag.

The aggregate shall extend at least 6" above and below and to each side of the weep hole and at least 10" into the side slope. The side and back of the burlap sack shall be protected from being coated by mortar or concrete during the lining placing operation.

On the day following the lining placement, each weep hole shall be rodded to assure it has not been blocked. The weep hole shall then be cut to fit the channel slope.

- E. Cutoff Walls: Cutoff walls shall be constructed around the perimeter at each end of the channel lining and at all locations where the new lining meets structures or

existing lining and at all other locations shown on the approved plans. The cutoff walls shall be a minimum of 6" thick and 18" in depth, as measured from the surface of the lining. The welded wire fabric shall be bent down into the cutoff walls.

- F. Geotextile Lining: Geotextile Linings shall follow the manufacturer's recommendations for preparation of soil, seed bedding, blanket orientation, anchoring details and appropriate seed blend and application rates.

**5-15 ABANDONING STORM DRAINS**

In newer construction, storm drain stubs and services to be abandoned shall be either removed to the main or manhole of origin or filled solid with concrete slurry, at the discretion of the City Engineer. Abandonment of existing storm drain stubs shall be removed or left in place as directed by the City's Construction Inspector and/or as shown on the approved plans.

## **SECTION 6**

### **DOMESTIC WATER SUPPLY SYSTEM**

**6-1 INTRODUCTION**

Design of water facilities shall conform to the requirements set forth in the most recent standards of the Placer County Water Agency (PCWA), the National Fire Protection Association (NFPA 24), and the City of Rocklin Fire & Life Safety Standards.

**6-2 WATER SUPPLY QUALITY**

The quality of the water shall conform to the Environmental Protection Agency Drinking Water Regulations.

## **SECTION 7**

### **SANITARY SEWER DESIGN**

Design of sewer facilities shall conform to the requirements set forth in the South Placer Municipal Utility District Standard Specifications and Improvement Standards "Latest Edition".



## **SECTION 8**

### **STREET LIGHTS**

#### **8-1 STREET LIGHTS REQUIRED**

Street lights shall be required for all lots and parcels being developed or constructed upon. In addition, street lights may be required for lots and parcels containing existing structures which are being improved or altered, depending on the nature and extent of the work. Illustrations of street lights generally required are shown on the Standard Drawing 7-2. Street lights shall only be energized after City acceptance of the installation.

#### **8-2 DEVELOPER'S RESPONSIBILITY**

Existing street lights which must be relocated or repositioned as a result of the construction of new streets or driveways into a development shall be the responsibility of the developer.

The Contractor installing the street lighting system shall give the City of Rocklin or its' Inspector, a minimum of twenty-four (24) hours' notice prior to performing any work on the project. All work installed without inspection will be rejected.

#### **8-3 MAINTENANCE DISTRICT ANNEXATION REQUIREMENT**

All developments other than subdivisions which contain street light installations shall complete and submit to the Director an agreement petitioning the City Council to annex the property to the City of Rocklin Street Lighting Maintenance District. The City will provide Annexation Agreement forms, upon request.

#### **8-4 GENERAL PLAN DETAILS**

The plans shall show and identify all street lights to be installed, all existing lights in the immediate vicinity of the project, and all applicable provisions and details specified in these standards. On subdivision plans, the street lights shall be shown on a separate sheet and shall be included in the improvement plans.

#### **8-5 DESIGN STANDARDS**

Street lighting shall be designed in conformance with these standards, the current edition of the City of Rocklin Standard Construction Specifications, Pacific Gas and Electric, and the "American National Standard Practice for Roadway Lighting" of the American Standards Institute, except that the average horizontal maintained foot candles for the various street classifications shall be as shown in the Standard Drawing 7-17.

#### **8-6 STREET LIGHT DESIGN DETAILS**

Design details for street lights are as follows:

- A. Intersections - All intersections shall conform to the Standard Drawing 7-1.

- B. Cul-de-sacs Bulbs - All cul-de-sacs exceeding 130' in length, measured from the street light location at the intersection to the right-of-way line at the end of the cul-de-sac, shall have a street light within the bulb. The location of the street light within the bulb shall conform to the Standard Drawing 7-2.
- C. Pedestrian Lanes - Street Lights shall be placed at both ends of pedestrian lanes.
- D. Spacing - Maximum street light spacing, measured along the street centerline, shall conform to the Standard Drawing 7-1.
- E. Street Light Poles
  - 1. All street lights on thoroughfares, arterials, collector approach to arterials, and commercial/industrial roadways shall be type "A" and shall be Philips Lumec SSM8V-30-1P-BKTX with Arm Bracket MM1A-BKTX-LMS33718D and fixture DMS50-80W48LED4K-R-LE3S-120-BKTX or as approved by the Director.
  - 2. Street lights on all other roadways shall be type "B" and shall be Philips Lumec AM6W-16-BKTX with Arm Bracket MM-1A-BKTX and fixture DMS50-55W48LED4K-R-ACDR-LE3A-120-BKTX or as approved by the Director.
  - 3. The position of the street light poles shall conform to the Standard Drawings 7-1 & 7-2. Streetlight spacing shall be staggered and located at property lines when possible. Street light designs utilizing one side, median or opposite configurations shall be approved by the Director.
  - 4. Street lights shall be numbered according to the City's sequential numbering system. Street Light numbers shall conform to the requirements of Standard Drawings 7- 13 to 7- 16. Contact Public Services Department to request street light numbers.
  - 5. Streetlight pole heights shall conform to the requirements of Standard Drawing 7- 9. Alternate pole heights shall be approved by the Director.
  - 6. Streetlight mast arm lengths shall conform to the requirements of Standard Drawing 7- 10. Alternate mast arm lengths shall be approved by the Director.
  - 7. The concrete footing requirements shall conform to the requirements of Street Light Standard Drawings 7-3 & 7-4.
  - 8. The base leveling requirements shall conform to the requirements of Street Light Standard Drawings 7-12.

- F. Luminaries - The type of street light and the appropriate wattage shall be specified on the plans. The luminaries shall be LED type with internal driver. All luminaries shall conform to the standards outlined in the Construction Specifications.

The light pattern for reach luminaire shall be specified on the plans. The light pattern for each luminaire shall be obtained from the Standard Drawing 7-18.

1. All street light all be designed for 120-volt service unless connecting to an existing system. The maximum allowable line voltage variation shall be  $\pm 5\%$ . Line voltage variation shall be shown on the plans.

Cobra Style Street lights - LED Leotek Model GC1, wattage based on appropriate light calculations or City approved equal.

Post Top Street lights - LED General Electric Salem series or Philips Hadco, Philips Independence or an approved equal.

2. A service pedestal shall be required for all improvements requiring three or more street lights. The service pedestal shall conform to the requirements of Standard Drawings 7-8, 7-8A, 7B and 7-8C. The service pedestal shall open towards the street.

- G. Service - All street light systems shall have underground service provided. Service points shall be provided within a utility easement immediately adjacent to or within the right-of-way and shall be open and easily accessible to the street frontage. Utility (PG&E) point of connection shall be NO MORE THAN 5' from any service pedestal.

- H. Pull boxes

1. Except as noted, a number 3 ½ or number 5 concrete pull box shall meet the provisions of Section 86 of the most recent edition of the California Standard Specifications and Standard Plan. The pull box shall be installed within the concrete cap and installed per Standard Drawings 7-5 and 7-6.
2. Pull boxes shall not be more than 250' apart on long runs. Pull boxes shall not be placed where they will be subject to vehicular traffic or in curb ramps. Exceptions shall require approval of the Director.
3. Except as noted, all pull box covers shall be inscribed with "Street Lighting" and be secured with 3/8" bolts, cap screws, or studs, and nuts which meet the provisions of Section 86 of the most recent edition of the California Standard Specifications and Standard Plans.

## I. Wiring

1. The wiring for the electrolier shall conform to the requirements of Streetlight Standard Drawing 7-20.
2. Except as noted, all wiring methods and equipment construction shall conform to the National Electric Code (N.E.C.) and applicable sections of the most recent edition of the California Standard Specifications.
3. All field connections and splices shall comply with Section 86 of the most recent of the California Standard Specifications and shall be full circle compression connectors with heat-shrink tubing insulation or Method B. Splices shall conform to the most recent edition of the California Standard Plans. Splices will only be permitted in grounded pull boxes or inside the light pole. All splices and terminal lugs shall be soldered by the hot iron, pouring or dipping method. Open flame soldering will not be permitted.
4. Unless authorized otherwise, all wiring shall be THW AWG. Copper only. For wire sizes #8 insulated and larger, wire shall be stranded copper. For wire sizes #10 and smaller, wire shall be solid copper. Unless otherwise specified, all wiring shall be of the following sizes.
  - a. All field wiring shall be #8 minimum.
  - b. Ground wire shall be #8 minimum solid.
  - c. All wire in pole: #10 minimum.
  - d. All wire to be connected to PG&E facilities shall be #  $\emptyset$ 1 minimum.
5. Conductor and wiring schedule shall be shown on the plans.

## J. Photoelectric Control - The photoelectric control shall be a Dark To Light (DTL) D120-1.0-S or an approved equal. All photoelectric controls shall be oriented to the north. For group controlled street lights, the photoelectric control shall be located in the service pedestal. All photoelectric controls shall conform to the following:

1. Photoelectric control must meet or exceed all requirements of ANSI C136.10-1996.
2. Line voltage operating range is 105 to 130 VAC at 60 Hz.
3. Load rating shall be 1,000 Watts tungsten 1800VA ballast.
4. Turn ON shall be  $1.5 \pm 0.3$  foot-candles at 120 VAC.

5. Turn OFF shall be 1.5 times the turn ON.
6. Photocontrol shall have a sealed cadmium sulfide light sensor.
7. Photocontrol shall have instantaneous turn ON and 3 to 5 second turn OFF delay.
8. Cover of photo control shall be constructed of UV resistant material. Impact resistance shall be greater than 1.0 foot-pounds from – 40° C to + 65° C.
9. Control shall be capable of withstanding a drop of 3 feet to a concrete floor without causing damage to the housing or changing the electrical operation.
10. Plug blades shall be brass which plug into an NEMA twist-lock receptacle integral with the luminaire.
11. Surge protection shall be a metal oxide varistor (MOV) of at least 160 joules wired line to neutral.
12. The following shall appear on the base: month and year of manufacture; individual serial numbers; complete model description; operating voltage range; load rating; and provision for marking installation and removal dates. Year of manufacture shall be permanently molded on cover.
13. Contact “chatter” on opening of contacts (turn OFF of Control) shall not exceed 5 milliseconds.

K. Conduit

1. All conduit to be used shall be a minimum of 2” diameter, schedule 40 PVC. Exception shall be one and 1 ½” from pole base to box per Standard Drawings 7-4 and 7-5. Conduit shall have a 2-foot minimum cover from the top of conduit to the finished grade of the sidewalk, parkway, or roadway.
2. Steel conduit shall not be used without the prior approval of the Director. All steel conduit and other metal parts, including bonding bushing, shall be N.E.C. approved parts and shall be continuously bonded and grounded per N.E.C. requirements.
3. All bends and/or offsets shall be made with factory sections using approved couplers per N.E.C. requirements.
4. All empty conduits shall have a #10 green solid copper wire inside and sealed with a duct seal, approved by the Director, on both ends of the conduit.

5. The ends of all conduits installed in a service pedestal shall be sealed with a duct seal approved by the Director. Conduits stubbed for future extension shall be capped.
  6. Prior to placement of conduit, a bed of clean sand, a minimum of 2" thick, shall be placed in the trench. A minimum of a 4" thick layer of clean sand shall be placed over the conduit prior to backfill with additional material.
  7. All interconnect conduits shall have a #10 THW solid conductor, either green or purple in color installed, whether empty for future use, or with a cable installed. All conduits in all pull boxes, services, and controllers, shall be sealed with an approved sealant. All loop detector installations shall be sealed hot melt sealant. Asphaltic emulsion sealant will not be allowed.
  8. All service pedestals shall be installed at the back of the sidewalk per Standard Drawing 7-7.
- L. Prior to installation, the Contractor shall submit to the Inspector one (1) copy of manufacturer's literature, and laboratory technical data for the following items:
1. Streetlight Poles
  2. Luminaires
  3. Mast Arms
  4. Photoelectric control
- M. Telecommunication
1. Telecommunication Conduit - Developer shall install telecommunication conduit within the Public Utility Easement of each street (Public or Private). The conduit shall be of 2" diameter PVC schedule 40 or with continuous #10 Green solid copper wire.
  2. A #5 telecommunication pull box will be supplied and installed for each and every lot and shall conform to the requirements of the most recent edition of the California Standard. One pull box may be installed at a property line to service 2 lots. In the event of a long run, the maximum distance between pull boxes shall not exceed 250', and be installed at a property line, or end of radius. All pull boxes to be installed Per Standard Drawings 7-5 & 7-6.
  3. Spacing - Pull boxes shall be 250' apart.
  4. Pull box covers shall be inscribed with "telecommunication cable" and secured with 3/8" bolt or cap screws.

- N. Sidewalk Replacement - Concrete sidewalk to be installed, or replaced, adjacent to existing curb or sidewalk, shall be performed in the following manner:
1. 3/4" holes will be drilled in the adjacent curb and/or sidewalk at approximately a five degree (5°) down angle with a minimum of two holes for each curb or sidewalk surface.
  2. Spacing shall be a maximum of 6" from the existing concrete surface, and a maximum spacing of 2'.
  3. A #4 rebar, 16" long, will be installed in the hole.
  4. An approved two part epoxy will be provided to secure the rebar into the existing concrete.

## **SECTION 9**

### **GRADING**

#### **9-1 INTRODUCTION**

The City's authority to regulate grading on private property varies depending on the property's location. For properties located within specific plan areas of the City, the authority is provided by the zoning ordinance for the specific plan area. For properties which are not located within a specific plan area, the City's authority for regulating grading is provided by the City's Grading, Erosion and Sediment Control Ordinance and Chapter 33 and 18 of the California Building Code (CBC). The CBC requires that a Grading Permit be obtained from the City prior to beginning any grading work unless the work meets certain exemptions specified in the CBC. This is necessary to ensure that on-site drainage adequately accommodated, off-site drainage is conveyed through the project, the proposed grading is compatible with adjacent property topography and adequate erosion and sedimentation control measures are addressed.

This section specifies design and plan submittal requirements of grading Plans for private developments. It includes items pertinent for the City's review and reflects established professional engineering practice for preparation of Grading Plans. Questions and clarifications regarding this Section should be directed to the Engineering Division.

The City of Rocklin has adopted Stormwater quality design standards to reduce water pollution generated by urban runoff. These design standards are detailed in the Stormwater Quality Design Manual for the Sacramento and South Placer Regions and the City of Rocklin Post Construction/Low Impact Development Manual.

#### **9-2 PLAN SHEET DETAILS**

In addition to the requirements of Section 3, the following items shall be included on grading plans:

- A. Slope symbols for 3:1 slopes or steeper.
- B. Ridge and/or valley delineation.
- C. Typical lot grading details.
- D. Proposed spot and/or pad elevations.
- E. Flow directional arrows (offsite, around perimeter of development when adjacent to developed areas) and perimeter elevations at the property line.
- F. Existing spot elevations and/or contour lines onsite and offsite around perimeter of development. Where the existing terrain is not relatively flat, contour lines shall be mandatory. The spot elevations or contour lines shall be extended



offsite for a minimum distance of 50' (flat terrain-100' minimum) when adjacent to undeveloped areas. Contour lines shall be in maximum increments of 2'.

- G. Existing trees (variety, size and elevation at base of all oak trees 9" diameter or larger).
- H. Retaining wall details (symbols, construction details and limits).
- I. Back of sidewalk elevations.
- J. Storm drainage system.
- K. Typical sections across side yard property lines where the difference in finish pad elevations exceeds 2'. Delineated on the section shall be the side yard drainage swale and the minimum distance between the proposed building and the side yard property line.
- L. Names of adjacent subdivisions.
- M. Offsite intersecting property lines.
- N. Signature block for certification of pad elevations by Consulting Engineer (subdivisions only). Standard Drawing 1-1.
- O. For all export projects:

If export is offsite within Rocklin a separate grading plan showing area and route shall be approved by the Director (or their designee).

Location of spoiled disposal area on or off site within the City of Rocklin shall be as specified below:

1. Spoil slopes to be 3:1 or flatter.
2. Finish spoil heights to be less than 3'.
3. No spoil within 5' of property lines.
4. Spoil shall not block drainage patterns.
5. Spoil shall be levelled prior to acceptance of project.
6. Silt retention and erosion control details as necessary and specified in these Design Standards.

7. Location of temporary protective fencing for environmentally sensitive areas such as: creeks, wetlands, vernal pools, perennial streams and preserve areas.

P. Excavation and embankment earthwork quantities shall be shown on the plans.

### 9-3 **BOUNDARY GRADING**

Special attention shall be given to grading adjacent to the exterior perimeter property line of a development. All adverse effects to offsite properties adjacent to new developments shall be reduced to an absolute minimum. Fills and cuts adjacent to the exterior perimeter property line shall be designed in accordance with the following:

- A. Fills - Fills in excess of 1', shall not be allowed without adequate justification and approval by the Director. All fill material shall achieve 90% relative compaction certified by a registered Geotechnical Engineer.

When fills are unavoidable, they shall conform to the Standard Drawing 2-1 and shall be constructed in the following manner.

1. If possible, fill slopes shall be constructed offsite, with the property line being situated at the top of the fill.
2. A notarized right-of-entry shall be required for all offsite fills. The following note shall be placed on the plans: Right of Entry obtained from (name) on (date). If a right-of-entry cannot be obtained, a retaining wall shall be placed as near to the property line as practicable.
3. In lieu of offsite slopes, retaining walls, 5:1 slopes or flatter, or combinations thereof may be utilized onsite.

- B. Cuts - Cuts shall be constructed in accordance with the Standard Drawing 2-2, except that the slope setback from the property line to the slope hinge point shall be a minimum of 2' for all slopes steeper than 5:1.

- C. Fences - When fences are required, they shall be placed on the property line. The height of a fence shall be measured from the highest ground adjacent to the fence, regardless of the side that is developing.

### 9-4 **INTERIOR GRADING**

Differences in elevations across interior property lines within a development, such that slopes or retaining walls are required, shall conform to the Standard Drawing 2-2 and the following:

- A. Property Lines - Property lines shall be situated at the top of fill and cut slopes. It is desirable that surface flow does not drain onto new slopes steeper than 5:1.

Grading shall be such that surface runoff will not be concentrated at the top of slopes, but will be allowed to sheet flow down the slopes.

Property lines shall be situated at the top sides of retaining walls with a minimum setback of 1' from the property line to the retaining wall.

- B. Slopes - earth slopes allowed shall be 2:1 or flatter (horizontal to vertical). Steeper slopes may be accepted based on Soils Engineer's recommendations. Minimum asphalt concrete surface slopes shall be 1% and minimum cement concrete slopes shall be 0.25%. All proposed slopes shall be shown on the plans by some type of slope symbol delineation.
- C. Interior Grading - Differences in elevations across interior property lines within a development, such that slopes or retaining walls are required, shall conform to the following:
  - 1. Cross lot drainage is not allowed unless specifically approved by the City Engineer for tree preservation. All single-family residential lots shall have Class 1 grading as per the Standard Drawings unless approved otherwise by the City Engineer. When a Class 2 or Class 3 lot grading plan is proposed as part of a tentative map application for a single-family residential subdivision, the tentative grading plan showing rear lot drains shall be supplemented with an alternative plan showing the effect on the subdivision if rear lot drains are not utilized.
  - 2. Retaining Walls shall be required whenever adjacent side lot elevations differ by more than 1 ½'. In such cases, a minimum 3' wide walk path shall be maintained adjacent to all side property lines. Where the Consulting Engineer feels that this path will be maintained without the use of a retaining wall, application for a waiver may be made by preparing and submitting a site plan scale on 8 ½" x 11" reproducible paper for each lot which is requested to be exempted, or by submitting a standard Lot Grading and Setback Guarantee. The Lot Grading and Setback Guarantee shall specify which lots for which a waiver of the retaining wall requirement is requested, shall state the minimum setback of the proposed structure from the toe of slope, and shall state that should the minimum setback not be possible during construction, a retaining wall shall be constructed to the requirements of these Design Standards. Upon approval, a copy of these will be given to the Building Division to utilize in their review. Any deviation to these plans will be subject to the approval of the Engineering Division.
  - 3. Property lines shall be situated a minimum of 1' inside the stop of fill or cut slopes when pad elevations differ by 1/2' or less. When retaining walls are used, the property lines shall be situated on the high side of the retaining wall with a minimum setback of 1.0' from the property line to the retaining wall. Where pad elevations differ by more than 1/2' and waiver of

placement of retaining walls is required per the requirements stated above, property lines shall be situated a minimum of 2.0' inside the stop of fill or cut slopes.

4. The maximum earth slopes allowed shall be 2:1 (horizontal to vertical). Minimum asphalt concrete surface slopes shall be one percent (1%) and minimum concrete cement surface slopes shall be one-quarter percent (0.25%). All proposed slopes that are 3:1 or steeper shall be shown on the plans by some type of slope symbol delineation.
5. Lots on the low side of streets at sag points shall have pad elevations a minimum of 1' above the 100-year water surface elevation assuming failure of all subsurface drainage systems.

#### **9-5 RETAINING WALLS**

Retaining walls, including limits, heights and construction details shall be shown on the development plans. Design calculations signed by the Consulting Engineer and including the registration number shall be required for all walls exceeding 30" in height or when a fence is an integral part of the wall. Any retaining wall greater than 4' from the bottom of the footing to the top of the wall will require a building permit.

Wood retaining walls shall not be allowed adjacent to street rights of way.

All retaining walls on commercial and multifamily developments placed at the property line shall be either concrete or masonry.

Grading shall be such that onsite runoff, other than side slope areas, will not flow over wood retaining walls.

Where pads on adjacent lots are 10' apart and the difference in elevation exceeds 2.5', a retaining wall will be required.

#### **9-6 GRADING AT TREES**

Grading at trees shall be done per the City of Rocklin most current tree preservation ordinance. No person shall conduct any activity within the Protected Zone of a Native Oak tree or Landmark Tree without approval of a Grading Permit issued conformance with the Tree Permit Conditions. Great care must be exercised when work is conducted upon or around Protected Trees. The purpose of this section is to define procedures necessary to protect the health of the Protected Trees. The policies and procedures described in this section apply to all encroachments into the Protected Zone of Protected Trees. All Tree Permits shall be deemed to incorporate the provisions of this section except as the Tree Permit may otherwise specifically provide.

A. General

1. Trenching within the Protected Zone of a Protected Tree when permitted, may only be conducted with hand tools in order to avoid root damage
2. Minor roots less the 1" in diameter may be cut, but damaged roots shall be traced back and cleanly cut behind any split, cracked or damaged trees.
3. Major roots over 1" in diameter may not be cut without approval of an Arborist. Depending upon the type of improvement being proposed, bridging techniques or a new site design may need to be employed to protect the root and the tree.
4. If any Native Ground Surface Fabric within the Protected Zone must be removed for any reason, it must be protected within forty-eight (48) hours.
5. An independent low-flow irrigation system may be used for establishing drought-tolerant plants within the Protected Zone of a Protected Tree. Irrigation shall be gradually reduced and discontinued after two (2) years.
6. Planting Live material under Native Oak Trees is generally discouraged and it will not be permitted within 6' of the trunk of a Native Oak Tree with a DBH of 18" or less, or within 10' of the trunk of a Native Oak Tree with a DBH of more than 18". Only drought-tolerant plants will be permitted within the Protected Zone of Native Oak Trees.
7. A minimum of 4' high protective fence shall be installed at the outermost edge of the Protected Zone of each Protected Tree or group of Protected Trees. The fence shall not be removed until written authorization is received from the Planning Director. Exceptions to this policy may occur in cases where Protected Trees are located on slopes that will not be graded. However, approval must be obtained from the Planning Department to omit fences in any area of the project. The fences must be installed in accordance with the approved fencing plan prior to the commencement of any grading operations or such other time as determined by the approving body. The Developer shall call the Planning Department and Engineering Division for an inspection of the fencing prior to grading operations.

Signs must be installed on the fence in four (4) locations (equidistant) around each individual Protected Tree. The size of each sign must be a minimum of 2' x 2' and must contain the following language:

**WARNING:**

**THIS FENCE SHALL NOT BE REMOVED  
OR RELOCATED WITHOUT WRITTEN  
AUTHORIZATION FROM THE  
PLANNING DEPARTMENT**

8. Once approval has been obtained, the fences must remain in place throughout the entire construction period and may not be removed without obtaining written authorization from the Planning Department.
9. A minimum of \$10,000 deposit, or amount deemed necessary by the approving body, shall be posted and maintained to insure the preservation of Protected Trees during construction. The deposit shall be posted in a form approved by the City Attorney prior to any grading or movement of heavy equipment onto the site or issuance of any permits. Each violation of any Tree Permit condition regarding Tree Preservation shall result in forfeiture of a portion of the deposit, at the discretion of the approving body.
10. In cases where a Tree Permit has been approved for construction of a retaining wall(s) within the Protected Zone of a Protected Tree, the Developer will be required to provide for immediate protection of exposed roots from moisture loss during the time prior to completion of the wall. The retaining wall shall be construction within seventy-two (72) hours after completion of the grading.
11. If required, preservation devices such as aeration systems, Oak Tree wells, drains, special paving and cabling systems must be installed per approved plans and certified by the Developer's Arborist.
12. Every effort should be made to avoid cut and/or fill slopes within or in the vicinity of the Protected Zone of any tree.
13. No grade changes are permitted which cause water to drain to within twice the longest radius of the Protected Zone of any Protected Tree.
14. Certification letters are required for all regulated activity conducted within the Protected Zone of Protected Trees. The Developer's Arborist will be required to submit a certification letter to the Planning Department within five (5) working days of completion of such regulated activity attesting that all of the work was conducted in accordance with the appropriate permits and requirements of this section.
15. The following information must be located and permanently retained in the construction trailer starting at the site planning meeting:
  - a. Arborist's report and all future modifications

- b. Tree location map with a copy of the tree fencing plan
- c. Tree permit and inspection card
- d. Approved Construction Plans
- e. Tree Preservation guidelines
- f. Approved Planting and Irrigation Drawings

B. Tree Permit Construction Phase

1. All work conducted within the Protected Zone of any Protected Tree shall be performed as required by this section and as required in project approval.
2. As a condition of the Tree Permit, the Developer will be required to submit a utility trenching-pathway plan for approval following approval of the project Improvement Plans. The trenching-pathway plan shall depict all of the following systems: storm drains, sewers, easements, water mains, area drains and underground utilities. Except in lot sale subdivisions, the trenching-pathway plan must show all lateral lines serving buildings. To be completely effective, the trenching-pathway plan must include the surveyed locations of all Protected Trees on the project as well as an accurate plotting of the Protected Zone of each Protected Tree.

The trenching-pathway plan should be developed considering the following general guidelines:

- a. The trenching-pathway plan must be developed to avoid going into the Protected Zone of any Protected Tree on its path from the street to the building.
- b. Where it is impossible to avoid encroachment, the design must minimize the extent of such encroachment. Encroachments and mitigation measures must be addressed in supplemental Arborist's reports.
- c. In some cases where utilities conflict with tree roots, the Contractor/Developer may have to bore per Engineer's request to avoid major root damage.

All of the tree preservation measures required by the conditions of the discretionary project approval, the Arborist's report and the Tree Permit, as applicable, shall be completed and certified by the Developer's Arborists prior to issuing an Occupancy Permit.

9-7 **CERTIFYING PAD ELEVATIONS**

Upon completion of the grading and prior to acceptance of the subdivision improvements by the City, the Consulting Engineer shall verify the final pad elevations.

The elevations shall be verified at the center and the corners of each pad. Elevation deviations or more than 0.20' shall be noted on the drawings.

A signature block, certifying that final graded elevations in the field are the same as those shown on the plans, shall be included on the drawings of the subdivision grading plans. The Consulting Engineer shall sign the signature block, certifying to the above, and shall provide one set of reproducible and two sets of record drawing grading plans to the Director. See City Standard Drawing 1-1.

**9-8 ROUGH GRADING PLAN REQUIREMENTS**

Grading Plans for subdivisions and all developments located within Planned Development zones shall conform to the same requirements as those specified for Finished Grading Plans excepting the following:

- A. Improvements - Only existing improvements such as utilities, curbs, gutters, etc. shall be shown. Utilities and streets to be constructed with the Improvement Plans shall not be shown as part of the Rough Grading Plans. Retaining walls can be included in the rough grading plans.
- B. Drainage - All rough plans shall provide for positive surface drainage flow except in those instances provided on the plans for erosion and/or sedimentation control.

**9-9 ROLLING TERRAIN GRADING**

Grading of rolling terrain shall be accomplished in a manner whereby the effect of the rolling terrain is maintained as close to that which exists, to the extent practicable. Every effort shall be made to keep grading of rolling terrain to an absolute minimum.

**9-10 STORMWATER POLLUTION PREVENTION PLAN (SWPPP)**

A site specific SWPPP shall be submitted concurrently with the Improvement and /or Grading Plans when a project disturbs an area more than 1 acre. For information concerning the preparation of a SWPPP, the Project Engineer should refer to the California Stormwater Quality Association (CASQA). "Stormwater BMP Handbook / Construction", and the State of California NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities.

The SWPPP shall match identically to that of the SWPPP submitted to the State Water Resources Control Board via their electronic SMART system, up until the time improvement plans are approved, encroachment and/or grading permits are issued, and construction commences.

SWPPPs are not required for projects under one acre, unless they are part of a larger development encompassing over one acre. For projects less than one-acre, an erosion and sediment control plan shall be submitted with the improvement plans to the City for approval. This is generally part of the Grading Plan for the development. The Engineering Division will accept the erosion and sediment control plan upon review of



the project. All erosion and sediment control devices shall be identified and implemented in the same fashion as projects with SWPPPs over one acre. Enforcement will be conducted similarly, with exception to SWPPP administrative requirements.

A. Criteria - The purpose of the SWPPP is to ensure protection of the following:

1. Water Quality - Measures shall be provided to prevent siltation of streams, rivers, etc.; avert in stream degradation due to turbidity and pollutant load; and prevent toxic materials from leaving construction sites.
2. Collection System - Methods shall be provided to prevent sediment from entering the storm drainage system.
3. Adjacent Properties - Methods shall be employed to prevent any damage to adjacent properties.

B. SWPPP Site Plan Requirements - SWPPP site plan(s) shall be submitted along with other SWPPP State permit required documents.

The discharger shall ensure that the SWPPP for the project site is developed and amended or revised by a Qualified SWPPP Developer (QSD). The SWPPP shall be designed to address the following:

1. All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled;
2. Where not otherwise required to be under Regional Water Board permit, all non-stormwater discharges are identified and either eliminated, controlled, or treated;
3. Site BMP's are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from construction activity to the BAT/BCT standard;
4. Calculations and design details as well as BMP controls for site run-on are complete and correct, and
5. Stabilization BMP's installed to reduce or eliminate pollutants after construction are completed.
6. Phasing of Erosion Control Measures - The Engineering Division may require phasing of the SWPPP plan(s) to ensure that all necessary erosion control measures are taken during separate phases of construction. As an example, this may require the Developer to construct sediment traps and basins during the first phase of grading operation.

7. To demonstrate compliance with requirements of the SWPPP, the QSD shall include information in the SWPPP that supports the rationale used in selecting BMP's including supporting soil loss calculations, if necessary, conclusions, selections, use, and maintenance of BMP's
  8. The discharger shall make the SWPPP available at the construction site during working hours while construction is occurring and shall be made available upon request by State or City inspectors. When the original SWPPP is retained by a crew member in a construction vehicle and is not currently at the construction site, current copies of the BMP's and map/drawing will be left with the field crew and the original SWPPP shall be made available via request by radio/telephone.
- C. SWPPP Control Measures Requirements - The following is a list of requirements for erosion and sediment control measures, also referred to as BMPs (Best Management Practices). The following erosion and sediment control requirements shall be part of site specific SWPPP.
1. All sediment control measures (drain inlet protection, perimeter protection, stabilized construction access, etc.) shall be implemented prior to the commencement of grading operations or other construction activities or as approved by the City Engineer. Grading during the wet season should be minimized.
  2. An adequate supply of erosion and sediment control materials (fiber rolls, blankets, mats, straw bales, silt fencing, etc.) shall be stored onsite throughout the course of construction and made available for maintenance and repair work.
  3. Straw, when used, shall be broadcasted, or hand distributed, at a rate of 4000 pounds per acre. Straw shall be anchored to soil surface by "punching", "pressing", or by tacking down using a tackifier.
  4. Slopes steeper than 4:1 and adjacent to the City right-of-way, flood plains, natural drainages, park land or designated open space shall be broadcast seeded and covered with a blanket material grade appropriate to the steepness and length of the slope. Alternative methods shall be approved by the Engineering Division.
  5. All areas of disturbed soil, regardless of slope, shall be protected for erosion control. For measures approved by the City for erosion control, see the California Stormwater Quality Association (CASQA) "Stormwater BMP Handbook/Construction" and the State of California NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities.

6. Where required, broadcast seed shall be applied as follows:

Blando Brome                      12lbs/acre  
 Rose Clover                        9lbs/acre

Areas with sandy, dry soil shall be:

Zorro Annual Fescue                2lbs/acre  
 Rose Clover                        9 lbs/acre

16-20-0 fertilizer or equivalent shall be applied at the rate of 500 pounds per acre. If hydro-seeding/mulching is used, seed quantities shall be increased by 30 percent.

For areas adjacent to City designated open space, perennial streams, creeks, or environmentally sensitive areas, native seeds shall be used. Approved seed blends are listed below. Seed blends and proposed alternate seed blends shall be Submitted to the stormwater or construction inspector for approval prior to application.

**Dry Mix**

<b>Botanical Name (Common Name)</b>	<b>Ecotype/Origin</b>	<b>Approximate Live Seeds/Bulk Lb.</b>	<b>Approximate Live Seeds/Sq. Foot</b>	<b>Bulk Lb./Acre</b>
Nassella pulchra (purple needlegrass)	Yolo County: Stone Ranch	50,000	14.9	13.00
Nassella cernua (nodding needlegrass)	Tehama County: Inks Creek	115,000	15.8	6.00
Bromus carinatus (California brome)	Amador County: Sierra Nevada	47,000	5.4	5.00
Poa secunda (one sided bluegrass)	Yolo County: Fiske Creek	500,000	11.5	1.00
Vulpia microstachys (three weeks fescue)	Yolo County: Fiske Creek	350,000	16.1	2.00
Melica californica (California melic)	Yolo County: Fiske Creek	240,000	16.5	3.00
		<b>TOTAL:</b>	<b>63.7</b>	<b>30.0</b>

### Swale/Wet Mix

Botanical Name (Common Name)	Ecotype/Orgin	Approximate Live Seeds/Bulk Lb.	Approximate Live Seeds/Sq. Foot	Bulk Lb./Acre
Nassella pulchra (purple needlegrass)	Yolo County: Stone Ranch	50,000	9.2	8.00
Bromus carinatus (California brome)	Amador County: Sierra Nevada	47,000	5.4	5.00
Vulpia microstachys (three weeks fescue)	Yolo County: Fiske Creek	350,000	8.0	1.00
Elymu glaucus (blue wildrye)	Butte County: Llano Seco Ranch	120,000	11.0	4.00
Leymus triticoides (creeping wildrye)	Yolo County: Yolo Bypass	125,000	11.5	4.00
Hordeum brachyantherum (meadow barley)	Yolo County: Yolo Bypass	75,000	6.9	4.00
Elymus trachycaulus (slender wheatgrass)	Yolo County: Willow Slough	69,000	6.3	4.00
		TOTAL:	52.0	30.0

These are broadcast seeding rates. To get the hydro seeding rate, multiply the rates by 1.5 to get 45/lbs. per acre.

7. No grading or trenching, except as required for erosion or sediment control, shall occur within 35 feet from the edge of perennial streams, creeks, or environmentally sensitive areas between October 1 and April 30 unless approved by the Engineering Division.
8. All erosion and sediment control measures shall be checked prior to, and following all storms to ensure that all measures are functioning properly.
9. Sediment and trash accumulated on-site, in drainages, or detention basins shall be removed and properly discarded as soon as possible.
10. Construction activities throughout the year shall have erosion and sediment control measures in place or capable of being placed within 24 hours. The Contractor shall ensure that the construction site is prepared prior to the onset of any storm. Per the States General Construction Permit, a Rain Event Action Plan (REAP) shall be reviewed and completed by a qualified SWPPP practitioner (QSP) 48 hours prior to a rain event.
11. The Contractor shall establish a specific site within the development for maintenance and storage of equipment or any other activity that may adversely contribute to the water quality of the runoff. This area shall include secondary containment measures such as, but not limited to weather protected bins, awnings, tubs for liquid pollutant containers, and spill kits, etc. This area shall be managed to prevent spills and stormwater

from coming into contact with pollutants, and shall be restored to an acceptable condition upon completion of project.

12. Hydro-seeding and hydro-mulching may be considered as an alternative to broadcast straw subject to the Engineering Division's approval based on a review of the existing site conditions (location, slopes, proximity to streams) and time of year.
13. SWPPP shall define erosion and sediment control measure objectives, and clearly identify control measure selections.

## **SECTION 10**

### **SOUND BARRIER DESIGN**

#### **10-1 LOCATION REQUIREMENTS**

When project is conditioned sound barriers may be required along the rear and side property lines of developments adjacent to freeways, major highways and other ground level noise elements in order to achieve the noise control objectives of the City of Rocklin Noise Element and Noise Ordinance.

#### **10-2 SOUND STUDY**

When it appears to the Director that a sound barrier may be necessary or when a sound barrier is a condition of development, a sound study prepared by an Acoustical Consultant shall be submitted to the Department of Community Development before the improvement plans will be approved by the City Engineer. The sound study shall include a recommended height, material and termination limits for the sound barrier including all backup material leading to the recommendations.

#### **10-3 DESIGN**

The sound barrier shall be designed to attenuate to acceptable noise levels at the affected property line consistent with the Noise Element of the Rocklin General Plan.

#### **10-4 PLAN REQUIREMENTS**

All construction details for sound barriers, including the locations and limits, shall be shown on the site improvement plans.

#### **10-5 DESIGN REQUIREMENTS**

Sound barriers shall be designed in accordance with landscaping requirements for the area in which the project is located. Walls shall be designed for a minimum longevity of 50 years. Walls shall have a minimum height of 6' measured from the highest adjacent pad elevation. Footings shall be designed for a height of wall 18" higher than the constructed wall. All sound walls shall be designed for 75 MPH wind loads at exposure Level C. Structural calculations shall be provided to the City Engineer for all proposed sound walls. All construction details for sound barriers, including locations and limits, shall be shown on the Improvement Plans.

Anti-graffiti coating shall be applied to the City side of the sound wall. Coating shall be as specified in the Caltrans Standards Specifications 2010, Section 59-8, Anti-Graffiti Coating.

## **SECTION 11**

### **BIKEWAYS**

#### **11-1 GENERAL**

The City of Rocklin bikeway standards are designed to insure that transportation and recreational bikeways are constructed in a manner that would provide a safe and comfortable use by both bicycles and pedestrians. Bikeways shall be designed to enhance safety and reduce maintenance.

#### **11-2 DESIGN CRITERIA**

All bikeway design conform to the latest editions of the following documents:

- The American Association of State Highway and Transportation Officials “Guide for the Development of Bicycle Facilities”
- The State of California Department of Transportation (Caltrans) Highway Design Manual Chapter 1000, “Bikeway Planning and Design”
- The most recent version of the California Manual on Uniform Traffic Control Devices (California MUTCD) for Streets and Highways (FHWA’s MUTCD), as amended for use in California.
- These Standards and any applicable Specific Plan guidelines which pertain to various areas of the City. Specific Plan Guidelines are available from the Planning Department.

All Bikeway improvement plans shall be prepared per “Plan Sheet Requirements” of these Standards and shall be drawn at a scale no smaller than 1” = 40’. The plans shall show all existing and proposed grades, sidewalks, landscaping, fences, guardrails, utilities, street lights, traffic signs and any other structure which may be impacted by revisions to grading.

#### **11-3 PLAN ACCEPTANCE**

Prior to construction of any bikeway related improvements, a complete set of bikeway improvement plans must be accepted by the Engineering Division. See “[General Requirements](#)” of these Standards for submittal requirements of bikeway improvement plans.

#### **11-4 CLASS I BIKEWAYS (Bike Paths)**

Class I bike paths are facilities located in separate right-of-way, for the exclusive use of bicycles and pedestrians with minimal cross flow by motor vehicles. Sidewalks are not considered Class I facilities. Sidewalks, including Class IA Sidewalks, Bikeways, are not subject to this Standard. See “Streets” of these Standards for design requirement of sidewalks and pedestrian walks.

- A. Width - The minimum paved width for a two-way bike path shall be 10'. The minimum width of a one-way bike path shall be 5'. In each case, a minimum of 2' wide graded shoulders shall be provided adjacent to the pavement. One shoulder shall consist of Class 2 Aggregate Base material and one shoulder shall consist of decomposed granite. Where profile grades are 4% or more, the decomposed granite may be stabilized with lime/fly ash or cement treatment. Otherwise, Class 2 Aggregate Base material may be considered for both shoulders.
  
- B. Clearance to Obstructions - A minimum of 3' of horizontal clearance to obstructions, including post and cable fencing, retaining walls, buildings and other permanent improvements, shall be provided adjacent to the pavement where the downgrades are less than 4% and a minimum of 5' from the edge of pavement where downgrades exceed 4%. If a bike path is paved contiguous with a continuous fixed object, such as a block wall, a 4" white edge line, 2' from the fixed object, is required.

Manhole covers shall be located within the bike path's shoulder area, with preference given to the Class 2 Aggregate Base shoulder. The Class 2 Aggregate Base or decomposed granite material shall be extended 1' beyond the rim of the manhole cover.

In conditions where the bike path is located adjacent to creeks, ditches or downslopes greater than 3' horizontal to 1' vertical, a minimum shoulder with of 5' from the edge of pavement to the top of the slope is required.

The clear width on structures between railings shall be not less than 12' with a preferred width of 14'.

The vertical clearance to obstructions across the clear width of the bike path shall be a minimum of 12' when Fire Department access is required, otherwise 9', including bike paths placed beneath bridge structures. The minimum elevation of the path shall coincide with the two (2) year water surface elevation.

- C. Signing and Delineation - For applications and placements of signs and markings, see the California Manual on Uniform Traffic Control Devices (California MUTCD) for Streets and Highways

Guide signs to roadways, parks, and other points of interest shall be provided at trail junctions and as determined by the City Engineer.

All stripes and pavement markings for Class I bike paths shall be constructed with the paint per Section 84-3 of the CalTrans Standard Specifications.

- D. Intersections with Roadways - Bicycle path intersections and approaches should be on relatively flat grades. Stopping sight distances at intersections shall be met



for vehicle traffic per “Design Site Distances” of these Standards and adequate warning should be given to permit bicyclists to stop before reaching the intersection, especially on downgrades. Curb ramps shall be installed with the same widths as the bicycle path.

Where applicable, three (3) barrier post/bollards shall be placed on the bike path where it intersects with roadways. One (1) shall be placed in the center of the bike path and be of a lockable, folding/collapsible design. Two (2) permanent post/bollards shall be placed on either side of the bike path, one (1) within each shoulder. Striping around the bollards shall be in accordance with the California MUTCD.

When crossing an arterial roadway, the crossing should either occur at the pedestrian crossing or at a location completely out of the influence of any intersection to permit adequate opportunity for bicyclists to see turning vehicles.

Mid-block crossing shall be considered on a case-by-case basis by the City Engineer. In these instances, right-of-way should be assigned by devices such as stop signs or traffic signals which can be activated by bicyclists. Grade separations shall also be considered at the discretion of the City Engineer.

- E. Separation Between Bike Paths and Roadways - Bike Paths immediately adjacent to roadways and within medians are not recommended. Bike paths closer than 5’ from back of curb shall include a physical barrier to prevent bicyclist from encroaching onto the roadway. Suitable barriers could include dense shrubs or other materials approved by the Development Services, Planning and Parks and Recreation Departments.
- F. Design Speed - The minimum design speed for bike paths is 20 mph. When a downgrade excess 4%, the minimum design speed for the section of bike path is 30 mph.
- G. Grades - The maximum grade rate recommended for bike paths is 5%. However, steeper grades can be allowed for short segments.

When using grades steeper than 5%, the following grade restrictions and grade lengths are required:

5-6%	for up to 800’
7%	for up to 400’
8%	for up to 200’

The bike path segment immediately following a positive grade of 8% is required to have a maximum grade of 5%. All bike path segments with grades steeper than 5% shall be posed with the appropriate warning signs.

Any bike path segments designed with a grade greater than 8% will require approval by the City Engineer and Parks and Recreation Director.

- H. Horizontal Alignment and Superelevation - A 2% cross slope is required on tangent sections. Bike paths superelevations rates may vary from a minimum of 2% to ensure drainage to a maximum of 5%.

The minimum distance for a transition from a 2% cross slope is 75' per 1% change in superelevation.

The minimum radius of curvature can be derived from Figure 1003.1C of the Cal Trans Highway Design Manual. The minimum radius with any given combination of design speed, rate of superelevation and friction factor shall not be less 30'. The minimum radius of curvature may be increased to 45' if the bikeway will also serve to function as a utility maintenance access.

- I. Stopping Sign Distance - The minimum stopping sign distances for various design speeds and grades can be determined from Figure 1003.1D of the Cal Trans Highway Design Manual. For two-way bike paths, the descending direction grade and design speed will control the design.
- J. Lateral Clearance on Horizontal Curves - The minimum clearances to line-of-site obstructions for horizontal curves can be determined from Figure 1003.1F of the Cal Trans Highway Design Manual.

Bicyclists frequently ride abreast of each other on bicycle paths and on narrow bicycle paths, bicyclists have a tendency to ride near the middle of the path. For these reasons, and because of the serious consequences of head-on bicycle accidents, lateral clearances on horizontal curves should be calculated based on the sum of the stopping sight distances for bicyclists traveling in opposite directions around the curve. Where this is not possible or feasible, consideration should be given to widening the path through the curve, installing a solid yellow centerline, installing a curve warning sign, or combination of these alternatives.

- K. Vertical Curves - The minimum allowable vertical (sag or crest) curve length at the intersection of two grades shall be 50'; however, vertical curves may need to be omitted where the algebraic difference in grades does not exceed 2.0%. The minimum lengths of crest vertical curves can be determined from Figure 1003.1E of the Cal Trans Highway Design Manual. When vertical curves are required, they shall provide for adequate sight distance based on the minimum design speeds specified in these Standards.
- L. Structural Section - Bike path structural section shall be a minimum of 2" of Type A asphalt concrete on 4" of Class 2 Aggregate Base. In those cases where Class 1 bikeways will be accessed by maintenance and/or emergency response vehicles, the bikeway shall be capable of supporting a minimum gross vehicular weight of

thirty thousand (30,000) pounds. Based on an assumed Traffic Index equal to 4.0 for Class 1 bikeways, the table below identifies the appropriate structural sections to support a gross vehicular weight of 30,000 pounds:

<b>R-value Range</b>	<b>Bikeway Structural Section</b>
25<	2" AC/8" AB
25-40	2" AC/6" AB
>40	2" AC/4" AB

If soils analysis along the bike path identifies an R-value less than ten (10), the structural section shall be modified as necessary, by the recommendation of a geotechnical Engineer, to support thirty thousand (30,000) pounds and meet the Traffic Index Requirement 4.0. Soils tests shall be taken every 1,000' along the bike trail alignment or as directed by the City Engineer.

- M. Drainage - Bike paths constructed within cut-slopes shall have a drainage ditch of suitable dimensions along the uphill side to intercept the hillside drainage. Where necessary, drain inlets and drain pipes or other acceptable conveyance systems shall be provided to carry intercepted water across the bike path. Bike paths constructed on top of fill slopes shall have drainage ditches of suitable dimensions along the downhill side to intercept the trail's drainage. When necessary, drain inlets and drain pipes or other acceptable conveyance systems shall be provided to carry the intercepted water over the fill slope as to control erosion of the slope.
- N. Access Points - Access points with a width of 20' shall be placed in minimum intervals of 750' and the cable must be coated with yellow plastic to designate access. A Parks and Recreation Department padlock must be placed on both ends of access.
- O. Temporary Bike Path Closures - Should a bike path need to be closed temporarily, at a minimum, the following measures shall be taken: Signage warning users of the trail shall be provided on each side of closure; safety cones and orange safety fencing shall be provided as appropriate. Other measures may be taken as determined by the Public Works Department.
- P. Bike Bridges - Bridge design shall conform to the requirements for pedestrian and bicycle bridges within the latest edition of the California Department of Transportation (Cal Trans) Bridge Design Specifications.

The minimum width of a bike path bridge is 12' with a minimum vertical clearance of 12' when Fire Department access is required, otherwise, 10'. A straight-line approach of 35' is required on each side of the bridge.

All bicycle bridges shall be designed for a fire access use and maintenance vehicles, capable of supporting a minimum gross vehicular weight of thirty thousand (30,000) pounds. All bicycle bridges shall have the maximum gross vehicular weight rating posted on each approach.

Bicycle bridges may be designed to support a gross vehicle weight of less than thirty thousand (30,000) pounds but shall include maintenance vehicle traffic loading with the approval of the Fire Department and City Engineer. In cases where the bike trail is not required for fire access use and bridge loading is less than thirty thousand (30,000) pounds, the bike trail shall be designed to accommodate a fire vehicle turn-around area on each side of the bridge and/or provisions for alternative access.

- Q. Lighting - Lighting is not required along bike trails. However, lighting may be required through underpasses, tunnels, roadway intersections, mid-block crossings and whenever security could be a problem and at the City's discretion.

Depending on the location, average maintained horizontal illumination levels within underpasses and tunnels of 50' candles should be considered. Where special security problems exist, higher illumination levels may be considered. All lighting shall be designed with appropriate shielding to prevent unnecessary glare and resistant to vandalism.

Light standards should meet the recommended horizontal and vertical clearances as specified within these Standards. Luminaries and standards should be at a scale appropriate for a pedestrian on the bicycle path.

#### **11-5 BIKE PATHS IN FLOODPLAINS**

When a bike path is to be located in the City's Floodplain, the path shall be designed to be no more than 1' below the ten year storm event water surface elevation (10-WSE). Exceptions to this requirement may be allowed where the path goes under existing bridges to accommodate minimum vertical clearance. At these crossings, the path shall have an elevation at least as high as the two year storm event water surface elevation (2-WSE). All segments of the path that are below the 10-WSE shall be Portland Cement Concrete, or other approved material, with toe portion to prevent the path from being undermined during flood events. All segments of the path that are more than forty-five (45) degrees to the directional flow of the water shall be Portland Cement Concrete, or other approved material, and shall have armored embankments with toe protection to prevent the path from being undermined during flood events.

#### **11-6 BIKE BRIDGES IN FLOODPLAINS**

When a bike or pedestrian bridge is to be placed in the City's Floodplain, the minimum elevation of the bridge deck shall be at or above the 10-WSE. Bridge railings shall be designed to sustain the 100-year flood event without damage and without human intervention. Hydraulic and structural calculations shall be based on the assumption

that the bridge (with railings) is solid, not assuming that water will pass through the rails.

Bridge railings shall be a minimum of 54" high and shall have a toe board at the base of the guardrail.

All material used on the bridge shall be water resistant.

A letter of map revision (LOMR) may need to be submitted to FEMA for approval, as determined by the Department of Public Services.

Approach ramps to the bridge shall be armored to allow for cross flow around the bridge without damage to path. Where feasible, the approaches to the bridge shall contain a dip in the profile (lower than the bridge) to facilitate the water to flow around the bridge instead of directly over it. All portions of the path that are more than forty-five (45) degrees to the flow path shall be Portland Cement Concrete, or other approved material and shall have armored embankments with toe protections to prevent the path from being undermined during flood events.

**11-7 CLASS IA SIDEWALK BIKEWAYS**

Class IA sidewalk bikeways are typically located along major streets and separated from the normal vehicle lanes. They are primarily sidewalks, paseos, etc., that are wider than normal to accommodate both pedestrians and bicycles.

The design of Class IA sidewalk bikeways shall follow the design standards for pedestrian walk construction located within these Standards. The location and width of Class IA sidewalk bikeways shall follow the applicable Specific Plan guidelines which pertain to various areas of the City. Specific Plan Guidelines are available from the Planning Department.

**11-8 CLASS II BIKEWAYS**

Class II bikeways (bike lanes) shall be provided within all collectors and arterial roadways as shown per the cross sections for various roadways within these Design Standards

- A. Signing and Pavement Markings - Details for signage and pavement markings for Class II bikeways are found in the California MUTCD and within the Standard Drawings for streets within these Design Standards.
- B. At-Grade Intersection Design - Details for design of Class II bikeways at intersections are found within the Standard Drawings of these Design Standards.

Bicycle-sensitive detectors, signs and pavement markings for traffic signal actuation shall be included within the traffic sign design for all intersections requiring traffic signals and at the discretion of the City Engineer per Sections 4D.104 & 105 of the California MUTCD.

**11-9** **CLASS III BIKEWAYS**

Class III bikeways are on-street routes designed by signs or permanent markings per the California MUTCD and are shared by motorists. The locations of Class III bikeway routes shall follow the Bicycle Master Plan and applicable Specific Plan guidelines which pertain to various areas of the City. Specific Plan Design Guidelines are available from the Planning Department.

## SECTION 12

### **SURVEY MONUMENTS**

#### **12-1** SURVEY MONUMENTS, SUBDIVISIONS

Materials and workmanship shall conform to the requirements of the California Land Surveyors' Act and local standards and regulations. The Consulting Engineer shall place survey monuments at the following locations within their improvements:

- A. At the intersections of all street centerlines.
- B. At the beginning and end of all curves on the street centerlines.
- C. At all subdivision boundary corners designated by the Director (or their designee); at the intersections of subdivision boundaries with street centerlines; and such other locations so as to enable any lot or portion of the improvement to be retraced or located at the center of all cul-de-sacs and elbow points.
- D. The above described monuments shall be as follows:
  - 1. Section and quarter section corners shall be not less than “ inside diameter galvanized iron pipe 30” long. The pipe is to be capped and marked in accordance with the instructions in Chapter 4 of the 1973 Manual of Instructions prepared by the Bureau of Land Management.
  - 2. Subdivision boundary monuments, except those in street pavement, shall be not less than 1 ¼” galvanized iron pipe, 30” in length, capped and tagged.
  - 3. Subdivision boundary monuments in street pavement shall be not less than ¾” galvanized iron pipe, 18” in length (tagged or stamped). Top of pipe shall be driven flush with the surface pavement.
  - 4. All survey points described in [Section 11-1](#) A and [11-1](#) B shall be marked with a ¾” iron pipe 18” in length (tagged or stamped); or a railroad spike (stamped) by the Engineer or Surveyor. The pipe or spike shall be driven flush with the finished surface of the pavement.

However, in addition to the above, each Subdivision shall have not less than two centerline points, marked by box monuments and in Subdivisions exceeding 3,000’ of centerline, inter-visible box monuments shall be set at a ratio of two inter-visible monuments per 3000’ of centerline.

Box monuments shall be as shown in the Standard Drawing 3-34.

- 5. All centerline monuments shall be referenced to permanent objects located nearby and all ties shall be furnished to the City Engineer for general public

use. Final approval of the subdivision will not be made until such ties have been furnished to the City Engineer.

- E. Found monuments which are used to establish lines of the property being surveyed shall be rehabilitated to city standards when found in a perishable condition. In any case, such monuments if unmarked shall be marked with the user's registration number.
- F. Survey monuments shall be placed by the Consulting Engineer at all section corners, quarter corners, and centers of sections within the improvements and offsite, due to deed dependency, as required by the City Engineer.
- G. The Consulting Engineer shall place a note on all construction plans stating that:
  - 1. The Contractor is responsible for the protection of all existing monuments and other survey markers.
  - 2. That no final acceptance of the construction shall be issued until the survey monuments are in place and the centerline monument ties are furnished to the City Engineer's office.



## **SECTION 13**

### **LANDSCAPING**

#### **13-1 GENERAL**

The following Design Standards must be considered during the design of projects and incorporated into the plans and specifications where applicable. Projects must also be in accordance with the Standard Specifications for Public Works construction. Whenever special requirements conflict on any subject matter, the Director shall determine which special requirement will govern.

#### **13-2 GRADING AND DRAINAGE**

- A. Parkway drainage and common area drainage will not be allowed to drain onto private property. Design must incorporate provisions to minimize drainage over sidewalks and prevent ponding in parkways. No concentrated flow shall be allowed over curbs, sidewalks, and property lines.
- B. Subsurface drains shall connect into storm drain system. A secondary drainage path must be provided where grate inlet-type basins are used for drainage. Grate inlet type basin shall not be used where leaves or other debris may clog the grates. Steel drain lines shall not be used.
- C. Turf areas shall have a minimum slope of 2% and a maximum slope of 20%.

#### **13-3 EROSION CONTROL**

Cut slopes 2:1 and steeper, 5' or more in height and fill slopes 2:1 and steeper, 3 ft or more in height, shall require special design provisions be made to control erosion and runoff.

#### **13-4 SIDEWALKS**

- A. Sidewalks shall be constructed with a 4' minimum width if parkway is between curb and sidewalk, a 5' minimum width when adjacent to curbs, and a 6' minimum width if cars are to overhang the walks when parked.
- B. Sidewalks adjacent to the curb shall have a cross slope of 1/4" per foot one to two percent (1 - 2%), not to exceed two percent (2%). It will be necessary to provide grades and alignments on concrete sidewalks within the parkway in accordance with the design features desired.
- C. Public sidewalks shall be constructed as per City Standards. Private sidewalks shall be constructed as recommended in the approved soils report.
- D. Special paving shall not be allowed in streets, sidewalks, or intersections without prior approval of the Director.

- E. Sidewalk ramps shall be provided as required at street intersections and at other locations where sidewalks terminate at full height curbs, and shall comply with the most recent version of the Caltrans Standard Plans, the California Building Code, and Standard Drawings 3-12 and 3-13.

**13-5 VEHICULAR SIGHT REQUIREMENT**

If the project includes intersections or driveways onto public streets, the plan shall show the intersection, driveway and approaches, noting vehicular sight distance as required by the Standard Drawings.

**13-6 MEDIANS AND PARKWAYS**

- A. Turf areas of parkways and medians shall be 6' wide, minimum. Shrub or groundcover areas shall be 4' wide, minimum.
- B. A 12" wide concrete mowstrip shall be required adjacent to curbs within all turfed landscaped medians. An 8" concrete mowstrip shall be required along walls and fences adjacent to turf areas. A 6" concrete mowstrip shall be required between turf and groundcover areas.
- C. Medians shall have a cross slope of 2% for both turf and groundcover areas unless the median is specifically designed for a special landscape treatment.

**13-7 IRRIGATION**

- A. All irrigation systems shall be designed to minimize vandalism (with special consideration in parks).
- B. Water velocity in system shall not exceed 5' per second.
- C. All irrigation systems shall have the design capability of delivering 1 ½" of water in a 5 day period. Watering time shall be between the hours of 10:00 P.M. and 6:00 A.M. unless subsurface irrigation is used.
- D. City maintained irrigation systems shall be designed to connect to the Central Computer Controller by a non-dedicated phone line and shall include moisture sensing, flow sensing capabilities, and the ability to operate Controller thru use of remote control (hand operated).
- E. Irrigation systems shall be designed to apply water at a rate which does not exceed the infiltration rate of the soil, and systems shall be programmable to prevent ponding and minimize runoff.
- F. Irrigation systems shall be designed to meet the peak moisture demand of all plant materials used within the design area. Individual station run time shall meet peak evapotranspiration (E.T.) rate. Separate remote control valves shall be used for shrub and groundcover areas versus turf, with sun and shaded areas also segregated.

- G. On all slopes or mounded areas requiring irrigation, lateral lines shall be installed parallel with contours. Provide separate remote control valves for sprinkler lines operating systems at the top, toe, and intermediate areas of slopes.
- H. Irrigation system shall be designed and operated to eliminate fogging and minimize overspray and discharge onto non-landscaped areas.
- I. The following specific constraints shall be adhered to during the design and any subsequent modification of irrigation systems using reclaimed water:
  - 1. Cross connections between potable water systems and other water systems are not permitted.
  - 2. Hose bibs are not permitted on irrigation systems using reclaimed water.
  - 3. Drinking fountains must be protected from the direct spray of reclaimed water by either proper placement of the drinking fountain or use of a covered fountain approved for this use.
- J. Irrigation systems shall be designed to provide uniform coverage throughout each system.
- K. All sprinkler heads shall be pop-up type.
- L. Sprinkler Heads:
  - 1. All sprinkler heads shall be spaced to not exceed 50% of the spray diameter (head to head coverage).
  - 2. In large turf areas and any area exposed to consistent winds, sprinkler heads shall be spaced to not exceed 45% of the spray diameter.
  - 3. No overhead spray unless approved in medians and parkways. Medians and parkways shall be drip irrigation for shrubs and groundcover, trees shall have bubbler heads. Sprinkler head spacing in medians and parkways shall not exceed the width of the landscape area.
  - 4. Large turf sprinklers with different patterns or different precipitation rates shall be operated by separate remote control valves.
  - 5. Use of sprinkler heads with a built-in check valve to reduce sprinkler head drainage.
- M. System design pressure shall not be greater than lowest available pressure during the previous 2 year period per PCWA records.

- N. Master valves, flow sensors, pressure regulating valve, and basket strainer equipment shall be required on all irrigation systems unless (domestic water and reclaimed water) otherwise approved by the Director. The strainer shall be located immediately downstream of the water meter.
- O. Gate valves shall be provided to allow shutting down various sections of the system independent of the entire system, and on the supply side of a line beneath a street.
- P. Backflow Prevention:
  - 1. All backflow prevention devices shall comply with requirements of Title 17 of the California Administrative Code, Placer County Health Department, PCWA, and City of Rocklin. Reduced pressure type backflow preventers are required for irrigation systems using domestic water. Shut-off valves shall be ball valves. The City recommends using Wilkins, Model 975XL2., or City approved equivalent
  - 2. System design shall prevent any back siphonage after system valves are closed.
  - 3. Backflow prevention devices are not permitted on irrigation systems using reclaimed water.
- Q. Remote Control Valves:
  - 1. The following criteria shall be used for locating remote control valves:
    - a. Locate valves in groundcover or shrub areas when possible.
    - b. Locate valves outside of designated athletic play areas.
    - c. Locate valves adjacent to paving to facilitate access.
    - d. For slopes, locate valves either at the top or toe of slope.
  - 2. Install remote control valves independently in green plastic valve boxes. Boxes shall be branded with the designated controller letter (if applicable) and value number.
- R. Quick Coupling Valves:
  - 1. Provide quick couplers a minimum of 100' on center in recreational areas and in general landscaped areas. Provide one quick coupler within 12" of paved end sections of landscape medians, and at the end of main line runs 200' and longer. Quick coupler valves shall be installed in green round plastic gate valve boxes with the lid head branded Q.C.

2. Quick couplers shall be located outside of designated athletic play areas and within an area of 12" to 18" from hardscape where possible.
  3. Provide two quick coupling valves at each baseball field. Valves to be located at first base and third base adjacent to fence or dugout.
- S. Stub-out requirements for future systems extending beyond the limits of the current project, for mainline piping and components shall be determined by the Director.
- T. Drip irrigation or subsurface irrigation may be used with prior approval of the Director. Design shall include manufacturer's specifications.
- U. Anti-drain valves (inline and/or under sprinkler heads) shall be installed on all slopes greater than 5%. Inline anti-drain valves shall be installed in approved valve boxes.

**13-8 PLANTING**

- A. All plant material shall be in accordance with the appropriate ordinances, resolutions, and specifications established by the City.
- B. All plant material shall be in conformance with City-approved Streetscape/Street Tree Master plans where applicable. The City retains the right to prohibit any plant material generally known to require excessive maintenance, because of factors such as, but not limited to, disease, pest control, troublesome root development, invasive properties, ultimate size, and difficult growth habits.
- C. The use of drought tolerant plant materials that are particularly compatible with our local environment is encouraged to promote water conservation and reduce maintenance costs.
- D. Parkways adjacent to industrial, commercial, and institutional areas shall be maintained by the adjacent property owner.
- E. No trees shall be planted within right of way in industrial areas.
- F. In addition to minimum setback requirements for certain species as shown on the Tree List, the following minimum distances shall be required:
1. Three feet from City maintenance limit line.
  2. Four feet from utility installations including, but not limited to sewers, gas, water lines, meter vaults, catch basins, etc.
  3. Ten feet from driveways.

4. Ten feet from fire hydrants.
  5. Twenty feet from light standards.
  6. Tree limbs must have a clearance of 14.5' over streets, 8' over bicycle trails, and 7' over pedestrian-traveled ways.
- G. Minimum sizes of trees shall be 15 gallons or as approved by the Director.
  - H. All turf shall be installed by hydro seeding or stolonizing unless alternative methods receive prior approval by the City Engineer.

**13-9 LIGHTING**

- A. All accent lighting shall be located on private property.
- B. All street, park, trail, and paseo lighting shall be vandal resistant and be LED lamps.
- C. All lighting shall be designed to conform with Section 8 and the requirements of PG&E.

**13-10 TRAFFIC EQUIPMENT AND INSTALLATION**

All traffic equipment and installation shall conform to Caltrans Standard Plans and Specifications.