

Cameron Estates Community Services District

Road Design Policies and Standards

Adopted March 20, 2014

Cameron Estates Community Services District

Board of Directors

President	Eva Robertson
Vice President	Doris Miller
Director	Ken Moonitz
Director	James Sholl
Director	David Proft

Staff:

Angela Johnson, General Manager/Secretary

Prepared by:



Matthew C. Boyer & Associates

TRAFFIC WORKS

**RESOLUTION NO. 2014-1
OF THE CAMERON ESTATES COMMUNITY SERVICES DISTRICT
ADOPTING ROAD STANDARDS**

WHEREAS, the Cameron Estates Community Services District has authority pursuant to Government Code Section 61060(b) to adopt and enforce rules and regulations for the administration, operation, use and maintenance of the District's facilities, including its roads; and

WHEREAS, under Government Code Sections 61100(l) and 61103(a) the District has the same authority as a county to acquire, construct, improve and maintain its roads; and

WHEREAS, the Cameron Estates subdivision was created in or around 1959 and the Cameron Estates Community Services District ("District") was formed in 1969; and

WHEREAS, the majority of the roads within the District were originally built between approximately 1959 to 1969 as unpaved gravel roads which are now considered substandard; and

WHEREAS, due to budgetary constraints, the roads have not been significantly improved but instead have been minimally upgraded as necessary over the years with chip seal /asphalt overlays and have been maintained at a level solely intended to serve the limited, light duty traffic volume generated by the parcels within the boundaries of the District; and

WHEREAS, any additional development in or around the District that increases the use of the roads and the volume of traffic upon them will have a detrimental impact upon the condition of the existing roads; and

WHEREAS, the District has consulted with Matthew C. Boyer and Associates to develop design standards and specifications for roads to be constructed or improved within the District; and

WHEREAS, the District wishes to adopt design standards and specifications consistent with safety considerations, including Fire Safe regulations and generally accepted standards and practices; and

WHEREAS, the District intends to adopt the standards and specifications as an objective, rather than a requirement, for the District's construction, improvement and maintenance of its existing roads under the present level of use; and

WHEREAS, the District intends that the District Engineer shall be responsible for interpretation and application of the road standards subject to the ratification of the Board of Directors; and

WHEREAS, nothing herein shall be construed to limit, restrict or prevent the District's right to install and maintain gates to limit access to the roads of the District to the residents of the District pursuant to Government Code Section 61105(f) or to install traffic calming measures approved by the Board; and

WHEREAS, the District intends the standards and specifications to be implemented as a condition of future development that increases the traffic burden on the District's roads.

NOW THEREFORE BE IT RESOLVED by the Board of Directors of the Cameron Estates Community Services District as follows.

1. The Board hereby adopts the Road Design Policies and Standards prepared by Matthew C. Boyer & Associates in the form attached hereto, which are incorporated herein.
2. The Road Design Policies and Standards are adopted as a goal of the District to be implemented within the District's budgetary constraints. The District is not obligated hereby to make any specific improvements to its existing roads or to bring the existing roads into compliance with the adopted Road Design Policies and Standards or to expend any portion of its general fund for any such road improvements.
3. The District's Road Design Policies and Standards shall be implemented, at the sole cost and expense of the developer, for all future road construction, improvements and maintenance on roads serving a development project undertaken as a result of the creation of new parcels located within the District, or as the result of the proposed annexation of parcels located outside the District, or other uses that increase the traffic burden on the District's roads from parcels that have not previously paid fees, assessments or taxes to the District and have not otherwise contributed to the improvement and maintenance of the District's roads.
4. The District Engineer shall be responsible for interpretation and application of the road standards subject to ratification by the Board of Directors.

PASSED AND ADOPTED this 20 day of March, 2014 by a majority vote of the members of the Board, as follows.

AYES:	<u>all</u>
NOES:	<u>0</u>
ABSTAIN:	<u>0</u>
ABSENT:	<u>0</u>

By: *Er Robert*
Chair, Board of Directors
Cameron Estates Community Services District

Attest:

Angela Johnson
Angela Johnson, Secretary

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The Mission of the Cameron Estates Community Services District is to construct and maintain district roadways, define and designate riding trails, and to represent the residents in issues that would have an effect on the community.

Adopted March 30, 2013

BACKGROUND

Formation and Authority

The Cameron Estates subdivision was approved in 1959. The Cameron Estates Community Services District (CECSD) was formed on August 26, 1969 by authorization of the El Dorado County Board of Supervisors (Resolution #309-69). Initial boundaries of the District were designated as part of that Resolution and have been amended over time, most recently by the Local Agency Formation Commission (LAFCO) in 1989.

Originally formulated under the 1911-13 Land Improvement Assessment Bond Act the CECSD is now operated under State regulations designated as the Community Service District Law, Sections 61000 through 61936 of the Government Code of the State of California.

More specifically, the CECSD has authority pursuant to Government Code Section 61060(b) to adopt and enforce rules and regulations for the administration, operation, use and maintenance of the District's facilities, including its roads. And, under Government Code Sections 61100(l) and 61103(a) the District has the same authority as a county to acquire, construct, improve and maintain its roads.

Further authorities for the District to regulate access and to establish fees for the use of roadways in the district were contained in the 1984 California Attorney General Opinion # 83-1106. This opinion classified such special districts who maintain roadways to have the same jurisdictional control as if given to County Boards of Supervisors responsible for roadways under their jurisdictional control.

Finally, AB 3195 (Statutes of 1990) granted further specific authorities to the District to control access to the district with the stipulation that no Augmentation Funds were to be utilized for roadway maintenance.

Existing Road Network

The majority of the roads within the District were originally built between approximately 1959 and 1969 as unpaved, gravel roads which are now considered substandard.

Due to budgetary constraints, the roads have not been significantly improved over time, but rather have been minimally-upgraded, as necessary. Each road within the district has been improved at different times and potentially with different methods and materials, though in general the progression has been to chip seal gravel roads, and when financially-feasible to

place a course of hot mix asphalt over the chip sealed road. Records indicate that at least some of the asphalt overlays may have incorporated a nonwoven fabric, stress-absorbing interlayer that also helps create a moisture barrier, helping extend the life of the asphalt pavement.

No records exist that indicate any of the internal roads were constructed with any structural section typically found in modern construction of roads in suburban or urban areas. More specifically, written and anecdotal evidence, verified by field observation, indicates that the originally gravel roads were placed on native soil, and the subsequent chip seals and asphalt concrete overlays were placed on top of the native soil base, rather than over a constructed section of suitable sub-base and base materials.

These historic practices are common in rural residential areas with very low traffic volumes, infrequent heavy-duty vehicles, and a community desire for a balance between moderate travel speeds, low noise, and reasonable life cycle maintenance costs.

As maintenance funds have allowed, the surface treatment program has been maintained at a level solely intended to serve the limited, light duty traffic volume generated by the parcels within the existing boundaries of the District.

Previous Policies and Standards

Over the years the CECSD has endeavored to develop more-formal policies and standards for roadway maintenance and improvement. Previously, a number of policies and procedures have been developed where necessary for the CECSD to fulfill its duties and obligations.

- On February 15, 1990 the CECSD Board of Directors adopted an Informal Bidding Procedure (Ordinance #89-300). Projects under the total of \$25,000 may be awarded by negotiated contract or purchase order upon approval by a board majority. Projects of \$75,000, or less, may be let to contract by informal bidding procedures as designated in Sec. 22032 of the Public Contract Code, by majority board approval. In August 1990 the CECSD Board of Directors amended its Rules and Regulations to be consistent with changes to State Law.
- Over the years, the District has worked on several drafts of "RECOMMENDED ROAD REPAIR and PREVENTATIVE MAINTENANCE PRACTICES" which stated standards for upgrading the pavement section of roadways at the time of maintenance.

The fourth, and most-recent draft, of these standards (2005) states the following:

- After repairs ALL roads to be asphalt (interlayer) fabric (Petromat or equivalent) and double chip seal!
- Widen the curves from the centerline to the inside by two feet to reduce the amount of damage done to the edge of the road due to cutting the curve to the inside. Add two feet of road to the inside of curves to reduce the amount of damage done to the edge of the road due to cutting the curve to the inside. Example: a road that is typically 18' wide the curve

area would be 20' wide with striping 9' from the outside edge and 11' from the inside edge.

- Drainage ditches should be five feet or more (three foot minimum) from the edge of the road and one to one and a half feet deep.
- Shoulders should be two feet wide minimum using road base.
- Cul-de-sac; 16' wide for short run and few (four or less) residents, 18' wide for longer runs and with more (five or more) residents.
- Culverts are needed at driveways for drainage flow and to keep water from flowing onto roads

Since 2005 these standards were used as general guidance in developing plans and specifications for road maintenance projects, but were never formally adopted by the District.

The District desires to use its prior work on roadway standards to develop formal policies and standards for roadway maintenance and improvement that are appropriate for adoption by the District Board of Directors.

By adopting more formal standards the CECSD Board can best ensure long-term uniformity in the condition and capabilities of roads throughout its jurisdiction.

GOALS AND OBJECTIVES

The District's goal is to plan for and provide a road system that is cost-efficient to maintain, and ensures the safe, orderly, and efficient movement of people and goods within the Cameron Estates community.

The long-term objective is to improve existing roads to a standard based upon a flexible (asphalt) pavement structural section designed to handle the wide range of light and heavy-duty vehicles that are found on public roadways in California, and that have a longer design life than the current roads that were not designed or constructed with any purposeful base or sub-base material. Achieving this objective will likely reduce the life-cycle cost of future investments in roadway maintenance. However, achieving this objective will be determined by the funding available for road maintenance and improvement purposes.

A flexible pavement structure is typically composed of several layers of material with better quality materials on top where the intensity of stress from traffic loads is high and lower quality materials at the bottom where the stress intensity is low. Flexible pavements can be analyzed as a multilayer system under loading.

A typical flexible pavement structure consists of the surface course and underlying base and sub-base courses. Each of these layers contributes to structural support and drainage.

When hot mix asphalt (HMA) is used as the surface course, it is the stiffest (as measured by resilient modulus) and may contribute the most (depending upon thickness) to pavement strength. The underlying layers are less stiff but are still important to pavement strength as well as drainage and frost protection.

When only a seal coat is used as the surface course, the base generally is the layer that contributes most to the structural stiffness. A typical structural design results in a series of layers that gradually decrease in material quality with depth.

POLICIES

The following policies of the CECSO provide the framework for implementing the goals and objectives defined above.

Policy 1. The District shall improve and maintain roads consistent with a goal of achieving adopted standards over time, as funding and other considerations allow. Road design standards for District-maintained roads shall be based on the American Association of State Highway and Transportation Officials (AASHTO) standards, supplemented by District-adopted design standards.

District standards shall include typical cross sections and typical structural sections.

Policy 2. In all circumstances roads should be maintained to comply with applicable Fire Safe Regulations, as may be periodically amended, including, but not limited to the following existing requirements as of the date of the CECSO's original adoption.

- **Road width.** All roads shall be constructed to provide a minimum of two nine-foot traffic lanes providing two-way traffic flow.
- **Surfaces.** The surface shall provide unobstructed access to conventional drive vehicles, including sedans and fire engines. Surfaces should be established in conformance with CECSO requirements, and be capable of supporting a 40,000 pound load.
- **Grades.** The grade for all roads and streets shall not exceed 16 percent.
- **Roadway Radius.**
 - No roadway shall have a horizontal inside radius of curvature of less than 50 feet and additional surface width of 4 feet shall be added to curves of 50-100 feet radius; 2 feet to those from 100-200 feet.

- The length of vertical curves in roadways, exclusive of gutters, ditches, and drainage structures designed to hold or divert water, shall be not less than 100 feet.
- *Turnarounds.* Turnarounds are required on driveways and dead-end roads. The minimum turning radius for a turnaround shall be 40 feet from the center line of the road. If a hammerhead-T is used, the top of the “T” shall be a minimum of 60 feet in length.
- *Roadway Turnouts.* Turnouts shall be a minimum of 10 feet wide and 30 feet long with a minimum 25 foot taper on each end.

Policy 3. The District shall generally base expenditure of discretionary road funds on the following sequence of priorities.

- A. Maintenance, rehabilitation, reconstruction, and operation of the existing road system.
- B. Safety improvements where physical modifications or capital improvements would reduce the number and/or severity of accidents.
- C. Improvement of existing, non-conforming roads to current standards.
- D. Other improvements, as desired and as funding allows.

STANDARDS

Engineering standards, and related specifications, are formal documents that establish uniform designs, criteria, methods, and practices. Standards are established based upon science and study for the purpose of building facilities that maximize public safety, ensure durability and longevity, keep costs reasonable, and provide for uniformity to the benefit of designers, maintenance personnel, and users.

Without uniform design standards, jurisdictions are unable to provide adequate guidance for public facilities, particularly roadways, to be improved or constructed. If facilities are not constructed or maintained appropriately, significant liability and maintenance expenses can be expected, along with the potential for significant costs to correct the situation.

If facilities are not consistent there is potential for driver confusion.

The District-specific standards identified in this section are to be used in conjunction with applicable standards, specifications, and testing procedures established by the American Association of State Highway and Transportation Officials (AASHTO), and the applicable provisions are incorporated by reference. AASHTO is a standards-setting body which publishes specifications, test protocols and guidelines that are used in roadway design and construction throughout the United States.

More specifically, AASHTO’s publication, [A Policy on Geometric Design of Highways and Streets, 6th Edition, 2011](#), commonly referred to as the “Green Book,” contains the current design

research and practices for highway and street geometric design, and AASHTO summarizes the contents and recommended use of these standards as follows.

The document provides guidance to highway engineers and designers who strive to make unique design solutions that meet the needs of highway users while maintaining the integrity of the environment. It is also intended as a comprehensive reference manual to assist in administrative, planning, and educational efforts pertaining to design formulation.

Design guidelines are included for freeways, arterials, collectors, and local roads, in both urban and rural locations, paralleling the functional classification used in highway planning. The book, similarly, is also organized into the following functional chapters to stress the relationship between highway design and function: Highway Functions, Design Controls and Criteria, Elements of Design, Cross-Section Elements, Local Roads and Streets, Collector Roads and Streets, Rural and Urban Arterials, Freeways, Intersections, and Grade Separations and Interchanges.

The District-specific standards identified in this section are to be used in conjunction with the California Manual on Uniform Traffic Control Devices (MUTCD) 2012 Edition which provides uniform standards and specifications for all official traffic control devices in California, including signs and pavement markings.

In addition to the “Green Book” and the California MUTCD, the District Engineer may rely on other State and nationally-recognized transportation engineering standards, specifications, and special provisions as are needed to fulfill the CECSA’s obligations.

District-specific standards are as follows. Exhibits depicting these standards are included on the following pages.

- Standard Plan 2000 – Roadways with projected traffic volumes under 2,000 average daily trips.
- Standard Plan 2001 – Roadways with projected traffic volumes over 2,000 average daily trips.

USE AND APPLICATION

Use

These policies and standards are intended for the use of the Board of Directors and the District Engineer as follows.

- As the basis for improvements as conditions warrant.
- Guidance when considering future maintenance and operations projects, and the budgeting of funds for specific projects.



MARCH 19, 2014

RESIDENT BOARD OF DIRECTORS

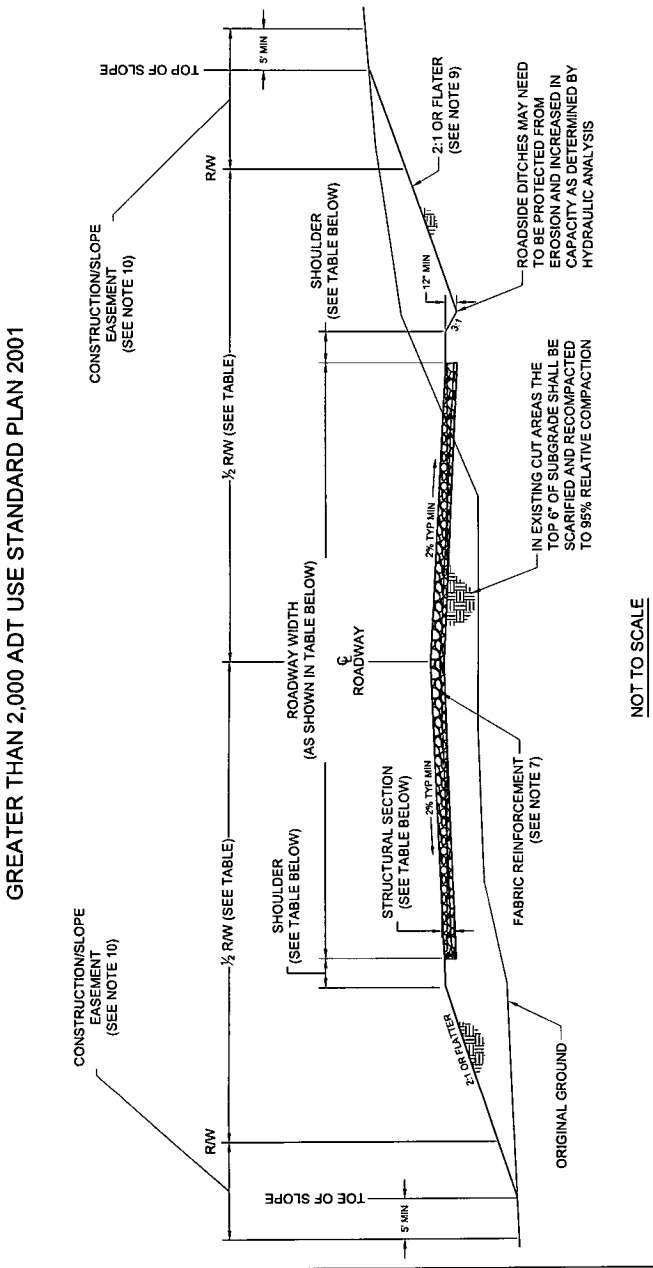
DESIGN STANDARDS
Cameron T. States Community Services District

ROADWAYS
UNDER 2,000 ADT

STANDARD PLAN 2000

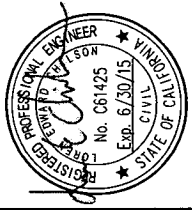
NOTES:

- ADT VALUES FOR DESIGN SHALL BE THE FORECASTED 20-YEAR HORIZON DAILY VOLUMES.
- ROADS WITH ADT LESS THAN 601 MAY EXCEED THE 12% MAXIMUM GRADE, UP TO A MAXIMUM OF 15% FOR MORE THAN 600 L.F. IF THEY ARE PAVED WITH A MINIMUM OF 2.5" AC ON 6" AB.
- WIDENING OF EXISTING ON-SITE ROADS SHALL COMPLY WITH MINIMUM STRUCTURAL SECTION REQUIRED AND HAVE AS GOOD OR BETTER SURFACING THAN EXISTING ROAD.
- ANY MODIFICATION TO STRUCTURAL SECTION SHOWN SHALL BE BASED ON "B" VALUE AND "1.1" DESIGN TO BE SUBMITTED TO DISTRICT ENGINEER FOR REVIEW AND APPROVAL.
- AC SHALL BE TYPE B.
- THE TOP 6" OF SUBGRADE AND ALL CLASS 2 AB SHALL BE COMPACTED TO 95% RELATIVE COMPACTION.
- FABRIC REINFORCEMENT IS REQUIRED ON ALL YIELDING SUBGRADES UNLESS AN ALTERNATIVE DESIGN IS PREPARED BY AN ENGINEER AND APPROVED BY THE DISTRICT ENGINEER.
- DOUBLE-CHIP SEAL MAY BE SUBSTITUTED FOR 2" OF AB FOR ROADS WITH ADT BELOW 601.
- CUT AND FILL SLOPES SHALL BE NO STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL, UNLESS A CIVIL ENGINEER DETERMINES THAT A STEEPER SLOPE WILL BE SAFE FOR THE INTENDED USE AND WILL NOT BE SUSCEPTIBLE TO EROSION. APPROVAL IS SUBJECT TO THE DISTRICT ENGINEER. SLOPES OVER 10 (TEN) HORIZONTAL TO 1 (ONE) VERTICAL ARE TO BE KEYED WHEN PLACING EMBANKMENT FILL.
- CONSTRUCTION/SLOPE EASEMENTS SHALL EXTEND 5' BEYOND HINGE POINTS, SLOPE TOES, AND DRAINAGE STRUCTURES.
- THIS STANDARD PLAN IS FOR NORMAL CONDITIONS. POOR SUBGRADE AND OTHER EXTENUATING CIRCUMSTANCES SHALL REQUIRE ADDITIONAL REVIEW, A SITE SPECIFIC STRUCTURAL SECTION DESIGN, OR OTHER CONDITIONS PRIOR TO CONSTRUCTION, AS DEEMED NECESSARY BY THE DISTRICT ENGINEER.



NOT TO SCALE

ADT	R/W	ROADWAY WIDTH	SHOULDER WIDTH	DESIGN SPEED	MAX GRADE	STRUCTURAL SECTION
1-150	50'	20'	1' (EACH SIDE)	20 MPH	15% PAVED 12% UNPAVED* (SEE NOTE 2)	6" CLASS 2 AB (SEE NOTE 8)
151-600	50'	20'	2' (EACH SIDE)	25 MPH	13%*	4" AC ON 7" AB 4" AC ON 8" AB
601-1500	60'	20'	5' (EACH SIDE)	25 MPH		
1501-2000	60'	22'	6' (EACH SIDE)	30 MPH		
* 15% WITH DISTRICT ENGINEER'S APPROVAL (NOT TO EXCEED 600 L.F.)						



MARCH 19, 2014
 PRESIDENT BOARD OF DIRECTORS

DESIGN STANDARDS

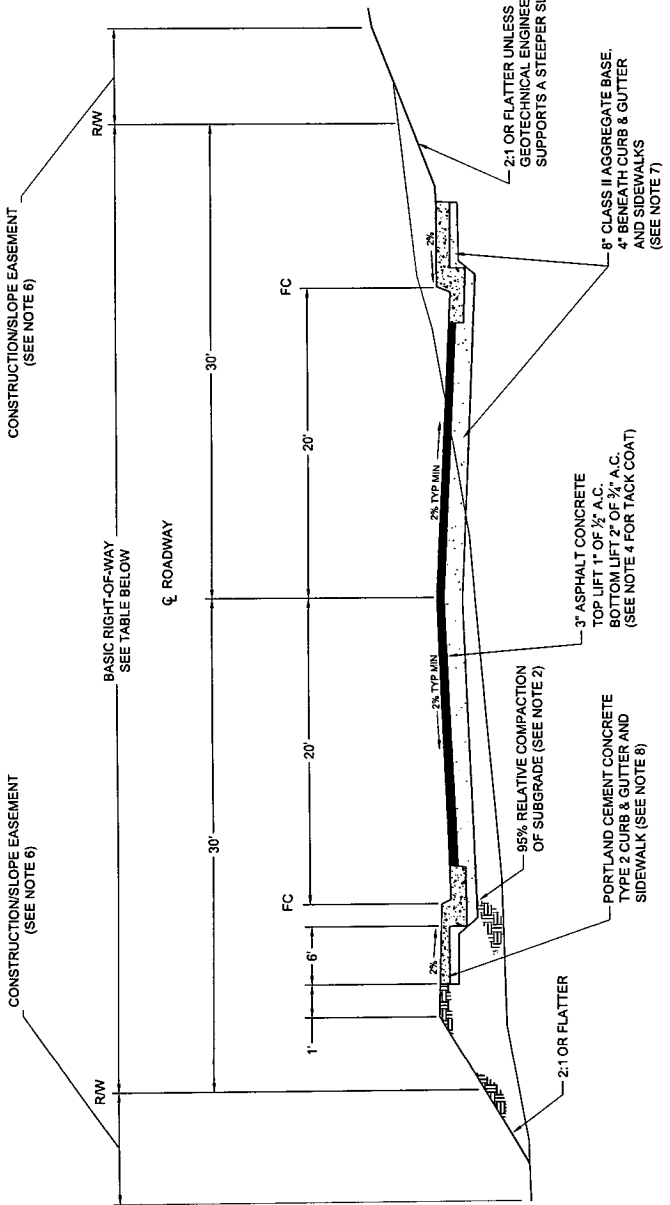
Cameron Estates Community Services District

ROADWAYS
 OVER 2,000 ADT

DRAWING
 STD. PLAN 2001

NOTES:

1. IN EXISTING CUT SECTIONS, SCARIFY AND RECOMPACT SUBGRADE TO 95% RELATIVE COMPACTION. KEY IN SLOPES OVER 10:1.
2. TOP 6" OF NATIVE SUBGRADE SHALL BE COMPACTED TO 95% RELATIVE COMPACTION (C.T.M. 231F OR ASTM 1557).
3. CLASS 2 AGGREGATE BASE SHALL BE COMPACTED TO 95% RELATIVE COMPACTION PER CALTRANS STANDARD SPECIFICATIONS, SECTION 26. (C.T.M. 231F OR ASTM 1557) INCLUDING THE 4" UNDER CURB & GUTTER AND SIDEWALKS.
4. OVER ALL AGGREGATE BASE, ASPHALT CONCRETE SHALL BE TYPE B PER CALTRANS STANDARD SPECIFICATION 39. AGGREGATE 1/2" MAX. MEDIUM TYPE B. ASPHALT GRADE AR-4000. FOR GRADES EXCEEDING 7% A.C. TO BE ONLY 3/4" MAX. MEDIUM. TACK COAT TO BE USED BETWEEN A.C. LIFTS.
5. FOG SEAL SS-1 OVER ALL ASPHALT CONCRETE. PRIME COAT TO BE SC76.
6. WHEN THE GRADING FOR CUT AND FILL SLOPES EXTENDS OUTSIDE OF THE BASIC RIGHT-OF-WAY WIDTH, SLOPE EASEMENT SHALL EXTEND 2' BEYOND HINGES, TOES, AND DRAINAGE STRUCTURES.
7. PAVEMENT, BASE, AND SUBGRADE COMPACTION THICKNESS MAY BE CHANGED IF DESIGNED BY A REGISTERED CIVIL OR GEOTECHNICAL ENGINEER. R-VALUE TEST RESULTS MUST BE SUBMITTED.
8. UPON SPECIAL APPROVAL, CURB, GUTTER, AND SIDEWALK MAY BE CHANGED TO A.C. DIKE AND OVERSIDE DRAINS WHEN CONNECTING ONTO EXISTING A.C. FACILITIES. *
9. ADT VALUES FOR DESIGN SHALL BE THE FORECASTED 20-YEAR HORIZON DAILY VOLUMES.
10. THIS STANDARD PLAN IS FOR NORMAL CONDITIONS. POOR SUBGRADE AND OTHER EXTENUATING CIRCUMSTANCES SHALL REQUIRE ADDITIONAL REVIEW, A SITE SPECIFIC STRUCTURAL SECTION DESIGN, OR OTHER CONDITIONS PRIOR TO CONSTRUCTION, AS DEEMED NECESSARY BY THE DISTRICT ENGINEER.



NOT TO SCALE

R/W	ROADWAY WIDTH (CURB FACE TO CURB FACE)	ADT	DESIGN SPEED	MAX. GRADE
60'	40'	2001 - 5000	35	12%

FOR ADTs OVER 5,000, CONSULT THE DISTRICT ENGINEER

- To determine appropriate specifications for maintenance projects.

Application

Engineering standards are not “one size fits all” and each circumstance warrants specific study and analysis to arrive at the appropriate design and/or maintenance program. Moreover, standards cannot be created for every situation.

The District Engineer will determine the most-appropriate application of these standards, including those incorporated by reference, to a specific circumstance and is expected to use engineering judgment.

The District Engineer will use their best professional judgment to consider and grant design exceptions and waivers, where determined to be appropriate.

The following issues are at the discretion of the District Engineer subject to the approval of the CECSD Board of Directors.

- Review and approval of site-specific roadway improvements, including roadway dimensions, encroachments, structural section, etc.
- Review and approval of site-specific pavement designs, including review and approval of geotechnical engineering reports used to determine the recommended structural section, and the suitability of native material to provide adequate sub-base.
- Review and approval of related hydraulic studies to determine the site-specific sizing and design of roadside ditches, culverts, etc., including the materials and surfaces to be used.
- Location, materials, and dimensions of new encroachments onto District roads.
 - Approval of site-specific applications of AASHTO standards, California Manual on Uniform Traffic Control Devices (MUTCD) 2012 Edition, and other standards as relate to horizontal and vertical curves, sight distance and all other engineering and design aspects of CECSD roadways, including related drainage facilities, lighting, signage, etc.

Supporting Studies

As needed, the District Engineer may require the preparation of geotechnical, hydraulic, traffic, and other engineering studies to support their review and approval of proposed roadway improvements.

Limitations

Approval of these standards creates no obligation on the CECSD, its Board, or property owners within the District.

The District will use these guidelines in accordance with these stated purposes, and these standards will be applied consistently, but specific to the conditions and circumstances related to each matter.

Nothing herein shall be construed to limit, restrict or prevent the District’s right to install and maintain gates that limit, to the residents of the CECSD, access to the roads of the CECSD

pursuant to Government Code Section 61105(f), or to install traffic calming measures approved by the Board.