EXHIBIT M

LAND USE
CHAPTER XVII: ROAD STANDARDS
~~Articles~~ SECTION 1.1 – 8.5

Sections:

SECTION 8 ENFORCEMENT

Sec. L-XVII 1.1 Purpose

It is the purpose of these Improvement Standards to set design and construction standards for public and private works under the jurisdiction of the County of Nevada ~~County~~ in order to provide for the coordinated development of facilities to be used by and for the protection of the public. These Nevada County Road Standards shall set the guidelines for the design, plan preparation and construction of roads, drainage and related improvements. These Nevada County Road Standards are not meant to apply to work within any other governmental jurisdiction's highways, streets, or roads unless adopted separately or by reference by that jurisdiction. These Nevada County Road Standards shall apply to applications deemed complete after February 15, 2021. (Ord. 2488.~~,~~ (01/12/2021))

Sec. L-XVII 1.2 Scope

This Chapter shall be known as and may be referred to as "Nevada County's Road Standards" or "Road Standards". Unless modified by these Road Standards, design and construction shall be performed in accordance with the latest editions of the State of California, Department of Transportation's "Highway Design Manual", "Traffic Manual", "Standard Specifications" and "Standard Plans". References in the State Standards to State maintained roads shall be construed to apply to County roads unless different provisions are specified in these Nevada County Road Standards.

Any details of road construction not specifically included in these Road Standards, including the above-referenced State Standards, shall be designed in accordance with accepted engineering practice, subject to approval by the Engineer. The Board of Supervisors may adopt by separate Resolution "Nevada County Standard Drawings" or "Standard Drawings" for the purpose of delineating what constitutes accepted practices for those minor details of road construction not set forth in this Chapter, but necessary for complete design of improvements. The Standard Drawings, in

supplementing the Road Standards, may also graphically depict said Road Standards, but shall not supersede them and in the case of conflict, the provisions of this Chapter shall prevail. All construction shall comply with the standards of this Chapter as supplemented by the Standard Drawings adopted by Resolution, unless a Petition for Exception, pursuant to ~~Sec. L-XVII 3.12~~ of this Chapter, ~~Code,~~ has been granted for a specific standard.

A. PRECEDENCE

These Standard Specifications and Standard Plans, CALTRANS Standard Specifications and Plans, and any special provisions or supplementary documents are essential parts of Nevada County's Standard Specifications, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work.

Nevada County's Road Standards and Construction Specifications shall govern over CALTRANS' Standard Specifications and Plans in right-of-way under Nevada County's jurisdiction. Special provisions shall govern over both of these Standard Specifications in right-of-way under Nevada County's jurisdiction.

In the event of any discrepancy between any drawing and the figures written thereon, the figures shall be taken as correct. Detail drawings shall prevail over general drawings. (Ord. 2488.~~,~~ (01/12/2021))

Sec. L-XVII 1.3 Definitions

In these Standards, the intent and meaning of the terms that are used shall be defined in Section I of the State Specifications except as modified or added herein.

A. AVERAGE DAILY TRAFFIC, OR AVERAGE DAILY TRIPS ("ADT"): The weighted average vehicle traffic or trips occurring during a twenty-four (24)-hour period on a weekday. The future ADT shall be computed using the sum of the existing traffic, plus any additional traffic generated from land uses allowed under the County's General Plan and Zoning Provisions ~~Chapter II~~ of this Code. A vehicle trip is a single or one-direction vehicle movement.

B. COLLECTOR ROAD: An urban road connecting principal and minor arterial roads to local roads. Equivalent in function to a (rural) major collector road.

~~B.~~C. CONSULTING ENGINEER: Any person or persons, firm, partnership or corporation legally authorized to practice engineering in the State of California. For the purpose of this Chapter, "Consulting Engineer" shall refer to an engineer retained by a project proponent or developer.

~~C.~~D. COUNTY: The County of Nevada.

~~D.~~E. DEAD END ROAD: A road which has only one point of vehicular ingress/egress, including cul-de-sac and looped roads.

~~E.~~F. DEPARTMENT: The Nevada County Department of Public Works. (Ord. 2239. (05/29/2007)).

G. DEVELOPER: Any person or persons, firm, partnership, corporation or combination thereof financially responsible for the improvements.

~~F.~~H. DIRECTOR: The Director of the Department of Public Works of the County of Nevada. (Ord. 2239. ~~)~~ (05/29/2007))

I. DRIVEWAY: A vehicular access constructed pursuant to Chapter XVI, Fire Safety Regulations, of the Land Use and Development Code, that serves up to two (2) parcels with no more than two (2) residential units and any number of non-commercial or industrial buildings on each parcel.

J. ENGINEER: The Director of the Department of Public Works of the County of Nevada or their ~~his or her~~ designee. (Ord. 2239. (05/29/2007))

K. FIRE STANDARD ACCESS ROAD: Minimum standard road for new construction. A Fire Standard Access Road serves more than two(2) parcels with no more than two (2) dwellings on each, and any number of accessory buildings.

L. FUEL MODIFICATION AREA: An area where the volume of flammable vegetation has been reduced, providing reduced fire intensity and duration.

M. GATE: A means of vehicular entrance or exit to a parcel or dwelling, including an opening in a wall, fence, or driveway abutments. A security gate is defined as a gate that is manually or electronically secured.

N. HAMMERHEAD/T: A road or driveway that provides a “T”-shaped, three-point turnaround space for emergency equipment, being no narrower than the road that serves it.

O. IMPROVEMENT: Work performed in accordance with these Road Standards.

P. INTERSTATE HIGHWAYS AND FREEWAYS: Limited access highways.

Q. LABORATORY: Any testing agency or testing firm which has been approved by the Department.

R. LOCAL ROAD: A road that functions primarily to provide access to individual properties.

S. MAJOR COLLECTOR ROAD: A (rural) road connecting local roads and (rural) minor collector roads to arterial roads.

T. MINOR ARTERIAL ROAD: A road providing primary access from freeways and principal arterials to major origins and destinations.

U. MINOR COLLECTOR EQUIVALENT LOCAL ROAD: A local road that is projected to serve a buildout volume in excess of 2,000 Average Daily Trips but is not classified as a minor collector on the General Plan Circulation Plan Map.

V. MINOR COLLECTOR ROAD: A rural road connecting local roads to major collector and arterial roads

W. PRINCIPAL ARTERIAL ROAD: A road carrying some regional traffic and connecting the major population centers within the County or immediate counties.

X. PROJECT: The proposed improvements by the County or others.

Y. RESIDENTIAL UNIT: Any building or portion thereof which contains living facilities, including provisions for sleeping, eating, cooking and/or sanitation for one or more persons. Manufactured homes, mobilehomes, and factory-built

housing are considered residential units for the purposes of mandatory measures required in Cal. Code Regs. Tit. 14 ~~CCR~~ § 1270.01 (c).

Z. ROADS: Vehicular access to more than two (2) parcels; more than four (4) residential units; or access to any industrial or commercial occupancy. Includes private streets and lanes under the jurisdiction of the County of Nevada.

AA. ROADWAY: Any surface designed, improved, or ordinarily used for vehicle travel.

BB. ROADWAY STRUCTURES: Bridges, culverts, and other appurtenant structures which supplement the roadway bed or shoulders.

CC. SHOULDER: Roadbed or surface adjacent to the traffic lane.

DD. SPECIAL CIRCUMSTANCES: Unusual circumstances not covered by these Road Standards which require additional specific review and evaluation by the Engineer in order to determine appropriate design standards.

EE. SPECIAL PROVISIONS: Specific clauses setting forth conditions or requirements peculiar to the work and supplementary to these Road Standards.

FF. SPECIFICATIONS: The directions, provisions and requirements contained in these Road Standards.

GG. STANDARD DRAWINGS: The latest edition of the Nevada County Standard Drawings kept on file in the Department of Public Works and adopted by a Resolution of the Nevada County Board of Supervisors.

~~G.~~HH. STATE SPECIFICATIONS: Shall mean the latest edition of the State of California, Department of Transportation (CALTRANS) Standard Specifications and Standard Plans, the CALTRANS Highway Design Manual, and the CALTRANS Traffic Manual.

II. TELECOMMUNICATION: Refers to data, voice, video or other information provided by wire, fiber optic cable or other technology.

JJ. TRAFFIC LANE: The portion of a roadway that provides a single line of vehicle travel.

KK. TURNAROUND: A roadway, unobstructed by parking, which allows for a safe opposite change of direction for emergency equipment. Design of such area may be a hammerhead/T or terminus bulb.

LL. TURNOUT: A widening in a road or driveway to allow vehicles to pass. Minimum twelve (12) feet wide and thirty (30) feet long with a twenty-five (25) foot taper on both ends.

MM. VERTICAL CLEARANCE: The minimum specified height of a bridge or overhead projection above the roadway. (Ord. 2488.~~,~~ (01/12/2021); Ord. 2474.~~,~~ (01/14/2020))

~~ARTICLE~~ SECTION 2 GENERAL REQUIREMENTS

Sec. L-XVII 2.1 Grading

All grading which is not subject to or done in conjunction with these Road Standards shall be done in accordance with Chapter V of this Code or the latest adopted encroachment permit procedures. (Amended by Ord. 1919. (11/05/1996))

Sec. L-XVII 2.2 Work in County Rights-of-Way

All work within the County rights-of-way shall be subject to the requirements of latest adopted Nevada County Encroachment Permit Procedures. Minor work within the rights-of-way may be performed without improvement plans, as defined herein, but is subject to the encroachment permit procedures. Minor work includes, but is not limited to, constructing standard driveway approaches, normal utility maintenance related work or minor structures such as signs, fences or walls. No work shall be done in the County rights-of-way without a traffic control plan approved by the Engineer.

Sec. L-XVII 2.3 Other Agency Notifications

The Consulting Engineer is responsible for obtaining the approval and necessary permits from governmental, municipal or district agencies when their facilities are involved.

Sec. L-XVII 2.4 Inspection Requirements

A. All improvements constructed under the requirements of these Standard Construction Specifications shall be subject to inspection during construction by the Department. The Consulting Engineer shall inspect and certify the construction (as required per Section ~~L-XVII~~ 2.5 of this Chapter). The Contractor shall submit to the Consulting Engineer a practicable progress schedule in accordance with Section 8, "Progress Schedule", State Specifications. Two (2) working days prior to the commencement of work the Consulting Engineer shall submit the "Progress Schedule" to the Department. Each salient feature of work shall be inspected by the Consulting Engineer and approved by the Department prior to proceeding to subsequent salient features of work.

B. When the improvements are completed, the Contractor shall request a final inspection by the Department and the Consulting Engineer (as required per Section ~~L-XVII~~ 2.5). The Department shall inspect the work and notify the Contractor, the Consulting Engineer and the Developer of any defects or deficiencies to be remedied. At such time as these defects or deficiencies are corrected or completed in accordance with the plans or as specified by the Department, the Department shall recommend acceptance of the work to the Nevada County Board of Supervisors.

C. Fees for inspection of improvements shall be based on the latest fee schedule adopted by the Nevada County Board of Supervisors.

Sec. L-XVII 2.5 Consulting Engineers' Certification

All improvements required to be constructed as a condition of approval shall be inspected during construction by the Consulting Engineer. Upon completion of a salient feature(s) of the work, the Consulting Engineer shall notify the Department, in writing, certifying that the improvements were constructed in accordance with the approved plans and specifications. The Department will then schedule inspection(s) in accordance with Section ~~L-XVII~~ 2.4, above.

Sec. L-XVII 2.6 Permits and Notices

The Developer or Developer's Agent shall be responsible for insuring that all necessary permits have been obtained and all required notices have been given prior to commencement of work, including:

A. An approved set of plans shall be available at the project site at all times during the work, and the Department shall be notified as required by this section.
B. All utility companies affected by the project shall be notified in advance of the work.
C. "Underground Service Alert" (phone 800-642-2444) shall be notified at least two (2) working days in advance of any excavation.

D. The Contractor shall be responsible for receiving rights-of-entry for any work done on private property or in non-public easements.

Sec. L-XVII 2.7 Testing of Materials

Testing of all materials utilized in work performed under these standard construction specifications shall conform to the requirements and methods for testing of the California Department of Transportation and their standard specifications. All materials must meet minimum specifications. Where testing may be allowed to be performed by the Consulting Engineering or authorized laboratory, signed copies of the test results shall be submitted to the Department within forty- eight (48) hours or prior to commencement of a subsequent salient feature of work. Test results shall show clearly the names of the individual and firm performing the tests, as well as the project name, the dates of sampling and testing, origin of the sample and the actual results of the test. The test result shall also indicate whether the test result met minimum specification for the material as well as any corrective action by the Contractor and any retest by which the material was found to be in compliance. The Department reserves the right to verify test results.

~~ARTICLE~~ SECTION 3 ROAD DESIGN STANDARDS

Sec. L-XVII 3.1 General

The following standards for the design of roads represent the minimum values or the lowest acceptable limit in design of roads. These standards apply to both public and private construction. In cases where California State Laws, Nevada County Codes, Resolutions or Ordinances or Project Conditions of Approval provide for more

stringent standards than those shown herein, the more restrictive standard shall prevail. (Ord. 2488.~~,~~ (01/12/2021))

Sec. L-XVII 3.2 Road Classification

Roadways within Nevada County are designated by a functional classification system. Minimum road design standards are based upon the classification of the road or roads being constructed or improved. Roads functionally classified as Minor Collector or greater may be constructed to a standard of a lessor classified road when it can be demonstrated to the Director's satisfaction that the minimum level of service (LOS) criteria of the Nevada County General Plan can be met for the street or road in question at buildout of the General Plan. Routine repair, maintenance, and safety enhancement projects are exempted from strict compliance with these standards.

A. GENERAL PLAN CLASSIFICATIONS

Interim Classification Map~~),~~ Until final adoption by the Nevada County Board of Supervisors of the revised Nevada County General Plan, the 1992 Functional Classification Map approved by the Federal Highway Administration (FHWA) on September 8, 1993, shall be the map referred to by the following paragraph. Upon final adoption of the Nevada County General Plan that map will be superseded by the Nevada County General Plan Land Use and Circulation Maps. The FHWA maps served as a basis for the recommended classification of County roads in the Nevada County General Plan. Upon final adoption of the General Plan, requests will be submitted to amend the FHWA Maps to be consistent will the Nevada County General Plan.

Regionally significant roads are classified by the General Plan or addendum to the General Plan. These roads are identified on General Plan or specific plan maps or other descriptions. Some of these roads may be maintained by the state or by the cities.

1. Interstate Highways and Freeways. Limited access highways (e.g., Interstate 80 and the Golden Center Freeway).
2. Principal Arterials. Roadways carrying some regional traffic and connecting the major population centers within the County (e.g., State Route 49 south of Grass Valley and State Route 20 west of Grass Valley).

3. Minor Arterials. Roadways providing primary access from freeways and principal arterials to major origins and destinations (e.g., Nevada City Highway, Brunswick Road and State Route 174).
4. Collectors (Major and Minor). Streets connecting arterials to local roads. Collectors are broken down into the subcategories of Major and Minor in the rural area of the County (e.g., [Urban] Collector, Sutton Way; [Rural] Major Collector, Alta Sierra Drive; [Rural] Minor Collector, Norlene Drive).

5. Local Road Classifications. The classification of roads not classified as Minor Collector and above by the General Plan Circulation Map is Local Road. These roads function primarily to provide access to individual properties. The standard to which these roads are to be constructed is determined by the type and intensity of the adjacent land uses. The class of local road will be determined by the estimated future Average Daily Traffic (ADT). The future ADT shall be computed using the sum of existing traffic, plus any additional traffic generated from land uses allowed under the County's current General Plan and the Zoning Chapter ~~I~~I of this Code. For the purpose of implementing the General Plan, local roads can be broken into the following subcategories:

a. Minor Collector Equivalent (Local Class 3) Road: Serves a buildout volume in excess of 2,000 Daily Trips (A.D.T.) and is constructed to the same standard as those roads classified as Minor Collector on the General Plan Circulation Plan.

b. Local Class 2: Serves a buildout volume of 401 to 2,000 Average Daily Trips (A.D.T.).

c. Local Class 1: Serves a buildout volume of 101 to 400 A.D.T.

d. Fire Standard Access Road: Is the minimum standard for access to a driveway for new construction and serves a maximum of 100 A.D.T.

B. FUTURE TRAFFIC GENERATION

Future traffic generation from allowed land uses will be based on the trip generation factors in the latest edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual unless specific local studies have been conducted and accepted for conditions unique to Nevada County. In the case of uses not specifically listed in the ITE Trip Generation Manual or for which local studies have not been conducted, the most similar use will be used.

The Chart on the following page summarizes the above Classifications.

TABLE I

NEVADA COUNTY ROAD CLASSIFICATION SYSTEM

Functional Classification	Jurisdiction	Criteria	Example	Purpose
Interstate	State	See Purpose	I-80	Limited access highways carrying regional and interstate traffic
Other Freeways or Expressways	State	See Purpose	Golden Center Freeway	Limited access highways carrying regional traffic
Other Principal Arterials	State	See Purpose	SR 49 South of Grass Valley	Major roadways providing access from rural to urban areas and access to freeways
Minor Arterial	State, County or City	See Purpose	Nevada City Hwy., SR 174	Streets providing through service to industrial and commercial areas and between cities and/or providing access to highways and freeways
Collector (Urban)	County or City	See Purpose	Sutton Way	Serves high density urban, industrial or commercial areas
Major Collector (Rural)	County	See Purpose	Alta Sierra Dr.	Roads that collect traffic from minor collectors and local roads
Minor Collector (Rural)	County	See Purpose	Bitney Springs Road	Roads that collect traffic from local roads and individual parcels
Local				
Class 2	County	401-2000 ADT	Jones Bar Rd.	Roads whose primary purpose is to provide access to individual properties
Class 1	County	101-400 ADT	Augustine Road	Roads whose primary purpose is to provide access to individual properties
Fire Standard Access Road	County	Up to 100 ADT		Minimum standard vehicular access to a driveway for new construction
Driveway	County	Up to 2 parcels		Minimum standard vehicular access to a dwelling. See Chapter XVI: Fire Safety Regulations, Nevada County Land Use and Development Code, for complete driveway specifications

(Ord. 2488.~~,~~ (01/12/2021))

Sec. L-XVII 3.3 Construction of Major Roads

When a subdivider is required to provide as an improvement a road functionally classified as a Minor Collector or greater within or adjacent to their ~~his or her~~ development, the right-of-way shall conform to the width and alignment standards contained herein for functionally classified roads. Oversizing of improvements may be required due to the eventual capacity needs of cumulative growth beyond the infrastructure needs generated by an individual project. Such oversized improvement may be subject to a reimbursement agreement pursuant to Sections ~~L-IX~~ 3.2 and ~~L-IX~~ 3.5 of this Code. If the project needed to accommodate cumulative growth is

contained within the list of projects upon which development fees are based, credit towards an individual project's development fees may be given in lieu of entering into a reimbursement agreement for the oversized improvement. All construction, including cut and fill slopes, shall be contained within the right-of-way offered for dedication.

A. OFFSITE ACCESS

The subdivider shall provide proof of adequate offsite right-of-way. Adequate offsite right-of-way is defined as the legal right of the developer and his assignees to use of a road that is of sufficient width to contain the entire road prism (including cut and fill slopes) which is required under this Chapter and which provides access to a County road or State highway. When the parcels being created are less than three (3) acres in size, the subdivider shall improve offsite County roads to a minimum of the local class road standard appropriate to the project based on the future ADT. In the case that an existing offsite County maintained access road is not within the Nevada County Department of Public Works Five Year Road Capital Improvement Program for upgrading to be adequate in capacity to accommodate the additional traffic to be generated by a specific project, the developer shall be responsible for upgrading the offsite County road to the standard appropriate to the existing traffic plus the traffic calculated to be produced by the project. (Ord. 2239. (05/29/2007))

~~A.~~B. EXISTING COUNTY ROADS

The subdivider shall surface existing onsite County roads in accordance with the standards based on the traffic that will be generated by his or her subdivision. The minimum road prism, including cut and fill slopes, to be constructed shall be that standard appropriate to accommodate cumulative growth and shall be subject to the oversizing provisions as discussed above under "Construction of Major Roads".

C. STREET EXTENSIONS

Streets which are to be extended in the future are not required to be constructed providing they do not exceed one (1) lot in depth and provided all lots adjacent to such streets have adequate frontage on and access to another street. Right-of-way and slope easements sufficient for construction shall be provided. (Ord. 2488.~~,~~ (01/12/2021))

Sec. L-XVII 3.4 Design Geometrics

A. DESIGN WIDTHS AND SPEEDS

The minimum design widths, speeds and other major design criteria for road construction are as follows in the chart on the following page. Further details are provided in the County's Standard Drawings which supplement this Chapter.

TABLE II

NEVADA COUNTY STANDARD SPECIFICATION SUMMARY CHART

Functional Classification	**Min. Right-of-Way Width Note 4**	**Standard Lane Width**	**Standard Shoulder Width**	**Fuel Mod. Area Width**	**Standard Design Speed**	**Standard Max. Grade Below 3500′**	**Standard Max. Grade Above 3500′**	**Required Surface**
Minor Arterial (Urban)	60-100′	12′	Varies	10′ min.	35 mph	10%	8%	Note 1
Minor Arterial (Rural)	60′	12′	6′	10′ min.	35 mph	10%	8%	Note 1
Collector (Urban)	60-100′	12′	Varies	10′ min.	35 mph	10%	8%	Note 1
Major Collector (Rural)	60′	12′	4′	10′ min.	35 mph	10%	8%	Note 1
Minor Collector (Rural)	60′	12′	4′	10′ min.	35 mph	10%	8%	Note 1
Local Class 3 Over 2000 ADT	60′	12′	4′	10′ min.	35 mph	10%	8%	Note 1
Class 2 401-2000 ADT	50′	10′	4′	10′ min.	25 mph	10%	8%	Note 1, 5, 6
Class 1 101-400 ADT	50′	10′	2′	10′ min.	20 mph	10%	8%	Note 1, 5, 6
Fire Standard Access Road Up to 100 ADT Two-Way	50′	10′	2′	10′ min.	20 mph	16%	16%	Note 2, 5, 6
One-Way	36′	12′	2′	10′ min.	20 mph	16%	16%	Note 2,5
Driveway								Note 3

Note 1: All structural sections for this classification based on future year traffic and estimated percentage of that traffic which will be heavy vehicle.

Note 2: Surface capable of supporting a 75,000 lb. vehicle with a minimum six (6) inch A.B. compacted to ninety-five percent (95%) with subgrade compacted to ninety-five percent (95%).

Note 3: Driveway standard specifications are contained in Chapter XVI of the Nevada County Land Use and Development Code, Fire Safety Regulations.

Note 4: Intersection channelization may increase the minimum right-of-way at spot locations.

Note 5: If approved by the Engineer, all grades over ten percent (10%) will require minimum three inch (3″) A.C. surface (Section L-XVII 3.4[C])

Note 6: All roads shall be constructed to provide a minimum of a two(2) ten (10) foot traffic lanes, not including shoulder and striping.

The Nevada County Department of Public Works Standard Drawings, available from the Nevada County Department of Public Works, illustrate and clarify the standard specifications contained within this Chapter, as well as the Driveway specifications. (Ord. 2239. (05/29/2007))

B. HORIZONTAL ALIGNMENT

Changes in horizontal alignment of roads shall be made with horizontal circular curves with the edges of the pavement parallel to and equidistant from the centerline. Design of the horizontal alignment of roads shall be in accordance with the standards outlined in the California Department of Transportation “Highway Design Manual” in accordance with the appropriate design speed. Unless otherwise approved by the Engineer, the centerline of the road improvement shall coincide with the right-of-way centerline or other previously approved alignment.

C. VERTICAL ALIGNMENT

Grade changes in the vertical alignment greater than two percent (2%) shall be designed with parabolic vertical curves. The maximum grade, unless otherwise specified or approved by the Engineer, is ten percent (10%) below 3,500-foot elevation and eight 8 percent (8%) above 3,500-foot elevation. The maximum grade without an Exception shall be sixteen (16%). The minimum grade for all classes of

roads is one-half percent (0.5%). The design of the vertical alignment of roads shall be in accordance with the standards outlined in the California Department of Transportation "Highway Design Manual" in accordance with the appropriate design speed.

The minimum vertical curve data to be complete and shown on the improvement plans shall identify the point of intersection elevation, the tangent gradients, the middle ordinate and the length of curve.

The minimum length of a vertical curve shall be one hundred (100) feet.

D. ROSS SLOPE DESIGN

The standard cross slope for all roads shall be two percent (2.0%), sloping both directions from the "crown" or high-point at the centerline towards road edge. Any deviation from this standard requires prior approval from the Engineer.

Superelevated cross sections in horizontal curves shall have a maximum rate of superelevation of six percent (6%) for roads below 3,500 elevation. For roads at elevation 3,500 or above, the maximum rate of superelevation shall be four (4%).

E. INTERSECTION DESIGN

Intersecting roads shall not exceed six percent (6%) grade for a minimum of thirty (30) feet from the edge of the traveled way of the intersecting road.

All roads shall intersect as nearly as possible at right angles, but in no case shall the angle of intersection be less than sixty (60) degrees.

Roads intersecting any road from opposite sides shall have their centerlines directly opposite, or the offset between intersections shall be a minimum of one hundred fifty (150) feet.

Minimum sight distances for intersections shall be designed to meet all standards as shown in the Nevada County Standard Drawings, Required Sight Distance at Intersection/Driveways.

F. CURVE WIDENING

No road or roadway structure shall have an inside radius of less than fifty (50) feet. In cases where the centerline radius of a road is less than or equal to two hundred (200) feet, the inside edge of pavement shall be widened by four (4) feet. In cases where the centerline radius is one hundred (100) to two hundred (200) feet, the inside edge of pavement shall be widened by two (2) feet.

G. ADDITIONAL RIGHTS-OF-WAY

The advisory agency may require additional rights-of-way to accommodate traffic or parking on business or major traffic streets. The advisory agency may also require right-of-way for non-vehicular traffic (i.e., bikeway, equestrian path, foot path, if the right-of-way is shown on an adopted master plan or specific plan).

H. SLOPE EASEMENTS

Slope easements shall be provided wherever they are needed to contain the cut or fill slopes. The slope easement line shall be set at the toe of the fill or top of the cut plus ten (10) feet.

I. CUL-DE-SAC

Roads that dead end or transition to a driveway or non-standard road shall be terminated with a bulb-shaped cul-de-sac at the point where the road ends or transitions as shown in Standard Drawings. Cul-de-sacs shall have a minimum forty (40) foot radius surfaced bulb, measured from the center of the bulb to the edge of the surfacing if parking is not allowed on the road. If parking is allowed on the road, a minimum fifty (50) foot radius surfaced bulb shall be provided. Said surfacing shall be the same as required for the terminating road.

Hammerhead turnaround designs may be utilized subject to approval by the Engineer for local class roads when unusual topographic or other conditions prevent cul-de-sac construction. If a hammerhead-T is used, the top of the “T” shall be a minimum of sixty (60) feet in length.

The maximum length for a cul-de-sac or other dead--end road, including all dead-end roads accessed from that dead--end road, shall not exceed the following cumulative lengths, regardless of the number of parcels served:

Parcels zoned for less than one (1) acre 800 ft.

Parcels zoned for one (1) acre to four and ninety-nine one-hundredths (4.99) acres 1320 ft.

Parcels zoned for five (5) acres to nineteen and ninety-nine one hundredth (19.99) acres 2640 ft.

Parcels zoned for twenty (20) acres or larger 5280 ft.

All lengths shall be measured from the edge of the road surface at the intersection that begins the road to the end of the road surface at its farthest point. Where a dead-end road crosses areas of differing zoned parcel sizes, requiring different length limits, the shortest allowable length shall apply.

For parcels zoned for five (5) acres or larger, turnarounds shall be provided at maximum 1,320-foot intervals.

Each dead--end road, including gated access roads, shall have a turnaround constructed at its terminus.

J. UTILITIES PLACEMENT

1. In no case shall utility poles, light standards, guy wires, etc. be placed closer than six feet (6′) to the edge of the traveled way. Manhole covers, grates, valve boxes, etc. shall be set so as not to interfere with snow removal.
2. New utilities shall be located as follows:

    a. Water – three (3) feet from edge of pavement on the north or west side of the road;
    b. Sewer – five (5) feet from the road centerline on the south or east side of the road;
    c. Storm Drains – five (5) feet from the road centerline on the north or west side of the road;

d. Joint trenches, telecommunications and other utilities – either side of the road and at least six (6) feet from the centerline of roadside ditches

3. Telecommunication Requirements - The installation of conduit for telecommunication purposes is required for all Capital Improvement Projects, development projects and Encroachment Permit work that includes any of the following:

a. All new arterial/collector road and bridge construction.
b. All new subdivision roads where underground utilities are required.
~~b.~~c. Arterial/Collector road reconstruction/widening involving reconstruction of the base and/or subbase on sections of a road spanning: 1) between two road intersections or more; or 2) 1,000 feet in length or more.
~~c.~~d. Bridge reconstruction.
e. Trench work on arterial/collector roads spanning: 1) between two road intersections or more; or 2) 1,000 feet in length or more.

An exception may be granted in writing by the Director per the following:

a. Capital Improvement Projects: Separate alternative bid items will be required for all projects where telecommunication conduit is required per the above. If funding is not identified from the County or others upon award of a construction contract or upon commencement of the work by the County, an exception may be granted.

b. Development project, non-County maintained road and/or Encroachment Permit work: An applicant may request funding from the County for the cost to construct telecommunication conduit if other funding sources are not available, less any costs shared by other utilities. Requests must include the associated project name, associated County permit numbers, an engineer or contractor estimate with a separately identified cost for construction of conduit for telecommunication use, the amount requested and any additional pertinent information. Approval of funding from the County will require Board of Supervisor approval of a funding agreement. In addition, an applicant may request to install conduit on other roads (other than arterials and collectors) for County consideration.

c. Any location where trenching is not advisable per a stamped and signed report from a licensed Geologist, Geotechnical Engineer or Civil Engineer.

Conduit for telecommunication purposes shall be a minimum of four inch (4") HDPE constructed per County trench backfill requirements with pull boxes every 250 feet. Telecommunication conduit must be constructed in road right-of-way or in Public Utility Easements or equivalent and may be constructed in joint trenches with other dry utilities. Completed telecommunication conduits must be granted to a telecommunication company or the County of Nevada.

K. ONE-WAY ROADS

One-way roads may be permitted subject to the approval of the Engineer. In no case shall one-way roads serve more than ten (10) dwelling units or exceed 2,640 feet in length. Standard one-way road structural sections are as shown on the Nevada County Standard Specifications Summary Chart. The surfacing requirements for one-way roads shall be the same as for the overall project of which they are a part. One-way roads shall serve only one direction of traffic and shall be signed appropriately and to the satisfaction of the entity responsible for fire protection. One-way roads shall connect on both ends to a two-way road.

L. MINIMUM VERTICAL CLEARANCE

The minimum vertical clearance over all roadways shall be fifteen (15) feet.

M. GATES ON ACCESS ROADS

1. Gate entrances shall be at least two feet wider than the width of the traffic lanes serving the gate~~,~~ and shall have a minimum gate opening of fourteen (14) feet.
2. All gates providing access from a road to a driveway or another road shall be located at least thirty (30) feet away from the primary road right-of-way or easement and shall open to allow a vehicle to stop without obstructing traffic on that primary road.
3. All gates installed on emergency access roads after May 14, 2010 shall be subject to the following provisions:

    a. At no time shall a gate on an emergency access road be locked.
    b. The following standard signage shall be required on all gates on emergency access roads: "Emergency Access Only. This Gate Shall Remain Unlocked."
    c. Pursuant to the enforcement powers established by the Nevada County ~~Land Use and Development~~ Code ~~Section L-XVII~~ 8.3 and 8.4, the County,

or an agent of the County, reserves the right to remove locks from gates or to remove other encumbrances, including but not limited to boulders, ditches, and berms, that inhibit the use of an emergency access road for its intended purpose.

4. All gates installed prior to May 14, 2010, shall be subject to the legal requirements, standards and/or conditions that were applicable at the time of original approval and installation.

5. Security gates shall not be installed without approval of the Fire Marshal's Office of the fire authority having jurisdiction. Where security gates are installed, they shall have an approved means of emergency operation. The security gates and the emergency operation shall be maintained operational at all times. (Ord. 2488.~~,~~ (01/12/2021); Ord. 2474.~~,~~ (01/14/2020))

Sec. L-XVII 3.5 Structural Section Design

A. MINIMUM STRUCTURAL SECTION STANDARDS ACCORDING TO ROAD CLASS AND PARCEL SIZE

Streets within the parcel(s) being developed and offsite non-county maintained access to the parcel(s) are to be brought/constructed to the minimum structural section condition indicated in the following table for the classes of streets within the parcel and the offsite access street and the parcel size being created. Higher standards are required if dictated by the projected traffic from the project.

TABLE III

MINIMUM SURFACING STANDARDS BY PARCEL SIZE AND FUNCTIONAL CLASSIFICATION

Parcel Size Acres	Fire Standard Access Rd <100 ADT Note 2	Local Class 1 101-400 ADT Note 1	Local Class 2 401-2000 ADT Note 1	Collector Minor >2000 ADT Note 1	Collector Major & Urban	Arterial Minor	Elevation
0-2.999	N/A	N/A	3″A.C/8″A.B.	3″A.C/8″A.C.	Engineered Design	Engineered Design	
3-4.999	6″ A.B. plus improve. Plans and Right-of-Way	3″A.C./6″A.B. 3″A.C/8″A.B.	3″A.C./8″A.B.	3″A.C./8″A.B.	Engineered Design	Engineered Design	<3500′ >3501′
5-9.999	6″ A.B. plus improve.	6″ A.B. Note 2, plus improve.	6″ A.B. Note 2, plus improve.	3″A.C./8″A.B.	Engineered Design	Engineered Design	

	Plans and Right-of-Way	Plans and Right-of-Way	Plans and Right-of-Way				
10-39.999	6″ A.B. plus improve. Plans and Right-of-Way	6″ A.B. plus improve. Plans and Right-of-Way	6″ A.B. plus improve. Plans and Right-of-Way	6″ A.B. plus improve. Plans and Right-of-Way	6″ A.B. plus improve. Plans and Right-of-Way	6″ A.B. plus improve. plans and Right-of-Way	
40 UP	6″ A.B. plus Right-of-Way	6″ A.B. plus Right-of-Way	6″ A.B. plus Right-of-Way	6″ A.B. plus Right-of-Way	6″ A.B. plus Right-of-Way	6″ A.B. plus Right-of-Way	

Note 1: Minimum requirements. Actual structural section design to be based on "R" value and "T.I."

Note 2: six inches (6″) A.B. = 6″ A.B. at ninety-five (95%) compaction over subgrade compacted to ninety-five (95%). If grade exceeds ten percent (10%), surface shall be three inch (3″) A.C. over six inch (6″)A.B.

Higher Standards are required if dictated by projected traffic from project.

B. STRUCTURAL SECTION DESIGN

The structural section design shall be based on the R-value of the underlying material, with the minimum structural sections as shown above and on the Standard Drawings. The location of R-value tests within the project area shall be selected so as to provide representative samples for the entire project area. Additional testing may be required in specific soil areas as directed by the Engineer.

C. AGGREGATE BASE (AB) OR BASE

Class 2 Aggregate Base is aggregate base in conformance with the provisions of Section 26, "Aggregate Bases" of the CALTRANS Standard Specifications.

D. DOUBLE SEAL

Double seal coat is seal coat in conformance with the provisions of Section 37, "Bituminous Seals" of the CALTRANS Standard Specifications.

E. ASPHALT CONCRETE (AC) PAVING OR PAVEMENT

Type B asphalt concrete is asphalt concrete in conformance with the provisions of Section 39, "Asphalt Concrete" of the CALTRANS Standard Specifications. (Ord. 2488.~~,~~ (01/12/2021); Ord. 2474.~~,~~ (01/14/2020))

Sec. L-XVII 3.6 Signing

Sign type and location shall conform to the following:

A. STREET SIGNS

Street signs shall be of the type and size as shown in the Nevada County Standard Drawings. A street sign installation with four sign plates on each post is required at each intersection. The location of street sign installations shall be shown on the improvement plans.

B. TRAFFIC SIGNS

Stop signs, speed limit signs and other traffic control signs shall be of the size and type and shall be installed in locations that are in conformance with the State of California, Department of Transportation Traffic Manual and as required and approved by the Engineer. (Ord. 2488.~~,~~ (01/12/2021))

Sec. L-XVII 3.7 Curb, Gutter and Sidewalk

A. ~~A.~~ Curb, gutter and/or sidewalk shall be installed adjacent to all road improvements where required by Ordinance, Resolution or as a Condition of Approval for the project. Type E rolled curb and gutter and the sidewalk adjacent to the curb and gutter shall be placed upon a layer of Class 2 aggregate base compacted to ninety-five (95%) percent relative compaction. The depth of the aggregate shall be thick enough so that when combined with the concrete above the resulting structural section is equivalent to that of the adjoining roadway. In no case shall the depth of Class 2 aggregate be less than two (2)
inches.

B. Type A2-6 curb and gutter shall be placed upon a layer of Class 2 aggregate base as described for Type E rolled curb and gutter except that the sidewalk adjacent to Type A2-6 curb and gutter need not be placed upon aggregate base, provided that the

subgrade is compacted to ninety five (95%) percent relative compaction. All curb, gutter and sidewalk shall be constructed in accordance with the latest edition of the State of California, Department of Transportation Standard Plans and Section 73, "Concrete Curbs and Sidewalks" of the Standard Specifications.

C. In areas above the ~~three thousand five hundred (~~3,500~~)~~ foot elevation, Type E rolled curb and gutter shall be constructed (see CALTRANS Standard Plans).

D. The minimum width for all sidewalks shall be four (4) feet except as otherwise specified or required.

E. Sidewalks shall be six (6) feet wide at bus turnouts and at signalized intersections. Where utility poles or other obstructions are situated within street-side sidewalks, a minimum of four feet of clear uninterrupted sidewalk area shall be provided. Where it is necessary to widen the sidewalk beyond the standard width to obtain the four (4) foot clearance, the widened area shall extend a minimum of five (5) feet beyond each side of the obstruction and a ten foot taper on each side of the widening shall be required.

F. All construction shall comply with the Americans With Disabilities Act of 1990 (42 U.S.C.S. Secs. 12101, et seq.). (Ord. 2488.~~,~~ (01/12/2021))

Sec. L-XVII 3.8 Bikeways

All bikeways shall be constructed in locations designated by and designed in conformance with the Nevada County Bicycle Master Plan and the CALTRANS Highway Design Manual, Chapter 1000, "Bikeway Planning and Design." (Ord. 2488.~~,~~ (01/12/2021))

Sec. L-XVII 3.9 Snow Stakes

Snow stakes shall be provided and placed by the Department where applicable. The Developer shall be responsible for payment to the Department for this service on a one-time-only basis. (Ord. 2488.~~,~~ (01/12/2021))

Sec. L-XVII 3.10 Snow Storage Easements

Snow storage easements shall be provided in subdivisions above 3,500 feet elevation and shall be ten (10) feet wide on both sides of the road right-of-way. (Ord. 2488.~~,~~ (01/12/2021))

Sec. L-XVII 3.11 Maintenance Agreements

If the roads constructed within a subdivision are to remain private, then a maintenance entity shall be formed to insure continued maintenance on the road system. Maintenance of the road system shall include maintenance of the fuel modification zones and minimum vertical clearances. The entity shall be formed in accordance with the Standard Maintenance Agreement on file in the Department of Public Works. The subdivider may be required to annex to an adjacent existing maintenance entity. (Ord. 2488.~~,~~ (01/12/2021); Ord. 2239. (05/29/2007))

Sec. L-XVII 3.12 Petition for Exception

Modification of the required standard, except as provided within this Chapter, for the construction of specific roads shall follow the petition for exception process as specified in Section governing Subdivisions~~L-IV~~ 2.6 of this Code. Otherwise, the Advisory Agency, in the case of petitions for exceptions from the Road Standards, shall be required to make findings of fact in support of the following in addition to those findings of fact specified in Section governing Subdivisions~~L-IV~~ 2.6:

That an exception to any Fire Safe Standard, including those standards adopted by Chapter governing Fire Safety Regulations~~XVI~~ of this Code and the Chapter governing ~~XVII~~ Fire Standard Access Road improvements, will provide the same practical effect of fire protection and is supported by the entity responsible for assuring compliance with ~~California Code of Regulations Title~~Cal. Code Regs. Tit. 14, Natural Resources Division 1.5, Department of Forestry and Fire Protection Chapter 7, Subchapter 2, Articles 1-5.

The same practical effect can be met in some cases by incremental improvements of offsite access roads proportional to the intensity of development proposed.

It is intended that every effort be made to grant a petition for exception that includes feasible road improvement requirements for tentative parcel maps for living persons, or the testamentary disposition of deceased persons, who owned their property prior

to March 4, 1972. The Board finds that such property owners have contributed significantly to the public trust through open space conservation by avoiding development of their property in prior years.

All requests for design exceptions shall be reviewed and approved by the County Engineer. In the case of requests for design exceptions for privately funded improvement projects, the Advisory Agency shall take action on the recommendation of the County Engineer and the findings for or against the exception shall be noted in the finding of facts either approving or denying the petition. All Petitions for Exceptions shall contain, at a minimum, the information requested on a Design Exception Information Form to be provided by the Department. (Ord. 2488.~~,~~ (01/12/2021); Ord. 2474.~~,~~ (01/14/2020); Ord. 2161. (10/05/2004))

~~ARTICLE~~ SECTION 4 IMPROVEMENT PLANS

Sec. L-XVII 4.1 General

Improvement plans, specifications and cost estimates prepared for all proposed private and public road, drainage and related improvements, including any necessary dedications, easements and rights-of-entry, shall be submitted to the Department of Public Works for approval. Approval, substantiated by the signature of the Engineer, is required prior to the beginning of construction of any such improvements. The Engineer shall order work to cease on any project if the contractor does not have approved plans in his/her possession. Enforcement/appeal of the stop work notice shall be as outlined in Section~~Articles~~ 8 of this Chapter. (Ord. 2239. (05/29/2007))

The fees for the Department's review of the plans shall be based on the latest fee schedule adopted by the Nevada County Board of Supervisors.

A. REFERENCE TO 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 County of Nevada Standard Construction Specifications."

B. PLAN REQUIREMENTS

Two (2) sets of plans, complete and in accordance with these Road Standards, along with any required specifications, computations, test data, cost estimates and other material requested by the Engineer shall be submitted to the Department for review.

The drafting of the plans must be heavy and large enough (hand lettering 1/8-inch minimum size, CAD lettering 1/10-inch minimum) to produce clear, sharp prints from microfilmed copies.

One (1) copy of the reviewed plans with corrections required by the Engineer shall be returned to the Consulting Engineer. The required corrections shall be made to the original tracing and two sets of the revised plans shall then be submitted to the Department along with the signature sheet for final review and signature. Any changes or additions to the plans other than those as required by the Department shall be highlighted or by some other means identified on the revised prints submitted by the Consulting Engineering. When approved and signed, the Department will return the signature sheet to the Consulting Engineer. Throughout the project the consultant will supply the County with prints as required by the County. After the project is completed, the Consultant will supply the County with one reproducible set of "As-Built" drawings.

1. Standard Sheets and Scales: Improvement plans shall be prepared on plan and profile sheets twenty-four (24) inches by thirty-six (36) inches.

Scales shall be horizontal 1″ = 20′, 40′ or 50′, vertical 1″ = 4′, 8′ or 10′.

Horizontal scale of plan and profile shall match.

~~1.~~2. Title Sheet: A title sheet for all plans shall be prepared showing the entire project complete with any district boundaries, city limits, street names, section lines and corners; and the location within the County.

3. The title sheet shall also include an index of the sheets, the date and scale of the drawing, and signature blocks for the Consulting Engineer and the approvals of the Engineer and other officials as required. Typical sections, construction details, etc. shall be placed elsewhere in the plans unless otherwise approved by the engineer.

Title Blocks: Each sheet shall have an approved title block showing the sheet title, number, scale, date, the Consulting Engineer's name and the name of the project.

Samples may be obtained from the Department. The preferred location is across the bottom of the plan sheets.

4. Typical Sections: A typical section for each type of road or facility proposed within the improvement shall be included as part of the plan.

5. Right-of-way: Right-of-way lines, lot boundaries and numbers, drainage easements, utility easements, section lines and corners 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 and labeled.

6. Topography: All pertinent topographic features which are affected by design or construction shall be shown. The tops of cuts and toes of fills shall be shown on the layout plans.

7. Profiles: The plans shall clearly show the existing and proposed profiles of all roadways, drainage ditches, storm drains and utilities. Curb returns and edge of pavement profiles shall be furnished for each intersection. Where driveways are to be built, profiles and work limits shall be shown on the plans.

Centerline stationing and elevations shall be shown at 50-foot intervals. Vertical curve lengths and tangent gradients shall also be included, and all ground lines, ditches, gutters and pipes shall be shown by distinctive symbols and labeled.

8. Bench Marks: Bench marks and datum shall be clearly shown on the plans both as to location, description and elevation. The datum shall be 1929 Sea Level Datum (USGS or USC & GS).

When there are no existing USGS or USC & GS bench marks within one thousand (1000) feet of the project, the Consulting Engineer may use an assumed datum after obtaining approval from the Engineer. In all cases, permanent bench marks shall be placed on each project in sufficient number and durability and efficiently placed so as not to be readily disturbed to assure the perpetuation or facilitate reestablishment of the elevation of any point in the project. The location(s) of the permanent bench marks shall be shown on the plans.

9. Basis of Bearing: The location, description and relationship of monuments used for horizontal control shall be clearly shown on the plans with reference made to supporting recorded maps or unrecorded maps on file with the Department.

10. Stationing and Orientation: Insofar as practical, the plans shall be arranged such that the north arrow is pointed toward the top of the sheet. The stationing on the plan and profile shall read from left to right. Centerlines or right-of-way lines shall be labeled with linear, angular and radial data sufficient to determine their bearings and lengths and relationship to those monuments shown on the plans per Section ~~L-XVII~~ 4.3.I., above.

11. Cross-Sections: Cross-sections shall be submitted with the plans and prepared at fifty (50)-foot intervals and more often where determined necessary by the Engineer. A cross-section at each culvert location and all existing or proposed driveway locations shall be shown. Cross-sections for roads shall be at ninety (90) degrees to, or radial with the centerline of the road.

The cross-sections shall be plotted on an appropriate scale on standard cross-section sheets. The roadway template shall be accurately plotted and properly stationed. Centerline elevations of the original ground and finish grade shall be shown and properly labeled. Right-of-way lines and slope easement lines shall be shown and labeled.

12. Required Notes: A list of notes required by the Department shall be clearly drafted onto the original plan drawings. These required notes are available on request from the Department of Planning. In addition, notes specifically required by the project's Conditions of Approval shall also be made part of the plans. (Ord. 2239. (05/29/2007))

13. Drainage List and Profiles: A drainage list shall be made part of the plans. The drainage list shall show the size, gauge, slope, length and type of all drainage structures to be placed on the project, including culverts, drainage inlets, pipes, headwalls, wingwalls, end sections, etc.

Drainage profiles shall be prepared and included as part of the plans. Each drainage profile sheet shall include the type, size, length, slope, invert elevations and location of culverts. Drainage appurtenances (headwalls, wingwalls, drainage inlets, etc.), all flowline elevations, existing ground lines and proposed finished grade shall be shown and properly labeled and/or dimensioned.

14. Superelevation Diagram: When superelevation is used, a diagram shall be drawn on the profile sheet. Superelevation diagrams shall be designed in accordance with the standards outlined in the CALTRANS "Highway Design Manual".

For superelevation through intersections, a separate plan and profile of the intersection shall be included. Cross slopes, elevations at drainage structures and flowline of drainage ditches or curb and gutter (if applicable) shall be shown and properly labeled.

C. 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, Nevada County Ordinance 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 Department's review of the plans.

D. PLAN REVISIONS

No changes shall be made to the approved plans unless authorized by the Engineer. Should changes become necessary, the Consulting Engineer shall resubmit two (2) copies of the affected plan sheets with the authorized changes noted and dated in a revision block on the title sheet. The changes shall be identified by the revision number in a triangle delineated on the plans adjacent to the change. The proposed changes shall be reviewed by the Department and approved by the Engineer. The Engineer may order changes in the plans in order to complete the necessary improvements.

E. UTILITIES

All existing and proposed utilities shall be shown on the plans to the extent practical. The Consulting Engineer shall submit copies of both the preliminary and approved plans to the affected utility companies. The Developer or the Developer's agent is responsible for obtaining approvals and necessary permits from utilities or other governmental agencies when required. The Department may condition approval of the plans upon receipt of proper permits from other agencies.

F. AS-BUILT PLANS

The Consulting Engineer or the developer's construction engineer shall keep an accurate record of all approved deviations from the plans and shall provide a reproducible set of plans to the Department upon completion of the work before final approval of the completed improvements.

G. ESTIMATES

An estimate of the cost of work, showing quantities and unit prices prepared by the Consulting Engineer, is required for all projects where the project proponents desire to enter into a Subdivision Improvement Agreement in accordance with Section governing Subdivisions~~L-IV~~ 3.9. Two (2) sets of computations showing how the quantities in the estimate were determined shall be furnished to the Department with the Improvement Plan submittal. Unit prices must be based upon the current approved prevailing wage schedule available at the Department.

Sec. L-XVII 4.2 Tentative Map Approval - Improvement Plans, Inspection, Completion, Acceptance

In addition to the General Requirements for Improvement Plans, the following shall apply in the case of tentative map approval:

A. GENERAL

Following approval of the tentative map, the subdivider shall cause to be prepared and submitted for approval complete construction plans for the improvements required by this Chapter.

B. REQUIREMENTS

The plans shall be prepared under the direction of a registered civil engineer, licensed by the state of California, and shall show the complete plans, profiles and details for all street work, drainage channels and structures, retaining walls or other improvements to support cut slopes and embankments, bridges, the location of underground utilities which may control the location and elevation of storm drains and culverts, the location of fire hydrants, street monuments, curbs, gutters, driveways, if constructed in conjunction with subdivision improvements, structures and drainage facilities to control slides, location of street lights, sanitary sewers and other improvements which may be required to complete the work. If the plans include three (3) or more sheets, a key map showing the streets, lots, street names,

storm drains, the area covered by each sheet of the plans, and a list showing the sheet numbers of the plans and of the profiles for streets and storm drains shall be included on the first sheet of the plans.

C. CHANGES

Requests shall be made by the subdividers or engineer for review of changes appearing necessary or desirable prior to or during construction and shall be submitted to the Department of Planning and shall be accompanied by four (4) sets of revised drawings showing the proposed revision. The Department of Planning shall review such requests and shall return one (1) copy of such drawing showing any corrections necessary for approval or notification of approval to the subdivider's engineer. (Ord. 2239. (05/29/2007))

D. REVIEW PREREQUISITE FOR FINAL AND PARCEL MAP APPROVAL

The review and signing of the improvement plans by the Department of Planning shall be a condition precedent to the approval of the final or parcel map for the subdivision by the Board of Supervisors when improvements are required. (Ord. 2239. (05/29/2007))

E. SUPPLEMENTARY PLANS AND DOCUMENTS

Supplementary plans and documents shall include grading plans, hydrology, hydraulic computations and structural computations as required.

F. INSPECTIONS REQUIRED

All work done in constructing the improvements and all materials furnished shall be subject to the inspection of the Department of Transportation.

G. RIGHT OF ENTRY

The Department of Transportation shall have access to the work at all times during its construction and shall be furnished with every reasonable facility for ascertaining that the materials used and the workmanship are in accordance with the requirements of this Chapter.

H. PRIOR WORK REJECTED

If any work on improvements is done by the subdivider prior to the approval of the improvement plans or prior to the inspection of the improvements as required by the Department of Transportation, such work may be rejected and shall be deemed to have been done at the risk and peril of the subdivider.

I. COMPLETION

1. General Requirements: The subdivider shall prosecute the work to completion without undue delay except for inclement weather or other reasonable causes.

2. Delay - Penalty: Delay on completion of the work beyond the period stated in the subdivision agreement, unless an extension thereof is approved by the Board of Supervisors and the surety company, may result in forfeiture of the cash deposit and/or security, or a portion thereof, for the completion of the work.

J. ACCEPTANCE

1. Recommendation by Department of Transportation: When all improvement work required by the improvement plans, or a complete unit thereof, is complete to the satisfaction of the Department of Transportation, the Department of Transportation shall notify the Board of Supervisors that such work has been satisfactorily completed and recommend the acceptance of the Board of Supervisors of the completed work.

2. Resolution Filing: Upon satisfactory completion of all work required to meet the requirements of this Section and its acceptance by the Board of Supervisors, the Board of Supervisors shall cause to be filed a resolution of acceptance.

~~ARTICLE~~ SECTION 5 STORM DRAINAGE

Sec. L-XVII 5.1 Hydrologic Design

Watershed areas of six hundred forty (640) acres and less can be analyzed by the Rational Method. Watershed areas larger than six hundred forty (640) acres shall be analyzed utilizing the Soil Conservation Service (SCS) Unit Hydrograph Method or a method agreed upon by the Consulting Engineer and the Engineer prior to submitting the analysis to the Engineer for review.

The submittal of the improvement plans shall be accompanied by the drainage analysis consisting of a watershed area map and drainage design calculations (two (2) copies each).

A. DESIGN STORMS

Drainage design calculations shall show the calculations used to determine the hydraulic load for both the ten (10)-year and one hundred (100)-year design storms at each drainage facility. The specific design requirements are detailed in Sections ~~L-XVII~~ 5.2, 5.3, 5.4, 5.5 and 5.6 of this Chapter~~ode~~.

B. RATIONAL METHOD OF ESTIMATING PEAK RUNOFF

1. Time of Concentration. The time of concentration is the time required for the runoff from the most remote point in the watershed to reach the point of concentration at which the flow is to be calculated. It is generally composed of two parts, the overland flow time (sheet flow) and the concentrated flow time.

   a. Overland Flow Time. In undeveloped or lightly developed watersheds, the initial runoff is usually in the form of sheet flow. This overland flow time shall be determined using Standard Drawing D-8.
   b. Concentrated Flow Time. Concentrated flow time is the time required for the water to flow from one point of concentration to the next. This flow may take place in a man-made or natural conveyance. The velocity chosen for use in this calculation should accurately reflect the hydraulic conditions in the drainage system.

2. Rainfall Intensity. Rainfall intensities for the ten (10)~~-~~year and one-hundred ~~100-~~year storms shall be determined using Standard Drawings D-11 and D-12.

3. Runoff Coefficient. The runoff coefficient shall be chosen to reflect the ultimate development of the drainage area. This shall be based on the County's General Plan, the County's Zoning Maps and the Soil Conservation Service

Soil Survey of Nevada County. The runoff coefficient shall be determined using Standard Drawing D-15.

C. UNIT HYDROGRAPH METHOD OF ESTIMATING PEAK RUNOFF AND VOLUMES

The Army Corps of Engineers' computer program, HEC-1, shall be used to calculate flow rates for all watersheds over 640 acres. The SCS method shall be the method used with HEC-1.

Copies of the HEC-1 program as well as technical support are available through private vendors. For a list of these vendors, contact the U.S. Army Corps of Engineers, Water Resources Support Center, The Hydrologic Engineering Center in Davis, California.

1. Lag Time. Lag time can be considered as a weighted time of concentration. It is discussed in detail in the Soil Conservation Service Publication SCS-TP-149. The equation for calculating lag time is as follows:

   L = 0.6tc

   Where L = lag in hours

   tc = time of concentration

2. Rainfall Duration-Depth. The rainfall duration-depth relationships to be used in unit hydrograph calculations are shown on Standard Drawings D-13 and D-14.
3. Loss Rate. Precipitation losses due to land surface interception, depression storage and infiltration shall be determined using SCS Curve Numbers. Hydrologic soil group information may be found in the "Soil Survey of Nevada County Area, California" published by the Soil Conservation Service. Curve numbers shall represent the ultimate development of the drainage area.

D. DRAINAGE AREA MAPS

A drainage area map shall be prepared to accompany all drainage calculations and shall reflect the following criteria:

1. All maps shall be of adequate scale to show a clear representation of the drainage conditions. Contours shall be shown and labeled throughout. Prominent features (roads, lakes, streams, etc.) shall be shown on the map.

2. All individual watersheds and subwatersheds shall be clearly defined with colored pencil shading and heavy lines delineating the boundaries.

~~2.~~3. Travel paths of all flow shall be clearly defined. Where concentrated flow exists, the type and dimensions of the conveyance shall be noted on the map. Where sheet flow exists, note this on the map.

~~3.~~4. Points of concentration for each structure shall be shown throughout. At each point of concentration, note the peak flow rates, generally the ten (10) and one-hundred~~100~~ year flows (Q10 and Q100).

~~4.~~5. The areas (in acres) of all individual watersheds and subwatersheds shall be noted on the map.

~~5.~~6. Rational Method "C" values or SCS Method Curve Numbers shall be shown for each watershed and subwatershed.

7. Unusual features: N.I.D. irrigation ditch spillways for discharging excess storm runoff, upstream drainage facilities discharging onto the project, etc. shall be shown including expected values for Q10 and Q100.

Sec. L-XVII 5.2 Hydraulic Design

Nevada County uses Manning's Equation to calculate friction losses and the pressure-momentum equations and energy equations to calculate junction or change in cross-section energy losses.

A. MINIMUM FREEBOARD REQUIREMENTS

Facility	Freeboard (FT.)	From HGL to:
Cross Culverts (Q10)	0	Top of Culvert
Cross Culverts (Q100)	0	Crown of Road

Closed Conduit Storm Drains (Q10)	1.0	Gutter Flow Line
Closed Conduit Storm Drains (Q100)	0	Top of Curb
Open Channels (Q10)	1.0	Top of Bank
Open Channels (Q100)	0	Top of Bank
Roadside Ditches (Q10)	0	Top of Bank
Roadside Ditches (Q100)	0	1/3 Travel Way
Curb and Gutter (Q100)	Shall inundate no more than 1/3 of the traveled way	
Bridges (Q100)	2.0	Lowest Member

B. FRICTION LOSSES

The Mannings Equation shall be used to calculate friction losses for hydraulic profiles. The following Mannings "n" values shall be used:

Facility	"n"
Corrugated Metal Pipe	
Annular	0.021
Helical	0.018
Spiral Rib	0.012
Reinforced Concrete Pipe	0.014
High Density Polyethylene Pipe	
Corrugated	0.021
Smooth Wall	0.012
Concrete or Asphalt lined	

Ditches & Channels	0.015
Cast in Place	0.015
Precast	0.014
Earth Ditches and Channels	
Smooth Geometric	0.030
Irregular or Natural	Refer to Brater & King "Handbook of Hydraulics"
Patented Products	See Manufacturer's Specs

C. JUNCTION LOSSES

At points in the hydraulic profile where there is a change in the flow rate or conveyance geometry, the energy loss being experienced due to these changes and the corresponding change in water surface elevation shall be calculated using either the pressure-momentum method or the energy equation method. The value of the loss coefficient, k, used in the energy equation shall be at the discretion of the consulting engineer and subject to the approval of the Engineer.

D. MINIMUM AND MAXIMUM VELOCITIES

Facility	Minimum Velocity, fps	Maximum Velocity, fps
Earth Ditches & Channels	2.0	4.0 - 6.0
Concrete or Asphalt Lined		
Ditches & Channels	2.0	14.0
Closed conduits	2.0	14.0

Vmax > 4.0 fps subject to prior approval by Engineer.

Velocities exceeding 14 fps are special circumstances and criteria shall be established on a case by case basis to provide for protection from scour and unstable flow conditions.

E. DETENTION FACILITIES

Detention facilities are intended to reduce the peak discharge of a watershed by storing the excess flow in a reservoir and slowly releasing it back into the system after the peak of the storm has passed. Reservoir size and outlet configuration shall be designed using an inflow hydrograph computed using HEC-1. The required storage volume and outflow requirements shall be determined using a flood routing method established in the engineering profession as being acceptable. An example of an acceptable method is the Modified Puls Method.

All detention reservoirs shall be designed such that the water surface returns to its base elevation within twenty-four (24) hours of the end of the storm and shall be placed as required by the Engineer.

Sec. L-XVII 5.3 Culverts

The following are minimum standards. They shall in no way relieve the consulting engineer from designing culverts to meet actual design conditions. All storm drain pipe intended for use within the roadway shall be checked for maximum allowable cover utilizing manufacturer's design values. The gauge or class of pipe shall be specified on the plans.

A. ROAD CROSS CULVERTS

Culverts crossing the roadway shall be adequate to carry the design flows. The culvert shall be reinforced concrete pipe, corrugated steel pipe, corrugated aluminum pipe or high density polyethylene plastic pipe. The minimum culvert diameter shall be eighteen (18) inches when the culvert length does not exceed eighty (80) feet and twenty-four (24) inches when culvert length exceeds eighty (80) feet. The maximum spacing between cross culverts shall be five hundred (500) feet, and the maximum differential in elevation between successive cross culverts shall be twenty (20) feet unless otherwise approved by the Engineer.

All corrugated metal pipe (both steel and aluminum) shall be a minimum of twelve (12) gauge. All reinforced concrete pipe shall be a minimum of Class III. The minimum cover depth for all culverts shall be one (1) foot.

B. DRIVEWAY CULVERTS

Culverts crossing driveway entrances shall be adequate to carry the design flow and shall be of the materials specified in Section ~~L-XVII~~ 5.3.A, above. Minimum pipe size shall be twelve (12) inches.

C. CROSS CULVERT INLETS

In cut areas with other than concrete curb and gutter, cross culvert inlets shall be installed as shown on Standard Drawing D-3, as required.

Cross culverts in fill areas shall be provided with a flared end section (FES) as shown on Standard Drawing D-2, as required.

Sec. L-XVII 5.4 Open Ditches

All open drainage facilities shall be adequately protected from erosion by the use of an appropriate lining, and shall, as a minimum, meet the design criteria set forth in "Erosion and Sediment Control Guidelines for Development Areas of the Sierras", prepared by the High Sierra RC&D. Temporary and permanent drainage structures not specifically included in these specifications are "Special Circumstances."

A. EXISTING DITCHES

Unless justified within the calculations, all abrupt changes in alignment or profile and all underbrush and debris which seriously restricts the flow in existing ditches shall be regraded and improved. Such work shall be shown on the improvement plans. Unless previously approved by the Engineer, centerline curve radius of an open ditch shall be a minimum of thirty~~-~~five (35) feet.

B. DIVERSION

The diversion of natural drainage, subject to Engineer's approval, will be allowed only within the limits of the proposed project. All natural drainage must leave the improved area at its original horizontal and vertical alignment unless a special agreement, approved by the Engineer, has been executed with the adjoining property owners.

C. NEW CONSTRUCTION

When selecting a ditch section or a lining material, consideration shall be given to the esthetics of the area. A trapezoidal section shall take precedence over a deep "V" ditch whenever possible.

A lining material shall be used which will adequately protect the channel from erosion.

1. Seeded Earth Ditches. This type of ditch may be used, subject to approval by the Engineer, only where the velocity does not exceed four (4) feet per second (6 fps with Engineer's approval) and the native material, when scarified, will support plant growth. Information regarding approved seed mixtures is available at the Department.

2. Concrete Poured in Place or Air Blown. Minimum thickness to be four (4) inches with welded wire fabric WW F6x6 - W2/W2, fiber mesh reinforcement or other approved reinforcing method in sides and bottom.

3. Asphaltic Concrete (Type B). Minimum thickness shall be three (3) inches after compaction (90% relative).

D. ROADSIDE GUTTERS

When roadside gutters are used to convey storm drainage, the flow from the ten (10) year design storm (Q10) shall not inundate the traveled way, and the flow from the one hundred (100) year design storm (Q100) shall not inundate more than 1/3 of the traveled way.

The maximum length of a roadside gutter shall be five hundred (500) lineal feet between cross culverts unless otherwise approved by the Engineer. The maximum

length of an asphalt concrete dike shall be five hundred (500) lineal feet between down drains.

E. TOE DITCHES

Rock-lined toe ditches may be used, subject to the approval of the Engineer, only at the base of fills. This type of ditch shall not be used as a roadside ditch. Rock lining shall conform to the provisions of Section 72 of the State Specifications. The minimum size shall satisfy the specifications for No. 2 Backing. The minimum thickness of the rock lining shall be twelve (12) inches.

Sec. L-XVII 5.5 Closed Conduit Storm Sewers

A. CAPACITY

Special provisions shall be made within the drainage system to ~~insure~~ensure that the inlet flow line elevation and the capacity of the drainage system is such that it may be extended to serve the entire drainage basin at the time of ultimate development. This is to include the entire upstream portion and the portion of the basin outside the development, regardless of existing conditions.

B. PIPE

Closed conduit storm drains shall be constructed of reinforced concrete pipe, corrugated metal pipe or high--density polyethylene plastic pipe.

C. STRUCTURES

Unless otherwise approved by the Engineer, all manholes, junction structures and catch basins shall conform to the following standards:

Facility	Type	Reference
Manhole	RCP	Nevada County Std. Dwg. D-4
Junction Structures	GMP or	CALTRANS Std. Plan D75 OCP (1)

Catch Basins	GO or	CALTRANS Std. Plan D74 GT3 (2) or Standard Nevada County Std. Dwg. D-3 Drop Inlet
	1)	Use type 36RX grate or steel cover, redwood cover prohibited
	2)	Use type 24-13 grate

D. OUTFALLS

All drainage outfalls shall be shown in both plan and profile on the improvement plans until a definite daylight condition is established.

When the outfall is from a closed conduit drain into a natural drainage course, an energy dissipater approved by the Engineer must be provided.

COVER REQUIREMENTS

At locations where the general minimum cover requirements cannot feasibly be obtained, the conduit shall be either encased in concrete or provided with a concrete cover, or another method of pipe protection as specified by the Consulting Engineer and approved by the Engineer.

Sec. L-XVII 5.6 Headwalls, Wingwalls, Endwalls and Trash Racks

The location and design of all proposed structures shall be considered individually and shall be designed in accordance with the State Standard Drawings and the Nevada County Standard Specifications. The design shall be as approved by the Engineer.

Sec. L-XVII 5.7 Easements

The boundary lines of all drainage easements shall be shown on the plans.

A. FOR IMPROVED DRAINAGE FACILITIES

Easements shall be provided for all ditches, culverts and conduit systems whether constructed as newly-built improvements or as rebuilt improvements.

B. FOR EXISTING DRAINAGE FACILITIES

Easements shall be provided for all existing drainage facilities within the boundaries of and/or affected by any land areas to be improved.

C. EXTENT

All drainage easements shall extend from the point at which a flow is concentrated to: 1) the point of confluence with a natural drainage course, or 2) the point where the flow is returned to sheet flow.

D. FOR OFFSITE DRAINAGE FACILITIES

All concentrated drainage leaving the boundaries of the area to be approved in other than natural drainage courses will require either specific easements or drainage release letters from the property owners of the lands from the point at which the drainage leaves the limits of the improvement area to the point at which it is deposited in a natural water course. The requisite easements must include adequate provision for all of the drainage structures to be used in the offsite drainage (i.e., culverts, ditches, dissipaters, etc.).

~~ARTICLE~~ SECTION 6 EROSION PROTECTION

Sec. L-XVII 6.1 General

All soil exposed by the construction shall be protected from erosion. The erosion protection measures shall be made part of the improvement plans and subject to approval by the Engineer. Temporary erosion protection measures shall be installed during the construction to contain all material within the project boundary. Permanent erosion protection measures shall be installed when the work is complete. Additional measures, as deemed necessary by the Engineer, shall be installed prior to final approval of the work.

Sec. L-XVII 6.2 Erosion Control Plan

In addition to the ditch linings and the energy dissipaters required by SectionArticle 5 of these standards, an Erosion Control Plan to prevent sediment runoff from all disturbed soils is required. The Erosion Control Plan shall be submitted with, or be made a part of, the Improvement Plans and shall be reviewed by the Engineer and the Resource Conservation District prior to approval of the Improvement Plans. Revegetation and stabilization with specific amounts and types of vegetative species, mulch and fertilizer materials and timing of placement shall be listed in the Erosion Control Plan. Sediment catchment installations shall be required to contain sediment runoff from migrating beyond the project boundaries. Soil disturbing activities may be limited to specific times of the year by either the Department or the Resource Conservation District.

ARTICLE SECTION 7 SURVEY MONUMENTS

Sec. L-XVII 7.1 General

The Consulting Engineer shall place a note in the Improvement Plans stating that the Contractor is responsible for the protection of all survey monuments, markers and accessories. Any such survey feature that is disturbed or removed during the course of construction shall be restored or replaced by a person legally authorized to survey in the State of California.

Sec. L-XVII 7.2 Horizontal Control Monuments

Survey monuments shall be placed at right-of-way boundaries, property boundaries or sectional corners within the improvement as required by the Engineer. These monuments shall be placed in such a way so as to provide easily accessible horizontal control for the work.

Sec. L-XVII 7.3 Vertical Control Monuments

If an established benchmark or other vertical control monumentation is not easily accessible, the Consulting Engineer shall establish vertical monumentation to control the work. The location and datum shall be shown on the Improvement Plans. An assumed datum may be used with Engineer’s approval.

Sec. L-XVII 7.4 Construction Staking

All construction staking shall conform to established staking methods and shall be uniform throughout the project. The staking method shall be supplied to the Engineer upon request. The Contractor shall keep the Consulting Engineer informed in advance of the times and locations where construction staking is needed. Stakes damaged or destroyed by the operations of the Contractor will be replaced at his expense.

~~ARTICLE~~ SECTION 8 ENFORCEMENT

Sec. L-XVII 8.1 General

The Engineer may issue a stop work notice for good cause, subject to appeal to the Board of Supervisors. However, no work shall be performed pending appeal except as authorized by the Engineer.

Sec. L-XVII 8.2 Stop Work Notice

A. Whenever it comes to the attention of the Engineer that any person is performing work in violation of the provisions of this Chapter, the Engineer may serve upon such person a written notice citing such violations and directing that person performing the work to stop work immediately.

B. Upon receipt of such stop work notice, the person performing the work shall:

1. Stop work immediately until authorized by the Engineer to proceed; and
2. Within twenty-four (24) hours provide the Engineer with a list of remedies which can be immediately undertaken to bring the work into compliance with this Chapter; and

~~2.~~3. Within twenty-four (24) hours after acceptance of such remedies by the Engineer undertake, at the violator's expense, such action as is necessary to bring the work into compliance with this Chapter.

4. If engineering work is required to identify and define the proper course of action, as determined by the Department, such work shall be provided by the violator at no cost to the County.

Sec. L-XVII 8.3 Criminal Enforcement

Any person violating a stop work notice shall be guilty of a misdemeanor. Any person who violates any other provision of this Chapter shall be guilty of an infraction and, upon conviction thereof, shall be subject to mandatory fines of one hundred dollars ($100) for a first violation; two hundred dollars ($200) for a second violation of the same Section within a twelve month period; and five hundred dollars ($500) for a third or subsequent violation of the same Section within a twelve month period. Every day any violation continues shall constitute a separate offense punishable by a separate fine.

Sec. L-XVII 8.4 Nuisance Abatement

Any act in violation of any provision of this Chapter is hereby declared to constitute a public nuisance the maintenance or continuance of which may be abated, removed and/or enjoined by any appropriate proceeding in the manner provided by law.

Sec. L-XVII 8.5 Nonexclusive Remedies

The remedies provided herein are not exclusive~~,~~ and are in addition to any other remedy or penalty provided by law.