

**CITY OF SAN BERNARDINO
DEPARTMENT OF PUBLIC WORKS
STREET IMPROVEMENT POLICY
ISSUED JUNE 1, 1987**

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DIVISION I - AUTHORITY

This policy paper has been prepared to provide guidelines and establish acceptable practices to be used in the design or modification of streets within the City of San Bernardino. Its intent is to provide a basis for- the preparation and review of submitted plans in conformance with the Municipal Code of the City, acceptable design criteria and adopted standard specification used by the City.

Authority for street design and construction is contained in the City of San Bernardino Municipal Code in the following sections:

Title 10	"Vehicles and Traffic'
Title 12	"Streets, Sidewalks and Public Places
Title 18	"Subdivisions"
	Section 18.08
	Section 18.28.050
	Section 18.28.070
	Section 18.28.090
	Section 18.40.070 through 18.40.240 inclusive

Additionally, the City of San Bernardino has adopted a General Plan and circulation element, various area plans, overlay zoning and the "Standard Specifications for Public Works Construction", (Green Book) current addition with all supplements, Caltrans Standard Specifications, and has its own set of Standard Drawings for Public Works Improvements.

Referenced code sections also refer to various resolutions and ordinances adopted by the Mayor and Common Council in which fees for plan checking, permits and inspection services are detailed.

The above authority is established as the minimum requirement of the City of San Bernardino with all design subject to the review and approval of the Director of Public Works/City Engineer for conformance to acceptable design practices and sound engineering judgement. All plans must receive approval by the Director of Public Works prior to construction and for the recordation of Final Maps. Permits must be obtained and inspection given for all Public Works Improvements within the right-of-way. Inspection is provided by the Department of Public Works.

DIVISION II- DESIGN CRITERIA (Major Streets-Arterial/Collector Designation)

- 1 Minimum grade shall be 1% unless otherwise approved in advance.
- 2 A maximum grade of 6% is desired and no grade over that amount shall be approved unless written evidence is provided that conformance would be impractical. Grades exceeding 12% must be approved by the Commission, Police Department, Fire Department, and Director of

Public Works/City Engineer. (18.40.100)

- 3 Maximum grade break shall be 1/2%.
- 4 Maximum grade break in vertical curves shall be 1/2%.
- 5 Minimum cord length in vertical curve shall be 25 feet along street and 1/4 delta in curb return.
- 6 Minimum curb return radius at intersection with collector or higher designation 35 feet. At intersections with local or lesser streets minimum shall be 25 feet.
- 7 Driveways on to collector or arterial streets shall be reviewed by the City Traffic Engineer and should not be placed within 10 feet of the nearest BCR without prior approval. Preferred distance is a minimum of 50' from prolongation of curb line of intersecting street. Certain arterial streets presently have all access prohibited as shown on record maps.
- 8 Minimum horizontal curve shall be in accordance with Caltrans computational methods using design speed established by City of San Bernardino Traffic Section. In general, local streets are designed for 30 mph, collector for 35 mph, and arterial for 40 mph minimum.
- 9 Handicap access is required at all curb returns.
- 10 All commercial driveways shall have pedestrian bypass in areas where walks are provided, see standard drawings. Type II driveway approach will be constructed as directed, and they are desired where speed exceeds 35 m.p.h. or volumes exceed 5000 ADT.
- 11 Traffic signing, striping, and markings shall be completed as directed and approved by the City Traffic Engineer. Suitable transitions to existing markings are required. Transitions and tapers shall conform with Caltrans' Traffic Manual requirements per Section 6-25.
- 12 Curb face shall be a standard 8" face with 18" gutter per City Standard Drawings - Type B.
- 13 Structural Section shall be designed on "R" value of subgrade as determined by soils testing and T.I. (Traffic Index) supplied by the City. Regardless of calculations supplied, the minimum AC thickness is 2.5 inches and the minimum AB thickness is 4 inches or full depth AC equivalent to 2.5"AC/4"AB with minimum full depth AC being 3.5 inches.
- 14 Continuation of the centerline of arterial or collector streets shall line up across intersections. If continuation of centerline is impractical, it shall be offset a minimum of 300' from the projection of the existing centerline.
- 15 Street intersections shall intersect at right angles. If impractical, they should intersect at no less than 75'.

- 16 Side street intersections shall conform to 14 above for arterial/collector streets and shall be a minimum of 150' offset for local/residential streets.
- 17 Utilities shall be undergrounded along all streets except for transmission lines exceeding 33KV. See Section 18.40.380 for details.
- 18 Sight distance at intersections shall provide the greatest possible unobstructed roadway vision. Minimum sight distances are provided in Table "A".
- 19 Graded berms in medians or parkways shall not exceed a slope of 3:1 or be more than 30" high without previous written approval.
- 20 Street cross fall is 1.75% desirable and 3% maximum without approval by the Director of Public Works/City Engineer.
- 21 Driveway approach aprons shall meet grade established by back of walk (1/4"/ft. from top of curb). Driveways to residential units shall not exceed 8%. Exceptions will be made for hillside areas and single lots with residence located more than 50' from the street.

DIVISION II DESIGN CRITERIA (Minor Streets - Local/residential)

- 1 Minimum grade shall be 1% unless otherwise approved in advance.
- 2 A maximum grade of 6% is desired and no grade over that amount shall be approved unless written evidence is provided that conformance would be impractical. Grades exceeding 12% must be approved by the Commission, Police Department, Fire Department, and Director of Public Works/City Engineer. (18.40.100)
- 3 Maximum grade break shall be 1%.
- 4 Maximum grade break in vertical curve shall be 1%.
- 4 Minimum cord length in vertical curve shall be 15 feet along the street and 1/4 delta in a curb return.
- 6 Minimum curb return radius at intersection with a collector or higher designation shall be 25 feet. Minimum at the intersection of local or lessor designated streets shall be 20 feet unless otherwise approved in advance. 25 foot radius is desired.
- 7 Driveways shall not be permitted closer than 5 feet to the BCR of a curb return for local to local street intersections.
- 8 Minimum horizontal curve radius shall be in accordance with Caltrans computational methods using design speed established by City Traffic Section (25 m.p.h. minimum).

- 9 Handicapped ramps are required at all curb returns.
- 10 Traffic signing, striping, and marking may be required as directed by the City Traffic Engineer.
- 11 Curb face shall be a standard 6' face with 18' gutter per City Standard Drawings Type C except where Type 8 is required for drainage control. Suitable transitions to 8' curb face for joins are required. Transitions shall normally be made around curb returns.
- 12 Structural section shall be designed on "R" Value of subgrade established by soil tests and T. I. (Traffic Index) supplied by the City. Regardless of calculations supplied, the minimum AC thickness is 2- 1/ 2 inches and minimum A.B. thickness is 4 inches or full depth A.C. equivalent to 2.5' AC/4" AB with minimum full depth AC being 3-1/2".
- 13 Center lines of local/residence streets shall line up across intersections. Center lines shall be offset 150 feet minimum from existing streets if continuation of centerline is impractical.
- 14 Street shall intersect at right angles. If impractical, they should intersect at no less than 75'.
- 15 Maximum cul-de-sac length shall be 500 feet from center line intersection to radius point of bulb unless otherwise approved by the Planning Commission in advance of plan submittal.
- 16 Side street intersections shall conform to 13 above for local/residential streets and shall be a minimum of 300 feet offset for arterial/collector streets.
- 17 Utilities shall be undergrounded along all streets except for transmission lines exceeding 33KV. See Section 18.40.380 for details.
- 18 Sight distance at intersections shall provide the greatest possible unobstructed roadway vision. Minimum sight distances are provided in Table "A".
- 19 Street cross fall is 1.75% desirable and 3% maximum without written approval by the Director of Public Works/City Engineer.
- 20 Driveway approach aprons shall meet grade established by back of walk (1/4'/ft. from top of curb). Driveways to residential units shall not exceed 8%. Exceptions will be made for hillside areas and single lots with residence located more than 50' from the street.

DIVISION III GUIDELINES AND FORMAT FOR PLAN PREPARATION

A Plan Requirements

- 1 Sheet size is 24 x 36 inches (Plan and Profile)

- 2 Plan to show the following (minimum)
 - a) Vicinity Map
 - b) North Arrow
 - c) Horizontal and vertical scale
 - d) Profile of existing centerline, and right-of-way lines or existing top of curb if joining existing improvements
 - e) Legend - Topo and Construction
 - f) General Notes
 - g) Engineer's signature
 - h) License number and expiration date
 - i) Right-of-Way
 - i) Existing and proposed improvements.
 - k) Join elevations
 - l) Sections and Details
 - m) Stationing and Dimensions
 - n) Utilities
 - o) Bench Mark

Submit 2 sets of plans for checking, cross sections or other design data may be requested.

B General Notes (On all Plans)

- 1 All work shall be in accordance with the Standard Specifications for Public Works construction (Green Book) latest edition with all supplements and City of San Bernardino Standard Drawings.
- 2 Approval of this plan by the City of San Bernardino does not constitute a representation as to the accuracy of the location or of the existence or non-existence of any underground utility pipe or structure within the limits of this project. The Contractor shall assume full responsibility for the protection of all utilities within the limits Of the project. Contractor shall contact Underground Service Alert 48 hours prior to start of work.
- 3 Inspection shall be by the City of San Bernardino Department of Public Works. All requests for inspection shall be made at least 24 hours in advance of the proposed construction
- 4 All join lines shall be saw cut on a neat, straight line parallel with the join. The cut edge shall be protected from crushing, and all broken edges shall be recut prior to paving.
- 5 During the period of construction, the Contractor shall furnish, erect and maintain such warnings, signs, stop signs, barricades and other safety measures in conformance with the W.A.T.C.H. manual .

- 6 Contractor shall reinstall pavement markings, striping and signing that has been disturbed by his operation.

Additional notes that may be used as warranted by specific project.

- 1 The Contractor shall provide safe and continuous passage for local pedestrian and vehicular traffic at all times.
- 2 Traffic signal functions shall be the responsibility of the City. However, the Contractor is required to give 48-hour notice prior to construction that will damage or affect any buried traffic detectors or other underground facilities.
- 3 Should any of the existing utilities or any other facilities conflict with the proposed improvements, the Contractor shall notify the Engineer and await the relocation and/or provide an alternate design.
- 4 The Contractor shall so conduct his operations as to offer the least possible obstruction and inconvenience to the public, and he shall have under construction no greater length or amount of work than he can prosecute properly with due regard to the rights of the public.

Convenient access to driveways, houses, and buildings along the line of work shall be maintained, and temporary crossings shall be provided and maintained in good condition. Not more than one crossing or intersecting street or road shall be closed at any one time without the approval of the Engineer.

The Contractor shall provide and maintain such fences, barriers, directional signs, lights, and flagmen as are necessary to give adequate warning to the public at all times of any dangerous conditions to be encountered as a result of the construction work and to give directions to the public.

- 5 The contractor shall exercise due care to avoid injury to existing improvements or facilities, utility facilities, adjacent property, and trees and shrubbery that are not to be removed.
- 6 In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work, and the Contractor shall fully comply with all State and Federal laws, rules, regulations, and orders relating to safety to the public and workmen.
- 7 Dust shall be controlled at all times by approved methods.
- 8 Public streets shall be kept clean and free from dirt and/or debris. The Contractor

shall be responsible for all costs incurred in street cleaning necessitated by his operation. .

- 9 Full street closure will not be permitted unless prior written approval is obtained from the Director of Public Works/City Engineer. 48 hour notice will be required to the City and affected property owners prior to any closure.
- 10 Street cut permits must be obtained from the Public Services Department.
- 11 CAL-OSHA permits shall be required for any trench work over 5' in depth. Evidence must be presented to the City prior to permit issuance.

Any such additional notes may be required for the completion of the plans and construction.

DIVISION IV TESTING AND INSPECTION

Testing and inspection shall be per the Standard Specifications for Public Works Construction (Green Book), the City of San Bernardino Municipal Code, the City of San Bernardino Standard Drawings and the Caltrans Specifications as required.

Permits are required for all construction, and inspection will be provided by the City or other agency having Jurisdiction over the inspection.

In addition to the above, the following shall apply:

- 1 All trench backfill shall be tested and certified by a soils engineer prior to acceptance.
- 2 24 hours advance notice is required for inspection. Arrangements for inspection can be made by calling 384-5166 between 7 :30 a.m. and 4:30 p.m. weekdays (subject to adjustments for the 9/80 work schedule).
- 3 Core inspection hours are 7:30 a.m. to 4:30 p.m. Monday through Friday (Please download the latest work schedule which is posted on the Department of Public Works/City Engineer Page). Requests for inspection at other times or on other days must be submitted to the Department of Public Works a minimum of 48 hours before the inspection is required. The contractor must bear the cost of such over-time inspections and will be billed accordingly. Normal over-time rates are 1.5 times the base rate. Over-time inspections will be made solely at the discretion of the City and based on staff availability.
- 4 Contractors will be required to obtain City bus i n e s s licenses, insurance and provide evidence of same to inspection staff upon request.
- 5 The Final Compact on Report and approval from the Soils Engineer shall contain the type of field testing performed. Each test shall be identified with the method of

obtaining the in place density, whether sand-cone, drive-ring, or other approved method and shall be so noted for each test. Sufficient maximum density determinations shall be performed to verify the accuracy of the maximum density curves used by the field technician. Recommendations for structural sections shall also be supplied.

- 6 The Contractor shall not place concrete or asphalt on the project without first having submitted compaction tests to the Department of Public Works.
- 8 All plan revisions shall be submitted to the Design Section for review and approval prior to making field revisions. Construction, other than shown on the approved plans will not be permitted without approval of revisions.
- 9 Certificates of Occupancy or utility clearance will not be issued until all work and safety items have been completed satisfactorily.

DIVISION V STREET PLAN CHECK LIST

Dates _____ 1st submittal
_____ 2nd submittal
_____ 3rd submittal

Project Name _____
Owner _____ Checked by _____
Engineer _____ Phone _____

_____ OK

_____ Needs Correction

_____ No Requirement

Submittal Completion

_____ 2 sets of plans

_____ 2 copies preliminary soils reports

_____ Hydrology submitted

_____ Hydraulics submitted

_____ Engineer's cost data and itemized quantity estimate complete.

_____ Permit or clearance needed from

_____ Condition # _____ from Review Committee or Planning Commission needs to be satisfied.

_____ Plans signed by RCE with expiration date shown

_____ Return check prints from previous plan checks

FEES AND PERMITS

_____ Pay plan check fee

_____ Pay permit fee

_____ Inspection fee

_____ Plans signed and approved by City Engineer

_____ Permit issued

_____ Other departments notified

COMMENTS:

PLAN REVIEW

Required Items to be Shown on All Plans:

- _____ Vicinity map
- _____ North Arrow
- _____ Horizontal and
- _____ vertical scale
- _____ Profile of existing centerline, and right-of-way lines or existing top of curb if joining existing improvements
- _____ Legend - Topo and construction
- _____ General notes
- _____ Engineer's signature
- _____ License number and expiration date
- _____ Right-of-Way
- _____ Existing and proposed improvements
- _____ Join elevations
- _____ Sections and details
- _____ Stationing and dimensions utilities
- _____ Bench mark

The following Items are to be shown when applicable

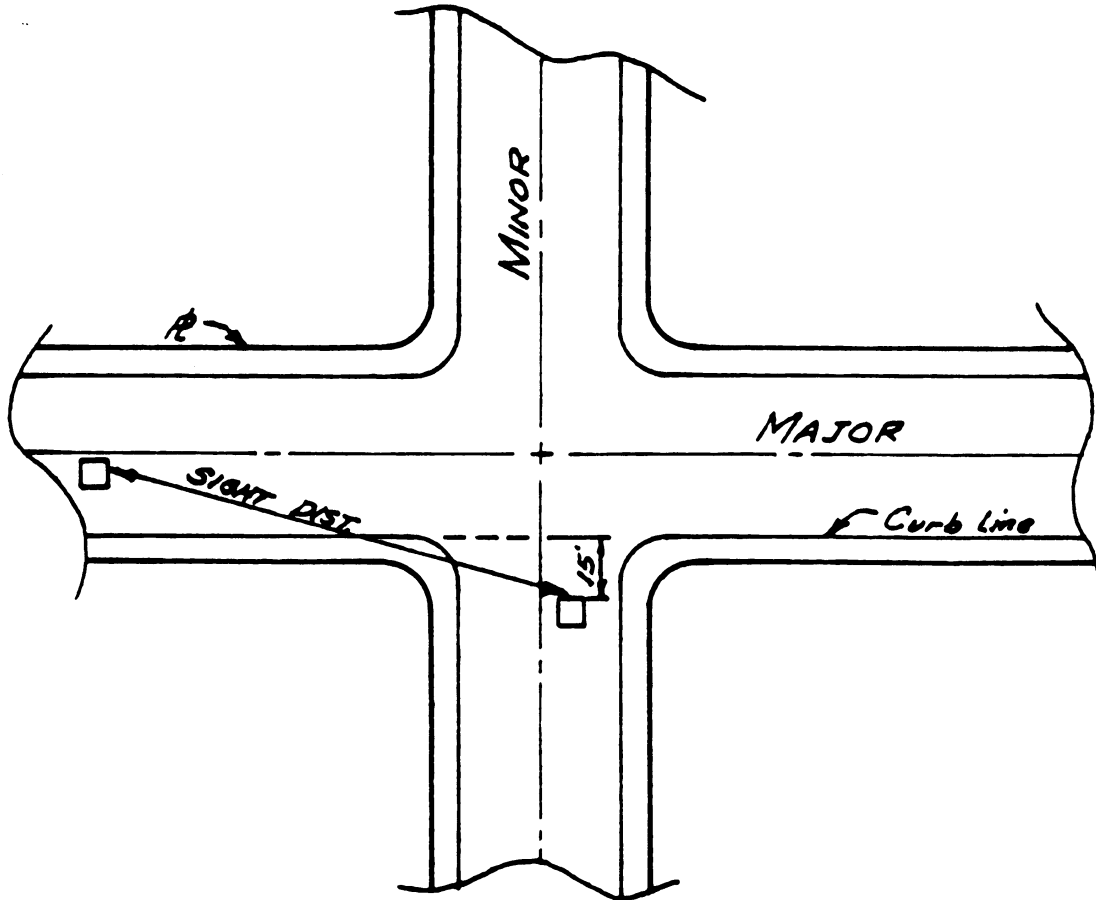
- _____ Street names in conformance with approved maps
- _____ Minimum/maximum grades within limits
- _____ Joins detailed and elevations shown
- _____ Street intersection angle within limits
- _____ Minimum curb radius provided
- _____ Horizontal curves within design criteria
- _____ Vertical curves checked and within design guidelines
- _____ Quantity/cost estimates provided
- _____ Street hydraulics checks
- _____ Intersection separation checked
- _____ Ingress/egress restrictions checked with map and conditions
- _____ Standard drawings referenced
- _____ Assessment district/landscape maintenance provided (if required)
- _____ Drainage pattern acceptable and outletted to correct location
- _____ Bench mark provided
- _____ Traffic control, signing and striping shown
- _____ Street lighting reviewed and approved
- _____ Driveway location in relation to BCR checked
- _____ Cul-de-Sac length within limits.

TABLE "A"

MINIMUM SIGHT DISTANCES AT INTERSECTIONS

<u>DESIGN SPEED</u>	<u>MINIMUM SIGHT DISTANCE</u>
20 MPH	200'
30 MPH	300'
40 MPH	400'
50 MPH	500'
60 MPH	600'

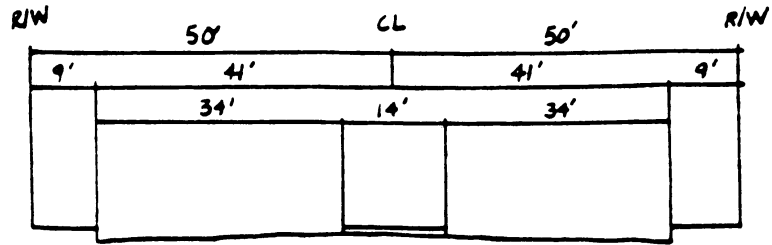
Sight distance is the distance measured from a point on the minor road at least 15 feet behind the project curb line of the major road at eye level (3.5') above the surface to an object 4.5' high on the major road.



C. STREETS

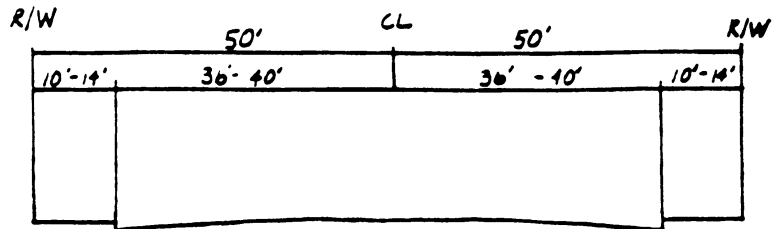
GENERAL

Divided Major Arterial



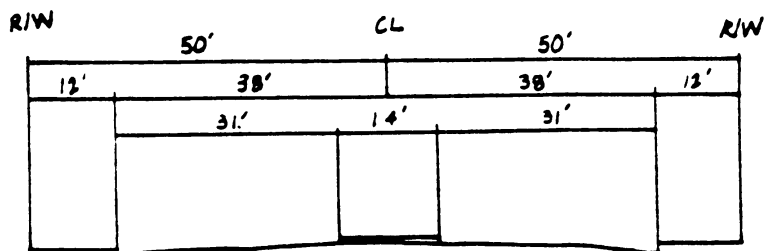
1. Northpark Boulevard
2. University Parkway

Major Arterial



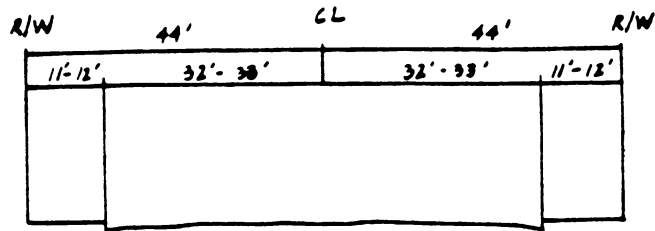
1. Cajon Boulevard

Major Arterial With Median



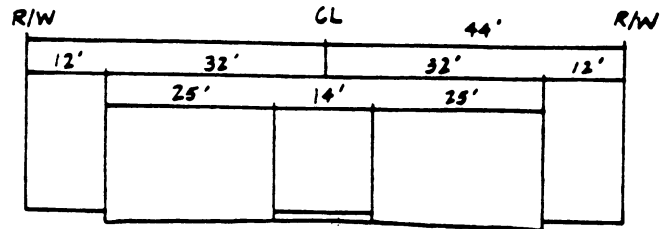
1. Kendall Drive

Minor Arterial



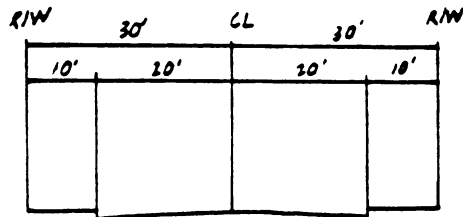
1. Pepper-Linden from the I-215 Freeway to Northpark Boulevard
2. Pine Avenue from Kendall Drive to Belmont Avenue

Minor Arterial With Median



1. Devore Road from the I-215 Freeway to Glen Helen Park
2. Palm Avenue from the I-215 Freeway to Belmont Avenue

**Residential/
Industrial Collector**



1. Cable Canyon Road from Santa Fe Avenue to Frontage Road
2. Frontage Road
3. Palm Avenue from Belmont Avenue to Ohio Avenue