

3 - STREET STANDARDS

3.01 STREET DESIGN CRITERIA

3.01.01 DEFINITIONS

A. Arterial

Arterial streets primary purpose is to carry higher volumes of through traffic between major residential and/or commercial areas and channel and distribute traffic from freeways to collector streets and vice versa. The optimum minimum distance between major intersections is approximately ½ mile. Driveways to major traffic generators may be located within the ½ mile spacing. New arterials will be constructed within 74-to-136-foot rights of way. Major arterials consist of four to six lanes and provide for a striped left turn lane or curbed median. Arterials carry up to 40,000 vehicle trips per day. Residential development along arterials generally requires larger than average setbacks and landscape buffers.

B. Collector

Collector streets have the primary purpose of serving as connectors between local and arterial streets. Collector streets provide direct access to parcels. At major intersections, driveways on collector streets should be no closer than 50 feet to the intersection. Collectors carry two lanes of traffic, usually do not have left turn medians, may have continuous left turn lanes, and are generally constructed within rights of way that are up to 84 feet in width. Collector streets carry up to 12,000 vehicle trips per day. Collector street typical intersection spacing is ¼ mile. The collector street standards are used for the industrial and office park street systems.

C. Local Streets

Local streets provide low volume access from abutting parcels to collector and arterial streets. Local streets generally consist of two travel lanes and rights of way widths up to 56 feet.

3.01.02 GENERAL

Design of City facilities shall conform to the provisions of these standard specifications, supplemented by these publications

- Caltrans Highway Design Manual, latest edition
- Manual of Uniform Traffic Control Devices as amended by the California Supplement, latest edition
- A Policy on Geometric Design of Highways and Streets (AASHTO), latest edition
- Caltrans Standard Plans, latest edition. Use revised standard plans as applicable.
- County Engineers Association & Caltrans & League of California Cities Flexible Pavement – Structural Section Design Guide for Cities and Counties (1979)
- AASHTO, Guide for Design of Pavement Structures (1993)

- Asphalt Institute MS-1, Thickness Design – Asphalt Pavements for Highways & Streets

Modifications to these design standards may be considered on a case-by-case basis as appropriate to accommodate and provide for storm water quality measures (Best Management Practices for storm water pollution prevention) as reviewed and approved by the City Engineer.

3.01.03 STREET DESIGN CRITERIA TABLE

The ***Street Design Criteria Table*** (Table 3.1) provides the minimum right of way widths, centerline radii, design speeds, structural sections, maximum longitudinal grades and the traffic indexes that correspond to the various city street classifications shown on City Standard Plans S-6(a-f).

TABLE 3.1 – STREET DESIGN CRITERIA

STREET CLASSIFICATION	AVG. DAILY TRAFFIC (ADT)	R/W WIDTH	PAVEMENT WIDTH (FC To FC)	MIN. C.L. RADIUS	DESIGN SPEED (MPH)	TRAFFIC INDEX	MIN. STRUCTURAL SECTION		MAX. GRADE
							AC	AB	
<u>ARTERIALS</u>	Up to 40,000							20"	6%
Major				1000'	50	10	6"		
6 Lane (Type A) (Divided w/ Pkg)		126' to 136'	88' to 98'						
4 Lane (Type B) (Divided w/ Pkg)		102' to 112'	64' to 74'						
4 Lane (Type C) (2-Way LTL w/o Pkg)		84' to 94'	64' to 74'						
4 Lane (Type D) (Undivided w/ Pkg)		84' to 94'	64' to 74'						
Minor				600'	40	9	5.5"		
2 Lane (2-Way LTL w/ Pkg)		74' to 84'	54' to 64'						
<u>COLLECTORS</u>	Up to 12,000							15"	10%
Type A		60' to 84'	40' to 64'	450'	35	7	4"		
Type B		68' to 82'	48' to 62'	300'	30	9	5.5"		
<u>LOCAL STREETS</u>	Up to 5,000							10"	
Standard		56'	36'	200'	25	5.5	3.5"		15%
Parking One Side		48'	28'	200'	25	4.5	2.5"		15%
No Parking		40'	20'	200'	25	4.5	2.5"		15%
Hillside Street		Varies	20' No Pkg 28' Pkg one side 36' Pkg both sides	200' 100**	25 20*	4.5	2.5"		15%
Rural Street		29'	28'	200'	25	4.5	2.5"		15%

*Requires specific approval by the City Engineer.

Table Notes:

1. Type A collectors serve residential, mixed use and commercial projects. Type B collectors serve corporate park and industrial projects.
2. See Standard Detail S-4 for Sidewalk and Landscape area standards.
3. 4 foot sidewalks separated from the street by a 6 foot planter are required on both sides of all street sections except:
 - a) Hillside and rural local streets as indicated on Standard Details S-6e and S-6f.
 - b) Private streets that will ultimately serve 4 or fewer units or as provided by Municipal Code Section 17.52.360 Pedestrian Friendly Streets Standards.
4. See Future Bikeway Map (Figure 3-5) in the General Plan for bike lane locations.
5. LTL = Left Turn Lane
6. Street cross sections may be wider than indicated in Table 3.1 as necessary to conform to the sight distance and visibility standards, parking requirements, vehicle backup turnaround movements and Fire Department turning movements. Compliance with access requirements is to be demonstrated by plotting the parking space locations and the appropriate AASHTO vehicle turning templates on the improvement plan.
7. Street pavement structural sections are to be designed in accordance with Section 3.01.06 of these specifications. If the calculated street structural section per Section 3.01.06 is less than that shown in Table 3.1, then the values shown in Table 3.1 are required.

3.01.04 VERTICAL ALIGNMENT

The vertical alignment of streets shall meet the following minimum criteria:

1. The minimum longitudinal grade on all streets shall be 0.5%.
2. The minimum grade around curb returns at intersections shall be 0.7%.
3. The minimum grade across valley gutters and around cul-de-sacs and Knuckles shall be 0.5%.
4. Cross-slopes for all streets shall be 2%. In special cases approved by the City Engineer cross-slopes up to 5% may be considered. A minimum cross slope of 1% may be approved in special cases as determined in accordance with a design exception approved by the City Engineer.
5. The gradient of each street entering an intersection shall not be more than 7% within a distance of 25 feet from the near curb line of the crossing street, except as approved by the City Engineer.
6. All street elevations and grades shown on the improvement plans shall be established in accordance with City of Napa benchmarks. The benchmark shall be identified on the plans.
7. Vertical parabolic curves shall be used to connect grade profiles where the algebraic difference in grade rates exceeds 1% (does not apply at intersecting streets).
8. Vertical curves shall be designed in accordance with Caltrans' Highway Design Manual. If the calculated vertical curve is less than 100 feet, a minimum 100-foot vertical curve shall be used. The length of sag vertical curves shall be calculated with the assumption that street lighting will not be installed.

3.01.05 HORIZONTAL ALIGNMENT

The horizontal alignment of streets shall meet the following minimum criteria:

1. Streets which are designed with reverse curves shall have a minimum tangent length between the curves equal to 50 feet for local streets and smaller, and 100 feet for all other streets unless otherwise approved by the City Engineer.
2. All streets shall be designed for two-way traffic (minimum 20 feet wide, no parking on either side) unless specific approval is obtained from the City Engineer to allow one-way traffic (minimum 14 feet wide, no parking on either side).
3. All street centerlines shall intersect one another as near to a 90-degree angle as practical. Driveways shall intersect streets as near to a 90-degree angle as practical. Angles may not deviate from the perpendicular more than 10-degrees.
4. At intersections, the centerlines of cross streets (including full access driveways to commercial developments, industrial developments, or five (5) or more residential units) shall be collinear or shall have a minimum centerline separation as indicated in the Table 3.2 and Figure 3.1 scenarios.

TABLE 3.2 – MINIMUM CENTERLINE STREET SEPARATION

STREET CLASSIFICATION (1)	SCENARIO A DISTANCE IN FEET (MIN.) (2)	SCENARIO B DISTANCE IN FEET (MIN.) (2)	SCENARIO C DISTANCE IN FEET (MIN.) (2)
Local Street	125	150	125
Collector	175	185	125
Minor Arterial	225	230	125
Major Arterial	300	275	125

Reference: Access Management Handbook, Center for Research and Education, Iowa State University
 Table Notes:
 (1) Street classification refers to the classification of the main roadway (not the cross streets).
 (2) Designs not meeting the above requirements are subject to design exception approval by the City Engineer and additional safety enhancements may be required.
 (3) The distances listed in Table 3.2 are minimums. The actual distance may be longer based on a traffic operations analysis and the resulting intersection configuration design parameters.

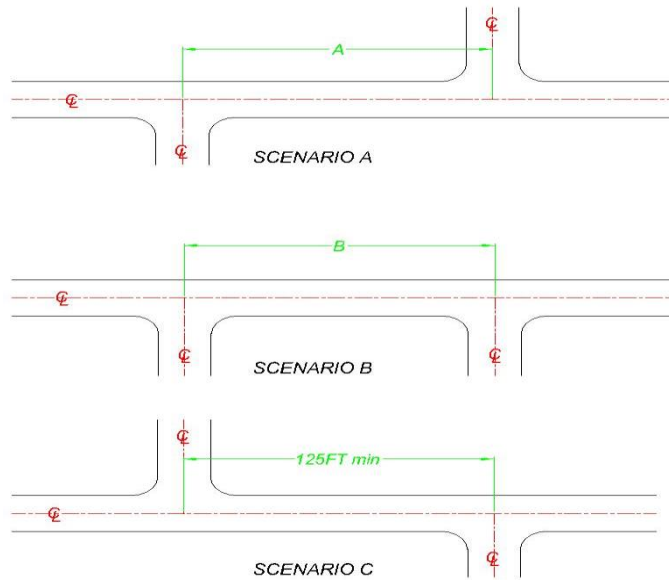


FIGURE 3.1

5. At street intersections, the curb return ramps shall be designed in accordance with City Standard Plans S-8 & S-9 and applicable Americans with Disabilities Act (ADA) standards.
6. Through access or turnarounds shall be provided in accordance with Section 3.04 – “Fire Department Access” of these Standard Specifications.

3.01.06 PAVEMENT STRUCTURAL SECTION (STREETS)

Improvement plans shall include the design “R” values, Expansion indexes and Traffic Indexes in the typical sections or in a note or table on the same sheet as the typical sections.

In addition, the following design requirements must be met:

A. Pavement Structural Section Design

The street pavement structural section shall be determined by a Registered Civil or Registered Geotechnical Engineer from “R” values obtained from native material gathered from the level of the proposed subgrade using the design methods in Chapter 600 of the State of California, Department of Transportation Highway Design Manual. If this calculated street pavement structural section is greater than the minimum pavement structural section listed in Table 1, then the calculated section shall be used. If this calculated street pavement structural section is less than that shown in Table 1, then the Table 1 values are required.

Streets designated as truck routes shall be designed to meet the minimum pavement structural section identified for arterials (see TRUCK ROUTE MAP – FIGURE 3.2).

B. Geotechnical Report (Pavement Structural Section Data)

1. Resistance “R” Values

The subgrade soil shall be tested in accordance with California Test 301 “Method of Determination of the Resistance “R” Value of Treated and Untreated Bases, Sub-bases and Basement Soils by the Stabilometer” in use by the California Department of Transportation, Transportation Laboratory.

In general, design of the structural section for a particular street shall be based on the lowest “R” Value material encountered. If the design is based on something other than the lowest “R” Value material encountered, then the geotechnical report is to include data and an explanation that specifically addresses and supports this alternative. If an “R” Value of 5 is utilized, then “R” Value tests will not be required.

2. Active Soils

An Expansion Index Test shall be provided regardless of the “R” Value used.

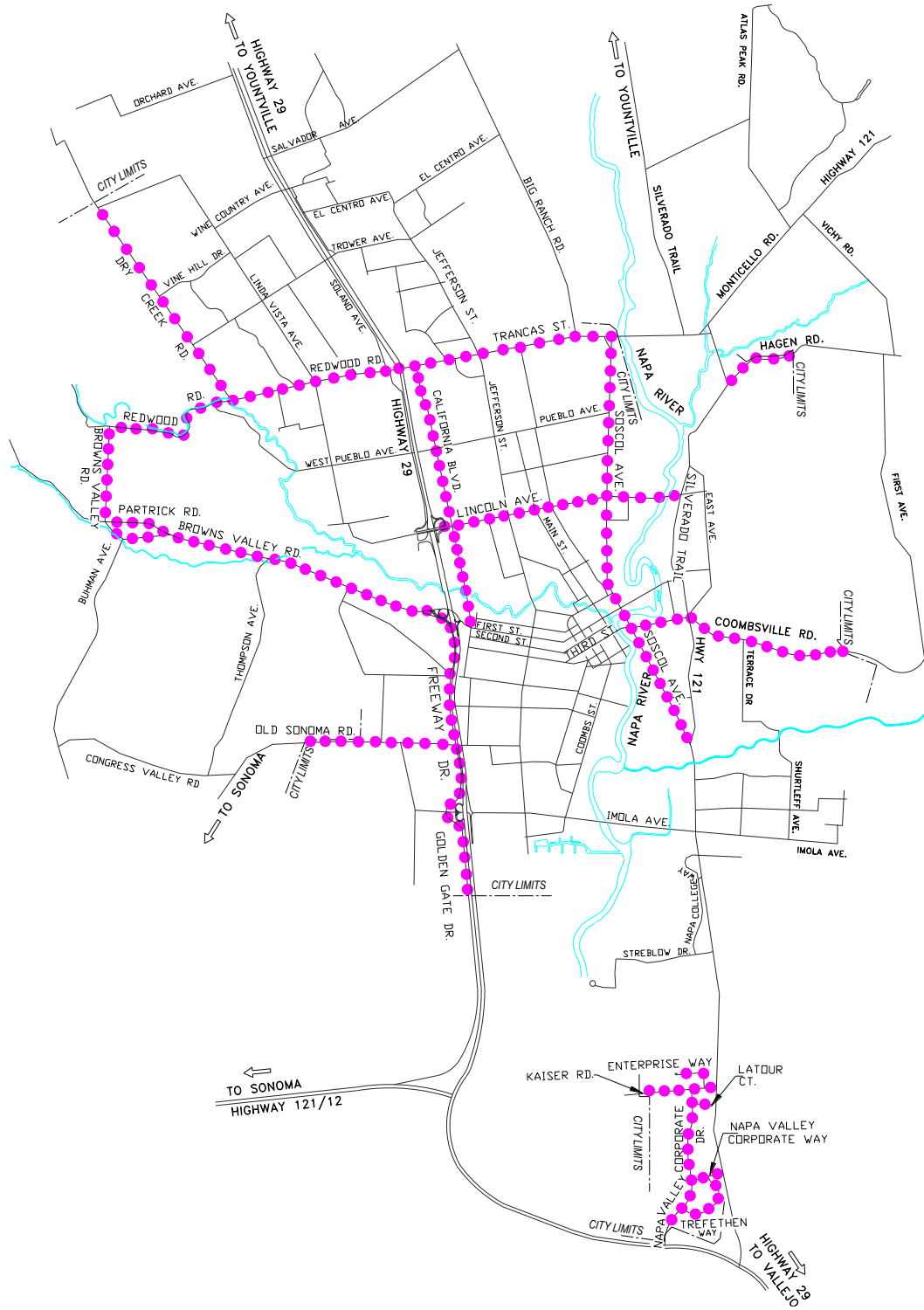
A soil will be classified as active if the Expansion Index is 50 or greater as measured by the Uniform Building Code Standard 29-2, “Expansion Index Test”.

The design of all streets constructed on active soils must include measures to prevent pavement structure damage resulting from shrink-swell movement of these soils. These measures may include lime treatment of subgrade materials, over-excavation and placement of additional aggregate base rock and stabilization fabric, cut-off walls or other methods presented by the developer’s Geotechnical Engineer and deemed appropriate by the City Engineer. The structural section required in some cases may be governed by

the expansion-shrinkage properties of the soils rather than the traffic and soils bearing criteria.

The proposed measures identified in the soils report to deal with active soils shall be submitted for review and approval by the City Engineer. A peer review of the proposed measures may be required.

3. The geotechnical report or supplemental letter shall include the location and elevation of sampling points, "R" Values, and Expansion Index Tests data. The developer's geotechnical engineer may be required to make a field survey of soils conditions when rough subgrade has been cut to verify data presented in the Soils Report. The costs of all sampling and testing shall be at the developer's expense.
4. All subgrade design selections shall be shown on the improvement plan set that is signed by the geotechnical engineer.



CITY OF NAPA
APPROVED TRUCK ROUTE MAP
FIGURE 3.2

3.01.07 PAVEMENT RESTORATION LIMITS (STREETS)

The **Pavement Restoration Table** (Table 3.3) provides the minimum restoration limits based on existing pavement conditions. Final limits of restoration to be verified by the City Inspector. Pavement Condition Index (PCI) will be provided by the City by contacting Public Works Engineering Division at engineering@cityofnapa.org

TABLE 3.3 – PAVEMENT RESTORATION LIMITS

PAVEMENT CONDITION INDEX (PCI)	RESTORATION LIMITS
70-100	For roads less than 24 feet wide – Curb to curb
	For roads over 24 feet wide – To centerline, unless repair crosses the centerline, then up to a full width restoration is required
	For all restoration – <ul style="list-style-type: none"> • The limits must extend 10 feet on each side of trench, 20 feet total • If another trench is found within 10 feet, the restoration limits will be combined into a continuous repair • Unused sawcuts into the roadway will require a full 10 feet wide repair
50-69	For roads less than 24 feet wide – A T-cut trench repair is required per City Standards
	For roads over 24 feet wide – The paving limits will clear the apparent wheel path located approximately 2-3 feet from the apparent centerline for the driver side and 9-10 feet for the passenger side
	For all restoration – <ul style="list-style-type: none"> • Restoration to extend up to 5 feet beyond each side of the trench excavation, 10 feet total. • If the limits of the repair are with 3 feet of the lip of gutter, the repair must extend to the lip of gutter • Unused sawcuts into the roadway will be considered a trench repair
0-49	A T-cut trench repair is required per City Standards. Restoration to extend minimum 1 feet beyond each side of the trench excavation
	For all restoration – <ul style="list-style-type: none"> • If the limits of the repair are with 3 feet of the lip of gutter, the repair must extend to the lip of gutter • Unused sawcuts into the roadway will be considered a trench repair

3.02 DRIVEWAYS AND PARKING FACILITIES

3.02.01 DEFINITIONS AND REGULATIONS

Driveway Definition – Driveways are defined in Section 17.54.150 of the Napa Municipal Code (NMC).

Driveway Regulations – Driveways and parking facilities are regulated in accordance with Chapter 17.54 of the NMC and these standards.

3.02.02 TWO-WAY SERVICE

All driveways (except residential driveways serving up to two single family dwelling units) shall be designed for two-way traffic (minimum 20 feet wide, no parking on either side) unless specific approval is obtained from the City Engineer to allow one-way traffic (minimum 14 feet wide, no parking on either side).

One-way driveways will only be permitted when a two-way driveway is not feasible because of site physical limitations or to avoid operational impacts to the public street system.

Where an entrance only driveway is allowed, on-site circulation shall provide for connection to a suitable exit drive.

Backing out of driveways (except on local streets or smaller for single family residences, accessory second units or duplex residences where each is served by an individual driveway) onto a public street shall not be allowed. A suitable on-site turn around or circulation pattern shall be provided that will enable the driveways to provide forward entry to the public street.

For a flag lot (that does not require Fire Department access) when through access is not available, a passenger vehicle (AASHTO P-Vehicle) turnaround is required to provide for forward entry and exit. When Fire Department access is required, turnarounds shall be provided per Section 3.04 – “Fire Department Access” of these Standard Specifications.

When forward entry and exit is required a minimum 25-foot backup turn-around street or drive aisle width shall be provided behind all required parking spaces, including tandem spaces, except for parking spaces served off of a driveway that provides access to a flag lot, in which case the backup turnaround minimum access width behind parking spaces may be 20 feet.

Dead-end parking lot drive aisles that are less than 30 feet wide shall extend a minimum 5 feet beyond the last parking space to provide for the required backup turnaround maneuver.

To avoid congestion at the entrance from the street to parking lots, no on-site parking space shall be allowed within the initial 20-feet of the driveway, where it connects to the public street measured from the back of sidewalk of the fronting street or from the ultimate right of way line in areas without sidewalks.

3.02.03 DESIGN CRITERIA

The design of all features relating to driveways and parking facilities shall conform to the requirements of these standards and Chapter 17.54 of the Napa Municipal Code and are subject to review and approval by the City Engineer.

1. The construction plans shall include a fully dimensioned layout of the parking lot, driveways and related features on the site being developed. These features shall include emergency vehicle access routes (with the appropriate Fire Department vehicle AASHTO turning template plotted at curves), accessible routes of travel conforming to ADA Standards, utilities, curbs, gutters, sidewalks, drainage facilities, pavement structural section, traffic circulation signing and pavement striping and markings. As an alternative to using a fire apparatus turning template, a proprietary vehicle turning program, such as “auto-turn” may be used to demonstrate compliance with fire department standards. The construction plans shall also include proposed finish grades and topographic mapping 100 feet beyond the boundaries of the site, or a sufficient distance to determine drainage patterns and related impacts to neighboring properties.
2. Parking stalls shall be marked using 4-inch-wide white paint stripes. All directional arrows and legends shall be white. Double lining of parking stalls may be used with specific approval of the City Engineer.
3. Construction materials and placement procedures shall meet the City construction specifications and standards as contained herein.
4. Portland Cement Concrete curbs and gutters are required around the perimeter of the parking facilities and driveways to control the surface drainage and contain the landscape planting areas. Concrete curbs shall be a minimum of 6 inches high above the paved areas. Asphalt berms may only be used with specific approval of the City Engineer. Railroad ties may be considered for specific applications if they will not be used to control drainage. Alternate curb designs may be considered on a case-by-case basis as required to accommodate and provide for water quality measures (Best Management Practices) as reviewed and approved by the City Engineer.
5. Pavement Structural Section (Driveways & Parking Facilities)
 - a. The minimum pavement structural section for driveways that serve a maximum of two residential units and do not serve as Fire Department access routes shall be equivalent to 2 inches of asphalt concrete over 6 inches of Class 2 Aggregate Base material over 95% compacted subgrade.
 - b. The pavement structural section for (1) driveways serving as Fire Department access routes, and (2) parking areas and drive aisles shall be determined using the design methods described in Section 3.01.06 “Pavement Structural Section (Streets)” of these Standard Specifications. In no case shall the minimum section for these facilities be less than 3 inches of asphalt concrete over 10 inches of Class 2 Aggregate Base. If the calculated pavement structural section is greater than the minimum pavement structural section, then the calculated section shall be used.
 - c. Equivalent Portland Cement Concrete Pavement structural sections may be used for parking facilities and driveways if designed by a registered civil or geotechnical engineer and approved by the City Engineer.

6. Project storm water runoff may not surface flow across any public sidewalk or driveway approach nor may it be directed onto adjacent properties without appropriate easements. Project drainage must be conveyed under the public sidewalk to the gutter (per Standard Detail D-5A and D-5B), or connected by pipe directly into either the public storm drain system or adjacent creek, if available.
7. The minimum slope of asphalt concrete surfacing shall be 1% and the minimum slope of Portland Cement Concrete surfacing shall be 0.5%.
8. The maximum cross slopes of parking space surfacing shall be 5%.
9. Handicap parking areas shall be designed to satisfy the Americans with Disabilities Act requirements.
10. Vertical parabolic curves shall be used to connect grade profiles where the algebraic difference in grade rates exceeds 1%.
11. Portland Cement Concrete valley gutters when used in non-traffic lane areas shall be a minimum of 2 feet wide. Valley gutters when used in traffic lanes shall be a minimum of 3 feet wide when running parallel with the drive aisle and shall be a minimum of 4 feet wide were crossing the drive aisle. The minimum grade across valley gutters shall be 0.5%.
12. City standard storm drain inlets (D-2 or other approved side opening inlet) shall be used where possible for curb inlets when pipe sizes are 10-inch diameter or larger.
13. Parking facilities shall drain away from the paths of travel of the pedestrian. Valley gutters shall not be located at pedestrian crossings if reasonable drainage alternatives are available.
14. Signs and/or red curb markings are required where necessary to prevent vehicles from parking in the driveway.
15. For compact parking stalls "Compact Parking Only" shall be stenciled on the pavement at the entrance to each stall with 6" minimum height letters.
16. The minimum vertical clearance shall be 13 feet 6 inches at all points across the required width of driveways.
17. Vehicle path of travel pavement width changes shall occur only at intersections or at other logical locations as approved by the City Engineer.
18. Porous and pervious pavement structural sections may be considered for private streets, parking areas and driveways on a case-by-case basis as appropriate to accommodate and provide for water quality measures (Best Management Practices for storm water pollution prevention) as reviewed and approved by the City Engineer.
19. Modifications to these design standards may be considered on a case-by-case basis as appropriate to accommodate and provide for storm water quality measures (Best Management Practices for storm water pollution prevention) as reviewed and approved by the City Engineer.

3.03 DRIVEWAY & PRIVATE STREET CONNECTIONS TO PUBLIC STREETS

For projects with frontage on a designated collector or arterial street, the design and location of driveways and private street connections is critical to maintaining good traffic flow on the street. Driveways and private street connections for these projects may be subject to special traffic operation studies as determined by the City Engineer.

1. The number of driveways and private street connections to public streets shall be kept to a minimum.
2. Driveways and private street connections to public streets shall be located as far as possible from public street intersections and other full access driveways to commercial, industrial or residential developments.
3. Residential driveways shall connect to the public street with Standard Detail S-5 concrete driveway approaches. Private streets and commercial driveways shall connect to the public street with Standard Detail S-5 concrete driveway approaches, or a street type opening with Standard Details S-8 & S-9 curb returns. When street type openings are used the limits of the private pavement areas shall be clearly distinguishable from the public street by installing a minimum 10 foot wide decorative concrete strip on the project parcel along the public street right of way line.
4. Driveway approach aprons (excluding the flare) shall be the same width as the required width of the driveway.

3.04 FIRE DEPARTMENT ACCESS

3.04.01 GENERAL

A. Access

More than one fire apparatus access route shall be provided when it is determined by the Fire Chief that access by a single route might be impaired by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit ingress or egress.

Residential developments having more than 50 dwelling units shall be provided with at least two points for fire apparatus access.

When two points of access are required, they shall be located a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between the two access points.

Emergency vehicle only access routes are not permitted as a means to satisfy the second point of access requirement.

Fire apparatus access routes shall be unobstructed as defined by the following criteria:

1. Streets and commercial driveway minimum widths shall be as follows:
 - (a) 14 feet for one-way traffic (no parking on either side).
 - (b) 20 feet for two-way traffic (no parking on either side).
2. Residential driveway minimum widths shall be 12 feet.
3. A minimum unobstructed vertical clearance of 13 feet 6 inches shall be provided.
4. A maximum longitudinal grade of 15% shall be provided.

Refer to the City of Napa "Citywide Guidelines for Traffic Calming and Neighborhood Traffic Management" for appropriate and acceptable traffic calming measures.

All temporary and permanent Fire Department access routes surfacing structural sections shall be designed to support an HS-20 loading, and in accordance with Section 3.01.06 – "Pavement Structural Section (Streets)" of these Standard Specifications.

Permanent Fire Department access routes shall be surfaced with an asphalt concrete or

Portland Cement Concrete structural section (or an alternate equivalent all-weather pavement structural section approved by the Fire Chief and City Engineer).

The City of Napa Fire Department's largest apparatus (currently the ladder truck) shall be used as the design vehicle for all fire access routes.

Fire Department access shall be provided so that a 150-foot length of hose can be extended from the parked fire vehicle to all points along the exterior perimeter of all structures along an approved route.

B. Turnaround

Public Street Turnaround – Fire Department access for all public streets shall be along a through route or (when through access is not available) shall end in a standard cul-de-sac bulb designed and installed in accordance with City Standard Plans S-7A & S-7B.

All streets (and driveways exceeding 150 feet in length) shall be along a through route or shall end with an approved turn around area (to provide for forward entry and exit). Private street access will be reviewed and approved by the Fire Chief and City Engineer based on site constraints in accordance with the following hierarchy:

1. Through access shall be provided.
2. Standard Turnaround – When through access is not available, a cul-de-sac bulb shall be installed at the end of the street as follows:
 - (a) Residential Developments
 - (1) Standard Bulb – A standard cul-de-sac bulb designed in accordance with Standard Detail S-7A shall be installed at the end of the street.
 - (2) Reduced Bulb – Generally, the cul-de-sac bulb face of curb radius shall be 40 feet to provide for on-street parking. However, on private streets the bulb face of curb radius may be reduced to 35 feet when at least one 8-foot-wide parallel parking bay is provided, outside of the 35-foot radius area, along the frontage of each lot. No parking is allowed along the reduced portion of the bulb, and appurtenant bulb return frontages. These no-parking frontages require red curbing and/or “No-Parking” signs (Standard Details FP-2A & FP-2B) as determined by the Fire Chief.
 - (b) Commercial/Industrial Developments
 - (1) A standard cul-de-sac bulb designed in accordance with Standard Detail S-7B shall be installed.
 - (2) The cul-de-sac bulb face of curb radius shall be 55 feet to provide for on-street parking.
3. Alternate Turnaround – For residential development private streets, when through access is not available, and a standard turnaround is not feasible, alternate turnarounds will be allowed (in accordance with Standard Details S-29A & S-29B) as follows:
 - (a) Based on evidence supplied by the developer (in the form of a design exception that is approved by the Fire Chief and City Engineer) when:
 - (1) The standard cul-de-sac bulb will cause significant environmental impacts such as excessive hillside grading, rock outcroppings, and/or removal of significant trees.

- (2) The standard cul-de-sac bulb will prevent site layouts that achieve minimum development densities.
- (b) For a driveway serving a flag lot.
- (c) For a street that abuts 4 or less lots.
- (d) The layout of the hammerhead turnaround and surrounding lots and connecting driveways shall be “self-policing”, (i.e., in addition to signage and painted curbing the layout configuration shall include design elements that discourage the parking of vehicles or placement of obstructions within the fire lane turnaround area), as reviewed and approved by the Fire Chief and City Engineer.

Residential Partial Cul-de-Sac (Standard Details S-7C & S-7D) – When a standard turnaround is required for residential developments (and that turnaround will serve future development across the street on an abutting parcel) a partial cul-de-sac designed in accordance with either City Standard S-7C (Fire Engine) or City Standard S-7D (Fire Ladder Truck) will be allowed as an interim solution when approved by the Fire Department. All public street partial cul-de-sacs shall be designed with parking, i.e., a minimum 40-foot face of curb radius partial bulb and a minimum 28-foot pavement width partial street cross section are required.

The cross slope of a turnaround area shall not exceed 5%.

When required by the Fire Chief, Fire Department apparatus access routes shall be designated as “Fire Lanes” and appropriate signs and/or markings shall be installed in accordance with City Standard FP-1 and the California Vehicle Code.

To allow for Fire Department apparatus access, 1) parking shall be prohibited on streets with pavement widths that are less than 28 feet, 2) parking on one side of a street is permitted on streets with pavement widths that are 28 feet or greater, and 3) parking on both sides of the street is permitted on streets with pavement widths that are 36 feet or greater.

Fire Department access routes that exceed 500 feet in length require additional intermittent turnaround areas. The maximum spacing between turnaround areas shall be 500 feet. Hammerhead turnarounds may be used to satisfy the intermittent turnaround requirement.

3.04.02 FIRE ACCESS REQUIREMENTS (FOR BUILDING CONSTRUCTION)

If the streets or access roads in a development are not paved from October 15th through April 15th, a temporary all weather access road shall be provided by the Contractor.

The City of Napa Fire Department requires that a fire hydrant be in service within 250 feet of the furthest point of construction prior to the stockpiling of combustible materials or the beginning of combustible construction. (Exception: Storage of combustible materials for framing of slab(s) only shall be allowed).

Temporary all weather construction phase Fire Department access route structural sections shall consist of a minimum of 12 inches of base rock material over either: (1) a lime treated subgrade, or (2) a subgrade covered with fabric in accordance with the following design criteria:

1. Subgrade is defined as the native soil at the bottom of the access route structural section, excavated to the lines and grades shown on the project grading plan, and

provided with a discharge for the collected storm water runoff, as approved by the City Engineer.

2. Base rock shall be Class II aggregate base compacted to at least 95% relative compaction.
3. Base rock shall be placed only on a firm and unyielding (compacted to at least 95% relative compaction) excavated and drained subgrade to a depth of 12-inches.
4. Lime treated subgrades shall be designed in accordance with the recommendations of a geotechnical engineer and compacted to at least 95% relative compaction.
5. Fabric shall be a ground stabilization fabric such as Mirafi 600X or equivalent.
6. Fire Department access shall be a minimum 20 feet in width and provided so that a 150-foot length of hose can be extended from the parked fire vehicle to all points along the exterior perimeter of all structures.
7. Alternate all weather access road sections may be proposed by a geotechnical engineer and submitted to the Public Works Director for approval. Approval of the Public Works Director and Fire Marshal is required for alternate all weather access roads.

3.05 STREET SPECIAL PROVISIONS

Whenever a pipe is installed in paved public streets, the sides of the trench shall be cut to a neat line in a manner satisfactory to the Public Works Director or their designee. The trench shall be backfilled with $\frac{3}{4}$ " Class II AB and a temporary patch of cold mix asphalt shall be placed on the trench at the end of the workday. Permanent pavement shall be placed on the trench within 48 hours after the storm drainage pipe has been installed unless otherwise approved by the Public Works Director or their designee. Refer to City of Napa Standard Plan D-12, "Storm Drain Trench" for drainage related facilities, City of Napa Standard Plan W-16, "Water Trench Detail" for water related facilities, and City of Napa Standard Plan S-12, "Standard Backfill Detail", for all other facilities.

3.05.01 EXISTING FACILITIES

The work performed in connection with various existing highway facilities shall conform to the provisions in Section 15, "Existing Facilities," of the Standard Specifications and these City Standard Specifications.

The Contractor shall remove and relocate/reset traffic signs and poles and other facilities which are in the construction area.

3.05.02 AGGREGATE BASE

Aggregate base shall be Class 2, three quarter inch ($\frac{3}{4}$ ") maximum grading, and shall conform to the provisions in Section 26, "Aggregate Bases," of the Standard Specifications and these City Standard Specifications.

Aggregate for Class 2 aggregate base placed in street sections shall not include material processed from portland cement concrete, lean concrete base, cement treated base or a combination of any of these materials. All subgrade and aggregate base placed must be compacted to a minimum relative compaction of ninety-five percent (95%).

Amend Section 26-1.03E of the Standard Specifications, "Compacting", by adding the following:

In addition, contractor shall obtain complete stabilization of aggregate base material with no rolling or deflection of the finish aggregate base grade. This proof-rolling is determined by passing a loaded 3 axle water truck, cement truck or similar vehicle over the completed subgrade without the material rolling, deflecting more than ¼" or cracking perpendicular to the path of travel.

If accepted aggregate base becomes saturated and/or disturbed or more than five working days pass between acceptance of the material and placement of the upper layer, the aggregate base must again be proof-rolled and retesting will be required. The cost of the retesting shall be borne by the Contractor.

3.05.03 ASPHALT CONCRETE

Attention is directed to Section 39, "Hot Mix Asphalt," Section 92, "Asphalts Binders," and Section 94, "Asphaltic Emulsions," of the Standard Specifications and these City Standard Specifications.

Amend Section 39-1.01 "General" of the Standard Specifications to add the following:

Produce and place ½ inch Type A HMA, Grade PG 64-16 per Section 39-2 "Standard Construction Process," of the 2010 Standard Specifications.

Amend Section 39-1.02B "Tack Coating" of the Standard Specifications to add the following:

Tack coat must be utilized and be emulsified asphalt Grade RS-1, RS-1h, SS-1, or SS-1h and must conform to Section 94 "Asphaltic Emulsions", of the 2010 Standard Specifications.

Amend Section 39-1.02C "Asphalt Binder" of the Standard Specifications to add the following:

Asphalt binder to be mixed with aggregate shall be grade PG 64-16.

The Contractor must submit mix designs for all asphalt concrete to be used on the project.

Amend Section 39-1.02E "Aggregate" of the Standard Specifications to add the following quality characteristic to the "Aggregate Quality" table:

The Durability Index for all HMA aggregates must be a minimum of 35.

The aggregate must not be treated with lime, cement or other chemical material before the Durability Index test is performed.

Amend Section 39-1.03A "General" of Hot Mix Asphalt Mix Design Requirements of the Standard Specifications to add the following:

The HMA must be ½ inch Type "A" HMA

Amend Section 39-1.03C "Job Mix Formula Submittal" of the Standard Specifications to add the following:

The Contractor must submit mix designs for all asphalt concrete to be used on the project.

Each delivery ticket must include information on the material type, binder type, oil content, and the mix design number. Material delivered to the project without such annotations shall be subject to rejection. Only original delivery tickets (no photocopies) shall be delivered to the City Engineer on a daily basis.

Amend Section 39-1.04F “Density Cores” of the Standard Specifications to delete the following:

To determine density for Standard and QC/QA construction process projects, take 4- or 6-inch diameter density cores at least once every 5 business days. Take 1 density core for every 250 tons of HMA from random locations the City Engineer designates. Take density cores in the City Engineer's presence and backfill and compact holes with authorized material. Before submitting a density core, mark it with the density core's location and place it in a protective container.

If a density core is damaged, replace it with a density core taken within 1 foot longitudinally from the original density core. Relocate any density core located within 1 foot of a rumble strip to 1 foot transversely away from the rumble strip.

Amend Section 39-1.04F “Density Cores” of the Standard Specifications to add the following:

In-place density and relative compaction for the Standard Construction Process projects is determined by the nuclear density device per California Test 375.

Amend Section 39-1.07 “Production Start-Up Evaluation” of the Standard Specifications to delete the following:

Within the first 750 tons produced on the 1st day of HMA production, in the City Engineer's presence and from the same production run, take samples of:

For Standard and QC/QA construction process projects, take 4- or 6-inch diameter density cores within the first 750 tons on the 1st day of HMA production. For each density core, the Department reports the bulk specific gravity determined under California Test 308, Method A, in addition to the percent of maximum theoretical density. You may test for in-place density at the density core locations and include them in your production tests for percent of maximum theoretical density.

Amend Section 39-1.07 “Production Start-Up Evaluation” of the Standard Specifications to add the following:

Within the first 500 tons produced on the 1st day of HMA production, in the City Engineer's presence and from the same production run, take samples of:

In-place density and relative compaction for the Standard Construction Process projects is determined by the nuclear density device per California Test 375. Test density within the first 500 tons on the 1st day of HMA production.

Amend Section 39-1.09A “General” of Subgrade, Tack Coat, and Geosynthetic Pavement Interlayer of the Standard Specifications to add the following:

Surface Preparation

The work must consist of preparing the existing street surfaces prior to the commencement of paving. Such work shall include removing raised pavement markers, removing thermoplastic and painted traffic markings and legends, controlling nuisance water, sweeping, watering, and removing loose and broken asphalt concrete pavement and foreign material as specified in the Standard Specifications and as directed by the City Engineer.

Amend Section 39-1.11 “Transporting, Spreading, and Compacting” of the Standard Specifications to add the following:

The Contractor must have hand-compaction equipment immediately available for compacting all areas inaccessible to rollers. Hand-compaction must be performed

concurrently with breakdown rolling. If for any reason hand-compaction falls behind breakdown rolling, further placement of HMA must be suspended until hand-compaction is caught up. Hand-compaction includes plate compactor, pneumatic tamper and hand tampers. Hand torches must be available for rework of areas which have cooled.

After compaction, the surface texture of all hand work areas must match the surface texture of the machine placed mat. Any course or segregated areas must be corrected immediately upon discovery. Failure to immediately address these areas will cause suspension of HMA placement until the areas are satisfactorily addressed, unless otherwise allowed by the City Engineer.

Cold Joints

All cold joints, both longitudinal and transverse, must be heated with a torch immediately prior to paving. Cold joints include previously installed asphalt passes that are more than three hours old. All cold joints must be tack coated.

Tolerances

The average pavement thickness must be equal to the specified thickness for the project. For total pavement thicknesses of less than four inches, the minimum allowable thickness will be ¼ inch less than that specified. For total pavement thicknesses of four inches or more, the minimum allowable thickness will be ½ inch less than that specified.

You are responsible for verifying the anticipated tonnage for each street segment using the data from the JMFs for the mix to be used at least 10 days prior to paving. If the anticipated quantity varies more than +/-5% from that indicated in the bid schedule, you must notify the City Engineer in writing of the discrepancy and provide computations regarding tonnage.

Daily Paving Completion

The Contractor must schedule paving activities such that each layer of HMA is placed across the entire excavated area at the end of each work shift.

Pavement Thickness and Temperatures

Pave HMA in maximum 0.25-foot thick compacted layers.

If the surface to be paved is both in sunlight and shade, pavement surface temperatures must be taken in the shade.

Spread HMA Type A and Type B at the atmospheric and surface temperatures shown in the following table:

Minimum Atmospheric and Surface Temperatures

Compacted layer thickness, feet	Atmospheric, °F		Surface, °F	
	Unmodified asphalt binder	Modified asphalt binder ^a	Unmodified asphalt binder	Modified asphalt binder ^a
	<0.15	55	50	60
0.15-0.25	45	45	50	50

^aExcept asphalt rubber binder.

If the asphalt binder for HMA Type A and Type B is unmodified asphalt binder, complete:

1. First coverage of breakdown compaction before the surface temperature drops below 250 degrees F

2. *Breakdown and intermediate compaction before the surface temperature drops below 200 degrees F*
3. *Finish compaction before the surface temperature drops below 150 degrees F*

If the asphalt binder for HMA Type A and Type B is modified asphalt binder, complete:

1. *First coverage of breakdown compaction before the surface temperature drops below 240 degrees F*
2. *Breakdown and intermediate compaction before the surface temperature drops below 180 degrees F*
3. *Finish compaction before the surface temperature drops below 140 degrees F*

Amend Section 39-2.02B “Quality Control Testing” of the Standard Specifications is remove the following:

For any single quality characteristic except smoothness, if 2 consecutive quality control test results do not comply with the action limits or specifications:

1. *Stop production.*
2. *Notify the City Engineer.*
3. *Take corrective action.*
4. *Demonstrate compliance with the specifications before resuming production placement.*

Amend Section 39-2.03A “Testing” of the Standard Specifications to remove the following:

Remove “HMA Acceptance – Standard Construction Process” Table.

No single test result may represent more than 750 tons or 1 day's production, whichever is less.

For any single quality characteristic except smoothness, if 2 consecutive quality control test results do not comply with the action limits or specifications:

1. *Stop production.*
2. *Take corrective action.*
3. *Take samples and split each sample into 4 parts in the City Engineer's presence. Test 1 part for compliance with the specifications and submit 3 parts to the City Engineer. The Department tests 1 part for compliance with the specifications and reserves and stores 2 parts.*
4. *Demonstrate compliance with the specifications before resuming production placement and placement.*

The Department tests the density core you take from each 250 tons of HMA production. The Department determines the percent of maximum theoretical density for each density core by determining the density core's density and dividing by the maximum theoretical density.

If the specified total paved thickness is at least 0.15 foot and any layer is less than 0.15 foot, the Department determines the percent of maximum theoretical density from density cores taken from the final layer measured the full depth of the total paved HMA thickness.

For percent of maximum theoretical density, the City Engineer determines a deduction for each test result outside the specifications using the reduced payment factors shown in the

following table:

Amend Section 39-2.03A "Testing" of the Standard Specifications to add the following:

The City will perform acceptance testing of the HMA based on the Acceptance Criteria as shown in the following Table 1.

Table 1 - HMA Acceptance - Standard Construction Process

Quality characteristic	Test method	HMA Type A	Frequency	Location of Sampling			
Aggregate gradation ^a	California Test 202	JMF ± tolerance ^c	1 per day	At plant per CT 125			
Sieve					3/4"	1/2"	3/8"
1/2"					X ^b		
3/8"						X	
No. 4							X
No. 8					X	X	X
No. 200					X	X	X
Sand equivalent (min) ^d	California Test 217	47	1 per day	At plant per CT 125			
Asphalt binder content (%)	California Test 379 or 382	JMF ± 0.45	1 per 500 TONS	Loose mix behind paver per CT 125			
HMA moisture content (% max)	California Test 226 or 370	1.0	1 per 500 TONS	Loose mix behind paver per CT 125			
Percent of maximum theoretical density (%) ^{e, f}	California Test 375	91-97	1 per day (max th. Density)	Loose mix behind the paver			
In-Place Density and Relative Compaction (Nuclear)	Nuclear California Test 375 or ASTM D2950	91-97	1 per 500 TONS	Random locations per CT 375			
Stabilometer value (min) ^{d, g} 1/2" and 3/4" gradings	California Test 366	37	1 per 500 TONS	Loose mix behind paver per CT 125			
Air Void content (%) ^{d, h}	California Test 367	4 ± 2	1 per 500 TONS	Loose mix behind paver per CT 125			
Asphalt binder	Various	Section 92	Sample 1 per day	At plant per CT 125			
Percent of crushed particles Coarse aggregates (% min) One fractured face Two fractured faces Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face	California Test 205	90 75	1 per mix per plant (sample aggregates 1 per day and hold)	At Plant			
Los Angeles Rattler (% max) Loss at 100 rev. Loss at 500 rev.		California Test 211			12 45		

Quality characteristic	Test method	HMA Type A	Frequency	Location of Sampling
Fine aggregate angularity (% min)	California Test 234	45		
Flat and elongated particles (%, max by weight @ 5:1)	California Test 235	Report only		
Voids filled with asphalt (%) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367	76.0-80.0 73.0-76.0 65.0-75.0 65.0-75.0		
Voids in mineral aggregate (% min) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367	17.0 15.0 14.0 13.0		
Dust proportion ⁱ No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 367	0.9-2.0 0.6-1.3		
Smoothness	Section 39-1.12	12-foot straight- edge, must grind, and PI	As necessary to confirm contract compliance	Final pavement surface

^aThe Engineer determines combined aggregate gradations containing RAP under California Test 367.

^b"X" denotes the sieves the Engineer tests for the specified aggregation gradation.

^cThe tolerances must comply with the allowable tolerances in section 39-1.02E.

^dThe Engineer reports the average of 3 tests from a single split sample.

^eThe Engineer determines percent of maximum theoretical density if the specified paved thickness is at least 0.15 foot under California Test 375, except the Engineer uses:

1. California Test 308, Method A, to determine in-place density of each density core instead of using the nuclear gauge in Part 4, "Determining In-Place Density By The Nuclear Density Device"

2. California Test 309 to determine maximum theoretical density instead of calculating test maximum density in Part 5, "Determining Test Maximum Density."

^fThe Engineer determines maximum theoretical density (California Test 309) at the frequency specified for Test Maximum Density under California Test 375, Part 5.D.

^gCalifornia Test 304, Part 2.13.

^hThe Engineer determines the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.

ⁱReport only if the adjustment for the asphalt binder content TV is less than or equal to ± 0.3 percent from the OBC value submitted on a *Contractor Hot Mix Asphalt Design Data* form.

If the Acceptance test results do not meet the Acceptance Criteria shown in Table 1 the HMA shall be rejected, removed and replaced as directed by the City Engineer at Contractor's expense.

Field density acceptance testing will be accomplished using the nuclear gauge method. If the density acceptance tests indicate failing compaction results, the City Engineer determines a deduction for each test result outside the Acceptance Criteria using the "Reduced Payment Factors for Percent of Maximum Theoretical Density," table in Section 39-2.03A "Testing" of the 2010 Standard Specifications.

If the Contractor requests verification of the nuclear density results by coring, the Contractor must perform the coring at no cost to the City.

The City Engineer will randomly identify core locations and test cores for density at no cost to the City.

The Contractor must backfill the core holes with HMA temperatures above 250°F. The HMA must be firmly tamped in place in lifts not to exceed three (3) inches. Tamping must consist of a minimum of 20 blows with a ten-pound minimum weight bar with an approximate two (2) inch diameter head or by a suitable head attached to a demolition hammer or pneumatic hammer. The finished surface must be flush with the adjacent pavement surface.

3.05.04 MISCELLANEOUS CONCRETE CONSTRUCTION

Miscellaneous concrete shall conform to the provisions in Section 73, "Concrete Curbs and Sidewalks," and Section 90, "Concrete", of the Standard Specifications and these City Standard Specifications.

First paragraph of Section 73-1.02A "General" of the Standard Specifications is amended to read:

Concrete for curbs, sidewalks and their appurtenance must be minor concrete conforming to the provisions in Section 90-2, "Minor Concrete," except as follows:

1. Concrete aggregate shall be $\frac{3}{4}$ " max unless otherwise approved by the City Engineer.
2. All concrete shall be 6 sacks per cubic yard (4,000 psi).

The Contractor shall be responsible for setting all of the utility boxes when installing sidewalk (except AT&T and PG&E) to the grade of the finished sidewalk and for cleaning and clearing concrete mortar from all utility boxes in the area so that they are fully accessible upon completion of the sidewalk installation. The Contractor shall be responsible for setting meter boxes to grade.

The Contractor shall be responsible for coordinating with AT&T and PG&E for the adjustment of AT&T and PG&E facilities prior to installing new curb, gutter, sidewalk, and driveway.

The Contractor shall be responsible for guarding or otherwise protecting concrete work from vandalism or other damage. All such damage shall be repaired by the Contractor at the Contractor's own expense.

The Contractor shall replace any asphalt paving that is removed as part of curb and gutter removal and as part of valley gutter removal; a 2-foot wide by 6-inches thick AC plug is required. The extent of removal and replacement of asphalt concrete on either side of valley gutters shall be a minimum of two feet. Attention is directed to the section 3.05.03, "Asphalt Concrete" of these City Standard Specifications.

Constructing P.C.C. curb, gutter, sidewalk and driveways shall include any necessary excavation and backfill, furnishing and installing aggregate base, reinforcement, expansion joint filler, and all other required materials, including water.

Utility identification symbols, typically "S" for sanitary sewer and/or "W" for water, may exist on some curb. Contractor shall reference these symbols prior to removal of the curb and gutter and stamp a new symbol at the location of the original symbol or the where the utility line has been identified. New symbol must be stamped where the underlying utilities are identified, 1/8" minimum depth, into the curing P.C.C., of a plain font that is easily read with a letter height of approximately 3" placed on top and face of curb. If the Contractor elects to use the curing compound method for curing concrete, the curing compound shall be curing compound (6),

non-pigmented, conforming to the provisions in Section 90-1.03B(3), "Curing Compound Method," of the Standard Specifications.

The curing compound shall be applied in a manner that will provide a complete coating of all exposed faces of the concrete surface.

The Downtown Napa Specific Plan states that all sidewalk within the "Parkway Plaza Redevelopment Area" shall include a 2 by 2-foot square scoring pattern. Jet-black lampblack shall be added to the Portland Cement Concrete at the rate of one (1) pound lampblack per cubic yard of concrete (only within the Downtown Specific Area).

3.05.05 SIGNS, PAVEMENT MARKERS, AND STRIPING

A. Special Directional Signs

To the extent that the Napa Municipal Code authorizes directional signs to be installed, they shall be installed in accordance with the requirements of the Napa Municipal Code.

B. Street Addresses on Curb Face

The painting of house address numbers on the face of the curb is used to identify houses for emergency vehicles, delivery vehicles and other similar purposes, and shall conform to City Standard Plan S-26.

C. Street Name Signs

These signs are used to identify intersecting public streets and shall conform to the following specifications:

1. Metal name and block number plates are to be unpainted aluminum alloy 6061-T6, 0.063 inch (standard street-sign thickness), degreased to such extent that water will wet the surface uniformly, etched and free from all dents, and are to have a smooth and uniform flat surface. The metal plates are to be cut to size and shape, and shall be smooth and free from defects, prior to application of the reflective sheeting.
2. Each individual sign face shall have 3/4-inch radius corners and 3/16-inch holes pierced as shown on Standard Plan S-19, entitled "Standard Street Name Sign".
3. Name and block number plate background to be 3M diamond cubed retro-reflective or equivalent. After the sign blank surface has been processed as specified, a reflective sheet shall be applied to the full face of the sign, unless otherwise noted.
4. Street name and number plate height total shall be 9 inches; width shall be a minimum of 24 inches. Sign letters shall be 4 inches high California Department of Transportation Series C; block numbers and arrows shall be 2 inches high and shall be 605 Black Scotch-Cal, direct screened with 705 Black, or approved equal.
5. Sign shall have a 1/4-inch wide black border, inset 1/8 inch from edge of sign.
6. Shall conform or be approved equal as shown on the street name sign City Standard Plan S-19.
7. Street name signs for private streets intersecting public or other private streets shall meet the above specifications except for color. These street name signs are to be privately owned and maintained and shall be located outside of the public street right-of-way. See City Standard Plans S-18B and S-19 for color and other details.

8. All traffic signs (excluding temporary construction signs) shall have 3M diamond cubed retro-reflective or equivalent base and 3M 1160 protective overlay film or equivalent.
9. Traffic control is to be per CA MUTCD per Section 6 (Section 5 is not allowed).
10. Internally illuminated street name signs shall conform to City Standard Plan E-12.

D. Striping and Pavement Marking

Traffic striping shall be thermoplastic with reflector unless otherwise specified.

Contrast striping shall be placed on all concrete roadway surfaces.

Prior to the street opening after HMA is placed, there shall be temporary paint, tape, or reflective markers placed City Engineer's approval. Contractor to wait a minimum of 5 days and a maximum of 10 days after HMA is placed before permanent striping is placed.

Bike lane legends shall be helmeted cyclist with arrow.

Green-backed dashed bike lanes shall be placed at Conflict Zones.

Median Nose Paint is required and shall be colored the same as the leading lines per City Standard Plans S-31 and S-32.

Type Q markers shall be placed one foot (1') back from all median nose.

Median nose shall be signed at intersections and at the start of a median chain.

All striping and legends must be cat-tracked prior to placement of striping and markings. Contractor shall notify the City Engineer after the cat-tracking is placed. Striping and markings must not be placed until the City Engineer has authorized the cat-tracking alignment and placement details.

Contractor must submit certificates of compliance from the materials suppliers indicating compliance of the materials with the requirements as specified in "Prequalified and Tested Signing and Delineations Materials" of the Standard Specifications.

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