Alpine County
Development Standards

Transportation Facilities

Drainage Systems

Water Supply Systems

Sewerage Systems

Other Related Facilities for Land Development

Adopted October 7, 2014
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Alpine County Development Standard Drawings

1.00 PURPOSE AND APPLICABILITY

The purpose of this manual is to establish design, construction, and maintenance standards for public and private works under the jurisdiction of Alpine County and are in addition to the requirements contained in the Apline County Subdivision Code. Other utility providers have their own standards. Standards are established to provide safe, efficient, environmentally sound, and economical facilities that comply with all the applicable County, State, and Federal requirements.

The standards apply to the design and preparation of plans for, and the construction and maintenance of collectors, roads, streets, lanes, driveways, bikeways, walkways, trails, parking lots, drainage systems, water supply systems, sewerage systems, bridges, and other facilities related to land development. They do not apply to the activities, structures, and facilities under the purview of the County Health Officer who, pursuant to the County code, has jurisdiction over sewer and water systems, unless that official includes them in other permits typically issued. See also Section 9.00 for additional exceptions.

These standards supplement, but do not replace, standards included as part of Specific Plans adopted by the County, such as Kirkwood Specific Plan adopted by County Ordinance 648-03. For projects to be designed and constructed by the County, by force account or by contract, the County and its contractors shall adhere to the appropriate standards in this manual. When provisions of a contract between the County and another person differ from these standards, the provisions of the contract shall take precedence.

Many of these standards apply only to a person who is engaged in a project for which a permit from the County is required. Such a person is referred to as an applicant.

Where the term "applicant/contractor" is used, both an applicant and a contractor working under a contract with the County are subject to these standards.

Upon request by an applicant, the Community Development Director will provide the applicant with a list of standards that apply to the project.

It is recognized that it is not possible to anticipate all situations that may arise or to prescribe standards applicable to every situation. Therefore, any work not covered in these standards shall be designed and constructed in accordance with accepted engineering practices, Caltrans Standard Specifications, Caltrans Highway Design Manual, or other sources approved by the Director.

2.00 DEFINITIONS

AASHTO – The American Association of State Highway and Transportation Officials – A national organization consisting of representatives of state highway departments from all the states in the United States which develops information, policies, and guidelines for highways, streets, and roads.

Accessory Building - Any building used as an accessory to residential, commercial, recreational, industrial, agricultural, or educational purposes and is in the class of accessory buildings defined in the California Building Code.

Applicant/Contractor – The responsible person who has applied to the County for a permit to undertake work subject to these development standards or that person's authorized representative / or the person who has entered into a contract directly with the County for work subject to these development standards or that person's authorized representative.

Average Daily Traffic (ADT) – The weighted average one direction vehicle trips occurring during a 24 hour period on a weekday on a given vehicle access facility.

Authorized Representative – A person who is authorized by a County official or a contractor or an applicant to act in place of such person with respect to the duties and responsibilities of such person.

Best Management Practices (BMPs) – Structural and non-structural practices during and after construction of a project that are effective in erosion control and management of surface runoff.

Bikeway – See 9.00-1.09.

Building - Any structure having a roof and used or intended to be used for the shelter or enclosure of persons, animals, or property and as further defined in the California Building Code. Buildings include mobile homes, manufactured homes, churches, and day care facilities.

Cal/OSHA – California's Occupational Safety and Health Administration.

Caltrans Highway Design Manual – The last issued volume of the Highway Design Manual of the California Department of Transportation.

Caltrans Standard Plans – The last issued volume of Standard Plans of the California Department of Transportation.

Caltrans Standard Specifications – The last issued volume of Standard Specifications of the California Department of Transportation.

Caltrans Statewide Storm Water Quality Practices Guideline – The last issued volume of Storm Water Quality Practices Guidelines of the California Department of Transportation.

Causeway – A structure that supports a transportation facility across and above the surface of the ground or a wetland.

Chief Building Official – The director of the Alpine County Building Department or his/her authorized representative.

Civil Engineer – Registered Civil Engineer in the State of California

Clearing – Removal of vegetation and other organic material from the surface of the ground.

Consulting Engineer – Any person or persons, firms, partnership or corporation legally authorized to practice civil, mechanical, electrical, soils, or geotechnical engineering in the State of California who works on behalf of applicant or contractor.

Contractor – Any person or persons, firms, partnership, corporation or combination thereof licensed to perform the type of work involved in a project subject to these standards, or his/her or their authorized representative.

County – The County of Alpine, California, including special districts administered by the County Board of Supervisors.

County Engineer – The person so designated by the Board of Supervisors to perform civil engineering functions which are required to be performed by a registered civil engineer and in matters subject to the County Subdivision Ordinance, Title 17, as the Director's authorized representative.

County Surveyor - The person so designated by the Board of Supervisors to perform surveying functions which are required to be performed by a licensed surveyor registered civil engineer and in matters subject to the County Subdivision Ordinance, Title 17, as the Director's authorized representative.

Cross Culvert – A pipe which carries storm water runoff or stream flow under a transportation facility from one side to the other.

Curve Widening – Extra width added to the traveled way on some curves to better accommodate the tracks of vehicles as they travel the curve.

Dead-end Road - A road that has only one point of vehicular ingress/egress, including cul-de-sacs and loop roads.

Department of Community Development – The Department of Community Development of Alpine County.

Developer – An applicant.

Development – Single properties or subdivisions.

Director – The Alpine County Community Development Director or his/her authorized representative.

Drainage Area – The total geographic area from which runoff from precipitation flows to a specific point.

Driveway – See 9.00-1.01.

Dwelling Unit - One room, or a suite of two or more rooms, equipped with cooking, sleeping, and bath facilities, and designed for legal use by not more than one family, but not including any tent or camping shelter, or any boat, camper, motor coach, vehicle, or trailer.

Earthwork – All work as described in Caltrans Standard Specification, Section 19-1.

Emergency Access Road – See 9.00-1.07.

Engineer - A civil engineer competent to practice civil engineering as defined in Business and Professions Code 6731 and who is registered under the provisions of the Business and Professions Code, who is retained to provide engineering services. A consulting engineer.

Excavation – The mechanical removal of earth material.

Exception - an alternative to the specified standard requested by the applicant that may be necessary due to health, safety, environmental conditions, physical site limitations or other limiting conditions such as recorded historical sites.

Fill (embankment) – A deposit of earthen materials placed by man.

Filling – The act of creating a fill.

Grading – Any excavating or filling or combination thereof.

Hammerhead T – A roadway that provides a "T" shaped, three-point turnaround space for emergency equipment, being no narrower than the road that serves it.

Inspection Authority – A designation by the California Board of Forestry pursuant to Section 1270.03 of the State Fire Safe Regulations that authorizes the County to consider and approve exceptions to the Fire Safe Regulations.

Inspector – An inspector assigned to a project by the Director.

Lane – See 9.00-1.02.

Major Collector – See 9.00-1.06.

Major Reconstruction – Modifications to an existing facility, the cost of which exceeds 50% of the cost of building a completely new facility.

Major Road – See 9.00-1.04.

Minor Collector – See 9.00-1.05.

Minor Road – See 9.00-1.03.

National Pollutant Discharge Elimination System – A set of regulations and standards established pursuant to the Federal Clean Water Act, as amended.

Off-Street Parking Space - A parking space located outside of the right of way, with a standard dimension of 20' long by 9 feet wide. Two off street parking spaces are typically required per single family residential parcel dwelling unit to comprise a compliant "parking area", and may include covered parking.

OSHA – The federal Occupational Safety and Health Administration.

Parcel – For the purposes of these standards, a plot of land accorded a specific number by the county assessor.

Permit – A written legal document which authorizes the performance of some specific activity.

Plans – All the drawings, specifications, and reports associated with the construction of a product.

Private Road or Lane - A road or lane not accepted by the county on behalf of the public as part of the county maintained system or by any other government entity as part of its system.

Project – All the activity and end products included in a set of plans.

Project Proponent – An applicant.

Road – When used without qualifying adjectives, means major or minor roads, major or minor collectors, streets, special purpose roads.

Roadway - Any surface designed, improved, or ordinarily used for vehicular travel, including shoulders.

Roadway Structures - Bridges, culverts, and other structures appurtenant to a roadway.

ROW – Right of way, an easement permitting the passage of vehicles, persons, and/or animals, usually containing an existing or proposed transportation facility.

Shotgun Culvert- A culvert which discharhes directly onto an unprotected slope.

Special Purpose Road – See 9.00-1.12.

Special Specifications – Specifications selected from sources other than Caltrans Standard Specifications or written especially for a given project.

SRA Fire Safe Regulations – A set of regulations applying to driveways, lanes, roads, water supplies for fire emergency use, signage, and fuel modification that is issued by the California Department of Forestry pursuant to the California Public Resources Code, Section 4290.

Standard Plans of the American Public Works Association – The latest volume of standard plans of the American Public Works Association.

Street – Means the same as "road".

Tahoe Rim Trail Association – A private non-profit organization with offices in Incline Village, Nevada.

Traffic Lane - A part of a Traveled Way that provides a single line of vehicle travel and does not include shoulders.

Trail – See 9.00-1.11.

Transportation Facility – A driveway, lane, road, bikeway, walkway, or trail.

Transportation Systems – The network of transportation facilities in and adjacent to Alpine County, including state and federal roads and highways.

Traveled Way - The portion of the roadway for the movement of vehicles, exclusive of shoulders, and capable of supporting a 40,000 lb vehicle.

Turnaround - A roadway, unobstructed by parking, which allows for a safe opposite change of direction for emergency vehicles. A turnaround may be a hammerhead T or a circular or bulb shaped facility.

Turnout – A widening in a roadway to allow vehicles to move off the traveled way to allow safe passage of other vehicles.

Utility and Drainage Systems – Electrical, sewerage, water, and irrigation systems as well as storm water conveyance systems, either natural or manmade.

Vehicular Access Facility – A transportation facility intended to accommodate motorized vehicles.

Walkway – See 9.00-1.10.

Work – Any activity or end product included in a set of plans.

3.00 GENERAL REQUIREMENTS

3.01 Systems Layout

3.01-1 Transportation

Transportation systems shall be designed to promote convenient and safe traffic circulation, to provide for ease of maintenance, to be integrated into existing or proposed systems, and to minimize environmental impacts, including scenic impacts.

3.01-2 Utility and Drainage

Utility and drainage systems shall be designed to provide for ease of maintenance and operation, to be integrated into existing or proposed systems where appropriate and to minimize environmental impacts.

3.01-3 Fire Safety

In accordance with Title 14 California Code of Regulations, Division 1.5, Chapter 7, Subchapter 2, Section 1270.04, all subdivisions shall be designed to promote fire safety and maintenance of defensible space as defined in 1272.00

3.02 Permits and Notices

An applicant is responsible for obtaining the approval and necessary permits, including encroachment permits, from governmental agencies and from public and private utilities. Copies of such approvals shall be provided to the Director.

An applicant is also responsible for giving all required notices, including to Underground Service Alert (811 or 1-800-227-2600), at least two days prior to commencement of work except in cases of emergency. Notification of emergency work should be done as soon as possible.

An applicant is responsible for obtaining rights-of-entry over any property not under his control, if passing over or occupying such property.

Contact with utilities should be done early in the plan development stage to provide sufficient time for utilities to plan for any relocations or additional facilities.

3.03 Studies and Reports

All engineering studies and reports provided to or required by the Director shall be prepared under the direction of individuals licensed as required by California law and competent to practice in the field addressed in said studies or reports.

3.04 Testing and Materials

Testing of materials utilized in a project, when such tests are a condition of approval by the Director, shall conform to the standards and methods of the California Department of Transportation (Caltrans) Standard Specifications. When there is no Caltrans standard, methods commonly accepted in the industry shall be followed.

When testing is authorized to be provided by the applicant, such testing shall be done by qualified engineers or testing laboratories. Signed copies of the results shall be provided to the Director within 48 hours of the test or prior to the completion of any work for which the tests are relevant. The test results shall be identified with the project name, the name of the person or firm performing the test, the date of the test, and the origin of the material being tested.

See also 10.23 of these standards.

3.05 Exceptions and Modifications

Exceptions to or modifications of these standards that are requested by the applicant, or his representatives, shall comply with the relevant notes for exceptions and modifications

provisions for Driveways; Lanes; and Roads, Collectors and Streets as well as the provisions in Construction Standards.

3.06 Cost Estimates

The applicant shall submit a detailed cost estimate of costs prior to approval to commence work on a project. The estimate shall include unit cost amounts for each major item of work. Unit costs shall reflect the estimated costs, including prevailing wage rates, to the County if it were to perform the work by the competitive bid process. A 10% contingency fee shall be included. The cost estimate must meet the approval of the Director. If circumstances experienced on the project indicate that costs have changed, a revised estimate may be required by the Director.

Security deposits may be required in accordance with the Alpine County Subdivision Ordinance.

3.07 Maintenance Agreements

If facilities subject to these standards are not to be maintained by the County or other governmental agency, a maintenance entity shall be formed to provide continued maintenance of the facilities including maintenance of road surfaces, shoulders, clearing widths and heights, ditches, and culverts. A maintenance entity may not be required for privately owned driveways and parking lots. A written maintenance agreement acceptable to the Director shall be provided by the applicant. If an existing entity exists and will maintain the facilities, a copy of such agreement to maintain shall be provided to the Director. The Director may require a suitable bond be provided to the County to ensure performance. Such items will be recorded.

4.00 PLANS

4.01 General

Five sets of plans, including one reproducible set, along with specifications, cost estimates, and engineering reports for all proposed private and public transportation facilities, subdivision improvements, and other construction activities subject to these standards; including any necessary dedications, easements, and rights-of-entry; and including an index of all such material, shall be submitted to the Director for review and approval. Such material submitted shall be prepared under the direction of individuals licensed as required by California law and bear the stamp and signature of the individual(s) responsible for such material.

Unless an exception is granted by the Director, project plans shall also be submitted electronically (Adobe PDF format). A separate document covering the requirements and procedures can be obtained from the Department of Community Development.

If the project is part of a subdivision development, two copies of the approved tentative map are also required to be provided.

Prior to review of such material, a plan check fee deposit will be required. Following approval of such material, but prior to beginning construction, an inspection fee deposit will be required. Such fees shall be as established by the Board of Supervisors. Unused portions of such fees will be refunded following final approval of the project.

Upon receipt of the plans, the Director will review the plans for conformance with conditions of approval, if any, by the Planning Commission; County Ordinances; these Development Standards; and generally accepted engineering standards. If the Director approves the plans, he/she will sign and date a reproducible set, including the specifications and reports, and return them to the applicant. The County shall retain copies of all approved plans and related materials.

In the event that the Director requires changes or additions to be made in the plans, he/she will return a set of plans to the applicant showing the needed revisions. The applicant shall resubmit revised plans for review and approval in the manner described above.

Approval of such plans, substantiated by the signature of the Director is required prior to beginning construction of such improvements.

Following completion of the project, Record Drawings plans" shall be required as described in the Construction Standards, Section 10.04-3.

The content and procedures for subdivision maps and related improvement plans shall comply with the provisions of the County Subdivision Ordinance as supplemented by these standards. If any standards conflict with County Ordinances, the ordinances shall prevail.

The overall project shown on the plans shall be in compliance with the Americans with Disability Act. (ADA)

4.02 Plan Requirements

All improvement plans shall be legibly drawn, printed, or reproduced on twenty-four by thirty-six inch sheets with a minimum ½ inch margin on all sides and suitable for duplication. Minimum size lettering shall be 1/10 inch. Scale ratios shall be 1"=4' vertical to 1"=40' horizontal or 1"=5' vertical to 1"=50' horizontal. Other scales with lesser ratios may be used to show plan details. Cross sections, where shown, shall be at intervals of 50' maximum.

4.02-1 Minimum Sheet Requirements

Each sheet shall be numbered and shall contain:
Title block showing the project's name

- A revision block
- The sheet title
- The date of drawing and any revisions
- The scale
- Responsible professional's name and registration stamp
- North arrow if it's a plan view which relates to land surface

4.02-2 Plan Sets

4.02-2.01 Transportation Facilities

A set of plans for transportation facilities should contain the following applicable sheets and in the order shown:

- Title sheet with index
- Location map
- General notes and specifications
- Topographic maps
- Grading and drainage sheets
- Drainage lists and profiles
- Plan and profile sheets
- Typical sections
- Cross-section sheets
- Utility plans
- Detail sheets
- Traffic signing and striping plans
- Traffic control plans
- Erosion control plans

4.02-2.02 Other Improvements

A set of plans for other improvements should contain the following applicable sheets and in the order shown:

- Title sheet with index
- Location map
- General notes and specifications
- Plan and profile sheets
- Elevation views and sections
- Erosion control plans
- Detail sheets

4.02-3 Location Maps

Show township, range, and section numbers.
Show assessor's parcel numbers.

4.02-4 General Notes and Specifications

List standard specifications with references to sources. List special specifications.

4.02-5 Topographic Maps

In addition to the provisions of the Subdivision Ordinance, topographic maps shall show existing and proposed:

- Spot elevations at appropriate intervals
- Roads, trails, streets, driveways, and walkways
- Material and equipment storage areas
- Trees over 8" DBH
- Fences
- Tops of cuts and toes of fills

- Wetlands
- Avalanche paths, if known
- High water levels from maximum and Q100 flood flows if known.

Scale shall be not less than 1"=40' with contour intervals of 2' if slope is less than 10% and 5' if 10% or over. Contour intervals shall not be spread more than 100' apart. Map shall show topographic features at least 50' beyond the project area. Existing contours, benchmarks and elevations shall be as near as is reasonably possible to NGS datum. (See 6.03)

4.02-6 Grading and Drainage Sheets

Show:

- Topography (can be combined with topographic map. See 4.02-5)
- Gutter and ditch flow arrows
- Drainage courses existing and proposed
- Location of culverts and other drainage structures with elevations at inlets and outlets.
- Retention basins
- Wetlands
- Drop inlets with elevations of grates

4.02-7 Drainage List and Profiles

A list of all drainage structures identified by station numbers from the plan and profile sheets shall be provided.

Profiles of each structure shall be shown at an appropriate scale and will show the following information:

- Type, size, length, and slope
- Inlet and outlet elevations
- Appurtenances such as headwalls, wing walls, rip rap, and energy dissipaters
- The ground surface or roadway surface above the structure
- Side slopes of fills and cuts

(In some instances a site plan for a structure may be required. See 4.02-12)

4.02-8 Plan and Profile Sheets

Elevations and stationing shall match the elevations and stationing of existing facilities, where available. Sheets shall show:

- Existing and proposed plan and profiles of all transportation facilities, including centerline and edge of pavement
- Existing and proposed underground and surface utilities
- Hydraulic grade lines for channels
- Stationing and elevations at 50' intervals and at 25' intervals for warped surfaces
- Vertical curves
- Elevations of gutters for curb and gutter installations
- Elevations at drainage outlets from transportation facilities

4.02-9 Typical Sections

Show sections for each different segment of the facility with details of structural sections.

4.02-10 Cross Section Sheets

Cross section scale ratios shall be appropriate for the purpose of the drawings.

Cross sections shall be provided at 50’ intervals and at all culvert locations.

Horizontal limits of the cross sections shall extend sufficiently beyond the limits of the facility to allow understanding of the effect of the construction on the surrounding terrain.

4.02-11 Utility Plans

Utility plans should show in plan view all existing and proposed manholes, junction boxes, transformers, tanks, and similar features; and structures and trees over 8” DBH within 50’ of the utility lines, including existing utilities and transportation facilities.

Detailed drawings of well sites shall be provided at a scale of 1” = 5’ and shall cover the area within 100’ in all directions from the well site.

4.02-12 Detail Sheets

Some improvements such as bridges, major culverts, recreation facilities, complex utility installations, retaining walls, and unusual or unconventional facilities, may require site plans and/or detailed drawings to enable the review and construction of such improvements.

4.02-13 Traffic and Street Signing

Traffic and Street Name Signing and Striping Plans
Plans shall include:

- An overall plan of the project showing the new roadways, surrounding existing roadways, both sides of streets and roads, and all traffic lanes, existing signs, pavement markings and striping
- Proposed signs, pavement markings and striping

4.02-14 Erosion Control Plans

See 8.00 of these standards

4.02-15 Traffic Control Plans

A traffic control plan shall be provided when required by the Director or by the State, and shall comply with the Federal Manual on Uniform Traffic Control Devices as amended by the California Supplement to the MUTCD. See Section 10.02-2.

4.03 Conflict, Errors, and Omissions

Excepted from approval are any features of the plans that are contrary to, in conflict with, or do not conform to federal law, California State law, Alpine County ordinance or resolution, conditions of approval or generally accepted engineering practices in keeping with the standards of the profession, even though such errors, omissions, or conflicts may have been overlooked in the Director's review of the plans.

4.04 Plan Revisions

See 10.04-2 of these standards.

5.00 SPECIFICATIONS

5.01 General

A list of all specifications to be applied to the project shall be provided with the plans. For transportation facilities, the latest volumes of the Caltrans Standard Specifications shall apply to all facets of the project unless replaced or modified by provisions in these standards or by Special Specifications.

Any Special Specifications shall be described in complete form in the package of specifications.

For other than transportation facilities, the provisions of these standards and specifications in general use for the work being proposed, subject to approval of the Director, shall be applied.

6.00 SURVEY MONUMENTS

6.01 General

The applicant/contractor is responsible for the protection and preservation of all survey monuments and markers, and a note shall be placed on the improvement plans to that effect. 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 practice land surveying in the State of California. See also Section 17.12.10 Survey of the Alpine County Subdivision Ordinance.

6.02 Horizontal Control Monuments

Permanent survey monuments shall be placed at:

- The right-of-way boundaries at the angle points of all changes in direction, or at the beginning and ending of curves

- At all subdivision boundary corners
- At the intersection subdivision boundaries
- At all lot or parcel corners
- At the centerline of all streets at:
  - Streets intersection
  - Beginning and ending of curves

6.03 Vertical Control Monuments

If an established benchmark or other vertical control monument is not accessible, a vertical control monument shall be established in the project area and its location and elevation noted on the plans. These shall be as close as reasonably possible to NGS datum. Where NGS published benchmarks are not available within a reasonable distance of the project establishment of benchmark elevations using GPS processed with NGS OPUS procedures will be permitted.

6.04 Size of Monuments

Subdivision boundary markers shall be not less than 1 ¼ inch galvanized iron pipe, 30 inches long, and tagged by the R.E. or L.S. number of the person responsible for the survey. Lot corners and angle point monuments shall a minimum of 5/8" by 18" steel pin with tag or cap marked with the registration number of the surveyor or engineer in responsible charge of the survey for the project. The centerline monuments shall be Copperweld monuments or approved equal.

7.00 STORM DRAINAGE

7.01 General

The design of improvements shall not cause storm water to accumulate so as to cause flooding or damage to adjacent improvements or building sites and shall not create or amplify erosion in the project area or down slope from the area. Drainage design shall anticipate future development within the drainage area, including land outside the project area, and drainage facilities shall be adequate to handle anticipated flows from such future development.

The diversion of natural drainages shall be allowed only within the limits of the project area. All natural drainage must enter and leave the project area at its original horizontal and vertical alignment unless an agreement, approved by the Director has been executed with the adjoining property owners.

Easements for conduits; open channels; drainage swales; and natural drainages, whether seasonal or not; within the project area that involve more than one parcel must be established.

For conduits or open channels on land outside the project area, easements must be obtained. Such easements must extend from the point of origin to the confluence with a natural drainage course.

All concentrated drainage leaving the boundaries of the project area into other than natural drainage courses shall require either specific easements or release letters from the

property owners of the lands receiving such drainage from the point at which the drainage leaves the project area to the point at which it is deposited into a natural drainage course.

Easements for closed conduits shall be a minimum of 12 feet or as required by the Director. Easements for open channels shall have sufficient width to contain the channel, side slopes, and fencing or service roads as required by the Director.

If the runoff from the project area into a natural drainage course is increased appreciably by development in the project area, any existing drainage structure, onsite or offsite, shall be checked to learn if its capacity can safely pass the increased runoff. If the existing capacity is found to be inadequate, the structure shall be replaced or modified to allow it to pass the expected flow.

Any additional easement required for the replacement or modification of existing structures shall be obtained by the applicant at no cost to the County.

All new pipes and channels shall be located no closer to an existing well than a minimum distance approved by the County Health Department.

Alignment of pipes, channels, and ditches shall be as near to parallel with the centerline of roads as practical. Changes in alignment shall not exceed 90 degrees. Vertical alignment shall be such as to preclude ponding in the drainage area.

7.02 Hydrologic Design

Watershed areas of 320 acres or less shall be analyzed by the Rational Method. Watershed areas larger than 320 acres shall be analyzed utilizing the Unit Hydrograph Method or a method agreed upon by the Consulting Engineer and the Director prior to submitting the analysis for review.

7.02-1 Design Storms

Drainage design reports shall show the calculations used to determine the hydraulic load for both the 10 year (Q10) and 100 year (Q100) design storms at each drainage facility.

7.02-2 Rational Method

Calculations by the Rational Method shall be in done in accordance with the Caltrans Highway Design Manual Chapter 810 or comparable publications or programs.
See Table on Standard Drawing SD-1 for “C” factors.

7.02-3 Unit Hydrograph Method

The National Resources Conservation Service unit hydrograph method, the United States Geological Survey regression equation method, or other comparable method approved by the Director shall be used for drainages over 320 Acres.

7.03 Hydraulic Design

The Manning formula shall be used for hydraulic design.

7.03-1 Closed Conduits and Culverts

For the roughness coefficient (n) of corrugated steel pipe over 60 inches in diameter, arches, pipe arches, and sectional plate pipe and arches, use the values in the Handbook of Steel Drainage & Highway Construction Products by the American Iron and Steel Institute.

For other products, "n" values are as follows:

Corrugated metal pipe,	
60 inches or less	0.021
Spiral metal pipe	0.013
Concrete pipe or box	0.015
Vitrified clay pipe	0.013
Cast iron pipe	0.015
Plastic pipe, smooth lining	0.013

7.03-2 Open Channels

The roughness coefficients (n) for open channels are as follows:

Asphalt lined channel	0.015
Concrete lined channel	0.020
Rip rap lined channel	0.040
Grass lined channel	0.035
Channel, grass & weeds, some brush	0.030 to 0.035
Dense growth of weeds	0.035 to 0.050
Some weeds, light brush	0.035 to 0.050
Some weeds, heavy brush	0.050 to 0.070
Some weeds, dense willows	0.060 to 0.080

7.03-3 Streams and Irregular Channels

The roughness coefficients (n) for streams and irregular channels shall be determined by the design engineer, subject to approval by the Director.

7.04 Closed Conduits

Material for closed conduits shall be as specified on the approved plans.

Closed conduits shall carry Q10 without a head.

Closed conduits shall be adequate to carry Q100 without failure.

The system may be allowed to operate under pressure provided the hydraulic gradient is 0.50 feet below the elevation of any surface inlet or manhole cover.

The hydraulic grade line shall be shown for pipe systems when the grade line is over top of the pipe inlet for Q100.

Minimum diameter for closed conduits shall be 18" except for culverts under roads, driveways, or lanes.

Minimum cover requirement for pipe 96" or less shall be 12".

Minimum cover requirement for pipe over 96" shall be as per manufacturer's recommendations for HS-20 loading.

Maximum cover requirement for pipes shall be as per manufacturer's recommendations for HS-20 loading.

All drainage outfalls shall be shown on both plan and profile views.

When the outfall from a closed conduit system discharges into a natural drainage course, an energy dissipater shall be provided with approval by the Director.

A stilling basin or catch basin may serve as an energy dissipater. The maximum lineal feet of road that may drain into a catch basin is 500 feet.

Connections to storm drainage system shall be made only at catch basins, inlets, or manholes.

7.05 Open Channels and Ditches

The capacity and flow levels for channels and ditches shall be computed at intervals where changes in direction, grade, or cross sections occur.

Channels and ditches shall be a minimum of 2.5 feet in depth unless otherwise approved by the Director and shall have a freeboard of 0.5 feet at Q10 and shall contain the Q100 flow without overflowing.

Whenever channel or ditch slopes exceed 7%, they shall be lined with a choice of material sufficient to carry the flow without destruction to the ditch.

Lining shall extend at least to the next cross culvert or drainage swale. Channel to be lined shall be lined to an elevation of 1 foot above the Q10 flow level.

The side slope of paved linings shall not exceed 1:1. If protected by grouted or ungrouted rock, the side slope shall not be steeper than 2:1.

A chart useful for determining rip-rap size is shown on Standard Drawing SD-5.

Maximum allowable ditch velocity shall be as shown on Standard Drawing SD-3.

When using an existing channel for drainage on a project, removal of existing material should be limited to brush and loose debris if possible to do so while accommodating the design flow. Abrupt changes in alignment, profile, and width should be avoided if possible.

Interceptor ditches at the top of cuts may be required by the Director if necessary to protect cut slope erosion.

A sample lead-off ditch from a dike section of road is shown on Standard Drawing SD-16.

7.06 Cross Culverts

Cross culverts shall be designed so as to convey the Q10 flow without pipe pressure and convey the Q100 in a manner such that the HGL is kept below the traveled way at the inlets and within the pipe. A diagram for determining headwater depth at various flow rates and various pipe sizes is shown on Standard Drawing SD-4.

Minimum diameter for cross culverts less than 80 feet shall be 18".

Minimum diameter for cross culverts over 80 feet shall be 24".

Minimum pipe sizes for a given Q shall be as shown on Standard Drawing SD-2.

Minimum design velocity shall be 2.0 fps.

Maximum design velocity shall be 14.0 fps.

Minimum cover for pipes 96" or less shall be 12".

Shotgun Culverts are prohibited.

Alternative designs for cross culverts will be considered on a case by case basis including use of arch pipes (if capacities of the pipes proposed are of a capacity equivalent to those above), use of alternative bedding or cover techniques, and when crossing over atypical ditches.

Minimum cover for pipes over 96" shall be as per manufacturer's recommendations for HS-20 loading.

Maximum cover shall be as per manufacturer's recommendations for HS-20 loading.

Culverts 48 inches or less in diameter with the inlet in fill sections shall have a flared end section or a concrete headwall.

Culverts shall not be beveled unless the end is contained in a concrete headwall of the same angle.

Culverts over 48 inches shall have a concrete headwall.

Culverts of any size may be required to have drop inlets, trash racks, endwalls, wingwalls, and/or outlet energy dissipaters. See Drawing SD-19.

7.07 Headwalls, Wingwalls, Endwalls, Trash Racks, Guardrails, Inlets, and Junction Boxes

7.07-1 Headwall, etc.

Headwalls, wingwall, endwalls, trash racks, and guard rails shall be considered on an individual basis and shall be in accordance with the California Vehicle Code and Standard Plans of the American Public Works Association, Caltrans Design Standards or Alpine County Standard Drawings SD-10, SD-17, and SD-18.

7.07-2 Guardrails

Metal beam guardrails may be required at culverts, headwalls, and along the edge of the roadway on curves with steep side slopes. When required, the railing shall comply with Caltrans Standard Specifications.

7.07-3 Inlets

Inlets shall be in accordance with Caltrans Design Standards or Alpine County Standard Drawing SD-6, SD-8, or SD-9.

Inlets shall be placed so that the length of flow leading to the inlet does not exceed 500 feet. The depth of flow in a gutter shall not exceed 0.35 feet, taking into account bypass flows from upstream inlets.

Inlets shall be designed to support the loads of any vehicles likely to cross over them.

7.07-4 Junction Boxes

Junction boxes shall be of reinforced concrete and have a minimum wall thickness of 6 inches. Junction boxes may be circular or rectangular. Boxes deeper than 4 feet shall have a minimum dimension of 48 inches.

7.08 Storm Drain Manholes

Manholes shall be placed at junction points, changes in gradient over 2%, and changes in pipe size.

The maximum spacing between storm drain manholes shall be 500 feet. Whenever possible, manholes should be evenly spaced. On curved storm drain mainlines with radii of 200 to 400 feet, manholes shall be placed at the beginning of the curve and at the end of the curve and at 300 feet maximum intervals along the curve. On curved storm drain main lines with radii exceeding 400 feet, manholes shall be placed at the beginning and ending of the curve and on 400 feet maximum intervals along the curve for pipes 24 inches and less in diameter and on 500 feet intervals along the curve for pipes greater than 24 inches. Manhole locations on curves with radii less than 200 feet will be specified on an individual basis.

Manholes shall be designed according to Standard Plans of the American Public Works Association or Alpine County Drawings SD-11 through SD-15.

7.09 Bridges or Causeways

All driveway, lane, and roadway bridges or causeways shall be designed to support an HS20 load with minimum width equal to the width of traveled way plus 2 feet on each side and vertical clearance of 15 feet or as required by the California Vehicle Code.

Bridges or causeways shall be designed in accordance with Caltrans standards.

Appropriate signing, including but not limited to weight, vertical clearance limitations, one way or single lane conditions shall reflect the capability of each bridge.

Bridges shall have a minimum freeboard of 2 feet at Q50 and pass the Q100. Exceptions may be approved at the discretion of the Community Development Director.

7.10 Temporary Drainage Diversions

Location and removal procedures for temporary drainage diversions such as dams or pipe plugs shall be as approved by the Director. Such installations may need to be removed under certain conditions to minimize downstream damage.

8.00 GRADING AND EROSION CONTROL PLAN

8.01 Grading

8.01-1 General

In addition to these standards,grading is subject to Title 15, Chapter 15.04 of the Alpine County Code, specifically the provisions of the Uniform Building Code, Section 1803, specifically the provisions of the California Building Code, Section 1803, Excavation, Grading, and Fill, and to Appendix J of the Code.

Grading of an area of any size is subject to the regulations of the Regional Water Quality Control Boards. In some cases Storm Water Pollution Prevention Plans may be required. See 8.02. Grading may also be subject to regulations of the US Corps of Engineers and/or the California Department of Fish and Wildlife.

The project proponent is responsible for satisfying all requirements of the state and federal agencies with jurisdiction. The project proponent is responsible for obtaining all permits required by state or federal agencies. Copies of such permits shall be provided to the Director prior to commencing work. See 3.02.

Grading administered by the Director is also subject to Section 9.11 and Section 10.13.

8.02 Erosion Control

An Erosion Control Plan shall be required by the Director. The Plan shall be submitted as part of the improvement plans. Revegetation and stabilization measures with specific amounts and types of vegetative species, mulch, and fertilizer materials plus the timing of placement as well as the intended result of revegetation shall be shown in the Erosion Control Plan. The plan shall list all Best Management Practices to be applied on the project. See 8.03.

When a Water Pollution Prevention Plan (SWPPP) is required by a Regional Water Quality Control Board it shall become part of the Erosion Control Plan.

Sediment catchment installations such as fiber rolls or catchment basins may be required to contain sediment runoff. These shall be maintained as necessary to ensure their capability to serve their intended purpose.

Materials necessary for rapid repair or augmentation of erosion control features to protect the project site in the event of storm events shall be available in approved locations.

The applicant shall maintain erosion control measures until permanent revegetation, as described in the Erosion Control Plan, has been achieved. Projects will be inspected annually to make that determination. Final acceptance of a project shall not be made until the Director finds that permanent erosion control measures, including revegetation, are complete.

8.03 Best Management Practices

Projects shall be designed using Best Management Practices (BMPs) for minimizing pollutants in storm water discharges. Both construction and post construction measures shall be included or specified in project plans.

Designs and field measures shall follow criteria included in current guidelines and handbooks such as the following:

- Caltrans Construction Site Best Management Practices (BMP) Manual;
- Caltrans Stormwater Pollution Prevention Plan (SWPPP)
- Caltrans Water Pollution Control Program (WPCP) Preparation Manual
- Or other criteria as approved by the Director.

Bales used for erosion control shall be straw and shall be certified weed free with evidence of the certification to be furnished to the Director prior to bringing the material on site. Rice straw is recommended. Locally obtained pine needles are preferable to loose straw when broadcasted for erosion control purposes.

Loose straw broadcasted on fills, cuts, or disturbed areas shall be punched into the surface by mechanical means.

9.00 TRANSPORTATION FACILITIES

The purpose of this section is to provide safe, efficient, and economical facilities for travel and access, to minimize environmental impacts associated with construction and maintenance, and to ensure compliance with California Department of Forestry and Fire Protection SRA Fire Safe Regulations (Title 14, California Code of Regulations, Division 1.5, Chapter 7, Subchapter 2, Articles 1-5. In the event that changes in the SRA Fire Safe Regulations are adopted that are more stringent than these Development Standards, the more stringent shall apply.

The County will be the designated "Inspection Authority" upon certification of these standards by the California State Board of Forestry and Fire Protection, pursuant to Section 1270.03 of the State Fire Safe Regulations.

These standards apply to the design and construction of all roads, streets, lanes, driveways, bikeways, walkways, and trails including the extension of existing facilities, in the County except as stated below in this section. Affected activities may include but are not limited to creation of new parcels of land by subdivision, parcel map, or lot splits; approval of building permits for new buildings; the siting of manufactured homes; and approval of special use permits.

These standards do not apply to the following:

- Existing roads, streets, private lanes, driveways, or roadway structures where no major reconstruction is involved. However, where such facilities are substandard,

every attempt should be made by the property owners served by the road to improve access to meet minimum lane standards. If one or more new parcels are created to be accessed by an existing road or lane, the standards that apply to such total development may be required.

- Vehicle access over easements or rights-of-way created as part of tentative maps approved before January 1, 1991, if the final map was approved within the time limits set forth in County ordinance.
- Access for agricultural or mining use solely on one ownership.
- Roads used solely for the management and harvesting of wood products.
- Projects of state or federal agencies, including projects done jointly with such agencies, in which case the standards of the agency may apply.

In unusual situations, on a case by case basis, alternative designs and exceptions to these standards will be considered and may be approved, if appropriate mitigation measures are included in the project that avoid compromising the intent of these standards, or where the exceptions provide the same practical effect as these standards. Requests for exceptions shall be made in writing and shall state the specific provision for which the exception is requested, include the material facts supporting requests, and provide the details of the exceptions and/or mitigation measures proposed. Higher standards may be required in unusual situations, if necessary to comply with the intent of these standards or as required by other regulations of the County.

9.00-1 Definitions

For purposes of the Development Standards of this section, the following definitions apply:

9.00-1.01 Driveways

A Residential Driveway is a vehicular access from a lane, road, or highway to a parking area of a single parcel that serves no more than two dwelling units and no more than two buildings as defined in Section 2.00, Definitions. The parcel may have any number of accessory buildings. Parking areas are considered part of the driveway. A driveway may be either one-way or two-way.

9.00-1.02 Lanes

A Lane is a vehicular access designed for travel by conventional motor vehicles for the three categories below. For the purposes of this section, the term lane is not to be confused with a traffic lane. Vehicular accesses which have been previously accepted by or offered for dedication to the county on behalf of the public, are otherwise part of the county maintained system, or are part of any other government entity's road system shall not be considered lanes.

9.00-1.02-a. Residential Two Parcel Lane

A Residential Two Parcel Lane shall serve no more than two residential parcels.

9.00-1.02-b. Residential Three to Five Lane

A Residential Three to Five Parcel Lane shall serve no more than five residential parcels.

9.00-1.02-c. Commercial, Industrial, or Multifamily Unit

A Commercial, Industrial, Or Multi-family Unit Lane is a lane that serves one such use or a combination of uses on one or more parcels.

9.00–1.03 A Minor Road

A Minor Road, whether public or private, is a vehicular access that has an ADT of < 200.

9.00-1.04 A Major Road

A Major Road, whether private or public, is a vehicular access that has an ADT of 200 to 400.

9.00-1.05 A Minor Collector

A Minor Collector has an ADT of 400 to 1500

9.00-1.06 A Major Collector

A Major Collector has an ADT > 1500

9.00-1.07 An Emergency Access Road

An Emergency Access Road is a low standard road, is gated, and used for emergency purposes only. These access roads shall be designed and constructed in accordance with Section 1273.00 of the State Fire Safe Regulations.

9.00-1.08 A Bikeway

A Bikeway is vehicular access serving non-motorized vehicles. It may occur as part of a roadway or as a separate facility.

9.00-1.09 A Walkway

A Walkway is a facility serving pedestrians, is open to the public, and is usually paved.

9.00-1.10 A Trail

A Trail is a facility, open to the public, usually dirt surfaced, and serving hikers, horses, and mountain bikes. Snowmobile routes are not included in this definition.

9.00-1.11 A Special Purpose Road

A Special Purpose Road is one providing limited access to a facility such as a transmission tower, water tank, or well head. Such roads are usually gated.

9.01 Driveways

Driveways shall comply with the standards presented in Table 9-1, Drawings R-5, R-6, R-7, R-13, and R-14, and other drawings, provisions, and specifications of these Development Standards.

The Community Development Director is the Inspection Authority pursuant to Section 1270.03 of the State Fire Safe Regulations for access both within the public right-of-way as well as for private driveway access to parcels.
Following the filing of an application, the Community Development Director will provide a list of drawings, provisions, and specifications that will apply to the project in addition to the following provisions:

Only one driveway encroachment to County roads per single family residential parcel is permitted for parcels less than ½ acre in size or with less than 120 feet of road frontage. For parcels with more than one permitted driveway encroachment, one such encroachment shall be identified on the plans for purposes of determining emergency access and for address assignment and signing.

In unusual situations, the Director may require that driveway access improvements, including paving, be extended from the edge of the access road to the ROW line at the same time as the vehicular access serving those parcels is being built.

An address sign approved by the Director or Chief Building Official shall be required at the entrance to each driveway.

9.02 Lanes

9.02-1 General

The review and approval authority (including "Inspection Authority" pursuant to Section 1270.03 of the State Fire Safe Regulations) for lane construction, and within the right-of-way limits of the access road serving the lane, rests with the Community Development Director.

In general, lanes will be private in nature and shall not be offered for dedication or accepted on behalf of the public by the county into the county road system.

For lanes with more than one permitted encroachments (loops), one such encroachment shall be identified on the plans for purposes of determining emergency access and for address assignment and signing. The entire loop shall be maintained open for access unless an approved turnaround is provided as required for single access roads or lanes and shall be constructed to SRA Fire Safe Regulation Section 1273.09.

An address sign approved by the Director shall be required at the entrance of each private lane.

9.02-2 Residential Lanes

Residential lanes shall comply with the standards presented in Table 9-1, Drawings R-1, R-5, R-6, R-7, R-13, R-14 and other drawings, provisions, and specifications included in these Development Standards.

Following the filing of an application, the Director will provide a list of the provisions, drawings, and specifications included in these Development Standards that will apply to the project in addition to those in 9.02-1.

9.02-3 Commercial, Industrial, or Multi-Family Lanes

Commercial, industrial, or multi-family lanes shall comply with the standards presented in Table 9-3, Drawings R-2, R-3, R-6, R-10, R-13, R-14, and other drawings, provisions and specifications included in these Development Standards.

Following the filing of an application, the Director will provide a list of the provisions, drawings, and specifications included in these Development Standards that will apply to the project in addition to those in 9.02-1.

9.03 Roads, Collectors, and Streets

9.03-1 General

The class of road or collector to be designed shall be based on the Average Daily Traffic (ADT) expected 20 years from the year the facility is ready for service. ADT can be determined from a traffic analysis or from R-18.

Name signs shall be installed at all intersections. Private streets, roads, or collectors shall have signs at the intersections with all public roads saying "Private Road" or "Not Maintained by County". Signs shall comply with the section on Signage. See 9.18 of these standards.

If a limitation exists, a sign identifying traffic access or flow limitation, including but not limited to weight or vertical clearance restrictions, dead-end road, one-way traffic or single lane conditions shall be placed at the intersection preceding the traffic access limitation.

9.03-2 Minor Roads

Minor roads shall comply with the standards presented in Table 9-2 and the drawings, provisions, and specifications included in these Development Standards.

9.03-3 Major Roads

Major roads shall comply with the standards presented in Table 9-2 and the drawings, provisions, and specifications included in these Development Standards

9.03-4 Minor Collectors

Minor collectors shall comply with the standards presented in Table 9-2 and the drawings, provisions, and specifications included in these Development Standards.

9.03-5 Major Collectors

Major collectors shall comply with the standards presented in Table 9-2 and the drawings, provisions, and specifications included in these Development Standards.

9.03-6 Emergency Access Roads

Emergency access roads shall comply with the standards presented in Table 9-3 and the drawings, provisions, and specifications included in these Development Standards.

Emergency access roads shall be gated and may include controlled access in accordance with SRA Fire Safe Regulations Section 1273.11(c). They shall be used for emergency access only. Signs shall be installed at either end of such roads saying, "For Emergency Access Only".

9.03-7 Residential Streets

Streets shall comply with the standards presented in Table 9-3 and the drawings, provisions, and specifications included in these Development Standards.

Streets shall be designed for a minimum of 25 mph except that dead end streets that serve a maximum of 10 lots may be designed for a speed of 15 mph. Design speeds between 15 and 25 may be approved if site conditions warrant. Minimum sight distance at intersections shall be based on a 25 mph design speed.

Any street to be gated must receive the approval of the Director. Gates must be at least 30 feet from any connecting street, road, or collector. If the gate is more than 300 feet from the connecting street, road, or collector, a turnaround at the gate is required. Gates shall be at least 2 feet wider than the width of the traffic lane(s) serving that gate.

9.04 Bikeways

Bikeways shall be designed in conformance with the Caltrans Highway Design Manual, Chapter 1000, Bikeway Planning and Design.

9.05 Walkways

The minimum width of walkways shall be 4 feet. Walkways shall comply with the Americans with Disabilities Act. Walkways shall be surfaced with aggregate, concrete, or hot mix asphalt. Walkways shall be maintained by the property owners adjacent to the walkways or by an entity approved by the Director.

9.06 Trails

Trails should have a maximum grade of 12%. Trails should be designed and constructed in accordance with the trails standards of the USDA Forest Service.

9.07 Special Purpose Roads

Standards shall be as determined by the Director.

9.08 Intersections

Design for driveways intersecting minor roads or lanes at between 60 and 120 degrees shall conform to Drawing R-5.

Design for lanes intersecting roads at angles between 60 and 120 degrees shall conform to Drawings R-6 and R-7.

Design for roads intersecting other roads at angles between 80 and 100 degrees shall conform to Drawing R-6.

The centerline of a driveway, lane, or road intersecting a road should be at least as far as the required minimum sight distance from another driveway, lane, or road. See Drawing R-6. The minimum separation between the centerline of a driveway or lane intersecting a road and the centerline of a road intersecting the same road shall be 60 feet.

The minimum separation between the centerlines of two roads intersecting another road shall be 150 feet.

Roads intersecting other roads from opposite sides shall have their centerlines directly opposite, or the offset of the intersection shall be a minimum of 150 feet.

Intersections at other than those covered by Drawing R-6 shall be designed in accordance with Chapter 9 of the AASHTO Policy on Geometric Design of Highways and Streets – 2011 or Chapter 400 of the Caltrans Highway Design Manual.

The design vehicle for intersections with lanes or roads shall be the SU vehicle. The design vehicle for intersections with collectors shall be WB-50 unless otherwise approved by the Director.

The profile grade for driveways intersecting minor roads or lanes shall conform to Drawing R-7.

Profile grades for roads intersecting other roads that carry more traffic shall be between 2% and 3%, +or-, for a minimum of 30 feet from the edge of the traveled way of the road intersected. The lesser roads shall be controlled by stop or yield signs.

Some intersections will require encroachment permits from agencies with jurisdiction over the roads being connected to. In such cases the requirements of such agencies shall apply.

9.09 Curbs and Gutters

Curbs and Gutters shall conform to Drawing R-15 and to the Americans with Disabilities Act. Asphalt dikes shall conform to Drawing R-14.

9.10 Curve Widening

For major and minor roads, curve widening required is as shown in Table 9-2.

For collectors, curve widening is applied in accordance with the AASHTO Policy on Geometric Design of Highways and Streets - 2001 for the width and design travel speed of the facility. Design vehicle shall be a WB-50 vehicle, unless otherwise approved by the Director.

For driveways and lanes, curve widening required is as shown in Table 9-1.

9.11 Cut and Fill Slopes

Cut and fill slopes shall not exceed 2 to 1. Steeper slopes may be approved if studies show that the slopes would be stable. Reinforced fills as well as rock facing and other means of stabilizing cuts and fills may allow steeper slopes to be approved also.

The Kirkwood Specific Plan requires application of mulch or tackifier on cut slopes 2:1 or steeper.

9.12 Ditches

Ditch design shall comply with Section 7.00 of these standards. Roadside ditches shall comply with the standards in Table 9-1, 9-2, or 9-3 according to the class of the facility unless hydraulic studies indicate a different design is warranted. Design of ditches other than roadside ditches shall be as determined by hydraulic studies.

9.13 Gates

Any driveway, lane, or road to be gated must receive approval for such gate from the Director. Gates must be at least 30 feet from the edge of the access road or lane in addition to any space required for the gate to swing open and, if more than 300 feet from the access road, must have a turnaround before the gate.

Cable or chain gates will not be permitted. See Drawings M-3 and M-4 for suggested gate designs. Gates are not permitted on collectors.

9.14 Horizontal Clearance

Horizontal clearance from edge of the traveled way to an obstruction, except for mailboxes, shall comply with the standards in Tables 9-1, 9-2, or 9-3, according to the type of facility.

9.15 Mail Boxes

Mail boxes must be of a type and in a location approved by the Postmaster Mail boxes shall be placed 12 inches from the edge of the roadway to the front of the mail box with the bottom of the box 40-46 inches above the ground. The Mail boxes are to be mounted on supports or standards made of wood or other breakaway material. Where a mail box is located on a major or minor road near an intersection, it shall be placed a minimum of 100 feet beyond the intersection in the direction of the delivery route. If located on a collector, the distance should be 200 feet. Multiple mail boxes or a cluster of boxes should be placed outside of the horizontal clearance zone.

Address shall be placed on the side or front of the box so that it is clearly visible.

A pull off may be required to be surfaced with pavement or aggregate at a mail box or mail box cluster.

9.16 Pavement Markings

Pavement markings shall be in accordance with an approved marking plan. Marking for street parking shall conform to standard drawing R-7 and Caltrans paint standards.

9.17 Right-of-Way Widths

Right-of-way widths shall comply with Tables 9-1, 9-2, or 9.3 according to the type of facility. In no case shall a road have a right-of-way width which is less than the road of which it is a continuation. Greater widths may be necessary to provide for proper cut and fill slopes in which case the right of way widths shall extend at least 5 feet beyond the hinge point.

9.18 Signage

Traffic signs shall comply with the Federal Highway Administration Manual on Uniform Traffic Control Devices, as amended by the California Supplement-. All other signage shall comply with Section 1274 of the California Fire Safe Regulations.

All roads which are part of a project shall be named by the applicant subject to approval by the Director. No duplication of names already in use or approved for use in another project will be permitted. Sound-alike names or names with more than 13 letters will not be approved.

Where work to be done only covers a portion of the ultimate improvement and where a road is proposed to be extended in the future, there shall be a barricade at the end of the road to extend completely across the roadway. The barricade shall comply with Standard Drawing M-2.

9.19 Sight Distances

At intersections, sight distances shall conform to the standards on DrawingR-6. Stopping and passing sight distances shall conform to the values in R-17.

9.20 Snow Storage Easements

Snow storage easements shall be shown on the plans if snow storage areas are required outside of the ROWs.

9.21 Structure Design Loads

Roadway structures shall be designed to support the HS20 design vehicle.
All other structures shall comply with the California Building Code for wind, snow, and seismic loads as supplemented by Alpine County Ordinance _____.

9.22 Structural Section

The minimum structural sections for vehicle access facilities shall comply with the standards in Tables 9-1, 9-2, 9-3 as applicable. In those locations where the Director considers the character of the soil below the proposed roadbed to be questionable, or the character of the traffic warrants a section greater than the minimum, the applicant may be required to have the structural section designed by a qualified engineer.

9.23 Structural Section Design

Structural section design shall be based on the R-value method as set forth in the Caltrans Highway Design Manual. The traffic index (TI) shall be based on a 20 year design life. The minimum traffic index for roads and collectors shall be as shown in Table 9-2. The Director may require higher indexes when special circumstances exist.

When the R-value method is used, the applicant shall obtain R-value tests in enough sections of the proposed facility to provide a sound basis for design. As a minimum, on facilities less than 500 feet long, two R-value tests shall be made. On facilities more than 500 feet long, soil samples shall be obtained at intervals of no more than 500 feet and at locations where soil types change. Test results, their locations, and design calculations shall be provided to the Director.

9.24 Surfacing Options

Surfacing options, including base, other than the minimums shown in Tables 9-1, 9-2, and 9-3 may be approved if supported by engineering studies by a qualified civil engineer or geotechnical engineer.

These can include, but are not limited to:

- Penetration treatment with chip seal
- Portland cement concrete
- Pavers/paving stones
- Rubberized hot mix asphalt
- Cement stabilized base

9.25 Superelevation

Maximum superelevation on all vehicular access facilities is 4%.

9.26 Utilities Under or By a Transportation Facility

All existing and proposed utilities under or adjacent to a proposed transportation facility shall be shown on the plans and identified by type and size. See Tables 9-1, 9-2, or 9-3 for minimum horizontal clearances from the edge of the traveled way for above ground

features. Manhole covers, grates, valve boxes and similar features shall be placed so as not to interfere with snow removal and shall be designed to support wheel loads of the vehicles using the facility.

9.27 Parking Lots

Design of parking lots, including features such as curbs, structural section, width and lengths of parking slots, and lighting shall be as approved by the Director.

9.28 Miscellaneous

Features such as speed bumps, street lighting, medians, and bus stops shall be as approved or required by the Director and in accordance with the applicable standards of this manual.
Retaining walls over 4 feet in height shall be designed by a civil engineer.

10.00 CONSTRUCTION STANDARDS

10.01 General Requirements

10.01-1 Construction Standards

Improvements shall be constructed in conformance with these Construction Standards. The applicant/contractor shall obtain all licenses, bonds, and insurance prior to commencing Work.

10.01-2 Approval to Start Work

The Director shall notify the applicant or contractor in writing of an "Approval to Start Work" after all required plans, specification, permits, and other documents have been approved. A pre-construction meeting may be required prior to approval. No work shall be started without first notifying the Director at least 2 working days before.

10.01-3 Plans on Site

At all times when construction is in progress, a complete set of approved improvement plans, specifications, and permits in good serviceable condition, shall be maintained on the project site

10.01-4 Unauthorized Work

Applicant/contractor shall not start work prior to the County's approval to start work. Work started before approval to start shall be considered unauthorized work and may be required by the County to be removed or changed.

10.01-5 Noise

Work being done shall comply with the County noise ordinance.

10.01-6 Storage Areas

Storage of materials and equipment shall be in locations shown on the approved plans or otherwise approved by the Director. See also Sections 3.02 and 4.02-5.

10.01-7 Specifications

Work shall be done according to the following specifications as applicable to the project. Specifications for items of work not described in these standards shall be done in accordance with the latest version of the Caltrans Standard Specifications or other sources approved by the Director.

10.02 Temporary Controls

10.02-1 Dust Control

Dust control shall normally be required. Dust control shall conform to the requirements of Section 10 of the Caltrans Standard Specifications and the requirements of the Great Basin Unified Air Pollution Control District.

10.02-2 Traffic Control

The applicant/contractor shall conform to any traffic control plans required by the County or State. Plans may include requirements for access by emergency vehicles, notification of times when routes may be closed to public travel, and use of signs and flaggers in accordance with Section 14 of the Caltrans Standard Specifications.

10.02-3 Trenches

Protective barricades shall be on each side of and parallel to any open trenches. Barricades shall remain until the trench is brought up to final grade. Safe access to adjacent land may be required by bridges or other means.

10.02-4 Best Management Practices

Installation and maintenance of BMPs shall be required throughout the period of construction. See 8.00 of these standards.

10.02-5 Existing Facilities

Existing facilities shall be removed, adjusted, or protected in accordance with Section 15 of the Caltrans Standard Specifications.

10.03 Construction Staking

10.03-1 General

The applicant/contractor shall furnish and maintain the construction stakes and reference points necessary to control the work as specified in these standards. It is the applicant/contractor's responsibility to examine the construction stakes and confirm their accuracy before commencing work. If discrepancies are discovered, the applicant/contractor shall notify the Director and arrange to have the errors corrected. When the surveying firm responsible for the construction staking is an agent of the applicant/contractor, he will be responsible for accuracy of the staking and for any errors in the finished work. The applicant/contractor shall be responsible for any errors in the finished work due to mistakes in staking done by others, if such mistakes are known to him to be in error.

10.03-2 Control Stakes

Control and reference stakes for all construction work shall be conspicuously flagged. The applicant/contractor shall be responsible for the preservation and perpetuation of these stakes, points, and marks. If the removal of a key control point is necessary in the

course of the operation, notice shall be given to the surveyor or engineer responsible for the staking sufficiently in advance of its removal to allow the control point to be referenced or moved before removal.

10.03-3 Road Grading

One set of slope stakes shall be set at a maximum of 50 foot intervals. Reference points shall be set at an appropriate offset from the top of cut or toe of fill. The top of cut and toe of fill will not be staked. Reference stakes or lath shall be set at each reference point and shall indicate the distance to the top of cut or toe of fill and the distance from the top of cut or toe of fill to the subgrade hinge point and to the centerline subgrade elevation. The plan station of the road centerline shall be marked on the back of the stake. Reference points shall be set to mark the beginning and ending of all horizontal and vertical curves and at no more than 25 foot intervals on vertical curves and on horizontal curves having a centerline radius of 750 feet or less throughout the curves. At road intersections the radius points of the curve returns shall be staked. The elevation of the top of the stake will be established and marked on the reference stakes or laths.

Cut sheets shall be provided to the contractor and the Director prior to work beginning.

10.03-4 Clearing

When clearing operations would destroy the slope stakes, or when no slope stakes are required, stakes marking the clearing limits shall be staked before clearing occurs. For roads, lath marked "Clear" shall be set at 50 foot intervals. Lath shall be oriented so the marking faces the centerline of the road.

10.03-5 Utility Lines (Sewer, Water, Telephone & Electric)

Unless othe utility provider standards apply. all utility lines lines shall be staked on an appropriate offset from the centerline at 50 foot intervals on tangents, at the beginning and ending of horizontal and vertical curves and at no more than 25 foot intervals on the curves. All transitions shall be staked on an appropriate offset from the centerline of each utility.

10.03-6 Curb and Gutter

Stakes for curb and gutter shall be set no more than 5 feet from the proposed work and a maximum of 25 foot intervals.

10.03-7 Cross Culverts

The ends of all cross culverts shall be staked by an offset stake set on the elongation of the centerline of the culvert. The offset stakes shall be marked with a cut or fill to the flow lines at the ends of the culverts. The final length of cross culverts will normally be determined at the time of the staking.

10.03-8 Closed Conduit Storm Drains

Closed conduit storm drains shall be staked on an appropriate offset from the drain centerlines at 50 foot intervals and 25 foot intervals on horizontal and vertical curves. The locations of angle changes and the beginning and ending of curves less than 50 foot radius shall also be referenced. All thrust blocks, manholes inlets, and other such features shall be referenced by offset stakes.

10.03-9 Drainage Channels

The centerline of drainage channels shall be marked with lath at 50 foot intervals, offset 10 feet, for horizontal alignment only. When vertical alignment is shown on the plans, offset grade stakes shall be set at 50 foot intervals.

10.03-10 Blue Tops

One set of blue tops shall be set on the centerline of roads at finished subgrade at 50 foot intervals on tangents and 25 foot intervals on vertical and horizontal curves less than 300 feet long or having a radius less than 750 feet.

An additional set of blue tops shall be set on hinge points at finished subgrade at 50 foot intervals on tangents and 25 foot intervals on curves. Any realignment or adjustments of blue tops on hinge points shall be reset as necessary. The applicant shall be responsible for staking base rock grade from the finished subgrade once the subgrade has been accepted by the inspector.

10.04 Control of Work

All work to be done and materials to be used shall be accordance with the approved plans, the provisions of Section 5, Control of Work, and Section 6, Control of Materials, of the Caltrans Standard Specifications, where applicable.

Subsections referring to Measurement and Payment in each Section of the Standard Specifications are not applicable to the work performed hereunder unless required by the Director in cases where the County or an assessment district is participating in the costs.

10.04-1 Authority of Director

The Director shall decide all questions which may arise as to interpretation of plans, the quality of, and acceptability of work performed. The applicant/contractor may appeal the Director's decisions to the County Board of Supervisors by filing an appeal with the County Clerk within two working days of the Director's decision.

10.04-2 Changes in Approved Plans and Specifications

The applicant/contractor shall present any requested changes in approved plans and specifications to the Director for approval. If the Director deems it necessary, new plans or specifications shall be provided to the Director for his review and approval in the same manner as set forth in Section 4.01. If the Director approves the revised plans he will sign and date the approved revised plans and return them to the applicant/contractor. Any such changes, if approved, shall be documented on the plans or specifications, including a revision number and date of approval. The applicant/contractor shall not proceed with any such changes prior to approval by the Director.

Minor changes which do not affect the basic design may be made upon the authorization of the Director and noted on the "as constructed plans" upon completion of the work.

When revisions are deemed necessary by the Director, a request, in writing, will be made to the applicant. The applicant shall change the plans, if deemed necessary by the Director, and submit the revised plans to the Director for approval in the same manner as set forth in Section 4.01. If the revisions have been made as requested, he Director will

return the approved plans to the applicant. Documentation of the changes shall be made on the plans and specifications, including revision numbers and date of approval. A copy of the revised plans shall be on site as per Section 10.01-3.

The applicant/contractor may appeal revisions required by the Director to the Board of Supervisors by filing an appeal with the County Clerk within two working days following receipt of the request to revise the plans. No work on the project that would obviate the requested revisions shall be done.

10.04-3 Record Drawings

The applicant/contractor's engineer or person responsible for the construction shall keep accurate records of all changes to the plans and shall provide a set of plans showing all changes to the Director upon completion of the work before final approval of the completed improvement will be granted. The revised plans shall clearly show the title "Record Drawings" unless an exception is granted by the Director; such plans shall be submitted electronically.

10.04-4 Certification

The Director shall require certification by the engineer responsible for the project that the work has been completed in accordance with the "record drawings".

The certification shall be in the following format:
"I _____ am the design engineer for the project and have had prepared the 'record drawings' for this project based on personal inspections and review of the project construction documents and inspections provided by the following firms and individuals:

Based on my personal knowledge and the information acquired from the sources listed above, I hereby certify that the improvements shown on these plans were constructed as represented in the 'record drawings' provided to the County for this project."

10.04-5 Inspection

The inspector shall have access to the project area at all time. All work shall be subject to the inspector's inspection and the Director's acceptance. Work not accepted shall be repaired or replaced. The applicant/contractor shall request inspections at least three working days in advance.

Prior to commencement of work, the inspector will inform the applicant/contractor of each element or phase of the work that the inspector must inspect and approve prior to the applicant/contractor proceeding to a subsequent phase. Any subsequent work constructed prior to approval by the inspector of work required to be inspected and approved shall be considered not in compliance with County requirements and may be rejected and required to be remedied at the applicant/contractor's expense.

Inspection requests shall be coordinated with utilities and other affected entities as appropriate.

10.04-6 Defective or Unauthorized Work

All defective or unauthorized work shall be remedied or removed and replaced by the applicant/contractor in a manner acceptable to the Director. Upon failure on the part of the applicant/contractor to comply with such order, the Director may issue a "Stop Work Order".

10.04-7 Stop Work Order

At any time the Director finds that any of the following conditions exists, the Director may issue a "Stop Work Order":

- The applicant/contractor is in violation of law or conditions of project approval
- The health or safety of the public, County employees, or applicant/contractor's personnel is at risk
- Work is proceeding without being in accordance with the provisions of these improvement standards
- Failure to comply with orders to correct defective or unauthorized work

Issuance of a "Stop Work Order" shall be by one or more of the following methods:

- By mail or e-mail addressed to the last known address of the applicant/contractor, which notice shall be presumed effective three working days after mailing.
- By telephone or personal delivery
- By posting a notice in a conspicuous location at the project site
- By any method reasonably determined to give notice

The applicant/contractor shall immediately comply with Stop Work Orders. Work may be resumed when the Director notifies the applicant/contractor that work is no longer suspended.

10.05 Superintendence

The applicant/contractor shall be represented on the project site, at all times during the work by a superintendent or lead person who is duly authorized to receive and carry out any instructions by the Director.

10.06 Legal Responsibilities

10.06-1 Registration of Contractors

Contractors shall be licensed in accordance with the provisions of Chapter 9 of Division III of the California Business and Professions Code.

10.06-2 Hold Harmless

The applicant/contractor shall at all times observe and comply with all laws and ordinances, and shall cause all his/her agents and employees to do likewise, and shall protect, indemnify and hold the County and all its Board Members, officers, agents and employees harmless against any demand, claim, or liability arising from or based upon the violation of any such law, whether by the applicant/contractor, or their agents or employees. The applicant/contractor shall report any discrepancy or inconsistency with any law that is discovered in the project plans.

10.06-3 Non-Discrimination

The applicant/contractor shall adhere to the provisions of the Americans with Disabilities Act, the California Labor Code, and the County Code.

10.06-4 Preservation of Property

The applicant/contractor shall avoid damage to existing road facilities, utility facilities, adjacent property, and trees and shrubbery that are not to be removed. The applicant/contractor may be required by the Director to repair or replace such damage at the applicant/contractor's expense.

The applicant/contractor shall examine all bridges, culverts, and other structures on or near the project area over which material for the project will moved. The applicant/contractor will be held responsible for any damage to existing improvements caused by his/her operations.

10.07 Health and Safety

10.07-1 Public Safety and Convenience

Operations shall be conducted with a minimum inconvenience to public traffic. See 10.02-2. The applicant/contractor shall furnish, erect, and maintain fences, temporary railings, barricades, lights, and signs and other devices as are necessary to give adequate warning to the public at all times. Materials and equipment shall be stored safely away from traffic.

The Director may require caches of fire tools be kept on the project area. Such tools shall be kept in good working condition.

10.07-2 Employee Safety

The applicant/contractor shall comply with all applicable requirements of OSHA, Cal/OSHA, and the California Labor Code.

10.08 Prosecution of Work

10.08-1 Applicant/Contractor's Responsibility

The Applicant/Contractor will be held responsible for the prosecution of the work. All persons engaged in the work, including subcontractors, are considered agents or employees of the applicant/contractor.

10.08-2 Failure to Complete Work

If the applicant/contractor fails to complete the work within a reasonable length of time, the County, pursuant to Conditions of Approval by the County and/or provisions of a Surety Bond, if any bond was required, shall serve legal notice thereof upon the surety and the applicant. Following legal notice, the County may take whatever action permitted under law to finish, close up, or take such action as necessary to protect the public, the environment, and County property and interests.

10.09 Site Maintenance and Cleanup

The project area shall be kept in a reasonably neat and orderly condition at all times. All transportation facilities open to the public shall be maintained free of dirt, mud, or debris from project activities unless the facility is under active traffic control.

Prior to requesting a final inspection, the applicant or contractor shall clean the project area and any other areas used for material and equipment storage or occupied by the applicant/contractor of all rubbish, excess materials, false work, temporary structures, equipment and other items. Those areas shall be left in a neat and presentable condition.

10.10 Final Inspection and Acceptance

Within 10 days after receiving the request for final inspection, the Director shall inspect the work. The applicant/contractor will be notified in writing as to any particular defects or deficiencies to be remedied. The applicant/contractor shall promptly proceed to correct any such defects or deficiencies. After the work has been corrected, a second inspection shall be made to determine the acceptability of the corrections. At such time as the Director determines the work is satisfactory, the applicant/contractor shall be notified of the acceptance of the work by the County and the date of such acceptance.

For assessment districts or projects where the County participates on the costs, final acceptance will not take place until the quantities which are the basis of determining costs are agreed upon jointly, in writing, by the County and the applicant/contractor and the assessment district representative when applicable.

10.11 Clearing and Grubbing

10.11-1 Procedures

Clearing and Grubbing procedures shall comply with Section 16 "Clearing and Grubbing", of the Caltrans Standard Specifications. Stumps and limbs shall be chipped on site or taken to a facility for grinding and recycling and not to landfills. The intended location for disposal shall be provided to the Director prior to transport. Small quantities of brush may be allowed by specific permission of the Director to be burned on site, subject to appropriate burning permits.

10.11-2 Trees

Trees to remain in the ROW shall be protected from damage. Trees that remain shall be trimmed to a minimum clearance of 15 feet over the traveled way.

10.12 Watering

Watering shall conform to Section 17 of the Caltrans Standard Specifications.

10.13 Earthwork

10.13-1 General

Earthwork shall conform to Section 19, "Earthwork" of the Caltrans Standard Specifications except as modified herein. No blasting shall be allowed unless specifically provided for in the approved plans or authorized in writing by the Director. Ponding shall not be permitted within the roadway template.

10.13-2 Suspension Due to Weather

The Director may require grading be suspended at any time of the year during periods of precipitation or when the project site is covered with snow or is in a saturated or unstable condition. If such occurs, the project site shall be protected as necessary to prevent erosion.

10.13-3 Winterization

For construction sites that will be inactive during the winter season:

- Temporary erosion controls shall be installed.
- Supplies and equipment shall be placed so as to not interfere with snow removal or emergency access.

For construction sites that will be active during the winter season:

- Temporary erosion controls shall be installed.
- Wheeled vehicle operation shall be confined to surfaces either paved or stabilized with gravel or other means. Field measures used in winterizing shall comply with the provisions of Section 8.03.

10.13-4 Interference with Groundwater

Grading that intercepts or interferes with groundwater flow may be halted by the Director until an alternate plan that avoids interception of groundwater or reroutes the exposed flow is implemented.

10.13-5 Discovery of Historic Resources

Whenever in the conduct of activities any historic, pre-historic, or paleontological materials are discovered which have not been accounted for previously and made subject to a resource protection plan, the activity shall be halted, the Director informed, and the materials protected until a determination by the County is made regarding its protection and a plan to do so is approved by all entities having jurisdiction.

10.13-6 Structural Fill

Prior to placement of any structural fill, non mineral material shall be removed from the surface of the ground under proposed structures. The existing ground shall be scarified to a minimum depth of 6 inches for the full width of the structures plus 3 feet on all sides. The scarified material shall be compacted to a minimum of 95% relative compaction.

Jetting may be permitted in the placement of structural backfill provided the backfill and surrounding subgrade material is of a granular nature and free of silt and clay material.

10.13-7 Subgrade

Non mineral material shall be removed from the surface of the ground under fills and under the roadway prior to preparing subgrade.

Subgrades for embankments and roadbeds shall be scarified to a depth of twelve (12) inches, removing rocks over three (3) inches in diameter and all roots, grass and other deleterious material.

The top twelve (12) inches of the roadbed shall be compacted to 95%. The full depth of any holes developed in the roadbed in the course of scarifying or rock removal shall be filled and compacted to 90%.

The roadbed shall be shaped and trimmed to produce a smooth and uniform surface. The surface of the grading plane shall not vary more than 0.05 feet from the design grade.

10.13-8 Surplus Material

Surplus material shall be disposed of in disposal sites designated on the approved plans. No other disposal sites shall be allowed unless approved by the inspector

10.13-9 Cement Treated Base

Cement treated base shall conform to the provisions of Section 27, Cement Treated Base, of the Caltrans Standard Specifications.

10.13-10 Lime Stabilization

Lime Stabilization shall conform to the provisions of Section 24, Stabilized Soils, of the Caltrans Standard Specifications.

10.14 Aggregate Subbase

Placing aggregate subbase shall conform to Section 25, “Aggregate Subbases” of the Caltrans Standard Specifications, except as modified herein. Relative compaction shall

be a minimum of 95%. The surface of the finished subbase shall not vary more than 0.05 feet from the design grade.

The applicant/contractor shall be responsible for all repairs needed due to damage of the subbase prior to placing the base material or pavement. All repaired subbase shall be compacted to 95%.

10.15 Aggregate Base

10.15-1 General

Placing aggregate base shall conform to Section 26, "Aggregate Bases", of the Caltrans Standard Specifications except as modified herein. Relative compaction shall be a minimum of 95%. The surface of the finished base shall not vary more than 0.05 feet from the design grade.

The applicant/contractor shall be responsible for all repairs needed due to damage of the base prior to placing the pavement. All repairs shall be compacted to 95%.

Class 2 Aggregate Base, ¾ inch maximum, shall be used in all cases except otherwise stated in the approved plans.

10.16 Penetration Treatment

Penetration treatment (see Section 9.24) shall conform to the following:

- Traveled way surfaces to be penetrated shall receive a treatment of the grade, quantity, and number of applications of asphalt as shown on the approved plans.
- All roadway shoulders of roads having a paved or penetrated surface shall receive a penetration treatment of a grade and quantity shown on the approved plans. The minimum rate of application shall be ½ gallon per square yard.

10.17 Hot Mix Asphalt

10.17-1 General

Hot mix asphalt shall conform to Section 39, "Hot Mix Asphalt", of the Caltrans Standard Specifications except as modified herein.

10.17-2 Prime Coat

The liquid asphalt for prime coats shall conform to Section 93, "Liquid Asphalts", of the Caltrans Standard Specifications. Liquid asphalt shall be furnished and applied as a prime coat on a prepared subgrade. The prime coat shall be Grade SC-70 or MC-800 or what is shown in the approved specifications. The prime coat shall be applied at the rate of 0.25 gallons per square yard for at least six inches beyond the planned edge of pavement. Sand cover shall be applied where traffic access must be maintained.

10.17-3 Tack Coats

The asphaltic emulsion for tack coats shall conform to Section 94, "Asphaltic Emulsions", of the Caltrans Standard Specifications and shall be Grade RS-1. A tack coat of asphaltic emulsion shall be applied to all vertical surfaces of existing pavement, curbs, gutters, and construction joints where hot mix asphalt is to be placed. Tack coat

shall be applied at a rate of 0.05 gallons per square yard or at a rate as established by the Director.

10.17-4 Geosynthetics

The placement of geosynthetic subsurface reinforcement (such as geotextile or geogrid) shall conform to Section 88, "Geosynthetics" of the Caltrans Standard Specifications.

10.17-5 Hot Mix Asphalt

Placement of hot mix asphalt shall conform to Section 39, "Hot Mix Asphalt", of the Caltrans Standard Specifications except as may be modified herein. Saw-cutting is required at all locations where new hot mix asphalt will be installed to abut existing pavement. The saw-cut shall be to the full depth of the existing pavement.

Hot mix asphalt shall be Type B.

The aggregate size for the hot mix asphalt shall be as follows:

- Pavement – 1/2 inch maximum
- Patches and trenches – 1/2 inch maximum
- Base course – 3/4 inch maximum
- Sidewalk – 3/8 inch maximum
- Ditch – 3/8 inch maximum
- Dike or berm – 3/8 maximum

10.17-6 Bituminous Seals

Bituminous seals (seal coats) shall be applied to hot mix asphalt surfacing and hot mix asphalt dikes at a rate and type shown in the approved plans. Bituminous seals shall conform to Section 37, "Bituminous Seals", of the Caltrans Standard Specifications.

10.18 Concrete Features

10.18-1 General

Concrete features such as curbs, gutters, sidewalks, and driveways shall be constructed of minor concrete and in accordance with Sections 73, "Concrete Curbs and Sidewalks" and 90, "Portland Cement Concrete" of the Caltrans Standard Specifications.

10.18-2 Coloring

Colored concrete may be specified in the project plans, with rates of additives per cubic yard shown in the specifications.

10.18-3 Curbs and Gutters

All gutters, including concrete curb and gutter, shall be constructed monolithically. Gutters shall be constructed at least seven days prior to paving operations. All gutters shall drain properly and be verified by a water flow test before paving operations. Deficiencies shall be corrected prior to paving operations.

The location of any water, gas, and sewer lines shall be indicated by marking the corresponding letters (W,G,S) in the wet concrete on the top of the curb or back of walk.

10.18-4 Sidewalks

Concrete sidewalks shall not be poured monolithically with the curb and gutter. A one inch by three inch key way shall be placed in the back of the curb as shown on Standard Drawing R-15.

10.18-5 Other Appurtenant Structures

Where utility poles, fire hydrants, and other appurtenant structures lie within the limits of the concrete work, a one half inch expansion joint around such items shall be placed. Expansion joints are to be placed between the concrete and any fixed objects, such as transformers, that are beside the concrete.

10.19 Underground Utilities

10.19-1 General

The scope of this work shall include trench excavation, bedding, backfill, and surface restoration. The material for the pipes or lines shall be as required by the utility company or as otherwise stated in the approved project specifications.

10.19-2 Existing Utilities

The applicant/contractor is responsible for locating all existing utilities. If a utility line is damaged during the work, the agency that owns the utility shall be notified immediately.

10.19-3 Bedding and Backfill Materials

Bedding and backfill materials shall conform to the Caltrans Standard Specifications Section 19-3 "Structure Excavation and Backfill" as applicable.

10.19-4 Trench Excavation

Excavations shall be supported and excavation operations conducted in accordance with Cal/OSHA requirements.

Excavations shall be made to the lines and grades shown on the approved plans. Saw cuts to the full depth of asphalt concrete pavement or Portland Cement Concrete that overlies a trench shall be made prior to excavation. Water in trenches shall be removed prior to placement of utility lines. Permanent under drains may be required by the Director.

Trenches should not remain open at the end of the day. Trenches that do remain open at the end of the day shall be fenced or barricaded and signed to prevent people from falling into the trenches.

If the Director determines that unsuitable material needs to be removed from a trench, the material shall be removed and replaced with suitable material.

10.19-5 Trench Backfill

Trench backfill shall be in accordance with the requirements of the utility company or these specifications if there are no utility company requirements.

10.19-5.1 Bedding

Bedding material shall be placed a minimum of six inches below the pipe or line.

10.19-5.2 Backfill

Backfill shall be placed in horizontal layers approximately eight inches thick and compacted to 90% relative compaction. The top twenty four inches of trenches which will be under pavements or other improvements shall be compacted to 95%.

The Director may permit the use of native material for backfill in unimproved areas. Such material shall be free of rocks over three inches for the first eight inches over the line. All such material shall be compacted to 90% in layers approximately twelve inches thick. The surface of trenches after backfill shall be level with the surface of the surrounding ground. Where paving is to occur over the line, the surface shall be at the same level of the subbase.

10.20 Storm Drains

10.20-1 Materials

Materials shall be that specified in the approved plans and in accordance with the Caltrans Standard Specifications. If high density polyethylene pipe (HDPE) is used, deflection tests may be required as specified in the approved plans and specifications.

10.20-2 Trenching and Placement

Trenching for and placement of storm drains shall be in accordance with the applicable provisions in 10.19, Underground Utilities. Care shall be taken to keep the ends of the pipes and joints free of dirt, rocks, mud, and other material. Deviation from grades set in the field shall not exceed 0.01 feet in ten feet.

10.21 Culverts

Furnishing and placing culverts shall be in conformance with Sections 61-67 of the Caltrans Standard Specifications.

10.22 Storm Drain Manholes, Catch Basins, Inlets, and Overside Drains

10.22-1 Manholes

All existing and new manhole frames and valve boxes shall be set to finished grade. Frames and boxes shall be set in minor concrete. Manholes shall conform to the Standard Drawings and Section 70, "Miscellaneous Facilities" of the Caltrans Standard Specifications.

Manhole frames shall be secured to the manhole cover or riser barrels with full mortar bed or full circle concrete collar that will secure the frame to the manhole structure. The mortar shall comply with Section 51, "Concrete Structures", of the Caltrans Standard Specifications.

When new connections are made to existing manholes, the joints shall be smooth and pipe ends shall not project more than two inches into the manhole. The bell of the pipe shall not be built into the wall of the manhole.

10.22-2 Inlets and Catch Basins

Inlets and Catch Basins shall conform to Section 70 of the Caltrans Standard Specifications and to the Standard Drawings. Concrete shall be minor concrete .Joints shall be smooth and in no case shall the bell of the pipe be built into the wall of the catch basin. Mortar shall be as per 10.22-1, Manholes.

10.22-3 Overside Drains

Overside drains shall be furnished and installed in accordance with Section 69, "Overside Drains" of the Caltrans Standard Specifications.

10.23 Material Testing

Material testing shall conform to the provisions of Section 6, "Control of Materials", of the Caltrans Standard Specifications. See also 3.04 of these standards.

All materials utilized in projects shall be subject to testing according to the approved specifications. Material testing shall be in accordance with commonly accepted practices in the industry, including the procedures of the Caltrans Laboratory. Field testing and laboratory testing shall be performed by qualified firms acceptable to the Director. All test results shall be submitted to the Director.

Following is a listing of tests normally required for road projects:

10.23-1 Compaction Testing

Tests for relative compaction shall be performed in accordance with Sections 19-5 and 19-6.02 of the Caltrans Standard Specifications and with California Test 216.

10.23-2 Portland Cement Concrete

Field tests for air entrainment and slump tests shall be conducted in accordance with Caltrans Standard Specifications. Compression strength shall be tested by certified laboratories in accord with California Tests, 539, 540, and 521.

10.23-3 Hot Mix Asphalt

The Director may require hot mix asphalt be tested by a certified lab for compliance with the approved design specified.

11.00 SEWAGE DISPOSAL:

11.01 Subdivisions:

11.01-1 Public or Community Sewer Systems

When a subdivision is located within 1,000 feet of an existing, operating, and available public or community sewage system, and it is practical and feasible to sewer the proposed subdivision by connecting to said system, the subdivider shall be required to connect the proposed subdivision to said system. Sewer mains, lift stations and other related facilities located within the subdivision and or necessary to connect said subdivision to the public or community system shall be designed and installed in accordance with the standards of the governing board of the public or community sewer system. All such facilities shall be operated and maintained by the public or community sewer entity unless a separate public entity is established for that purpose. No tentative map shall be approved before a statement from the public system has been furnished to the Health Department and the Department of Public Works stating the sewer system purveyor is willing and able to supply sewer service to the subdivision. No final map shall be approved until the required facilities are installed and accepted by the public entity or until the public entity advises the Board of Supervisors in writing it holds a bond adequate to insure the installation of required facilities.

11.01-2 Sewer

If it is not practical or feasible to sewer a subdivision by connecting to an existing public or community sewer system, or if such system is unable to provide the subdivision with sewer service, the subdivider may provide for sewer service by the development of a community sewer system with collection, treatment and disposal facilities.

When a subdivider proposes to develop such a community sewer system, he must:

- Provide for the establishment of a public entity empowered and adequate to maintain and operate the system.
- Obtain discharge requirements from the Central Valley or Lahontan Regional Water Quality Control Board.
- Submit complete plans and specifications including design criteria prepared by a registered civil engineer to the County Health Department and the Community Development Director for approval and designed in accordance with Title 13 of the Alpine County Code and latest adopted edition of The Standard Specifications for Public Works Construction, popularly known as the“Greenbook”.

11.01-3 Complete Plans

Complete plans and specifications including design criteria prepared by a registered civil engineer shall be submitted to the Department of Community Development, the Department of Health and the public or community sewer district for approval prior to connection to or construction or installation of sewers, sewage distribution, disposal and treatment facilities in a subdivision. All connections to, construction or installation of such facilities shall be in accordance with such approved plans and specifications.

11.02 Land Divisions: (Parcel Maps)

Public or Community Sewer System. When a land division is located within 1,000 feet of an existing, operating, and available public or community sewage system, the subdivider shall be required to request annexation to that system. In such cases annexation to an existing public entity may be required in the same manner as specified above in 11.01-1 through subsection 11.01-3.

12.00 WATER SUPPLY:

12.01 Subdivisions:

12.01-1 Subdivider

The Subdivider shall state in a letter accompanying the tentative map or a note placed on the tentative map proposed method of water supply for subdivisions. Wells are not to be considered as an adequate water supply without extensive long term testing.

12.01-2 Distribution

The distribution system for any community water system developed to serve a subdivision within 1,000 feet of an existing public water system shall be designed and installed in accordance with standards of the public water system and in no case less than the established by the Public Utilities Commission, General Order No. 103, latest version.

12.01-3 Water Supply

Where the water supply is proposed by the extension of service from an existing water system, the subdivider shall, prior to the approval of the tentative map, furnish the Health Department and the Department of Community Development a statement from the water purveyor stating that the purveyor is willing and able to supply water to the subdivision.

12.01-4 Water System

Should the subdivider propose to develop a water system in accordance with County ordinance for the subdivision, he shall:

- Provide a legal entity adequate to construct, maintain and operate the system.
- Submit complete plans and specifications including design criteria prepared by a registered civil engineer to the County Health Department and the Community Development Director for approval and designed in accordance with Title 13 of the Alpine County Code and American Water Works Association standard plans and details.

TABLE 9-1

RESIDENTIAL – DRIVEWAY AND LANE STANDARDS

PARAMETER	DRIVEWAY (RDW)	TWO PARCEL LANE (RL2)	THREE TO FIVE PARCEL LANE (RL5)	NOTES
General Parameters (Typical Section and Horizontal Criteria)				
Alignment	90 degrees preferred. 80-100 degrees acceptable.	90 degrees preferred. 80-100 degrees acceptable.	90 degrees preferred. 80-100 degrees acceptable.	See R-5 and R-6
Access easement width, min.	Greater of 22' or 4 feet beyond the top of cut or toe of fills for required minimum driveway roadway surface and shoulder	Greater of 30' or 4 feet beyond the top of cuts or toe of fills for required minimum roadway surface and shoulder	Greater of 30' or 4 feet beyond the top of cuts or toe of fills for required minimum roadway surface structure and shoulder	
Number of encroachments per parcel, max.	Two if more than 120' frontage and parcel more than 1/2 acre. Minimum 50' separation between driveway centerlines	See Note 5	See Note 5	See Note 5
Access location for parcel with access to more than one street		Access will generally be limited to the lowest volume street		
Vehicular access facility clearance from obstructions, min.	3'	3'	3'	The nearest edge of driveway cut shall be at least 3 feet from the centerline of a fire hydrant, utility pole, traffic signal, light standard or other similar feature
Vehicular access facility separation from property line of parcel not using facility, min.	6'	6'	25'	
Vertical Clearance, min.	15'	15'	15'	
Structural Section- min.		2"HMA w/4"CL2 AB 8"CL2 AB	2"HMA w/6"CL2 AB 8"CL2 AB	See R-6 and Note 7
Traveled Way Width, *Unpaved Surface* where straight or inside horizontal radius is greater than 200' min.	12'	20' See Note 11	22'	See R-5
Traveled Way Width, *Paved Surface* where straight or inside horizontal radius is greater than. 200' min.	10'	20' See Note 11	20'	See R-5 Kirkwood: Driveways providing access to garages or parking areas set back more than 20 feet from the property line shall have a minimum width of 12 feet at the property line

PARAMETER	DRIVEWAY (RDW)	TWO PARCEL LANE (RL2)	THREE TO FIVE PARCEL LANE (RL5)	NOTES
General Parameters (Typical Section and Horizontal Criteria) (Continued)				
Traveled Way width, where inside horizontal radius is greater than 100' and less than 200', min.	12'	20'	20' paved, 22' unpaved	See R-5
Traveled Way width, where inside horizontal radius is greater than 50' and less than 100', min.	14'	22'	22'	See R-5
Traveled Way width, One Way Vehicular Access Facility min.	Same as widths for Residential Driveway parameter	Same as widths for Residential Driveway parameter	Same as widths for Residential Driveway parameter	
Roadway Width within Right of Way max.	28'	36'	36'	Does not include flares; additional 5' shoulder is acceptable. For Kirkwood, See Note 12
Shoulder width, each side min.	1' unless stabilized edge of driveway, 2 sack mix or equal	1' unless stabilized edge of roadway, 2 sack mix or equal	1' unless stabilized edge of roadway, 2 sack mix or equal	See R-10
Gate Location	30' from serving roadway to allow for vehicle staging	30' from serving roadway to allow for vehicle staging	30' from serving roadway to allow for vehicle staging	Gate may not interfere with staging area and must be accessible to the satisfaction of local fire agencies.
Gate width, garage entry width for multi-family or commercial parking structures, min.	Minimum driveway width + 1’ on each side	Minimum lane width + 1’ on each side	Minimum lane width + 1’ on each side	

PARAMETER	DRIVEWAY (RDW)	TWO PARCEL LANE (RL2)	THREE TO FIVE PARCEL LANE (RL5)	NOTES
Grades and Vertical Curves (Vertical Criteria)				
Traveled Way Curve Inside Radius, minimum	50'	50'	50'	See width parameters for widening required for radius less than 200'
Traveled Way Flare Radius, encroaching onto minor road or smaller	8' See R-5	See R-6	See R-6	
Centerline Profile Grade - Unpaved, max.	10%	10%	10%	See Note 8 and R-7
Centerline Profile Grade - Paved, max.	13%	13%	13%	See Note 8 and R-7
Centerline Profile Grade within Right of Way Encroachment	Minus 2-5% from EOP for: 8' Min for encroachment onto minor road or smaller; 10' Min for encroachment onto collector road; Then +/- 5% max. to P/L	Minus 2-5% from EOP for: 8' Min for encroachment onto minor road or smaller; 10' min. for encroachment onto collector road; Then +/- 5% max. to P/L	Minus 2-5% from EOP for: 8' Min for encroachment onto minor road or smaller; 10' min. for encroachment onto collector road; Then +/- 5% max. to P/L	See Note 8 and R-7
Vertical curve transition, 4-8% change in grade minimum	1/2' transition length per % change in grade	1/2' transition length per % change in grade	1/2' transition length per % change in grade for crest, 1' per % change in grade sag	Minimum criteria, designers should anticipate actual vehicle use and adjust accordingly
Vertical curve transition, 8-12% change in grade	1' transition length per % change in grade	1' transition length per % change in grade	Professional design required	Minimum criteria, designers should anticipate actual vehicle use and adjust accordingly
Vertical curve transition, 13+% change in grade	2' Transition length per % change	2' Transition length per % change	Professional design required	Minimum criteria, designers should anticipate actual vehicle use and adjust accordingly
Roadway Cross Slope, min.	1%	1%	1%	See R-5
Roadway Cross Slope, recommended	2%	2%	2%	See R-5
Roadway Cross Slope, max.	5%	5%	4%	See R-5

PARAMETER	DRIVEWAY (RDW)	TWO PARCEL LANE (RL2)	THREE TO FIVE PARCEL LANE (RL5)	NOTES
Shoulders, Drainage and Crossings				
Shoulder Cross Slope	5%	5%	5%	See R-5
Drainage Ditch Flow line from Shoulder Edge, min.	4'	4'	4'	See R-7
Drainage Ditch Side Slope, max.	1.5:1 stabilized; 2:1 unstabilized	1.5:1 stabilized; 2:1 unstabilized	1.5:1 stabilized; 2:1 unstabilized	See R-7
Drainage Depth at flow line, below fog line (or elevation at outside edge of traffic lane width for serving road width) min.	2.5'	2.5'	2.5'	See R-7
Culvert cover, min.	12	12"	12"	See R-5 and R-7 See Note 9 and Section 7.06
Culvert Size for Ditch Crossing, minimum	18" CMP or 15" HDPE	18" CMP or 15" HDPE	18" CMP or 15" HDPE	See R-5 and R-7 See Note 9
Bridges				Reviewed and permitted on a case by case basis. See Note 10
Intersection Parameters				
Sight Distance, min.	See R-5	See R-6	See R-6	See R-5 and R-6 See Section 9.08
Flare Setback, min.	N/A	See R-6	See R-6	See R-6
Flare Taper length, min.	N/A	See R-6	See R-6	See R-6

PARAMETER	DRIVEWAY (RDW)	TWO PARCEL LANE (RL2)	THREE TO FIVE PARCEL LANE (RL5)	NOTES
Turnarounds – Cul-De-Sac and Hammerhead				
No parking, fire lane pavement marking or signage	As required by fire chief, fire official, or CalFire	As required by fire chief, fire official, or CalFire	As required by fire chief, fire official, or CalFire	
Traveled Way Radius Cul-de-sac turnaround, min	50'	50'	50'	See R-13
Traveled Way Radius – Cul-de-sac turnaround center island, max.	35'	35'	35'	
Traveled Way Inside Radius - hammerhead turnaround, min.	30'	26'	25'	See R-14
Leg length from centerline- hammerhead turnaround, min.	40', two terminal leg lengths must total 100'	40', two terminal leg lengths must total 100'	40', two terminal leg lengths must total 100'	See R-14
Leg width- hammerhead turnaround, min.	14'	18'	20'	See R-14
Clearing of obstructions beyond roadway surface, all turnarounds, min.	4'	4'	4'	See R-13 and R-14
Turnaround, when required	When driveway length is greater than 300’	Required for dead end lanes	Required for dead end lanes	See Note 4
Turnouts				
Turnout Frequency - Driveways greater than 800', min.	Intervisible and no more than 400' between turnouts	N/A	N/A	
Turnout Frequency - Driveways length greater than 150' and less than 800', min.	Intervisible and no more than 400' between turnouts	N/A	N/A	
Turnout Frequency - 1-way, 1-traffic lane, min.	Intervisible and no more than 400' between turnouts	Intervisible and no more than 400' between turnouts	Intervisible and no more than 400' between turnouts	
Turnout - Width, min.	10'	10'	10'	Only required for single lane facility where permitted
Turnout - Length, min.	30'	30'	30'	Only required for single lane facility where permitted
Turnout - Taper Length, min.	25'	25'	25'	Only required for single lane facility where permitted

TABLE 9-2

ROAD AND COLLECTOR STANDARDS

PARAMETER	MINOR ROAD	MAJOR ROAD	MINOR COLLECTOR	MAJOR COLLECTOR	NOTES
General Parameters (Typical Section and Horizontal Criteria)					
Intersection Angle	90 degrees preferred. 80-100 degrees acceptable.	90 degrees preferred. 80-100 degrees acceptable.	90 degrees preferred. 80-100 degrees acceptable.	90 degrees preferred. 80-100 degrees acceptable.	See R-6 and Section 9.08
Access easement width, min.	54’	54’	60’	60’	See R-1 and R-2
Horizontal clearance (min. distance from edge of traveled way to obstruction)	7'	10’	10'	10'	Outer edge of roadside cut shall be at stated distance from the centerline of a fire hydrant, utility pole, traffic signal, light standard, or other similar feature.
Vehicular access facility separation from property line of parcel not using facility, min.	150'	150'	300'	300'	
Vertical Clearance, min.	15'	15'	15'	15'	
Structural Section- min.	3" HMA w/ 8" Class 2 AB	3" HMA w/ 8" Class 2 AB	3" HMA w/ 8" Class 2 AB	3" HMA w/ 8' Class 2 AB	See Sections 9.21 -9.24
Traffic Index, minimum	5	6	8	9	
Minimum Centerline Radius of Curvature, *Unpaved*	300’	N/A	N/A	N/A	
Minimum Centerline Radius of Curvature, *Paved*	210’	450’	750’	750’	
Minimum Traveled Way Width, *Unpaved*	22’	N/A	N/A	N/A	See R-1 and R-2, See Section 9.15
Minimum Traveled Way Width, *Paved*	20’	22’	22’	24’	See R-1 and R-2, See Section 9.15
Traveled Way Width for One Way Roads	Same width as for two way	Same width as for two way	N/A	N/A	See Section 9.15
Parallel Parking Lane Width	7'	7'	8'	8'	
Angle Parking Lane Width, One Side Only	18'	N/A	N/A	N/A	
Gate Location	30' from serving roadway to allow for vehicle staging	30' from serving roadway to allow for vehicle staging	30 ' from serving roadway to allow for vehicle staging	30' from serving roadway to allow for vehicle staging	See Section 9.13
Gate Width	Traveled way width plus 2’ each side	Traveled way width plus 2’ each side	N/A	N/A	See Section 9.18

PARAMETER	MINOR ROAD	MAJOR ROAD	MINOR COLLECTOR	MAJOR COLLECTOR	NOTES
Grades and Vertical Curves (Vertical Criteria)					
Centerline Profile Grade - *Unpaved*, max.	10%	N/A	N/A	N/A	See Note 2
Centerline Profile Grade - *Paved*, max.	14%	12%	10%	10%	See Note 2
Vertical Curves	See R-17	See R-17	See R-17	See R-17	See R-17
Traveled Way Cross Slope, *Unpaved*	3-6%	N/A	N/A	N/A	See R-1 and R-2
Traveled Way Cross Slope, *Paved*	2%	2%	2%	2%	See R-1 and R-2
Shoulders, Drainage and Crossings					
Shoulder width, each side min.	2'	4'	5'	7'	See R-1 and R-2. Does not include width at intersections.
Shoulder Cross Slope	5%	5%	5%	5%	See R-1 and R-2
Drainage Ditch Flow line from Shoulder Edge, min.	4 feet	4 feet	4 feet	4 feet	See R-1 and R-2
Drainage Ditch Side Slope, max.	1.5:1 stabilized; 2:1 unstabilized	1.5:1 stabilized; 2:1 unstabilized	1.5:1 stabilized; 2:1 unstabilized	1.5:1 stabilized; 2:1 unstabilized	See R-1 and R-2
Drainage Depth at flow line, below fog line (or elevation at outside edge of traffic lane width for serving road width) min.	2.5 feet	2.5 feet	2.5 feet	2.5 feet	
Culvert Cover Minimum for Culverts 96" or less	12"	12"	12"	12"	See Section 7.06
Culvert Cover Maximum	See Section 7.06	See Section 7.06	See Section 7.06	See Section 7.06	See Section 7.06
Min. Culvert Size for culverts less than 80 feet long	18"	18"	18"	18"	See Section 7.06
Min. Culvert Size for Culverts over 80 feet long	24"	24"	24"	24"	See Section7.06
Bridges					See Section 7.09

PARAMETER	MINOR ROAD	MAJOR ROAD	MINOR COLLECTOR	MAJOR COLLECTOR	NOTES
Intersection Parameters					
Sight Distance, min.	See R-6	See R-6	See R-6	See R-6	See R-6
Flare Setback, min.	"	"	"	"	See R-6
Flare Taper length, min.	"	"	"	"	See R-6
Centerline Profile Grade	See Section 9.08	See Section 9.08	See Section 9.08	See Section 9.08	See Section 9.08
Turnarounds – Cul-De-Sac and Hammerhead					
Traveled Way Radius, Cul-De-Sac Turnaround, Outside, Minimum	50'	50'	50'	50'	See R-13
Traveled Way Radius, Cul-De-Sac Inside Center Island, Maximum	35'	35'	26'	26'	
Traveled Way Radius, Hammerhead Turnaround, Minimum	30'	30'	30'	30'	See R-14
Leg length from centerline-hammerhead turnaround, min.	40', two terminal leg lengths must total 100'	40', two terminal leg lengths must total 100'	65', two terminal leg lengths must total 130'	65', two terminal leg lengths must total 130'	See R-14
Leg width- hammerhead turnaround, min.	20’	20’	20’	20'	See R-14
Clearing of obstructions beyond roadway surface, all turnarounds, min.	7'	7'	10'	10'	
Turnaround, When Required	Required for dead end roads	Required for dead end roads	N/A	N/A	See Note 4

TABLE 9-3

	MISCELLANEOUS STANDARDS			
PARAMETER	**RESIDENTIAL STREET**	**COMMERCIAL, INDUSTRIAL OR MULTI-FAMILY LANE**	**EMERGENCY ACCESS ROAD**	**NOTES**
General Parameters (Typical Section and Horizontal Criteria)				
Intersection Angle	90 degrees preferred. 60-120 degrees acceptable.	90 degrees preferred. 80-100 degrees acceptable.	90 degrees preferred. 45-135 degrees acceptable.	See R-6 and Section 9.08
Access easement width, min.				See R-2 and R-3
Number of encroachments per parcel, max.	N/A	Two if 180 feet of frontage	N/A	See Note 14
Access location for parcel with access to more than one street		Access will generally be limited to the lowest volume street		
Horizontal clearance from edge of traveled way to obstructions, minimum	3’	3’	3'	The nearest edge of driveway cut shall be at least 3 feet from the centerline of a fire hydrant, utility pole, traffic signal, light standard or other similar feature
Vehicular access facility separation from property line of parcel not using facility, min.	6’	10’	6’	
Vertical Clearance, min.	15'	15'	15'	
Structural Section- min.	3" HMA w/ 8" Class 2 AB	3" HMA w/ 8" Class 2 AB	N/A	See Section 9.21-9.24
Gate Location	30' from serving roadway to allow for vehicle staging	30' from serving roadway to allow for vehicle staging	N/A	See Section 9.13
Minimum Centerline Radius of Curvature, *Unpaved*	N/A	N/A	50’	
Minimum Centerline Radius of Curvature, *Paved*	150’	150’	50’	

PARAMETER	RESIDENTIAL STREET	COMMERCIAL, INDUSTRIAL OR MULTI-FAMILY LANE	EMERGENCY ACCESS ROAD	NOTES
General Parameters (Typical Section and Horizontal Criteria) (Continued)				
Roadway Width, *Unpaved* Surface, where straight or inside horizontal radius is greater than 200' min.	N/A	N/A	12’	See R-9
Traveled Way Width, *Paved*, on Tangent or Horizontal Radius 200’ or More	20’	20’ See Note 7	10’	See R-2, R-3, R-4, R-9 and R-10 See Note 12
Traveled Way Width, *Paved*, on Tangent or Horizontal Radius 150’ to 200’	20’	20'	12’	See R-2, R-3, R-4, R-9 and R-10
Traveled Way Width where Horizontal Radius is 50’ to 150’	N/A	N/A	14’	See R-9
Traveled Way Width for One Way Facility	Same width as for two way	12’	Same width as for two way	
Roadway Width, Maximum	40’	36’ See Note 12	14’	Does not include width at intersections
Shoulder width, each side min.	4’	4’	1’	See R-2, R-3, R-4, R-9 and R-10
Gate width and garage entry width for multi-family or commercial parking structures, min.	14’	14’	14’	
Intersection Parameters				
Sight Distance, min.	See R-6	See R-6	Same as driveway See R-5	See R-5 and R-6
Flare Setback, min.	See R-6	See R-6	Same as driveway See R-5	See R-5 and R-6
Flare Taper length, min.	See R-6	See R-6	Same as driveway See R-5	See R-5 and R-6

PARAMETER	RESIDENTIAL STREET	COMMERCIAL, INDUSTRIAL OR MULTI-FAMILY LANE	EMERGENCY ACCESS ROAD	NOTES
Grades and Vertical Curves (Vertical Criteria)				
Centerline Profile Grade - *Unpaved*, max.	N/A	N/A	13%	See Note 2
Centerline Profile Grade - *Paved*, max.	14%	14%	13%	See Note 2
Centerline Profile Grade at Intersections	Minus 2-5% from EOP for 30’	Minus 2-5% from EOP for 10’, then +/- 5% max. to property line	Minus 2-5% from EOP for 8’, then +/- 10% max. to property line	See Note 12 See Section 9.08
Vertical Curves	See R-17	See R-17	1/2' transition length per % change in grade for crest, 1' per % change in grade sag	Minimum criteria, designers should anticipate actual vehicle use and adjust accordingly
Traveled Way Cross Slope, *Unpaved*	N/A	N/A	3% to 6%	See R-9
Traveled Way Cross Slope, *Paved*	2%	2%	2%	See R-2, R-3 and R-9
Shoulders, Drainage and Crossings				
Shoulder Cross Slope	5%	5%	5%	See R-2, R-4 and R-9
Drainage Ditch Flow line from Shoulder Edge, min.	4'	4'	4'	See R-2, R-4 and R-9
Drainage Ditch Side Slope, max.	1.5:1 stabilized; 2:1 unstabilized	1.5:1 stabilized; 2:1 unstabilized	1.5:1 stabilized; 2:1 unstabilized	See R-2, R-4 and R-9
Drainage Depth at flow line, below fog line (or elevation at outside edge of traffic lane width for serving road width) min.	2.5'	2.5'	2.5'	See R-2, R-4 and R-9
Culvert Cover Minimum for Culverts 96" or less	12"	12"	12"	See Section 7.06
Culvert Cover Maximum	See Section 7.06	See Section 7,06	See Section 7.06	See Section 7.06
Culvert Size Minimum for Culverts Over 80’ long	24"	24"	24"	See Section 7.06
Culvert Size Minimum for Culverts less than 80’ long	18"	18"	18"	See Section 7.06
Bridges				See Section 7.09

PARAMETER	RESIDENTIAL STREET	COMMERCIAL, INDUSTRIAL OR MULTI-FAMILY LANE	EMERGENCY ACCESS ROAD	NOTES
Turnarounds – Cul-De-Sac and Hammerhead				
No parking, fire lane pavement marking or signage	As required by fire chief, fire official, or CalFire	As required by fire chief, fire official, or CalFire	N/A	
Traveled Way Radius - Cul-De-Sac Turnaround, Outside, Minimum	50’	50’	N/A	See R-13
Traveled Way Radius - Cul-De-Sac Inside Center Island, Maximum	35’	35’	N/A	
Traveled Way Inside Radius Hammerhead Turnaround	30’	30’	N/A	See R-14
Leg length from centerline-hammerhead turnaround, min.	40’, two terminal leg lengths must total 100 feet	40’, two terminal leg lengths must total 100 feet	N/A	See R-14
Leg width- hammerhead turnaround, min.	20 feet	20 feet	N/A	See R-14
Clearing of obstructions beyond roadway surface, all turnarounds, min.	4'	4'	N/A	See R-13 and R-14
Turnaround, when required	Required for dead end streets	Required for dead end lanes	Emergency access roads cannot be dead ends	See Note 4
Turnouts				
Turnout Frequency	N/A	N/A	Intervisible and no more than 400' between turnouts	
Turn-out - Width, min.	N/A	N/A	10'	Only required for single lane facility where permitted
Turn-out - Length, min.	N/A	N/A	30'	Only required for single lane facility where permitted
Turn-out - Taper Length, min.	N/A	N/A	25'	Only required for single lane facility where permitted

NOTES (Appended to Tables 9-1, 9-2 and 9-3)

Note 1 – The maximum length of a dead-end road including all dead-end roads accessed from the dead-end road, shall not exceed the following cumulative lengths:

Serving parcels zoned for less than 1 acre ----------800 feet

Serving parcels zoned for 1 acre to 4.99 acres----------1320 feet

Serving parcels zoned for 5 acres to 19.99 acres---------2640 feet

Serving parcels zoned for 20 acres or larger----------5280 feet

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

Note 2 – Documentation of grade taking into account subsequent surfacing to be installed shall be provided by an appropriately licensed professional prior to application of base material when the road is over 7% and unpaved, and when over 12% when paved. The County Engineer may require grade documentation in other cases, regardless of intended slope.

Note 3 – All one-way roads shall connect to a two-lane road at both ends and may provide access to an area in which the General Plan would allow no more than 10 dwelling units. Maximum length of one-way roads is 2640 feet.

Note 4 – Turnarounds are required at the terminus of all dead end roads or lanes and shall be provided at a maximum of 1320 foot intervals, not including the intersection. A turnaround shall be provided at all building sites on driveways over 300 feet in length and shall be within 50 feet of the building. Where a one way single lane traffic lane provides access to a gated entrance, a turnaround is required before the gate.

Note 5 - A lane may have two entrances when served by a private road not offered for dedication or accepted for maintenance by the County.

Note 6 - Designs that vary from the typical drawings shown on R-13 and R-14 may be approved provided they can be shown to allow the maximum size fire equipment that serves the area to turnaround with no more than 3 maneuvers.

Note 7 - Must meet SRA Fire Safe Regulations. Design by a qualified professional may be required by the Director of Public Works or the Chief Building Official.

Note 8 -

(a) Driveway grade for atypical encroachments for 30 feet beyond EOP shall be the same as driveway grade within the ROW. Recommendation is -2% from EOP within ROW for downhill driveway staging, and -4% for 8 feet from EOP for uphill driveways to allow for proper drainage routing to the roadside ditch and vehicle staging.

(b) Documentation of grade taking into account subsequent surfacing to be installed shall be provided by an appropriately licensed professional prior to application of base rock when over 7% and unpaved, and when over 12% and paved. The Director of Public Works and/ or the Building Official may require grade documentation in other cases, regardless of intended slope. Kirkwood specific plan requires that vehicular access centerline slope for a distance of 20' from the Right of Way line may not exceed 10% when serving 4 or fewer dwellings, or 8% when serving 5 or more dwellings.

Note 9 - Alternative designs for ditch crossings (Standard Drawing R-7) will be considered on a case by case basis, including use of arch pipes, if pipe sizes proposed are determined to be of capacity equivalent to those shown; alternative bedding or cover techniques; and when crossings are over atypical ditches.

Note 10 –

(a) All driveway, road, street, and private lane roadway structures (including bridges) shall be constructed to carry at least the maximum load and provide the minimum vertical clearance as required by Vehicle Code Sections 35550, 35750 and 35250, or these standards, whichever are more stringent.

(b) Appropriate signing, including but not limited to weight or vertical clearance limitations, one-way road or single lane conditions, shall reflect the capability of each bridge.

(c) A bridge with only one traffic lane may be authorized; however, it shall provide for unobstructed visibility from one end to the other and turnouts at both ends.

(d) Development permit applications that include a bridge shall include appropriate engineering calculations, and documentation of permits or approvals from all other appropriate agencies.

Note 11 - An 18' travel way width may be permitted where deed restrictions limit the construction on two parcels served to 1 Group R, Div. 3 Occupancy/ parcel. This arrangement is typical of a duplex.

Note 12 –

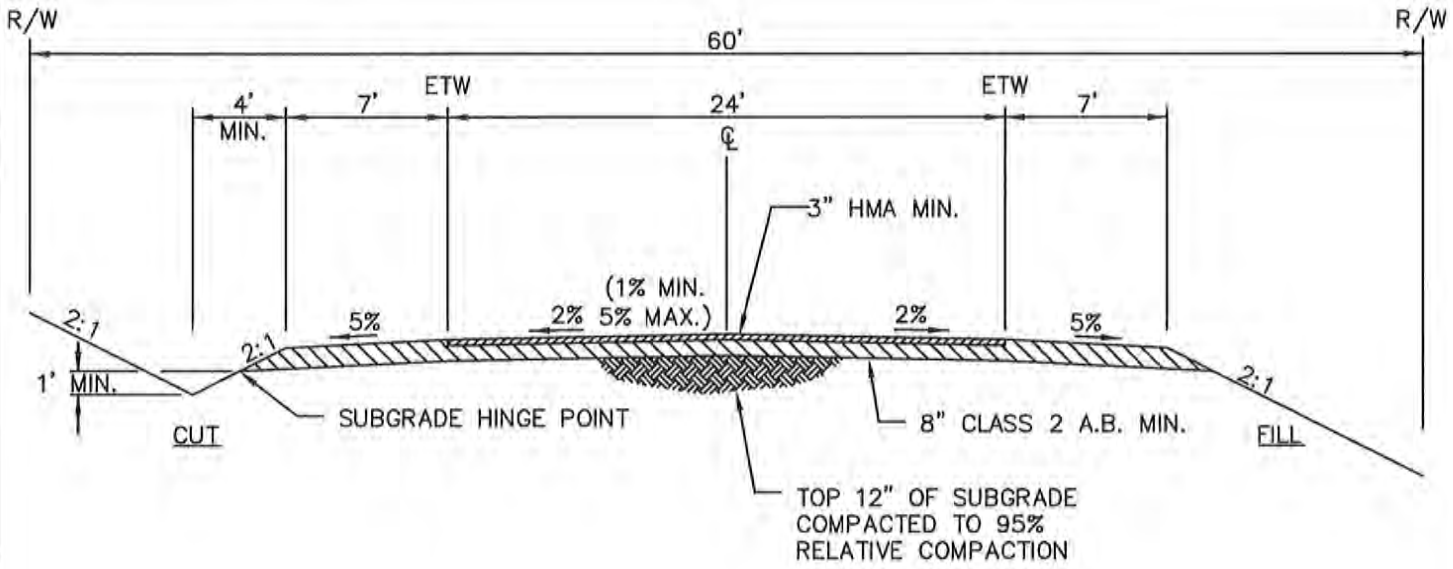
(a) Kirkwood specific plan requires that driveways providing access to garages or parking areas that are set back more than 20 feet from the property line shall have a maximum width of 14 feet at the property line; driveways providing access to garages and parking areas that are set back 20 feet or less from the street right of way shall not exceed the width of the garage door opening plus 2 feet at the property line.

(b) Kirkwood Specific Plan allows a maximum grade of 8% for not less than 20 feet from the right-of-way of a street.

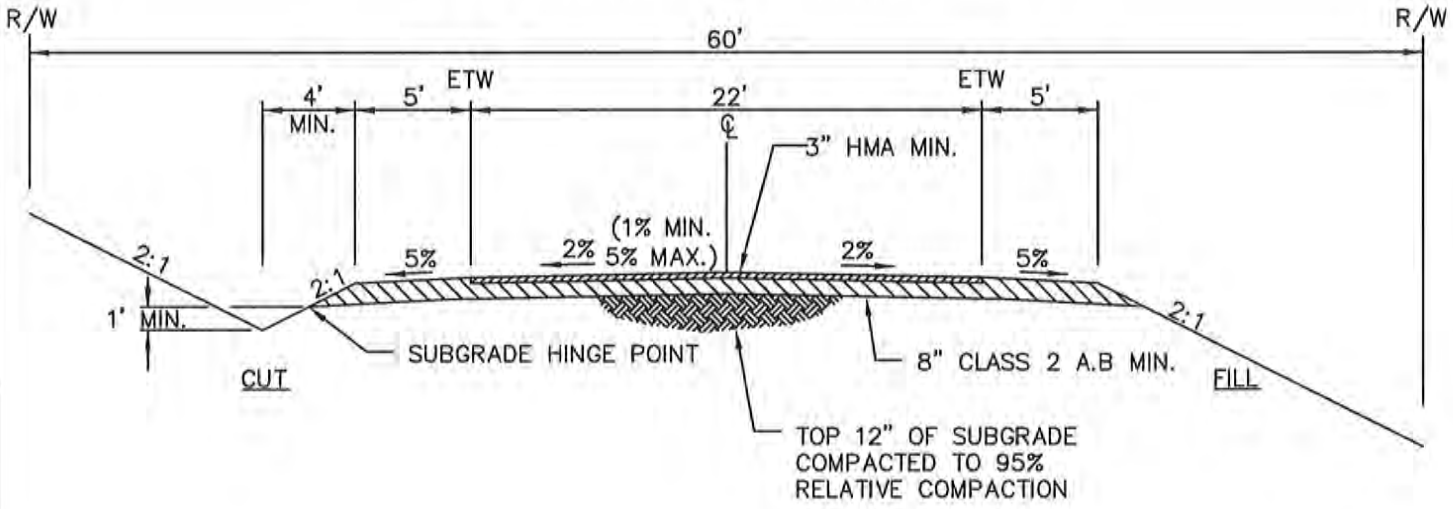
(c) Kirkwood Specific Plan sets a minimum width of 24 feet for two way facilities and a maximum width of 30 feet.

Note 13 - When driveway encroaches on paved road, the driveway shall be paved from the edge of road pavement to edge of Right of Way.

Note 14 - Where two or more driveways serve the same parcel, the centerlines of the driveways shall be separated a minimum of 50 feet.

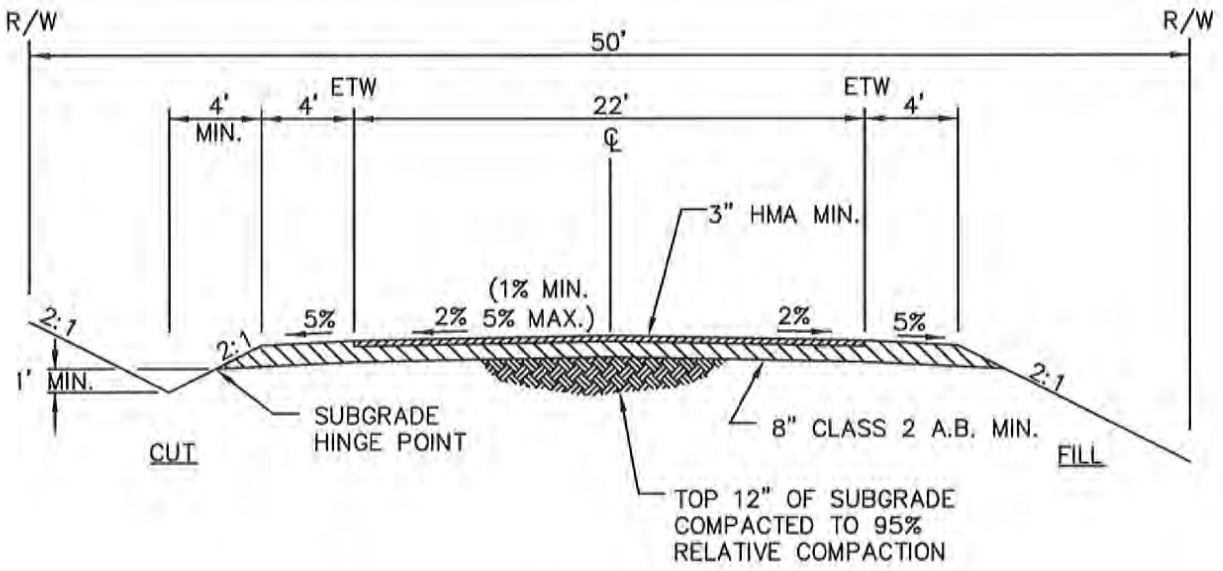


MAJOR COLLECTOR

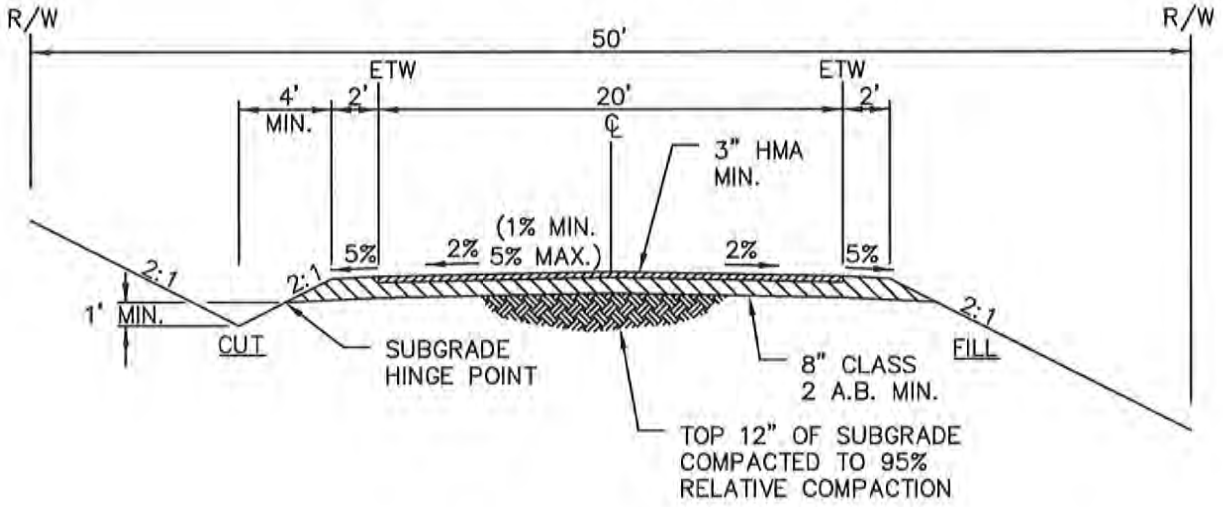


MINOR COLLECTOR

APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER	
				ROADWAY TYPICAL SECTION	R-1	
REVISION	BY	APPROVED	DATE		SCALE	DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014

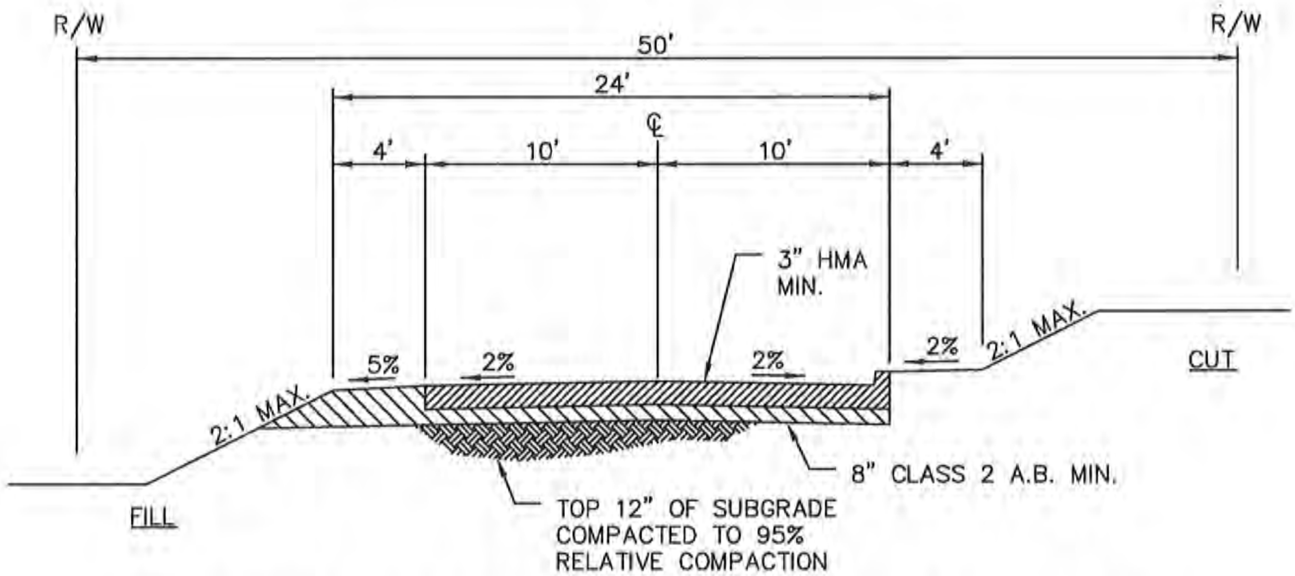


MAJOR ROAD

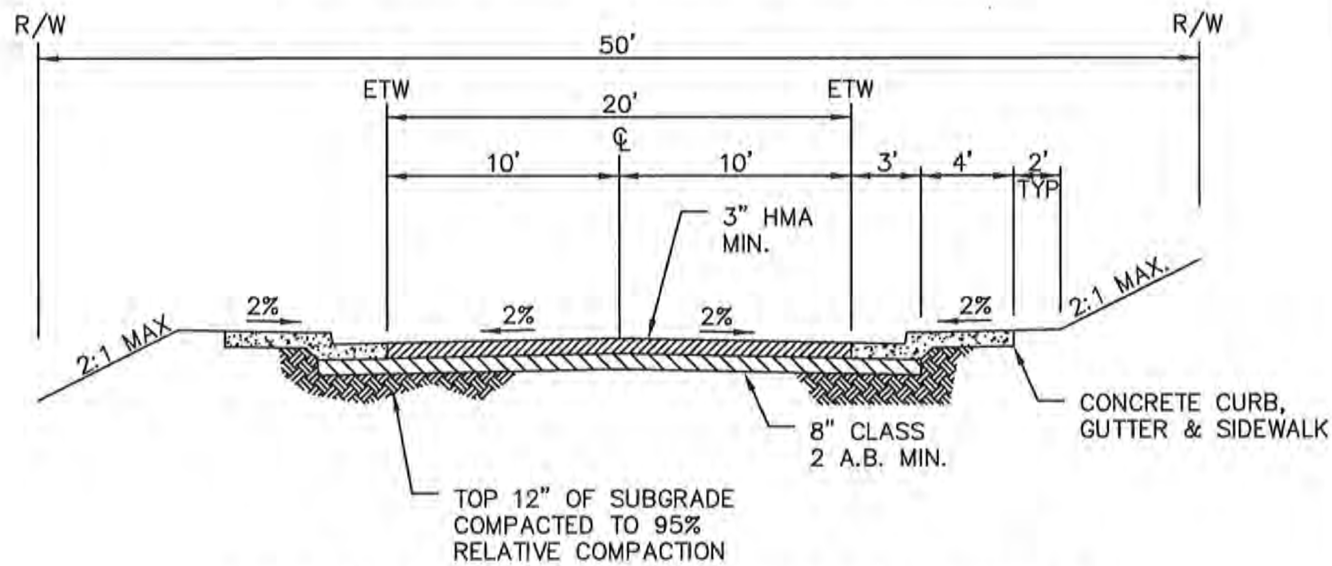


MINOR ROAD

ALPINE COUNTY CALIFORNIA	APPROVED BY: COUNTY ENGINEER			STANDARD DRAWING TITLE	SHEET NUMBER
				ROADWAY TYPICAL SECTION	R-2
	REVISION	BY	APPROVED / DATE		SCALE: NTS; DATE: MARCH 2014
				ALPINE COUNTY - DEVELOPMENT STANDARDS	

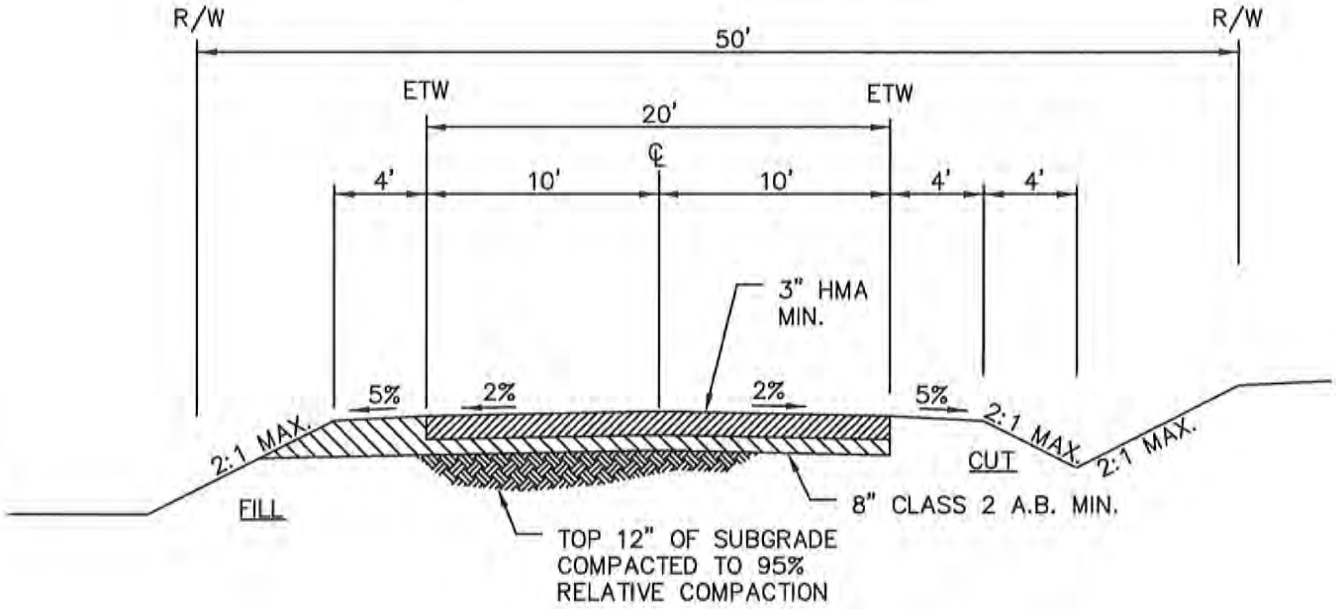


TYPICAL SECTION – RESIDENTIAL STREET AND COMMERCIAL, INDUSTRIAL, MULTIFAMILY LANE W/O SIDEWALK AND W/O PARKING



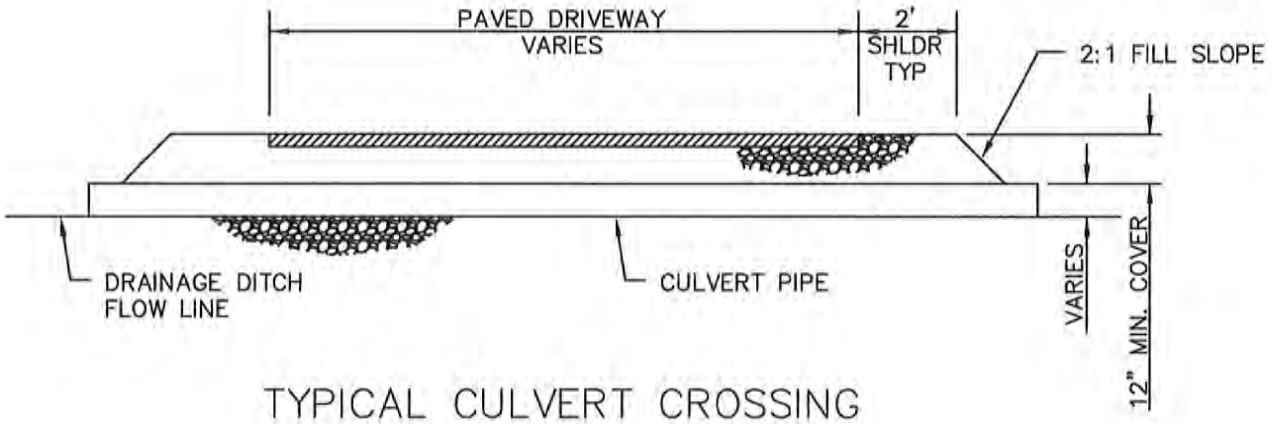
TYPICAL SECTION – RESIDENTIAL STREET WITH SIDEWALKS W/O PARKING

APPROVED BY:	STANDARD DRAWING TITLE	SHEET NUMBER	
COUNTY ENGINEER	ROADWAY TYPICAL SECTION	R-3	
REVISION / BY / APPROVED / DATE		SCALE	DATE
	ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014

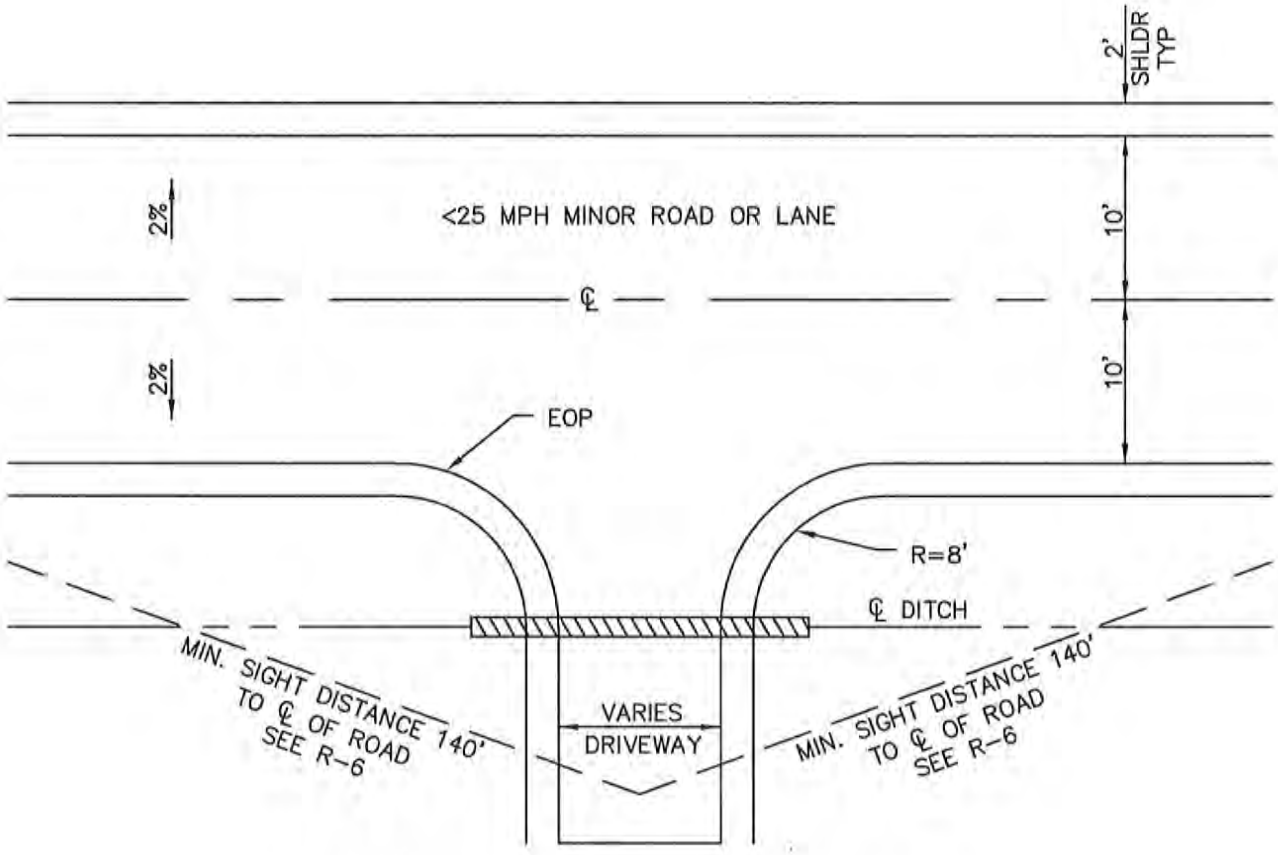


TYPICAL SECTION – COMMERCIAL, INDUSTRIAL, MULTIFAMILY W/O C&G SIDEWALKS, PARKING

APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER
				ROADWAY TYPICAL SECTION	R-4
REVISION	BY	APPROVED	DATE		SCALE: NTS; DATE: MARCH 2014
				ALPINE COUNTY - DEVELOPMENT STANDARDS	



TYPICAL CULVERT CROSSING

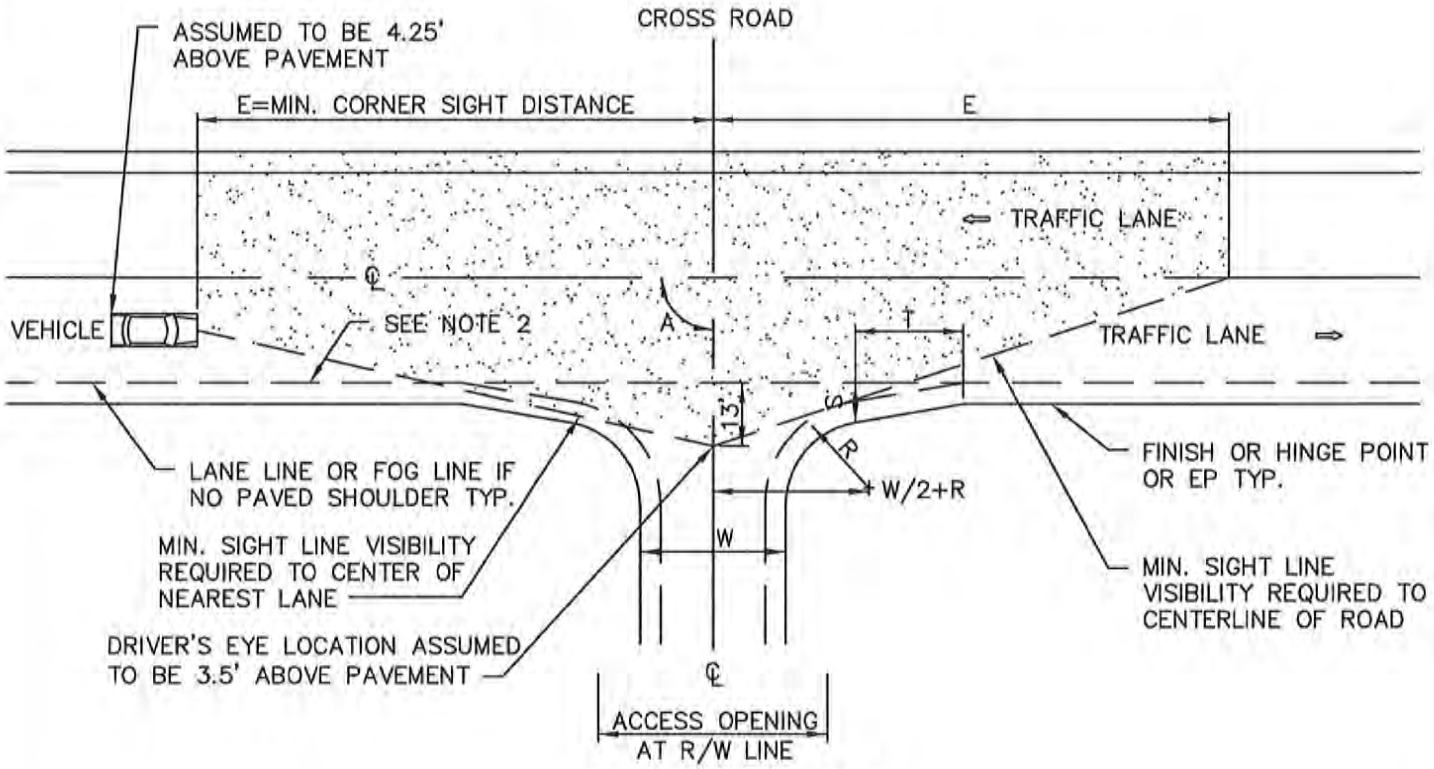


TYPICAL DRIVEWAY INTERSECTION

ALPINE COUNTY CALIFORNIA	APPROVED BY: Marlene Mercer COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER
					TYPICAL RESIDENTIAL DRIVEWAY INTERSECTION & CULVERT CROSSING	R-5
	REVISION	BY	APPROVED	DATE		SCALE: NTS; DATE: MARCH 2014
					ALPINE COUNTY - DEVELOPMENT STANDARDS	

NOTES:

1. INTERSECTING R/W LINES AT ROADWAY CONNECTIONS SHALL BE JOINED BY A 25' OR GREATER RADIUS CURVE TO ALLOW FOR ROADWAY IMPROVEMENTS.
2. SETBACK = 13' MIN. FROM EDGE OF TRAVELED WAY. THIS SETBACK MAY BE REQUIRED TO BE INCREASED UP TO 30' DUE TO INTERSECTION LAYOUT.
3. IN BOTH DIRECTIONS TO TRAVEL ALONG THE CROSSROAD, SIGHT DISTANCE (E) IS TO BE MEASURED ALONG THE CROSSROAD CL FOR TWO LANE CROSSROADS, AND ALONG THE CL OF THE NEAREST LANE TO THE ROAD FOR MULTI-LANE ROADS.
4. WHERE RESTRICTIVE CONDITIONS DO NOT ALLOW COMPLIANCE WITH THE SPECIFIED SIGH DISTANCE REQUIREMENTS, THE ENGINEER MAY APPROVE A REDUCTION OF THE CORNER SIGHT DISTANCE TO NO LESS THAN THE MIN. STOPPING SIGHT DISTANCE AS OUTLINED IN THE CALTRANS HIGHWAY DESIGN MANUAL.
5. LINE OF SIGHT CLEARANCE SHALL TAKE INTO ACCOUNT EXISTING/FUTURE LANDSCAPING.
6. WHERE ADT<400 FOR BOTH ROADS/LAKES, REDUCE E BY 50%.



ROAD OR LANE

LANES

	DESIGN SPEED (MPH)							
	25	30	35	40	45	50	55	60
A	60° TO 120°							
E	275'	330'	385'	440'	495'	550'	605'	660'
S	3'	3'	3'	3'	4'	4'	5'	5'
R	15'	15'	20'	20'	25'	25'	25'	25'
T	VARIABLE – 25' MIN.							
W	AS APPROVED							

ROADS

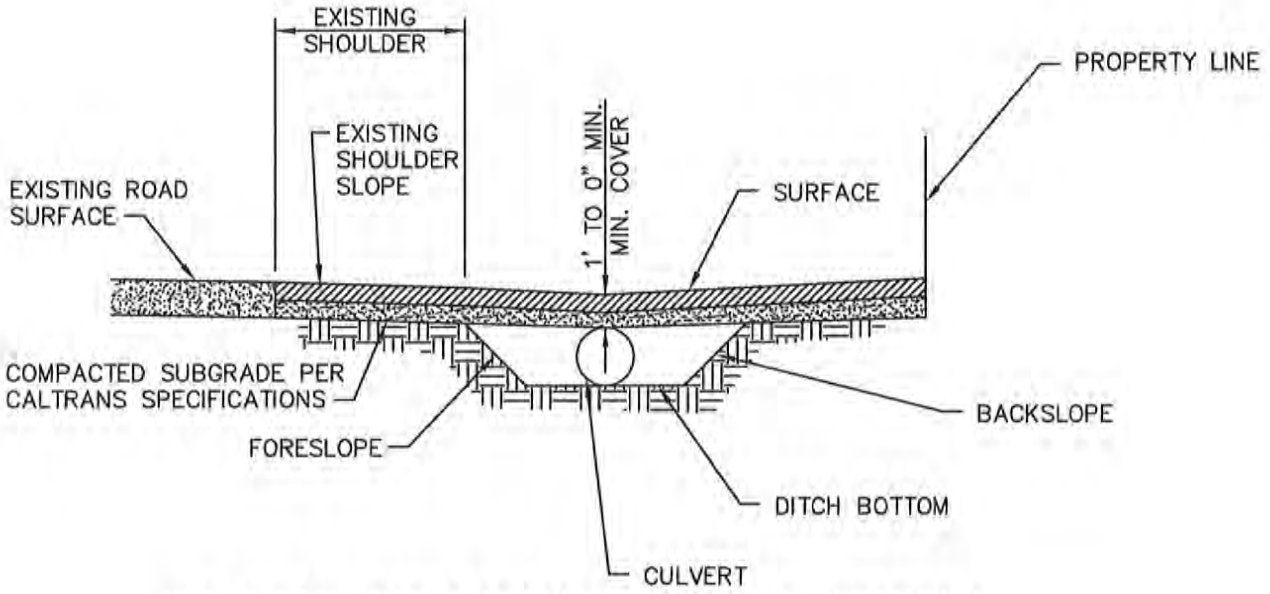
	DESIGN SPEED (MPH)							
	25	30	35	40	45	50	55	60
A	80° TO 100°							
E	275'	330'	385'	440'	495'	550'	605'	660'
S	8'	8'	12'	12'	12'	12'	12'	12'
R	25'	30'	35'	40'	45'	50'	50'	50'
T	50'	75'	100'	150'	200'	250'	250'	250'
W	CONFORM TO ROAD SECTION							

APPROVED BY:

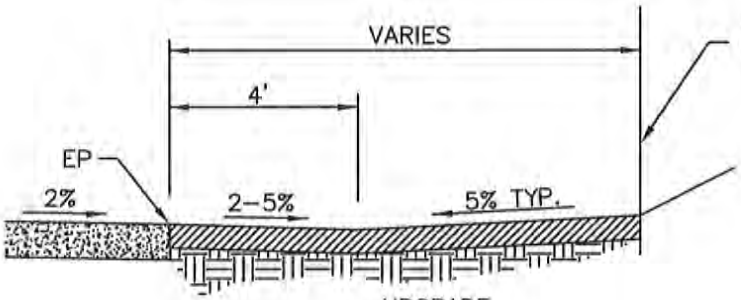
COUNTY ENGINEER

REVISION	BY	APPROVED	DATE

STANDARD DRAWING TITLE	SHEET NUMBER
ROADWAY CONNECTIONS	R-6
	SCALE: NTS; DATE: MARCH 2014
ALPINE COUNTY - DEVELOPMENT STANDARDS	

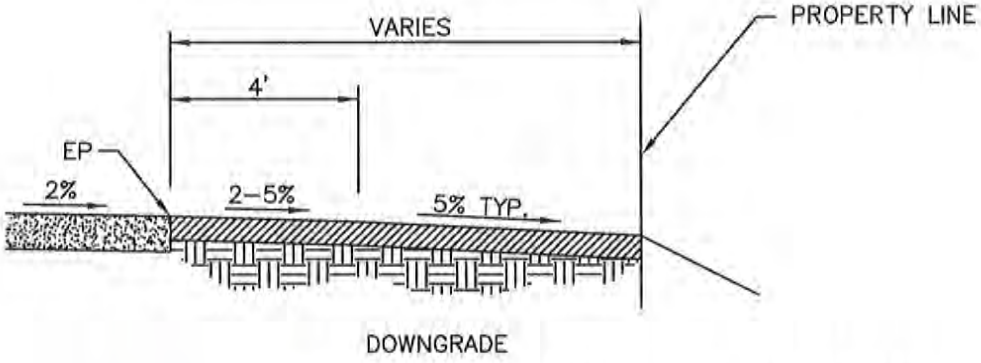


TYPICAL DRIVEWAY AND LANE PROFILE



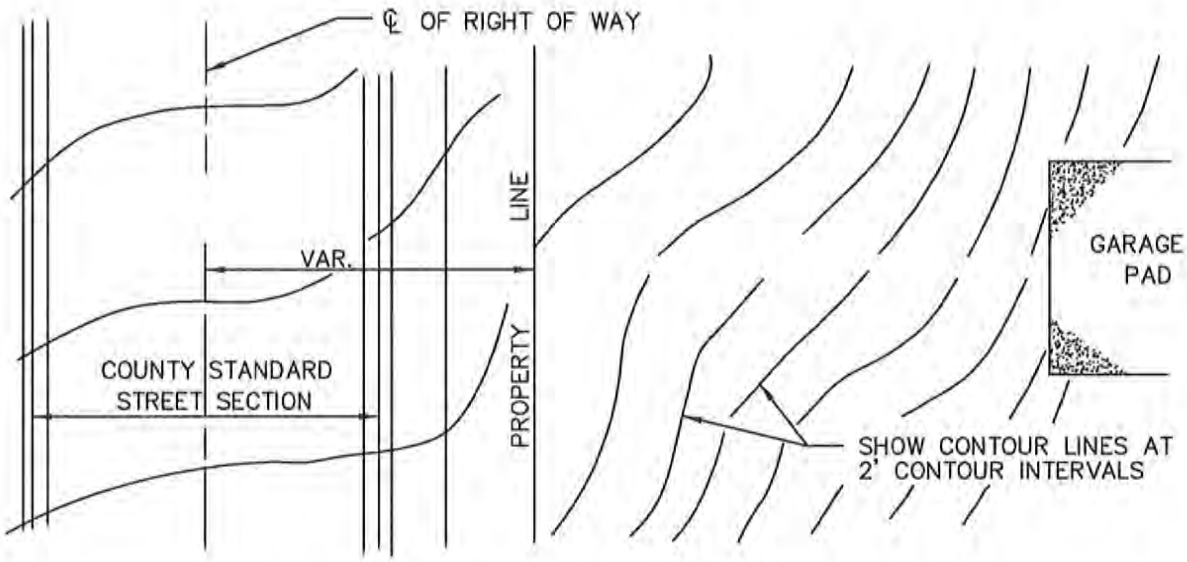
NOTES:

1. REFER TO TABLES 9–1, 9–2 AND 9–3 FOR MORE SPECIFIC DRIVEWAY AND LANE DESIGN CRITERIA.

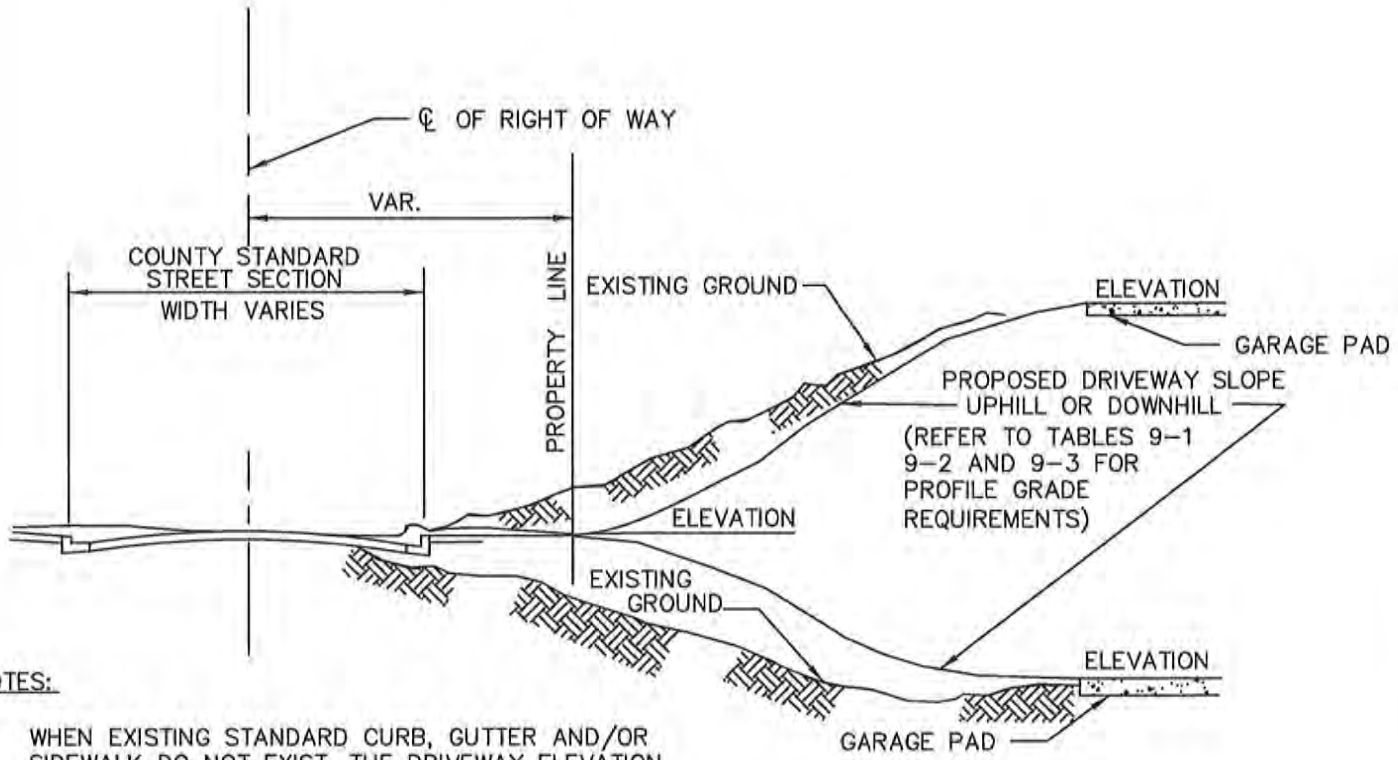


DRIVEWAY AND LANE GRADES

APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER	
				DRIVEWAY AND LANE PROFILE AND GRADES	R-7	
REVISION	BY	APPROVED	DATE		SCALE	DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



DRIVEWAY PLAN VIEW

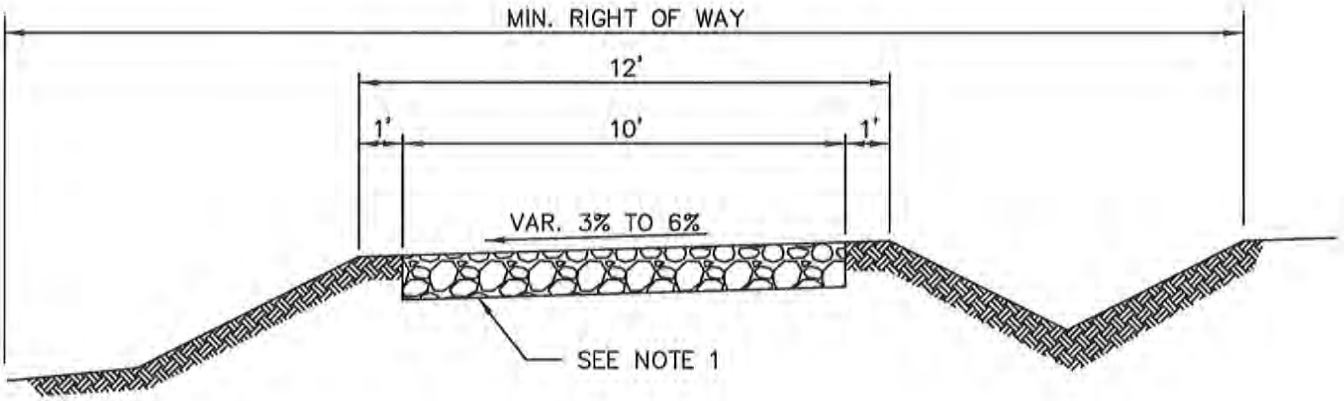


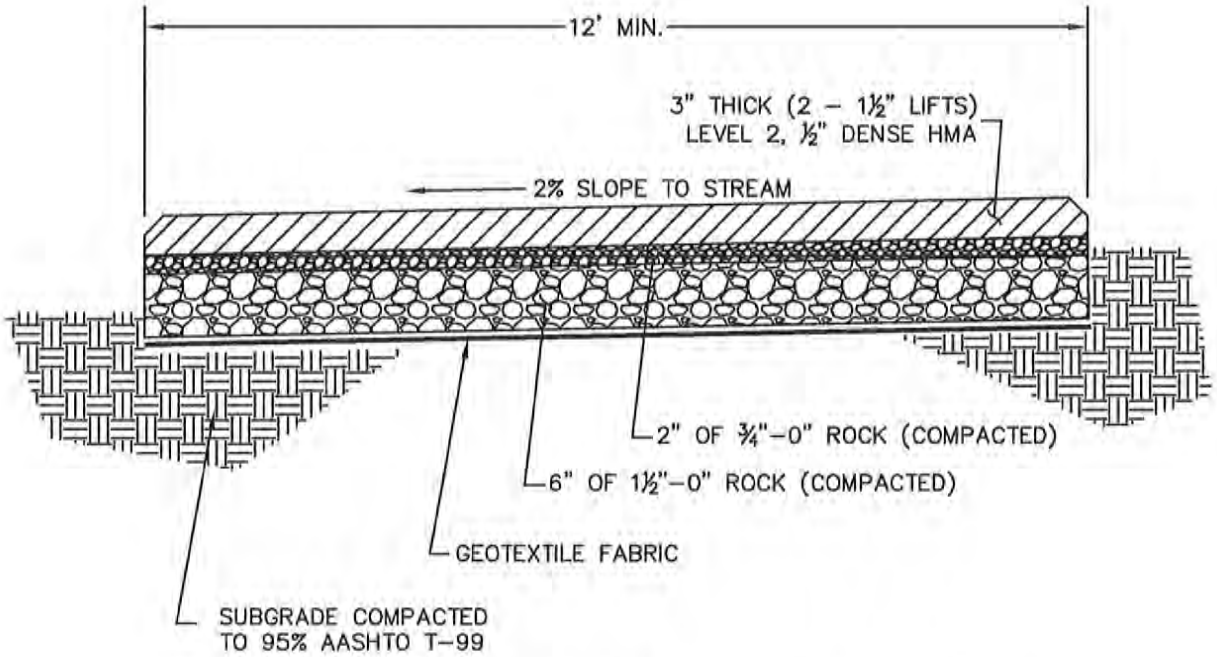
NOTES:

1. WHEN EXISTING STANDARD CURB, GUTTER AND/OR SIDEWALK DO NOT EXIST, THE DRIVEWAY ELEVATION AT THE FUTURE PROPERTY LINE SHALL BE EQUAL TO THE EXISTING CENTERLINE ELEVATION UNLESS FUTURE STREET GRADES HAVE BEEN ESTABLISHED BY THE COUNTY.

DRIVEWAY PROFILE VIEW

ALPINE COUNTY CALIFORNIA	APPROVED BY: COUNTY ENGINEER			STANDARD DRAWING TITLE	SHEET NUMBER
				DRIVEWAY PLAN & PROFILE	R-8
	REVISION	BY	APPROVED / DATE		SCALE / DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS / MARCH 2014



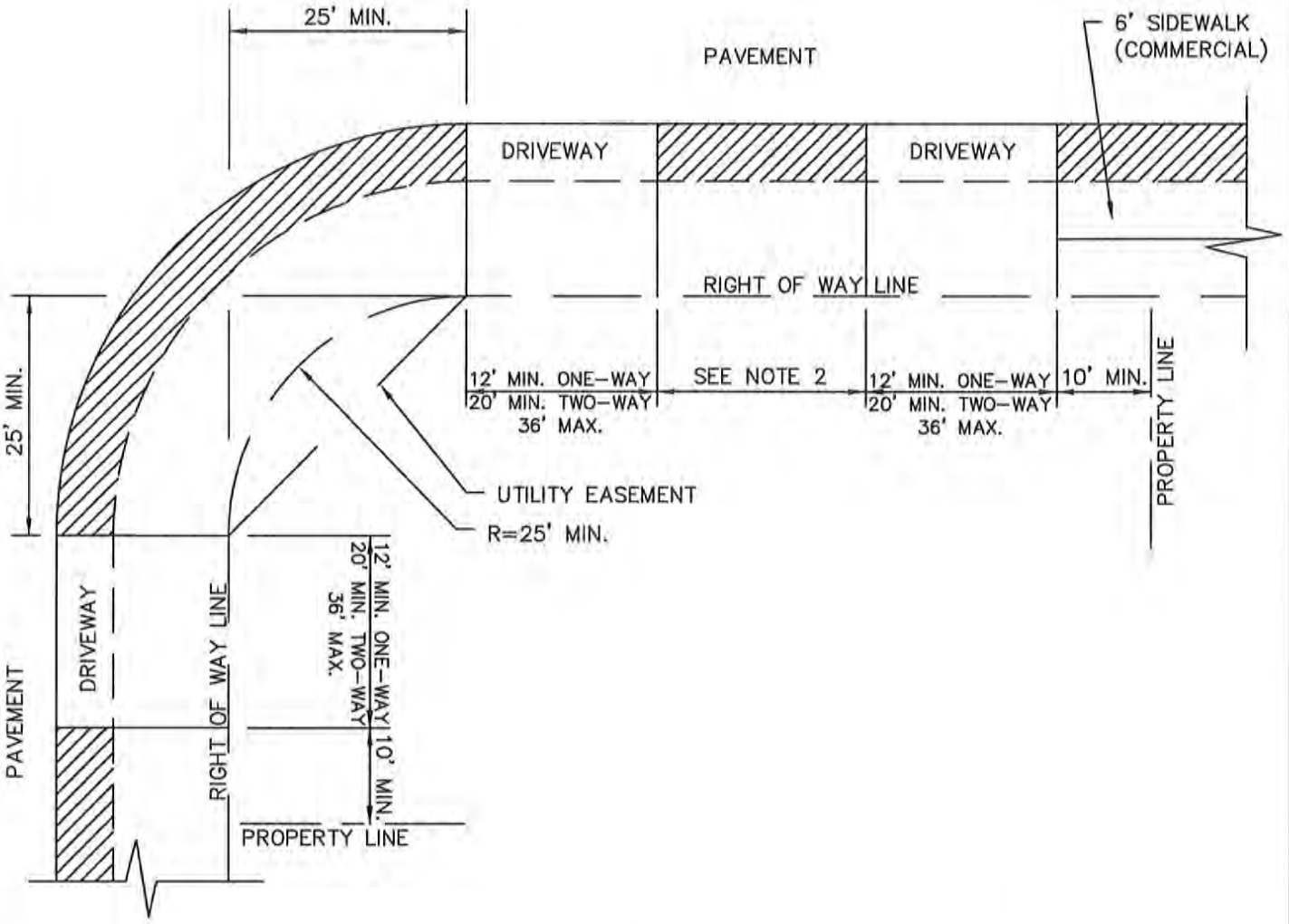


MAINTENANCE ACCESS ROAD

NOTES:

1. SURFACE CAPABLE OF SUPPORTING A 40,000 LB. VEHICLE, BUT NO MINIMUM STRUCTURAL SECTION IS REQUIRED.
2. CROSS SLOPE OF 2% IF PAVED.

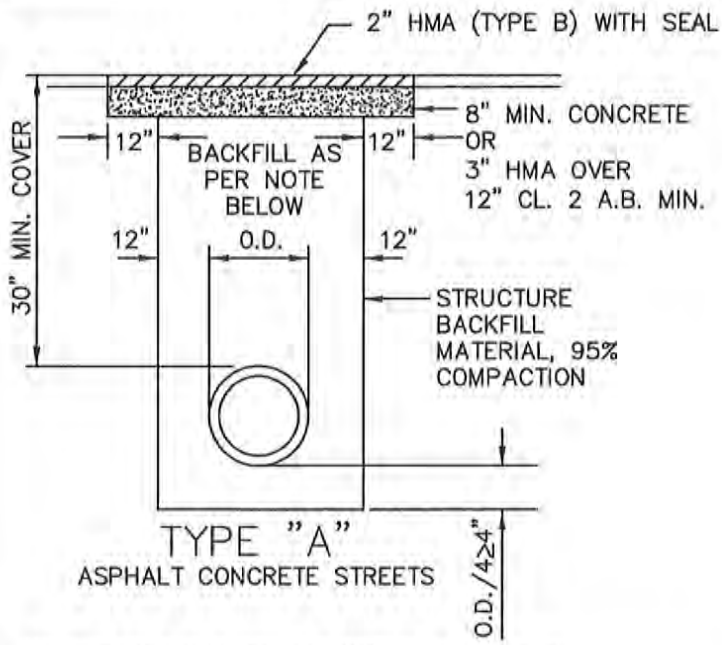
APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER	
				EMERGENCY ACCESS ROAD	R-9	
REVISION	BY	APPROVED	DATE		SCALE	DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



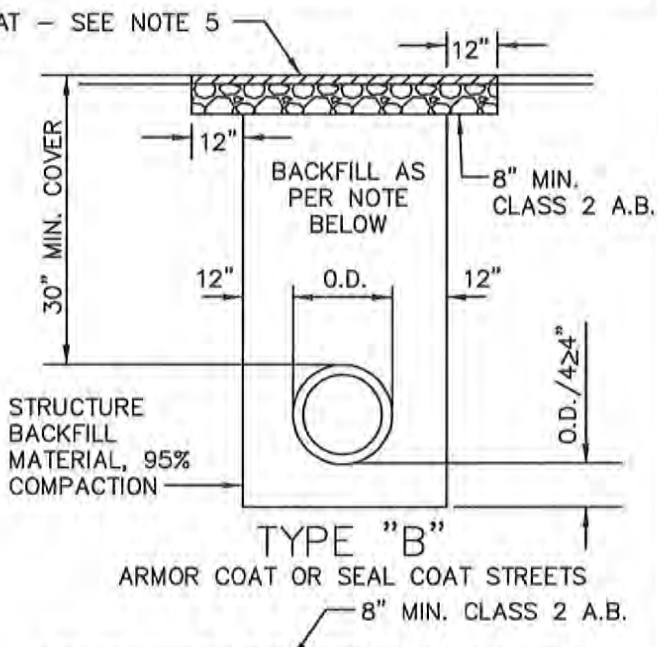
NOTES:

1. FRONTAGE MEASURED ALONG R/W LINE AND FROM THE INTERSECTION OF PROJECTED R/W TANGENTS ON LOT CORNERS. DRIVEWAYS NOT PERMITTED WITHIN 10' OF PROPERTY LINES OR 25' OF INTERSECTING R/W TANGENTS.
2. 22' MIN. ALLOWABLE DISTANCE BETWEEN DRIVEWAYS FOR LESS THAN 200' FRONTAGE AND 45' MIN. ALLOWABLE DISTANCE BETWEEN DRIVEWAYS FOR GREATER THAN OR EQUAL TO 200' FRONTAGE AS MEASURED AT R/W LINE.

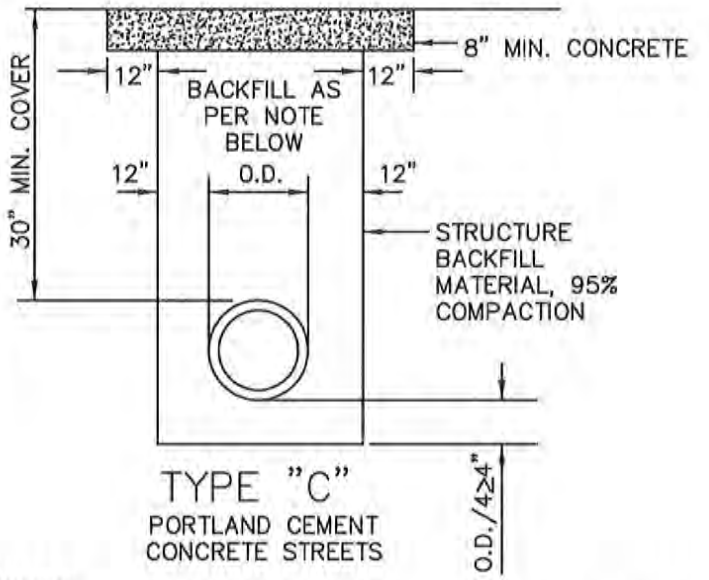
APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER	
				COMMERCIAL DRIVEWAY LOCATIONS	R-10	
REVISION	BY	APPROVED	DATE		SCALE	DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



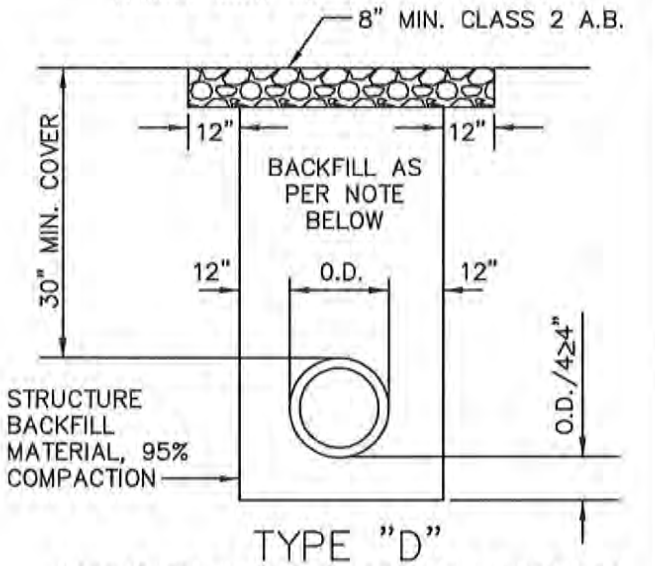
TYPE "A"
ASPHALT CONCRETE STREETS



TYPE "B"
ARMOR COAT OR SEAL COAT STREETS



TYPE "C"
PORTLAND CEMENT CONCRETE STREETS

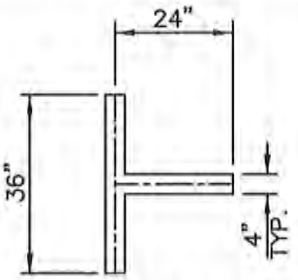


TYPE "D"
AGGREGATE BASE SURFACED, OR UNIMPROVED STREETS, ALLEYS, OR EASEMENTS

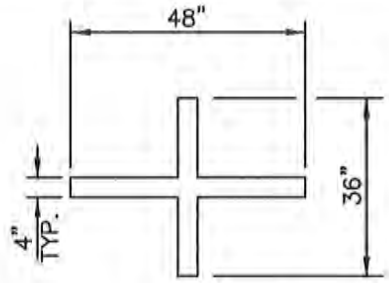
NOTES:

1. ALL WORK SHOWN ABOVE SHALL CONFORM TO THE APPLICABLE SECTION OF THE STANDARD SPECIFICATIONS.
2. ALL EXCAVATION WITHIN PUBLIC RIGHT–OF–WAY SHALL BE BACKFILLED IN ACCORDANCE WITH SECTION 19–3 OF THE STANDARD SPECIFICATIONS.
3. AREA ADJACENT TO THE TRENCH SHALL BE LEFT IN A CONDITION EQUAL TO OR BETTER THAN THAT OF EXISTING PRIOR TO CONSTRUCTION.
4. SEAL COAT – BITUMINOUS BINDER SHALL BE COVERED WITH EITHER SAND OR SCREENINGS TO MATCH EXISTING SURFACE.
5. STRUCTURAL SECTION ELEMENTS MAY BE INCREASED WHEN REQUIRED BY THE COUNTY ENGINEER AND DUE TO SOIL CONDITIONS AND TRAFFIC CONSIDERATIONS. THE REPLACEMENT STRUCTURAL SECTION SHALL EQUAL THE EXISTING STRUCTURAL SECTION AS A MINIMUM REQUIREMENT, EXCEPT THAT THE SECTION SHOWN ABOVE IS AN ABSOLUTE MINIMUM.
6. MAXIMUM TRENCH WIDTH TO BE 24 INCHES PLUS THE OUTSIDE DIAMETER OF THE PIPE TO A HEIGHT OF 24 INCHES ABOVE THE TOP OF PIPE. NO EXCEPTIONS.

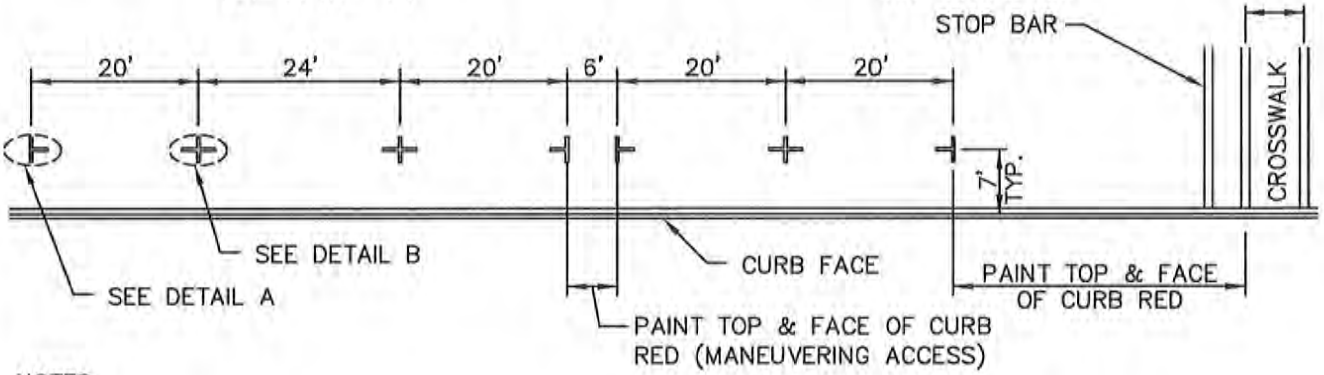
APPROVED BY: COUNTY ENGINEER	STANDARD DRAWING TITLE	SHEET NUMBER
REVISION / BY / APPROVED / DATE	CROSSING DETAIL	R-11
		SCALE: NTS / DATE: MARCH 2014
	ALPINE COUNTY - DEVELOPMENT STANDARDS	



DETAIL A

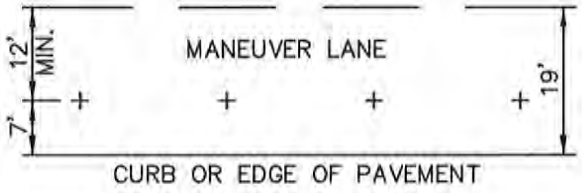


DETAIL B

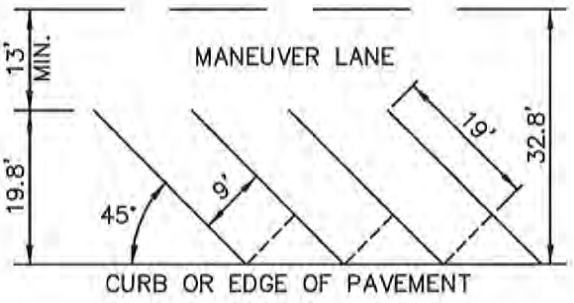


NOTES:

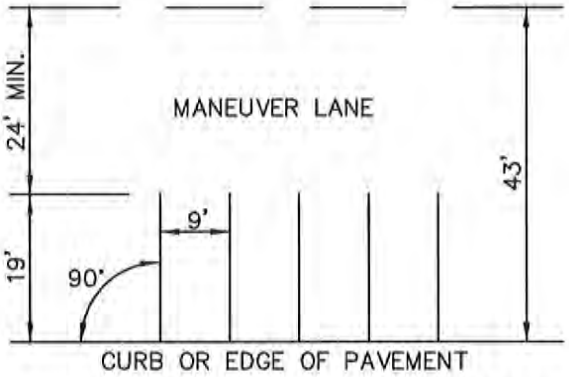
1. NO PARKING WITHIN 20' OF A CROSSWALK OR 15' ON EITHER SIDE OF A FIRE HYDRANT.
2. PARKING SPACE MARKINGS SHALL BE WHITE, TRAFFIC PAINT.
3. PARKING SPACE MARKINGS SHALL BE SYMMETRICAL ABOUT AXES.



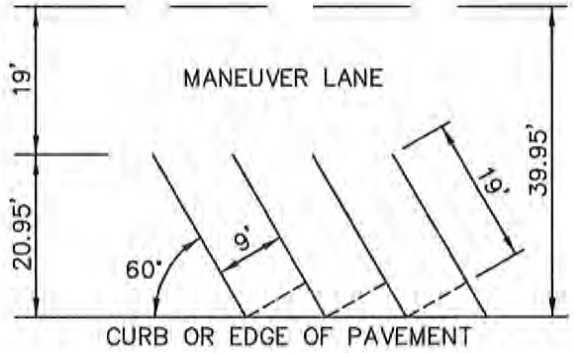
PARALLEL PARKING



45° PARKING

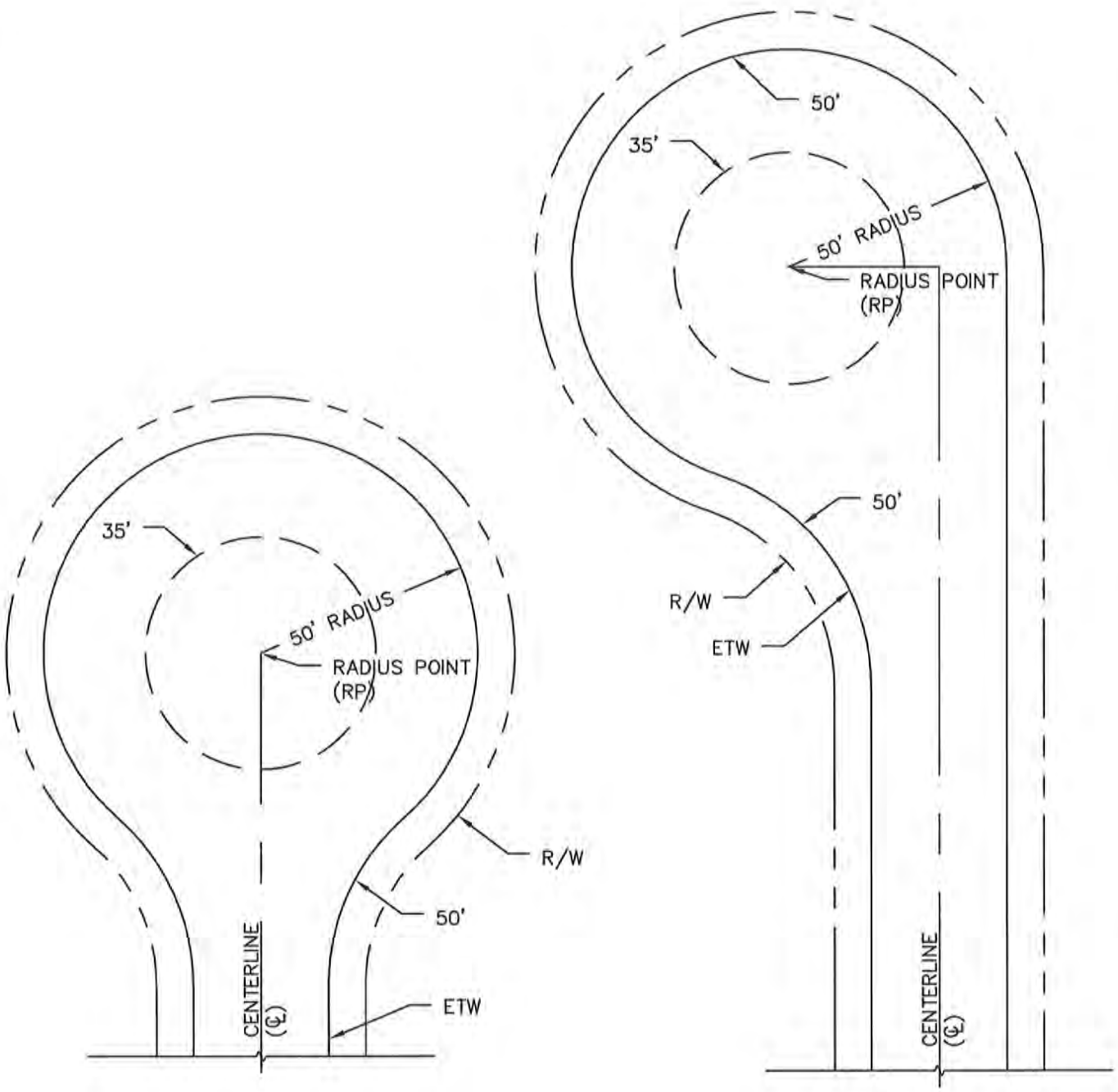


RIGHT ANGLE PARKING



60° PARKING

APPROVED BY: COUNTY ENGINEER	STANDARD DRAWING TITLE	SHEET NUMBER	
	STREET AND ROADSIDE PARKING	R-12	
REVISION / BY / APPROVED / DATE		SCALE	DATE
	ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



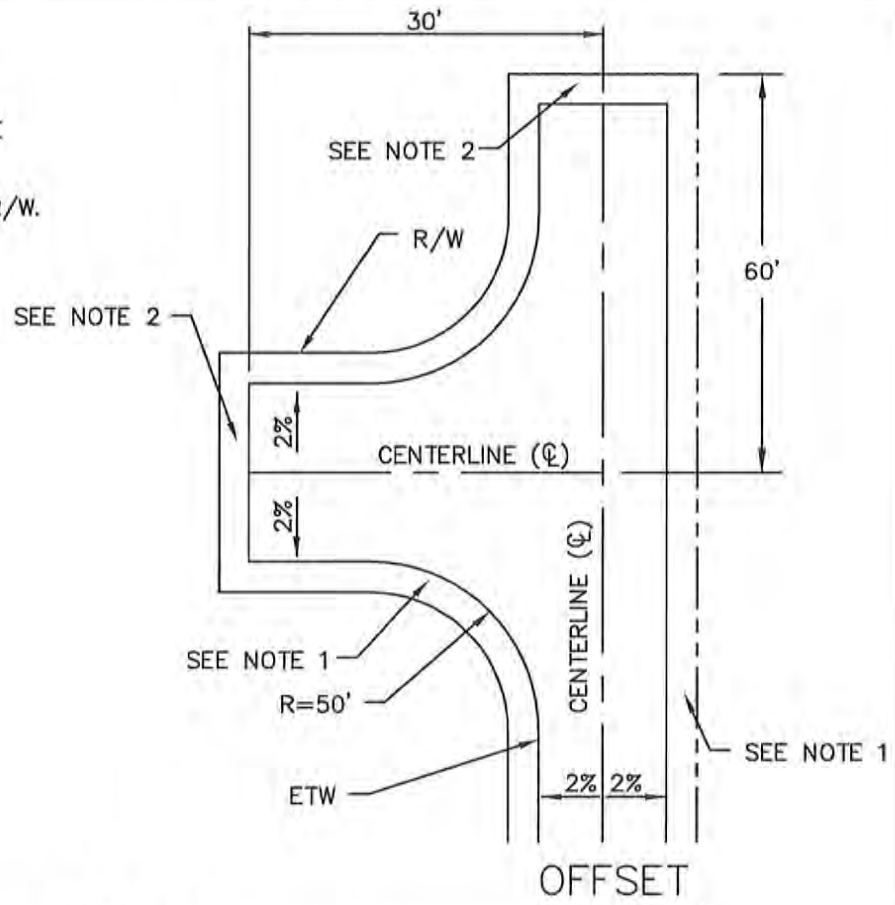
NOTES:

1. PROVIDE MINIMUM PAVEMENT SLOPES OF 1%.
2. THE ETW TO R/W DISTANCE IS CONSTANT THROUGH THE BULB, UNLESS THE DISTANCE IS INCREASED DUE TO HILLSIDE GRADING.

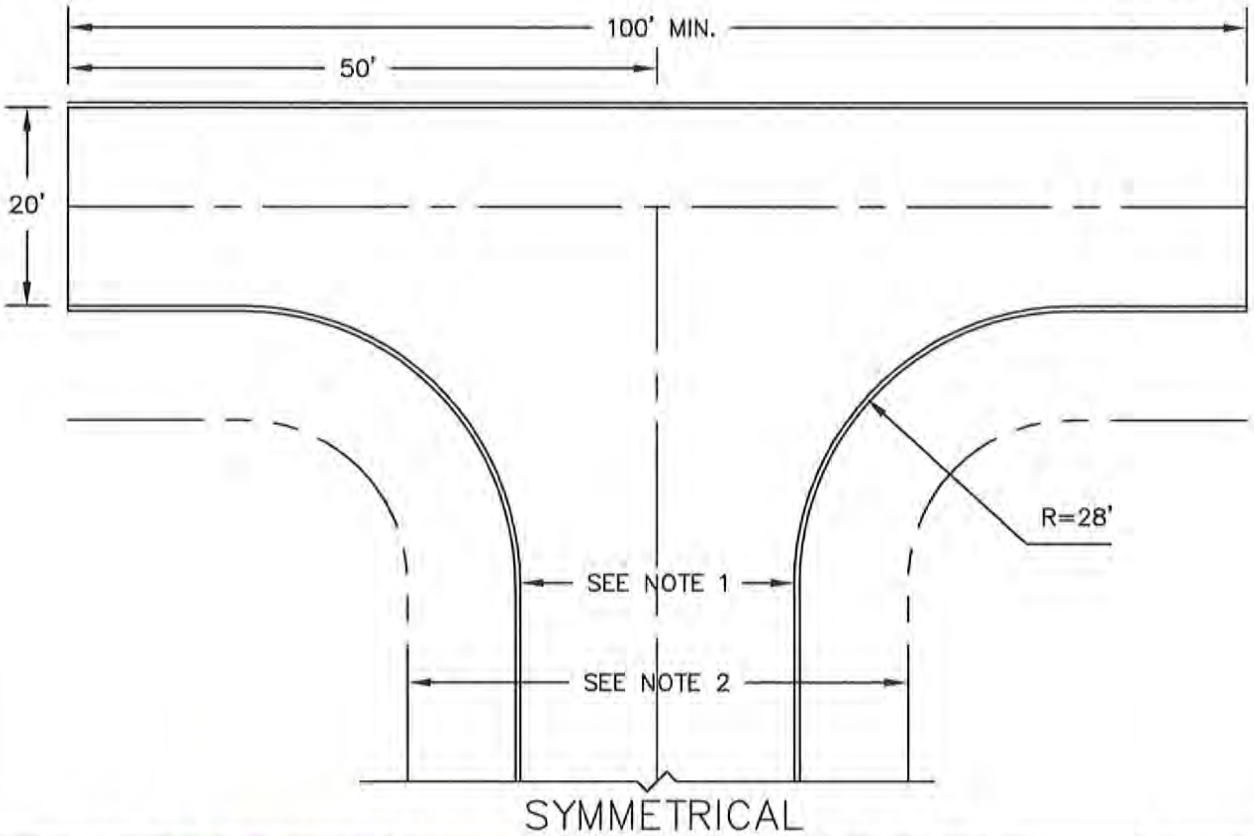
APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER
				CUL-DE-SAC TURNAROUND	R-13
REVISION	BY	APPROVED	DATE		SCALE: NTS; DATE: MARCH 2014
				ALPINE COUNTY - DEVELOPMENT STANDARDS	

NOTES:

1. THE ETW TO R/W DISTANCE IS CONSTANT THROUGH THE HAMMER HEAD UNLESS THE DISTANCE IS INCREASED DUE TO HILLSIDE GRADING.
2. PROVIDE 2' MINIMUM BETWEEN ETW AND R/W.

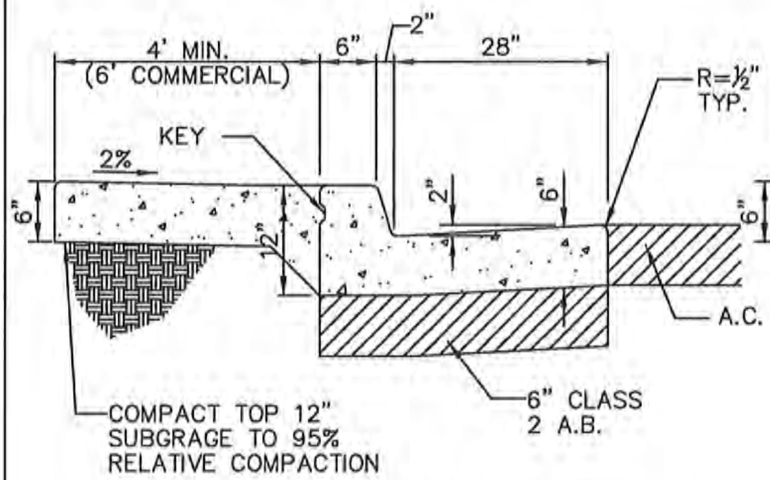


OFFSET

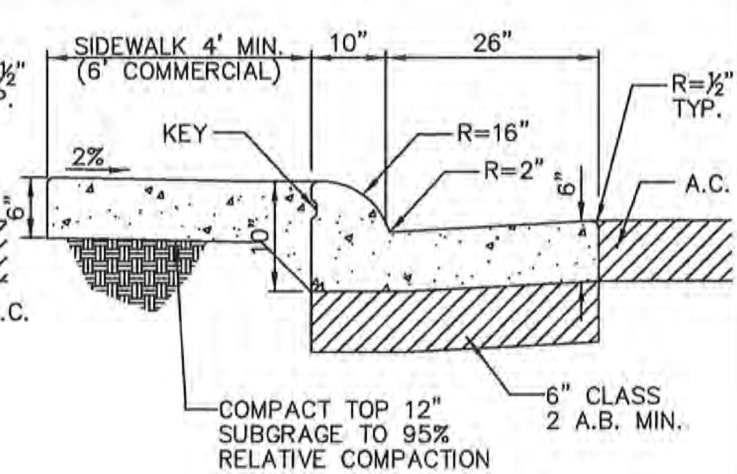


SYMMETRICAL

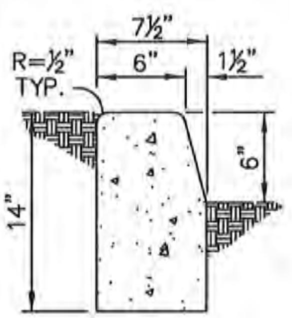
APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER	
				HAMMERHEAD TURN AROUND	R-14	
REVISION	BY	APPROVED	DATE		SCALE	DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



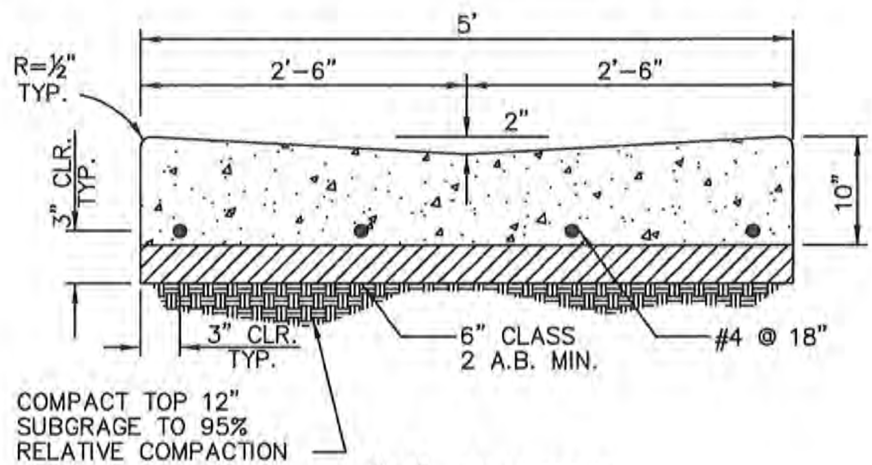
TYPE 1
VERTICAL CURB & GUTTER



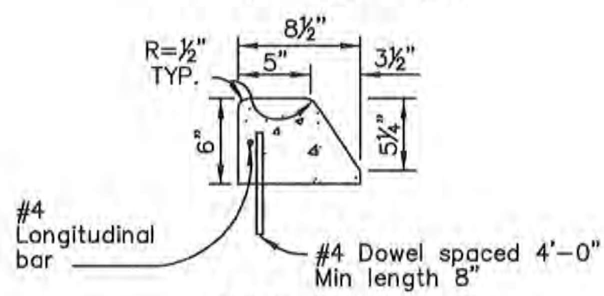
TYPE 1A
ROLLED CURB & GUTTER



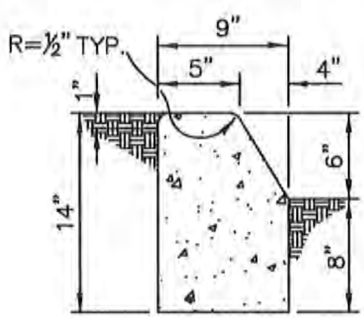
TYPE 1-6
BARRIER CURB FOR
COMM. FRONTAGE



"V" GUTTER



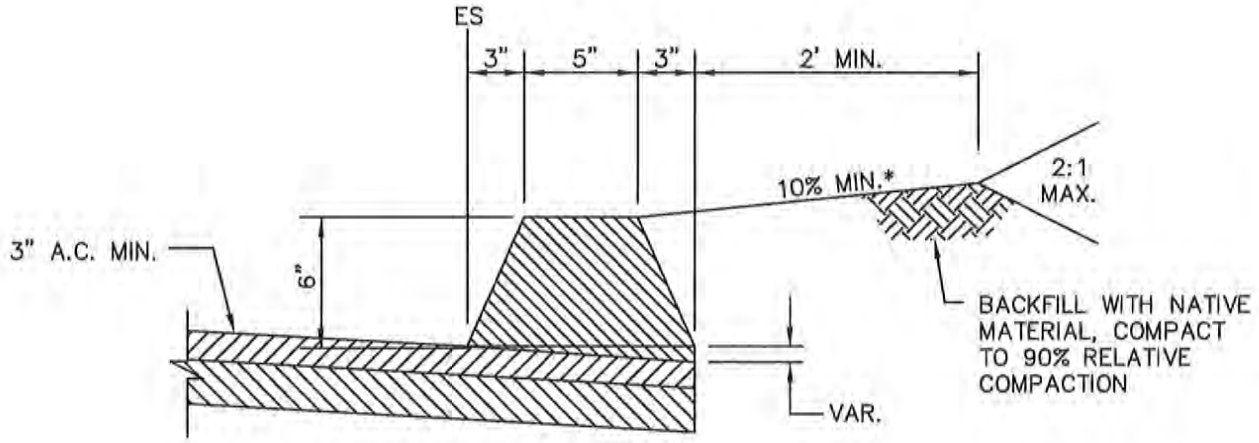
TYPE B3
BARRIER CURB



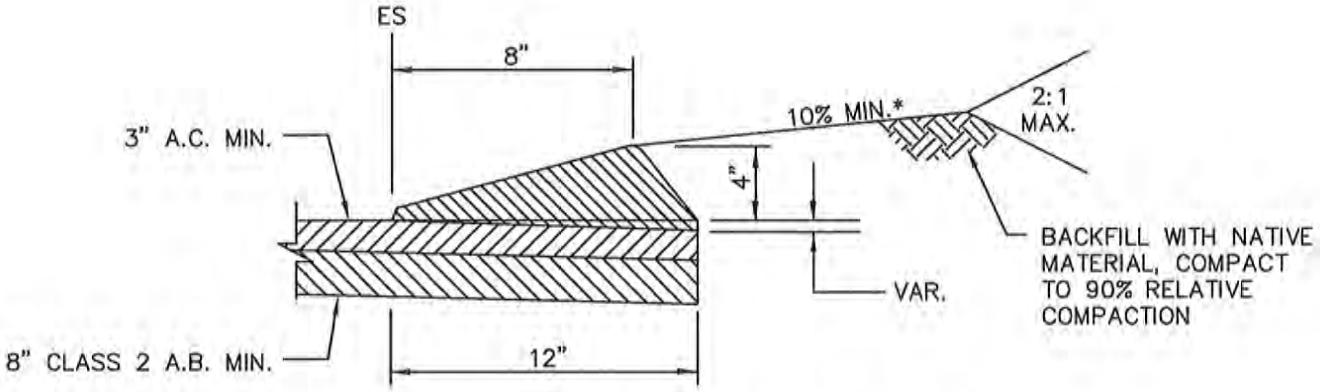
TYPE B1
BARRIER CURB

NOTES:
1. STRUCTURAL THICKNESSES ARE MINIMUM. INCREASED SECTIONS MAY BE REQUIRED BASED ON ACTUAL SOIL CONDITIONS, OR PROJECT APPROVALS.
2. UNSUITABLE MATERIALS TO BE REMOVED AND REPLACED WITH SUITABLE MATERIAL.

ALPINE COUNTY · CALIFORNIA	APPROVED BY:				STANDARD DRAWING TITLE	SHEET NUMBER	
	COUNTY ENGINEER				CONCRETE CURBS AND GUTTERS	R-15	
	REVISION	BY	APPROVED	DATE		SCALE	DATE
					ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



TYPE A HMA DIKE



TYPE E MODIFIED DIKE

* FOR ROADS WITH LONGITUDINAL CENTERLINE SLOPES GREATER THAN 8%, USE 18% MIN., 22% MAX. SLOPE

APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER	
				ASPHALT DIKES	R-16	
REVISION	BY	APPROVED	DATE		SCALE	DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014

DESIGN CONTROLS FOR STOPPING SIGHT DISTANCE AND FOR CREST AND SAG VERTICAL CURVES

INITIAL SPEED (MPH)	DESIGN STOPPING SIGHT DISTANCE (FT)	RATE OF VERTICAL CURVATURE, K (FT/%)	
		CREST	SAG
15	80	3	10
20	115	7	17
25	155	12	26
30	200	19	37
35	250	29	49
40	305	44	64
45	360	61	79
50	425	84	96
55	495	114	115
60	570	151	136

RATE OF VERTICAL CURVATURE, K IS THE LENGTH OF CURVE PER PERCENT ALGEBRAIC DIFFERENCE IN THE INTERSECTING GRADES (I.E., K=L/A).
(REFERENCE: AASHTO 2011)

DESIGN CONTROLS FOR CREST VERTICAL CURVES ON PASSING SIGHT DISTANCE

DESIGN SPEED (MPH)	DESIGN PASSING SIGHT DISTANCE (FT)	RATE OF VERTICAL CURVATURE, K (FT/%)
20	400	57
25	450	72
30	500	89
35	550	108
40	600	129
45	700	175
50	800	229
55	900	289
60	1000	357

RATE OF VERTICAL CURVATURE, K IS THE LENGTH OF CURVE PER PERCENT ALGEBRAIC DIFFERENCE IN THE INTERSECTING GRADES (I.E., K=L/A).
(REFERENCE: AASHTO 2011)

ALPINE COUNTY CALIFORNIA

APPROVED BY:

COUNTY ENGINEER

REVISION	BY	APPROVED	DATE

STANDARD DRAWING TITLE: LENGTH OF VERTICAL CURVES

SHEET NUMBER: R-17

SCALE	DATE
NTS	FEBRUARY 2013

ALPINE COUNTY - DEVELOPMENT STANDARDS

TRIP GENERATION RATE (VEHICLES PER DAY)

DEVELOPMENT TYPE	GROSS TRIP RATE (VEHICLES/DAY)	PASS THROUGH FACTOR	NET TRIP RATE (VEHICLES/DAY)
SINGLE FAMILY RESIDENTIAL (PER DU)*	10.062	0%	10.062
MULTI-FAMILY RESIDENTIAL (PER DU)*	6.595	0%	6.595
OFFICE (PER 1000 SF)	12.000	20%	9.600
RENTAL/SERVICE (PER 1000 SF)	75.000	70%	52.500
WAREHOUSE (PER 1000 SF)	4.882	0%	4.882
SERVICE COMMERCIAL (PER 1000 SF)	6.969	0%	6.969
MANUFACTURING (PER 1000 SF)	3.846	0%	3.846

*DU = DWELLING UNIT

REVISION	BY	APPROVED	DATE

APPROVED BY:

COUNTY ENGINEER

STANDARD DRAWING TITLE: TRIP GENERATION RATES

SHEET NUMBER: R-18

SCALE: NTS

DATE: MARCH 2014

ALPINE COUNTY - DEVELOPMENT STANDARDS

TABLE FOR ESTIMATING "C" IN RATIONAL FORMULA

UNIMPROVED AREAS

CONDITION	EXTREME	HIGH	MODERATE	LOW
SLOPE	.36–.28 ABOVE 30%	.28–.15 30%–10%	.15–.10 10%–5%	.10–.05 5%–0%
SURFACE PERMEABILITY	.20–.15 BARE ROCK OR VERY THIN SOIL	.15–.07 IMPERVIOUS CLAYS SHALLOW SOILS	.07–.04 DEEP PERVIOUS LOAM, SANDY LOAM	.03 DEEP SAND, VOLCANIC ASH
VEGETATION	.20–.15 NONE OR VERY SPARSE	.15–.07 LESS THAN 20% COVERED WITH SUBSTANTIAL GROWTH	.07–.04 ABOUT 50% COVERED WITH HEAVY GROWTH	.03 90% COVERED WITH HEAVY GROWTH, DEEP HUMAS LAYER
SURFACE	.20–.15 SMOOTH SOIL, SLICK ROCK, DRAINAGE FLOW CONTINUOUS	.15–.07 ROUGHENED SOIL OR ROCKS	.07–.04 DRAINAGE FLOW INTERRUPTED, MANY PONDS, LAKES MARSHES	.03 DRAINAGE FLOW ARRESTED, LARGE LAKES PONDS, MARSHES

IMPROVED AREAS

SURFACE	C
ROOF SURFACES	.95
A.C. OR P.C.C. PAVEMENT, PATIOS, DRIVEWAYS, STREETS, SIDEWALKS	.90
LANDSCAPED AREAS	.25
GRAVEL WALKS, ROADWAYS	.30

EXAMPLE, UNIMPROVED

20% SLOPE	.22
WELL DRAINED SOIL	.05
FAIR COVER	.07
NO PONDS	.08
C=	.42

EXAMPLE, IMPROVED

100 ACRE TRACT

15 ACRE ROOF	@ .95
50 ACRES A.C. PAVE	@ .90
35 ACRES LANDSCAPED	@ .25

$$C = \frac{(15 \times .95) + (.50 \times .90) + (35 \times .25)}{100 \text{ ACRES}} = 0.68$$

C=0.68

APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER
				'C' FACTORS	SD-1
REVISION	BY	APPROVED	DATE		SCALE: NTS; DATE: MARCH 2014
				ALPINE COUNTY - DEVELOPMENT STANDARDS	

CULVERTS
MINIMUM PIPE SIZES FOR GIVEN "Q"
PIPE FLOWING FULL – NO HEAD

PIPE SIZE (IN.)	AREA (SQ. FT.)	PIPE–ARCH EQUIV. (IN.)	"Q" C.F.S.	MINIMUM (CRITICAL) N=.021%	SLOPES N=.015%
12	0.785		2.6	1.6	0.8
15	1.2	18x11	4.6	1.8	0.9
18	1.767	21x15	7.1	1.6	0.8
21	2.4	24x18	11.0	1.8	0.9
24	3.142	28x20	15.0	1.4	0.7
30	4.909	35x24	26.0	1.6	0.8
36	7.069	42x29	40.0	1.2	0.6
42	9.62	49x33	59.0	1.2	0.6
48	12.57	57x38	83.0	1.4	0.7
54	15.90	64x43	110.0	1.0	0.5
60	19.63	71x47	150.0	1.2	0.6
66	23.76	76x52	190.0	1.2	0.6
72	28.27	83x57	230.0	1.0	0.5
78	33.18	92x65	280.0	1.0	0.5
84	38.48	98x69	330.0	1.0	0.5
90	56.75	128x83	400.0	1.0	0.5
96	60.27	131x85	470.0	1.0	0.5
108	63.62	137x87	630.0	1.0	0.5
120	78.54	150x95	810.0	0.8	0.4

REFERENCES

ARMCO HANDBOOK
TABLE 26–2 PAGE 230
TABLE 33–2 PAGE 278

APPROVED BY: COUNTY ENGINEER	STANDARD DRAWING TITLE	SHEET NUMBER	
	CULVERT SIZE CHART	SD-2	
REVISION | BY | APPROVED | DATE		SCALE	DATE
	ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014

MATERIAL OF CHANNEL BED	VELOCITY IN FEET PER SECOND	
	SHALLOW DITCH	DEEP DITCH
DECOMPOSED GRANITE	1.00–1.50	1.50–2.50
CLAYEY LOAM OR SANDY CLAY	1.50–2.00	2.25–3.50
COLLOIDAL CLAY OR NON–COLLOIDAL GRAVELLY LOAM	2.00–3.00	3.00–5.00
SODDED GUTTERS	3.00–5.00	–
COBBLED GUTTERED, NOT GROUTED, OR BITUMINOUS PAVING	5.00–7.50	–
STONE MASONRY (GROUTED RIP–RAP)	7.50–15.00	–
SOLID ROCK – CONCRETE GUNITE	15.00–25.00	–

NOTES:

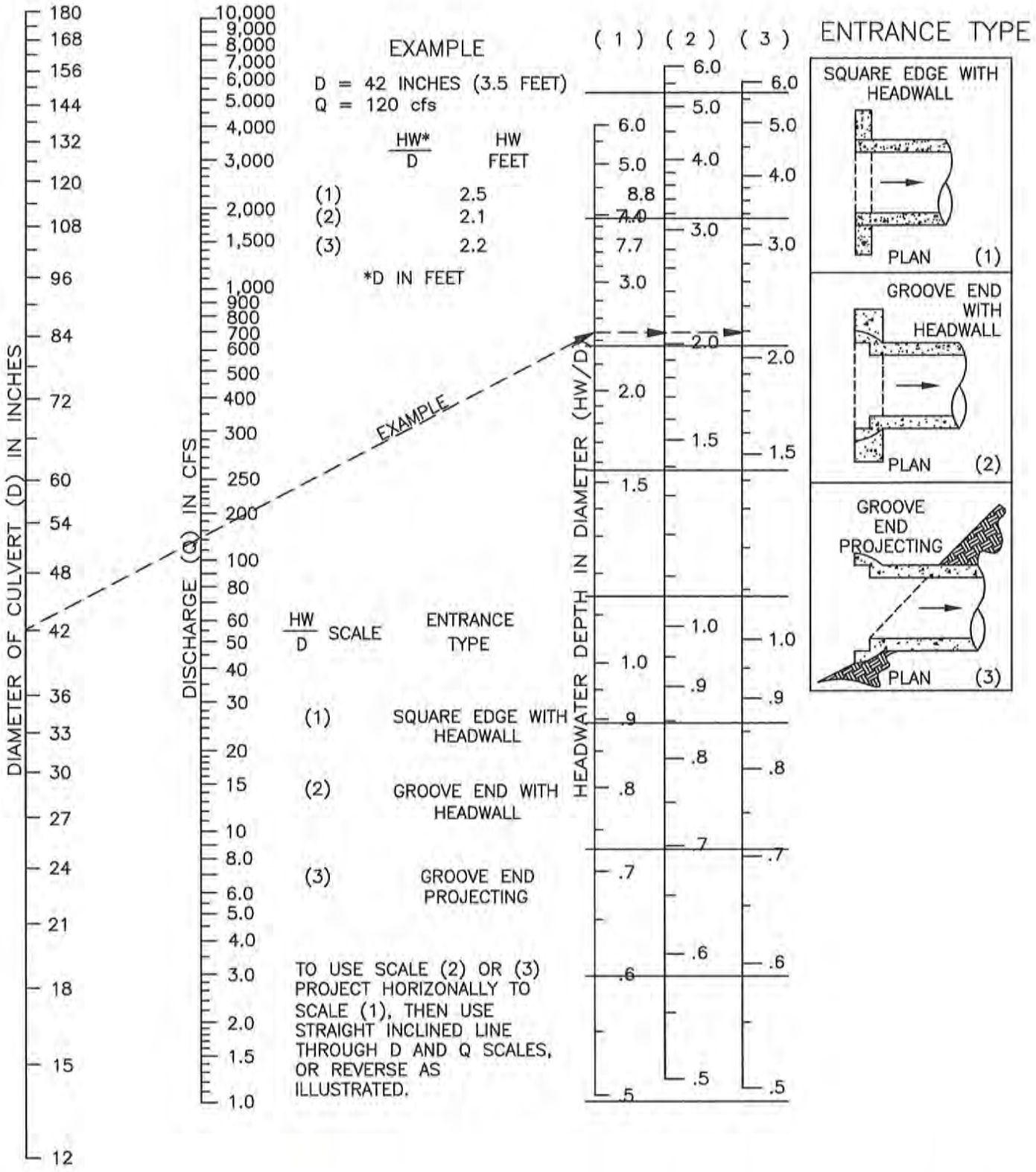
1. THIS CHART CONTAINS THE MAXIMUM VELOCITIES ALLOWABLE FOR VARIOUS TYPES OF LINING MATERIAL.
2. IN NO CASE SHALL UNLINED CHANNELS BE ALLOWED WHERE THE SLOPE EXCEEDS 7% OR WHERE VELOCITIES ARE EXCESSIVE.
3. ANY CHANNEL REQUIRING LINING IN ITS UPPER REACHES SHALL BE LINED TO ITS JUNCTION WITH ANOTHER PAVED CHANNEL, A PIPE OR NATURAL CHANNEL.

APPROVED BY:

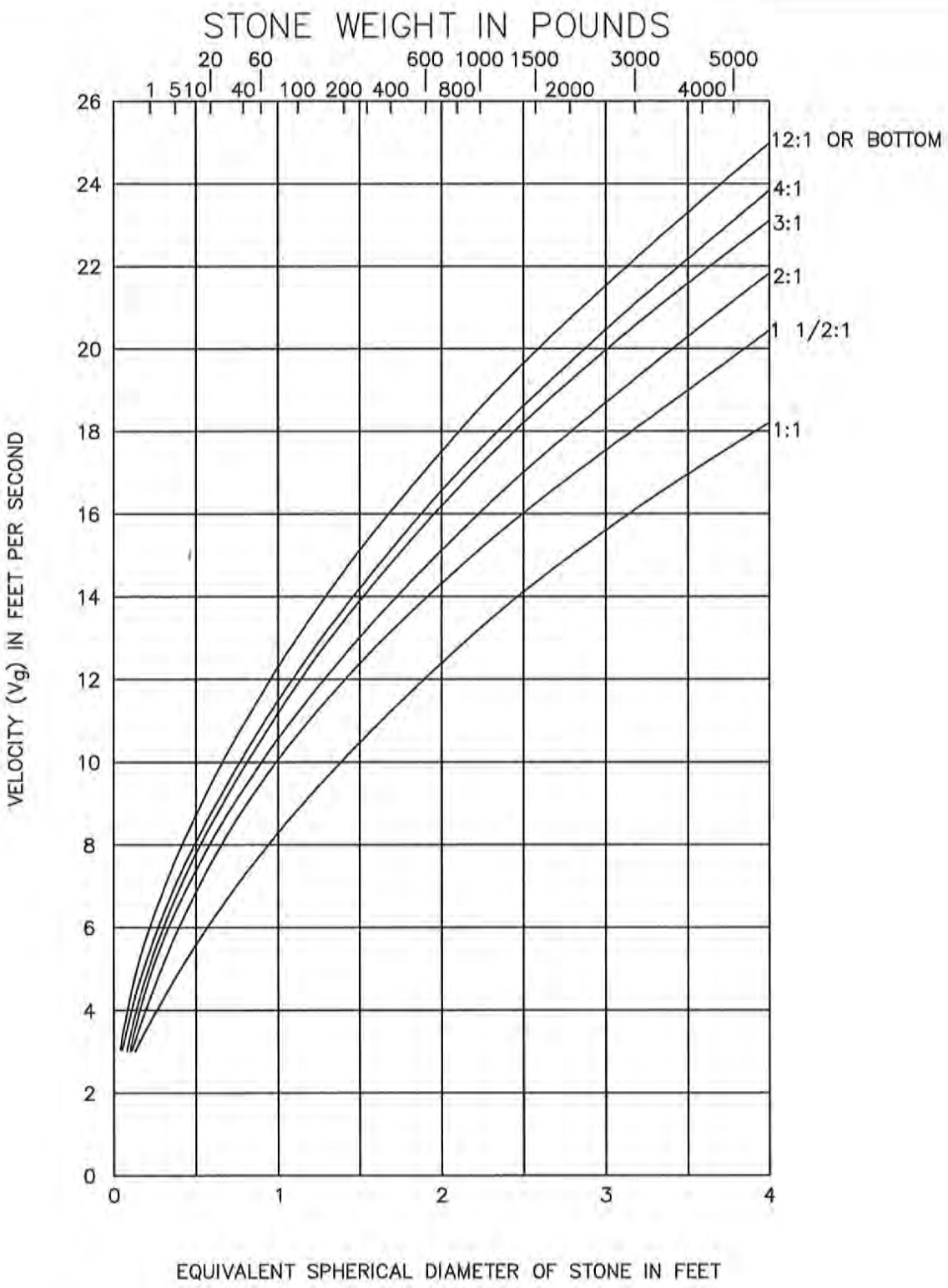
COUNTY ENGINEER

REVISION	BY	APPROVED	DATE

STANDARD DRAWING TITLE	SHEET NUMBER	
DITCH TYPES	SD-3	
	SCALE	DATE
ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



APPROVED BY: COUNTY ENGINEER	STANDARD DRAWING TITLE	SHEET NUMBER	
	HW FOR ROUND PIPE	SD-4	
REVISION / BY / APPROVED / DATE		SCALE	DATE
	ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



NOTES:

1. IS FOR STONE WEIGHING 165 LBS. PER CU. FT.
2. SHOWS THE SIZE OF STONE THAT WILL RESIST DISPLACEMENT FOR VARIOUS VELOCITIES & SIDE SLOPES.
3. IS ADOPTED FROM THE REPORT OF THE SUBCOMMITTEE ON SLOPE PROTECTION, AM. SOC. CIVIL ENGINEERS PROC. JUNE 1948.

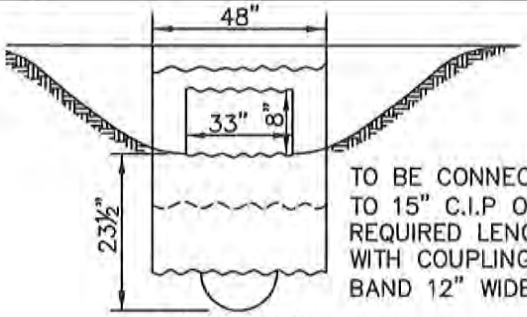
ALPINE COUNTY CALIFORNIA

APPROVED BY:

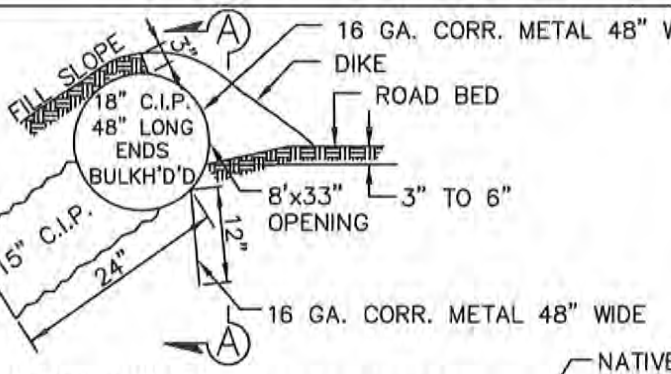
COUNTY ENGINEER

REVISION	BY	APPROVED	DATE

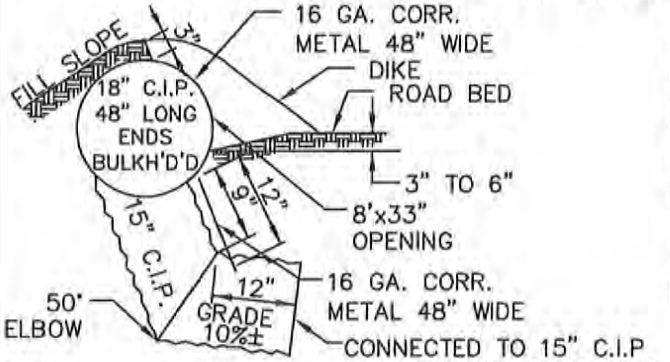
STANDARD DRAWING TITLE	SHEET NUMBER	
RIP-RAP SIZE	SD-5	
	SCALE	DATE
ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



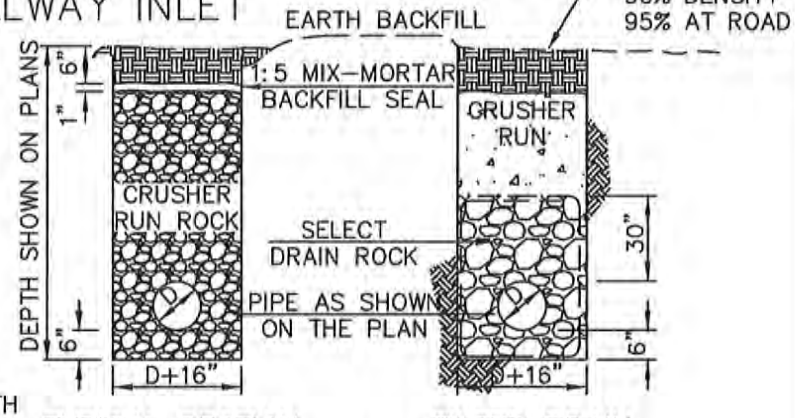
VIEW A–A
SIMILAR FOR TYPE B



TYPE A SPILLWAY INLET

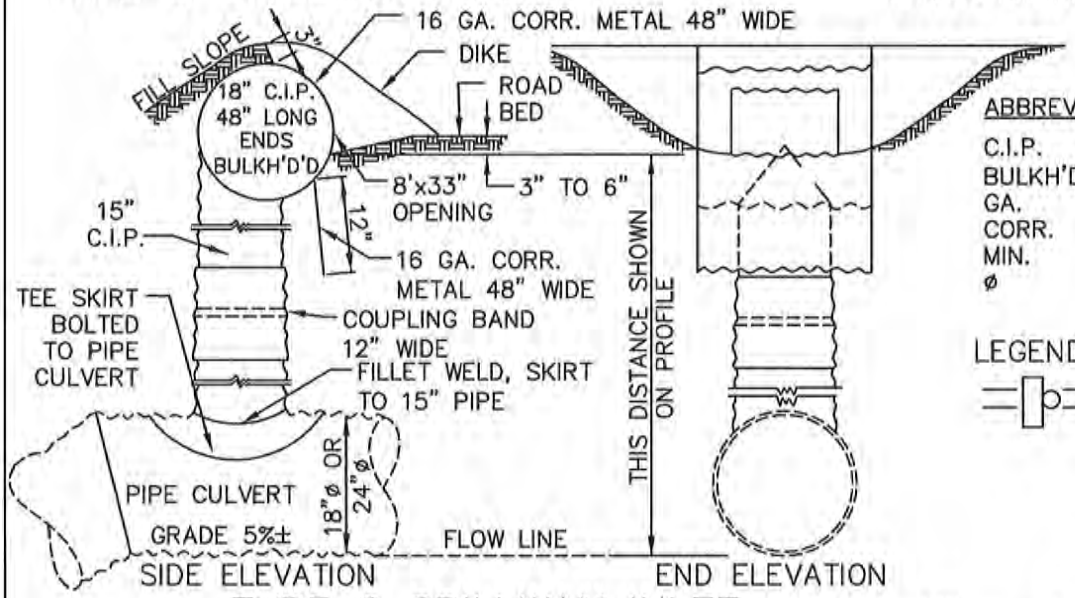


TYPE B SPILLWAY INLET



TYPICAL SECTION FILTER DRAIN

UNDERDRAIN

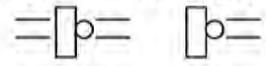


SIDE ELEVATION END ELEVATION

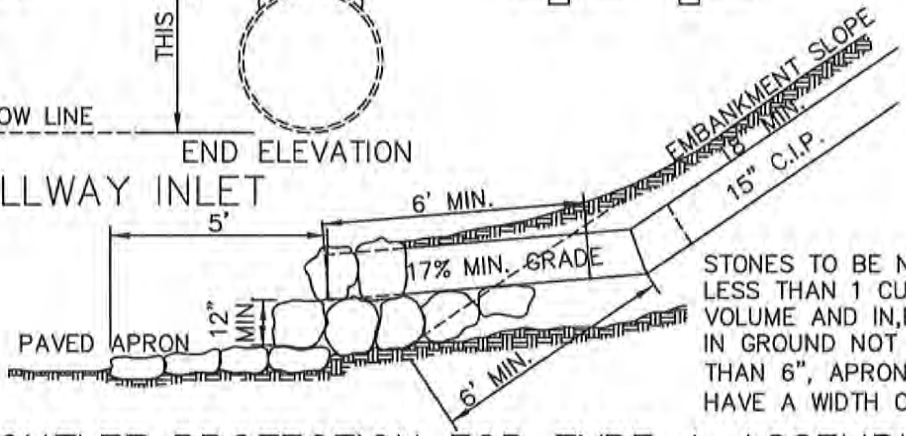
ABBREVIATIONS

C.I.P.	CORRUGATED IRON PIPE
BULKH'D'D	BULKHEADED
GA.	GAGE
CORR.	CORRUGATED
MIN.	MINIMUM
ø	DIAMETER

LEGEND ON PLANS



TYPE C SPILLWAY INLET



STONES TO BE NOT LESS THAN 1 CU.FT. IN VOLUME AND IN,EDDED IN GROUND NOT LESS THAN 6", APRON TO HAVE A WIDTH OF 4'.

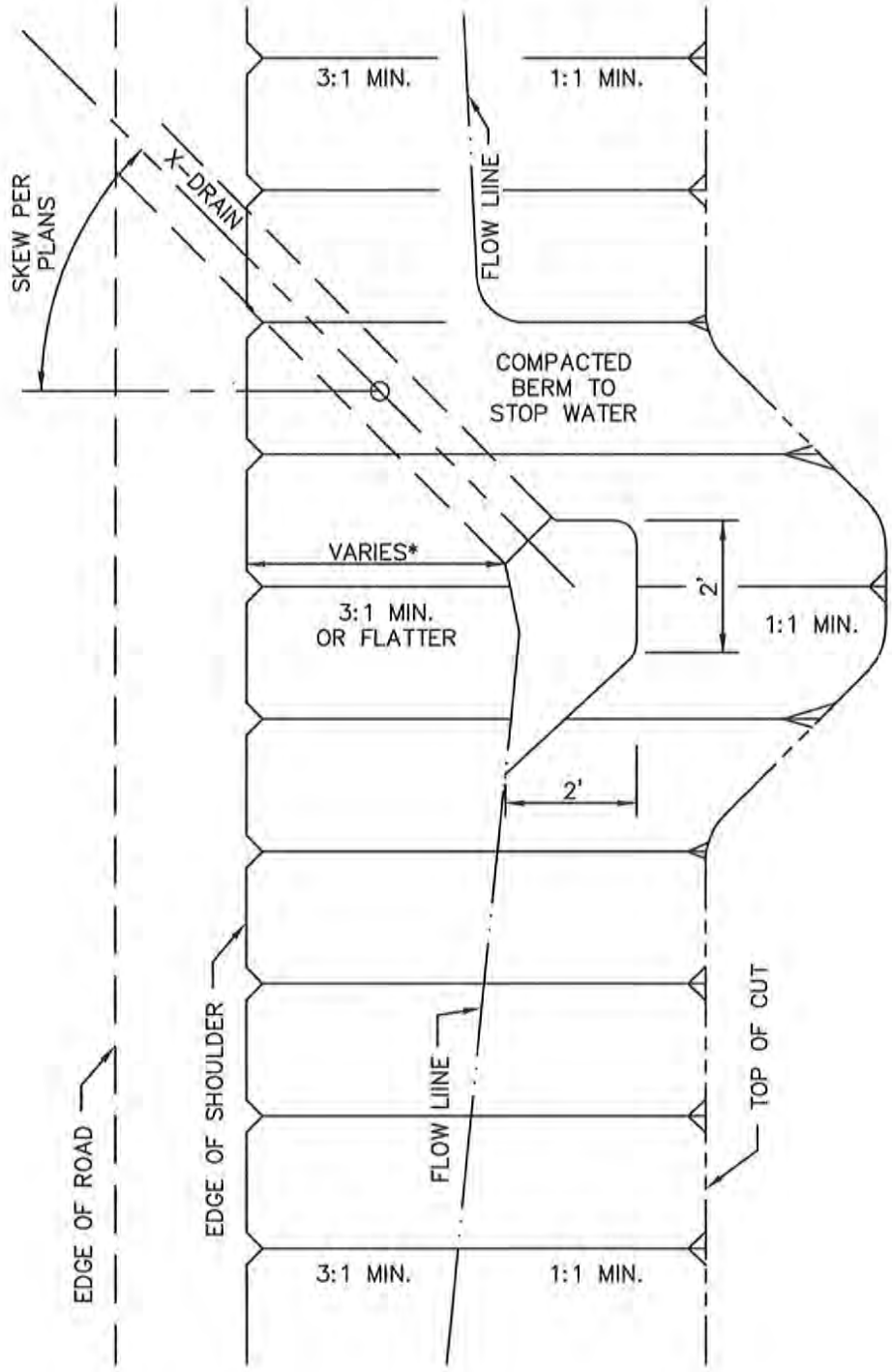
OUTLET PROTECTION FOR TYPE A ASSEMBLIES

ALPINE COUNTY CALIFORNIA

APPROVED BY:
COUNTY ENGINEER

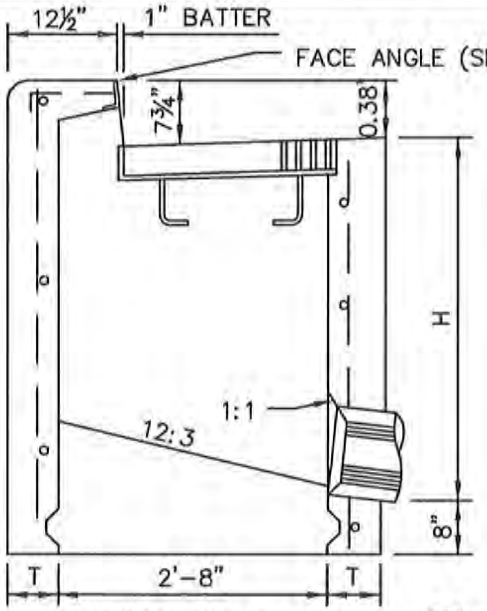
REVISION	BY	APPROVED	DATE

STANDARD DRAWING TITLE	SHEET NUMBER
SPILLWAY INLETS AND UNDERDRAIN	SD-6
	SCALE: NTS / DATE: MARCH 2014
ALPINE COUNTY - DEVELOPMENT STANDARDS	

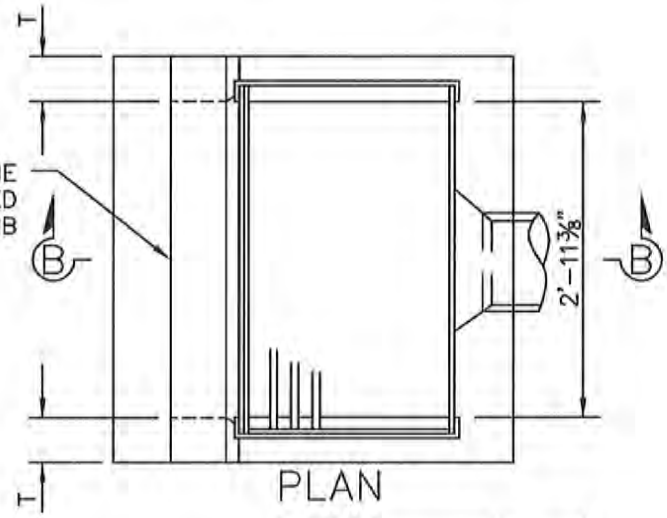


* THIS DISTANCE WILL VARY WITH DEPTH OF FLOW LINE OF CULVERT

APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER	
				CATCH BASIN	SD-7	
REVISION	BY	APPROVED	DATE		SCALE	DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014

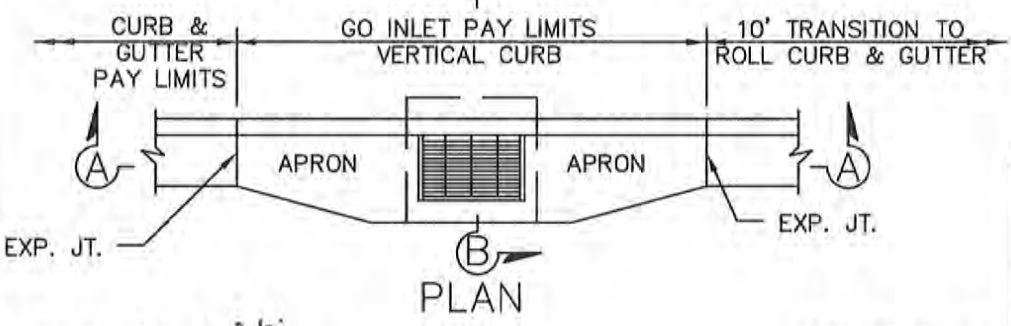


SECTION B-B



PLAN

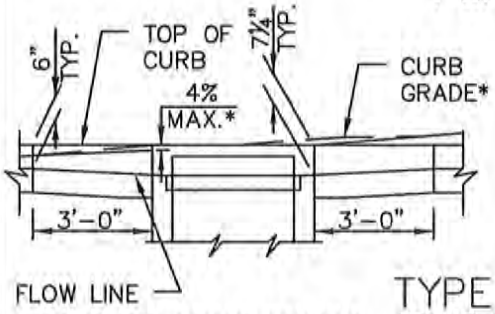
H	T
8'-0" OR LESS	6"
8'-1" TO 20'-0"	6"



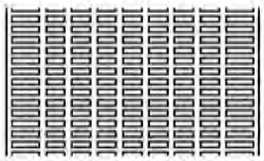
PLAN

SLOPE NOTES

D.I. GRADE	ROAD GRADE
MATCH RD. GR. 4%	0-4%
4%	4-8%
HOLD 4% GR. CHANGE	8%-UP



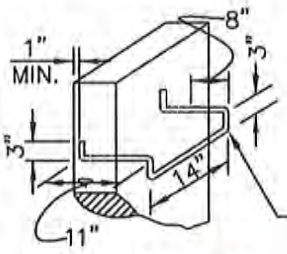
SECTION A-A



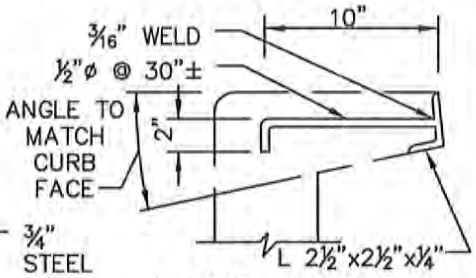
TYPE 24-13 GRATE
FRAME & GRATE SHALL CONFORM TO PINKERTON FOUNDRY TYPE A-854 OR EQUAL

GENERAL NOTES:

1. "H" IS THE DIFFERENCE IN ELEVATION BETWEEN THE OUTLET PIPE FLOW LINE AND THE NORMAL GUTTER GRADE LINE UNDEPRESSED.
2. REINFORCING STEEL IN WALLS SHALL BE #4 BARS AT 18"± CENTERS PLACED 1½" CLEAR TO INSIDE OF BOX UNLESS OTHERWISE SHOWN.
3. STEPS - NONE REQUIRED WHERE "H" IS 3'-6" OR LESS. INSTALL ONE STEP 16"± ABOVE FLOOR WHEN "H" IS MORE THAN 3'-6" AND LESS THAN 5'-0". WHERE "H" IS MORE THAN 5'-0", STEPS SHALL BE EVENLY SPACED AT 12"± OF THE TOP OF THE BOX. PLACE STEPS IN WALL WITHOUT PIPE OPENINGS.
4. PIPE(S) CAN BE PLACED IN ANY WALL.
5. CURB SECTION SHALL MATCH ADJACENT CURB.
6. BASIN FLOOR SHALL HAVE WOOD TROWEL FINISH AND A MINIMUM SLOPE OF 12:3 FROM ALL DIRECTIONS TOWARD OUTLET PIPE.
7. ALL HARDWARE SHALL BE GALVANIZED.
8. WHEN USING STANDARD ROLLED CURB & GUTTER WARP TO VERTICAL CURB 10'.
9. WHEN APRON IS REQUIRED WITH DROP INLET EXTEND #4 SIDEWALL REBAR 12" INTO TAPERED GUTTER PAN.
10. DELETE APRON IN NON CURB & GUTTER AREAS.

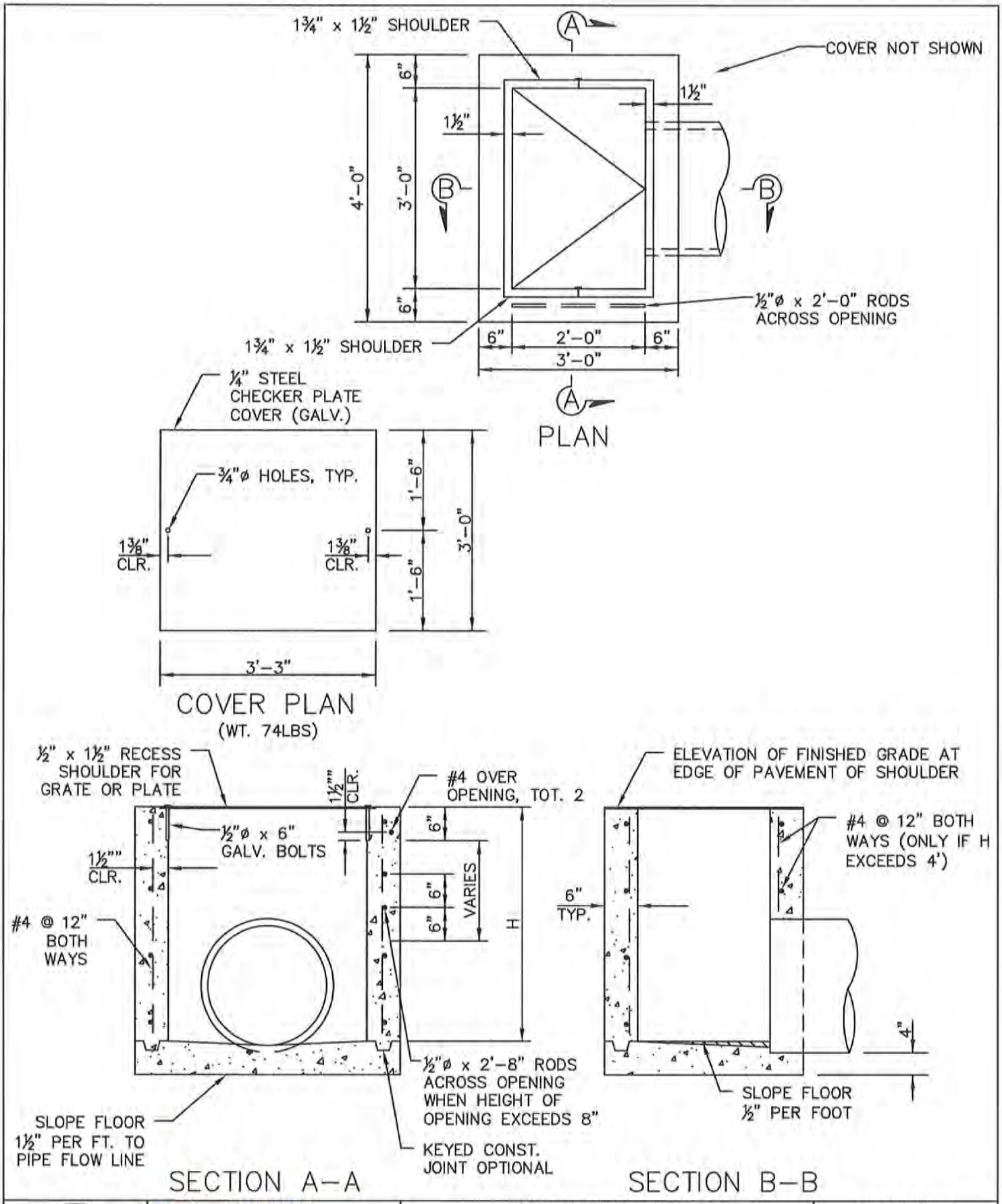


STEP DETAIL



FACE ANGLE ANCHOR

APPROVED BY: COUNTY ENGINEER	STANDARD DRAWING TITLE	SHEET NUMBER
REVISION / BY / APPROVED / DATE	DROP INLET	SD-8
		SCALE: NTS / DATE: MARCH 2014
	ALPINE COUNTY - DEVELOPMENT STANDARDS	



ALPINE COUNTY CALIFORNIA	APPROVED BY: COUNTY ENGINEER		STANDARD DRAWING TITLE	SHEET NUMBER	
			ROADSIDE INLET	SD-9	
REVISION	BY	APPROVED / DATE		SCALE	DATE
			ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014

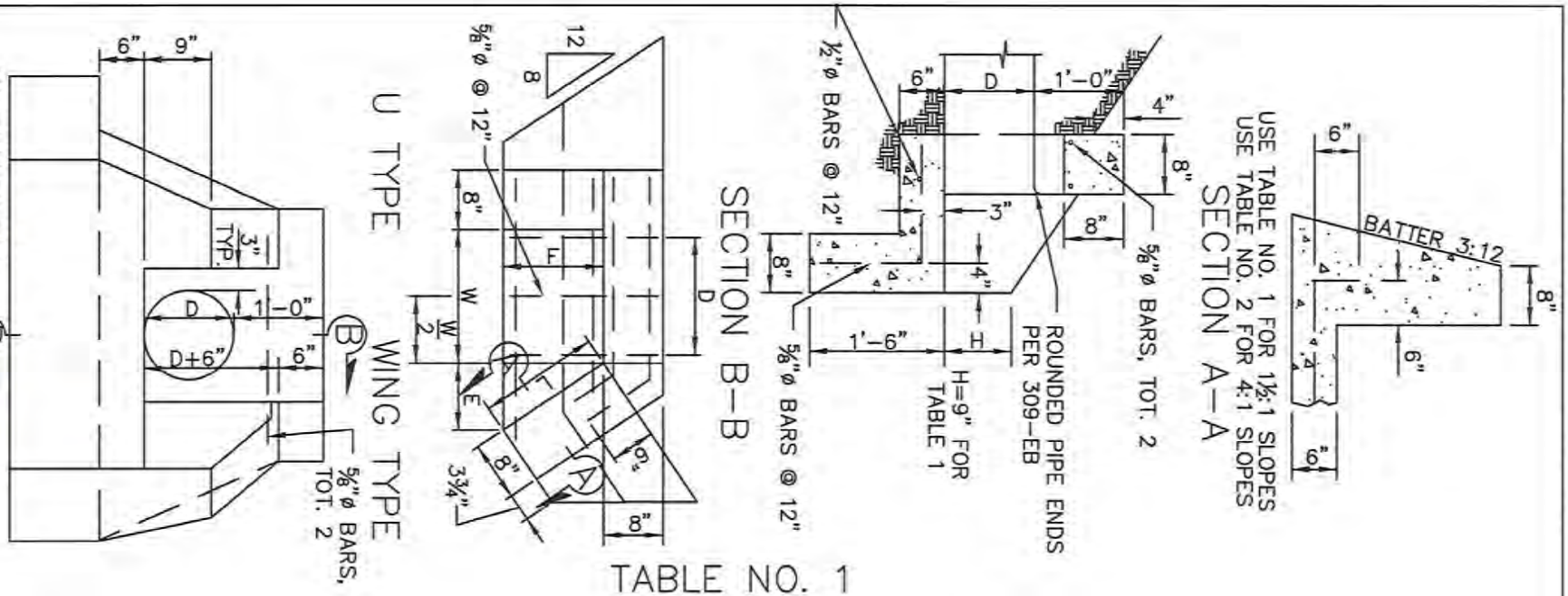


TABLE NO. 1

WING B U TYPE HEADWALLS FOR 12" TO 36" PIPE (1½:1 FILL SLOPE)

ø OF PIPE	DIMENSIONS			SINGLE PIPE						DOUBLE PIPE					
				AREA OF WATER	W	U TYPE		WING TYPE		AREA OF WATER	W	U TYPE		WING TYPE	
	L	E	F			CONCRETE (CU. YD.)	STEEL (LBS)	CONCRETE (CU. YD.)	STEEL (LBS)			CONCRETE (CU. YD.)	STEEL (LBS)	CONCRETE (CU. YD.)	STEEL (LBS)
12"	1'-4¼"	9"	1'-1½"	0.758	1'-6"	0.39	–	0.44	–	1.57	3'-2"	0.54	–	0.59	–
15"	1'-9¾"	1'-0"	1'-6"	1.23	1'-9"	0.53	–	0.57	–	2.46	3'-10"	0.75	–	0.79	–
18"	2'-3⅜"	1'-3"	1'-10½"	1.77	2'-0"	0.66	–	0.73	–	3.54	4'-6"	0.96	–	1.03	–
24"	3'-1⅞"	1'-9"	2'-7½"	3.14	2'-6"	0.95	–	1.07	–	6.28	5'-10"	1.40	–	1.52	–
30"	4'-0⅝"	2'-3"	3'-4½"	4.91	3'-0"	1.29	–	1.50	–	9.82	7'-2"	1.95	–	2.16	–
36"	4'-11½"	2'-9"	4'-1½"	7.07	3'-6"	1.72	–	2.03	–	14.12	8'-6"	2.60	–	2.91	–

TABLE NO. 2

WING TYPE HEADWALLS FOR 4:1 FILL SLOPES

ø OF PIPE	DIMENSIONS				SINGLE PIPE			DOUBLE PIPE		
	L	E	F	H	W	CONCRETE (CU. YD.)	STEEL (LBS)	W	CONCRETE (CU. YD.)	STEEL (LBS)
12"	1'-7¼"	10⅝"	1'-4"	1'-2"	1'-6"	0.50	–	3'-2"	0.66	–
15"	2'-0"	1'-1⅜"	1'-8"	1'-4"	1'-9"	0.65	–	3'-10"	0.88	–
18"	2'-4¾"	1'-4"	2'-0"	1'-6"	2'-0"	0.83	–	4'-6"	1.12	–
24"	3'-7⅜"	2'-0"	3'-0"	1'-9"	2'-6"	1.37	–	5'-10"	1.84	–
30"	4'-9¾"	2'-8"	4'-0"	2'-0"	3'-0"	2.04	–	7'-2"	2.75	–
36"	6'-0"	3'-4"	5'-0"	2'-3"	3'-6"	2.88	–	8'-6"	3.84	–

CONCRETE:
ALL CONCRETE SHALL BE 3000 P.S.I EXPOSED CORNERS SHALL BE ¾" ROUND EXPOSED SURFACES SHALL BE FINISHED

REINFORCING:
ALL BARS SHALL BE DEFORMED GRD 40 MULTIPLE PIPES TO BE SET WITH LONGITUDINAL CENTERS 1¾"ø OF PIPE APART,

SKEWED PIPES:
DIMENSION "W" TO BE INCREASED IN WIDTH OR LENGTH DUE TO SKEW OR MULT

APPROVED BY:
COUNTY ENGINEER

REVISION	BY	APPROVED	DATE

TYPICAL CROSSROAD HEADWALL

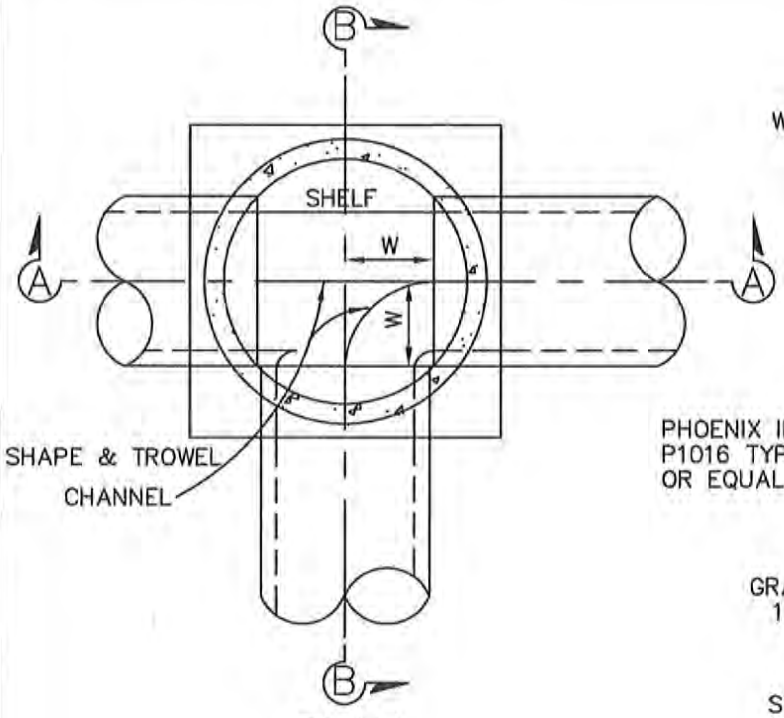
ALPINE COUNTY - DEVELOPMENT STANDARDS

STANDARD DRAWING TITLE

SCALE: NTS

DATE: MARCH 2014

SHEET NUMBER: SD-10

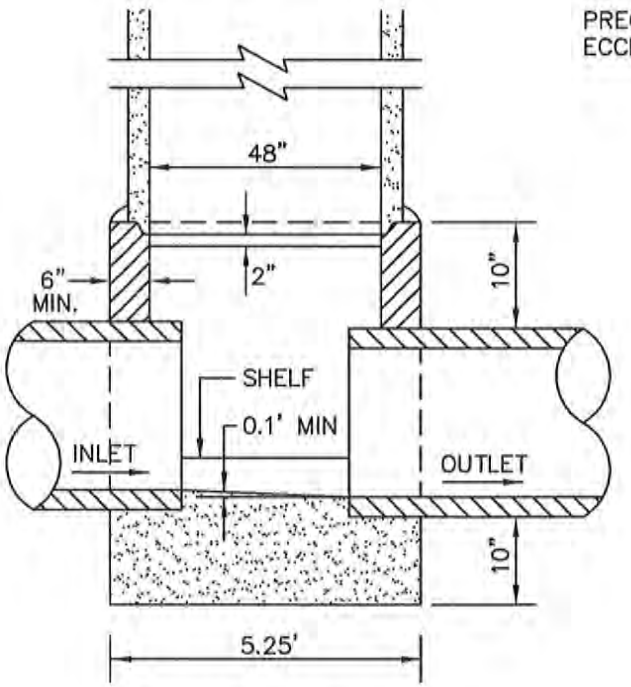


PLAN

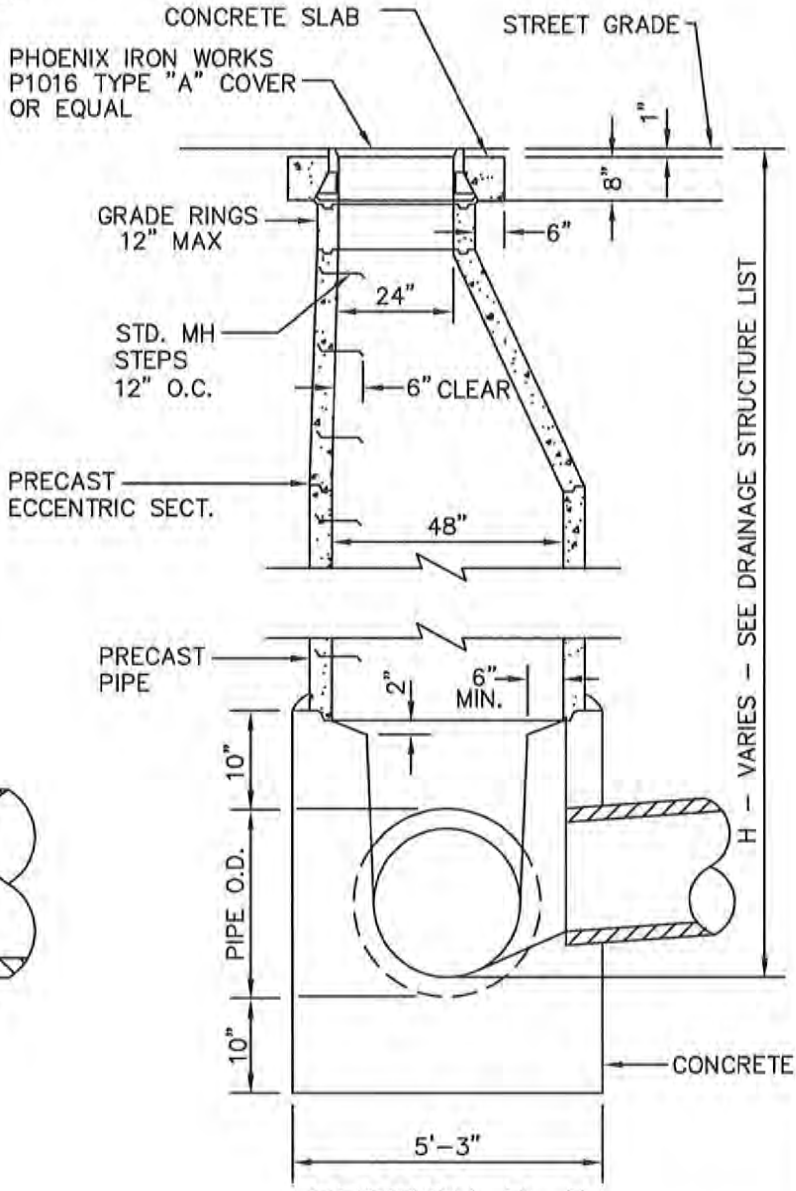
W–VARIES WITH PIPE SIZE (SEE TABLE 1)

PIPE SIZE	W
15"	22"
18"	21"
21"	20"
24"	19"
27"	18"

TABLE 1

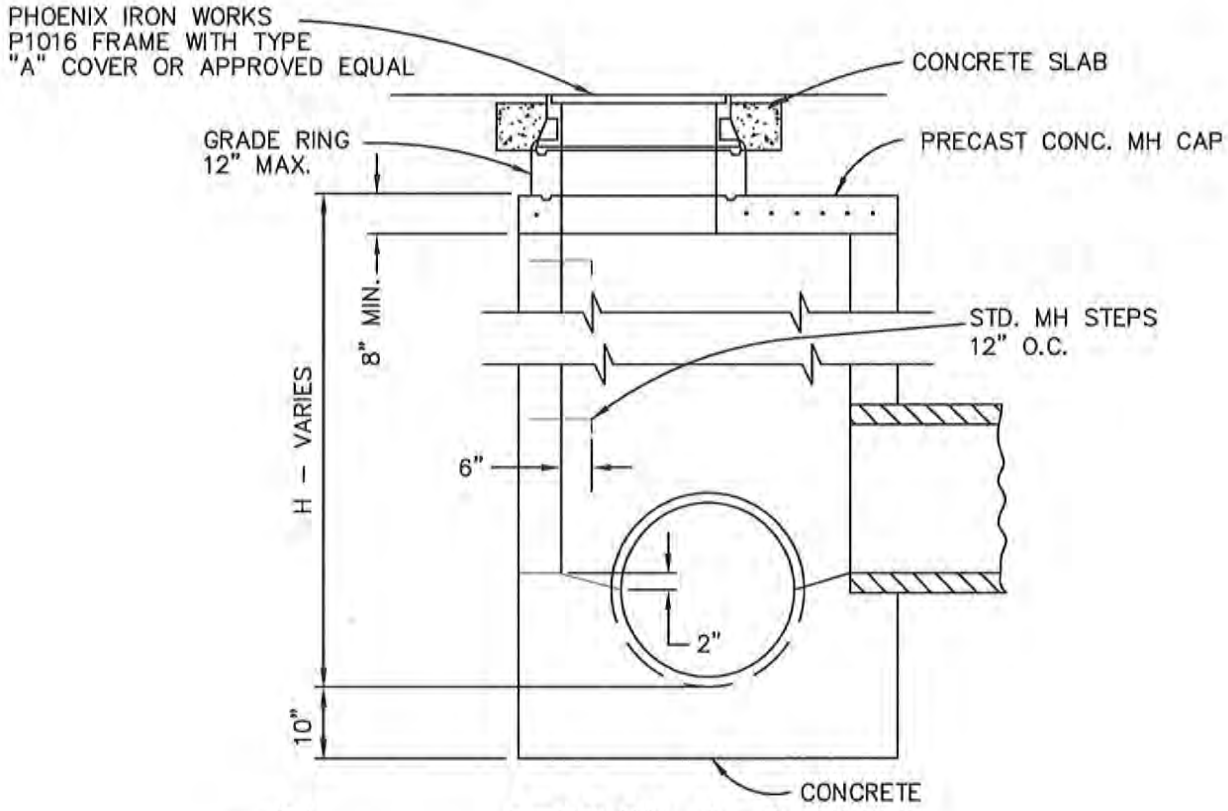


SECTION A–A

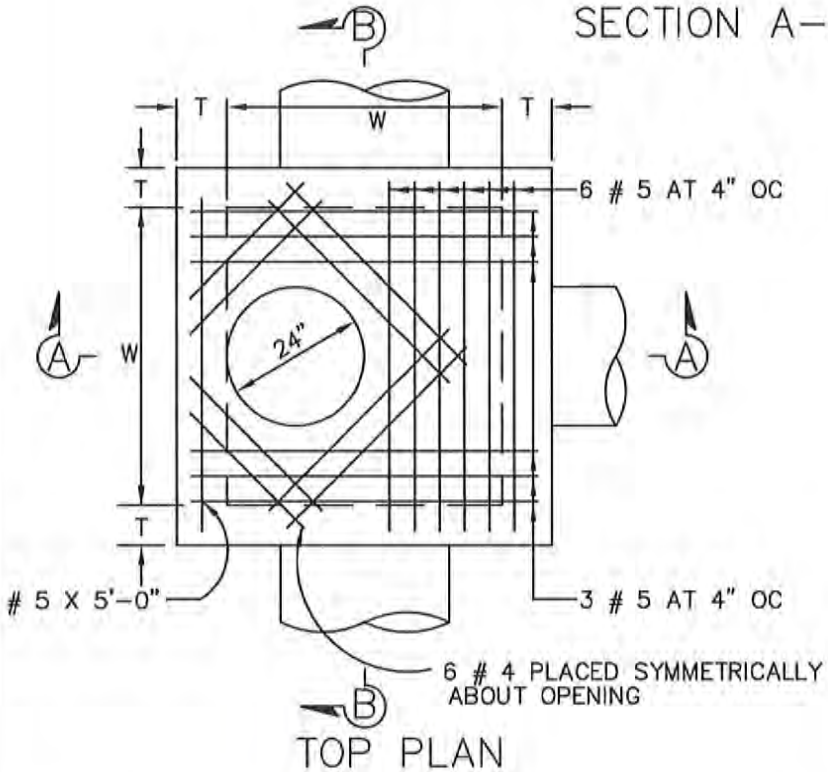


SECTION B–B

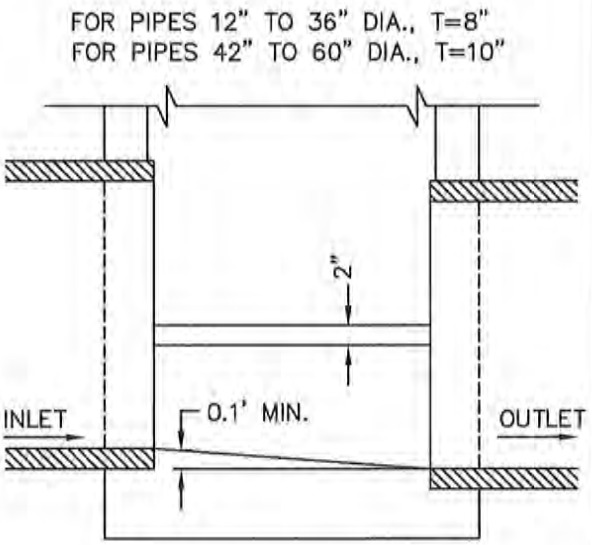
ALPINE COUNTY CALIFORNIA	APPROVED BY: COUNTY ENGINEER			STANDARD DRAWING TITLE	SHEET NUMBER
				STANDARD STORM DRAIN MANHOLE	SD-11
	REVISION	BY	APPROVED / DATE		SCALE / DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS / MARCH 2014



SECTION A–A

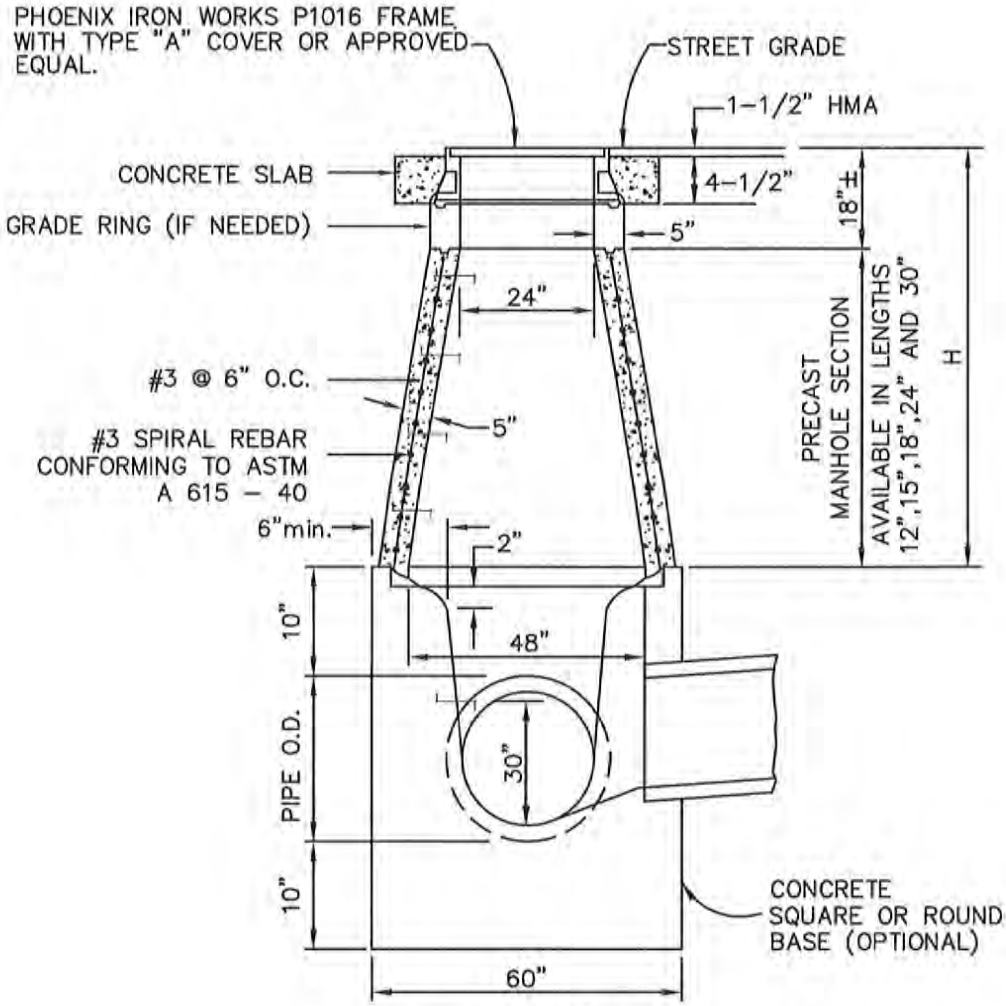


TOP PLAN



SECTION B–B

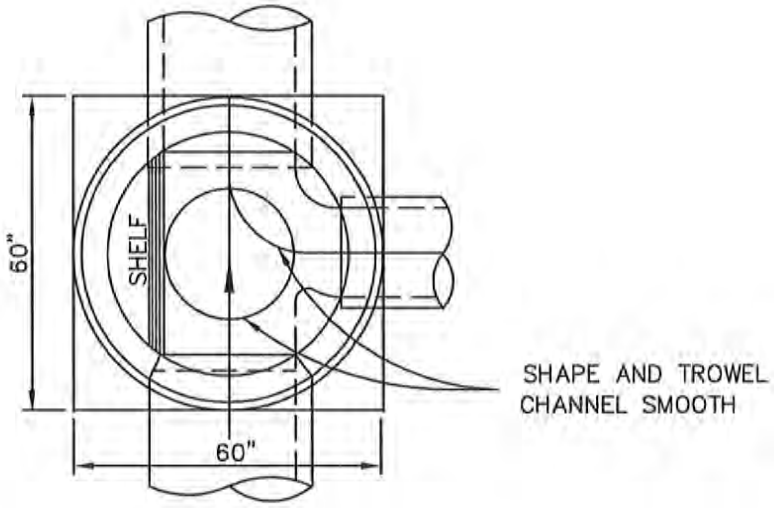
ALPINE COUNTY CALIFORNIA	APPROVED BY: COUNTY ENGINEER			STANDARD DRAWING TITLE	SHEET NUMBER
				STANDARD STORM DRAIN MANHOLE SHALLOW COVER	SD-12
	REVISION	BY	APPROVED / DATE		SCALE / DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS / MARCH 2014



SECTION

NOTES:

1. ALL PRECAST MANHOLE SECTIONS TO BE MANUFACTURED IN STRICT ACCORDANCE WITH THE LATEST PROVISIONS OF A.S.T.M. DESIGNATION C-478.
2. ALL 48" PRECAST SECTIONS SHALL HAVE 5" THICK WALLS.
3. MANHOLE BASE TO BE POURED ON UNDISTURBED EARTH OR ON 95% COMPACTED SOIL.
4. MANHOLE CASTING TO BE SET TO GRADE PRIOR TO PLACING 1-1/2" HOT MIX ASPHALT PATCH.
5. FOR STEPS SEE COUNTY STANDARD CATCH BASIN STEP DETAIL.



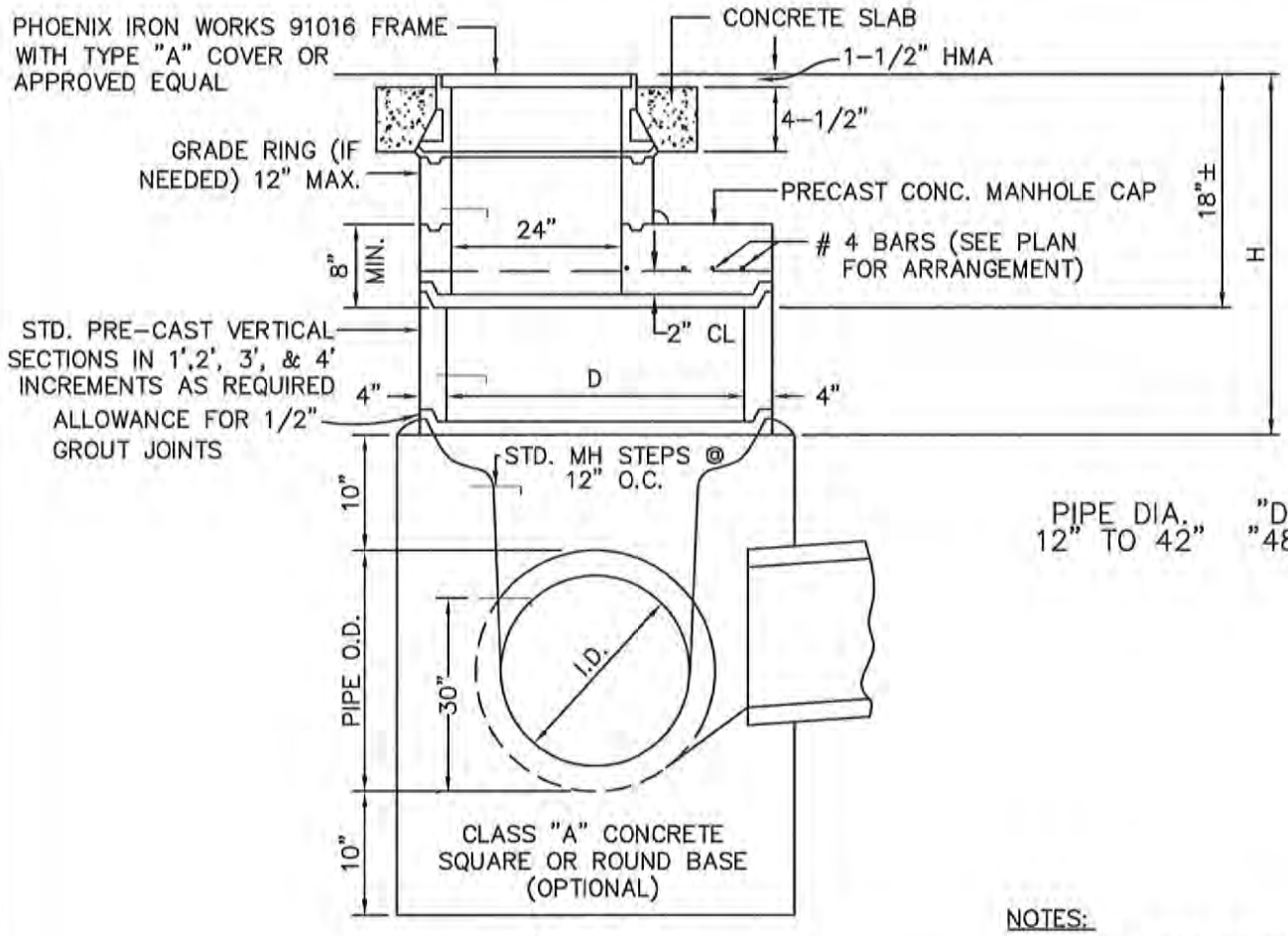
PLAN

APPROVED BY:

COUNTY ENGINEER

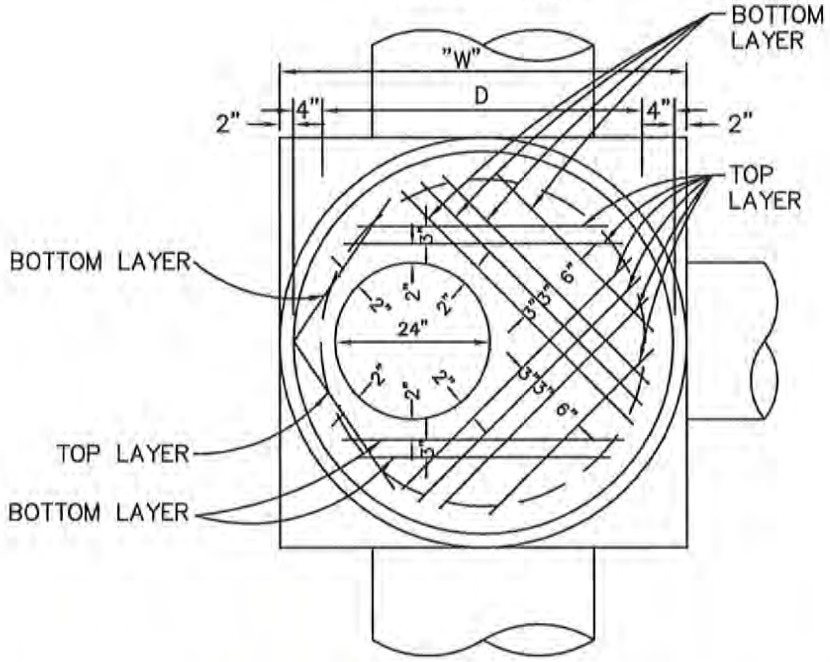
REVISION	BY	APPROVED	DATE

STANDARD DRAWING TITLE	SHEET NUMBER	
STORM DRAIN MANHOLE SHALLOW COVER FOR PIPES 42" I.D. OR LESS	SD-13	
	SCALE	DATE
ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



SECTION

PIPE DIA.	"D"	"W"
12" TO 42"	"48"	"60"



PLAN

NOTES:

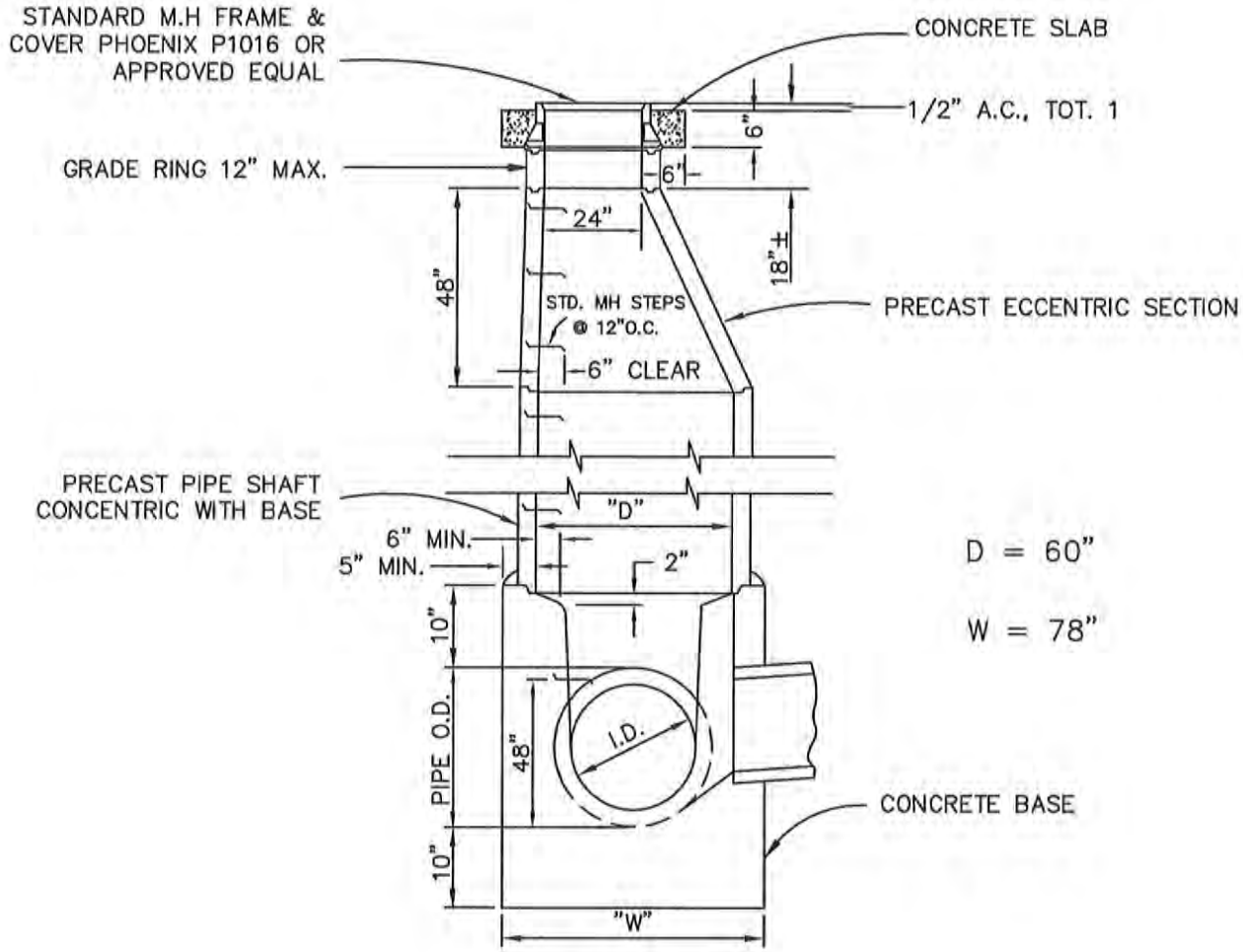
1. ALL PRECAST MANHOLE SECTIONS TO BE MANUFACTURED IN STRICT ACCORDANCE WITH THE LATEST REVISIONS OF A.S.T.M. DESIGNATION C-478.
2. MANHOLE BASE TO BE POURED ON UNDISTURBED EARTH OR ON 95% COMPACTED SOIL.
3. 1:3 GROUT MIX OR RAM-NEK JOINT COMPOUND TO BE USED IN ALL JOINTS.
4. MANHOLE CASTING TO BE SET TO GRADE PRIOR TO PLACING 1-1/2" ASPHALT CONCRETE PATCH.
5. FOR STEPS SEE COUNTY STANDARD CATCH BASIN STEP DETAIL.
6. ALL SLAB REINFORCING BARS TO BE #4.
7. #2 BARS BENT UP AND SPACED 6" O.C. AROUND 24" OPENING. HORIZONTAL LEG TO FAN OUT AT EQUAL SPACE TO 2" CLEARANCE AT EDGE OF SLAB.

APPROVED BY:

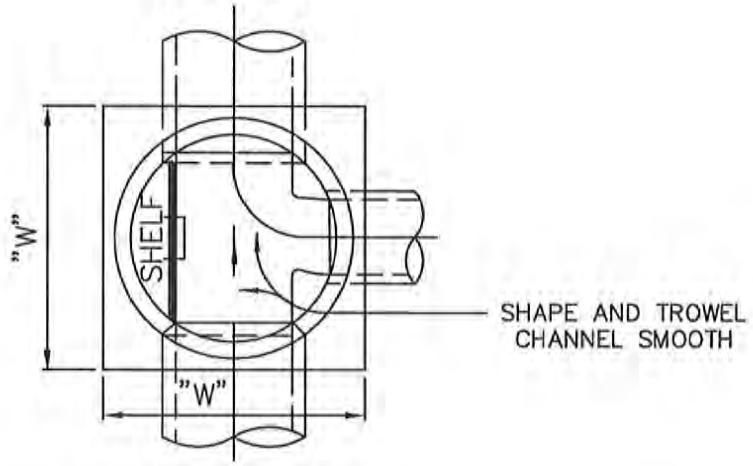
COUNTY ENGINEER

REVISION	BY	APPROVED	DATE

STANDARD DRAWING TITLE	SHEET NUMBER	
STANDARD FLAT TOP STORM DRAIN MANHOLE FOR PIPES I.D. 42" OR LESS	SD-14	
	SCALE	DATE
ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014

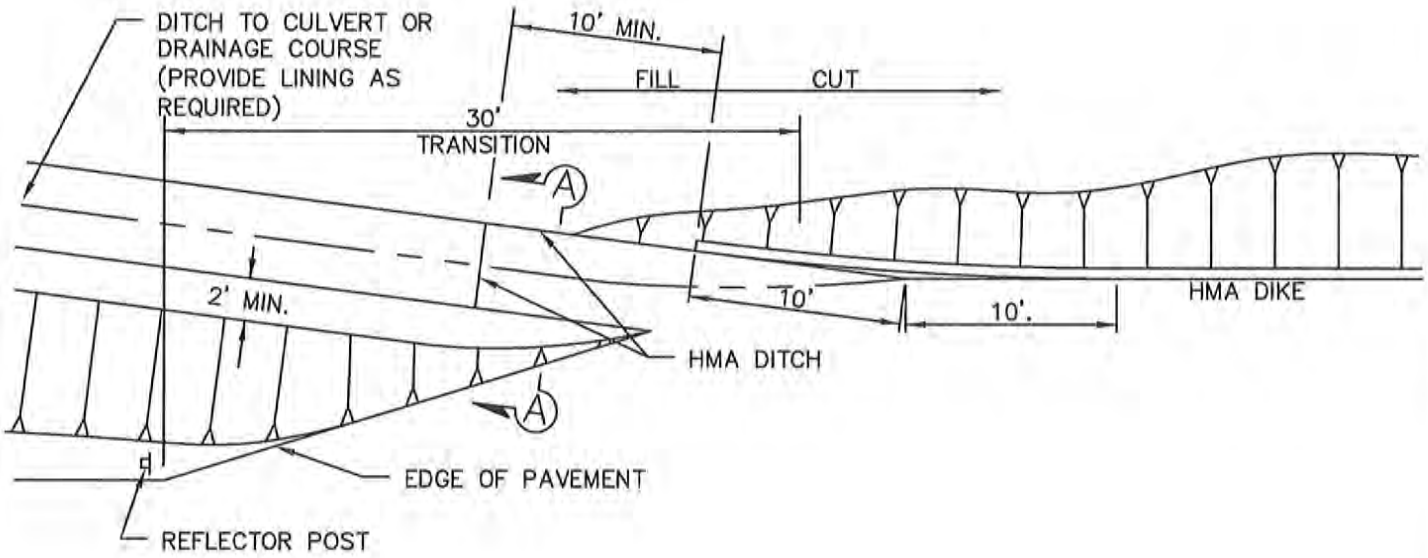


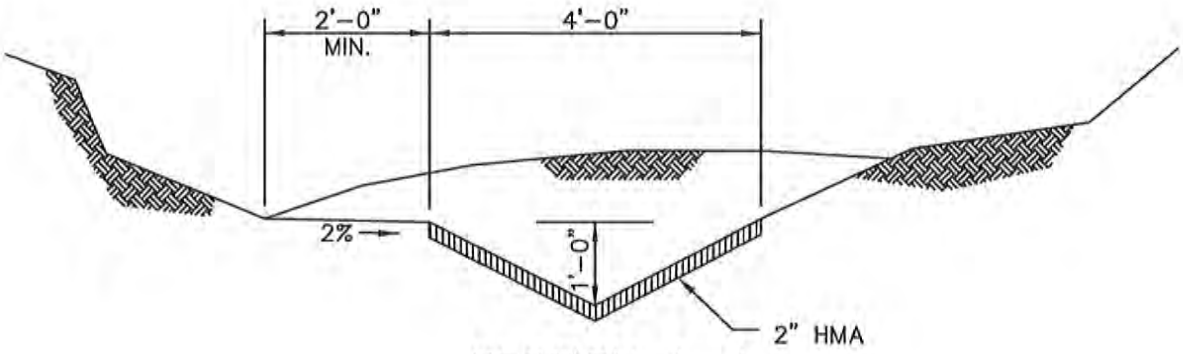
SECTION



PLAN

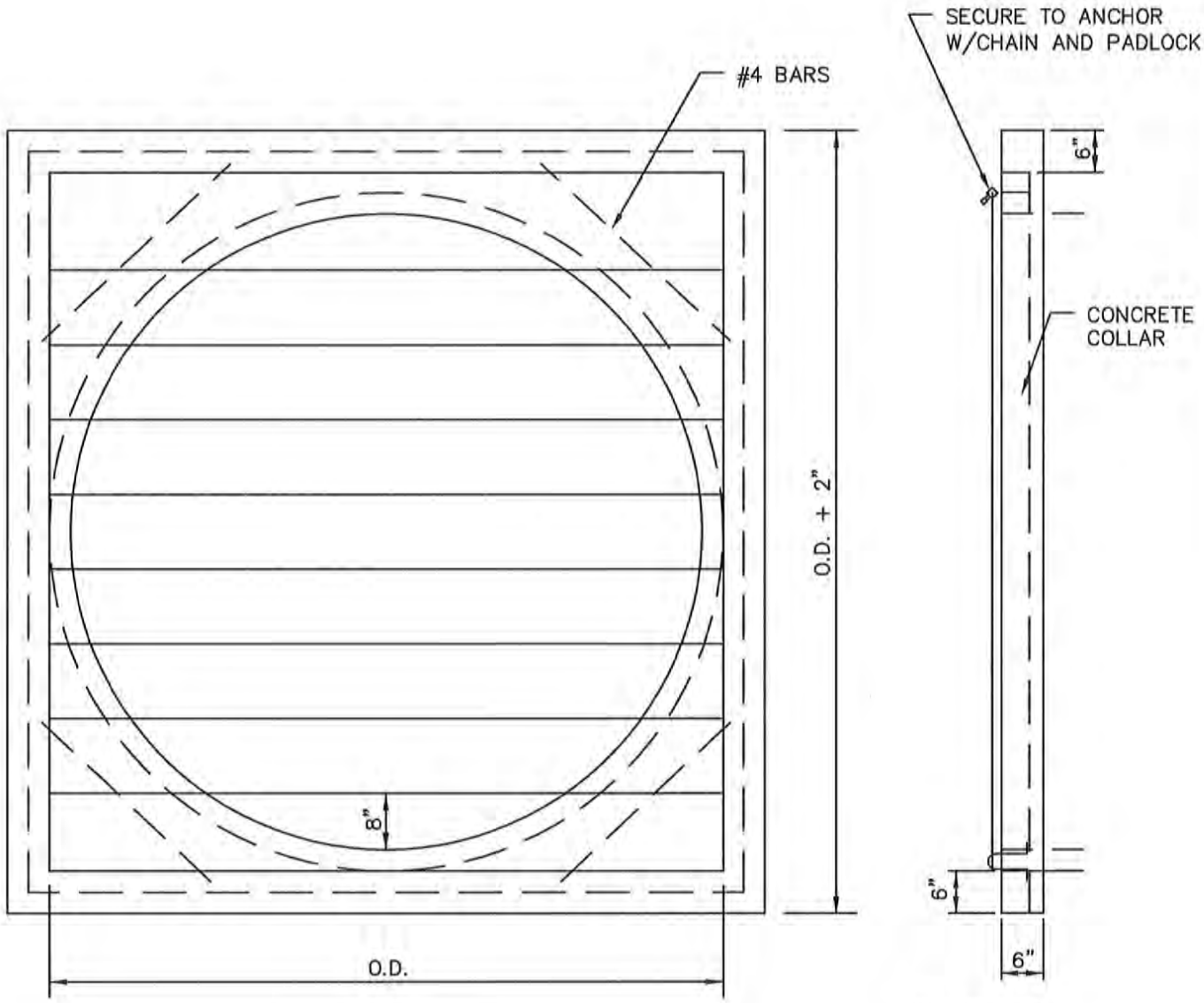
ALPINE COUNTY CALIFORNIA	APPROVED BY: COUNTY ENGINEER			STANDARD DRAWING TITLE	SHEET NUMBER
				STANDARD STORM DRAIN MANHOLE FOR PIPES I.D. 45" TO 60"	SD-15
	REVISION	BY	APPROVED DATE		SCALE / DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS / MARCH 2014





SECTION A-A

APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER	
				TYPICAL LEAD-OFF DITCH	SD-16	
REVISION	BY	APPROVED	DATE		SCALE	DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



PIPE SIZE	BAR SIZE
24"	#4
27"	#5
30"	#5
33"	#6
36"	#6
42"	#7
48"	#7

NOTES:

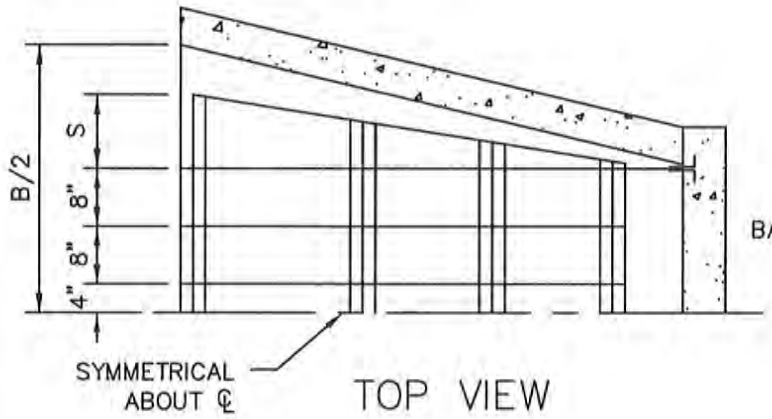
1. ENTIRE RACK TO BE WELDED REINFORCING STEEL OR ROUND BARS OF EQUAL DIAMETER WITH HORIZONTAL BARS BEING 8" CENTER TO CENTER.
2. USE 5 SACK MIX CONCRETE.
3. ROOM SHALL BE PROVIDED DOWNSTREAM TO LAY RACK FLAT.

APPROVED BY:

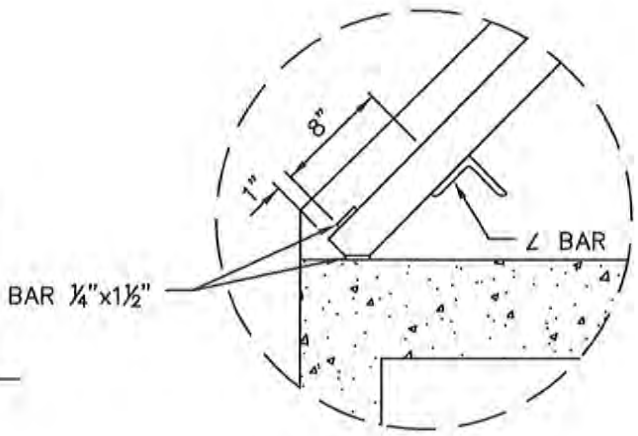
COUNTY ENGINEER

REVISION	BY	APPROVED	DATE

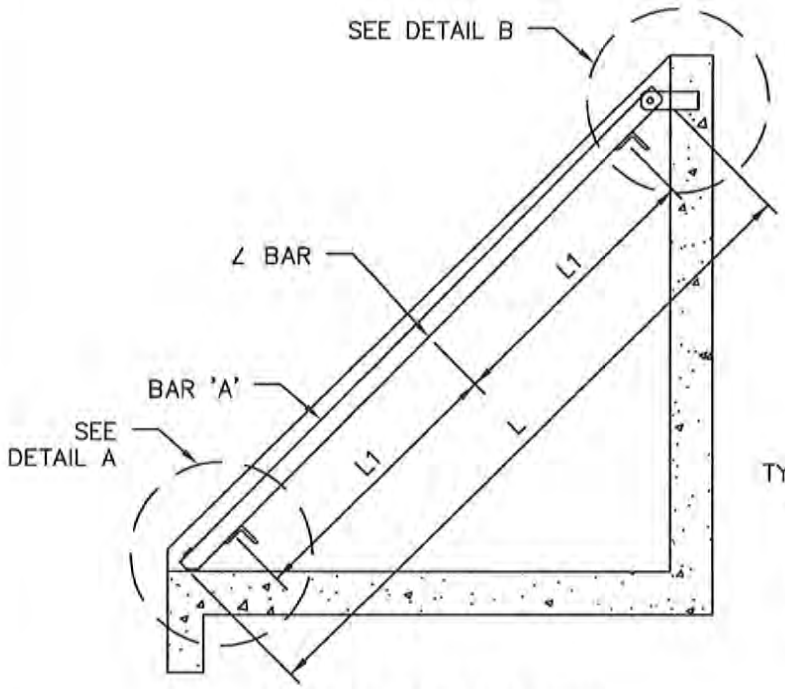
STANDARD DRAWING TITLE	SHEET NUMBER	
TRASH RACK 48" AND SMALLER	SD-17	
	SCALE	DATE
ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



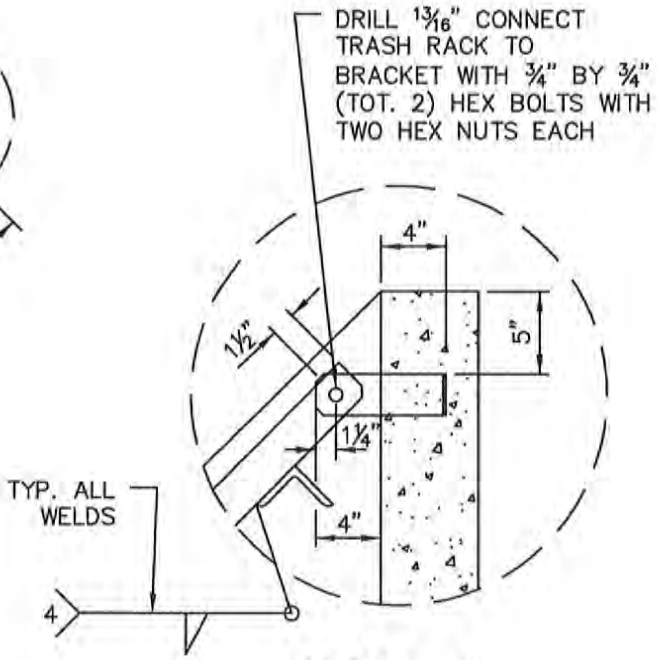
TOP VIEW



DETAIL A



ELEVATION VIEW
(PIPE NOT SHOWN)



DETAIL B

NOTES:

1. THIS TRASH RACK MAY BE USED WITH PIPE INLET STRUCTURES.
2. MATERIAL TO CONFORM TO ASTM DESIGNATION A-36
3. 'S' MAY VARY WITH 'B'.
4. ALL FILLET WELDS TO BE 3⁄16"
5. THREE HINGES REQUIRED.

TRASH RACK DIMENSIONS

DIA.	BAR A		∠ BAR		L	L1	S	H
	NO.	SIZE	NO.	SIZE				
54"	10	⅜x3	4	3x3x¼	7'-9"	2'-1½"	10½"	5'-8"
60"	11	⅜x3½	4	3x3x¼	8'-5"	2'-4"	11"	6'-2"

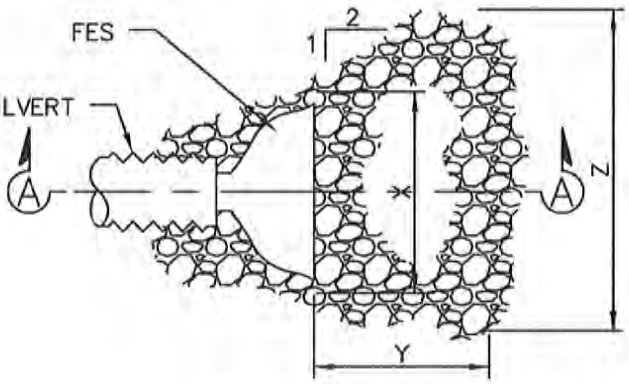
ALPINE COUNTY CALIFORNIA

APPROVED BY:

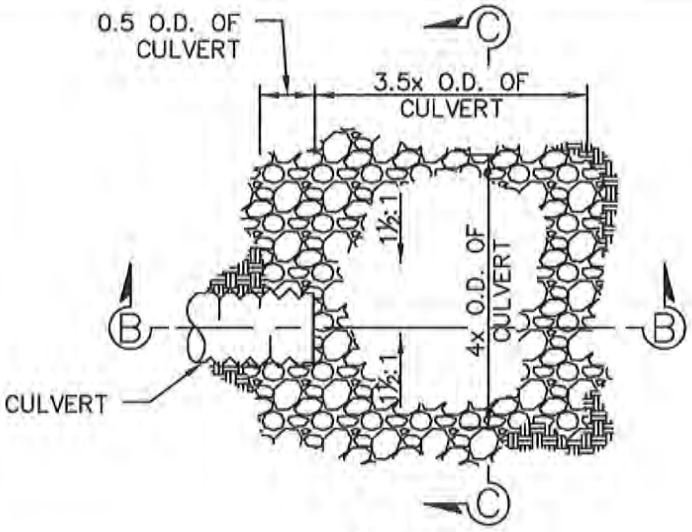
COUNTY ENGINEER

REVISION	BY	APPROVED	DATE

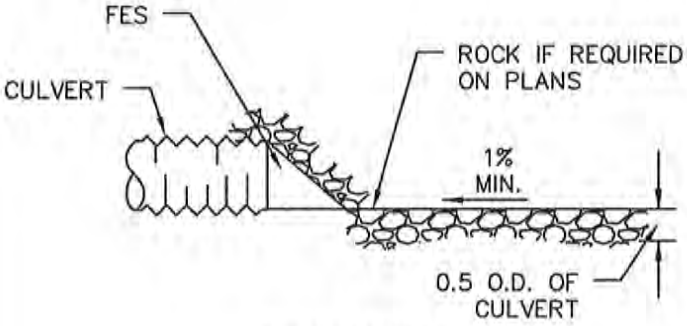
STANDARD DRAWING TITLE	SHEET NUMBER	
TRASH RACK 54" AND LARGER	SD-18	
	SCALE	DATE
ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



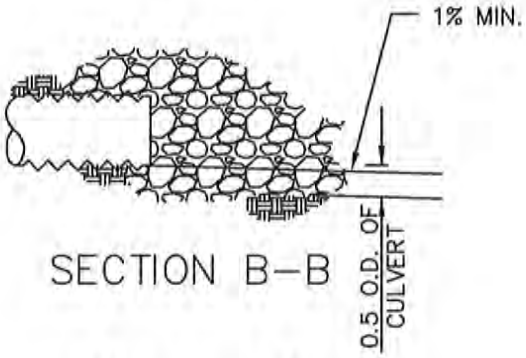
INLET PROTECTION
PLAN VIEW



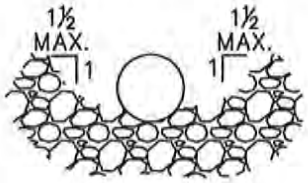
OUTLET



SECTION A–A



SECTION B–B



SECTION C–C

INLET PROTECTION
MINIMUM DIMENSIONS

ROCK CLASS	PIPE ø (IN)	X (FT)	Y (FT)	Z (FT)
BACKING NO. 1	12	3	4	5
	15–18	4.5	6	7.5
	21–24	6	8	10
	27–30	7.5	10	12.5
	36	9	12	15
	42	10.5	14	17.5
	48	12	16	20

NOTES:

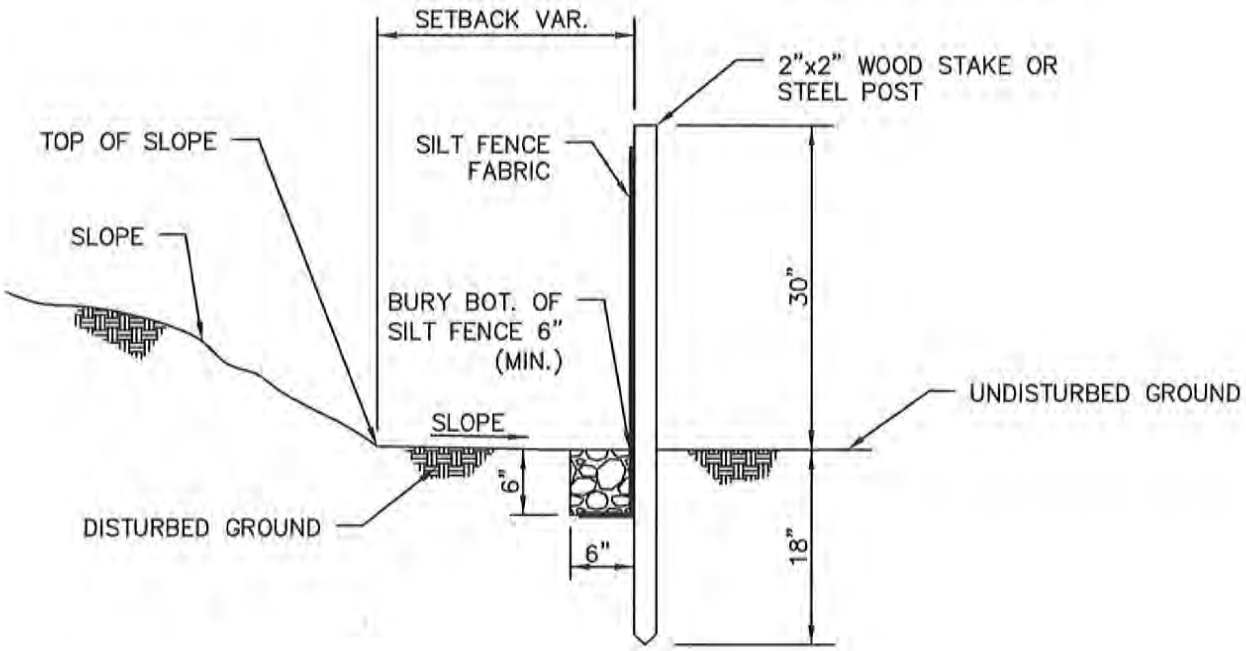
1. HAND PLACE ROCKS.
2. ALL ROCKS SHALL BE ANGULAR AND HAVE TWO FACES.
3. WHERE SLOPE OF OUTLET EXCEEDS 5% A SEDIMENT BOWL OR ENERGY DISSIPATER SHALL BE REQUIRED.
4. FLARED END SECTION AND ROCK SLOPE PROTECTION SHALL BE SLOPED AT A MIN. OF 1% INTO OR OUT OF CULVERT.
5. FOR ADDITIONAL EROSION PROTECTION, ENGINEER MAY REQUIRE FILTER FABRIC BENEATH ROCK.

ALPINE COUNTY CALIFORNIA

APPROVED BY:
COUNTY ENGINEER

REVISION	BY	APPROVED	DATE

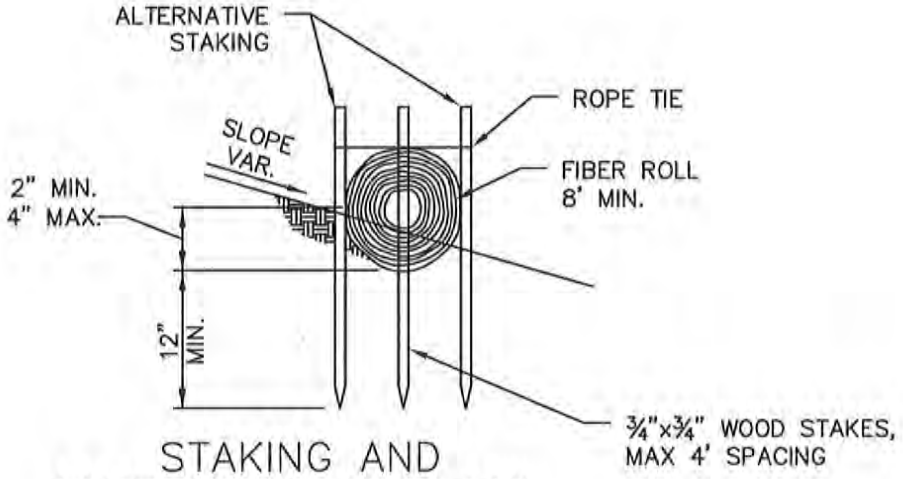
STANDARD DRAWING TITLE	SHEET NUMBER	
ROCK INLET/OUTLET PROTECTION	SD-19	
	SCALE	DATE
ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



NOTES:

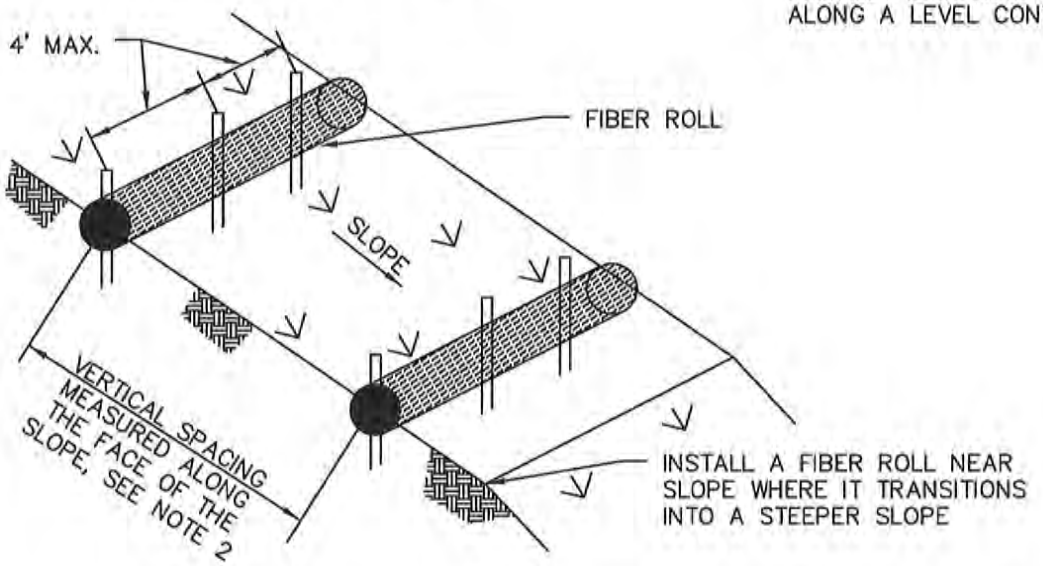
1. DO NOT USE IN STREAMS, CHANNELS, DRAIN INLETS, OR ANYWHERE FLOW IS CONCENTRATED. DO NOT USE TO DIVERT FLOW.
2. THE MAXIMUM LENGTH OF SLOPE DRAINING TO ANY POINT ALONG THE SILT FENCE SHOULD BE 200' OR LESS.
3. SILT FENCE FABRIC SHOULD BE WOVEN POLYPROPYLENE WITH A MINIMUM WIDTH OF 36" AND A MINIMUM TENSILE STRENGTH OF 100 LB FORCE.
4. THE FOLLOWING CRITERIA IS RECOMMENDED FOR SELECTION OF THE FABRIC EQUIVALENT OPENING SIZE:
   A. IF 50% OR LESS OF THE SOIL, BY WEIGHT, WILL PASS THE U.S. STANDARD SIEVE NO. 200, SELECT THE EOS TO RETAIN 85% OF THE SOIL. THE EOS SHOULD NOT BE FINER THAN EOS70.
   B. FOR ALL OTHER SOIL TYPES, THE EOS SHOULD BE NO LARGER THAN THE OPENINGS IN THE U.S. STANDARD SIEVE NO. 70 EXCEPT WHERE DIRECT DISCHARGE TO A STREAM, LAKE, OR WETLAND WILL OCCUR, THEN THE EOS SHOULD BE NO LARGER THAN STANDARD SIEVE NO. 100
5. CONNECTION/JOINING OF SILT FENCES SHALL BE COMPLETED BY TIGHTLY OVERLAPPING THE ENDS OF THE ROLLS OF MINIMUM OF 12" OR BY OVERLAPPING THE END POSTS AND SECURING THE TWO POSTS TOGETHER TIGHTLY WITH PLASTIC WIRE TIES AND/OR STEEL BAILING WIRE (9 GAUGE OR HEAVIER).
6. STAKES SHALL BE SPACED AT 8'–0" MAXIMUM AND SHALL BE POSITIONED ON A DOWNSTREAM SIDE OF FENCE.
7. STAPLES USED TO FASTEN THE FENCE FABRIC TO THE STAKES SHOULD BE NOT LESS THAN 1.25" LONG AND SHOULD BE FABRICATED FROM 15 GAUGE OR HEAVIER WIRE. PLASTIC WIRE TIES AND/OR STEEL BAILING WIRE (9 GAUGE OR HEAVIER) MAY BE SUBSTITUTED. NOT LESS THAN 4 STAPLES/TIES SHALL BE USED ON EACH STAKE.
8. THE LAST 8' OF FENCES SHALL BE TURNED UPSLOPE.
9. SILT FENCES SHOULD BE LEFT IN PLACE, REGULARLY INSPECTED, AND MAINTAINED UNTIL THE UPSTREAM AREA IS PERMANENTLY STABILIZED.
10. SEDIMENT SHOULD BE REMOVED BEFORE THE SEDIMENT ACCUMULATION REACHES ONE–THIRD OF THE BARRIER HEIGHT.

APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER	
				SILT FENCE	EC-1	
REVISION	BY	APPROVED	DATE		SCALE	DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



STAKING AND ENTRENCHMENT DETAIL

NOTE:
INSTALL FIBER ROLL ALONG A LEVEL CONTOUR

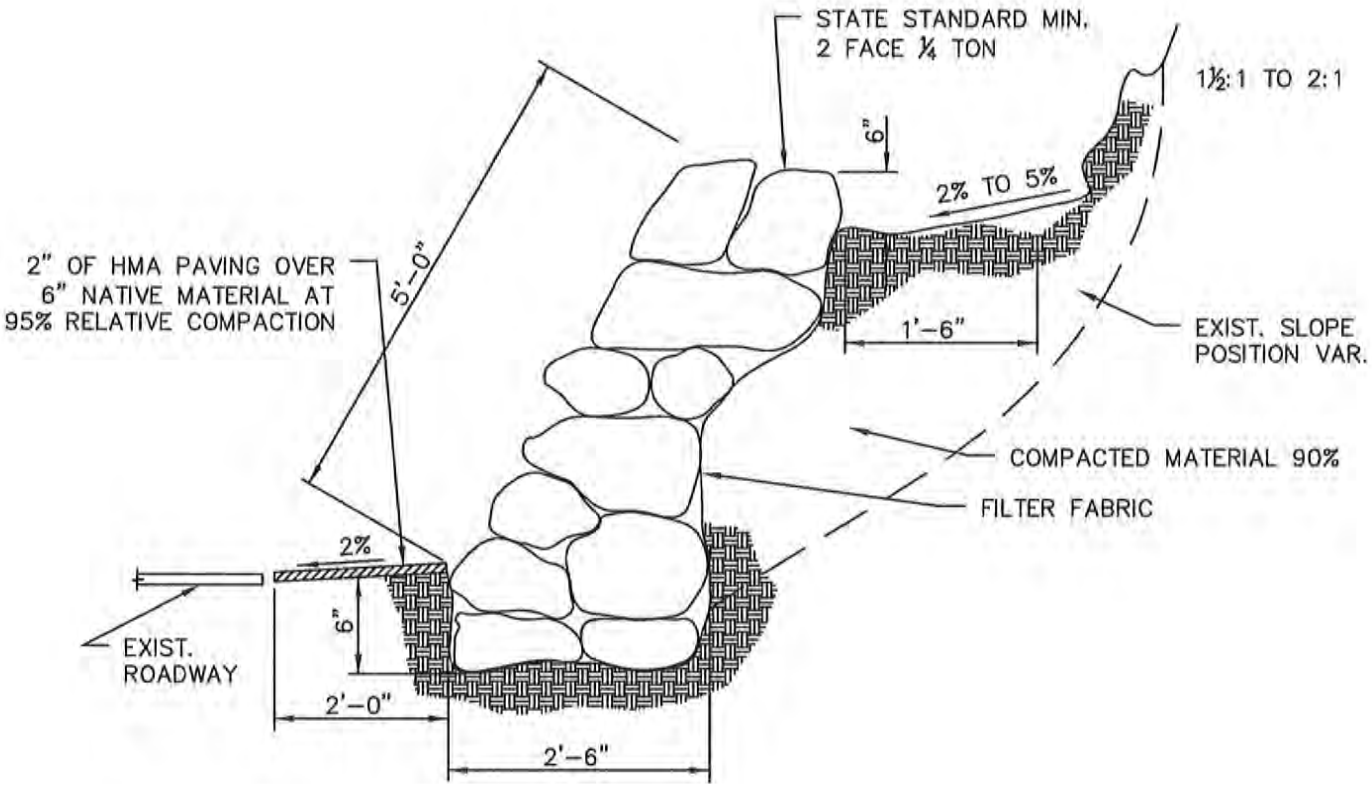


TYPICAL FIBER ROLL INSTALLATION

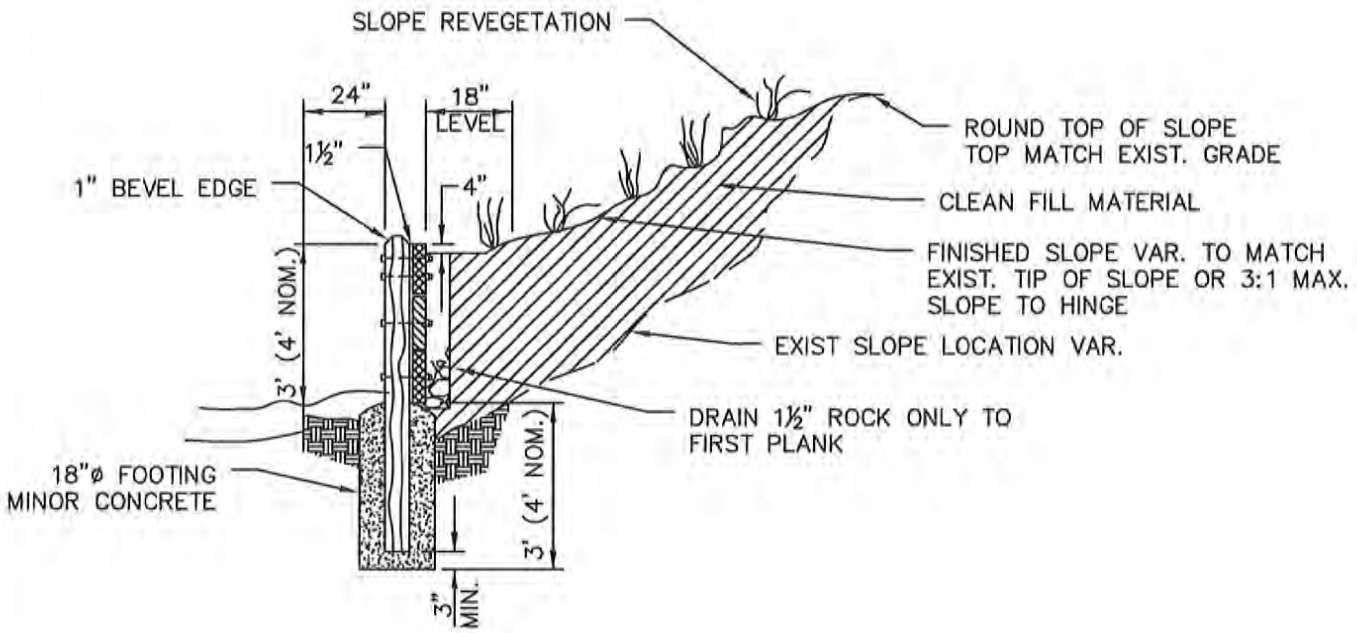
NOTES:

1. FIBER ROLLS SHOULD CONSIST OF STRAW, FLAX, WOOD EXCELSIOR OR COCONUT FIBERS BOUND IN A TIGHT TUBULAR ROLL.
2. LOCATE FIBER ROLLS ON LEVEL CONTOURS SPACED AS FOLLOWS:
   - SLOPE INCLINATION OF 4:1 (H:V) OR FLATTER;
     FIBER ROLLS SHOULD BE PLACED AT A MAXIMUM INTERVAL OF 20'.
   - SLOPE INCLINATION BETWEEN 4:1 AND 2:1 (H:V);
     FIBER ROLLS SHOULD BE PLACED AT A MAXIMUM INTERVAL OF 15'.
   - SLOPE INCLINATION OF 2:1 (H:V) OR GREATER;
     FIBER ROLLS SHOULD BE PLACED AT A MAXIMUM INTERVAL OF 10'.
3. TURN THE ENDS OF THE FIBER ROLL UP SLOPE TO PREVENT RUNOFF FROM GOING AROUND THE ROLL.
4. IF MORE THAN ONE FIBER ROLL IS PLACED IN A ROW, THE ROLLS SHOULD BE OVERLAPPED, NOT ABUTTED.
5. FIBER ROLLS MAY BE USED FOR DRAINAGE INLET PROTECTION IF PROPERLY ANCHORED. SEDIMENT SHOULD BE REMOVED WHEN SEDIMENT ACCUMULATION REACHES ONE-HALF THE SEDIMENT STORAGE DEPTH.

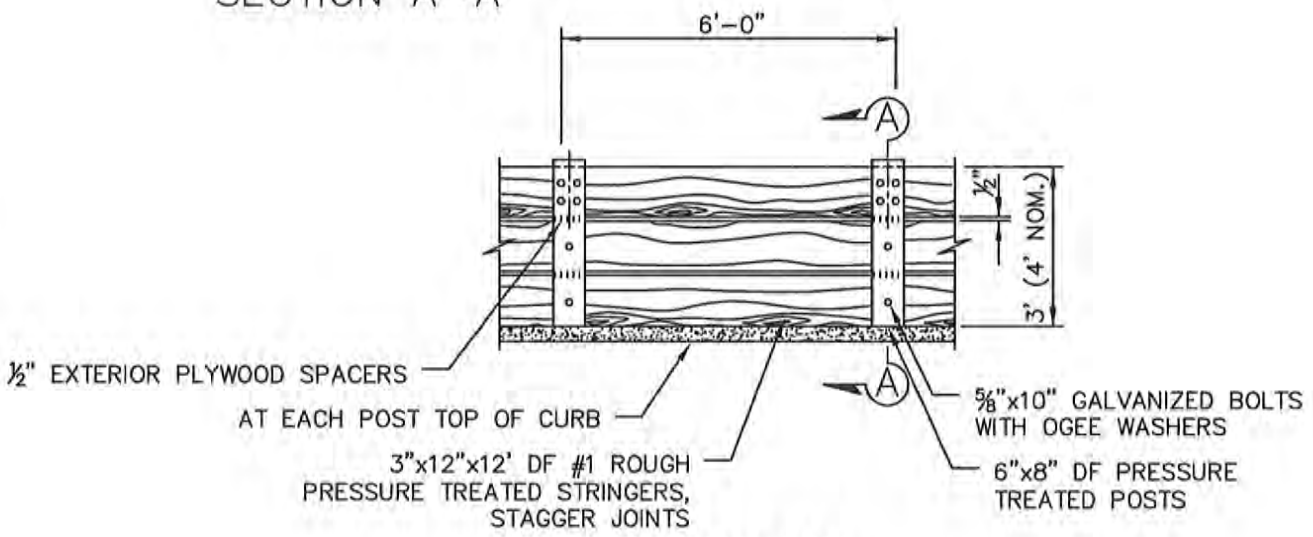
APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER	
				FIBER ROLL INSTALLATION	EC-2	
REVISION	BY	APPROVED	DATE		SCALE	DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



ALPINE COUNTY CALIFORNIA	APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER
					ROCK WALL	EC-3
	REVISION	BY	APPROVED	DATE		SCALE / DATE
					ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS / MARCH 2014



SECTION A–A



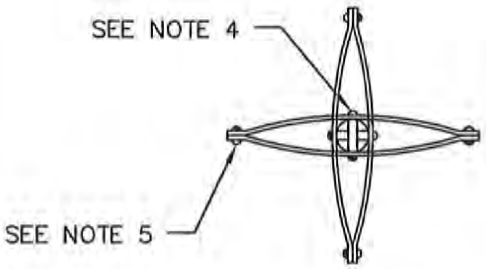
ELEVATION

NOTES:

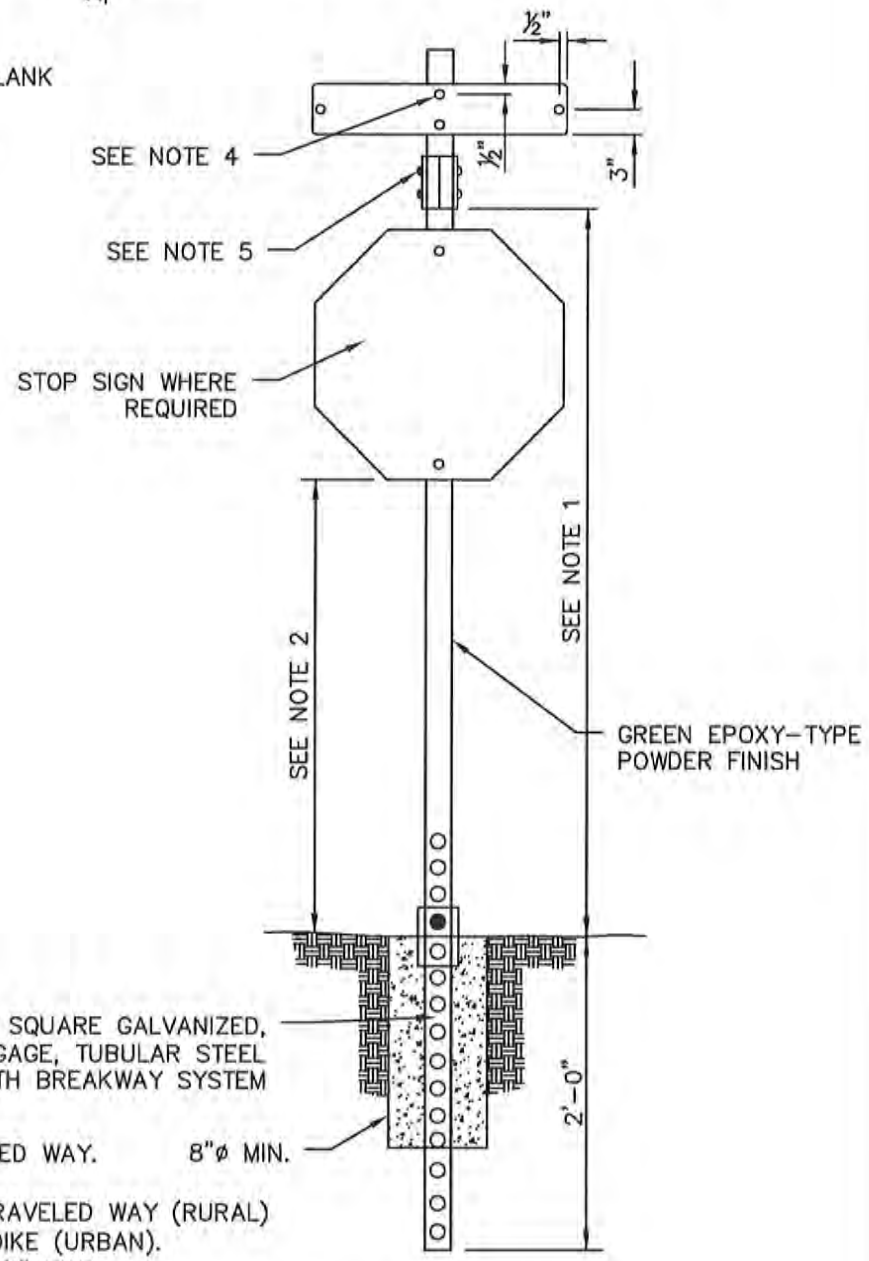
1. DEPTH OF FOOTING MAY BE REDUCED TO 2' AS DIRECTED BY ENGINEER.
2. USE 12' LENGTHS FOR STRINGERS. 6' STRINGERS ALLOWABLE FOR RADII AND TRANSITIONS WHERE NECESSARY.
3. PROVIDE SLOPE PROTECTION AT THE END OF EACH WALL.

APPROVED BY: COUNTY ENGINEER				STANDARD DRAWING TITLE	SHEET NUMBER	
				TIMBER RETAINING WALL 3' TO 4'	EC-4	
REVISION	BY	APPROVED	DATE		SCALE	DATE
				ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014

SIGN PLATE DETAIL



TOP VIEW



SIGN DETAIL

NOTES:

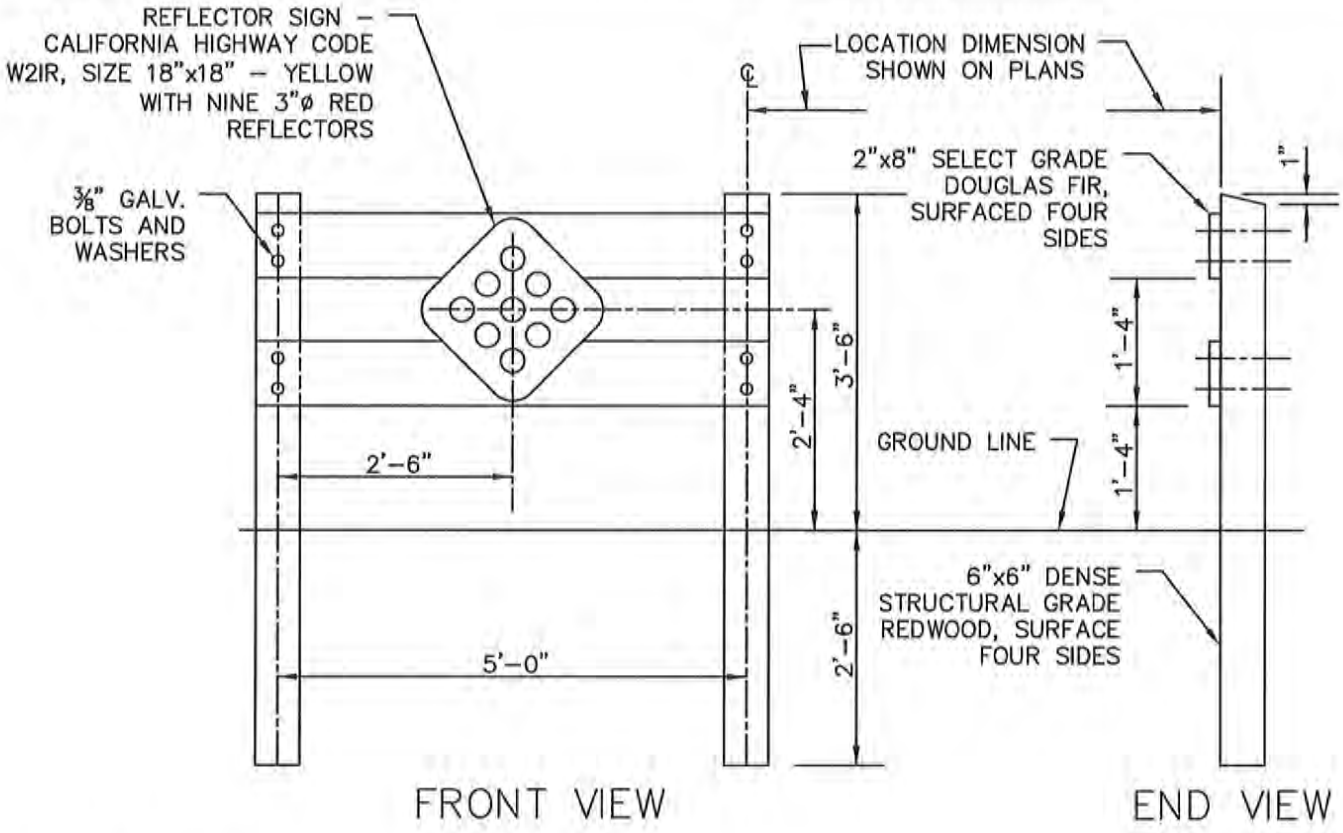
1. 7' MINIMUM ABOVE THE EDGE OF TRAVELED WAY.
2. 7' ABOVE THE EDGE OF TRAVELED WAY.
3. POSTS SHALL BE SET 6' TO 12' FROM TRAVELED WAY (RURAL) OR 2' FROM THE BACK OF A CURB OR DIKE (URBAN).
4. ¼" DIAMETER x 3" CARRIAGE BOLT WITH ¼" NUT, 5/16" DIAMETER HOLE.
5. 19/32" DIAMETER x ¾" FLAT HEAD MACHINE SCREW WITH 19/32" NUT, ⅜" DIAMETER HOLE CENTERED ON PLATE.
6. LETTERING TO BE CENTERED.
7. POST SHALL BE A MINIMUM OF 1' BEHIND SIDEWALK.

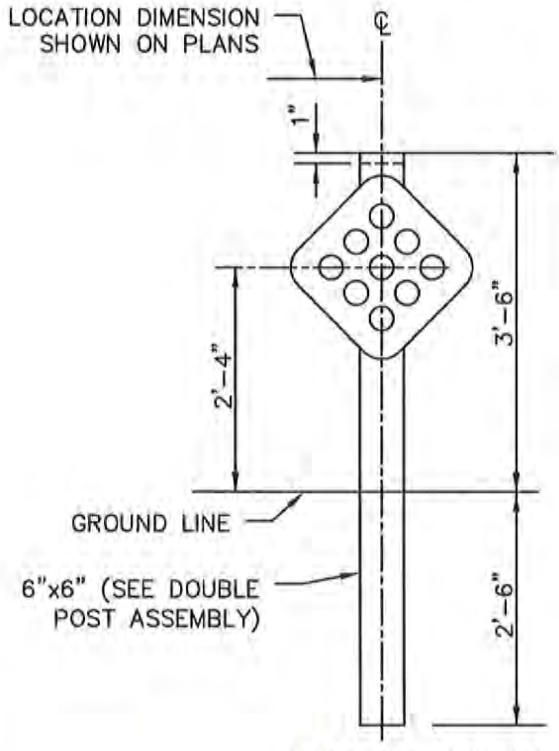
ALPINE COUNTY CALIFORNIA

APPROVED BY:
COUNTY ENGINEER

REVISION	BY	APPROVED	DATE

STANDARD DRAWING TITLE	SHEET NUMBER	
STREET NAME & STOP SIGN	M-1	
	SCALE	DATE
ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014





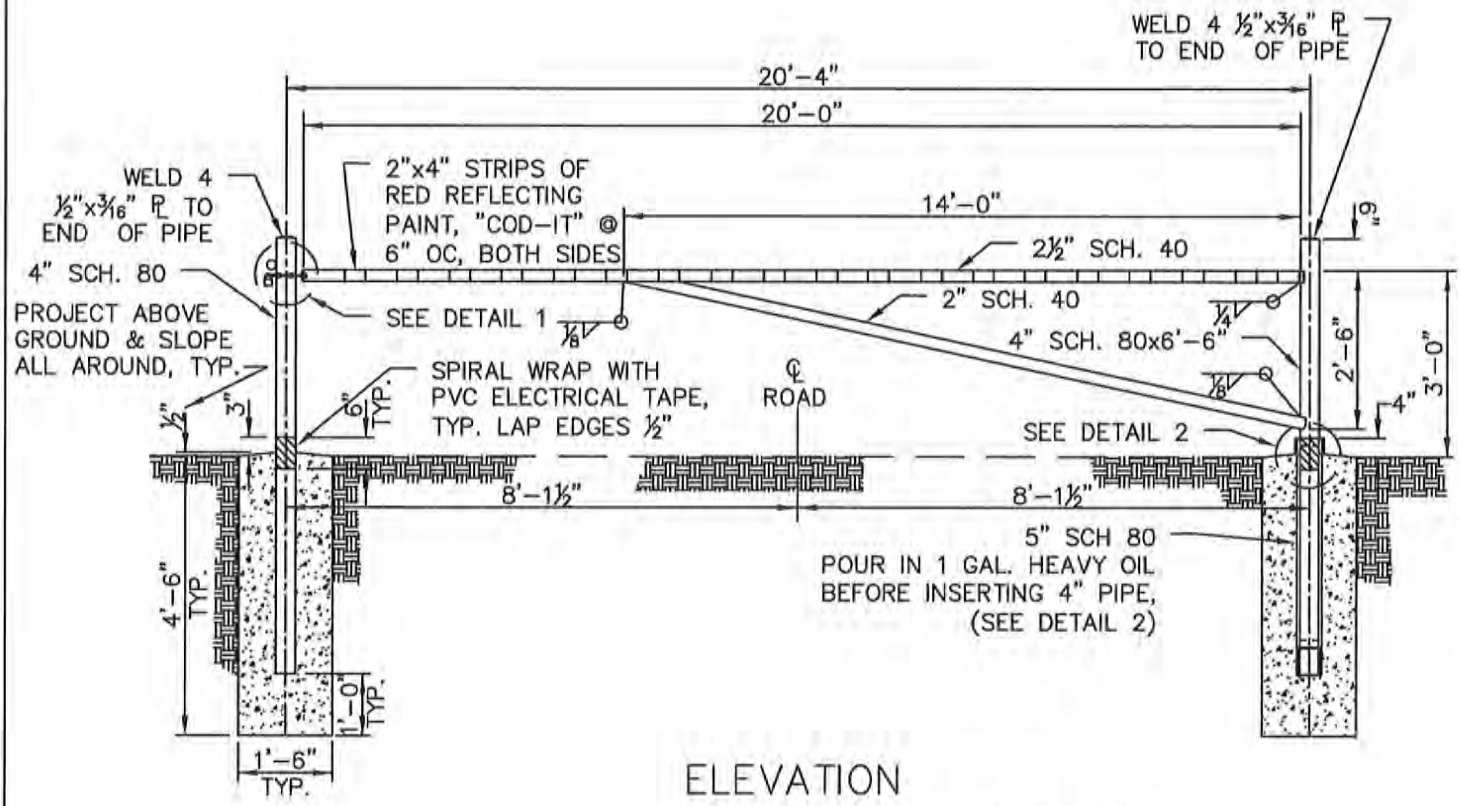
TYPE C (DOUBLE POST WITHOUT REFLECTOR SIGN)
TYPE CS (DOUBLE POST WITH REFLECTOR SIGN)
TYPE D (SINGLE POST WITHOUT REFLECTOR SIGN)
TYPE DS (SINGLE POST WITH REFLECTOR SIGN)

APPROVED BY:

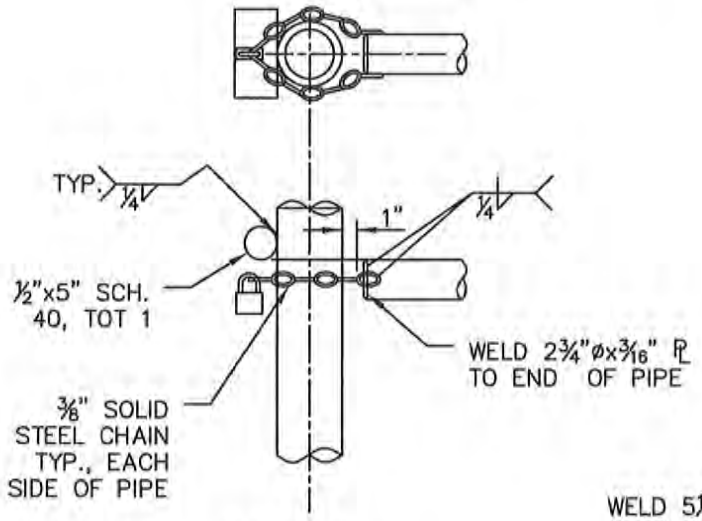
COUNTY ENGINEER

REVISION	BY	APPROVED	DATE

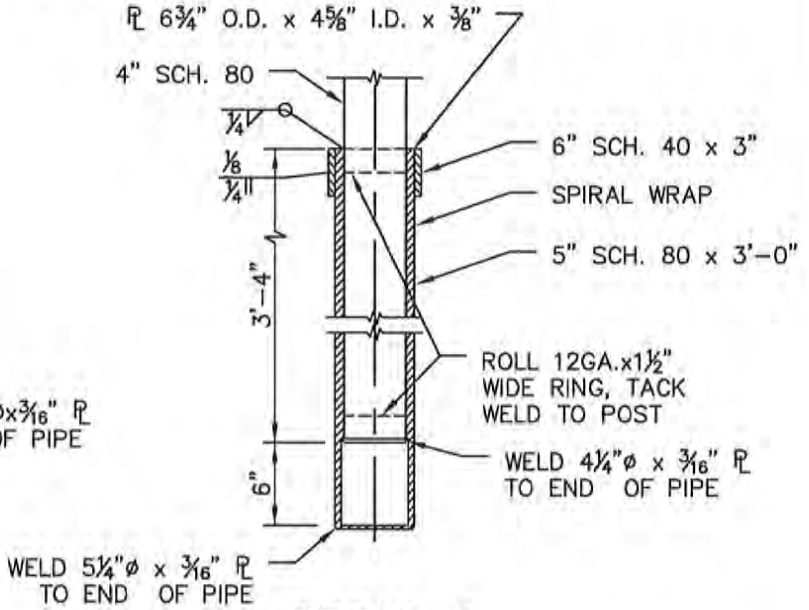
STANDARD DRAWING TITLE	SHEET NUMBER	
TYPICAL ROAD GUARD FENCE	M-2	
	SCALE	DATE
ALPINE COUNTY - DEVELOPMENT STANDARDS	NTS	MARCH 2014



ELEVATION



DETAIL 1

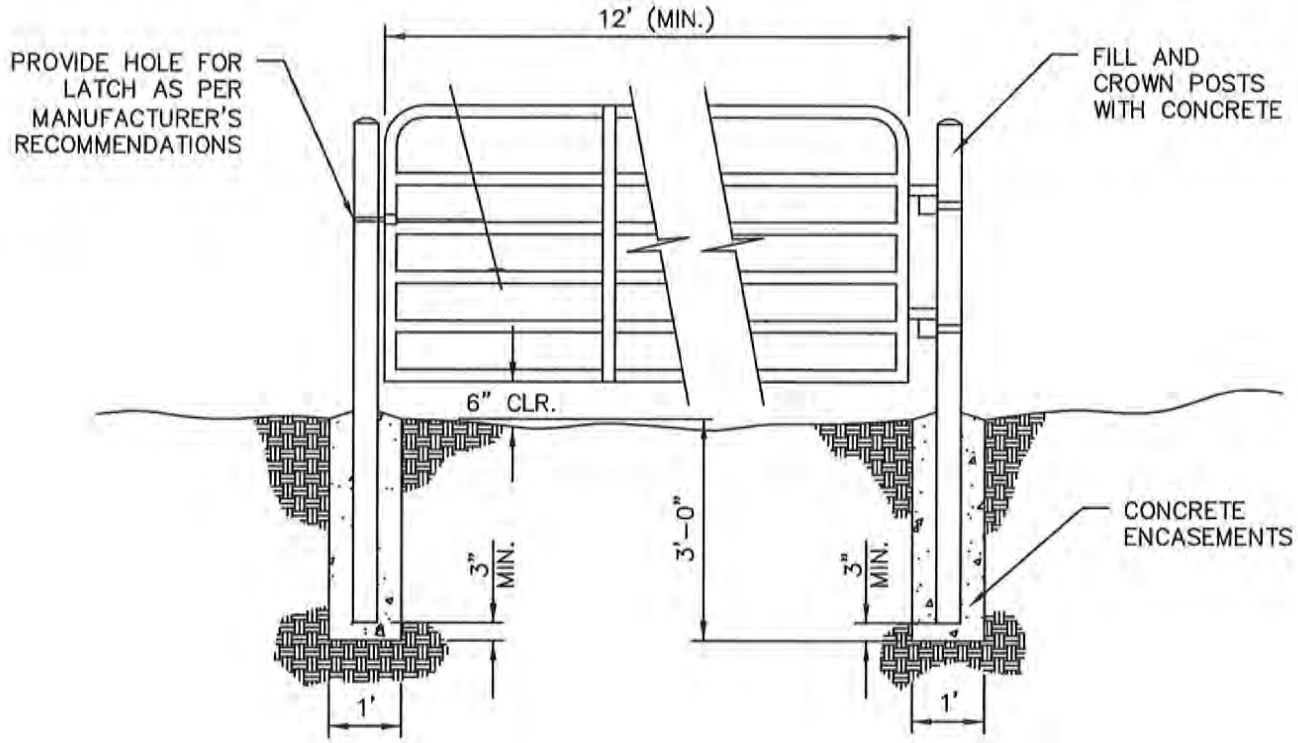


DETAIL 2

NOTES:

1. CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 2500 PSI AT 28 DAYS.
2. ALL WELDS SHALL BE GROUND FLUSH AND SMOOTH.
3. HOT-DIP GALVANIZE AFTER FABRICATION.

APPROVED BY: COUNTY ENGINEER	STANDARD DRAWING TITLE	SHEET NUMBER
REVISION / BY / APPROVED / DATE	PIPE BARRIER GATE	M-3
		SCALE: NTS / DATE: MARCH 2014
	ALPINE COUNTY - DEVELOPMENT STANDARDS	



NOTES:

1. CONCRETE ENCASEMENTS SHALL HAVE A 1" CROWN ABOVE GROUND LEVEL.
2. 12' WIDE GATE OF 16 GAGE, 2"ø TUBE CONSTRUCTION WITH MOUNTING HARDWARE AND SINGLE, LOCKABLE PISTON LEVER LATCH BY WESTGUARD INDUSTRIES OR EQUIVALENT.
3. GATE POSTS 4"ø SCHEDULE 40 GALVANIZED STEEL.

ALPINE COUNTY CALIFORNIA	APPROVED BY: COUNTY ENGINEER			STANDARD DRAWING TITLE	SHEET NUMBER
				GATE	M-4
REVISION	BY	APPROVED	DATE		SCALE: NTS; DATE: MARCH 2014
				ALPINE COUNTY - DEVELOPMENT STANDARDS	