

**California Board of Forestry and Fire Protection  
SRA Fire Safe Regulations  
Certification Matrix**



Without an accompanying letter from the Board of Forestry and Fire Protection, completion of this matrix does not indicate Board certification approval or denial of submitted local ordinances under 14 CCR § 1270.03. This matrix does not reflect the full text of the regulations and should be used as a guide only.

<i>Internal Use Only</i>			
Jurisdiction	Date Received	Board Meeting Date	Board Action
Napa County	June 17, 2016	August 23, 2016 November 2, 2016	

CCR Title 14 SRA Fire Safe Regulations	Local Ordinance	Meets or Exceeds
<b>Sec. 1270 Title</b> <i>Statement of the title of regulation</i>	N/A	
<b>Sec. 1270.01 Purpose</b> <i>Statement of the purpose of regulation</i>		
<b>Sec. 1270.02 Scope</b> <i>Statement of the scope of regulation</i>	Napa County Road and Street Standards (RSS) 2. Scope of Standards, page 2	Y
<b>Sec. 1270.03 Local Ordinances</b> <i>Board may certify local ordinances</i>	N/A	
<b>Sec. 1270.04 Provisions for Application of These Regulations</b> <i>How these regulations will be applied</i>	N/A	
<b>Sec. 1270.05 Inspection Authority</b> <i>Establishing responsibility for enforcement</i>	RSS 4. Definitions, page 6	Y
<b>Sec. 1270.06 Inspections</b> <i>Authorization to conduct inspections</i>	RSS 4. Definitions, page 6	Y
<b>Sec. 1270.07 Exceptions to Standards</b> <i>Exceptions will be made on a case-by-case basis where the exception provides for same practical effect. Exceptions granted shall be forwarded to the CAL FIRE Unit Headquarters.</i>	RSS 3. Exceptions to Standards, page 3	Y
<b>Sec. 1270.08 Requests for Exceptions</b> <i>Requests shall be made in writing, stating the section(s), material facts, the exception proposed, and a map.</i>	RSS 3. Exceptions to Standards, page 3	Y
<b>Sec. 1270.09 Appeals</b> <i>Applicants may appeal exception denials. The inspection authority shall be consulted. If an appeal is granted, findings must be made and forwarded to CAL FIRE Unit HQ.</i>	RSS 3. Exceptions to Standards, page 4	Y
<b>Sec. 1271.00 Definitions</b> <i>Definitions</i>	RSS 4. Definitions, page 4 Recommend clarifying driveway definitions	Y
<b>Sec. 1271.05 Distance Measurements</b> <i>Distance measurements are along the ground.</i>	Ordinance 17.34.010	Y
<b>Sec. 1272.00 Maintenance of Defensible Space</b>	Ordinance 8.36	Y

CCR Title 14 SRA Fire Safe Regulations	Local Ordinance	Meets or Exceeds
<b>Measures</b> <i>Defensible space maintenance plans shall be provided.</i>		
<b>Sec. 1273.00 Intent</b> <i>Unobstructed traffic circulation during a wildfire emergency and concurrent fire equipment and civilian movement.</i>	RSS 1. Objectives, page 1	Y
<b>Sec. 1273.01 Road Width</b> <i>Roads shall have a minimum of two 10-foot traffic lanes, not including shoulder and striping.</i>	RSS 15. Design Criteria, page 11	Y
<b>Sec. 1273.02 Roadway Surface</b> <i>Designed and maintained to support the imposed load of fire apparatus weighing at least 75,000 pounds; provide an all-weather aggregate base; project proponent shall provide engineering specifications to support design if requested.</i>	RSS 15. Design Criteria, pages 11-12  H20-44 is equivalent to 20-ton semi-trailer with two axles; 8,000lbs on first axle, 32,000lbs on second for 40,000 total  Revised by County to reflect 75,000lb requirement and reference fire apparatus road design requirements	Y
<b>Sec. 1273.03 Roadway Grades</b> <i>The grade of roads shall not exceed 16%.</i>	RSS 15. Design Criteria, page 12 Same practical effect mitigations for grades between 16 and 20%	Y
<b>Sec. 1273.04 Roadway Radius</b> <i>Horizontal inside turning radius minimum 50 feet; additional 4 foot with added to curves of 50 to 100 foot radius; additional 2 feet shall be added to curves from 100 to 200 feet. Vertical curves no less than 100 feet.</i>	RSS 15. Design Criteria, page 12	Y
<b>Sec. 1273.05 Roadway Turnarounds</b> <i>Required on driveways and dead-end roads. Minimum turning radius shall be 40 feet, not including parking. The top of the "T" in a hammerhead/T turnaround shall be 60 feet.</i>	RSS 15. Design Criteria, page 13 Detail C-12, C-13, C-14	Y

CCR Title 14 SRA Fire Safe Regulations	Local Ordinance	Meets or Exceeds
<p><b>Sec. 1273.06 Roadway Turnouts</b>  <i>Shall be a minimum of 12 feet wide, 30 feet long, and a 25 foot taper at both ends.</i></p>	<p>RSS 15. Design Criteria, page 13</p>	<p>Y</p>
<p><b>Sec. 1273.07 Roadway Structures</b>  <i>Designed to carry maximum load according to CVC; must have signage posting maximum weight and height; constructed and maintained according to AASHTO HB-17; one-way bridges must have unobstructed visibility and turnouts each end.</i></p>	<p>No reference to Vehicle Code § 35250 but 15 feet of clearance required overall</p>	<p>Y</p>
<p><b>Sec. 1273.08 One-Way Roads</b>  <i>All one way roads will have a minimum 12 foot traffic lane, not including shoulders. All one-way roads shall connect a two lane roadway at both ends. Maximum access to no more than 10 dwelling units. Maximum length 2,640 feet. Turnout constructed at approximately mid-point.</i></p>	<p>RSS 15. Design Criteria, page 14  Detail C-6</p>	<p>Y</p>
<p><b>Sec. 1273.09 Dead-End Roads</b>  <i>The length of dead-end roads is limited, based upon zoning.</i>  -800 feet for parcel zoned for less than one acre.  -1320 feet for parcel zoned one to five acres  -2640 feet for parcel zoned five acres to 20 acres  -5280 feet for parcel zoned larger than 20 acres</p>	<p>RSS 15. Design Criteria, page 14</p>	<p>Y</p>
<p><b>Sec. 1273.10 Driveways</b>  <i>All driveways will provide a minimum 10 foot width traffic lane with a minimum width of 14 feet unobstructed horizontal clearance and vertical clearance of 15 feet. Driveways greater than 150 feet but less than 800 feet shall provide a turnout near the midpoint; turnouts every 400 feet if driveway &gt;800 feet. A turnaround is required on all building sites with driveways over 300 feet in length, sited within 50 feet of building.</i></p>	<p>RSS 14. Street and Road Classifications, page 11  RSS 15. Design Criteria, page 14</p>	<p>Y</p>

CCR Title 14 SRA Fire Safe Regulations	Local Ordinance	Meets or Exceeds
<p><b>Sec. 1273.11 Gate Entrances</b>  <i>Gates shall be at least 2 feet wider than the width of the traffic lane. Minimum width of 14 feet unobstructed horizontal clearance and 15 feet vertical clearance. All gates shall be located 30 feet from the roadway shall provide unobstructed traffic access on the roadway. Security gates shall not be installed without approval. Where a one-way road provides access to a gated entrance, a 40 foot turning radius shall be used.</i></p>	<p>RSS Detail D-11 Gated Entrances, page 82  Clearance requirement added to Detail D-11</p>	<p>Y</p>
<p><b>Sec. 1274.00 Intent</b>  <i>Roadways and buildings are to be clearly identified.</i></p>		
<p><b>Sec. 1274.01 Size of Letters, Numbers and Symbols for Street and Road Signs</b>  <i>Size of letters and numbers on street signs to be minimum 4 inch height, 0.5 inch stroke, reflectorized and contrasting with background.</i></p>	<p>RSS 27. Specifications, Street Signs, page 56  Detail D-6, D-6A</p>	<p>Y</p>
<p><b>Sec. 1274.02 Visibility and Legibility of Street and Road Signs</b>  <i>Street signs to visible in both directions for a minimum distance of 100 feet.</i></p>	<p>RSS 27. Specifications, Street Signs, page 56  Detail D-6, D-6A</p>	<p>Y</p>
<p><b>Sec. 1274.03 Height of Street and Road Signs</b>  <i>Height of street signs to be uniform county wide.</i></p>	<p>RSS 27. Specifications, Street Signs, page 56  Detail D-6, D-6A</p>	<p>Y</p>
<p><b>Sec. 1274.04 Names and Numbers on Street and Road Signs</b>  <i>Streets to be identified in a consistent countywide system. Signs to be mounted in a uniform manner.</i></p>	<p>RSS 27. Specifications, Street Signs, page 56  Detail D-6, D-6A</p>	<p>Y</p>
<p><b>Sec. 1274.05 Intersecting Roads, Streets and Private Lanes</b>  <i>Street signs shall be at provided road intersections.</i></p>	<p>RSS 27. Specifications, Street Signs, page 56  Detail D-6, D-6A</p>	<p>Y</p>
<p><b>Sec. 1274.06 Signs Identifying Traffic Access Limitations</b>  <i>Shall be placed at the intersection preceding the limitation, no more than 100 feet before the</i></p>	<p>RSS 27. Specifications, Street Signs, page 56  Detail D-6, D-6A</p>	<p>Y</p>

CCR Title 14 SRA Fire Safe Regulations	Local Ordinance	Meets or Exceeds
<i>limitation</i>		
<p><b>Sec. 1274.07 Installation of Road, Street and Private Lane Signs</b>  <i>Street signs shall be installed prior to final acceptance by local jurisdiction for road improvements.</i></p>	<p>RSS 27. Specifications, Street Signs, page 56  Detail D-6, D-6A</p>	<p>Y</p>
<p><b>Sec. 1274.08 Addresses for Buildings</b>  <i>All buildings shall be addressed according to the jurisdiction's address system. Each dwelling unit shall be separately identified.</i></p>		
<p><b>Sec. 1274.09 Size of Letters, Numbers and Symbols for Addresses</b>  <i>Letter and numbers for addresses must be minimum 4 inch high, 0.5 inch stroke and contrasting background. Address shall be visible from street.</i></p>	<p>California Fire Code Section 505.1 Address Identification</p>	<p>Y</p>
<p><b>Sec. 1274.10 Installation, Location and Visibility of Addresses</b>  <i>All buildings must be clearly identified. Shall have a permanently posted address placed at each driveway entrance, visible from both directions of travel along road. Address shall be posted during construction and maintain thereafter. Address signs along one-way road shall be visible from both intended direction of travel and opposite direction. Multiple addresses on a single driveway shall be mounted on a single post. Addresses for single commercial business shall be placed at the nearest intersection providing access to the site.</i></p>	<p>RSS Standard Detail D-12 page 84</p>	<p>Y</p>
<p><b>Sec. 1275.00 Intent</b>  <i>Emergency water for wildfire protection shall be available, accessible, and maintained.</i></p>	<p>California Fire Code Section 507.1</p>	<p>Y</p>

CCR Title 14 SRA Fire Safe Regulations	Local Ordinance	Meets or Exceeds
<p><b>Sec. 1275.01 Application</b>  <i>Emergency water systems shall be installed and made serviceable prior to and during the time of construction except for alternatives approved by the authority having jurisdiction.</i></p>	<p>California Fire Code Section 507.1</p>	<p>Y</p>
<p><b>Sec. 1275.10 General Standards</b>  <i>System must meet or exceed NFPA 1142 and California Fire Code fire flow requirements. Water may be provided in a mobile water tender or other containment structure. Nothing prohibits the combined storage of emergency wildfire and structural firefighting water supplies unless prohibited by local ordinance. Freeze protection when required.</i></p>	<p>California Fire Code Section 507.1  Amendments to Fire Code 15.32.200, 210, 220, 230, 240; page 12 of supplemental ordinance</p>	<p>Y</p>
<p><b>Sec. 1275.15 Hydrant/Fire Valve</b>  <i>Hydrant shall be 18 inch above ground, 8 feet from vegetation, no closer than 4 feet nor farther than 12 feet from roadway, in a location where fire apparatus will not block the roadway.</i>  <i>Hydrant servicing an a building shall be not less than 50 feet nor more than ½ mile by road from building it serves and be located at a turnaround along the driveway or road that intersects the driveway.</i>  <i>Headed with a 2 ½ inch National Hose male thread with cap for pressure and gravity flow systems and 4 ½ inch draft system.</i>  <i>Hydrant shall have wet or dry barrel and shall have suitable crash protection required by local jurisdiction.</i></p>	<p>No relevant ordinance submitted  Language from the Fire Marshal standards updated and added to ordinances – page 57</p>	<p>Y</p>
<p><b>Sec. 1275.20 Signing of Water Sources</b>  <i>If located along a driveway: marked with a 3 inch reflectorized blue marker on the driveway address sign and mounted on a fire retardant post.</i>  <i>If located on a street or road: 3 inch marker shall be</i></p>	<p>California Fire Code Section 509.1 requires fire protection equipment to be identified but does not provide standards  language from the state regulations added to ordinances – page 58</p>	<p>Y</p>

CCR Title 14 SRA Fire Safe Regulations	Local Ordinance	Meets or Exceeds
<p><i>mounted on a fire retardant post within 3 feet of hydrant, no less than 3 feet nor greater than 5 feet above the ground</i></p> <p><i>Or specified in the OSFM's Guidelines for Fire Hydrant Markings Along State Highways and Freeways, May 1988.</i></p>		
<p><b>Sec. 1276.00 Intent</b></p> <p><i>Reduce the intensity of wildfire through fuel modification for safe emergency operations and civilian evacuation and to establish a point of attack or defense from a wildfire.</i></p>		
<p><b>Sec. 1276.01 Setback for Structure Defensible Space</b></p> <p><i>Parceled one acre or larger provide a minimum 30 foot setback.</i></p> <p><i>Parcels less than one acre, local jurisdiction shall provide same practical effect.</i></p>	<p>Fire Marshal defensible space policy – implementing CFC 4907.1 and CFC 104.1</p>	<p>Y</p>
<p><b>Sec. 1276.02 Disposal of Flammable Vegetation and Fuels</b></p> <p><i>Disposal of flammable vegetation and fuel modification to be done prior to final building inspection.</i></p>	<p>County added language to page 57 for clarity</p>	<p>Y</p>
<p><b>Sec. 1276.03 Greenbelts</b></p> <p><i>Subdivisions and other developments, which propose greenbelts as part of their plan, shall locate the greenbelts strategically. The locations shall be approved by the local authority having jurisdiction and may be consistent with the CAL FIRE Unit Fire Management Plan or Contract County Fire Plan.</i></p>	<p>Definition for greenbelts in RSS 4. Definitions, page 6</p> <p>County added language; general language in definition of “greenbelts” on page 6 about their location consistency w plans, etc, would be appropriate.</p>	<p>Y</p>



A Tradition of Stewardship  
A Commitment to Service

**NAPA COUNTY  
OFFICE OF COUNTY COUNSEL**

1195 Third Street, Suite 301  
Napa, CA 94559

Main: (707) 253-4521  
Fax: (707) 259-8220

Deputies

Silva Darbinian  
Laura Anderson  
Robert C. Martin  
Chris R. Y. Apallas  
Susan B. Altman  
Thomas S. Capriola  
Tivonna D. Stern  
Dylan Roy  
Jason Dooley  
John Myers

**Minh C. Tran**  
County Counsel

**Jennifer Yasumoto**  
Chief Deputy County Counsel

**Jeffrey M. Richard**  
Chief Deputy County Counsel

October 14, 2016

Board of Forestry and Fire Protection

Re: Fire Safe Regulation 1276.01 Setback for Structure Defensible Space

Members of the Board:

In working with the Napa County Fire Chief and Fire Marshal, we would like to propose a solution to address the Board of Forestry's concerns regarding building setbacks within the SRA lands of Napa County. Napa County does have a series of setback ordinances, many of which exceed the 30 foot setback requirement. There are times, however, where the ordinances do not exceed the 30 foot setback requirement.

As the Board is aware, Napa County has adopted the California Fire Code into its local ordinances. Fire Code Section 104.1 directs:

The fire code official is hereby authorized to enforce the provisions of this code and shall have the authority to render interpretations of this code, and to adopt policies, procedures, rules and regulations in order to clarify the application of its provisions. Such interpretations, policies, procedures, rules and regulations shall be in compliance with the intent and purpose of this code and shall not have the effect of waiving requirements specifically provided for in this code. (California Fire Code (2013), Section 104.1, emphasis added)

Section 4907.1 of the California Fire Code provides that "[d]efensible space will be maintained around all buildings and structures in the State Responsibility Area (SRA) as required in Public Resources Code 4290 and "SRA Fire Safe Regulations..."

Attached to this letter is a document authored by the Napa County Fire Marshal (the fire code official for the County). This is the Fire Marshal's official policy as it relates to setbacks in the SRA. The Fire Marshal and the Marshal's deputies are intimately involved in the approval process for new construction in Napa County. This policy closely follows the intent and language of Section 1276.01 and the Fire Marshal's official policy is that if there are setbacks that do not

meet the 30 foot requirement, the Fire Marshal will require other design features such as exterior fire sprinklers, two hour fire walls, and a combination of other mitigation design elements, prior to final approval of the permits for construction is given.

As already noted, Napa County has a weed abatement ordinance (Section 8.36 et seq.) which exceeds the State's abatement statutes in that the clearance zone is concretely 100 feet as opposed to 30 feet of full clearance and the remaining 70 feet moderately cleared. The local ordinance also has an enforcement provision where Napa County will abate the hazards if a property owner does not comply. Further, Napa County's ordinance extends from one property owner's parcel onto any adjoining property in order to ensure a uniform 100 foot clearance of fire hazards around all buildings.

We appreciate the opportunity to work cooperatively with the Board of Forestry and remain committed to assisting the Board in mitigating fire risks throughout Napa County. We believe that the policies of the Fire Marshal and our local ordinances provide the same overall practical effect as required by Section 1276.01.

Respectfully,

/s/

Dylan Roy  
Deputy County Counsel  
Napa County

**From:** Roy, Dylan <Dylan.Roy@countyofnapa.org>  
**Sent:** Thursday, October 06, 2016 7:43 AM  
**To:** Hannigan, Edith@BOF  
**Subject:** Napa County

Edith here is what the policy is. This is up on the website now. The only issue is the document has some corrections in other sections and our County wants those corrected before we send it to the BOF. None of these corrections change anything in the policy below (they are things like being consistent about whether it is a Knox Box or Knox Cabinet).

Let me know if this suffices and you have all you need for the 11/1 meeting, please. If anything is urgent – please call or text me at 909-816-2923 because I am at a conference and it is not always easy to check email.

## **I. DEFENSIBLE SPACE**

Defensible space is a perimeter that provides a buffer to stop or slow the spread of an encroaching wildland fire or prevent a structure fire from escaping into the adjacent wildland. Defensible space is an area of reduced and/or modified fuel that will not readily transmit or carry fire and will provide firefighters with a safe working environment that allows them to protect buildings and structures from encroaching wildfires and minimizes the chance that a structure fire will escape to the surrounding wildland.

Public Resource Code 4291, the California Fire Code and the Napa County Fire Hazard Abatement Ordinance require 100 feet of defensible around all structures and also require 10 feet of defensible space on each side of roads and driveways. The Napa County Defensible Space Guidelines were developed to provide a guideline of fuel modification to ensure compliance with the state and local requirements for defensible space. The guidelines can be found online at the Napa County Fire Marshal's Office webpage. <http://countyofnapa.org/firedepartment/>

For new construction in the SRA, California Fire Code Section 4907 and the SRA Fire Safe Regulations (Title 14, Division 1.5, chapter 7, Subchapter 2, Section 1270) require:

- (a) All parcels 1 acre and larger shall provide a minimum 30 foot setback for buildings and accessory buildings from all property lines and/or the center of the road.
- (b) For parcels less than 1 acre, the local jurisdiction shall provide for the same practical effect.

Whenever the setback, as defined above, is less than 30 feet, the design professional is responsible for detailing how the building design will provide the same overall practical effect. The Fire Marshal or the Fire Marshal's designees will review the proposed design. Examples of methods that may be considered as providing the same overall practical effect are: increasing fire wall rating, designing fire exterior sprinklers and setback easements on adjacent parcels.

Structures built in fire hazard severity zones are required to comply with the ignition resistant construction requirements of the California Building Code, Part 2 Volume 1, Chapter 7A. Chapter 7A of the building code is enforced by the Napa County Building Department.

CONFIDENTIALITY NOTICE: This email message is intended only for the use of the individual or entity to which it is addressed, and may contain information that is privileged, confidential, and/or exempt from disclosure under applicable law. If you are not the intended recipient of the message, please contact the sender immediately and delete this message and any attachments. Thank you.

## RESOLUTION NO. 2016-131

### RESOLUTION OF THE NAPA COUNTY BOARD OF SUPERVISORS, STATE OF CALIFORNIA, AMENDING THE NAPA COUNTY ROAD AND STREET STANDARDS IN ORDER TO SEEK CERTIFICATION BY THE CALIFORNIA BOARD OF FORESTRY AND FIRE PREVENTION

**WHEREAS**, the County wishes to have the State Board certify the amended Road and Street Standards and all local ordinances related to the Fire Safe Regulations (“Regulations”) to ensure they are consistent with the Regulations and thereby maintain local control over the inspection and exception process connected with the enforcement of the Regulations and Road and Street Standards and the other requirements of the Regulations within those portions of unincorporated Napa County that are within the State Responsibility Area as defined in Public Resources Code section 4126-4127, and the California Code of Regulations, Title 14, Division 1.5, Chapter 7, Subchapter 2, Article 1 through Article 5; and

**WHEREAS**, Section 4290 of the Public Resources Code requires the Board of Forestry and Fire Protection (“State Board”) to adopt regulations implementing minimum fire standards related to defensible space which are applicable to State Responsibility Area lands; and

**WHEREAS**, the State Board regularly adopts amendments to the Regulations, including most recently amendments that went into effect on January 1, 2016; and

**WHEREAS**, the criteria for the design of road and street improvements in Napa County are set forth in the booklet on file with the Clerk of the Board of Supervisors, entitled “Adopted Road and Street Standards, Napa County (dated April 27, 1971 and as amended through January 26, 2016)”, hereinafter referred to as the “Road and Street Standards”; and

**WHEREAS**, pursuant to Napa County Code Sections 17.02.470 and 17.36.010(B) the Road and Street Standards may be amended from time to time by resolution of the Board of Supervisors; and

**WHEREAS**, the Road and Street Standards have been revised nine times since their adoption on April 27, 1971 and were last revised on January 26, 2016, by Resolution No. 2016-06; and

**WHEREAS**, the Road and Street Standards were tentatively amended on June 7, 2016 at a duly noticed public hearing, where the Board of Supervisors considered the proposed revised Road and Street Standards and considered all verbal and written public comment; and

**WHEREAS**, the California Board of Forestry and Fire Protection required minor additions to the tentative Road and Street Standards at a public hearing on August 23, 2016; and

**WHEREAS**, pursuant to Napa County Code Sections 8.36 et seq. Napa County has enacted ordinances that regulate Fire Protection – Weed and Rubbish Abatement that are equal to or more strict than the requirements of the Regulations; and

**WHEREAS**, pursuant to Napa County Code Sections 15.32 et seq. Napa County has enacted a Fire Code that is equal to or more strict than the requirements of the Regulations; and

WHEREAS, the Fire Marshal has promulgated interpretative policy to provide the same overall practical effect as the setback requirements set by the Fire Safe Regulations; and

WHEREAS, the Department of Planning, Building and Environmental Services and the County Fire Department request that the Board amend and supersede Resolution No. 2016-72, adopted on June 7, 2016; and

WHEREAS, the Department of Planning, Building and Environmental Services and the County Fire Department have prepared a draft version to update the Road and Street Standards to provide local rules and standards that are equal to or exceed the Regulations adopted by the State Board and recommends that the Napa County Road and Street Standards be revised to incorporate the changes as reflected in the updated draft version of the Road and Street Standards attached as Exhibit "A" and incorporated here by reference; and

**NOW, THEREFORE, BE IT RESOLVED** that the Board hereby resolves as follows:

1. The Board hereby finds that the revised proposed Road and Street Standards attached as Exhibit "A" are exempt from the California Environmental Quality Act ("CEQA") under the General Rule because it can be seen with certainty that there is no possibility the proposed action may have a significant effect on the environment and therefore CEQA is not applicable. [See Guidelines For the Implementation of the California Environmental Quality Act, 14 CCR 15061(b)(3).]

2. The Board hereby adopts the tentative Road and Street Standards attached as Exhibit "A" and incorporated here by reference.

3. The Board hereby directs staff to transmit the above referenced ordinances and the tentative Road and Street Standards to the State Board for certification.

4. The Board hereby directs staff to submit the Road and Street Standards for final adoption, upon certification by the State Board.

5. The Board hereby finds that Resolution No. 2016-72 is amended and superseded.

///  
///  
///

**THE FOREGOING RESOLUTION WAS DULY AND REGULARLY ADOPTED** by the Napa County Board of Supervisors, State of California, at a regular meeting of the Board held on the 4<sup>th</sup> day of October, 2016, by the following vote:

AYES: SUPERVISORS WAGENKNECHT, CALDWELL, DILLON,  
LUCE and PEDROZA

NOES: SUPERVISORS NONE

ABSENT: SUPERVISORS NONE

NAPA COUNTY, a political subdivision of  
the State of California

By: \_\_\_\_\_  
ALFREDO PEDROZA, Chairman of the  
Board of Supervisors

<p>APPROVED AS TO FORM Office of County Counsel</p> <p>By: <u>Dylan Roy (e-sign)</u> Deputy County Counsel</p> <p>Date: <u>September 28, 2016</u></p>	<p>APPROVED BY THE NAPA COUNTY BOARD OF SUPERVISORS</p> <p>Date: October 4, 2016 Processed By: _____ Deputy Clerk of the Board</p>	<p>ATTEST: GLADYS I. COIL Clerk of the Board of Supervisors</p> <p>By: _____</p>
---	--	--

2016

Adopted April 27, 1991

Revised May 10, 1977

Revised August 18, 1987

Revised June 5, 1990  
{Ordinance 854}

Revised August 2, 1999  
{Ordinance 1160}

Revised August 31, 2004  
{Resolution 04-150}

Revised November 21, 2006  
{Resolution 06-198}

Revised August 9, 2011  
{Resolution 2011-95}

Revised January 26, 2016  
{Resolution 2016-06}

Revised June 7, 2016  
{Resolution 2016-72}

Revised September 13, 2016

{Resolution 2016-XXX}



Formatted: Indent: First line: 0"

Formatted: Font color: Auto

A Tradition of Stewardship  
A Commitment to Service

# NAPA COUNTY ROAD & STREET STANDARDS

Department of Planning, Building & Environmental Services \* 1195 Third  
Street \* 2nd Floor \* Napa, California 94559

Phone: (707) 253-4417 \* Fax: (707) 299-4138 \* [www.countyofnapa.org](http://www.countyofnapa.org)

## Table of Contents

SECTION.....	PAGE NO.
<u>1. OBJECTIVES.....</u>	<u>1</u>
<u>2. SCOPE OF STANDARDS.....</u>	<u>2</u>
<u>3. EXCEPTIONS TO STANDARDS.....</u>	<u>3</u>
<u>4. DEFINITIONS.....</u>	<u>4</u>
<u>5. LOCAL RESPONSIBILITY AREA (LRA) EXCEPTION.....</u>	<u>8</u>
<u>6. [RESERVED.].....</u>	<u>8</u>
<u>7. [RESERVED.].....</u>	<u>8</u>
<u>8. PRIVATE ROAD DEVELOPMENTS.....</u>	<u>8</u>
<u>9. PARKING REQUIREMENTS.....</u>	<u>8</u>
<u>10. PEDESTRIAN, BICYCLE AND/OR BUS FACILITIES.....</u>	<u>9</u>
<u>11. CURB, GUTTER AND SIDEWALK.....</u>	<u>9</u>
<u>12. RESIDENTIAL DRIVEWAYS.....</u>	<u>9</u>
<u>13. COMMERCIAL, INDUSTRIAL AND NON-RESIDENTIAL DRIVEWAYS.....</u>	<u>10</u>
<u>14. STREET AND ROAD CLASSIFICATIONS.....</u>	<u>10</u>
<u>Major Roads.....</u>	<u>10</u>
<u>Minor Roads.....</u>	<u>11</u>
<u>Other Roads.....</u>	<u>11</u>
<u>15. DESIGN CRITERIA.....</u>	<u>12</u>
<u>Design Criteria Chart.....</u>	<u>17</u>
<u>16. INDUSTRIAL AND COMMERCIAL DEVELOPMENT.....</u>	<u>18</u>
<u>17. TRAFFIC CONTROL DEVICES.....</u>	<u>18</u>
<u>Left Turn Lane Warrant Graph.....</u>	<u>20</u>
<u>18. TYPICAL CROSS SECTIONS.....</u>	<u>21</u>
<u>C-1 Arterial Cross Sections.....</u>	<u>22</u>
<u>C-2 Arterial Cross Sections Without Parking.....</u>	<u>22</u>
<u>C-3 Collector Cross Sections.....</u>	<u>23</u>
<u>C-4 General Minor Cross Sections.....</u>	<u>25</u>
<u>C-5 Non-Continuing Minor, Loop Road and Cul-De-Sac.....</u>	<u>26</u>
<u>C-6 One Way Loop Cross Sections.....</u>	<u>26</u>
<u>C-7 Common Drive Cross Sections.....</u>	<u>27</u>
<u>C-8 Industrial Collector Standards.....</u>	<u>28</u>

Formatted: Font: Palatino Linotype

C-9 Industrial Minor.....	29	Formatted: Font: Palatino Linotype
C-10 Residential Driveway or Agricultural Special Purpose Road.....	30	Formatted: Font: Palatino Linotype
C-11 Standard Driveway Turn Out.....	32	Formatted: Font: Palatino Linotype
C-13 Standard Hammerhead Turnaround.....	34	Formatted: Font: Palatino Linotype
C-14 Residential Driveway Shunt Turnaround.....	34	Formatted: Font: Palatino Linotype
19. DETERMINATION OF TRAFFIC VOLUMES.....	36	
20. DETERMINATION OF STRUCTURAL SECTION.....	36	
Traffic Index Chart.....	37	Formatted: Font: Palatino Linotype
Structural Section Thickness Chart.....	37	Formatted: Font: Palatino Linotype
21. GRADING REQUIREMENTS AND SOILS INVESTIGATIONS (FOR ROADS).....	39	
22. DRAINAGE REQUIREMENTS.....	39	
Design Discharge For Small Basins.....	42	Formatted: Font: Palatino Linotype
Watershed Types and Factors.....	42	Formatted: Font: Palatino Linotype
Precipitation Chart – Lower County.....	45	Formatted: Font: Palatino Linotype
Precipitation Chart – Upper County.....	46	Formatted: Font: Palatino Linotype
Mean Annual Precipitation vs. 60 Minute Rainfall.....	47	Formatted: Font: Palatino Linotype
Intensity – Duration Chart.....	48	Formatted: Font: Palatino Linotype
Critical Slopes and Capacities of Round Pipes Table.....	48	Formatted: Font: Palatino Linotype
Nomograph Chart.....	50	Formatted: Font: Palatino Linotype
Unlined Channel Velocity.....	50	Formatted: Font: Palatino Linotype
23. PLANNED UNIT DEVELOPMENT AND OTHER TYPES.....	52	
24. ASSESSMENT DISTRICTS.....	52	
25. PARCEL MAP IMPROVEMENTS - RESIDENTIAL DEVELOPMENT.....	53	
26. PARCEL MAP IMPROVEMENTS - COMMERCIAL AND INDUSTRIAL DEVELOPMENT.....	54	
27. SPECIFICATIONS.....	54	
Road and Streets.....	54	Formatted: Font: Palatino Linotype
Utilities.....	55	Formatted: Font: Palatino Linotype
Drainage.....	56	Formatted: Font: Palatino Linotype
Street Signs.....	56	Formatted: Font: Palatino Linotype
Monuments.....	56	Formatted: Font: Palatino Linotype
General.....	57	Formatted: Font: Palatino Linotype
Hydrant/Fire Valve.....	57	Formatted: Font: Palatino Linotype
Signing of Water Sources.....	58	Formatted: Font: Palatino Linotype
Permits.....	58	Formatted: Font: Palatino Linotype





Precipitation Chart – Lower County .....	45	Formatted: Default Paragraph Font
Precipitation Chart – Upper County .....	46	Formatted: Default Paragraph Font
Mean Annual Precipitation vs. 60 Minute Rainfall .....	47	Formatted: Default Paragraph Font
Intensity – Duration Chart .....	48	Formatted: Default Paragraph Font
Critical Slopes and Capacities of Round Pipes Table .....	48	Formatted: Default Paragraph Font
Nomograph Chart .....	50	Formatted: Default Paragraph Font
Unlined Channel Velocity .....	50	Formatted: Default Paragraph Font
23. PLANNED UNIT DEVELOPMENT AND OTHER TYPES .....	52	Formatted
24. ASSESSMENT DISTRICTS .....	52	Formatted
25. PARCEL MAP IMPROVEMENTS – RESIDENTIAL DEVELOPMENT .....	53	Formatted
26. PARCEL MAP IMPROVEMENTS – COMMERCIAL AND INDUSTRIAL DEVELOPMENT .....	54	Formatted
27. SPECIFICATIONS .....	54	Formatted
Road and Streets .....	54	Formatted: Default Paragraph Font
Utilities .....	55	Formatted: Default Paragraph Font
Drainage .....	56	Formatted: Default Paragraph Font
Street Signs .....	56	Formatted: Default Paragraph Font
Monuments .....	56	Formatted: Default Paragraph Font
General .....	57	Formatted: Default Paragraph Font
Permits .....	57	Formatted: Default Paragraph Font
STANDARD DETAILS .....	58	Formatted: Default Paragraph Font, Font: Calibri, Check spelling and grammar
P 1 On Lot Parking Detail .....	59	Formatted
P 2 Driveway Connection to Arterial Roads – Rural Roads .....	60	Formatted
P 3 Residential Driveway and Adjoining Sidewalk .....	60	Formatted
P 4 Commercial and Industrial Driveway and Adjoining Sidewalk .....	62	Formatted
P 5 Standard Vertical Curb and Gutter .....	63	Formatted
P 6 Mountable Curb .....	64	Formatted
P 7 P.C.C. Cross Gutter .....	65	Formatted
P 8 Standard Asphalt Dike .....	66	Formatted
P 9 Typical Dike Installation .....	67	Formatted
P 10 Trench Backfill Typical Section .....	68	Formatted
P 11 Drainage Outlet .....	69	Formatted
D 1 Storm Drain Inlet Type “A” .....	70	Formatted
D 2 Storm Drain Inlet Type “B” .....	71	Formatted
D 3 Storm Drain Inlet Type “C” .....	72	Formatted
D 4 Standard Barricade .....	73	Formatted
D 5 Driveway Setback .....	74	Formatted
D 6 Standard Street Sign .....	75	Formatted

D-6a Standard Street Signs, Type 'A' and Type 'B' ..... 76  
Subdivision Street Monuments Accuracy ..... 77  
D-7 Survey Monument ..... 78  
D-8 Off Street Parking ..... 79  
D-9 Handicap Symbol ..... 80  
D-10 Wheel Chair Ramp ..... 81  
D-11 Gated Entrance ..... 82

- Formatted: Default Paragraph Font, Font: Calibri, Check spelling and grammar
- Formatted: Default Paragraph Font, Font: Calibri, Check spelling and grammar
- Formatted: Default Paragraph Font

## 1. OBJECTIVES

The following material was originally prepared through the cooperation of the Road Standards Advisory Committee of 1970. Since then, updates have been incorporated to reflect changes in accepted health and safety practices and to comply with changes in County Ordinances and State and Federal Law. These Road and Street Standards ("Standards") attempt to meet the related interests of several other agencies, including the Resource Conservation District, California Board of Forestry and Fire Protection (CBOF), CAL FIRE, Napa County Fire Department, the Federal Emergency Management Agency, the Napa County Planning, Building and Environmental Services (PBES) Department, and the California Department of Fish and Wildlife. The objectives of these Standards are summarized below:

- (a) To provide reasonable Standards that relates to terrain and parcel size.
- (b) To preserve the natural landscape and desirable aesthetic features while balancing the needs of property owners.
- (c) To encourage the location of roads to minimize disturbance or impacts on wetlands, critical native plant communities, or other environmentally sensitive areas.
- (d) To minimize diversion and concentration of storm runoff, including selection of appropriate discharge locations, outlet dispersion appurtenances and selection of practices that maximize soil infiltration.
- (e) To encourage use of native grasses and other native plant materials for erosion control and habitat enhancement.
- (f) To minimize alteration of streams and ephemeral drainage at discharge outfalls, utilizing "bio-technical" stream stabilization techniques and preservation of natural stream morphological conditions.
- (g) To identify "impacted" runoff basins where special design considerations may be necessary to minimize downstream flooding and other impacts to neighboring properties.
- (h) To provide adequate safety and service.
- (i) To provide low maintenance cost road facilities.
- (j) To produce Standards compatible with city requirements within areas of influence.

The Standards were developed and revised over the years in an effort to meet all of the objectives noted above while striving to maintain the preservation of the health, safety, and welfare of the public. The 2016 revisions are intended to provide clarification and flexibility in order to ensure conformance with local, State and Federal regulations while also incorporating appropriate general engineering and construction practices and accommodation of unique project elements.

Users of the Standards are encouraged to become familiar with all of the codes, rules, regulations, and guidance documents available. These include, for example, the State Responsibility Area Fire Safe Regulations (SRA Fire Safe Regulations)<sup>1</sup>; the Conservation

---

<sup>1</sup> The SRA Fire Safe Regulations are set forth at Title 14, the Natural Resources Division of the California Code of Regulations, Division 1.5, Chapter 7 Fire Protection, Subchapter 2 SRA Fire Safe Regulations.

Regulations; Floodplain Ordinance; Grading Ordinance; Policies, Practices and County Code Sections Administered by the Environmental Health Division of the PBES Department; County Fire Code; Policies and Procedures of the California Department of Fish and Wildlife (DFW); the State Water Resources Control Board's Construction General Permit; the BASMAA Post-Construction Manual; and the Napa Countywide Stormwater Pollution Prevention Program Erosion and Sediment Control Plan Guidance manual. Roadway design guidance can be found in "A Policy on Geometric Design of Highways and Streets" generated by the American Association of State Highway and Transportation Officials ("AASHTO"), and the Caltrans "Highway Design Manual" and "Standard Specifications." Where these Standards refer to the Caltrans Specifications or the Caltrans Standard Specifications, the reference shall mean the current edition of the Caltrans Standard Specifications.

## **2. SCOPE OF STANDARDS**

These Standards are not applicable retroactively to existing roads, streets and driveways or facilities. These Standards shall apply to all construction within the unincorporated portions of Napa County beginning on the date they are adopted by the Board of Supervisors. Activities which will trigger application are included, but not limited to:

- (a) Application for a building permit for new construction (as defined on Page 6), not relating to an existing structure,
- (b) Application for a building permit for any work, addition to, remodel, repair, renovation, or alteration of any building(s) or structure(s) that results in:
  - i. fifty percent increase or more of square footage, and
  - ii. the increase is greater than 1,500 square feet;
  - iii. The application of (i) and (ii) will be evaluated as construction accumulated on the same structure within a 36 month time period,
- (c) Applications for a use permit,
- (d) Road construction, including construction of a road that does not currently exist, or extension of an existing road,
- (e) New subdivisions created by Parcel Map or Final Map,
- (f) Conditional certificates of compliance.

In the event a structure is destroyed by a disaster the reconstruction of the existing structure may not be considered new construction and may find relief from these Standards provided the following two conditions are met:

- (a) The replacement structure's livable space will not be greater than 125 percent of the original structure's livable space (based on square footage), and
- (b) Napa County staff determines the driveway was not a contributing factor in delaying or prohibiting emergency responders from accessing the original structure or for safe evacuation during the disaster.

If both provisions above cannot be met, then the reconstruction of the existing structure shall be considered new construction and subject to these Standards accordingly.

### **3. EXCEPTIONS TO STANDARDS**

(a) A property owner or leaseholder of a site seeking an exception to an applicable provision of the Standards shall make a written request to the Director of PBES for review and concurrence by the County Engineer and Fire Marshal. The request shall state the specific section(s) for which an exception is requested, material facts supporting the contention of the developer, the details of the exception or mitigating measures proposed, a map showing the proposed location and siting of the exception or mitigation measures, and shall be accompanied by that fee established by resolution of the Board of Supervisors.

(b) An application for an exception from these Standards submitted in connection with a building permit clearance for a single family residence shall be decided by the Zoning Administrator after the appropriate environmental review has been completed by the PBES Department. An application for an exception from these Standards submitted in connection with a use permit, variance, subdivision map or other discretionary permit shall be heard and decided by the Planning Commission or other approving body at the same time as the use permit, zoning variance, subdivision map or other discretionary permit.

(c) An exception to these Standards, when properly submitted, reviewed, and approved by the Zoning Administrator, Planning Commission or other approving body, is intended to serve as an alternate method by which adherence to these Standards may be achieved at the same time as the County assures compliance with its goal to protect and ensure the preservation of the unique features of the natural environment. It is also intended to ensure compliance with the SRA Fire Safe Regulations and procedures set forth therein.

(d) An exception to these Standards may be allowed as provided if one or more of the following findings can be made and the findings in subsection (e) can also be made:

- i. The exception will preserve unique features of the natural environment which includes, but is not limited to, natural water courses, steep slopes, geological features, heritage oak trees, or other trees of least six feet in diameter at breast height and found by the decision-maker to be of significant importance, but does not include human altered environmental features such as vineyards and ornamental or decorative landscaping, or artificial features such as, rock walls, fences or the like;
- ii. The exception is necessary to accommodate physical site limitations such as grade differentials; and/or
- iii. The exception is necessary to accommodate other limiting factors such as recorded historical sites or legal constraints.

Exceptions are only allowed “where the exceptions provide the same overall practical effect as ‘the SRA Fire Safe Regulations’ towards providing defensible space.” Exceptions shall be made

on a case-by-case basis only. Exceptions granted by the County shall be forwarded to the Sonoma-Lake-Napa Unit of CAL FIRE.<sup>2</sup>

(e) The Zoning Administrator, Planning Commission, or other approving body shall not grant an exception unless it finds that grant of the exception, as conditioned by the Zoning Administrator, the Planning Commission, or other approving body provides the same overall practical effect as these Standards towards providing defensible space, and consideration towards life, safety and public welfare. Monetary hardship alone shall not be considered as a basis for an exception.

(f) The Fire Department shall recommend to the Zoning Administrator, the Planning Commission or other approving body that certain conditions (as determined necessary by the Fire Department) be imposed on the project to achieve the same overall practical effect as these Standards towards providing defensible space, consideration of life, safety and public welfare and not compromising civilian egress or Fire Department access. Such conditions may include, but are not limited to, installation of built in fire protection systems, limited marketing events or visitors to the site, and improved defensible space for structures and roads.

(g) Notwithstanding the above, a request for an exception to these Standards for a public road or public drainage facility (i.e., catch basins, storm drain lines, bio-retention areas, etc.) shall be decided by the Director of Public Works and determined on a case-by-case basis.

(h) The grant or denial of an exception shall be considered part of the decision of the underlying permit and appeals shall be processed in the same manner as provided by the Napa County Code for appeals of the underlying permit.

#### **4. DEFINITIONS**

'AB'	Aggregate Base – a gravel mixture meeting material and compaction requirements as defined in Section 26 of the Caltrans Standard Specs.
'Accessory building'	Any building used as an accessory to residential, commercial, recreational, industrial, or educational purposes as defined in the California Building Code, 1989 Amendments, Chapter 11, Group M, Division 1 Occupancy that requires a building permit.
'Building'	Any structure used or intended for supporting or sheltering any use of occupancy that is defined in the California Building Code, 1989 Amendments, Chapter 11, except Group M, Division 1, Occupancy. Building includes mobile homes and manufactured homes, churches, and day care facilities.

---

<sup>2</sup> 14 CCR 1270.07 and 1270.09.

‘CAL FIRE’	The Sonoma-Lake-Napa Unit of CAL FIRE.
‘Caltrans’	The State of California, Department of Transportation.
‘Caltrans Standard Specs’	State of California, Department of Transportation, Standard Specifications in latest edition.
‘County Engineer’	The PBES Engineering Manager or designee.
‘Defensible space’	The area within the perimeter of a parcel, development, neighborhood or community where basic wildland fire protection practices and measures are implemented, providing the key point of defense from an approaching wildfire or defense against encroaching wildfires or escaping structure fires. The perimeter as used in this regulation is the area encompassing the parcel or parcels proposed for construction and/or development, excluding the physical structure itself. The area is characterized by the establishment and maintenance of emergency vehicle access, emergency water reserves, street names and building identification, and fuel modification measures.
‘Developer’	The owner of land on which activities are proposed which are subject to the application of these Standards, as listed in Section 2 (Scope of Standards) above, or designated representative of the landowner.
<u>‘Distance Measurements’</u>	<u>All specified or referenced distances are measured along the ground, unless otherwise measured.</u>
‘Drivable shoulder’	The area adjoining the travel lane that is designed to support <del>H20-</del> <u>apparatus weighing 44,750 pounds loading</u> , which shall be a minimum of five inches of aggregate base material and can be used on a regular basis to support daily traffic. <u>For guidance refer to Section 1411.7 of Chapter 7, Division 2, Title 21 of the California Code of Regulations for axle weight distribution.</u>
‘Drivable swale’	A shallow sloped drainage way that runs parallel to the travel lane of a driveway and is surfaced with non-erodible material designed to support <del>H20-44 loading criteria</del> <u>apparatus weighing 75,000 pounds</u> at all times even during periods of saturation. <u>For guidance refer to Section 1411.7 of Chapter 7, Division 2, Title 21 of the California Code of Regulations for axle weight distribution.</u>

‘Driveway’	A privately owned and maintained access road connecting a parcel to a public or private roadway.
‘Dwelling unit’	Any building or portion thereof which contains living facilities, including provisions for sleeping, eating, cooking and/or sanitation for not more than one family.
‘Engineer’	The agent of the developer with the responsibility for the preparation of construction plans for the activities which are subject to the application of these Standards, as listed in Section 2 (Scope of Standards) above.
‘Exception’	An alternative to the specified standard requested by the developer that may be necessary due to health, safety, environmental conditions, physical site limitations or other limiting conditions such as recorded historical sites that mitigates the problem.
‘Fire Marshal’	The Napa County Fire Department Fire Marshal or designee.
‘Fuel modification area’	An area where the volume of combustible vegetation has been reduced, providing reduced fire intensity and duration.
‘Greenbelts’	A facility or land-use, designed for a use other than fire protection, which will slow or resist the spread of a wildfire. Includes parking lots, irrigated or landscaped areas, golf courses, parks, playgrounds, maintained vineyards, orchards or annual crops that do not cure in the field. <a href="#">Subdivision and other developments, which propose greenbelts as a part of the development plan, shall locate said greenbelts strategically, as a separation between wildland fuels and structures. The locations shall be approved by the local authority having jurisdiction and may be consistent with the CAL FIRE Unit Fire Management Plan or Contract County Fire Plan.</a>
‘HMA’	Hot Mix Asphalt (HMA) meeting material and compaction requirements as defined in Section 39 of the Caltrans Standard Specs.
‘Inspection Authority’	The CBOF has certified the several Napa County Ordinances that expressly incorporate these Standards into the Napa County Code (14 CCR Sections 1270.1 and 1270.3). In accordance with 14 CCR Section 1270.05, Napa County has been delegated Inspection Authority for ensuring compliance with the SRA Fire Safe

Regulations.<sup>3</sup> For the purposes of Napa County's implementation of this authority and compliance with the Standards, "Inspection Authority" shall be vested with the Napa County Fire Chief who with their authority has delegated the Inspection Authority to the Napa County Fire Marshal.

'Inter-visible Turnout'	Turnouts where the driver of a vehicle within a turnout can visibly identify a vehicle in the other turnout and vice versa.
'New Construction'	Construction of a new structure. Further, any work, addition to, remodel, repair, renovation, or alteration of any existing building(s) or existing structure(s) that results in: (a) 50 percent increase or more of square footage, and (b) the increase is greater than 1,500 square feet.  Application of (a) and (b) will be evaluated as new construction accumulated on the same structure within a 36 month time period.
'Paved'	A road surface meeting either the minimum structural section of 2 inches HMA over 5 inches Class 2 AB or as designed and approved by the County Engineer with both meeting Caltrans Standard Specs for material type and compaction.
'PBES'	Planning, Building and Environmental Services Department.
'Roadway'	Any surface designed, improved or ordinarily used for vehicle travel that is either publicly owned and maintained, or privately owned and maintained, but dedicated for public use.
'Same Practical Effect'	Means an exception or alternative with the capability of applying accepted wildland fire suppression strategies and tactics, and provisions for fire fighter safety, including, but not limited to: (a) access for emergency wildland fire equipment, (b) safe civilian evacuation, (c) signing that avoids delays in emergency equipment response, (d) available and accessible water to effectively attack wildfire or defend a structure from wildfire, and (e) fuel modification sufficient for civilian and fire fighter safety.

---

<sup>3</sup> A copy of the aforementioned letter from CAL FIRE delegating Inspection Authority in accordance with 14 CCR 1270.05 is attached to these Standards as Appendix "A".

‘Shoulder’	The surfaced or unsurfaced portion of the roadway contiguous with the travel lane for accommodating emergency use, for lateral support of base and surface courses, and capable of carrying vehicle loads.
‘Travel Lane’	The surfaced portion of the travel way that is designed to carry the daily traffic volume.
‘Travel Way’	The combination of travel lane and drivable shoulder that shall constitute the full width area a vehicle can safely traverse.
‘Wildfire’	As defined in Public Resources Code Section 4103 and 4104.
‘Zoning Administrator’	The Napa County Director of Planning, Building and Environmental Services has been appointed by the Napa County Board of Supervisors to serve as the Napa County Zoning Administrator in accordance with the Napa County Code and Government Code Sections 65900, et seq.

**5. LOCAL RESPONSIBILITY AREA (LRA) EXCEPTION**

Improvements to an existing driveway are not required for the construction of new second dwelling units located in the LRA. For new second dwellings that require new access driveways, the new access driveways shall be constructed to the residential driveway standard from the point of access to the new second dwelling unit.

**6. [RESERVED.]**

**7. [RESERVED.]**

**8. PRIVATE ROAD DEVELOPMENTS**

Private road developments may be allowed upon specific approval of the County, and are subject to the same improvement requirements as public road requirements. However, the roads will not be maintained by the County. In order to secure access rights for the public, developers are generally required to offer to dedicate roadways but the County will not accept maintenance responsibility for the roads that are to remain private.

**9. PARKING REQUIREMENTS**

(a) Full street parking, consisting of two parallel parking lanes, as required per County Engineer.

(b) Parking for all other developments shall consist of at least two street spaces per lot or four spaces on the lot (see Detail P-1) in addition to the garage and/or carport. Further, an equivalent combination on lot parking and street spaces will be permissible. An example of such is two spaces on the lot and one space on the street. Street parking may be provided by "bays," parallel street parking on one side only, or an acceptable alternate as long as the distance from the parking bay to the lot served does not exceed 150 feet. Set back requirements will be shown on a document to be recorded concurrently with the final subdivision map or parcel map. All streets without on-street parking provisions shall be posted with "No Parking" signs or other suitable regulatory devices.

#### **10. PEDESTRIAN, BICYCLE AND/OR BUS FACILITIES**

(a) Fully improved Portland<sup>4</sup> cement concrete sidewalks will be provided on both sides of all roads as required by County Engineer in accordance with the typical cross sections.

(b) An improved walkway will be provided on both sides of urban arterial and collector roads as required by County Engineer.

(c) Where development is located on an existing bus route, the Napa Valley Transportation Authority shall be consulted for recommended improvements based on the Transit Improvement Standards Handbook.

Additional pedestrian and/or bicycle facilities may be required if there is a potential for concentrated pedestrian and/or bicycle traffic in the opinion of the County Engineer.

#### **11. CURB, GUTTER AND SIDEWALK**

Vertical curb and gutter with required sidewalk improvements may be used if all driveway locations are predetermined and constructed at the time of the subdivision development.

If driveway locations are not provided with the road construction, mountable curb per Standard Detail P-6 will be used and any required sidewalks will be located with one side contiguous with the right of way line. Mountable curb will not be used on steep grades where it would be a hazard to the public, as determined by the County Engineer.

#### **12. RESIDENTIAL DRIVEWAYS**

As part of the construction requiring a building permit for new construction the property owner shall meet the common drive and/or residential driveway provisions (as defined in these Standards) applicable to the proposed improvement and site specific conditions, from the publicly maintained road to the new or improved structure. Refer to Section 15 for specific

---

<sup>4</sup> At the discretion of the County Engineer, types of cement that provide the same overall practical effect as Portland cement concrete may be utilized.

design criteria. Group “R” shall apply as defined in Section 310 of the California Building Code, and as defined in Section 1.1.3.1.1 of the California Residential Code.

**13. COMMERCIAL, INDUSTRIAL AND NON-RESIDENTIAL DRIVEWAYS**

As part of a new commercial, industrial, and non-residential (excluding Group U as defined by the California Building Code) use or improvements to an existing commercial, industrial or non-residential building requiring a building permit, the developer shall provide a minimum 20 foot wide driveway from the publicly maintained road to the improved structure. See Detail C-7, Common Drive, for cross-section information. See Details D-5 and P-4 for urban driveways and Detail P-2 for rural driveways. As an alternative to meeting the common drive requirement the developer may provide a one-way loop road in accordance with these Standards and as approved by the County Engineer and Fire Marshal.

**14. STREET AND ROAD CLASSIFICATIONS**

The following list of street and road types is intended to be representative of typical subdivision development and does not include all roads and streets that will be encountered. Geometric requirements relative to highways, expressways, major roads, access roads, roads with access on one side only, and others are not specifically included in these Standards; requirements for such facilities will be determined on a case-by-case basis. Regarding the requirements relative to roads serving commercial and industrial areas see the appropriate subsequent sections. All roads are required to be paved with the exception of agricultural special purpose roads and residential driveways which shall be surfaced per Detail C-10. Upon request and approval by the County Engineer and Fire Marshal on a case by case basis, a common drive may meet the surfacing requirements as outlined in Detail C-10. Pavement structural sections shall be determined by the designed traffic index. The minimum structural section shall be two inches of HMA over five inches of Class 2 AB in accordance with Section 27 of these Standards.

**MAJOR ROADS**

<u>Street or Road</u>	<u>Definition</u>
(a) Arterial	Connects collectors to highways, and other major arterials; functions primarily to carry traffic, estimated traffic volume 5,000 vehicles per day or more. May be two or more lanes, with or without median strips, and may have controlled access.
(b) Collector	Generally collects traffic from lesser roads and also serves as access to adjacent land. Estimated traffic volume 1,000 to 5,000 vehicles per day.

#### MINOR ROADS

- (c) General Minor Serves primarily as access to adjacent land, carries up to 1,000 vehicles per day.
- (d) Loop Road and Non-Continuing Minor Serves abutting property; carries up to 250 vehicles per day.
- (e) Cul-de-Sac Serves as an access road to abutting property; traffic volume up to 250 vehicles per day. (Cul-de-sac situations with lengths greater than 1,000 feet shall be provided with turnaround areas at 1,000 foot intervals and emergency access unless it is not considered feasible by the County Engineer.)
- (f) One Way Loop Roads Special purpose roads depending on site circumstances; maximum length one-half mile; traffic volume up to 150 vehicles per day.
- (g) Common Drive Serves as residential access for two to six parcels based on ultimate development and as access for commercial, industrial and non-residential uses. Developments that have a legal and practical potential for re-division into more than six parcels will not qualify for use of common drives.
- (h) Residential Driveway Serves as the minimum access to one residential parcel meeting PBES development standards, and any number of accessory buildings.

#### OTHER ROADS

- (i) Agricultural Special Purpose Road Serves agricultural related single use facilities and light traffic facilities which generate up to 100 vehicle trips per day. This road is not applicable to any winery access. Applies to lightly traveled, low speed roads connecting two activity areas with no significant side traffic. Turnouts must be inter-visible.
- (j) Split level Split level means a roadway where each direction of travel has a different vertical alignment. Split level construction is permissible in all of the above defined categories if the design is satisfactory to the County Engineer.
- (k) Special Purpose Way This applies to secondary access roads, emergency roads, bicycle paths, equestrian trails and other similar facilities

when required by either the Fire Marshal, County Engineer or County Code. The design will depend on each particular situation and be approved by the County Engineer. Acceptable provisions for maintenance must be established and dedication may be required.

## **15. DESIGN CRITERIA**

Tabulated herein are the design criteria applicable to each of the street and road classifications in Section 14, (a) through (i) in terms of minimum design speed, minimum horizontal radius, minimum stopping sight distance, and maximum slopes. The radii shown are based on a negative cross slope of two percent which is typical for a newly-constructed street or road. If the street or road is super elevated, the radius can be reduced accordingly. All streets and roads shall have a minimum longitudinal slope of 0.5 percent.

Roadway Width: All streets and roads, with the exception of agricultural special purpose roads and residential driveways, shall be constructed to provide a minimum of two 10-foot traffic lanes and a minimum of one foot of shoulder on each side of the roadway providing two-way traffic flow. A common drive shall provide a minimum of two 10-foot traffic lanes and provide a horizontal clearance of 22 feet.

Roadway Surface: The surface shall provide unobstructed access to conventional drive vehicles. Road surfaces and structures shall be capable of supporting ~~loads equivalent to the H20-44 apparatus weighing 75,000 pounds. criterion.~~ [For guidance refer to Section 1411.7 of Chapter 7, Division 2, Title 21 of the California Code of Regulations for axle weight distribution.](#) No traffic calming devices shall be installed on any private roadway surface unless approved by Fire Marshal.

Roadway Grade: The grade for all roads, streets, private lanes and driveways shall not exceed 16 percent. Roadway grades of 16 to 20 percent may be allowed on a case-by-case basis provided the following:

- (a) The length of road, street, private lane or driveway that exceeds a roadway grade of 16 percent but has a roadway grade equal to or less than 18 percent shall be surfaced with a minimum of 2 inches of HMA over 5 inches of Class 2 AB.
- (b) The length of road, street, private lane or driveway that exceeds a roadway grade of 18 percent but has a roadway grade equal to or less than 20 percent shall be surfaced with a minimum of 3 inches of HMA over 5 inches of Class 2 AB or approved equal designed by a licensed engineer, shall not have a length greater than 300 feet, and shall have a roadway grade not exceeding 10 percent for 100 feet immediately preceding and ensuing the section of road with the roadway grade of 18 to 20 percent.
- (c) The Inspection Authority retains the discretion to deny applications that meet the above Standards if there are other concerns that lead to the determination that these mitigations do not have the same overall practical effect of a 16 percent grade.

(d) Provided subsections (a) and (b) above are met to the satisfaction of the Inspection Authority, and that the Inspection Authority has not denied the application per subsection (c), the proposed design shall be construed as meeting the same overall practical effect as meeting this standard and shall be considered an approved road exception.

Road 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 to 100 feet radius; 2 feet to those from 100 to 200 feet. A road horizontal inside radius of curvature less than 50 feet may be approved for residential driveways (excluding driveways serving commercial, industrial, or non-residential uses) provided the following:

(a) The horizontal curve is designed and modeled by a licensed professional engineer demonstrating that a fire apparatus (fire apparatus to be determined by the Fire Marshal) can negotiate the proposed horizontal inside radius, and

(b) Clearance of 3 feet shall be provided on the far front bumper radius and provide 2 feet of additional clearance for the inside rear wheel radius.

(c) The Inspection Authority retains the discretion to deny applications that meet the above Standards if there are other concerns that lead to the determination that these mitigations do not have the same overall practical effect as intended.

(d) Provided subsections (a) and (b) above are met to the satisfaction of the Inspection Authority, and that the Inspection Authority has not denied the application per subsection (c), the proposed design shall be construed as meeting the same overall practical effect as meeting this standard and shall be considered an approved road exception.

Vertical Curves: The length of vertical curves in roadways, exclusive of gutters, ditches, and drainage structures designed to hold or divert water shall not be less than 100 feet. A vertical curve less than 100 feet in length may be approved provided the following:

(a) The vertical curve is designed by a licensed professional engineer demonstrating that a fully loaded fire apparatus (fire apparatus to be determined by the Fire Marshal) can negotiate the sag and crown with a minimum clearance of 4 inches.

(b) The Inspection Authority retains the discretion to deny applications that meet the above Standards if there are other concerns that lead to the determination that these mitigations do not have the same overall practical effect as intended.

(c) Provided subsection (a) above is met to the satisfaction of the Inspection Authority, and that the Inspection Authority has not denied the application per subsection (b), the proposed design shall be construed as meeting the same overall practical effect as meeting this standard and shall be considered an approved road exception.

Roadway 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 (Detail C-12). If a hammerhead is used, the top of the hammerhead shall be a minimum of 60 feet in length (Detail C-13). An alternative to the hammerhead turnaround is the shunt turnaround (Detail C-14). A turnaround other than those listed above can be designed and proposed for review to the County Engineer and Fire Marshal for possible acceptance of use.

Roadway Turnouts: Turnouts shall be a minimum of 22 feet wide and 30 feet long with a minimum 25 foot taper on each end. See Detail C-11.

Roadway Structures:

(a) All driveway, road, and private lane roadway structures shall be constructed to carry at least the maximum load as required by Vehicle Code Sections 35550 and 35750, and provide the minimum vertical clearance of 15 feet;

(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) Where a bridge or an elevated surface is part of a fire apparatus access road, the bridge shall be constructed and maintained in accordance with the American Association of State and Highway Transportation Officials Standard Specifications for Highway Bridges, 17th Edition, published 2002 (known as AASHTO HB-17) hereby incorporated by reference. Bridges and elevated surfaces shall be designed for a live load sufficient to carry the imposed loads of fire apparatus. Vehicle load limits shall be posted at both entrances to bridges when required by Napa County. Where elevated surfaces designed for emergency vehicle use are adjacent to surfaces which are not designed for such use, barriers, or signs, or both, as approved by Napa County, shall be installed and maintained. A bridge with only one traffic lane may be authorized by Napa County; however, the bridge shall have unobstructed visibility from one end to the other and turnouts at both ends.

One-Way Roads: All one-way roads shall be constructed with a minimum of one 12-foot travel lane, and have a minimum of 14-feet of horizontal clearance. Shoulder requirements shall apply per Detail C-6. All one-way roads shall connect to a two-lane roadway at both ends, and shall provide access to an area zoned for no more than 10 dwelling units. In no case shall a one-way road exceed 2,640 feet in length. A turnout shall be placed and constructed at approximately the midpoint of each one-way road.

Dead-End Roads:

(a) The maximum length of a dead-end road, or system of roads which are served by a single point of vehicular ingress/egress, shall not exceed the following cumulative lengths, regardless of the number of parcels served:

Parcels zoned for less than one acre	800 feet
Parcels zoned for 1 acre to 4.99 acres	1,320 feet
Parcels zoned for 5 acres to 19.99 acres	2,640 feet
Parcels zoned for 20 acres or larger	5,280 feet

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

(b) Where parcels are zoned 5 acres or larger, turnarounds shall be provided at a maximum of 1,320 foot intervals.

(c) Each dead-end road shall have a turnaround constructed at its terminus.

Special Purpose Roads: All special purpose roads shall have a minimum 10 foot travel lane, an unobstructed vertical clearance of 15 feet, and an unobstructed horizontal clearance of 14 feet along their entire length. Special purpose roads exceeding 150 feet in length, but less than 800 feet in length, shall have a standard turnout near the midpoint of the driveway. Where the special purpose road exceeds 800 feet, standard turnouts shall be provided no more than 400 feet apart. A turnaround shall be provided at all building sites as required by the County Engineer and Fire Marshal on special purpose roads exceeding 300 feet in length, and shall be within 50 feet of the building.

Residential Driveways: New residential driveways shall be constructed to provide 14 feet of travel way and unobstructed vertical clearance of 15 feet along its entire length. The travel way shall, at a minimum, consist of a 10 foot wide all weather surfaced travel lane with 4 feet of drivable shoulder (see Detail C-10). The drivable shoulder may be placed on both sides of the travel lane with the total shoulder width summing to 4 feet. For new residential driveways between 150 and 800 feet in length, a standard inter-visible turnout shall be provided near the midpoint of the driveway as approved by the County Engineer. Where new residential driveways exceed 800 feet in length, standard inter-visible turnouts shall be provided no more than 400 feet apart (see Detail C-11).

There are two types of Residential Driveways defined below:

Rural Area – A residential driveway connected to a rural County road per Detail P-2.

Urban Area – A residential driveway connected to a County road with curb, gutter and sidewalk improvements, and has a driveway approach per Detail P-3.

For structure improvements, as defined in Section 12 of these Standards, that are served by an existing common drive and/or residential driveway that does not meet current common drive and/or residential driveway Standards, respectively, the existing common drive and/or residential driveway shall be improved with turnouts only, spaced as shown in Table 15.1. Residential projects that fully comply with the turnout spacing requirements listed in Table 15.1 for existing residential driveways and residential common driveways shall be construed as meeting the same overall practical effect as meeting these Standards for residential driveway and residential common driveway width. The determination of compliance with the turnout spacing in Table 15.1 shall be made by the Fire Marshal and the County Engineer.

A turnaround shall be provided at all building sites on residential driveways and common drives exceeding 300 feet in length, and shall be within 50 feet of the building (see Details C-12, C-13 or C-14).

Table 15.1

## Turnout Spacing on Existing Residential Driveways

Level of Improvement	Number of Residential Units Served by Existing Driveway					
	6+	5	4	3	2	1
<i>Improvement increases enclosed Group R area by 50% or more.</i>	300 ft	300 ft	300 ft	400 ft	400 ft	400 ft
<i>2<sup>nd</sup> Dwelling Unit</i>	300 ft	300 ft	300 ft	300 ft	400 ft	400 ft
<i>Primary Residence</i>	250 ft	250 ft	250 ft	300 ft	300 ft	400 ft
<i>Primary Residence with a 2<sup>nd</sup> Dwelling Unit</i>	200 ft	200 ft	200 ft	250 ft	250 ft	400 ft

While turnouts spaced at the above noted distances would be ideal, the Fire Marshal and the County Engineer will work with the developer to space turnouts per site conditions. The standard number of turnouts required shall be determined by dividing the total length of the driveway by the applicable spacing in the above table and rounding up to a whole number. The number of turnouts may be reduced through an Exception to the Standards, as defined in Section 3. The intent of requiring turnouts noted above is to improve an otherwise non-compliant residential driveway or common drive to the maximum extent practicable through individual development with the goal of achieving a driveway that is compliant with the Standards for its entire length.

## DESIGN CRITERIA CHART

Street	Min. Design Speed (mph)	Min. Centerline Radius (ft)	Min. Stopping Sight Distance (ft)	Max. Grade ( percent)
Arterial	40	825	275	8
Collector	35	585	225	10
General Minor	20	220	150	16
Loop Road and Non Continuous Minor	20	120	110	16
Cul-de-Sac	20	120	110	16
One Way Loop road	20	120	110	16 <sup>5</sup>
Common Drives	15	50 <sup>6</sup>	75	16
Residential Driveway	15	50 <sup>6</sup>	75	16
Agricultural Special Purpose Road	Level 30 mph	400	400	16
	Rolling 20 mph	120	250	16
	Mountain 10 mph	50 <sup>6</sup>	100	16

<sup>5</sup> When the sight distance falls below 220 feet for One Way Loop, the minimum paved width shall not be less than 18 feet.

<sup>6</sup> Minimum horizontal inside radius

## **16. INDUSTRIAL AND COMMERCIAL DEVELOPMENT**

Industrial references in these Standards are applicable to all appropriately zoned lands.

Road cross sections for existing County roads and State highways which have full improvement widths different from these Standards shall be improved to provide additional pavement width and thickness plus additional right of way, all as determined by the County Engineer.

Structural pavement sections shall be based upon a minimum traffic index of 6.0 and appropriate "R" value.

Bus turnouts and related sidewalks may be required as a condition of development.

Where on-street parking is allowed, a sidewalk shall be provided on the same side of the street as the parking lane. The sidewalk shall be Portland cement concrete. Where no sidewalk is required, an unpaved, clear walkway shall be provided.

Consistent with the Board policy of accepting into the road system only those roads improved to County Standards, any new roads or drainage improvements proposed under a parcel map or final map to be accepted for maintenance by the County or by a County Service Area shall first be improved to full improvement in accordance with the Standards.

In any land divisions where road and drainage improvements are proposed to be privately maintained, the developer shall furnish covenants calling for maintenance of such improvements. Covenants shall run with the land and be recorded with the final map or parcel map.

## **17. TRAFFIC CONTROL DEVICES**

The California Manual on Uniform Traffic Control Devices, the Caltrans Standard Specs and the Caltrans Highway Design manual shall be utilized to determine traffic warrants, design and construction procedures for all traffic control devices with the exception of left-turn lanes. Warrants for construction of a left-turn lane on County maintained roads as defined in Sections 18.112.040 through 18.112.080 of the County Code shall be as follows:

Left-Turn Lane Warrants: Use Permits or modifications thereof shall trigger the application of the following warrants to determine the necessity for a left-turn lane for the proposed use.

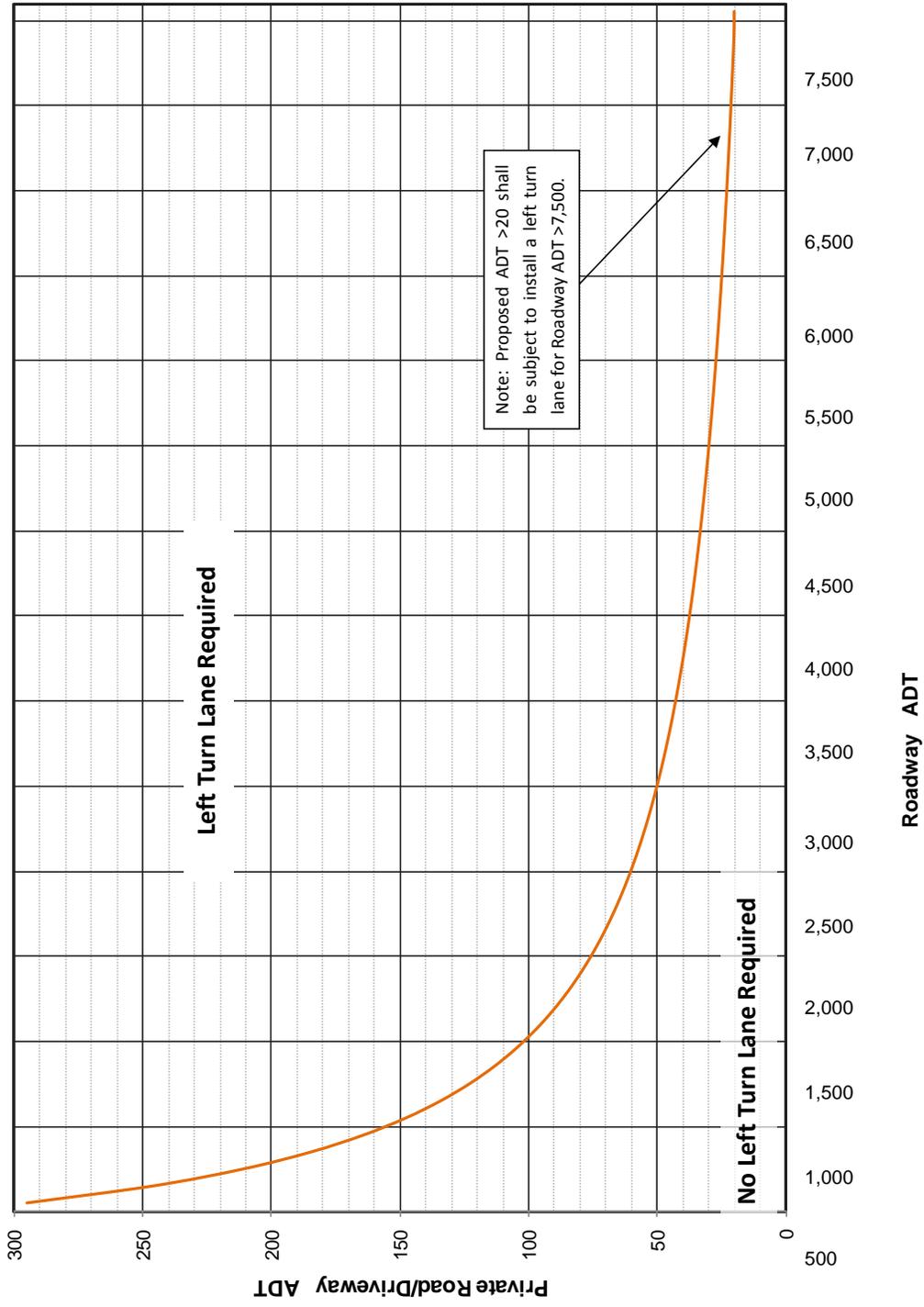
(a) Application of the following Left-Turn Lane Warrant Graph based on road average daily trips (ADT) and the projected ADT of the proposed use. The chart is a representation of probable conflict between turning traffic and advancing traffic. Private Road or Driveway ADT is the total average daily traffic utilizing the facility. A left-turn lane will not be considered for uses generating an ADT of 10 or less.

(b) If the corner sight distance in advancing direction, measured from the driveway, is less than required per Caltrans design standards (usually the posted speed limit multiplied by 11, read in feet) a left-turn lane shall be installed.

(c) If traffic conditions or turning movements pose a considerable threat to public safety, as determined by the Director of Public Works, a left-turn lane shall be installed.

Design: Design of the left-turn lane shall be prepared by a Licensed Civil Engineer and be based on the County Standard Detail LTL-1, available at the PBES Department. Installation of a left-turn lane on a County public road shall require an encroachment permit issued by the Department of Public Works and the property owner shall be required to enter into a one year maintenance agreement including appropriate bonding. Installation of a left-turn lane on a State highway requires an encroachment permit issued by Caltrans.

**LEFT TURN LANE WARRANT GRAPH**

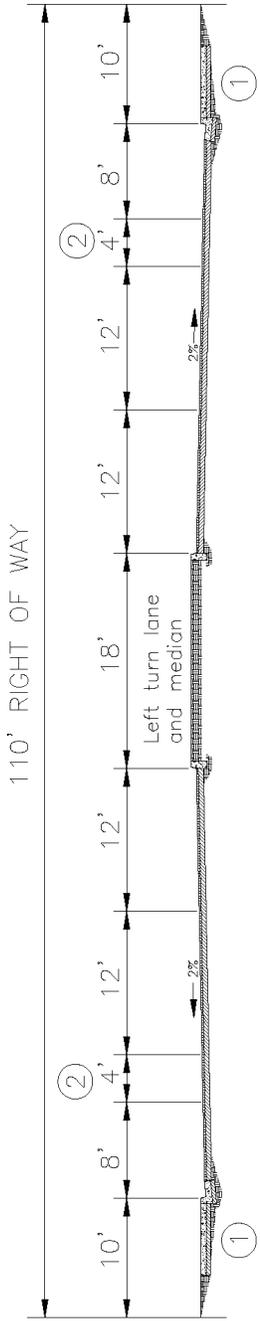


## **18. TYPICAL CROSS SECTIONS**

The cross sections which follow are intended to represent typical applications in land development and do not include all possibilities or elements of design that may be required or permitted. The minimum right of way for any public street or road will not be less than 40 feet. In addition, slope easements extending 10 feet beyond the top of cut or toe of fill will be required whenever the vertical height of the cut or fill exceeds 5 feet. Easements are not required when cut or fill slopes are flatter than 3:1.

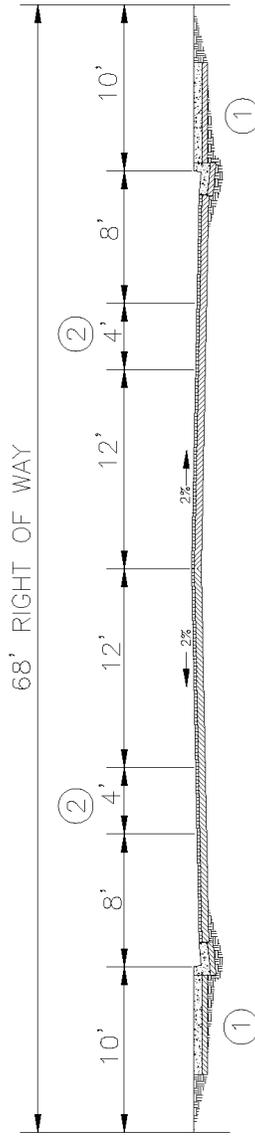
Please note that for simplification, mountable curb is not shown on the typical sections. When it is used, the sidewalks must be located as shown on the Standard Details.

Fill slopes higher than 10 feet will be protected with asphalt concrete dikes or other acceptable means. Super elevations and continuous cross slope streets without a crown may be permitted and encouraged in specific cases upon the approval of the County Engineer.



4 LANE ARTERIAL WITH MEDIAN

- 1. 10' P.C.C. SIDEWALK IN COMMERCIAL AREAS. 6' P.C.C. SIDEWALK IN RESIDENTIAL AREAS.
- 2. BIKE LANE

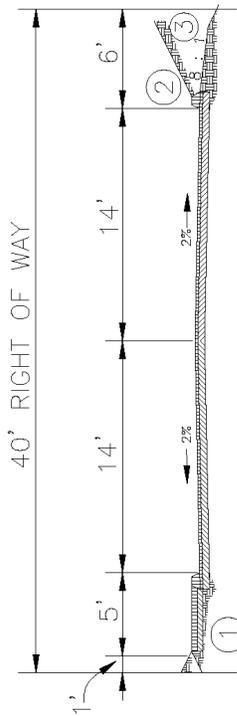


2 LANE ARTERIAL WITH PARKING

- 1. 6' P.C.C. SIDEWALK.
- 2. BIKE LANE.

NOT TO SCALE

ARTERIAL CROSS SECTIONS	DESIGN SPEED - 40 M.P.H. A.D.T. 5,000 OR MORE VEHICLES PER DAY
COUNTY OF NAPA DEPARTMENT OF PBES	DATE: JUNE 2016
	 ENGINEERING MANAGER RCE 57273



2 LANE ARTERIAL WITHOUT  
PARALLEL PARKING LANES

1. 4' A.C. SIDEWALK ON FILL SIDE.
2. A.C. DIKE IN CUT AREAS. BERM REQUIRED WHERE FILL HEIGHT EXCEEDS 10 FEET.
3. 4' SHOULDER IN FILL AREA.

NOT TO SCALE

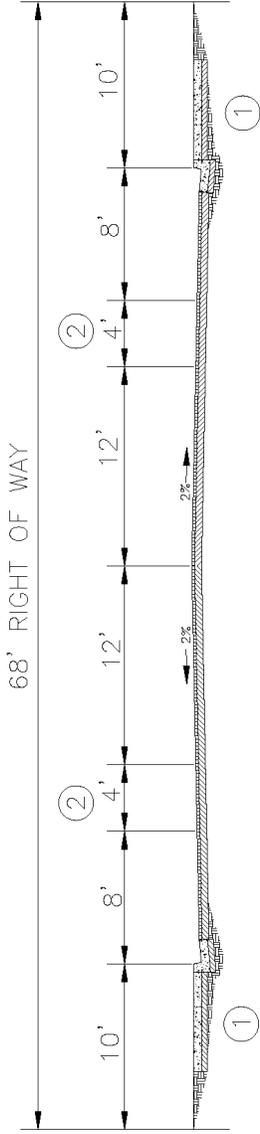
ARTERIAL  
CROSS SECTIONS

DESIGN SPEED - 40 M.P.H.  
A.D.T. 5,000 OR MORE VEHICLES PER DAY

COUNTY OF NAPA  
DEPARTMENT OF PBES

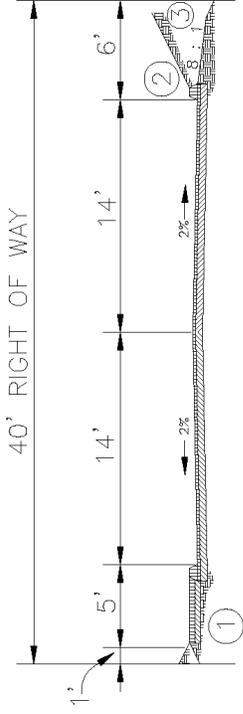
DATE: JUNE 2016

*Mark J. Galant*  
ENGINEERING MANAGER  
RCE 57273



COLLECTOR WITH PARALLEL PARKING LANES

- 1. 5' P.C.C. SIDEWALK.
- 2. BIKE LANE.

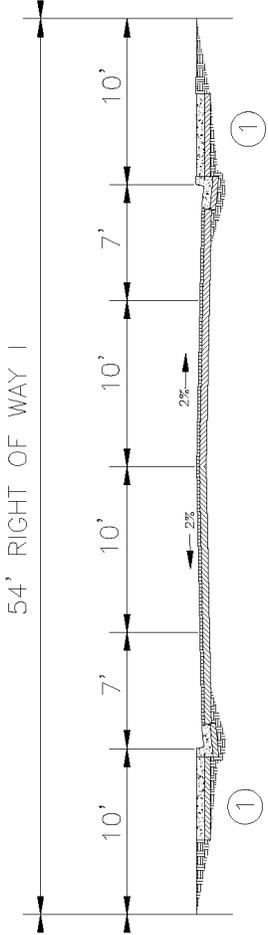


COLLECTOR WITHOUT PARALLEL PARKING LANES

- 1. 4' A.C. SIDEWALK ON FILL SIDE.
- 2. A.C. DIKE IN CUT AREA. BERM REQUIRED WHERE FILL HEIGHT EXCEEDS 10 FEET.
- 3. 4' SHOULDER IN FILL AREA.

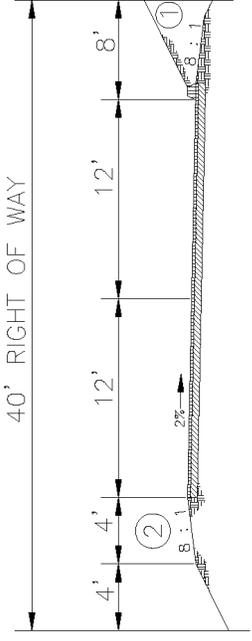
NOT TO SCALE

COLLECTOR CROSS SECTIONS	DESIGN SPEED - 35 M.P.H. A.D.T. 1,000 TO 5,000 VEHICLES PER DAY
COUNTY OF NAPA DEPARTMENT OF PBES	DATE: JUNE 2016
	 ENGINEERING MANAGER RCE 57273



GENERAL MINOR WITH PARALLEL  
PARALLEL PARKING LANES

1. 5' P.C.C. SIDEWALK.



GENERAL MINOR WITHOUT PARALLEL  
PARALLEL PARKING LANES

- 1. A.C. DIKE IN CUT AREAS. BERM REQUIRED WHERE FILL HEIGHT EXCEEDS 10 FEET.
- 2. 4' SHOULDER IN FILL AREAS.

NOT TO SCALE

GENERAL MINOR  
CROSS SECTIONS

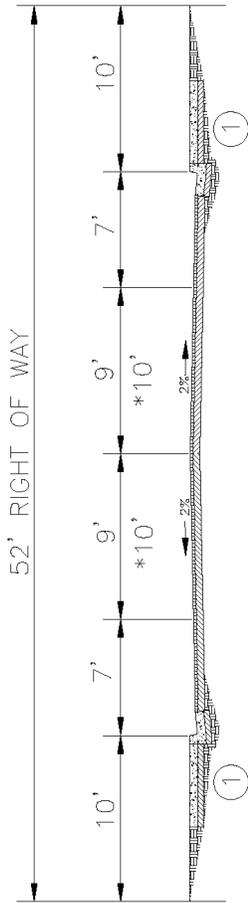
DESIGN SPEED - 25 M.P.H.  
A.D.T. UP TO 1,000 VEHICLES PER DAY

COUNTY OF NAPA  
DEPARTMENT OF PBES

DATE: JUNE 2016

*North Oakland*  
ENGINEERING MANAGER

RCE 57273

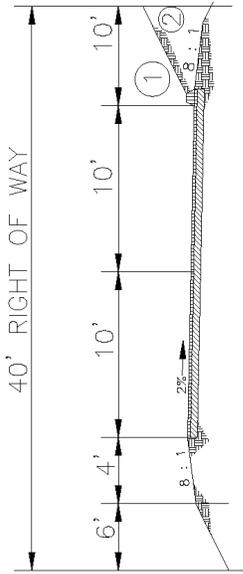


WITH PARALLEL PARKING LANES

MINIMUM CUL-DE-SAC RADIUS IS 40' TO FACE OF CURB.

1. 5' P.C.C. SIDEWALK.

\*NOTE: INCREASE DRIVING LANE WIDTH TO 10' WHEN LENGTH EXCEEDS 1,000' & EMERGENCY ACCESS IS NOT PROVIDED.



WITHOUT PARALLEL PARKING LANES

MINIMUM CUL-DE-SAC RADIUS IS 40' TO EDGE OF PAVEMENT.

1. A.C. DIKE IN CUT AREAS. BERM REQUIRED WHERE FILL HEIGHT EXCEEDS 10 FEET.
2. 4' SHOULDER IN FILL AREAS.

NOT TO SCALE

NON-CONTINUING MINOR,  
LOOP ROAD & CUL-DE-SAC

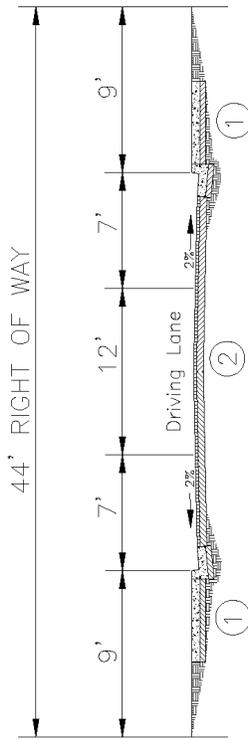
DESIGN SPEED - 20 M.P.H.  
A.D.T. UP TO 250 VEHICLES PER DAY

COUNTY OF NAPA  
DEPARTMENT OF PBES

DATE: JUNE 2016

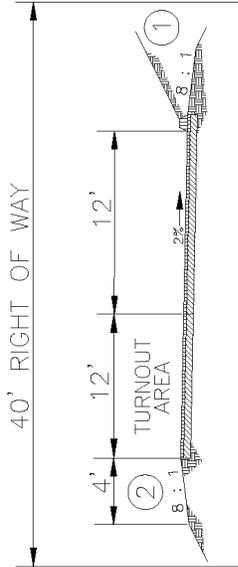
*North Oakland*  
ENGINEERING MANAGER

RCE 57273



ONE WAY LOOP ROAD WITH PARALLEL PARKING LANES

- 1. 5' P.C.C. SIDEWALK.
- 2. PARKING LANES MUST BE DELINEATED.

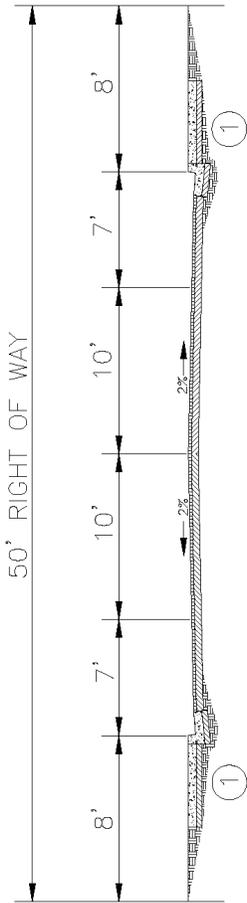


ONE WAY LOOP ROAD WITHOUT PARALLEL PARKING LANES

- 1. A.C. DIKE IN CUT AREAS. BERM REQUIRED WHERE FILL HEIGHT EXCEEDS 10'.
- 2. 4' SHOULDER IN FILL AREAS FOR PUBLIC ROADS AND AS REQUIRED BY COUNTY ENGINEER FOR PRIVATE ROADS AND DRIVEWAYS.

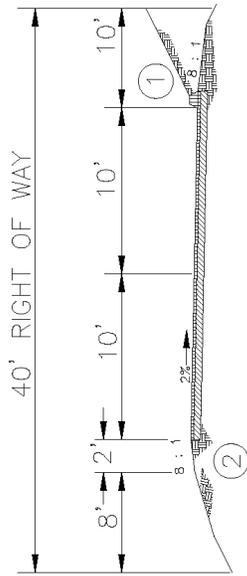
NOTE: INCREASE PAVEMENT WIDTH TO 18' WHEN STOPPING SIGHT DISTANCE IS LESS THAN 220'. NOT TO SCALE

ONE WAY LOOP CROSS SECTIONS	DESIGN SPEED - 20 M.P.H. A.D.T. UP TO 100 VEHICLES PER DAY
COUNTY OF NAPA DEPARTMENT OF PBES	DATE: APRIL 2016
	 ENGINEERING MANAGER RCE 57273



COMMON DRIVE WITH PARALLEL PARKING LANES

1. 5' P.C.C. SIDEWALK FOR TYPE I OR 4' P.C.C. SIDEWALK FOR TYPE II



COMMON DRIVE WITHOUT PARALLEL PARKING LANES

1. A.C. DIKE IN CUT AREAS. BERM REQUIRED WHERE FILL HEIGHT EXCEEDS 10 FEET.
2. 2' OF ADDITIONAL HORIZONTAL CLEARANCE CAN BE LOCATED ON ONE SIDE OR SPLIT BETWEEN BOTH SIDES.

NOT TO SCALE

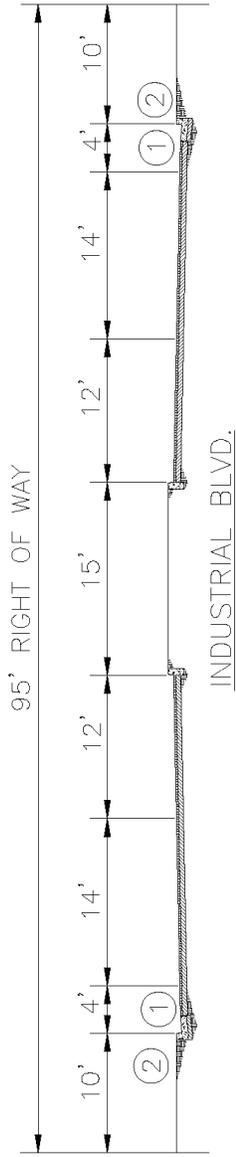
COMMON DRIVE  
CROSS SECTIONS

DESIGN SPEED - 15 M.P.H.  
SERVES UP TO 6 DWELLING UNITS

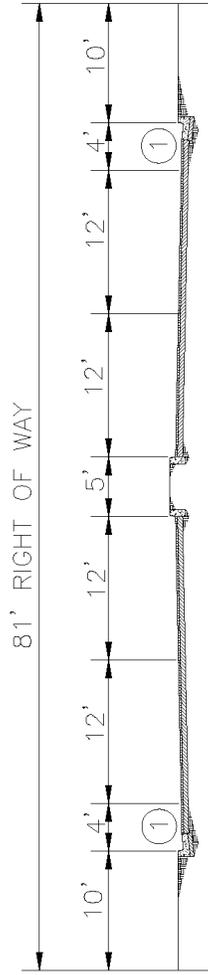
COUNTY OF NAPA  
DEPARTMENT OF PBES

DATE: APRIL 2016

*North & Johnson*  
ENGINEERING MANAGER  
RCE 57273

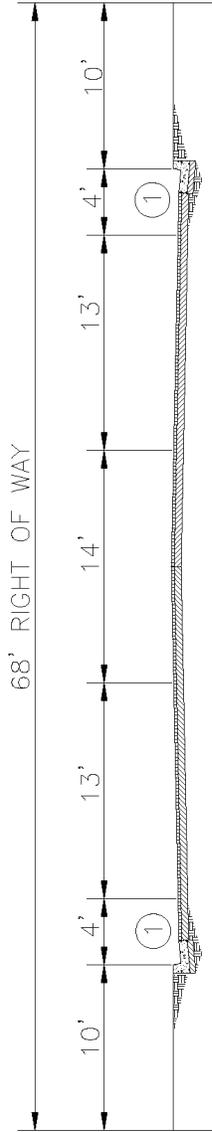


- 1. BIKE LANE AND EMERGENCY PARKING.
- 2. NO PRIVATE DRIVEWAY CONNECTIONS.



INDUSTRIAL 4 LANE COLLECTOR

- 1. BIKE LANE AND EMERGENCY PARKING.



INDUSTRIAL 3 LANE COLLECTOR

- 1. BIKE LANE AND EMERGENCY PARKING.

NOT TO SCALE

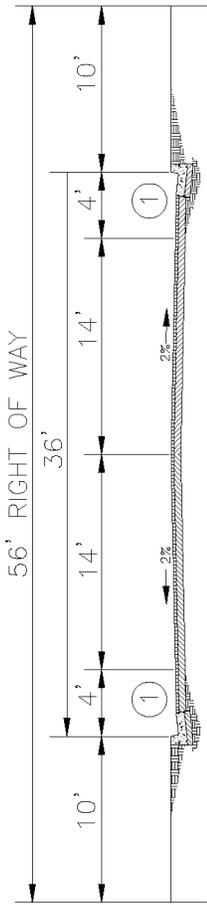
INDUSTRIAL COLLECTORS

COUNTY OF NAPA  
DEPARTMENT OF PBES

DATE: JUNE 2016

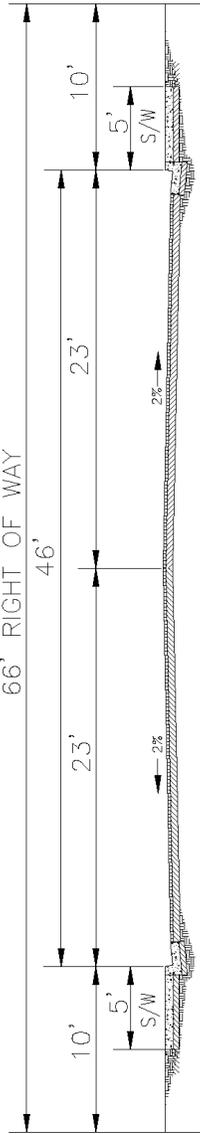
*Nathaniel Spalding*  
ENGINEERING MANAGER

RCE 57273

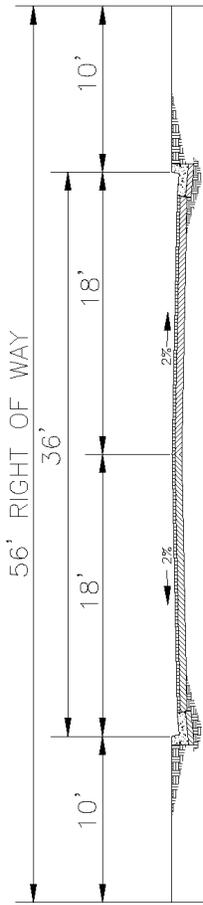


INDUSTRIAL 2 LANE COLLECTOR

1. BIKE LANE AND EMERGENCY PARKING.



INDUSTRIAL MINOR  
(ON-STREET PARKING)



INDUSTRIAL MINOR  
(NO PARKING)

NOT TO SCALE

INDUSTRIAL COLLECTOR AND INDUSTRIAL MINOR

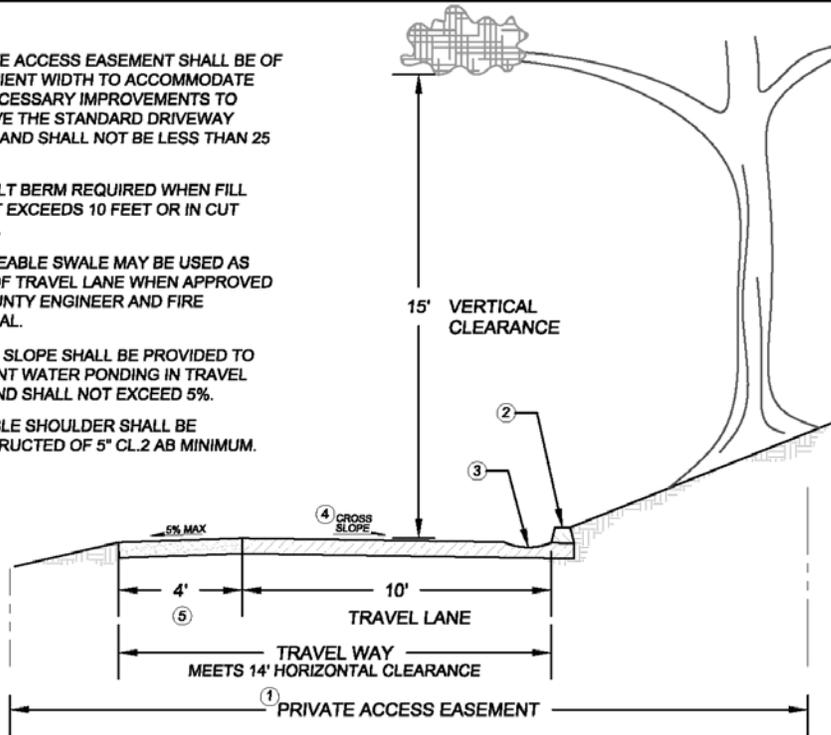
COUNTY OF NAPA  
DEPARTMENT OF PBES

DATE: JUNE 2016

*North & Johnson*  
ENGINEERING MANAGER

RCE 57273

- ① PRIVATE ACCESS EASEMENT SHALL BE OF SUFFICIENT WIDTH TO ACCOMMODATE ALL NECESSARY IMPROVEMENTS TO ACHIEVE THE STANDARD DRIVEWAY WIDTH AND SHALL NOT BE LESS THAN 25 FEET.
- ② ASPHALT BERM REQUIRED WHEN FILL HEIGHT EXCEEDS 10 FEET OR IN CUT AREAS.
- ③ A DRIVEABLE SWALE MAY BE USED AS PART OF TRAVEL LANE WHEN APPROVED BY COUNTY ENGINEER AND FIRE MARSHAL.
- ④ CROSS SLOPE SHALL BE PROVIDED TO PREVENT WATER PONDING IN TRAVEL WAY AND SHALL NOT EXCEED 5%.
- ⑤ DRIVABLE SHOULDER SHALL BE CONSTRUCTED OF 5" CL.2 AB MINIMUM.



**NOTES:**

1. SEE SECTION 15 OF THESE STANDARDS FOR DESIGN CRITERIA.

2. ROAD SURFACING REQUIREMENTS FOR TRAVEL LANE (APPLIES TO RESIDENTIAL DRIVEWAYS AND AGRICULTURAL SPECIAL PURPOSE ROADS):

TRAVEL LANE ALL WEATHER SURFACE OPTIONS	RANGE OF $\nabla$ GRADE FOR SURFACE OPTION
5" CL. 2 AB	0% - 5% (MAX)
5" CL. 2 AB WITH DOUBLE SEAL COAT	0% - 16% (MAX)
2" HMA / 5" CL. 2 AB	0% to <18% (MAX)
3" HMA / 5" CL. 2 AB	0% - 20% (MAX)

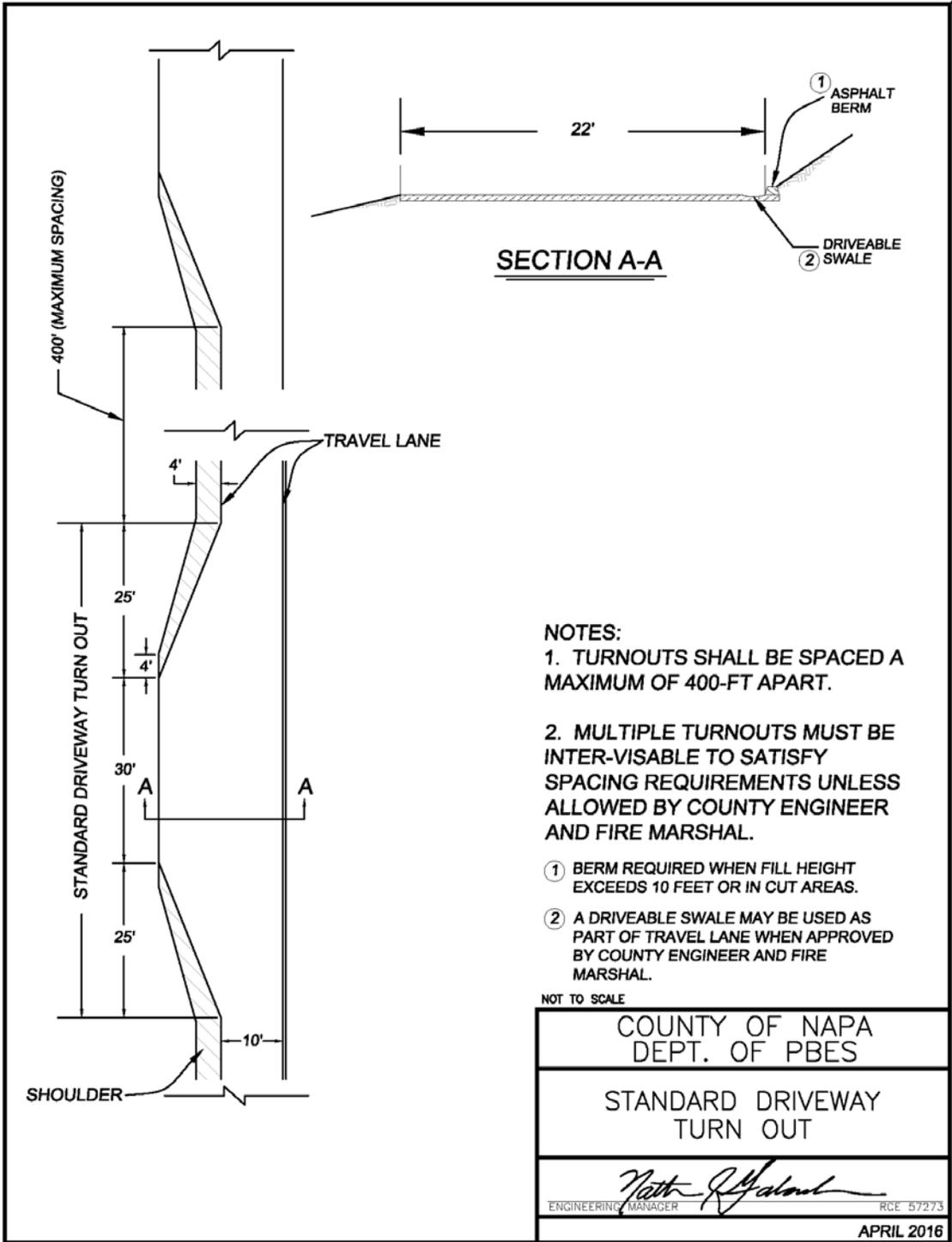
3. SEE THE FOLLOWING DETAILS FOR DESIGN OF DRIVEWAY APPURTENANCES:

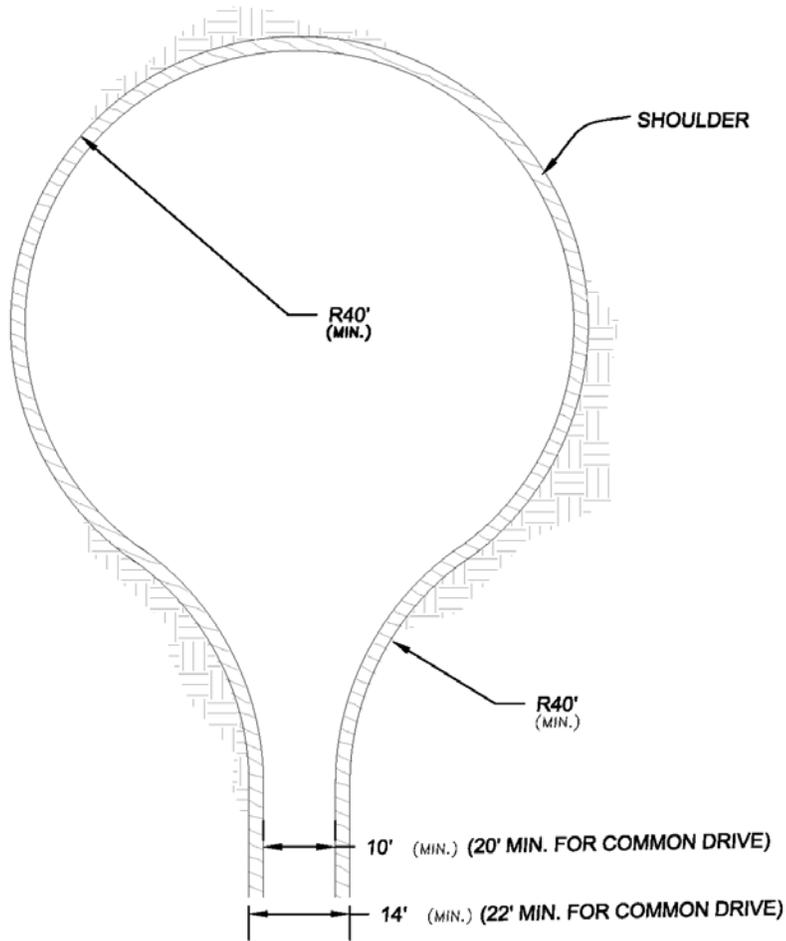
- > CONNECTION TO COUNTY ROAD - DETAIL P-2 (RURAL) OR DETAIL P-5 (URBAN)
- > STANDARD DRIVEWAY TURNOUT - DETAIL C-11
- > STANDARD DRIVEWAY TURNAROUND - DETAIL C -12, C -13 OR C -14

4. PROVIDE REFLECTOR TYPE ADDRESS NUMBER PLACARDS IN ACCORDANCE WITH ARTICLE 3 OF THE LATEST VERSION OF THE CBOF STATE RESPONSIBILITY AREA FIRE SAFE REGULATIONS.

NOT TO SCALE

COUNTY OF NAPA DEPARTMENT OF PBES	
RESIDENTIAL DRIVEWAY OR AGRICULTURAL SPECIAL PURPOSE ROAD	
<i>Nath R. Galamb</i> ENGINEERING MANAGER	RCE 57273
APRIL 2016	

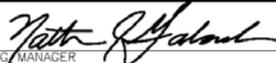


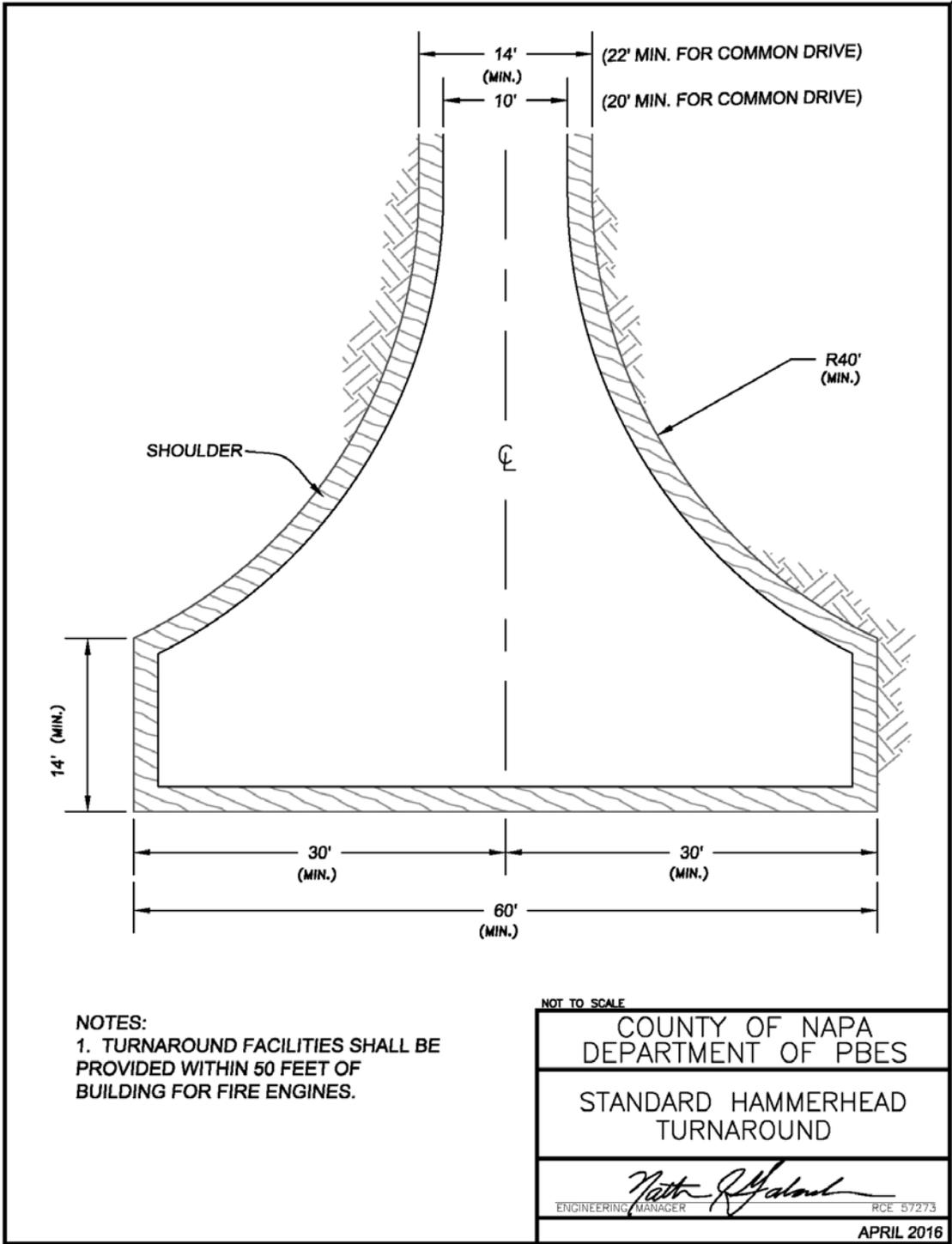


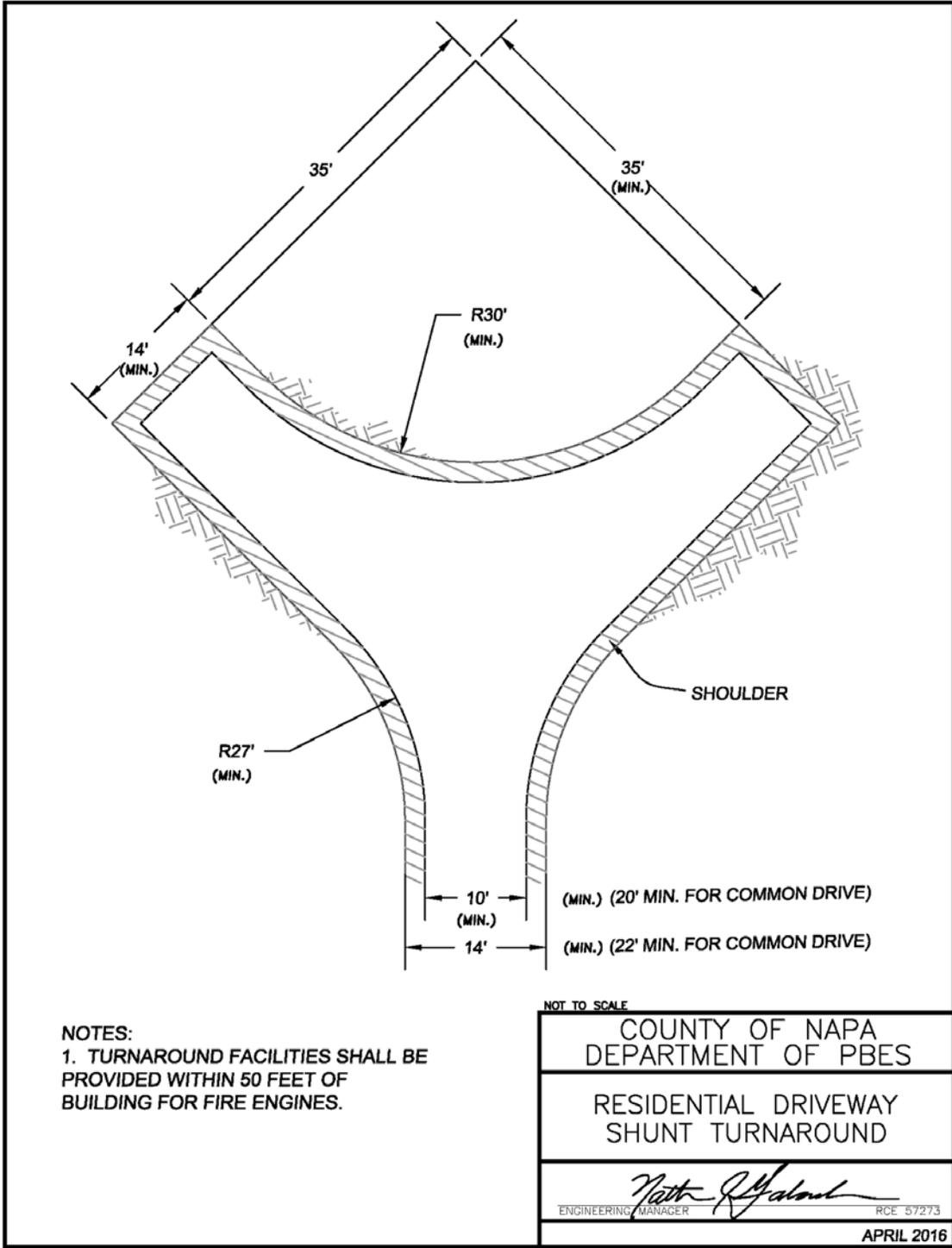
**NOTES:**

1. TURNAROUND FACILITIES SHALL BE PROVIDED WITHIN 50 FEET OF BUILDING FOR FIRE ENGINES.
2. DOES NOT INCLUDE ON STREET PARKING.

NOT TO SCALE

COUNTY OF NAPA DEPARTMENT OF PBES	
STANDARD BULB TURNAROUND	
 ENGINEERING MANAGER	RCE 57273
APRIL 2016	





Detail C-14

## **19. DETERMINATION OF TRAFFIC VOLUMES**

Traffic volumes for new streets or roads will be computed on the basis that each single family dwelling unit generates an average of 10 trips per day. The developer's engineer is required to submit a traffic analysis showing the calculated traffic volumes for all new streets or roads and the estimated pattern of traffic flow plus any other data that could have a bearing on the proper street classification. This report shall be submitted with the project application to enable an early determination of the street and road system to be used. The traffic analysis shall include existing and projected 10 year truck traffic volumes. Traffic index adjustments of anticipated truck trips are not included in Figure 1. Adjustments to the traffic index shall be made to account for the truck traffic.

The report will be reviewed by the County Engineer using estimated traffic flow patterns based on the layout of each development and normal driver behavior, and the street classifications will be determined. Planned unit developments and other types that may have unique traffic characteristics will be investigated on an individual basis.

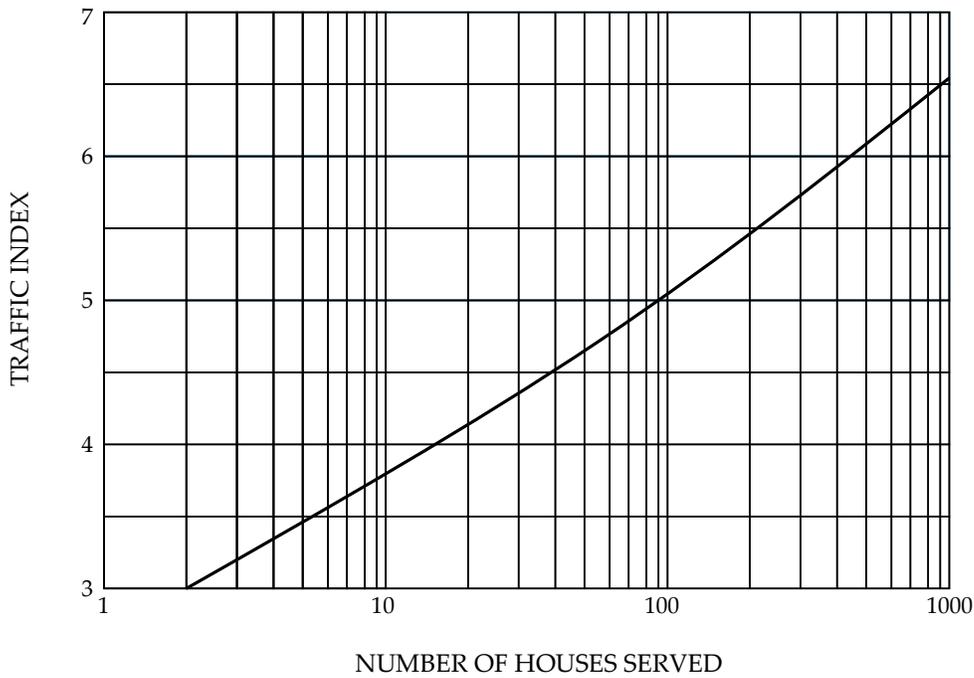
## **20. DETERMINATION OF STRUCTURAL SECTION**

Pavement design will be based on Caltrans design procedures using the traffic index and the resistance value as the design variables. Traffic index values will be developed by the County Engineer based on Figure 1 which shows the relationship between the number of houses served and the traffic index.

Resistance values will be furnished by the developer and will be based on soil tests taken at proposed sub-grade at intervals of 500 feet and/or where there is a definite change in the soil conditions. The lowest resistance value will be used for design unless it can be shown that the material is substantially different than that used in the other tests. In heavy clay soils, expansive conditions may be encountered that will require special attention. The use of soil stabilization to increase the resistance value may be allowed in certain instances upon approval of the County Engineer. The accompanying chart (Figure 2) gives the minimum values of surfacing and base and the total section thickness for various traffic indices. Seal coat pavements may be used on minor roads if the structural section is adequate for the Traffic index and soil conditions.

The minimum pavement section shall be 2 inches of HMA and 5 inches of Class 2 AB or a structural equivalent, with the exception of an Agricultural Special Purpose Road of which a minimum section shall be a double seal coat and 5 inches of Class 2 AB or a structural equivalent. Residential driveways in the rural area shall meet surfacing requirements per Detail C-10. Common driveways in rural areas may utilize surfacing requirements outlined in C-10 with prior approval from the County Engineer and Fire Marshal. The pavement structural section shall be constructed in accordance with Section 27 of these Standards.

CHART FOR ESTIMATION OF TRAFFIC INDEX  
USING A HOUSE COUNT



Notes: For use only within subdivisions for residential and residential collector streets.

Chart is based on a 10 – year design life.

Figure 1

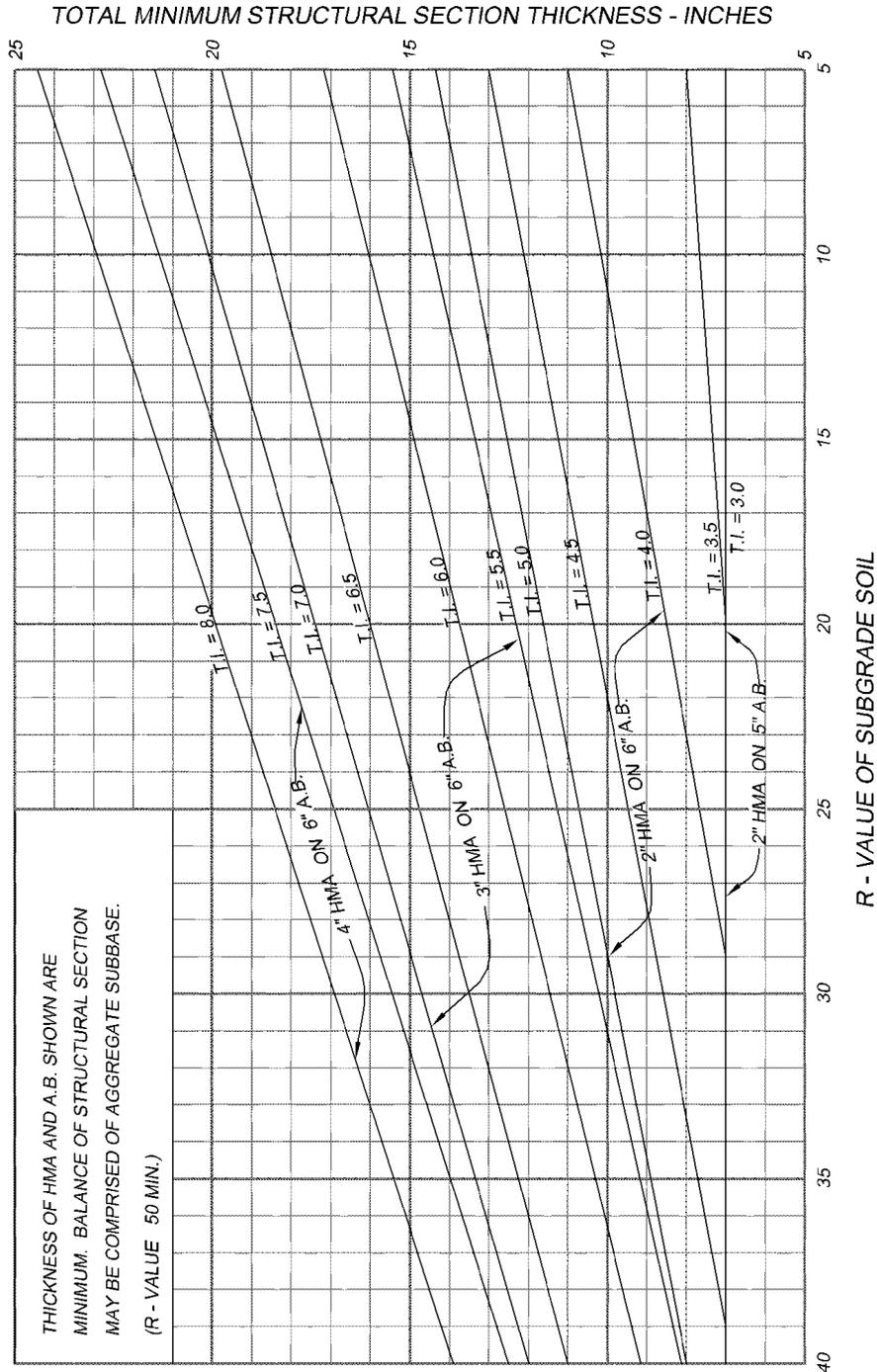


Figure 2

## **21. GRADING REQUIREMENTS AND SOILS INVESTIGATIONS (FOR ROADS)**

Geologic investigations will be required on developments of 40 acres or more in size to determine safe cut and fill slopes and unusual soils situations, and may be required on smaller parcels if considered necessary by the County Engineer. In the absence of soils tests, all cut and fill slopes shall be flatter than 2:1; flatter slopes to conform to the existing terrain are encouraged. Slope rounding at the top of cuts and toe of fills is required under all conditions. In addition, all cut and fill slopes except in rock shall be seeded with durable, hardy species of grass or other acceptable plants or grasses that do not require irrigation. Geologic reports and soil investigations will conform to criteria set by the County Engineer.

## **22. DRAINAGE REQUIREMENTS**

General:

The purpose of drainage improvements is to provide protection from flooding and reduce or eliminate maintenance costs and erosion damage. Erosion is particularly troublesome in sloped areas and whatever steps deemed necessary will be taken to reduce erosion and its attendant problems. The paved roadbed shall be used wherever possible to carry runoff, and the typical sections may be modified to accomplish this. Concentrated runoff shall not be discharged onto native ground under any circumstances.

(a) Minimum Pipe Size: 18 inches in diameter or equivalent

(b) Material: Metal, concrete or high density polyethylene plastic (up to 36 inch diameter, corrugated outer wall and smooth inner liner) pipes are suitable for culverts; concrete shall generally be used for comprehensive drainage systems. Cast-in-place concrete pipe is not allowed in the County right of way. Concrete pipe shall be Class III minimum. When metal pipes are used, they shall be asphalt coated and dipped or sufficient data shall be submitted to substantiate a 50 year service life in accordance with California Test Method No. 643.B. Culverts 24 inches in diameter or less with four feet or less of cover to flow line may be designed for a 25 year service life.

(c) Erosion Protection: (see subsection (i) also) All culverts shall have flared end sections or concrete headwalls. Erosion protection shall be provided at all culvert outlets and at culvert inlets where abrupt changes in channel alignment are encountered. Typical erosion protection consists of keyed rock rip-rap surrounding sensitive areas. Erosion Protection measures shall be detailed and approved by the County Engineer. See Detail P-11 for a typical Drainline Outlet installation.

(d) Abrasion Protection: Paved inverts are required for metal pipe culverts when the velocity in the channel is five feet per second or more.

(e) Minimum Cover: The minimum cover over pipes installed within the road right of way shall be as required for pipe strength, loading conditions, and hydraulic requirements.

(f) Runoff computations: Figure 7-811.6 of the State Planning Manual, provided on Page 42 of this manual, is generally acceptable for computing runoff in rural areas. Additional field information and possible revised criteria should be developed for culverts or systems requiring 66 inch diameter or larger pipe. A tabular chart for each drainage basin incorporating elevation of the most remote point of the watershed above the point of concentration, length of the channel from the most remote point to the point of concentration, intensity, area of the tributary basin, percentage of runoff, design discharge for 100 year and 10 year runoff  $\{Q_{10} = (2/3) Q_{100}\}$  and velocities should be submitted with proposed improvement plans or made a part of the improvement plans. In rural areas, runoff factors can be determined by summing up the values shown on Figure 3. The minimum time of concentration shall be 10 minutes for any drainage basin. For developed areas or areas that have a potential for future development, Figure 3.1 will give runoff factors.

(g) Design Capacity: Culverts shall be designed to pass a 10 year runoff without head on the inlet under free outfall conditions, and a 100 year runoff with a head not higher than the nearest edge of the traveled way. Entrance capacity for the 10 year runoff will generally control culvert design. Comprehensive drainage systems shall be designed to carry a 10 year runoff without head and a 100 year runoff using the head available in the appurtenant structures. Figure 4 gives the critical capacities of the most common pipe sizes.

The following exceptions are allowed for Common Drives per Detail C-7:

- i. In flood hazard areas as designated on the FIRM map, culverts shall be sized to the 10 year runoff without head and assuming no adjacent inundation. The minimum pipe size shall be 18 inch.
- ii. In the remaining areas culverts shall either meet the requirements set forth in subsection (g) above, or pass a runoff equal to the capacity of the upstream channel, and together with the road being designed for this purpose, convey the 100 year runoff without damage to the road. The minimum pipe size shall be 18 inch.

(h) Curbs and Gutters: Curbs and gutters shall be designed to carry a 100 year runoff without overtopping the curb or the back of sidewalk. Generally, drainage water in gutters will not be allowed to travel more than 1,000 feet.

(i) Roadside Ditches: Roadside ditches, where allowed, shall be designed to carry ten year runoff with six inches of freeboard. The minimum slope shall be 0.25 percent and paving or rock-lining will be required when the velocity would cause erosion in an unpaved ditch. Roadside ditches generally will not be allowed in areas that are to be developed into lots unless the area is very remote and the lots are unusually large. Permissible velocities for unlined ditches and channels are given in Figure 5.

(j) Channels: Channels may be used in place of pipe when the required pipe size would be larger than 48 inches in diameter. Existing natural channels and creeks may remain unimproved in built up areas if the flow of water is continuous throughout the year and if the channel or creek

is adequate to carry a 100 year runoff with 1 foot of freeboard or more and with minimal backflow effect. Existing inadequate creeks and channels shall be improved as required to obtain capacity to carry a 100 year runoff with 1 foot of freeboard within the boundaries of the area to be developed. The design of large channels shall also be reviewed and approved by the Napa County Flood Control and Water Conservation District.

Natural ravines and swales may remain undisturbed if it is determined that this would not create drainage or erosion problems.

(k) Bridges: Bridges shall be designed to pass a 100 year runoff with a minimum of 2 feet of freeboard. Streams which carry large floating debris may require greater freeboard at bridge sites. Abutments shall be protected from erosion damage which may necessitate use of rip-rap or other suitable material and methods. Abutments on fill material will not be allowed unless supported on piles and the fill is adequately protected from erosion. Piers in the waterway area shall have no opening. Bridges shall generally conform to standards and guidelines of the Caltrans.

(l) Outfall Requirements: Drainage water originating within or passing through a development shall be disposed of in a natural watercourse, which may require work outside of the development site. A watercourse is defined as: a running stream of water; a natural stream, including rivers, creeks, runs, and rivulets. There must be a stream usually flowing in a particular direction, though it need not flow continually. It may sometimes be dry. It must flow in a definite channel, having a bed, sides, or banks; it must be something more than a mere surface drainage over the entire face of a tract of land, occasioned by unusual freshets or other extraordinary causes. It does not include the water flowing in the hollows or ravines of land, which is the mere surface flow from rain and is discharged through them from a higher to a lower level, but which at other times are destitute of water. Such hollows or ravines are not watercourses.

Special attention must be given to drainage in sloped areas because of the potential for erosion damage and maintenance problems. Overbank storm drain outlets shall provide adequate slope protection and erosion control measures as directed by the County Engineer. Typical protection measures include placement of rock rip rap or a concrete pad to capture the culvert outfall drainage and discharge it safely at the base of the slope. See Detail P-11.

Miscellaneous Design Criteria: Loss of head through structures shall be calculated using standard engineering methods and equations. Roughness factors for use in design shall be as follows:

- |  |       |
|--|-------|
| 1. Concrete pipe over 36 inch diameter | 0.013 |
| 2. Concrete pipe less than 36 inches   | 0.015 |
| 3. Corrugated Metal Pipe               | 0.021 |
| 4. CMP with paved invert               | 0.019 |
| 5. Smooth walled HDPE Pipe             | 0.012 |

# DESIGN DISCHARGE FOR SMALL BASINS

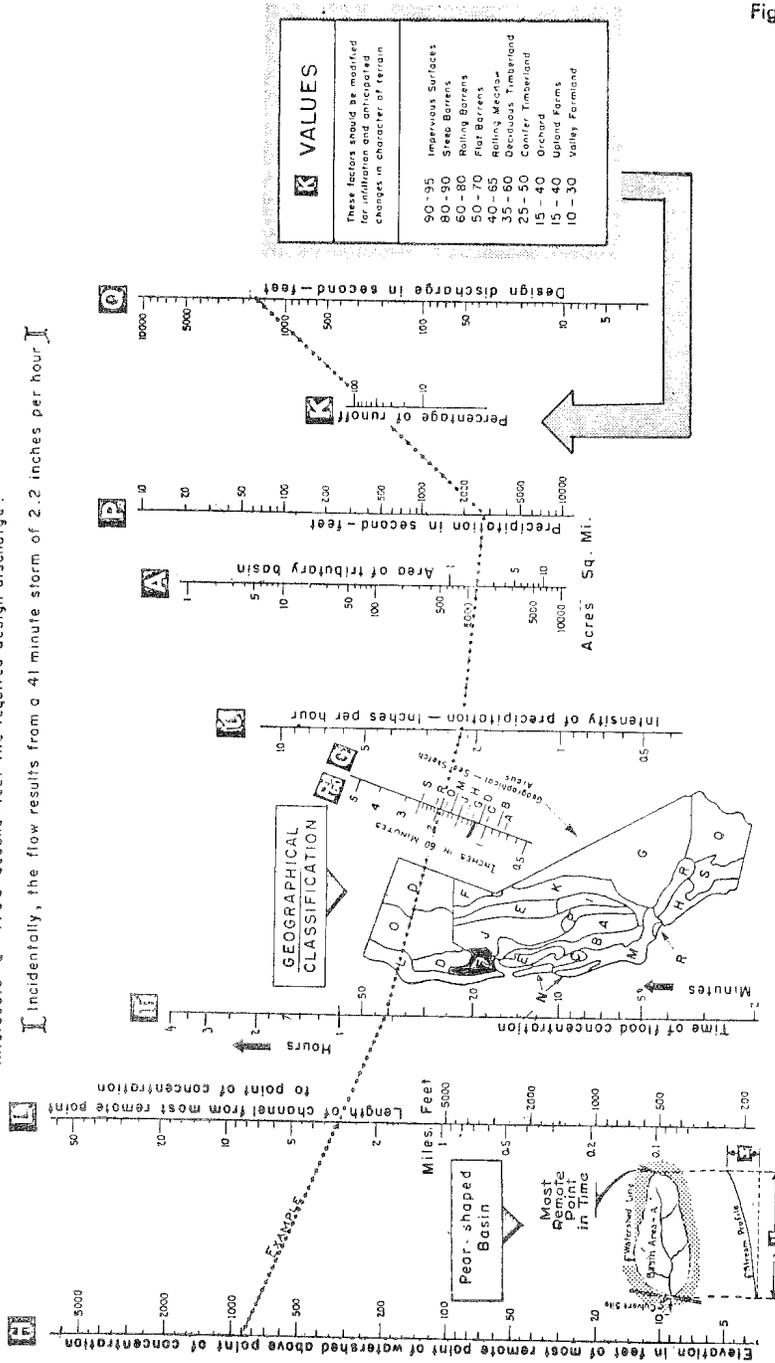
Figure 7-811.6  
August, 1964

## DESIGN DISCHARGE FOR SMALL BASINS

### Example:

A culvert site in the Imperial Valley is 3 miles downstream and 900 ft. lower than the most remote point on the watershed. The tributary basin has an area of 2.0 square miles and average ratio of runoff to precipitation is estimated at 60 percent.  
The line through  $H = 900$  ft.,  $L = 3$  mi.,  $G = Q$ ,  $A = 2$  sq. mi., and  $K = 60$  intersects  $Q = 1700$  second-foot the required design discharge.

Incidentally, the flow results from a 41 minute storm of 2.2 inches per hour.



## WATERSHED TYPES AND FACTORS

WATERSHED TYPES AND FACTORS				
Run-off Producing Features	Extreme	High	Normal	Low
Relief	<b>0.28 – 0.38</b> Steep, rugged terrain, with average slopes above 30%	<b>0.20 – 0.28</b> Rolling, with average slopes of 10 to 30%	<b>0.14 – 0.20</b> Rolling, with average slopes of 5 to 10%	<b>0.08 – 0.14</b> Relatively flat land, with average slopes of 0 to 5%
Soil Infiltration	<b>0.12 – 0.16</b> No effective soil cover either rock or thin soil mantle of negligible infiltration capacity.	<b>0.08 – 0.12</b> Slow to take up water; clay or shallow loam soils of low infiltration capacity imperfectly or poorly drained.	<b>0.06 – 0.08</b> Normal; well drained light and medium textured soils sandy loams, silt, and silt loams.	<b>0.04 – 0.06</b> Slow to take up water; clay or shallow loam soils of low infiltration capacity imperfectly or poorly drained.
Vegetation Cover	<b>0.12 – 0.16</b> No effective plant cover; bare or very sparse cover.	<b>0.08 – 0.12</b> Poor to fair; clean cultivation crops or poor natural cover; less than 20% of drainage area under good cover.	<b>0.06 – 0.08</b> Fair to good; about 50% of area in good grassland or woodland; not more than 50% of area in cultivated crops.	<b>0.04 – 0.06</b> Good to excellent; about 90% of drainage area in good grassland, woodland, or equivalent crop.
Surface	<b>0.10 – 0.12</b> Negligible; surface depressions, few and shallow; drainage ways steep and small; no marshes.	<b>0.08 – 0.10</b> Low well-defined system of small drainage ways; no ponds or marsh.	<b>0.06 – 0.08</b> Normal; considerable surface depression storage; lakes, ponds, and marshes.	<b>0.04 – 0.06</b> High; surface storage high; drainage system not sharply defined; large floodplain storage or large number of ponds or marshes.

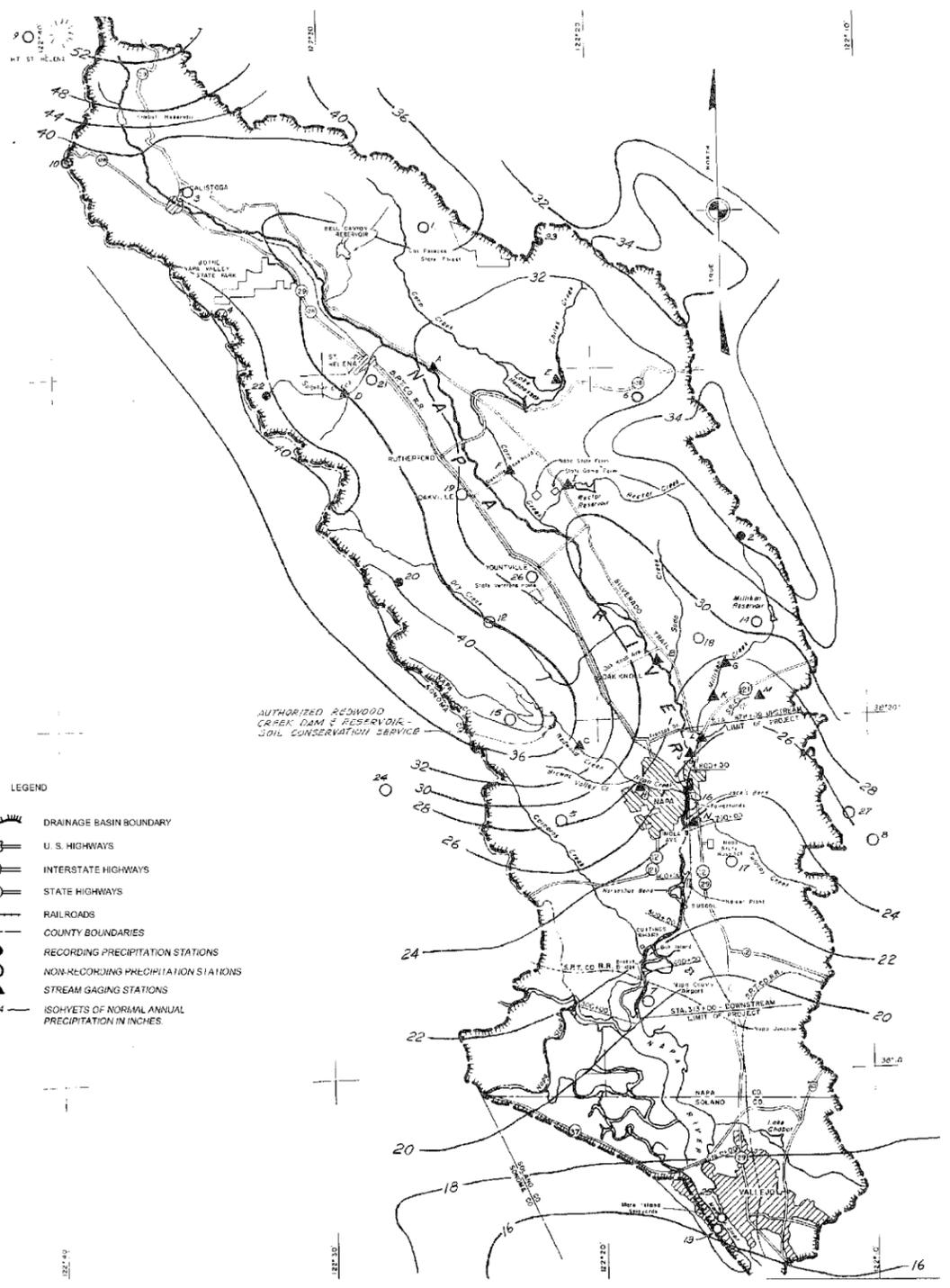
THE RUNOFF FACTOR IS DETERMINED BY THE SUM OF THE FACTORS FOR RELIEF INFILTRATION, COVER, AND SURFACE. NOT APPLICABLE TO BUILT UP AREAS.

FIGURE 3

Runoff Coefficient for Developed Areas

Type of Development	Coefficient	
	<i>Mild Slope</i>	<i>Steep Slope</i>
Low Density Residential 1-3 Units/Acre	0.40	0.60
Medium Density Residential 4-9 Units/Acre	0.45	0.65
High Density Residential 10 or more Units/Acre	0.60	0.75
Limited Industrial	0.60	0.80
Industrial	0.75	0.90
Commercial	0.80	0.90
Schools	0.45	0.65
Parks	0.25	0.50

FIGURE 3.1



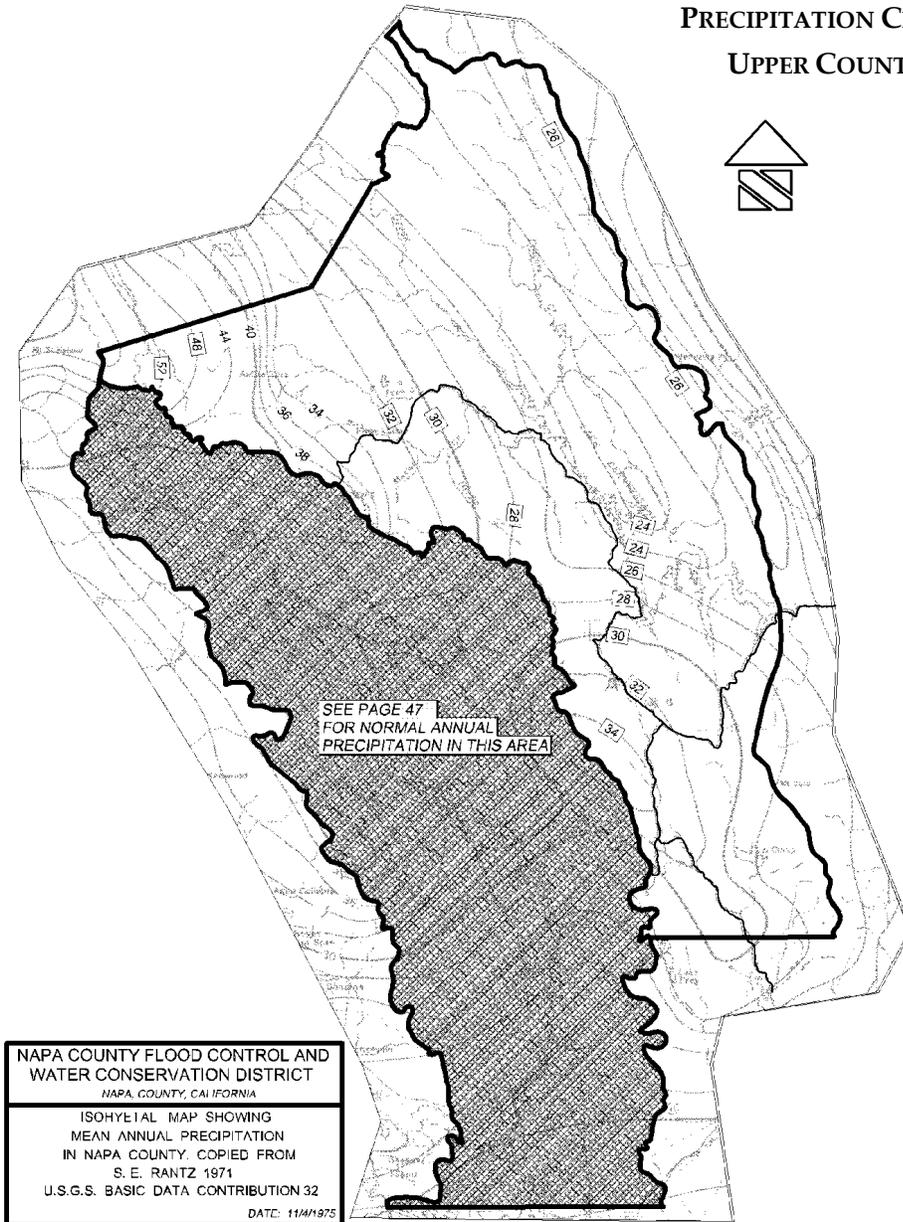
## PRECIPITATION CHART LOWER COUNTY

FLOOD CONTROL  
 GENERAL DESIGN MEMORANDUM  
 NAPA RIVER CHANNEL IMPROVEMENTS  
 NAPA COUNTY, CALIFORNIA  
 HYDROLOGY AND HYDRAULIC ANALYSIS  
 NORMAL ANNUAL PRECIPITATION AND  
 HYDROLOGIC INDEX MAP  
 U.S. ARMY ENGINEER DISTRICT, SAN FRANCISCO, CORPS OF  
 ENGINEERS

TO ACCOMPANY REPORT  
 DATED 12 March 75

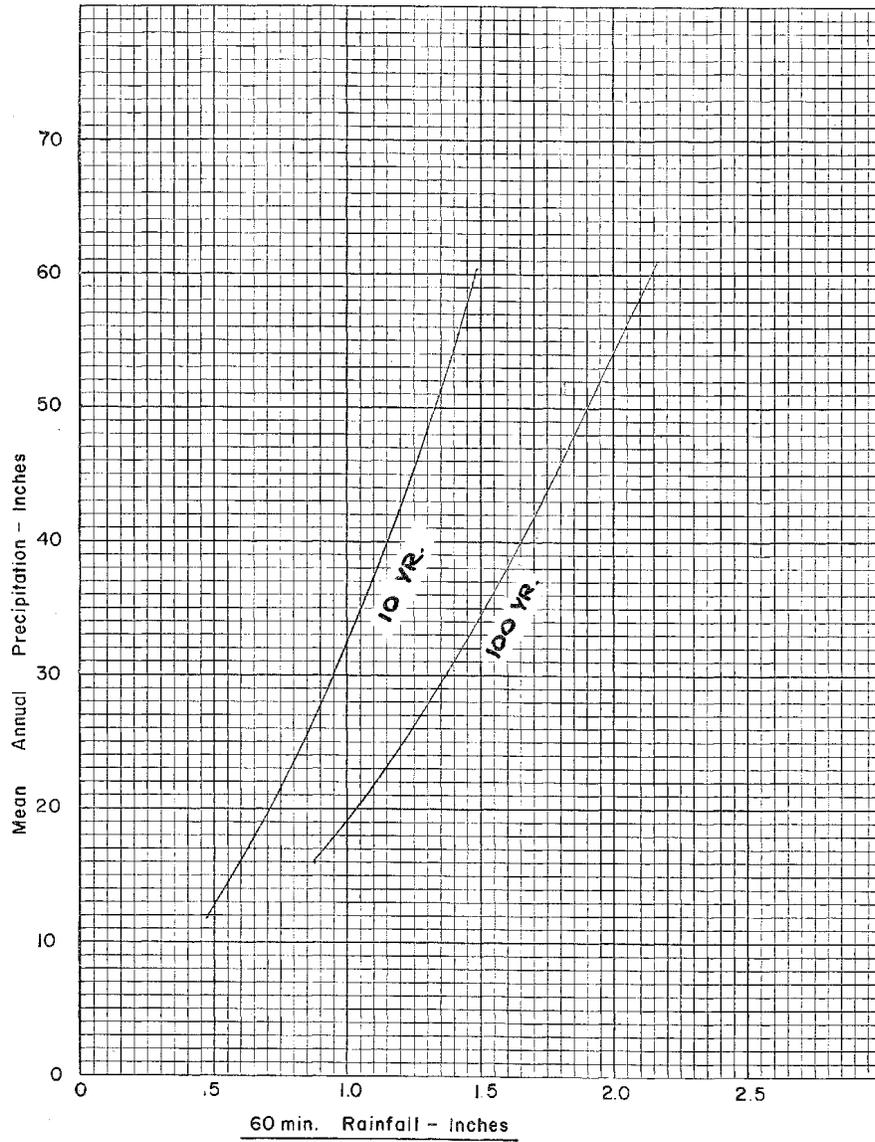
FILE NO.  
**50-47-1**

PRECIPITATION CHART  
UPPER COUNTY

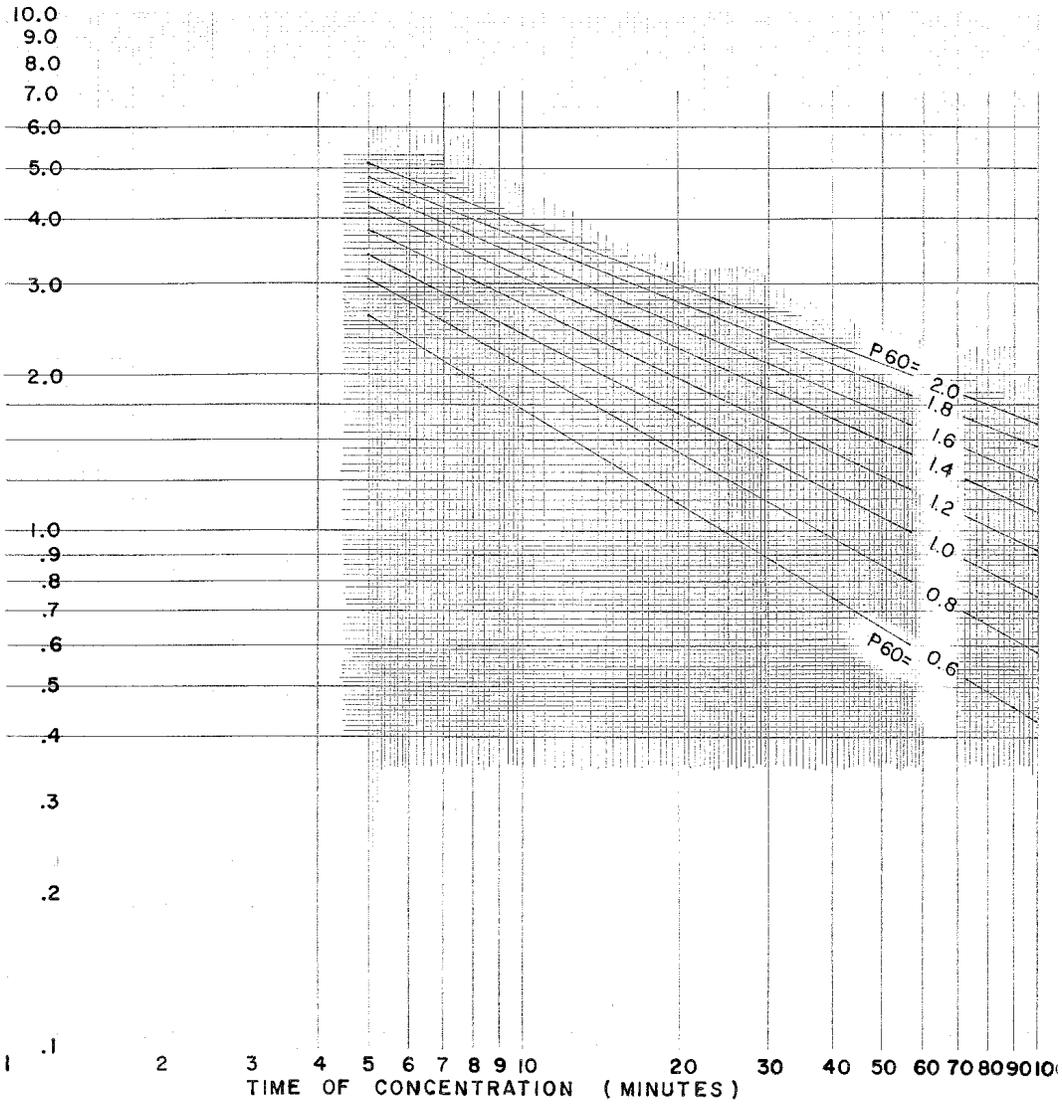


PRECIPITATION CHART – UPPER COUNTY

# MEAN ANNUAL PRECIPITATION VS. 60 MINUTE RAINFALL



# INTENSITY - DURATION CHART

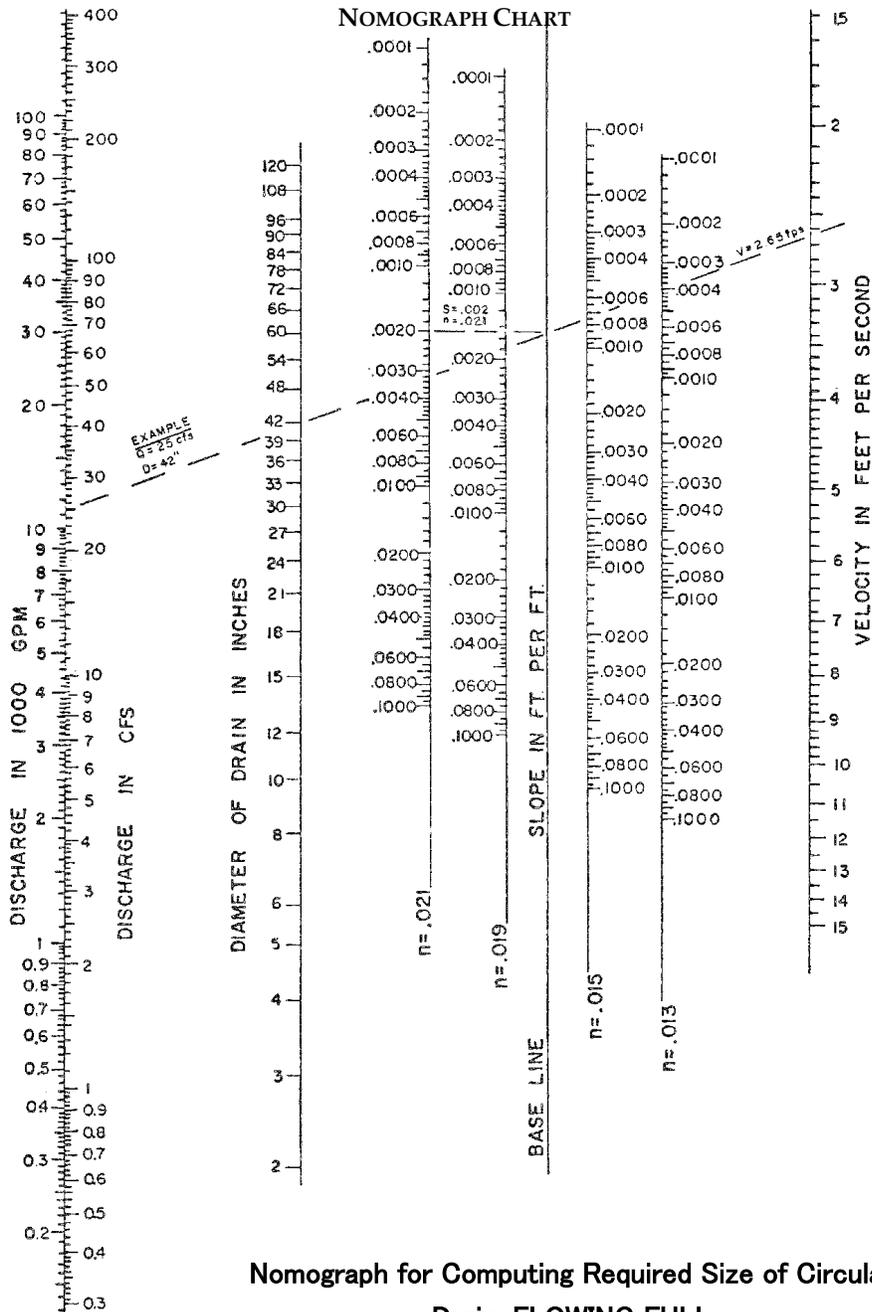


Based on figure 7-811.6 (-8-64)  
 State of California  
 Division of Highways  
 Planning Manual

**CRITICAL SLOPES AND CAPACITIES OF ROUND PIPES TABLE**

Depth of Flow = 0.6887 D					
Diameter of Pipe (inches)	Area (0.5768d <sup>2</sup> )	Velocity (ft/s)	Critical Slope N=0.015	Critical Slope N=0.025	Critical Capacity (CFS)
6	0.14	3.16	0.0132	0.0367	0.5
8	0.25	3.66	0.0119	0.0330	0.9
10	0.40	4.08	0.0110	0.0306	1.6
12	0.58	4.48	0.0104	0.0290	2.6
15	0.90	5.01	0.0097	0.0270	4.5
18	1.30	5.48	0.0091	0.0252	7.1
21	1.77	5.92	0.0086	0.0239	10.5
24	2.31	6.33	0.0083	0.0230	14.6
27	2.92	6.72	0.0080	0.0221	19.6
30	3.61	7.08	0.0077	0.0213	25.6
36	5.19	7.75	0.0072	0.0200	40.2
42	7.07	8.38	0.0069	0.0191	59.2
48	9.23	8.95	0.0066	0.0182	82.6
54	11.68	9.50	0.0063	0.0176	111.0
60	14.42	10.01	0.0061	0.0169	144.3
66	17.45	10.50	0.0059	0.0164	183.2
72	20.76	10.97	0.0057	0.0159	227.7

FIGURE 4



**Nomograph for Computing Required Size of Circular Drain, FLOWING FULL**

- n = 0.013      n = 0.015
- n = 0.019      n = 0.021

## UNLINED CHANNEL VELOCITY

### Recommended Permissible Velocities for Unlined Channels

Types of Material in Excavation Section	Permissible Velocity (FT/Sec)	
	<i>Intermittent Flow</i>	<i>Sustained Flow</i>
Fine Sand (Noncolloidal)	2.5	2.5
Sandy Loam (Noncolloidal)	2.5	2.5
Silt Loam (Noncolloidal)	3.0	3.0
Fin Loam	3.5	3.5
Volcanic Ash	4.0	3.5
Fine Gravel	5.0	4.0
Stiff Clay (Colloidal)	6.0	4.5
<b><i>Graded Material (Noncolloidal)</i></b>		
Loam to Gravel	6.5	5.0
Silt to Gravel	7.0	5.5
Gravel	7.5	6.0
Coarse Gravel	8.0	6.5
Gravel to Cobbles (Under 6 inches)	9.0	7.0
Gravel to Cobbles (Under 8 inches)	10.0	8.0

FIGURE 5

**23. PLANNED UNIT DEVELOPMENT AND OTHER TYPES**

Developments other than the normal single family residential and recreational subdivisions will be improved with facilities that are consistent with the objectives and criteria in the preceding pages. Specific design elements will be determined by the County Engineer on an individual basis.

**24. ASSESSMENT DISTRICTS**

Improvement requirements for assessment districts are the same as for privately financed developments. However, before an assessment district can be formed, the developer must comply with the requirements of the County's assessment district policy. An excerpt from the County's policy is included below for reference. Full copies of the policy may be obtained from the Department of Public Works.

(a) Purpose of Policy.

- i. To facilitate the acquisition and construction of public facilities in those portions of the County designated on the Napa County General Plan as suitable for commercial or industrial uses if needed to promote any of the following:
  - (A) The health and welfare of the developed areas;
  - (B) The promotion of the orderly development of the County;
  - (C) The development of needed commercial or industrial property.
- ii. Residential improvements shall not be eligible for assessment financing.

(b) Policy considerations regarding the need for an assessment district.

Factors to be considered in reviewing a request that a special assessment district be formed shall include, but not be limited to, the following:

- i. Is there a need for the development of additional commercial and industrial zoned lots in the community?
- ii. Is the inventory of existing improved parcels in the community adequate?
- iii. Will the proposed assessment, when added to the existing public indebtedness in the area to be assessed, result in an unusually high tax rate or collection charge being assessed which will tend to make the sale or use of the property uneconomic?
- iv. Does the County anticipate debt issuance during the applicable calendar year for purposes of general County operations, which, in the absence of any assessment district debt authorization, would make total County debt issuance eligible for the applicable small issuer arbitrage exemption rule?

(c) Facilities eligible for funding through assessment financing.

Facilities the construction of which may be financed through assessment proceedings are limited to public facilities located within dedicated rights-of-way or easements which the County or other local agency will be required to maintain and operate. The types of facilities to be financed are:

- i. Streets;

- ii. Drainage facilities;
- iii. Public utilities, whether privately or publicly owned, which are appurtenant and incidental to streets or which otherwise provide significant public benefit if not appurtenant or incidental to streets; and
- iv. Landscaping when used in conjunction with other public improvements listed above.

**25. PARCEL MAP IMPROVEMENTS - RESIDENTIAL DEVELOPMENT**

Divisions of land by Parcel Map fall into three general categories: (1) those adjacent to a county road, (2) on an existing private road, and (3) on a proposed new road which may be private or public. Road improvement requirements are as follows:

Case I – Adjacent to County Road

<u>Parcel Size</u>	<u>Improvement</u>
0 to less than ¼ acre	Full improvements including curb, gutter and sidewalk as required for the particular road and dedication of right of way to contain the improvements.
¾ to 2 acres	<ol style="list-style-type: none"> <li>1. Widen the existing road to provide a minimum 60 foot long parking lane per lot exclusive of driveways, or</li> <li>2. Provide improved all weather surface in parking areas in accordance with County Standards for 4 cars per lot in addition to garage and carport, or</li> <li>3. Provide 60 foot building setback from right of way line.</li> </ol> <p>A statement shall be placed on a document recorded concurrently with the Parcel Map explaining the parking options and also clearly indicating that one of the three options must be provided before or at the time that a building permit is finalized. On parcels already improved with dwellings, the parking requirements must be met prior to recordation of the Parcel Map.</p>
More than 2 acres to 200 acres	Right of way dedication

Case II – On Existing Private Roads

The portion of the existing private road fronting or crossing the proposed parcels shall be improved to the appropriate subdivision road standard as determined by the County Engineer. That portion of the private road between the subject parcel and the County Road shall be improved to meet the requirements of a Common Drive per Detail C-7. Parking shall be as required for Case I.

### Case III – New Roads

Parcel map divisions on new roads, public or private, shall be served by roads constructed to the appropriate subdivision standard. New roads that do not connect to an existing publicly maintained road system will not be accepted into the County Road System. Parking shall be as required for Case I.

## **26. PARCEL MAP IMPROVEMENTS - COMMERCIAL AND INDUSTRIAL DEVELOPMENT**

Full road and drainage improvements shall be constructed for all parcel map divisions in areas zoned industrial or commercial.

## **27. SPECIFICATIONS**

The following specifications shall apply to all developments, public or private.

### **ROAD AND STREETS**

Street and road work shall conform to approved Plans and Profiles, the Napa County Standard typical sections, these special requirements, and Caltrans Standard Specs, except that all Portland cement concrete shall be "Class B," with 1 ½ inch maximum aggregate.

Roadway excavation shall be in accordance with Section 19-2 of Caltrans Standard Specs, except that sub-grade excavation below the grading plane as specified in Section 19-5.03 will not be required. When the original ground below the grading plane and within 2 ½ feet of finished grade has a relative compaction of less than 95 percent, the 0.5 foot of base material below said grading plane shall be compacted until not less than 95 percent relative compaction is obtained.

Embankment construction shall conform to Section 19-6 of Caltrans Standard Specs, except that sub-grade excavation or original ground below the grading plane as specified in Section 19-5.03 will not be required. Original ground within 2 ½ feet of finished grade shall be compacted as specified above for excavation areas.

The laying of the aggregate base shall not commence until:

- All of the utility lines, including the following, are installed in the streets;
  - Mains and service connections for water
  - Recycled water
  - Gas
  - Electrical, cable television or telephone conduit
  - Sanitary sewer
  - Storm drains
- All service connections are made beyond the graded section;
- Backfilling completed in accordance with the hereinafter specified requirements;
- and
- The County Engineer has approved the subbase in writing.

Aggregate base material and the placing thereof shall conform to Section 26 of Caltrans Standard Specs. Aggregate base material shall be "Class 2 Aggregate Base," 1 1/2 inch maximum size, or 3/4 inch maximum as specified in Caltrans Standard Specs. Subbase material shall be Class 2 in accordance with Section 25 of Caltrans Standard Specs.

A prime coat treatment shall be applied to the finished surfaces of the aggregate base prior to placement of the HMA in accordance with the provisions of Section 39 of said Caltrans Standard Specs. The Liquid Asphalt used for penetration treatment shall conform to the requirements of Section 93 of Caltrans Standard Specs, as modified, and the total amount to be applied will be determined by the County Engineer or authorized representative.

HMA shall be Type B conforming to Section 39-2 of Caltrans Standard Specs. Asphalt binder to be mixed with aggregate shall be a steam-refined paving asphalt conforming to performance grading PG 64-10 in accordance with Section 92 of Caltrans Standard Specs.

Napa County standard barricade(s) shall be constructed at the end of all stub streets, and at any other locations as shown on the plans.

#### UTILITIES

All mains and service connections for all utility facilities to be installed in the street area shall be laid to the line and grade shown on the plans or to the line and grade as established by the County Engineer. In no case shall any utility facility be installed in the street area less than 30 inches below finish grade, except storm drain facilities, where approved.

Excavation and backfill for all pipe lines within the roadway section, including mains and service connections for water; gas; electrical, cable or telephone conduit; sanitary sewer and storm drains shall conform to Section 19-3 of Caltrans Standard Specs except as modified herein. The trench shall be filled to 1 foot above the top of the facility with imported fine material, readily compactable around and under the facility; conforming to Section 19-3.06 of Caltrans Standard Specs or equivalent approved by the County Engineer. The remainder of the trench shall be backfilled by one of the following methods:

(a) If a granular backfill material is used for backfilling the remainder of the trench (minimum sand equivalent 30), compaction may be accomplished by adding sufficient water to the material as it is placed in the trench to achieve consolidation and a relative compaction of not less than 90 percent up to 2 1/2 feet below finish grade, and 95 percent within 2 1/2 feet of finish. If the trench is in solid rock, the backfill shall be compacted to 95 percent relative compaction the entire depth of the trench. The backfill material shall be placed and compacted in layers not exceeding 4 feet in thickness and vibratory or other compaction equipment shall be used whenever necessary to obtain the required compaction. Ponding or use of excessive amounts of water will not be permitted however, and permission from the County Engineer or authorized representative must be obtained before these methods of compaction will be allowed.

(b) The use of material from the excavation for structure backfill will be allowed providing that the relative compaction is 90 percent up to 2 ½ feet below finish grade and 95 percent within 2 ½ feet of finish grade. If the trench is in rock, the backfill shall be compacted to 95 percent relative compaction the entire depth of the trench. The backfill material shall be placed in horizontal, uniform layers not exceeding 8 inches in thickness before compaction, and shall be brought up uniformly on all sides of the facility and the trench. Compaction must be accomplished by mechanical methods only. No ponding, jetting or use of excessive amounts of water will be allowed.

### **DRAINAGE**

Drainage provisions and structures shall be installed in accordance with the approved Plans and Profiles, the Napa County typical sections and applicable provisions of Caltrans Standard Specs.

In lieu of reinforced concrete pipe, storm drains may be installed outside of the street areas as shown on the approved Plans and Profiles. All such storm drains shall conform to Caltrans Standard Specs.

Sacked Portland cement concrete or Light Stone Rip-Rap conforming to Section 72 of Caltrans Standard Specs shall be placed at the locations indicated on the approved Plans and Profiles or at the locations specified by the County Engineer or authorized representative. Sufficient rip-rap shall be placed at each location to insure adequate protection for the facilities involved.

### **STREET SIGNS**

Public Streets: Napa County street signs shall be located and installed per Detail D-6. Street signs shall be designed per Detail D-6A and the latest version of the California Manual on Uniform Traffic Control Devices.

Private Streets, Lanes and Driveways: Signs shall be located, installed and designed in accordance with the latest version of the CBOF State Responsibility Area Fire Safe Regulations.

### **MONUMENTS**

Napa County Standard Street Monuments consisting of cast-in-place "Class A" Portland cement concrete, six inches in diameter, eighteen to thirty-six inches in depth, and covered with a standard cast iron monument cover, shall be installed in the streets as shown on the approved Plans and Profiles.

The monuments shall have the exact point marked by cross on a brass disk bearing the license number of the Engineer or Surveyor making the survey, fastened by a rod or dowel into the concrete. See Standard Detail D-7.

In lieu of the above type monument, on the exterior boundary angle and curve points not in the street area, the following type monuments will be allowed: A three quarter inch minimum

interior diameter galvanized pipe at least three feet long projecting one inch above ground, filled with mortar, and with the exact point marked on a tag to be permanently set in the mortar by means of a dowel extending not less than two inches into the mortar, or a three-quarter by three-quarter inch steel T-bar at least three feet long projecting one inch above ground, treated with a corrosion resisting coating and fitted with a one inch minimum diameter brass cap attached to the stake by means of a drive screw.

Following the setting of all monuments and the completion of all other improvements required hereunder, the street monuments and exterior boundary monuments may be field checked and the measurements obtained will be compared with the dimensions shown on the Parcel Map or Final Map. Any discovered errors in excess of the allowable error as specified in the Napa County Standards shall be corrected prior to the acceptance of the subdivision improvements by Napa County. After discovered errors have been corrected, the County will make one re-check at no cost. Any additional checks required by the County will be at the expense of the developer, and a cash deposit for the monument checking will be posted with the County prior to field work by County crews.

**GENERAL**

The developer shall notify the County Engineer in writing, at least three working days in advance of the commencement of any part of the work. In addition, the developer's contractor and subcontractor shall contact the County Engineer's office to arrange a pre-project conference for the purpose of reviewing job requirements and County procedures. It is the developer's responsibility to supply the contractor with a copy of this document prior to construction. Upon completion of all work, including the setting of all monuments, the developer shall request a final inspection in writing. The Fire Marshal will ensure that disposal, including chipping, burying, burning or removal to a landfill site approved by the local jurisdiction, of flammable vegetation and fuels caused by site development and construction, road and driveway construction, and fuel modification shall be completed prior to completion of road construction or final inspection of a building permit.

No variation in the corrected and approved plans, conditions, specifications and provisions will be allowed without first obtaining approval for each variation from the County Engineer. Any request for variation shall be submitted in writing to the County Engineer. No work shall be done on the portion of the work on which the variation is requested until written approval is obtained from the County Engineer.

**HYDRANT/FIRE VALVE**

The hydrant or fire valve shall be eighteen (18) inches above grade, eight (8) feet from flammable vegetation, no closer than four (4) feet nor farther than twelve (12) feet from a roadway, and in a location where fire apparatus using it will not block the roadway.

- Formatted: Font: 12 pt
- Formatted: Heading 2, Indent: First line: 0", Adjust space between Latin and Asian text, Adjust space between Asian text and numbers
- Formatted: Font: Palatino Linotype, 11.5 pt
- Formatted: Indent: First line: 0.25"

The hydrant serving any building shall:  
(a) be not less than fifty (50) feet nor more than 1/2 mile by road from the building it is to serve, and  
(2b) be located at a turnout or turnaround, along the driveway to that building or along the road that intersects with that driveway.

The hydrant head shall be 2-1/2 inch National Hose male thread with cap for pressure and gravity flow systems and 4-1/2 inch draft systems. Such hydrants shall be wet or dry barrel as required by the delivery system. They shall have suitable crash protection as required by the local jurisdiction.

The Fire Marshal will ensure compliance with this rule.

### SIGNING OF WATER SOURCES

Each hydrant/fire valve or access to water shall be identified as follows:

(a) If located along a driveway, a reflectorized blue marker, with a minimum dimension of 3 inches shall be located on the driveway address sign and mounted on a fire retardant post, or

(b) If located along a street or road,

(1) a reflectorized blue marker, with a minimum dimension of 3 inches, shall be mounted on a fire retardant post. The sign post shall be within 3 feet of said hydrant/fire valve, with the sign no less than 3 feet nor greater than 5 feet above ground, in a horizontal position and visible from the driveway, or

(2) as specified in the State Fire Marshal's Guidelines for Fire Hydrant Markings Along State Highways and Freeways, May 1988.

The Fire Marshal will ensure compliance with this rule.

### PERMITS

The Department of Public Works shall, upon request of the County agencies and departments, make comments and recommendations in response to various applications and permit requests. The department shall review such applications and at the discretion of the County Engineer make recommendations consistent with these Standards.

Formatted: Indent: First line: 0.25"

Formatted: Font: Palatino Linotype, 11.5 pt

Formatted: Tab stops: 0.25", Left

Formatted: Font: Palatino Linotype, 11.5 pt

Formatted: Indent: First line: 0.5", Line spacing: Multiple 1.15 li

Formatted: Font: Palatino Linotype, 11.5 pt

Formatted: Font: Palatino Linotype, 11.5 pt

Formatted: Font: Palatino Linotype, 11.5 pt

Formatted: Indent: First line: 0", Line spacing: Multiple 1.15 li

Formatted: Font: Palatino Linotype, 11.5 pt

Formatted: Indent: First line: 0.5", Line spacing: Multiple 1.15 li

Formatted: Font: (Default) Palatino Linotype, 12 pt, Underline, Font color: Auto

Formatted: Heading 2, Indent: First line: 0", Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Font: 12 pt

Formatted: Font: 12 pt, Not Bold, Underline

Formatted: Font: Palatino Linotype, 11.5 pt

Formatted: Indent: First line: 0.5"

Formatted: Tab stops: 0.25", Left

Formatted: Font: Palatino Linotype, 11.5 pt

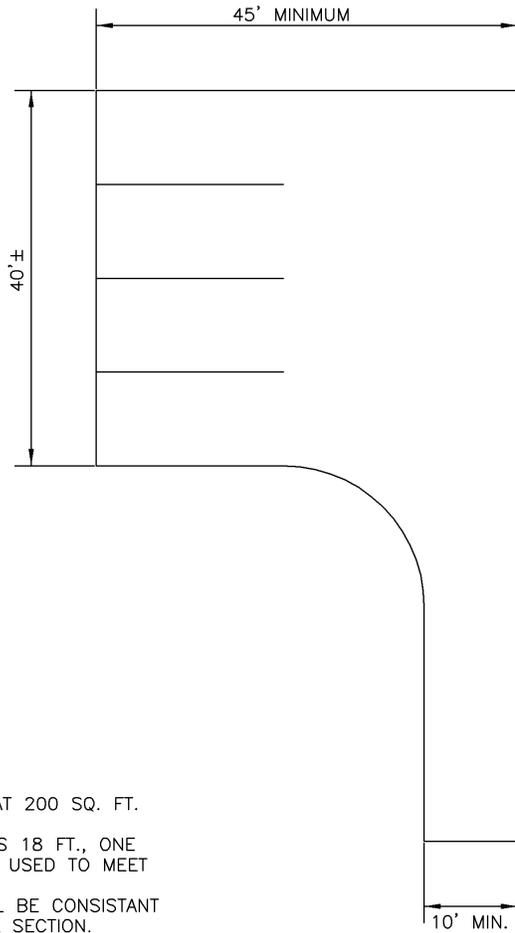
Formatted: Font: Palatino Linotype, 11.5 pt

Formatted: Indent: Left: 0.5"

Formatted: Indent: First line: 0"

# STANDARD DETAILS

P-1 ON LOT PARKING DETAIL



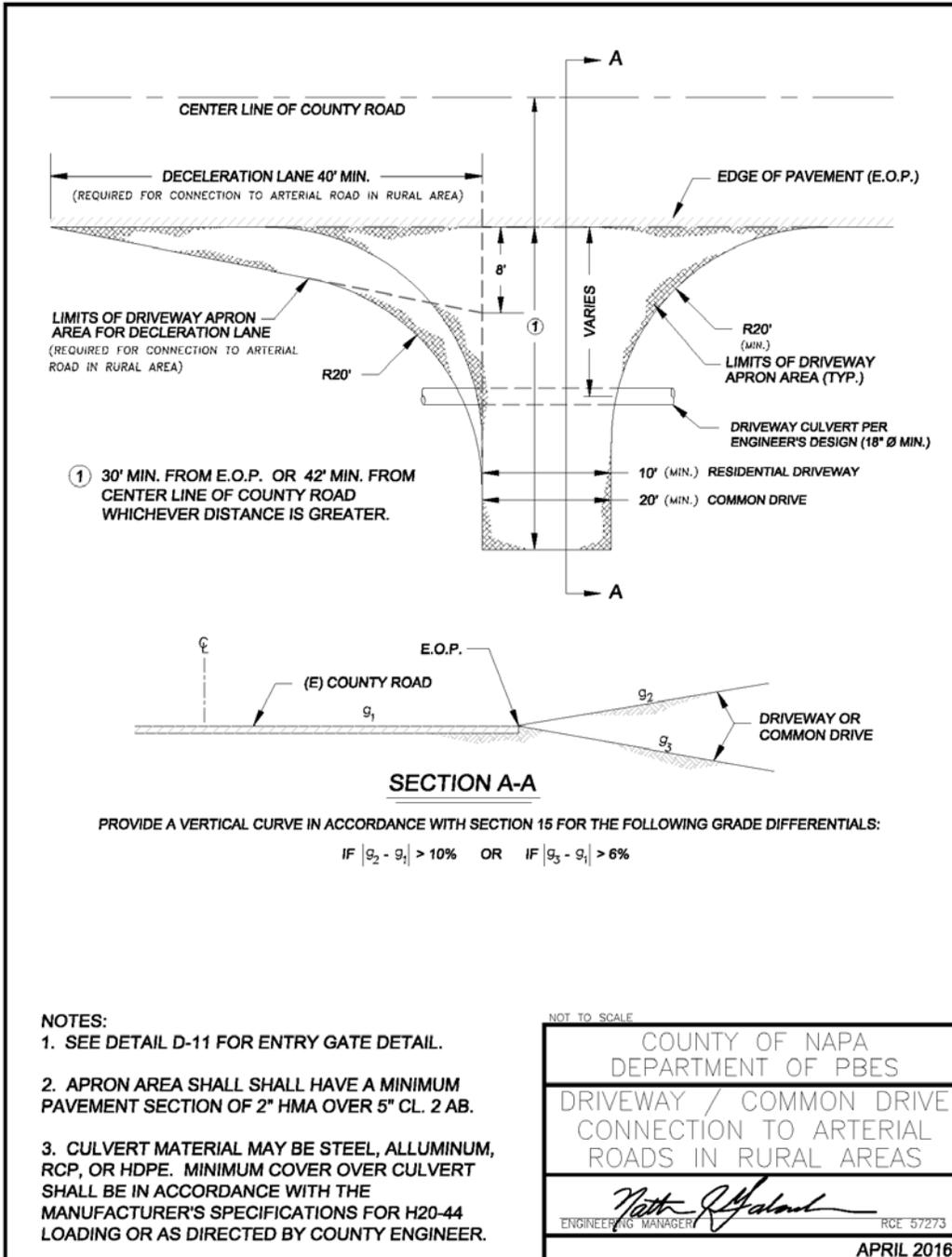
NOTE:

1. 2 TO 4 SPACES PER LOT AT 200 SQ. FT. PER SPACE.
2. IF DRIVEWAY WIDTH EXCEEDS 18 FT., ONE HALF OF DRIVEWAY MAY BE USED TO MEET PARKING REQUIREMENTS.
3. STRUCTURAL SECTION SHALL BE CONSISTANT WITH DRIVEWAY STRUCTURAL SECTION. ALTERNATE STRUCTURAL SECTION MAY BE USED UPON APPROVAL BY COUNTY ENGINEER.
4. MUST BE DUST FREE ALL WEATHER SURFACES.
5. GEOMETRIC DESIGN MAY BE VARIED.

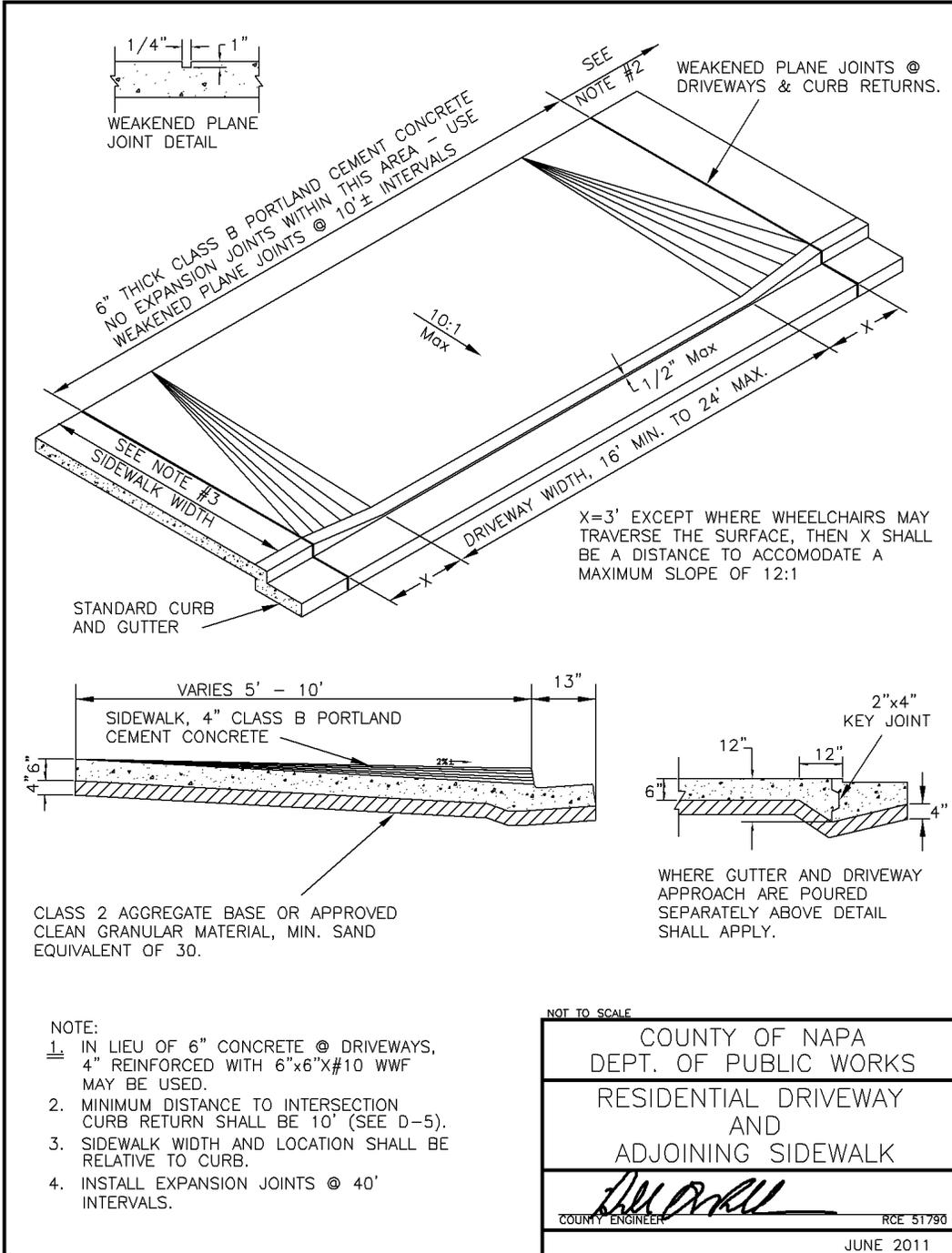
NOT TO SCALE

COUNTY OF NAPA DEPT. OF PUBLIC WORKS	
ON LOT PARKING DETAIL (LOW DENSITY AREA)	
 COUNTY ENGINEER	RCE 17995
JAN 1999	

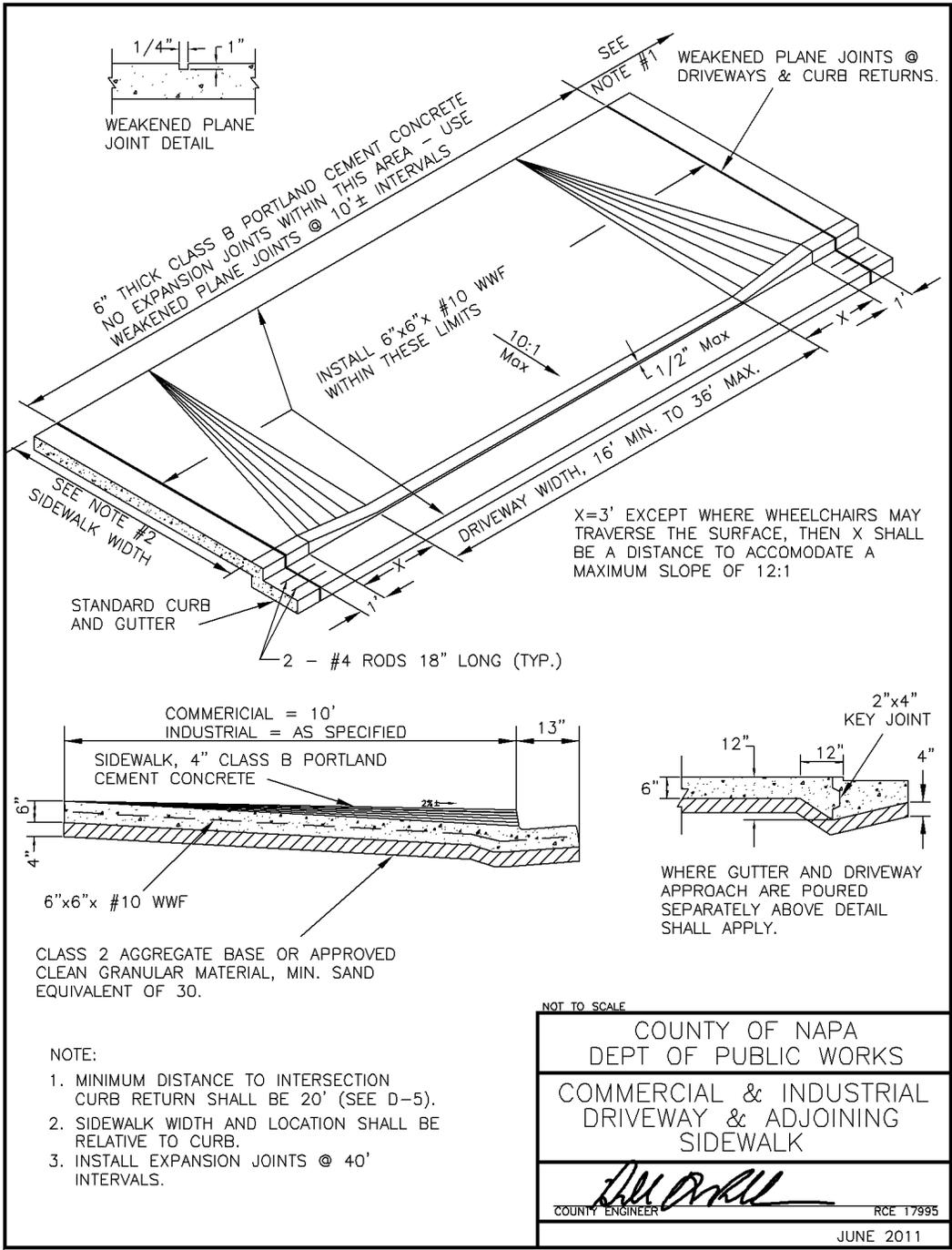
P-2 DRIVEWAY CONNECTION TO ARTERIAL ROADS – RURAL ROADS



**P-3 RESIDENTIAL DRIVEWAY AND ADJOINING SIDEWALK**

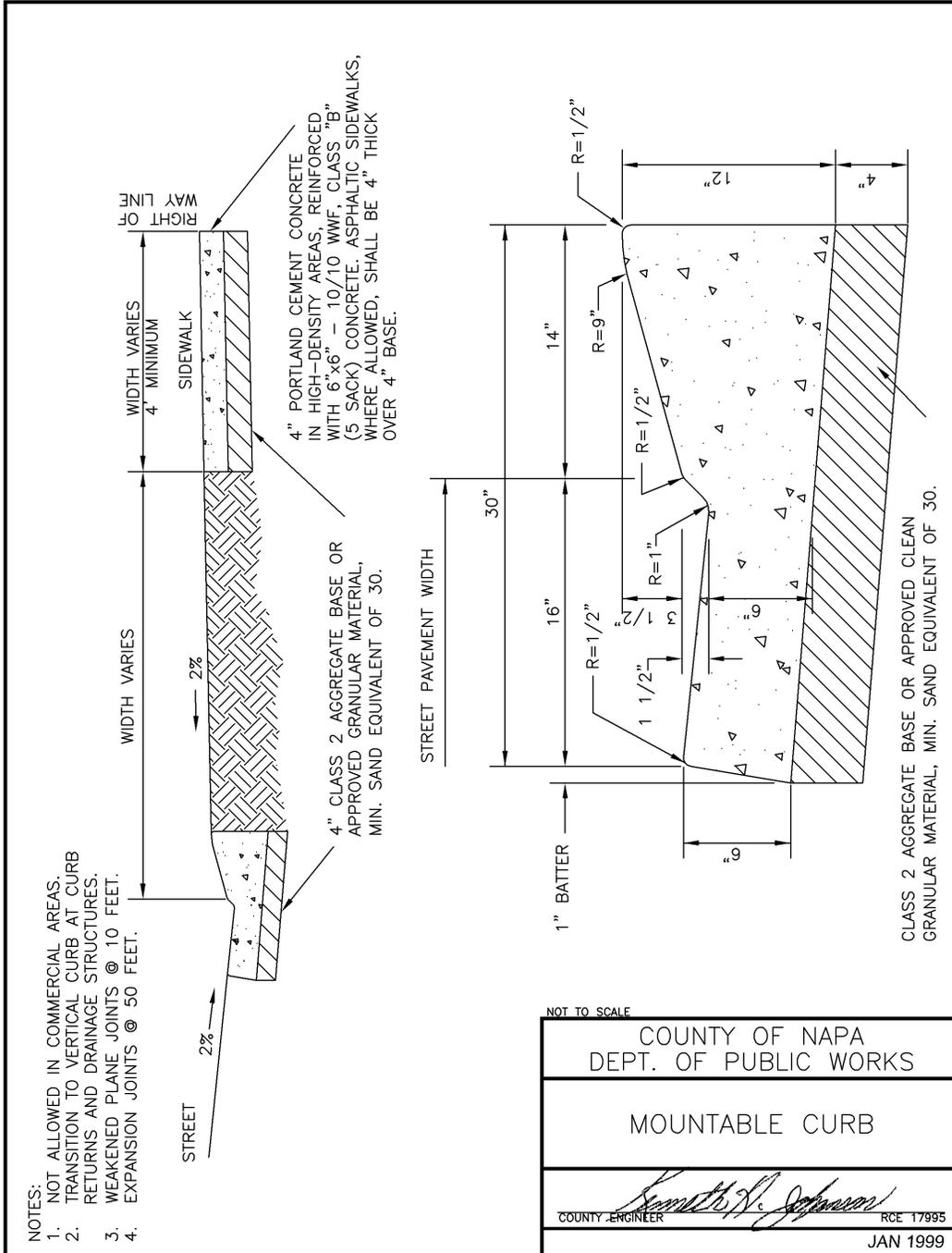


**P-4 COMMERCIAL AND INDUSTRIAL DRIVEWAY AND ADJOINING SIDEWALK**





P-6 MOUNTABLE CURB



NOT TO SCALE

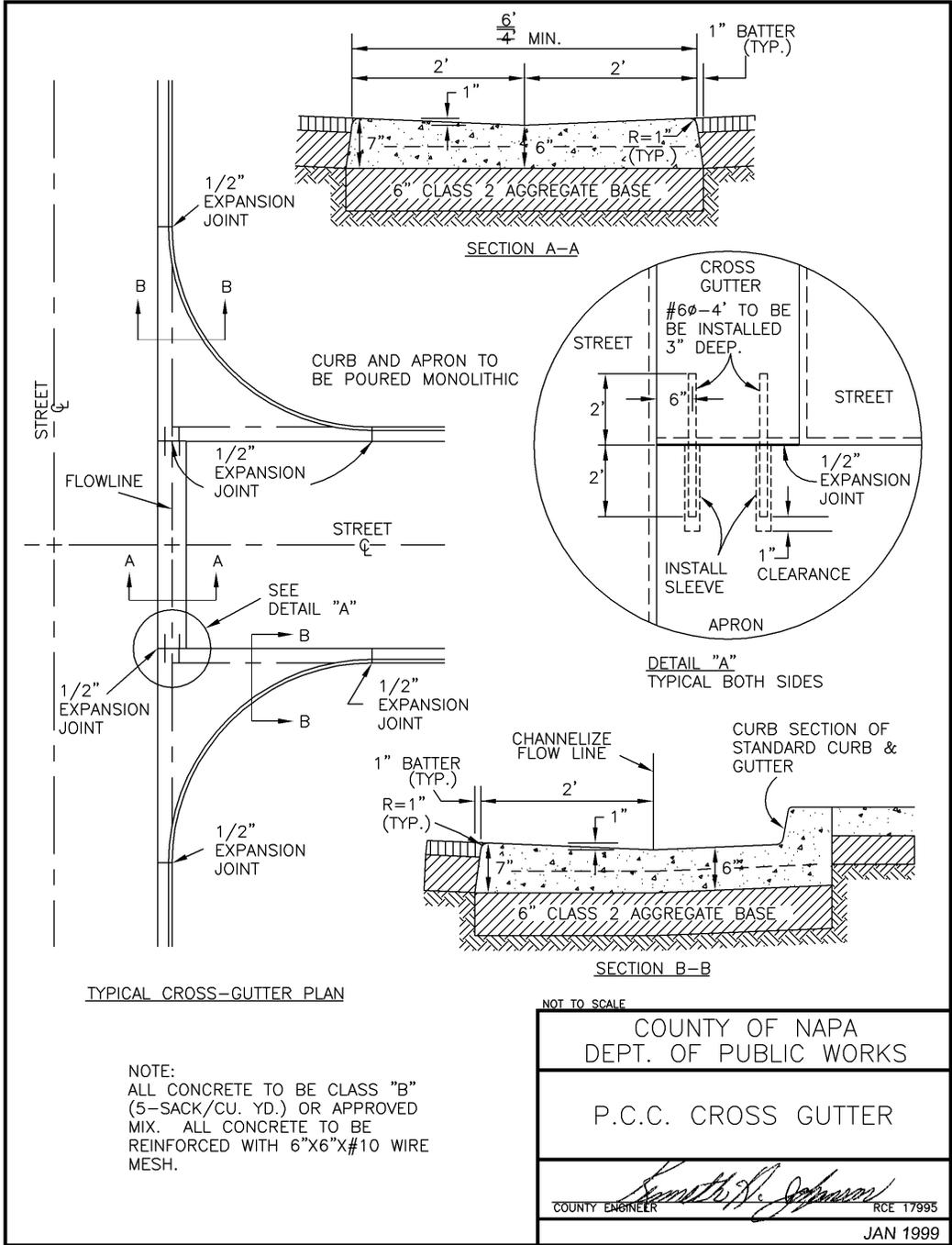
COUNTY OF NAPA  
DEPT. OF PUBLIC WORKS

MOUNTABLE CURB

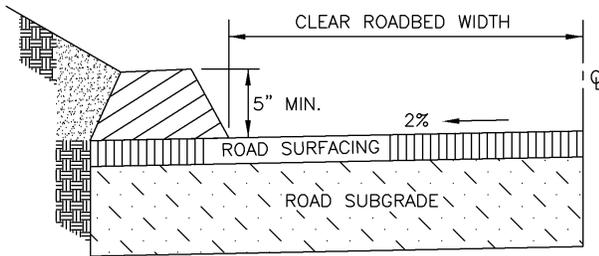
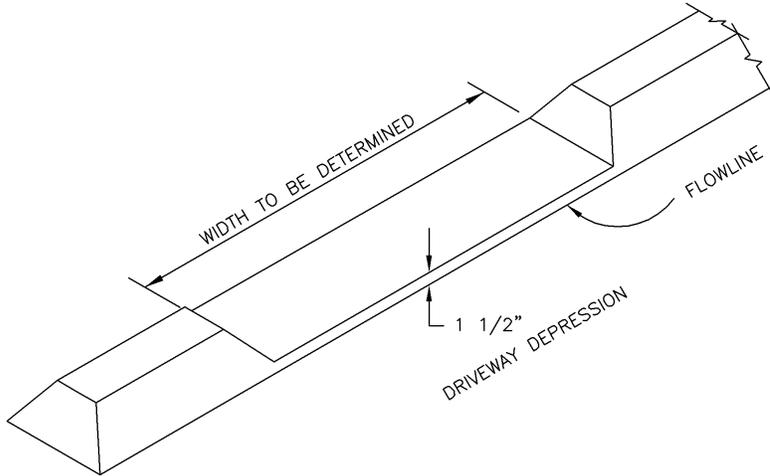
COUNTY ENGINEER *Samuel H. Johnson* RCE 17995

JAN 1999

P-7 P.C.C. CROSS GUTTER



P-8 STANDARD ASPHALT DIKE

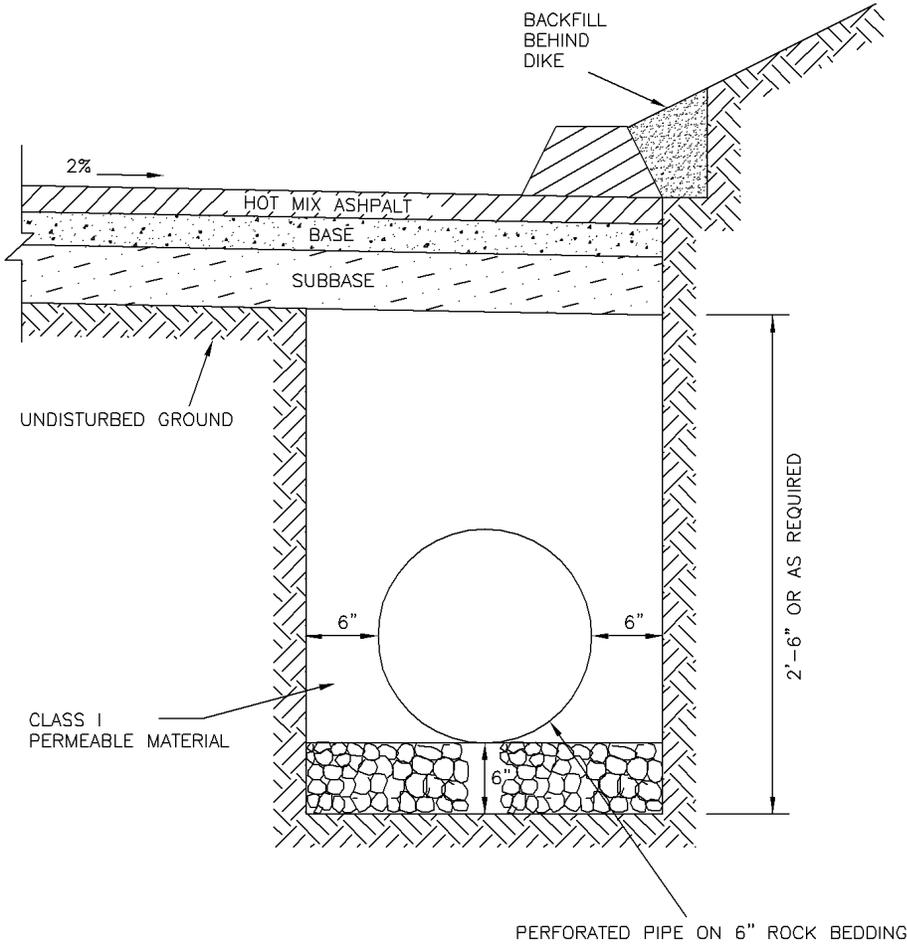


NOTE:  
 DRIVEWAY APPROACHES ON DOWNHILL SIDE  
 SHALL MATCH TOP OF BERM ELEVATION  
 WITHIN THE ROAD RIGHT OF WAY.

NOT TO SCALE

COUNTY OF NAPA DEPT. OF PUBLIC WORKS	
STANDARD ASPHALT DIKE	
COUNTY ENGINEER	<i>Samuel H. Johnson</i> RCE 17995
JAN 1999	

P-9 TYPICAL DIKE INSTALLATION

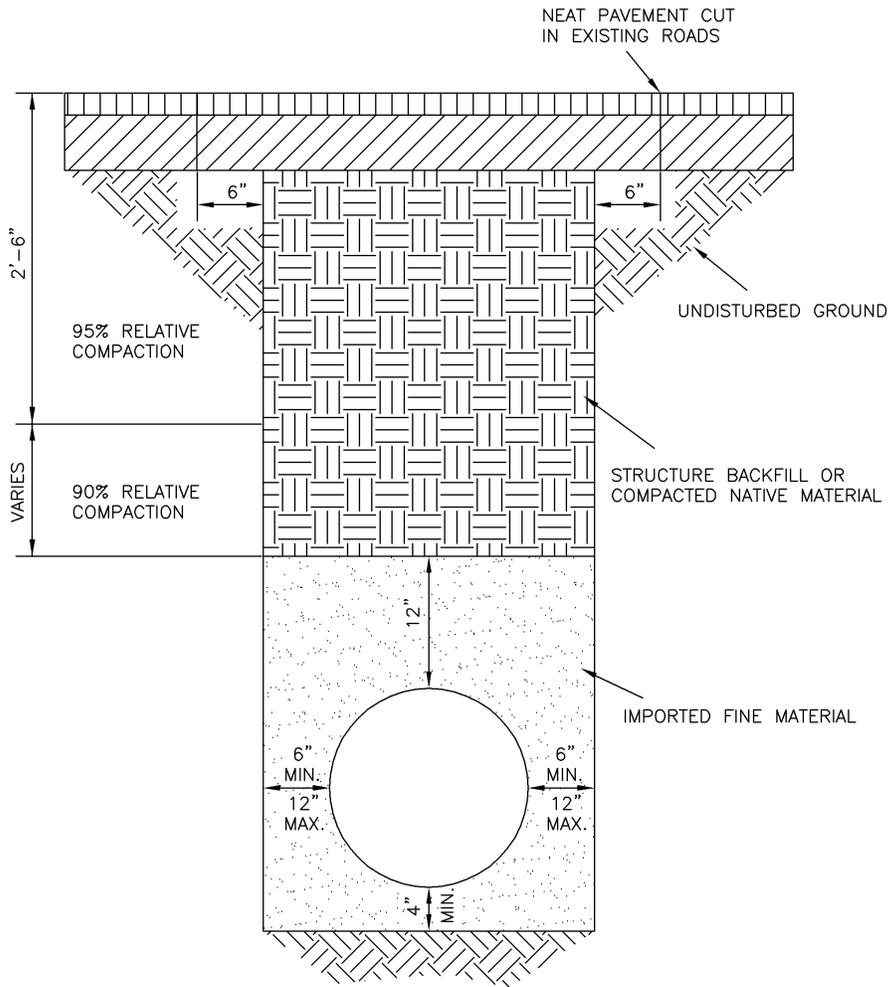


NOTE: SUBDRAINS TO BE INSTALLED AS REQUIRED BY THE COUNTY ENGINEER. TRENCH MAY BE LOCATED 2' FROM EDGE OF PAVEMENT TO FACILITATE CONSTRUCTION. ASPHALT PLUGS SHALL BE PLACED BEHIND THE DIKE AT 50' INTERVALS WHEN ROAD GRADE EXCEEDS 5% OR AS DIRECTED BY THE COUNTY ENGINEER.

NOT TO SCALE

COUNTY OF NAPA DEPT. OF PUBLIC WORKS	
TYPICAL DIKE AND SUBDRAIN INSTALLATION	
<i>Samuel H. Johnson</i> COUNTY ENGINEER	RCE 17995
DATE: JANUARY 1999	

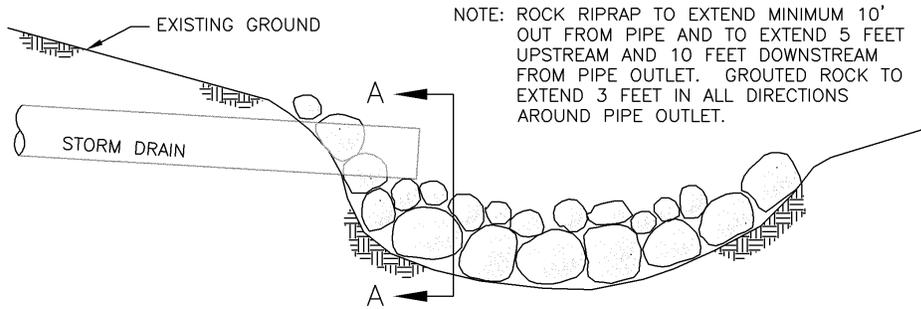
**P-10 TRENCH BACKFILL TYPICAL SECTION**



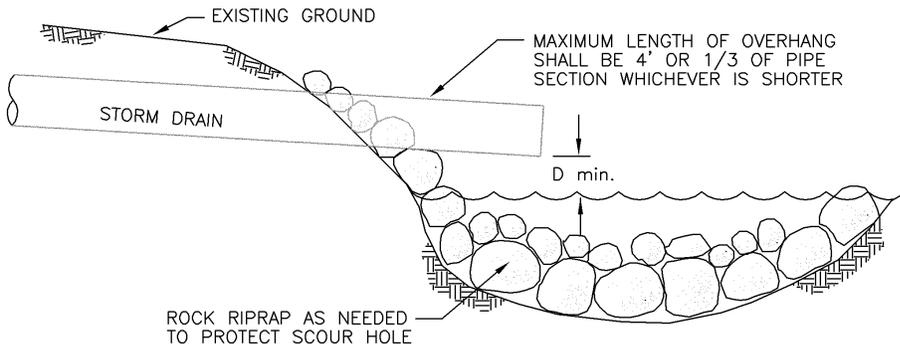
NOT TO SCALE

COUNTY OF NAPA	
DEPT. OF PUBLIC WORKS	
TRENCH BACKFILL TYPICAL SECTION	
COUNTY ENGINEER	<i>Samuel N. Johnson</i>
	RCE 17995
JAN 1999	

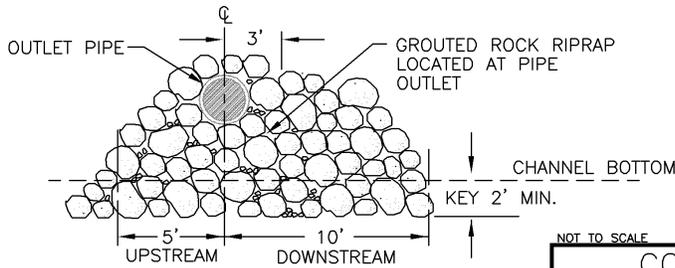
**P-11 DRAINAGE OUTLET**



OUTLET (flush type, subcritical flow only)



OUTLET (drop type)

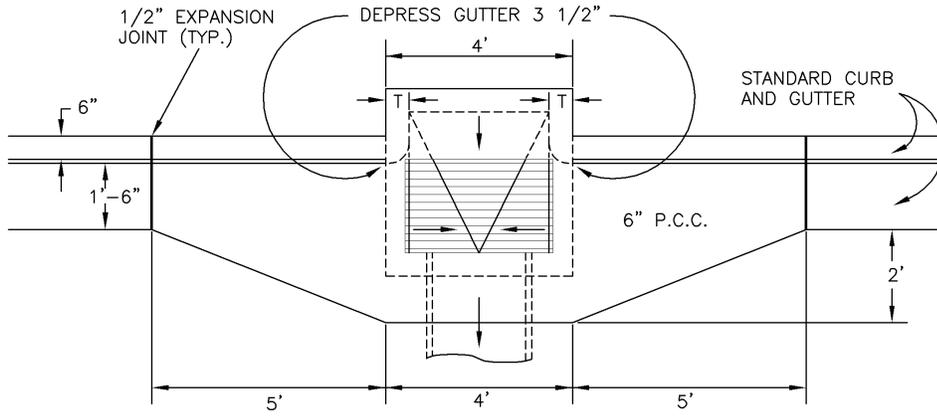


SECTION A-A

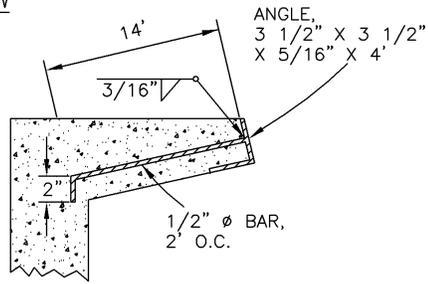
NOTE: INSTALL FLAP GATE ANIMAL GUARDS ON DRAINLINE OUTLET PIPES 15" AND SMALLER  
ADDITIONAL INFORMATION AVAILABLE AT PUBLIC WORKS OFFICE

NOT TO SCALE	
COUNTY OF NAPA DEPT. OF PUBLIC WORKS	
DRAINLINE OUTLET	
COUNTY ENGINEER	RCE 17995
JAN 1999	

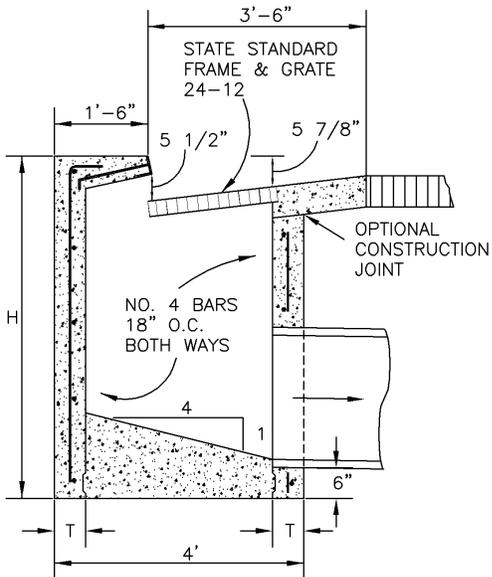
**D-1 STORM DRAIN INLET TYPE "A"**



PLAN VIEW



FACE ANGLE ANCHOR DETAIL



SECTION

NOTE:  
 T = 6" WHEN H < 8'  
 T = 8" WHEN H > 8'  
 NORMALLY USED IN SUMP CONDITION

NOT TO SCALE

COUNTY OF NAPA  
 DEPT. OF PUBLIC WORKS

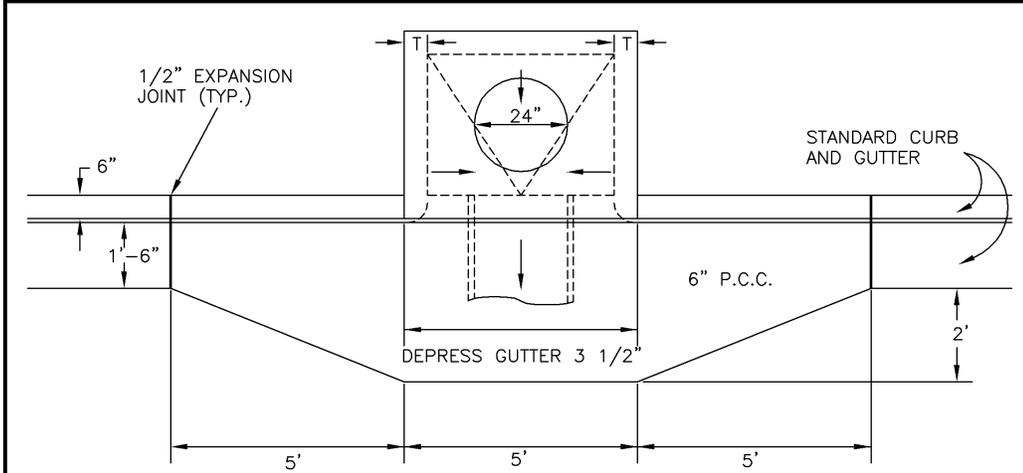
STORM DRAIN INLET  
 TYPE "A"

*Samuel N. Johnson*  
 COUNTY ENGINEER RCE 17995

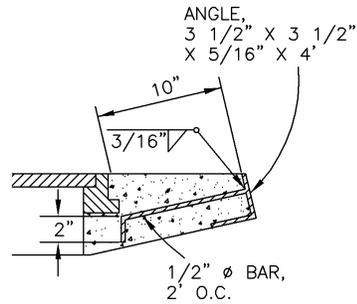
JAN 1999



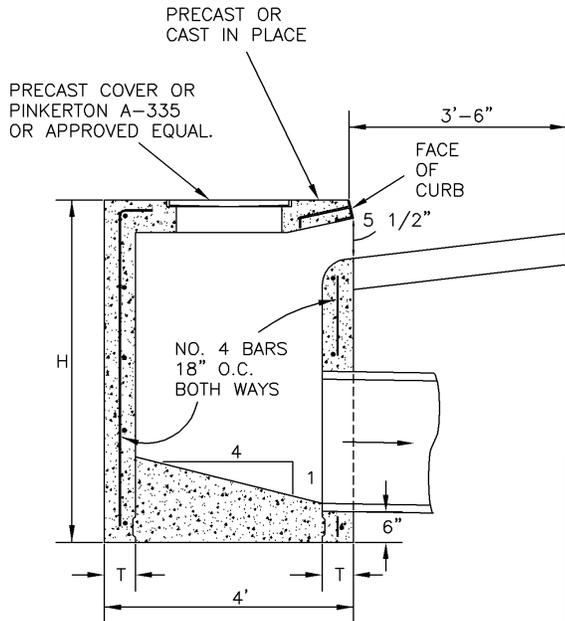
D-3 STORM DRAIN INLET TYPE "C"



PLAN VIEW



FACE ANGLE ANCHOR DETAIL



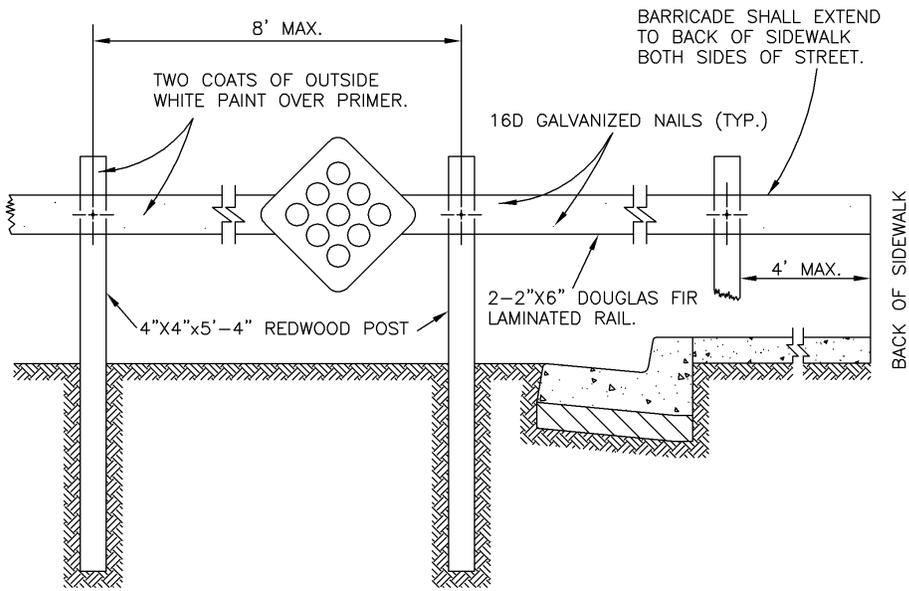
SECTION

NOTE:  
 T = 6" WHEN H < 8'  
 T = 8" WHEN H > 8'  
 NORMALLY USED IN SUMP CONDITION

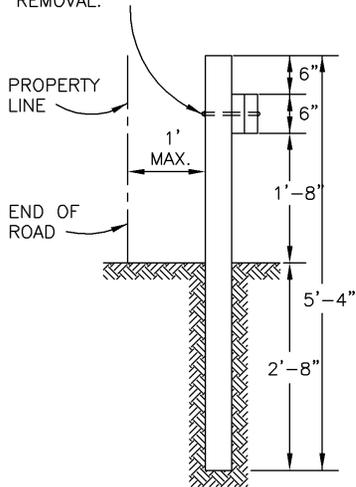
NOT TO SCALE

COUNTY OF NAPA DEPT. OF PUBLIC WORKS	
STORM DRAIN INLET TYPE "C"	
COUNTY ENGINEER <i>Samuel H. Johnson</i>	RCE 17995
JAN 1999	

D-4 STANDARD BARRICADE



1/2"Ø CARRIAGE BOLTS WITH CUT WASHER. BOLTS SHALL BE GALVANIZED. BURR THREADS TO PREVENT REMOVAL.



NOTE:  
1-TYPE "N" MARKER SIGN TO BE MOUNTED ON BARRICADE FACING ONCOMING TRAFFIC.

NOT TO SCALE

COUNTY OF NAPA  
DEPT. OF PUBLIC WORKS

STANDARD BARRICADE

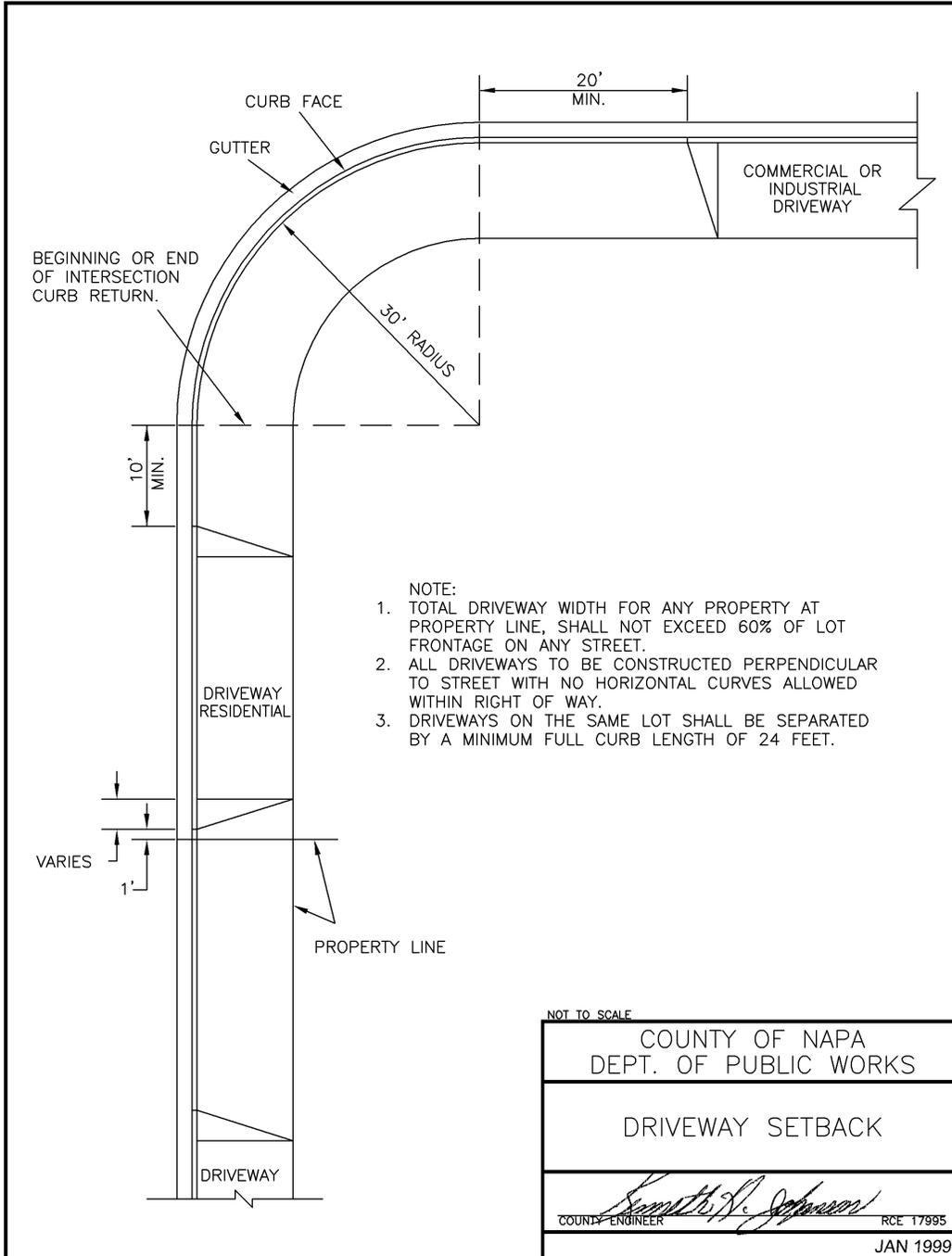
COUNTY ENGINEER

*Samuel H. Johnson*

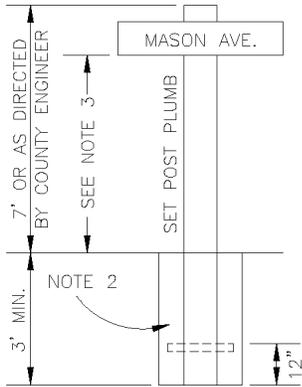
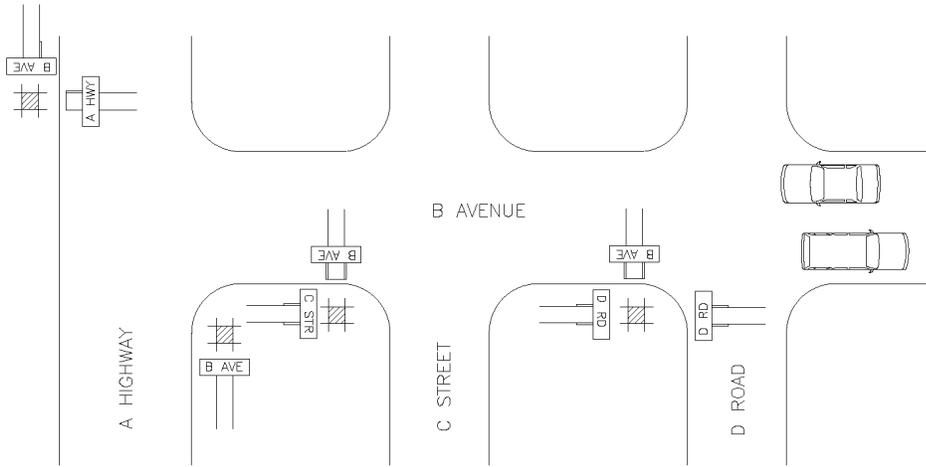
RCE 17995

JAN 1999

D-5 DRIVEWAY SETBACK

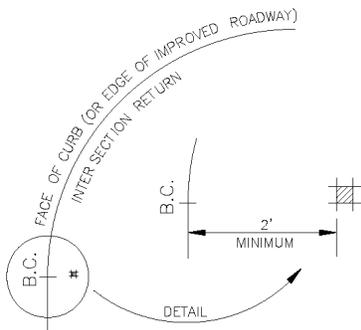


D-6 STANDARD STREET SIGN



NOTE:

1. LOCATION OF INSTALLATION SHALL BE ON THE RIGHT SIDE OF THE PRIMARY ROAD, APPROACHING INTERSECTION. THE SIGN IDENTIFYING THE SECONDARY ROAD SHALL BE UPPERMOST ON THE POST.
2. BACKFILL MATERIAL SHALL BE SUITABLE MATERIAL AND SHALL BE THOROUGHLY TAMPED AND COMPACTED. IN AREA OF PCC SLABS, FORM 12" SQUARE OR CIRCLE TO EXCLUDE PCC. PLACE BACKFILL TO WITHIN 2" OF F.G. AND TOP WITH MORTAR.
3. IN PEDESTRIAN WALK AREAS, MINIMUM HEIGHT SHALL BE 7' UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER. MAY BE 5' TO BOTTOM OF SIGN IN RURAL AREAS WITH NO PEDESTRIAN WALKWAYS.



NOT TO SCALE

COUNTY OF NAPA  
DEPARTMENT OF PBES

STANDARD  
STREET SIGNS

*Nath J. Malouf*  
ENGINEERING MANAGER RCE 57273

DATE: JUNE 2016

**D-6A STANDARD STREET SIGNS, TYPE 'A' AND TYPE 'B'**

**STANDARD STREET SIGNS**

**Street Sign Type A**

- Size:** 30"x9" (36"x9" may be used where additional length is required due to length of copy. If 36" is not sufficient, copy shall be on two lines and size shall be 30" x 18" and 36"x18" may be used if necessary.) If directional arrow is necessary, size shall be as specified for State of California Department of Transportation Type G-7 "Street Name" sign.
- Material:** .125 gage thickness sheet aluminum 6061-T6 alloy or 5052-H38, State of California "Interstate Green" high intensity wide angle retroreflective sheeting.
- Copy:** All copy to be in 6" Series C upper case letters, and 4 ½" Series C lower case letters, nomenclature for street, road, avenue, etc.
- Borders:** All borders to be ½" wide with radiused comers die cut white high intensity wide angle retroreflective sheeting.
- Layout:** Letter spacing and copy layout to be similar to State of California Department of Transportation Type C 1-7 "Street Name Sign."
- Fabrication:** Blanks to be cut to size with approximately ½" rounding of the comers; two (2) holes drilled for ¾" bolt mountings, ½" inset on center of blanks: face to be of State of California specification "Interstate Green" high intensity wide angle retroreflective sheeting prior to the application of the copy and borders. All copy, borders and sheeting to be applied by the thermo-vacuum process. Copy shall be edge sealed when applied.
- Installation:** Signs to be mounted on 4" x 4" S4S Redwood or 4" x 4" S4S pressure treated Douglas Fir posts of length necessitated by physical conditions, per Caltrans Standard Specs. ¾" dia. Carriage bolts with nuts and 1" dia. Washers (all galvanized) for fasteners. Alternate post material and installation will be considered but approval must be obtained prior to installation.

**Street Sign Type B**

(For installation on State Highways, County Major Arterial Highways and County Major Roads).

- Size:** 30"x24" (36" x 24" may be used where additional length is required due to length of copy. If 36" is not sufficient, copy shall be on two lines and size shall be 42"x30" or 42"x36" with full back framing.)
- Copy:** All copy to be in 8" Series C upper case letters and 6" lower case letters. An arrow 17.25" total length denoting left or right or both ways as may be required, to appear below the road name. Copy and arrow to be die cut from white high intensity wide angle retroreflective sheeting.
- Layout:** Letter spacing and copy layout to be similar to State of California Department of Transportation Type G-8-22 Street Name Sign.
- Material, Fabrication and Installation:** Same as Type A.

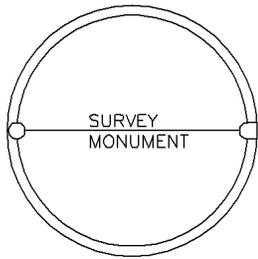
## SUBDIVISION STREET MONUMENTS ACCURACY

### SUBDIVISION STREET MONUMENTS

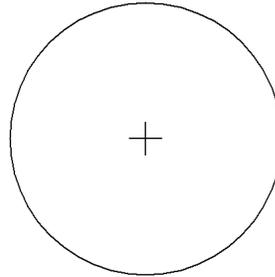
Following is the current established policy of this department for allowable error for subdivision street monuments:

<u>Slope of 75%</u> <u>Of Land</u>	<u>Distance Between</u> <u>Monuments</u>	<u>Angle Between</u> <u>Tangents and/or Chord</u>
0 < 8%	1 / 50,000	4 seconds
8 < 15%	1 / 25,000	8 seconds
15% <	1 / 15,000	14 seconds

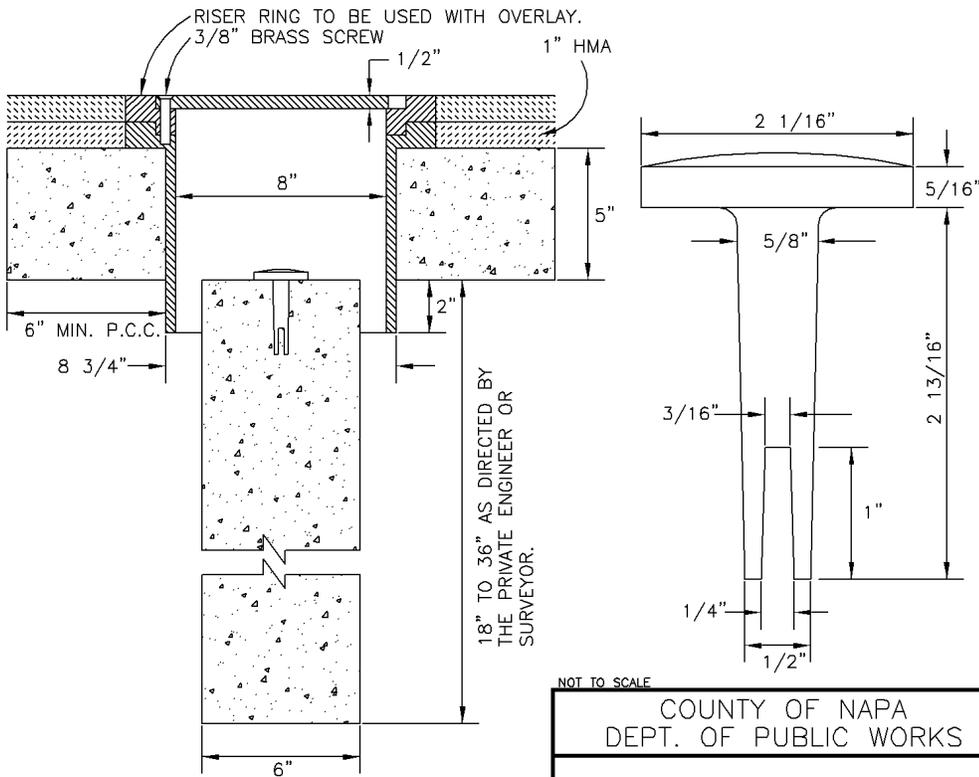
D-7 SURVEY MONUMENT



COVER PLAN



CAP PLAN



NOT TO SCALE

COUNTY OF NAPA  
DEPT. OF PUBLIC WORKS

SURVEY MONUMENT

COUNTY ENGINEER

*Samuel H. Johnson*

RCE 17995

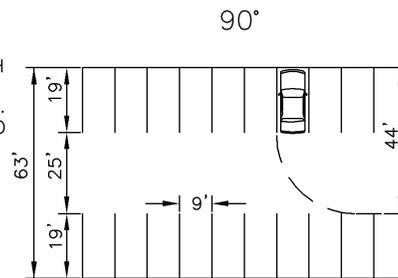
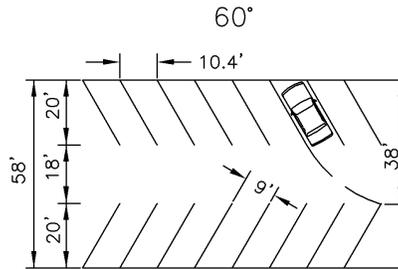
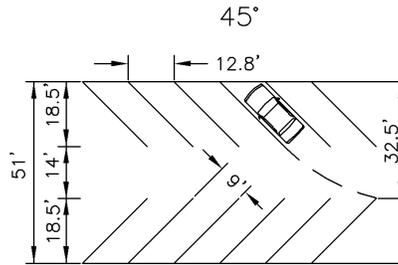
DATE: JANUARY 1999

NOTE:  
THE PRIVATE ENGINEER OR SURVEYOR SETTING  
THE MONUMENT SHALL INDICATE THE EXACT POINT  
BY MARKING A CROSS ON THE CAP. HE SHALL  
STAMP HIS LICENSE TYPE AND NUMBER.

D-8 OFF STREET PARKING

NOTES

1. ALL PARKING AREAS AND DRIVEWAY ACCESS THERETO SHALL BE IMPROVED TO A DUST FREE ALL WEATHER SURFACE – A MINIMUM OF 5 INCHES OF CLASS 2 AGGREGATE BASE AND EITHER 2 INCHES OF ASPHALT CONCRETE OR A DOUBLE SEALCOAT. (THE OPTION SHALL BE THE CHOICE OF THE COUNTY ENGINEER.)
2. WHERE PUBLIC PARKING STALLS ARE ADJACENT TO PUBLIC RIGHTS OF WAY OR PEDESTRIAN PATHS, AN ACCEPTABLE BARRIER SHALL BE INSTALLED TO PREVENT ENCROACHMENT.
3. PARKING STALLS SHALL BE DELINEATED TO THE SATISFACTION OF THE COUNTY ENGINEER.
4. THE NUMBER OF STALLS NECESSARY SHALL BE DETERMINED BY THE CONSERVATION DEVELOPMENT AND PLANNING DEPARTMENT IN CONFORMANCE WITH COUNTY ORDINANCES.
5. ALTERNATE CONFIGURATION AND PAVEMENT SECTION MAY BE CONSIDERED BY THE COUNTY ENGINEER.
6. WHERE THROUGH CIRCULATION DOES NOT EXIST, PROVISIONS FOR TURN AROUND SHALL BE PROVIDED.
7. THE FRONT TWO FEET OF REQUIRED PARKING LENGTH MAY BE USED TO ENLARGE ADJACENT LANDSCAPING BUT NOT USED TO MEET MIN. LANDSCAPING REQUIREMENTS. LANDSCAPING WITHIN OVERHANG SHALL BE LIMITED TO LOW-LYING SHRUBS AND GROUND COVER.
8. A MAXIMUM OF 35% OF THE STALLS IN PARKING LOTS OF MORE THAN TWENTY SPACES MAY BE DESIGNATED FOR COMPACT CARS. THE STALL WIDTH MAY BE REDUCED BY ONE FOOT AND THE STALL LENGTH MAY BE REDUCED BY THREE FEET.
9. STALLS FOR COMPACT CARS SHALL BE CLEARLY DESIGNATED EITHER BY "COMPACT CARS ONLY" STENCILED ON THE PAVEMENT OR AN 18" BY 18" SIGN STANDING SEVEN FEET HIGH WITH THREE INCH LETTERING.
10. PARALLEL PARKING SPACES SHALL BE 8' X 22' WITH THE FOLLOWING EXCEPTIONS:
  - A. PARALLEL SPACES ALONG A WALL, FENCE OR HEDGE SHALL BE 10 FEET WIDE.
  - B. PARALLEL SPACES HAVING NO OBSTRUCTION OR ADJACENT PARKING SPACE WITHIN TEN FEET OF ONE END MAY REDUCE THE LENGTH TO 20 FEET. IF BOTH ENDS ARE SIMILARLY CLEAR, THE SPACE MAY BE REDUCED TO 18 FEET.



NOT TO SCALE

COUNTY OF NAPA DEPT. OF PUBLIC WORKS
OFF STREET PARKING
COUNTY ENGINEER <span style="float: right;">RCE 17995</span>
JAN 1999

D-9 HANDICAP SYMBOL

Notes:

Location goal: On shortest accessible route to accessible entrance(s).

Placement goal: Persons with disabilities must not be compelled to wheel or walk behind parked cars other than their own.

Dimensions:

Van: Min 9 feet wide with min 8 feet side loading & unloading *passenger side aisle*, min 18 feet length.

Auto: Min 9 feet wide with min 5 feet wide loading and unloading *passenger side aisle*, min 18 feet long. Two spaces may share the same 5 feet aisle.

Slope: Max 1 vertical to 50 horizontal in any direction.

Signage:

"Van Accessible" for van spaces. Reflectorized International Symbol of Accessibility at each space, min 70 inches sq., min 80 inches high if in path of travel, and unobscured by a parked vehicle. (see symbol below). Tow away sign with telephone number at each entrance to parking area or adjacent to accessible spaces, min size: 17 inches by 22 inches, 1 inch high letters.

Surface Marking: Painted or outlined space in blue and outlined profile view depicting wheelchair with occupant, or 36 inch by 36 inch outlined profile view of wheelchair with occupant in white on blue background visible to traffic enforcement officer when vehicle occupies space.

Curb Ramps: Ramps shall be provided wherever an accessible route crosses a curb.

Maximum slope shall be 1:12. Minimum width, exclusive of flares shall be 36 inches.

See current California Title 24, Sections 3105A(n) & 3107A of the California Code of Regulations for further information.

Total Number of Parking Spaces	Handicaped Accessible Spaces
1 – 25	1 van accessible space
26 – 50	2 including 1 van accessible space
51 – 75	3 including 1 van accessible space
76 – 100	4 including 1 van accessible space
101 – 150	5 including 1 van accessible space
151 – 200	6 including 1 van accessible space
201 – 300	7 including 1 van accessible space
301 – 400	8 including 1 van accessible space
401 – 500	9 including 2 van accessible spaces
500 – 1000	2% including 3 van accessible spaces
1001 +	20 + 1 per 100 or fraction, including min 1 van accessible space per 8 accessible spaces or fraction thereof.

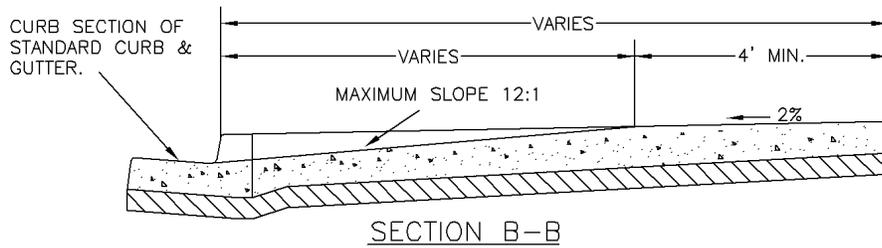
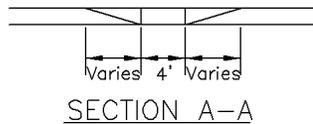
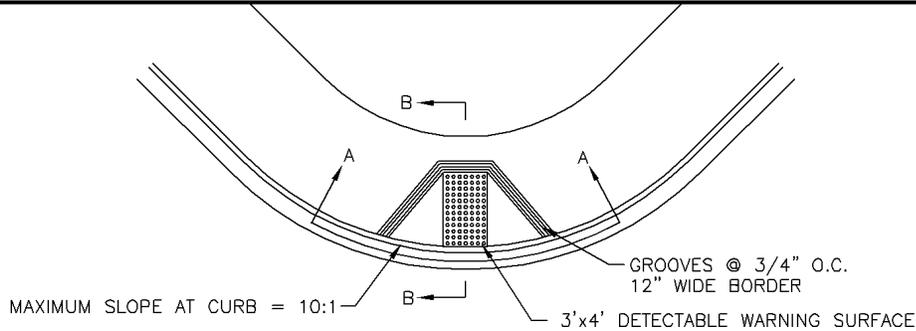


International Symbol of Accessibility

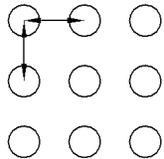
NOT TO SCALE

COUNTY OF NAPA DEPT. OF PUBLIC WORKS
HANDICAP PARKING
 COUNTY ENGINEER
RCE 51790 JUNE 2011

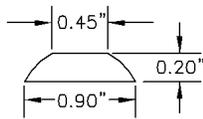
**D-10 WHEEL CHAIR RAMP**



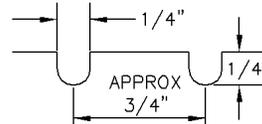
1.67"-2.35" CENTER TO CENTER SPACING



**DETECTABLE WARNING SURFACE DETAIL**



**RAISED TRUNCATED DOME DETAIL**



**GROOVE DETAIL**

**NOTES:**

1. WHEELCHAIR RAMPS ARE TO BE LOCATED AT THE CENTER OF THE RETURN.
2. RAMP SURFACES THAT ARE NOT GROOVED SHALL BE FINISHED WITH A ROUGHER SURFACE THAN THE SURROUNDING SURFACE.
3. WHEN EXISTING FACILITIES ARE NONCONFORMING OR RIGHT OF WAY LIMITATIONS EXIST, RAMPS MAY BE MODIFIED AS APPROVED BY THE COUNTY ENGINEER. SEE CALTRANS STANDARD PLANS SHEET A88A FOR OPTIONS AND OTHER DETAILS.

NOT TO SCALE

COUNTY OF NAPA  
DEPT. OF PUBLIC WORKS

WHEEL CHAIR RAMP

COUNTY ENGINEER

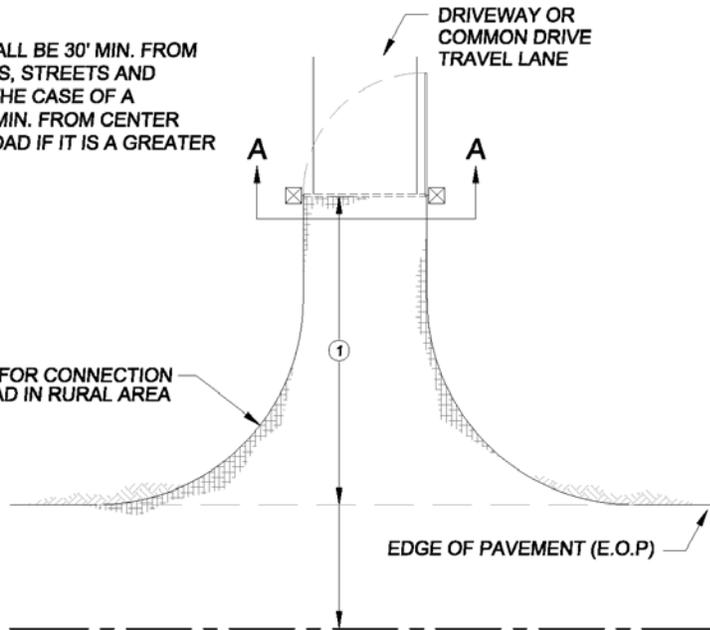
RCE 51790

JUNE 2011

D-11 GATED ENTRANCE

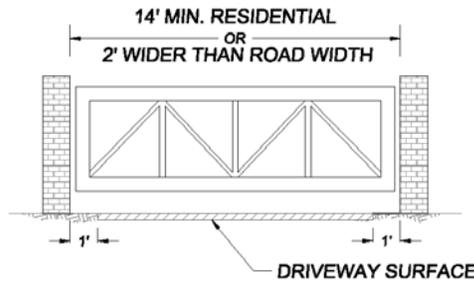
- ① GATE SET BACK SHALL BE 30' MIN. FROM E.O.P. OF ALL ROADS, STREETS AND DRIVEWAYS OR IN THE CASE OF A COUNTY ROAD, 42' MIN. FROM CENTER LINE OF COUNTY ROAD IF IT IS A GREATER DISTANCE THAN 30'.

SEE DETAIL P-2 FOR CONNECTION TO COUNTY ROAD IN RURAL AREA



NOTES:

1. FOR GATES THAT SWING TOWARD PUBLIC ROADWAY THE MINIMUM SET BACK SHALL BE A TOTAL OF THE SET BACK DISTANCE PLUS THE TOTAL WIDTH OF THE GATE PLUS 2 FEET.
2. ALL GATES SHALL HAVE A FIRE MARSHAL APPROVED KEY ACCESS:
  - a) ELECTRIC GATES SHALL HAVE A KNOX KEY SWITCH MOUNTED TO ACCESS PANEL.
  - b) MANUAL GATES SHALL HAVE A KNOX PADLOCK INSTALLED.
3. FOR GATES THAT MEET SET BACK REQUIREMENTS AND ARE STILL IN THE COUNTY RIGHT-OF-WAY, THE PROPERTY OWNER SHALL OBTAIN A RECORDED ENCROACHMENT PERMIT FOR THE GATE STRUCTURE.
4. GATE SHALL PROVIDE FOR AN UNOBSTRUCTED VERTICAL CLEARANCE OF 15 FEET.



SECTION A-A

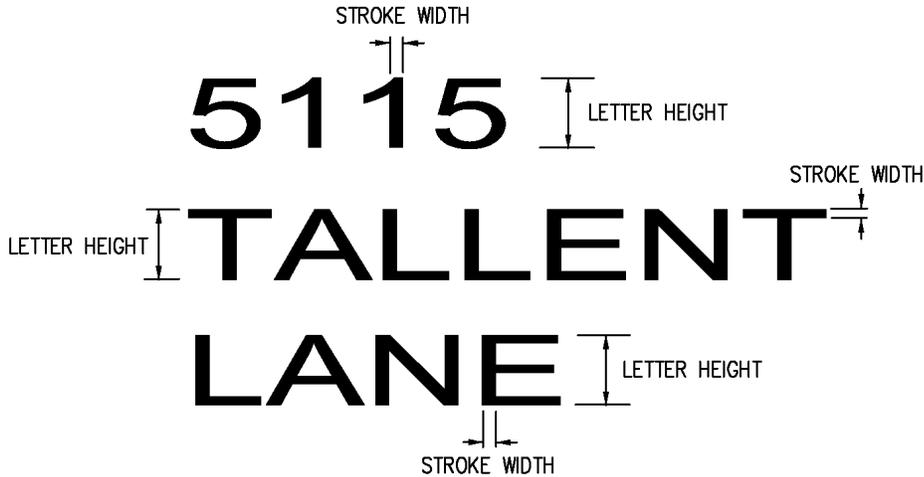
NOT TO SCALE

COUNTY OF NAPA DEPARTMENT OF PBES
GATED ENTRY
<i>Nath J. Haland</i> ENGINEERING MANAGER RCE 57273
SEPTEMBER 2016

**D-12 ADDRESS SIGNAGE**

Formatted: Heading 2, Centered

**SIGNAGE SIZE AND LOCATION OF ADDRESSES**



	MINIMUM LETTER HEIGHT	MINIMUM STROKE WIDTH	
RESIDENTIAL	4"	1/2"	LETTERING SHALL BE REFLECTORIZED OR ILLUMINATED AND CONTRASTING WITH THE BACKGROUND COLOR OF THE SIGN.
COMMERCIAL	6"	3/4"	
INDUSTRIAL	12"	1-1/2"	

**ADDRESS SIGNAGE NOTES**

- ALL BUILDINGS SHALL HAVE A PERMANENTLY POSTED ADDRESS, WHICH SHALL BE PLACED AT EACH DRIVEWAY ENTRANCE AND VISIBLE FROM BOTH DIRECTIONS OF TRAVEL ALONG THE ROAD. IN ALL CASES, THE ADDRESS SHALL BE POSTED AT THE BEGINNING OF CONSTRUCTION AND SHALL BE MAINTAINED THEREAFTER, AND THE ADDRESS SHALL BE VISIBLE AND LEGIBLE FROM THE ROAD ON WHICH THE ADDRESS IS LOCATED.
- ADDRESS SIGNS ALONG ONE-WAY ROADS SHALL BE VISIBLE FROM BOTH THE INTENDED DIRECTION OF TRAVEL AND THE OPPOSITE DIRECTION.
- WHERE MULTIPLE ADDRESSES ARE REQUIRED AT A SINGLE DRIVEWAY, THEY SHALL BE MOUNTED ON A SINGLE POST.
- WHERE A ROADWAY PROVIDES ACCESS SOLELY TO A SINGLE COMMERCIAL OR INDUSTRIAL BUSINESS, THE ADDRESS SIGN SHALL BE PLACED AT THE NEAREST ROAD INTERSECTION PROVIDING ACCESS TO THAT SITE.

NOT TO SCALE

NAPA COUNTY FIRE DEPARTMENT
ADDRESS SIGNAGE
FIRE SAFE STANDARDS
SEPTEMBER 2016

# APPENDIX

## "A"



A Tradition of Stewardship  
A Commitment to Service

***CAL FIRE***  
**NAPA COUNTY**  
**FIRE MARSHAL OFFICE**

**Development Guidelines**

**Revision: August 2016**

## TABLE OF CONTENTS

Service Area.....	1
Applicable Codes and Standards.....	1
Fire Sprinkler Systems.....	1
Water Storage .....	2
Wildland Urban Interface Building Standards.....	2
Defensible Space.....	2
Site Access – Driveways – Bridges.....	3
Plan Submittal.....	3
Inspections.....	TBD
Final Occupancy Checklist.....	TBD
Details.....	TBD

## **I. SERVICE AREA**

CAL FIRE/Napa County Fire Department (CAL FIRE/NCFD) provides fire protection, emergency medical, rescue, and Fire Marshal services to the unincorporated areas of Napa County and the Town of Yountville.

## **II. APPLICABLE CODES AND STANDARDS**

Code Reference:

2013 California Fire Code with local amendments (CFC)

Public Resources Code (PRC 4290 & 4291)

2013 California Building Code with local amendments

Adopted Standards:

NFPA 13D, 13R-2013 Edition, Fire Sprinkler Systems for One & Multi-Family Dwellings

NFPA 1142-2012 Edition, Water Supplies, Suburban and Rural Fire Fighting.

NFPA-22, 2013 Edition, Water Tanks for Private Fire Protection

## **III. AUTOMATIC FIRE SPRINKLER SYSTEM**

Automatic fire sprinkler systems are required in all new residential occupancies in Napa County as of January 2008. Automatic fire sprinkler systems shall be designed and installed in compliance with the NFPA 13-D, 2013 edition. Plans for the residential sprinkler systems are a separate submittal and can be deferred until after the residential building permit has been issued provided the building plans identify that the structure will be protected by an automatic fire sprinkler system designed and installed in compliance with NFPA 13 D, 2013 edition under a separate permit. Water storage to operate the sprinkler system design area in compliance with NFPA 13-D is also required. Typically water storage for a residential sprinkler system is a two sprinkler head calculation for a minimum of ten minutes although building construction features may increase the water storage required for the sprinkler system.

## **IV. WATER STORAGE**

Water storage for fire flow is required for all residential occupancies in addition to water storage to operate the sprinkler system. For single family residences under 6000 square feet the amount of water storage required is 2500 gallons of water storage plus the water storage to operate the sprinkler system (which is calculated by the fire sprinkler contractor). Please contact the Napa County Fire Marshal's Office for multi-family residential projects or structures over 6,000 square feet. The water storage shall be delivered by either a wet draft hydrant or a pressurized hydrant. Piping for the water storage shall be a minimum of 4" and shall be either C-900 or ductile iron pipe.

Swimming pools are allowed as alternative water storage for fire protection. The water storage shall be configured in compliance with Detail #3 OR #5 of the Napa County Standards.

**EXCEPTION: If the proposed project is served by a community water system, no tank is required. The nearest hydrant shall be within 1,000 feet of the residence and shall be shown on the building plans.**

## **V. WILDLAND URBAN INTERFACE BUILDING STANDARDS**

As of January 2008 structures built in fire hazard severity zones are required to comply with the ignition resistant construction requirements of the 2013 California Building Code, Part 2 Volume 1, Chapter 7A. Chapter 7A of the building code is enforced by the Napa County Building Department.

### **VI. DEFENSIBLE SPACE**

Formatted: Highlight

Defensible space is a perimeter that provides a buffer to stop or slow the spread of an encroaching wildland fire or prevent a structure fire from escaping into the adjacent wildland. Defensible space is an area of reduced and/or modified fuel that will not readily transmit or carry fire and will provide firefighters with a safe working environment that allows them to protect buildings and structures from encroaching wildfires and minimizes the chance that a structure fire will escape to the surrounding wildland.

Public Resource Code 4291, the California Fire Code and the Napa County Fire Hazard Abatement Ordinance require 100 feet of defensible around all structures and also require 10 feet of defensible space on each side of roads and driveways. The Napa County Defensible Space Guidelines were developed to provide a guideline of fuel modification to ensure compliance with the state and local requirements for defensible space. The guidelines can be found online at <http://www.napafirewise.org/>.

For new construction in the SRA, California Fire Code Section 4907 and the SRA Fire Safe Regulations (Title 14, Division 1.5, Chapter 7, Subchapter 2, Section 1270) Article 5 requires:

- (a) All parcels 1 acre and larger shall provide a minimum 30 foot setback for buildings and accessory buildings from all property lines and/or the center of the road.
- (b) For parcels less than 1 acre, the local jurisdiction shall provide for the same practical effect.

Formatted: Font: (Default) Times New Roman

Formatted: Indent: Left: 0.5", No bullets or numbering

Formatted: Font: (Default) Arial, 12 pt

Whenever the setback, as defined above, is less than 30 feet, the design professional is responsible for detailing how the building design will provide the same overall practical effect. The Fire Marshal and the Fire Marshal's designees will review the proposed design. Examples of methods that may be considered as providing the same overall practical effect are: increasing fire wall rating, designing fire exterior sprinklers and setback easements on adjacent parcels.

Formatted: No bullets or numbering

(b)

## **VII. SITE ACCESS - DRIVEWAYS - BRIDGES**

Fire department access is required for all new structures. The Napa County Planning and Engineering department is responsible for enforcing the road/driveway requirements found in both the California Fire Code and the Napa County Road and Street Standards. The Napa County Fire Marshal's Office will review all building permit applications for adequate access to and around structures. This will typically include access to within 150 feet of all exterior portions of a structure and a turnaround adequate for responding fire apparatus within 50 feet of the structure. Bridges roadways that access new residential structures shall be certified to carry 75,000 pounds by an engineer and load limits shall be posted.

### VIII. PLAN SUBMITTAL

A minimum of **Three SETS** of plans shall be submitted for fire review to the Napa County Building Department at 1195 Third Street in Napa. The Building Department will forward all plans that require fire department approval to our office for review. When approved, plans will be sent back to the building department for permit issuance. If changes are necessary a correction letter will be sent to the applicant with a list of the required corrections. Three sets of corrected plans shall be submitted directly to Napa County Fire Marshal at 1125 3<sup>rd</sup> street Napa, CA 94559.

In order to expedite your plan review, please have **ALL** of the following information on your plans:

1. Identify on the plans the total square footage of proposed residence or building and specify as new or remodeled construction.
2. The site plan shall be to scale with north reference.
3. A note shall be on all residential building plans indicating that the structure will be protected by an automatic fire sprinkler system designed and installed in compliance with NFPA 13 D, 2013 edition under a separate permit.
4. Show the numerical address on the plans. The numerical address shall be posted at the public roadway and any other intersections or residential driveway. Height and numbers shall be a minimum of 4 inches with reflective numbers or numbers on a contrasting back ground and/or illuminated See detail #14 Napa County Fire Standards.
5. Defensible space for wildfire shall be a minimum of 100 feet from all structures. Greater clearance may be required upon inspection as determined due to slope and fuel load.
6. Horizontal defensible space shall be provided a minimum of 10 feet on each side of the driveway.
7. Overhead clearance of the entire length of the driveway shall be a minimum of 15 foot vertical clearance. See detail #8 of the Napa County Fire Standards.
8. Location, size and radius of turnarounds. Turnarounds at the building site shall be constructed so as to allow large fire equipment to turn around with a minimum of maneuvering. Turnarounds shall be within 50 feet of the structure. More than one turnaround may be required depending on building size and access.

Note: Fire hydrants shall not be located in the turnaround area. See detail #11, #12 and #13 of the Napa County Fire Standards.

9. Driveway – include any easements from the county road to the residence and include distance of driveway in notes.
10. Gates – Where gates are provided a means of fire department entry shall also be provided. Manual gates shall have a KNOX padlock provided. Electronic gates shall be provided with a

KNOX key switch to override the system. All gates shall open inward. Gate entrances shall be 2 feet wider than the lane serving the gate, or a maximum required width of 20 feet, and shall be located a minimum of 30 feet from the roadway to allow a vehicle to stop without obstructing traffic. See

Napa County Fire Standards detail # 7. Knox products should be ordered on line at [www.knoxbox.com](http://www.knoxbox.com) or call 1-800-552-5569. **NOTE:** When ordering any Knox locking devices, be sure to specify the locks to be keyed for "CAL FIRE/Napa County".

11. Water Storage - Plans shall show all components of the water storage including water storage tank, piping, hydrants, and capacity dedicated to fire protection. The water storage required for domestic use shall be in addition to the required storage for fire protection.

Swimming pools are an acceptable use for fire protection. See detail #3 and #5 of the Napa County Standards.

12. The fire hydrant shall be located no closer than 30 feet and no further than 150 feet from the residence or building. The fire hydrant shall be located centered in a turnout area and shall be within 5 feet to the edge of curb or driveway. The hydrant outlet must be within 24 inches to 36 inches above finished grade of turnout area. See detail #2 of the Napa County Fire Standards.

**NOTE:** The fire hydrant turnout location shall be established in an area separate from the fire apparatus turn around area. The fire hydrant turnout area is for fire apparatus to be parked during drafting operations and shall not interfere with the fire department access to and from the structure.

13. Show on plans the size, location and routing of pipe from fire hydrant to water source. Pipe shall be a minimum of 4 inches in diameter C-900 or ductile iron with a gate valve and 4½ inch national hose male outlet. See detail #2 of the Napa County Standards.

- a. **Wet draft** hydrant systems will require a 4 ½ inch male National hose thread adapter with metal cap.
- b. A pressurized hydrant system will require a 4 ½ inch and two 2 ½ inch male National hose thread adapter with metal cap.
- c. A pressurized system must have a minimum capability of delivering 200 GPM at 20 PSI and must be calculated and certified by a registered engineer.

14. Wet draft hydrants shall be painted red and have 1 inch white letters posted on it to read: "**Wet draft**". See detail #2 of the Napa County Fire Standards.

15. A blue dot reflector shall be adjacent to all hydrants. Bollard protection around hydrants will be required. See detail #2 of the Napa County Fire Standards.

16. Locate on plans new or existing bridges on the property that will be utilized for any fire apparatus to access any structures. All bridges shall have weight limits posted on an all-weather sign. See detail #15 of the Napa County Fire Standards.

**For additional information, please call the Napa County Fire Marshal's Residential Inspector @ (707) 299-1462.**