

STREET DESIGN

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STREET DESIGN

I. Definitions

"Alley" means any unnamed street contained in the public right-of-way twenty-four feet or less in width, used primarily for vehicular service access to the back or side of properties.

"All weather surface" means any surface that provides unobstructed access to conventional drive vehicles, including sedans and fire engines, is capable of supporting a 40,000 pound load during wet weather conditions. The surface treatment must be either concrete or paving unless otherwise approved by the city engineer and the Cloverdale Fire Protection District.

"Arterial street" shall mean a street whose primary purpose is to carry through traffic and means a fast or heavy street of considerable continuity which is used primarily as a trafficway to facilitate movement of heavy traffic between major residential areas or major residential areas and commercial areas.

"Bike lane" means those on-street bikeways that are part of the normal street section and provide marked bike lanes that delineate the separate rights-of-way assigned to bicyclists and motorists.

"Bike path" means a separate, off-street bike path or trail that is not part of the normal street section.

"Collector street" shall have the primary purpose of intercepting traffic from intersecting minor streets and handling traffic to the nearest arterial street or intercepting traffic from one collector street and handling traffic to another collector street. It shall serve as an access to abutting properties.

"Cul-de-sac street" shall have the primary purpose of serving abutting land use and connecting to the nearest minor street or collector street. It is not intended to pass traffic through to another street and is a local street with only one outlet.

"Curb cut" shall mean an opening or depression in the street curb installed and intended for pedestrian or vehicular use. Curb cuts shall be measured across the "flat bottom" width of the opening or depression.

"Dead end road" means any road that has only one point of vehicular ingress/egress. Dead end roads shall include cul-de-sacs.

"Development" means and includes, but is not limited to, the subdivision of land into two or more parcels, the construction of new structures or buildings, and changes in or renovations to existing structures or buildings and the attendant construction of improvements, either of public or private nature, for which approval by the City of Cloverdale is required prior to commencement.

"Driveway" For the purposes of single family detached housing, "driveway" means a way or place in private ownership for vehicular traffic providing access to two or fewer residential units or buildings less than 150 feet from a public roadway over a common parcel or easement(s), primarily by the owners or occupants of the common parcel or easement(s), and necessary service and

emergency vehicles, but from which the general public may be excluded, and which are not maintained by a public agency. Driveways shall meet all provisions, as adopted, of the Uniform Fire Code with respect to Fire Department access. Access to driveways shall be via a curb cut per City Standard 209.

"Fire Department access road" means a access road reserved for emergency vehicles and the conduct of fire fighting or rescue operations, or as designated by the fire department, and posted in accordance with Vehicle Code section 22500.1.

"Hillside" shall mean properties or portions of properties that have an average cross-slope of ten percent or greater.

Properties or portions of properties to which this definition applies or which have other demonstrated hillside characteristics qualify for consideration for use of hillside design standards. Determination of the appropriateness of use of such standards shall rest with the City Engineer.

"Industrial street" shall have the primary purpose of handling industrial and manufacturing type business traffic. It is a street that provides access to or through an industrial zone, commercial zone, or an area of high truck and other large vehicle traffic.

"Minor street" shall have the primary purpose of serving abutting land use and handling traffic to the nearest collector street.

"Pathway (equestrian)" shall mean a public or private paved or rock-surfaced path, excluding sidewalks, for the use of pedestrians and horses.

"Pathway (mixed use)" shall mean a public or private paved or rock-surfaced path, excluding sidewalks, for the use of pedestrians, horses and bicycles.

"Pathway (pedestrian)" shall mean a public or private paved or rock-surfaced path, excluding sidewalks, for the use of pedestrians.

"Private road or street" means a way for vehicular traffic providing access to lots or units over a common parcel, primarily by the owners or occupants of the common parcel, and necessary service and emergency vehicles, but from which the general public may be excluded, and which is not maintained by a public agency.

Such roads or streets may be designed and constructed to different standards than public streets in the following areas: width, pavement, street lighting, signing and entry islands. Private streets should not connect two or more public streets (except when necessary for internal circulation or emergency vehicle access) and shall be designed and constructed to the standards of private roads or streets as defined within these standards in terms of minimum width, structural section, curb, gutter, sidewalk, and all other aspects not specifically referenced above or in this section. No City enforcement of "no parking" signs or other such regulatory signs shall be provided for such streets.

"Public street" means a way for vehicular traffic, whether designated as a minor street, collector street, arterial thoroughfare, freeway, or other designation, which is improved to City standards.

dedicated for general public use and maintained by a public agency. The term "street" shall include alleys as defined above.

"Public way" shall mean any street, channel, viaduct, subway, tunnel, bridge, easement, right-of-way or other way in which a public agency has a right of use.

"Sidewalk" shall mean a Portland Cement Concrete (PCC) surfaced area for pedestrian usage located within the public or private street right-of-way or sidewalk easement and included as a standard element of a street section.

"Street right-of-way" width shall mean the shortest distance between the lines delineating the right-of-way of a street.

"Street width" means the distance between the curb faces of a street or edge of pavement where a curb face may be omitted by approval of the City Engineer.

"Turnout" means a widening on a roadway to allow vehicles to pass. All turnouts shall be per city standard and shall be intervisible.

II. General

- A. For purposes of street layout and design, streets shall be classified as:
 - 1. Arterial Streets
 - 2. Industrial Streets
 - 3. Collector Streets
 - 4. Minor Streets
 - 5. Cul-de-Sac Streets
 - 6. Alleys
 - 7. Driveways
- B. Street design standards shall be used for the design and construction of all private and public streets and for flatland streets and hillside streets.
- C. Deviations from these standards may be granted by approval of the City Engineer.
- D. The standards are considered minimum and do not preclude the use of a higher standard.

III. Requirements for Submittal of Improvement Plans

The City has requirements for submittal of Improvement Plans and Parcel Maps/Final Maps. Submittal forms shown in Figures 1 through 6 contain minimum submittal requirements. Submittal forms which have been filled out and signed by the engineer or surveyor must be included with all submittals. Current submittal forms may be obtained from the City of Cloverdale.

FIGURE A

**CHECK LIST
IMPROVEMENT PLANS**

CITY OF CLOVERDALE

PROJECT ADDRESS	APN	FILE NO.
PROJECT NAME	NO. OF PROPOSED LOTS	RELATED FILES
APPLICANT'S NAME	ADDRESS	PHONE
PROPERTY OWNER'S NAME (PRINT)	ADDRESS	PHONE
ENGINEER & LICENSE NO.	MAILING ADDRESS	PHONE

NOTE: Improvement Plans must be prepared by a California Registered Civil Engineer. All submitted plans and calculations must be signed and stamped. Incomplete submittals will not be accepted.

SUBMITTAL REQUIREMENTS

- FINAL MAP (Associated with these plans)
- PARCEL MAP (Associated with these plans)
- NO MAP (Associated with these plans)
- If a rezoning or zoning permit is associated with these Improvement plans, has that rezoning been approved by the City?
 Yes No

NUMBER OF COPIES

- Six blue-line or black-line copies (24" x 36"). (DO NOT SUBMIT ORIGINAL DOCUMENTS UNTIL REQUESTED BY THE CITY ENGINEER).

GENERAL

- 22. North arrow (to be upward facing if practical) and sheet number (all sheets).
- 22. Scale, written and graphic (all sheets).
- 22. Location Map
- 22. Benchmark (established City, or County USGS benchmark).
- 22. Symbols Legend.
- 22. Abbreviation legend.
- 22. Index to drawings including reference to sheet numbers.
- 22. General Notes with reference to City Standard 100.
- 22. City Engineer approval block.
- 22. Title block (all sheets):
 - B. Name of Engineering firm.
 - B. R.C.E. seal, signature, and expiration date.
 - B. Date prepared.
 - B. Title of project.
- 22. Clear and distinct delineation of project boundaries.
- 22. Nature and dimension of existing and proposed easements.
- 22. Typical section of all streets.
 - B. Width of street, right-of-way, easements, curb, gutter, sidewalk and landscape parcels (if required).
 - B. Crown and centerline location.
 - B. Pavement and base type and thickness, traffic index and R-value.
 - B. Cut and fill slopes (maximum & minimum and limits).
 - B. Saw cut line 1' minimum into existing paving.
- 22. City Standards applicable to construction.

STREETS

Plan View:

- 22. Centerline data (submit calculations).
- 22. Street names, widths (including right-of-way widths).
- 22. Property lines and lot numbers.
- 22. Centerline stationing:
 - B. Conform to existing stationing if previously set.
 - B. All B.C.'s, E.C.'s and grade breaks, driveways, etc.
- 22. Gutter slopes and flow arrows showing magnitude and direction between grade breaks and around curb returns, cul-de-sacs and knuckles.
- 22. Flow arrows showing slope and direction from roadway crown or center of intersection to ¼ points of curb returns, cul-de-sacs and knuckles.
- 22. Direction of flow arrows.
- 22. Top of curb elevations and stationing at curve points, grade breaks, and lot lines.

- 11. Required sidewalk and handicap ramps.
- 11. Monument location at all E.C.'s, B.C.'S and street intersections
- 11. Existing improvements (shown in dashed lines).
- 11. Length and location of all transitions in curb and gutter.
- 11. Redwood headers and barricades.
- 11. Radius, length and delta of all curb returns, centerline curves and curves at face of curb.
- 11. Driveway gradients.
- 11. Striping, Signing and Lighting Plan. (Shown on a separate sheet from street and utility improvements).

Profile View:

- 11. Existing ground surface at centerline of streets (100' each direction beyond improvements, 200' for major streets).
- 11. Profile of improvement:
 - C. Stationing and elevation at all grade breaks.
 - C. Vertical curve data.
- 11. Cross sections every 25 feet for all half streets with future x-sections, see 31 above.
 - C. Stationing.
 - C. Existing and proposed elevations.
 - C. Existing and proposed cross-slopes.
 - C. Centerline, existing edge of pavement (conform) and top of curb elevations.
 - C. Scale - vertical - maximum of 1" = 5'; horizontal - maximum of 1" = 50'.
- 11. Street centerline slope.

STORM DRAINAGE**Plan View:**

- 11. Direction of flow arrows.
- 11. Stationing of all drainage structures within streets.
- 11. Specified size/type for all drainage structures.
- 11. Inlet and manhole numbers corresponding to profile view.
- 11. Pipe diameter and length (radius for curved section).
- 11. Pipe material (may be specified instead in general note or shown on profile) and class of pipe.
- 11. Open channels or swales:
 - C. Flowline elevation at the beginning, end and all grade breaks.
 - C. Slope of swale.
 - C. Typical section.
 - C. Existing and proposed improvements clearly delineated as such.

Profile View:

- 11. Invert grades/flowlines at all drainage structures.
- 11. Inlet/manhole numbers corresponding to plan view.
- 11. Existing ground surface and finished grade.
- 11. Pipe diameter and length.
- 11. Pipe slopes.
- 11. Utility crossings (show with clearance).
- 11. Profile open channels.

UTILITIES

- 11. Existing and proposed utilities (sewer, water, street lighting, etc.).
 - C. Location.
 - C. Type, size, length, class, and slope.
 - C. Material (can specify in General Note).
 - C. Clear delineation between public and private utilities.

SEWER

- 11. Plan:
 - C. Manhole/cleanout numbers corresponding to profile view.
 - C. Stationing of structures within street right-of-way.
 - C. Direction of flow arrows.
 - C. Lateral locations (include invert at upstream end of lateral for other than 2% slope or where cover is critical).
- 11. Profile:
 - C. Existing and finished grade over the line.
 - C. Invert elevations (in and out) and slopes.
 - C. Manhole cleanout numbers corresponding to plan review.

WATER

- 11. Plan View: (Profile only necessary when conflicts occur).
 - C. Applicable City standards (500 series) & depth of pipe note.
 - C. Valve size and locations, valve boxes.
 - C. Fire hydrants and service lateral information.

STREET LIGHTING

- 73. Plan:
 - F. Compliance with City Standards.
 - F. Light locations, stationing and standard.
 - F. Pull box location and standard when not located adjacent to light pole.
 - F. conduit location; size and type.
 - F. service point location.
- 73. Exact horizontal & vertical location of all existing high pressure gas line(s) shown every 100 ft.

GRADING

- 73. Existing and finished contours (and grade elevations at all grade breaks).
- 73. Existing and proposed (if known or required) structures (i.e., houses, wells, septic systems, etc.).
- 73. Flow arrows, drainage plan.
- 73. Existing trees noted as to whether to be saved or removed (base elevations for trees to be saved).
- 73. Typical cross-section and conform grades at all property lines.
- 73. Erosion and sediment control measures proposed (show on separate plan for grading).
- 73. Creek cross-sections to establish setback per City ordinance.
- 73. Provisions for lot drainage, lot-to-lot drainage is not allowed.
- 73. Provisions for accepting off-site drainage.
- 73. Top of curb elevation and stationing of property lines.
- 73. Slope rounding details for top of cuts.
- 73. Retaining wall details and engineering calculations (2 copies if applicable).
- 73. Specify soils engineer's control of grading in compliance with Chapter 70 U.B.C. and soil's investigation (note on grading plan).
- 73. Provisions for pad drainage when exterior grades are higher.
- 73. Existing structures and dimensions from new lot lines to structures to be saved.
- 73. Typical lot drainage details.
- 73. Quantities of cut and fill.
- 73. Elevation of pads, including property corners.
- 73. Sidewalk drains (minimum 1 per lot).

SUPPORTING DATA

- 2 copies of the Resolution of Approval.
- 2 copies of the Soils Report
- 2 copies of the Engineer's Estimate
- 2 copies of the design calculations (structural sections, walls, etc.).
- 1 copy of fire flow calculations.
- 1 copy of sewer demand calculations.
- 1 copy of house fire sprinkler and water service demand calculations for water meter sizing.
- 1 copy curb and centerline calculations of all streets.
- 1 copy of any necessary off-site letters of permission.
- 2 copies of on-site easements/rights-of-way deeds and plats (if map is not included).
- 2 copies of all required off-site easements/rights-of-way deeds and plats.
- 2 copies of Arborist's Report.
- 4 sets of Site Lighting Plans (if applicable).
- 4 sets of Site Parking and Signing Plans (if applicable).
- Copies of transmittal letters to:
 - F. Sonoma County Water Agency.
 - F. P G & E.
 - F. Pacific Bell.
 - F. Corps of Engineers (as necessary).
 - F. Caltrans (as necessary).
 - F. Other

I HAVE READ THE FOREGOING AND HAVE SUPPLIED ALL OF THE INFORMATION REQUESTED (OR HAVE PROVIDED A WRITTEN EXPLANATION WHICH ACCOMPANIES THIS CHECKLIST WHICH EXPLAINS ANY OMISSIONS) AND HAVE SIGNED AND STAMPED ALL SUBMITTALS OTHER THAN NORMAL CORRESPONDENCE.

SIGNATURE AND STAMP OF ENGINEER _____ DATE _____

PROJECT ADDRESS	APN	FILE NO.
NAME OF PROPOSED PROJECT	NO. OF PROPOSED LOTS	RELATED FILES
APPLICANT'S NAME	ADDRESS	PHONE
PROPERTY OWNER'S NAME (PRINT)	ADDRESS	PHONE
SURVEYOR/ENGINEER & LICENSE NO.	MAILING ADDRESS	PHONE

NOTE: Final Maps and Parcel Maps must be prepared by a person licensed in California to perform land surveying. All submittals must be signed and stamped. Incomplete submittals will not be accepted.

SUBMITTAL REQUIREMENTS

Number of Copies

- () Five (5) blue/line or black/line copies (18" x 26") showing the proposed division clearly and legibly with accurate dimensions and including the following information (check, or mark as not applicable): **DO NOT SUBMIT ORIGINAL DOCUMENTS UNTIL REQUESTED BY THE CITY ENGINEER.**

CERTIFICATES AND ACKNOWLEDGEMENTS

(Required on the first sheet or sheets)

- () 24. Owner's certificate and acknowledgement (individual/partnership/corporate).
- () 24. City Clerk's Certificate.
- () 24. Trustee (if such exists) certificate and acknowledgement.
- () 24. Engineer's or Surveyor's statement and seal.
- () 24. Owner's of interest certificate (if applicable).
- () 24. City Engineer's statement.
- () 24. City Treasurer's certificate
- () 24. County Tax Collector's certificate.
- () 24. County Clerk's certificate.
- () 24. County Recorder's certificate.
- () 24. Planning Commission certificate

Note: All certificates shall be in accordance with state law and in the format kept on file in the offices of the City Engineer.

TITLE BLOCK

Required on all sheets:

- () 24. Title block located in lower right hand corner of drawing.
- () 24. Assessor's parcel number(s).
- () 24. Name of project or parcel map number.
- () 24. Total number of lots.
- () 24. Total number of common parcels (if applicable).
- () 24. Total project acreage (to the nearest 0.01 acre).
- () 24. Date prepared.
- () 24. Sheet number and number of sheets (if more than one sheet is required).
- () 24. Name of party (company) responsible for preparing the map.

GENERAL INFORMATION

Required on all sheets:

- () 24. Sheet size 18" x 26" (outside dimensions).
- () 24. 1" blank margin all around the edge of the sheet.
- () 24. No use of ditto marks.

Required on Specific Sheets:

- () 24. Key map (if more than two map sheets are required).

() 69. Location map (to be located on the first map sheet or the key map, if one is required, and to be oriented in the same direction as the parcel/final map).

() 69. Title company name, located inside the border in the lower left corner of the first sheet only.

MAP REQUIREMENTS

General Requirements (Required on all Map sheets):

- () 69. North arrow (to be upward facing, if practical).
- () 69. Scale (written and graphic).
- () 69. Symbols legend.
- () 69. Basis of bearings with tie shown to the subdivision.
- () 69. The exterior boundary of the subdivision designated by a distinctive border.
- () 69. Reference to adjoining tracts or lots (record data).
- () 69. Reference to adjoining map sheets (if more than one map sheet is required).
- () 69. Reference to adjoining railroads and highways.
- () 69. Existing easements (on-site and off-site):
 - () B. Locations and dimensions.
 - () B. Noted with deed reference.
 - () B. Purpose and nature (public or private).
- () 69. Proposed easements.
 - () B. Locations and dimensions.
 - () B. Noted with deed reference.
 - () B. Purpose and nature (public or private).
- () 69. Each lot shown entirely on one sheet.
- () 69. All dimensions in feet and hundredths.
- () 69. Pertinent record data shown in parenthesis or per legend designation (next to measure data).
- () 69. Existing monuments shown along with relevant information (found, set, retagged, or removed).
- () 69. Monuments to be set shown and labeled with relevant information (size, location, type and tag).
- () 69. Reference to additional map sheets.

Street Requirements:

- () 69. Approved names.
- () 69. Existing and proposed street widths.
- () 69. Distance from centerline to edge of right-of-way.
- () 69. Centerline monuments.
- () 69. Distance between centerline monuments.
- () 69. Centerline bearing.
- () 69. Centerline curve data (delta, radius, and length).
- () 69. Right-of-way curve data.
- () 69. Private streets designated as such.

Lot Requirements:

- () 69. Lots numbered (beginning with number 1 or letter A and continuing consecutively without duplication or omission. No circles or other figures shall be placed around lot numbers except for the last number where such placement shall be optional).
- () 69. Lot line dimensions.
- () 69. Lot line bearings.
- () 69. Lot line curve data (delta, radius, and length).
- () 69. Survey tie to boundary (for planned unit developments or condominium "footprints").

"Designated Remainder" and "Remaining Lands":

- () 69. "Designated remainder" - Government Code Sections 66424.6 and 66434(e) shall be treated as follows:
 - () B. If greater than or equal to 5 acres in size, shown by deed reference.
 - () B. If less than 5 acres in size, shown as part of the survey.
- () 69. "Remaining Lands" (future phases) labeled with a document number, and if less than 5 acres in size, shown as part of the survey.

Additional Map sheet:

- () 69. Net acreage to the nearest square foot (0.01 acre for lots over 1 acre in size).
- () 69. Soils report notation.
- () 69. Area(s) subject to inundation identified as such.
- () 69. Building setback lines.
- () 69. Building envelope with survey tie to lot line or boundary (if applicable).
- () 69. Vehicular access restriction notation (if applicable).
- () 69. Seismic setback lines (if applicable).
- () 69. Archaeological sites (if applicable).
- () 69. Creek setback lines (if applicable).

SUPPORTING DATA

- 77. One (1) Copy of Tentative Map.
- 77. One (1) Copy of Resolution of Approval.
- 77. One (1) copy of Preliminary Title Report (issued within the most recent three months).
- 77. Two (2) copies of computer printout documenting survey closure calculations for the following:
 - C. Blocks
 - C. Lots
 - C. Street centerlines
 - C. Survey ties
 - C. Proposed easements (when not parallel to property lines)
- 77. One (1) copy of records referenced and used to prepare the survey (Examples: record of survey, filed maps, recorded deeds, and easements, etc.).
- 77. Two (2) copies of the legal descriptions and plats for all dedications performed by separate instrument (on-site and off-site).
- 77. Two (2) copies of project conditions, covenants, and restrictions.
- 77. Additional submittals involving condominium and townhouse projects:
 - C. Two (2) copies of condominium and townhouse plans.
 - C. One (1) copy of architectural drawings.
 - C. One (1) copy of computer printout establishing the location of the building footprint(s) within the subdivision.

I HAVE READ THE FOREGOING AND HAVE SUPPLIED ALL OF THE INFORMATION REQUESTED (OR HAVE PROVIDED A WRITTEN EXPLANATION WHICH ACCOMPANIES THIS CHECKLIST WHICH EXPLAINS ANY OMISSIONS AND HAVE SIGNED AND STAMPED ALL SUBMITTALS OTHER THAN NORMAL CORRESPONDENCE.

SIGNATURE AND STAMP OF SURVEYOR _____ DATE _____

IV. Street Design

A. Geometric Standard Cross Sections

<u>Item</u>	<u>Minimum Width</u>	<u>Street Classification</u>
Travel lane	14 feet	Industrial
	12 feet	Arterial, Collector
	10 feet	Minor, Cul-de-sac, Alley
Parking lane or shoulder	8 feet	All streets
Curb lane (no parking)	2 ft increase face of curb	All streets
Bike lane	6 feet against curb	All streets
	5 feet against parking	All streets
Curb radius for cul-de-sac	43 feet (see Std. #212)	Cul-de-sac
One-way loop, hillside street	20 feet width	Minor - 100 ft \varnothing radius
One-way loop, flatland street	20 feet width	Minor - 200 ft \varnothing radius
Maximum length of cul-de-sac street measured from projected curb or edge of pavement line of intersecting street to center of turnaround.	500 feet (or as approved by City Engineer)	Cul-de-sac
Length of streets allowed with no cul-de-sac	150 ft. from the projected curb or edge of pavement line of the cross street to end of dead-end street	All Streets
Sidewalk	5 feet	All Streets (widen at obstructing locations to provide 4-foot minimum clear sidewalk)

<u>Item</u>	<u>Minimum Width</u>	<u>Street Classification</u>
Sidewalk - meandering (where permitted by Std.)	5 feet	Where applicable
Sidewalk easement	To back of sidewalk	All streets where required
Public utility easement	5 feet in back of property line or as required	All streets where required
Double left turn lane	Two 12-foot lanes	All streets where required
Single left turn lane	12 feet	All streets
2-Way left turn lane	14 feet	All streets
Right turn lanes	12 feet	All streets

B. Access to Public Right-of-Way - Curb Cuts

1. Each vehicular passageway to any parking or loading facility to or across a public right-of-way shall comply with the following requirements:
 - a. Curb cuts shall be a maximum of 40 feet in width for non-residential uses. The width is not to exceed 35% of each lot frontage, except as otherwise approved. Minimum of 20 feet for each legal lot of record.
 - b. Driveway widths, within residential areas, shall be a minimum of 12 feet in width for single driveways, a minimum of 16 feet for double or triple driveways up to a maximum of 24 feet, except as otherwise approved.
 - c. Wherever feasible, curb cuts serving adjacent uses shall be combined to minimize the number of entrances onto a public right-of-way on any block. No curb island is allowed when it is less than ten feet between uses.
 - d. Only one curb cut may be installed for any parking or loading facility, except that one or more additional curb cuts may be allowed if the City Engineer determines that each such additional curb cut is necessary for the efficient operation of the facility and will not significantly reduce street capacity and traffic safety. Twenty feet top to top on the curb island is required between driveways on a single parcel.

- e. Any curb cut in a residential area on a corner lot shall be located at the farthest point possible from the curb return and outside of the sight vision triangle. Curb cuts shall be located a minimum of 10 feet from curb returns, except as otherwise approved by the City Engineer.
- f. In commercial/industrial area, a minimum of 200 feet required separation between driveway and the intersection of two arterial, industrial and/or collector streets except as otherwise approved by the City Engineer. At no time shall a curb cut be located closer than 20 feet from a curb return or 30 feet from a crosswalk which ever distance is greater.
- g. Except as otherwise approved by the City Engineer, curb cuts for any circular or "through" residential driveway must meet the following requirements:
 - 1.) The curb cuts for such driveway shall be at least twenty feet apart top to top and a minimum of 10 feet from the side property line.
 - 2.) Property frontage of 50' or less shall be limited to one driveway with not more than two driveways to be provided to any single property frontage.

V. Street Alignment

- A. Streets shall be aligned with adjacent existing streets by continuations of the center lines thereof, or by adjustment by curves, and shall be laid out for the most advantageous development of the entire area.
 - 1. Minimum centerline horizontal curve radii shall be as follows:

a. Arterial Streets	500 feet
b. Collector & Industrial Streets	300 feet
c. Minor Streets (flatland)	200 feet
d. Cul-de-Sac Streets	200 feet
e. Minor Streets (hillside)	100 feet
 - 2. Lesser radii may be used only when sufficient evidence is presented to the City Engineer to show that the radii described above are not practicable. Any deviations require specific City Engineer's approval.
 - 3. Superelevations are required on curves for the design of all arterial streets and for any other street with a design speed above 25 miles per hour, except as otherwise approved by the City Engineer.
- B. Where necessary to give access to or permit satisfactory future subdivision of adjoining land, streets shall extend to the boundary of the property and resulting

dead-end streets greater than 150 feet (measured from the projected curb or edge of pavement line of the cross street) shall have a temporary turnaround. Design of turnarounds other than the standard temporary turnarounds in the standard drawings requires specific approval by the City Engineer.

VI. Street Grades

A. All street grades shown on the improvement plans shall refer to U.S.G.S. benchmarks as established in the City of Cloverdale. Assumed benchmark elevations will not be allowed.

1. All arterial and industrial streets shall have no grade rate in excess of 7 percent.
2. Collector, minor, and cul-de-sac streets in the flatland shall have no grade rate in excess of 10 percent, except as specifically approved by the City Engineer.
3. Collector, minor, and cul-de-sac streets in the hillside shall have no grade rate in excess of 15 percent unless specifically approved by the City Engineer.
4. Minimum grade rate for all streets shall be 0.5 percent.
5. The grade of the pavement surface across an intersection shall not be more than 7 percent, except as approved by the City Engineer.
6. The gradient of each street entering an intersection shall not be more than 7 percent within a distance of 25 feet from the near curb line of the crossing street, except as approved by the City Engineer.
7. Vertical parabolic curves shall be used to connect grade profiles where the algebraic difference in grade rates exceeds one percent. The length of vertical curve required shall be determined by the following:

	Minimum Stopping Sight Distance	Minimum Length of Curve
Arterial and Industrial Streets	350 feet	200 feet
Collector Streets	200 feet	100 feet
Minor Streets	100 feet	100 feet
Cul-de-Sac	100 feet	100 feet

8. Minimum cross-slopes for all streets shall be 2 percent. Maximum cross-slopes shall be 5 percent.

9. Maximum cross slopes in cul-de-sac bulbs shall be 5 percent in flatland and 8 percent in hillside.
10. Driveway, private road and fire department access road grades shall conform to the requirements of minor streets.
11. Exceptions to this section require specific approval by the City Engineer.

VII. Intersections

- A. All streets entering upon any given street shall have their centerlines directly opposite each other or separated by at least 200 feet, except as otherwise authorized by the City Engineer.
- B. All streets shall intersect at right angles, or along radial lines when the intersection is within a curve, and shall have at least 50 feet of centerline tangent adjacent to the intersection, except as specifically approved by the City Engineer.
- C. Curb return radius:

Arterial/Industrial/Commercial	35 feet
Collector	30 feet
Residential	20 feet

At all intersections, the curb return radius to be utilized will be determined by the highest street classification (e.g., a minor-arterial street intersection will require 35' radius).

VIII. Typical Sections

- A. Typical sections for the improvement of streets and alleys shall be shown on the Improvement Plans. Curb and gutter sections, curb return radii, parking strip widths, and sidewalk widths may be modified where these improvements have been constructed in a portion of a block to other than the sections shown. However, any modifications require the specific approval of the Engineer.

IX. Pavement Design

Design of the structural section for all streets shall be in accordance with the following criteria:

- A. **Traffic Index**
 1. Street classification shall be determined by the City Engineer.
 2. Within subdivisions for residential and residential collector streets, use Standard Drawing No. 201, "Traffic Index Chart for Flexible Pavements". For all other streets, the T.I. will be determined by the City Engineer.

3. In no instance will the T.I. be less than the following:
 - (1) Arterial & Industrial Streets a minimum T.I. of 7.0
 - (2) Collector Streets a minimum T.I. of 5.5
 - (3) Minor & Cul-de-Sac Streets a minimum T.I. of 4.5
4. For all street design use Standard Drawing No. 202, "Structural Design Chart for Flexible Pavements" and these "Street Design Standards".

B. Soils Reports

1. Resistance "R" Values
 - a. A qualified Soils Engineer shall obtain sufficient soil samples within the proposed street right-of-way to permit the determination of the R-Value of the various materials that lie immediately under the planned structural section. The cost of sampling and testing shall be at the Owner's expense.
 - b. The basement soil shall be tested according to California Test 301 "Method for Determination of the Resistance "R" Value of Treated and Untreated Bases, Subbases, and Basement Soils by the Stabilometer" in use by the California Department of Transportation, Transportation Laboratory. Design of the structural section for a particular street will normally be based on the lowest R-Value material encountered.
 - c. If the Engineer elects to utilize an "R" Value of 5, then R-Value tests will not be required.
 - d. The Owner's Soils Engineer shall submit to the City a Materials Report showing the location and elevation of sampling points and R-Value data. The Owner's Soils Engineer may be required to make a field survey of soil conditions when rough subgrade has been cut to verify data presented in the Materials Report. The cost of any additional sampling and testing shall be at the Owner's expense.

2. Material Testing

- a. A minimum of one sample of asphalt shall be tested for all developments installing public street improvements to ensure that the asphalt is meeting with city specifications. If developments are installing in excess of 500 tons of asphalt, one test shall be required for every 500 tons used.

C. Gravel Equivalentents

1. Structural sections are to be determined using the following formula applied to determine the G.E. of the cover required over the basement soil and intermediate structural section layers.

$$GE = 0.0032 (TI)(100-R)$$

where:

GE = gravel equivalent in feet

TI = traffic index

R = R-Value of the material to be covered.

2. Structural sections using aggregate base shall have the gravel equivalent of the asphalt concrete layer increased by 0.20 feet.
3. In no instance shall a structural section be less than as follows:

Arterial & Industrial Streets: 0.37' asphalt concrete
1.00' Class 2 aggregate base

Collector Streets: 0.27' asphalt concrete
0.80' Class 2 aggregate base

Minor & Cul-de-Sac Streets: 0.25' asphalt concrete
0.50' Class 2 aggregate base

D. Gravel Equivalent Factors & R Values

1. The gravel equivalent factor for asphalt concrete surface courses shall be obtained from the following equation: $G_f = 2.5 (5.14/T.I.)^{0.5}$
In no case shall the gravel equivalent factor exceed 2.5.

2. Gravel factors and R-Values for design shall be as follows:

<u>Materials</u>	<u>Gravel Equivalent</u>	<u>R Value</u>
Class 2 A.B.	1.1	78
Class 4 A.S.B.	1.0	50

E. Improvement Plan Notation

1. All Improvement Plans shall include the design "R" Value and the Traffic Index. This information shall be included in the typical section or in a note or table on the same sheet as the typical sections.

X. Requirements for Emergency Access During Construction

A. Subgrade Conditions

	Good	Poor
Summer April 1 - Sept. 30	Excavated & Drained Subgrade	Excavated & Drained Subgrade
Winter October 1 - March 31	6 inches rock	6 inches rock & fabric

1. For structures with a ridge line of at least 35 feet above adjacent rough fire access grade, or for structures with three or more stories, 1½ inches of asphalt base over 4 inches of aggregate base shall be provided in all proposed and approved fire access areas from the structure out 150 feet.
2. Winter conditions shall take effect and be enforced by the City Engineer on October 1. The City Engineer shall have the authority to move this date up as early as September 1, depending on the particular season's rainfall and projections.
3. Subgrade defined as native soil at bottom of street section (base and paving), excavated to the approximate lines and grades shown on the project grading plan, and provided with a discharge for collected water, as approved by the City Engineer.
4. Base shall be Class 2 aggregate base or alternative recommended by Soils Engineer and approved by the City Engineer.
5. Poor subgrade defined as R-Value 10 or less.
6. Base shall be placed only on an unyielding excavated and drained subgrade, and to be compacted to at least 90% relative compaction.
7. Fabric to be a ground stabilization fabric such as Mirafi 600X or equivalent.

XI. Requirements for Driveways, Private Roads and Fire Department Access Roads

- a) Private driveways shall be in conformance with City Standard 209 with a maximum length of 150 feet from a public road and serve a maximum of two residential buildings. The width of driveways serving one residential building shall be a minimum of 12 feet and a maximum of 24 feet. Driveways serving two residential buildings shall have a minimum width of 24 feet.
- b) Private driveways serving one residential building that has a distance greater than 150 feet from a public road shall be considered a Fire Department Access Road and shall have a minimum width of 24 feet.
- c) Any driveway or access road serving more than 2 residential buildings shall be considered a private road.
- d) The structural section of all private roads, driveways and fire department access roads shall be constructed in conformance with City Standards and shall have a minimum designed live-load capacity of HS 20.
- e) Any private road serving more than one parcel shall be required to be named.
- f) Fire Department Access Roads shall have an all weather access road surface width of not less than 20 feet and an unobstructed vertical clearance of not less than 15 feet. The widths and clearances required by this section shall be increased when the fire chief or city engineer determines that such widths and clearances are not adequate under the particular circumstances to provide fire apparatus access.
- g) The turning radius of either a Fire Department Access Road or private road shall be a minimum of 25 feet.
- h) All private roads and fire department access roads shall have intervisible turnouts.
- i) No private road, fire department access road or driveway shall have a maximum grade in excess of fifteen percent (15%).
- j) No fire department access road or private road shall have a vertical curve whose length is less than one hundred (100) feet.
- k) No private road, driveway or fire department access road shall have a horizontal inside radius of curvature of less than fifty (50) feet.
- l) When a bridge is required to be used as access for a private driveway, private road or fire department access road, it shall be constructed and maintained in accordance with the applicable sections of the Building Code and the Standard Specifications for Highway Bridges, and using designed live loading sufficient to

carry the imposed loads of fire apparatus. The minimum designed live load capacity shall be HS 20, as defined by the American Association of State Highway and Transportation Officials. All bridges shall have appropriate signing identifying bridge capability, including weight and vertical clearance limits.

- m) The required roadway width of a fire department access road shall not be obstructed in any manner, including parking of vehicles. Minimum required widths and clearances established under this section shall be maintained at all times. No owner, lessee, or other person in charge or control of any premises shall, after receiving notice thereof, permit or allow any activity, practice, or condition to occur or exist on the premises which lessens, obstructs, or impairs the access required under this section.
- n) When required, approved signs or other approved notices shall be provided and maintained for fire department access roads to identify such roads and prohibit the obstruction thereof or both. When used, "NO PARKING" signs shall comply with the provisions of the California Vehicle Code. Where curbs exist adjacent to hydrants located along the roadway of a fire department access road, the curbs shall be painted red or otherwise appropriately marked by the owner, lessee, or other person in charge or control of the premises to prohibit parking for a distance of fifteen (15) feet in either direction from any such hydrant.
- o) Parking of vehicles on a fire department access road may be prohibited when the fire chief determines that it is necessary to keep the roadway clear and unobstructed. In such case, the chief may require the owner, lessee, or other person in charge or control of the premises to paint the curbs red or install signs or other appropriate notice to the effect that parking is prohibited by order of the fire department. It shall be the property owners' responsibility to maintain in good condition the signs or paint. When a fire department access road is marked or signed as provided herein, no person shall park or leave standing any vehicle on the roadway.

