



ENGINEERING DESIGN GUIDELINES

Policies & Procedures

City of Lancaster
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
JANUARY 1997

**CITY OF LANCASTER
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION**

ENGINEERING DESIGN GUIDELINES, POLICIES AND PROCEDURES

FOREWORD AND ACKNOWLEDGMENTS

The City of Lancaster Engineering Division's *Engineering Design Guidelines, Policies and Procedures* Manual represents an update of related data contained in the City of Lancaster *Subdivision Ordinance* (effective July 6, 1994) prepared by the City Community Development Department.

The manual's intended use is for developers, architects, engineers, City Staff, contractors, and the general public for clarification and guidance on City engineering policies and procedures for primarily private development in the City of Lancaster. It establishes comprehensive design guidelines, and sets parameters for design requirements of private development infrastructure improvements and plan preparations to be processed by the City of Lancaster. It also utilizes already existing approved and recognized design standards and manuals of other public agencies, such as the Los Angeles County department of Public works, Caltrans, and the American Public Works Association (APWA) Standard Plans and Details.

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**CITY OF LANCASTER
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION**

ENGINEERING DESIGN GUIDELINES, POLICIES AND PROCEDURES

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SECTION 1

General

SECTION 1 GENERAL

1.1 INTRODUCTION

The Engineering Design Guidelines Policies and Procedures Manual, prepared by the City of Lancaster, Department of Public Works, Engineering Division, provides guidelines for the design of improvement plans for streets, sewer systems, water systems, grading, storm drains, landscaping, street lighting, and for the preparation of hydrology and geotechnical reports and sewer area studies. These guidelines also provide policies and procedures for other development related requirements such as improvement securities, construction permits and Final Maps.

This manual will be revised periodically to reflect the changing technology of the engineering and construction industry.

1.2 DESIGN REFERENCES

All improvement plans to be submitted to the Department of Public Works, Engineering Division for review and approval shall be prepared in accordance with this manual.

The Director of Public Works reserves the right to reduce or increase improvement requirements to the degree necessary to fully protect the Public interest. In addition, when a conflict between these guidelines and other referenced manuals arises, the Director of Public Works reserves the right to specify which standard or requirement is to be used.

A request for an exception, waiver, variance or deviation from these guidelines shall be submitted in writing to the Director of Public Works for a determination with appropriate detail and documentation sufficient to support the request.

Any item not included in this manual shall be designed in accordance with the latest City-approved edition of the following references, except as otherwise specified by the Director of Public Works:

- a. Uniform Building Code
- b. APWA Standard Plans for Public Works Construction
- c. Standard Specifications for Public Works Construction
- d. Highway Design Manual of Instructions issued by the Los Angeles County Department of Public Works
- e. Standard Plans of the Los Angeles County Department of Public Works
- f. Hydrology Manual issued by the Los Angeles County Department of Public Works
- g. Standard Plans issued by the Los Angeles County Department of Public Works Road Department
- h. Design Manual (Structural) issued by the Los Angeles County Department of Public Works

- i. City of Lancaster Specifications for Landscape Development (Ordinance No. 629)
- j. City of Lancaster Subdivision Ordinance
- k. Subdivision Map Act
- l. Highway Design Manual of Instructions issued by the State of California Department of Transportation (CALTRANS)
- m. Standard Plans issued by CALTRANS
- n. Procedures for the Preparation of Street Light Layouts by Private Developers
- o. Standard Specifications issued by CALTRANS
- p. Los Angeles County Private Contract Sanitary Sewer Procedural Manual
- q. Division 2, Title 20, Ordinance 6130 (Sanitary Sewer and Industrial Waste)
- r. All other applicable Codes and Ordinances

1.3 DEFINITIONS OF TERMS AND ABBREVIATIONS

1.3.1 DEFINITIONS

BID is an offer or proposal submitted on the prescribed form setting forth the prices for the Work.

BIDDER is any individual, firm, partnership, corporation, or combination thereof, submitting a Bid for the Work, acting directly or through a duly authorized representative.

CITY shall mean the City of Lancaster.

CITY ENGINEER shall mean the City Engineer of the City of Lancaster, California, or designated representative.

CIVIL ENGINEER means a professional engineer licensed by the State of California to practice or offer to practice civil engineering in any of its phases.

CONTRACT is the written agreement between the Developer/Owner and the Contractor covering the Work.

CONTRACTOR is any individual, partnership, corporation, joint venture, or other legal entity having a Contract with the Developer/Owner to perform the Work.

COUNCIL shall mean the City Council of the City of Lancaster, California.

DESIGN means (1) street, alley, and access road alignments, grades and widths; (2) drainage, sanitary facilities and utilities alignments, grades and sizes; (3) location and size of easements and rights-of-way; (4) grading; (5) lot size and configuration, and; (6) miscellaneous improvements required by the Director of Public Works.

DEVELOPER is any person or persons, firm, corporation, partnership or association engaged in the development of a property.

DEVELOPMENT means the uses to which the land shall be put, the buildings to be constructed on it, and all alterations of the land and construction thereto.

DIRECTOR OF PUBLIC WORKS shall mean the Director of Public Works of the City of Lancaster, California, or designated representative.

ENGINEER OF RECORD see PRIVATE ENGINEER.

ENGINEERING DIVISION refers to the capital design, assessment, subdivision and inspection sections of the Department of Public Works, City of Lancaster.

IMPROVEMENT refers to any street work, grading, and utilities to be installed on the land to be used for public or private streets, highways and easements or other specific improvements or types of improvements by the Developer, Public Agencies or by Private Utilities.

INSPECTOR means the authorized inspector or a representative of the City of Lancaster and the City Engineer.

MAY is a permissive condition.

ORDINANCE means the ordinance of the City of Lancaster.

PLANS are the drawings, profiles, cross sections, working drawings, and supplemental drawings, or reproductions thereof, plan checked by the City Plan Check Engineer, reviewed by the City Engineer, and approved by the Director of Public Works, which show the location, character, dimensions or details of the work.

PRIVATE ENGINEER or DEVELOPER'S ENGINEER is any individual, partnership, corporation or joint venture licensed by the State of California having an agreement with the Developer or Owner to perform professional design of a respective work.

PROFESSIONAL ENGINEER refers to a person engaged in the professional practice of rendering service or creative work requiring education, training and experience in engineering sciences and the application of special knowledge of the mathematical, physical and engineering sciences in such professional practice. Said individual is a licensed engineer by the State of California.

SHALL is a mandatory condition.

SHOULD is an advisory condition.

STANDARD SPECIFICATIONS means The Standard Specifications for Public Works Construction.

WORK is anything proposed to be constructed or performed under the Contract or permit, including the furnishing of all labor, materials, and equipment.

1.3.2 ABBREVIATIONS

AC	.....	Asphalt Concrete
BC	.....	Beginning of Curve
BCR	.....	Beginning of Curb Return
BM	.....	Bench Mark
BOW	.....	Back of Walk
BVC	.....	Beginning of Vertical Curve
CAB	.....	Crushed Aggregate Base
CB	.....	Catch Basin
Cb	.....	Curb
CF	.....	Curb Face
C&G	.....	Curb and Gutter
C/L	.....	Centerline
E	.....	Electrical
EC	.....	End of Curve
ECR	.....	End of Curb Return
EG	.....	Edge of Gutter
EGL	.....	Energy Grade Line
EL	.....	Elevation
EP	.....	Edge of Pavement
EVC	.....	End of Vertical Curve
EX	.....	Existing
FG	.....	Finished Grade
FH	.....	Fire Hydrant
FL	.....	Flow Line
FLD	.....	Flow Line Drain
FLG	.....	Flow Line Gutter
FS	.....	Finished Surface
FTG	.....	Footing
FUT	.....	Future
G	.....	Gas
HGL	.....	Hydraulic Grade Line
Horiz or Hor	.....	Horizontal
IE	.....	Invert Elevation
INV	.....	Invert
L	.....	Length
LMD	.....	Landscape Maintenance District
LLMD	.....	Lancaster Lighting Maintenance District
DMD	.....	Drainage Maintenance District
MH	.....	Manhole
PCC	.....	Portland Cement Concrete
PCC	.....	Point on Compound Curve
PC	.....	Point of Curvature
PI	.....	Point of Intersection
PL	.....	Property Line
POC	.....	Point on Curve (or) Point of Connection
PROP	.....	Proposed
PVI	.....	Point of Vertical Intersection

Q	Rate of flow (in cubic feet per second or gallons per minute)
R	Radius
RC	Reinforced Concrete
RCB	Reinforced Concrete Box
RCP	Reinforced Concrete Pipe
R/W	Right-of-Way
S or SS.....	Sewer or Sanitary Sewer
SD	Storm Drain
Sta	Station
S/W	Sidewalk
T or Tan	Tangent
TC	Top of Curb
TOE	Toe of Slope
TOF	Top of Footing
TOS	Top of Slope
TOW	Top of Wall
Tel	Telephone
Tr	Tract
TS	Transition Structure
USA	Underground Service Alert
W	Water
VC	Vertical Curve

1.4 FEES

The Developer may obtain a current schedule of City of Lancaster Development Fees from the Building and Safety or Engineering Division. See Subsection 1.4.2 for a partial listing of possible applicable Engineering and Traffic Engineering Division Fees.

1.4.1 FIRST SUBMITTAL

The following fees shall be paid at the time of first submittal of improvement plans for review as applicable:

- a. Improvement Plan Checking Fee
- b. Drainage or Grading Plan Checking Fee
- c. Water System Plan Review Fee
- d. Maintenance District Processing Fees for Landscape Maintenance District (LMD), Lancaster Lighting Maintenance District (LLMD), and Drainage Maintenance District (DMD).

1.4.2 BUILDING PERMIT ISSUANCE

Prior to the issuance of a building permit, the Developer shall pay all applicable Development Permit Fees. The Developer shall also show evidence of outside agency fees being paid by submitting copies of appropriate receipts. These fees shall include, but are not limited to, school district fees, waterworks district fees, and sewer connection maintenance/ annexation fees. The following Engineering Services (Engineering Division)

and Traffic Engineering (Traffic Division) fees (though not exhaustive) may be applicable to the Developer's project development and shall be paid to the City Building and Safety Division, in addition to applicable Building and Safety Division Building Fees and Community Development Department Development fees:

- a. Grading Plan Check Fee or Drainage Plan Check Fee
- b. Grading Permit Fee or Drainage Permit Fee and Issuance Fee
- c. Maintenance District Processing Fees for LMD, LLMD, and DMD.
- d. First Year's Assessment for LMD, LLMD and DMD
- e. Sewer Reimbursement District Processing, Special Studies, Sewer Connection Frontage Fees
- f. Final Map and Legal Property Documentation Processing, Plan Check and Inspection Fees
- g. Improvement (Street, Sewer, Water, Storm Drain, Drainage Channel/ Basin, etc.) Plan Check Fee
- h. Improvement (Street, Sewer, Water, Storm Drain, Drainage Channel/ Basin, etc.) Inspection and Construction Permit Fee and Issuance Fee
- i. Encroachment Permit Fee
- j. Desert Woodland Fees (if applicable)
- k. Traffic Division Sign/Striping Plan Check Fee
- l. Traffic Division Street Improvement Plan Check Fee (in addition to the Engineering Division "Improvement Plan Check" Fee)
- m. Traffic Control Plan Check Fee
- n. Traffic Signage Plan Fee (for the Traffic Division to produce the plan for the Developer)
- o. Traffic Signal/Timing Plan Fee (for the Traffic Division to produce the plan for the Developer)
- p. Miscellaneous Traffic Division Reproduction Fees
- q. Flood Elevation Certificate Plan Check Fee
- r. Bond Reductions Fee
- s. Assessment District Formation Fee
- t. Photocopy Reproduction Fees
- u. Engineering Division Miscellaneous Improvement Plan Check, Inspection, and Permit Issuance Fees

- v. Additional Improvement Revision Plan Check Fees
- w. Abandoned Plans Re-Plan Check Fee

1.4.3 MAINTENANCE DISTRICT CHARGES

The Developer shall pay the applicable first year's Maintenance District (LMD, LLMD, DMD) Assessment/Annexation charges before submitted plans are approved by the City. No City Engineering Development permit (including Drainage and Grading Permits) shall be issued until the City has received a signed, notarized, and accepted petition and/or affirmative vote ballot from the affected development's property owner(s) for acceptance into the applicable City Maintenance District(s).

1.4.4 BONDS AND SECURITIES

The Developer shall post applicable bonds before issuance of a permit. The bonds to be posted are:

- a. Grading Permit Bond
- b. Bond for Faithful Performance
- c. Bond for Labor and Materials

Refer to Section 5 of this manual for securities details and the Engineering Division for current sample bond forms.

1.5 PUBLIC UTILITIES

Applicants may be required to coordinate with other agencies and service districts. Each of these agencies has specific requirements for processing plans and permits.

Applicants may obtain a current utility contact listing from the Engineering Division prior to project development.

Approved design plans from other public agencies and utility companies associated with the private developer's offsite improvements in the City right-of-way shall be submitted to the City prior to issuance of a City encroachment permit. Refer to subsection 6.1.2 for more information regarding Encroachment Permits.

SECTION 2

Design Guidelines Improvement Plans

SECTION 2.1

Grading Improvement Plans

SECTION 2.1 GRADING IMPROVEMENT PLANS

2.1.1 GENERAL

This section provides guidelines for the design and preparation of Grading and Drainage Plans for approval by the City of Lancaster.

Grading shall conform to the current Uniform Building Code as adopted and modified by the City of Lancaster and hereinafter referred to as the "City Grading Ordinance." Drainage Plans may be used in lieu of Grading Plans if:

- 1) the structure to be constructed is a single family residence located on a lot which is not part of a subdivision, and
- 2) the lot is larger than 1/4 acre, or
- 3) the "net" earthwork volume of the site (regardless of zoning) is less than 50 cubic yards (excluding overexcavation and recompaction volumes); or
- 4) the site has previously been rough graded with a certified pad, but no slab or drainage swales constructed.

Grading or Drainage Plans shall be submitted to the City Engineering Division for review and approval. Prior to submittal, Grading plans and Precise Grading plans shall be prepared by, or under the direction of, a Registered Civil Engineer or Registered Architect of the State of California, and shall be stamped and signed by the Registered Engineer or Architect. Unsigned plans will not be accepted for plan checking. Drainage plans need not be stamped and signed by a registered professional.

2.1.2 DEFINITIONS OF TERMS

COMPACTION is the densification of a fill by mechanical means.

DRAINAGE PLAN is a plan that shows fine grading (Final Grade) of a site reflecting drainage swales around existing and proposed structures in which there is no more than 50 net cubic yards of excavation or fill.

EARTHWORK is the removal, filling, or shaping of any rock, natural soil or fill or any combination thereof.

ENGINEERING GEOLOGIST is a registered geologist experienced and knowledgeable in Engineering Geology.

ENGINEERING GEOLOGY is the application of the knowledge and principles in the investigation and evaluation of naturally occurring rock and soil for use in the design of civil works.

EROSION is the wearing away of the ground surface as a result of the movement of wind, water and/or ice.

EXCAVATION is the mechanical removal of earth material.

EXISTING GRADE is the elevation of the existing ground prior to grading.

FILL is a deposit of earth material placed by mechanical means.

FINISH GRADE is the final grade of the site which conforms to the approved plan.

GEOTECHNICAL ENGINEER. See Soils Engineer.

GEOTECHNICAL ENGINEERING. See Soils Engineering.

GRADE is the vertical location or slope of the ground surface.

GRADING is any excavating or filling or combination thereof with respect to a referenced datum.

GRADING PLAN is a plan prepared by, or under the responsible charge of, a California licensed Architect or Civil Engineer that shows the rough grading of a site; wherein the earthwork is greater than 50 cubic yards.

NATURAL GROUND (ORIGINAL GROUND) is original ground contours prior to any man-made disturbance.

NOI (Notice of Intent for NPDES) for projects involving five (5) acres or more of ongoing construction activity. Said NOI is a notification to the California State Water Resources Control Board applying for coverage under the state permit.

NPDES (National Pollutant Discharge Elimination System) administered by the State of California Water Resources Control Board to regulate the discharge of construction pollutants into the waters of the United States.

PRECISE GRADING PLAN is a grading plan prepared by, or under the responsible charge of, a California licensed Architect or Civil Engineer that shows the final (precise) grading of a site, as an "as-built" plan to within 0.1 foot precision.

ROUGH GRADE is the stage at which the grade approximately conforms to the approved plan.

SITE is any lot or parcel of land or contiguous combination thereof, under the same ownership, where grading is performed or permitted.

SLOPE is an inclined ground surface expressed as a ratio of horizontal distance to vertical distance in percentage.

SOIL is naturally occurring superficial deposits overlying bed rock.

SOILS ENGINEER shall be a registered engineer experienced and knowledgeable in the practice of soils engineering.

SOILS ENGINEERING is the application of the principles of soil mechanics in the investigation, evaluation and design of civil works involving the use of earth materials and the inspection or testing of the construction thereof.

TERRACE is a relatively level step constructed in the face of a graded slope surface for drainage and maintenance purposes.

2.1.3 SUBMITTAL REQUIREMENTS

2.1.3.1 INITIAL SUBMITTAL OF GRADING PLANS

Initial submittal of Grading Plans for review shall comply with the requirements of the latest Grading Plan Submittal Requirements Packet available upon request from the Engineering plan checker.

2.1.3.2 INITIAL SUBMITTAL OF DRAINAGE PLANS

Initial Submittal of Drainage Plans for review shall comply with the requirements of the latest Drainage Plan Submittal Requirements Packet available upon request from the Engineering plan checker.

2.1.4 GRADING AND DRAINAGE PLAN PREPARATIONS

All Grading Plans shall be prepared on 24" x 36" mylar sheets. The plans shall be prepared in conformance with the sample plans included with this manual. Approved grading plan originals are the property of the City of Lancaster. The City only needs prints of approved Drainage Plans.

2.1.5 CITY OF LANCASTER GENERAL GRADING AND DRAINAGE NOTES

Grading and Drainage Plans shall include General Notes as shown in the latest Grading or Drainage Plan Submittal Requirements Packet. These notes are a minimum.

2.1.6 GRADING AND DRAINAGE IMPROVEMENT PLANS CHECKLISTS

A plan check checklist is available from the City plan checker. The Developer's Engineer or Architect is advised to obtain the latest checklist and the applicable Submittal Requirements Packet before preparing the Grading or Drainage Plan.

2.1.7 DESIGN CRITERIA

Grading shall conform to the latest edition of the City of Lancaster Building Code, the direction of the City of Lancaster Building Official, and the following:

2.1.7.1 CUTS

The slope of cut surfaces shall not exceed 2 horizontal to 1 vertical. A steeper slope is allowed if the soils engineering or an engineering geology report states that the site has been investigated and a steeper slope will be stable and not create a hazard to public or private property. Stamped and signed slope stability calculations shall be submitted for approval.

2.1.7.2 FILLS

Fill slopes shall not be constructed on natural slopes steeper than 2 to 1. Detrimental amounts of organic material shall not be permitted in fills.

The bench under the toe of a fill on a slope steeper than 5 to 1 shall be at least 10 feet wide.

The area beyond the toe of fill slopes shall be sloped for a minimum 2% sheet overflow to daylight.

No rock or similar material greater than 6" in diameter will be placed in the fill unless recommendations for such placement have been submitted by the Soils Engineer and approved by the Building Official.

Fills shall be compacted throughout to at least 90% of the maximum dry density as determined by A.S.T.M. Soil Compaction Test D1557-78.

2.1.7.3 SETBACKS

Setback dimensions shall be horizontal distances measured perpendicular to the site boundary.

The top of cut slopes shall not be nearer to a site boundary line than $1/5$ of the vertical height of cut with a minimum of 2 feet and a maximum of 10 feet.

The toe of fill slope shall not be nearer to the site boundary line than $1/2$ the height of the slope with a minimum of 2 feet and a maximum of 20 feet.

The Building Official may approve alternate setbacks.

2.1.7.4 DRAINAGE

Drainage from commercial/industrial development shall not occur over the sidewalks or driveway approaches in the public right-of-way, but shall be directed to an approved drainage device which outlets through the curb face in the public right-of-way.

A minimum 2% overall gradient shall be maintained between rear of hillside (slopes 3:1 or greater) single family residential or rough graded hillside lots to curb or drainage structure.

A 1% minimum swale flowline is required around the house or building to a drainage structure or the street. Asphalt pavement, shall have a minimum cross gradient of 1.5%.

Concrete paving and concrete gutter in paved areas for residential, commercial, and industrial sites, shall have a minimum gradient of 0.4%.

Maximum gradient for sheet flow is 20% (5:1).

Common swales are not acceptable.

Fine-graded dirt pads shall have minimum 2% positive sheet flow away from pad for a minimum of 3 feet.

Pad shall be at least 0.3 foot above high point of swale.

For residential lots, swales shall be 3 feet minimum from building pad.

Drainage shall not sheet flow over the top of any slopes steeper than 5:1.

Swales, berms or other devices shall be provided at the top of cut or fill slopes to prevent surface waters from overflowing onto and damaging the face of the slope. Special drainage provisions shall be made where the building or structure exists within 5 feet of the top of a slope.

New construction and substantial improvement in Federal Emergency Management Agency (FEMA) "AO" flood zones in the City of Lancaster shall have the lowest floor (including basement) elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's applicable Flood Insurance Rate Map (FIRM), at least two feet if no depth number is specified. An Elevation Certificate shall be completed.

"Highest adjacent grade" means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

Paved interceptor drains shall have a 3-inch minimum reinforced concrete or gunite pavement, minimum depth of 12 inches, minimum "y" paved width of 30 inches measured horizontally across the drain. Said drain shall be installed along the top of all cut slopes (with slope height greater than 10 feet and slope gradient steeper than 5:1) with a minimum gradient of 1.0% or as acceptable to the Building Official. The drain is required where the tributary drainage area above slopes toward cut slope and has a drainage path greater than 40 feet measured horizontally.

2.1.7.5 EROSION CONTROL

The faces of cut and fill slopes shall be prepared and maintained to control against erosion. This control may consist of effective planting. Contact the City Public Works Maintenance Yard for the approved methods of soil stabilization and planting mixes or refer to the City of Lancaster Guidelines and Specifications for Landscape Development.

2.1.7.6 RETAINING WALLS

Retaining walls that support an inclined fill with surface surcharge or impounds Class I, II, or III-A liquids, require structural calculations and shall be plan checked by the City Building & Safety Division, regardless of height to top of the wall from the bottom of the footing.

Retaining walls that support earthwork material level with the top of the wall and measuring less than 4 feet in height from the bottom of the footing to the top of the wall, may not require plan checking by the City Building and Safety Division. However, if said wall has an inclined surface to top of the wall or impounds Class I, II and III-A liquids that require calculations, then City plan checking and permitting shall be required.

The Building & Safety Division retaining wall plan check shall be processed separately of the Engineering Division Grading Plan. A separate permit shall be issued for each. Under no circumstances shall the retaining wall permit be issued unless the grading permit is approved to be issued.

The engineer may use an appropriate retaining/slough wall standard plan accepted by the City of Lancaster.

2.1.8 TEMPORARY EROSION CONTROL DESIGN CRITERIA

If the project is expected to be under construction from November 1 to April 15, Temporary Erosion Control Plans shall be submitted prior to October 1. The control devices shown on the plans shall be installed prior to November 1 and maintained in operable condition until April 15. A sample Temporary Erosion Control Plan is included in this manual. Use the most current City of Lancaster Erosion Control Plan General Notes available in the City Submittal Requirements Packets.

2.1.9 STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

When a site being developed is 5 acres or greater in area, a NPDES (National Pollutant Discharge Elimination System) General Permit shall be obtained by the developer. This permit shall be obtained from the California State Water Resources Control Board (SWRCB) An information guide and a blank Notice of Intent (NOI) may be obtained from the City Engineering Division upon initial submittal for grading plan check.

The applicant shall complete the NOI application and submit it to the SWRCB with the required fee. The grading permit will not be issued until the Engineering Division has received photocopies of the completed NOI and the applicant's fee receipt from SWRCB.

All dischargers must prepare, retain at the construction site, and implement a SWPPP (Storm Water Pollution Prevention Plan). This is a report that shall conform to NPDES format as outlined in the information guide. The report includes site map(s), an identification of construction/contractor activities possible sources of pollutants that could

be on site, in the storm water, and a description of measures or practices to control these pollutants. The SWPPP must be prepared and a copy submitted to the City before the grading permit is issued and it is implemented before construction begins.

2.1.10 FORMS AND AGREEMENTS

The most current forms, sample letters, and agreements pertaining to grading requirements are available upon request from the Engineering Division (see applicable required documents submission on the Grading or Drainage Plan Checklists or applicable Submittal Requirements Packets).

SECTION 2.2

Street Improvement Plans

SECTION 2.2 STREET IMPROVEMENT PLANS

2.2.1 GENERAL

This section provides guidelines, policies and procedures for the design of street improvements.

Plans shall be submitted in accordance with City requirements to the Engineering Division for review and approval.

The street improvement plans are submitted by the Developer's Engineer to the Department of Public Works, Engineering Division, as part of the improvement plans submittal package for review and approval. Any plans submitted shall be prepared by, or under the direction of a Registered Civil Engineer of the State of California. The plan print sets shall be stamped and signed by the Registered Engineer for each plan check submittal.

Plans will be reviewed for compliance with the guidelines provided in this section and with the approved Conditions of Approval (as applicable).

2.2.2 SUBMITTAL REQUIREMENTS

2.2.2.1 PRELIMINARY CHECK

A preliminary check is performed on all projects regardless of status during the first submittal of plans. The plans will be reviewed as part of the submittal package and checked solely for compliance with the applicable items on the Street Improvements Plan Requirements Submittal Packet Checklist forms. Plans which do not comply will not be accepted.

Improvement plans accepted for plan checking will be placed on a waiting list in the order in which they are received. When checked plans are ready for pickup, the Private Engineer or his representative will be notified by phone.

2.2.2.2 INITIAL SUBMITTAL REQUIREMENTS

Initial submittal of Street Improvement plans for review shall comply with the requirements of the latest Street Improvement Plan Submittal Requirements Packet, available upon request from the Engineering plan checker.

2.2.3 STREET IMPROVEMENT PLAN PREPARATIONS

Street Improvement Plans shall be prepared on 24" x 36" City of Lancaster Standard Format mylar sheets. The plans shall be prepared in conformance with the sample plan included with this manual. Approved Street Improvement Plans are the property of the City of Lancaster.

2.2.4 STREET PLAN GENERAL NOTES

Street Improvement Plans shall include General Notes as shown on the latest Street Improvement Plan Submittal Requirements Packet. These notes are a minimum.

2.2.5 STREET CONSTRUCTION NOTES

Street Improvement Plans shall have Construction Notes applicable to each individual plan. These notes shall conform to the notes shown on the sample plan included with this manual.

2.2.6 STREET IMPROVEMENT PLAN CHECKLIST

A plan check checklist is available from the City plan checker. The Developer's Engineer is advised to obtain the latest checklist before preparing a Street Improvement Plan.

2.2.7 PRIVATE ENGINEER'S NOTICE TO CONTRACTOR

This note shall be placed on all Street Improvement Plans:

The existence and location of any underground utility pipes or structures shown on these plans are obtained by a search of available records. To the best of my knowledge there are no existing utilities except as shown on these plans. The Contractor is required to take due precautionary measures to protect the utility lines and any other lines not shown on this drawing. Prior to excavation the Contractor shall call Underground Service Alert, toll free (800) 422-4133 to verify the location of underground utilities.

Engineer's Signature

R.C.E. No.

Date

2.2.8 PAVEMENT TESTING

Testing of pavement shall be required when no development exists across the street from the proposed development, or when the proposed development frontage is more than 200 feet, or an existing portion of the roadway impacted contains a grossly inadequate pavement section or "desert mix". The "desert mix" or the grossly inadequate street sections shall be removed and replaced.

The removal area will be based on test results and design cross sections. The existing pavement sections shall be tested by a registered Soils Engineer. The City Engineer shall determine how many tests will be performed. The Soils Engineer shall provide to the City Subdivision Section new pavement section recommendations per the street functional classification and the latest City Traffic Indices.

2.2.9 AS-BUILT (RECORD DRAWING) STREET IMPROVEMENT PLANS PROCEDURE

The amount of base shall be determined by a soils test. The developer's soils engineer shall perform these tests after streets have been rough graded and prior to the developer's contractor starting work on the street subgrade. The Street Improvement Plan shall be

revised by the developer's Engineer of Record to show the actual base to be constructed, as determined by the soils test.

The City Inspector shall direct which items shall be appropriate for as-built records.

The Contractor on the project shall show in red on the "as-built" street improvement plan prints, applicable field changes (street sections and other appropriate items not revised on the plans). The Contractor shall give the "as-built" blueline set to the appropriate City Senior Public Works Inspector.

The appropriate City inspector(s) assigned to the developers project shall review the red-line "as-built" set.

Once the City inspector(s) concur(s) with the contractor's red-lines the inspector(s) shall sign the plan set.

Once City Inspector delivers the signed red-line prints to the Engineering Division, the Engineer of Record shall be contacted to pick up both the approved street plan mylar originals and "as-built" prints.

The private engineer shall revise the original plans to reflect the "as-builts". The words "AS-BUILT" or "RECORD DRAWING" shall be shown on sheet one of the plan originals one-half (1/2) inch high. the private engineer shall sign and date the "AS-BUILT" or "RECORD DRAWING" note.

After corrections are made to the mylar original street plans, the private engineer shall return the originals and blueline "as-builts" to the appropriate City Senior Public Works Inspector.

Once the City inspectors and the City Engineering Division approve the "as-built" plans, copy print sets shall then be produced and distributed by the private engineer.

Five folded blueline copy sets and the mylar originals shall be returned to the Engineering Division, and a vellum copy to the private engineer.

All submittals shall be accompanied by a letter of transmittal.

2.2.10 DESIGN CRITERIA

Street Improvements shall be designed in accordance with the criteria and policies set forth in these Design Guidelines, Policies and Procedures and the following:

1. Additional pavement on partially improved regional, primary, or secondary arterials shall be constructed to provide a striped left-turn lane at all street intersections.
2. * Cross gutters shall not be permitted across or adjacent to regional and primary arterials. Secondary arterials shall be reviewed on a case by case basis. An underground conveyance facility shall be provided to the satisfaction of the City Engineer.

2.2.10.1 DEFINITIONS

- A. Arterial - A freeway, expressway, avenue or street with a minimum length of three miles, limited access and a minimum width capable of accommodating four (4) through travel lanes and whose function is to distribute large volumes of traffic over a broad area.
- B. Collector Street - A non-arterial street normally through a residential area, designed to collect traffic from local streets and distribute it onto regional and primary arterials at 1/4 and 1/8 mile points.
- C. Commercial Street - A public street, other than an arterial, primarily serving and/or providing access to commercially zoned property.
- D. Cul-de-Sac - A public street or passage closed at one end.
- E. Freeway - A public highway with interchanges.
- F. Industrial Street - A public street, other than an arterial, primarily serving and/or providing access to industrially zoned property.
- G. Local Street - A street with direct residential or industrial and commercial frontage.
- H. Primary Arterial - A public highway with a designated vehicular roadway section capable of accommodating a minimum of six (6) through travel lanes and limited access to one-quarter mile points. Typically, they are located at one mile intervals on section lines.
- I. Regional Arterial (also "Peripheral Loop) - A public highway with a designated roadway section able to accommodate a minimum of eight (8) through travel lanes and limited access to 1/2 mile points. These arterials include, but are not limited to: Avenue H and Avenue L between 90th Street West and 90th Street East; 110th Street West and 90th Street West between Avenue L and SR 138; 50th Street West between Avenue L and Avenue G; and 20th Street East, 50th Street East, 90th Street East and 120th Street East between Avenue L and Avenue E.
- J. Residential Local Street - A public street primarily serving and/or providing access for residentially zoned property.
- K. Secondary Arterial - A public highway with a designated roadway section able to accommodate a minimum of four (4) through travel lanes and access limited to 1/8 mile points. Generally, they are located at 1/2 mile intervals between section lines.

2.2.10.2 MINIMUM DESIGN SPEEDS FOR ARTERIALS AND STREETS

The following shall be the minimum design speeds for all Arterials and Streets:

- A. 25 Miles Per Hour- Residential Local and Residential Cul-de-Sac Streets;
- B. 30 Miles Per Hour - Industrial and Commercial Cul-de-Sac Streets;
- C. 35 Miles Per Hour - Residential Collector Streets;
- D. 40 Miles Per Hour - Industrial and Commercial Local Streets;
- E. 55 Miles Per Hour - Secondary Arterials, Industrial and Commercial Collector Streets; and
- F. 65 Miles Per Hour - Regional Arterials and Primary Arterials.

2.2.10.3 HORIZONTAL CURVES

Compound curves and broken-back curves are prohibited. Reversing curves without an intervening tangent will not be permitted, except in the cases of bus turnouts or acceleration and deceleration lane curblines.

The minimum length of the intervening tangent between horizontal curves for all regional, primary, and secondary arterials is 400 feet. The minimum length of the intervening tangent between horizontal curves for all residential, industrial, commercial collectors, cul-de-sacs, and industrial and commercial local streets is 200 feet.

Design local residential streets to have a minimum curve length of 100 feet. The length of the curve outside of the Beginning of Curb Return (BCR) is used to satisfy the 100 foot minimum length requirement. A minimum 50-foot tangent is required between two curves. No residential street shall have a centerline radius less than 208 feet.

Curves on all regional, primary, and secondary arterials shall be superelevated.

2.2.10.3.1 MINIMUM CENTERLINE RADIUS

The minimum centerline radius on residential streets with an intersecting residential street on the concave side should comply with minimum design speed sight distances per the current AASHTO guidelines or LACRD HIGHWAY DESIGN MANUAL.

The following shall be the minimum centerline radius for all Arterials and Streets (based on minimum design speed and AASHTO guidelines):

- A. 208 Feet - Residential Local and Residential Cul-de-Sac streets;
- B. 302 Feet - Industrial and Commercial Local Cul-de-Sac streets;
- C. 430 Feet - Residential Collector Streets;
- D. 573 Feet - Industrial and Commercial Local and Collector Streets;

- E. 1186 Feet - Industrial and Commercial Collector streets, Secondary Arterials, and;
- F. 1637 Feet - Regional Arterial, and Primary Arterials (assumes superelevation equals .06).

2.2.10.4 VERTICAL CURVES

The minimum length of vertical curves will be governed by the Algebraic Grade Differential as noted in the table below:

Algebraic Difference In Grades (%)	Minimum Length Vertical Curve (ft)	
	Local	Regional/Primary/ Secondary
0.50 & Less	Not Required	Not Required
0.51-1.00	50'	80'
1.01-2.00	60'	80'
2.00 & Greater	100'	120'

In addition to the previous table, the minimum length of vertical curves shall comply with current Los Angeles County Public Works Department Standards (refer to 1972 Los Angeles County Road Department Highway Design Manual). The minimum length of Crest Vertical Curves shall be governed by Passing Sight Distance, if appropriate (Plate 2.5 - 01), or by Stopping Sight Distance (Plate 2.5 - 02). The minimum length of Sag Vertical Curves shall be governed by Headlight Sight Distance (Plate 2.5 - 03).

2.2.10.5 RIGHT-OF-WAY WIDTHS *

The following shall be the standard ultimate right-of-way widths for all arterials and streets:

- A. 58 Feet - Residential Cul-de-Sac Streets
- B. 60 Feet - Residential Local Streets
- C. 64 Feet - Residential Collector Streets
- D. 66 Feet - Industrial and Commercial Cul-de-Sac Streets
- E. 80 Feet - Industrial and Commercial Streets
- F. 84 Feet - Secondary Arterial Streets
- G. 100 Feet - Primary Arterial
- H. 120 Feet - Regional Arterial (Peripheral Loop)
- I. 300 Feet (minimum) Variable - Freeway

Refer to Subsection 2.2.10.26 for Details of Right-of-Way and Road Section Improvements and Subsection 2.2.10.27 for Intersection Flare Right-of-Way Sections.

2.2.10.6 ADDITIONAL RIGHT-OF-WAY AND IMPROVEMENTS

2.2.10.6.1 RESIDENTIAL STREET RIGHT-OF-WAY CORNER RADII

Intersections of rights-of-way lines where both streets are residential streets, shall have a corner cut-off per City std. Plan PW-2.1. The intersection of primary and secondary arterials and local streets serving industrial or commercial developments shall be a 35-foot curb return radius, measured at the curb face, with a back of walk corner cut-off between BCR and ECR.

Curb return radius at the intersection of residential collector, local, and Cul-de-Sac streets shall be 25 feet, with a back of walk corner cut-off between BCR and ECR.

Curb return radius at the intersection of peripheral loops or industrial collector/local streets shall be 35 feet.

2.2.10.6.2 RIGHT-OF-WAY CORNER CUT-OFFS AT ARTERIAL AND STREET INTERSECTIONS

Right-of-way shall be dedicated to the City within those triangles formed on a corner of an intersection of right-of-way lines on such streets for minimum distances from the intersection on each of such lines and a line connecting the ends of such lines. The tangent distances from the intersection of those right-of-way lines to the points to be connected to form the triangles for various road types are listed below:

- A. A person shall not place any structure within those triangles formed by intersections of the right-of-way lines on arterials and streets for distances established in the Lancaster Municipal Code, Article VII, Section 7-2.41 from such intersections on each of such lines and a line connecting such lines, except as permitted within a yard by the Zoning Ordinance, Sections 452.9, Subsection A, and 452.12, Subsections A, D, H and I, and provided that such structures do not constitute a visual obstruction between 2 feet 8 inches and 8 feet above the top of curb.
- B. Corner cut-offs, as required in Section 498, shall be provided as specified in the Lancaster Municipal Code, Article VII, Chapter 2, Section 7-2.15.
 - (1) 42 feet - Primary, Secondary, Regional Arterials and Industrial Streets
 - (2) 27 feet - Commercial Streets
 - (3) 19.5 feet - Residential Streets

2.2.10.6.3 BUS/VANPOOL TURNOUTS

Vehicle turnouts along arterials and streets for all high-occupancy vehicles for pick up and dropping off of passengers are required at areas on arterials and streets as designated by the Director of Public Works. Minimum dimensions are: 10 feet wide by 50-foot minimum (60-foot preferred) length plus a 43.59-foot long transitional segment back to established arterial or street cross-section width, as provided in this Section, on each end of the 50-foot turnout section. Refer to the City's Standard PW-4. Turnouts are to be located on primary arterials at the farside of the intersections of quarter mile points. On secondary arterials, locations will be determined as directed by the Traffic Engineering Manager.

2.2.10.6.4 DRIVEWAY DECELERATION AND ACCELERATION LANES

A. Deceleration Lanes are required for:

- (1) Commercial projects - all driveways to access an arterial(s) and/or street(s) and have 40 or more right turn maneuvers onto the project site during any peak hour - this number being calculated from the latest edition of the Institute of Traffic Engineer's "Trip Generation" manual. The minimum dimensions of such deceleration lanes shall be: 12 feet wide by 90-foot long, as measured from the centerline of a driveway, plus, an additional 90-foot long transition segment with a reverse curve from the deceleration lane back to the established/street or arterial width as provided in this Section.
- (2) Industrial project - all driveways to access an arterial(s) and/or streets(s) and have single unit (SU) or larger vehicles on the project site. The minimum dimensions of such deceleration lanes shall be 14 feet wide by 90 feet long as measured from the centerline of a driveway, plus a 90-foot long transition segment with a reverse curve back to the standard street or arterial width as provided in the Section.

B. Acceleration Lanes are required at all industrial project driveways to access arterial(s) and accommodate single unit (SU) truck or larger vehicles. The minimum dimensions of such acceleration lanes shall be 14 feet wide by 80 feet long as measured from the driveway centerline, plus a 140-foot long transition segment from the end of the acceleration lane to the established arterial or street width as provided in this Section.

2.2.10.7 RIGHT-OF-WAY DEDICATION

In all zones, right-of-way lines are hereby established parallel to and, at these minimum distances from, the centerlines, exclusive of additional right-of-way requirements where intersections, driveways, entrances or interchanges may occur, as determined by the Director of Public Works.

2.2.10.7.1 IMPROVEMENT AND RIGHT-OF-WAY DEDICATION BEYOND CENTERLINE

In cases where the ultimate street right-of-way is not entirely within a proposed development, the developer shall provide minimum paved improvements and right-of-way dedication beyond the centerline in order to provide for adequate vehicle circulation, parking, and the installation of required medians and left turn pockets in their ultimate location shown below, exclusive of deceleration lanes, acceleration lanes, corner cut-offs, bus turnouts or any other additionally required dedications and/or improvements:

- (1) Freeway - 150 feet (or as determined by State Department of Transportation)
- (2) Arterials
 - (a) Regional - 80 feet of an ultimate 120 foot right-of-way
 - (b) Primary - 70 feet of an ultimate 100 foot right-of-way
 - (c) Secondary - 62 feet of an ultimate 84 foot right-of-way
- (3) Industrial or Commercial Street - 60 feet of an ultimate 80 foot right-of-way
- (4) Industrial/Commercial Cul-de-Sacs - 51 feet of an ultimate 66 foot right-of-way
- (5) Residential Streets *
 - (a) Collector - 44 feet of an ultimate 64 foot right-of-way
 - (b) Local - 42 feet of an ultimate 60 foot right-of-way
 - (c) Cul-de-Sacs - 40 feet of an ultimate 58 foot right-of-way

2.2.10.8 OFF-SITE RIGHT-OF-WAY DEDICATIONS AND IMPROVEMENTS

Where an under improved, unimproved and/or undedicated portion of an established street adjoins a project along the frontage of the property to be subdivided, parceled or improved with structures, minimum right-of-way acquisitions, where necessary, dedications, and/or street improvements on the opposite side of the centerline of the ultimate right-of-way and/or roadway section as established by the Director of Public Works shall also be required at the following minimum widths:

- A. 20 feet - Regional Arterials (Peripheral Loop)
- B. 20 feet - Primary and Secondary Arterials, and Commercial/Industrial Local and Cul-de-Sac Streets
- C. 12 feet - All Residential Collector and Local Cul-de-Sac Streets
- D. 13 feet - All Residential Local streets
- E. 18 feet - All Commercial and Industrial Cul-de-Sac streets

2.2.10.9 ALIGNMENT CRITERIA *

Align the centerlines of all local streets without creating jogs of less than 150 feet when intersecting a street with a 64-foot right-of-way or less, except that a 1-foot jog may be used where a street changes width from a standard 60-foot to a standard 58-foot right-of-way.

Abrupt changes in driving lane alignment shall be avoided. Transitions of not less than $V:1$ are required at the beginning of medians, islands or other obstructions. "V" is defined as the posted speed limit. Where permanent curbs are being constructed, standard flares should be used for this purpose. Where temporary improvements are to be constructed, sufficient pavement shall be constructed to provide room for painted transitions of the same length.

2.2.10.9.1 INTERSECTIONS

Intersections of primary arterials, secondary arterials, and primary and secondary arterials shall be designed to provide future signalization.

4-way intersections of local residential streets are prohibited.

4-way intersections of collector streets are allowed only if the intersection is or will be signalized and has been approved by the City Traffic Engineering Manager.

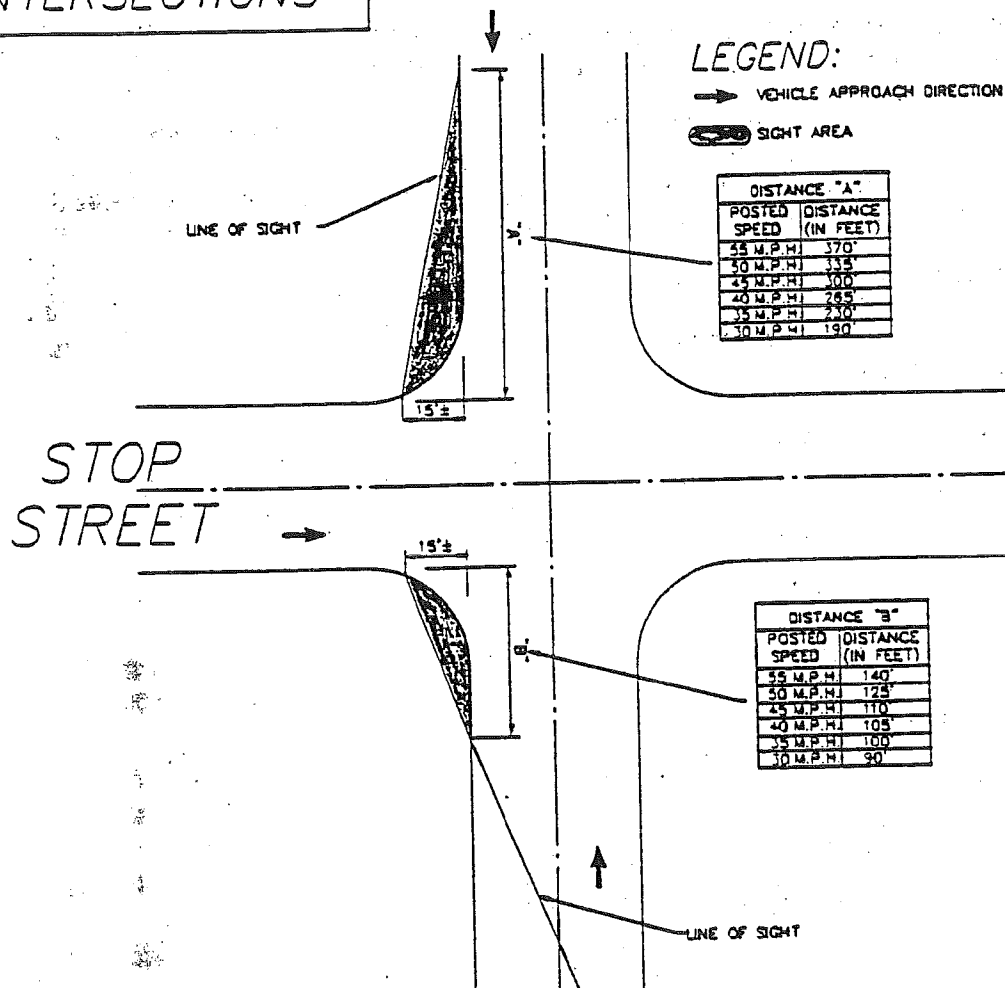
When the design angle of an intersection is acute, or where a sight distance problem is anticipated, an increased right-of-way may be required by the Director of Public Works.

Intersections can be classified as follows:

- a. Right- Angle Intersections - The safest and most economical design for three- and four-leg intersections is obtained when all turning movements are 90 degrees. A 90-degree intersection also affords the best horizontal sight distance for both approaches. An intersection may be considered as right-angle when the skew is within 20 degrees of a right angle.
- b. Skewed Intersections - When it is impractical to eliminate the skew of an intersection, the resultant conflict of movements may be reduced by the use of channelization. For this purpose, painted or raised islands serve to reduce the conflicting areas and to delineate the turning lanes. The radius of curvature for turning lanes should be selected to favor the major traffic movements.
- c. Multilegged Intersections - Intersections with more than four legs are difficult to channelize and should be avoided.
- d. Curved Intersections - Horizontal curves within intersections should be avoided.

Refer to Figure 2.2.10.9.1.1 Sight Distance Standard for intersection sight distance clearances.

CONTROLLED INTERSECTIONS



NOTES:
 SIGHT AREA
 NO PLANTS, WALLS, ETC. OVER 24 INCHES IN HEIGHT. NO MORE THAN THREE TREES WITH LOWEST BRANCHES A MIN. OF 10 FEET HIGH. ALL HEIGHTS MEASURED FROM TOP OF CURB.

Bob Wittler
 TRAFFIC ENGINEERING MANAGER
 11/27/96
 DATE

Jeff Long
 DIRECTOR OF PUBLIC WORKS
 27 Nov 96
 DATE

CITY OF LANCASTER
 DEPARTMENT OF PUBLIC WORKS

SIGHT DISTANCE STANDARD.

Figure 2.2.10.9.1.1 Sight Distance Standard

2.2.10.9.2 DECELERATION AND ACCELERATION LANES

Deceleration and Acceleration lanes shall be provided at the intersections of primary arterials, secondary arterials with primary and secondary arterials.

Acceleration lanes provided at the intersections of primary arterials, secondary arterials and primary and secondary arterials shall have a minimum lane width of 12 feet for a minimum distance of 150 feet beginning at the BCR and extending to the BC or angle point of the taper. The taper shall have a horizontal distance parallel to the centerline of 148 feet.

Acceleration lanes provided at the intersections of collector streets joining primary and secondary arterials shall have a minimum lane width of 12 feet for a minimum distance of 100 feet, beginning at the BCR and extending to the BC or angle point of the taper. The taper shall have a horizontal distance parallel to the centerline of 90 feet.

Deceleration lanes provided at the intersections of primary arterials, secondary arterials with primary and secondary arterials shall have a minimum lane width of 12 feet for a distance of 150 feet, beginning at the BCR and extending to the BC or angle point of the taper. The taper shall have a horizontal distance parallel to the centerline of 140 feet.

2.2.10.9.3 APPROACHES

The geometrics of intersection approaches shall be designed in accordance with the City Traffic Division's Draft Master Plan of Streets and Highways and/or any subsequently City-approved Master Plan.

2.2.10.10 GRADE AND GRADE BREAKS

The preferred range of grades on all streets and alleys is 0.4% to 6%. Vertical curves should be used where the change in rate of grade exceeds the maximum allowable grade break on centerline of 0.5%. Refer to subsection 2.2.10.4.

Minimum chord length between grade breaks on any street is 15 feet.

Grade breaks should be avoided at the BCR's and ECR's of all new street improvements and of existing improvement tie-ins. If unavoidable, the maximum grade break is 1.0%. Provide the Point of Intersection based on flow line at each return on the street improvement plans.

Straight grades shall be used on all cross gutters. No grade breaks shall be permitted. The minimum grade on any cross gutter is 0.4% measured from BCR to BCR.

The minimum drop around any curb return in the direction of flow is 0.15 foot. The minimum grade from BCR to ECR on any curb return shall be 0.4%.

Profile breaks through intersections shall not exceed 3.0% for summit or sag breaks.

2.2.10.11 CONCRETE CURBS, WALKS, GUTTERS, CROSS GUTTERS, ALLEY INTERSECTIONS, ACCESS RAMPS, AND DRIVEWAYS

All concrete curbs, walks, gutters, cross gutters, alley intersections, access ramps and driveways shall be constructed of Portland Cement Concrete. PCC curbs and gutters, sidewalks, parkway drains, and miscellaneous PCC construction shall be constructed in accordance with Section 303 of the Standard Specifications. Sidewalks shall be 4" thick. Curb access ramps shall be constructed in accordance with City of Lancaster Standard Plan 2.1 (Modified). Said curb ramps shall be constructed and located to accommodate proposed traffic signal standard locations. For existing structures to be removed, all edges shall be sawcut. All fresh PCC surfaces shall be protected from weather and from graffiti. Any damaged PCC surfaces shall be repoured or replaced to the satisfaction of the City.

2.2.10.11.1 CURBS

The standard curb face of 8 inches shall be used on all streets. A minimum curb face of 6 inches on Cul-de-Sac streets are permitted only if the hydrology report substantiates that the 6-inch curb face is adequate to handle the anticipated drainage flows.

2.2.10.11.2 WALKS

The standard widths of sidewalk adjacent to curb measured from the back of curb to the outside edge of sidewalk are as follows:

- a. 7 1/2 feet - expressways, regional arterials, primary and secondary arterials, industrial and commercial streets
- b. 5 feet - all industrial, commercial (at the discretion of the City Engineer), collector, local, and cul-de-sacs streets. Where surface obstructions fall within the 5' path of travel, sidewalks shall be designed per City standard Plan PW-1

The parkway widths from back of curb to property line where sidewalk is required are as follows:

- a. 7 1/2 feet - expressways, regional arterials, primary and secondary arterials, industrial and commercial streets
- b. 9 1/2 feet - industrial cul-de-sacs (sidewalk width equals 5.5 feet)
- c. 5 feet - residential collector, local and Cul-de-Sac streets with a 4 foot utility and access easement

2.2.10.11.3 DRIVEWAYS

DEFINITIONS

"Driveway" means that portion of the road right-of-way between the right-of-way line and curb, or between the right-of-way line and pavement (if no curb exists) where motor vehicles enter or leave the roadway onto private property.

"Width" or "W" means that depressed portion of an individual driveway that is the net width thereof, exclusive of side slopes (or "X"s) and returns measured along the curblines or centerline of the roadway.

DESIGN CRITERIA *

Driveway entrances shall be provided in new curb at all existing driveways along the line of work. The minimum width is 12 feet for both residential and commercial driveways.

Individual residential driveways shall have a maximum width of 27 feet. The sum of all residential driveway widths shall be limited to 40% of the property frontage if the property frontage is 100 feet or more.

Commercial/Industrial property with less than 100 feet of frontage shall have a maximum driveway width of 24 feet; if frontage is 100 feet or more, the maximum width is 30 feet or 20% of property frontage, but not to exceed a cumulative maximum of 60 feet in total widths. Joint-use commercial driveways located at a common property line are encouraged. However, the maximum joint-use width shall be 36 feet or per the direction of the City Traffic Engineering Manager.

The maximum width for school and park driveways shall be 27 feet.

A driveway shall not be located ahead of a traffic control device where it will interfere with intersection traffic.

Commercial corner development driveways shall not be located closer than 150 feet from the curb line of the nearest intersecting roadway, to the nearest edge of the proposed driveway, or as approved by the City Traffic Engineering Manager.

The minimum length of full height curb shall be 22 feet between adjacent driveways serving the same lot and shall be five feet for driveways serving adjoining lots; in the latter case, a common joint-use driveway is preferred.

Sidewalk constructed across driveways to commercial/industrial establishments shall be 6 inches thick. At residential driveways, the thickness of the sidewalk is 4 inches.

Driveway approaches shall be in conformance with the provisions of the American Disabilities Act (ADA) per the direction of the City Building Official.

Where obstructions (such as public utility structures) occur, a minimum clearance from top of "X" of 5 feet for both residential and commercial driveways is required.

If the parkway is over twelve (12) feet, the driveway shall be constructed as if the parkway were twelve (12) feet deep.

If sidewalk is adjacent to the curb, the back of driveway apron coincides with the back of sidewalk. In no case is the apron less than 5 feet deep.

A driveway shall not be constructed or maintained where fences, buildings, natural grade or any other obstacle will prevent a motor vehicle from being stored entirely off the public right of way after entering such driveway.

Residential Driveways shall be constructed of four (4) inches of Portland Cement Concrete, if curb has been constructed. If no PCC street curb within the public right-of-way has been constructed, driveways shall be constructed of three (3) inches of Asphalt Concrete (C2-AR-4000), on (6) inches of crushed aggregate base.

If curb has been constructed, Commercial Driveways shall be constructed of six (6) inches of Portland Cement Concrete. If no PCC street curb within the public right-of-way is being constructed, driveways shall be constructed of three (3) inches of Asphalt Concrete (C2-AR-4000) on six (6) inches of crushed aggregate base, or six (6) inches of Asphalt Concrete. (B-AR-4000).

All Portland Cement Concrete driveways shall be given a rough broom finish.

Retrofitted PCC driveways and/or aprons into existing PCC curb, gutter, and aprons shall be neatly sawcut and steel rebar-tied (if existing PCC curb and gutter is an acceptable standard and in good condition). The existing PCC gutter shall be longitudinally sawcut a maximum of three inches parallel to the flowline of the gutter. New PCC driveway curb and apron shall be rebar-doweled to neatly sawcut sections of existing gutter and apron sections with No. 3 rebars, 18 inches long, at 24-inch spacing or per the direction of the City Inspector.

2.2.10.11.4 TEMPORARY ACCESS

Temporary access shall comply with subsection 2.2.10.11.3.

2.2.10.12 PARKWAY GRADING

Parkway grading shall be 1/4 inch per foot and draining toward the curb.

Shoulder Grading

In those areas within the public right-of-way, where no curb and gutter exists, the Developer shall regrade the dirt shoulder to a width that joins the existing flowline (minimum width of 8' at a 2% minimum and a 5% maximum cross slope into the flowline). The shoulder shall be uniformly watered prior to grading. Dampened soil shall be graded, then compacted with a pneumatic wheeled compactor to form a firm surface to the satisfaction of the City. The graded shoulder shall be uniformly watered sufficiently to eliminate dust, but not to such an extent as to form mud or pools of water. Finished shoulder shall match elevation of new pavement and taper outward to join the flow line. The shoulder shall be graded within 48 hours of completion of paving of each section of street, a section not to exceed one-half linear mile. Prior to opening an ungraded section of newly paved street to traffic, the Developer shall provide and place low shoulder signing. Upon completion of grading, signing shall be removed. Any existing dirt driveway approaches shall be graded smooth to neatly join the new A.C. pavement.

Shoulder Backing

In those areas where the City determines that there exists inadequate shoulder material to properly regrade the dirt shoulder, the Developer shall import dirt or other shoulder backing material to the approval of the City. Imported material shall not contain any rock, the diameter of which is greater than half the compacted thickness of the portion to be graded. The material shall be evenly spread and graded to the same specification as shoulder grading.

2.2.10.13 CUT AND FILL SLOPES

When cut and fill slopes do not have a requirement for lesser slope grades recommended by the soils report, then the typical maximum slope shall be 2:1 for excavations and embankment.

2.2.10.14 ROADWAY EXCAVATION

All excavation shall be completed in accordance with Section 300-2 of the Standard Specifications. Roadway Excavation shall include all earthwork and the following:

A.C. Pavement Removal

Where shown on the Plans, outlined by paint on the roadway, or required by the Engineer, the Developer shall remove the existing A.C. pavement and dispose of it away from the site. All work under this item shall be performed as described in Section 300 of the Standard Specifications.

Utility Protection

The Developer shall protect and maintain all valve cans, valve sleeves, valve covers, meter boxes, utility handholes, vehicle detector handholes, traffic signal interconnect handholes, etc. before and during excavation so that said valves, meters, handholes, etc. can be relocated and raised during sub-base and A.C. finished surface construction. The Developer shall protect and maintain all existing underground utility lines during excavation.

Roadway Subgrade Preparation

Subgrade preparation shall conform to the provisions of Section 301 of the Standard Specifications. The finished subgrade tolerances shall be as specified in Section 301-1.4 of the Standard Specifications.

Right-of-Way Clearing

The public right-of-way, as shown on the Plans, shall be left clear of trees, vegetation, debris, trash, and obstructions.

2.2.10.15 ASPHALT CONCRETE

Asphalt concrete used for paving shall be Type B-AR4000, for the base course, and Type C2-AR4000 for the surface course, both in conformance with Subsection 203 of the

Standard Specifications. The asphalt cement used shall be AR 4000 and shall be mixed with the mineral aggregate in conformance with Section 203 of the Standard Specifications.

The asphalt concrete finished surfacing shall conform to Section 302-5 of the Standard Specifications and these Special Provisions.

Subsection 302-5.7 is supplemented as follows: poorly constructed transverse joints and poorly constructed longitudinal joints shall be repaired by removing a 10' wide section of pavement straddling the joint for the length of the bad joint and replacing with new pavement. Removal shall be by cold planing to a minimum depth of 1.5".

Any transverse joints left unfinished at the end of the day shall be protected with a papered transverse joint.

The contact surfaces of all cold pavement and joints, edge of gutter, manholes, and the like, shall be painted with a tack coat as designated in Section 302-5 of the Standard Specifications immediately before the adjoining asphalt concrete is placed. The final lift of the remove and reconstruct areas shall be placed monolithically and concurrently with the proposed A.C. overlay cap.

Liquid asphalt used for tack coat shall be SS-1h Emulsified Asphalt, except where placing pavement fabric, in conformance with Subsection 203.3 of the Standard Specifications. A tack coat shall be used wherever asphalt concrete pavement is being constructed directly on existing pavement, and shall be applied at the rate of .05 to 0.10 gallons per square yard, or as determined by the City Engineer.

Any existing conflicting raised pavement markers shall be removed prior to the placement of the proposed A.C. overlay cap.

The Developer shall feather out the A.C. pavement to a smooth transition at those locations where an existing A.C. driveway joins the existing pavement, or where otherwise directed by the Engineer.

Utility Valve Covers and Miscellaneous Covers

Water valve covers, gas valve covers, survey monument covers, and miscellaneous covers and sleeves shall be adjusted by the Developer to finished grade during the placement of A.C. pavement, or immediately thereafter.

2.2.10.16 A.C. LEVELING COURSE

The asphalt concrete leveling course shall be type D2-AR4000 asphalt concrete in conformance with Subsection 203 of the Standard Specifications. The leveling course shall be placed prior to the final lift of paving.

2.2.10.17 PAVEMENT FABRIC

The pavement fabric and placement shall conform to Section 302-7 of the Standard Specifications. Section 302-7 is supplemented and amended by the following provision:

The pavement fabric shall be "PETROMAT" by Phillips Fibers Corp. or "AmoPave 4599" by AMOCO or an approved equal. Approved equal shall be in writing by the City Engineer.

2.2.10.18 CRUSHED AGGREGATE BASE

The aggregate base shall be crushed aggregate base as specified in Section 200-2.2 of the Standard Specifications and shall be constructed in accordance with Section 301.2 of the Standard Specifications.

2.2.10.19 AGGREGATE BASE SUBSTITUTE

Class 2 aggregate base as defined in the Caltrans Specifications may be substituted for crushed aggregate base provided that test results are completed, submitted to the City Engineer, and approved by the City Engineer prior to placement. Any material placed prior to this approval shall be removed.

The City also accepts processed miscellaneous base as specified in the Standard Specifications for Public Works Construction, provided that the R-value exceeds 80, as a substitute for Aggregate Base on an equal basis. Material must be tested by the Developer's Soils Engineer and approved by the City prior to placing on a project.

2.2.10.20 COLD PLANING

The Developer shall cold plane a minimum width of six feet (6') along the edge of existing gutters, cross gutters, cold joint areas, or as otherwise directed by the City Engineer. Cold planing (cold milling) shall be per Section 302-5 of the Standard Specifications.

Pavement Transitions

Where cold planing precedes paving by more than 12 hours, the Developer shall place and maintain a 2' minimum width A.C. pavement transition at all transverse join lines, cross gutters, and guttered commercial driveway approaches. Said A.C. transitions shall be removed just prior to paving. Pavement transitions shall be protected in place and repaired if damaged. Failure to comply with these requirements will result in a \$500 per day penalty to be assessed to the Developer by the City for each calendar day of non-compliance.

Disposal

All cold plane tailings shall be delivered to the City of Lancaster Maintenance Facility at 46008 North 7th Street West. The Developer shall coordinate said disposal with the City Engineer. The City Engineer reserves the right to reject what he determines to be unsuitable cold plane tailings.

Schedule

Cold planing shall not be performed more than 72 hours in advance of the proposed final lift of A.C. pavement. Failure to comply with this requirement, without the express written consent of the City Engineer, will result in a \$500 per calendar day fine to be assessed to the Developer by the City on each calendar day of noncompliance.

2.2.10.21 TENSAR GEOGRID

If a geogrid is used, then Tensar geogrid, Type SS2 or an approved equal shall be specified and installed at the mid-layer of the crushed aggregate base section. The Developer shall install the Tensar geogrid (or approved equal) in accordance with the manufacturer's

specifications. The Developer shall submit a sample to the City Engineer for approval along with any documentation supplied by the manufacturer. Approval shall be in writing by the City Engineer.

2.2.10.22 REDWOOD HEADER

The Redwood headers shall be constructed of construction common grade redwood lumber. The redwood header shall be constructed per Section 302-5.5 of the Standard Specifications.

2.2.10.23 NEW A.C. PAVEMENT SECTIONS

The amount of base and A.C. pavement shall be determined by a certified soil tests report and the current City of Lancaster Traffic Indices. The Developer's Soils Engineer shall provide testing after the streets have been rough graded. Plans shall be revised to show the actual section to be constructed per the City Street Improvement As-built policy.

* In all new A.C. pavement construction, the minimum street structural cross section is 3-1/2 inches of asphalt pavement over crushed aggregate base determined per R-value testing, with a minimum positive cross-drainage of 1.8%.

The structural section shall be determined from "R" values obtained from an analysis of specimens gathered at the level of the proposed subgrade. The analysis shall be per State of California Division of Highways Design methods for crushed aggregate base.

Rigid P.C.C. pavement structural sections shall be determined from "R" value testing and the Developer's Certified Soils Report.

Crushed Aggregate base shall conform to Section 200-2.2 of the latest edition of the Standard Specifications for Public Works Construction.

2.2.10.24 PAVEMENT TRANSITIONS

Pavement transitions are used to avoid abrupt changes in the direction of traffic when approaching a narrowing or widening of the traveled way. The transition on the improved roadway should be defined with an A.C. curb and a painted stripe, a Type N reflector, and a SW-44 sign. To delineate a tapered transition, the ends of the transition should be shown by station and offset from centerline. Points for intermediate elevations shall be given at distances along the taper at 50-foot minimum intervals.

2.2.10.24.1 TRANSITIONS, REGIONAL, PRIMARY, OR SECONDARY ARTERIALS

When traffic direction must be changed, use a "V:1" transition as follows (where "V" is the posted speed of the roadway):

- (1) When narrowing a roadway from full width improvement to existing narrow pavement
- (2) At the approach to a median
- (3) The approaches of a bridge or underpass

When traffic is not forced to change directions such as in widening in the direction of traffic, the City Traffic Engineering Manager shall determine the appropriate pavement transition.

2.2.10.24.2 OTHER STREETS

A 1:1 pavement transition should be used for both widening and narrowing. Guide markers should be provided in hazardous locations as determined by the Traffic Engineering Manager.

2.2.10.25 STRUCTURAL CLEARANCE

2.2.10.25.1 HORIZONTAL CLEARANCE

Horizontal clearance to bridge piers, abutments, retaining walls and other obstructions, with respect to the edge of the traveled way, shall be a minimum of 6 feet on the left and 10 feet on the right. Additional clearance shall be provided where necessary to meet sight distance requirements.

2.2.10.25.2 VERTICAL CLEARANCE

Vertical clearance for all separation structures shall be a minimum of 15 feet at any point between curbs.

2.2.10.25.3 RAILROAD GRADE SEPARATIONS

The minimum vertical clearance for an underpass is 15 feet; for an overhead crossing, the minimum vertical clearance is 23 feet, from the top of rail to the bottom of the structure (considering structure falsework allowances). These clearances shall be verified in the early stages of design with the State and Railroad Agencies.

2.2.10.26 DETAILS OF RIGHT-OF-WAY & ROAD SECTION IMPROVEMENTS *

Fig. Ia. Freeway.

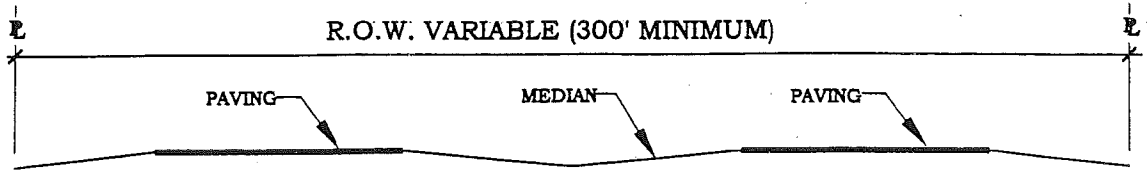


Fig. Ib. Regional Arterial ("Peripheral Loop").

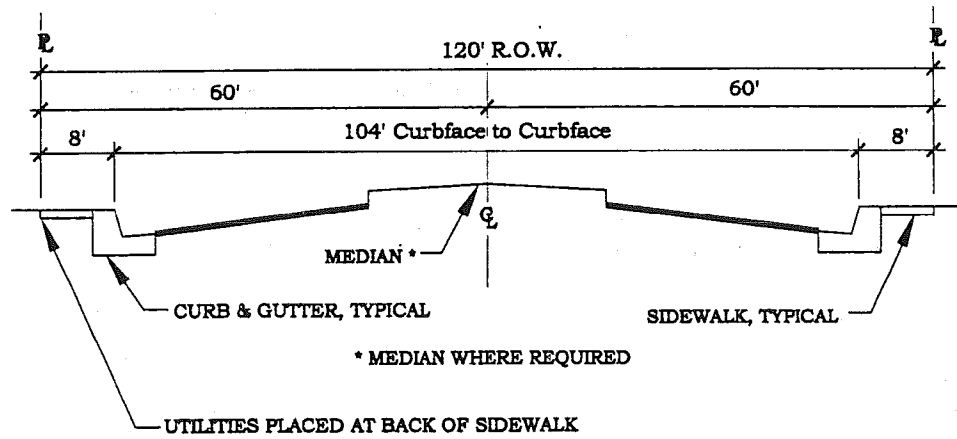
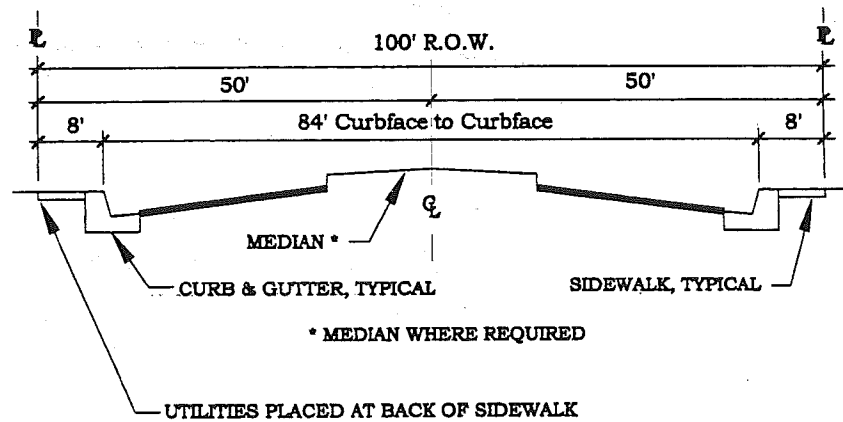


Fig. Ic. Primary Arterial.



2.2.10.26 DETAILS OF RIGHT-OF-WAY &
ROAD SECTION IMPROVEMENTS *
(CONTINUED)

Fig. Id. Secondary Arterial.

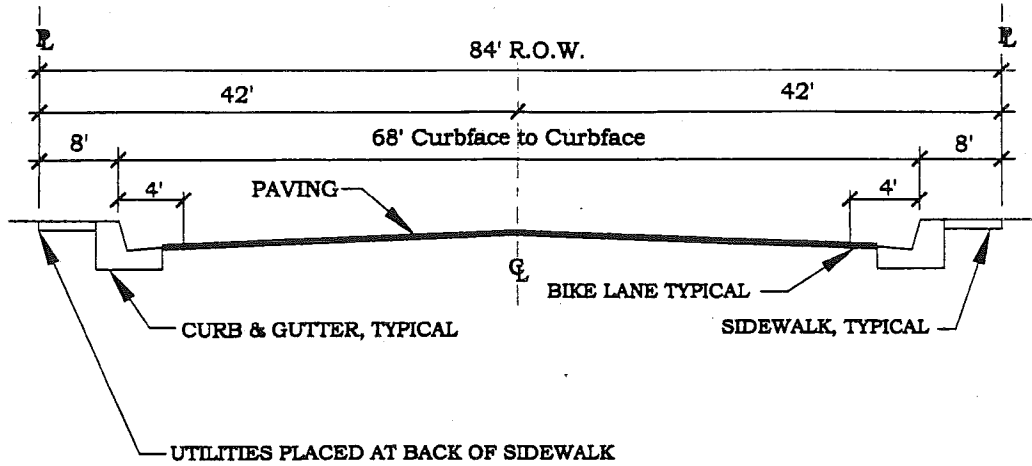
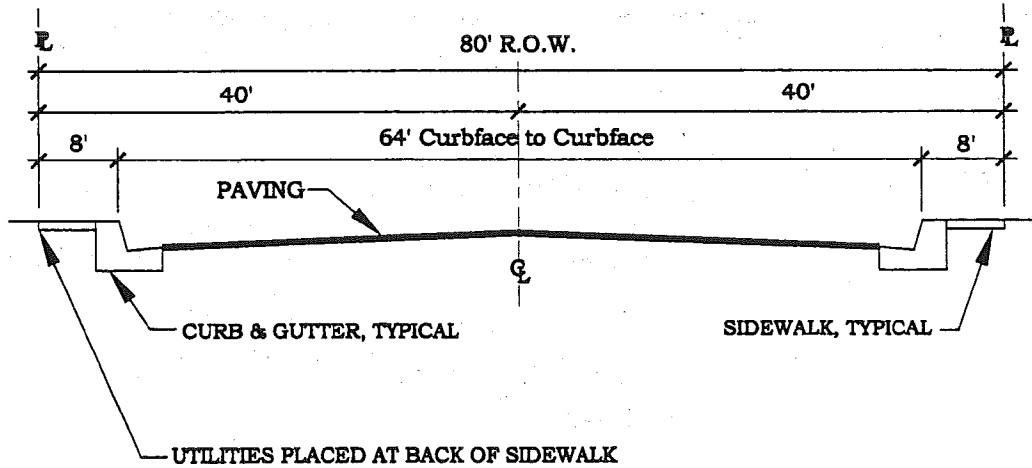


Fig. Ie. Industrial and Commercial Streets. *



* Industrial Streets may be designed with a 5.5 foot sidewalk adjacent to face of curb at the discretion of the City Engineer.

2.2.10.26 DETAILS OF RIGHT-OF-WAY &
ROAD SECTION IMPROVEMENTS *
(CONTINUED)

Fig. If. Industrial Cul-de-Sac.

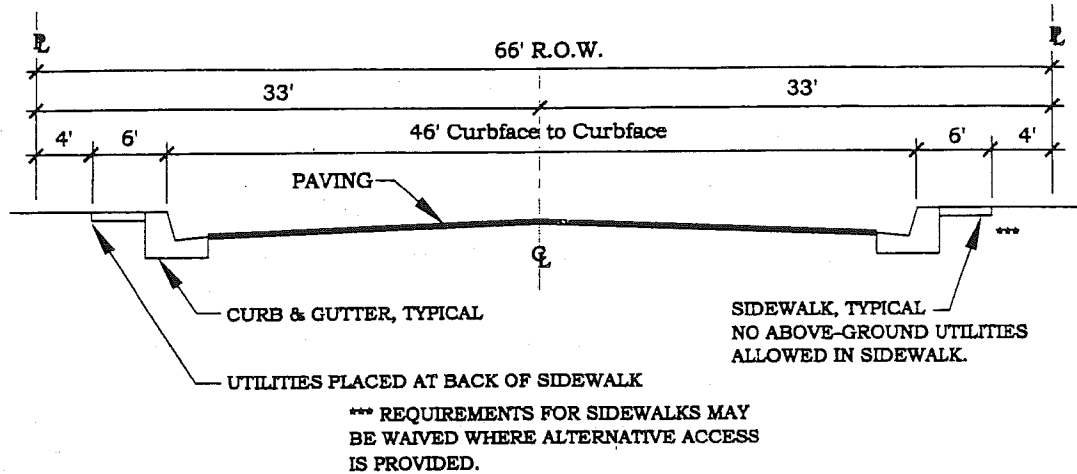


Fig. Ig. Residential Collector Street.

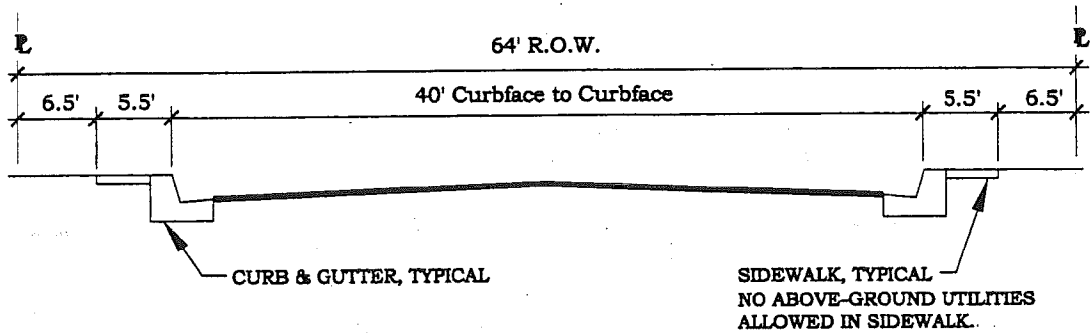
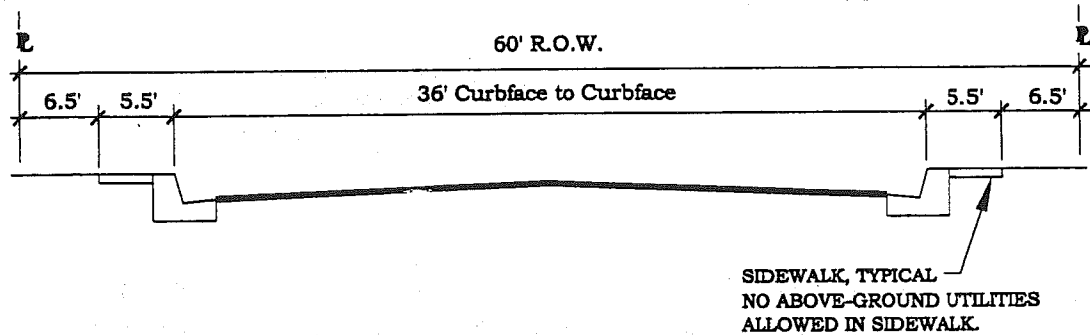


Fig. Ih. Residential Local Street.



2.2.10.26 DETAILS OF RIGHT-OF-WAY &
ROAD SECTION IMPROVEMENTS *
(CONTINUED)

Fig. Ii. Residential Cul-de-Sac Street.

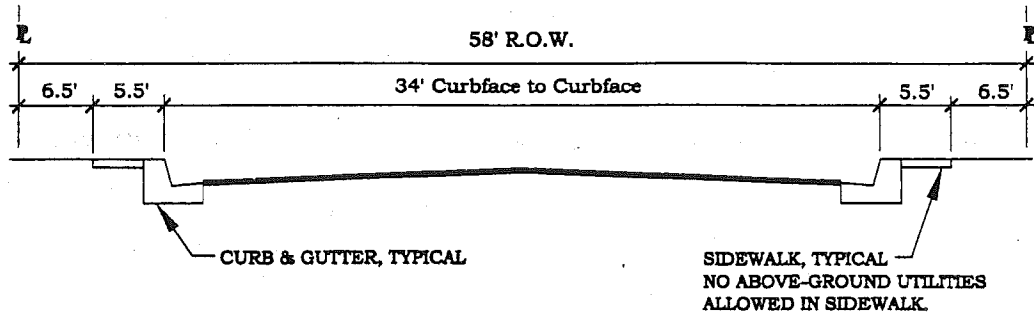
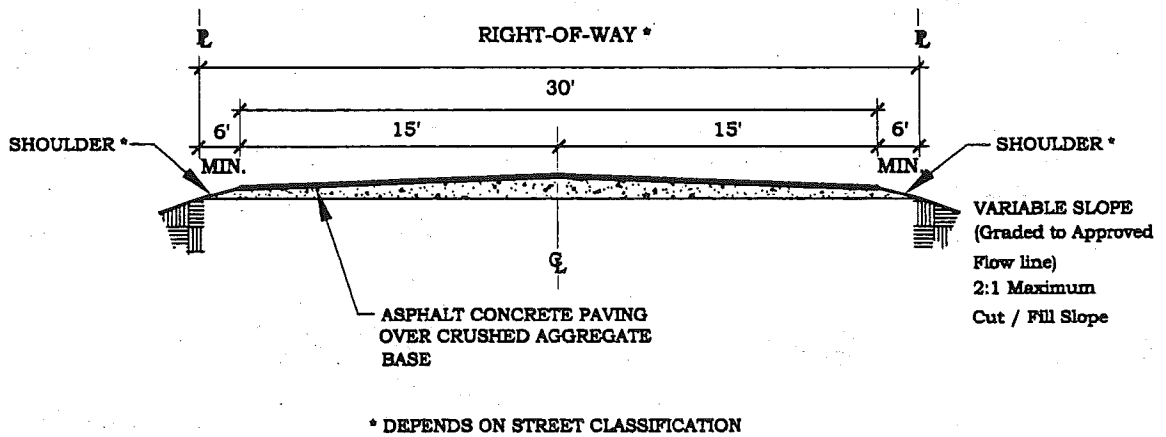


Fig. Ij. Rural Street Cross-Section.



City Standard Plan PW-12 shall be used as the minimum street section where required for drainage purposes with existing Rural roadways.

2.2.10.27 INTERSECTION FLARE RIGHT-OF-WAY SECTIONS

Fig. IIa. * Regional Arterials at Regional and Primary Arterials.

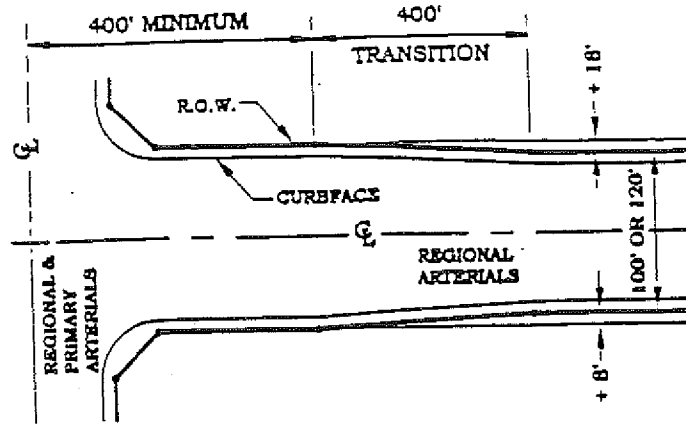


Fig. IIb. * Regional & Primary Arterials at Secondary Arterials, Commercial Streets and Signalized Driveways.

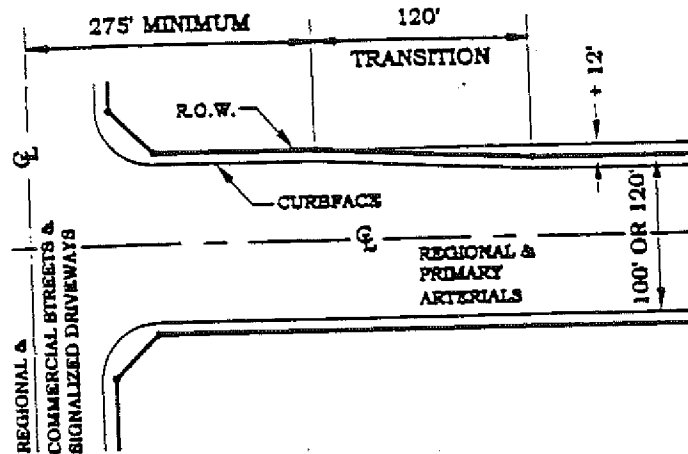
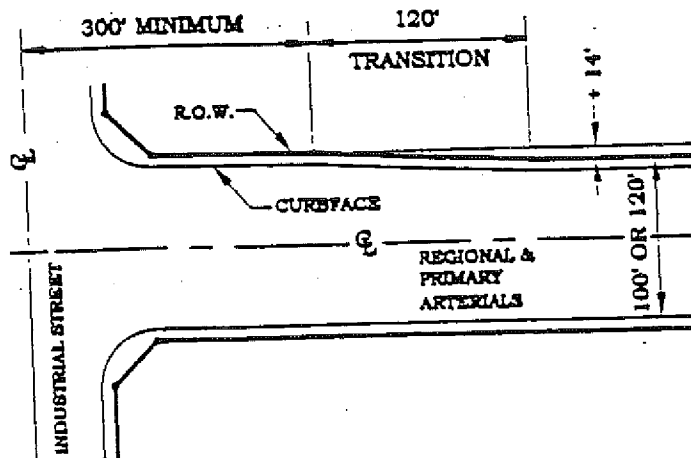


Fig. IIb. * Regional and Primary Arterials at all Industrial Streets



2.2.10.27 INTERSECTION FLARE RIGHT-OF-WAY SECTIONS
(CONTINUED)

Fig. II.d. Primary Arterials at Regional and Primary Arterials.

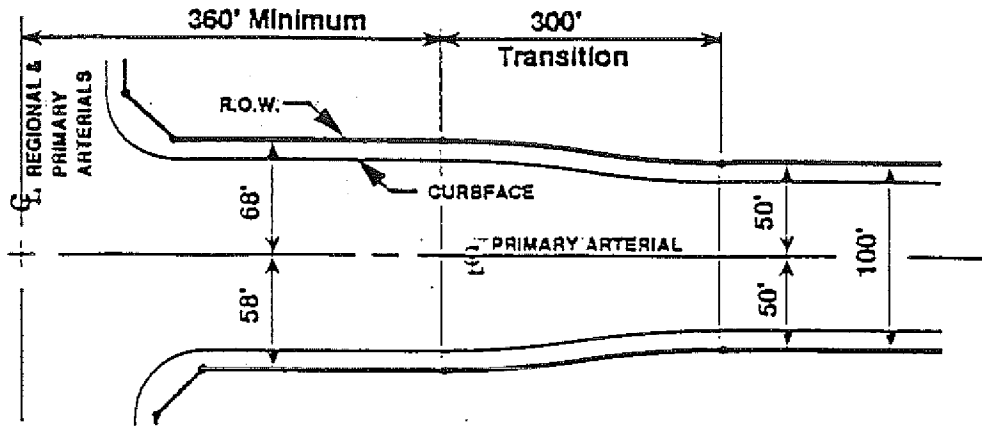


Fig. II.e. * Secondary Arterials and Commercial Collector Streets at all Arterials and Signalized Driveways.

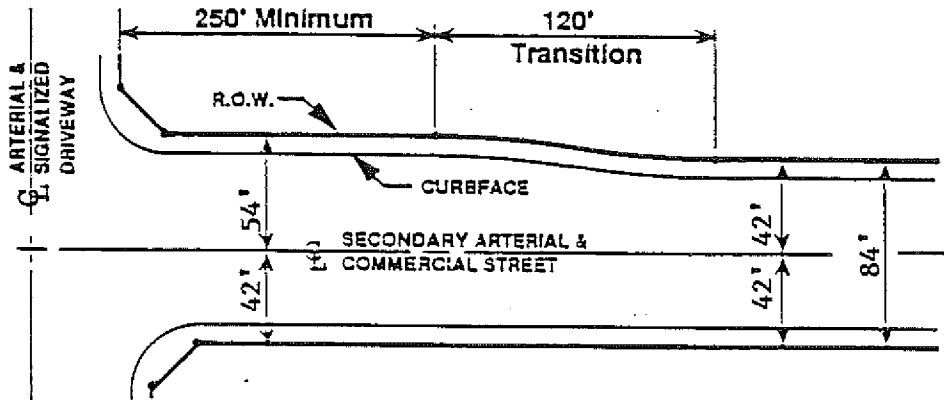
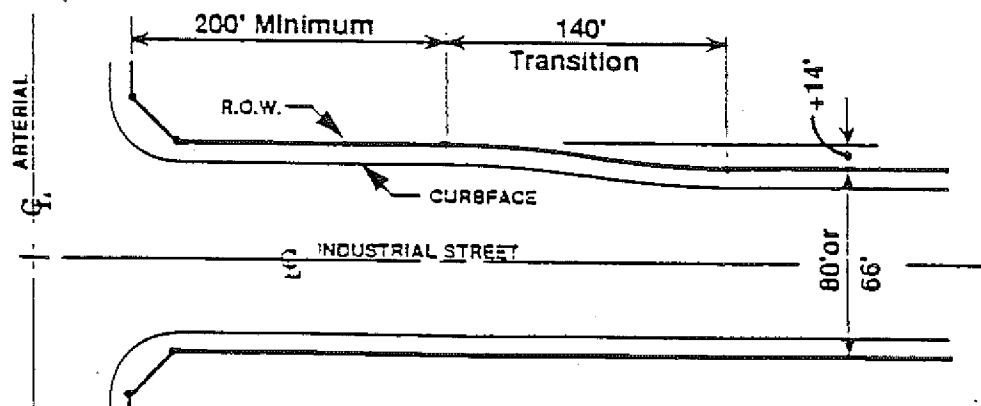


Fig. II.f. All Industrial Streets at all Arterials.



2.2.11 TRAFFIC SIGNAL DETECTORS

The City of Lancaster is converting from vehicle detection loops to video detection. At its' sole discretion, the City may decide to install video detection in lieu of detection loops. The developer will be required to provide their fair share of the cost of the video detection based on the number of loops to be replaced versus the total number of loops at the intersection.

2.2.12 TRAFFIC DETOUR PLANS

Traffic Detour Plans on existing roadways shall be submitted for review and approval to the City Traffic Engineering Division for approval prior to any permit issuance on all traffic detours that involve any of the following conditions:

1. Moving Traffic over the street centerline during construction.
2. Reducing the number of travel lanes by more than one lane during construction.
3. Any street construction work being performed within 250 feet of an existing traffic signal.
4. When closing a roadway to one or more directions of travel.

A plan check fee shall be required for plan review and approval.

2.2.13 TRAFFIC SIGNAL PLANS

When a traffic signal installation is required as a condition of development, the Developer shall submit a Traffic Signal Plan to the City Traffic Engineering Division for review and approval. The Traffic Signal Plan shall be prepared by a California-registered Traffic Engineer or a California-registered Civil Engineer. The signal plan shall be signed and stamped by the responsible registered engineer. The signal plan shall be submitted through the Engineering Division Plan Check Engineer as part of the street improvement plan submittal and shall be subject to separate plan checking fees.

2.2.14 SIGNING, STRIPING, AND PAVEMENT MARKING PLANS

If the Developer's new street improvements cause the repair, replacement, or installation of new signing, striping, and pavement markings, the Developer shall submit a Signing, Striping, and Pavement Marking Plan to the City Traffic Engineering Division for review and approval. The plan shall be prepared by a California-registered Traffic Engineer or a California-registered Civil Engineer. The signing, striping, and marking plan shall be signed and stamped by the responsible registered engineer. The plan shall be submitted through the Engineering Division Plan Check Engineer as part of the street improvement plan submittal and shall be subject to separate plan checking fees.

The City Traffic Engineering Division shall provide the Developer an estimated fee for the City to provide, install, and inspect the required signing, striping, and pavement markings per the approved Signing, Striping, and Pavement Marking Plan. The Developer shall have the option, subject to acceptance by the City, to provide and install the required signing, striping, and pavement markings or have the City do the work per the estimated

fee. All work shall be inspected and approved by the City Traffic Division and subject to separate inspection fees.

Thermoplastic striping and raised pavement markers (RPMs) shall be used on all arterial streets, unless otherwise specified by the City Traffic Engineering Manager.

SECTION 2.3

Street Lighting Plans

SECTION 2.3 STREET LIGHTING PLANS

2.3.1 GENERAL

The installation of street lights may be required for various real estate and public works projects such as tract maps, parcel maps, deeded streets, conditional use permits, road improvements, permits and developments on existing lots. The Southern California Edison Company (SCE) designs the electrical circuits and installs the wire, light and poles. The Developer is responsible for the street light plan design and submittal, installation costs, operation and maintenance costs until the City accepts the installed and energized street lights into the Lancaster Lighting Maintenance District (LLMD).

The LLMD was established by adoption of Resolution Nos. 92-150, 151, 152, 153, 154, and 92-169 between May 18, 1992 and July 6, 1992. This action transferred the jurisdiction of the management and administration of street lighting from the County of Los Angeles to the City of Lancaster.

Street Lighting plans shall conform to the current design criteria of the Los Angeles County Department of Public Works, Traffic and Lighting Division, Procedures for the Preparation of Street Light Layouts by Private Developers. Street Lighting plans shall be submitted directly to the City of Lancaster subdivision section for plan check and approval. The plans are submitted as part of the street improvement plan check submittal (refer to section 2.2.2.2). Plans shall conform to the City of Lancaster standard plan format.

2.3.2 SUBMITTAL REQUIREMENTS

2.3.2.1 STREET LIGHTING PLAN SUBMITTAL REQUIREMENTS

1. The initial submittal of Street Lighting Plan shall consist of three (3) folded copy prints of the plan.
 - a. 24"X36" size plan on mylar.
 - b. Use current City of Lancaster Street Light General Notes.
 - c. Use latest City of Lancaster I.E.S. Based Design Criteria.
 - d. Use current Los Angeles County Department of Public Works, Traffic and Lighting Division Procedures for the Preparation of Street Light Layouts by Private Developers.
 - e. Street Light Plan check fee shall be calculated in the project Bond Estimate Form. Said fee shall be paid upon initial submittal of the plan to the City Subdivision Section for plan check with the Street Improvement plans, and shall be included in the improvement plan check fee initial payment.
 - f. The property owner/developer shall pay processing fee to be annexed into the Lancaster Lighting Maintenance District (LLMD).

2. Subsequent submittals shall include:

- a. Previous marked up check prints.
- b. Revised Plans.
- c. Additional documents requested by Plan Checker.
- d. Any adjustments or additional fees.

3. Plan Approval

- a. Plan originals shall receive City approval signatures once property owner/developer has paid the first years assessment and signed the petition to be annexed into the Lancaster Lighting Maintenance District (LLMD).
- b. City Subdivision Section assigns a LLMD "LTG" number to the approved plan.
- c. Developer's private engineer provides five (5) folded blueprint copies of the approved original to the Subdivision Section along with the approved mylar plan original.
- d. City Subdivision Section and City Engineer issues approved blueprint copies to SCE, Developer and Design Engineer along with the City authorization letter for SCE to proceed with design.

SECTION 2.4

Sewer Improvement Plans

SECTION 2.4 SEWER IMPROVEMENT PLANS

2.4.1 GENERAL

This section provides the guidelines, policies and procedures for the design of sewer improvement plans. The sewer improvement plans shall meet the criteria specified in the Los Angeles County Private Contract Sanitary Sewer Procedural Manual, latest edition and Division 2, Title 20, Ordinance No. 6130 (Sanitary Sewer and Industrial Waste Ordinance) of the County of Los Angeles. If a conflict arises, the more restrictive criteria shall apply. The City of Lancaster adopted Los Angeles County Ordinance No. 6130 under City Ordinance No. 91 on December 18, 1978. All subsequent amended ordinances shall apply.

2.4.2 SUBMITTAL REQUIREMENTS

The sewer improvement plans are submitted by the developer's engineer to the Department of Public Works, Subdivision Section, as part of the improvement plans submittal package for review and approval. Any plans submitted shall be prepared by, or under the direction of, and shall be stamped and signed by a Registered Civil Engineer of the State of California.

The sewer improvement plans shall also be submitted for plan check review concurrently with City of Lancaster plan check review to the Chief Engineer of the County Sanitation Districts and/or the Los Angeles County Department of Public Works Consolidated Sewer Maintenance District, whichever and whenever it is applicable.

After the City has approved the plans, the plans and a letter of transmittal are submitted by the developer's engineer to the Chief Engineer of County Sanitation District for approval and to the Los Angeles County Department of Public Works Consolidated Sewer Maintenance District for approval. The approved original mylar tracings and four folded blueprint copies of the plans are then submitted to the City Engineering Division.

The City Construction Permit shall be issued upon payment of applicable fees and submission of an Occupation Safety and Health permit and Workmen's Compensation Insurance. Construction shall commence within one year from the date of approval.

The review and approval of sewer improvement plans by the City Subdivision Section may be waived when: (a) sewer facilities are not dedicated to the City; (b) sewer facilities are not maintained by the City; (c) sewer facilities are not in dedicated right-of-way and; (d) sewer facilities do not outlet into the City-owned sewer; and (e) for lateral-only construction and connection, refer to subsection 2.4.9.1.

When a mainline sewer is proposed, initial and subsequent submittals shall require two sets of the proposed mainline sewer to be provided.

2.4.3 SEWER IMPROVEMENT PLAN CHECKLIST

A sewer plan check checklist is included in the Sewer Plan Submittal Requirements Packet. The Developer's Engineer is advised to obtain the latest checklist before preparing a Sewer Development Plan.

2.4.4 SEWER IMPROVEMENT PLAN GENERAL NOTES

Sewer Improvement Plans shall include General Notes as shown on the sample plan included with this manual or the most current Sewer Plan Submittal Requirements Packet available from the Subdivision Section. These notes are a minimum.

2.4.5 SEWER IMPROVEMENT PLAN CONSTRUCTION NOTES

Sewer Improvement Plans shall have Construction Notes applicable to the individual plan. These notes shall conform generally to the notes shown on the sample plan included with this manual.

2.4.6 PRIVATE ENGINEER'S NOTICE TO CONTRACTORS

This note shall be placed on all Sewer Improvement Plans:

The existence and location of any underground utility pipes or structures shown on these plans are obtained by a search of available records. To the best of our knowledge, there are no existing utilities except as shown on these plans. The contractor is required to take due precautionary measures to protect the utility lines shown and any other lines not of record or not shown on this drawing. Prior to excavation, the contractor shall call Underground Service Alert, toll free at 1-800-422-4133 to verify the location of underground utilities.

2.4.7 MISCELLANEOUS NOTES

The following notes shall be placed on all Sewer Improvement Plans:

- a) The subject sanitary sewer project will not be accepted for maintenance until such time as the outlet sewer has been constructed and accepted by the City of Lancaster for public use.
- b) No connection for the disposal of industrial waste shall be made to sewers shown on these drawings until a permit for industrial waste water discharge has been issued by the Sanitation District for said connection.
- c) Before breaking into, or construction on, any County Sanitation District sewers and prior to final acceptance of the project, the Sanitation District Inspector shall be notified by phone at (805) 266-4683 or (805) 947-5027 so that required inspections can be made.
- d) Before breaking into, or construction on, any City sewers and prior to final acceptance of the project, the Los Angeles County Sewer Maintenance

District Inspector shall be notified by phone at (805) 942-6042 so that required inspections can be made.

- e) Leakage tests, cleaning and TV video inspection of all sanitary sewer main will be required by the City of Lancaster, prior to the final acceptance for maintenance.
- f) Bedding shall be used under sewer pipe per Section 306-1.2.1 of the Standard Specifications and per Sanitation District Standard Plan S-21. Use of 4 inches of crushed aggregate base bedding shall be required where the sand equivalent of bedding is less than 40%.

2.4.8 PRIVATE ENGINEER'S STATEMENT OF RESPONSIBILITY

This note shall be placed on all Sewer Improvement Plans:

The private engineer signing these plans is responsible for the accuracy and acceptability of the work hereon. In the event of discrepancies arising during construction, the private engineer shall be responsible for determining an acceptable solution and revising the plans for approval by the City.

Name

R.C.E. No.

Date

2.4.9 DESIGN CRITERIA

2.4.9.1 LATERAL CONNECTION

All sewer lateral connection material (including wyes or saddle connections) shall be vitrified clay pipe (VCP), from the sewer mainline to the City right-of-way or easement lines. For lateral connection to existing main line sewer, three (3) blueprint copies of the approved specific plan-profile sheet for the main line sewer showing the proposed lateral in red line shall be submitted to the Subdivision Section of the Department of Public Works for review and approval. When approved, the developer's engineer shall add the as-built lateral information on the original approved plan. The sewer construction permit shall then be issued upon payment of applicable sewer agency, encroachment permit, and plan check fees.

When a mainline sewer is not proposed and a lateral connection is required, three (3) blue-line copies of the original approved mainline sewer plans that the proposed lateral is being tied into shall be provided with the proposed lateral and associated stationing drawn on the plan in red.

When a mainline sewer is not proposed and an existing wye is proposed for a lateral connection, three (3) blue-line copies of the approved mainline sewer the existing wye originates from shall be provided with the proposed lateral, properly stationed, drawn from the existing wye on the plan in red.

Sewer service connections shall be made to sewer mains utilizing single wyes or tees. Double wyes are not permitted.

All wyes and/or house laterals are to be located on the mainline sewer no closer than five feet (5') apart and not closer than five feet (5') to the outside of any manhole.

2.4.9.2 DEVELOPMENTAL SEWER AREA STUDY

A sewer area study shall be submitted for all private contract mainline sewers. It shall be prepared and presented with two parts:

Part A:	Map
Part B:	Report

The results of all sewer area studies shall be presented on a 24"x36" standard mylar sheet map at a scale of 1"=600' or larger scale if necessary for clarity and shall include the following:

- a. Any boundary lines of influence including the Sanitation District, Improvement Districts, Sewer Reimbursement Districts, City Limits and County Limits. Identify applicable utility company jurisdictions.
- b. Tributary areas served should be identified and acreage noted. The sewer study map shall show not only the project being served but all areas tributary to the sewers under study to the point of the trunk connection. The tributary areas if covered by previously approved sewer area studies may be referenced in lieu of duplication in the new study.
- c. Existing contour lines shall be provided on the original mylar.
- d. Zoning boundaries shall be indicated within the tributary area under consideration.
- e. Existing utilities, proposed utilities, storm drains, master plan drainage facilities, state highways, or any other improvements which may affect the sewer design shall be noted on the sewer study map (in a larger scale if necessary for clarity).
- f. Major street names shall be noted on the sewer study map.
- g. All existing sewer mains, existing manholes, proposed sewer main, proposed manholes, trunk sewer mains, and trunk manholes applicable to the tributary area of the project, shall be included on the sewer study map.
- h. All reaches shall be keyed to a reference chart on the drawing.
- i. Direction of sewer flow shall be indicated.
- j. Existing invert elevations at existing tie-in manholes and proposed manholes shall be provided.

- k. The study shall include a chart indicating reach, size, grade, acreage, etc. A sample of this chart is presented below:

Reach	A	B	C
Size	8"	8"	10"
Grade	0.40%	0.40%	0.32%
Acreage	2	2	4
Contributing CFS	0.10	0.10	0.10
Available CFS 1/2 Full (Q AVG)	0.38	0.28	0.62
Available CFS 3/4 Full (Q PEAK)	0.70	0.70	1.13
Manhole No.	1	2	3
Invert Elevation and Approximate (Depth) North	2373.66 (7.5')	2373.76 (7.6')	2373.86 (7.7')
Invert Elevation and Approximate (Depth) South	-	2373.66 (7.5')	2373.76 (7.6')
Invert Elevation and Invert (Depth) East	-	-	-
Invert Elevation and Invert (Depth) West	-	-	-

1. All sewer study maps shall be stamped and signed by the Registered Civil Engineer responsible for the study.

All calculations and conclusions shall be presented in report form with a copy of the sewer study map attached. A copy of the survey notes with the invert elevations and the rim elevation at the point of connection to the existing system stamped and signed by the registered land surveyor shall be included in this report. The sewer area study shall be stamped and signed by the responsible Registered Civil Engineer.

Project sewer mains shall be sized to satisfy the needs of the proposed development, keeping in mind the future sewer needs of adjacent tributary areas.

Sewer Area Studies are not approved until they are signed approved by the City Engineer.

2.4.9.3 SEWER LOADING CRITERIA

The average family unit shall be 3-1/2 persons per residential unit.

The average daily discharge (Q Average) of domestic sewage shall be 100 gallons per day (or .000155 ft³/sec) per person.

The peaking factor shall be 2.5.

The daily peak discharge (Q peak) of domestic sewage shall be two hundred fifty (250) gallons per day (or .000387 ft³/sec) per person.

RESIDENTIAL ZONING				
DESIGNATION	ZONING OR USE DESCRIPTION	BASIS OF DAILY FLOW COMPUTATION	AVERAGE FLOW COEFFICIENT FOR Coverage	PEAK FLOW COEFFICIENT FOR Open
R R-2.5	Rural Residential; 1 Unit/2.5 Acres	3.5 Persons/Unit/2.5 Acres	0.000217 cfs/acre	0.000543 cfs/acre
R R-1	Rural Residential; 1 Unit/ 1 Acre	3.5 Persons/Unit/Acre	0.000543 cfs/acre	0.001356 cfs/acre
SRR	Semi-Rural Residential; 1-2 Units/ 1 Acre	3.5 Persons/Unit/Acre, 7 Persons/2 Units/Acre	0.000543 cfs/acre	0.001356 cfs/acre
R-15,000	Single Family Residential on 15,000 SF Lots	3.5 Persons/Unit/0.344353 Acres	0.001575 cfs/acre	0.003939 cfs/acre
R-10,000	Single Family Residential on 10,000 SF Lots	3.5 Persons/Unit/0.229568 Acres	0.002363 cfs/acre	0.005908 cfs/acre
R-8,500	Single Family Residential on 8,500 SF Lots	3.5 Persons/Unit/0.195133 Acres	0.002780 cfs/acre	0.006950 cfs/acre
R-7,000	Single Family Residential on 7,000 SF Lots	3.5 Persons/Unit/0.160698 Acres	0.003376 cfs/acre	0.008440 cfs/acre
R-6,000	Single Family Residential on 6,000 SF Lots	3.5 Persons/Unit/0.137741 Acres	0.003939 cfs/acre	0.009846 cfs/acre
M D R-1	Moderate Density Residential of 8.6-11 Units/ 1 Acre (8.6 Entitlement Density. Additional facilities required for higher densities).	3.5 Persons/Unit	0.003581- 0.005968 cfs/acre	0.008951- 0.014919 cfs/acre
M D R-2	Moderate Density Residential of 7.1-15 Units/ 1 Acre (11 Entitlement Density. Additional facilities required for higher densities).	3.5 Persons/Unit	0.003852- 0.008138 cfs/acre	0.009629- 0.020344 cfs/acre
H D R-1	High Density Residential of 15.1- 25 Units/ 1 Acre (15.1 Entitlement Density. Additional facilities required for higher densities).	3.5 Persons/Unit	0.008192- 0.013563 cfs/acre	0.020479 - 0.033906 cfs/acre
H D R-2	High Density Residential of 15.1- 30 Units/ 1 Acre (20 Entitlement Density. Additional facilities required for higher densities).	3.5 Persons/Unit	0.008192- 0.016275 cfs/acre	0.020479- 0.040688 cfs/acre
MHP	Mobile Home Park, RV Park	3.5 Persons/Space (Minimum 10.0 Gross Acres, 4.6-6.0 Spaces/Acre)	0.002496- 0.003255 cfs/acre	0.006239- 0.008138 cfs/acre

Table 2.4.9.3.1 SEWER LOAD COEFFICIENTS BY ZONING

COMMERCIAL/INDUSTRIAL /SPECIAL ZONING				
USE	ZONING DESIGNATION	BASIS OF DAILY FLOW COMPUTATION	AVERAGE FLOW COEFFICIENT FOR Coverage	PEAK FLOW COEFFICIENT FOR Peak
Airport	LI, MI, HI	0.000008 cts/Passenger	0.000008 cts /Passenger	0.000019 cts /Passenger
Animal Kennels	RR-1, RR-2.5	0.000155 cts/1,000 SF	0.006752 cts /acre	0.016880 cts/acre
Auditorium, Entertainment	C, CBD, CPD	0.000541 cts/1,000 SF	0.023588 cts /acre	0.058969 cts/acre
Auto Parking w/ Facilities	C	0.00005 cts/1,000 SF Gross Floor Area	0.002178 cts /acre	0.005445 cts/acre
Auto Sales/Repair	C	0.000155 cts/1,000 SF	0.006752 cts /acre	0.016880 cts/acre
Bathhouses, Swimming Pools	C,O	0.000016 cts/Person	0.000016 cts /Person	0.000039 cts /Person
Bar, Cocktail Lounge, Night Club, etc.	C, CBD, CPD	0.000541 cts/1,000 SF	0.023588 cts/acre	0.058969 cts/acre
Bowling/Skating	C	0.000232 cts/1,000 SF	0.010109 cts/acre	0.025272 cts/acre
Car Wash	C	Tunnel (No Recycling): 0.005724 cts/1,000 SF Tunnel (With Recycling): 0.004177 cts/1,000 SF Self-Serve Wash: 0.001083 cts/1,000 SF	0.249337 cts/acre 0.181950 cts/acre 0.047175 cts/acre	0.623344 cts/acre 0.454875 cts/acre 0.117939 cts/acre
Church	C	0.000078 cts/1,000 SF	0.003376 cts /acre	0.008440 cts /acre
Club (Service)	C	0.000193 cts/1,000 SF	0.008424 cts/acre	0.021060 cts/acre
Commercial Shops & Stores	C, CBD, CPD	0.000155 cts/1,000 SF	0.006752 cts /acre	0.016880 cts/acre
Convalescent Home	C, CPD	0.000193 cts/Bed	0.000193 cts/Bed X 1/Acreage	0.000483 cts/Bed X 1/Acreage
Convention Center, Fairground, Race-track, Sports Stadium/Arena	C, CPD	0.000016 cts X Average Daily Attendance	0.000016 cts X Avg. Attendance X 1/Acreage	0.000039 cts X Avg. Attendance X 1/Acreage
Drive-In Theatre	C	0.000031 cts/1,000 SF	0.001348 cts/acre	0.003370 cts/acre
Factories	LI, MI, HI	0.000054 cts/Person/Shift	0.000054 cts /Person/Shift	0.000135 cts /Person/Shift
Financial Institution (Bank, Credit Union, etc.)	C, OP	0.000155 cts/1,000 SF	0.006752 cts /acre	0.016880 cts/acre
Golf Course, Camp, and Park (Structures and Improvements)	O	0.000155 cts/1,000 SF	0.006752 cts /acre	0.016880 cts/acre
Health Spa, Gymnasium	C	(With Showers): 0.000930 cts/1,000 SF (Without Showers): 0.000465 cts/1,000 SF	(With Showers): 0.040511 cts/acre (Without Showers): 0.020255 cts/acre	(With Showers): 0.101277 cts/acre (Without Showers): 0.050639 cts/acre
Hotel, Motel, Rooming House	C	0.000232 cts/Room(Unit)	0.000232 cts /Room(Unit)	0.000580 cts /Room(Unit)
Hospital (Surgical)	H	0.000775 cts/Bed	0.000775 cts/Bed	0.001938 cts/Bed
Hospital (Convalescent)	H	0.019375 cts/Bed	0.019375 cts/Bed	0.048438 cts/Bed

COMMERCIAL ZONING KEY
C - General Commercial
CBD - Central Business District
CPD - Commercial Planned Development
H - Hospital
OP - Office Professional
RC - Regional Commercial

INDUSTRIAL ZONING KEY
LI - Light Industrial
MI - Medium Industrial
HI - Heavy Industrial
BP - Business Park

SPECIAL PURPOSE ZONING KEY
O - Open Space

Table 2.4.9.3.1 SEWER LOAD COEFFICIENTS BY ZONING (Continued)

COMMERCIAL/INDUSTRIAL /SPECIAL ZONING				
USE	ZONING DESIGNATION	BASIS OF DAILY FLOW COMPUTATION	AVERAGE FLOW COEFFICIENT FOR Averages	PEAK FLOW COEFFICIENT FOR Open
Indoor Theatre	C	0.000193 cfs/1,000 SF	0.006424 cfs/acre	0.021060 cfs/acre
Laundry	C	0.005916 cfs/1,000 SF	0.257775 cfs/acre	0.644445 cfs/acre
Lumber Yard	C, LI, MI	0.000039 cfs/1,000 SF	0.001685 cfs/acre	0.004212 cfs/acre
Dry Manufacturing (Light)	LI	0.000039 cfs/1,000 SF	0.001685 cfs/acre	0.004212 cfs/acre
Manufacturing (Medium, Heavy)	MI, HI	0.000310 cfs/1,000 SF	0.013504 cfs/acre	0.033759 cfs/acre
Medical Office Building	C, CBD, CPD	0.000465 cfs/1,000 SF	0.020255 cfs/acre	0.050639 cfs/acre
Mortuary/Cemetery	O	0.000155 cfs/1,000 SF	0.006752 cfs/acre	0.016880 cfs/acre
Nursery/Greenhouse	C, LI	0.000039 cfs/1,000 SF	0.001685 cfs/acre	0.004220 cfs/acre
Office Building	OP	0.000310 cfs/1,000 SF	0.013504 cfs/acre	0.033759 cfs/acre
Open Storage	HI	0.000039 cfs/1,000 SF	0.001685 cfs/acre	0.004220 cfs/acre
Professional Building	OP	0.000465 cfs/1,000 SF	0.020255 cfs/acre	0.050639 cfs/acre
Restaurant	C, CBD, CPD	0.001547 cfs/1,000 SF	0.067393 cfs/acre	0.168462 cfs/acre
School (Boarding)	O	0.000155 cfs/Student	0.000155 cfs/Student	0.000388 cfs/Student
School (Private)	O	0.000310 cfs/1,000 SF	0.013504 cfs/acre	0.033759 cfs/acre
School (Elementary or Jr. High)	O	0.000016 cfs/Student	0.000016 cfs/Student	0.000039 cfs/Student
School (High School)	O	0.000023 cfs/Student	0.000023 cfs/Student	0.000058 cfs/Student
College/University	O	0.000031 cfs/Student	0.000031 cfs/Student	0.000077 cfs/Student
College Dormitories	O	0.00132 cfs/Student	0.000132 cfs/Student	0.000329 cfs/Student
Service Shop	C, LI	0.000155 cfs/1,000 SF	0.006752 cfs/acre	0.016880 cfs/acre
Service Station	C, LI	0.000155 cfs/1,000 SF	0.006752 cfs/acre	0.016880 cfs/acre
Shopping Center	C	0.000503 cfs/1,000 SF	0.021903 cfs/acre	0.054757 cfs/acre
Supermarket	C	0.000232 cfs/1,000 SF	0.010109 cfs/acre	0.025272 cfs/acre
Regional Mall	RC	0.000232 cfs/1,000 SF	0.010109 cfs/acre	0.025272 cfs/acre
Warehousing	HI	0.000039 cfs/1,000 SF	0.001685 cfs/acre	0.004212 cfs/acre
Wholesale Outlet	C, LI	0.000155 cfs/1,000 SF	0.006752 cfs/acre	0.016880 cfs/acre

COMMERCIAL ZONING KEY
C - General Commercial
CBD - Central Business District
CPD - Commercial Planned Development
H - Hospital
OP - Office Professional
RC - Regional Commercial

INDUSTRIAL ZONING KEY
LI - Light Industrial
MI - Medium Industrial
HI - Heavy Industrial
BP - Business Park

SPECIAL PURPOSE ZONING KEY
O - Open Space

Table 2.4.9.3.1 SEWER LOAD COEFFICIENTS BY ZONING (Continued)

The size of main-line sewer shall be determined by the loading factors listed in Table 2.4.9.3.1, but in no case shall be less than eight inches inside diameter.

Mainline sewers shall be designed flowing 1/2 full using the Q average loading factors.

Under no condition shall a gravity sewer ever be designed to flow under pressure.

Individual building, commercial or industrial plant capacities shall be the determining factor when the coefficients exceed those shown in the load table (Table 2.4.9.3.1).

The coefficient to be used for any zoned area not listed will be determined by the City Engineer based on the intended development and use.

The City Engineer shall determine which of the coefficients or combination of coefficients shall be used for design as determined by the established or proposed zoning in the study area. Any modifications to these coefficients due to topography, development or hazard areas shall be approved by the City Engineer.

All sewer area studies shall be submitted in report form and at a minimum shall include the following:

All reports shall be bound or stapled and provided in some form of binder.

All reports shall include on the first page the project number in reference to a tract, parcel map, conditional use permit, site plan review, or permit number. The first page shall also furnish the name of the developer, the developer's engineer, the date the study was prepared, the engineer's stamp and signature, and project name.

All reports shall include on the second page an index listing the sections contained in the report and their pertinent page numbers. All maps and references shall also be reflected in the index.

All reports shall include an introduction discussing the location of the project, location and identification of existing sewer main tie-in, and what the project is proposing to the City of Lancaster in terms of a sewer system.

All reports shall include a conclusion summarizing specifically all results and conclusions made by the preparing engineer. These results should include conclusions as to capacity, mainline size, line grade, benefits to future development, relation or concurrence with the master plan of sewers, any temporary systems, any relief to existing systems, deficiencies, benefits, reimbursement or related districts, and any other conclusions required by City Staff.

All reports shall include at least one sample calculation in relation to capacity and area determinations.

The method used to determine loading shall be units/acre as prescribed by the loading factors provided by these guidelines in subsection 2.4.9.3.

The method used to determine mainline capacity shall be Manning's equation using an "n" value of 0.13.

All reports shall include an appendix furnishing all reference material and maps associated with the sewer area study.

2.4.9.4 SEWER GRADES

Sewer mainline grades shall be designed in multiples of 0.04%. No sub-minimum grades will be allowed, unless approved by the City Engineer. Minimum slopes shall conform to the following table:

<u>Pipe Size</u>	<u>Minimum Slope</u>	<u>Half Pipe Capacity</u>
8"	0.40%	0.38 CFS
10"	0.32%	0.62 CFS
12"	0.24%	0.87 CFS
15"	0.16%	1.29 CFS
18"	0.14%	1.97 CFS
21"	0.12%	2.75 CFS
24"	0.10%	3.58 CFS

Sewer laterals shall have a minimum slope of two percent (2%), or 1/4 inch per foot, where practical.

2.4.9.5 SEWER SIZE AND MATERIAL

Minimum line size for any mainline sewer shall be eight inches (8") inside diameter.

Sewer mains shall be sized to satisfy the needs of the proposed development. Future needs of the adjacent tributary areas shall also be considered in sizing sewer mains.

All City sewer mainline and/or lateral connection fitting and pipe material shall be Vitriified Clay Pipe (VCP) when said facilities are located within the City right-of-way or easements.

2.4.9.6 SEWER LOCATION

All sanitary sewers and appurtenant structures shall be offset by a distance of five feet (5') on the north or east side of centerline on all collector, local or interior, and cul-de-sac streets where possible.

All sanitary sewers and appurtenant structures shall be offset from curb face and into the street six feet (6') on the north or east side of the street on all secondary or primary arterials where possible. The six foot (6') offset on the south and west side shall be reserved for relief systems.

The minimum horizontal offset distance between water mains and sewer mains shall be ten (10) feet outside of pipe to outside of pipe.

Sewer lines shall be installed along the frontage of the property being developed when it is adjacent to public rights-of-way or public utility and facilities easement. The mainline sewer shall be developed in the adjacent public rights-of-way, utility and facility easements

to a point five feet from the property boundary lines to provide a future hook-up for adjacent properties and prevent cutting of pavement or disturbances of utility and facility easements through developed properties.

2.4.9.7 SEWER DEPTH

Minimum depth for mainline sewers shall be of seven and one-half feet (7.5') from the top of manhole rim to the higher invert elevation if the curb grade is accurately known. The mainline invert depth shall be a minimum of eight feet (8') if curb grade is proposed. The City may require greater depths when it is necessary to extend the main line sewer to serve other areas. However, in some cases, if the existing outlet sewers are too shallow to obtain such a depth, a shallower depth may be approved.

Minimum depth for mainline sewers shall be eight feet (8') from the top of the manhole rim to the higher invert elevation in all cases where the developer intends to construct a structure with a basement or a split-level home below street grade containing waste facilities.

The Developer shall submit a letter to the City Engineer stating that he agrees to the condition that said basement structures and split-level homes cannot be constructed without installing a pump at the structures and stating that he understands the sewer depth requirements.

Mainline depths may be allowed at less than seven and one-half feet (7.5') if approved by both the City Engineer and the Los Angeles County Sewer Maintenance District. Special encasement(s) and approved standard plan shallow manholes may be required. In all cases, no shallow manhole shall be less than four (4) feet deep to the upstream invert elevation.

The minimum depth for a house lateral at the property line shall be six feet below the top of curb grade, except at shallow mainline-allowed conditions.

The depth of house laterals at the right-of-way shall meet the minimum depth requirements and shall provide service to a point to be served on the lot within 150 feet of the right-of-way line at a minimum grade of two percent (2%) and all points of the lot beyond at a minimum grade of one percent (1%), with the top of lateral not less than two feet (2') below the ground surface at any point.

2.4.9.8 VELOCITY

Mainline sewers shall be designed to provide a minimum velocity of two feet per second (2 ft/sec).

Mainline sewers shall provide a maximum design discharge not to exceed the flow at critical slope and velocity. Mainline sewers shall not be designed for flow conditions at critical slope and velocity.

Design velocities for sanitary sewers shall be computed using Manning's formula with a constant "n" value of 0.013.

Maximum velocity for mainline sewers shall not exceed nine feet per second (9 ft/s)

2.4.9.9 CURVED SEWERS

Minimum radius for eight inch (8") sewer mainline is one hundred twenty feet (120') or as recommended by the pipe manufacturer, whichever is the more restrictive requirement.

Only one curve of any kind shall be allowed between manholes. Curve deltas shall not exceed sixty degrees (60°). A manhole shall be placed at the B.C. and E.C. of all curves.

Any non-metallic sewer line on a horizontal curve shall have a No. 10 bare copper detector wire placed over the pipe line prior to backfilling. The detector wire shall be brought up to the manhole frames at each end of the pipeline.

2.4.9.10 CONDOMINIUM SEWERS

New condominium developments shall be served by main-line sewers and house laterals such that each unit will have a separate and independent connection to a main-line sewer.

2.4.9.11 APARTMENT COMPLEX SEWERS

New apartment complex developments shall be reviewed on a case-by-case basis for eligibility to be served on-site by City mainline sewers in City easements. Otherwise, apartment complexes shall be served on-site by a private system and be connected to the City system at the City right-of-way line.

2.4.9.12 DRY SEWER LINES

Dry sewer lines will not be permitted without special approval from the Director of Public Works.

When a dry sewer line is permitted, it shall be plugged at the manhole and no lateral connection shall be permitted until the upgraded manhole is completed and an outlet sewer is provided. A note to this affect shall be placed on the sewer plans.

2.4.9.13 MANHOLES

Manhole structures shall be placed in the mainline sewer at all changes of alignment, gradient, and at the intersections of all mainline sewers.

End-of-line (Terminal) manholes shall be constructed on all sewer mainlines, whether on public or private property. Cleanouts or lampholes are not permitted.

The maximum distance between manholes shall be three hundred and fifty feet (350').

Manhole construction shall conform to the appropriate city-accepted standard plan applicable for its use.

Special encasement(s) and approved standard plan shallow manholes may be required. Shallow manhole requests shall be reviewed for approval of use on a case-by-case basis and are subject to both the City Engineer and the Los Angeles County Sewer Maintenance

District approvals first. In all cases, no shallow manhole shall be less than four (4) feet deep to the upstream invert elevation.

A manhole shall be placed at the B.C. and E.C. of all curves.

Manhole tops in unimproved rights-of-way shall be six inches above finished grade.

2.4.9.14 ADJUST MANHOLE FRAME AND COVER

Existing sewer manhole covers and frames shall be raised or lowered to match the elevation and slope of the new pavement surface in accordance with Section 302-5 of the Standard Specifications.

Sewer manholes shall be adjusted to finished grade within 48 hours of placement of A.C. pavement.

The Developer will be responsible for removing necessary pavement from around the cover to facilitate the adjustment. The Developer shall repave around the frame and cover to complete the work. The adjustment of sewer manhole frames and covers belonging to the Los Angeles County Sanitation district requires the presence of an inspector from the Sanitation District. The Developer shall request such inspection no less than 24 hours in advance of adjusting said manholes. The District inspector can be contacted at (805) 947-5027 between the hours of 7:00 a.m. and 8:00 a.m.

2.4.9.15 EASEMENTS

Location of sewer mainlines in sanitary sewer easements shall be kept to a minimum and shall be avoided when an alternate location exists. Whenever possible, sewers shall be placed in the public roadway.

On a case-by-case basis, when easement(s) are requested, a research, plan check, and processing fee shall be paid to the City. The City will review the request for said sewer easement(s) and research alternate locations. The Developer or Developer's agent shall submit as part of the easement request the reason the easement is needed and alternate solutions to the easement, if any. The easement request shall also include an explanation why there are no alternative solutions with a cost analysis (if required by the City Engineer) describing hardship to the Developer. Upon conclusion of this review, if it is determined that a sewer easement is required, the developer or the developer's agent shall obtain in writing the City Engineer's approval of the location and width of any such easement.

All sanitary sewer easements, once approved, shall be granted with a final tract or parcel map, or be dedicated via separate instrument to the City of Lancaster.

The minimum width of any easement for sanitary sewer purposes shall be fifteen feet (15'). The sewer main shall be within the easement as directed by the City Engineer. In special cases of terrain, depth of sewer line or any other complications, the required easement width shall be increased as needed and the location of the sewer mainline adjusted accordingly. There shall be no other overlapping or conflicting utility easements with the sanitary sewer easement.

All easements shall include the right of ingress and egress over adjoining property for maintenance, replacement and operation. No permanent structures shall be constructed in such easements, except fences.

Until the easements have been properly executed, approved, and submitted to the City for recordation, no plans shall be approved by the City Engineer for facilities to be constructed by any person across the property of others, nor shall any sewer facility be accepted for public use or placed in use by any person.

2.4.10 FINAL ACCEPTANCE BY THE CITY

2.4.10.1 CLEANING

Prior to the acceptance of any sewer line by the City, the contractor shall clean all sewer lines with a Wayne -Type sewer cleaning ball under hydrostatic pressure. Any stoppage, dirt, or foreign matter shall be removed from the sewer lines. All cleaning and testing of the sewer lines shall take place after all construction work is completed, but prior to final paving. The system will be inspected after the final paving is completed and any damage to the system during the final paving and clean up must be corrected prior to approval.

2.4.10.2 TESTING SEWER LINES

All leakage tests shall be completed and approved prior to placing of permanent resurfacing and final acceptance by the City. All sewer lines shall be tested for leakage per Section 306-1.4 of the Standard Specifications.

The entire project sewer system will be initially pressure tested in the presence of an inspector representing the Director of Public Works. All reports shall be delivered to the City of Lancaster for review.

The Developer shall be notified in writing of any deficiencies which will require repair as determined by the leakage test. If corrective work is required and the developer desires to review the reports, he shall contact the City of Lancaster to make an appointment with the City Engineer.

Necessary corrections shall be made to reduce the leakage to acceptable limits and to the satisfaction of the City Engineer. All necessary corrections shall be performed at no cost to the City.

2.4.10.3 VIDEO INSPECTION

Prior to acceptance of any sanitary sewer line by the City of Lancaster, an inspection of said line by video shall be required at no cost to the City. All new mainline sewers shall be video inspected per the provisions of Section 500-1.1.5 of the Standard Specifications.

Defects such as high and low spots, joint separations, offset joints, chipped ends, cracked pipe, damaged pipe, infiltration points, lateral connections at less than the minimum 5 foot separation, and debris in lines shall be corrected.

When leakage tests have been completed and approved, the developer shall arrange for the video inspection.

The developer of the project shall notify the City of Lancaster in writing at least 24 hours in advance of the scheduled date of the video inspection.

1. The following procedures shall be completed prior to video inspection:
 - (a) All sewer lines are installed and backfilled.
 - (b) All structures are in place, connections are complete and lines are accessible from the structures.
 - (c) All other underground utility, piping, conduits, structures or facilities have been installed.
 - (d) The final subgrade is complete and ready for paving.
 - (e) Pipelines to be inspected have been preliminary balled, flushed, and cleaned with a high-pressure cleaner.
 - (f) The Developer of the project shall notify the City in writing of the proposed date of the pressure test at least 24 hours in advance.
 - (g) All leakage tests have been completed and approved (Air Tests, etc.).
2. The entire project sewer system will be initially video taped in the presence of the City Inspector. The tapes and reports shall be delivered to the City of Lancaster for review.
3. The Developer shall be notified in writing of any deficiencies that require repair, determined by the review of the video inspection. If corrective work is required and the developer desires to review the video tapes, the Developer shall contact the City of Lancaster to set a time for review with the City Engineer.
4. All corrective work shall be approved by the City prior to being performed, and approved prior to pavement construction. All corrective work shall be performed at no cost to the City of Lancaster.

Repeat procedures 1 through 4 until all deficiencies determined by the video inspection have been corrected to the complete satisfaction of the City Engineer.

All video tapes and reports shall become the property of the City of Lancaster to become a part of the as-built file.

2.4.10.4. AS-BUILT SEWER IMPROVEMENT PLANS PROCEDURE

The as-built drawing shall be submitted after the private contract sewer has been approved and accepted. Any changes on the as-built drawing shall be reflected on the approved original mylar drawing.

The City Inspector shall direct which items shall be appropriate as-built records.

The as-built drawing should reflect any known changes in invert elevations, top of manhole elevations, stationing, lateral locations, or any other changes from the proposed plans.

The sewer contractor shall denote any change made in the field in red on an approved set of sewer plan prints. This print set shall be called "Field As-Builts."

Said contractor shall give the final "Field As-Builts" to the City Inspector at the time of air testing notice to city. If no "As-Builts" are submitted, then no air test will be conducted.

The City Inspector shall review the final As-Built prints. If the inspector concurs with the accuracy and completeness of the plans, he will sign them. The City Inspector shall forward the signed as-built prints to the Subdivision Section.

The Subdivision Section shall then contact the Engineer of Record to pick up both the original approved sewer plans and the inspector-signed field as-built print set. The private engineer shall revise the original plans to reflect the as-built changes. (Lines shall be drawn through the corrected information and the new data shown thereon). The words "As-Builts" shall be shown on each sheet's left margin in 1/2 inch high letters. The engineer shall sign and date each as-built or note that the Record Engineer did not field verify the as-builts. All sewer laterals shall be drawn on the back of the original sewer plans.

The Engineer shall return the original "as-built" sewer plans with the "Field As Built" print set and one folded copy print set of the as-built originals to the Subdivision Section for review and approval.

Once approved, the private engineer shall distribute four folded print sets of the approved sewer plans with the original plans to the Subdivision Section. Additional prints may be distributed to other sewer agencies.

The "as-built" sewer shall be recorded in the City sewer map books. No on-site sewer connection permits shall be issued until the City has approved the as-builts.

All submittals shall be accompanied with a letter of transmittal.

2.4.11 DEDICATION OF SEWERS

An offer of dedication must be prepared for all private contracts.

An offer of dedication for a new subdivision or parcel map shall be included in the agreement accompanying the bond guaranteeing the construction of sewers.

The form is to be signed, notarized and if it is executed by a corporation or partnership, appropriate notary acknowledgments must be attached and the corporate seal affixed.

No sewer shall be accepted for dedication unless such sewer has been constructed in conformance with the City guidelines. Upon acceptance, the City assumes all further responsibility for the operation and maintenance of the dedicated main line sewers.

A sample form is shown below, or shall be provided by the City subdivision section in the Sewer Plan Submittal Requirements Packet:

OFFER OF DEDICATION

Honorable City Council
City of Lancaster
Lancaster, California

We hereby declare that the sanitary sewers and appurtenant structures constructed under Lancaster Private Contract No. _____ in accordance with the plans filed in the Office of the City Engineer are built for public use and that upon their acceptance by the City of Lancaster, all right, title and interest of the undersigned in and to said sewers shall vest in said City.

(corporate seal)

(print name under each signature)

Subscribed and acknowledge to before
me this _____ day of
_____, 19_____.

Notary Public in and for the County of
Los Angeles, State of California

NOTE:

If the above instrument is executed by a corporation or partnership, appropriate notary acknowledgments are to be attached.

2.4.12 PARTICIPATION LETTER

A "Letter of Participation", provided by the City subdivision section in the Sewer Plan Submittal Requirements Packet shall be submitted before approval of public sewer plans describing all properties which have participated in the cost of the project.

All Properties listed on the "Letter of Participation" will be exempt from the connection charge only, specified in Section 20.32.130 of the Los Angeles County, Title 20, Division 2 of Sanitary Sewers and Industrial Waste Manual.

The "Letter of Participation" shall not be revised after the sewers have been accepted for public use by the City Council.

The "Letter of Participation " shall not be revised after a reimbursement agreement has been approved by the City Council. Listed participants will be exempt from the reimbursement district connection charges specified in Section 20.32.130 of the Los Angeles County Title 20, Division 2 of Sanitary Sewers and Industrial Waste.

SECTION 2.5

**Water System
Improvement Plans**

SECTION 2.5 WATER SYSTEM IMPROVEMENT PLANS

2.5.1 GENERAL

On July 7, 1986, the City Council adopted Ordinance no. 407. This ordinance adopts by reference the Water Ordinance as adopted by Division 1 of Title 20, as amended, of Los Angeles County as the Water Ordinance of the City of Lancaster.

2.5.2 SUBMITTAL REQUIREMENTS

2.5.2.1 INITIAL SUBMITTAL

Water Improvement plans shall meet the design criteria of the Water Ordinance of the City of Lancaster.

Plans are submitted as part of the complete package for preliminary check. Plans are also submitted to the water district having the jurisdiction. The following are to be submitted to the City as a part of the submittal package outlined in the Water System Improvement Plan Submittal Requirements Packet:

- a. Two (2) copies of water improvement plans
- b. Fire Department map
- c. Fire Department Requirements
- d. Performance Bond estimate
- e. Plan checking and processing fee for City plan check of water plans

2.5.2.2 SUBSEQUENT SUBMITTALS

Subsequent submittals include the following:

- a. Check sheet
- b. Check prints
- c. Copy of corrected prints
- d. Copy of final prints with signature of water purveyor
- e. Current water purveyor registration certificate
- f. Statement from water purveyor that the proposed water system will be operated by the water purveyor and under normal conditions the system will meet the requirements of Ordinance No. 407

2.5.3 WATER SYSTEM CONSTRUCTION

Before water system construction begins, the following shall be done:

- a. Obtain City encroachment permit and pay appropriate City inspection fees
- b. Pay pavement restoration inspection fee per proposed square footage of pavement restoration. Said work shall conform to the provisions of the City of Lancaster Street Opening and Pavement Restoration Regulation (Refer to Section 8.3)
- c. Water line Developer shall post a water trenching deposit (\$600.00 minimum or \$6.00/sf of trench area, whichever is greater.)
- d. Receive clearance from water purveyor
- e. Post water bond
- f. Provide City four (4) County approved plans and three (3) specification books. These documents shall be red stamped approved by the City plan checker and appropriate sets issued with the City encroachment permit issuance.

2.5.4 ABANDONED PLANS NOTE

The following shall be added to the water plan general notes:

ABANDONED PLANS NOTE

When improvement plans have been submitted to the City of Lancaster for checking and the checking process has been interrupted for a period of one year or more, the plans shall be deemed abandoned. Approved improvement plans shall be deemed abandoned if construction has not commenced within two years of the latest approval date. If construction is interrupted for a period of one year or more, the plans shall be deemed abandoned. Abandoned plans shall be re-reviewed and all fees shall be paid in accordance with the City's Abandoned Plans policy prior to any permits being issued.

SECTION 2.6

**Landscape
Improvement Plans**

SECTION 2.6 LANDSCAPE IMPROVEMENT PLANS

2.6.1 GENERAL

The City of Lancaster Specifications for Landscape Development (Ordinance No. 629) were adopted by the City Council in 1992. These specifications provide design criteria to landscape designers for the preparation of landscape improvement plans. Additionally, designers should refer to related information in the Landscaping Design and Performance standards of the City of Lancaster Zoning Ordinance No. 139.

Copies of the City of Lancaster Specifications for Landscape Development (Ordinance No. 629) are available for designers at the City Building and Safety counter. Copies of the City of Lancaster Zoning Ordinance No. 139 are available for designers at the City Community Development counter.

The Developer, or Developer's agent, shall submit to the City the required documents for all projects where landscaping is required as part of the project development.

SECTION 2.7
**Storm Drain
Improvement Plans**

SECTION 2.7 STORM DRAIN IMPROVEMENT PLANS

2.7.1 GENERAL

This section provides guidelines, policies and procedures for the design of Storm Drain Improvement Plans. Storm Drain Improvement Plans shall conform to these guidelines. Plans shall be submitted to the Engineering Division for review and approval. Prior to submittal, plans shall be prepared by, or under the direction of, a Registered Civil Engineer of the State of California and shall be stamped and signed by the Registered Engineer.

2.7.2 DEFINITION OF TERMS

CULVERT is a conduit for conveying water through an embankment.

DISCHARGE, Q is a peak rate of flow due to excessive runoff.

EMBANKMENT is a bank of earth, rock or other material constructed above the natural ground surface.

ENERGY GRADE LINE represents available energy at a given point and is equal to total energy less losses to that point. It is equivalent to the sum of the velocity head ($V^2/2g$) the pressure head (P/γ_w) and height above datum of the fluid element (Z) at various points along the fluid path:

$$E = (v^2/2g) + (P/\gamma_w) + Z.$$

ENERGY HEAD is the elevation of the hydraulic gradient at any section, plus the velocity head ($V^2/2g$).

FREEBOARD as applied to free water surface flow is an additional wall height above the calculated water surface.

HEADWALL is a wall at the end of a culvert or other drainage facilities used to protect fill from undermining, increase hydraulic efficiency, divert direction of flow and serve as a retaining wall.

HYDRAULIC GRADE LINE represents the elevation that water would rise to if there was a hole in a pipe line where water was flowing. It is equivalent to the sum of the pressure head (P/γ_w) and the height above the datum of the fluid element (Z) at various points along the fluid path:

$$\text{H.G.L.} = (P/\gamma_w) + (Z).$$

HYDRAULIC JUMP a local phenomenon in which an abrupt rise of water surface occurs when a rapid change in the depth of flow is from a low stage to a high stage.

INVERT is the lowest point of the internal cross section of a pipe.

STORM DRAIN is any conduit and appurtenances intended for the reception and transfer of storm water.

SUMP CONDITION is a low-lying area that has no outlet, or is an area in which the water will pond beyond the property line before escaping through a secondary outlet.

2.7.3 SUBMITTAL REQUIREMENTS

The Developer's Engineer shall submit plans in accordance with this manual to the Subdivision Section for approval.

The storm drain improvement plans are submitted by the Developer's Engineer to the Department of Public Works, Subdivision Section, as part of the improvement plans submittal package for review and approval. The storm drain improvement plans are submitted if the Developer is conditioned by the City to construct storm drain or other drainage facilities, or the Developer's Engineer finds it necessary to construct such facilities or upgrade the existing drainage system in connection with the street improvement project.

2.7.4 STORM DRAIN IMPROVEMENT PLAN PREPARATIONS

Storm Drain Improvement Plans shall be prepared on 24" x 36" mylar sheets per the City of Lancaster standard format. The plans shall be prepared in conformance with the sample plan included with this manual.

2.7.5 STORM DRAIN GENERAL NOTES

Storm Drain Improvement Plans shall include General Notes as shown on the sample plan included with this manual or the most current Storm Drain Improvement Plan Submittal Requirements Packet available from the Engineering Division. These notes are a minimum.

2.7.6 STORM DRAIN IMPROVEMENT PLAN CHECKLIST

Current Storm Drain Plan check checklist is available from the City plan checker as part of the most current Storm Drain Improvement Plan Submittal Requirements Packet. The Developer's Engineer is advised to obtain a copy of this checklist before preparing the Storm Drain Improvement Plans.

2.7.7 STORM DRAIN CONSTRUCTION NOTES

Storm Drain Improvement Plans shall have Construction Notes applicable to the individual plan. These notes shall conform generally to the notes shown on the sample plan included with this manual.

2.7.8 HYDRAULIC DESIGN CRITERIA

2.7.8.1 DESIGN STORM FREQUENCY

All master plan and local drainage facilities shall be designed based on **50-year Los Angeles County Storm Frequency**. Refer to Section 3 Hydrology Study.

2.7.8.2 ANGLE OF CONFLUENCE

The Angle of Confluence should not be greater than 30 degrees for the following cases:

1. Lateral flow exceeds 10% of the main line flow.
2. Lateral flow velocities are 20 feet per second or greater.
3. Lateral size is 60 inches in diameter or greater.
4. Hydraulic calculations indicate excessive losses in the main line.

A confluence angle of 45 degrees up to a maximum of 90 degrees may be used if none of the conditions described in (1) through (4) exist or hydraulic losses are calculated.

2.7.8.3 MANHOLES

LOCATION

Manholes shall not be located in street intersections and shall be located at the beginning or ending of curves, pipe size changes, angle points, junctions, and as required for maintenance. Manholes should be placed in streets rather than in easements.

SPACING

For conduit 30 inches in diameter or less, use a manhole spacing of approximately 300 feet. For conduit 30 inches in diameter or less and the horizontal alignment has bends or angle points, use a manhole spacing of approximately 200 feet.

For conduit with a diameter larger than 30 inches but less than 45 inches, use a 400 foot manhole spacing and for conduit 45 inches in diameter or larger, use a manhole spacing of approximately 500 feet.

ADJUST MANHOLE FRAME AND COVER

Existing sewer and storm drain manhole covers and frames shall be raised or lowered to match the elevation and slope of the new pavement surface in accordance with Section 302-5 of the Standard Specifications.

2.7.8.4 DRAINAGE PIPES

STORM DRAIN PIPE

RCP shall comply with Section 207-2 (Reinforced Concrete Pipe) of the Standard Specifications. Pipe installation shall be completed in accordance with Section 306-1.2 (Installation of Pipe) of the Standard Specifications. Width of trenches at any point below the top of the pipe shall be not more than the outside diameter of the pipe plus 24" (12" on both sides) for pipes with diameters less than or equal to 30" and plus 36" (18" on both sides) for pipes with diameters greater than 30" to permit satisfactory jointing and thorough tamping of the bedding material under and around pipe.

Testing requirements for RCP are not required when the Developer provides manufacturer's certificates of compliance for all pipe material on site certifying that the RCP meets the minimum D-loading requirements as shown on the Plans.

CIPCP installation shall be completed in accordance with Section 306-4 (Cast-in-Place Non-reinforced Concrete Pipe) of the Standard Specifications. The Developer shall submit one copy of the manufacturer's CIPCP installation manual to the Engineer 5 working days prior to the installation process. The concrete mix necessary for this project shall be designed and stamped by a Civil or Structural Engineer registered in the State of California. The mix design shall comply to the D-load requirements of pipes as shown on the Plans and using the ample stock of material presently existing at the concrete plant. Concrete mix sampling and testing of slump, flexural, and compressive strength shall be performed by an independent materials laboratory and forwarded 7 days in advance of concrete placement directly to the Agency engineer for review.

The Developer shall provide a concrete inspector (certified by ACI or ICBO) who makes continuous inspection of actual cast-in-place operations at his expense. The concrete inspector shall perform the thickness inspections as outlined in Section 306-4.7.2 (CIPCP Thickness Test Requirements) of the Standard Specifications as a minimum requirement. The concrete inspector shall also provide a written report of all the thicknesses measured, reference stations, and location on pipe where the holes were drilled to the Engineer within 48 hours after each day of inspection. The coring laboratory shall also provide a similar report while taking test samples. No CIPCP will be installed in the absence of the certified concrete inspector.

Sections of pipe not meeting the minimum wall thickness requirements per Section 306-4.6.3 (CIPCP Wall Thickness) of the Standard Specifications shall be replaced by the Developer at his expense. Replacement shall be by same diameter RCP with reinforced concrete collars. The laboratory personnel will determine the length of the defective sections. The length of pipe to be removed shall be the length of the defective section plus a minimum of 5' on each side of the defective section. Sections of pipe meeting any of the rejection requirements per Section 306-4.4.9 (CIPCP Rejection) of the Standard Specifications shall be replaced by the Developer at his expense.

SIZE

The minimum diameter of pipe for main line or lateral pipe is **24 inches**. For an area where the pipe may carry a significant amount of debris, the minimum diameter is **48 inches**.

RADIUS OF CURVATURE

Pipe line curves shall have a minimum radius of curvature per pipe diameter size as designated in tables 306-1.2.3(B) and 306-1.2.3(C) of the Standard Specifications. When radius of curvature is less than the allowable, the joint opening shall be protected by a reinforced concrete collar.

CLEARANCE

The desirable clearance between the gutter flowline grade of the street and a storm drain pipe is **30 inches**. If the desirable clearance cannot be met, the pipe must be encased in concrete when the cover from finished surface is 12 inches or less.

SLOPE

The minimum slope for main line conduit shall be 0.10%, unless otherwise approved by the Director of Public Works.

The minimum slope for debris carrying storm drains shall be 0.5%, unless otherwise approved by the City Engineer.

2.7.8.5 OPEN CHANNELS

CHANNEL IMPROVEMENTS

Open channels shall be designed for a 50-year storm. Lined and unlined open channels are usually constructed with a trapezoidal cross section. They are usually constructed in an easement outside the roadway where vehicle crossing is not anticipated. Channel design shall be based on the following:

1. Two unpaved 15-foot-wide access side roads - one on each side of the channel
2. 2:1 Side slopes (Lined)
3:1 Side slopes (Unlined)
3. 0.12% minimum grade for lined channel; 0.25% for unlined channel
4. Minimum 10-foot bottom width (for trapezoidal), 15-foot bottom width (for rectangular)
5. For an unlined channel: 4-5 feet per second-maximum velocity (based on the erosion characteristics of the soil). Minimum velocity shall be 3 feet per second.

6. Minimum 5 foot depth to invert (with acceptable freeboard) to provide for local drainage systems. If channel is this shallow, then only one access side road will be required.
7. Locate inlet and outlet in existing channel.
8. Preserve direction of flow at inlet and outlet.
9. Provide approved inlet and outlet structures. Trash racks may be required.
10. Decelerate water at outlet to reduce erosion by flaring the outlet, using rip rap, placing obstacles in water course, flattening the grade or by employing a stepped floor with one or more vertical drops.
11. A 15-foot wide concrete access road into the channel bottom. Maximum 15% slope.
12. Perimeter fences and gates shall be installed to prohibit unauthorized entry and use. Use design greater than or equal to (or revised update thereof) A.P.W.A. standard plan 600-1, with a minimum height of six feet (6').

CHANNEL FREEBOARD

The recommended freeboard for a lined-rectangular channel for a 50-year storm frequency is as follows:

1. 2 feet of freeboard for velocities 35 feet per second or less. For curved alignments, the wall height shall be at least 1.0 foot above the super elevated water surface or 2 feet, whichever is greater.
2. 3 feet of freeboard for velocities higher than 35 feet per second. For curved alignments, the wall height must be at least 2.0 feet above the super elevated water surface or 3 feet, whichever is greater.
3. If the flow is supercritical, the wall height shall be equal to the sequent depth but not less than the heights required on (1) and (2). Special consideration shall be given to additional freeboard if the channel was not designed to reduce or eliminate the formation of waves.

The recommended freeboard for a lined-trapezoidal channel, for a 50-year storm frequency is as follows:

1. 2.0 feet of freeboard for velocities 35 feet per second or less. For curved alignments, the wall height must be at least 1.0 foot above the super elevated water surface or 2.5 feet, whichever is greater.
2. 3.5 feet of freeboard for velocities higher than 35 feet per second, including super elevation. For curved alignments, the wall height must be at least 2.0 feet above the super elevated water surface or 3.5 feet whichever is greater.

3. If the flow is supercritical, the wall height shall be equal to the sequent depth but not less than the heights required on (1) and (2). Special consideration shall be given to additional freeboard if the channel was not designed to reduce or eliminate the formation of waves.

For closed conduits, the recommended freeboard is a minimum of 1 foot.

For roadside drainage channels used for diverting surface runoff from street right-of-way, the recommended minimum freeboard is 0.5 foot.

2.7.8.6 DITCHES

Ditches may be used to transport small quantities of surface runoff to a natural water course or storm drain. The typical section of a ditch is triangular with 2:1 side slopes. Top of slopes shall be rounded, minimum 0.12% grade for lined ditches and minimum 0.25% grade for unlined ditches. However, review may vary on a case by case basis and steeper grades may be required.

2.7.8.7 CATCH BASINS

The construction of catch basin with "W" dimensions over 28 feet in length shall be avoided. Two shorter equivalent length basins should be used instead. The "W" dimension shall be hydraulically defined by the contributing hydrology to the catch basin location. The minimum "W" dimension for a catch basin shall be 3.5 feet.

The basic types of catch basins are as follows:

1. A curbside opening catch basin is preferred for mild street slopes and for sump conditions.
2. A grating basin is preferred on street slopes greater than 4%. Grating basins should not be used in sump conditions because of the possibility of debris clogging the grates.
3. The grating and curbside combination opening catch basin is preferred for steeper street slopes.

The recommended types of catch basins are as follows (or revised updates thereof):

1. * A.P.W.A. Curb Opening. Catch Basin Std Plan 300-2 (Side opening, W = 3.5' without protection bar) - Use for small "Q" with mild street slopes or picking up nuisance water.
2. * A.P.W.A. Curb Opening Catch Basin Std. Plan 300-2 with protection bar (curbside opening, W = 7') - use on mild street slopes but with a greater amount of "Q".
3. * A.P.W.A. Curb Opening Catch Basin Std. Plan 300-2 with protection bar (Curb opening, W = 10', 14', 21', 28', etc.) - use on mild street slopes. Choose the most economical width.

4. * A.P.W.A. Curbside Grating Catch Basin Std. Plan 303-2 - use on 2% or greater street slopes. Recommended in front of driveways where a curbside opening catch basin is impossible to use.
5. * A.P.W.A. Grating Catch Basin - Alley (Longitudinal) Std. Plan 304-2 - use in alleys or in similar situations where the catch basin longitudinal centerline can be aligned with the surface flowline.
6. * A.P.W.A. Grating Catch Basin - Alley (Transverse) Std. Plan 305-2 - use in alleys or in similar situations where there is an inverted crown.
7. * A.P.W.A. Curb Opening Catch Basin with Grating(s) and Debris Skimmer Std. Plan 301-2 - use on mild or steep street slopes when the amount of "Q" is large.
8. A.P.W.A. Curb Opening Catch Basin with Grating(s) - use on 2% or greater street slopes and when there is limited clearance within the sidewalk area for a catch basin. Not recommended when considerable debris is present in the area.
9. * A.P.W.A. Curb Opening Catch Basin at Driveway Std. Plan 306-2 - use at driveway with a very small space to construct another type of basin and when there is a considerable amount of "Q". Not recommended for driveways especially service stations where trucks or other vehicles will run over the curb face when turning into the driveway.
10. * A.P.W.A. Curb Opening Catch Basin with manhole in street Std. Plan 307-2 - use where sidewalk area is limited and manhole access is necessary.
11. * A.P.W.A. Modifications for Side Opening Catch Basin Std. Plan 314-2 - use as needed for utility and space conflicts with A.P.W.A. Std. Plan Nos. 300-2, 301-2, and 306-2.

*Catch basin work includes bicycle-proof grates (where applicable); reinforcing top, walls, and bottom; manhole frames and covers; protection bars; face plates; steps; and local depression work. The catch basins, and storm drain laterals shall be constructed in accordance with Section 303 of the Standard Specifications and as shown on the Improvement Plans. Reinforcement steel is to be placed in walls, top and bottom of catch basins per A.P.W.A. Standard Plan 309-1 (or revised update thereof).

CONCRETE AND REINFORCING STEEL FOR STRUCTURES

Subsection 201-1.1.3 is supplemented with the following:

Except as shown on Plans:

The concrete shall contain not less than 560 pounds of cement per cubic yard. The minimum compressive strength of concrete at 28 days shall be $f_c = 3250$ psi. Concrete shall have minimum compressive strength of 2450 psi within 2 days of pour prior to backfill (to be verified by core test).

2.7.8.8 LOCAL DEPRESSIONS

The recommended types of A.P.W.A. Local Depressions at catch basins Std. Plan 313-0 (or revised update thereof), are as follows:

1. Cases A and B - It should have a 4-inch drop and produce a curb face at the catch basin opening equal to the existing curb face plus 4 inches, unless otherwise shown on the general plan. It is used on residential streets and other streets with light vehicular traffic and is applicable to A.P.W.A. Curb Opening Catch Basin No. 300-1 (or revised update thereof).
2. Cases C, D, F, and G - It has either a 2-inch or 4-inch drop and can be used with A.P.W.A. Catch Basin Std. Plan Nos. 303-1, 301-1, and 302-1 (or revised updates thereof). A 4-inch drop local depression can only be used on streets with light vehicular traffic. Case E can be used with A.P.W.A. Catch Basin Std. Plan No. 300-1 (or revised update thereof).
3. Local Depression (varied use) - It has either a 1-inch or 2-inch drop and can be used with Catch Basins Nos. 300-1, 301-1, 302-1 and 306-1 (or revised updates thereof). It shall be used on heavily traveled major streets.

2.7.8.9 CONNECTOR PIPES

Connector pipes shall have a minimum diameter of 18 inches and a minimum slope of 1%. The horizontal alignment of connector pipes shall not have any angle points or bends. The maximum length of connector pipes between catch basins in series shall be 12 feet.

2.7.8.10 INLETS

LOCATIONS

Inlets to catch basins and other drainage facilities shall be situated at the following locations:

1. Natural drainage course
2. Low points in street grade
3. Where "Q" in the street becomes excessive
4. Upstream from sump conditions to reduce ponding
5. Reverses in the cross slope of the street section to prevent water from crossing the street.
6. Changes in alignment to prevent water from spreading laterally.
7. Points of reduced grade to prevent sedimentation

9. Maximum interval of 1000 feet where a storm drain is available.

2.7.8.11 LATERAL PIPE

Lateral pipe entering a main storm drain shall be connected radially. Lateral pipe entering a main box manhole structure shall conform to the following:

1. Lateral pipe 24 inches or less in diameter shall be no more than 5 feet above the invert.
2. Lateral pipe 27 inches or larger in diameter shall be no more than 18 inches above the invert, with the exception that catch basin connector pipe less than 50 feet in length may be no more than 5 feet above the invert.

2.7.8.12 INLET STRUCTURES

Inlet structures consisting of headwalls, wingwalls and paved inlet aprons shall be provided for storm drains located in natural channels. The apron slope shall be limited to a maximum of 2:1. Wall heights should conform to the height of the water upstream of the inlet, and be adequate to protect both the fill over the storm drain and embankments. Headwall and wingwall fencing and protective barrier such as breakaway gates, chain link fencing, and single horizontal bars across catch basin openings shall be provided to prevent public entry.

2.7.8.13 OUTLET STRUCTURES

When a storm drain outlets into a natural channel and the discharge velocity is low, an outlet structure consisting of a headwall, wingwalls, and an apron shall be provided to prevent erosion and property damage. The apron may consist of concrete or grouted rock.

When the discharge velocity is high or supercritical, a bank protection and an energy dissipater structure shall be considered.

Fencing and protection barriers shall be provided.

2.7.9 DETENTION/RETENTION BASINS

All new tracts with over 100 lots are required to retain on-site flows (Delta Q) that are the result of the development, unless otherwise waived by the City Engineer. Construction of detention/retention basins shall meet the design standards set by the City. Basins are to be designed using a 25-year storm frequency.

On-site detention basins which have a passive means of discharging collected storm flows shall include the following improvements (unless waived by the City Engineer):

1. Sufficient storm drain inlet invert stabilization

2. A bypass or under drain to discharge low flows from the basin to a downstream conveyance facility
3. An outlet tower to the under drain to prevent debris from plugging the under drain
4. A concrete-lined spillway
5. A conveyance facility downstream of spillway as an emergency flow path
6. A 17-foot wide perimeter road
7. A 15-foot wide concrete access road to the basin floor. Maximum 15% slope
8. Maximum 2:1 unlined side slopes or per Soils Engineer recommendations and approved soil stability calculations.
9. Perimeter walls or fences to prohibit unauthorized entry and use. Use design greater than or equal to City standard plans PW-10 and PW-11. A steel rail gate shall be provided for a second access.

Retention Basins which do not have passive means of discharging collected storm flows shall include the following improvements:

1. Sufficient storm drain inlet invert stabilization
2. A pump station housing a pump or pumps capable of draining a full basin within a month
3. A downstream conveyance facility for the discharge of the pumped flows
4. A concrete-lined spillway
5. A conveyance facility downstream of the spillway as an emergency flow path
6. A means of bypassing low flows and nuisance flows around the basin to the downstream conveyance facility
7. A 15-foot wide A.C. - paved perimeter road (for Regional facilities)
8. A 15-foot wide concrete access road to the basin floor; maximum 15% slope
9. Maximum 2:1 unlined side slopes or per Soils Engineer recommendations
10. Perimeter walls or fences to prohibit unauthorized entry and use. Use design greater than or equal to city standard plans PW-10 and PW-11. A steel rail gate shall be provided for a second access.

2.7.10 HYDRAULIC FORMULAS

Recommended reference book is the latest edition of the Handbook of Hydraulics by Ernest F. Brater and Horace King, and the L.A.C.F.C.D. Hydraulic Design Manual.

2.7.10.1 MANNING EQUATION

Manning Equations shall be used for Hydraulic Design.

$$V = \frac{1.486}{n} R^{2/3} S^{1/2}$$

$$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$$

Where: V = velocity, feet per second

Q = discharge, cubic feet per second

n = roughness coefficient

R = hydraulic radius, feet = A/P_w

S = slope

A = area, square feet

P_w = wetted perimeter, feet

2.7.10.2 MANNING'S "n" VALUES (Commonly used in design)

SURFACE, STRUCTURE OR TYPE OF DEVELOPMENT	"n"
Industrial/Commercial	0.014
Residential	0.040
Rural	0.060
Natural Grass	0.030
Concrete Pipe	0.013
Concrete- lined channel	0.014
Rip-rap rock	0.030
Earth, straight and uniform canals and ditches	0.0225
Concrete gutter, troweled finish	0.012
Concrete gutter with asphalt pavement, smooth	0.013
Concrete gutter with asphalt pavement, rough	0.015
Concrete pavement, float finish	0.014
Concrete pavement, broom finish	0.016
Concrete pavement, broom finish, rough	0.020
Asphalt pavement, smooth	0.015
Asphalt pavement, rough	0.016

SECTION 3

Storm Drain Hydrology

SECTION 3 STORM DRAIN HYDROLOGY

LANCASTER DRAINAGE MANAGEMENT PLAN

INTRODUCTION

The City of Lancaster is currently planning significant improvements to the existing drainage system. Presently most storm runoff traverses the city as downstream surface flows from the City of Palmdale and are subject to concentration and increased short duration peaking in areas where development is occurring. Nuisance waters travel exceptionally long distances as gutter flows, and attain unacceptable depth and width of flow on flat reaches of streets.

It is the policy of the City of Lancaster that each development greater than five (5) acres (gross) in size be responsible for on-site mitigation of the short duration peak flows caused by the development. In addition, nuisance flows generated on-site shall be mitigated in every development.

Peak flow mitigation shall be accomplished by utilizing landscaped detention, retarding or retention basin(s) in acceptable soil type areas with good infiltration rates. Other methods of peak runoff attenuation will be considered on a case by case basis. Until the drainage system allowing the disposal of nuisance flow is in place, the preferred method of nuisance flow mitigation is by surface flow via street improvements.

Nonstructural flood protection measures (flood plain management) will be used within all watershed drainage areas.

For the flood plain management areas, development within the floodway determined based on the capital flood will not be allowed. Development outside the floodway will be allowed at the current general plan land use designations. Refer to Subsection 3.12.4 for the definition of "Floodway".

After a review of drainage ordinances, hydrologic and hydraulic design manuals, and related material and flood control methodologies for adjacent and nearby drainage authorities, and input from the engineering community, this drainage management plan has been developed for the City of Lancaster as a guide for planning and design of master and local drainage facilities. The major sections in this Drainage Management Plan are: A) Hydrologic Protection Levels, B) Hydrologic Design Standards and Procedures, C) Hydraulic Standards and Procedures, D) Peak Flow Reduction Facilities, E) Percolation test procedure for retention basin design, and F) Nuisance Water Management.

The City of Lancaster definitions of Design Storms equal those of Los Angeles County Department of Public Works Hydrology Manual definitions for 10-year, 25-year and 50-year frequency recurrence intervals.

The City will accept Design Storm definitions based on the computer modeling program flood hydrograph package HEC-1 methodology, or other FEMA-approved methodologies. The HEC-1 methodology will be the preferred method on future projects. For projects in FEMA Special Flood Hazard Areas (SFHA), the Design Storm shall be the FEMA 100-year frequency storm, or an equivalent event determined by the Los Angeles County Hydrology Manual methodologies. The City intends to move towards exclusively using

the FEMA (HEC-1) methodology in order to be more consistent with this national standard.

BACKGROUND

The City of Lancaster adopted the Master Plan of Drainage for the City of Lancaster in October 1981. This plan was prepared by Wildan and Associates. In 1984, the County of Los Angeles prepared an Antelope Valley Comprehensive Plan of Flood Control and Water Conservation which was adopted by the City Council in October 1985. The

County revised the 1984 plan removing the majority of the retention/detention basins and increasing the size of many of the drainage facilities. There were conflicts in the three plans that needed to be resolved.

Ordinance No. 368 was adopted on January 21, 1985, which required payment of drainage fees to construct planned drainage facilities within the City.

Resolution No. 85-11, passed on January 7, 1985, established a fee schedule for drainage fees and an automatic annual increase in the fees based on the construction cost index published by Engineering News Record magazine or by action of the City Council.

The current fee has come about through automatic annual increases.

The City has grown significantly since 1985 and other Master Drainage Plans have been approved for the Valley.

3.1 CITY MAP OF MASTER PLANNED DRAINAGE FACILITIES (MPDF)

In October, 1992, the City developed and approved its own MPDF map. This map is available for review from the Engineering Division.

3.2 PRIORITY OF PLANS

The map was revised using the following priorities:

1. The alignment, size and type of drainage facility as shown on the 1984 Antelope Valley Comprehensive Plan of Flood Control and Water Conservation (County Plan) were held as the Base Facilities.
2. The alignment, size and type of drainage facilities as shown on the Wildan and Associates study dated August 1981, Option II, were adjusted to connect with the County Plan facilities.
3. Drainage facilities in the outlying areas of the City were added to connect with the County Plan facilities.

3.3 IDENTIFICATION

The MPDF are identified on the map by reach type and size.

Existing facilities, where shown, are so identified.

3.4 CHANGES

It is anticipated that some changes in alignment type and size will occur as specific land is developed. These changes will require approval of the Director of Public Works.

3.5 HYDROLOGIC PROTECTION LEVELS

3.5.1 CAPITAL FLOOD PROTECTION

The following shall be designed for the Capital Flood: (Based on runoff resulting from a rainfall with a probability of occurrence of once in 50 years).

1. All regional facilities as described in the Los Angeles County Flood Control District (FCD) Master Plan of Drainage.
2. All regional facilities as described in the City of Lancaster and Los Angeles County Drainage Master Plan or as modified by the City Engineer.
3. Natural Watercourses.
4. Open channels, closed conduits, bridges, dams, detention basins and debris basins which are constructed in or intercept flow from natural watercourses.
5. Floodways.
6. Natural depressions or sumps. Secondary overflow will be provided for all sump areas. These include channels, closed conduits, retention basins, detention basins, pump stations and street and roadway underpasses.
7. Culverts under arterial and collector streets and roadways, except interim low flow culverts constructed for the purpose of eliminating cross gutters.
8. The lowest finish floor elevation of all habitable structures shall be a minimum of one-foot above the maximum water level resulting from a Capital Flood.
9. All commercial and industrial-zoned on-site development shall design for the 50-year storm.
10. Areas greater than 100 acres.

3.5.2 25-YEAR AND 10-YEAR STORM

The Urban Design Storm shall be the level of protection for all developed areas with other than conditions described in Capital Flood Protection above.

All master plan and local drainage facilities will generally be designed so that:

1. The peak runoff from a 25-year storm will be contained within the street right-of-way (see Figure 3.5.1).

2. The peak runoff from a 10-year storm will be contained at or below the street curbs (see Figure 3.5.2).
3. For undivided arterials and collector streets and roadways, one twelve (12) foot lane in the center will be clear of water for a 10-year storm peak runoff. For divided highways, one ten (10) foot lane in each direction will be clear of water for the peak runoff from a 10-year storm at ultimate development conditions (see Figure 3.5.3) Subdivisions adjacent to highways with pre-existing flooding will be considered on a case-by-case basis.
4. All residential development shall design for the peak runoff from a 25-year storm.
5. All developed areas less than 100 acres and greater than 40 acres shall design for the 25-year storm.

If a storm drain is required to meet any of the three conditions listed above, it shall be designed for a minimum capacity of the peak flow from a 10-year storm. If a master planned storm drainage facility is proposed through the project which would mitigate the flooding, the developer may be required to construct the facility.

3.6 HYDROLOGIC DESIGN STANDARDS AND PROCEDURES

3.6.1 GENERAL

Hydrologic design shall be predicated upon full urban development of the tributary watershed except where development cannot occur, such as in very rough or steep terrain. Lands which are undeveloped at the time of design shall be assumed to be fully developed as residential unless a publicly proposed development, proposed zone change, the General Plan, or applicable specific plan indicates a more intense land use.

3.6.2 DESIGN

The design of all master and local facilities will be in accordance with the following standards and procedures:

1. Hydrologic calculations will be performed in accordance with the most current Los Angeles County Department of Public Works Hydrology Manual, except the initial time of concentration may be determined from Figure 3.6.1 and used in the subsequent calculations. Figure 3.6.1 nomograph may be used, subject to the limitations of length and area.
2. Design frequencies will be as described under "HYDROLOGIC PROTECTION LEVELS". (Section 3.5)
3. Where applicable, the design shall include provisions for future extension of the drainage system to serve the entire drainage basin.
4. Required submittals - Improvement Plan Stage

The Developer's Engineer shall obtain a current Storm Drain Hydrology Submittal Requirements Packet from the Subdivision Section for current criteria for area and site Hydrology studies.

1. * Hydrology map on a scale of 1"=500' or larger (e.g. 1"=200') showing the entire drainage area tributary to a master plan drainage facility of a regional drainage facility. It will show the entire tributary area with contours/elevations, drainage area sizes, catch basins, connector pipes, mainline pipes, and the pertinent discharge data. Appropriate soil classifications and land use information will also be submitted.

Hydrology calculations shall show points of concentration, area (sub-areas and cumulative area), soil type, time of concentration, rainfall zone/intensity, percent impervious, subarea runoff, total runoff, conveyance facility size, length, slope, flowline used in the calculations and other characteristics.

Additionally, detention, retarding and retention basin design calculations shall be submitted.

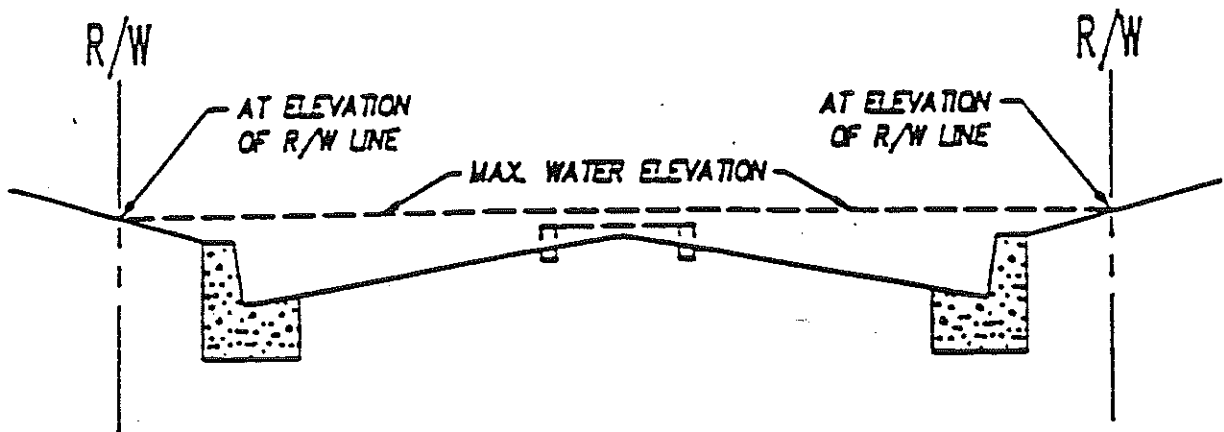
2. Plan of the proposed road system with grades and typical street cross-sections.
3. Hydrology calculations. Hydrology calculations shall be stamped and signed by a civil engineer registered in the State of California.
4. Three copies of the above will be submitted in the form of a report.

3.6.3. REQUIRED SUBMITTALS - TENTATIVE MAP STAGE

A preliminary drainage study shall be submitted to the City at the time of Tentative Map submittal. The submittal shall be in the form of a report, including drainage maps.

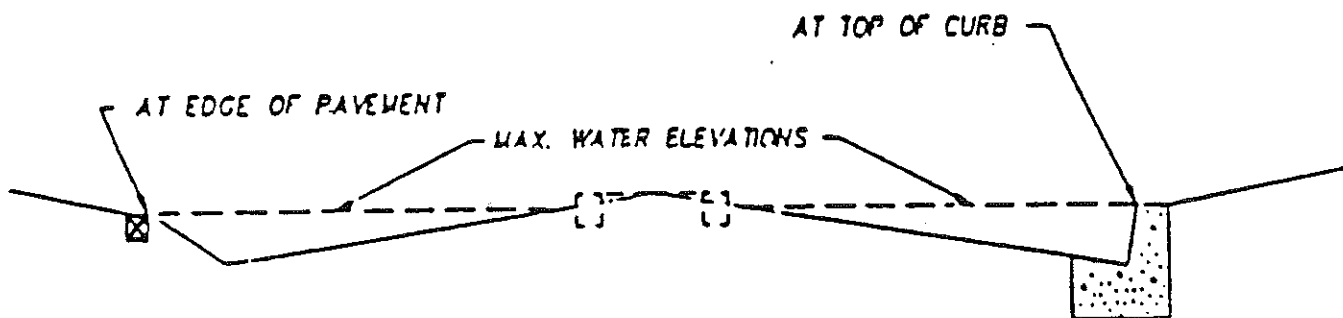
At this stage, runoff rates may be estimated using the current LACDPW Hydrology Manual Methodologies. Retarding and detention basin volumes may be assumed as one acre foot for each 10 acres of single family residential land use and 1 acre-foot for each 5 acres of multi-family residential, commercial and industrial land uses. Retention basin volumes will be determined using Figure 3.6.2.

It must be understood that the guidelines for this stage may result in facilities sized smaller than those based on detailed hydraulic criteria as described in Sections 2.7 and 3.7. Approval of a Tentative Map based on the requirements of the City's Subdivision Ordinance will in no way represent approval of the final drainage design. The final drainage facilities will be designed per the guidelines of Sections 2.7 and 3.7.



Maximum water elevation shall be based on runoff from a 25-year frequency storm and shall apply to all cases including streets and highways.

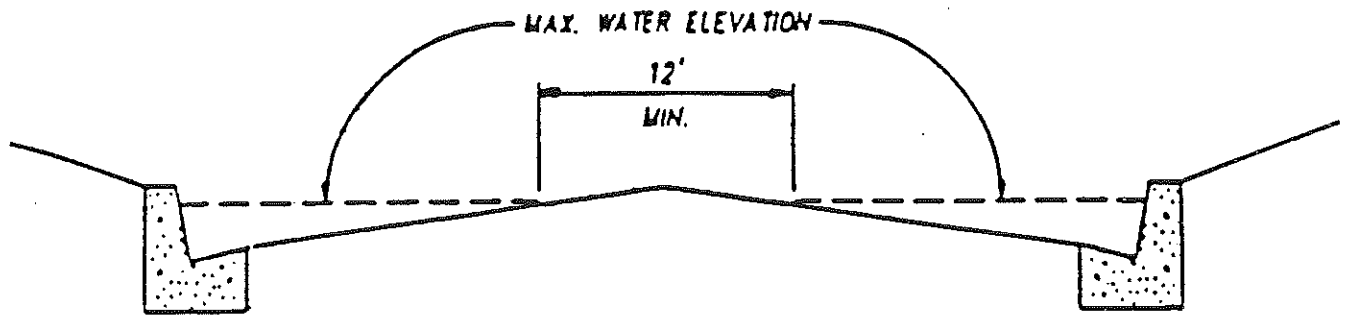
FIGURE 3.5.1 FLOODED ROADWAY TO RIGHT-OF-WAY LINE REQUIREMENTS



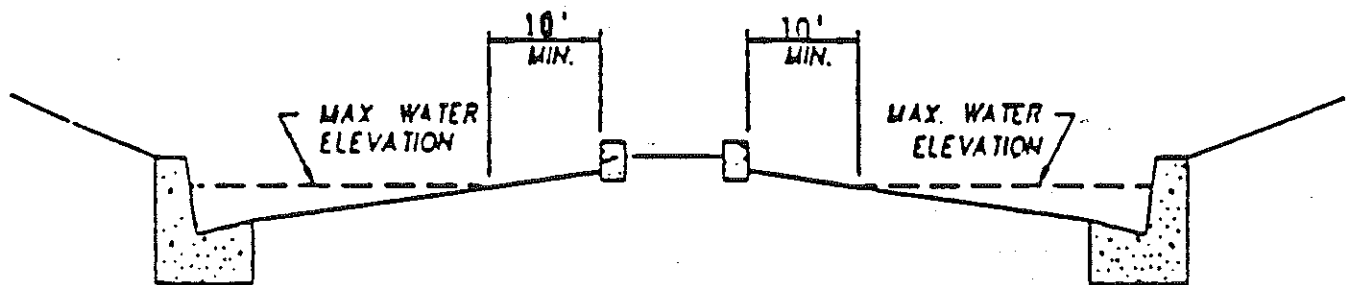
For roadways with slope gradient, maximum water elevation shall be based on runoff from a 10-year frequency storm.

FIGURE 3.5.2

FLOODED ROADWAY TO TOP OF CURB OR
EDGE OF PAVEMENT REQUIREMENTS



Primary and Secondary Undivided Streets



Divided Highways and Streets

Maximum water elevation shall be based on runoff from a 10-year frequency storm and shall apply to all cases including streets in sump condition.

FIGURE 3.5.3 MINIMUM NON-FLOODED ROADWAY WIDTH REQUIREMENTS

LIMITATIONS:

1. Maximum length = 1000 Feet
2. Maximum Area = 10 Acres

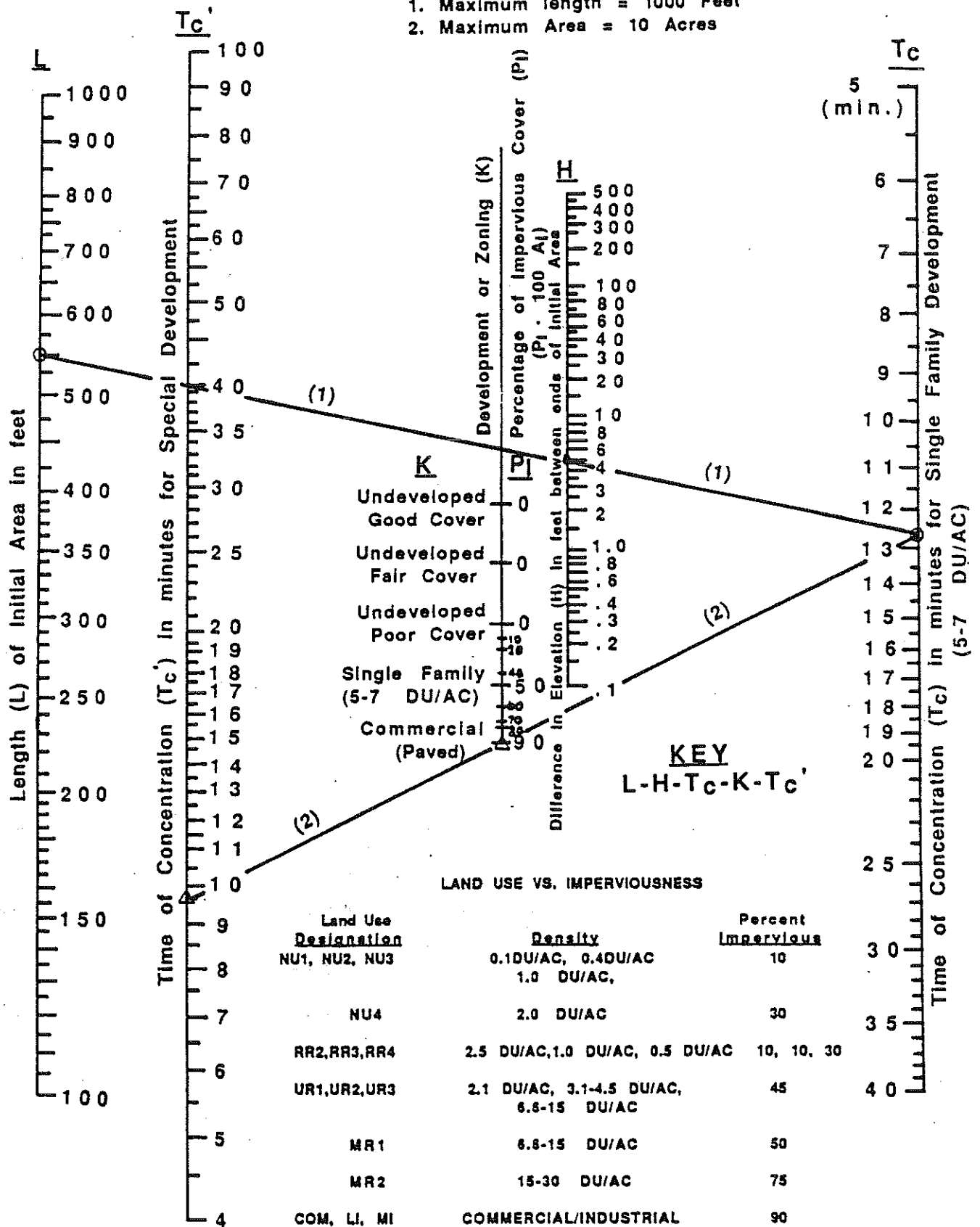


FIGURE 3.6.1

TIME OF CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA

VOLUME (ACRE-FEET) = 1.25 X (COEFFICIENT) X AREA (ACRES) (IN J ZONE)

VOLUME (ACRE-FEET) = 1.10 X (COEFFICIENT) X AREA (ACRES) (IN I ZONE)

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS HYDROLOGIC SOIL TYPE	U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE HYDROLOGIC SOIL GROUP	RELATIVE INFILTRATION RATE	% IMPERVIOUSNESS									
			0%	5%	10%	15%	20%	30%	40%	50%	90%	100%
124	A	HIGH	0.0032	0.0185	0.0338	0.049	0.0643	0.0949	0.1254	0.156	0.2782	0.3087
134	B	MODERATE	0.0055	0.0207	0.0358	0.051	0.0661	0.0965	0.1268	0.1571	0.2784	0.3087
120	C	SLOW	0.014	0.0287	0.0435	0.0582	0.0729	0.1024	0.1319	0.1614	0.2792	0.3087
123	D	VERY SLOW	0.0891	0.1001	0.111	0.122	0.133	0.155	0.1769	0.1989	0.2867	0.3087

FIGURE 3.6.2 CITY OF LANCASTER
RETENTION BASIN HYDROGRAPH
VOLUME COEFFICIENTS FOR THE 25-YEAR CURVE

3.7 HYDRAULIC STANDARDS AND PROCEDURES

3.7.1. GENERAL HYDRAULIC CRITERIA

1. Hydraulic calculations will be in accordance with "Los Angeles County Flood Control District Design Manual, Hydraulic", latest edition.
2. Closed conduits may be designed as flowing full and may be allowed to flow under pressure if the hydraulic grade line is sufficiently below the street surface to intercept catch basin flows with a minimum of 0.5 ft. freeboard in the catch basin below the gutter invert. (For catch basins outletting to detention or retention basins, this requirement may be waived by the City Engineer.)
3. In any street or highway, the depth of water at curb times the velocity shall not exceed six. When this condition cannot be met, catch basins will be required to intercept the flow.
4. Where debris may be expected, the design flows will be increased by an appropriate bulking factor.

3.8 PEAK FLOW REDUCTION FACILITIES

3.8.1 GENERAL

Peak flow reduction facilities will consist of ultimate facilities identified in the City Master Plan of Drainage and Los Angeles County Master Plan of Drainage and interim facilities which will accommodate development before the Master Plan facilities are in place. Peak flow reduction facilities may include retention basins, flow-by or flow through detention basins, and flow through retarding basins. Retarding basins will be designed for detention and retention in combination.

In housing tracts of 100 or fewer lots a differential Q basin shall not be required.

Where the upstream watershed is undeveloped, the basins will be sized to handle undeveloped condition flows from the upstream tributary area and developed condition flows from the development itself.

Where the upstream watershed is developed, the method of handling the flows from the upstream tributary area will be determined based on the existing conditions with consideration of the future master plan and Comprehensive Plan facilities.

3.8.2 RETENTION BASINS

Retention basins may be used if the results of percolation tests, performed and signed by a Soils Engineer or an engineering geologist show that the basin can percolate dry (no water in the basin) within seven (7) days.

In determining the required retention basin volume, Figure 3.8.1 shall be used with an additional 1.25 multiplier in the J-Zone and 1.1 multiplier in the I-Zone. Hydrologic soil classifications to be used with Figure 3.8.1 and the boundaries of J-Zone and I-Zone map as shown on LACDPW Hydrologic Maps and USDA, USCS soil maps.

Proper nonerosive PCC emergency spillways directing flow away from private properties shall be provided.

Nuisance water flow shall not be allowed into the retention basins.

3.8.3 DETENTION AND RETARDING BASINS

1. Regional detention basins will be allowed only if they are appurtenant to an approved storm drainage facility or approved blue line creek. They will be designed such that no more than 85% of the predeveloped peak flow rates for the 2, 10, and 25 year storm will discharge downstream.
2. Retarding basins will route the entire storm runoff for 2, 10 and 25-year storms through the basin and provide outlets which will maintain the downstream flow at no more than 85 percent of respective peak predevelopment flows.

The minimum required flood storage volume for retarding basins is that volume described by the area between the 25-year storm runoff hydrographs for the post-development condition and predevelopment conditions on the rising limb up to 85 percent of the peak predevelopment flow plus the difference between the post-development hydrograph and 85 percent of the predevelopment condition peak flow. Hydrographs shall be developed using most current methods of the Los Angeles Department of Public Works Hydrology Manual.

Using this design procedure, the flow through the retarding basin may be divided into two regions; the detention region and the retention region. The detention region shall be designed with adequate volume to assure that post-development flows, for the 2, 10, and 25-year storm conditions, do not exceed 85% of respective predevelopment peak flows. The retention region volume, as a minimum, shall be the difference between the required flood storage volume and the detention volume, subject to other conditions necessitated by basin design requirements. The retention volume shall be located such that it will not discharge downstream. The retention volume will not be considered as a credit in the detention region volume calculation.

The peak flow rate for the 2-year and the 10-year storms shall be estimated using current LACDPW Hydrology Manual methodologies.

3.8.4 REQUIRED RETENTION, DETENTION, AND RETARDING BASIN CHARACTERISTICS AND FEATURES

1. A spillway or an overflow structure will be provided to discharge 125 percent of the 25-year storm runoff without flooding upstream development. Detention basin outflow shall not be allowed to run uncontrolled over a pedestrian facility or sidewalk. This does not apply to emergency overflow provisions.

2. Entrance facilities shall be designed for the 25-year storm, developed conditions except for sump conditions, in which case the design will be for the 50-year storm, developed conditions.
3. Nuisance Water shall not be introduced into a retention or a detention basin. A gutter or bypass flow device shall be installed to ensure that any nuisance water which bypasses storm drain structures will also bypass detention, retention, and retarding basins. Development shall mitigate all nuisance water developed on site.
4. All detention basins shall incorporate a gravity drain of sufficient size or capacity to drain the detention basin dry (no water in the basin) within 24 hours, once runoff to the basin ceases.
5. Retarding basins, because of their retention feature, will be subject to the same percolation criteria as retention basins. That is, they shall percolate dry or evaporate within thirty (30) days. If this is not possible, the City Engineer on a case-by-case basis shall mandate a pumping system to help meet this criteria.
6. All weirs, orifices, spillways, underdrains, and other control or design features which are subject to malfunction due to collection of trash or debris shall be protected, and the design of such features shall be clearly and adequately shown on the drawings of the detention basins.
7. Detention, retarding, and retention basins will be constructed as close to the Master Plan facilities as possible so that they can be eliminated in the future upon completion of the ultimate facilities.
8. Freeboard will not be required in detention, retention, or retarding basins. However, an emergency spillway which can convey 125% of peak post-development 25-year flow in a safe manner and preclude upstream flooding will be required.
9. Basin side slopes shall be 2:1 or flatter, subject to slope stability analysis. Side slopes of 4:1 or flatter will be required if slope is planned to be mowed.
10. Retention, retarding, and detention basin designs will incorporate a 15-foot wide all weather access road to the basin floor to facilitate maintenance. The maximum slope of the access road shall be limited to 15 percent. A proper turning radius or a hammerhead shall be provided. The paved section shall be 15 feet wide and shall have a structural section of 5" PCC over a properly compacted base material prepared as recommended by the soils engineer and approved by the City Engineer. The PCC access drive shall have a minimum 6-inch PCC monolithic curb.
11. For flow-by detention basins, a reinforced concrete low flow channel shall be provided from basin inlet(s) to basin outlet.

For retention basins and retarding basins, an approved energy dissipater shall be provided at the basin's inlet to preclude erosion. In addition, those basins which incorporate retention storage, shall have a bypass flow device to carry nuisance water around and out of the basins should upstream drywells fail.

12. All basins shall be fenced with a 6-foot high fence or wall approved by the City. Access to the basins shall be gated (15ft. minimum) and locked.
13. All storm mitigation basins shall be operational and in a clean dry condition prior to issuance of the first Certificate of Occupancy.

3.8.5 MAINTENANCE

All developments are required to annex into the Lancaster Drainage Benefit Assessment District (LDBAD) or better known as the Drainage Maintenance District (DMD) to provide for maintenance of facilities whether planned drainage facilities or other drainage facilities. Annexation is required whether drainage facilities are constructed or not.

The Developer shall pay the fees necessary to annex into the district.

Planned Drainage Facilities (PDF) constructed by the City will be accepted into the DMD for maintenance.

3.8.6 PLANNED DRAINAGE FACILITY (PDF) DESIGN REQUIREMENTS

3.8.6.1 BASINS

New developments shall mitigate onsite differential flow of storm water. If basin(s) are used, the basin(s) are to be dedicated to the City in fee simple title. Smaller developments (2 1/2 acres or less) may provide an easement to the City for drainage purposes in lieu of fee simple title dedication.

Onsite basins are to be located such that future connections to PDF's can be accomplished at minimal cost.

It is anticipated that once the PDF's are operational, the onsite basins will no longer be necessary.

It is recommended that PDF earthen channels be used as interim basins.

Regional type basins are shown on the City and Los Angeles County Master Plans of Drainage maps.

Detention basins, retention basins, and/or a combination of the two are allowed.

Basins, shall have the following characteristics (unless waived by the City Engineer):

	<u>Regional</u>	<u>Onsite</u>
1. 50-year storm frequency for ultimate development	Volume to Peak	Delta Q ₂₅ Volume
2. A bypass or underdrain to discharge low flows from the basin to a downstream conveyance facility.	Y	Y

		<u>Regional</u>	<u>Onsite</u>
3.	An outlet tower to the underdrain to prevent debris from plugging the underdrain.	Y	Y
4.	A spillway designed for a capital storm in the event of back-to-back capital storm events.	Y	Y
5.	A conveyance facility downstream of the spillway as an emergency flow path.	Y	Y
6.	An elevated access path around the perimeter of the basin, with 2' slope setback (regional only)	15' wide AC paved	7' wide
7.	A 15-foot wide, 5-inch thick P.C.C. access road, on suitably compacted base to basin bottom, with 2' slope setback.	Y	Y
8.	Maximum 15% access road slope, 3:1 unlined slide slopes	Y	Y
9.	Fencing or masonry walls to prohibit unauthorized entry and use.	Y	Y
10.	A pump station housing a pump or pumps capable of draining a full basin (for retention basins only). Auxiliary power/backup pump regional only.	30 days	5 days
11.	A downstream conveyance facility for the discharge of the pumped flows.	Y	Y

3.8.6.2 EARTH CHANNELS

Conveyance facilities in the Antelope Valley should generally be wide, shallow, earthen channels with side slope protection and invert stabilization as necessary. Wide channels should minimize concrete construction and enhance the aesthetics of the adjacent areas. A typical earthen channel cross section shall include:

1. Two unpaved 15-foot wide access side roads - one on each side of the channel.
2. One A.C.-paved 8-foot wide access side road and a 4-foot wide decomposed granite walkway (if part of Amargosa Creek Pathway system).
3. Unlined 3:1 side slopes.
4. Minimum 10 feet bottom width (for trapezoidal channel).
5. Minimum 5 foot depth to invert.
6. 5-inch thick PCC access ramp, on suitably compacted base, into channel floor, maximum slope 15%.
7. Additional right-of-way for trails systems as needed.

8. Fencing and/or walls to prohibit unauthorized entry and use.
9. Maximum velocity 4-5 feet per second without slope protection.
10. 2' freeboard.
11. Use Planning flows as shown on the City and County Master Plans.

3.8.6.3 CONCRETE CHANNELS

A typical concrete channel section shall include:

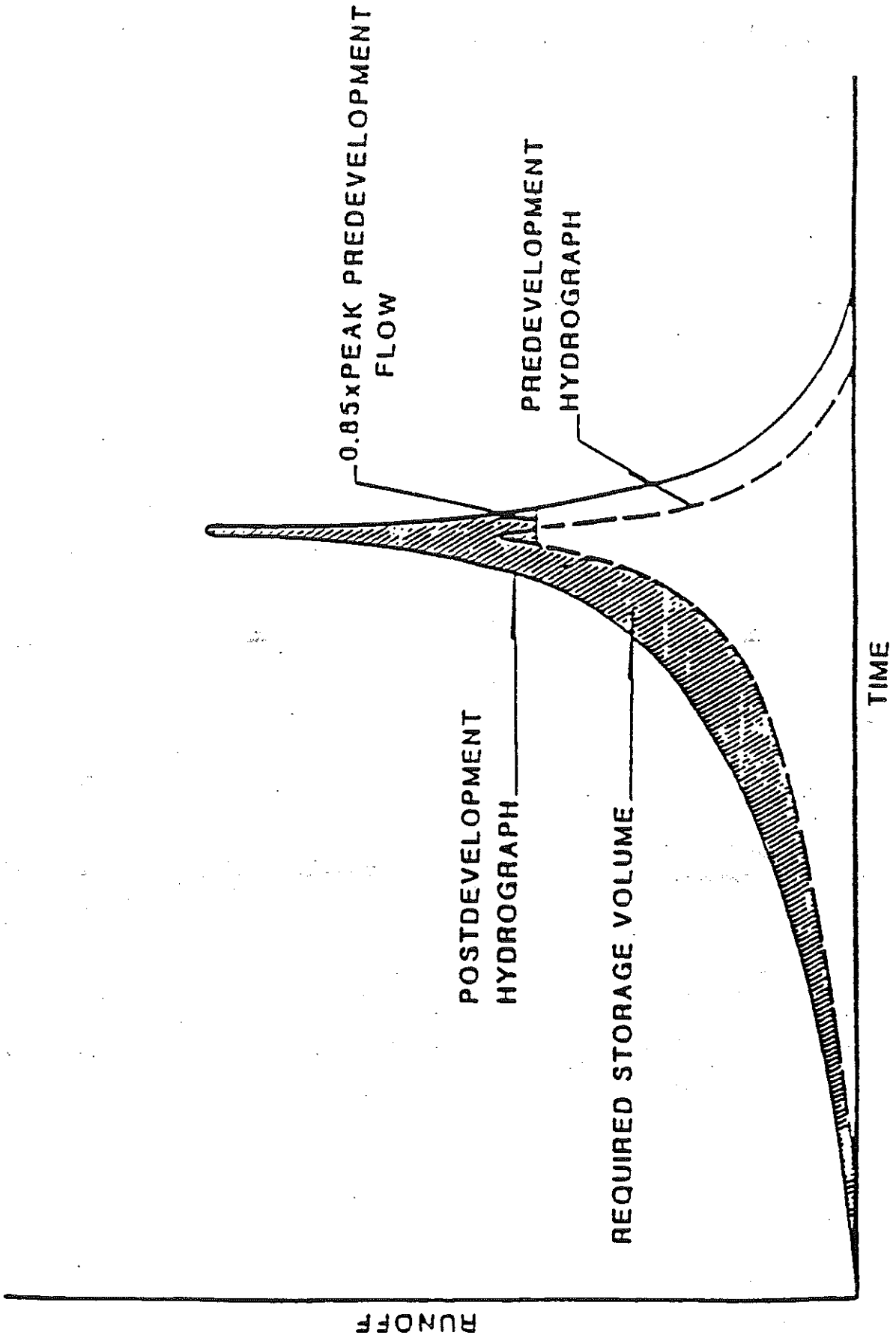
1. Two unpaved 15-foot wide access side roads if the channel top width is greater than 30 feet.
2. One unpaved 15-foot wide access side road and a 10-foot wide walkway if the channel top width is 30 feet or less as needed to incorporate trails system.
3. Reinforced concrete lined 2:1 side slopes of minimum 6" thick, trapezoidal section.
4. Minimum 10-foot bottom width (for trapezoidal channel), 15-foot bottom width (for rectangular channel).
5. Minimum 5 foot depth to invert.
6. 15-foot wide, 5-inch thick PCC ramps, on suitably compacted base, to the channel floor will be required as needed to allow for maintenance. Maximum slope 15%. A monolithic 6-inch PCC side curb shall be provided.
7. Fencing and/or walls to prohibit unauthorized entry and use.
8. Rectangular channels require design calculations for walls, etc.
9. 2' freeboard.
10. Minimum velocity 3 feet per second (for cleansing).

3.8.6.4 STORM DRAINS - CLOSED CONDUITS

Design of closed conduits will be in accordance with the following:

1. 25 year frequency storm for ultimate local development.
2. Planning flows as shown on City and County Master Plans of Drainage Maps for regional facilities.
3. Sizes of facilities may be different from those shown on the map of planned drainage facilities. Specific design shall govern, based on an approved hydrology study by the private engineer.

4. Manholes, junction structures, angles of confluence, catch basins, etc. to be designed per Los Angeles County Design Manuals and as adopted by the City of Lancaster Department of Public Works.



RETARDING BASIN MINIMUM STORAGE REQUIREMENTS
 FIGURE 3.8.1

3.9 CREDIT/REIMBURSEMENT TO DEVELOPERS FOR CONSTRUCTION OF MASTER PLANNED DRAINAGE FACILITIES

3.9.1 EFFECTIVE DATE

This policy was made effective as of January 19, 1993.

3.9.2 POLICY

Actual costs for construction of Master Planned Drainage Facilities (MPDF) i.e., those shown on the Revised Master Plan of Drainage dated October 1992, as approved by the Director of Public Works, shall be available for credit and/or reimbursement in accordance with the following guidelines.

3.9.2.1 CONSTRUCTION OF MPDF

Whenever a master planned drainage facility is within, or adjacent to, a subdivision or development project and the drainage facilities are necessary for the proper drainage of the project and protection of surrounding properties, the developer shall be required to construct said facilities.

Construction of the MPDF will be required prior to occupancy of any building in the project. If the project is approved for phasing, construction of the MPDF is required prior to occupancy of any building within the phase affected by the drainage facility.

Construction of local drainage facilities are the responsibility of the developer, and as such are not addressed in this policy.

3.9.2.2 CREDITING OF MPDF FEES

When construction of a MPDF is required per (Subsection 3.9.2.1) above, the developer will receive credit towards the payment of the required drainage impact fee. In no event will the credit exceed the actual cost of the MPDF.

Credit will not be given for right-of-way dedication within the property being developed. Credit for offsite right-of-way acquisition shall be considered on a case by case basis.

3.9.2.3 REIMBURSEMENT

If the cost of the facilities required per Subsection 3.9.2.1 exceeds the credit available in Subsection 3.9.2.2, the City may enter into a reimbursement agreement with the developer constructing the MPDF.

In the event a reimbursement agreement is executed, the amount of the reimbursement will be as specified in the agreement.

The developer will be responsible for submitting copies of documentation regarding the construction costs of the MPDF for review and approval by the City prior to execution of the reimbursement agreement.

The fee to set up the MPDF reimbursement agreement will be the same fee used for processing sewer reimbursement agreements.

3.9.2.4 PAYMENT OF REIMBURSEMENT

In any one year, no single developer that has entered into a reimbursement agreement shall receive payment in an amount greater than 20% of the total drainage impact fee revenue collected for that year.

If more than one reimbursement agreement is in effect during a year, each agreement shall receive a percentage of the 20% of the total drainage impact fee revenue collected for that year. The amount to which each agreement is entitled for the year will be determined by the ratio of the balance owed each agreement to the total amount owed all of the agreements in effect for the year (% of Total).

The following is an example of the method used to determine the amount to which each agreement is entitled:

- 1) TOTAL DRAINAGE FEE REVENUE COLLECTED BETWEEN JAN. 1ST AND DEC. 31ST. = \$3,000,000.
- 2) AMOUNT OF (1) ABOVE AVAILABLE FOR PAYMENT TO AGREEMENTS = .20 X \$3,000,000 = \$600,000
- 3) NUMBER OF AGREEMENTS IN EFFECT = 3
- 4) PAYMENT - % OF TOTAL X (2) ABOVE

<u>AGREEMENT</u>	<u>BALANCE</u>	<u>% OF TOTAL</u>	<u>PAYMENT</u>
A	\$100,000	8.7	\$52,200
B	\$50,000	4.3	\$25,800
C	<u>\$1,000,000</u>	<u>87.0</u>	<u>\$522,000</u>
TOTAL	\$1,150,000	100.0	\$600,000

Payments will be made after December 31 each year. Only one payment will be made each year. Only agreements that are in effect prior to December 31 each year will be included in the determination of the payment amount.

3.10 PERCOLATION TEST PROCEDURE FOR RETENTION/DETENTION BASIN DESIGN

This procedure shall be required and findings submitted to the City when the proposed project site is to be located in areas of Lancaster with relatively "high" infiltration rates, such as SCS Soil Group "A" (or LACDPW Hydrology Soil No. 124), or as determined by the City Engineer.

3.10.1 TEST PROCEDURE

3.10.1.1 Preparing The Test Hole

A 6" to 8" diameter hole is excavated to the level chosen to receive retention basin water. The depth of the hole will vary (depending on site conditions and preliminary basin design) but should be at least 10 feet below the elevation of the bottom of the proposed

basin. Materials encountered in the hole should be logged continuously by a soils engineer or engineering geologist. Surficial deposits should be classified according to the Unified Soil Classification System (USCS). Bedrock should be described in accordance with standard geologic practice. The sidewalls should be vertical, the bottom should be as free of loose material as possible and covered with two inches of 1/2" to 3/4" gravel to prevent scouring upon addition of water. If the hole is likely to cave in, it should be cased. The annular space between perforated casing and sidewall should be filled with gravel.

3.10.1.2 Presoaking

The percolation boring should be presoaked 24 hours in advance of the test. The hole should be filled with clear water to the bottom elevation of the proposed basin. The water level should not be closer than 4 feet to the ground surface.

3.10.1.3 Measurements

At the start of the percolation rate test, the water level should be at the bottom elevation of the proposed basin. From a fixed reference point, the water level drops are measured to the nearest 0.5 inch with respect to the time of drop. After each measurement the water level is raised to the starting elevation.

The measuring and refilling operation is repeated until the water level drops are approximately stable. This occurs when three successive measurements do not vary by more than 5 percent. Final measurements at or after the point of stabilization are used to calculate percolation times.

Total depth of hole should be measured before and after the test measurements.

3.10.2 PRESENTATION

The percolation report shall be signed and stamped by a Civil Engineer or Certified Engineering Geologist licensed to practice in California and shall include the following:

3.10.2.1 Test Results

- 1) Describe the test method used.
- 2) Provide a test hole location map.
- 3) Provide logs of all test holes.
- 4) Provide copies of all field data and calculations. All data should be in tabular form.

3.10.2.2 Discussion of Results

- 1) Discuss soil conditions encountered with regard to percolation rates obtained.
- 2) Discuss any variation in test results.

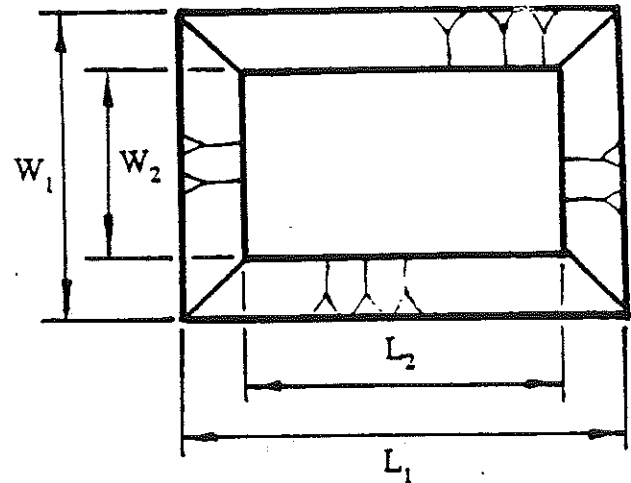
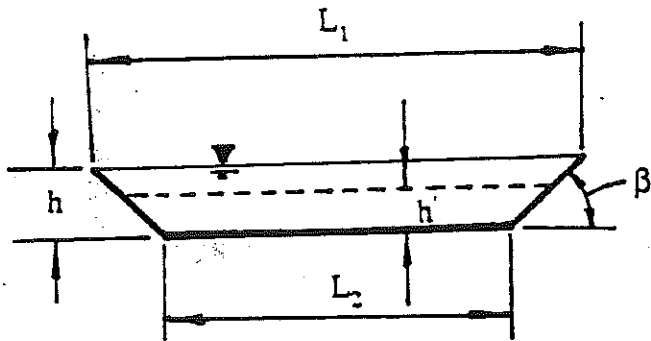
- 3) Discuss potential geotechnical hydrogeologic effects of percolation of retention basin water (mounding, hydrocollapse of near-surface soils, etc.).

RETENTION BASIN PERCOLATION TIME SAMPLE CALCULATION

To determine the time necessary to drain a simple rectangular basin, the following equations may be used. (For the sake of simplicity in this example, the access ramp is not considered. All calculations submitted for review shall include suitable allowance for the access ramp in the volume calculations.)

Necessary information:

1. Length, width and depth of basin.
2. Side slope angle.
3. Absorption rate of soil.



$$A_1 = L_1 * W_1 \quad (1)$$

$$A_2 = L_2 * W_2 \quad (2)$$

$$\text{Basin Volume } V = ((h * (A_1 + A_2 + (A_1 * A_2)^{.5}) / 3) \quad (3)$$

The average wetted area is the surface area of the basin still underwater when half of the total volume is empty. Basin depth at half volume is given by:

$$h' = (h/4) * [4 - ((A_1 + (2(A_1 * A_2)^{.5}) + 3A_2) / (A_1 + (A_1 * A_2)^{.5} + A_2))] \quad (4)$$

The wetted area is given by:

$$A_w = (2h(L_2 + W_2 + 2h) + A_2)/\sin\beta \quad (5)$$

The time required for the basin to empty is given by:

$$T = V/(R * A_w) \quad (6)$$

Where R = percolation rate in gal/ft²/day.

The factor of safety is given by:

$$FS = 7/T \quad (7)$$

Example Retention Basin Problem

50' x 800' basin (bottom dimensions), 10' deep with 2:1 side slopes ($\beta = 26.6^\circ$), and an absorption rate of 20 gal/ft²/day.

$$A_2 = (50)(80) = 4,000 \text{ ft}^2$$

$$\begin{aligned} L_1 &= L_2 + ((2h)/\tan \beta) \\ &= 80 + (2(10)/\tan 26.6^\circ) \\ &= 120' \end{aligned}$$

$$\begin{aligned} W_1 &= W_2 + ((2h)/\tan \beta) \\ &= 50' + (2(10)/\tan 26.6^\circ) \\ &= 90' \end{aligned}$$

$$A_1 = (90)(120) = 10,800 \text{ ft}^2$$

$$\begin{aligned} V &= [h(A_1 + A_2 + (A_1 * A_2)^{-5})]/3 \\ &= [10(10,800 + 4,000 + ((10,800)(4,000))^{-5})]/3 \\ &= 71,242 \text{ ft}^2 \end{aligned}$$

$$V = 71,242 \text{ ft}^2 * 7.48 \text{ gal.ft}^3 = 532,892 \text{ gal}$$

$$\begin{aligned} h' &= (h/4) * [4 - ((A_1 + (2(A_1 * A_2)^{-5}) + 3A_2)/(A_1 + (A_1 * A_2)^{-5} + A_2))] \\ &= (10/4) * [4 - ((10,800 + (2((10,800)(4,000))^{-5}) + 3(4,000))/(10,800 + ((10,800)(4,000))^{-5} + (4,000))] \\ &= 5.8 \text{ ft.} \end{aligned}$$

$$A_w = [2h(L_2 + W_2 + 2h)/\sin\beta] + A_2$$

$$= [2(5.8)(80 + 50 + 2(5.8))/\sin 26.6^\circ] + 4,000$$

$$= 7,673 \text{ ft}^2$$

$$T = V/(R * A_w) = 532,892/[(20)(7,673)] = 3.47 \text{ days}$$

$$FS = 7/3.47 = 2.02 \text{ days}$$

3.11 NUISANCE WATER MANAGEMENT

Nuisance Water Flow Generation

The design generation rate for nuisance water in single family residential areas is 160 gal/household/day (0.000245 cfs) including a safety and longevity factor of 4.0. For calculations involving nuisance water, flows generated by applying this rate to the number of households upstream shall not be additive with offsite flows. Flow generated by subdrains, or from any other anticipated sources onsite shall be provided for.

Nuisance water generation rates for multi-family, commercial and industrial areas will be determined on a case-by-case basis.

Nuisance water shall be intercepted and disposed of whenever design flow depth in the gutter exceeds 3/4 inch or 6.6 gpm, whichever is less. Flow depth shall be calculated using Manning's Equation with $n=0.014$. Nuisance water inlets shall be sited to provide maximum utility and to minimize flows to cross gutters and detention basins. Nuisance water generated on-site will not be allowed to flow off site as surface flow. Near and far side inlets shall be combined to flow to Parkway drain devices into the public right-of-way.

For infill developments (unless waived by the City Engineer) all parcels one (1) acre or larger in size will be responsible for mitigation of flow generated by such development through on-site retention facilities such as depressed landscaping designed for a Q25 hydrology.

3.12 DEFINITIONS

3.12.1 NATURAL WATERCOURSES - A natural watercourse is a path along which water flows as a result of natural topographic features. Furthermore, for the purposes of this definition, a natural watercourse drains a watershed greater than 100 acres and also meets one or more of the following conditions:

1. Experiences flow velocities greater than five feet per second while carrying a Capital Flood.
2. Has flow depths greater than 1.5 feet while carrying a Capital Flood.

3. Would have water surface elevations, while carrying a Capital Flood, within one foot of the finished floor elevation of adjacent habitable structures, if such water surface elevations would result from construction of facilities with less than a Capital Flood capacity.
4. If it is desirable to develop adjacent to a natural creek and leave the creek undisturbed, the following shall be the minimum requirements:
 - (1) **Setbacks:** Set backs shall be determined by first calculating the area needed to contain the 50 year developed storm, then adding one foot of freeboard. This will define the boundary of the creek. The setback from that boundary shall be determined by projecting an additional fifteen (15) feet horizontally and from that point, projecting a 2:1 slope, until natural ground is intercepted.
 - (2) **Flood area:** The area described in the preceding paragraph, including the area for setback, shall be designed as a "FLOOD AREA" on recorded maps and grading plans.
 - (3) **Irrevocable Offer of Dedication:** The developer shall provide an irrevocable offer of dedication for drainage purposes to the City for the land designated as a flood area.
 - (4) **Private Ownership:** The land designated as a "FLOOD AREA" shall be privately owned and maintained.

3.12.2 DEPRESSIONS OR SUMPS

A depression or sump is an area for which there is no surface route to outlet flows. Furthermore, for the purposes of the definition, a depression or sump also meets one or more of the following conditions:

1. Would have a ponded water surface elevation, during a Capital Flood, within one foot of the finished floor elevation of adjacent habitable structures, if such elevation would result from construction of facilities with less than a Capital Flood capacity. This condition does not apply if there is a surface route for outflow such that the ponded water surface cannot reach the finished floor elevation of adjacent structures during a Capital Flood.
2. In a roadway, would have a ponded water surface elevation higher than the elevation of the public right of way line, if facilities with less than a Capital Flood capacity were constructed. This condition applies to flows which reach the roadway upstream of the sump and are conveyed to the sump by the roadway.
3. Has a ponded depth of three feet or greater.
4. An exception is made for fenced or walled detention, retarding, or retention basins.

3.12.3 STREET CAPACITY

Maximum street capacity is defined herein as the capacity of the street section to carry flows within street right-of-way (depth of flow does not exceed either property line).

3.12.4 FLOODWAY

A floodway is the channel of a stream plus any adjacent floodplain areas which must be kept free of encroachment so that the 50-year storm runoff can be carried without substantial increases in flood depths. Such increase in depth will not exceed one (1) foot.

The floodway, as defined in this Management Plan, does not correspond to the floodways or "floodplains" defined in FEMA (FIRM) maps.

SECTION 4
Soils Engineering
and
Engineering Geology Report

SECTION 4 SOILS ENGINEERING AND ENGINEERING GEOLOGY REPORTS

4.1 GENERAL

A Soils Engineering Report and/or Engineering Geology report (as required) shall be submitted as part of the submittal package for grading and street improvement plans. They shall be presented in report form, signed, stamped and dated by a Geotechnical Engineer or Civil Engineer registered in the State of California.

The report shall be a culmination of the results of the Soils Engineer's observation, tests and conclusions based on the findings and opinions during the time of site exploration. It should include copies of all boring and test-hole logs and of all laboratory test results.

All new commercial/industrial, apartment, condominium, multiple-density housing, and subgrade construction and expansion shall require professional inspection and testing by a registered Soils Engineer with a Certified Soils Engineering and/or Engineering Geology Reports submitted for City review and approval.

The City Building Official shall have the authority to require that a soils report or engineering geology report be prepared and submitted prior to starting any permitted grading work.

4.2 DEFINITIONS OF TERMS

COMPACTION is the process of densification in which the volume change is due almost entirely to the expulsion of air from the soil mass.

ENGINEERING GEOLOGIST is a geologist experienced and knowledgeable in Engineering Geology.

ENGINEERING GEOLOGY is the application of the knowledge and principles of geology and engineering in the investigation and evaluation of naturally occurring rock and soil for use in the design of civil works.

EROSION is the wearing away of the ground surface as a result of the movement of wind, water and/or ice.

EXCAVATION is the mechanical removal of earth material.

FILL is a deposit of earth material placed by artificial means.

GEOTECHNICAL ENGINEER. See Soils Engineer.

GEOTECHNICAL ENGINEERING. See Soils Engineering.

GRADING is any excavating or filling or combination thereof.

IN-SITU TEST is a type of soil test used to enhance profile definitions, to provide data on soil properties, and to obtain parameters for empirical analysis and design applications

SITE is any lot or parcel of land or contiguous combination thereof, under the same ownership, where grading is performed or permitted.

SLOPE is an inclined ground surface expressed as a ratio of horizontal distance to vertical distance.

SOIL is naturally occurring superficial deposits overlying bed rock. It is initially the products of chemical alteration or mechanical disintegration of bedrock that has been exposed to weathering processes.

SOILS ENGINEER is an engineer who has a thorough knowledge of soil and engineering mechanics, subsurface exploration, and laboratory investigation techniques as well as an understanding of earthwork and foundation construction.

SOILS ENGINEERING is the application of the principles of soil and engineering mechanics to evaluation of the behavior of earth materials, usually in the context of engineering investigation, design, and construction.

TEST BORING LOGS are records identifying the depths and material classification of the various strata encountered, the sample location and penetration resistance, rock-core interval and recovery, groundwater levels encountered during and after drilling.

THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) is an organization who issues standard test methods for classifying soil and for the determination of various soil properties.

UNIFIED SOIL CLASSIFICATION SYSTEM is the most widely used of the various constitutive classification systems and correlates soil type with generalized soil behavior.

WATER CONTENT of a soil sample represents the weight of free water contained in the sample expressed as a percentage of its dry weight.

4.3 SOILS ENGINEERING REPORT (GEOTECHNICAL ENGINEERING REPORT)

The minimum format requirements for Soils Engineering Reports are as follows:

a. INTRODUCTION

The introductory part of the report shows the extent of the report .

b. PROJECT DESCRIPTION

Project descriptions shall include the acreage, location, topography, existing surface conditions, and intended future accommodation. It shall also describe the proposed structure and its foundations, assumptions used for

the basis for the exploration, testing and analysis programs and for the recommendations.

c. **PURPOSE AND SCOPE**

The purpose of the report is to evaluate the site conditions and the factors affecting the stability of the site, and to provide conclusions and recommendations relative to its intended use. The scope of the report shall include the following:

(1) **SITE DESCRIPTION**

This section of the report describes the location, configuration, topography, acreage, and existing surface conditions of the site. It also describes the existing conditions of the adjacent properties, drainage flow direction and available access to the site.

(2) **FIELD EXPLORATION**

The objective of most geotechnical site investigations is to obtain information on the site and subsurface conditions that is required for design and construction of engineered facilities and for evaluation and mitigation of geologic hazards, such as landslides, subsidence, and liquefaction. The site investigation is a part of a fully integrated process that includes:

- (a) Synthesis of available data
- (b) Field and laboratory investigations
- (c) Characterization of site stratigraphy and soil properties
- (d) Engineering analysis
- (e) Formulation of design and construction criteria or engineering evaluations.

Subsurface exploration is conducted to obtain a continuous soil profile at the time of field observation. Undisturbed and bulk soil samples are taken at various depths for laboratory testing.

This section of the report includes the date of the exploration, number of borings performed, boring depths, boring equipment used, boring locations, soil sample descriptions and geotechnical exploration procedures. The interpretation of the field logs prepared for each boring and the soil conditions between samples and results of the laboratory tests are represented in Test Boring Logs. The samples are placed in a sealed container or plastic bag.

Field Exploration sites should be shown on a plan with a scale sufficient to describe their locations.

(3) SOIL SAMPLING

A sufficient number of soil borings should be made in the proposed site and in potential borrow areas to identify the different soil characteristics likely to be present on site.

(4) LABORATORY TESTING

Representative samples of the soil are collected during field exploration. After visual classification in the field, the soil samples are returned to the laboratory and classified in accordance with the Unified Soil Classification System. Various laboratory tests are performed and their results are described in this section of the report.

The laboratory tests include, but are not limited to: soil compressibility, in situ density and moisture content, grain size distribution, direct shear tests, consolidation tests, R-value, maximum density-optimum moisture, and expansion index.

Summary of test results are represented in charts.

(5) SUMMARY OF FINDINGS AND RECOMMENDATIONS

This section of the report includes, but is not limited to, the following.

- (a) Data regarding the nature, distribution and strength of existing soils;
- (b) Conclusions and recommendations for foundation design and retaining wall design;
- (c) Grading procedures and design criteria for corrective measures including buttress fills, when necessary;
- (d) Opinions and recommendations covering adequacy of sites to be developed by the proposed grading and intended construction;
- (e) Stability of slopes, slopes steeper than 2:1 shall require slope stability calculations;
- (f) Existing soil removal, including recommended over excavation limits, percentage range of shrinkage due to compaction, amount of subsidence (in decimal feet), and depth of scarification;

- (g) Structural section recommendations of proposed pavements (whether A.C. or P.C.C.) for the proposed streets, parking, and drive areas based upon R-value findings and current applicable City Traffic Indices;
- (h) Compaction requirements, and;
- (i) Other pertinent soils condition.

Recommendations included in the report and approved by the Building Official and/or the City Engineer shall be incorporated in the grading and/or street, storm drain, or sewer plans or specifications and into the site preparation, foundation design, retaining wall design and construction of the proposed development.

d. GENERAL GRADING SPECIFICATIONS

These specifications represent the minimum requirements for grading and other associated operations on construction projects and should be considered a portion of the project specifications. Any recommendations made in the soils engineering report, or subsequent reports, shall become an addendum to these specifications.

The grading specifications shall include, but are not limited to, the following.

- (1) The specifications shall cover the preparation of the surface to receive fill, type of soil suitable for use in fills, control of compaction, and the methods of testing compacted fills.
- (2) The Contractor, prior to site preparation for grading, should arrange a meeting with the Developer, the Design Engineer, Soils Engineer, and City of Lancaster representative. All parties shall be given a 48 hours notice.
- (3) It shall be the Contractor's responsibility to place, spread, moisture condition and compact the fill in strict accordance with these specifications. The Contractor should have suitable and sufficient equipment in operation to handle the amount of fill being placed. Deviations from these specifications will be permitted only upon written authorization from the Soils Engineer.
- (4) The Soils Engineer shall be the owner's representative to inspect the construction of fills. Excavation and the placement of fill shall be under the direct supervision and inspection of the Soils Engineer.
- (5) The placement of controlled fill by the Contractor shall include all clearing and grubbing, removal of existing unsatisfactory material, preparation of the areas to be filled, spreading, moisture

conditioning and compacting the fill in the areas to be filled and all other work necessary to complete the grading of the filled areas.

- (6) Earth materials for compacted fill shall consist of any material that is suitable for use in constructing engineering fills. In general, no material shall contain rocks or hard lumps greater than 6 inches in size and shall contain at least 50% of the material smaller than 1/4 inch in size. Materials greater than 3 inches in size shall be placed by the Contractor so that they are surrounded by compacted fines; no nesting of rocks shall be permitted. No material of a perishable, spongy, or reducible nature shall be used in fill.
- (7) Unless otherwise specified, all fill shall be compacted by the Contractor in accordance with ASTM Test Method D 1557-78. Densities shall be expressed as a relative compaction in terms of the maximum density obtained in the laboratory by the foregoing standard procedure.
- (8) Existing structures, foundations, trash, debris, loose fill, rubble, trees (not including landscaping), tree stumps and other objectionable material shall be piled or burned or otherwise disposed of so as to leave the areas that have been cleared free of debris. No burning shall be permitted in the area to be filled.
- (9) After the foundation for the fill has been cleared, plowed, or scarified it shall be brought to proper moisture content and "proof rolled" as directed by the Soils Engineer.
- (10) Existing septic tanks and other underground storage tanks, must be removed from the site prior to commencement of building, grading or fill operations. Underground tanks, including connecting drain fields and other lines, shall be totally removed and the resulting depressions properly reconstructed and filled. Underground tanks that have stored hazardous materials shall be removed and the resulting site and environs remediated per the oversight agency's regulations. Depressions left from tree removal shall be properly filled and compacted.
- (11) Abandoned water wells on the site shall be destroyed and capped according to the requirements of the appropriate regulatory agency. The strength of the cap shall be at least equal to the adjacent soils. The final elevation of the top of the well casing must be a minimum of 36 inches below adjacent grade, prior to grading or fill operations. Structure foundations should not be placed over the capped well.
- (12) Organic matter shall be removed from the surface upon which the fill foundations or pavement sections are to be placed. The surface shall then be plowed or scarified to a depth of at least 12 inches and until the surface is free from ruts, hummocks or other uneven features

which would tend to prevent uniform compaction by the equipment to be used. Specific recommendations pertaining to stripping and minimum depth of recompaction of native soils are presented in the main body of the soil report.

- (13) Where fills are made on hillsides or exposed slope areas, greater than 10%, horizontal benches shall be cut into firm undisturbed natural ground to provide a horizontal base so that each layer is placed and compacted on a horizontal plane. The initial bench at the toe of the fill shall be at least 10 feet in width on firm, undisturbed natural ground at the elevation of the toe stake placed at the natural angle of repose or design slope. The width and frequency of succeeding benches will vary with the soil conditions and steepness of slope.
- (14) Native soil, free from organic material and other deleterious material may be used as compacted fill; however, during the grading operations the Soil Engineer will reexamine the native soils for organic content.
- (15) Imported material shall be tested and reviewed by the Soils Engineer before being brought to the site. The materials used shall be free of organic matter.
- (16) The selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in thickness. Layers shall be spread evenly and thoroughly blade-mixed during spreading.
- (17) Large rocks will not be allowed to nest and voids must be carefully filled with small stones or earth and properly compacted. Rock larger than 6 inches in diameter will not be permitted in the compacted fill without the approval of the Soils Engineer.
- (18) When the moisture content of the fill material is not sufficient to achieve required compaction, water shall be added until the soils attain a moisture content so that thorough bonding is achieved during the compacting process. When the moisture content of the fill material is excessive, the fill material shall be aerated by blades or other satisfactory methods until the moisture content is reduced to an acceptable content to achieve proper compaction.
- (19) After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to a relative compaction of not less than 90%.
- (20) Compaction shall be by sheepsfoot rollers, vibrating sheepsfoot rollers, multiple-wheel pneumatic-tired rollers, or other types of acceptable compacting rollers. Rollers shall be able to compact the fill to the specified density. Rolling shall be accomplished while the fill material is within the specified moisture content range. Rolling

of each layer shall be continuous over its entire area and the roller shall make sufficient trips to insure that the density has been obtained.

- (21) Field Density tests will be performed by the Soils Engineer during the grading operations. At least one test shall be made for each 500 cubic yards, or fraction thereof placed with a minimum of two tests per layer in isolated areas. Where sheepsfoot rollers are used, the soil may be disturbed to a depth of several inches. Density tests shall be taken in compacted material below the disturbed surface. When these tests indicate that the density of any layer of fill, or portion thereof, is below the required density, the particular layer or portion shall be recompacted until the required density has been obtained.
- (22) The fill operation shall be continued in 6-inch compacted layers, as specified above, until the fill has been brought to the finished slopes and graded as shown on the approved plans.
- (23) Fill material shall not be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations shall not resume until field tests by the Soil Engineer indicate that the moisture content and density of the fill are as previously specified.
- (24) The Soils Engineer shall be retained to provide continuous soils engineering services during grading construction, excavation and foundation construction. This is required to comply with the design concepts, specifications or recommendations and to allow design changes.
- (25) The Soils Engineer, or his representative, performs observation and field testing at the site. However, this presence in the site does not excuse the Contractor from any defects discovered during observation. The work does not include supervision or direction of the actual work of the Contractor, his employees or agents. Job and site safety shall be the sole responsibility of the Contractor.
- (26) During Grading operations, soil types other than those described in the soils engineering report, contract plans or specifications may be encountered. The Soils Engineer shall determine the suitability of these soils and provide appropriate recommendations to mitigate unsuitable soils for structural or site use.
- (27) The Contractor shall grade all excavated surfaces to provide good drainage and prevent ponding of water. The Contractor shall control surface water to avoid damage to adjacent properties or to avoid water from running into excavated areas. Excess water shall be promptly removed and the site shall be kept dry.

- (28) The Contractor shall take any necessary measures required to prevent erosion of newly graded areas and maintain such measures until permanent drainage and erosion control devices are in place.
- (29) When grading is completed, the Soils Engineer shall complete his observations of the work. No further excavation or filling shall be done except under the approval of the Soils Engineer.
- (30) Maintenance of drainage devices and ground water is the responsibility of the ultimate user of the lots created by grading. Homeowners should be informed of this responsibility.

4.4 ENGINEERING GEOLOGY REPORT

The Engineering Geology Report shall include the following:

- a. An adequate description of the geology of the site;
- b. Review of available geologic and seismic literature and maps;
- c. Analysis of geo-seismic data. Determination of geologic and seismic hazards which could affect the proposed development;
- d. Maps, tables and graphs;
- e. Conclusions and recommendations regarding the effect of geologic conditions on the proposed development;
- f. Opinions and recommendations covering the adequacy of sites to be developed by the proposed grading.

Recommendations included in the report and approved by the Building Official and/or the City Engineer shall be incorporated in the grading and/or the street, storm drain, or sewer plans or specifications and into the site preparation, retaining wall and foundation design, and construction of the proposed development.

4.5 ENGINEER'S AREA OF RESPONSIBILITY

The Soils Engineer's area of responsibility shall include, but not be limited to:

- a. Professional inspection and approval concerning the preparation of ground to receive fills;
- b. Testing for required compaction, stability of all finish slopes and the design of buttress fills, where required;
- c. Incorporating data supplied by the engineering geologist;

- d. Signing and stamping the appropriate box on the grading plan original cover sheet signifying approval of the plan's adherence to the soils report recommendations.

The Engineering Geologist's area of responsibility shall include, but not be limited to:

- a. Professional inspection and approval of the adequacy of natural ground for receiving fills and the stability of cut slopes with respect to geologic matters;
- b. Determining the need for subdrains or groundwater drainage devices;
- c. Reporting findings to the Soils Engineer and the Civil Engineer for engineering analysis;
- d. Signing and stamping the appropriate box on the grading plan original cover sheet signifying approval of the plan's adherence to the engineering geology report recommendations.

SECTION 5

Improvements Securities

2

SECTION 5 IMPROVEMENTS SECURITIES

5.1 SECURITIES REQUIREMENTS

The Applicant shall guarantee the performance of all required public improvements in accordance with the Undertaking Agreement entered into with the City. The guarantee shall be an acceptable form of security as defined in Section 800 of the City's Subdivision Ordinance.

5.1.1 GRADING SECURITY

The Applicant shall provide an on-site grading security, subject to City approval, prior to the issuance of the grading permit.

5.1.2 IMPROVEMENT SECURITY

The Subdivider shall provide a Faithful Performance Security and a Labor & Material Security guaranteeing the construction of any public improvements as set forth in the Undertaking Agreement. The sum of the Faithful Performance Security shall be 100% of the estimated construction cost to faithfully perform all work (except on-site grading) required under the terms of the Undertaking Agreement. The Subdivider shall submit an estimate of this Faithful Performance amount to the City for review and approval on the City's Bond Estimate Form, before the City will accept the Faithful Performance Security. The amount of the Labor & Material Security shall be an additional 50% of the Faithful Performance Security Amount.

5.1.3 MONUMENT SECURITY

The applicant shall provide a monument security, subject to City approval, prior to approval of the final map by City Council, unless monuments are to be set prior to the final map recording.

5.2 AUTHORIZED SECURITIES

5.2.1 PERFORMANCE SECURITY

The form of security as set forth in Section 800 of the City Subdivision Ordinance and as more fully defined herein, shall be satisfied prior to City's acceptance of securities for any and all City projects:

a. Bonds

- (1) One performance bond per agreement.
- (2) Use City bond forms only.

- (3) Security amounts must be approved by the City on the City's Engineering Bond or Letter of Credit Estimate Form (DPW-0080).
- (4) Forms must be fully completed (including date, project no., address, etc.).
- (5) All signatures on the bond forms must be notarized.

b. Letters of Credit

- (1) One Letter of Credit per Agreement.
- (2) Security amounts must be approved by the City on the City's Engineering Bond or Letter of Credit Estimate Form (DWP-0080).
- (3) Letters of Credit must be provided by Federally insured banking institution
- (4) City Project No. must be noted on security.
- (5) Security forms must have an authorized bank officer's signature.
- (6) All signatures on Letters of Credit must be notarized.
- (7) Letters of Credit must be approved by the City Attorney.

c. Certificates of Deposit

- (1) Requires assignment to the City of Lancaster
- (2) Original to be held at Lancaster City Hall - Finance Department
- (3) City Project No. must be noted on certificate.
- (4) Security amounts must be approved by the City on the City's Engineering Bond or Letter of Credit Estimate Form (DPW-0080).
- (5) Security forms must have an authorized bank officer's signature.

d. Passbook Savings Accounts

- (1) Requires assignment to the City of Lancaster
- (2) Original to be held at Lancaster City Hall - Finance Department
- (3) City Project No. must be noted on Passbook.
- (4) Security amounts must be approved by the City on the City's Engineering Bond or Letter of Credit Estimate Form (DPW-0080).
- (5) Security forms must have an authorized bank officer's signature.

e. Cashiers Check

- (1) Made payable to the City of Lancaster
- (2) Security amounts must be approved by the City on the City's Engineering Bond or Letter of Credit Estimate Form (DPW-0080).
- (3) Date of check must be within 30 days of submittal
- (4) City Project No. must be noted on check.

5.3 AGREEMENTS

The following agreements must accompany all project securities at the time of submission to the City of Lancaster:

5.3.1. UNDERTAKING AGREEMENT

The Applicant shall execute two (2) originals of the Undertaking Agreement ("Agreement") with the City prior to issuance of any permit for construction of any public improvements, or prior to City Council approval of a parcel or final map. The Agreement shall be filed on the City's form and shall be signed by authorized officials of the Applicant. Once the City Engineer has signed both copies of the agreement, one signed copy of the agreement will be returned to the applicant.

- a. All authorized signatures must be notarized.
- b. The City Agreement form must be fully completed. (including date, project no., address, etc.)

5.3.2 GRADING SECURITY ASSIGNMENT AND AGREEMENT

When a grading security is posted, other than a bond, a Grading Security Assignment and Agreement must be completed and signed by the applicant. This is to ensure that the submitter reads and acknowledges that the grading security is held in full until final grading is completed and all clearances are received from the Building and Safety Division.

5.3.3 IMPROVEMENT SECURITY ASSIGNMENT AND AGREEMENT

An Improvement Security Assignment and Agreement must be completed and signed by the applicant when a Certificate of Deposit, Passbook Savings Account, or Cashier's Check is used as a form of security.

5.3.4 MONUMENT SECURITY ASSIGNMENT AND AGREEMENT

A Monument Security Assignment and Agreement must be completed and signed by the applicant when a Certificate of Deposit, Passbook Savings Account, or Cashier's Check is used as a form of security for monumentation.

5.4 SECURITY REDUCTIONS

5.4.1 GRADING SECURITY REDUCTIONS

Grading securities will not be reduced. The City shall retain 100% of all grading securities until such time as all grading work is completed to the satisfaction of the Department of Public Works.

5.4.2 FAITHFUL PERFORMANCE SECURITIES REDUCTIONS

Faithful performance securities may be granted a **one time reduction** of up to 50% of the "streets" amount of security as designated on the City's "improvement security status" log. This reduction will be allowed only after not less than 50% of the improvement work* is completed to the satisfaction of the Director of Public Works.

To obtain a faithful performance security reduction, the applicant shall submit a written request to the City, stating the applicant's name, project number (parcel, tract, CUP, etc.) and pay a security reduction processing fee.

In addition, the faithful performance security will be reduced to 10% of the original amount upon acceptance of all required improvements by the City Council. **Please note:** The one-year guarantee period begins after the acceptance of all required improvements by City Council.

*Improvement work shall include, but not limited to, sewers, water mains, storm drains, curbs, gutters, aggregate base, temporary street name signs, and the first lift of street asphalt pavement. Completion of sidewalks, driveways, street lights, street trees, permanent street signs, and final pavement cap may not, at the discretion of the City Engineer, be required as a part of partial security reduction.

5.4.3 LABOR & MATERIALS SECURITIES

Labor and Material securities shall not be reduced.

5.5 SECURITY EXONERATIONS

5.5.1 GRADING SECURITY EXONERATION

Grading securities will be released when the Director of Public Works is satisfied that all grading work is completed in accordance with the approved grading plans and all required documentation is submitted for each parcel or lot. To obtain a Grading Security Release, the applicant's Engineer shall first submit to the City a rough grading certification, soils certification, and a final grading certification on the City's most current form (DPW-0085).

5.5.2 FAITHFUL PERFORMANCE SECURITY EXONERATION

Performance Securities shall be released and the Undertaking Agreement shall be considered fulfilled upon completion of the one-year guarantee period and the repair of any and all defective work found during that time.

5.5.3 LABOR & MATERIAL SECURITY RELEASE EXONERATION

The Labor & Material Security shall be released 90 days after all required improvements have been accepted by City Council and there is no evidence of any mechanic's liens filed against the property.

5.5.4 MONUMENT SECURITY EXONERATION

The Monument Security Assignment and Agreement shall be released to the applicant once the City has completed a field inspection and approved the installation of the monuments, has received the swing tie notes and a letter from the applicant's surveyor stating that the monument has been set, the swing tie notes have been submitted to the City of Lancaster, and he has been paid for setting the monuments.

5.6 SUBSTITUTION OF SECURITIES

5.6.1 SECURITY FOR PUBLIC IMPROVEMENTS

When a Developer has purchased property which is under an Agreement with the City for installation of infrastructure improvements, it is the City's policy for the Developer to substitute all securities in his name and enter into a new Agreement before a grading permit is issued (if a grading permit is applicable).

5.6.2 SECURITY FOR GRADING

When a Developer purchases property which is under an agreement with the City for on-site grading, it is the City's policy that the Developer substitute securities in his name for lots that he owns before a grading permit is issued. The City will allow the Developer to either: (1) take the original amount of the grading bond and divide it by the original number of parcels or lots in the subdivision, then take that factor and multiply it by the number of parcels or lots he owns for the new amount of the grading bond; or (2) the Developer can have his surveyor take elevation shots for final grade. The difference in cubic yards that still needs to be moved for final grade will be the basis for the new grading amount. In grading security substitution cases, the City requires that the minimum grading security amount be \$5,000.00. This amount would cover the cost of finishing the grading work and/or reimburse the City for any emergency work, such as providing emergency erosion control.

SECTION 6

**Construction Phase
Requirements**

SECTION 6 CONSTRUCTION PHASE REQUIREMENTS

6.1 PERMITS

6.1.1 GENERAL PROVISIONS

Permits covered under this section include, but are not limited to, Encroachment Permits, including street, sewer, water, storm drain and dry utility installation and Grading Permits.

Any and all permit requirements will apply to this section, to including the payment of required fees. Work performed without the issuance of permits will not be allowed and subsequently, will be subject to all permit requirements, including payment of fees and/or fines, if applicable. Work performed without benefit of permit and/or inspection shall be removed prior to proceeding with the approved work.

Permits will not be issued until all Public Works requirements have been fulfilled. For verification on project requirements and/or outstanding items, the applicant is to contact the Public Works Department, Engineering Division, (805) 723-6144.

6.1.2 PERMIT APPLICATION

The Developer, Contractor, or authorized agent shall apply for an applicable permit that shall include plan check processing, permit inspection services, and applicable fees pertaining to the applicant's proposed improvement project at the Building and Safety Counter at City Hall.

If the applicant can provide a plan that gives some detail of the project, the City Plan Check Engineer and/or Subdivision Map Plan Checker will meet with the applicant to discuss and preview the scope of the project and provide applicable forms and checklists for the initial submittal and payment of fees.

The applicant shall fill out the applicable permit application upon initial submittal and pay any appropriate fees that may be due for plan check and maintenance district processing, to the Building Services Technician. A permit number shall be then assigned to the submittal. This permit number shall be the specific City reference number for the type of permit involved.

6.1.3 ENCROACHMENT PERMITS

To define the scope of private development infrastructure work in the City right-of-way for the purposes of encroachment permit issuance during the Engineering plan check process, the City requires the following procedures:

1. Approved design plans from Southern California Edison (SCE), GTE, Jones Intercable and any other "dry conduit" utility work associated with that developer's offsite improvements in the City right-of-way. These plans shall be submitted to the Subdivision Section for City acceptance. This is in addition to the City's approval of other "fixed works" design plans in the public right-of-way such as

Street Improvement plans, Street Light Improvement plans, Storm Drain Improvement plans, Sanitary Sewer Improvement plans, and Water Line Improvement plans.

The above named utility companies require City-approved print sets of project improvement plans prior to starting their own design plans for the developer's use. Therefore, once an improvement original plan set has been approved by the City, the developer or his engineer shall provide to the Subdivision Section the appropriate number of print sets of the plans, via a bonded print company, as required by the plan checker. The plan checker shall "red-stamp" a certain number of the print sets as approved and sign and date them. These "red-stamped" plan sets will be used for permit issuance purposes later. The remaining print sets will be given to the developer or his engineer for the utility companies use to develop their respective design plans.

Once the Subdivision Section plan checker has received and accepted the required number of SCE, GTE, Jones Intercable, etc. utility print sets, and the other checklist items are completed, and fees are paid to the City's satisfaction, an encroachment permit may be issued.

2. A "General Encroachment Permit" will only be issued to an appropriately licensed contractor whose license in the State of California entitles him to work in the public right-of-way. If a project requires off-site improvements in the public right-of-way, and the on-site "prime" contractor has the appropriate license entitling him to do so, he will be issued a General Encroachment Permit. This permit shall briefly describe all those public improvements to be constructed under that contractor's license and responsible charge i.e., street, sewer, water, storm drain construction, etc. Prior to permit issuance, the scope and "area limits" of the work described on the permit shall be defined by the assigned plan checker and/or the Subdivision Senior Public Works Inspector, using the information from the approved plans and additional plans cited in Item one above.
3. If during the course of construction, additional or unforeseen work, within the City right-of-way, but outside of the area limits of the General Encroachment Permit, is required, an additional encroachment permit will be required with the additional scope of work described on it.
4. If construction of public utilities, or other fixed works on private land, is to be dedicated in a future easement or public right-of-way by recordation of a tract or parcel map, a General Encroachment Permit for record purposes will be issued to the prime contractor having responsible charge of the work. The permit's scope of work shall be described as stated in Item two above.
5. If an encroachment permittee has no work started, nor inspection requested, or the work is abandoned and not accepted by the City, within 60 days from date of permit issuance, the permit shall be voided. If there is a change of permit holders or different work for the same project is to be performed after 60 days from the date of the original permit issuance within the defined area limits of the original General Encroachment Permit, a new permit shall be issued.

6. If there arises some question as to what contractors on a private development project may be issued a General Encroachment Permit, the assigned Subdivision Section plan checker, Senior Public Works Inspector, or the City Engineer shall decide.

6.1.4 PERMIT ISSUANCE

The following general requirement criteria applies to all City permit applicants. Developers, who hire contractors, should be aware of and ensure compliance with the requirements below. Developers, contractors, or property owners will have to fulfill the requirements in subsection 6.1.4.3.

Drainage permits are usually issued concurrently with a Building Permit.

Building Permits on projects requiring a Grading Plan shall not be issued until: (1) applicable Rough Grade Certifications have been submitted to the City Engineering Division by the Record Engineer/Record Architect or authorized substitute professional, and (2) applicable Soils Certifications, certified compaction reports, and final soils reports have been submitted to the City Engineering Division by the Record Soils Engineer or authorized substitute professional. Building Certificates of Occupancy shall not be issued until Final Grade Certifications have been submitted by the Record Engineer/Record Architect or authorized substitute professional and all City conditions have been satisfied. Refer also to subsection 6.4.2.

6.1.4.1 LICENSES

Contractors and subcontractors shall have, and bring to the Building and Safety Counter at City Hall the appropriate license(s) for the work they will perform for the applicable project. Contractors holding current licenses are subject to laws that protect the consumer. A general contractor can obtain permits for different types of work. Specialty contractors shall hold a specific license for their specialized trade.

The California Contractors State License Board (CSLB) should be contacted at 1-800-321-CSLB (2752) to ensure that the contractor being considered holds the appropriate license for the work to be performed and that the license is active and in good standing.

Any contractor who operates in the City of Lancaster shall obtain a Business License from the City Finance Department.

The Developer, Property Owner, and/or Contractor shall have on file with the City Building Services Technicians a notarized authorization of other individuals who may sign for any City permits or other required documentation in their place.

6.1.4.2 INSURANCE

All contractors and subcontractors shall carry the appropriate insurances. These may include Worker's Compensation; Unemployment Insurance, and Liability Insurance. The California Contractors State License Board regulates the amount of coverage the subject contractor shall carry for each type of insurance. CSLB also regulates bond requirements to be posted by contractors.

The Contractor proof of insurance shall be put on file with the City Building Services Technicians to save time and trouble of having to resubmit the proof on subsequent permit applications.

6.1.4.3 OTHER AGENCY/DEPARTMENT INVOLVEMENT

Prior approvals from other agencies and/or City Departments may be required depending upon the nature of the applicant's project. Other City departments that may be involved are the Building and Safety Division, Traffic Engineering Division, Lancaster Redevelopment Agency, Planning/Community Development, and Parks, Recreation and Arts. The City Engineering Division has a current listing of other agency utility contact information available for the applicant.

6.1.4.4 MAINTENANCE DISTRICT CHARGES AND PETITION/BALLOT ACCEPTANCE

The Developer shall pay the applicable first year's Maintenance District (LMD, LLMD, DMD) Assessment/Annexation charges before submitted plans are approved by the City. No City Engineering Development permit, including Drainage and Grading Permits, shall be issued until the City has received a signed, notarized, and accepted petition and/or affirmative vote ballot from the affected development's property owner(s) for acceptance into the applicable City Maintenance District(s).

6.1.5 PERMIT EXPIRATION DATES

Encroachment Permits	Expire 60 days after issuance date, unless work has started and continued to completion. Extensions may be granted at the discretion of the applicable Senior Public Works Inspector or the City Engineer.
Drainage and Grading Permits	Expire 180 days after issuance date.

6.1.6 PERMIT EXTENSIONS

All requests for extensions to Encroachment and/or Grading and Drainage Permits must be requested in writing to:

City of Lancaster
Department of Public Works
Attention: (Senior Public Works Inspector's Name)
44933 North Fern Avenue
Lancaster, California 93534

Within 5 working days of receipt of the request, the City will notify the applicant by phone whether his request was approved or denied.

6.1.7 PRESERVATION OF ARCHAEOLOGICAL ARTIFACTS AND SURVEY MONUMENTS

During construction, if subsurface archaeological resources are encountered, they shall be left in place and a qualified archaeologist shall be called in to examine the findings. Work shall not resume until the archaeologist has reviewed the findings, made recommendations for their removal or preservation, and has had a reasonable opportunity to carry out the necessary mitigation procedures.

Existing land subdivision monuments and stakes shall be fully protected from damage or displacement and they shall not be disturbed unless directed by the City Engineer.

6.2 REVISIONS

When revisions to improvement plans are proposed during the course of construction, the procedures are as follows:

1. The applicant shall notify the Public Works Inspector of any proposed revisions to the plan.
2. The Engineer of Record shall notify the Subdivision Section of the proposed revisions.
3. The Engineer of Record shall submit one blueline copy of the plans with the proposed revisions marked in red, with applicable fees to be determined at the time of submittal.
4. After City approval of the proposed revisions, the applicant or Engineer of Record shall obtain the original plans from the City Subdivision Section by signing them out so that the approved revisions can be made on the original plans.
5. When the approved changes are made on the original, the Engineer of Record shall submit the original (with the revisions) and the marked up blueline copy. The original plans must include a revision block for the signatures of the Engineer of Record and the City Engineer.
6. After final approval, the applicant retains a blueprint company to pick up the signed, revised originals and re-submits them to the City Subdivision Section with the appropriate number of blueline copies required by the Subdivision Section.
7. The revised original plans shall remain on file with the City's Subdivision Section.

6.3 AS-BUILT DRAWINGS

The Developer's contractor shall provide and keep up-to-date, complete, as-built drawings indicating locations, sizes, dimensions, and kinds of equipment installed. These drawings shall serve as work progress sheets and the Developer's contractor shall make neat and legible annotations thereon daily as the work proceeds, showing the work as it was actually constructed and installed. These drawings shall be available at all times for inspection and shall be kept in the location designated by the City.

During the progress of the construction, the Developer's contractor shall keep a print set copy of signed improvement plans and permit on the job at all times for as-built construction purposes.

The City Inspector shall direct which items shall be appropriate for as-built records.

Before the date of the final inspection, the Developer's contractor shall turn over all information recorded on the as-built prints to the City Inspector.

The Developer's contractor shall provide the City Inspector one (1) marked up copy of City-signed Improvement Plans showing "as-built" changes.

The as-built plans are reviewed for accuracy and signed by the City Inspector.

See appropriate subsections of this manual regarding street and sewer as-built procedures.

6.4 FINAL INSPECTION

6.4.1 STREET AND OTHER INFRASTRUCTURE IMPROVEMENTS

Final inspection by a Public Works Engineering Inspector shall be requested after the following work has been completed:

1. Construction of all improvements per the applicable improvement plan. Improvements include, but are not limited to, the following: AC pavement and base, curbs and gutters, sidewalks, cross gutters, catch basins and storm drains.
2. Compliance with all notes on the cover sheet of the applicable improvement plan.
3. Installation of end of street barricades per plan, if required.
4. Installation of "Stop" signs where residential streets intersect a major street. Street name signs installed or request submitted to the City and names painted on curb returns.
5. Replacement of cracked sidewalk and approach areas.
6. Repair of all chipped curbs, gutters, sidewalks and approaches.
7. Removal of concrete slop from all curbs, gutters, sidewalks, approaches and streets.
8. Repair of damaged AC pavement in street areas.
9. Repair of all scrapes and scars in concrete and pavement.
10. Box culverts have been flushed clean and stripped of forms. All drains have been flushed and perimeter drainage cleaned.

11. Removal of any trash and debris from construction area and adjacent property.
12. Installation of two blue reflectors at each fire hydrant per L.A. County standard.
13. Removal of fencing from the models if in right-of-way, or post bond and pull an encroachment permit.
14. All curbs, gutters, sidewalks, approaches and streets have been cleaned.
15. Payment of any striping fees and bills due to the City. Street striping request submitted to the City.
16. Completion of perimeter block walls and retaining walls, as required.
17. Final approval of sewer system. Sewers have been installed and air and compaction tests passed.
18. Final approval of water system from Purveyor. Water mains installed and compaction tests passed.
19. Final approval of interior street trees from Public Works Department. Street trees planted, staked and properly tied.
20. Final approval for Landscape Maintenance District from Public Works Department.
21. Final approval for monumentation.
22. Gas, electricity, TV, phone or ducts in place across streets and compaction tests passed. Street light poles and luminaires installed.

6.4.2 GRADING

Rough grading inspection by the Public Works Inspector shall be requested after the following work has been completed:

Rough grading has been completed in conformance with plans. The work includes but is not limited to the following: grading to approximate final elevations; staking of property lines; location and gradient of cut and fill slopes; location of cross-sectional configuration and flowline gradient of drainage swales and terraces (graded ready for paving); berms installed where indicated; and required drainage slopes provided on building pads. Rough grading certification by the Record Engineer or Architect (either of whom is registered in California) is on file. Said consultants of record shall provide a listing of those individuals who are authorized to provide rough and final grade certifications in place of the record Engineer/Architect and/or Soils Engineer. This listing shall be signed and notarized by the record consultant and each authorized individual shall provide their name, company name, address, phone number, California registration number, wet-signature and wet-stamp.

Rough grade certifications that are six months old shall not be valid and a new certification shall be required. Some items that shall be certified are:

1. Inspection of the construction of block walls, perimeter or retaining walls by the Public Works Inspector shall be requested prior to and during construction. An approved City Standard Plan shall be used or an approved equal for said walls. A separate permitted-plan check may be required for retaining walls by the Building and Safety Division.
2. Earth fills that are to be constructed upon properly prepared base material and compacted in compliance with the most current requirements of The Uniform Building Code. Certification of registered Soils Engineer, compaction reports; and final soils report are on file.
3. Surface drainage devices in place as shown on the plans.

Final grading inspection by the Public Works Inspector shall be requested after the following work has been completed.

1. Compliance with all the work shown on the Grading Improvement Plans.
2. All proposed structures have been built and completed.
3. Final grading has been completed in accordance with the approved plans and specifications. Provisions have been made for drainage of surface water to the street, around buildings and their appurtenances. Final grade certification by the Record Engineer or Architect (either of whom is registered in California) is on file.

6.4.3 SEWER AND STORM DRAIN

Final sewer and storm drain inspection shall comply with any approved plan revisions and the sewer as-built procedures guidelines.

SECTION 7

Final Map Processing

SECTION 7 FINAL MAP PROCESSING

7.1 GENERAL

After a Tentative Map has been approved by the Planning Commission, and prior to the expiration of such map, the Final Map shall be prepared in accordance with the approved, or conditionally approved, Tentative Map.

7.2 DEFINITION OF TERMS

SUBDIVIDER means a person, firm, corporation, partnership or association who proposes to divide real property.

SUBDIVISION means the division of any improved or unimproved land by any Subdivider for the purpose of sale, lease or financing. It includes a condominium project, a community apartment project, or the conversion of five or more existing dwelling units to a stock cooperative.

TENTATIVE MAP refers to a map made for the purpose of showing the design and improvement of a proposed subdivision and the existing conditions in, and around it.

7.3 SUBMITTAL REQUIREMENTS

The Subdivider's Engineer shall submit the Final Map with all the requirements for submittal in accordance with the City "Tract and Parcel map requirements for Final Map submittal" form (DPW-0045) to the Department of Public Works, Subdivision Section for review. The form and contents shall conform to the provisions of the City's Subdivision Ordinance. Incomplete submittals shall be rejected. At the time of submittal, the Subdivider's Engineer or applicant shall be instructed to complete the City Council requirement list for placement on the City Council Agenda.

7.4 CITY COUNCIL AGENDA

All items required for Council Agenda consideration shall be submitted at least 4 weeks prior to the agenda date. Final Maps will not be scheduled for agenda review until landscape, lighting, and/or drainage maintenance districts are approved for formation. However, Final Maps may be placed on the same agenda as the last meeting required for any such district formations.

When the Final Map is approved by the City Council, the Subdivision Guarantee is ready to be issued by the Title Company, and the original map has been endorsed, said map shall be shipped by the City of Lancaster as per Government Code 66464 along with a black line mylar copy of the map to the County Recorder's office for recordation. One blue line copy of the Final Map shall be placed on file before the map is sent to record.

Note: The Subdivider's Engineer is responsible for completing all other requirements such as tax clearance, etc. with the County Engineer, Land Development Section, prior to Final Map recordation. The Subdivider's Engineer shall provide to the City the following items after map recordation:

- (a) One mylar copy of the Final Map; and
- (b) 2 blueline copies of the recorded map

7.5 SURVEY MONUMENTATION

7.5.1 GENERAL

It is the policy of the City of Lancaster to protect, preserve, and perpetuate the survey monuments in the public rights-of-way pursuant to Section 8771, et al, of the Business and Professions Code of the State of California. The following guidelines are based on statutory regulations and will be followed as they are applicable to existing survey monuments and the establishment of any new survey monuments.

7.5.2 PERMITS

Before any permits are issued for public improvements, the City's plan checker for subdivision maps shall research all monuments that may have been set within, or near, the limits of construction. The applicant's Surveyor shall submit to the City's plan checker for subdivision maps a Corner Record, tying out all existing monuments. The City's plan checker for subdivision maps will do a field inspection as to the status of the monument as stated on the Corner Record. Once the monument matches the Corner Record, the City will send the Corner Record and a self addressed envelope to the County, requesting them to file the Corner Record and return a copy in the self addressed envelope to the City of Lancaster. The City will keep the copy of these corner Records on file for the public.

If the applicant's Surveyor insists on filing his own Corner Record without processing it through the City, permits will not be issued until the City receives a readable filed copy of the Corner Record. At that time, the City's plan checker for subdivision maps will do a field inspection to be sure that all monuments that may be possibly lost or obliterated, at the City's discretion, where tied out, and the points used for tying out the monument are not in position to be destroyed by the proposed construction.

Before the Director of Public Works presents the improvements to the City Council for acceptance, the applicant's Surveyor shall submit to the City's plan checker for subdivision maps a Corner Record for any monument that was disturbed or destroyed. The City's plan checker for subdivision maps will do a field inspection for the proper installation of the monument. Once the monument inspection has been approved, the City will send the Corner Record to the County following the same procedure as stated above.

If the applicant's surveyor insists on filing his own Corner Record without processing it through the City, the Director of Public Works will not present the improvements to the City Council for acceptance, until the City receives a readable filed copy of the Corner Record. At that time, the City's plan checker for subdivision maps will do a field

inspection to assure that all monuments that may be possibly lost or obliterated, at the City's discretion, where tied out, and the points used for tying out the monument are not in position to be destroyed by the proposed construction.

7.5.3 CORNER RECORD STATEMENT

All grading plans shall show existing and set monuments on site. Before a Grading Permit is issued, the City shall have a Corner Record Statement (DPW 0088) on file.

7.5.4 SURVEY MONUMENTATION CONSTRUCTION

Placement, or replacement, of monuments which are lost or obliterated shall be the responsibility of the Surveyor or Engineer of Record for parcel maps or subdivision maps, if the points are essential to the re-establishment of any point or alignment which fall on section corners, quarter sections, and center of section of the survey. These points shall be monumented per the City of Lancaster Standard PW-3. Said Surveyor or Engineer shall process all Corner Records through the City of Lancaster.

If the applicant's surveyor insists on filing his own Corner Record without processing it through the City, the Director of Public Works will not present the final map to the City Council for approval, until the City receives a readable filed copy of the Corner Record. At that time, the City's plan checker for subdivision maps will do a field inspection to be sure the monument was properly set per the City's Standard PW-3 and tied out.

7.6 ADDRESSING

Parcel Maps and subdivisions are to be addressed after the Community Development Department approves the plot plan. All others are tentatively addressed before the Community Development Department approves the site plan.

Electric meters, water meter and pedestals are addressed with "1/4" following by the main address number.

Power poles are addressed with "1/2" following by the main address number.

New buildings with multiple units or suites are to be addressed "101, 103, 105, 107, 109" etc. Units or suites that are subdivided again in the future will use the numbers not originally used (i.e. 102, 104, 106, 108, etc.). In an existing building with multiple units or suites that are addressed "101, 102, 103, 104" etc., where a unit or suite is being subdivided again, the new units or suites will still maintain the same numbers starting with 101 with a letter added on the end, i.e. "101A, 102B, 103C, 104D", etc.

Requests for address changes must be from the property owner in the form of a written letter to the City Engineer.

The following shall apply at all times.

1. All Primary Arterials, Secondary Arterials, both east-west and north-south alignments, which fall on the established 1 mile (section line), and half-mile (quarter section line) grid pattern shall be named with the corresponding alpha-numeric or numeric designation, as shown on Figure 7.6.1, except as designated by City Council for commemorative purposes; i.e. 10th Street East is now Challenger Way.
2. All streets which fit the diagrammed pattern for collector and standard local streets, including those which outlet on primary or secondary arterials, shall perpetuate and extend the name of the corresponding alpha-numeric or numeric name with which it aligns, or the name of the existing street with which it aligns that has been long established and has been extended at least once.
3. Local streets which do not fit the standard local street alignment and do not line up with any other established streets, may have proposed street names submitted for consideration as approved street names. For such east-west streets, the beginning letter of that name is to be, if possible the same as the alpha designation of the Primary Avenue which falls on the east-west section line to the north of the proposed street. The rules of the following paragraphs shall apply.
4. The following designations shall apply for streets which are not alpha-numeric or numeric and which fall into the direction category shown below:

n	N
W-----E	w-----e
s	S
Avenue	Street
Road	Way
Drive	

Cul-de-Sacs, and/or single-ended streets, requiring new name assignments are to be designated as Circle, Court, Lane, or Place. The use of terms such as Avenida, Calle, Via or other such non-English designators are limited and may be considered for site specific projects, but will not be considered for extension to streets outside that area. The use of Highway and Boulevard shall be limited to primary highways and are subject to prior approval of the City.

5. The use of names of famous or notorious persons or personalities, real or fictitious, is not allowed. The use of historically significant or commemorative names is reserved for action by the City Council for application at their discretion. Their proposed use may be submitted to the City staff to verify qualification for use; i.e. already used or not, or alignment with currently established streets, or any other conflicts. Final approval for use shall be ordered by City Council action.
6. For purposes of alignment, if the centerlines of two streets fall within 150 feet of each other, they will be considered in alignment for the purposes of street naming, unless it can be shown that so naming would result in confusion or conflict.

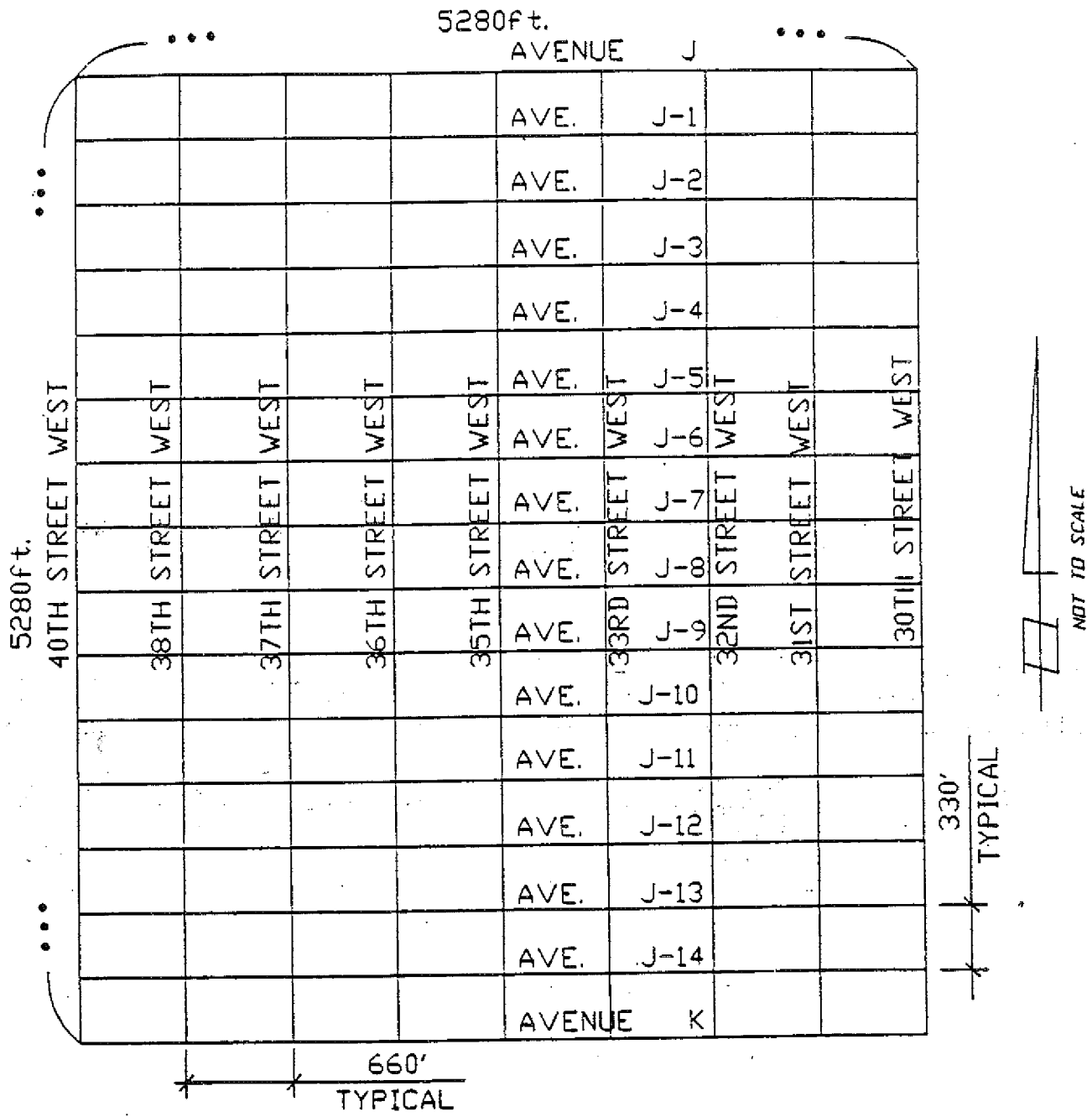


FIGURE 7.6.1 STREET NAME ASSIGNMENT

SECTION 8

Miscellaneous

SECTION 8 MISCELLANEOUS

8.1 PAVE-OUTS

8.1.1 PAVE-OUT POLICY

Street improvements are required along the frontage of any lots or parcels with the construction or erection of any new dwelling or building, or any dwelling or building expanded in excess of 50 % of the existing square footage of that dwelling or building. Exceptions to this are:

- a. Where the street is a private street
- b. Where a lot, by virtue of its zoning classification, exhibits a minimum size of one acre gross and does not front on a major or secondary street
- c. Where lots representing frontages totaling at least 50 percent of a block are improved and without street improvements.
- d. Where improvements have been waived

8.1.2 PAVEMENT REQUIREMENTS ALONG EXISTING STREET

Where street improvements are required along existing sections of roadway, the Developer is required to insure that the existing street has an adequate section to meet current traffic index requirements. Verification may be accomplished by boring the existing street or using deflection testing studies. If an inadequate section exists, the Developer shall be responsible for upgrading the street section to the centerline of street, except in instances noted below. Boring or other testing shall be accomplished in advance of street improvement plan submittals so that any information from such testing can be incorporated into the street plans.

In instances where the Developer is required to provide additional pavement beyond the centerline of the street, the developer shall insure that the entire street width has an adequate street section.

In instances where the existing pavement beyond the centerline is one lane width or less and where the pavement is in need of repair as determined by the City Engineer, the developer shall insure that the entire street width has an adequate street section.

Where new pavement abuts existing pavement and the existing pavement has been shown to have an adequate street section, a minimum of one and one-half inches of cold planing and resurfacing of the existing street to centerline is required. Feathering of pavement is unacceptable. Where existing pavement does not have a redwood header edge, the existing pavement shall be sawcut one foot from the edge and existing pavement removed prior to joining new pavement.

8.1.3 EMERGENCY ACCESS TO BUILDING SITES

All building permits issued for new commercial, industrial, or residential construction will be valid for footings and slabs only, until street improvements are installed. Framing and delivery of construction lumber will not be allowed until at least the first lift of paving is placed, water systems required for fire protection are operable, and temporary street name signs are in place. A pre-framing inspection and clearance given to frame is required prior to delivering lumber to the site and starting framing. This policy does not apply to single-family residences not associated with land subdivision.

The final lift of paving, of at least one and one-half inch, is required before final inspection and issuance of a Certificate of Occupancy.

8.2 UNDERGROUNDING

8.2.1 UNDERGROUNDING POLICY

The City Council has implemented an undergrounding policy by adopting Article X, CHAPTER 2 entitled Installation/Relocation for New/Expanded Development of City Ordinance No. 361.

UNDERGROUNDING OF UTILITIES

The public necessity, health, safety, or welfare requires that all permanent existing or proposed electric, communication, or similar or associated services having a nominal voltage less than 66,000 volts be provided underground.

PROHIBITION OF NEW OVERHEAD UTILITIES

No new permanent poles, overhead wires, and associated overhead structures supplying electric, communication, or similar or associated service not required for appropriate maintenance; facility upgrades; maintenance of structural integrity (i.e., guy wires); street lighting system; fire alarm devices; or traffic control apparatus shall be installed.

APPLICABLE TO SUBDIVISIONS

All utilities for on-site and distribution services to all proposed subdivisions, building sites, and structures shall be installed underground. The Developer or Owner is responsible for complying with the requirements of this section and shall make all the necessary arrangements as required by the serving utilities for the installation of such facilities. For the purpose of this section, surface mounted transformers, pedestal mounted terminal meter cabinets, and concealed ducts in underground system may be placed above ground.

DEVELOPER TO BEAR COSTS

When the approval of subdivisions, building sites, and structures requires the improvement of public streets and such street improvements will result in the removal and/or relocation of existing electric communication, or similar or associated utility services, the Developer or Owner shall bear the cost of undergrounding such utility services. The underground portion shall extend to the first utility service pole beyond the limits of the proposed street improvements. This section shall not apply to any projects of 4 or less single-family

residential lots or units or new buildings on any lot which in total do not exceed 50% of the floor area of all existing buildings prior to the effective date of this Ordinance.

LETTER OF COMPLIANCE

Prior to the approval of any final map, parcel map, or development plan, whichever occurs first, the Developer or Owner shall provide the City with a Letter of Compliance from the serving utility.

CONVERSION OF EXISTING OVERHEAD TO UNDERGROUND UTILITIES

All existing overhead utility services serving lots not within the proposed development but served from utility lines which are required to be undergrounded, shall be converted by the Developer to underground service. Nothing in this section shall require the Developer to convert any on-site existing overhead services to underground service on property not within the development.

HARDSHIP

In case of hardship, the requirements may be appealed to the City Engineer. The City Engineer, in cooperation with the serving utilities, may grant exception if he finds that an unusual or hardship case exists. There is no hardship allowance for non-residential developments.

The City Council, from time to time, shall establish a cost of undergrounding above which a hardship is applicable. In these cases, the Developer shall pay to the City this established cost. The City shall use these funds to underground facilities throughout the City.

8.2.2 UTILITY UNDERGROUNDING HARDSHIP PROVISION

To provide a mechanism for allowing exceptions to the Undergrounding Ordinance, the City Council adopted special "hardship" provisions.

- a. The underground fees which a hardship maybe applied are as follows:
 - 1) \$ 750/ dwelling - Zones RR-2.5, RR-1.0, SRR, R-6,000 through R-10,000
 - 2) \$ 600/dwelling - MDR-1 zone
 - 3) \$400/ dwelling - MDR-2 zone
 - 4) \$300/ dwelling - HDR-1 zone
 - 5) \$200/ dwelling - HDR-2 zone
- b. The City may require the installation of conduit and appropriate structures to be placed prior to improvement of the streets. This is to avoid cutting of new streets to install these facilities at a later date. The cost of these facilities shall be a credit toward the cost of undergrounding.

- c. Any existing single-family structure being served by overhead means may continue to be served overhead even when relocating or enlarging the service. This exception shall strictly apply to existing single-family residential structures. All new residential structures will continue to be served underground to the site. All commercial relocations and enlargement of services shall continue to be installed underground.

8.3 STREET OPENING AND PAVEMENT RESTORATION REGULATIONS

8.3.1 NEWLY RENOVATED STREETS

Permission to excavate in newly renovated (capped, overlaid, or sealed) streets will not be granted for 2 years after completion of street renovation. Utilities shall determine alternate methods of making necessary repairs to avoid excavating in newly renovated streets.

Exceptions to the above are as follows:

- a. Emergencies which endangers life or property;
- b. Interruption of essential utility service;
- c. Work that is mandated by the City, State, or Federal legislation;
- d. Service for buildings where no other reasonable means of providing service exists;
- e. Other situations deemed by the City Engineer to be in the best interest of the general public; and
- f. Where boring is not feasible due to technical engineering reasons.

If exception is granted, street excavation shall be governed by the Street Opening and Pavement Restoration Regulation for Non-Moratorium City Streets. Special requirements for pavement restoration may be set at the option of the Director of Public Works.

8.3.2 NON-MORATORIUM STREETS

Pursuant to Section 16.08.050 of Chapter 16.08 of the Highway Permit Ordinance, the Department of Public Works hereby adopts the following regulations pertaining to street excavations:

PERMITS

- a. Except in extreme emergency, street opening permits must be taken out in advance of excavation work. An extreme emergency is considered to exist only when life or property is endangered, or when an essential utility service is interrupted during weekends, holidays or after 5 p.m. or before 8 a.m. of any normal working day. Street opening permits may be taken out by the Owner or Contractor. Permits will state whether or not an annual bond or cash deposit was received.

- b. A plan showing the approximate location of the excavation will be acceptable provided that an as-built plan shall be submitted when the location of the excavation changes substantially from the original plan.
- c. Permits for street opening shall be as specified in Section 16.06.010 of the Highway Permit Ordinance and valid for 60 days. The estimated date of commencement and completion of work shall be indicated on all permits. Conflicts in the schedules of work under two or more permits shall be resolved by the permittees involved, if unresolved, work under these permits will be executed in order of permit applications received by the Department of Public Works.
- d. No permit to excavate shall be valid unless the applicant has been provided an inquiry identification number by a Regional Notification Center (USA) pursuant to Section 4216, Chapter 1153, Assembly Bill #1606 of the California State Law.
- e. A permit inspection fee will be required to cover the costs of inspection and administration.
- f. * A special deposit of \$6 per square foot of surface to be replaced in existing paved streets or alleys, shall be given to the Department of Public Works prior to the issuance of an encroachment permit. No special deposit shall be less than \$600. In lieu of the special deposit, the permittee may make and maintain with the Department of Public Works, a general deposit in the sum of \$6,000. Said deposit shall be cash or cashier's check approved by the Department of Public Works. The amount of deposit for each permit will be deducted from the general deposit. If the amount of outstanding permits equals the general deposit, no further permits will be issued until the general deposit is increased. Once the permanent repair is made and approved by the City, the amount of the deposit for the permit will be reduced to 10% of its regular requirement to cover repairs for the 2-year guarantee period indicated in the regulations. The City will notify the Utility Companies or Contractor when the deposit required for all outstanding permits is over 90% of the value of the general deposit. The cost of plan review, inspection, and processing is not included in the required deposit.

Acceptable forms of the deposit are:

- 1) Cashier's Check
- 2) Cash

- g. * The permittee shall repair all street resurfacing which becomes depressed or broken within 2 years from the date of the original permanent resurfacing. If the repair is not made within 10 days after notification by the Department of Public Works, the Department shall make such repairs and the cost thereof shall be deducted from the cash deposit.

EXCAVATION

- a. All excavated material not suitable for backfilling shall be removed from the job site by the end of each work week. Excavated material suitable for backfilling may be stored on the job site for a maximum of 5 working days, provided it does not occupy any more street space than the permit allows and provided this material is completely prevented from blowing, washing, or being thrown about at all times.
- b. No trench shall be opened in any street for the purpose of laying pipes or conduits more than what the Contractor is capable of installing, backfilling, compacting and restoring the traveled surface by the end of each work day.
- c. For trenches in sidewalks and driveways, excavation shall be to the nearest score line or joint.

BACKFILL

- a. Trenches shall be backfilled with sand or suitable excavated material having a minimum sand equivalent (S.E.) of 20. Backfill below 3 1/2 feet of the street pavement surface shall be compacted to attain a relative compaction of not less than 90%. If the permanent resurfacing will be concrete, See Plan EP-2 and EP-3, Section 11 - Standard Drawings, or if resurfacing is asphaltic concrete, see Plan EP-4.
- b. Clean sand backfill with a minimum S.E. 20 may be flooded or jetted per Section 306-1.3.3 of the Standard Specifications for Public Works Construction. If other methods are used for clean sand fill, compaction shall be per Section 306-1.3.2 of the Standard Specifications for Public Works Construction.
- c. When undermining has occurred, remove existing pavement as required to compact backfill.
- d. Certificates shall be obtained from an independent testing laboratory, or from an authorized permittee approved by the Department of Public Works, verifying that the compaction meets requirements, prior to placement of final resurfacing. Test shall be taken at 300-foot intervals. In trenches less than 25 feet, one test shall be taken. Depth of tests shall range from 4 feet to 1 foot. Tests will be required on all excavations except those excavations backfilled with 1 1/2 sack, sand slurry. The number of tests required will increase if results are poor and decrease if good compaction is consistently obtained.
- e. The Public Works Engineering Inspection Section, telephone no. (805) 723-6040, shall be notified 1 day in advance of any backfilling and paving work. A permit number must be provided for each notification to the Public Works Engineering Inspection Section. The City Inspector must approve the paving.

PAVING

- a. Two inches of asphalt shall be placed and maintained on all trenches at the close of each day. Compaction of backfill to 90% or 95% (See Plan EP-1) relative density shall be certified by a Soil Testing Laboratory and test results given to the City Inspector prior to placement of final resurfacing. Permittee may provide his own tests if approved by the Director of Public Works. Temporary resurfacing shall be per Section 306-1.5.1 of the Standard Specifications for Public Works Construction.
- b. Trenches shall be permanently paved as shown on Plan EP-2, EP-3, or EP-4. Sawcutting of the existing pavement shall be neat, straight lines to allow for proper placement of the new pavement section. Damaged pavement outside of the original trench cut lines shall be removed by sawcutting in lines perpendicular to, or parallel to, the original trench lines. No diagonal cuts will be allowed. Undamaged pavement of 3 feet or less between the edge of gutter or shoulder shall also be removed.
- c. Pavement may be restored using the T-section shown on Plan EP-3. For trenches parallel to the centerline of the street, and greater than 300 feet in length, the 1 1/2 inch asphalt concrete wearing surface shall extend across the entire lane.
- d. Trenches in concrete streets shall be paved with concrete pavement. The thickness of the new pavement shall be equal to the thickness of the existing pavement, with a maximum thickness of 12 inches and a minimum thickness of 6 inches in the roadway and 3 1/2 inches in the sidewalk.
- e. Trenches in streets or sidewalks that are constructed of special material or color shall have the pavement of sidewalk replaced in kind. A sample of each special material and 3 samples of each color shall be submitted for approval prior to the start of work.
- f. Concrete base in roadway trenches on Secondary Arterial streets and greater shall be fast curing and placed within 1 1/2 inches of the finish pavement grade. Concrete base shall be vibrated and leveled off so that no lumps or uneven surfaces will result that will carry through to the new asphalt paving. Concrete shall be cured for at least 4 hours before traffic is allowed on it and, if poured after twelve noon, the opening shall be covered with steel plates.
- g. Permanent pavement shall be restored within 30 working days from the time the newly constructed utility line or structure is tested and certified. If Plan EP-3 is used, the asphalt concrete wearing surface shall be placed on the concrete base in a trench within 2 working days after placement of concrete base, weather permitting.
- h. Prior to placing permanent asphalt concrete, the existing asphaltic concrete shall have a vertical face so that new asphalt concrete paving can be butt joined. No feathering of new paving to existing paving is allowed. Before placement of new asphalt concrete pavement in trenches, the base surface shall be blown or swept clean and a tack coat of SS-1h applied. On trenches of 4 feet or more, placement of new asphalt concrete should be

done by a paving machine or spreader box in order to eliminate the uneven wash-board effect that results from hand spreading. Asphalt concrete should be delivered and compacted in accordance with Section 306-1.5.2 of the Standard Specifications for Public Works Construction (Use 3/4" aggregate for base course and 3/8" aggregate for top course).

- i. Asphalt pavement shall be compacted to obtain a minimum relative compaction of 95%. The asphalt concrete wearing surface will be smooth enough so that there is no irregularity greater than 1/2 inch in 10 feet in any direction. All edges shall be hot ironed. Asphalt concrete pavement 3 inches in thickness or greater shall be installed and compacted in 2 equal lifts. Finish surface shall match existing (chip seal, etc.).
- j. Steel plates may be used to protect the excavation until finished pavement is restored. Steel plates used to bridge a street opening shall be ramped to the elevation of the adjacent pavement and secured against movement in any gradual direction. Temporary ramps shall be 3 feet wide and shall be constructed of asphalt and shall have a gradual slope. Steel plates shall be removed and temporary or permanent paving shall be installed within 24 hours or longer, as approved by the City Inspector.
- k. Utility trenches shall be color coded with a 2-inch painted mark at the beginning and end of each trench and at each intersection when paving is completed, at the discretion of the City Inspector. The colors assigned are as follows:

Southern California Edison Company	(red)
General Telephone Company	(orange)
Water Department	(blue)
Cablevision	(green)
Street Repair	(white or silver)
Southern California Gas Company	(yellow)
City of Lancaster Traffic Signal	(fluorescent red)

- l. Curb Ramps, as shown on A.P.W.A. Standard Plan 111-1 (or revised update thereof) or City of Lancaster Standard Plan PW-2.1, shall be constructed where any portion of the curb at the legal pedestrian crosswalk or any portion of the sidewalk in immediate contact with such curb is removed, except where there is an existing curb ramp in the crosswalk.

COMPACTION

Compaction and/or soil tests are required for the backfill prior to placement of permanent resurfacing. These must be provided by a testing laboratory or an authorized permittee. In order to be authorized to provide these tests, the Contractor's personnel and equipment to be used must have prior approval by the Department of Public Works. No compaction tests will be required when sand slurry is used for backfill.

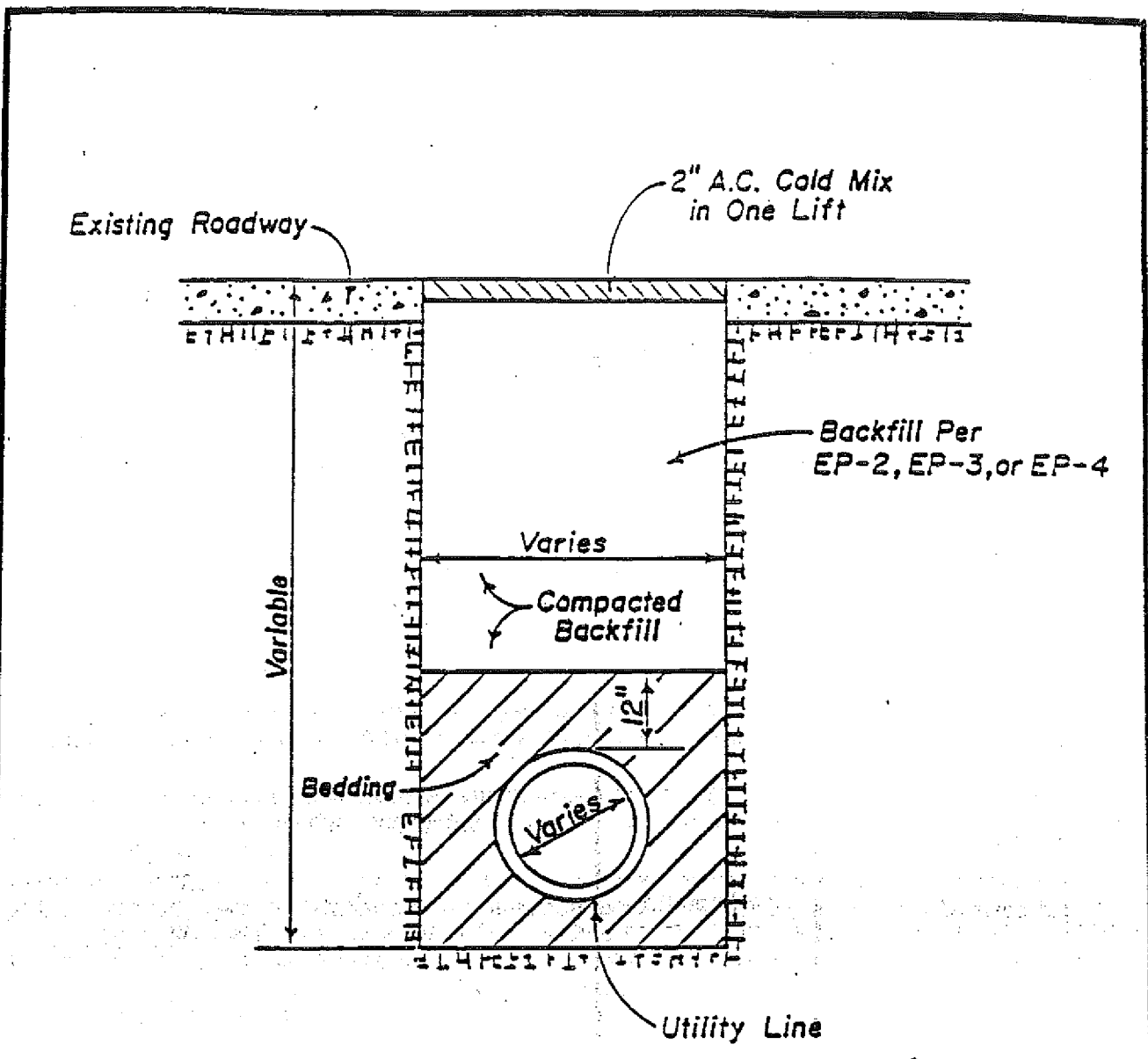
DEFECTS

- a. Depressed trench pavement shall be repaired as follows:
 - (1) Wearing surface defect - remove and restore wearing surface
 - (2) Major defects - excavate, remove and restore surface and base
 - (3) The severity of the defect will be determined by the Public Works Engineering Inspector.
- b. Work not complying with the above requirements will be rejected, removed, and redone to the satisfaction of the City Engineer.

MISCELLANEOUS

- a. Street excavation signs or barricades shall be installed at the project site at least 2 days in advance of any construction work lasting 5 days or more. Signs and barricades shall be required during the progress of the work and as indicated above.
- b. Standard Specifications and Regulations for working in the City of Lancaster streets will apply for any regulations not covered in this order.
- c. Any violation of the above regulations may result in revocation of the street opening permit and/or be subject to a police citation or fine.

It is necessary to decide prior to the temporary repair whether the permanent repair will be asphalt or concrete. Approved native soil may be used for concrete repairs as shown on Plan EP-2 or EP-3. One and one-half sacks of sand slurry or crushed aggregate base must be used for permanent asphalt repairs as shown on Plan EP-4.



Temporary A.C. Pavement shall be placed per Sec. 306-1.5.1 of the Standard Specifications for Public Works Construction.

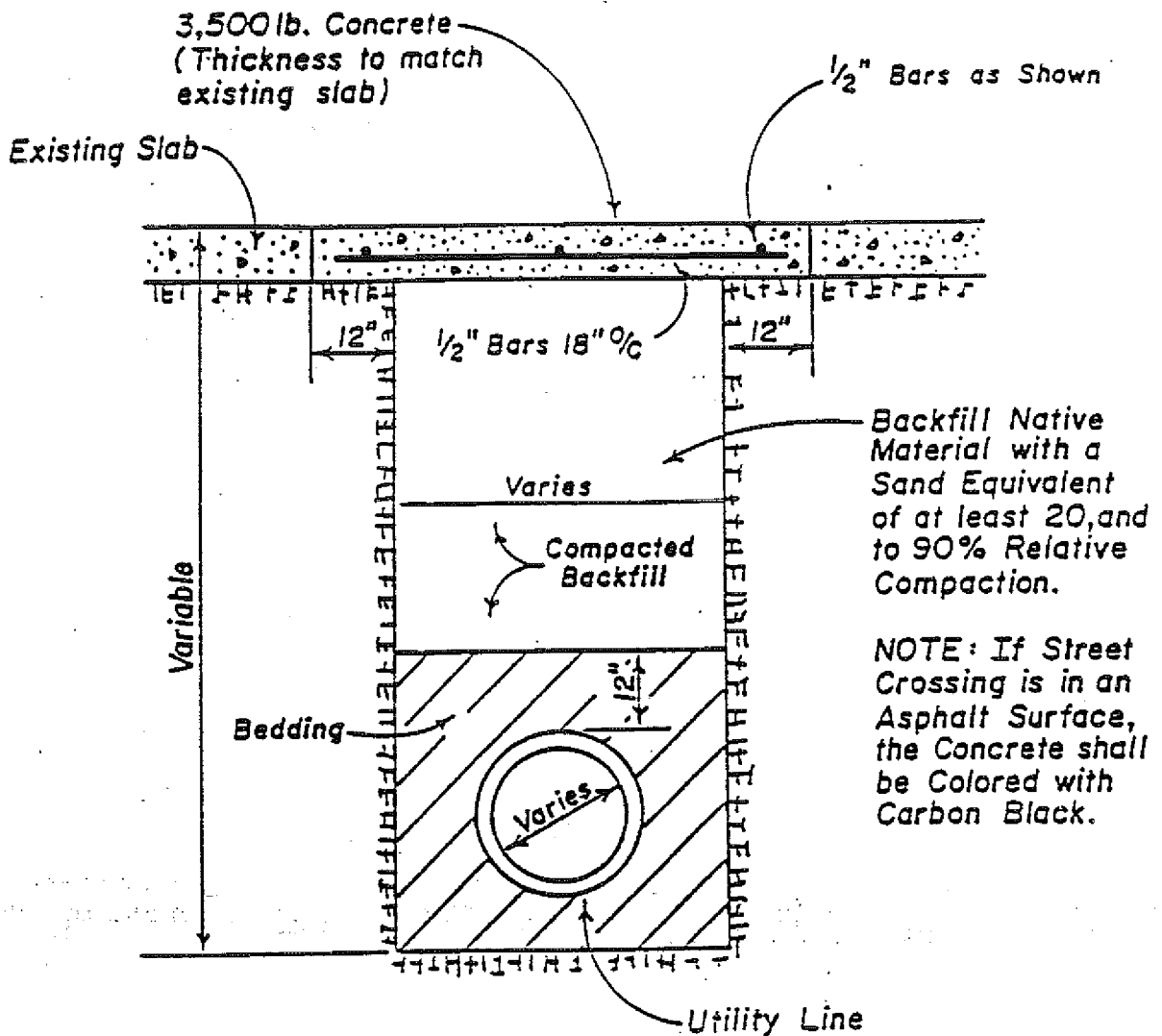
TEMPORARY

CITY OF LANCASTER

ASPHALT REPAIR (TEMPORARY)

PLAN
EP-1

APPROVED *John S. Long* 16 Dec 88
DIRECTOR OF PUBLIC WORKS DATE



Compaction Shall be Certified

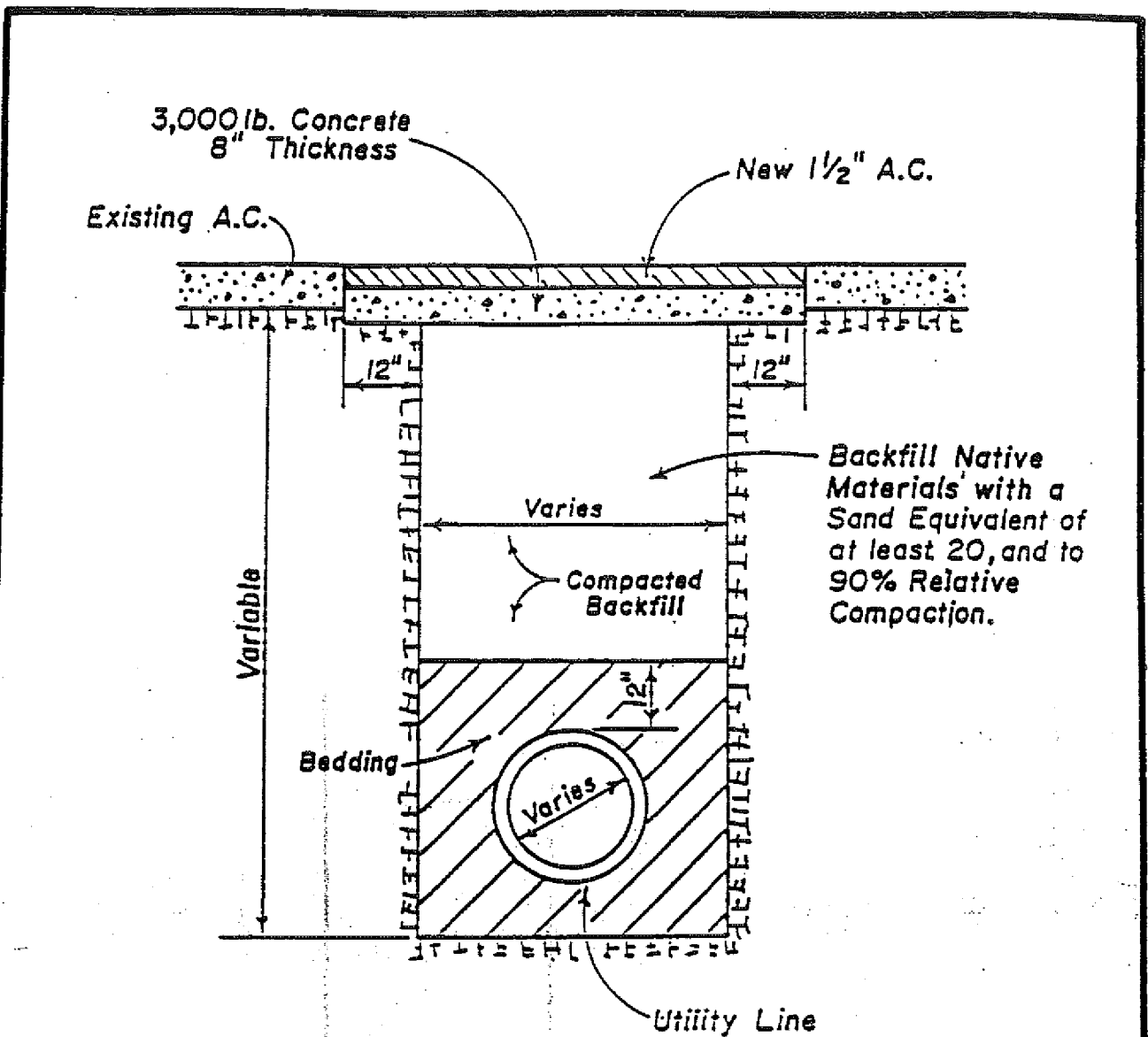
SPECIAL NOTICE:
 If the Trench has been Excavated Closer than 12" to the Sawn Edge of the Street, the Concrete Shall be Resawn to provide 12" of Undisturbed Earth Prior to Paving.

CITY OF LANCASTER

PERMANENT REPAIR OF
 EXISTING STREETS AND ALLEYS

PLAN
 EP-2

APPROVED *John L. ...* 16 Dec 88
 DIRECTOR OF PUBLIC WORKS DATE



CONCRETE OPTION #1

CITY OF LANCASTER

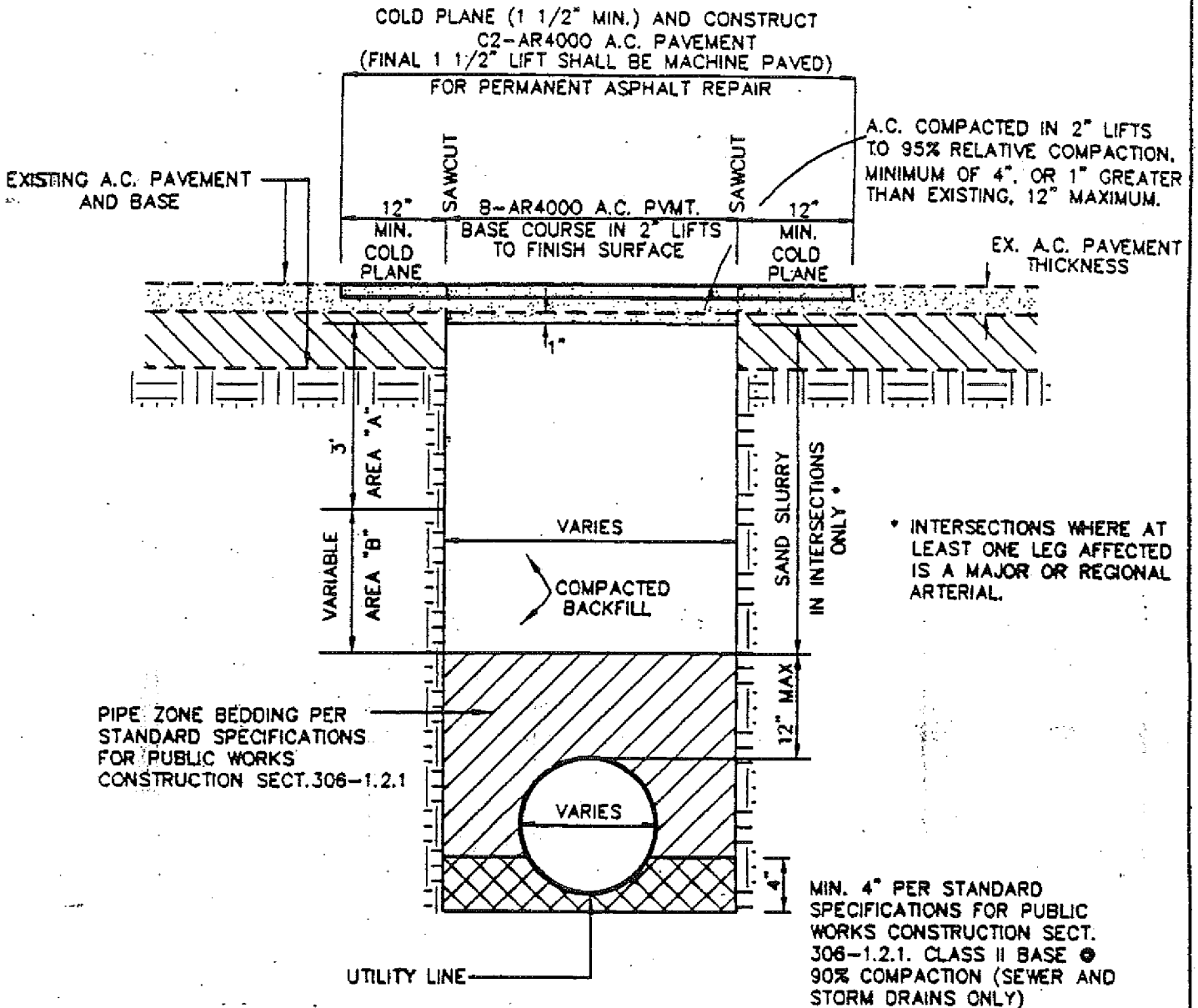
PERMANENT REPAIR OF
EXISTING STREETS AND ALLEYS

PLAN
EP-3

APPROVED

[Signature]
DIRECTOR OF PUBLIC WORKS

[Signature]
DATE



AREA "A"- BACKFILL SHALL BE 1 1/2 SACK SAND SLURRY (NO CERTIFICATION REQUIRED), OR CRUSHED AGGREGATE BASE. IF CRUSHED AGGREGATE BASE IS USED IT SHALL BE MECHANICALLY COMPACTED TO 95% RELATIVE COMPACTION AND BE CERTIFIED. (SEE "*" NOTE FOR INTERSECTIONS).

AREA "B"- BACKFILL NATIVE OR IMPORT MATERIAL WITH A SAND EQUIVALENT OF AT LEAST 20. MECHANICALLY COMPACTED TO 90% RELATIVE COMPACTION, (SEE "*" NOTE FOR INTERSECTIONS).

**PLAN
EP-4**

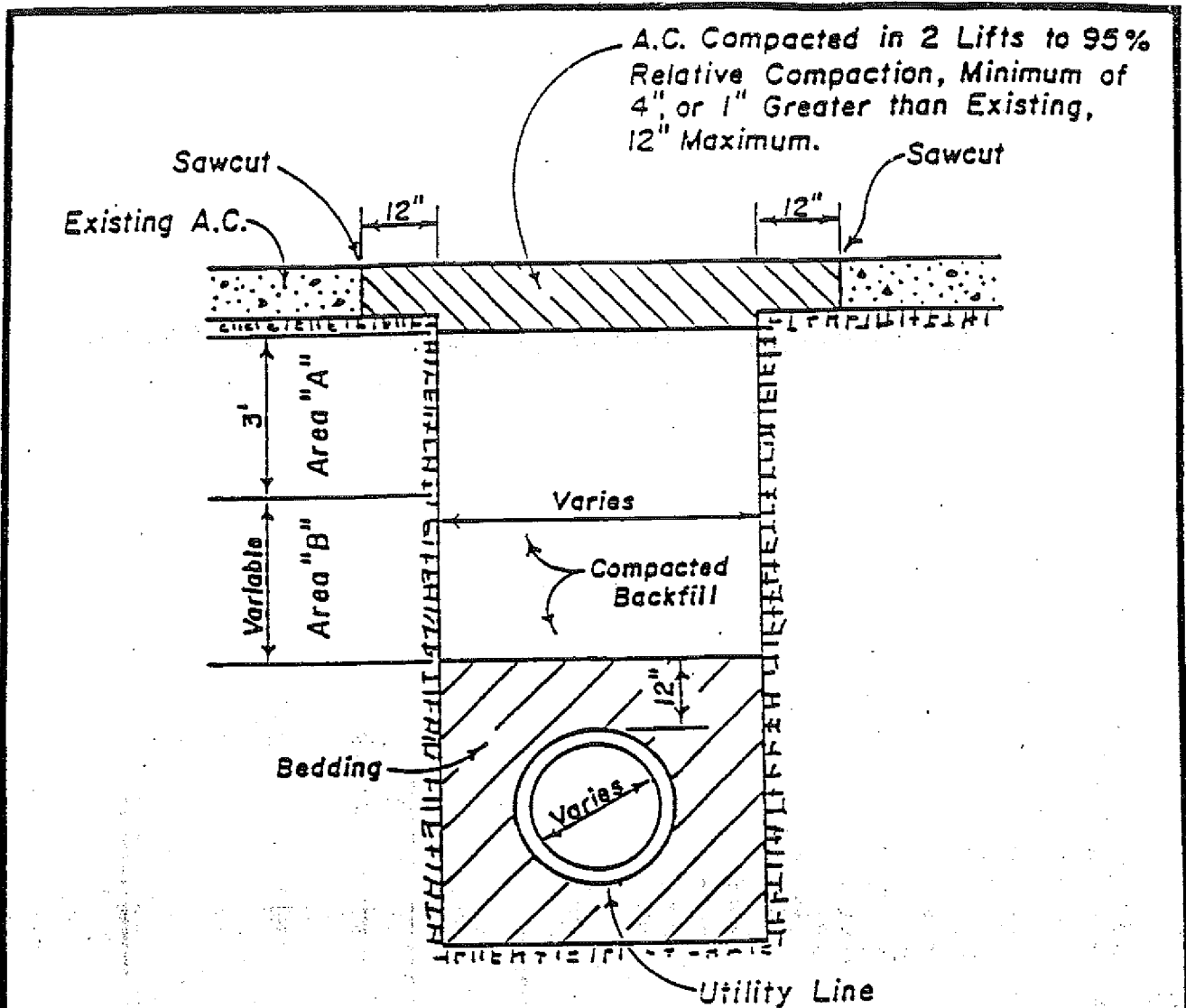
REVISION DATE: MARCH 18, 1998

SUBMITTED *[Signature]* 3-19-98
CITY ENGINEER DATE

CITY OF LANCASTER
DEPARTMENT OF PUBLIC WORKS

APPROVED *[Signature]* 24/MAR/98
DIRECTOR OF PUBLIC WORKS DATE

CONSTRUCTION OF UTILITY TRENCHES
IN EXISTING STREETS AND ALLEYS



Area "A" - Backfill Shall be 1/2 Sack Sand Slurry (No Certification Required), or Crushed Aggregate Base. If Crushed Aggregate Base is used it Shall be Compacted to 95% Relative Compaction and be Certified.

Area "B" - Backfill Native Material with a Sand Equivalent of at least 20, and to 90% Relative Compaction.

FULL DEPTH A.C. - OPTION # 2

CITY OF LANCASTER

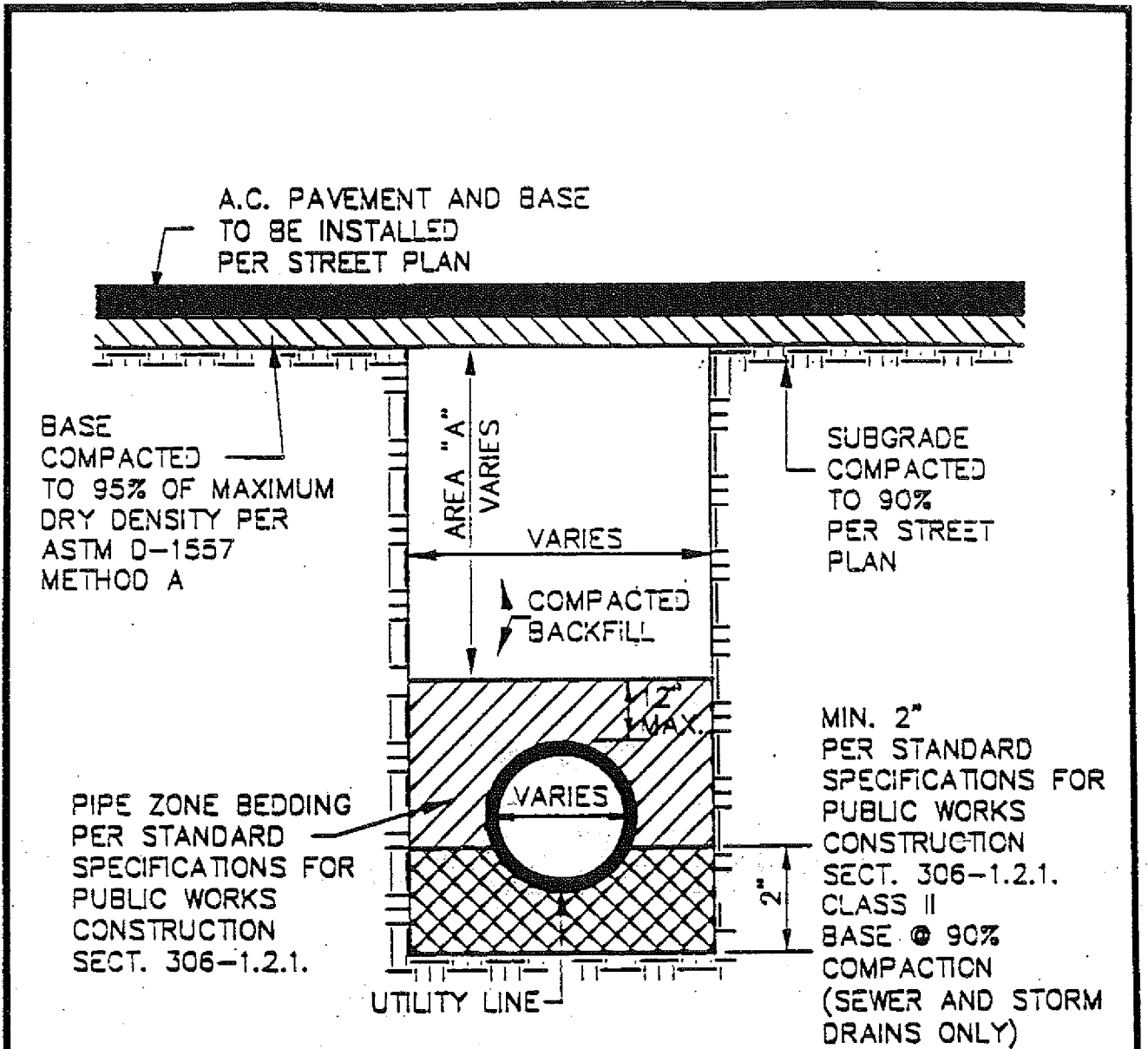
PERM. REPAIR OF EX. STREETS & ALLEYS
VERTICAL TRENCHES ONLY

PLAN
EP-4

APPROVED

Cheryl L. Lane
DIRECTOR OF PUBLIC WORKS

16 Dec 88
DATE



AREA "A" - SUITABLE BACKFILL NATIVE MATERIAL, AS PER STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION SECT. 306-1.2.1., TO 90% RELATIVE COMPACTION OF THE MAXIMUM DRY DENSITY, PER ASTM D-1557, METHOD A.

PLAN
EP-5

4-8-92

SUBMITTED *[Signature]* 11-18-92
DATE

CITY OF LANCASTER
DEPARTMENT OF PUBLIC WORKS

APPROVED *[Signature]* *[Signature]*
DIRECTOR OF PUBLIC WORKS DATE

CONSTRUCTION OF UTILITY TRENCHES
PRIOR TO STREET CONSTRUCTION

8.4 PUBLIC IMPROVEMENTS THROUGH ASSESSMENT PROCEEDINGS

Assessment Districts are formed to: a) finance the construction of public capital improvements such as streets, drainage facilities, sanitary sewers, water systems, and off-street parking facilities; b) acquire existing improvements; and c) where authorized, to pay the annual operation and maintenance costs of certain public facilities.

When districts are formed to build capital improvements, bonds are usually sold and their proceeds used to pay the cost of construction, right-of-way acquisition, and incidental expenses. The debt service is paid over the term of the bonds for the annual installments of principal and interest received from the assessments levied.

The City can make contributions to an assessment district to represent the general public's benefit, such as for the additional lanes of a major highway, or for excess capacity provided in utility facilities beyond that required to serve the district, and for which the City may be reimbursed as future connections are made.

8.4.1 ASSESSMENT DISTRICT FINANCING

Assessment district financing has several attractive features. These may include some or all of the following:

- a. Financing costs are relatively low compared to private financing.
- b. Larger construction projects may be feasible, possibly resulting in lower unit prices and the spreading of fixed costs over several owners.
- c. Each benefited party pays his fair share of the costs.
- d. Each property owner can decide if he is willing to incur the cost in return for the benefit he will receive. Inadequate support by the owners can abandon the project.
- e. An entire improvement can be accomplished in a single contract in a short period of time.

8.4.2 PRELIMINARY PROCEEDINGS

- a. Property owners file a request to the City for improvements under the provisions of the Municipal Improvement Act of 1913 and the Improvement Bond Act of 1915 of the California Streets and Highways Code. The request form is available at the Engineering public counter at City Hall. A non-refundable filing fee is due at the time the request is filed.
- b. Council authorizes the circulation of petition, approves a Resolution instituting proceedings and the Engineering Division prepares preliminary drawings, cost estimates and petition letter.
- c. A petition letter, signed by at least 60% of the owners in the proposed assessment district, must be received by the City Clerk on or before the set deadline.

- d. The Project Engineer prepares an Engineer's report comprised of a plan, cost estimate, diagram map and assessment roll. Upon completion, it is presented to the City Council for adoption.
- e. The City Council adopts the Engineer's report and the Resolution of Intention indicating its intention to form a special assessment district for the construction of the proposed improvements.
- f. Following the adoption of the Engineer's Report and Resolution of Intention, each property owner is given notice by mail setting the date of the public hearing. These notices are sent to the property owners prior to the date of public hearing
- g. If protested, the Council will either order modification of the project so as to be acceptable to all concerned or the Council will abandon the project.
- h. If approved either in its original form or modified form, the plans and specifications will be advertised for bid.
- i. The project will be awarded to the lowest responsible bidder.
- j. Construction begins within a short time after the award of the contract.

8.4.3 RIGHT- OF-WAY

For most assessment improvement projects, each property owner is requested to grant any needed right-of-way or easement to the City for free. Should the City have to pay for the easement, or initiate eminent domain proceedings, the property owner from whom the easement is acquired will be assessed for the costs of acquiring the right-of-way, in addition to the normal assessment costs.

8.4.4 CONSTRUCTION

Construction begins shortly after the award of the contract. The Contractor's work will be inspected regularly and must conform to the Plans and specifications.

8.4.5 PAYMENT PROCEDURES

- a. Written notice of Final assessment will be mailed to the property owners. The total project cost includes the cost of surveying, engineering, right-of-way acquisition, assessment work, legal work, bond sales and incidental costs. The cost is then spread proportionally over every parcel of land within the district that will benefit from the improvements.
- b. The owners will have 30 days to pay the assessment in cash, check or money order either for the full amount or in part. The unpaid amount should not be less than \$50.

- c. The City will then issue assessment bonds under the proceedings of Improvement Bond Act of 1915 for the remaining unpaid assessment.
- d. Billings thereafter will be on the County Tax bill and will be referred to as a Special Assessment thereon.
- e. The assessment will be paid over a period of 20 years for this project. The owner at any time thereafter, may elect to pay the outstanding bond by payment of the current principal balance and the interest for that 6 month period.
- f. The bonds, when sold by the City to the public, will have an interest rate determined by the bidding process. The interest rate cannot exceed 12% per annum.

8.5 FEDERAL EMERGENCY MANAGEMENT AGENCY

The Federal Emergency Management Agency (FEMA) works with the state and local communities to identify flood hazard areas. FEMA publishes maps indicating the flood hazard areas and degrees of risk. Flood maps are on display at the Engineering Counter at the City Hall. A free copy of the Flood Insurance Rate Maps (FIRM's) are available free to property owners by calling toll free at (800) 358-9616.

8.5.1 FLOOD HAZARD ZONES

Special attention is required in the design and construction of proposed development in flood hazard zones to ensure that construction materials and methods used will minimize extensive flood damage to properties.

Flood hazard areas and flood levels are determined on the basis of records of river flow and rain data, information obtained through consultation with the community, and hydrologic and hydraulic analyses. These flood hazard areas are subdivided into flood hazard zones (insurance risk rate zones) according to the following criteria:

ZONE V

Special flood hazard areas along coasts inundated by the 100-year flood, as determined by approximate methods, and that having additional hazards due to velocity (wave action) and no base flood elevations are shown or flood hazard factors determined.

ZONE V1-30

Special flood hazard areas along coasts inundated by the 100-year flood as determined by detailed methods, and that have additional hazards due to velocity (wave action); base flood elevations are shown and zones subdivided according to flood hazard factors.

ZONE A

Special flood hazard areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations are shown or flood hazard factors determined.

ZONE AO

Special flood hazard areas inundated by types of 100-year shallow flooding where depths are between 1 and 3 feet; depths are shown, but no flood hazard factors are determined.

New construction and substantial improvement in Federal Emergency Management Agency (FEMA) "AO" flood zones in the City of Lancaster shall have the lowest floor (including basement) elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's applicable Flood Insurance Rate Map (FIRM), at least two feet if no depth number is specified. An Elevation Certificate shall be completed.

"Highest adjacent grade" means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

ZONE AH

Special flood hazard areas inundated by types of 100-year shallow flooding where depths are between 1 and 3 feet; base flood elevations are designated, but no flood hazard factors are determined.

ZONE A1-30

Special flood hazard areas inundated by the 100-year flood, determined by detailed methods; base flood elevations are shown and zones subdivided according to flood hazard factors.

ZONE A99

Special flood hazard areas inundated by the 100-year flood which will be affected by a flood protection system where adequate progress has been made toward completion; no base flood elevations are shown or flood hazard factors determined.

ZONE B

Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.

ZONE C

Areas of minimal flood hazard

ZONE D

Areas of undetermined but possible flood hazard

FLOOD INSURANCE RATES AND FLOOD PLAIN MANAGEMENT MEASURES WILL VARY DEPENDING ON THE ZONE.

8.5.2 NATIONAL FLOOD INSURANCE PROGRAM

The National Flood Insurance Program (NFIP) is a federal program enabling property owners to purchase flood insurance. Congress established the NFIP with the passage of the National Flood Insurance Act of 1968. It was created to mitigate future damage and provide protection to property owners against potential losses. The flood insurance program is designed to reduce high costs of property damage caused by floods and is generally unavailable from private sector insurance companies. The program is based on an agreement between local communities and the federal government that if the community implements programs to reduce flood risks, the federal government will make flood insurance available within the community as a financial protection against flood losses.

8.6 NUISANCE WATER

8.6.1 NUISANCE WATER POLICY

In an effort to eliminate some of the nuisance water problems throughout the City, the following policies are implemented by the City Council:

1. All new developments are required to carry water to nearest existing carrier of water by means of concrete curb and gutter or other City approved method. This procedure will reduce the off-site areas being subject to ponding and breeding of mosquitoes.
2. As part of regular maintenance program, the Public Works Department shall regrade existing roadside ditches in an effort to eliminate stagnant water conditions.
3. Investigate and install seepage pits primarily on the east side of the City or where seepage pits will work effectively. The U.S.D.A. Antelope Valley Soil Survey does indicate this as a possible solution in a small portion of the City.
4. To avoid nuisance water interference safety problems in traffic areas, the following guidelines shall be considered:
 - (1) Construct concrete swales or cross drains when appropriate in high traffic area intersections to eliminate continual maintenance
 - (2) Reconstruct areas having icing problems using resistant asphalt or concrete products adjacent to the concrete swales

- * Cross gutters shall not be permitted across regional, primary, and/or (in most cases) secondary arterials or any street intersecting said streets. An underground conveyance facility shall be provided to the satisfaction of the City Engineer.

8.7 ABANDONED PLANS POLICY

8.7.1 "ABANDONED" AS IT RELATES TO:

A. APPROVED SUBDIVISION PLANS

When a final map has been approved by the City Council for recordation, securities and undertaking agreements have been submitted and accepted by the City, the improvement plans have been reviewed and approved by the City (signed plans), the improvement plans shall be deemed "abandoned" if construction has not commenced within two years. (The time the subdivision agreements are subject to extension.)

B. APPROVED NON-SUBDIVISION PLANS

Improvement plans for all non-subdivision projects, such as C.U.P.'s, S.P.R.'s, and permits that have been approved by the City (signed plans) shall be deemed "abandoned" if construction has not commenced within one year of the approval date of the plans.

C. UNAPPROVED PLANS

When improvement plans have been submitted to the City for checking and the checking process is interrupted for a period of one year or more the plans shall be deemed "abandoned".

8.7.2 REVIEW FEE FOR RE-SUBMITTAL OF ABANDONED PLANS

A. APPROVED SUBDIVISION PLANS

Plans deemed to be "abandoned," shall be re-reviewed by City staff prior to permits being issued or reissued.

An additional plan check fee of 25% of the total current plan check fee calculation will be required from the developer for the recheck. Credits may be allowed for any previous inspection fees paid against the current inspection fee calculations. Any necessary changes to the plans will be made and the plans re-signed by the City. Bonds are subject to review and modification as deemed necessary by City staff. This shall require new bond estimate forms to be submitted.

B. APPROVED NON-SUBDIVISION PLANS

Plans deemed abandoned for projects covered under 1B above will require an additional plan check fee of 25% of the total current plan check fee calculation. Credits may be allowed for any previous inspection fees paid against the current inspection fee calculations. Any necessary changes to the plans will be made by the private engineer and the plans re-signed by the City. Bonds are subject to review and modification as deemed necessary by City staff. This shall require new bond estimate forms to be submitted.

C. UNAPPROVED PLANS

Plans abandoned per 1C above shall pay plan check fees as if the project were new. The plan checking process shall start over. Fees will be paid prior to acceptance of the plans for checking. Fees will be in accordance with the current fee schedules with no credit for fees paid with prior/original submittal. A complete submittal package will be required.

8.7.3 RE-REVIEW OF ABANDONED PLANS

Minimum items to be checked:

1. Notes - must reflect current City requirements.
2. Details - must reflect current City requirements.
3. Design - will be checked for compliance with current standards & compatibility with adjacent or nearby development plans.
4. Policy - general improvements will be checked for compliance with current City policy (drainage, walls, grades, etc.).
5. Bonds - shall require updating based on the above items; additional improvements will be bonded at the City's current bonding unit costs. Posting of bonds or securities if not previously posted.

8.7.4 ABANDONED PLANS NOTE

The following note shall be placed on every cover sheet of City-approved improvement plans:

When improvement plans have been submitted to the City for checking and the checking process has been interrupted for a period of one year or more, the plans shall be deemed abandoned. Approved improvement plans shall be deemed abandoned if construction has not commenced within two years of the latest approval date. If construction is interrupted for a period of one year or more, the plans shall be deemed abandoned. Abandoned plans shall be re-reviewed and all fees shall be paid in accordance with the City's Abandoned Plans policy prior to any permits being issued.

8.7.5 ABANDONED PLANS RENEWAL PROCEDURE

The following steps are necessary to renew abandoned plans:

1. Complete "Application for Abandoned Plans Renewal". Pick up the form from City Subdivision Section personnel.
2. Submittal of the appropriate number of blueprints and any other requested information for checking.
3. Upon approval of the plans cost estimate, etc., posting of bonds, the plans will be assigned by City staff.
4. Payment of required fees to City of Lancaster and other agencies as needed.
5. When all approvals have been completed, fees paid, bonds posted, and required print sets submitted, the appropriate permits may be issued.

8.8 MAINTENANCE DISTRICTS

8.8.1 SUBMITTAL REQUIREMENTS

Submittals for annexation into the Landscape Maintenance District (LMD), Lancaster Lighting Maintenance District (LLMD), and Drainage Maintenance District (DMD) shall comply with the requirements of the latest Maintenance District Submittal Requirements Packet available upon request from the Engineering plan checker.