

MODESTO CITY STANDARD SPECIFICATIONS

Design Sections

- 00 Design Index
- 01 Design General
- 02 Design Maps & Improvements
- 03 Design Streets
- 04 Design Storm Drainage
- 05 Design Sanitary Sewer
- 06 Design Water
- 07 Design Street Light
- 08 Design Non-city Utility
- 08A Fiber Optic Design
- 09 Design Survey
- 10 Design Driveway Access
- 11 Design Grading
- 14 Design Demo
- 15 Design Estimates
- 16 NPDES
- 20 Design Walls
- 21 Development Processes

Design Appendices

- APP A-Design CAD Standards
- APP B-Construction Notes
- APP C-Bonding
- APP D-Review Checklist
- APP Dc-Commercial Review Checklist
- APP F-SS design procedure
- APP G-SD Design Example
- APP H-Private Developments
- APP I-Private Fire Water
- APP J-Village Sewer
- APP K-Easement Deeds
- APP L-Water Outside City
- APP M-Water_Sewer Separation
- APP N-NPDES
- APP O-Fiber Optics Permit
- APP O-Fiber Optics questionnaire
- APP P-Outdoor_Washing_Facilities
- APP Q_Digital_File_Req
- APP R-Outside Service Agreements

Standards Section

- 00 Standards Index
- 01 Standards Safety
- 02 Permitting
- 03 Standards Street
- 04 Standards Storm
- 05 Standards Sanitary
- 06 Standards Water
- 07 Standards Lighting
- 08 Utilities
- 11 Standards Earthwork
- 12 Standards Landscaping
- 13 Standards Irrigation
- 17 Standards Adj of MH
- 18 Standards Traffic Signals
- 19 Standards Emergency Vehicle

Standard Details

- 0000 Standard Details Index
- 0100 Safety
- 0200 Cad Standards
- 0300 Streets /Traffic
- 0400 Storm Drain
- 0500 Sewer
- 0600 Water
- 0700 Lighting
- 0800 Utilities
- 0900 Survey
- 1000 Driveways/Access
- 1100 Earthwork
- 1200 Landscaping

General Provisions

- 00 Index
- 01 Definittins and Terms
- 02 Award and Execution of Contract
- 03 Nature of Contract/Changes in Work
- 04 Control of Work
- 05 Control of Materials
- 06 Utilities
- 07 Legal Relations and Responsibilities to the Public
- 08 Prosecution and Progress
- 09 Measurement and Payment

City of Modesto



Engineering & Transportation Department

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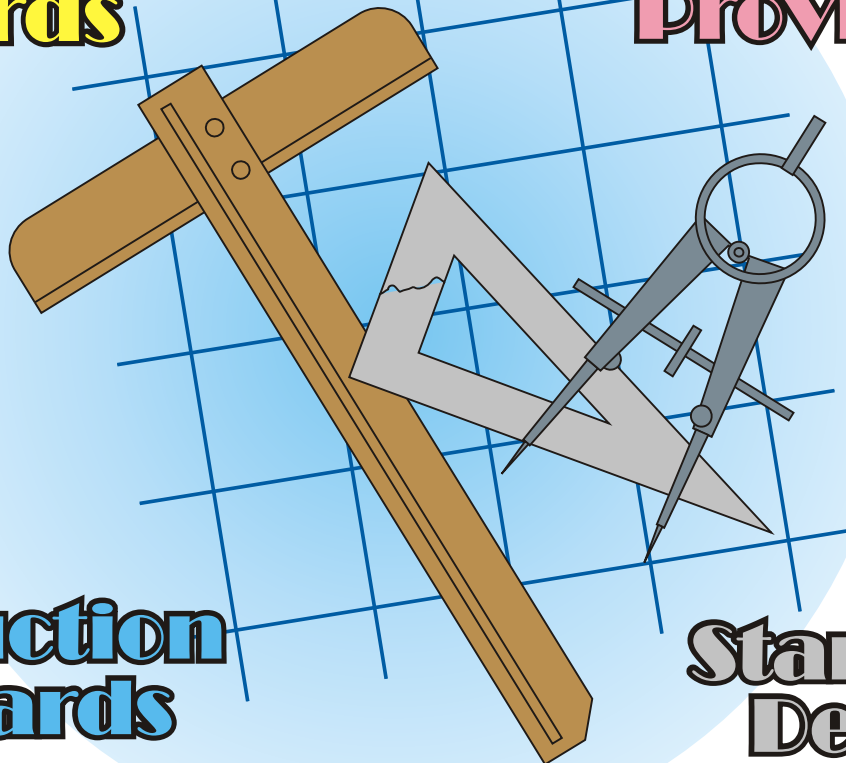
STANDARD SPECIFICATIONS

**Design
Standards**

**General
Provisions**

**Construction
Standards**

**Standard
Details**



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2001 Edition

Planning Commission Resolution # 2001-58, September 17, 2001
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INDEX

ENGINEER DESIGN STANDARDS

<u>SECTION</u>		<u>PAGE</u>
1	GENERAL	
1.01	Purpose and Intent.....	1-1
1.02	Scope.....	1-1
1.03	Design	1-1
1.04	Final Authority.....	1-1
1.05	Definitions.....	1-1
2	MAPS AND IMPROVEMENT PLANS	
2.01	General.....	2-1
2.02	Preparation	2-1
	A. Dimensions.....	2-1
	B. Drafting Specifications.....	2-1
	C. Improvement Plan Format.....	2-2
	D. Final Maps.....	2-7
	E. Checklist (Appendix D).....	2-8
2.03	Submittal	2-8
	A. Improvement Plans	2-8
	B. Final Map Package	2-10
	C. Submittal For Grading Permit.....	2-10
	D. Subsequent Plan Submittals.....	2-11
2.04	CFF, CFD, City Utilities, & Other Reimbursables.....	2-12
2.05	City Engineers Signature Block.....	2-12
2.06	Record Drawings	2-13
2.07	As-built Drawings.....	2-13
3	STREET DESIGN	
3.01	General.....	3-1
3.02	Pavement Design	3-2
3.03	Streets Rights-of-way/Easements	3-3
3.04	Subdivision Boundaries	3-4
3.05	Horizontal Alignment	3-5
3.06	Vertical Alignment.....	3-5
3.07	Sidewalks, Curbs and Gutters	3-6
3.08	Bollards	3-8
3.09	Curbed Medians	3-8
3.10	Bus Turnout	3-9
3.11	Driveway Standards	3-9

3. STREET DESIGN (cont'd)

3.12	Open-Ended Culdesacs	3-9
3.13	Alleys	3-10
3.14	Intersections	3-10
3.15	Street Survey Monuments	3-11
3.16	Design Speed	3-11
3.17	Street Striping	3-11
3.18	Signing and Barricades	3-12
3.19	Undergrounding of Utilities	3-12
3.20	Standard Locations of Utilities	3-12
3.21	Relocating Existing Irrigation Lines	3-13
3.22	Fire Department Standards for Private Streets & Developments	3-13

4. STORM DRAIN DESIGN

4.01	General	4-1
4.02	Submittal of Drainage Calculations	4-2
4.03	Hydrology Calculations	4-3
4.04	Pipe Materials	4-3
4.05	Cover Requirements	4-4
4.06	Horizontal Alignment	4-4
4.07	Drainage Structures	4-5
4.08	Easements	4-5
4.09	Miscellaneous Items	4-6
4.10	Detention Basins	4-6

5. SANITARY SEWER DESIGN

5.01	General	5-1
	A. Definition of Sewer Lines (MMC)	5-1
	B. Submittal Map & Calcs	5-1
	C. Line Size and Service Policy	5-2
	D. Right-of-way Policy	5-2
	E. Service Policy	5-3
	F. Septic Tank Policy	5-3
	G. Fly Line Policy	5-3
5.02	Flow	5-3
5.03	Velocity	5-5
5.04	Vertical Alignment	5-6
5.05	Horizontal Alignment	5-6
5.06	Pipe Materials	5-7
5.07	Sewer Laterals	5-7
5.08	Manholes	5-9

5. SANITARY SEWER DESIGN (cont'd)

5.09	Pump Systems	5-10
5.10	Village One PVC Standard Specifications	5-15

6. WATER SYSTEM DESIGN

6.01	General	6-1
6.02	Layout of Mains	6-1
6.03	Vertical Alignment	6-1
6.04	Horizontal Alignment	6-2
6.05	Pipe Size and Material	6-2
6.06	Water Service	6-3
6.07	Fire Hydrants	6-3
6.08	Valves	6-4
6.09	Blow-Offs	6-5
6.10	Thrust Blocks	6-5
6.11	Easement Requirements	6-5
6.12	Private Water System Design for Fire Protection	6-5

7. STREETLIGHT DESIGN

7.01	General	7-1
7.02	Spacing, Intensity and Mounting Heights	7-1
7.03	Pole Height and Arm Length	7-2
7.04	Location of Streetlights	7-2
7.05	Pull Boxes	7-3

8. NON-CITY UTILITY DESIGN

8.01	General	8-1
8.02	Layout of Utility or Joint Trench	8-1
8.03	Vertical Alignment	8-1
8.04	Horizontal Alignment	8-1
8.05	Overhead Utility Lines	8-1
8.06	Fiber Optics	8-3

8A. FIBER OPTIC DESIGN

8.01A	Design	8A-1
8.02A	Layout of Fiber Optics	8A-1
8.03A	Vertical Alignment	8A-2
8.04A	Horizontal Alignment	8A-2
8.05A	Encroachment Permit Requirements	8A-3

9. SURVEY STANDARDS

9.01	Parcel Maps.....	9-1
9.02	Subdivision Maps	9-2
9.03	Specifications for Surveys on the California Coordinate System 1983 Based on the NAD 83 Datum.....	9-2
9.04	Vertical Datum.....	9-3
9.05	Street Monuments	9-3
9.06	Boundary Monuments.....	9-3
9.07	Block Corner Monuments.....	9-4
9.08	Lot Corner Monuments.....	9-4

10. DRIVEWAY ACCESS AND DESIGN

10.01	General.....	10-1
10.02	Design Standards	10-3
10.03	Design Criteria.....	10-4

11. GRADING DESIGN STANDARDS

11.01	General.....	11-1
11.02	Soils Report.....	11-1
11.03	Grading at Property Lines.....	11-1
11.04	Lot Grading.....	11-2
11.05	Storm Water Pollution Prevention Plan.....	11-2

12. LANDSCAPING (w/ Construction Standards Section 12)

13. IRRIGATION (w/ Construction Standards Section 13)

14. DEMOLITION AND ABANDONMENT PLAN

14.01	General.....	14-1
14.02	Content.....	14-1
14.03	Scale	14-1

15. ESTIMATES FOR BONDING

15.01	General.....	15-1
15.02	Costs	15-1
15.03	Form	15-1
15.04	Grading	15-1
15.05	Construction of Existing Streets	15-1
15.06	Groundwater	15-2

16. EROSION & SEDIMENT CONTROL STANDARDS FOR CONSTRUCTION ACTIVITIES

16.01	General	16-1
16.02	Permitting.....	16-1
16.03	Inspection.....	16-2

20. WALL DESIGN STANDARDS

20.01	General	20-1
20.02	Design Standards	20-1
20.03	Finish Treatments.....	20-2
20.04	Color	20-2
20.05	Panel Supports	20-2
20.06	Inspections	20-2
20.07	Wall Caps.....	20-2
20.08	Location	20-2

21. DEVELOPMENT PROCESS

21.01	General	21-1
21.02	Division and Department Processing.....	21-1
21.03	Referral Process	21-1
21.04	Maps & Improvement Plans	21-2
21.05	Agreements, Annexations, & Bonds.....	21-2
21.06	Final Acceptance of Improvements	21-2
21.07	Permitting.....	21-2
21.08	City Council.....	21-3
21.09	Fees	21-3

APPENDIX A CITY CAD STANDARDS

Preface	A-2
Table of Contents	A-3
Chapter 1 General Drawing Requirements.....	A-5
Chapter 2 Layers	A-7
Chapter 3 Fonts	A-13
Chapter 4 Pen Assignments	A-16
Chapter 5 Symbols & Abbreviations.....	A-23
Chapter 6 Title Block	A-28
Chapter 7 Deviations	A-29
Chapter 8 Standards Modifications	A-30
Chapter 9 Standards Committee Members.....	A-32

APPENDIX B CONSTRUCTION NOTES

1.01	General	B-1
1.02	Water	B-3
1.03	Storm Drain.....	B-3
1.04	Sanitary Sewer	B-4

APPENDIX C BONDING

1.01	General	C-1
1.02	Bond Estimate Costs	C-2
	A. Earthwork and Paving.....	C-2
	B. Concrete Work	C-3
	C. Water System	C-3
	D. Sewer System.....	C-4
	E. Storm Drain System	C-5
	F. Electrical	C-6
	G. Miscellaneous	C-6

APPENDIX D SUBDIVISION IMPROVEMENT PLAN REVIEW CHECKLIST

1.01	General.....	D-1
1.02	Title Sheet	D-1
1.03	Sheet Two (and Three if required).....	D-2
1.04	Demolition and Abandonment Plan.....	D-2
1.05	Grading Plans.....	D-2
1.06	Utility Plans	D-3
1.07	Streets	D-3
1.08	Sanitary Sewers.....	D-5
1.09	Drainage.....	D-6
1.10	Waterlines	D-8
1.11	Streetlighting.....	D-9
1.12	Landscape and Irrigation.....	D-9
1.13	Engineers Cost Estimate	D-9

APPENDIX Dc COMMERCIAL IMPROVEMENT PLAN REVIEW CHECKLIST

1.01	General.....	Dc-1
1.02	Title Sheet	Dc-1
1.03	Sheet Two (and Three if required).....	Dc-2
1.04	Demolition and Abandonment Plan.....	Dc-2
1.05	Grading Plans.....	Dc-2
1.06	Utility Plans	Dc-3
1.07	Streets	Dc-3
1.08	Driveways	Dc-4
1.09	Dedications	Dc-5

**APPENDIX Dc COMMERCIAL IMPROVEMENT PLAN REVIEW CHECKLIST
(cont'd)**

1.10	Utility Plans	Dc-6
1.11	Streetlighting.....	Dc-7
1.12	Landscape and Irrigation.....	Dc-7
1.13	Engineers Cost Estimate	Dc-7

APPENDIX E MINIMUM SUBMITTAL PACKAGE E-1

APPENDIX F SANITARY SEWER DESIGN PROCEDURE F-1

APPENDIX G STORM DRAIN DESIGN EXAMPLE G-1

**APPENDIX H FIRE DEPARTMENT STANDARDS FOR
PRIVATE STREETS & DEVELOPMENTS**

1.01	General.....	H-1
1.02	Automatic Fire Protection.....	H-1
1.03	Access to Site.....	H-1
1.04	Access to Buildings.....	H-1
1.05	Access Roadways.....	H-2
1.06	Street Widths.....	H-2
1.07	Fire Lane and Fire Hydrant Marking.....	H-3
1.08	Electronically Controlled Vehicle Access Gate.....	H-3
1.09	Pedestrian Gates & Barriers Installed Across Required Exit Pathways.....	H-4
1.10	Buildings Under Construction	H-4
1.11	Sidewalks	H-4

**APPENDIX I PRIVATE WATER SYSTEM DESIGN FOR
FIRE PROTECTION**

1.01	General.....	I-1
1.02	Pipe Size and Material	I-1
1.03	Fire Main Restraints.....	I-1
1.04	Depth of Bury	I-2
1.05	Control Valves	I-2
1.06	Check Valves	I-2
1.07	Fire Hydrants	I-2
1.08	Fire Department Connections	I-3
1.09	Approval Procedure	I-3
1.10	Inspection and Test Procedures	I-4

APPENDIX J VILLAGE ONE PVC SEWER STANDARDS

1.01	General	J-1
1.02	Design	J-1
1.03	Manholes.....	J-1
1.04	PVC Pipe Material	J-1
1.05	Excavation.....	J-3
1.06	Sewer Service Materials	J-3
1.07	Bedding	J-3
1.08	Backfill.....	J-4
1.09	Air Pressure Test.....	J-4
1.10	Deflection Testing.....	J-6
1.11	Inspection.....	J-7
1.12	Special Notes and Details Required on Design Plans.....	J-7

APPENDIX K PREPARING EASEMENTS AND DEEDS

1.01	General	K-1
1.02	Signatures.....	K-2

APPENDIX L MODESTO WATER OUTSIDE CITY LIMITS

1.01	General	L-1
1.02	Design	L-1
1.03	Fees	L-2
1.04	Process	L-2

APPENDIX M CRITERIA FOR THE SEPARATION OF WATER MAINS AND SANITARY SEWERS

1.01	General	M-1
1.02	Notes and Definitions	M-5

APPENDIX N PLANNING DOCUMENTATION REQUIREMENTS FOR THE SWPP PLAN

APPENDIX O FIBER OPTICS

Part I	Agreement Conditions	O-1
Part II	Encroachment Permit Conditions	O-3
Part III	Fiber Optic Encroachment Questionnaire.....	O-7

APPENDIX P OUTDOOR VEHICLE AND EQUIPMENT WASHING AND STEAM CLEANING

1.01	General.....	P-1
1.02	Minimum Design Criteria.....	P-1

APPENDIX Q DIGITAL FILE SUBMISSION REQUIREMENTS FOR CITY CONTRACTORS/CONSULTANTS

1.01	General.....	Q-1
1.02	Software and File Specifications	Q-1
1.03	Meta Data.....	Q-2
1.04	City Data	Q-3
1.05	CD Submittal	Q-3

TABLES AND FIGURES

TABLE 3.1	Street Design Standards	3-1
TABLE 4.1	Design Storm Methods	4-3
TABLE 4.2	Basic Runoff Coefficients.....	4-11
TABLE 4.3	Composite Runoff Coefficients & Minimum Over land Travel Times for Various Land Uses	4-11
TABLE 4.4	Manning Coefficient	4-12
FIGURE 4.1	Standard Form - Runoff Calculations	4-13
FIGURE 4.2	Rain Intensity FrequencyCurve	4-14
TABLE 5.1	Acreage Flows Estimates	5-4
FIGURE 5.1	Ratio of Peak to Average Flow of Sanitary Sewer	5-5
TABLE 7.1	Spacing, Intensity and Mounting Heights	7-2
TABLE 8.1	Non-city Utility Horizontal Alignment	8-2
TABLE 10.1	Driveway Design Standards	10-5
FIGURE 21.1	Development Referral Process	21-4
FIGURE 21.2	Parcel Map Processing.....	21-5
FIGURE 21.3	Subdivision Plan Check and Permitting	21-6
FIGURE 21.4	Commercial Plan Check and Permitting.....	21-7
FIGURE 21.5	Development Services Function by Departments	21-8
FIGURE 21.6	Engineering & Transportation Department Org. Chart	21-9
FIGURE 21.7	Engineering & Transportation Department Org. Chart	21-10
FIGURE 21.8	Processing Charts.....	21-11
FORM 21-9	Request for Reimbursements (CFF, CFD, Utilities).....	21-17
FORM 21-10	Request to Deviate from the Standard Specifications.....	21-19
FIGURE H.1	Fire Department Approved Turnarounds	H-5
FIGURE H.2	Fire Department “No Parking” Signs	H-6
TABLE H.1	Guidelines for Installing Sidewalks	H-7
TABLE I.1	Flow Rate to Produce Velocity of 10ft/sec.....	I-4
TABLE J.1	Air Pressure Testing Chart	J-5
TABLE J.2	Description of Material Classification (ASTM D 2321)	J-8

FIGURE P.1	Wash Pad Detail.....	P-2
FIGURE Q.01	Sample Meta Data Requirements.....	Q-3
FIGURE Q.02	City of Modesto Common Data Layers	Q-4
FIGURE Q.03	Agreement for City of Modesto GIS Data.....	Q-5
FIGURE Q.04	CD Legend	Q-7

SECTION 1

GENERAL

1.01 PURPOSE AND INTENT

The purpose and intent of these Design Standards is to provide certain minimum standards for the design, construction, repair and alterations for streets, roadways, alleys, drainage, sewerage, water supply facilities, utility location, landscaping & irrigation, lighting, and all appurtenances thereunto, within the City of Modesto.

1.02 SCOPE

The primary scope of these Design Standards is intended to be those improvements to be turned over to the City of Modesto for operations and/or maintenance. The City recognizes, however, that it has a responsibility to assure that certain other owned improvements (private streets, public and private utilities, etc.) meet a minimum standard as well. City Design Standards may be applied to privately owned and maintained improvements which affect public health and safety.

1.03 DESIGN

The design of each development is in itself a special case and these Design Standards shall not be construed to be a maximum required design on all or any separate phase of the construction. Under certain conditions, any or all phases of the development may be required to exceed these Standards. It is also recognized that there may be developments where it is impossible to meet these Design Standards. It is suggested that these cases be reviewed with the City Engineer early in the design process to minimize reworking plans where deviation is not permitted.

1.04 FINAL AUTHORITY

The City Engineer shall be the final authority on all questions which may arise as to the interpretation of these Standards. The City Engineer's decision shall be final and he/she shall have authority to enforce and make effective such decisions. Appeals of the City Engineer's decisions may be made to the City Council.

1.05 DEFINITIONS

In these Standards, the intent and meaning of the terms that are used shall be as defined in Section 1 of the City General Provisions except as herein below specifically noted, revised, or added.

- A. **CALTRANS – Shall mean California Transportation Department**

- B. CITY - Shall mean the City of Modesto, a municipal corporation.
- C. CITY ENGINEER - Shall mean the Director of Engineering and Transportation, City of Modesto, or his designated representative.
- D. CONSULTING ENGINEER - Any person or persons, firm, partnership or corporation legally authorized to practice Civil Engineering in the State of California who prepares or submits improvement plans and specifications to the Department of Community Development for the City of Modesto for approval.
- E. COUNTY - Stanislaus County
- F. DESIGN - Shall mean, including but not limited to, street alignment, grade, geometric section, structural section; sanitary sewer alignment, grade, size; water system alignment, size, valving, fire hydrant location; storm drain alignment, grade, size and miscellaneous improvements as required by the City Engineer.
- G. DEVELOPER - Shall mean any person, firm, corporation, partnership or association engaged in the development of property in part or in whole by the placing of any improvements thereon, whether the property was previously developed in whole, in part, or at all.
- H. EASEMENT - Shall mean an easement dedicated to the City or Public Utility which shall be continuing and irrevocable unless formally abandoned.
- I. IMPROVEMENTS - Refers to street work, sidewalk, curb, gutter, driveways, water mains, sanitary sewer, storm drainage, public utilities, landscaping, and fences to be installed by the developer on land to be used for public right of way.
- J. MANUAL OF WARNING SIGNS - Shall mean the "Manual of Warning Signs, Lights, and Devices for Use in Performance of Work Upon Highways" of the State of California, Department of Transportation - Current Edition.
- K. NPDES – Shall mean the National Pollution Discharge Elimination System.
- L. SOILS REPORT - Shall mean a report as prepared by any person or persons, firm, partnership, or corporation legally licensed to prepare "Soils Reports" in the State of California.
- M. STANDARD DETAIL AND SPECIFICATIONS - Shall mean the Standard Details and Specifications of the City of Modesto.
- N. STATE HIGHWAY DESIGN MANUAL - Shall mean the State of California Department of Transportation Highway Design Manual, latest edition, unless otherwise stated.

- O. STATE MATERIAL MANUAL - Shall mean the Materials Manual of Testing and Control Procedures of the State of California, Public Transportation Laboratory Manual of Tests, Department of Transportation, latest edition, unless otherwise stated.
- P. STATE PLANNING MANUAL - Shall mean the Planning Manual of Instructions of the State of California, Department of Public Works, Department of Transportation, latest edition, unless otherwise stated.
- Q. STATE SPECIFICATIONS - Shall mean the Standard Specifications of the State of California Department of Transportation, latest English unit edition, unless otherwise stated.
- R. STANDARD PLANS - Shall mean the Standard Plans of the State of California Department of Transportation, latest edition, unless otherwise stated.
- S. SUBDIVISION ORDINANCE - Shall mean the Subdivision Ordinance of the City of Modesto.
- T. SWPPP – Shall mean Storm Water Pollution Prevention Plan.
- U. UBC - Shall mean the edition, as approved by City Council, of the Uniform Building Code of the International Conference of Building Code of the International Conference of Building Officials.
- W. UPC - Shall mean the edition, as approved by City Council, of the Uniform Plumbing Code.
- X. ZONING ORDINANCE - Shall mean the zoning ordinance of the City of Modesto.

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SECTION 2

MAPS & IMPROVEMENT PLANS

2.01 GENERAL

Complete plans and specifications for all proposed improvements including any necessary dedications and easements shall be submitted to Development Services for approval and must receive the required approval prior to the commencement of construction of any such improvements. This shall apply where it is the intent that any portion of such improvement will be turned over to the City of Modesto. Such plans shall be prepared and signed by a Registered Civil Engineer in accordance with the provisions of "Professional Engineer's Act" Chapter 7 - Division 3 of the Business and Professional Code, relating to the practice of Civil Engineering.

Improvement plans from the City's perspective of this Standard Specifications includes only improvements being dedicated to the City of Modesto which require a registered engineers signature. The list of improvements may include streets, parks, bike paths, and utilities.

Subdivision plans will not be approved without executed reimbursement agreements and landscape plans, if applicable.

All reimburseable work shall be clouded on each sheet with a note describing the type of reimbursement. ie. "544 lf – 18"VCP City Sewer Reimbursement", "CFF Road Reimbursement", etc. In lieu of a cloud on each sheet, a separate plan sheet may be inserted in the plan set that diagrammatically shows the various reimbursements and refers to the applicable sheets.

2.02 PREPARATION

Improvement plans and specifications shall be prepared in accordance with the following requirements:

- A. Dimensions - Improvement plans shall be clearly and legibly drawn in ink on engineering vellum paper 24 by 36 inches with a 1-1/2 inch minimum clear margin on the left edge and 1/2 inch minimum margins on all other edges.
- B. Drafting Specifications - Standard drafting symbols are shown in Appendix A of these Design Guidelines. Consulting Engineers under city contract shall use these symbols and standards or close facsimiles on all improvement plans. Deviations must be approved prior to submittal of any plans to the City. Consulting engineers on private development are requested to use these symbols and standards or close facsimiles. At this time, the City will not enforce these standards on private development. **(Appendix A only recommended)**

C. Improvement Plan Format

1. Title Sheet (Sheet 1 and/or sheet 2)

- a. Name of Subdivision or project
- b. Vicinity Map with North Arrow
- c. Index of sheets.
- d. City Engineer's Signature Block
- e. Consulting Engineer's Signature Block
- f. General and special notes relating to construction methods. Standard notes for plans prepared in the City of Modesto are shown in Appendix B of these Design Standards (May place on sheet 2 instead of cover sheet).
- g. List of applicable city standards, with latest revision date.
- h. Temporary and permanent bench marks and horizontal control points including their description (NAV88 Datum).
- i. Planning Commission, City Council or Board of Zoning Adjustment Resolution No. that approves the project. **The actual verbiage shall be inserted on the detail sheet(s).**
- j. Plan view showing the limits of each sheet and sheet number within the plan set.
- k. Typical Street Sections. Show storm drain open channels where applicable in these sections.
- l. Pavement Design Chart showing street name (and station if section changes), TI, R-value, AC, AB and ASB thicknesses.

2. Utility Plan (Sheet 2 or 3)

- a. Plan view showing the entire street right-of-way layout, proposed water and sewer mains, storm drainage system, fire hydrant, streetlight locations, lot numbers and other miscellaneous improvements to be installed.
- b. **Show all existing power poles to be relocated and, if possible, the ultimate location. Developer is responsible to relocate all lines within the subdivision and areas dedicated to the Public.**
- c. **Where street improvements adjacent to a development project are deferred, such as CFF and CFD street or landscaping improvements, the engineer shall consider installing storm drain conduit, an electrical pull box for streetlights, an irrigation controller, and a water service for irrigation. The consulting engineer may determine some or all of the improvements are not needed. If any of these facilities are not provided, a short note shall be placed on the plans stating how these facilities are ultimately provided. City utilities shall be constructed in dedicated public ROW and not easements between individual lots.**
- d. Complete Legend using the standard symbols as shown in Appendix A of these Design Standards. **(Appendix A - only recommended)**

3. Demolition and Abandonment Plan (If needed)
 - a. Plan view showing existing topography at a scale large enough to clearly show existing improvements.
 - b. Show all existing surface and subsurface improvements, especially buildings, wells, septic tanks and leach fields.
4. Grading Plan
 - a. Plan view at 1" = 40' or 50' showing existing and proposed topography on site and a minimum 50' of the immediately adjacent areas.
 - b. Top of curb elevations at all property line extensions and grade breaks.
 - c. Street slopes at centerline.
 - d. Lot elevations.
 - e. Lot numbers.
 - f. Location of proposed and existing storm drain structures to include adjacent developments which have an effect on the proposed drainage system.
 - g. Retaining walls and sound walls.
 - h. Typical lot grading details showing plans and section.
 - i. Elevations at rear of all lots.
 - j. Elevations of all adjacent property to include the existing streets top of curb elevations.
5. Street Plan and Profiles
 - a. Plan views at a scale of 1" = 40' for all new streets, widening of existing streets, etc. including existing improvements, proposed improvements, and future improvements if known.
 - b. Proposed improvements shall include sidewalk, curb, gutter, driveways, sewer mains and laterals, water mains and services, storm drains, manholes, drainage inlets, valves, fire hydrants, barricades, streetlights, survey monuments and other data required by the City Engineer.
 - c. Centerline stationing shall be shown with grades indicated in plan view for street intersections, drainage structure (include dimensions or station offsets

from centerline), beginning and endings of curb returns and vertical and horizontal curve information as required.

- d. Street plans shall include right-of-way lines and widths, street widths and names, and easement widths.
 - e. Profile view of each street shall be shown on the same sheet as plan view and at a vertical scale of 1" = 2' or 4' or approved alternate.
 - f. Profiles shall show existing grade at centerline of street, proposed top of curb, sanitary sewer mains, water mains, storm drains, utility crossings, and any other features of interest.
 - g. Elevations shall be shown in profile of top of curb at grade breakpoints, manhole and drainage inlet inverts, high points and low points of water mains. Vertical curves shall show station and elevation of beginning points, points of intersections, low points and ending points.
 - h. Street, storm drain and sewer main slopes shall be shown.
 - i. Centerline curve data shall be shown in plan view or by tabulation for street centerline; curb data for curb returns shall also be shown. If a utility is non-concentric with the street centerline, utility curb data shall be annotated on the pipe in plan view.
6. Signing and Striping Plan (combined with the electrical streetlighting plan)
- a. Provide a plan at a scale sufficient to clearly indicate all street striping and signing. Plan shall include all existing and proposed striping and markings for the full width of the roadway. Also, any intersecting streets shall be shown. Any tapering needs to show the striping at least 300' past the tapering.
 - b. Striping plan shall conform to CALTRANS standards.
7. Streetlighting Plan (incl. signing and striping information)
- a. Plans shall be 1" = 40', 50' or 100' scale.
 - b. The consulting engineer shall show the streetlight locations and wattage the initial submittal of improvement plans. The final as-built set of improvement plans shall show the service points, conduit runs, pull box locations and wire size. As-builts shall be provided before final acceptance of the subdivision.
 - c. Streetlight locations & wattage shall be shown on plans and approved by the City of Modesto. Any streetlights attaching to existing or new MID poles shall

be approved by the Modesto Irrigation District with a signature block for MID provided on the base sheet.

- d. Service Pedestal shall be located out of sight distance triangle area, 25 feet or more from corner property line.
- e. Plans shall be stamped by a registered Professional Engineer.
- f. The following notes shall be placed on the Streetlighting Plan Sheet of the improvement plans:

GENERAL NOTES FOR STREETLIGHTS

- 1. When pole location conflicts with an existing or proposed facility, the pole shall be placed as directed by the City Engineer. In no circumstances shall a pole be moved more than 20' without an approved revision of the plan sheets.
 - 2. Developer shall supply all materials when served from an underground source. MID shall supply and install conduit on overhead connections.
 - 3. Contractor shall provide a pull box at the service point, each side of the street crossing, and at 200' maximum spacing. Pull box may be set adjacent or behind pole in R.O.W. Any conduit run over 100' will require a pull box at the pole.
 - 4. Conduit shall be a minimum depth of 18" below sidewalk grade in park strips and 30" below top of curb grade in streets, alleys and easements not adjacent to curb or sidewalk. Depth shall not exceed 48".
 - 5. Where sidewalk is against property line, the conduit shall be placed 6" behind curb.
 - 6. Where walk is separated from curb and gutter, or a 10' sidewalk is installed in back of curb and gutter, place pole 18" from back of curb. All other zones shall be 18" from back of sidewalk.
 - 7. Pole foundations shall be 72" deep by 30" diameter or 60" deep by 36" square and placed against undisturbed earth.
 - 8. When spotting the distance for placement of pull boxes, a pull box shall be placed at the light pole and then space from there.
8. Traffic Signal Plan (when required by City - Special Circumstances)
- a. Plans shall be 1" = 20' scale in AutoCAD version 12 or higher Windows format.

- b. Plans shall have a cover sheet showing project location, map, Caltrans standards used, general notes, project name, index of sheets, City & consulting engineer signing block.
 - c. Plans shall have equipment and wiring schedules.
 - d. Plans shall have detector loop layout, service and phasing diagrams.
 - e. Detector loop assignments shall be called out.
 - f. Type A detector loop hand holes are required.
 - g. Plans shall show existing or proposed lane widths. A signing and striping plan will be required for any new or modified street widths.
 - h. Plans shall show all existing utilities and accommodate for them. Overhead line heights at pole locations shall be noted on plans.
 - i. Conductors shall be THW.
 - j. Emergency Vehicle pre-emption shall be installed.
 - k. Phase 2 & 5 shall be for eastbound traffic.
 - l. Plans shall have overhead street name signs with block numbers using diamond grade sheathing.
 - m. Service locations shall be shown on plans and approved by Modesto Irrigation District.
 - n. Controller Cabinet and Service Pedestal shall be located out of Sight Distance Triangle area, 25 feet or more from corner property line.
 - o. Plans shall be stamped by a registered Professional Engineer.
9. Detail Sheet(s) and/or Off-site Improvements
- a. Additional drawings may be required to show special project improvements or structures.
 - b. Plan and profiles of streets, storm drain lines, sanitary sewers or water lines built off-site.
 - c. Sticky or re-type the final conditions of approval from Planning Commission onto this plan sheet(s).

10. Reimbursements Plan Sheet (if required or in lieu of clouding individual items on the various sheets)

- a. May be used in lieu of clouding individual items on the various sheets.
- b. Note the type of reimbursement and quantities (ie. CFF, CFD, Sewer, Water, Storm, Traffic Signal, etc.).
- c. If two or more types of reimbursement are on the plan sheets, provide some type of delineation between the types.

11. Landscape & Irrigation Drawings

- a. Shall be submitted when improvement plans are submitted.
- b. Scale shall be 1" = 20'.
- c. Irrigation schematic to be shown separate from planting details.
- d. Projects developing adjacent to a CFD or CFF street shall provide an irrigation stub and internal power source for the irrigation to the area in front of the subdivision wall. If applicable, the developer may recover these costs from the CFF or CFD.

D. Final Maps

1. All maps shall be prepared in conformance to the current version of the State of California Subdivision Map Act.
2. The generic term PUE (Public Utility Easement) may be used as a label on the map only when the City is accepting the PUE for its utilities or other public utility companies. If sewer, water, or storms are to be private utilities, the PUE label may not be used. The private utilities to be shared between parcels will be labeled by the type of dedication and a separate instrument number shall be used. For example, "private sewer easement, instrument no. 3452233". If one of the systems in an easement is public and the remainder private, the label might be "Public Sewer Easement, Private Water Easement, Instrument 34593".
3. Non-buildable remnants of parcels may not be dedicated on a Final Map or Parcel Map. The non-buildable remnant must be combined with public right-of-way or another parcel. Non-buildable remnants are parcels not conforming to the zoning code.

E. Checklist (Appendix D)

A detailed checklist has been provided in Appendix D for use by the Consulting Engineer in the preparation of construction plans for projects in the City. Specific design requirements are listed in the checklist that are not being defined in these Design Standards. The Consulting Engineer is hereby cautioned to review this checklist carefully prior to the preparation of any construction plans to minimize the need for revisions. This checklist will be used by City staff to review submittal of all construction plans.

2.03 SUBMITTAL (Appendix E)

All plans submitted for review shall be final and complete as defined in this section. Incomplete plans or partial submittal will not be reviewed. Delays may be incurred when incomplete plans or partial packages are submitted for review.

A developer may seek a Grading Permit for Grading prior to the approval of the Improvement Plans. Development Services must approve the grading plan prior to issuing a permit. Checklist A defines a complete submittal for a review of Improvement Plans. Checklist B is for a submittal seeking a Grading Permit only. Special conditions may require additional items. Plan checking shall not normally be started until all items on the checklist are submitted.

A. Improvement Plans (Initial Check)

1. Improvement Plans - 2 Sets (Initial & subsequent submittals until signed for construction)

Prepared as prescribed in Section 2.02 of these Design Standards. Striping Plans are required for each subdivision and Demolition Plans are required when existing structures will be or have recently been removed or there is possibility of wells, septic tanks or retention basins on-site. Supporting calculations for pavement sections, retaining walls, etc. are required.

The checklist in Appendix D of these Design Standards will assist the Consulting Engineer with the preparation of plans for submittal to the city.

Commercial Development and Private Gated Communities are not exempt from providing improvement plans to Engineering and Transportation Department for the portion of construction in the public right-of-way. The plan sheet(s) for a commercial or gated community development shall, at a minimum, detail the following information:

- Handicap ramps (type, elevation, and any obstructions)
- Curb & sidewalk (width, TC, and existing obstructions)
- Driveways (type, elevations to demonstrate control of on- & off-site drainage, HC ramp for drop approaches, and slopes & radii on drop approaches)

- Street Signage (locations)
- Sewer Connection w/ cleanout at property line (invert & rim connections at manhole or sewer lateral)
- Water connection with meter and backflow locations
- General notes with type of construction materials for utilities placed in the ROW
- Landscape & irrigation layout incl. Electrical connection and backflow prevention device

Where applicable, the plan sheets for Commercial Development and Private Gated Communities shall substantially conform to this entire section. Smaller commercial developments may be addressed in a single D sized drawing or on the site plan drawings from the architect. A signature block for the City Engineer shall be provided on all sheets showing new construction within the Public ROW.

On-site drainage and grading shall also be provided on a single sheet to Engineering and Transportation. A set of drainage calculations shall be provided for all in-fill projects that do not have positive storm drain. The requirement for rock well areas is to contain 2" of storm water over the site. To demonstrate this, the calculations should refer to cross-sections drawn on the grading and drainage plan.

2. Storm Drain Package - 2 Sets

Drainage calculations are required for any new subdivision or development and shall be done on standard form Figure 4.1 (page Design 4-10). Submittal of drainage calculations shall include the following items:

- Hydrology calculations for 5 year and 100 year storms, together with assumptions, charts, tables, references and methods used.
- A plan, preferably at 1" = 100' scale, showing proposed street system, existing and proposed drainage system, tributary sub-areas (including offsite drainage), and peak flow in all pipes.
- The hydraulic calculations shall show as a minimum the hydraulic grade line (HGL), the proposed storm drain, including slopes and sizes, the flow in the pipes, velocities in pipes, structure losses, tailwater assumptions and top of curb elevations (or freeboard at structures).
- Calculations for any temporary storm drain retention basins.

3. Sanitary Sewer Package - 2 Sets (if required)

Engineering calculations shall be submitted to the City Engineer for the design of all proposed sanitary sewer systems. The calculations shall include the following items:

- a. A plan, preferably at 1"= 100' scale, showing the proposed street system, tributary sub-areas, existing and future tributary sub-areas, existing and future tributary areas outside the project limits, zoning, projected land use, and any features affecting the system design.
 - b. Design flows at major junction points including flows coming from outside the project limits.
 - c. Size, length, slope, and invert elevations of all proposed lines and location of manholes.
4. Soils Report or supplemental R-value test data & street design - 2 Copies.
 5. Submit a completed deviation and reimbursement worksheet. See Form 21-9.

B. Final Map Package

1. 2 Copies of the Map, 1 Copy of remaining items:
 - a. Copy of the complete Final Map.
 - b. Preliminary Title report less than 3 months old.
 - c. Copies of all deeds and easements referenced to the Final Map.
 - d. Lot, parcel and boundary closure calculations.
 - e. Survey monument letter (memo).
2. Development Conditions - 1 Copy (Resolution approving subdivision)
3. Engineer's Estimate (at the final corrected improvement plans) - 1 Set -The estimate shall utilize the City's standard costs and other requirements as defined in Section 10 of these Design Standards.

C. Submittal for Grading Permit (Checklist B)

1. Grading Plans - 3 Sets

Prepared as required by Section 2.02-C-4 and Section 11 of these Design Standards. The checklist in Appendix D provides the Consulting Engineer with additional guidance for the preparation of these plans.

2. Storm Drain Package - 2 Sets

Drainage calculations are required for any new subdivision or development and shall be done on standard form Figure 4.1. Submittal of drainage calculations shall include the following items:

- a. Hydrology calculations for 5 year and 100 year storms, together with assumptions, charts, tables, references and methods used.
- b. A plan, preferably at 1" = 40' or 50' scale, showing proposed street system, existing and proposed drainage system, tributary sub-areas (including offsite drainage), and peak flow in all pipes. If drainage is not installed and silt will not enter the City system or a stream or river, then no storm drain information is required.
- c. The hydraulic calculations shall show as a minimum the hydraulic grade line (HGL), the proposed storm drain, including slopes and sizes, the flow in the pipes, velocities in pipes, structure losses, tailwater assumptions and top of curb elevations (or freeboard at structures).
- d. Calculations for any temporary storm drain retention basins.

3. Soils Report - 2 Copies (If available)

4. Grading Permit

Grading permit is required on all new developments prior to grading or discing. For developments 5 acres or greater, provide a copy of the notice of intent (NOI) application filed with the state. This is a NPDES requirement (See Section 16).

D. Subsequent Plan Submittals

1. Improvement Plans - 2 Sets

If the Consultant or Engineer feels there are issues remaining after re-working the initial set of plans returned from the City, the Consultant may submit 2 sets of Improvement plans with the revised Design.

2. Storm & Sewer Packages - not required unless changes in pipe lengths change substantially.

2.04 COMMUNITY FACILITIES FEES (CFF), COMMUNITY FACILITIES DISTRICT (CFD), AND OTHER DEVELOPER INSTALLED AND CITY OR DISTRICT REIMBURSED FACILITIES

At a minimum, all improvement plan sets shall place four separate signature blocks for City staff to sign-off on. These signatures are verifying compliance standards and execution of any and all reimbursement agreements. Possible reimbursement agreements include CFF, CFD, and utility work. All plan sheets having CFF, CFD, utility and/or other city or CFD reimbursable facilities shall have additional signature blocks placed on the specific plan sheet(s) for the CFD, CFF, and/or Utility Planning Engineer. Also, those items being reimbursed shall be “clouded” on the plan sheet(s). In lieu of “clouded” plan sheets, the engineer may create another plan sheet for reimbursable work. Staff will indicate not applicable (“N/A”) before their signature if they are not reimbursing the developer. Below is an example of the required signatures on the cover sheet for reimbursement:

REIMBURSEMENT AGREEMENTS:

BY: _____ DATE: _____
CFD COORDINATOR

BY: _____ DATE: _____
CFF COORDINATOR

BY: _____ DATE: _____
UTILITY PLANNING COORDINATOR

Only the plan sheets with reimbursable CFF/CFD work and the title sheet must have these signature blocks placed on the sheets. The fourth required signature block is the City Engineer’s signature block.

2.05 CITY ENGINEER’S SIGNATURE BLOCK

The following signature is required for improvement plan sets to include small commercial sites making public improvements.

APPROVED BY CITY ENGINEER: CITY OF MODESTO, CALIFORNIA
FOR PUBLIC IMPROVEMENTS ONLY (SHEETS _____)

BY: _____ DATE: _____
CITY ENGINEER

After the signature block for the City Engineer, the following statement shall be added:

APPROVAL OF THESE PLANS DOES NOT RELEASE THE DEVELOPER FROM RESPONSIBILITY FOR CORRECTION OF MISTAKES, ERRORS OR OMISSIONS CONTAINED THEREIN. IF DURING THE COURSE OF CONSTRUCTION THE PUBLIC INTEREST REQUIRES A MODIFICATION OR A

DEPARTURE FROM THE CITY SPECIFICATIONS, OR THE APPROVED PLANS, THE CITY SHALL HAVE THE AUTHORITY TO REQUIRE SUCH MODIFICATION OR DEPARTURE, AND TO SPECIFY THE MANNER WHICH THE SAME IS MADE.

2.06 RECORD DRAWINGS (For Construction Purposes)

After final approval and signatures on the vellums by the City Engineer and all agencies, the consulting engineer shall submit the following:

- A. Five (5) sets of blueline prints of the Improvement Plans and a compact disk with a scans of the prints and CAD drawing of the entire improvement area and a map of the lots. Scans shall be 200 DPI and saved into a single Adobe PDF file. CAD shall be either Autodesk DWG format (any version) or a generic CAD with a DXF output.
- B. Traffic plans shall include all of the above plus a vellum or mylar.

2.07 AS-BUILT DRAWINGS (Required for final acceptance of improvements)

The consulting engineer and contractor are responsible for completing the as-built plans. The consulting engineer shall submit the following prior to final acceptance of improvements by the City:

- A. One set of bluelines of the Improvement Plans with “As-Built” or “Record Drawing” stamped or printed on each sheet of the plans and a compact disk with scans of the as-builts. Scans shall be 200 DPI and saved into a single Adobe PDF file.
- B. Traffic plans shall include all of the above plus a vellum or mylar.
- C. Any maintenance and/or operational manuals for such things as pumps, traffic signals, lift station packages, and other dedicated improvements requiring daily to yearly service.

As-built drawings will not require re-survey of the improvements. As-builts shall indicate horizontal movement and additions of any appurtenances such as catch basins, manholes, cleanouts, streetlights, pull boxes and monuments. Only horizontal movements exceeding 10' must be shown. Other data required in the as-builts is schematics of the streetlight conduit and additions of elbows in the water line to cross specific unknown obstructions and other unknown obstructions discovered in the course of construction.

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SECTION 3

STREET DESIGN

3.01 GENERAL

All new street improvements will require that underground utilities extend to the limit of improvements plus 5' beyond the edge of new pavement (when ROW is available) and services extend to the property line. If half-street construction is approved, utility services must extend a minimum of 5' from beyond the edge of new pavement.

For purposes of geometric and structural design, streets shall be classified according to the following. Any deviation from the following standard shall require the approval of the City Engineer. If there is insufficient soils data, specifically R-values, then streets shall be designed using an assumed R-value of 5. The table on Standard Detail #301 lists street structural sections for R values of 5 through 60.

TABLE 3.1 STREET DESIGN STANDARDS

Class	Right of Way (Feet)	Mid-Block Width Between Curbs (Feet)	Design Speeds	*Traffic Index	Street Section Requirement	Min. Pavement Section AC/AB	Minimum Centerline Radius for Horizontal Curve (ft.)
Expressway 4 lane	110	90	55	11	"	.55/.345	800**
Expressway 6 lane	135	115	55	11	"	.55/.35	800**
Principal Arterial	114	94	45	11	"	.55/.35	1000
Minor Arterial	100	80	40	10	"	.50/.35	750
Major Collector	84 96 w/bike lanes	64 76	35	10	"	.40/.35	525
Minor Collector	60 72 w/bike lanes	40 52	25	8	"	.40/.35	250
Local	50	36	25	6	"	.20/.35	250**
Cul-de-sac	50	34	25	4.5	"	.20/.35	250**
Industrial	60	40	40	9	"	.45/.35	600**
Alleys	20	N/A	15	5	"	.20/.35	200**

** Smaller radii may be acceptable. City Engineer shall judge the suitability of the curve based on design. In all circumstances except cul de sacs, the curves must meet

CALTRANS geometric guidance. Superelevation will be accepted on expressways only. Expressway minimums based on superelevation.

* May be raised at the discretion of the City Engineer if traffic warrants a higher value.

The minimum street section shall be determined from R-values obtained from material gathered from the level of the proposed subgrade using the design method described in the Highway Design Manual. In no case shall the minimum street section be less than 0.20 ft. of asphalt concrete and 0.35 ft. of aggregate base. Aggregate base section may be comprised of an equivalent section of aggregate base and aggregate subbase, but in no case shall aggregate base be less than 0.35 ft.

The developer's engineer shall indicate on the plans a 0.1' overlay on any section of street where five or more multiple street tie-ins for sewer and/or water in 500 feet are placed in an existing city street. The overlay shall be proceeded by grinding at the lip of curbs and conforms, and removal of any temporary AC. Feathering the edges will not be allowed. City water tie-ins in the area of multiple taps shall be backfilled with a minimum of 24" aggregate base and 0.17' of temporary AC. The developer will remove the temporary AC and pave to the depth required. The City will not charge the patching fee and will offer discounts on multiple water taps.

In designing a half street, the developer's engineer shall show the construction of a minimum of 2 travel lanes (24'), an 8' parking lane, and 4' of paved shoulder for a total of 36' of travel way from face of curb.

The plans shall show the reconstruction of the street section to centerline on any street bounded by the subdivision where the street section has a pavement condition index less than 80.

3.02 PAVEMENT DESIGN (See Table on Standard Detail #301)

- A. Structural street sections posted in Standard Detail #301 shall be used for all pavement designs in the City (based on R-value design).
- B. Intersections for an **arterial** street connecting to an **arterial** street shall use a TI of 11 for design. Industrial streets connecting to industrial streets shall use a TI of 10 for design.
- C. R-Value Testing

The developer shall be responsible for obtaining soil R-value tests, specifically supervised by a licensed registered civil engineer in sufficient quantity to establish the quality of the soil and to provide a basis for the design of the structural section.

The following R-value tests will be required at the street subgrade elevation:

- 1) A minimum of one R-value test shall be taken for all developments with additional R-value tests specified by the City Engineer. The City Engineer may require as many as one test per 10 lots along a residential street.
- 2) On **arterial** and collector streets where the frontage is less than 500 feet, one R-value test shall be made. On major or collector streets, where the frontage exceeds 500 feet, a minimum of one R-value test shall be taken at each 500 foot interval.

Exact locations of the R-value tests shall be as approved by the City Engineer. The developer shall stake the field test locations and shall provide an existing ground and finish **subgrade** elevation for each test location. **The top of the R-value sample shall be taken at the estimated finished subgrade elevation.**

The Developer shall provide results of the R-value tests to the City Engineer. The results provided to the City shall include the following:

- 1) Locations and a summary table shown in the soils report or the supplement.
- 2) Self-certification that the stabilimeter is properly calibrated per California Test 102.
- 3) Completed California Test 301 Forms T.C. - 361.

3.03 STREETS RIGHTS-OF-WAY, EASEMENTS & EXACTIONS

A. Right-of-way

The right-of-way widths and typical sections for the various class streets shall conform to the City of Modesto Standard **Detail #300** and the established Specific Plans on file in the Public Works & Transportation Department.

B. Easements

Public service, drainage, tree planting, and fence easements shall be located as required by the Utility companies and the City.

Public Utility easements (PUE's) on private property shall be a minimum of 10 feet in width and provide for the express purposes of placement of underground utilities. Where the City Engineer finds that sufficient public right-of-way exists, underground utilities shall be placed within said public right-of-way in the location deemed appropriate by the City Engineer. PUE's through cul-de-sac bulbs are discouraged. If a utility is cross connected through a cul-de-sac to an adjacent street, the City Engineer will require dedication of the property and line of sight vision where possible (See Standard **Detail #313**).

C. Exactions Policy (MMC 99-32) (see Detail #323 & 323A)

- 1) Local streets internal to development shall be dedicated and improved by the developer.
 - 2) All other streets with the exception of expressways:
 - a) A width of 40 feet shall be dedicated and improved (40 feet dedication, improve 30 feet from face of curb and 10 feet behind face of curb).

Thirty (30) feet of paved width provides sufficient width for one parking lane and two way travel. To make use of the parking an additional four (4) feet of pavement shall be provided at the developers cost. This additional four (4) feet serves as dust control, an air district requirement.
 - b) In some cases, initial development of added width may be necessary. Such additional dedication and improvement would be subject to reimbursement.
 - c) In existing circumstances, where at least 40 feet of dedication and improvements have previously been made and standards change requiring additional right-of-way, such additional right-of-way shall be acquired with reimbursement.
 - d) Any extra facilities required specifically for the development (e.g. deceleration/acceleration lanes, slip ramps, median modification or construction in existing streets) shall be provided by and at the expense of the developer. Median construction in new roadways may be included within the community facility fees (CFF).
 - 3) Expressways:
- Forty (40) feet of right-of-way shall be dedicated with development. Additional right-of-way shall be acquired with reimbursement.

No expressway improvements shall be required to be dedicated. Where interim improvements are required to facilitate current development pending future expressway improvement, such interim improvements shall be provided by the abutting developer.

3.04 SUBDIVISION BOUNDARIES

Subdivision boundary lines should follow lot lines where possible and should cross streets perpendicular to street centerline. Streets shall be fully improved within tract boundaries.

3.05 HORIZONTAL ALIGNMENT

- A. Intersections - Streets shall intersect at as near right angles as practical. In no case shall the angle of intersection be less than 70 degrees.
- B. Opposing Streets - All streets entering upon opposite sides of any given street shall either have their centerline directly opposite each other , or separated by at least 100 feet on residential streets, 200 feet on collector streets and 300 feet on arterial streets.
- C. Curb line radii shall be shown on the improvement plans.
- D. Street Curvature - Curve design shall be based on Table 3.1 and the State of California Department of Transportation Highway Design Manual.
- E. Cul-de-sac - The maximum length of a cul-de-sac street, from center of intersecting street to center of turn-around, shall be 750 feet.
- F. Curb Return Radii -

Downtown District (See Standard Detail #321) - the minimum radius shall be 15 feet.

Local - Minimum radius shall be as shown in the traffic details (300's).

Commercial and Industrial - Minimum radius for new construction shall be as shown in the traffic details (300's).

- G. Minor Streets - Minor streets shall be laid out so that their use by through traffic will be discouraged.
- H. Block Lengths - Block lengths shall not exceed 1,100 feet.
- I. The minimum stopping sight distance over any segment of the roadway shall conform to the State Highway Design Manual.
- J. When an existing City street tree(s) is within 15 feet of a proposed improvement project, a Tree Evaluation Report must be obtained from the Operation & Maintenance Department and submitted to the City Engineer prior to commencement of work.

3.06 VERTICAL ALIGNMENT

- A. Top of Curb Grades - Grades shall not be less than 0.20% and not greater than 6%. With the approval of the City Engineer, in problem areas, the gutter slope may be 0.15% for residential and 0.10% for commercial.
- B. Grades on opposite sides of the street shall be the same wherever practical.
- C. Curb Returns - The minimum fall around returns shall be as follows:

0.20 feet for 15' to 20' radius
0.35 feet for 30' to 40' radius
0.40 feet for a radius greater than 40'.

- D. Cross Slope - The standard cross slope of the street shall be 2 percent. Where necessary when matching existing facilities, the cross slope may vary between 1.5 percent and 4 percent.
- E. Vertical Curves - Where the algebraic difference in slope exceeds 1 percent, a vertical curve shall be used. The minimum length of vertical curve shall be 50' minimum or as required by the Highway Design Manual, whichever is larger.
- F. Low points - Whenever possible, streets shall be designed to collect storm water at intersections (3' past the curb return ER's) and property lines. Low points shall not be designed in driveways or on the curb return.
- G. High points - High points shall be successively lower than the last high point for at least 2 high points. The purpose for this is to allow plugged up drains to overflow within the street right-of-way and overland release to the next inlet before flooding private property. Successive high points with a relative flat grade shall not differ more than 0.3 feet (ponding at inlet limited to 0.8 feet).

3.07 SIDEWALKS, CURBS AND GUTTERS

- A. Curb, gutter and sidewalk shall be installed in conformance with the City of Modesto Construction Specifications and Standard Details.

Vertical curb and gutter (6") and 5' wide sidewalk shall be installed in P-O Zones and on local connector or collector streets. Sidewalk in C-1, C-2, C-M and C-3 Zones shall be extended to within 1" of property line (width may be determined by use or by existing conditions, if specifically approved in writing by the City Engineer - See Details 306 - 309).

Sidewalk in C-1, C-2, C-M and C-3 Zones may substitute landscape for sidewalk under the following conditions:

1. The finished width of sidewalk is at least eight (8) feet wide. (7.5' if it constructed immediately in back of curb).
2. If there is parking on the street, a minimum of twenty-four inches of sidewalk landing (curb + 18") must be constructed behind the curb before the landscaping may begin.
3. The landscaping maintenance will be performed by the property owner at his or her own expense including the irrigation water.

4. The landscaping design must be approved by the City Engineer.

Drive-over curb (4 1/2") and 4' sidewalk shall be installed on **local** street widths in newly developed R-1, R-2, and R-3 zones.

Vertical curb (6") and 4' sidewalk shall be installed in existing in-fill R-1, R-2, and R-3 zones where previous work is vertical curb.

Replacement and Repair - Where existing curb, gutter and sidewalk do not meet the current City Standards and are in need of repairs, it shall be the developer's responsibility to remove and replace necessary curb, gutter and sidewalk. Removal shall be removed to the nearest expansion, weakened plane or construction joint or sawed at the nearest score line.

- B. Private gated communities shall be required to install sidewalks in accordance with ITE standards set forth in Design Appendix H, Table H-1.
- C. Downtown Exposed Aggregate Sidewalk & **Streetscape** - These Standards, as shown in Standard Details #316-321 & #342, shall be mandatory within the area as shown in Standard Detail #321, except that exposed aggregate sidewalks shall not be required on the streets bordering the area.

Any proposed changes to this pattern or substitution of materials shall be considered on a case by case basis. The Downtown Improvement District Board of Directors (D.I.D.) will provide the initial review and recommendation to the City Council. The City Engineer will also make a recommendation for D.I.D. and City Council consideration. The City Council will then approve or deny the proposed change with appropriate modifications.

Minor modifications required by special conditions may be made with approval of the City Engineer.

New, full-width, exposed aggregate sidewalk shall be constructed and shall replace existing sidewalk when the existing sidewalk is less than 50% of the total sidewalk area.

For existing developments in areas requiring full-width sidewalk, fill-in sidewalk, added to provide the full-width, shall be exposed aggregate when the existing sidewalk is less than 50% of the total sidewalk area.

See Modesto Municipal Code, Section 7-1.502, for required locations of full-width sidewalk. Where existing sidewalk is more than 50%, exposed aggregate finish is optional.

The sidewalk area shall be defined as the entire area required to have sidewalk including tree and tree blockout areas, but not including curb ramps or drive approaches.

Corner lot frontages shall have each street considered separately.

- C. Handicap Ramps - Handicap ramps shall be installed at all street crossings and curb returns. Ramps shall conform to Standard Details #345 through #349) according to type of street.

3.08 BOLLARDS

- A. Removable Bollards – 6” galvanized steel pipe (6’ long minimum) with galvanized steel pipe sleeve at least 1/10” diameter larger installed 2’ to 3’ deep, painted or unpainted, welded galvanized lock boxes, minimum 42” of exposed pipe, developer pays cost of lock which will be provided by City.
- B. Permanent Bollards – 6” or 8” galvanized steel pipe, buried in 2’ diameter hole at least 4’ deep, 42” minimum of exposed pipe unless sloping ground and aesthetics requires longer exposure of pipe.
- C. Bollard Spacing – maximum of 5’ spacing between bollards
- D. Bollard location – must be a minimum of 4’ behind the sidewalk of the culdesac or intersection street.

3.09 CURBED MEDIANS (Standard Detail #328)

On existing major streets of 70 feet or wider (excluding expressways), from curb to curb, an 8 inch high curbed median shall be installed at the intersection of a major street at Developer’s expense as shown in standard details #328, 329, 353-387 or as directed by the City Engineer. The median shall extend a minimum of 350 feet from the intersection centerline. The minimum width of a median shall be 4 feet without landscaping. The developer shall install landscaped medians on any new or existing street being modified. Landscaped medians shall be a minimum of 6 feet in width. All medians 6 feet or greater in width shall be landscaped.

On new major streets or where part of a street is widened from two lanes to four or more lanes, a curbed median shall be installed for the full length of the new street or street widening at Developer’s expense and shall conform to the following:

- A. A curbed median with a minimum width of 4 feet and a maximum width of 16 feet shall be installed as indicated in the standard details. The specific design of medians and traffic lanes shall be as directed by the City Engineer. Breaks in curbed medians shall be at all arterial and collector streets with a minimum of 660 feet between breaks. Additional or fewer breaks are at the discretion of the City Engineer and shall be approved by the City Engineer. Traffic lanes adjacent to the medians shall be 12 feet 6 inches in width.

- B. All areas of the median that are 6 feet in width or greater shall be landscaped. In landscaped areas the curb shall extend to the bottom of the aggregate base layer of pavement section or a maximum of 24". Landscape and irrigation plans shall be submitted for approval as part of any improvement plans for work within the public right-of-way.
- C. All areas of the median that are less than 6 feet in width shall be paved with exposed aggregate concrete as shown on standard detail #328 except that on principle arterial and larger streets the median paving shall be colored stamped concrete. The stamp pattern shall be Bomanite "Hex Tile" and the color shall be Bomanite "Brick Red" or approved equal.

3.10 BUS TURNOUT (Standard Details #325 - 327)

Prior to filing of a tentative parcel or subdivision map or prior to property development, the location of bus turnouts shall be approved by the City Engineer. Bus turnouts may be required on major and collector streets where there is a curbside travel or bike lane or the probability of replacing curbside parking with travel or bike lanes. Bus turnouts may be placed approximately 1,000 feet apart, or as directed by the City Engineer. Turnouts may be required at all four corners at arterial/arterial, arterial/collector, and collector/collector street intersections where there is no parking lane or where the parking lane will be eliminated, as directed by the City Engineer.

Bus turnouts may be placed on the far side of the intersection in the travel direction. Other locations shall be as determined by the City Engineer. Location of mid-block turnouts shall be as approved by the City Engineer and shall only be approved if there is no intersection available to accommodate a turnout within 1000 feet.

Bus turnouts shall be constructed as shown in Standard Details #325-328. The slope of the bus turnout parallel to the roadway shall match the slope of the roadway. A maximum cross slope of 2% is allowed perpendicular to the roadway in the passenger loading area.

3.11 DRIVEWAY STANDARDS

See Design Section 10

3.12 OPEN ENDED CULDESACS (Standard Details #313-315, #715)

- A. Open ended culdesacs must be dedicated easements to the City, Community Facilities District, or Homeowners Association for Private Gated Communities.
- B. If city water, storm or sewer utilities are installed through the culdesac, a minimum of 10' of concrete pavement is required.
- C. Culdesacs concrete shall be a minimum 6" thick when proposed as a secondary access point for fire. Otherwise, concrete may be a minimum of 4" thick.

- D. Culdesacs shall be protected from vehicular traffic. A combination of bollards, landscaping, and fencing may be used. A detailed layout shall be provided on the civil drawings. See details #313-315 for conceptual examples.
- E. Wrought iron fence may be used in closing off the culdesac. Wrought iron fence must be between 42" and 72". Wrought iron fence can start at the building setback line. Fencing shall be set back a minimum of 25' from the centerline extension of the culdesac.

3.13 ALLEYS

- A. Commercial Alleys shall be 20' or 30' wide with 5' wide valley gutter. Sectional thickness design of the aggregate base shall be based on a minimum traffic index (TI) of 5 and a minimum of a 0.2' asphaltic cap. A commercial alley approach shall be constructed as detailed in the Standard Details. Concrete alleys are encouraged in commercial areas but not required over asphalt alleys.
- B. New residential alleys shall be designed with a TI of 5 and a minimum of 0.2' AC. Drainage shall also be provided with new alleys.
- C. Existing residential alleys may be surfaced with a 0.2' AC over existing base.
- D. Existing alleys contiguous to new development shall be improved to a minimum width of 14 feet.

3.14 INTERSECTIONS

- A. Street intersections shall be designed so that the larger street or through street maintains its cross-slope through the intersection. The plans shall clearly indicate which street cross-slope is to be maintained.
- B. Sufficient elevations shall be shown on the plan or profile to clearly indicate how it is to be constructed. As a minimum, see section 2.02 C 5 of these Design Standards.
- D. Intersections shall be designed to drain all water to drainage inlets without ponding or draining water across intersections. Valley gutters are not to be utilized in positive storm drain areas to obtain drainage across intersections except in cul-de-sacs and unusual circumstances approved by the City Engineer. Valley gutters are discouraged from use in in-fill projects. The City Engineer may require detailed design submittals for problem intersections.
- E. The developer shall dedicate the appropriate taper area for intersections and transitions per the standard details.

3.15 STREET SURVEY MONUMENTS

- A. Street survey monuments and boxes shall be installed as follows:
1. At all 1/4 Section corners, section corners and intersections with streets that have a designated width greater than a collector.
 2. At BC's, EC's, PCC's and angle PT's on streets that have a designation greater than a collector.
 3. At all locations as required by the City Engineer.
 4. A minimum of 1 monument tied to the California Coordinate System (NAD83), 1992 Adjustment, or current Adjustment or as directed by the City Surveyor shall be referenced to the subdivision. This one monument shall be constructed per standard detail 900. All other monuments shall consist of durable new material. They shall be 1 inch O.D. x 24 inch long galvanized iron pipe or approved equal. The center of the top shall be the exact point monumented. The monument shall be tagged as required by the State of California Land Surveyor's Act.
 5. All other referenced monuments shall be boxed with a 3/4" pin.
- B. All monuments boxes set shall be as shown on the Standard Details and shall clearly show the registration number of the licensed Civil Engineer or Land Surveyor who prepared the final or parcel map.
- C. Developers will be required to install a box around existing monuments fitting the criteria outlined in 3.13A above.
- D. The location and detail of monument pins and boxes in the ROW shall be shown on the improvement plans, Streetlighting/Striping Plan Sheets and on Final Maps or recorded maps.

3.16 DESIGN SPEED

Street speeds shall be designed as listed in Table 3-1 or as approved by the City Engineer.

3.17 STREET STRIPING

All street striping will be designed and installed by the developer and his/her contractor. A striping plan shall be prepared and placed on the Streetlighting Plan sheet at a scale sufficient to clearly indicate all street striping, including centerline, stop street markings, crosswalks, etc. Street signs shall be shown on the same drawing. Plan sheet shall include any and all mergers and tapers beyond property limits and on both sides of the street.

Removal of striping and pavement markers shall be per the approved State Standards.

3.18 SIGNING AND BARRICADES

- A. Street names shall be approved by the City Staff.
- B. Street name and stop signs shall be paid for by the developer. City shall supply and install street name and stop signs.
- C. Permanent barricades shall be installed where improvements cover only a portion of the ultimate development or as directed by the City Engineer. The barricade shall be constructed, erected, painted and signed in accordance with the Standard Details.

3.19 UNDERGROUNDING OF UTILITIES

All subdivisions and major developments, in accordance with City policy, shall underground all new services and existing fronting overhead utilities in accordance with respective utility company policies in either public utility easements or within the public right-of-way. Any installation of utilities outside a PUE and in a public ROW shall be specifically approved by the City Engineer for location. Installation of said underground utilities shall be in accordance with the specifications of the respective utilities. Where corner properties are undergrounding existing fronting overhead facilities and those facilities continue across the fronting streets, the developer shall be responsible for undergrounding to the street right-of-way line opposite the development.

Undergrounding of electrical utilities shall include lines up to 12 KVA. Utilities over 12 KVA may remain pole mounted. A 12 KVA line may remain on poles when installed on a 69 KVA line.

Design Section 8, Non-City Utilities Design, gives some additional guidance to undergrounding utilities.

3.20 STANDARD LOCATIONS OF UTILITIES

Utilities in a common trench shall be located as shown in the Standard Details #804, 805, 805a, and 806. Revisions to these locations or separate utilities in an existing right of way should be noted on the plan submitted with the encroachment permit request.

3.21 RELOCATING EXISTING IRRIGATION LINES

Existing cast-in-place irrigation lines in street right of way shall be replaced with rubber-gasketed, reinforced concrete pipe (RCP) conforming to Sections 65-1.02A and 65-1.06B of the State Standards.

The pipe shall be Class III RCP except where the cover to finish grade is less than 3 feet, the pipe shall be Class IV. Special bedding and type of pipe shall be required where cover depth is less than 3 feet.

Irrigation lines to be abandoned shall be removed, and not crushed and left in place.

Irrigation lines within a subdivision shall be removed, protected or relocated as required by the Irrigation District and the City Engineer. Appropriate easements for irrigation lines to remain shall be dedicated as necessary. If required, a release of irrigation rights shall be executed by the Property Owner.

3.22 FIRE DEPARTMENT STANDARDS FOR PRIVATE STREETS AND DEVELOPMENTS.

Design Appendix H provides design requirements in use by the Modesto Fire Code and Modesto Municipal Code.

The City Engineer will be the final authority for Engineering and Transportation on allowing gated communities with public sewer, water, and storm drain facilities. Policy decisions to accept the utilities as public facilities are based on the size of the development and conformance to the minimum Modesto Standards. These design standards include meeting the requirements for street width and structural section, installation of Curb, Gutter & Sidewalk and installation of sewer, water and storm drain.

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SECTION 4

STORM DRAINAGE DESIGN

4.01 GENERAL

All drainage facilities shall be designed in accordance with accepted engineering principles, and shall conform to these Design Standards.

The Storm Drainage Master Plan requires a multiple criteria policy for all future drainage system design within the City. The criteria are as follows:

- A. The 100-year storm is to be contained within the top of curb grade (provided finished floor pads are a minimum 1.0' above top of curb). Finished floor pads that are less than 1.0 feet above top of curb must be in a positive storm drain area and the engineer must request and justify a requirement to be less than the minimum of 1.0 feet above the adjacent top of curb. Commercial projects finished floor pads may be lower than 1.0 foot above the adjacent top of curb. However, commercial projects must provide a high point on-site of at least 0.8 feet above street flow line. This is to prevent street flooding from flooding the on-site buildings and parking lot. This also assumes the commercial development has mounded landscaping to prevent the 0.8 feet of street water from entering the parking area over the landscaping. Typically, the high point in a commercial drive is placed 10' to 35' behind the property line within the driveway lane.
- B. The hydraulic grade line (HGL) for a 10-year, 24-hour duration storm shall be below the gutter pan (flowline). Engineer will assume the storm basin is full when modeling with these criteria.

All proposed storm drainage facilities shall include provisions for future upstream development. This would entail indicating on plans a storm drain pipe stub 5 feet beyond the development for pipe depths less than 6' and an additional 1' per foot of depth over 6'. All developments connecting to a pipe network discharging directly to a creek, river, or stream shall not exceed the pre-development storm release rates and no development shall discharge at a rate, which exceeds the capacity of any portion of the existing downstream system. Calculations for storm drainage design within a development as well as calculations for runoff generated by upstream areas within the contributing watershed shall be submitted to the City Engineer for approval.

- C. Storm drain discharges for all projects, commercial, industrial, or residential, regardless of project size, shall include Stormwater Quality Control Measures. A City of Modesto document entitled "Guidance Manual for New Development Stormwater Quality Control Measures" has been adopted to establish minimum requirements for stormwater quality control measures and to provide guidance to

the Developer, Contractor, and Engineer in selecting appropriate control measures. This document is incorporated into these Standard Specifications by reference. The Contractor and Developer assume full responsibility for conforming to the requirements stated in this document. In the event of conflict between the requirements stated in this document and these Standard Specifications, the requirements of the Standard Specifications shall take precedence.

- D. The Contractor's attention is directed to a City document entitled "Design Standards for Dual Use Flood Control/Recreational Facilities". This document is incorporated into these Standard Specifications by reference. The Contractor assumes full responsibility for conforming to the requirements stated in this document. In the event of conflict between the requirements stated in this document and these Standard Specifications, the requirements of the Standard Specifications shall take precedence.

These adopted criteria are intended primarily for new construction and make use of the surface capacity of the new streets as a part of the detention/discharge system. Small in-fill projects in areas without positive storm drain shall utilize rock wells for the street ROW and all on-site drainage shall be stored and disposed of on-site with rock wells or some other approved method.

In areas of Stanislaus County under the City's sphere of influence exceptions may be made to substitute galvanized pipe french drains (small development - less than 1.5 acre) for drainage of the ROW. The City's preference will be rock wells or on site detention basins for drainage of the ROW.

The diversion of natural drainage will be allowed only within the limits of a proposed improvement. All natural drainage must leave the improved area at its original horizontal and vertical alignment unless a special agreement, approved by the City Engineer, has been executed with adjoining property owners.

All proposed improvements shall be designed such that, for the 10-year, 24 hour design storm, the HGL is below the gutter pan throughout the conduit system.

Containment of floodwaters shall be within the top of curb. Adjacent finished floor pads are a minimum of 1.0 foot above top of curb or where provisions are made to provide a high point, which prevents floodwaters from entering the finished floor pads. Floodwater shall be confined to streets or other approved right-of-ways by grading, levees or alternative means acceptable to the City Engineer. In no instance shall an improvement be designed such that floodwaters can reach a depth greater than 1.0 foot below finished floor elevations, as measured from the low point flow line, before overland release occurs.

The design of all bridges, box culverts, levees, detention basins, spillways, and other applicable structures shall comply with the latest FEMA and DWR Division of Safety of Dams regulations.

At intersection of pipes, the downstream pipe shall have a crown elevation which is less than or equal to the crowns of all upstream connecting pipes. Pipe diameters shall not decrease in the downstream direction.

4.02 SUBMITTAL OF DRAINAGE CALCULATIONS

Drainage calculations are required for any new subdivision or development and shall be done on standard form Figure 4.1, a spreadsheet reproducing this information, or a software program designed for hydrology output such as StormCad. Submittal of drainage calculations shall include the following items:

- A. Topographic map showing the relationship between the proposed development and the remainder of the watershed, including acreage of all sub-areas.
- B. Hydrology calculations for 10-year, 24-hour duration storm, with the design basin at capacity and a 100-year storm, together with assumptions, charts, tables, references and methods used.
- C. A plan, preferably at 1" = 100' scale, showing proposed street system, existing and proposed drainage system, tributary sub-areas (including offsite drainage), the magnitude and direction (indicated by arrows) of flow in each pipe and flow to each structure contributed by its tributary area. All flow rates shall be in cubic feet per second (cfs).
- D. The hydraulic calculations shall show as a minimum the hydraulic grade line (HGL), the proposed storm drain, including slopes and sizes, the flow in the pipes, velocities in pipes, elevation of pipe inverts at structures, top of structure elevation at each structure and top of curb elevations (or freeboard at structures).

4.03 HYDROLOGY CALCULATIONS

Design storm methods shall be according to the following guidelines:

TABLE 4.1 DESIGN STORM METHODS

Design Area or Item	Design Method	Design Return	Comments
Less than 400 acres	Rational Method	10 year	Refer to these specifications and details
Greater than 400 acres	Unit Hydrograph	100 yr 24 hr	Rainfall depths shall be taken from NOAA Atlas 2, Volume XI, or Rainfall Intensity Curves (Standard Detail 400).

Detention Basin	Unit Hydrograph	100 yr 24 hr	Peak discharge from a detention basin shall not exceed 90% of the undeveloped peak flow from the 24-hour, 100-year event.

- A. Rational Method - Storm runoff for areas smaller than 400 acres shall be computed using the Rational Method according to the formula:

Where: $Q = CIA$
 Q = design runoff, in cubic feet per second (cfs)
 C = Coefficient of runoff based on ultimate development of the drainage area, as defined in Table 4.2
 I = Rainfall intensity from Standard Detail 400 (in/hr)
 A = Area of drainage basin in acres

- B. Unit Hydrograph - Detention basin capacity and storm runoff for areas larger than 400 acres shall be computed using the Unit Hydrograph Method as defined by the Stanislaus County Hydrology and Drainage Procedure Manual and as modified herein.

4.04 PIPE MATERIALS

The minimum allowable inside diameter of any storm drain pipe shall be 12 inches and designed to flow with a minimum velocity of 2 feet per second when flowing full. The pipe materials, which may be used for storm drainage improvements within the City right-of-way, are specified in Section 4 of the Construction Standards.

4.05 COVER REQUIREMENTS

All storm drain pipe alignments shall be designed to allow a minimum of 2 feet of cover as measured from finished grade to top of pipe or 1 foot below the subgrade, whichever is greatest. If, for sound engineering reasons, 2 feet of cover cannot be obtained, the pipe shall either be encased in concrete or provided with a concrete cover (5 sack concrete minimum) as specified by the City Engineer.

- A. Reinforced Concrete Pipe (RCP) - The following chart lists the minimum allowable classes of RCP. For use in this chart, cover is defined as the distance from the outside top of pipe to either the top of curb or finished grade, whichever is applicable.

<u>Cover in Feet</u>	<u>Minimum Class, RCP</u>
Less than 2.5	Class IV (2000 D)
2.5 to 14.5	Class III (1350 D)
14.6 to 23.0	Class IV (2000 D)
23.1 to 37.0	Class V (3000 D)

Any storm drain pipe which lies wholly or in part within the structural section of a street shall be Class V.

B. Cast-In-Place Concrete Pipe (CIPP) - CIPP shall have a minimum cover in conformance with the following:

1. CIPP shall not be used if the finished grade is less than 30 inches above the top of pipe or a distance of 18 inches below subgrade, whichever is greater.
2. If the paving surface is 18 inches or more above the top of pipe, backfill shall be placed in accordance with the City of Modesto standard backfill requirements for utility trenches.
3. The City Engineer may seasonally or permanently deny the use of CIPP if, in his/her judgement, local conditions make the use of said pipe undesirable.
4. CIPP stubs which will need to be tied onto in the future with additional pipe shall have a connection piece of CL IV RCP installed as a stub. Design Engineers shall indicate any pieces of RCP needed for connection with the CIP on the improvement plan profile.

4.06 **HORIZONTAL ALIGNMENT**

Typical residential storm drainage pipe of 12" to 24" RCP shall be parallel with the centerline of the street and centered one foot from face of curb toward the centerline. Unnecessary meandering and angular changes shall be avoided. Pipe curvature shall not exceed manufacturer's recommendations. Access points to the conduit, a manhole or catch basin, shall not exceed 400'.

The table below provides the guidance for locating storm drain pipe in the street.

	Street ROW 64' or Less	Street ROW greater than 64'
12" to 24"	Pipeline shall be parallel to the centerline and centered 12" from face of curb toward the centerline.	Pipeline shall be located parallel to the centerline and either centered 12" from face of curb toward the centerline or greater than 36" from the lip of gutter toward the centerline, as measured from the outside diameter of pipe.
Greater than 24"	Pipeline shall be located parallel to the centerline and greater than 36" from the lip of gutter toward the centerline, as measured from the outside diameter of pipe.	Pipeline shall be located parallel to the centerline and greater than 36" from the lip of gutter toward the centerline, as measured from the outside diameter of pipe.

4.07 DRAINAGE STRUCTURES

1. Manholes, inlets, rockwells, and junction boxes shall conform to the City Standard Details. They shall be located at changes in grade or conduit size, at junction points, on curved pipe at the EC or BC or the curve, and at 300 foot intervals along the curve. A forty-eight inch (48") diameter barrel may be used for pipe up to thirty-six inch (36") diameter, a sixty-inch (60") diameter barrel for pipe up to fifty-four inch (54") diameter and a seventy-two inch (72") diameter barrel for pipe up to sixty-inch (60") diameter. A custom designed box structure for pipe over sixty inches (60") in diameter as determined by the City Engineer.
2. Catch basins shall conform to the City Standard Details. Catch basins shall be designed and spaced such that they intercept and fully contain the 10-year storm. Under no circumstances shall the spacing of catch basins exceed 1,000 feet. Catch basins which connect to positive drainage and do not first contribute to a detention basin, retention basin or rockwell, shall be a Type 1 (catch basin) with a minimum of one Type 18 bicycle proof grate. Catch basins, which are connected to a positive drainage and settling basin or separator, shall be curb inlets with cast iron hoods or Type 2 (storm drain catch basin) (see Standard Details).
3. Box culverts shall be required when specified by the City Engineer and designed on an individual basis.
4. Headwalls, wingwalls, endwalls, etc. shall be considered on an individual basis and, in general, designed in accordance with the State Specifications and Standard Plans.
5. Drainage pump stations may be permitted on an individual basis with the written approval of the City Engineer.
6. Temporary inlets and outlets shall conform to accepted engineering practice and shall be specifically designed and detailed on the plans.
7. Storm water runoff in gutters shall be conveyed in underground structures when any one of the following criteria is met:

Gutter runoff exceeds 3.0 cfs
Length of gutter exceeds 1,000 feet
8. Access points for the storm drain system shall not exceed 400'. Both catch basins and manholes are considered access points.
9. Rock wells will be allowed in certain areas as designated in the General Plan. They are also a necessity in temporary basins. Design of rock wells shall meet the criteria in section 4.08.

4.08 ROCK WELLS

Rock wells (vertical and horizontal), when approved by the City Engineer, shall be constructed as shown in the Standard Details. The rock wells shall be located at least 150 feet from domestic water wells. Vertical rock wells shall be at least 10 feet above ground water and have a 20-foot minimum horizontal separation from all other vertical rock wells.

1. Modesto rock wells shall be drilled to fifty feet (50') in depth unless soil core testing proves the drilling can penetrate at least a 10 feet continuous coarse sand stratum that is not less than thirty-five feet (35') from surface of the street. Plan sets shall indicate a fifty foot (50') depth rock well unless a soils core testing has been submitted to the City Engineer prior to submitting the plan sets for approval. The contractor, with a signed plan set indicating a fifty foot (50') requirement for drilling, may conduct soils testing to provide data for a shallower rock well. This data must be submitted a minimum of ten (10) days prior to drilling. A single soils core test represents a single rock well unless another proposed rock well is located within a five hundred foot (500') radius of the core test.
2. The soil core test must show penetration of a ten-foot (10') continuous coarse sand stratum that is thirty-five feet (35') or more below the surface. The core pipe of the rock well shall penetrate the sand strata layer at least three feet (3').
3. The maximum street right-of way drained shall be as follows: for a single rock well a maximum of 10,000 square feet of street right-of-way. Double rock wells may be used for a maximum of every of 14,000 square feet of street right-of-way. Triple rock wells may be used for every 18,000 square feet of right-of-way. A minimum horizontal distance of twenty feet (20') shall separate rock wells.
4. Provisions shall be made by means of street geometric design to minimize the overflow of one rock well service area into adjacent areas. Where possible, the street geometric design shall be such that overflow from a rock well service area into adjacent areas shall only occur for storms with a return frequency of greater than 5 years.
5. Turlock style rock well shall be drilled to a depth of 50' to 70'. The soil core test must show penetration of a 10 feet continuous coarse sand stratum that is 50 feet or more below the surface. The core pipe of the rock well shall penetrate the sand strata layer at least 3 feet.
6. Rock wells shall be tested for adequacy after completion of all work in their designed service area. This service area shall include nearby on-site development. The developer may have all the street improvements accepted except the rock wells by replacing the bonds with a lower bond amount while waiting for on-site development to be completed. This is to guarantee that silts produced by on-site development is strictly controlled and damaged rock wells are rejuvenated prior to acceptance. Testing shall consist of flooding with water until static head is obtained at the well inlet. Rock wells shall absorb this

static water head within 24 hours. If the maximum practical input flow has been applied continuously for 1 hour without obtaining a static head, the rock well will be approved.

7. To comply with the City's NPDES permit, the driller or developer shall submit to the Engineer a well drilling log for each rock well as soon as possible after drilling is completed and prior to acceptance of the improvements by the City.

4.09 EASEMENTS

Publicly owned drainage pipelines and channels will not be allowed on private property unless they lie within a dedicated public easement. Where minor improvement of a drainage channel falls on adjacent property, such as day lighting a ditch profile, written permission from the adjacent property owner(s) for such construction shall be required. A copy of the document which grants said approval shall be submitted to the City Engineer prior to the approval of the improvement plans.

Easements for closed conduits shall meet both of the following width criteria:

1. Minimum width of any easement for a closed conduit shall be 15 feet.
2. All easements for closed conduits shall have a minimum width in feet equal to the required trench width according to the standard detail for trench backfill plus 2 additional feet of width for every foot of depth of the pipe as measured from the bottom of the pipe to finished grade. All conduits shall be centered within their easements.

Drainage easements for open channels shall have sufficient width to contain the open channel and a 17-foot wide service road. The toe of a bank shall not be within 5 feet of an easement boundary. Easement boundary lines shall, at changes of alignment, have a radius sufficient enough to provide turning room for vehicles operating on the service road.

4.10 DISCHARGE APPROVAL AND PERMITS

The developer shall have the responsibility of obtaining written approval and encroachment permits from all agencies controlling the discharge of drainage into the receiving waterways.

4.11 MISCELLANEOUS ITEMS

- A. Fencing—All basins and open channels shall be enclosed a chain link fence or masonry wall complying with the City Standard Details and Specifications. The fence or wall shall be located a minimum of 6 inches within the required easement boundary. Vertical slats inserted in the fence shall be used to screen the service road or site. The City Engineer shall determine the type of fence or wall. In most cases, a masonry wall will be required for all permanent basins except dual-use basins and a fence will be required along open channels or long and narrow access roads to a basin.

Masonry walls shall be constructed of 8" block and at a minimum of 6' high. Landscaping around the outside perimeter shall be a minimum of 10' wide.

- B. Service Road-A service road shall be provided within the boundary of all open channels. It shall be a minimum of 16 feet wide, 10% maximum graded for vehicular traffic and clear of trees, shrubbery, and other obstructions for its full width. Fourteen feet of the road's width shall be concrete paved (surface type to be determined by the City Engineer for each case) with a minimum unpaved rock shoulder width of 1 foot on each side of the roadway. Turning radii of 45' for maintenance vehicles shall be maintained. Service roads extending into the basin shall have a turnaround. Service roads may be required on both sides of the channel as determined by the City Engineer.

4.12 STORM WATER BASINS

The City will accept for maintenance two different types of master basins – percolation (retention) and detention. A third type of basin, temporary retention, will not be accepted for maintenance by the city and will remain the developers' responsibility. Temporary basins may be used only when storm pipelines and right-of-ways to the master basin do not exist. A temporary basin is the minimum required to allow the sales of homes. The ultimate connection to a master basin or pipeline to a master basin must be shown in the plan set. All basins, temporary or permanent, shall meet the following conditions and conform to the standard details.

The developer and/or consulting engineer shall use the City of Modesto Design Standards for Dual Use Flood Control/Recreational Facilities for all basins designed for dual use (See the Computer CD (Compact Disc) for these Standard Specifications).

All storm drainage basins (retention/detention) shall be fully landscaped in accordance with the criteria established in the "Design Standards for Dual Use Flood Control/Recreation Facilities' Manual".

- A. Layout – A square or rectangle master basin layout is recommended, as this is the most efficient use of the land.
- B. Depth – The maximum water depth shall be 20 feet and at least 10 feet above the water table. Water table measurements shall be taken in the months January through May. The basin bottom shall be shaped to concentrate the water to the inlet/outlet area where either infiltration or pumping will take place.
- C. High Water Elevation – The high water elevation in the basin shall be 6 inches below the lowest gutter elevation.
- D. Side Slopes – Side slopes shall be at 4:1 for permanent basins and a minimum of 2:1 for temporary basins. Temporary basins will be defined as basins planned for less than 10 years of service and not maintained by City forces.

- E. Access – A 16' wide access road shall be constructed to the bottom of the detention basin and around the basin. The road surface shall be 8" concrete (5 sack with fibermesh) over 4" Class II aggregate base over 6" of native compacted at 95%. Road stabilization fabric will be required within the basin itself. A 12" wide shoulder consisting of 12" aggregate base over native shall be constructed. The access road shall extend to the street. Access road grade shall not exceed a 10:1 with 3:1 side slopes. A turning radii of 45' is required for maintenance vehicles. Basins shall be provided with a minimum of a 25-foot wide strip around the top perimeter for an access road and a buffer zone for landscaping, fencing, and/or screen walls. Inside the basin bottom, a turnaround shall be constructed.
- F. Inlet Structure – Temporary basins shall use either a concrete flared end section (FES) or a head wall. Permanent basins shall construct headwalls on inlet pipes greater than 30" in diameter. A 2' deep x 12" wide concrete cutoff wall shall be constructed at the outlet to prevent scouring. Engineer rock (20 lb+) w/ engineer fabric under rock shall be installed to prevent erosion and vegetative growth under the rock.
- G. Fencing – See 4.11 A for details.
- H. Trash Separator – All inlets and outlet structures shall include appropriate provisions to prevent access by small children and prevent clogging of structures. This will include the installation of trash racks or rebar across the open areas of said structures and pipes.
- I. Inlet/Outlet Locations – The inlet and outlet location shall be at least three feet deeper than the remainder of the basin. This area shall trap the nuisance water on a daily basis and allow percolation. The entire basin shall have a slope toward this area of a minimum of 3%.
- J. Community Facilities District (CFD)– All master basins shall be part of a designated CFD district to maintain the basin. Maintenance costs covered by the CFD shall include all aspects of the basin such as pumps, structural integrity, mowing and planting grasses, weed control, and irrigation system.
- K. Irrigation – All drainage basins will be irrigated to include side slopes. This is to produce grasses for settling out pollutants. The City Recreation and Neighborhoods Department shall approve the system design.

4.13 Percolation (Infiltration) Basins

Percolation basins are designed to allow the entire volume of a 100-year frequency, 6-day duration storm to infiltrate, thus not requiring any pumping. Infiltration rates can vary significantly, depending on the soil types encountered at various depths. The actual design infiltration rate for percolation basins must be based on infiltration tests performed on the actual basin site at the time of design.

- A. Volume – The volume of the basin shall be large enough to hold a 100-year, 6-day frequency storm. This volume is based on average infiltration rates, which is much greater than pumped basins based on the City's experience with percolation basins.

- B. Soils Testing for Percolation Basins – A soils test must be prepared for all percolation basins. The soils test shall identify the infiltration rates and how deep an infiltration trench must be constructed to fulfill the requirements for emptying a 100-year, 24 hour storm event within 48 hours, including the conduit system's water. Also, a soil boring must be made to water table or a minimum of 60 feet, the shallower of the two. The deepest portion of the exposed basin bottom must be constructed a minimum of ten feet above the existing water table.
- C. Infiltration Trench – The infiltration trench shall be excavated to a depth such that 10' of sand strata is exposed to the sidewalls of the trench. The required soils test shall identify this depth. The width of the trench shall be a minimum of 12". The trench shall be lined with a 4 oz. woven filter fabric with 6 feet of overhang to wrap up the rock. Engineer rock 3" to 12" in size shall be used to backfill the trench. The trench shall initially be filled to the surface and then the fabric overlapped over the trench. An additional pile of rock 4' wide by 3' high shall be placed over this trench in the low basin.

4.14 Detention Basins

Detention basins shall allow the option of a dual use or multi-use basin with turfed bottoms (for parks, softball, soccer, etc.). The detention basin must be designed to hold the first 24 hours of runoff. The settling period is required for controlling sediments or other pollutants. The basin pumps will then be able to pump out the water within 48 hours to be able to absorb another storm and to keep the turf from being killed.

- A. Volume – The volume of the basin shall be large enough to hold a 100-year, 24-hour storm. The volume is calculated by the formula $V=CAR/12$, where V=volume in acre-feet, C=runoff coefficient, A=area in acres and R=100-year, 24-hour rainfall. From Figure 4-2, $R_{10}=(0.08 \times 24)=1.92''$, $R_{100}=(0.12 \times 24)=2.88''$. Use appropriate C values and corrections for R based on location determined from Standard Drawing No. 4xx.
- B. Pumping to an MID Canal – Prior to building a pump basin, the developer must obtain City and MID or TID approvals.
- C. Pump Station Design – The storm basin design must hold the 100-year, 24-hour storm. The pumps shall be designed to drain a 1-year frequency, 3-day duration storm within the next 48 hours. Criteria for pump station design including the electrical work shall be established on a case-by-case basis.

TABLE 4.2

BASIC RUNOFF COEFFICIENTS

<u>Surface</u>	<u>Coefficient (C)</u>
Pavement	0.95
Roofs	0.95
Compacted earth without paving	0.75
Lawns and Open Lands	0.20

TABLE 4.3

COMPOSITE RUNOFF COEFFICIENTS FOR VARIOUS LAND USES

	<u>Coefficient (C)</u>
Residential Areas	
Suburban Density (0.5 to 1.0 acre lots)	0.40
Low Density (2.1 or more lots per acre)	0.60
Medium Density (Multi-family)	0.70
Commercial	0.90
Industrial	
Light	0.80
Heavy	0.90

TABLE 4.4**MANNING COEFFICIENT**

<u>CONDUIT MATERIAL</u>	<u>MANNING COEFFICIENT</u>
<u>Closed conduits *</u>	
Asbestos cement	0.013
Cast iron pipe	0.013
Concrete pipe	0.013
Corrugated metal pipe	
Plain	0.024
Pave invert	0.020
Fully paved	0.013
Vitrified clay	0.013
<u>Open channels</u>	
Lined channels	
Asphalt	0.015
Concrete	0.015
Rubble or riprap	0.030
Vegetal	0.040
Excavated or dredged	
Earth, straight & uniform	0.030
Earth, winding, fairly uniform	0.040
Unmaintained	0.100

(Adapted from Table XIV, ASCE Manual No. 37, 1970)

TABLE 4.5

JUNCTION LOSSES

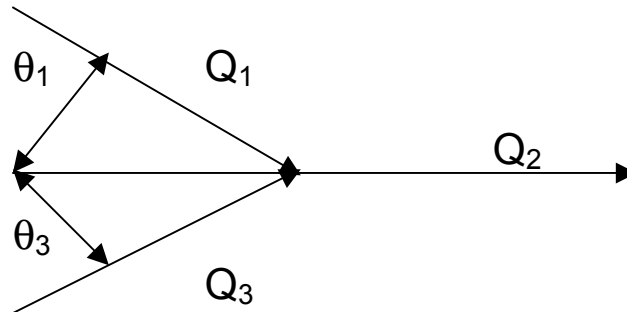
At point of change in the hydraulic parameters of flow rate or section (including manholes and catch basins), the HGL shall be calculated considering velocity heads and losses due to bends, entrances, exits, turbulence, etc.

Losses may be determined using energy equations (with appropriate coefficients), or by using the pressure-momentum method as outlined below. Junction losses used in the hydraulic calculations shall not be less than those calculated by the pressure-momentum method.

The pressure-momentum method may be used to calculate the change in water surface at junctions and section changes, as follows:

$$\Delta y = \frac{Q_2 v_2 - Q_1 v_1 \cos (\theta_1) - Q_3 v_3 \cos (\theta_3)}{g(A_1 + A_2)} \cdot 2$$

Where:



- Δy = Change in hydraulic gradient through junction, in feet
 Q = Flow in cubic feet per second (cfs)
 V = Velocity in feet per second (fps)
 A = Area of flow in square feet (sf)
 θ_3 = Angle of convergence between the center line of the main and the center line of the lateral in degrees ($^{\circ}$)
 θ_1 = Angle of deflection between the upstream and downstream centerlines, in degrees ($^{\circ}$)
 g = Acceleration due to gravity, 32 ft/sec²

However, the minimum loss through a junction shall not be less than one-tenth (0.10) of the outflow pipe velocity head.

FIGURE 4-1
STANDARD FORM – RUNOFF CALCULATION

City of Modesto
Engineering and Transportation
Storm Sewer Design

JOB TITLE: _____

RAINFALL CURVES

PIPE: Type: _____

DES BY: _____ DATE: _____

Source: _____

Roughness Coefficient $n =$ _____

CHK BY: _____ DATE: _____

M.A.P. _____

Minimum Velocity at

Frequency: _____

Design Flow: $v =$ _____ fps

RUNOFF COEFFICIENTS:

TIME OF CONCENTRATION

Land Use: _____

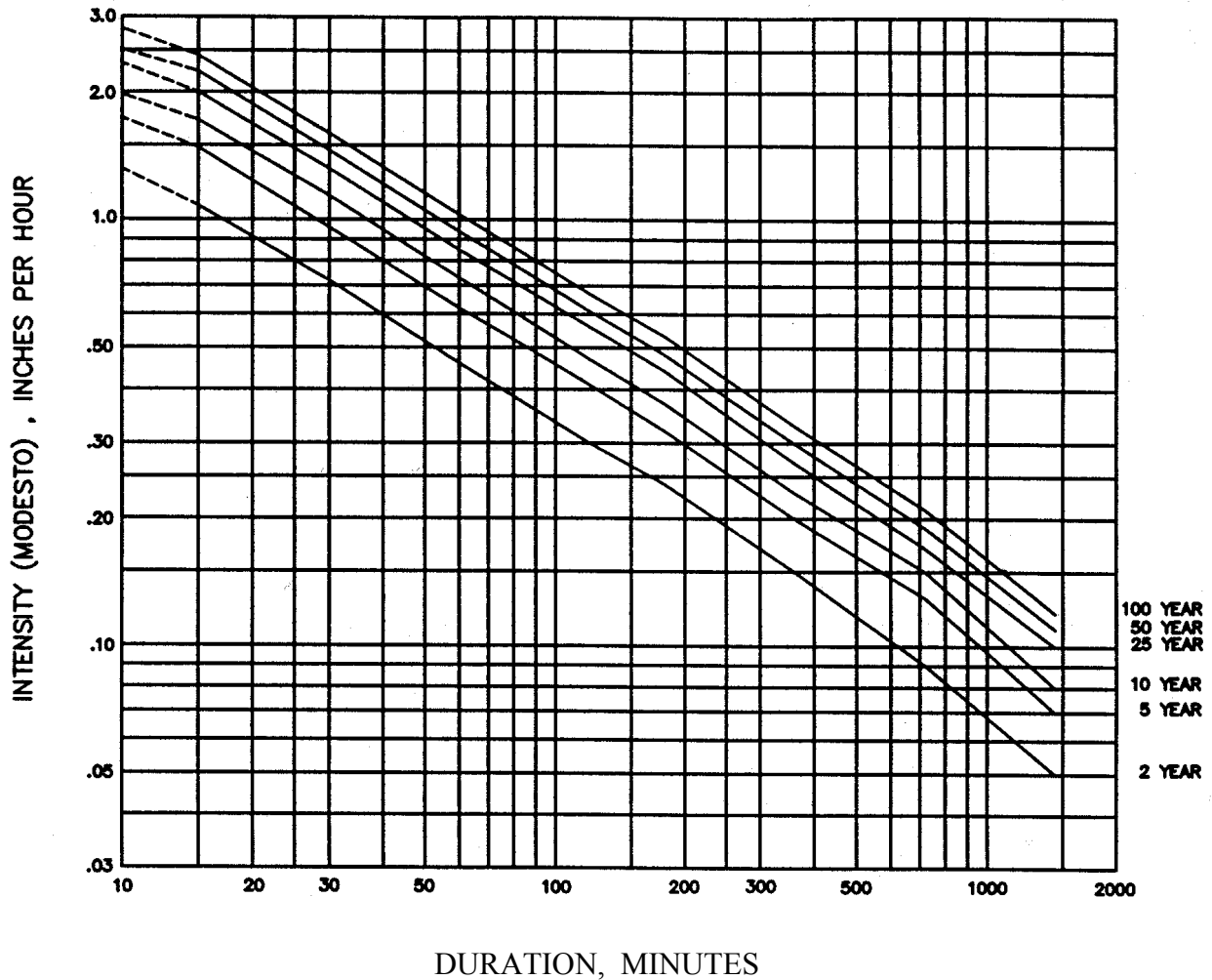
Initial: _____ min.

Weighted Coefficient:

[illegible]

FIGURE 4-2

RAIN INTENSITY FREQUENCY CURVE



These curves are based on California Department of Water Resources data from the Modesto rainfall gauging station. (Mean annual precipitation = 11.95") to obtain intensities for locations other than Modesto, multiply intensity on this chart by mean annual precipitation at the point in question divided by 11.95.

DWR #800 57 00

Data through 1995

\\USP\\Projects\\Don\\Rain_idf2.dwg

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SECTION 5

SANITARY SEWER DESIGN

5.01 GENERAL

A. Definitions of sewer lines (MMC 5-6.103):

1. House sewer line. The line connecting a user's property to the sewage system.
2. Sewer lateral/sewer main. A pipeline which collects sewage from one (1) or more individual users and transports it to subtrunk and trunk sewers.
3. Subtrunk sewer. A pipeline designed to transport sewage from the subtrunk sewer service area to the trunk sewer.
4. Sewer system. The facility designated and used for the collection, treatment, and disposal of industrial wastes and sanitary sewage.
5. Sewer service. The services and facilities for the collection, treatment, and disposal of industrial wastes and sanitary sewage.
6. Subtrunk sewer service area. An area that is one hundred sixty (160) acres or larger that is not adjacent to a trunk sewer that is served by a subtrunk sewer.

B. Submittal Map & Calculations

Sanitary sewer system design within a developing area must include provisions for size and capacity to adequately convey all domestic and industrial waste that can be reasonably anticipated under conditions of full ultimate development. Engineering calculations to support the sewer system design shall be submitted to the City Engineer for approval. The calculations shall include:

1. Map indicating service area within the sewer system including any future contributing development with projected land use, zoning, and any physical features contributing to the sewer system design.
2. Sanitary sewer waste volumes, either existing or proposed, within the service area of the system.
3. Size and slope of each pipe between appurtenant structures.
4. Invert/RIM elevations of each pipe and appurtenant structure.

C. Line Size and Service Policy

1. To eliminate mandrel changes, defer maintenance and permit in-situ lining of an existing pipe, the line size and service policy requires that the minimum size of any new public sewer main shall be 8 inches in diameter.
2. All intersecting sewer pipe 8" in diameter and larger shall be connected by or at a manhole.
3. The minimum lateral size is 4 inches. Where grade requirements can not be met and the lateral's intended use is to serve single family residences, six inch or larger laterals shall be installed where intended use is industrial, commercial or greater than single family residential flows. Joint use of laterals will not be permitted except in multi-family residential uses.
4. Sewer laterals connecting structures having a finished floor elevation 12 inches or less above the highest elevation of the nearest upstream structure shall require installation of a backwater prevention device on the house sewer or lateral next to the cleanout adjacent to the right-of-way according to the Uniform Plumbing and Uniform Building Code (Detail #503).
5. No direct connections are permitted on 12 inch or larger sewer mains.
6. The construction, maintenance and repair of the house sewer line (service) including the wye in the street at the sewer lateral shall be the property owners responsibility. The property owners responsibility extends into the streets, alleys, and/or easements to the city main.
7. No direct connections will be allowed on sewer trunk and subtrunk lines. A PVC lined manhole must be used.

D. Right of Way Policy

The right of way policy requires that all public sewers be in dedicated rights-of-way (not easements) for sewers and/or public use. Sewer services are not permitted in dedicated rights-of-way outside the roadway without prior written approval by the City Engineer. This approval will be given only when insufficient grade makes it impossible to serve the property directly from a sewer main in the right-of-way.

Dedicated right-of-way outside the roadway for sanitary sewers shall meet both of the following width criteria:

1. Minimum width of any dedication shall be 15 feet.
2. All dedications shall have a minimum width in feet equal to the required trench width according to the standard detail for trench backfill plus 2 additional feet

of width for every foot of depth of the pipe as measured from the bottom of the pipe to finished grade. All sewer pipes shall be centered within the dedications.

3. In a residential cul-de-sac where the sewer is extended through the cul-de-sac to another street, a dedicated right-of-way shall be constructed with a 10' wide drive (6" concrete) and landscaped on both sides of the drive. One removable bollard shall be installed at each end of the dedicated right-of-way. Curbs shall not be modified to accommodate the access driveway.

E. Service Policy

The service policy of the Modesto Municipal Sewer District #1 requires that all properties served must annex into the District.

A property already inside the district may extend sewer mains and laterals to connect to the system. If the extension requires use of force mains, the property owner must prove to the City Engineer its requirement and design the facility to the City Engineer's satisfaction.

As a minimum, sewer mains shall be extended across frontage, unless otherwise approved by the City Engineer.

F. Septic Tank Policy

No new septic tanks are allowed within the municipal sewer district's boundaries. In older areas, in which a sewer service is installed after the homes have been on septic tanks, property owners have a five year grace period to connect to the new sewer main. If no service is available, then septic tanks will remain until such time the municipality makes sewer service available.

G. Fly Line Policy

Fly lines, a parallel sewer line constructed adjacent to a main trunk and/or a deep line, may be constructed in most circumstances when approved by the City Engineer. The standards of construction are outlined in Detail 508.

5.02 **FLOW**

- A. The design sanitary sewer flow shall be computed using the following formula:

Where:

$$Q_D = Q_P + I$$

Q_D = Design Flow (gal per day)
 Q_P = Peak Flow
 I = Infiltration

The peak flow (Q_P) for residential service areas is defined as 2-1/2 times the average flow or as shown in Figure 5.1. The average flow for the service area shall be computed from two basic assumptions:

1. 2.50 persons per single family dwelling
2. 100 gallons per person per day

Acreage flows estimates for master planning and sizing mains when the exact number of residential services are not specified by are as follows:

TABLE 5.1 ACREAGE FLOWS ESTIMATES

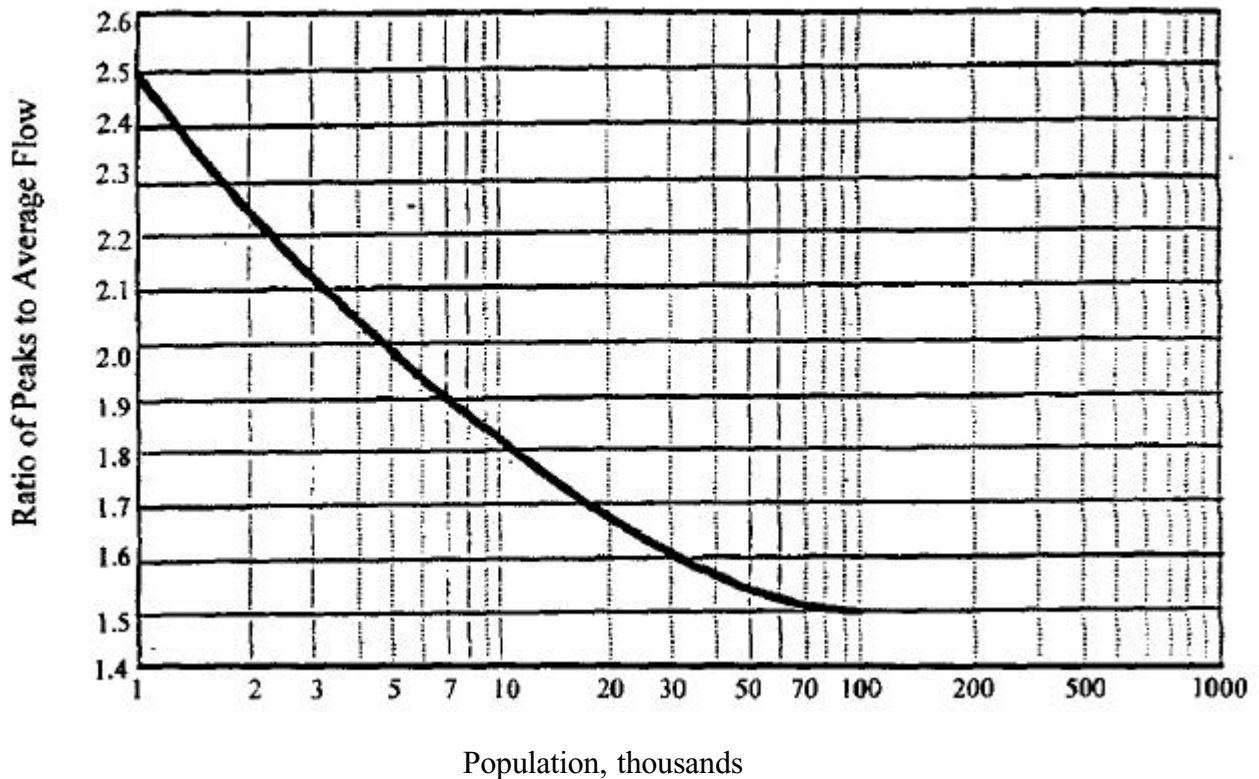
Land Use	Density Units/Acre	Persons Dwelling/Unit	Average Flow (Gal/Ac/Day)	Peak Flow (Gal/Ac/Day)
Very Low Density Residential	2	2.50	500	1650
Low Density Residential	5	2.50	1250	4125
Medium Density	8	2.50	2000	5280
High Density Residential	10	2.50	2500	6600
Multi-Family	22	1.90	4180	10450
Commercial				7500
Office				7500
Light Industrial				3000
Heavy Industrial				*Note 1
Schools			20 GPCD	*Calculate*

*Note 1 - Sewage flow rate shall be considered on a case by case basis and may require special design.

- B. Infiltration and inflow (I & I) shall be computed by using 500 gallons per inch diameter mile per day for sewer mains and laterals or 1000 gal/acre/day. Residential laterals shall be assumed to be a minimum of 75 feet in length.

FIGURE 5.1

RATIO OF PEAK TO AVERAGE FLOW OF SANITARY SEWAGE



Reference: Modesto Sewage Survey, 1966C. Pipe Capacity

1. Manning's Formula, $Q = A (1.49/n) R^{2/3} S^{1/2}$, shall be used to determine pipe capacity. The "n" value shall be 0.013 or the pipe manufacturer's recommendation, whichever is greater.
2. All main sewers shall be sized to carry the design flows at 70% of pipe capacity.
3. Design capacities for trunk sewers 12 inches and larger shall require approval by the **Director of Engineering and Transportation**.

5.03 VELOCITY

Sewer velocity shall be equal to or greater than 2 feet per second for all sewers when flowing full. Where design velocities for main sewers exceed 10 feet per second, **ceramic epoxy-lined ductile iron pipe**. The ductile iron pipe shall be wrapped with a 40-mil polyethylene blanket.

The following are minimum slopes required for sewer lines:

PIPE SIZE	MIN. SLOPE
8 inch	0.35%
10 inch	0.25%
12 inch	0.20%

5.04 VERTICAL ALIGNMENT

- A. Minimum pipe cover and clearance shall be maintained in the design of sanitary sewers. If certain conditions exist which make it impractical to meet the minimum cover and clearance requirements, the conditions and locations shall be specifically noted above the sewer profile on the plans. Each location not meeting the minimum cover and clearance requirements will require special pipe, bedding and/or backfill and shall be approved by the City Engineer.

Under no conditions or circumstances shall other utilities be allowed to be installed directly over and parallel to any sanitary sewer installation.

- B. Main and trunk sewers shall have a minimum depth of 42 inches from the top of pipe to the finished grade and a minimum of 2 feet to bottom of street subgrade. Mains installed with less cover shall use ductile iron pipe or other engineered alternatives and shall require the approval of the City Engineer.
- C. Sewer laterals shall have a minimum depth of 3 feet from the top of the pipe to the finished grade at the right-of-way. Maximum depth of 5 feet at right-of-way for residential subdivisions. Commercial, industrial, apartment and multi-family shall have a minimum of 5 feet at right-of-way and shall be increased by one foot for every 250' of lot depth.
- D. Pipe shall be laid with a minimum of 12 inches vertical clearance from all improvements and utilities, unless otherwise approved by the City Engineer.
- E. At points of convergence of pipes of various sizes, the soffits of the pipe elevations shall match.
- F. A change of direction requires a 0.10 foot minimum drop from the incoming pipe flowline to the outgoing pipe flowline in the structure.
- G. Sewer lines shall be installed on a straight grade between manholes.

5.05 HORIZONTAL ALIGNMENT

- A. Sanitary sewers shall be placed within street rights of way or in a dedicated public ROW such as through the end of a culdesac to an adjacent street. Sewer easements through private property will not be accepted.

- B. Alignment shall be parallel to the street centerline wherever possible. In new developments, the horizontal alignment of sewer mains shall be 6 feet north or 6 feet west of the street centerline. When looping the system around the new subdivision, the utility lines may become reversed - 6 feet south or 6 feet east of the street centerline.
- C. Sanitary sewer mains shall be on a straight line between manholes. Whenever it is essential that a curved alignment be used, a minimum radius of 200 feet shall be required, but shall be greater whenever possible. The radius and delta of all curves shall be indicated on the plans adjacent to the curve. If the sewer line parallels the road centerline, then only the street centerline data on radius and delta needs to be indicated on the plans.
- D. The deflection in the joint between any two successive pipe sections shall not exceed eighty percent (80%) of the maximum deflection as recommended in writing by the pipe manufacturer. Minimum 2 foot pipe lengths may be used to install short radius curves providing the requirements specified herein are met.
- E. Sewers within 100 feet of domestic wells shall be cast iron or ductile iron.
- F. Sewer mains and laterals that are stubbed for future development shall be stubbed the greater distance of five feet (5') or 2' for every 1' of depth below finished grade beyond the termination of developed landscaping or pavement (if ROW is available).

5.06 PIPE MATERIALS

Sewer pipe shall be Vitrified Clay Pipe, Cast Iron Pipe, or Ductile Iron Pipe. Vitrified Clay Pipe shall be clay bell and spigot end compression joint pipe and shall conform to the current standard specifications of the A.S.T.M. C700-71T for Extra Strength Clay pipe, except that no glazed pipe will be permitted. Pipe material greater than 39" shall be RCP T-Lock. Ductile Iron Pipe for use in sewer systems shall be lined with "Protecto 401 Ceramic Epoxy Liner". Village One may use 8" - PVC SDR 35 pipe with approved backfill requirements. See Specifications in Appendix J.

5.07 SEWER LATERALS

House sewer lines are those portions of the sewer system between the sewer lateral, trunk, or subtrunk and the sewer maintained by property owners. Property owners shall be responsible for the entire house sewer line from the sewer lateral, trunk, or subtrunk in the street to the house. This shall include the wye on the lateral, trunk, or subtrunk. In all cases City maintained sewer lines will lie in a street right-of-way or dedicated public easement. In all new subdivision work, the house sewer lines and risers from the sewer to the property line shall be installed at the time the sewer is constructed. Wherever a sanitary sewer is installed which will serve existing houses or other buildings, a house sewer line shall be constructed for each existing house or building. Each house sewer line shall be referenced to the plan stationing. Each individual building parcel shall be connected by a separate house sewer line.

Exceptions to separate **house** sewer and water lines may be granted by the City Engineer in commercial centers with associations or management agencies and appropriate private easements. The Public ownership will, in all cases, stop at the right-of-way line of the street. No dedicated public easement will be accepted.

The following are requirements for sewer laterals:

- A. All sewer laterals, from property line or edge of easement to the point of connection with the main line or a manhole shall have an alignment that provides an angle of intersection with the downstream section of the main sewer of no more than 90° .
- B. The maximum deflection at any one point in a lateral including fittings at the wye connection to main sewer or at angle points having clean outs, shall be 22-1/2° (1/16 bend) and any two consecutive deflection (bends) shall not be less than 2 feet apart.
- C. Building drains (i.e. floor drains, roof leaders, etc.) shall not be connected to the sanitary sewer system.
- D. All wash racks and car washes must be connected through an oil/water separator before connection to the sanitary sewer. Also, overhead cover must be installed to prevent rainwater infiltration. **See Appendix P for wash rack specifications.**
- E. A sewer cleanout shall be provided on the sewer lateral within the City right-of-way at the back of sidewalk as shown in the Standard Details.
- F. Cleanouts shall be constructed in all sewer laterals at the following locations:
 - 1. At the City right-of-way as shown on the Standard Details.
 - 2. At any single turn greater than 45° .
 - 3. At intervals not to exceed 100 feet along the side sewer lateral.
- G. Cleanouts shall be constructed in conformance with the City Standard Details.
- H. Backflow prevention devices may be required as specified in Section 5.01 B.4.
- I. When connecting a sewer lateral directly from an existing manhole to the right-of-way line, ductile iron pipe (DIP) shall be inserted into the manhole and brought to the right-of-way line. Vitrified Clay Pipe (VCP) may be used with an adjustable repair coupling connecting to the DIP at least 4 feet from the outside face of the existing manhole.
- J. **The maximum depth of a sewer service connection to the main shall be 12'. A fly line must be constructed for services deeper than 12'.**

K. Grease Traps

Grease traps and interceptors shall be constructed by the Developer on private property on the sewer service lateral for any facility whose operation will result in oil, grease, sand or other solids being discharged into the City's sanitary sewer system.

The traps or interceptor shall conform to Section 708 and 711 of the current Uniform Plumbing Code adopted by the City and it shall be constructed where it can be easily inspected for proper operation by the City Engineer.

For additional information regarding specific requirements for grease traps contact the Chief Building Official.

5.08 MANHOLES

- A. Manholes shall be placed at the intersections of all sanitary sewers, at all locations where there is a change in size, grade or direction and at the ends of all permanent lines.
- B. Manhole spacing shall not exceed 400 feet.
- C. Manholes installed in areas outside of the street shall have bolted manhole covers. Rim elevations shall be a minimum of one (1) foot above ground. The exposed manhole above existing ground shall be constructed entirely of grade rings and noted on the plan sheets. If the manhole outside an existing street is in a future street area, then grade rings shall extend below ground at least eighteen inches. Four bollards shall be installed around the manholes to protect it from farm machinery and other vehicles.
- D. Manholes shall be constructed at all service lateral connections where the main line is not at least 1-1/2 times the size of the service lateral.
- E. Where the location of two manholes is determined by intersecting lines, the distances between intervening manholes shall be approximately equal.
- F. Whenever a change in the size of pipe, or an angle of 20° or more in alignment occurs at manholes, the flow line of the incoming pipe shall be a minimum of 0.10 feet above the flow line of the outgoing pipe, or an amount necessary to match pipe soffits. The improvement plans shall show invert in and invert out of the manhole.
- G. Manholes shall be used at the termination of cul-de-sac sewer mains. House sewers shall be connected to this manhole for services to adjacent properties.
- H. Cleanouts may be installed at the upstream end of mains which are proposed to be extended in the future and do not exceed 250' and/or 3 services. Future extensions exceeding 250' and/or 3 services shall use a manhole with a five foot stub and plug for future extension.

- I. All manholes constructed on trunk mains (12" or larger pipe) shall be PVC lined (T-Lock).
- K. A 48" diameter barrel manhole may be used on pipe sizes up to 33" in diameter. All pipe diameters 36" to 48" shall use 60" diameter barrels for manholes. Pipe diameters 54" to 60" shall use 72" barrels for manholes. All larger pipes shall have custom made boxes with 48" diameter barrels and a manhole cone extending to the surface.

5.09 PUMP SYSTEMS

Special design of sewer force mains or other unusual features or structures require individual study and approval by the City Engineer.

- A. All sewage pump systems, including residential sewage pumps, when proposed, shall be submitted to the City Engineer.
- B. Pump stations shall have 50 percent standby and a minimum of 2 pumps. Standby power shall be provided.

C. Force Mains

Force mains shall be sized to flow at a minimum of 3 feet per second under normal operating conditions. Pipe shall be ductile iron pipe, and shall conform with Section 5.02 of the City Standards. Length of force mains shall not exceed 100' without individual approval of the City Engineer. All force mains shall be marked with pipe ID tape which reads "Sanitary Sewer" and is buried within 6" of the top of pipe.

D. Pumping Station

1. General

All sewage pumping systems when proposed shall be submitted to the City Engineer. All pumping stations shall conform to the following minimum standards.

E. Lot & Site Details

1. Layout and Location

- a. Total area of the site shall be no less than 4500 SF when located on a residential or industrial street. If access is located on collector or wider, an additional 10' setback will be required from sidewalk.

- b. The site shall be dedicated to the City prior to use. Minimum lot depth shall be 50', with minimum street frontage of 40 feet. See Standard Detail #504 for typical layout and dimensions. Final Lot layout and configuration shall be subject to individual approval.

2. Fencing

- a. Fencing shall be 7' - CMU on all sides and rear, constructed per City Std Detail 1214, unless located adjacent to open space or park area, in which case, all fencing shall be chain link fencing conforming to the following.
- b. Front fence shall be 8' Chain link with 9 gage, 2" knuckle mesh. Fence shall include a 16' roll gate, on concrete pad with steel roller and track. Gate shall include track brackets, 2 pressed steel rear wheels for pipe track, pipe track, double wheel ground carrier w/ 8 inch rubber tires and pressed steel wheels. Gate frame shall be a minimum of 1-7/8" O.D. Corner and gate posts shall be 2-7/8" OD and line posts shall be 2-3/8" O.D. spaced at 10' max. All posts shall be schedule 40 and embedded a minimum of 36" in 12" diameter holes, filled with 5 sack concrete. All hardware and posts shall be galvanized. Bottom tension wire shall be 2 gage coil spring, top tension wire shall be 6 gage coil spring. Bracing as required provide a rigid gate.
- c. Gate shall be constructed with allowance for future installation of automatic remote gate opener (Include pull box and conduit for power from control panel).
- d. In addition to the roll gate, provide a 4' wide double-swing lockable man gate separate from the roll gate.

3. Paving & Utilities

- a. Provide 1200 SF of 6" concrete paved driveway. Min./max. width of 20/30 feet.
- b. Provide a 8'x10'x4" concrete slab for electrical controls (center pedestals on slab)
- c. Pave remainder of site with 2" AC over compacted native (90% RC)
- d. Provide 3 phase 230/460V underground service to the meter panel
- e. Provide 1" water service complete with backflow preventer and two hose bibs.

F. Pumps, Piping & Mechanical

1. General: These specifications shall only apply to pumping/lift stations whose ultimate design capacity is **500 gpm or less**. Larger flows require an independent analysis.
2. The lift station shall be a duplex lift station designed and constructed with pumps and controls designed specifically to prevent the build up and accumulation of grease and other nuisance material. Pumps and controls shall conform to these standards but shall be subject to individual approval by City Engineer. All new pumps shall be certified as correctly installed and ready for full time operation by the supplier who shall supply

a complete O&M manual (including parts list) and a written 2 year warranty prior to the City taking beneficial use.

3. Pumping station shall include the following items:

a. Piping and Manholes

- i. The terminal manhole (located in street) shall be located within 10' of the center of the lot, opposite of the driveway. The invert of the influent line in the terminal MH shall be at least ½ diameter lower than the tributary lines. The influent line shall be sized to handle the peak flow without backing up any flow, and at a minimum 2" diameter larger than the largest tributary line. The slope of the influent line shall be set to provide a minimum velocity of 2.5 fps when flowing 25% full.
- ii. The discharge manhole shall be located in the street immediately in front of the lift station site, no more than 20' from the terminal manhole. The two manholes shall be connected by a DIP air bypass line equal in diameter to the influent line. The invert of the bypass line shall be higher than the soffit of the gravity discharge line.
- iii. All piping from pumps to terminal manhole shall be Class 53 ductile iron pipe conforming to AWWA C151. Fittings shall conform to AWWA C110. Pipe and fittings shall be double cement mortar lined with Type V cement. Joints inside the pump structure and adjacent to valves shall be flanged or grooved. Grooved couplings shall conform to AWWA C606. All fasteners shall be stainless steel, and installed with anti-galling compound.

b. Wet Well

- i. The wet well shall be a minimum of 8' diameter or 6'x8' concrete vault. Interior walls shall be lined with PVC liner cast into the structure (T-Lock).
- ii. The minimum wet well capacity shall be equal to 5 minutes at peak flow, with a minimum of FIVE feet from the invert of influent line to the bottom of the wet well.
- iii. The wet well shall be covered with a concrete cover with integral aluminum hatch cover conforming to the following:

c. Hatch Cover

- i. The hatch cover and all hardware shall be constructed of aluminum and stainless steel (ASTM A276, Type 304 or 316). No mild steel, plated, galvanized or otherwise shall be permitted.

ii. Hatch cover shall have an angle frame (channel frames are unacceptable). Factory finish shall be mill finish with bituminous paint on surfaces to be in contact with concrete.

iii. All doors shall have slam locks with removable keys, and all mounting joints shall be sealed with cement mortar inside and out.

iv. Cover shall be designed to withstand **300 psf** loading without the use of any exterior bolts or other secondary anchors that have to be removed prior to opening.

v. Doors shall be spring assisted, and all lifting handles shall be recessed.

vi. Installation shall be in accordance with manufacturer's instructions, who shall guarantee the installation for a period of 10 years.

vii. Frame shall be sealed with a continuous neoprene gasket (except at hinges).

viii. Cover shall include an integral hinged aluminum safety grate capable of supporting 200 psf

d. Pumping System

i. The pumping system shall include two solids handling, single speed, slide rail mounted, submersible non-clog pumps capable of passing 3" sphere. The system will be designed to be self cleaning, and able to pump raw unscreened sewage without clogging.

ii. All bolting and hardware within the wet well shall be stainless steel. Each pump shall have sufficient capacity to pump 100% of the peak flow.

iii. Pumping system shall be approved by City Engineer.

e. Valves

i. Each pump discharge line shall include a swing check valve and plug valve located either above ground or in a covered vault. Valves shall be as per City Standard Section #5

G. Electrical Controls and Lighting

1. Service Connection

- a. All pumping facilities shall have 3Phase 230/460V service provided to the onsite meter panel via underground service conforming to MID/TID standards. Electrical service poles shall not be allowed on the site.

2. Pedestals

- a. Electrical services shall be contained in no less than three pedestals, all located on concrete pad, as shown on the standard detail #504. All pedestals shall meet the following:
 - i. Fabricated of 14 gage Grade 304 Stainless steel, electrically welded factory wired, and conform to Nema 3R and 12, rain tight and dust tight.
 - ii. All hardware shall be stainless steel with no nuts or bolts visible from the outside of the pedestal.
 - iii. All items shall be marked with Phenolic nameplates. Wiring will be marked at both ends by permanent wire markers. Stick on wire markers are not acceptable.
 - iv. A plastic covered wiring diagram shall be attached to the inside of the front door.
 - v. Pedestal shall be unpainted, mounting pans, barriers, deadfront doors and covers painted hospital white.
 - vi. Back pans and contractor brackets shall be 12 ga hot dipped galvanized steel.
 - vii. All metering and service equipment shall be EUSERC and local utility company standards, and UL Listed.
 - viii. Pedestals shall be constructed to the dimensions shown on standard detail #504.
Note: Generator and meter pedestal maybe mounted back to back as a single contiguous unit.
 - ix. Control pedestal shall contain all pump control gear, starters, switches, breakers, and SCADA panel (provided by City), located as shown on standard detail #504.
 - x. Generator switch pedestal shall include three way switch and generator receptacle.

3. Lighting

Provide one site light, located as directed by Engineer, with dusk / dawn controller and 100 watt I.E.S. Type II or III Luminair mounted on 25' pole, constructed in conformance with Section 7 of the city standards.

5.10 VILLAGE ONE PVC STANDARDS

The installation of Polyvinyl Chloride (PVC) pipe sewers is allowed in Village One only. It is being allowed as an experiment to evaluate the use of this type of pipe, the field installation, and the long-term stability of the pipe. The special specifications in Appendix J are a supplement to the current Modesto Standard Specifications.

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SECTION 6

WATER SYSTEM DESIGN

6.01 GENERAL

All improvements, including extensions, replacements and repairs, shall conform to the requirements of the National Board of Fire Underwriters, American Water Works Association Standards, the Modesto Municipal Code, and these Standard Specifications and Details of the City of Modesto.

All installations shall conform to regulations prescribed by the California State Department of Public Health (Located in Appendix M).

In all cases, water mains shall be of sufficient size to meet fire-flow requirements set forth in the Modesto Fire Code.

6.02 LAYOUT OF MAINS

The distribution system, whenever possible, shall employ the "Gridiron System" of water circulation so as to allow pressure equalization. All water pipelines designed for the transmission or distribution of domestic water supply shall be constructed and installed within the right-of-way of public streets or roads, unless such construction or installation is determined to be impractical by the City Engineer.

The Consulting Engineer shall show, on the profile of improvement plans, inverts of pipe at all changes in grade and in all areas where conflicts with other utilities might arise, he/she shall also show the top of pipe. A detail shall be drawn of such conflicts with sufficient information shown that the City Engineer can make a determination as to the adequacy of the solution shown.

6.03 VERTICAL ALIGNMENT

Water mains and services shall be installed at a depth which will provide a minimum of 42 inches from the top of the pipe to finished grade or a minimum of 24 inches from the top of pipe to the street subgrade, whichever is greater.

Where a water line crosses a sewer line, the appropriate line(s) shall be designed according to "Criteria for the Separation of Water Mains and Sanitary Sewers", Department of Health Services, State of California.

When crossing a sewer, storm, or irrigation line, it is desirable that the water main be installed above the storm, irrigation, or sewer line with a clearance of 12 inches. Construction shall conform to the Standard Details. The consulting engineer shall detail all crossings with a clearance less than 15".

When lines are realigned in such a way that an 18" high point is required, an air release valve shall be required. Air release valves shall be located within 3' of lot lines within the ROW. Fire hydrants may be used in lieu of an air release valve.

6.04 HORIZONTAL ALIGNMENT

Alignment shall be parallel to the street centerline wherever possible. In new developments, the horizontal alignment of water mains shall be 6 feet south or 6 feet east of the street centerline. When looping the system around the new subdivision, the utility lines may become reversed - 6 feet north or 6 feet west of the street centerline. In existing streets and non-residential streets, the alignment may vary from the Standard Specifications with approval of the City Engineer, but in no case shall there be less than 10 feet horizontal clearance to a sanitary sewer, or 10 feet horizontal clearance to a storm drain or industrial site.

Curved water mains are allowed in curved streets when curvature does not exceed 80% of the manufacturer's recommendations.

6.05 PIPE SIZE AND MATERIAL

The minimum size pipe used for water mains shall have a nominal diameter of 8 inches. Water mains serving a cul-de-sac beyond a fire hydrant may use a 6 inch diameter line. Larger sizes will be required as designated by the City Engineer from the City of Modesto Master Plan. Industrial and commercial areas may require installation of 12 inch mains.

For single family residential areas, all water mains shall be sized to provide 1000 gallons per minute fire flow from each of 2 adjacent fire hydrants flowing simultaneously with 20 pounds per square inch residual pressure.

For multi-family, commercial, and industrial areas, all water mains shall be sized to provide fire flow as specified in the Modesto Fire Code, Table A-III-A-1, but shall provide not less than 1500 gallons per minute from each of 2 adjacent fire hydrants flowing simultaneously with 20 pounds per square inch residual pressure.

The fire flow can generally be obtained using the following design standards:

- 1/2 mile looped grid - 12 inch mains or larger
- 1/4 mile looped grid - 8 inch mains
- Distribution system, looped - 8 inch mains

Pipe materials may be ductile iron pipe (D.I.P.) or polyvinyl chloride pipe (P.V.C.). All allowable materials are specified in **Section 6.02** in the Construction Standards of these Specifications.

6.06 WATER SERVICE

The minimum size service is 1 inch and shall be installed in conformance with Standard Detail #612. For properties other than single family residential, and for non-typical single family residential, the design engineer shall determine the water service size.

All water services shall be metered, except dedicated fire services.

Each individual property shall have a separate water service complete from the water main to the property. Water services are not permitted in easements without prior approval of the City Engineer. Water services are not permitted to connect to a transmission main (14" or larger).

All meter boxes shall be located in the public right-of-way. Meter boxes shall not be located in vehicular traffic areas.

For commercial properties, individual services for irrigation, domestic, and fire water shall be installed from the main. The water division will not manifold the water services at property line from a fire service.

A double check assembly will be required on all Class 1 & 2 fire systems. Double checks must be above ground and within view for the Fire Marshall's inspection. At a minimum, an above ground single check is required within view (usually 30' of property line) on any private fire system, including a single fire hydrant.

The City of Modesto Water Division will make all connections to the active City water mains. The developer or contractor shall pay the appropriate fees to Development Services prior to being connected.

6.07 FIRE HYDRANTS

Fire hydrants shall be supplied from the largest available main except transmission mains.

Fire hydrants shall be fed from two directions unless specifically approved by the City Engineer and Fire Marshall or unless located in a cul-de-sac.

Fire hydrant spacing and distribution shall be determined as follows:

- A. R-1 & R-2 Residential Zones - 500 feet, All other zones - 300 feet
- B. In addition, hydrants shall be placed on both sides of a major street and shall be spaced on each side according to the maximum distance allowed. On major streets where buildings and streets are separated by a 6 foot restrictive wall, hydrants shall be placed at all street intersections with a maximum distance of 1000 feet between

hydrants. If the distance exceeds 1000 feet, intermediate hydrants shall be placed at even intervals between intersections.

- C. On divided streets, planned divided streets or state highways, the above spacing shall apply to both sides of the street.
- D. A fire hydrant shall be located at the end of all cul-de-sacs in lieu of a blow-off. The Contractor shall install fire hydrants per the Standard Specifications. The fire hydrant, bury, 6" GV and break-off riser shall be provided free of charge by the City of Modesto. Pickup shall be coordinated with the City Water Division. The Design Consultant shall not count this fire hydrant in satisfying the Fire Marshall's spacing requirements. This hydrant is for health reasons.
- E. Fire hydrants installed by city crews on 10" and larger waterlines will be provided free of charge every 1000 feet. Fire hydrants at a distances less than 1000 feet shall be at the developers expense. The fire hydrant at the 1000 foot spacing is for maintenance of the system and is in lieu of a blowoff.

Fire hydrant shall be installed in conformance with Standard Details #605 and #606.

Fire hydrants shall be located at ends of curb returns or at lot lines. The preferred fire hydrant location is at curb returns.

6.08 VALVES

The distribution system shall be equipped with a sufficient number of valves so that no single shutdown will result in shutting down a main, or necessitate the removal from service a length of pipe greater than 550 feet. Transmission mains greater than 12" in diameter shall have valves at 1000 feet on center. Additionally, in no case shall more than two fire hydrants be removed from service. The valves should be so located that any section of main can be shut down without going to more than three valves. One of the valves for a tee or cross at a cul-de-sac must be in the direction of the cul-de-sac. Valves, incorporating a blow off device, shall be installed at the boundary of development. A valve shall be installed on each side of services to all hospitals, schools and major industrial sites as directed by the City Engineer.

Valves installed on all ten inch (10") and smaller lines shall be gate valves. Mains twelve inches (12") and larger shall utilize butterfly valves. When butterfly valves are used, butterfly operator shall be toward nearest property lines.

Valves shall be installed in conformance with Standard Details.

6.09 BLOW-OFFS

Blow-offs shall be constructed at the end of all temporary DEAD END runs. Blow-offs for future extensions shall be installed at mains to be extended at a later date. Install in conformance with Standard Detail # 610.

Permanent dead ends must have a fire hydrant installed at the end of the line in lieu of a blow-off. See criteria in 6.07d above.

6.10 THRUST BLOCKS

Thrust blocks shall be installed in conformance with Standard Detail #609. Joint restraints are an acceptable alternative but must be approved by the City Engineer.

6.11 WATER LINE EASEMENT

Dedicated water mains outside the public right-of-way are discouraged and will be scrutinized. The design engineer should strive for a design to put them within the public right-of-way.

6.12 PRIVATE WATER SYSTEM DESIGN FOR FIRE PROTECTION

Appendix Design I provides design requirements in use by the Modesto Fire Code and Modesto Municipal Code.

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SECTION 7

STREETLIGHTING

7.01 GENERAL

These specifications shall cover the design and installation of streetlights and park trail lights. The design and installation shall conform to these specifications, the City of Modesto, Standard Specifications and Plans, and Section 86 of the State Specifications.

The Consulting Engineer shall show the proposed streetlighting system or park trail lighting system on the project improvements plans.

The plans shall include the following items:

1. Location of electroliers.
2. Intensity of luminaries
3. Location of service points (As-builts).
4. Location of pull boxes (As-builts).
5. Location of conduit runs (As-builts).

* As-built - The consulting engineer shall provide the final as-builts prior to final acceptance of the construction improvements.

The Consulting Engineer shall submit three (3) copies of the streetlight plans to the City for preliminary review in the initial submittal. The consulting engineer shall furnish plans and obtain approvals from M.I.D. The consulting engineer will then obtain service locations and identification numbers from Modesto Irrigation District (M.I.D.)(where possible).

The City will not make a power application for service to M.I.D. unless the plans have obtained prior approval from M.I.D.

After the Consulting Engineer receives the service locations, he/she shall determine the wire size and length of each conduit run. These items may be shown in tabular form or denoted next to each conduit run on the plans. The circuit lengths and conductors shall be sized such that the maximum voltage drop between the source and any streetlight does not exceed 5 percent of the nominal circuit voltage. Conductors shall be THW No. 10 copper or larger.

The cost for all M.I.D. services shall be paid for by the developer or contractor. This shall include the M.I.D. connection charge for energizing streetlights.

7.02 SPACING, INTENSITY AND MOUNTING HEIGHTS

- A. Streetlights shall have the following spacing, intensity and mounting heights according to the type of street they are to be installed on.

TABLE 7.1 SPACING, INTENSITY AND MOUNTING HEIGHTS

Type of Street	Spacing (feet)	Luminaire Wattage	Mounting Height
Local & Collector	330'	100W - mid block 150W - intersections	25' H w/ 15' arm
Arterial & Expressway	150' staggered to each side	200W	28' H w/ 15' arm

- B. Streetlights shall be placed at street intersections and curves. Additional lights may be added as required.

7.03 POLE HEIGHT AND ARM LENGTH

All poles shall have a single arm.

Pole height and arm length shall be as shown in the Standard Details.

7.04 LOCATION OF STREETLIGHTS

- A. If possible, streetlights shall be located within 3' of a property line.
- B. On streets with separated sidewalks, streetlights shall be located at the front of sidewalk. The edge of the pole foundation shall meet the front of sidewalk.
- C. On streets with monolithic curb, gutter, and sidewalk, streetlights shall be located at the back of sidewalk. The edge of the pole foundation shall meet the back of sidewalk. On major streets, streetlights shall be located directly behind curb.
- D. Where there is only curb and gutter, the center of the streetlight foundation shall be located four (4) feet from the back of curb.
- E. T intersections - A streetlight shall be located on the through street at within 12.5' of the projected centerline of the intersecting street (either direction).
- F. Cul-de-sac - A streetlight shall be located within the bulb.
- G. Four way intersection/major streets - Streetlights shall be located at all curb returns.
- H. Four way intersection/major and minor street - Streetlights shall be located at the far right curb returns of the major street in the direction of travel.
- I. Four way intersection/minor streets - A streetlight shall be located at one of the returns.

- J. Electroliers will normally be staggered on opposite sides of the street. Electroliers shall be placed on the outer edge of curves.
- K. Electroliers are required at each knuckle. The electrolier shall be located on the outside of the knuckle.

7.05 PULL BOXES

- A. Pull boxes shall be spaced at a maximum of 200 feet.
- B. Where conduit runs exceed 100 feet, one pull box shall be located next to each electrolier.
- C. One pull box shall be located at each side of all street crossings, at or near the curb return.
- D. Pull boxes shall be placed immediately behind the sidewalk in sidewalk areas or 4 feet behind the back of the curb in non-sidewalk areas.
- E. Where a utility company transformer is designated as the service point, a pull box shall be installed adjacent to the transformer.

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SECTION 8

NON-CITY UTILITY DESIGN

8.01 GENERAL

These specifications shall cover some of the design and installation procedures for gas, cable, telephone and electric facilities within the City of Modesto. Any cost incurred in conforming to these standards will not be reimbursed by the City.

8.02 LAYOUT OF UTILITY OR JOINT TRENCH

The distribution system, whenever possible, shall be undergrounded in the dedicated public utility easement (P.U.E.). All new electrical service shall become part of the joint trench where practical and the facility undergrounding is consistent with California Public Utilities Commission Rule 20. Where it is necessary to construct underground facilities in, on, over, under, along, through or across any portion of a surfaced street, the same, where practicable and economically reasonable shall be done by a tunnel or bore so as not to disturb the surfaced street; and in the event that the same cannot be so done, such street work shall be done under an excavation permit to be granted by the City Engineer.

8.03 VERTICAL ALIGNMENT

Conduits shall be installed a minimum of 36" under the existing ground as well as the final grade in the P.U.E. When installing conduits for crossings through existing streets, a minimum of 42" of cover is required. Conduits installed in undeveloped areas of future streets shall be installed at a depth which will provide a minimum of 42 inches from the top of the conduit to finished grade or a minimum of 24 inches from the top of conduit to the street subgrade, whichever is greater.

8.04 HORIZONTAL ALIGNMENT

Alignments shall be parallel to the street centerline wherever possible. In new developments, the horizontal alignment of joint trench shall be parallel to the centerline within the P.U.E. Where a P.U.E. is not available or in existing urbanized and built-up areas Table 15.1 gives guidance for locating the utility.

8.05 OVERHEAD UTILITY LINES

Utility overhead lines are discouraged. Wherever reasonable, utility companies forced to relocate lines by street dedication or widening shall underground the facility. In the case where a pole facility cannot be economically undergrounded, other facilities may remain on the pole during and after relocation i.e. a 69 KVA line is not economically feasible to underground, therefore, a 12 KVA line on the same set of poles will not be forced to

underground. The utility lines must be consolidated as much as possible. A 69 KVA on one side of the street and a 12 KVA on the other side will be combined onto one set of poles.

Where utility poles are permitted, poles shall be located behind sidewalk wherever possible. Where a separated sidewalk is proposed or existing, the pole shall be placed a minimum of 18 inches behind curb. Where the entire area behind curb is concrete, the pole shall be a minimum of 4.5' behind curb.

TABLE 8.1 NON-CITY UTILITY HORIZONTAL ALIGNMENT

Condition	Alignment
Extending or repairing an existing service through urbanized areas.	Trench and install conduit at either behind walk, under walk or within 3 feet of existing lip of gutter but in no case shall installation be closer than 36" to an existing sewer, water or storm drain line (outside wall to outside wall of conduits - see Detail 810 - Case E).
Extending new service through a new area with a minimum of 10' of sidewalk and/or landscaping.	Install conduit behind curb, gutter and sidewalk. (Detail 809 & 810 - Cases A thru D).
Extending new service through rural areas with only 40' of right-of-way.	Install conduit 1' +/- off the existing right of way. All junction boxes shall be installed in easements outside the ROW. Utilities must negotiate the construction and permanent easement (Detail 808).
Extending new service through right-of-way less than 40' and congested areas with 45' of right of way or less.	City Engineer shall engineer a location based on the master plan of utilities. In most cases with less than 40' of ROW, developer or utility will acquire easement (Detail 808).

8.06 FIBER OPTICS

The City has been working to promote fiber optic lines and, at the same time, limit its impact to the streets' structural integrity and smoothness. All fiber optic permit applicants are required to fill out a questionnaire and sign a permit agreement. Appendix O contains the questionnaire and sample permit agreement. The City also has a trench cut ordinance which attempts to minimize street cuts by promoting horizontal boring and sharing costs with other utilities in constructing a joint trench.

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SECTION 8A

FIBER OPTIC DESIGN

These specifications shall cover some of the design and installation fiber optics within the City of Modesto. Any cost incurred in conforming to these standards will not be reimbursed by the City.

8.01A DESIGN

- A. General: To facilitate the CAD design, the owners design staff or consultant should purchase a CD of the City utilities and centerline file (NAD 83 coordinate system) for design layout and ultimate submittal of the as-built plans in digital format. The designer must also reference Section 8 section should be

- B. Location of Lines.

Location of lines shall be per section 8 of these standard specifications. Fiber optic lines may also be installed under an existing sidewalk parallel to the centerline. In fully developed areas, fiber optics shall be installed by horizontal boring.

All Telecommunications Facilities shall be installed within existing underground ducts or conduits whenever excess capacity is available on reasonable terms.

Whenever existing Telecommunications Facilities or electric utility facilities are located underground along a particular street or public way, new Telecommunications Facilities must be installed underground along that street or public way.

Whenever any new or existing Telecommunications Facilities or electric utility lines are located or relocated underground along a particular street or public way, the Telecommunications Operator shall relocate its Telecommunications Facilities underground concurrently with the other lines at its sole expense to the full extent permitted by law.

Whenever new Telecommunications Facilities will exhaust the capacity of a street or otherwise make the installation of future Telecommunications Facilities impractical, the Telecommunications Operator installing the new Telecommunications Facilities shall provide additional ducts, conduits, manholes and other facilities designated by the Community Development Department for reasonable nondiscriminatory access by other Telecommunications Operators.

8.02A LAYOUT OF FIBER OPTICS

The distribution system, whenever possible, shall be undergrounded in the dedicated public utility easement (P.U.E.). All new fiber optic shall become part of the joint trench where practical and the facility undergrounding is consistent with California Public

Utilities Commission Rule 20. Where it is necessary to construct underground facilities in, on, over, under, along, through or across any portion of a surfaced street, the same, where practicable and economically reasonable shall be done by a tunnel or bore so as not to disturb the surfaced street; and in the event that the same cannot be so done, such street work shall be done under an excavation permit to be granted by the City Engineer.

8.03A VERTICAL ALIGNMENT

Conduits shall be installed a minimum of 36" under the existing ground as well as the final grade in the P.U.E. When installing conduits for crossings through existing streets, a minimum of 42" of cover is required. Conduits installed in undeveloped areas of future streets shall be installed at a depth which will provide a minimum of 42 inches from the top of the conduit to finished grade or a minimum of 24 inches from the top of conduit to the street subgrade, whichever is greater.

8.04A HORIZONTAL ALIGNMENT

Alignments shall be parallel to the street centerline wherever possible. In new developments, the horizontal alignment of joint trench shall be parallel to the centerline within the P.U.E. Where a P.U.E. is not available or in existing urbanized and built-up areas Table 15.1 gives guidance.

A Street Cut Mitigation Measures.

Street Cut mitigation fees have been adopted or are about to be adopted. The purpose of this fee is to encourage coordinating utility work, create more joint trench sharing, and selling of empty conduits in areas where fiber companies have already installed conduits.

All open cutting of pavement will be scrutinized. The City Engineer must make a finding that boring is infeasible before allowing open cutting of asphaltic streets. Horizontal boring will be encouraged.

B. Surplus Conduit Requirements.

The greatest cost in installing underground lines is labor, not materials. As a result, companies are encouraged to install empty surplus conduit for potential future uses along side the conduit they use immediately. Per the permit agreement for fiber optics in the City of Modesto, one additional conduit shall be installed and identified for City use. Permit fees will be reduced to reflect this contribution.

C. Cabinets and Pedestals

No cabinets or pedestals shall be installed above ground without specific authorization from the city engineer. When it is determined that an above-ground cabinet or pedestal is necessary, the cabinet shall be camouflaged behind existing landscaping just behind the

sidewalk. The City Engineer reserves the authority to determine where the cabinets may be located.

8.05A ENCROACHMENT PERMIT REQUIREMENTS

A. General

The review and negotiations time period for an encroachment permit is generally 30 days. During this time period the applicant must:

1. Provide 2 sets of plans for review
2. Provide the contractors name and submit contractors insurance per City Clerk's Requirements.
3. Owner shall answer the preliminary questionnaire
4. Owner shall provide an in-briefing of its business plan to City Staff.
5. Provide 3 sets of plans and a compact disk of the scanned plans for the final set of construction plans. Scanning to be at 300 dpi and saved in an Adobe PDF format, single file.
6. Plan sets shall be a reduced size plan set (11x17)
7. For final acceptance, provide one as-built plan set and a compact disk of the scanned plans with the permits and agreements scanned with the plans. Final scanned documents to be at 300 dpi and saved in an Adobe PDF format, single file.

B. Permit Agreement

Appendix O gives a sample of the permit agreement. The owner and the contractor must sign the permit agreement. The questionnaire should be provided at the time of plan set submittal for review. The plan set typically takes two weeks to review and the agreement takes an additional week to complete. The insurance and payment of the fees must be submitted prior to the permit being issued.

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SECTION 9

SURVEY STANDARDS

9.01 PARCEL MAPS

- A. The City Surveyor has established coordinated positions in the City of Modesto by tying the section corners or other appropriate corners or road centerlines on an approximate 1-mile grid convenient for proper coordinate tie-in of such map boundaries to the existing monuments of and, where possible, intervisible with the local control network, and by calculating and adjusting coordinates for these corners using the California Coordinate System based on the North American Datum of 1983, 1992 Adjustment or current adjustment.
- B. All data pertaining to these control monuments has been or will be filed in accordance with the requirements of the Land Surveyor's Act and these records shall be indexed and made readily available to the general public.
- C. The City shall require the surveyor or engineer to show, on the Parcel Map, those ties made by the surveyor or engineer to such control monuments in accordance with Division 8, Chapter 1, Section 8813 of the Public Resources Code; and that coordinates published by the City for these control monuments be shown on the map.
- D. The surveyor or engineer shall be permitted to show, on any Record of Survey submitted for filing, the information prescribed above when the normal course of survey activities includes ties made to points for which coordinates have been provided or accepted into the control network by the City and when such information may be shown pursuant to the requirements of the California Public Resources Code.
- E. The City shall require the surveyor or engineer preparing the Parcel Map to tie the boundary of said map into the California Coordinate System (NAD 83) in at least two locations, preferably on opposite sides of the boundary or as mutually agreed to by the surveyor or engineer and the City Surveyor.
- F. The Basis of Bearings of the Parcel Map shall be the California Coordinate System (NAD 83), 1992 Adjustment or current adjustment as directed by the City Surveyor as established by the use of existing monuments, Global Positioning System surveys (GPS), or by astronomic observation.
- G. If the boundary of the Parcel Map being submitted is a parcel or lot of a map already tied to the California Coordinate System, NAD 83, 1992 Adjustment or current adjustment as directed by the City Surveyor, the requirements in Paragraph E (above) shall be waived.

9.02 SUBDIVISION MAPS

- A. The City Surveyor has established coordinated positions in the City of Modesto by tying the section corners or other appropriate corners or road centerlines on an approximate 1-mile grid convenient for proper coordinate tie-in of such map boundaries to the existing monuments of and, where possible, intervisible with the local control network, and by calculating and adjusting coordinates for these corners using the California Coordinate System based on the North American Datum of 1983, 1992 Adjustment or current adjustment.
- B. All data pertaining to these control monuments has been or will be filed in accordance with the requirements of the Land Surveyor's Act and these records shall be indexed and made readily available to the general public.
- C. The City shall require the surveyor or engineer to show, on the Subdivision Map, those ties made by the surveyor or engineer to such control monuments in accordance with Division 8, Chapter 1, Section 8813 of the Public Resources Code; and that coordinates published by the City for these control monuments be shown on the map.
- D. The surveyor or engineer shall be permitted to show, on any Record of Survey submitted for filing, the information prescribed above when the normal course of survey activities includes ties made to points for which coordinates have been provided or accepted into the control network by the City and when such information may be shown pursuant to the requirements of the California Public Resources Code.
- E. The City shall require the surveyor or engineer preparing the Subdivision Map to tie the boundary of said map into the California Coordinate System (NAD 83) in at least two locations, preferably on opposite sides of the boundary or as mutually agreed to by the surveyor or engineer and the City Surveyor.
- F. The Basis of Bearings of the Subdivision Map shall be the California Coordinate System (NAD 83), 1992 Adjustment or current adjustment as directed by the City Surveyor as established by the use of existing monuments, Global Positioning System surveys (GPS), or by astronomic observation.
- G. If the boundary of the Parcel Map being submitted is a parcel or lot of a map already tied to the California Coordinate System, NAD 83, 1992 Adjustment or current adjustment as directed by the City Surveyor, the requirements in Paragraph E (above) shall be waived.

9.03 SPECIFICATIONS FOR SURVEYS ON THE CALIFORNIA COORDINATE SYSTEM 1983 BASED ON THE NAD 83 DATUM

The following specifications apply to surveys on the California Coordinate System of 1983 based on the NAD 83 Datum.

- A. All points coincident with City Geodetic Control Points will have the exact published coordinate values in U.S. feet. If a survey is initiated prior to publication of a readjustment, the previously adjusted values will be accepted for a period of up to 90 days from the date of current publication.
- B. The whole number for the coordinate will be shown, i.e. no constants will be applied.
- C. One point on the external boundary will have a grid coordinate value. All other points on or internal to the boundary will have coordinates based on computations from the grid boundary point using ground distances. The boundary point assigned grid coordinate values should be on the major control line where applicable. The boundary point assigned a grid value will be annotated with the grid coordinates.
- D. A tie to the geodetic control network will be made to the boundary point showing the California Coordinate System Values. Additional ties as previously required will also be provided.
- E. A combination factor and coordinate system information, including the date of adjustment, will appear on the recorded map.
- F. The difference between computed tie distances and annotated tie distance multiplied by the combination factor will not exceed 0.02 feet.

9.04 VERTICAL DATUM

- A. The official vertical datum for the City of Modesto is the North American Vertical Datum of 1988 (NAVD 88).
- B. Elevations shown on plans shall be based upon the official City Datum, NAVD 88.

9.05 STREET MONUMENTS (see Street Design - Design Section 3.13)

9.06 BOUNDARY MONUMENTS

Boundary monuments shall be placed on the exterior boundary of the subdivision at the following locations:

- A. Changes in direction
- B. Beginning and end of curves
- C. Other points deemed necessary by the City Engineer.

Boundary monuments shall be placed in the same manner and of the same material as street monuments except that in unpaved areas the top shall be at least 1 foot below finished grade.

9.07 BLOCK CORNER MONUMENTS

Corner monuments shall be placed at all block corners and alley corners.

Block corner monuments shall be placed in the same manner and of the same material as street monuments except the top shall be at least 1 foot below the surface.

9.08 LOT CORNER MONUMENTS

Lot corner monuments shall be placed in the same manner and of the same material as street monuments except that they may be 3/4 inch O.D. and, in unpaved areas, the top shall be at least 1 foot below the finished grade.

Lot corner monuments shall be located where required by the City Engineer. The basic criteria for the locations shall be as follows:

- A. Lots shall have a monument at each corner except as otherwise provided by this section.
- B. Lots that are crated with zero back or side yards may have lot corners under building foundations deleted except those corners that are Block or alley corners.
- C. Lots that are created as part of a townhouse condominium development where realty is to be owned in fee by the individual lot owner shall be monumented using a minimum of 4 monuments for each contiguous group of lots. Contiguous groups of lots containing more than 10 lots shall have additional monuments as required by the City Engineer. Monuments shall not be located under footing or structure.
- D. Condominium airspace developments where realty is not to be owned in fee by the individual lot owner shall have the exterior boundary monumented as required by Section 9.06 of these Standards.

SECTION 10

DRIVEWAY ACCESS AND DESIGN

10.01 GENERAL

- A. The purpose of this design section is to ensure standards are met to protect the public health, safety and welfare. The standards are meant to apply to new developments which are not constrained by already existing improvements or severe topography. To the extent deemed reasonably possible by the City Engineer, in-fill developments will be required to match these standards. The City Engineer may approve modifications of these standards only when necessary to allow private and public construction which is compatible with surrounding in-place improvements and conditions.
- B. For the purposes of this driveway design, the following definitions apply:
1. Auxiliary Lane - A separate right turn lane, left turn lane, deceleration lane or acceleration lane.
 2. Commercial Property - Property regardless of zoning district upon which any structure is either wholly or partially used for offices or the wholesale or retail sale of goods or services. In addition, for purposes of this design section, all properties other than residential, apartment or industrial shall be considered a commercial property.
 3. Continuous Deceleration Lane - A deceleration lane that serves two (2) or more driveways, public streets or combination thereof.
 4. Deceleration Lane - A lane, including tapered areas, in advance of a driveway or public street used to allow turning vehicles to exit the through traffic lane and slow before making the turn.
 5. Peak Hour - The one (1) hour period between 4:00 p.m. and 6:00 p.m. of a typical weekday with the highest volume of traffic on the roadway.
 6. Driveway - Any approach or access that connects private property to the public right-of-way but may be considered to extend onto private property when necessary to ensure safe operation of the driveway/street intersection.
 7. Driveway Throat Width - The shortest distance between the parallel edges of a driveway.
 8. Drop approach driveway - Driveway approach requiring a curb return radius, no vertical lip, handicap ramps and concrete apron extending a minimum to the

public right-of-way and a gradual slope to at least 15' back from curb line. See Standard Detail 1010.

9. Flared driveway - Driveway access requiring the curb to depress to street level and 3' flared aprons transition the sidewalk into the driveway. Driveway ends at the property line or at back of sidewalk. See Standard Details 1011 & 1012.
 10. Industrial Property - Property, regardless of zoning district, upon which all the structure or structures is used for warehousing or manufacturing.
 11. Internal Driveway - A private road or access way on private property that connects buildings or abutting ground to the driveway.
 12. Major Street Facility - Any of the following: (1) freeway frontage road, (2) principal or minor arterial street, (3) major collector street.
 13. Median Type Driveway - A driveway having ingress and egress drives divided by a raised median.
 14. Residential Property - Property that contains three (3) or less dwelling units.
 15. Shared Driveway - A driveway constructed on or near a common property line between two (2) or more properties and providing access to all such properties.
 16. Street Class - The functional classification of a street as defined in the Circulation Element of the General Plan or as defined by the City Engineer for those streets not shown in the General Plan.
- C. For commercial, industrial or apartment driveways on a major street facility, the City Engineer may require an applicant to submit a driveway volume and capacity analysis of the proposed driveway as part of the driveway permit application and review process. Traffic studies shall be submitted in accordance with the City's Traffic Study Procedures. This requirement may be waived if the City Engineer determines that the driveway has been adequately analyzed in a previous traffic study.
- D. A joint private access easement may be required between adjacent lots fronting on arterial and major collector streets in order to minimize the total number of access points along those streets and to facilitate traffic flow between lots. Lots with sufficient frontage to safely meet the design requirements of Section 10.03 shall be permitted their own driveways. The owner or developer of property required to use shared driveways shall be responsible for obtaining easements on adjacent property as necessary. The City may, but shall not be required to, assist in the acquisition of offsite easements if the owner is unable to acquire them. With a request for assistance, the owner shall provide the evidence of a reasonable offer made to the adjacent property owner. Upon such a written request for assistance, the City may attempt to acquire these easements through negotiations. If the negotiations are unsuccessful, the request may be submitted to

Council for consideration of acquisition through condemnation. In either case, the total cost of the acquisition and the cost of the easements shall be paid by the owner (developer). In the event the City elects not to acquire the property through condemnation, alternate driveway locations and designs in conformance with this standard shall be required.

- E. When an application for building permit or change in property use results in changes in the type of driveway operation, and the driveway is not in conformance with this standard, the reconstruction, relocation or conformance of the access to these standards may be required. The City Engineer will require driveway revisions when one or both of the following access change conditions occurs:

1. The existing use of the driveway is projected in the opinion of the City Engineer using generally accepted transportation engineering standards to increase in actual or proposed daily vehicular volume on the driveway by twenty percent (20%) or more.
2. The change in the use of the property or modifications to the property restricts the flow of vehicles entering the property in a manner which is anticipated to disrupt normal traffic flow on the public street, thereby creating a hazard.

“Change in property use” may include but is not necessarily limited to: change in type of business; expansion in existing business; change in zoning; and subdivision which creates new parcels. It does not include modifications in advertising, landscaping, remodeling less than 25% of a building, general maintenance or aesthetics that do not affect internal or external traffic flow or safety (per Modesto Municipal Code).

- F. Driveways shall not be constructed at such locations or in such manner that water is diverted from the street onto private property, unless requested in writing and specifically approved in writing by the City Engineer. Likewise, the driveway may not be used as a drainage channel for the onsite runoff. Driveways located in areas utilizing rock wells will be scrutinized much closer due to the capacities and cost of City rock wells.

10.02 DESIGN STANDARDS

The values in Table 13.1 represent minimum and /or maximum standards to be applied in designing and locating driveways on streets in the City of Modesto. For each driveway, the City Engineer may require a specific combination of dimensions within these ranges based on the anticipated traffic flow and safety characteristics of the driveway and public street. New subdivisions will use drive over curb. Flared driveways are required where some or all the following conditions exist: (1) on-street parking creates extra width to maneuver, (2) the street facility is residential, minor collector or major collector and (3) traffic volume over the driveway is less than one thousand (1,000) vehicles per day. Drop approaches are required where some or all the following conditions exist: (1) traffic conditions are at a level of service

“D” or “E”, (2) the street facility is rated major or above and (3) traffic volume over the driveway is one thousand (1,000) or more vehicles per day.

10.03 DESIGN CRITERIA

A. All Driveway Types (Flared, Drop Approach, Drive-over curb)

1. The use of shared driveways shall require the dedication of a joint-use private access easement on each affected property and the filing of a private maintenance agreement with the City. Said dedication shall be provided on the final plat of the subject properties or be filed by separate instrument with Stanislaus County and the City. When the center of the easement is offset from the common lot line, the easement must extend past the lot line in a minimum distance of one foot (1'). The combined size of the access easement must be minimum of ten feet (10') wide and fifteen feet (15') deep for residential property, and a minimum of twenty-four feet (24') wide and forty-eight feet (48') deep (as measured from the right-of-way line) for all other land uses. As a minimum, the easement width shall encompass the entire width of the future planned driveway.
2. No portion of any driveway shall be located within four feet (4') of any fire hydrant, electrical pole or any other surface public utility. At the applicant's expense, applicant may have the surface utility moved if the public utility agency involved determines that the move will not detrimentally affect the service.
3. The driveway curb return (drop approach type) at the point of tangency with the street curb or driveway flare (ramp approach type) shall not be located within (a) four feet (4') of the downstream edge, or eight feet (8') of the upstream edge of a straight curb inlet or inlet extension; nor (b) within ten feet (10') of a recessed inlet without prior written permission of the City Engineer.
4. All vehicle maneuvering on apartment, commercial and industrial properties into a parking space or up to a loading dock or into any other area shall be accomplished by off-street maneuvering areas and internal driveways. No back-in or back-out vehicle maneuvering from a driveway shall be allowed to occur on any public street or right-of-way with the exception of residential drives on local and minor collector streets (Low Volume<3000 vehicles per day (VPD)).

Table 10.1 Driveway Design Standards

Requirements	Street Class	Residential Driveway	Apartment-Commercial Driveway	Industrial Driveway
Driveway Throat Width ¹	Local Minor Collector Major Collector Arterial & Larger	10' - 28' 10' - 28' 12' - 28' 12' - 28'	24' - 36' 24' - 36' 24' - 36' 30' - 36'	24' - 45' 30' - 45' 35' - 45' 40' - 45'
Driveway Curb Radius (Drop Approach Type Only)	Local Minor Collector Major Collector Arterial & Larger	N/A ² N/A ² 10' - 15' 15'	N/A ² 15' - 20' 15' - 20' 20' - 30'	10' - 20' 15' - 20' 20' - 25' 20' - 30'
Minimum Centerline Driveway ³ Spacing Along Roadway	Local Minor Collector Major Collector Arterial & Larger	28' 28' 100' 100'	100' 150' 200' 300' ⁴	100' 150' 200' 300' ⁴
Driveway Angle ⁵	All	70' - 90'	90'	90'
Minimum Distance ⁶ From Driveway to Intersection Along:	Local Minor Collector Major Collector Arterial & Larger	30' 50' 150' ⁷ 350' ⁸	75' 150' 150' ⁷ 350' ⁸	75' 100' 150' ⁷ 350' ⁸
Maximum Approach Grade ⁹ (Drop Approach Only)	Local & Minor Col. All Others	+9% +6%	+6% +3%	+6% +3%
Minimum Distance to Property Line ¹⁰	All	2' ¹⁰	2'	2'
Minimum Approach Length ¹¹ (Drop Approach Only)	Local & Minor Col. All Others	6' 9'	9' 17'	9' 17'

NOTES:

1. The requirements for Driveway Throat is standard for undivided two-way operation and may be varied by the City Engineer if, in that person's discretion, traffic volumes, truck usage, shared driveways, and other factors warrant the variance. Not more than 50% of the

frontage of any parcel shall be devoted to driveways. Lots fronting on a cul-de-sac are exempt from this requirement. See Table 10.2 for throat depth requirements.

2. Driveways may only be flared or drive over curb in these areas.
 3. The minimum distance between driveways serving the same parcel shall not be less than 20 feet as measured between the ends of the driveway flare or curb return.
 4. Driveways on major collectors and larger served by deceleration lanes may be spaced at two hundred foot (200') minimum intervals.
 5. Measured as intersection of the tangent centerline of driveway with the tangent portion of the public street curb line, extending a minimum of twenty feet (20') from the future curb line.
 6. Distance measured from the intersection as measured from the intersection ROW line to the driveway centerline (see Standard Details 1002, 1004 & 1005).
 7. If the driveway has to be located less than 150' from an intersection with a major street facility ROW line, the approach shall be placed at or near the farthest property line from the intersection and a one hundred and fifty foot (150') long raised median from the stop bar at the intersection shall be installed by the Developer at Developer's expense.
 8. If the driveway needs to be located less than 300' from an intersection with a major street facility ROW line, the approach shall be placed at or near the farthest property line from the intersection and a three hundred foot (300') long raised median from the stop bar at the intersection shall be installed by the Developer at Developer's expense. The median shall extend a minimum of 100' past the farthest edge of the driveway from the intersection.
 9. The percent of slope measured along the centerline of the driveway from the flow line of the future curb line.
 10. The minimum distance over which the maximum approach grade must be maintained measured from the flow line of the present curb or a known future curb, as determined by the City Engineer, or his designee.
 11. Driveway locations for single family property shall not be permitted within 2 feet of a property line unless a property fronts on a cul-de-sac bulb in which case a driveway may be constructed up to the property line. Shared driveways or unusual situations may be approved by the City Engineer.
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TABLE 10.2 DRIVEWAY THROAT DEPTH

LAND USE	SIZE	Minimum Throat Length L ** (ft)	
		Collector	Arterial***
Light Industrial	<100,000 sq. ft.	25	50
	100,000-500,000 sq. ft.	50	100
	>500,000 sq. ft.	50	200
Free Standing Retail	<30,000 sq. ft.	25	50
	>30,000 sq. ft.	25	75
Shopping Center	<250,000 sq. ft.	25	50
	250,001-500,000 sq. ft.	50	5
	500,001-750,000 sq. ft.	75	200
	>750,000 sq. ft.	125	250
Supermarket	<20,000 sq. ft.	50	75
	>20,000 sq. ft.	75	125
Apartments	<100 units	25	50
	100-200 units	50	75
	>200 units	75	125
Sit-down Restaurant	<15,000 sq. ft.	25	50
	>15,000 sq. ft.	25	75
Drive-through Restaurant	<2,000 sq. ft.	25	75
	>2,000 sq. ft.	50	100
General Office	<50,000 sq. ft.	25	50
	<50,000-100,000 sq. ft.	25	75
	>100,000-200,000 sq. ft.	50	100
	200,000-500,000 sq. ft.	100	150
	>500,000 sq. ft.	125	250
Motel	<150 rooms	25	75
	>150 rooms	25	100

* This table is based on Table 6-4 in Transportation and Land Development by Institute of Transportation Engineers.

** Detail 1016 illustrates throat length L.

*** The Engineering and Transportation Director will decide driveway throat length in downtown

For a gated situation, the storage depth outside

5. Driveways may be prohibited where adequate sight distance is not available for the established speed limit or the design speed of a future street improvement, if higher. Sight distances shall be calculated in accordance with the latest edition of the State Standards for Highway Design Manual. If an inspection by the City Engineer indicates that driveway sight distance may be insufficient, the applicant will be required to submit vertical and horizontal information to the City that verifies adequate sight distance is available for the proposed driveway location. The City Engineer may deny access or a specific driveway location to any abutting public street if said access cannot be provided in a reasonable and safe manner.
6. Temporary driveways shall only be permitted when a contractual agreement is executed between the property owner and the City. Said agreement shall require annual reviews of driveway use, and the City may require removal of driveway at no cost to the City. The City Engineer may require an escrow fee be provided to the City for a maximum ten (10) year period for the removal of the driveway and related expenses.
7. The City Engineer may authorize variance from the design criteria contained herein whenever the City Engineer determines such variances are necessary to preserve the safe and efficient movement of traffic.
8. Any abandoned driveway shall be completely removed and replaced with standard sidewalk, curb, and gutter.
9. Parking lot driveways shall be designed in such a manner as to preclude the use of the abutting public street for vehicular circulation solely related to the parking lot.
10. Roll over curb is the standard for new subdivision construction on local streets.

B. Drop Approach Driveways

1. When a drop type driveway approach is required for an apartment, commercial or industrial property because of its connection to a major street facility, the driveway shall extend onto private property a minimum distance of fifteen feet (15') from the right-of-way line before intersecting any internal driveway.
2. For any drop approach type driveway, the point of radius return tangency with the street curb shall not extend beyond the property line (projected perpendicular to the street centerline), except as provided in shared driveway agreements and as approved by the City Engineer. See Section 3.17 for further detail.
3. Unless contained on the building permit site plan, a drop approach type driveway shall have a site plan showing all existing right-of-way, easements, curbs, storm drain inlets, flumes, underground and overhead utilities, trees and sidewalks shall be required for each non-residential driveway permit application. The proposed

driveway grade profile shall also be shown for a minimum distance of fifteen feet (15') past the right-of-way line. All driveways and median openings within one hundred fifty feet (150') of the subject property on both sides of each abutting street shall be shown on the site plan. If an adjacent street contains a raised median, showing driveway(s) on the opposite side of the street shall not be required unless a median opening is present or proposed.

4. Handicap ramps not exceeding 12:1 slope shall be required on all driveway drop approaches.
5. Any driveway drop approach shall have an initial positive approach grade not to exceed the values shown in Table 13.1. The initial approach grade shall have a length equal to or greater than the appropriate minimum approach length value shown in Table 13.1, as measured from the present curb or any known future curb line, as determined by the City Engineer. The initial approach shall extend onto private property if necessary, but driveways shall not be constructed at locations or in such manner that water is diverted from the street onto private property. Any sidewalk affected by driveway approach construction shall be adequately transitioned with the driveway using a maximum eight-percent (8%) grade.

C. Residential Standards

1. A circular residential driveway may be allowed on local and collector streets only provided that the minimum distance between driveways shall not be less than 50 feet as measured from the centerline of the driveways.
2. A residential driveway shared by two (2) or more properties shall have a minimum throat width of twelve feet (12'). A joint-use private access easement shall also be required.
3. Driveway access to a residential lot from any major street facility or minor collector shall not be permitted unless that lot has no other public access. If such a driveway is approved on a major street facility or a minor collector, an off-street maneuvering area approved by the City Engineer shall be provided to ensure that vehicles will not back into the public street. Driveway access to a residential lot from a minor collector street or major street facility may be denied if: (a) the lot has access to a local street and/or (b) the proposed access would create a traffic flow or safety problem.
4. Shared residential driveways may be required for adjoining residential lots on major street facilities to reduce the number of access points on those roadways.
5. To provide adequate vehicle storage and maneuvering area, a minimum twenty foot (20') driveway space shall be required between the street right-of-way and all garages or other structures served by the driveway. For side-yard driveways to local streets, a fifteen-foot (15') driveway space will be allowed. A minimum twenty-four foot (24')

maneuvering space shall be required for all rear-entry garages which may extend into an adjacent access easement or alley.

D. Auxiliary Lanes

1. The City Engineer may require the applicant to provide a deceleration lane for any driveway located on an arterial street if the right-turn ingress volume exceeds fifty (50) vehicles in the peak hour of the street. If the existing or future speed limit on the street facility exceeds 40 mph., a deceleration lane may be required if forty (40) right-turn ingress vehicles occur in the peak hour. Such calculation shall be made by the City Engineer unless a traffic study is provided by the applicant. The design of such a deceleration lane shall conform to the dimensions shown in Standard Detail 1008, unless authorized by the City Engineer.
2. When a driveway is approved within the separate right-turn lane of a public street intersection, the lane shall be extended a minimum of **one hundred fifty feet (150')** in advance of the driveway. No driveway shall be permitted within the transition area of any separate right-turn or deceleration lane.
3. A continuous deceleration lane may be required as a condition of driveway permit when two (2) or more deceleration lanes are planned, and their proximity necessitates that they be combined for proper traffic flow and safety. The transition taper for a continuous deceleration lane shall not extend into or beyond a public street intersection.
4. On undivided arterial and collector roadways, a left-turn lane and taper may be required as a condition of the driveway permit when the projected product of the left-turn ingress volume (fifty (50) minimum) and the opposing volume per lane exceeds **750** in any peak hour. In such cases, the City Engineer will analyze the present and future traffic volumes to verify that the left-turn lane is necessary to maintain minimum levels of traffic flow and safety.
5. The City Engineer may require a temporary auxiliary lane to be constructed on existing arterial roadways that are planned for future improvement.
6. In the event an applicant chooses to locate a driveway that requires an auxiliary lane to extend wholly or partially across one (1) or more adjacent properties, the City Engineer may require the applicant to attempt to obtain any necessary right-of-way for such lane.
7. In the event the applicant is allowed to locate a driveway with deceleration lane within one hundred feet (100') of an arterial intersection, he/she may be required to extend the deceleration lane to such intersection. The one hundred feet (100') shall be measured from the center of the driveway to the intersection of the extended right-of-way lines of the arterial intersection.

8. The applicant shall be responsible for the design, right-of-way, adjustment of utilities and construction costs of any auxiliary lane and street widening required as a condition of the driveway permit.

E. Signalized Driveways

1. As a condition of a driveway permit on a major street facility, the City Engineer may require the applicant to submit driveway volume and capacity information when signalization is requested or expected at the driveway intersection. When signal warrants are met and an overall public benefit is shown, the City Engineer may require as a condition of the permit that the applicant pay for the traffic signal installation costs necessary to serve the subject driveway. The applicant may also be required to construct onsite and offsite improvements necessary to provide proper alignment, adequate signal capacity, smooth traffic flow and safety for the public street/driveway intersection.
2. If a driveway is installed at an existing or proposed signalized intersection, the applicant must provide a traffic signal access easement (minimum twenty feet (20') wide by sixty feet (60') deep must be provided to allow the City to install and/or maintain the signal detectors placed in the driveway.
3. If a driveway is permitted and installed at an existing signalized intersection, the applicant shall pay any costs necessary to modify the existing signal and intersection to accommodate the new driveway.

F. Special Driveway Designs

1. The Director may require internal driveway improvements, turning movement prohibitions, auxiliary lanes and traffic control devices to address safety and/or capacity problems within the property which will have a detrimental effect on the adjacent public street system.
2. All driveways on undivided arterial roadways having a projected exiting left-turn volume that will operate at a level of service "E" or worse may be required to be constructed with a left-turn egress control median. Likewise, any driveway having a projected ingress left-turn volume that will have a level of service "E" or worse may be required to have a left-turn ingress control median. If both conditions exist, a right-in/right-out driveway design may be required by the City Engineer.
3. Driveways having a projected design volume of five thousand (5,000) or more vehicles per day shall have a minimum of one hundred foot (100') continuous approach length without adjacent parking stalls or vehicular cross flow.

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SECTION 11

GRADING DESIGN STANDARDS

11.01 GENERAL

All grading shall be designed in accordance with the soils report and Chapter 70 of the latest Uniform Building Code.

11.02 SOILS REPORT

A comprehensive soils report shall be prepared for each project in the City. The report must be prepared by a licensed Geotechnical experienced in soil work or Geotechnical Engineer. It shall include R-values (if greater than 5) taken at the site with a map showing the locations and depths of the test samples. Additionally, it shall include ground water elevations, stripping and grading recommendations, determination if expansive soil is present, etc. The subdivision improvement plans shall provide a chart of the pavement sections. The chart shall contain the R value and the design TI. Below the chart shall be the reference source such as "Kleinfelder, Legends Village Unit 2, July 99".

11.03 GRADING AT PROPERTY LINES

- A. The property line of any proposed or existing site or parcel located within the grading project shall be setback a minimum 1.5' from the top of the slope.
- B. Excavation and fill slopes shall be set back a minimum of two feet from the project boundary line except as provided below.
- C. Pad excavations may cross a phasing line of a project as long as a method has been provided to allow construction on the newly created parcel which will protect the rights of any future owners of either phase of the project. The pad extension shall extend a minimum two (2) feet across the phasing boundary line of the project.
- D. Cut or fill slopes may be allowed on adjacent existing parcels with a recorded slope easement from the current owners of the existing parcel.
- E. A twelve inch (12") maximum wood wall (2" x 12" rowd) may be installed along project boundaries to preclude grading on adjacent property.
- F. Walls higher than twelve inches (12") shall be masonry or reinforced concrete. Calculations shall be provided with submittal of improvement plans or the design engineer may refer to Modesto City Standard Details #338 & 339.

11.04 LOT GRADING

- A. Lots shall be graded or swaled to slope a minimum of 1% toward a public street from the low point in the rear of the lot to the back of fronting sidewalks or top of curb grades. Pad elevations for buildings shall be at least 0.1' above the high point as determined above. Alternative lot grading may be approved by the City Engineer if special conditions exist as long as disposal of all site drainage can be provided in a safe manner. A typical detail for the lot grading for a subdivision shall be provided in the plan set.

11.05 STORM WATER POLLUTION PREVENTION PLAN

The consulting engineer and developer must apply best management practices in the grading design to minimize erosion and soil runoff. Appendix N provides a sample storm water pollution prevention plan (SWPPP). Details for protection against erosion and infiltration of soils into the storm system are provided in Details #1600-1608. The design engineer may want to place applicable details on the grading plans as well as include the details in the SWPPP provided to the state and on-site contractor. A grading permit will not be issued without a copy of the Notice of Intention (NOI) filed with the state (5 acre sites or greater).

SECTION 14

DEMOLITION AND ABANDONMENT PLAN

14.01 GENERAL

A Demolition and Abandonment plan shall be prepared when the development site has existing improvements upon it. The City's primary purpose for preparing this plan is to identify those sites which may have wells, septic tanks, retention basins, etc. that require special treatments for abandonment or significant costs to prepare the site for construction.

14.02 CONTENT

The plan, when required, shall show all houses or other structures, wells, existing trees, septic tanks, septic tank leach fields, pipelines, storm drain retention or detention basins, street trees, irrigation facilities, utilities, streets or roads, bridges or other concrete structures that currently exist at the site of the planned development. The Consulting Engineer is encouraged to contact the City staff as early as possible during the design process to determine if this plan is required, what scale will be acceptable and which existing improvements are required to be shown.

14.03 SCALE

The drawings shall be prepared at a scale sufficient to clearly show all existing improvements, as described above.

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SECTION 15

ENGINEER'S ESTIMATE FOR BONDING

15.01 GENERAL

An Engineer's Estimate shall be prepared to allow bonding all improvements to be constructed in the subdivision and to establish City fees. Bonds and/or equivalent securities shall be provided to the City by the developer prior to the recording of any Final Map. A warranty bond is required prior to acceptance of the subdivision. Separate estimates are required for any reimburseable work or work involving capital facilities fees, community facilities fees, or public utility work.

15.02 COSTS (Recommended but not required)

- A. The City has established minimum unit costs for the most common items constructed. Copies are available from the City Engineer and are periodically updated. In Appendix C of these Design Guidelines is a copy that should be verified to assure that it is the latest version.
- B. Unit costs have been used which reflect, as much as possible, the costs the City may incur in constructing the improvements. It is not the intent to estimate the costs private developers may incur.
- C. A ten percent (10%) contingency fee shall be included to protect the City from inflation of costs and unforeseen conditions.

15.03 FORM

The Engineer's Estimate shall be in the form of a table listing items, units used, unit costs, quantity of each item and the total cost of the improvement. The estimate shall be in categories according to the type of facility ie. sewer, water, storm, street work, etc. See example in Appendix C.

15.04 GRADING

Estimates for grading shall indicate cubic yards to be moved onsite and cubic yards of import or export required, if any. Grading of temporary drainage basins shall be shown as a separate item. Estimates for grading shall include the costs of any grading performed under a grading permit. The grading permit shall be charged according to the Uniform Building Code (UBC).

15.05 CONSTRUCTION OF EXISTING STREETS

When new facilities are to be installed in existing streets, unit prices for underground improvements shall be increased. To simplify the estimation of these costs the City will require a fifty-percent (50%) increase in unit prices.

15.06 GROUNDWATER

If the soil report or other historical evidence or records indicates that groundwater will be encountered during construction, unit costs for all pipelines installed within 2 feet of the groundwater shall be increased by \$10 per lineal foot.

SECTION 16

EROSION & SEDIMENT CONTROL STANDARDS FOR CONSTRUCTION ACTIVITIES

16.01 GENERAL

Appendix N of these standards and a city document called “Erosion and Sediment Control Standards for Construction Activities” have been adopted to provide guidance to the Developer, Contractor, and Engineer. These set the minimum standard and do not relieve any of the parties from liability of utilizing best management practices to eliminate pollution discharge caused by construction activities. The contractor shall implement best management practices regardless of project size.

The State Water Control Board requires a Storm Water Pollution Prevention Plan (SWPP) to be developed before any construction activity of 5 acres or greater. To avoid duplication of effort, the City of Modesto requires a copy of the State Notice of Intention (NOI) Application to obtain a grading permit and a copy of the SWPP Plan to be on-site for inspection. Appendix N of these specifications provides the required framework for a SWPP plan and is available in Word Format by email or disk. The permit will be issued without a review of plans or documents. Our Storm Water Discharge division will be notified of the permit issuance through staff.

The City also has a digital document available called “Erosion and Sediment Control Standards for Construction Activities” and various CAD details not in these standard specifications. The document gives suggested management practices and other construction details that may not be shown in the standard details or Appendix N. This document is a compilation of the State documents for SWPP planning for construction related activities.

16.02 PERMITTING

The process and sequence required to obtain the grading permit from the City is as follows:

- A. Engineer Completes & Submits Grading Plans
- B. Developer submits a Notice of Intention (NOI) to the State (for 5 acres or greater).
- C. Contractor, Developer, or Engineer pulls a grading permit from Development Services Division. Fees based on the UBC, a copy of the NOI, and 3 sets of Grading Plans are required.
- D. Contractor Begins Grading Operation. The grading contractor shall maintain a copy of the SWPP Plan on-site during the construction. All subcontractors on-site shall be

informed to the location of this document and the requirements of this document. When the general site contractor completes his or her work and turns over the supervisory duty to the building contractor, the plan's maintenance and execution shall become part of the building contractor's responsibility.

16.03 INSPECTION

The majority of inspections will be by Building Inspection and Construction Administration during the course of their regular inspections. Any infractions will be pointed out to the site supervisor during their normal inspection. Building and Construction Administration staff inspectors will be forwarding all storm water related findings to the city stormwater inspectors. Serious infractions will be followed up by a site visit from our storm water inspectors.

16.04 STORM WATER QUALITY CONTROLS FOR MULTIFAMILY, COMMERCIAL, AND INDUSTRIAL FACILITIES/LAND USES

Treatment control measures are designed based on flow rates or volume of runoff. Those designs based on flow are to be designed for the water quality flow, and those designed based on volume are to be designed as the peak flow from the 2-year/6 hour storm event of the contributing area directly connected to the treatment control measure. For the Modesto area, the average rainfall intensity associated with this storm event is 0.15 in/h. The water quality volume is defined as the first 0.5 inches of runoff from the contributing drainage area that is directly connected to the storm drain system. The focus is predominantly impervious surfaces (excluding rooftops when designed to drain directly to the City storm drain system). However, the water quality flow or volume is to include all runoff volume from other on-site impervious areas, pervious areas and any off-site flows that may contribute runoff to the control measure. The treatment control measures are to be sized for the water quality flow or volume only. Flows in excess of the water quality flow or volume are to be diverted around or through the treatment control measure. (Note- The diversion shall not collect pollutants and flush them through the treatment control measure.)

Alternative technologies, those not listed in the Guidance Manual for New Development Stormwater Quality Control Measures, that provide equivalent treatment are encouraged but may result in additional time for agency review and approval unless coordinated in advance with the City's stormwater management staff in the Department of Operations and Maintenance.

The landowner is responsible for the operation and maintenance of the treatment control measures. Failure to properly operate and maintain the measures could result in no treatment of stormwater runoff, or a slug loading of pollutants to the storm drain system. To protect against failure, a Maintenance Plan must be developed and implemented for all treatment control measures. The Plan must be made available at the City's request. In addition, a maintenance agreement with the governing agency may be required. The standard maintenance agreement for the City is included in

Appendix C of the Guidance Manual for New Development Stormwater Quality Control Measures.

In addition to maintenance, the City may require water quality monitoring agreements for any of the treatment control measures. Monitoring may be conducted by the site operator, the City or both. Monitoring may be required for a period of time to help the City evaluate the effectiveness of the treatment control measures in reducing pollutants in stormwater runoff.

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SECTION 20

WALL DESIGN STANDARDS

20.01 GENERAL

Walls shall be designed by a licensed Civil or Structural Engineer in accordance with accepted engineering principles and shall conform to these Design Standards.

The design code to be utilized to design walls within the City of Modesto shall be the currently adopted version of the Uniform Building Code, except as modified in Section 9.02 of these standards. Specific design parameters and references are listed for the designer's convenience in Section 9.02 of these standards.

20.02 DESIGN STANDARDS

A. Wind Load

For walls less than twelve (12) feet in height, ten (10) pounds per square foot of exposed face shall be used. When the wall is twelve (12) feet high or higher, fifteen (15) pounds per square foot of exposed face shall be used.

B. Seismic Load

A load equal to 0.2 times the dead load shall be used for fences over six (6) feet in height.

C. Earth Loads

In the absence of a soils report giving site-specific data, a minimum active pressure of forty (40) pounds per cubic foot and a maximum passive pressure of one-hundred (100) pounds per cubic foot shall be used.

D. Pier Depth

Pier depth shall be calculated per Section 2906 of the UBC.

E. Cover for Reinforcing

The minimum allowable cover for structural steel reinforcement shall be a minimum of one-and-one half (1.5) inches.

F. Minimum Reinforcement (Temperature)

For temperature refer to Section 2607 of the UBC.

20.03 FINISH TREATMENTS

Finish treatments shall be as specified by the City.

20.04 COLOR

All color shall be integral to the wall. Painted walls shall not be allowed.

20.05 PANEL SUPPORTS

- A. For clarity in this section of these Design Standards, piers are defined as those portions of the panel support, especially for precast walls, which are below ground and carry the weight of the panels vertically. Posts are defined for this section as those above ground portions of the panel supports that serve chiefly to provide horizontal stability.
- B. When piers and posts are separate members connected by a method requiring plate connections, all support shall be continuous. No shimming shall be allowed.
- C. Piers shall be designed to a size to provide sufficient support to prevent crushing, cracking and deformation of the panels being supported.

20.06 INSPECTIONS

The City may require coring of prefabricated wall sections to assure conformance with these Standards. Walls found in nonconformance will be required to be removed and replaced with conforming walls at the developer's expense. The City Engineer may require inspections at the fabrication facility to assure compliance. The City will require reimbursement by the developer for these expenses.

20.07 WALL CAPS

Where specified by the City, walls shall be provided with rolled caps to prevent moisture penetration to walls.

20.08 LOCATION

In areas where a Community Facilities District (CFD) is established to pay for annual maintenance of landscaping in front of the wall, the wall shall be located within the public

right-of-way and become a part of the CFD. If there is no CFD mechanism to pay for the cost of repair, the wall shall be located 6" behind ROW on private property. Hence, the owner of the property is responsible for maintenance.

A standard detail shall be provided on the wall drawings indicating the placement of the wall in relationship to the property line and public ROW. This detail will also be shown in the improvement plans.

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SECTION 21

DEVELOPMENT PROCESS

21.01 GENERAL

This section provides a brief explanation of the development process after the entitlements have been given and the process passes from the Community Development Department to Engineering and Transportation Department (E & T).

E & T provides a Development Services Division on the 3rd Floor (Suite 3100) at 1010 Tenth Street. This division's charter is to provide the developer a staff of professionals to facilitate his or her development of public infrastructure through final acceptance by staff and City Council.

Prior to reading this section, the user should familiarize himself/herself with Design Section 2, Maps and Improvement Plans, and with Standards Section 2, Permitting. Design Section 2, Maps and Improvement Plans, provides the consultant information on providing the city with the required submittal package for approval of plans. Also, Design Section Appendix E, Submittal Package, summarizes what Development Services requires for a complete submittal package.

Standards Section 2, Permitting, provides guidance on the requirements for pulling an encroachment permit in the public right-of-way or obtaining a permit to construct a subdivision.

21.02 DIVISION & DEPARTMENT PROCESSING

The City of Modesto has many departments and divisions involved in handling development. Figures 21.5 and 21.6 provide a small glimpse into the various responsibilities each organization has as it relates to development.

To provide tracking of plans, maps, agreements, unresolved issues, etc, the City would prefer all submittals for your project to go through its Development Services' Division. This division will provide you with a receipt for your submission and route the submittal to the proper individual in the organization.

21.03 REFERRAL PROCESS

A development will go through the referral process many times. The City has two development referral teams. One development review team headed by the Deputy City Manager, provides the overall strategic vision. This team will not normally deal with individual issues. The second development team deals with developments on a case by case basis. This team meets once a week (see Figure 21.1) to discuss topics from specific plans and vesting maps to specific issues dealing with the improvement plans.

The coordinator for the second development team facilitates all the requests for resolution. The following are examples of the issues and the various divisions responding:

A Utility Planning

- 1 Providing a “will serve” letter
- 2 Minor modifications of the City Standards for sewer, storm, or water
- 3 Identification of future master-planning of utilities in a specific area
- 4 Reimbursement agreements for oversizing lines

B Traffic Engineering

- 1 Identification of required dedication for street ROW, PE, or PUE.
- 2 Traffic striping
- 3 Median construction
- 4 CFF paid items
- 5 Traffic Signal modifications

C Design Engineering

- 1 Minor modifications of the City Standards
- 2 Identification of City Projects in the area
- 3 CFF paid items

D Development Services

- 1 CFD reimbursements
- 2 Dedications
- 3 Minor modifications of the City Standards

If a developer or consultant engineer requests a face-to-face meeting to discuss an issue, the best time is proceeding one of these weekly meetings.

21.04 MAPS & IMPROVEMENT PLANS

The developers shall process the plans through Development Services

21.05 AGREEMENTS, ANNEXATION, & BONDS

Agreements for any reimbursement(s) must be executed prior to approval of the improvement plans by the City Engineer. The developer’s engineer should provide the developer draft plans to begin the negotiations. Actual reimbursement will be per the Public Report or actual contractor costs, depending on the circumstances and type of reimbursement. Most reimbursements require long lead times and must be endorsed by the City Attorneys Office.

Prior to filing a Final, the developer must have annexed to the CFD (if applicable) and have executed a Fees Letter and provided Performance and Payment bonds. Annexation to a CFD requires a minimum of 6 months.

Bonds are required at several stages. The Performance and Payment bonds for a subdivision permit are required prior to filing a Final Subdivision Map. A Warranty bond is required prior to final acceptance of a subdivision.

21.06 FINAL ACCEPTANCE OF IMPROVEMENTS

Final acceptance of subdivision improvements require the following:

- A. Consultant's submittal of as-builts
- B. Developers submittal of a warranty bond and payment of all fees. Fees include inspection and water tap fees. Staff will provide development services a memorandum
- C. Staff processing of a City Council Agenda.

21.07 PERMITTING

The consulting engineer and contractor are responsible for completing the as-built plans. The consulting engineer shall submit the following prior to final acceptance of improvements by the City:

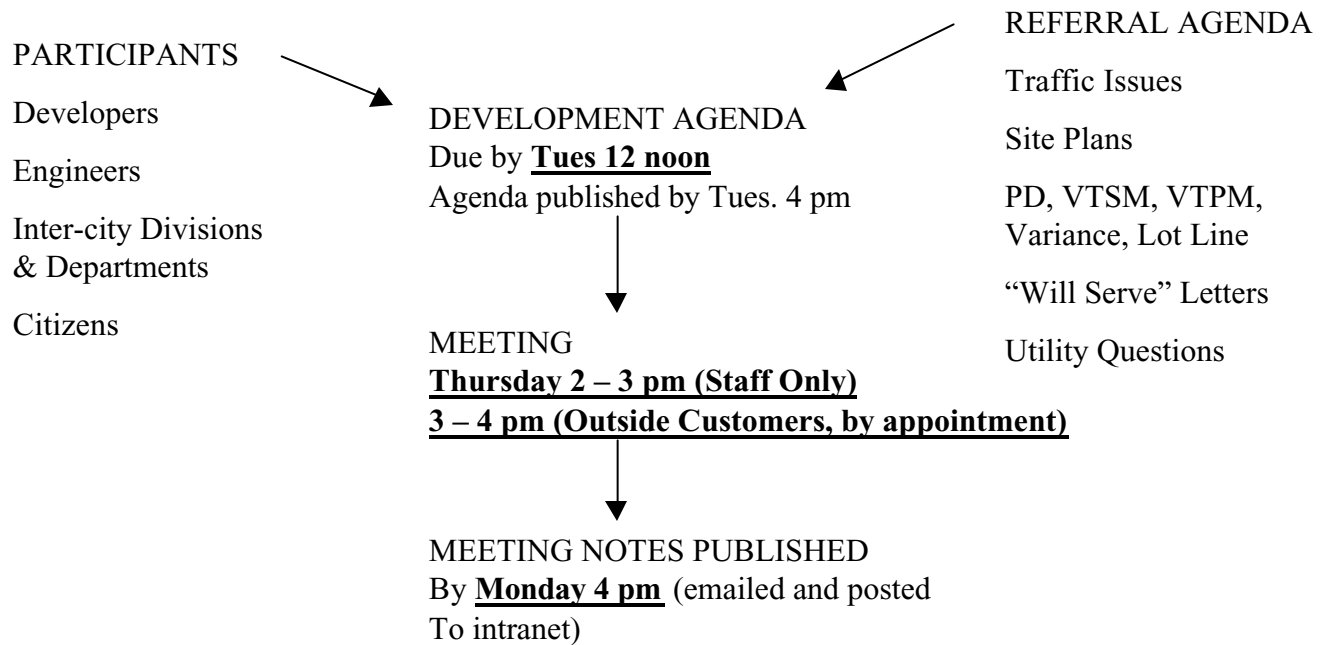
21.08 CITY COUNCIL

Only City Council may accept a Final Subdivision Map, Subdivision Improvements, or developer reimbursement agreements for CFF or CFD. The developer must provide staff 3 full weeks to process the subdivision through City Council.

21.09 FEES

A complete list of fees is available with the City Clerks Office. However, to identify the applicable fees, visit Suite 3100.

FIGURE 21.1
DEVELOPMENT REFERRAL
PROCESS



GOALS

- Decrease number of referrals by screening the “New Items” on the Agenda (See sample)
- Maintain a combined list of development referrals
- Communicate to staff the results of issues
- Provide research capability of the issues
- Save resources (staff time, paper, & emails)

RULES

- Calendar all referrals
- Cc the Development Referral facilitator on all development related items – even those not on the agenda
- Schedule meetings outside this time for development issues that involve more than 10 minutes of discussion or if you cannot make the meeting and you are scheduled as a responsible party to an item of discussion on the agenda (see sample)

FIGURE 21.2

PARCEL MAP PROCESSING

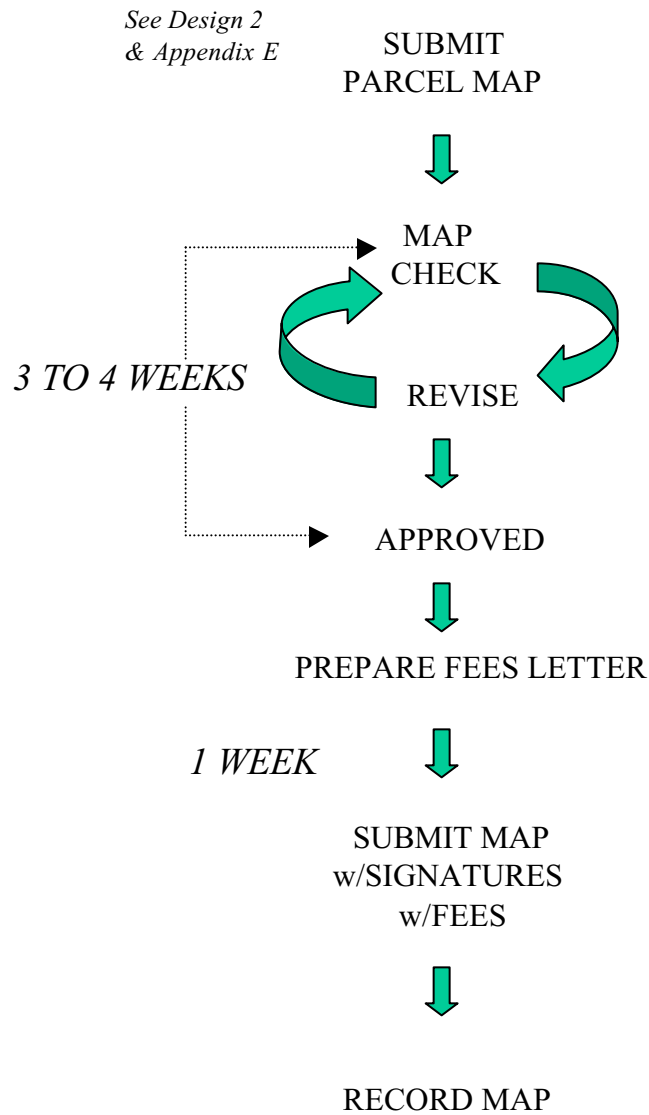


FIGURE 21.3

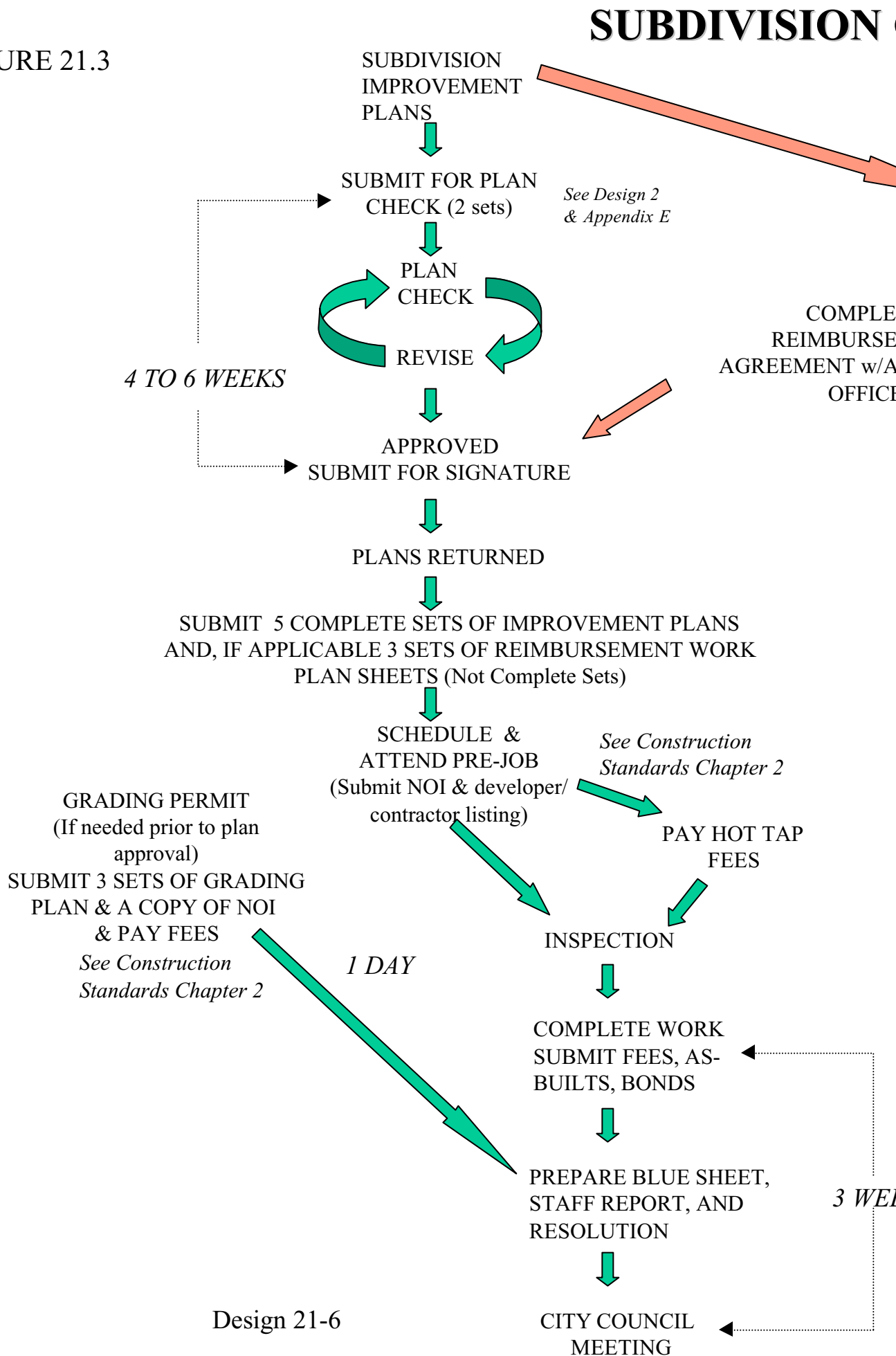


FIGURE 21.4

COMMERCIAL PLAN CHECK & PERMITTING

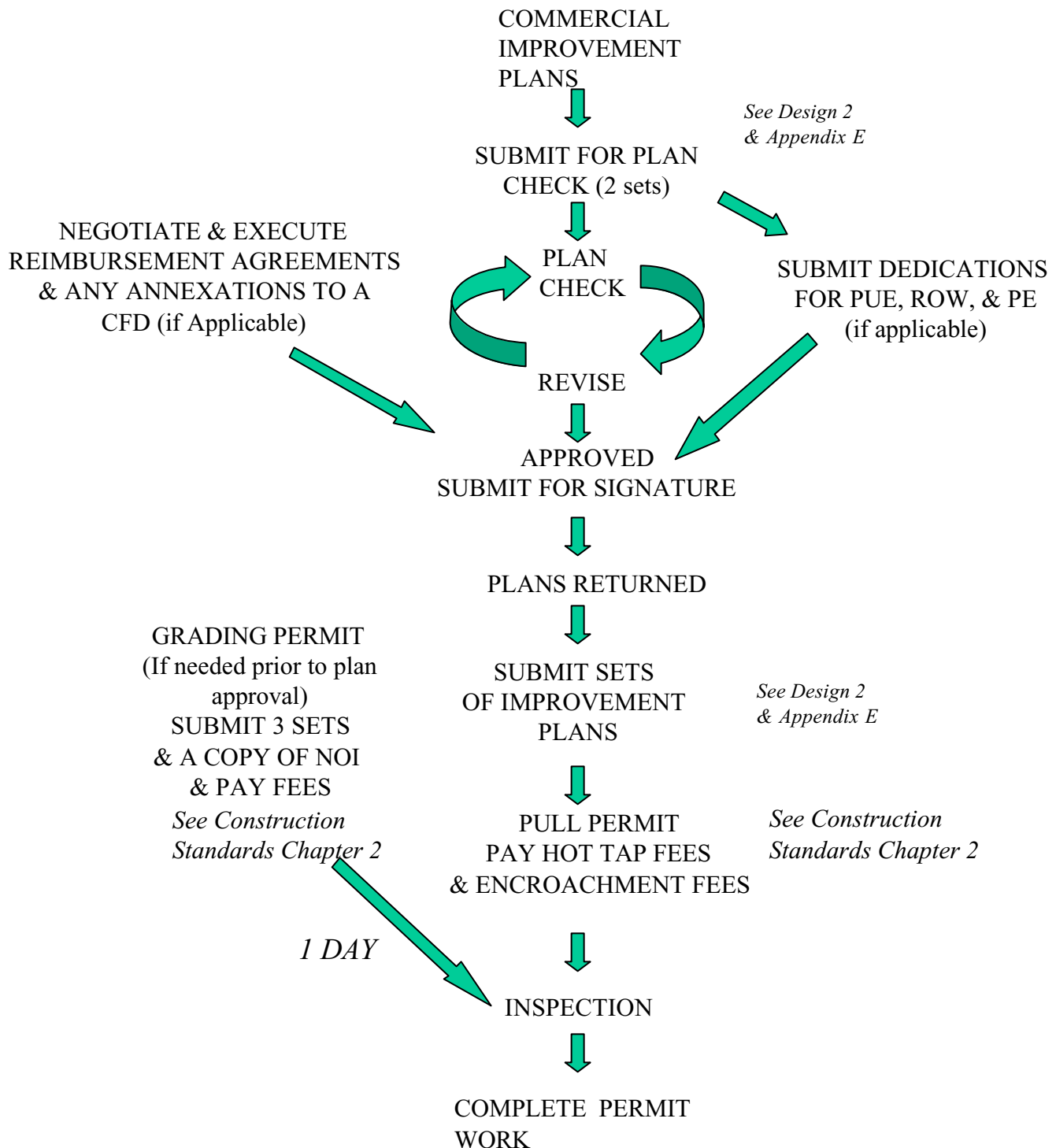


Figure 21.5 City of Modesto Development Service Functions by Departments

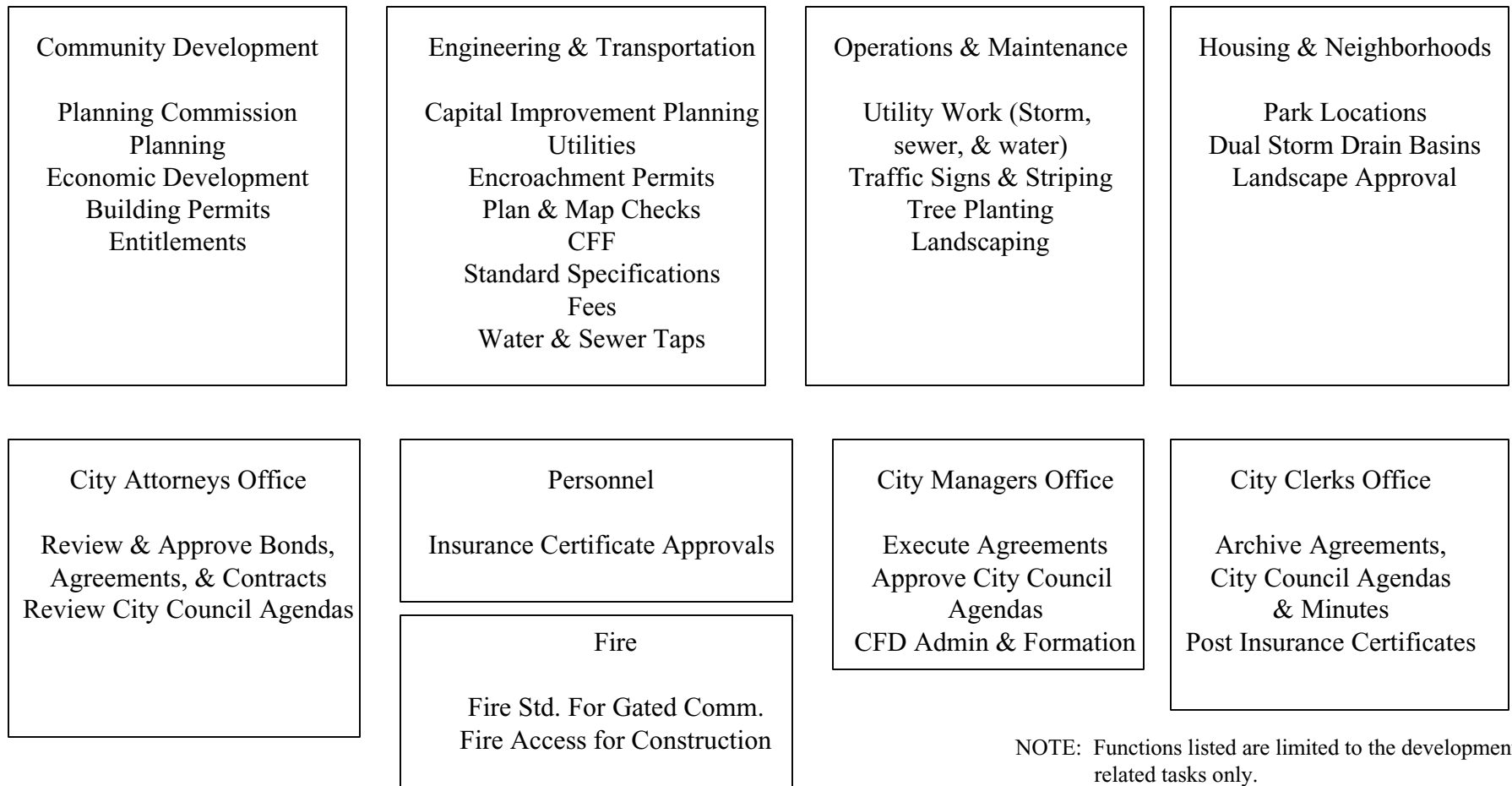
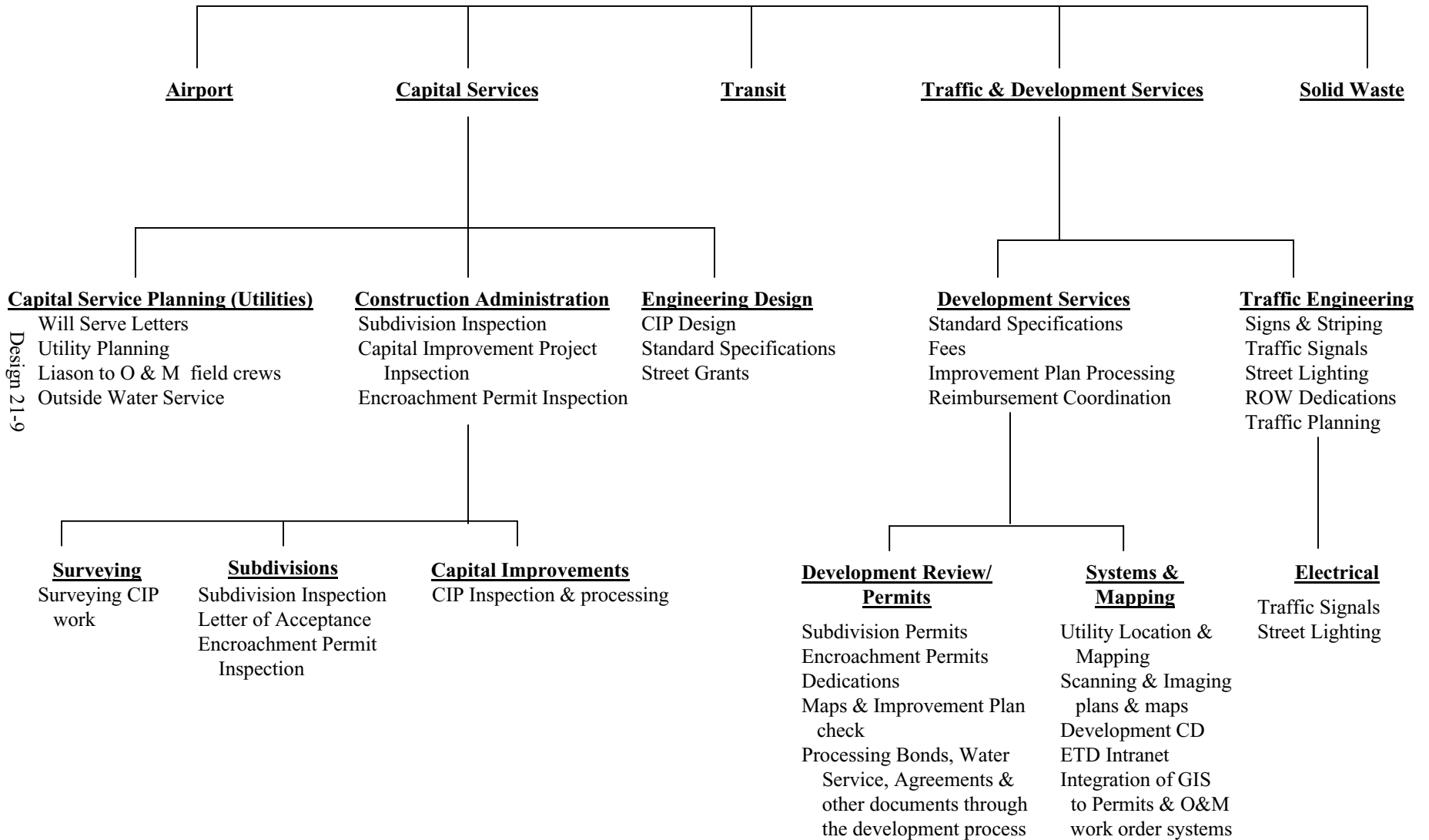


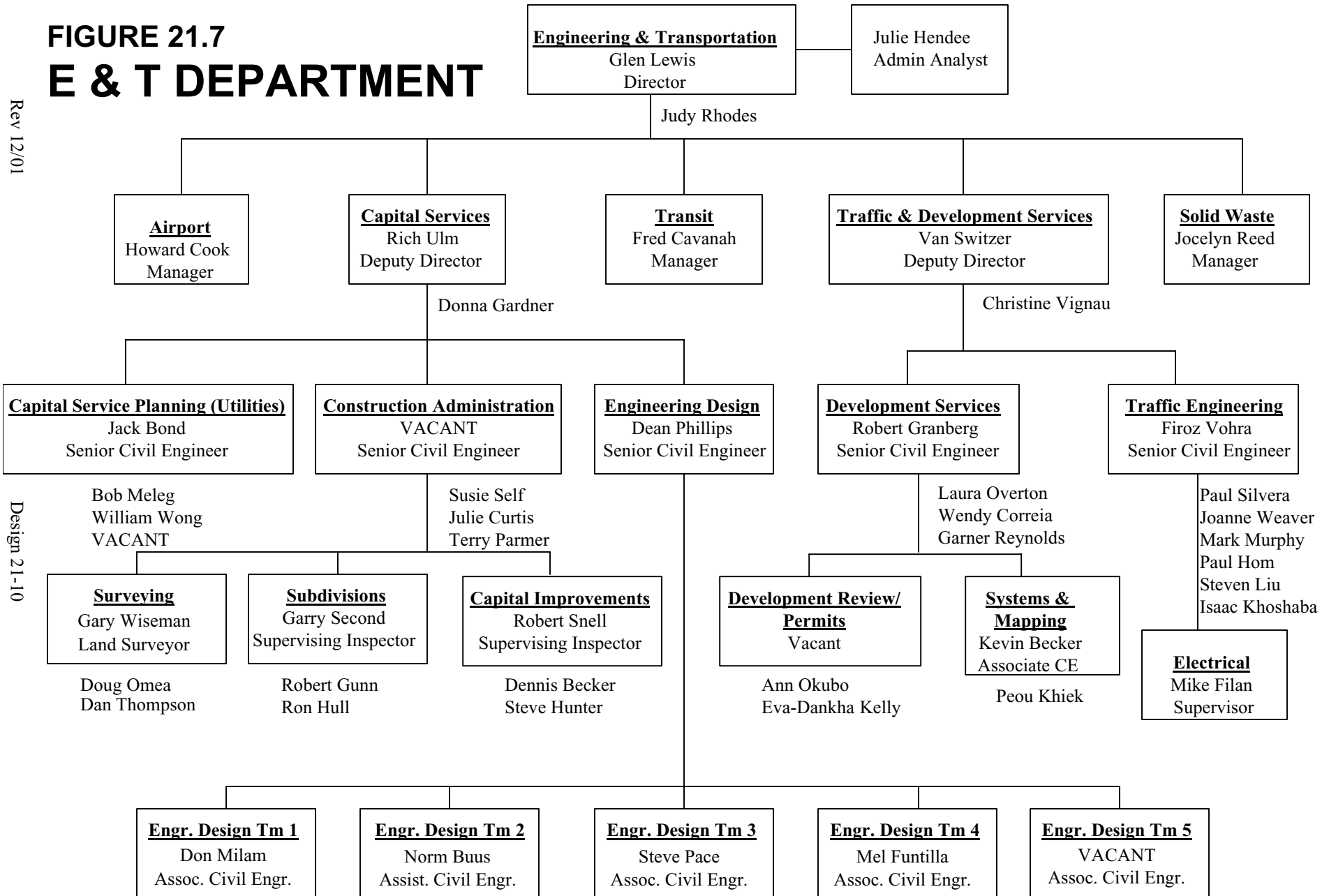
FIGURE 21.6 E & T DEPARTMENT



NOTE: Functions listed are limited to the development related tasks only.

FIGURE 21.7
E & T DEPARTMENT

Rev 12/01



Design 21-10

FIGURE 21.8

VESTING MAPS							
	Approx. Time Req'd (in weeks)	Consulting Engineer/ Developer	Community Development: Planning	E & T: Development Services	Attorneys Office	Submittal Requirements	Submt To Whom
1	9	Research & Prepare Tent Map		Will Serve Lts for Utilities			
2	4 to 6	Submit Tentative Map to CDD	Distribute Tent. Map & Assemble Cmts	Cmt to CDD		3 bluelines	CDD
3	5 to 8	Respond to Cmts/ Place on Planning Commission Agenda w /CDD	Place on Planning Commission Agenda (4 week lead req'd)	Review Final Cmts from Planning	Review Final Cmts from Planning		
4	1	Receive Planning Commission Recommendations (CDD)	Distribute Recommendations to Consultant	Receive BZA Conditions	Receive BZA Conditions		
5	3	City Council Mtg (CDD)	Prepare Council Agenda (3 wk lead req'd)		Approve Agenda/Resolution		

FINAL MAP							
	Approx. Time Req'd (in weeks)	Consulting Engineer/ Developer	Community Development: Planning	E & T: Development Services	Attorneys Office	Submittal Requirements	Submt To Whom
*NOTE: Must annex to the CFD prior to recordation of the Final Map							
1	2 to 4	Submit Draft Final Map (Dev. Services)	Check for street name & lot & block conflicts	Check for conformance		3 bluelines, deed references, title report, BZA conditions	Development Services
1a	24	Annex to CFD			CFD agreement	Agreement	Development Services
2	1 to 2	Re-submit until approved		Check until conformance		2 blueline w/red line	Development Services
3	2	Final Map Submitted	make mylar copy, Address Final Map	Prepare Fees Letter & Agreements (to include annexation to a CFD)	Appove Title, Agreements, & Performance Bond	1 signed map (mylar), fees, notary, agreements	Development Services
4	3			Prepare City Council Agenda*	Approve Agenda/Resolution		
5	1 day		distribute address map after approval	City Council Mtg		2 blueline distributed w/address for scanning (CDD)	Development Services

*Agenda for City Council includes Staff Report, Blue Sheet, and Resolution

PARCEL MAP							
	Approx. Time Req'd (in weeks)	Consulting Engineer/ Developer	Community Development: Planning	E & T: Development Services	Attorneys Office	Submittal Requirements	Submt To Whom
1	2 to 4	Submit Draft Final Map (Dev. Services)	Check for street name & lot & block conflicts	Check for conformance		3 bluelines, deed references, title report, BZA conditions	Development Services
2	1 to 2	Re-submit until approved		Check until conformance		2 blueline w/red line	
3	2	Parcel Map Submitted	make mylar copy, Address Final Map	Prepare Fees Letter	Appove Title	signed map, fees, notary	
4	3		distribute address map after approval			1 blueline distributed w/address for scanning (CDD)	

*Agenda for City Council includes Staff Report, Blue Sheet, and Resolution

SUBDIVISION IMPROVEMENT PLANS							
	Approx. Time Req'd (in weeks)	Consulting Engineer/ Developer	Community Development: Planning	E & T: Development Services	Attorneys Office	Submittal Requirements	Submt To Whom
*NOTE: Must annex to the CFD prior to doing CFD Work. Must have reimbursement agreements processed prior to construction of reimburseable work							
1	1 to 3	Submit Draft Improvement Plans w/Landscape Plans in package		Check for conformance		calcs for sewer, water & storm, 3 bluelines, BZA conditions, soils rpt (r values)	Development Services
1a	24	Annex to CFD. Negotiate reimbursement agreements (CFF, CFD, and/or Utility reimbursements)			CFD agreement and/or CFF and/or Utility reimbursement agreement	Agreement	Development Services
2	1 to 2	Re-submit until approved		Check until conformance		2 blueline w/redline	
3		Improvement Plan Submitted/Reimbursement work identified on plans and coordinators signature		Check Bond, Check Reimbursement Work	Approve Bonds, Prepare and Approve Agreements for Reimbursement	5 bluelines, warranty bond, performance bond, payment bond, reimbursement agreements	Development Services

4	3			Prepare City Council Agenda	Approve Agenda/Resolution		
5	1 day			City Council Mtg			
6	2 day			Prepare encroachment permit & water service tap w/invoice, distribute plans, scan & log plan w/ permit & conditions (see permitting)			

*Agenda for City Council includes Staff Report, Blue Sheet, and Resolution

GRADING PLANS							
	Approx. Time Req'd (in days)	Consulting Engineer/ Developer	Community Development: Planning	E & T: Development Services	Attorneys Office	Submittal Requirements	Submt To Whom
1	2	Submit Draft Grading Plan		Check for conformance		2 blueline	Dev. Services
2	2	Re-submit until approved		Check until conformance		2 blueline w/redline	Dev. Services
3	1	Approved Grading Plan		Check for conformance, Prepare grading permit & water service tap w/invoice, distribute plan w/permit & conditions (see permitting)		3 bluelines, soils rpt, NOI, SWPPP	Dev. Services

IMPROVEMENT PLANS							
	Approx. Time Req'd (in days)	Consulting Engineer/ Developer	Community Development: Planning	E & T: Development Services	Attorneys Office	Submittal Requirements	Submt To Whom
*NOTE: Must annex to the CFD prior to doing CFD Work. Must have reimbursement agreements processed prior to construction of reimburseable work							
1	2	Submit Improvement Plans		Check for conformance		2 blueline	Dev. Services
2	2	Re-submit until approved		Check until conformance & approval of reimbursement agreements & annexation to CFD		2 blueline w/redline, Agreements, annexation agreement	Dev. Services
3	1	Approved Improvement Plans		Check for conformance, Prepare grading permit & water service tap w/invoice, distribute plan w/draft permit & conditions (see permitting),		5 bluelines, soils rpt, NOI (if applicable), SWPPP	Dev. Services

OUTSIDE WATER PLANS							
	Approx. Time Req'd (in days)	Consulting Engineer/ Developer	Community Development: Planning	E & T: Development Services	Capital Services Planning	Submittal Requirements	Submt To Whom
*NOTE: Must have reimbursement agreements processed prior to construction of reimburseable work							
1	2	Submit Improvement Plans		Check for conformance; large projects approved by Capital Services Planning	Plan check outside water plans	2 blueline	Dev. Services
2	2	Re-submit until approved		Check until conformance & approval of reimbursement agreements		2 blueline w/redline, Agreements	Dev. Services
3	1	Approved Improvement Plans		Check for conformance, Prepare water service tap w/invoice, distribute plan w/permit & conditions (see permitting)		3 bluelines	Dev. Services

REIMBURSEMENT AGREEMENTS (CFF, CFD, UTILITY)							
	Approx. Time Req'd (in weeks)	Consulting Engineer/ Developer	Attorneys Office	E & T: Development Services	Capital Services Planning	Submittal Requirements	Submt To Whom
1	24	Submit Draft Improvement Plans	Prepare agreements for reimbursement	Check for conformance to vesting map, specific plan, precise plan, and standards	If applicable, prepare reimbursement agreement	2 blueline	Dev. Services
2	2	Submit Improvement Plans & Signed Agreements	Sign-off on improvement plans when CFD reimbursement agreement complete	Sign after CFD, CFF, and Utility Coordinators have signed	Sign-off on improvement plans when Utility reimbursement agreement complete	Vellum & Agreements	Dev. Services

STANDARD ENCROACHMENT PERMIT w/o PLANS						
	Contractor	Development Services	Construction Admin	City Clerk	FEES	Submittal
1	Apply & Pickup Permit at Development Service	Check insurance for conformance, map utility cuts in pavement, issue blue card for trench cuts, enter in Tidemark, distribute permit & map - 4 copies (mapping, permits, contractor, inspector).	Inspect project, issue final acceptance notice w/Development Services, inspect all trench cuts & report on yearly basis	Approve Contractor's Workmens Comp & Liability Insurance	Encroachment, Trench Cut, Application	Pay fee, assist in mapping trench cuts

ENCROACHMENT PERMIT W/PLANS						
NOTE: Permit will not be issued without reimbursement agreements (CFD, CFF, and/or Utility Reimbursement Agreements)						
	Contractor	Development Services	Construction Admin.	City Clerk	FEES	Submittal
1	Submit Plans for Approval	See Subdivision & Improvement Plans Processing for obtaining approvals			Applicable Plan Checking fees	See Plan Processing
2	Apply at Development Service	Check insurance for conformance, if not approved plans - applicant to follow plan processing. If approved plans, find draft permit and proceed with permitting. Setup pre-job to issue permit on larger jobs.* Issue pre-job permit package to larger jobs. Smaller jobs - issue permit. Map utility cuts in pavement, issue blue card for trench cuts, enter into Tidemark, distribute permit & map - 4 copies (mapping, permits, contractor, inspector).	Inspect project, issue final acceptance notice w/Development Services, inspect all trench cuts & report on yearly basis	Approve Insurance	Encroachment, Trench Cut, Application, Utility Connection fees	distribute plans: vault, inspector, NPDES, water (minus electrical), sewer & storm, electrical)
3	Larger Development: Pickup Permit at pre-job (subdivisions and larger jobs inside city)	Issue permit	Attend Pre-job, identify submittal requirements, prepare final acceptance notice and assist in final invoice.			Invitees: city inspector, NPDES, plan checker, contractor & subs

*Larger Developments - typically subdivisions and large commercial projects where street frontage is being constructed & dedicated; T & M billing for permit is std.

GRADING PERMIT						
	Contractor	Development Services	Construction Admin.	City Clerk	FEES	Submittal
1	Submit Plans for Approval	See Subdivision, Improvement Plans, or Grading Plan Processing for obtaining approvals				See Plan Processing
2	Apply at Development Service	Check insurance for conformance, if not approved plans - applicant to follow plan processing. If approved plans, find draft permit and proceed with permitting				distribute plans: vault, inspector & NPDES
3	Pickup Permit	Issue on first visit if already approved plans; include NPDES conditions	Inspect for compliance to NPDES	Approve Insurance	Grading Permit per building code	

WATER SERVICE REQUEST						
	Contractor	Development Services	Construction Admin.	City Clerk	FEES	Submittal
1	Apply at Development Service: Subdivision or other major improvement plans must go through the approval process (see plan processing) Single lots & minor improvement plans apply at building permits or encroachment permits.	Check for plan approval or for small project, check for plan conformance, map utility cuts in pavement, distribute copies, enter in Tidemark, for subdivisions on T & M and inside city limits bill water service request directly to developer. Collect immediately if outside city or not a subdivision. Invoice may include plan check , outside agency permit, soils testing, and water tap fees. Issue water service request to Water Division.	Inside city, inspect project, issue final acceptance notice w/Development Services, inspect all trench cuts & report on yearly basis. Outside city - no inspection required	Approve Insurance	Encroachment, Trench Cut, Application, Water Service Fees, Systems Fees where applicable	3 sets of plans if not already submitted, (distribute: vault, water, inspector), pay applicable fees or assist in invoicing developer (inside city subdivisions only), assist in mapping trench cuts, route water service to Water

FIGURE 21.9
IDENTIFICATION OF DEVIATIONS FROM STANDARDS & REIMBURSEMENT
AGREEMENTS

Project Name: _____

APN(s): _____

Developer(s) Name & Address: _____

Engineer: _____

With this development, I will be seeking the following reimbursements (circle all that apply):

CFD

CFF

Water

Sewer

Storm

Other

Please clarify the items which are reimbursable. Attach a sketch or reduced drawing(s) of all the reimbursable work.

The approximate time schedule for this project (indicate a month and year):

Final Map _____

Improvement Plans _____

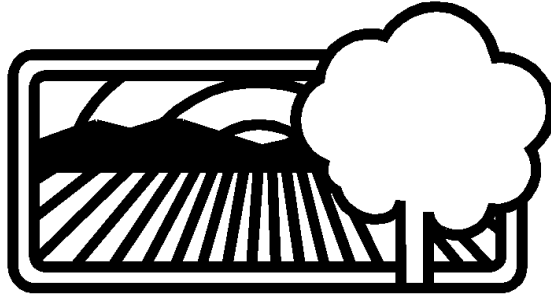
Will this be phased? _____ If so, clarify? _____

I will be requesting the following deviations from the standard specifications or approved tentative map (traffic, utilities, streets, map phasing, etc.)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

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City of Modesto



AutoCAD Drafting Manual

Version - 1.03
September 1998

PREFACE

The main objectives of standardization are to make drawings more compatible and interchangeable between City groups therefore increasing productivity, setting standards for receivables from City groups and outside consultants, make City's drawings more consistent, and to decrease the learning curve for future projects. These standards concentrate on Capital Improvement Program (CIP) design drawings drafted using AutoCAD Release 2000.

In an effort to meet these objectives this manual was developed in a cooperative effort with the following groups within the City of Modesto: Community Services and Neighborhood Connections Department, Operations and Maintenance Department and Community Development Department, Department of Engineering & Transportation: Engineering Division, Transportation Division and Permits & Mapping Division.

The above mentioned groups met approximately twice a month to exchange ideas regarding standardization and to come to a consensus regarding what needed to be standardized to meet the objectives. A documented set of core standards was developed and agreed upon.

It is expected that the standards developed will be implemented in each group. Modifications to these standards would be by a process consistent with this manual.

TABLE OF CONTENTS

CHAPTER 1 - GENERAL DRAWING REQUIREMENTS.....A-5

1.1	Computer Software.....	A-5
1.2	File Format.....	A-5
1.3	Scale	A-5
1.4	Accuracy.....	A-5
1.5	Coordinate System.....	A-5
1.6	File Names	A-5
1.7	Xref Guidelines	A-5
1.8	Paper Space Guidelines.....	A-6
1.9	Final Settings Before Saving	A-6

CHAPTER 2 - LAYERS.....A-7

2.1	General.....	A-7
2.2	Standard Layer Convention.....	A-7
2.3	Special Layers	A-7
2.4	Layer Exceptions	A-7

CHAPTER 3 - FONTS.....A-13

3.1	AutoCAD Fonts	A-13
3.2	Additional Fonts.....	A-14

CHAPTER 4 - PEN ASSIGNMENTS.....A-16

4.1	General.....	A-16
4.2	Configuration File & Settings	A-16

CHAPTER 5 - SYMBOLS & ABBREVIATIONS.....A-23

5.1	General.....	A-23
5.2	Symbols.....	A-23
5.3	Abbreviations.....	A-23
5.4	Blocks.....	A-23
5.5	Street Names.....	A-23

CHAPTER 6 - TITLE BLOCK.....A-28

6.1	General.....	A-28

6.2	Paper Size	A-28
6.3	Electronic Files.....	A-28
CHAPTER 7 - DEVIATIONS.....		A-29
7.1	General.....	A-29
7.2	Documentation.....	A-29
CHAPTER 8 - STANDARDS MODIFICATIONS.....		A-30
8.1	General.....	A-30
8.2	Procedure.....	A-30
CHAPTER 9 - STANDARDS COMMITTEE MEMBERS.....		A-32

CHAPTER 1

GENERAL DRAWING REQUIREMENTS

- 1.1 Computer Software: AutoCAD Release 12 is the standard software to be used to produce and edit drawings. The only additional software that should be used to plot or edit drawings are the fonts, shape files, and enhancements listed in this standard. The use of other software is permitted only if it will not require installation of that software to later edit or plot files.
- 1.2 File Format: The standard file format is AutoCAD Release 12 DWG files.
- 1.3 Scale: Drawings should be created in full scale. Where several details at different scales to be located on one sheet shall utilize tilemode 0 with view ports. Drawings and or details that are not otherwise visible in a smaller scale and not utilizing tilemode 0 with view ports shall be clearly annotated that it is not to scale.
- 1.4 Accuracy: All connecting entities shall meet mathematically exact. Object snaps shall be used to ensure that end points of connecting entities meet exactly.
- 1.5 Coordinate System: Where feasible drawings coordinate system shall be North American Datum 1983.
- 1.6 File Names: File names shall be logical and describe the project and include street name, and/or block numbers when possible. Although desirable no City standard for file names is proposed at this time. File names shall appear on each drawing.
- 1.7 Xref Guidelines: Document xref dependencies for each project. Don't use hard-coded paths (paths that include a drive letter and/or subdirectory name) when you attach xrefs. In other words, keep parent and child drawings in the same directory.
Attach each xref on a layer whose name is the same as the xref's DWG file name. Control xref layer settings (visibility, color, and linetype) from either the xref child (preferred) or the parent drawings but not both. Minimize layers in xrefs to reduce the number of layers and other dependent symbols in parent drawings. Don't bind xrefs in working drawings. If you bind before you archive or send out drawings, do it in a copy of the parent drawing. Before you send out or archive a set of drawings, verify that the set includes all xrefs.
- 1.8 Paper Space Guidelines: Always document how paper space is used on a project. Cartoon model space and paper space for each drawing, and list information about how you set up paper space (named views, zoom, scale factors, layers frozen in view ports). Create all paper space view ports on a unique layer. Before sending out or archiving paper space drawings, arrange them so they're ready to plot. Also send or archive project paper space documentation with the DWG files.

1.9 Final Settings Before Saving: Prior to saving a drawing for archiving or distribution make the following settings:

- A. Purge all unused text styles, blocks, dimension styles, and line types.
- B. Turn snap, grid, and UCS off.
- C. All layers that are required for plotting should be on and thawed.
- D. Always save the drawing at zoom extents or the plotted view.

CHAPTER 2

LAYERS

- 2.1 General: Insomuch as CAD files may be used by different people for many different purposes during the life of these data files, it is imperative that layering conventions be followed exactly.
- 2.2 Standard Layer Convention: The following layer name format shall be used when creating layer names: Group, Major, Subgroup, Description. In many instances a description will not be necessary. A list of valid designations for layer names is attached.

Layer Name Format: Group, Major Subgroup, Description

Example: Existing 12"Ø VCP Sewer Main

Group='ss'
Major='ex'
Subgroup='ml'
Description='12VCP'
Layer Name: ssexml12VCP

Text shall be placed on a separate layer. The layer name for text shall end in 'txt'. For the above example text necessary for an existing 12"Ø VCP Sewer Main shall be place on layer named: ssexml12VCPtxt.

- 2.3 Special Layers: Layer 0 (zero) or the DEFPOINTS layer have special properties and should not be used.
- 2.4 Layer Exceptions: In order to utilize the Crossroads program used by Traffic Section of the Department of Engineering & Transportation and Transportation layer name exceptions listed on the attached are allowed. Any other exceptions if required shall be noted on the drawing as part of the non-plotting area.

GROUPS

Name	Description	Group	Major	Sub-Groups
AP	Airport	X		
BR	Bridge	X		
BU	Building	X		
CD	Community Development	X		
CG	Curb/Gutter	X		
CN	Canals	X		

GROUPS (continued)

Name	Description	Group	Major	Sub-Groups
EL	Electrical	X		
GP	General Plan	X		
GS	Gas	X		
IR	Irrigation	X		
LG	Legend	X		
MP	Master Plan	X		
MS	Misc	X		
PC	Parcels	X		
PK	Park	X		
PL	Parcel Lines	X		
RR	Railroad	X		
RV	Rivers	X		
SD	Storm Drain	X		
SS	Sanitary Sewer	X		
ST	Street	X		
SV	Survey	X		
SW	Sidewalk	X		
TL	Telephone	X		
TO	Topo	X		
TS	Traffic	X		
TV	Cable/TV	X		
UT	Utility	X		
WT	Water	X		
ZN	Zoning	X		

MAJOR

Name	Description	Group	Major	Sub-Groups
AB	Abandoned		X	
EX	Existing	X		
FT	Future		X	
PR	Proposed		X	
RE	Record		X	
TI	Title Block		X	

SUB-GROUPS

Name	Description	Group	Major	Sub-Groups
CG	Curb/Gutter	X		X
EL	Electrical	X		X
SW	Sidewalk	X		X

SUB-GROUPS (continued)

Name	Description	Group	Major	Sub-Groups
AD	Address			X
BA	Storm Basin			X
BC	Bank			X
BK	Street Black Lines			X
BL	Bike Lane			X
BN	Block Numbers			X
BO	Blow Off			X
BV	Butterfly Valve			X
CB	Catch Basin			X
CD	Conduit			X
CE	Curb Inlet			X
CI	City Limit			X
CL	Center Line			X
CM	Concrete-Minor			X
CN	Curb Return			X
CO	County			X
CP	Control Point/Line			X
CR	Curb Ramp			X
CT	City			X
CU	Contour			X
CW	Crown			X
DB	Drainage Basin			X
DC	Ditch			X
DI	Drop Inlet			X
DK	Dike			X
DN	Drainage			X
DR	Drive Approach			X
DT	Details			X
DW	Drywell			X
EL	Electrical	X		X
EP	Edge of Pavement			X
EQ	Equipment			X
FD	Foundation			X
FE	Fence			X
FH	Fire hydrant			X
FL	Flowline			X
FO	Fiber Optics			X
GB	Grade Break			X
GC	Game Court			X
GD	Ground			X
GO	Golf Course			X
GP	Guy Pole			X

SUB-GROUPS (continued)

Name	Description	Group	Major	Sub-Groups
GR	Grading			X
GS	Gas			X
GV	Gate Valve			X
HH	Hetch Hetchy			X
HI	High point			X
HV	Hydrant Valve			X
IN	Information			X
IR	Irrigation			X
IS	Island			X
LA	Service Lateral			X
LC	Lip of Curb			X
LE	Landscape			X
LH	Lamp Hole			X
LI	Lighting			X
LL	Lane Line			X
LN	Lot Numbers			X
LS	Lift Station			X
MH	Manhole			X
MI	Miscellaneous			X
MN	Median			X
MO	Monument			X
NM	Names			X
NT	Notes			X
OD	Oiled Dirt			X
OF	Outfall			X
OH	Overhead			X
PA	Play Appuratus			X
PB	Pull Box			X
PC	PT&T			X
PE	Pipe			X
PH	Phase Diagram			X
PL	Property Line			X
PN	Point			X
PO	Utility Pole			X
PS	Pump Station			X
PT	Parking Lot			X
PV	Pavement			X
RD	Reducers			X
RO	Rock Well			X
RW	Right of Way			X
SA	Sample Staions			X
SC	Sections			X

SUB-GROUPS (continued)

Name	Description	Group	Major	Sub-Groups
SD	Storm Drain			X
SE	Service			X
SG	Striping			X
SH	Sphere			X
SI	Signal			X
SK	Sidewalk			X
SL	Street Light			X
SN	Signs			X
SO	Shoulder			X
SP	Swimming Pools			X
SR	Structures			X
SW	Sewer			X
TC	Top of Curb			X
TE	Tree			X
TF	Traffic			X
TK	Tank			X
TO	Toe			X
TR	Trail			X
UG	Underground			X
VA	Valve			X
VT	Vertical			X
WA	Water			X
WL	Water Well			X
WR	Wiring			X
XS	Cross Section			X
XW	Cross Walk			X

EXCEPTIONS FOR CROSSROADS PROGRAM

Name	Description	Exception
CL	Centerlines	X
CURB	Proposed & Existing Curb & Gutter	X
DEFPOINT	Standard AutoCad Non-plotting Layer	X
DIMS	Dimension Lines and Leader Lines	X
EX-CO	Existing Conduit	X
EX-EQ	Existing Equipment	X
EX-ST	Existing Striping	X
PROP-CO	Proposed Conduit	X
PROP-EQ	Proposed Equipment	X
PROP-ST	Proposed Striping	X
RW	Right of way	X

EXCEPTIONS FOR CROSSROADS PROGRAM (continued)

<u>Name</u>	<u>Description</u>	<u>Exception</u>
TEXT	Text Notes and Labels	X
UTIL	Utilities	X

CHAPTER 3 – FONTS

3.1 AutoCad Fonts: All AutoCAD Release 12 fonts are valid.

Standard Fonts :

txt	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
monotxt	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
gothicc	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z a b c d e f g h i j k l m n o p q r s t u v w x y z 1 2 3 4 5 6 7 8 9
gothicg	А В С Д Е Ф Г И Й К Л М Н О П Р С Т У В Х Ц Ч Ш Щ Ъ Ы Э Ю Я а б в г д е ф г и й ж з к л м н о п р с т у в х ц ч ш щ ъ ы э ю я 1 2 3 4 5 6 7 8 9
gothici	H B C D E F G H I J K L M N O P Q R S T U V W X Y Z a b c d e f g h i j k l m n o p q r s t u v w x y z 1 2 3 4 5 6 7 8 9
italict	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
italicc	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
romans	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
romand	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
romant	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
romanc	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
scriptc	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z a b c d e f g h i j k l m n o p q r s t u v w x y z 1 2 3 4 5 6 7 8 9
scriptg	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z a b c d e f g h i j k l m n o p q r s t u v w x y z 1 2 3 4 5 6 7 8 9

Nonroman Fonts:

cyrillic АБВГДЕЖЗИЙКЛМНОПРСТУФХЦЧШЩ 125789
 cyrillic АБЧДЕФГХИЩКЛМНОПЦРСТУВШЖЙЗ 125789
 greeks ΑΒΧΔΕΦΓΗΘΚΛΜΝΟΠΘΡΣΤΤΥΩΞΨΖ 123456789
 greekc ΑΒΧΔΕΦΓΗΘϞϠϡϢϣϤϥϦϧϨϩϪϫϬϭϮϯϰϱϲϳϴϵ϶ϷϸϹϺϻϼϽϾϿ 123456789

Symbol Fonts:

syastro	⊙♂♀⊕♂7hδψE℄¢*∞βγϑπκλμνξ≈	1245789
symap	□△☆+×*■▲◀▶★†‡×风✎≧±♡🔔	12345789
symath	K' ± ∓ × ÷ = ≠ ≡ < > ≥ ≤ α ~ √ ⋈ ⊃ ∩ ∈ → ↑	12345789
symeteo	☉x▲●▲▴w~xS∞RG—↑—//	123456789
symusic	♪♪○○#bb-xy♯H•→↗	123456789

Postscript Fonts :

cibt	ABCDEF GHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
cobt	ABCDEF GHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
eur	ABCDEF GHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
euro	ABCDEF GHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
par	ABCDEF GHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
rom	ABCDEF GHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
romb	ABCDEF GHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
sas	ABCDEF GHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
sasb	ABCDEF GHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
sasbo	ABCDEF GHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
saso	ABCDEF GHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
suf	ABCDEF GHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
* te	ABCDEF GHIJKLMNOPQRSTUVWXYZ ABCDEFGHIJKLMNOPQRSTUVWXYZ 123456789
* teb	ABCDEF GHIJKLMNOPQRSTUVWXYZ ABCDEFGHIJKLMNOPQRSTUVWXYZ 123456789
* tel	ABCDEF GHIJKLMNOPQRSTUVWXYZ ABCDEFGHIJKLMNOPQRSTUVWXYZ 123456789

* Fonts without lower case letters

- 3.2 Additional Fonts: Following is a list of additional fonts that may be used in CAD drawings that will be interchanged between City groups. Drawings that are not normally interchangeable between City groups may contain fonts that are not listed.

Each of these fonts has three applications – designated by the final letters 'O', 'L', and 'H'. 'O' designates an open letter. 'L' and 'H' designate line-filled letters. 'L' stands for 'light'. These letters are designed to be used for lettering up to a height of about 3/4". 'H' stands for heavy. These letters contain twice as many fill lines and are designed to be used for lettering 3/4" high and larger.

These size guidelines are not absolute. Depending on the lettering style and the line weight used, 'L' fonts can be used for sizes slightly larger than 3/4" and 'H' fonts can be used for sizes slightly smaller than 3/4".

basketb L&H	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
basketb O	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
brshc L&H	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
brshc O	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
buckmn L&H	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
buckmn O	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
claireb L&H	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
claireb O	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
dumcasb L&H	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
dumcasb O	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
* jumpng L&H	ABCDEFGHIJKLMNOPQRSTUVWXYZ ABCDEFGHIJKLMNOPQRSTUVWXYZ 123456789
jumpng O	ABCDEFGHIJKLMNOPQRSTUVWXYZ ABCDEFGHIJKLMNOPQRSTUVWXYZ 123456789
technq L&H	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
technq O	ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 123456789
* umbila L&H	ABCDEFGHIJKLMNOPQRSTUVWXYZ ABCDEFGHIJKLMNOPQRSTUVWXYZ 123456789
umbila O	ABCDEFGHIJKLMNOPQRSTUVWXYZ ABCDEFGHIJKLMNOPQRSTUVWXYZ 123456789

* Fonts without lower case letters

CHAPTER 4

PEN ASSIGNMENTS

- 4.1 General: Standardization of pen widths is important for future plots of a particular drawing. In many cases accurate plots depend on the properly selected pen widths.
- 4.2 Configuration File & Settings: A standard plotting configuration file shall be supplied to ensure uniformity. Variation to the plotting configuration file is not allowed. Drawings created prior to implementation of these standards shall include as part of the non-plotting area notes the plotter configuration filename and location. Pen assignments shall at all times be defined with a plotter configuration file (files with extension 'pcp'); no exceptions. Below is the standard plotter configuration (Copies of the color/line weight palette can be obtained from Mark Chadwick at 5263):

COLOR NO.	PEN NO.	LINETYPE	PEN WEIGHT
1	7	0	0.010
2	7	0	0.014
3	7	0	0.020
4	7	0	0.028
5	7	0	0.039
6	7	0	0.014
7	7	0	0.010
8	8	0	0.010
9	9	0	0.010
10	7	0	0.014
11	7	0	0.020
12	7	0	0.010
13	7	0	0.014
14	7	0	0.010
15	7	0	0.028
16	7	0	0.010
17	7	0	0.010
18	7	0	0.014
19	7	0	0.020
20	7	0	0.020
21	7	0	0.014
22	7	0	0.028
23	7	0	0.039
24	7	0	0.014

25	7	0	0.010
26	7	0	0.014
27	7	0	0.020
28	7	0	0.028
29	7	0	0.014
30	7	0	0.014
31	7	0	0.020
32	7	0	0.010
33	7	0	0.010
34	7	0	0.010
35	7	0	0.006
36	7	0	0.028
37	7	0	0.014
38	7	0	0.014
39	7	0	0.010
40	7	0	0.010
41	7	0	0.010
42	7	0	0.014
43	7	0	0.020
44	7	0	0.020
45	7	0	0.014
46	7	0	0.014
47	7	0	0.010
48	7	0	0.010
49	7	0	0.010
50	7	0	0.010
51	7	0	0.020
52	7	0	0.028
53	7	0	0.014
54	7	0	0.014
55	7	0	0.010
56	7	0	0.010
57	7	0	0.010
58	7	0	0.014
59	7	0	0.020
60	7	0	0.020
61	7	0	0.014
62	7	0	0.014
63	7	0	0.010
64	7	0	0.010
65	7	0	0.012
66	7	0	0.014
67	7	0	0.020

68	7	0	0.028
69	7	0	0.014
70	7	0	0.014
71	7	0	0.010
72	7	0	0.010
73	7	0	0.020
74	7	0	0.014
75	7	0	0.020
76	7	0	0.028
77	7	0	0.014
78	7	0	0.014
79	7	0	0.010
80	7	0	0.010
81	7	0	0.010
82	7	0	0.020
83	7	0	0.028
84	7	0	0.028
85	7	0	0.014
86	7	0	0.014
87	7	0	0.010
88	7	0	0.010
89	7	0	0.010
90	7	0	0.014
91	7	0	0.020
92	7	0	0.028
93	7	0	0.014
94	7	0	0.020
95	7	0	0.047
96	7	0	0.010
97	7	0	0.010
98	7	0	0.014
99	7	0	0.020
100	7	0	0.028
101	7	0	0.014
102	7	0	0.014
103	7	0	0.010
104	7	0	0.010
105	7	0	0.010
106	7	0	0.014
107	7	0	0.020
108	7	0	0.028
109	7	0	0.014
110	7	0	0.014

111	7	0	0.010
112	7	0	0.010
113	7	0	0.039
114	7	0	0.039
115	7	0	0.020
116	7	0	0.028
117	7	0	0.014
118	7	0	0.014
119	7	0	0.010
120	7	0	0.020
121	7	0	0.010
122	7	0	0.014
123	7	0	0.020
124	7	0	0.028
125	7	0	0.055
126	7	0	0.014
127	7	0	0.010
128	7	0	0.010
129	7	0	0.010
130	7	0	0.010
131	7	0	0.020
132	7	0	0.020
133	7	0	0.014
134	7	0	0.014
135	7	0	0.010
136	7	0	0.010
137	7	0	0.010
138	7	0	0.014
139	7	0	0.020
140	7	0	0.028
141	7	0	0.014
142	7	0	0.014
143	7	0	0.010
144	7	0	0.010
145	7	0	0.028
146	7	0	0.014
147	7	0	0.020
148	7	0	0.028
149	7	0	0.014
150	7	0	0.014
151	7	0	0.010
152	7	0	0.010
153	7	0	0.014

154	7	0	0.014
155	7	0	0.079
156	7	0	0.028
157	7	0	0.014
158	7	0	0.014
159	7	0	0.010
160	7	0	0.010
161	7	0	0.028
162	7	0	0.014
163	7	0	0.020
164	7	0	0.028
165	7	0	0.014
166	7	0	0.014
167	7	0	0.010
168	7	0	0.010
169	7	0	0.010
170	7	0	0.014
171	7	0	0.020
172	7	0	0.028
173	7	0	0.014
174	7	0	0.014
175	7	0	0.028
176	7	0	0.010
177	7	0	0.010
178	7	0	0.014
179	7	0	0.020
180	7	0	0.028
181	7	0	0.014
182	7	0	0.020
183	7	0	0.010
184	7	0	0.010
185	7	0	0.010
186	7	0	0.014
187	7	0	0.020
188	7	0	0.028
189	7	0	0.014
190	7	0	0.020
191	7	0	0.010
192	7	0	0.010
193	7	0	0.010
194	7	0	0.014
195	7	0	0.020
196	7	0	0.028

197	7	0	0.014
198	7	0	0.014
199	7	0	0.010
200	7	0	0.010
201	7	0	0.010
202	7	0	0.014
203	7	0	0.020
204	7	0	0.028
205	7	0	0.014
206	7	0	0.014
207	7	0	0.010
208	7	0	0.010
209	7	0	0.010
210	7	0	0.010
211	7	0	0.020
212	7	0	0.028
213	7	0	0.014
214	7	0	0.014
215	7	0	0.039
216	7	0	0.010
217	7	0	0.010
218	7	0	0.014
219	7	0	0.020
220	7	0	0.020
221	7	0	0.014
222	7	0	0.014
223	7	0	0.028
224	7	0	0.010
225	7	0	0.010
226	7	0	0.014
227	7	0	0.020
228	7	0	0.028
229	7	0	0.014
230	7	0	0.014
231	7	0	0.010
232	7	0	0.010
233	7	0	0.010
234	7	0	0.014
235	7	0	0.020
236	7	0	0.028
237	7	0	0.014
238	7	0	0.014
239	7	0	0.010

240	7	0	0.010
241	7	0	0.010
242	7	0	0.020
243	7	0	0.020
244	7	0	0.028
245	7	0	0.014
246	7	0	0.014
247	7	0	0.010
248	7	0	0.010
249	7	0	0.010
250	250	0	0.010
251	251	0	0.010
252	252	0	0.010
253	253	0	0.010
254	254	0	0.010
255	255	0	0.010

CHAPTER 5

SYMBOLS & ABBREVIATIONS

- 2.1 General: The goal is to provide uniformity to symbols used for utility designations on drawings.
- 2.2 Symbols: California Department of Transportation (Caltrans) symbols are the basis for the City's symbols library. Minor changes to Caltrans symbols were necessary to better implement these standards. For the purposes of the City's standards, line types are included in the symbols library. Standard symbols, which are to be used, are shown on the attached pages.
- 2.3 Abbreviations: Caltrans abbreviations are the basis for the City's abbreviation library. Minor changes to Caltrans abbreviations were necessary to better implement these standards. Standard abbreviations, which are to be used, are shown on the attached pages.
- 2.4 Blocks: A library that contains all standard symbols is currently under development.
- 2.5 Street Names: Street names used in a drawing shall be as shown in the City of Modesto Street Index. The index is currently maintained by and available from Hopkins Fitzpatrick (Extension 5106) in the Community Development Department.

[illegible]

EXISTING TOPOGRAPHIC LINES AND SYMBOLS

Building		Orchard, Missing Tree, Interior Trees	
Foundation or Run			
Shoulder		Tree	
Surfaced Road with Lane Stripe		Trees	
Curb without Gutter		Ground Cover	
Curb with Gutter		Freeway Signs (Overhead)	
Gravel or Dirt Road Drives or Velts		2 Posts	
Trail		1 Post	
Railroad		Roadside Signs (New & Existing)	
Bridge		Transmission Tower	
Culvert and Headwalls		Pole Guy	
Fence and Gate		Power Pole (New & Existing)	
Retaining Wall with Fence on Top		Utility Pole (New & Existing)	
Wall		Stand Pipe, Flagpole, Pullbox, Windmill, Well, Crash Cushion, Valve Cover	
Median Barrier		Aerial Photo Center	
Guard Rail			
Small Stream or Ditch			
Large Body of Water			
Small Body of Water			
Vineyard (Show row direction)			

CONTROL POINTS

	Horizontal and Vertical Control Point
	Horizontal Control Point
	Vertical Control Point
	Bench Mark

NEW CONSTRUCTION AND CADASTRAL SYMBOLS

Centerline (C)		Existing Wall	
Right of Way Line		New Wall	
Slope Line		Existing Guard Railing / Wood Fence	
Original Ground Line		New Guard Railing	
		Concrete Barrier	
		Double Metal Beam Barrier, Double Three Beam Barrier	
		Curb without Gutter	
		Curb with Gutter	
		Chain Link or Wire Fence	
		Ditch Flow Line	
		Dike and Overside Drain	
		Pipe Culvert (900 mm or less in diameter)	
		Pipe Culvert (greater than 900 mm in diameter)	
		Railroad	

SYMBOLS NO SCALE

	(E) Hydrant
	(P) Proposed Hydrant
	Sewer Manhole
	Storm Drain Manhole
	Water Valve
	Gas Valve
	Catch Basin
	New Catch Basin & Rockwell
	New Rockwell
	Existing Rockwell
	Existing Catch Basin & Rockwell

	Water
	Pacific Gas & Electric
	Natural Gas
	Sewer
	Electrical
	Telephone
	Gasoline
	Oil
	Cable Television
	Storm Drain
	Irrigation

ELECTROLIERS

STANDARD TYPES	SYMBOL
15 ROADWAY	
15 STRUCTURE	
21 STRUCTURE	
22 ROADWAY	
30 ROADWAY	
31 ROADWAY	
32 ROADWAY	

- Existing electroliter to remain in place unless otherwise specified or indicated.
- Foundation for future electroliter (see project notes).

NOTES

- Luminaires shall be 310-watt HPS when installed on Type 21, 22, 30, 31 and 32 standards, unless otherwise specified. Luminaires shall be 200-watt HPS when installed on all other type standards or poles, unless otherwise specified.
- All luminaires shall be the cutoff type, ANSI Type III medium cut off lighting distribution, unless otherwise specified.
- Variations noted adjacent to symbol on project plans.

Electroliter (see project notes or project plans)

Luminaire on wood pole

SOFFIT AND WALL MOUNTED LUMINAIRES

- Pendant, 70 watt HPS unless otherwise specified.
- Flush, 70 watt HPS unless otherwise specified.
- Wall surface, 70 watt HPS unless otherwise specified.
- Existing soffit or wall luminaire to remain unmodified.
- Existing soffit or wall luminaire to be modified as specified.

NOTE
Arrow indicates "street side" of luminaire or glassware.

STANDARD NOTES

- Abandon. If applied to conduit, remove conductors.
- Install pull box in existing conduit run.
- Pedestrian barricade, type as indicated on plan.
- Install conduit into existing pull box.
- Connect new and existing conduit. Remove existing conductors and install conductors as indicated.
- Conduit to remain for future use. Remove conductors. Install pull wire or rope.
- Detector handhole. Type A unless otherwise indicated.
- Foundation to be abandoned.
- Install State-furnished sign on signal mast arm.
- No slip base on standard.
- Photoelectric control.
- Equipment or material to be removed and become the property of the contractor.
- Relocate equipment.
- Remove and reuse equipment.
- Remove and salvage equipment.
- Install slip base insert.
- Splice new to existing conductors.
- Service disconnect.
- Standard to remain for future use. Remove luminaire, pole conductors, fuses and ballast. Tape disconnects.
- Telephone service point.

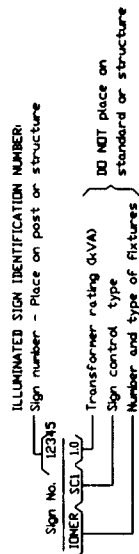
ABBREVIATIONS AND EQUIPMENT DESIGNATIONS

PROPOSED

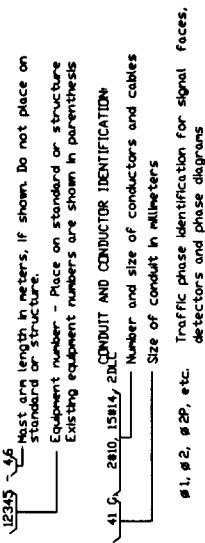
AC+	Ungrounded conductor
AC-	Grounded conductor
AVG	American wire gauge
C	Conduit
CCTV	Closed circuit television
CNS	Changeable message sign
DL	Loop detector lead in cable
ENS	Extinguishable message sign
FB	Flashing beacon
FBCA	Flashing beacon control assembly
HAR	Highway advisory radio
HPS	High pressure sodium
IISNS	Internally illuminated street name sign
LMA	Luminaire mast arm
LPS	Low pressure sodium
MC	Mercury contactor
NER	Mercury
NLC	Magnetometer detector lead-in cable
N/M	Multiple to multiple transformer
NT	Conduit with pull wire or rope only
NC	Normally closed
NO	Normally open
PB	Pull box
PEC	Photoelectric control (Type I, II, III, IV or V as shown)
PEP	Pedestrian
PEU	Photoelectric unit
PPB	Pedestrian push button
R/S	Radio Interference Suppressor
RM	Ramp metering
SB	Slip Base
SIC	Signal Interconnect cable
SMA	Signal mast arm
S/M	Series to multiple transformer
SN	Solid neutral
SP	Service point
TDC	Telephone demarcation cabinet
TOS	Traffic Operation System
TRF	Transformer

EXISTING

EQUIPMENT IDENTIFICATION

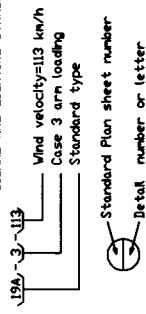


ELECTROLIER OR EQUIPMENT IDENTIFICATION NUMBER



- 1 2 3 Project note numbers
- 4 B C Equipment description, installation or item numbers
- A A A Conduit run numbers

SIGNAL AND LIGHTING STANDARD (TYPICAL DESIGNATIONS)



SIGNAL, LIGHTING AND ELECTRICAL SYSTEMS SYMBOLS AND ABBREVIATIONS

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

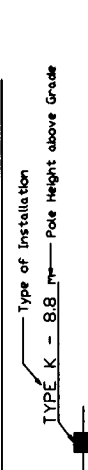
CONDUIT

PROPOSED	EXISTING	
---	---	Conduit-Lighting, unless Otherwise Indicated or Noted
---	---	Traffic Signal Conduit
---	---	Communication Conduit
---	---	Sprinkler Control Conduit
---	---	Telephone Conduit
---	---	Fire Alarm Conduit
---	---	Conduit Termination (Detail C, ES-7B in Structures)
---	---	Conduit Riser in Structure

SERVICE EQUIPMENT

PROPOSED	EXISTING	
---	---	Overhead Lines
---	---	Wood Pole "U" Indicates Utility Owned
---	---	Pole Guy-with Anchor
---	---	Pad Mount for Ground - Mounted Utility Transformer
---	---	Service Equipment Enclosure Type
---	---	Service Equipment Enclosure Door Indicates Front of Enclosure
---	---	Telephone Demarcation Cabinet

POLE-MOUNTED SERVICE DESIGNATION



SIGN LIGHTING EQUIPMENT

PROPOSED	EXISTING	
---	---	Overhead Sign-Single Post
---	---	Overhead Sign-Two Post
---	---	Overhead Sign-Mounted on Structure
---	---	Overhead Sign with Roadway Electroliner Attached
---	---	"Meter On" Sign
---	---	Extinguishable Message Sign - Changeable Message Sign - On Structure

SIGNAL EQUIPMENT

PROPOSED	EXISTING	
---	---	Pedestrian Signal
---	---	Pedestrian Push Button Post
---	---	Pedestrian Barricade
---	---	Vehicle Signal Face, 3-Section 200 mm Yellow and Green Sections, 300 mm Sections for SHA mounted
---	---	Vehicle Signal Face with Angle Visor
---	---	Modifications of Basic Symbols: "L" Indicates All Non-Arrow Sections Lowered "LG" Indicates Lowered Green Section Only "PV" Indicates 300 mm Programmed Visibility Sections "300" Indicates all 300 mm Sections
---	---	Vehicle Signal Face with Back Plate
---	---	Vehicle Signal Face with 300 mm Red, Yellow and Green Left Arrow Sections
---	---	Vehicle Signal Face with 300 mm Red and Green Arrow
---	---	Vehicle Signal Face (S-Section) with 300 mm Yellow and Green Right Arrows and 200 mm Red, Yellow and Green Sections
---	---	Type 1 Standard and Attached Signals
---	---	Standard with Signal Mast Arm Only and Attached Signals
---	---	Left-Turn Signal and Sign Standard, Type 33
---	---	Standard with Luminaire and Signal Mast Arms and Attached Signals
---	---	Countdown Flashing Beacons Type 9 Frame, unless Otherwise Specified or Indicated
---	---	Flashing Beacon One Signal Section with 300 mm Red, Yellow and Green Visor "R" Indicates Red Lens, "Y" Indicates Yellow Lens
---	---	Controller Assembly Door Indicates Front of Cabinet
---	---	Guard Post

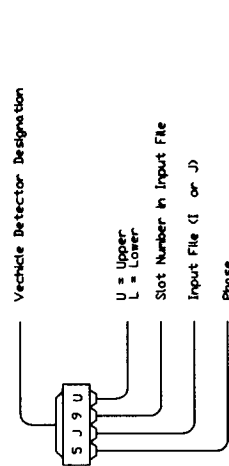
MISCELLANEOUS EQUIPMENT

PROPOSED	EXISTING	
---	---	Closed Circuit Television
---	---	Highway Advisory Radio

PULL BOXES

PROPOSED	EXISTING	
---	---	Pull Box-No. 5 unless Otherwise Indicated or Noted as Below
---	---	Pull Box-Additional Designations or Descriptions (C) = Communications Pull Box (E) = Pull Box with Extension (S) = Sprinkler Control Pull Box (G) = Anchor Bolts and Conduit for Future Installation of Type 21 Standard (T) = Traffic Pull Box
---	---	3 = No. 3 1/2 Pull Box
---	---	5 = No. 5 Pull Box
---	---	6 = No. 6 Pull Box
---	---	7 = No. 7 (Celling Pull Box)
---	---	8 = No. 8 (Pendant Soffit Pull Box)
---	---	9 = No. 9 Pull Box
---	---	9A = No. 9A Pull Box

VEHICLE DETECTORS



PROPOSED	EXISTING	
---	---	Inductive Loop Detector Outline and Location of Sarcut Shown (Type A Loop Illustrated)
---	---	Magnetometer Detectors
---	---	Magnetic Detector
---	---	Pressure Detector, Subscript "D" Indicates Directional Type
---	---	Detector Handhole Type A unless Otherwise Specified

SIGNAL, LIGHTING AND ELECTRICAL SYSTEMS SYMBOLS AND ABBREVIATIONS

NO SCALE
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

CHAPTER 6

TITLE BLOCK

- 2.1 General: The majority of CIP projects shall be plotted on the City of Modesto standard title block.
- 2.2 Paper Size: The standard paper size for CIP projects shall be 24" x 36". Other sizes may be used when warranted.
- 2.3 Electronic Files: Electronic copies in AutoCAD R12 format of the City's standard title blocks are included in this manual:

	<u>Description</u>	<u>File Name</u>
1.	24"x36" Title Block	24x36.dwg
2.	11"x17" Title Block	11x17.dwg
3.	8 1/2"x11" Title Block	85x11.dwg

CHAPTER 7

DEVIATIONS

- 7.1 General: This standard provides guidelines for most drawings in the design of CIP projects. It is not intended to cover every situation that may arise, however, it is required that designs conform to these guidelines whenever possible. Flexibility in making deviations to this standard is important to ensure efficiency in the development of CIP projects.
- 7.2 Documentation: To facilitate the usefulness of drawings by future users, all non-standard aspects of the drawing shall be documented in the non-plotting area on the drawing. (This can be done either in a sidebar or in a distinct layer).

CHAPTER 8

STANDARDS MODIFICATIONS

- 8.1 General: It is expected that modifications to these standards will be required. In order to ensure that all City groups are in concurrence with changes all changes must be approved by the respective groups prior to implementation.
- 8.2 Procedure: Each group shall designate a AutoCAD Standards representative. The representative will be responsible for collecting and submitting proposed changes from his group to the other groups. The representative will be responsible for collecting comments from his group regarding changes from other groups and submitting his group's vote (Approve, Reject, Neutral, & Comments). The representative will represent his group at all meetings called to discuss proposed changes. The representative will present his group's case in meetings called to discuss his groups proposed changes.

Proposed changes and justification will be clearly and legibly marked on a copy of each sheet of the AutoCAD Standards manual with the proposed change. The proposed changes will be routed through each group's representative for Approval, Rejection, Neutral, & Comments. When all representatives have reviewed the proposed changes and voted the final document will be forwarded to the AutoCAD Standards chairman who will tally the votes and notify the originating representative of the final vote. All rejection votes must state the reason for the rejection.

Proposed changes receiving no rejection votes will automatically be included in the manual. It will be the responsibility of the keeper of the AutoCAD Standards manual to make the revisions to the AutoCAD Standards manual and produce copies of the revised pages and distribute them to each group.

Proposed changes receiving Rejection votes from all groups will be rejected without opportunity for appeal.

Proposed changes receiving rejection votes, but not unanimous, may call a meeting of all group representatives opposed to the change and attempt to change their vote through persuasion or compromise. In the event of a compromise in the change the compromise change must be re-routed to the other groups for their concurrence in the compromised proposed change. It is the responsibility of the representative of the original group to see to it that the compromised changes are re-routed to those not participating in the compromise. It is the responsibility of the group calling the meeting to take notes and

inform the Chairman of the outcome of the meeting in writing with the signature of all group representatives who previously voted to reject. The proposed change will be approved and implemented if there are no further Rejection votes.

The chairman of the AutoCAD Standards committee shall make the final ruling in all cases not resolved by the above procedure. His or her ruling shall be final.

CHAPTER 9

STANDARDS COMMITTEE MEMBERS

Community Development Department:

Hopkins Fitzpatrick	571-5106

Community Services & Neighborhood Connections Department:

Bob Ford	577-5437

Engineering & Transportation Department:

Engineering Division:

Mark Chadwick	577-5263
Gary Wiseman	571-5138
Donald Milam	571-5175

Transportation Division:

Mark Murphy	577-5431

APPENDIX B

CONSTRUCTION NOTES

The following notes shall be placed on all plan cover sheets by the Engineer (may be placed on Sheet 2 instead of Cover Sheet).

1.01 GENERAL

1. All material and work shall conform to City of Modesto Specifications and Plans. The improvements are subject to the inspection and approval of the **Engineering & Transportation Department**. Contact the Construction Administration Office at 577-5452 two working days (48 hours) prior to the start of any work to arrange for inspection.
2. Contractor or developer shall obtain an encroachment permit prior to the start of any work. No work can begin without an approved and signed set of improvement plans.
3. Prior to excavating near any underground utilities, call U.S.A. at least forty-eight (48) hours in advance at phone (800) 642-2444 or (800) 227-2600.
4. These plans have been checked by the City of Modesto and/or its authorized representative, but such checking and/or approval does not relieve the developer and contractor from his/her responsibility to correct errors, omissions or make changes required by conditions discovered in the field during the course of construction.
5. Contractor shall control dust at all times during construction as required by the City of Modesto and the Regional Air Quality Control Board.
7. Relocation of designed utility systems more than 25' must be reviewed by the **Engineering & Transportation Department** prior to construction and shall be accurately shown on revised plans stamped and signed by City staff prior to the installation of the improvements.
8. All construction staking for curb, gutter, and sidewalk, sanitary sewers, storm drains, water lines, fire hydrants, electroliers, etc. shall be done under the direction of a registered civil engineer or licensed land surveyor.
9. All existing **underground** utilities may **not** be shown. The contractor shall take precautionary measures to protect these utilities. The contractor shall do no excavation until all utility **companies** and the City of Modesto have been notified and have been given the opportunity to mark their facilities in the field.

10. House services, fire hydrant laterals, gas and telephone lines, and all other underground utilities shall be installed prior to curb, gutter, and sidewalk construction and street paving.
11. All lines abandoned during construction shall be removed.
12. For all projects, regardless of size, the Contractor shall implement best management practices (BMPs) to eliminate or minimize pollution discharge caused by construction (see Section 16).
13. **Material Testing:**
 - a) All independent material testing and inspection called for by the City Engineer shall be furnished and paid for by the developer or contractor.
 - b) Subgrade testing for R-values are required prior to the installation of base rock.
 - c) Contractor shall furnish material certifications of pre-manufactured material when called for by City Engineer.
14. Street striping shall include stop bars, centerline striping or markers, crosswalks and all other markings required by the City Engineer. Striping shall be done with thermoplastic and reflective markers.
15. All trenches shall be backfilled in accordance with City standards.
16. When widening the pavement on an existing road, the existing pavement shall be cut to a neat line and removed back to an existing adequate structural section, or to the original road section. An exploratory trench, or pot-holing, may be required to determine the limits of pavement removal.
17. Existing curb and sidewalk within the project limits that are damaged or displaced, even though they were not to be removed, shall be repaired or replaced per City Standard Details even if damage or displacement occurred prior to any work performed by the contractor.
18. Asbestos Cement Pipe (ACP) or fittings shall not be used within the City of Modesto.
19. Prior to trenching for any sewer, water, or storm drain pipe, the contractor shall verify, in the field, the size and location of the existing pipe at the point of connection. Any deviation from the plans shall be resolved by the design engineer prior to trenching.
20. Manholes, valves, cleanouts, etc. shall be brought to finish grade by the underground contractor after the final paving course is placed.

21. For pipes greater than 30" on sewer and 36" on storm drain, 60" inside diameter, manholes shall be used.
22. Street closure or lane closure will require a traffic control plan and the designation of a qualified individual for its implementation and safe maintenance.

1.02 WATER

1. All water lines shall be pressure-tested, disinfected, flushed, and tested for bacteria in conformance with the City of Modesto specifications prior to final acceptance by the City.
2. All water services shall be 1" minimum. Water service shall be connected to water mains with two-strap bronze saddles. City shall make all taps on existing water mains only.
3. All valves, tees and crosses to be flanged to their respective fittings. Water valves to be resilient seat only.
4. Water mains at the end of future streets shall have two half-lengths of pipe between gate valve and blow-off. Deflection of water lines shall not exceed 80% of manufacturer's specifications.
5. Water mains shall be as per city standards and fire hydrants shall be Jones J-4040, Long Beach 425, Clow 850, AVK 2470 or approved equal and shall conform to the latest AWWA Specifications, C-503, for wet-barrel fire hydrants. All hydrants shall be painted with Caterpillar Yellow Polyurethane high duty industrial enamel. No lead based paint may be used.
6. All valve stems must be brought to a minimum of four feet (4') below finish grade with stem extension units.
7. Thrust blocks shall be provided at all required locations on water line in accordance with the City of Modesto Specifications and Details.

1.03 STORM DRAIN

1. Storm drain pipe sizes shall not be changed without the approval of the City Engineer.
2. Storm drain pipe alternatives:
 - a) Reinforced concrete pipe class III (unless otherwise noted).
 - b) Cast-in-place concrete pipe, City of Modesto Standard (36" or larger).
3. Catch basins to be constructed per City Standard Details.

4. For all construction projects, Contractor shall file a Notice of Intention (NOI) to the State Water Quality Board. This is part of the NPDES permit process. Contractor shall also be in compliance with Chapter 10 of Title V of the Modesto Municipal Code. The Contractor may file for a notice of exemption with the State Water Quality Board.
5. All construction site activities, regardless of size, shall conform to Section 16 of these Specifications and the State Water Resources Control Board, National Pollution Discharge Elimination System (NPDES), Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity.

1.04 SANITARY SEWER

1. Sanitary sewer pipe shall be V.C.P. extra strength (ASTM C-700).
2. All sanitary sewer mains shall be television inspected, flushed with an approved sewer ball and pass a leakage test in conformance with City of Modesto Standard Specifications prior to acceptance by the City. All testing shall be performed after the compaction for street base rock and prior to paving.
3. One 4" V.C.P. sanitary sewer lateral shall be installed to each lot at location shown on the plan. A cleanout shall be placed at right-of-way line per standard plan #509. Cover on lateral at property line to be 3' minimum to 5' maximum except as noted on plans.
4. All manholes constructed on a trunk main shall be PVC lined and tested in conformance with City of Modesto Standard Specifications prior to acceptance by the City.
5. All connections to an existing PVC lined manhole shall be repaired per the current PVC lining specifications for welding PVC.

APPENDIX C

BONDING

1.01 GENERAL

Developers required to bond improvements within the City will be screened utilizing the proceeding cost schedule wherever possible. This schedule will be updated every few years based on numerous bids.

The bond estimate shall contain the following information: Name of development, Developer(s) Company, Today's date, Preparer's Company, address and phone number. The example below shows all the pertinent information.

#6000
pg 1 of 1
Aug 3, 2000

**Bond Estimate
Valley Oak Subdivision
by Reicher Development**

Prepared by: XYZ Engineers
2300 McHenry Ave
Modesto, CA 98768
Ph. (209) 578-1111

A. GRADING AND STREET WORK

Item	Quantity	Unit	Description	Unit Price	Total
1	20,000	CY	Excavation	4.00	80,000
2	5,000	CY	Import Fill (incl. spreading)	6.00	30,000
3	100	EA	Lot Grading	200.00	20,000
4	100,000	SF	Subgrade	0.25	25,000
			TOTAL GRADING AND STREET WORK		\$155,000

B. CONCRETE

Item	Quantity	Unit	Description	Unit Price	Total
1	4,000	LF	Curb and gutter	9.00	36,000
2	20,000	SF	Sidewalks	2.00	40,000
3	10	EA	Catch Basin	1450.00	11,600
			TOTAL GRADING AND STREET WORK		\$87,600

Contingency 10%

1.02 BOND ESTIMATE COSTS

A. EARTHWORK & PAVING

	<u>DESCRIPTION</u>	<u>UNIT COST</u>
1.	Disc site	\$120/acre
2.	Clear, grub & mobilization	If total costs \$100K to \$200K then 15% If total costs \$200K to \$600K then 8% If total costs exceed \$600K then 4%
3.	Roadway excavation	0 to 5000 cy - \$4.00/cy 5000 cy and above - \$3.00/cy
4.	General excavation	0 to 5000 cy - \$4.00/cy
5.	Subgrade (paving)	\$0.25/sf
6.	Subgrade (concrete)	\$0.30/sf
7.	Import (incl. spread)	\$6.50/cy
8.	Export	\$3.50/cy
9.	Lot Grading	\$200/lot
10.	Grade landscape	0 to 20,000sf - \$0.30/sf 20K & up - \$0.15/sf
11.	Channel Excavation	\$10/cy (incl. trimming banks)
12.	Engineer Rock	\$55/cy
13.	Cobbles	\$50/cy or \$3.50/sf
14.	Grouted Cobbles	\$65/cy or \$4.50/sf
15.	Bridge/structure excavation	\$35/cy
16.	3/4" AB or ASB	\$15/tn or \$.10 per inch/sf
17.	2" AC	\$40/tn or \$.25 per inch/sf

A. EARTHWORK & PAVING (continued)

	<u>DESCRIPTION</u>	<u>UNIT COST</u>
18.	Prime Coat	\$500/tn or \$1.50/gal or \$.05/sf ((?sf x .25)/(240x9))=? tn
19.	Seal coat (park top or =)	\$0.15/sf
20.	Crushed Rock	\$18/tn or \$36/cy
21.	Geotextile Fabric (subgrade)	\$.12/sf
22.	Petromat (overlays)	\$1.00/sy
23.	AC Overlay (1.5")	\$.55/sf (w/Tack Coat)
24.	12" Lime Treated Base	\$.80/sf (thru final trim)

B. CONCRETE WORK

	<u>DESCRIPTION</u>	<u>UNIT COST</u>
1.	Vertical Curb	\$14/lf
2.	Curb & Gutter	\$14/lf
3.	Extruded Curb (6" epoxied)	\$7/lf
4.	Monolithic C, G & SW	\$19/lf
5.	Sidewalk	\$2.50/sf
6.	Structural Concrete (Exclude exc & backfill)	1 to 50 cy - \$850/cy 50 cy & above - \$350/cy
7.	Rockwell	\$3600/ea
8.	Catch Basin	\$1400/ea
9.	Junction Box	\$1700/ea
10.	Concrete Flatwork	6" conc/4" AB - \$7.50/sf
11.	Bomanite	\$7/sf
12.	Paving Stones	\$5/sf
13.	Concrete Cap (on utilities)	\$5/lf
14.	Seeded Concrete Flatwork	Add \$.70/sf to unit cost
15.	Colored Concrete	Add \$.50/sf to unit cost
16.	Concrete Lining (Guniting)	\$3/sf
17.	Concrete Lining (w/mesh)	\$3.50/sf
18.	Rebar in Lining	\$0.80/lb
19.	Valley Gutter	\$15/lf
20.	Handicap Ramp (Labor Only)	\$250/ea

C. WATER SYSTEM

	<u>DESCRIPTION</u>	<u>UNIT COST</u>
1.	4" Water Main	\$15/lf
2.	6" Water Main	\$17/lf

C. WATER SYSTEM (continued)

	<u>DESCRIPTION</u>	<u>UNIT COST</u>
3.	8" Water Main	\$21/lf
4.	10" Water Main	\$26/lf
5.	12" Water Main	\$32/lf
6.	15" Water Main	\$42/lf
7.	18" Water Main	\$52/lf
8.	24" Water Main	\$63/lf
9.	4" Gate Valve	\$380/ea
10.	6" Gate Valve	\$480/ea
11.	8" Gate Valve	\$580/ea
12.	10" Gate Valve	\$780/ea
13.	12" B.V.	\$950/ea
14.	15" B.V.	\$2,200/ea
15.	18" B.V.	\$3,100/ea
16.	24" B.V.	\$5,200/ea
17.	Air Release Valve (ARV)	\$500/ea
18.	Blowoff Valve	\$500/ea
19.	1 1/2 " Irrigation Service	\$350/ea
20.	Residential Water Service	\$300/ea
21.	2 1/2" dia PVC & smaller	\$12/lf
22.	Water Quality Sampler	\$2000/ea
23.	Bore & Jack	\$12/lf per diameter inch
24.	Fire Hydrant	\$2000/ea

D. SEWER SYSTEM

	<u>DESCRIPTION</u>	<u>UNIT COST</u>
1.	4" SS	\$16/lf
2.	6" SS	\$20/lf
3.	8" SS	\$25/lf
4.	10" SS	\$32/lf
5.	12" SS	\$38/lf
6.	15" SS	\$45/lf
7.	18" SS	\$70/lf
8.	21" SS	\$105/lf
9.	24" SS	\$110/lf
10.	SS Lateral	\$450/ea
11.	Cleanout in street	\$450/ea

D. SEWER SYSTEM (cont'd)

	<u>DESCRIPTION</u>	<u>UNIT COST</u>
12.	48" SSMH	\$1500/ea
13.	60" SSMH	\$2400/ea
14.	Street Tie In	\$3000/ea
15.	Adjust Manhole to Grade	\$350/ea
16.	Bore & Jack	\$10/lf per diameter inch

E. STORM DRAIN SYSTEM

	<u>DESCRIPTION</u>	<u>UNIT COST</u>
1.	4"& 6" Perforated Drain System	\$24/lf
2.	10" CP	\$18/lf
3.	12" R.C.P.	\$20/lf
4.	15" R.C.P.	\$22/lf
5.	18" R.C.P.	\$24/lf
6.	21" R.C.P.	\$26/lf
7.	24" R.C.P.	\$28/lf
8.	30" R.C.P.	\$45/lf
9.	36" R.C.P.	\$65/lf
10.	36" CIPP	\$40/lf
11.	36" RG R.C.P. (Cent Spun)	\$70/lf
13.	42" R.C.P.	\$75/lf
14.	42" CIPP	\$48/lf
15.	42" RG R.C.P. (Cent Spun)	\$80/lf
16.	48" R.C.P.	\$85/lf
17.	48" CIPP	\$55/lf
18.	48" RG R.C.P. (Cent Spun)	\$90/lf
19.	54" R.C.P.	\$100/lf
20.	54" CIPP	\$65/lf
21.	54" RG R.C.P. (Cent Spun)	\$105/lf
22.	60" R.C.P.	\$125/lf
23.	60" CIPP	\$75/lf
24.	60" RG R.C.P. (Cent Spun)	\$130/lf
25.	72" R.C.P.	\$180/f
26.	72" CIPP	\$95/lf
27.	72" RG R.C.P. (Cent Spun)	\$185/lf
28.	84" R.C.P.	\$230/lf
29.	84" CIPP	\$130/lf
30.	96" R.C.P.	\$300/lf
31.	96" CIPP	\$160/lf
32.	48" Manhole	\$1,300/ea

E. STORM DRAIN SYSTEM (cont'd)

	<u>DESCRIPTION</u>	<u>UNIT COST</u>
33.	60" Manhole	\$1,700/ea
34.	Rockwell (complete)	\$3,500/ea
34.	Rip Rap/Engr Rock	\$55/cy
36.	12" to 18" Corrugated Pipe Stub	\$30/lf
37.	12" to 18" FES (Corrugated)	\$300/ea
38.	Bore & Jack	\$10 per diameter inch per lf

F. ELECTRICAL

	<u>DESCRIPTION</u>	<u>UNIT COST</u>
1.	Conduit and cable/trench	\$18/lf
2.	70W Electrolier	\$1,600/ea
3.	100W Electrolier	\$1,800/ea
4.	150W Electrolier	\$1,900/ea
5.	200W Electrolier	\$2,000/ea
6.	Pull Box	\$170/ea
7.	Traffic Signal New Rd. w/o Turn Lt	\$70,000/ea
8.	Traffic Signal New Rd. w/ Turn Lt	\$85,000/ea
9.	Joint Trench	\$15/lf

G. MISCELLANEOUS

	<u>DESCRIPTION</u>	<u>UNIT COST</u>
1.	AC Patching	\$6/sf
2.	Conc. Patching (SW gaps)	\$400/ea
3.	Hydroseeding	\$0.03/sf
4.	Landscape	\$3.50/sf
5.	Street Sign w/stop sign attached	\$300/ea
6.	Signs	\$170/ea
7.	FH Markers	\$12/ea
8.	Striping (not thermoplastic)	\$1.50/lf
9.	Monuments	\$150/ea
10.	Barricades	\$40/lf
11.	6' Chain Link Fence	\$12/lf
12.	3 Strand Barbed Wire Fence	\$6/lf
13.	6' Masonry Sound Wall	\$45/lf
14.	Chain Link Gates	\$45/lf
15.	Header Board	\$4/lf
16.	Redwood Fence	\$16/lf

APPENDIX D
REVIEW CHECK LIST

DEVELOPMENT OR SUBDIVISION NAME_____

Engineering Firm _____

Contact Person _____

Telephone Number _____

Assessor's Parcel No. _____

Tentative Map Expiration Date _____

() First Check () Recheck #

- ___ Sets of Plans
- ___ Sets of Hydrology Map and Calcs
- ___ Copies of Engineer's Estimate
- ___ Copies of Soil Report
- ___ Sets of Sewer Map and Calcs
- ___ Copies of Tentative Map
- ___ Copies of Final Conditions of Approval (Resolutions)
- ___ Sets of Final Map Package (S 2.03 D)
- ___ **Form: Identification of deviations and reimbursements**

1.01 GENERAL

- ___ 1. Plans follow standard detail #202.
- ___ 2. North arrow and scale on each sheet. North up and/or left or right.
- ___ 3. Titles and numbers on all sheets and match index.
- ___ 4. Conformance to Tentative Map and Conditions of Approval, especially street and R/W Widths, grading, drainage, sewerage, water lines, number and size of lots, etc.

1.02 TITLE SHEET

- ___ 1. Name of Tract or project.
- ___ 2. Tract Number.

- ___ 3. Vicinity Map with north arrow (north up and/or left or right).
- ___ 4. Sheet Index.
- ___ 5. City Engineer's Signature Block.
- ___ 6. Consultant Signature Block.
- ___ 7. General Notes per Appendix "B" of the Design Standards (may be on sheet 2).
- ___ 8. Resolution No. approving project and a separate sheet with the conditions on sticky back or retyped.

1.03 SHEET ONE (TITLE SHEET AND/OR SHEET TWO, IF REQUIRED)

- ___ 1. Map showing all streets, utilities, structures, etc. and show improvement plan sheet layout.
- ___ 2. Drafting symbol legend.
- ___ 3. Street sections shown.
- ___ 4. Structural sections shown and agree with City Std Detail No. 301 (TI, R-value, AB, AC)
- ___ 5. Curb shown.
- ___ 6. Right-of-way and street widths shown.
- ___ 7. Cross-slope shown - note relative difference of and T/C.
- ___ 8. Sidewalk shown.
- ___ 9. Pedestrian paths shown.
- ___ 10. Drainage ways shown.
- ___ 11. Temporary and permanent bench marks and descriptions.
- ___ 12. List of Abbreviations.

1.04 DEMOLITION AND ABANDONMENT PLAN (If required)

- ___ 1. Show existing buildings and structures.
- ___ 2. Existing septic tanks and leach fields shown.
- ___ 3. Existing wells shown.

1.05 GRADING PLANS

- ___ 1. Existing elevations or contours shown (may be separate sheet).
- ___ 2. Proposed lot grades.
- ___ 3. TC elevations at property line extensions.
- ___ 4. TC at grade breaks and curb returns shown.
- ___ 5. TC at storm drain inlets shown.
- ___ 6. Street slopes at centerline shown. (0.2 % minimum)

- ___ 7. Lot numbers shown.
- ___ 9. Retaining walls and sound walls shown.
- ___ 10. Plan view of typical lot drainage. Minimum swale slope of lots 1%.
- ___ 11. Section of typical lot to show property line/slope relations.
- ___ 12. Show grading required for off-site drainage.
- ___ 13. Grading shown between back-of-curb or sidewalk and original ground at right-of-way line.
- ___ 14. Grading conforms to adjacent properties shown correctly and no adverse effect on future development.
- ___ 15. Check on drainage across lot lines and lots to drain to streets.
- ___ 16. Maximum slopes 2:1 or per Soils Report.
- ___ 17. All pads above high water if storm drains plug. (Surface flows)
- ___ 18. Elevations at rear of lots shown.

1.06 UTILITY PLANS (1 or 2 sheets)

- ___ 1. Station number on sanitary sewer laterals (in cul-de-sacs - dimension off lot lines at ROW).
- ___ 2. Water service dimensioned off sanitary sewer or standard detail describing offset.
- ___ 3. Water, sewer and storm drain mains with line size and direction of flow indicated.
- ___ 4. Appurtenances (Fire hydrants, manholes, blow-offs, air release valves, catch basins, street lights, irrigation sleeves, MID irrigation lines).
- ___ 5. Gate valves.
- ___ 6. Off-site utility work (may be a different scale).
- ___ 7. Scale 1" = 40' up to 1" = 100', north arrow.
- ___ 8. Irrigation service points for landscaping in the public right-of-way.
- ___ 9. Street names.
- ___ 10. Boundaries of subdivision.
- ___ 11. Irrigation service points for landscaping to be constructed in the future (CFF, CFD, or deferred improvement areas).
- ___ 12. Electrical connection(s) for irrigation including future areas (CFF, CFD, deferred areas).
- ___ 13. Pipe stub to future areas needing drainage including future major streets (CFF and CFD areas).

1.07 STREETS (Plan & Profile)

A. Plan Views

- ___ 1. Wheelchair ramps shown per Standard Details.
- ___ 2. Radius of curvature, central angle, and length shown on all street curves.

- ___ 3. Curb curve data given; central angle, length, and radius (30' on residential streets and 50' on industrial streets).
- ___ 4. Scale 1" = 40'.
- ___ 5. Cul-de-sac radius per Standard Detail No. 311.
- ___ 6. R/W and street width dimensions shown.
- ___ 7. Centerline stationing at 100' and at BC and EC of curves.
- ___ 8. Lot/parcel lines and numbers/letters shown.
- ___ 9. Cul-de-sac cross slopes from high point to gutter lip minimum 2% and maximum 5%.
- ___ 10. Valley gutters (in-fill projects only) - show flow lines at center of street.
- ___ 11. Stationing on all drainage structures shown.
- ___ 12. T/C elevation given at all drain structures.
- ___ 13. Drainage easements shown and dimensioned.
- ___ 14. Location of underground pipes and utilities shown.
- ___ 15. Location of fire hydrants per Tentative Map.
- ___ 16. Street monuments shown.
- ___ 17. Pedestrian Paths shown. Basic grades shown.
- ___ 18. Street names shown.
- ___ 19. Stations and elevations street intersections shown.
- ___ 20. All notes and symbols standard and conforming to legend.
- ___ 21. All existing utility poles, manholes, valves, signs, mail, boxes, trees, etc. shown. Indicate those to be removed, relocated or adjusted to grade.
- ___ 22. Continuations and cross streets properly referenced.
- ___ 23. Project limits and City limits shown.
- ___ 24. Standard knuckle used (Standard Detail No. 312).
- ___ 25. Barricades shown in proper locations.
- ___ 26. Handicap ramps shown.
- ___ 27. Driveway locations and widths shown. Minimum 2' from property line unless a shared driveway or cul-de-sac lot.
- ___ 28. Bordering streets are being re-constructed to centerline if pavement condition index is less than 80.
- ___ 29. Streets are being overlayed in areas where new utility services excessively cut the existing pavement.

B. Medians (if required)

- ___ 1. Approved by City Traffic Engineer.
- ___ 2. Irrigation and electrical service shown.
- ___ 3. Standard flow-thru breaks and exposed aggregate surface treatment.
- ___ 4. Executed reimbursement agreement (CFF, CFD, etc -if applicable).

- ___ 5. Approved landscape plans for median (CFF, CFD, etc -if applicable).

C. Profiles

- ___ 1. Vertical curves designed for proper speeds per Highway Design Manual.
- ___ 2. Minimum vertical curve lengths observed (50').
- ___ 3. Vertical scale 1" = 2' or 4'.
- ___ 4. Vertical curve, used for grade breaks greater than 1%.
- ___ 5. In cul-de-sacs, show profiles @ centerline from end of TC profile through the radius point to top of curb at end of cul-de-sac (dashed line).
- ___ 6. 2% maximum grade observed across intersections.
- ___ 7. 0.20% minimum grade observed on all streets at curb.
- ___ 8. 0.35' minimum fall around curb returns on all streets.
- ___ 9. All underground pipes and utilities shown; storm drain, water and sewers.
- ___ 10. Existing ground on centerline shown.
- ___ 11. Finished grade profile for top of curb shown.
- ___ 12. Centerline profiles of intersecting streets shown on to their point of intersection.
- ___ 13. Off-tract profile to catch point shown where road is constructed to subdivision boundary.
- ___ 14. Centerline stations and elevations shown @ all BVC, EVC, PIVC, grade breaks, low points and high points.
- ___ 15. All slopes in profile shown.
- ___ 16. Show all utility crossings with clearances indicated when closer than 15".
- ___ 17. Manhole and drop inlet invert and flowline elevations shown.

1.08 SANITARY SEWERS

- ___ 1. System in agreement with tentative map and master plan.
- ___ 2. Design conforms to City standards.
- ___ 3. Size of line shown.
- ___ 4. Adequate cover; 42" min. to finished grade - 2' min. to subgrade, Ductile Iron Pipe or engineered alternatives if shallower.
- ___ 5. Clearance with water main.
- ___ 6. Size, slope, length between structures, and type of pipe.
- ___ 7. Connection to existing facilities.
- ___ 8. Extension lines to subdivision boundary.
- ___ 9. Sewer line to be located per Standard Detail Nos. 804 & 805.
- ___ 10. Curves allowed within 80% of recommendations of pipe manufacturer. Show curve

data or offsets if concentric with centerline.

- ___ 11. On all curves where short pipe lengths are used, indicate clearly on plans.
- ___ 12. Rim elevations on manhole shown.
- ___ 13. Stations given for manholes.
- ___ 14. Sizes of existing lines shown.
- ___ 15. Pipe types allowed - VCP only. (D.I.P. if cover requires it - PVC SDR35 in Village One -
- ___ 16. 350' maximum distance manhole to manhole.
- ___ 17. Minimum 2 fps velocity.
- ___ 18. .10' drop around corner through manhole.
- ___ 19. Sewer lines crossing water lines are in conformance with Department of Health Requirements. Plans must specify length of section and type of piping at crossing.
- ___ 20. Bolted manhole covers for any off street manholes.
- ___ 21. In unimproved areas, manholes extended 1' above ground.
- ___ 22. Check sanitary calculations.
- ___ 23. Laterals shown in plan and 11' center to center from water services and 3' below water if crossing. (Follow health department diagram.)
- ___ 24. Special approval areas shall be noted in profile (less than minimum cover and clearances.)
- ___ 25. Cleanout on main where temporary phasing exists and run does not exceed 250' and 3 services. Manhole and stub when temporary stop exceeds 250' or more than 3 services are going to be installed.
- ___ 26. PVC Lining on manholes constructed on trunk mains.
- ___ 27. 8" minimum sewer main size.
- ___ 28. Manhole size ie. 48", 60", etc..

1.09 DRAINAGE

A. Hydrology - Hydraulics

- ___ 1. Calculations per City Standards and based on 5-year storm with minimum velocity of 2 fps.
- ___ 2. Calculations shall include the following: HGL, FL EL, Q, A, S, V, freeboard at structures, structure losses, and tailwater assumptions (5 yr. & 100 yr.).
- ___ 3. Adequacy of in-tract and off-tract drainage system verified.
- ___ 4. All starting water surface calculations adequately verified.
- ___ 5. Drainage map showing street system, existing and proposed drainage system, slope arrows, tributary sub-areas, peak flow in all pipes (1" = 100' preferred).
- ___ 6. All pipe in tributary areas labeled to correspond with calculations.

- ___ 7. Improvements to SD lines which cross water mains in conformance to Department of Health Requirements (Specify type & length of section, centered over water main.)

B. Easements

- ___ 1. Off-tract drainage improvements (plan and profile) and accompanying easements shown. Off-tract offers of dedication for drainage easement submitted for review.
- ___ 2. Off-tract work to be done but no easement requirements. Right of entry submitted for review.
- ___ 3. Easement widths indicated.
- ___ 4. Easements across lots are not permitted.

C. Structures

- ___ 1. Max. Diameter pipes through drainage structures observed.
Standard D.I. - 30"
Manhole Base - >30"
- ___ 2. 1.00' Minimum HGL to TC.
- ___ 3. Special structure calculations provided.
- ___ 4. Access to storm drain line does not exceed 500'. Access provided by catch basin, manhole, or open ditch (headwall).

D. Pipe

- ___ 1. Size, slope, length between structures, type and class or thickness of pipe shown in profiles. (12" minimum).
- ___ 2. Reinforced concrete or cast in place pipe only (CIPP on 36" diameter or larger).
- ___ 3. Trunk lines 1.25' behind top face of curb. Transition to enter catch basin in the center.
- ___ 4. Outlet protection provided.
- ___ 5. 3' minimum cover over pipe to finished grade unless special design and calcs submitted.
- ___ 6. Curve radii allowed to within 80% of pipe manufacturer's recommendations.
- ___ 7. All curve data at centerline of pipe shown unless concentric with street then offsets allowed.
- ___ 8. Elevations, slopes and distances all mathematically correct.
- ___ 9. Match hydraulic/hydrology calculations.
- ___ 10. Drainage provided for frontages along subdivision but separated by retaining wall. This includes areas designated in a CFF or CFD.

E. Channels

- ___ 1. Maximum velocity in earth channel verified by soils report.
- ___ 2. Channel side slopes as specified by soils report.
- ___ 3. Channel design per City of Modesto Specific Plan.

F. Temporary & Permanent Storm Drain Basins

- ___ 1. Runoff and volume calculations per City Design Guidelines.
- ___ 2. Groundwater level shown on basin section.
- ___ 3. Basin bottom 10' above water table
- ___ 4. Outfall protection using rip-rap required and flared end section on temporary basins and headwalls on permanent basins.
- ___ 5. Chain link fence with slats around basin required.
- ___ 6. Ramp at 10% maximum required.
- ___ 7. Off-tract basins require an access road around the basin.
- ___ 8. Easements are required.
- ___ 9. Calculations match new city standards for percolation or retention basin.
- ___ 10. Infiltration test results turned in for percolation basin.
- ___ 11. Irrigation system & 4:1 slopes on master basin.
- ___ 12. Pumping system for permanent basin per standards.

1.10 WATER LINES

- ___ 1. System in agreement with Tentative Map.
- ___ 2. Design conforms to City standards.
- ___ 3. Size - 8" min., except cul-de-sacs without hydrants where 6" is allowed.
- ___ 4. Valves.
- ___ 5. Hydrants - locations as shown on approved Tentative Map.
- ___ 6. Cover - 42" min. to finished grade.
- ___ 7. Proper separation from sewer lines & storm drain (10' min.).
- ___ 8. Location - per City Standard Detail No. 805.
- ___ 9. Lines kept in streets - easements discouraged.
- ___ 10. Crossings with sewer mains, storm drain, irrigation or other non-potable laterals meet health standards (Standard Detail No.600). Consulting engineer has specified type of pipe, length of sections, and centered over non-potable system(s).
- ___ 11. Length & size of pipe shown in profile (indicate all changes in class of pipe exceeding CL 150).
- ___ 12. Length shown as distance between crosses or tees.

- ___ 13. Invert elevations shown at grade breaks.
- ___ 14. Sizes of all existing lines shown.
- ___ 15. Top of curb at hydrant locations.
- ___ 16. Curves allowed to within 80% of pipe manufacturers recommendations. Curve data shown unless concentric with street improvements where slowing offsets is acceptable.
- ___ 17. Air Valves and Blow-offs behind walks.
- ___ 18. Fire hydrants at back of cul-de-sacs for terminating water lines (in lieu of a blow-off)
- ___ 19. Connection to existing facilities.
- ___ 20. At points of future extension install temporary BLOWOFF with valve.
- ___ 21. Lines extended to tract boundaries and along frontage.
- ___ 22. House services shown in plan.
- ___ 23. Fire hydrants maximum spacing - 500' residential and 300' other. Hose lay lengths 250' residential and 150' other. Cul-de-sacs within 200' of radius point.

1.11 STREET LIGHTING

- ___ 1. Shown at 1" = 40', 50' or 100' plan scale.
- ___ 2. Cul-de-sacs, 100 watt at end of 100 foot deep or deeper.
- ___ 3. Residential streets - evenly spaced at 330 feet maximum. 100 watt on 25'-6" poles with 15 foot arms.
- ___ 4. Collector Streets - evenly spaced at 330 feet maximum. 150 watt on 28' - 6" poles with 15 foot arms.
- ___ 5. Arterial Streets - evenly spaced at 330 feet maximum. 200 watt on 28' - 6" poles with 15 foot arms.
- ___ 6. Wattage and pole heights indicated on plans.
- ___ 7. Point of connection (MID transformer)
- ___ 8. Conduit location.
- ___ 9. Striping and barricades.

1.12 LANDSCAPE & IRRIGATION

- ___ 1. Shown on 20-scale plan.
- ___ 2. Electrical connection point for Irrigation System.
- ___ 3. Water connection point for Irrigation System.
- ___ 4. Property/Right of Way lines and Planting Easements.
- ___ 5. Drainage.

1.13 ENGINEERS COST ESTIMATE

- ___ 1. Verify that unit costs compare with City Standard Costs.
- ___ 2. Verify quantities of all items.
- ___ 3. Review with plans to determine if there are missing items.
- ___ 4. 10% contingency required.
- ___ 5. Grading quantities shown - lump sum not acceptable.
- ___ 6. Driveways included as separate item.
- ___ 7. Sidewalk on square foot and not included in curb and gutter item.
- ___ 8. Increase costs of facilities installed in existing streets by 50%.
- ___ 9. Check groundwater depth. If pipes installed below water table, increase costs by \$10 per lineal foot.
- ___ 10. For each 20 electroliers, 1 extra is required.
- ___ 11. When resubmitted, verify that all changes in plans are reflected in the estimate.
- ___ 12. Engineer categorized by type of work for acceptance by City Council.

APPENDIX D

COMMERCIAL REVIEW CHECK LIST

DEVELOPMENT NAME & ADDRESS _____

Engineering Firm _____

Contact Person _____

Telephone Number _____

Assessor's Parcel No. _____

BZA Conditions Resolution _____

() First Check () Recheck #

- ___ 2 Sets of Plans
- ___ Hydrology Map with cross sections and Calcs for 2" over site
- ___ Engineer's Estimate
- ___ Soil Report
- ___ Parcel Map (if applicable)
- ___ Final Conditions of Approval (Resolutions)

1.01 GENERAL

- ___ 1. Civil Engineer Stamp where utility design & surveying is required.
- ___ 2. North arrow and scale on each sheet. North up and/or left or right.
- ___ 3. Titles and numbers on all sheets and match index.
- ___ 4. Conformance to Parcel Map and Conditions of Approval, especially street and R/W Widths, grading, drainage, sewerage, water lines, etc.

1.02 TITLE SHEET (may be with architects cover sheet)

- ___ 1. Name of Tract or project.
- ___ 2. Address of the property.
- ___ 3. Vicinity Map with north arrow (north up and/or left or right).
- ___ 4. Sheet Index.

- ___ 5. City Engineer's Signature Block (only on civil engineering drawings, not architect's drawings)
- ___ 6. Consultant Signature Block.
- ___ 7. General Notes per Appendix "B" of the Design Standards (may be a handout at pre-job and not on the plan sheets).
- ___ 8. Resolution No. approving project and a detail sheet with the actual approval conditions on the plan sheet.
- ___ 9. Benchmark data to tie in the parcel

1.03 SHEET ONE (TITLE SHEET AND/OR SHEET TWO, IF REQUIRED)

- ___ 1. Map showing all streets, utilities, structures, etc. and show improvement plan sheet layout.
- ___ 2. Drafting symbol legend & list of Abbreviations
- ___ 3. Street sections shown.
- ___ 4. Structural sections shown and agree with City Std Detail No. 301 (TI, R-value, AB, AC)
- ___ 5. Curb shown.
- ___ 6. Right-of-way and street widths shown.
- ___ 7. Cross-slope shown - note relative difference of TC.
- ___ 8. Sidewalk shown.
- ___ 9. Pedestrian paths shown.
- ___ 10. Drainage ways shown.
- ___ 11. Temporary and permanent bench marks and descriptions.
- ___ 12. Soils report referenced on plan sheets.

1.04 DEMOLITION AND ABANDONMENT PLAN (If required)

- ___ 1. Show existing buildings and structures.
- ___ 2. Existing septic tanks and leach fields shown.
- ___ 3. Existing wells shown.

1.05 GRADING PLANS (on & off-site)

- ___ 1. Existing elevations or contours shown (may be separate plan sheet).
- ___ 2. Proposed pad grades.
- ___ 3. TC elevations at property line extensions.
- ___ 4. TC at grade breaks and curb returns shown.
- ___ 5. TC at storm drain inlets shown.
- ___ 6. Street slopes at centerline shown. (0.2 % minimum)

- ___ 7. Pad numbers or letters shown.
- ___ 9. Retaining walls and sound walls shown (detail shown)
- ___ 10. Contains 2" water over the site.
- ___ 11. On-site high point at driveways at least 0.8' above flowline.
- ___ 12. Show grading required for off-site drainage.
- ___ 13. Grading shown between back-of-curb or sidewalk and original ground at right-of-way line.
- ___ 14. Grading conforms to adjacent properties shown correctly and no adverse effect on future development.
- ___ 15. Check on drainage across lot lines and lots to drain to streets.
- ___ 16. Maximum slopes 2:1 or per Soils Report.
- ___ 17. All pads above high water if storm drains plug. (Surface flows)
- ___ 18. Elevations at rear of lots shown.

1.07 STREETS w/Utilities (Plan & Profile –if installing new utility lines in the ROW parallel to centerline)

A. Plan Views

- ___ 1. Wheelchair ramps shown per Standard Details. City Detail # noted if not shown on plans.
- ___ 2. Radius of curvature, central angle, and length shown on all street curves.
- ___ 3. Curb curve data given; central angle, length, and radius (30' on residential streets and 50' on industrial streets).
- ___ 4. Scale 1" = 40'.
- ___ 5. Cul-de-sac radius per Standard Detail No. 311.
- ___ 6. R/W and street width dimensions shown.
- ___ 7. Centerline stationing at 100' and at BC and EC of curves.
- ___ 8. Lot/parcel lines and numbers/letters shown.
- ___ 9. Cul-de-sac cross slopes from high point to gutter lip minimum 2% and maximum 5%.
- ___ 10. Valley gutters (in-fill projects only) - show flow lines.
- ___ 11. Stationing on all drainage structures & utility stubs to property.
- ___ 12. T/C elevation given at all drain structures.
- ___ 13. Drainage easements shown and dimensioned.
- ___ 14. Location of underground pipes and utilities shown.
- ___ 15. Street monuments shown.
- ___ 16. Pedestrian Paths shown. Basic grades shown.
- ___ 17. Street names shown.

- ___18. Stations and elevations street intersections shown.
- ___19. All notes and symbols standard and conforming to legend.
- ___20. All existing utility poles, manholes, valves, signs, mail, boxes, trees, etc. shown. Indicate those to be removed, relocated or adjusted to grade.
- ___21. Continuations and cross streets properly referenced.
- ___22. Project limits and City limits shown.
- ___23. Standard knuckle used (Standard Detail No. 312).
- ___24. Barricades shown in proper locations.
- ___25. Handicap ramps with reference to city detail number.

B. Profiles

- ___1. Minimum vertical curve lengths observed (50').
- ___3. Vertical scale 1" = 2' or 4'.
- ___4. Vertical curve, used for grade breaks greater than 1%.
- ___5. In cul-de-sacs, show profiles @ centerline from end of TC profile through the radius point to top of curb at end of cul-de-sac (dashed line).
- ___6. 2% maximum grade observed across intersections.
- ___7. 0.20% minimum grade observed on all streets at curb.
- ___8. 0.35' minimum fall around curb returns on all streets.
- ___9. All underground pipes and utilities shown; storm drain, water and sewers.
- ___10. Existing ground on centerline shown.
- ___11. Finished grade profile for top of curb shown.
- ___12. Centerline profiles of intersecting streets shown on to their point of intersection.
- ___13. Centerline stations and elevations shown @ all BVC, EVC, PIVC, grade breaks, low points and high points.
- ___14. All slopes in profile shown.
- ___15. Show all utility crossings with clearances indicated when closer than 15".
- ___16. Manhole and drop inlet invert and flowline elevations shown.

1.08 DRIVEWAYS

Flared & Drop Approaches

- ___1. Design conforms to City standards.
- ___2. Size of driveway shown.
- ___3. Flare ends a minimum of 2' from the property line.
- ___4. Uses a Drop approach instead of a flared approach for the heavier traffic volumes or truck traffic.

- ___ 5. An on-site high point is established at least 0.8' above the gutter flow line. Drop approach may require 17' or more.
- ___ 6. On-site drainage stays on-site except for minor driveway drainage. Contains 2" water over the site

Drop Approach

- ___ 7. Handicap ramps 12:1 at driveway drop approach.
- ___ 8. Driveway part in sidewalk does not exceed 2% cross slope and is 4 feet wide for pedestrians to traverse.

1.09 DEDICATIONS (If required)

- ___ 1. ROW Dedications made. New property line shown on plans. Off-tract drainage improvements (plan and profile) and accompanying easements shown. Off-tract offers of dedication for drainage easement submitted for review.
- ___ 2. All PUE's dedicated and shown on improvement plans. NO PUE's for private on-site utilities. These should be indicated as private utility easement.
- ___ 3. Planting easement dedicated.
- ___ 4. Off-tract work to be done but no easement requirements. Right of entry submitted for review.
- ___ 5. Easement widths indicated.
- ___ 6. Easements across lots are not permitted.

1.10 UTILITY PLANS

1.10a GENERAL

- ___ 1. Design conforms to City standards.
- ___ 2. Sizes of line shown. Stations annotated at all services to lots.
- ___ 3. Adequate cover; 42" min. to finished grade for water and sewer - 2' min. to subgrade, Ductile Iron Pipe or approved if shallower; storm at minimum 36" to finished grade. engineered alternatives if shallower.
- ___ 4. Connections to existing facilities.
- ___ 5. Curves allowed within 80% of recommendations of pipe manufacturer. Show curve data or offsets if concentric with centerline.
- ___ 6. On all curves where short pipe lengths are used, indicate clearly on plans.
- ___ 7. Pipe types allowed – Sewer-VCP only. (D.I.P. if cover requires it), Water-C900 PVC CL150, Storm - RCP
- ___ 8. Conformance with Department of Health Requirements. Plans must specify length of section and type of pipe at crossing.

- ___ 9. Special approval areas shall be noted in profile (less than minimum cover and clearances).
- ___ 10. Water & Sewer – 8” minimum main size. Storm – 12” RCP minimum
- ___ 11. Length & size of pipe shown in profile (indicate all changes in class of pipe exceeding CL 150).

1.10b SEWER & STORM

- ___ 1. Size, slope, length between structures, and type of pipe.
- ___ 2. Rim elevations on manhole shown.
- ___ 3. Stations given for manholes.
- ___ 4. Sewer - 400' maximum distance manhole to manhole. Storm – 500' maximum distance manhole to manhole
- ___ 5. Gravity Systems - Minimum 2 fps velocity.
- ___ 6. Sewer - 0.10' drop around corner through manhole.
- ___ 7. Bolted manhole covers for any off-street manholes under public maintenance.
- ___ 8. In unimproved areas of ROWs and PUEs, manholes extended 1' above ground, a minimum of 3 each one foot grade rings are used to bring up to grade.
- ___ 9. Cleanout on main where temporary phasing exists and run does not exceed 250' and 3 services. Manhole and stub when temporary stop exceeds 250' or more than 3 services are going to be installed. Terminal manhole on short runs that end shallow.
- ___ 10. Sewer - PVC Lining on manholes constructed on trunk mains.
- ___ 11. Manhole size ie. 48”, 60”, etc..
- ___ 12. Storm calculations showing 2” over site (engineer provides cross sections and map locations of the cross sections with calculations).
- ___ 13. An on-site high point behind driveway is established at least 0.8' above the gutter flow line. High points for Drop approaches will require 17' or more feet to locate a high point.
- ___ 14. Access to storm drain line does not exceed 500'. Access provided by catch basin, manhole, or open ditch (headwall).
- ___ 15. Trunk lines 1.25' behind top face of curb. Transition to enter catch basin in the center.
- ___ 16. Storm drain outlet protection provided.

1.10c WATER

- ___ 1. Length shown as distance between crosses or tees.
- ___ 2. Invert elevations shown at grade breaks.
- ___ 3. Top of curb at hydrant locations.
- ___ 4. Blow-offs behind walks.
- ___ 5. Fire hydrants at back of cul-de-sacs for terminating water lines (in lieu of a blow-off)

- ___ 6. Connection to existing facilities.
- ___ 7. At points of future extension install temporary BLOWOFF with valve.
- ___ 8. Fire hydrants maximum spacing - 500' residential and 300' other. Hose lay lengths 250' residential and 150' other. Cul-de-sacs within 200' of radius point.

1.11 STREET LIGHTING

- ___ 1. Cul-de-sacs, 100 watt at end of 100 foot deep or deeper.
- ___ 2. Collector Streets - evenly spaced at 330 feet maximum. 150 watt on 28' - 6" poles with 15 foot arms.
- ___ 3. Arterial Streets - evenly spaced at 330 feet maximum. 200 watt on 28' - 6" poles with 15 foot arms.
- ___ 4. Wattage and pole heights indicated on plans.
- ___ 5. Point of connection (MID transformer)
- ___ 6. Conduit location.
- ___ 7. Striping and barricades.

1.12 LANDSCAPE & IRRIGATION

- ___ 1. Shown on 20-scale plan.
- ___ 2. Electrical connection point for Irrigation System.
- ___ 3. Water connection point for Irrigation System.
- ___ 4. Property/Right of Way lines and Planting Easements.
- ___ 5. Drainage.

1.13 ENGINEERS COST ESTIMATE

- ___ 1. Verify that unit costs compare with City Standard Costs.
- ___ 2. Verify quantities of all items.
- ___ 3. Review with plans to determine if there are missing items.
- ___ 4. 10% contingency required.
- ___ 5. Grading quantities shown - lump sum not acceptable.
- ___ 6. Driveways included as separate item.
- ___ 7. Sidewalk on square foot and not included in curb and gutter item.
- ___ 8. Increase costs of facilities installed in existing streets by 50%.
- ___ 9. Check groundwater depth. If pipes installed below water table, increase costs by \$10 per lineal foot.
- ___ 10. When resubmitted, verify that all changes in plans are reflected in the estimate.
- ___ 11. City fees shown – grading, water (systems, lateral and hot taps), sewer bond redemption, subtrunk, and lateral

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APPENDIX E

MINIMUM SUBMITTAL PACKAGE

I. Minimum Submittal Package for **Subdivision Plan Checking**

- A. Improvement Plans with Supporting Calculations – 2 sets preliminary
- B. Storm Drain Package - 2 sets
- C. Engineers Estimate - 1 copy
- D. Final Map Package - 2 sets
- E. Approved Tentative Map - 1 copy
- F. Final Conditions of Approval - 1 copy
- G. Soils Report - 2 sets (if available - minimum requirement of R-value testing and pavement design recommendation with testing locations.)
- H. Sewer Design Calculations - 2 sets (if required-normally at tentative map).
- I. Form: Deviations and Reimbursements – 1 copy

A detailed description of the items listed above is included in Section 2.03 of the City of Modesto Engineering Design Standards.

II. Minimum Submittal Package for **construction permit on a subdivision or commercial development** (Once Approved & signed by City Engineer)

- A. A minimum of 3 and maximum of 5 sets of blue lines with City Engineer's signature required. If no sewer and storm is required, 4 sets of prints required. If no water is required, 3 sets of prints required.
- B. 1 each compact disk with AutoCAD Dwg or a DXF export file of the improvements and a complete set of electronic scans of the approved set of prints. Scans to be at 200 dpi and converted to single Adobe PDF file.
- C. Copy of Notice of Intention (part of NPDES permitting process) for 5 acre sites or greater.
- D. For subdivisions and large commercial projects the permit to be issued at a scheduled pre-job.
- E. For CFD, CFF, or other reimbursable item of work on the plans, 3 additional copies of these plan sheets must be made and a signature block for the city coordinator of this

work shall be placed on these sheets. An executed reimbursement agreement shall be submitted prior to issuing a construction permit for the work.

F. Contractor's insurance certificates.

G. Payment of the encroachment/inspection fees and city water hot tap fees (if applicable).

H. Copy of Final Engineer's Estimate

III. Minimum Submittal Package for **grading permit on a subdivision or commercial development** (Once reviewed by City Engineer)

A. 3 sets of prints

B. Copy of Notice of Intention (part of NPDES permitting process) for 5 acre sites or greater.

C. Payment of the grading permit.

IV. Minimum Submittal Package for **Commercial Plan Checking**

A. Improvement Plans for only the public improvements (not complete building set) plus a single grading & drainage sheet of the commercial site.

B. Storm Drain Package - 2 sets (if applicable). In-fill sites in rock well areas shall have calculations attached. The single grading & drainage sheet of the commercial site shall have hand drawn cross-sections or some other method to show calculations for ponding 2" of water over the site. Reference each cross-section on the calculation sheet.

C. Engineers Estimate - 1 copy

D. Dedications of PE, PUE, or ROW - 2 sets (if applicable)

E. Approved Parcel Map - 1 copy (if applicable)

F. Final Conditions of Approval - 1 copy (if applicable)

G. Soils Report - 2 sets (if available - minimum requirement of R-value testing and pavement design recommendation with testing locations.)

APPENDIX F

SANITARY SEWER DESIGN PROCEDURE

The following procedure is used in determining design Q's for City of Modesto projects. See Design Section 5 for further explanation. Calc's required if no master plan exists or master plan is being modified by the design submitted.

PROCEDURE:

1. A plan, preferably 1" - 100' scale, showing the proposed street system, tributary sub-areas, existing and future tributary areas outside the project limits, zoning, projected land use, and any features affecting the system design.
2. Determine and show the tributary sub-areas to the nearest 0.1 acre.
3. Considering all criteria (available slope, cover and design standards), establish pipe size and slope, then determine velocity and pipe capacity.
4. Minimum pipe size of sewer laterals shall be 8" VCP.

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APPENDIX G

STORM DRAIN DESIGN EXAMPLE

The following procedure, based on the Rational Formula $Q = CIA$ in conjunction with the City of Modesto Design Standards, is used in determining design Q 's for City of Modesto project. See Design Section 4 for further explanation. Calculation's required for all subdivisions.

PROCEDURE:

1. On a plan, preferably 1" - 100' scale, show proposed street system, existing and proposed drainage systems and delineate tributary sub-areas.
2. Assume initial time of concentration (T), roof to gutter runoff time, normally 20 minutes.
3. Calculate travel time (T) to the first inlet. Assume average velocity in curb and gutter to be 1.0 feet per second (at slope of .002).
4. The time of concentration (T) to the inlet is then the sum of the initial time of concentration and the travel time. $T_c = T - + T_t$.
5. Determine " I ", rainfall intensity in inches per hour, for a time equal to the time of concentration (T_c) from the Rainfall Intensity Curve, Figure 4-2 of these Design Standards.
6. Determine " c ", coefficient of runoff using C values given in City of Modesto Design Standards, Design Section 4, Table 4.2.
7. Determine " A ", the area of the tributary sub-areas to the nearest 0.1 acres.
8. Compute $Q = CIA$, where Q equals the peak flow in cubic feet per second.
9. Considering all criteria (available slope, cover, hydraulic grade line, etc.), establish pipe size and slope, then determine pipe velocity and travel time (T) required to carry above Q to the next M.H. inlet of M.H. confluence. Use Manning's " n " equals 0.013 for all pipes.

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APPENDIX H

FIRE DEPARTMENT STANDARDS for PRIVATE STREETS and DEVELOPMENTS

1.01 GENERAL

All commercial, industrial, multi-family and private residential properties shall comply with the following minimum standards. These standards have been developed in accordance with the currently adopted 1994 Uniform Fire Code, current department standards, current city standards and nationally recognized recommended standards.

1.02 AUTOMATIC FIRE PROTECTION

With the exception of one and two family dwellings (R3 occupancy) and private garages (U1 occupancy), any new building or structure with a floor area under one roof that exceeds five thousand (5,000) square feet shall be equipped with an approved automatic fire sprinkler system designed and installed in accordance with the current adopted edition of NFPA 13 (or 13R when applicable). MMC 3-1.102 originally adopted in 1982.

1.03 ACCESS TO SITE

Commercial, industrial, and institutional complexes shall have two access ways, one from each of two public streets, preferably from one North-South and one East-West street.

Multi-family housing complexes and private residential subdivisions with 25 or more dwelling units shall have two access ways from a single public street.

Multi-family housing complexes and private residential subdivisions with 24 or fewer dwelling units may have a single access from a single public street.

1.04 ACCESS TO BUILDINGS

Every building shall be located in such a manner that the farthest point of the building, from a public or private fire access road, does not exceed one hundred fifty (150) feet. This distance shall be measured around the outside perimeter of the building and shall take into consideration any natural or man-made barriers that may impede rescue and firefighting efforts.

This distance may be increased to 200 feet when an automatic fire sprinkler system is installed throughout a building or buildings.

1.05 ACCESS ROADWAYS

Access roads shall be designed, constructed and maintained to support the 30-ton (60,000 pound) imposed load of the fire apparatus. These roads shall have a smooth hard surface of asphalt or concrete to provide all-weather driving capability.

Engineered alternative surfaces that incorporate turf with pavers may be permitted on emergency-only access roads and shall be designed to support the same apparatus loads

An unobstructed vertical clearance of 13 feet 6 inches shall be maintained.

All curves and changes in direction shall afford a minimum inside turning radius of 25 feet and outside radius of 45 feet.

Dead-end roads that exceed 150 feet in length shall be constructed with approved turnarounds. See Standard Details #314 & 315.

Cul-de-sac streets shall be designed and installed in accordance with public street standards. See Standard Detail #311.

1.06 STREET WIDTHS

Parallel parking of vehicles is assumed when determining minimum widths.

Private one & two family residential and multi-family developments:

- 34 feet when parking is unrestricted
- 34 feet in cul-de-sacs and streets when parking is restricted to passenger vehicles only
- 28 feet when parking is restricted to one side only
- 20 feet when parking is prohibited on either side

Mobile homes parks (regulated by Title 25, CCR):

- 40 feet when parking is unrestricted
- 30 feet when parking is restricted to one side only
- 20 feet when parking is prohibited on either side

Commercial and Industrial developments:

- 40 feet when parking is unrestricted
- 30 feet when parking is restricted to one side
- 20 feet when parking is prohibited on either side

Upon approval of the chief, street width reduction may be considered when an automatic fire sprinkler system is installed throughout buildings or complexes. These reductions will be evaluated on a case-by-case basis and in no case shall the width be reduced to less than 20 feet.

Parking restrictions shall be posted in an approved manner.

1.07 FIRE LANE and FIRE HYDRANT MARKING

When parking is prohibited or restricted, approved signs or other approved notices shall be provided and maintained using one of the following methods:

Curb or road surface shall be painted bright red; the words "NO PARKING-FIRE LANE" shall be painted in white letters, 6 inches in height with a 1 inch stroke or

A sign shall be posted immediately adjacent to, and visible from, the designated place with the words "NO PARKING-FIRE LANE"; the letters shall be 3 inches in height with a 1/2 inch stroke. Signs shall be posted not less than four (4) feet and no more than eight (8) feet above finish grade. See Standard Detail #715.

Spacing for signage or curb marking shall be every 25 feet or as necessary to properly identify the designated area. A combination of red striping and signage may be used.

1.08 ELECTRONICALLY CONTROLLED VEHICLE ACCESS GATES

Plans shall be submitted to and approved by Fire Marshal prior to installation.

Plans shall be submitted to and approved by the Development Services Department to insure pedestrian and vehicular safety and compliance with established fence setback standards.

A building permit is required for ANY electrical installation, and for structural consideration if gates or fence exceeds 6 feet in height.

Recommended gate setback from property line is 35 feet but this distance may be modified when approved by both the Fire Marshal and Development Services Manager.

Entrance/exits 1) with one-way, physically divided, traffic lanes shall provide 15 feet of driving surface, 2) with undivided two way traffic lanes shall provide 20 feet of driving surface. Additional width will be required for parking or turnout areas.

Gates serving the one-way traffic lanes shall be capable of opening to a clear and unobstructed width of 12 feet; gates serving the two-way traffic lanes shall be capable of opening to a clear and unobstructed width of 16 feet.

Required gates shall be equipped with a Modesto Fire Department accessible, electrically operated KNOX key switch.

Required gates shall also be operable by remote telephone access. The telephone number which activates the gate shall be provided to the Fire Department for entry into the emergency dispatch file.

Other forms of remote gate activation will be considered and may be approved on a case-by-case basis.

All electrically operated controls shall unlock upon power failure.

1.09 PEDESTRIAN GATES AND BARRIERS INSTALLED ACROSS REQUIRED EXIT PATHWAYS

Latch gates and barriers shall be openable from the inside without the use of a key or any special knowledge or effort and handicap accessible.

Width: The clear width of the opening shall not be less than 36 inches or the exit width required by the Building Code.

Swing: The gate shall swing in the direction of travel when required by the Building Code for exit doors.

Exception: Grounds may be fenced and gates equipped with locks providing there are accessible safe dispersal areas located not less than 50 feet from buildings. Dispersal areas shall be sized to provide an area not less than three square feet per occupant.

1.10 BUILDINGS UNDER CONSTRUCTION

Access roads shall be constructed to within 150 feet of all buildings under construction.

Required access roads shall be constructed and approved prior to the start of any building construction.

Temporary dead-ends created during project phasing shall be limited to 150 feet or less or approved temporary turnarounds shall be constructed.

Fire hydrants shall be installed and approved prior to the start of building construction. See Sec. 6.07 and Standard Detail #605 and 606.

1.11 SIDEWALKS

Private gated communities within the City limits shall conform to the guidelines set forth in Table H-3 - Guidelines for Installing Sidewalks.

FIGURE H.1
FIRE DEPARTMENT APPROVED TURN-AROUNDS

***NOTE:** Measurements are to edge of pavement - no parking

Scale: 1" = 30' (One inch equals thirty feet)

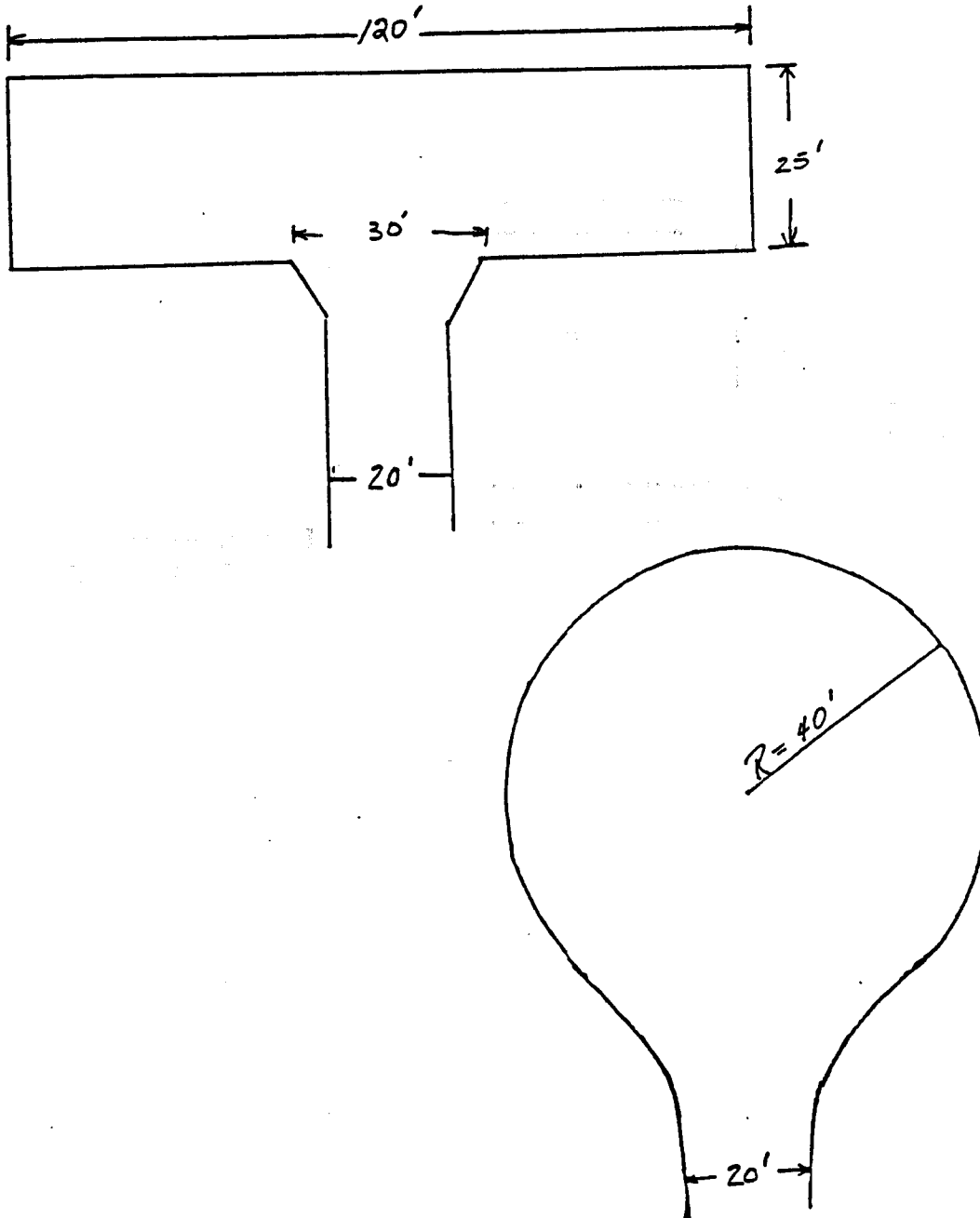


**FIGURE H.2
FIRE DEPARTMENT NO PARKING SIGNS**

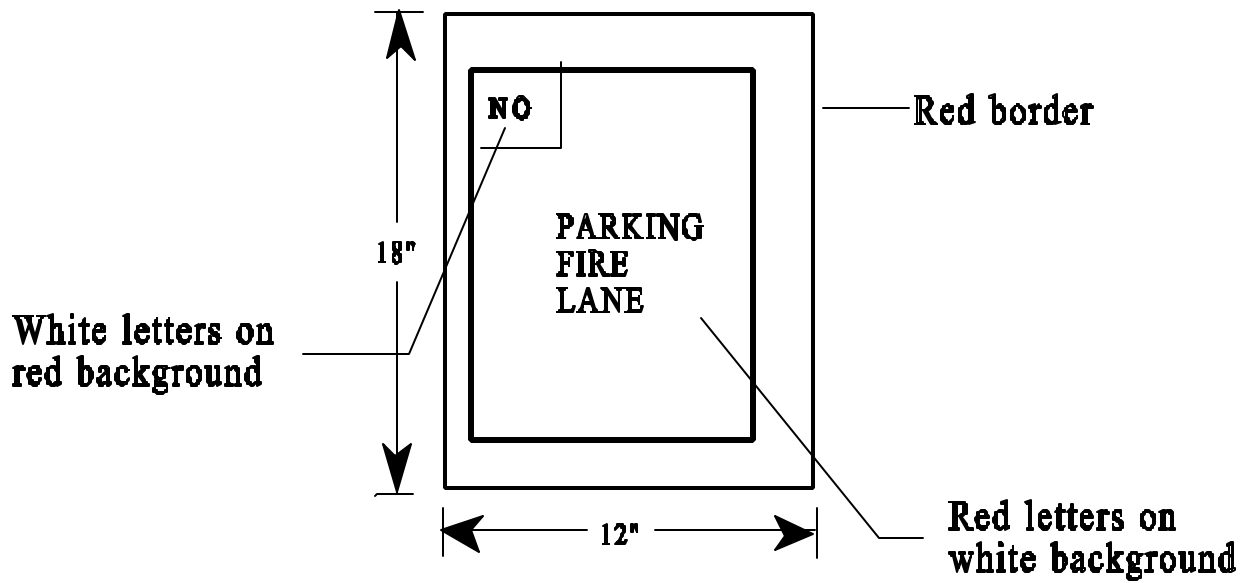


**TABLE H.1
GUIDELINES FOR INSTALLING SIDEWALKS.**

Land-Use/Roadway Functional Classification/ and Dwelling Unit	New Urban and Suburban Streets	Existing Urban and Suburban Streets
Commercial & Industrial (All Streets)	Both sides.	Both Sides. Every effort should be made to add sidewalks where they do not exist and complete missing links.
Residential/(Major Arterials)	Both sides.	Both sides.
Residential/(Collectors)	Both sides.	Multi-family - both sides. Single family dwellings - prefer both sides; require at least one side.
Residential/(Local Streets) More than 4 Units Per Acre	Both sides.	Prefer both sides; require at least one side.
1 to 4 Units per Acre	Prefer both sides; require at least one side.	One side preferred, at least 4 ft; shoulder on both sides required.
Less than 1 Unit per Acre	One side preferred, shoulder on both sides required.	At least 4-ft shoulder on both sides required.

Notes:

- 1) Any local street within two blocks of a school site that would be on a walking route to school - sidewalk and curb and gutter required.
- 2) Sidewalks may be omitted on one side of a new street where that side clearly cannot be developed and where there are no existing or anticipated uses that would generate pedestrian trips on that side.
- 3) Where there are service roads, the sidewalk adjacent to the main road may be eliminated and replaced by a sidewalk adjacent to the service road on the side away from the main road.
- 4) For rural roads not likely to serve development, a shoulder at least 4 ft in width, preferably 8 ft on primary highways should be provided. Surface material should provide a stable, mud-free walking surface.

Taken from INSTITUTE OF TRANSPORTATION ENGINEERS, "Sidewalks", by Fred N. Ranck, pg 17.

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APPENDIX I

PRIVATE WATER SYSTEM DESIGN FOR FIRE PROTECTION

1.01 GENERAL

All on-site improvements shall conform to the requirements of the American Water Works Association, the Modesto Municipal Code, the Modesto Fire Code, these Standard Specifications and Details, NFPA 13, *Standard for Installation of Fire Automatic Sprinkler Systems*, NFPA 24, *Standard for Private Fire Service Mains* and NFPA 1141, *Standard for Fire Protection in Planned Building Groups*.

1.02 PIPE SIZE AND MATERIAL

The minimum pipe size used to supply only a fire sprinkler system may have a nominal diameter of 4 inches if hydraulic calculations show that the main will supply the total demand, including hose allowances at the available design pressure, and the main size is at least as large as the riser.

The minimum pipe size used for a dead-end main, not exceeding 300 feet in length, supplying only one fire hydrant, shall have a minimum nominal diameter of 6 inches.

The minimum pipe size used for a dead-end main up to 600 feet in length, supplying one or more hydrants or a combination of fire hydrant and fire sprinkler system, shall have a nominal diameter of 8 inches.

The minimum pipe size used for a dead-end main exceeding 600 feet in length shall have a nominal diameter of 10 inches.

The minimum pipe size used for looped mains supplying fire hydrants and fire sprinkler systems shall have a nominal diameter of 6 inches.

Larger pipe sizes may be required when minimum fire flow, set forth in Section 6.05, can not be attained or when hydraulic calculations dictate otherwise.

Pipe materials shall be listed for fire protection service, comply with AWWA Standards, and be designed to withstand a minimum working pressure of 150 psi.

1.03 FIRE MAIN RESTRAINTS

All changes of direction, caps, bends and hydrant branches shall be restrained against movement. Type of pipe, soil conditions and available space will determine the method.

Thrust blocking shall be installed in conformance with Standard Detail #609. Other joint restraints shall be installed in conformance with NFPA 24.

1.04 DEPTH OF BURY

Water mains shall be buried a minimum of 36 inches under driveways and 48 inches under railroad tracks. When vehicular traffic is not a concern, the piping may be buried a minimum of 30 inches to prevent mechanical and damage.

Depth of covering shall be measured from the top of pipe to finished grade.

1.05 CONTROL VALVES

At least one control valve shall be installed in each source of water supply except for fire department connections. The City gate valve may be used as the system control valve for mains supplying only fire hydrants.

At least one control valve shall be installed on each sprinkler system. Sprinkler system control valves shall be listed indicating type. Outside stem and yoke (O S & Y) used in connection with a double check valve assembly or post indicator valves (PIV) are acceptable.

Post indicator valves shall be set so that the top of the post will be 36 inches above final grade, and should be located not less than 40 feet from buildings. When a PIV cannot be placed at this distance, the alternate location shall be approved by the Fire Marshal.

Sectional valves may be required on large systems; see Section 6.08. Locations and type shall be approved by the Fire Marshal.

1.06 CHECK VALVES

All private fire systems shall have installed at least one listed check valve. When there is more than one source of water supply, a check valve shall be installed in each connection.

When installed underground, the required fire sprinkler system check valve shall be in a vault large enough to allow for State mandated inspection, maintenance, and repair of the valve.

Class 1 and 2 private fire systems (direct connection from public water mains, with or without a booster pump) will have a single check valve installed by the City at the connection to the public water system. This valve is not to be considered the required sprinkler system check valve. See Standard Detail #620

Private fire systems with domestic water connections and Class 3, 4, 5, and 6 private fire systems (cross-connected to fire pumps, unapproved water sources, or having materials or conditions that could contaminate the potable water) shall have an approved back-flow

prevention device as required by AWWA M-14. When FEBCO Models 806 or 825 with OS & Y gates, or equal, is used on a fire sprinkler service, no additional system check valve is required.

1.07 FIRE HYDRANTS

See Section 6.05, and Standard Detail #605 & 606.

1.08 FIRE DEPARTMENT CONNECTIONS

Except for residential systems with 20 or fewer heads, every sprinkler system shall have installed an approved fire department connection (FDC), with internal National Standard (NST) treaded swivel fittings. Listed caps shall be provided. All fire department connections shall be easily accessible, without interference from buildings, fences or other objects.

A listed check valve shall be installed in each FDC.

An FDC shall be installed on the system side of the system check and control valves, and on each side of a sectional valve.

The FDC shall not be connected to the suction side of a fire pump.

Parking shall be prohibited in front of and within 20 feet of the hose connections. FDC's shall be located within 18 and 48 inches of adjacent grade or access level; and when possible shall be located within 90 feet of a fire hydrant.

Two 2" inch hose connections shall be supplied by a 4 inch pipe when the riser is 4 inches or larger; a single 2" inch hose connection supplied by a 3 inch pipe may be used when the riser is 3 inches or smaller.

1.09 APPROVAL PROCEDURE

Underground fire services for fire hydrants and/or automatic fire protection systems shall be included in civil drawings or on site plan at time of submittal for building permit. Plans shall include piping from street connection to termination at building or at hydrant, or both. Locations of existing (or proposed new) off-site fire hydrants, FDC, and approved shut-off valve shall also be included. If required fire protection system check valve will be underground, it shall also be included.

Aboveground automatic fire sprinkler and standpipe system plans may be submitted separately to Fire Department after building permit for the structure is issued. A separate permit is not required unless the fire sprinkler installation is the only work being done.

All fire sprinkler systems shall be designed and installed in accordance with NFPA Standard 13; all standpipe systems shall be designed and installed in accordance with NFPA Standard 14.

A minimum of three sets of complete plans shall be submitted.

Plans shall be approved by Fire Department prior to start of construction.

1.10 INSPECTION AND TEST PROCEDURES

All required inspections and tests shall be witnessed by Fire Department personnel. It is the installing contractors responsibility to schedule and be present during all inspections and tests. Contact the Fire Prevention Bureau 24 hours prior to desired inspection or test to schedule an appointment.

One set of APPROVED plans shall be kept on the job site during construction.

All private fire system trenches, piping, joints, valves and pipe restraints (thrust blocks or other approved method) shall be inspected prior to covering.

All private fire main piping, supplying only fire hydrants, shall be hydrostatically tested at 150 psi for 1 hour; all fire main piping supplying a sprinkler system shall be hydrostatically tested at 200 psi for 2 hours. This test will be against a blind flange (skillet). It is recommended that the pipe only be backfilled between joints during this test so that leaks can be easily detected. The hot tap to the City main will not be made until this test has been completed.

**TABLE I.1
FLOW RATE TO PRODUCE VELOCITY OF 10FT/SEC**

Pipe Size (in.)	Flow Rate (gpm)
4	390
6	880
8	1560
10	2440
12	3520

The main shall be thoroughly flushed to remove foreign materials. The minimum flow rate shall be the water demand rate of the system or the necessary flow rate to provide a velocity of 10 feet per second, whichever is greater.

All fire hydrants shall be installed and tested prior to building construction. Furthermore, the fire hydrant must have unobstructed access and be maintained operational at all times.

Appendix J

City of Modesto



Village One PVC Sewer Standards

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PVC Sewers - Village One

TABLE OF CONTENTS

SECTION	TEXT PAGE
1.01. General	J-1
1.02. Design	J-1
1.03. Manholes	J-1
1.04. PVC Pipe Material	J-1
1.05. Excavation	J-3
1.06. Sewer Service Materials	J-3
1.07. Bedding	J-3
1.08. Backfill	J-4
1.09. Air Pressure Test	J-4
1.10. Deflection Testing	J-6
1.11. Inspection	J-7
1.12. Special Notes and Details Required on Design Plans	J-7

TABLES:

J.1	Air Pressure Testing Chart	J-5
J.2	Description of Material Classification (ASTM D 2321)	J-8

DETAILS:

811V	PVC Sewer Trench Backfill in Undeveloped Streets	Detail No. 811V
812V	PVC Sewer Trench Backfill in Existing Streets	Detail No. 812V

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APPENDIX J

SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF POLYVINYL CHLORIDE PIPE FOR SANITARY SEWERS WITHIN VILLAGE ONE

1.01 GENERAL

The installation of Polyvinyl Chloride (PVC) pipe sewers is allowed in Village One only. It is being allowed as an experiment to evaluate the use of this type of pipe, the field installation, and the long-term stability of the pipe. PVC pipe sewers shall be installed by a Contractor holding the appropriate license for such work under the provisions of the State of California Business and Professions Code. **These special specifications are a supplement to the current Modesto Standard Specifications.** Where there is a conflict of specifications, these specifications shall take precedence.

Due to the care needed to install PVC sewer pipe correctly, the developer shall hire an independent geotechnical firm to provide 100% inspection of the sewer line installation.

1.02 DESIGN

PVC pipe sewers shall not be used for sewers that exceed the nominal diameter of 8-inches. PVC pipe sewers shall be sized to carry the quantity of sewage which will be discharged from their service area with a minimum design flow of 0.007 cfs/acre. When using PVC, sewer mains shall be no smaller than 8-inch diameter. Eight inch diameter sewers shall have a grade of not less than 0.35% (n coefficient = .013).

All sewers shall have a minimum cover of 3-feet 6 inches from the top of the pipe to finished grade and a minimum of 2 feet to bottom of street subgrade. Sewers with less than minimum cover shall be ductile iron pipe.

1.03 MANHOLES

Connections of PVC pipe and fittings to a manhole shall be water tight. The use of manhole water stops per manufacturer's requirements shall be approved by the City Engineer prior to the installation of any pipe or fitting.

1.04 PVC PIPE MATERIAL

PVC pipe and fittings 4 inch through 8 inch shall conform to the current ASTM Specifications D-3034 **SDR 26** with an initial pipe stiffness of 46 lbs./in./in. Additives and fillers including but not limited to stabilizers, antioxidants, lubricants, colorants, etc., shall not exceed 10 parts by weight per 100 parts of PVC resin in the compound per ash test results conducted in accordance with ASTM D817.

All pipe, fittings, and couplings shall be clearly marked at intervals not to exceed 5 feet as follows:

- 1) Nominal pipe diameter.
- 2) Date of Manufacture.
- 3) Manufacturer's name or logo.
- 4) ASTM and SDR designation.

For fittings and couplings, the Pipe Stiffness is not required.

All pipe and fittings shall be suitable for use as a gravity sewer conduit, with provisions for expansion and contraction at each joint. All joints shall be made with flexible elastomeric seals meeting the requirements of ASTM D3212, and shall be capable of passing all tests specified in said standard and within these specifications. A factory-applied reference mark shall be provided on the spigot end to ensure proper positioning in the adjoining bell. The pipe shall be uniform in color, opacity, density, and other physical properties.

Wyes for house service connections shall be complete molded fittings. Solvent type saddle and wye are not allowed at any time.

Any wye found to have been solvent welded will require the complete removal of both pipe and joint and replacement with a complete fitting and repair couplings. The cost of repairs shall be borne by the Contractor.

Written certification (compliance), by the manufacturer, shall be submitted showing that all pipe and fittings meet the requirements herein.

When testing is required by the City Engineer because of suspect quality or because the date of manufacture to installation exceeds 13 months, one test pipe shall be selected at random by the City Engineer from each 1,000 feet or fraction thereof of each size of pipe delivered to the work site. But no less than one test pipe per lot. The length of specimen for each selected pipe shall be a minimum of 8 feet. The cost of such tests shall be borne by the Contractor.

The standards for testing set forth in the specifications will need to be 95% or better of ASTM's recommended initial values for Tensile Strength, Modulus of Tensile Elasticity, Pipe Flattening and Stiffness. Impact strength will meet 90% of the recommended ASTM value for pipe manufacturers.

Flexible Pipe not installed within 120 days of the latest test shall not be used without prior written approval from the City Engineer.

Care shall be taken during transporting of the pipe to insure that the binding and tie down methods do not cut the pipe in any manner. Pipe bowed, deformed or otherwise damaged during shipping or storage shall be rejected.

Pipe stored on the job site for an excessive duration, over 8 months, shall be covered with canvas or other opaque material to protect it from the sun's rays. Air circulation shall be provided under the covering.

Pipe shall be made of PVC plastic having a cell classification of 12454-B or C as defined in ASTM D 1784. The fittings shall be made of PVC plastic having a cell classification of 12454-C. PVC compounds of other cell classifications shall be approved by the City Engineer.

1.05 EXCAVATION

Trench width shall be a minimum width not less than the greater of either the pipe outside diameter plus 16in. (400mm) or the pipe outside diameter times 1.25 plus 12 in. (300 mm).

PVC sewer pipes shall be over excavated a minimum of 4 inches below the pipe or bell, which ever is lower in elevation.

1.06 SEWER SERVICE MATERIALS

PVC pipe shall be used for all sewer services from 4 inches to 8 inches. PVC pipe shall not be used for any sewer services on VCP or Ductile Iron Sewer Mains. PVC pipe shall not be used for any sewer services over 8 inch in diameter.

Connections to PVC Pipe sewer mains shall utilize a wye fitting. Tee connections to PVC Pipe will not be allowed. Solvent type fittings are not allowed.

When cutting in a wye, 3/4 inch crushed stone shall be placed under the main line and the sewer service lateral within the right of way line.

1.07 BEDDING

PVC pipe and fittings shall be bedded in conformance with these specifications.

Bedding shall be defined as that material supporting, surrounding, and extending a minimum of 4 inches under the pipe or projecting bell which ever is lowest to 1 foot above the top of the pipe or projecting bell which ever is highest. Where it becomes necessary to remove boulders or other interfering objects at subgrade for bedding, any void below such subgrade shall be filled with the bedding material.

If soft, spongy, unstable, or other similar material is encountered upon which the bedding material is to be placed, this unsuitable material shall be removed to a depth ordered by the City Engineer and replaced with bedding material of suitable density.

Bedding Material shall first be placed on a firm and unyielding subgrade so that the pipe is supported for the full length of the barrel. There shall be a minimum of 4 inches of bedding below the pipe barrel or projecting bell which ever is lowest. Haunching of the Class II bedding around pipe shall be done by hand to provide the maximum performance. Bedding material shall be placed, and densified by mechanical means in lifts not exceeding 6 inches to an elevation of 1 foot over the top of the pipe. Bedding material shall be compacted to 90 percent relative compaction. Jetting of the bedding material will not be allowed. Unless the sheeting and shoring is to be cut off and left in place, densification of bedding for pipe shall

be accomplished after the sheeting or shoring has been removed from the bedding zone, and prior to the placement of backfill.

Remaining backfill shall be in accordance with the Modesto Standard Specifications unless noted on the improvement plans.

Except where otherwise specified, bedding material shall consist of clean sand & gravels, Class II material (ASTM designation D 2321-72) or manufactured granular angular material, Class IB (ASTM designation D 2321-72). The description of the material may also be found in Table 10.8 of the Uni-Bell Handbook of PVC Pipe.

Written certification, by a certified geotechnical laboratory, shall be submitted showing that the bedding material meets the requirements herein prior to the placement. If the sand bedding material changes, the Contractor shall resubmit written certification that the new bedding material meets the requirements herein.

1.08 BACKFILL

PVC pipe shall be bedded with 100% sand. Above this bedding, all clods of any kind shall be removed which are larger than 3 inches in diameter. Ponding or jetting may not be allowed.

In existing paved streets, Class 1 aggregate sub-base conforming to Section 25-1.02A of the State Standards shall be used as the backfill material where a sewer wye is installed on an existing main. Ponding or jetting will not be allowed in existing paved streets, either paved or undeveloped.

Compaction tests shall be performed by a soils technician under the supervision of a registered Geotechnical Engineer retained at the Contractor's expense.

Due to the nature of the Village soils, the contractor shall provide 4" of bedding under the pipe and 12" above the pipe.

1.09 AIR PRESSURE TEST

The Contractor shall furnish all materials, equipment, and labor for making an air test. Air test equipment shall be approved by the City Engineer unless otherwise provided on the Plans or in the Specifications.

The Contractor may conduct an initial air test of the sewer mainline after densification of the backfill, but prior to installation of the house connection sewers. Such tests will be considered to be for the Contractor's convenience and need not be performed in the presence of the City Engineer.

Each section of sewer shall be tested between successive manholes by plugging and bracing all openings in the sewer mainline and the upper ends of all house connection sewers. Prior to any air pressure testing, all pipe plugs shall be checked with a soap solution to detect any air leakage. If any leaks are found, the air pressure shall be released, the leaks eliminated, and

the test procedure started over again. The Contractor has the option of wetting the interior of the pipe prior to the test.

The final leakage test of the sewer mainline and branching house connection sewers, shall be conducted in the presence of the City Engineer in the following manner:

Air shall be introduced into the pipeline until 3.0 psi gage pressure has been reached, at which time the flow of air shall be reduced and the internal air pressure shall be maintained between 2.5 and 3.5 psi gage pressure for at least 2 minutes to allow the air temperature to come to equilibrium with the temperature of the pipe walls. Pressure in the pipeline shall be constantly monitored by a gage and hose arrangement separate from hose used to introduce air into the line. Pressure in the pipeline shall not be allowed to exceed 5 psi gage pressure.

**TABLE J.1
AIR PRESSURE TEST**

Main Line		4" House Connection				
Diameter (Inches)	Length (Feet)	House Connection Length				
		0 ft.	100 ft.	200 ft.	300 ft.	400 ft.
8	0	0	20	40	50	70
	50	40	50	70	90	80
	100	70	90	100	100	90
	150	110	120	110	100	100
	200	140	120	110	110	100
	300	140	130	120	110	110
	400	140	130	120	120	110

Main Line		6" House Connection				
Diameter (Inches)	Length (feet)	House Connection Length				
		0 ft.	100 ft.	200 ft.	300 ft.	400 ft.
8	0	0	40	80	100	100
	50	40	70	110	110	110
	100	70	110	120	110	110
	150	110	120	120	120	110
	200	140	130	120	120	120
	300	140	130	120	120	120
	400	140	130	130	120	120

Time in Seconds for Pressure to Drop from 2.5 to 1.5 psi Gage Pressure

After the temperature has stabilized and no air leaks at the plugs have been found, the air pressure shall be permitted to drop and, when the internal pressure has reached 2.5 psi gage pressure, a stopwatch or sweep-second-hand watch shall be used to determine the time lapse required for the air pressure to drop to 1.5 psi gage pressure.

If the time lapse (in seconds) required for the air pressure to decrease from 2.5 to 1.5 psi gage pressure exceeds that shown in Table No. 5.2 the pipe shall be presumed to be within acceptance limits for leakage.

If the time lapse is less than that shown in Table No. 5.2 the Contractor shall make the necessary corrections to reduce the leakage to acceptance limits.

1.10 DEFLECTION TESTING

Deflection testing shall be conducted following final compaction of the rock base in the streets but no sooner than 30 days following pipe installation. Percent allowable deflection shall follow the ASTM Standards. With the Village standard of 8" PVC sewer pipe, the maximum permissible deflection is 4%.

Following the placement and densification of backfill and prior to the placing of permanent pavement, 100 percent of all mainline PVC sewer pipe installed shall be cleaned and measured for obstructions (deflections, joint offsets, and lateral pipe intrusions). A rigid, odd numbered-leg (9 legs minimum) mandrel, with a circular cross section having a minimum diameter at any point along the full length of 7.282 inches, shall be pulled through the pipe by hand in the presence of the City Engineer. The minimum length of the circular portion of the mandrel shall be equal to the ID of the pipe. Contractor shall submit its design of the mandrel to the City Engineer for approval. Once the deflection testing has started the mandrel(s) shall stay in the possession of the City Engineer.

The initial maximum deflection shall be 5%. Vertical deflection exceeding 5% shall be cause for rejection of the pipe and all related work. Any over deflected pipe shall be uncovered and, if not damaged, reinstalled. Damaged pipe shall not be reinstalled, but shall be removed from the work site. Any pipe subjected to any method or process other than removal, which attempts, even successfully, to reduce or cure any over deflection, shall be uncovered, removed from the job site and replaced with new pipe (such as the use of a "re-rounder"). Any pipe found to be re-rounded will be replaced from structure to structure with new pipe at the expense of the contractor.

All deflection testing conducted by the Contractor shall be under the supervision and approval of the City Engineer. All reports and records of deflection testing shall be given to the City Engineer. The costs of the initial deflection test shall be borne by the contractor. Any retests for vertical deflection due to failure shall be borne by the contractor.

The maximum 11 month deflection for PVC pipe shall be 6 percent. The City will conduct deflection testing approximately one month prior to expiration of the contractor's one-year warranty period. Any pipe failing the 6% deflection test within the one-year warranty period will be subject to replacement by the Contractor at his/her expense.

Any pipe which has been replaced will be re-tested by the contractor at his/her expense.

1.11 INSPECTION

One hundred percent independent inspection is required for the installation of PVC sewer pipe. Defects such as high and low spots, joint separations, offset joints, chipped ends, cracked or damaged pipe, infiltration points, and debris in lines shall be corrected by the contractor at

his/her expense. For joint separations, low spots, and chipped ends, the following maximum acceptable limits will apply for eight and ten inch pipes:

Joint separations - 1/2 inch

Low spots -	6"	-	1/2" (.04')	Depth tolerance of trapped water
	8"	-	3/4" (.06')	
	10"	-	1" (.08')	
	12" & larger		depth tolerance = 10% of pipe area	

Chipped ends - 1/4 inch

For pipe larger than 10 inches, specific maximum limits will be specified by the City for each project.

1.12 SPECIAL DETAILS REQUIRED ON DESIGN PLANS

Design Engineers specifying the use of 8" PVC sewer line shall place the standard trench backfill detail within the set of improvement plans and a note detailing the mandrel and air test requirements.

TABLE J.2
DESCRIPTION OF MATERIAL CLASSIFICATION
As Defined in ASTM D 2321

Class	Type	Soil Group Symbol	Description ASTM D 2487	<u>Percentage Passing Sieve Sizes</u>			<u>Atterberg Limits</u>		<u>Coefficients</u>	
				1.5 in (40mm)	No. 4 (4.75mm)	No. 200 (0.075 mm)	LL	PI	Uni- formity C _U	Curva- ture C _C
IA	Manufactured Aggregates: open-graded class	None	Angular, crushed stone or rock, crushed gravel, broken coral, crushed slag, cinders or shells; large void content, contain little or no fines	100%	≤10%	<5%	Non Plastic			
IB	Manufactured, Processed Aggregates: dense-graded, clean	None	Angular, crushed stone (or other Class IA materials) and stone/sand mixtures with gradations selected to minimize migration of adjacent soils; contain little or no fines	100%	≤50%	<5%	Non Plastic			
II	Coarse-Grained Soils, clean	GW	Well-graded gravels and gravel-sand mixtures; little or no fines	100%	<50% of Coarse Fraction	<5%	Non Plastic		>4	1 to 3
		GP	Poorly-graded gravels and gravel-sand mixtures; little or no fines						<4	<1 or >3
		SW	Well-graded sands and gravelly sands; little or no fines						>6	1 to 3
		SP	Poorly-graded sands and gravelly sands; little or no fines						<6	<1 or >3
	Coarse-Grained Soils, borderline clean w/fines	eg. GW-GC, SP-SM	Sands and gravels which are border-line between clean and with fines	100% 12%	Vanes	5% to	Non Plastic		Same as for GW, GP, SW and SP	

APPENDIX K

EASEMENT DEEDS

1.01 GENERAL

The City of Modesto may require dedication of public right of way associated with development or utility operations or maintaining city trees. To expedite the dedication, the consulting engineer shall prepare the dedication for the City Engineer's signature using the format and signature block as shown in this appendix. Any questions about the format may be directed to the City Engineer.

Any offers of dedication will be sent through Development Services, Community Development Department. Offers will be forwarded from Community Development to Public Works and Transportation. Within Public Works and Transportation, the City's surveyor will check the description and Encroachment Permits will check for form and record the dedication at the Stanislaus Records Office.

The consulting engineer or individual offering dedication will provide all documentation referenced in the dedication map. In other words, a preliminary title report and all referenced maps, surveys, and deeds referenced in the dedication. The title report shall have been prepared within the past sixty (60) days. All offerings of dedications shall have a platt.

1.02 SIGNATURES

A. Individual

Individuals or married couples by legal definition.

B. Partnership

A partnership only requires the signature of one partner to be legal. The signing partner must have documentation to prove he/she is a partner and the partnership by-laws allow just one signature. Usually the name of the partnership is printed above the signatures. The name and title of the partner(s) should be printed below the signature lines.

C. Corporations

A Corporation requires the signatures of two authorized corporate officers or one signature and the corporate seal. The signing parties must have documentation to their corporate status and the corporate by-laws establishing their signature as legal. Usually the name of the corporation is printed above the signatures. The name and title of corporate officers should be printed below the signature lines.

EXAMPLE A

3337 Coffee Road
EASEMENT FOR PUBLIC RIGHT OF WAY
Lot Por Block 12419
APN 013-8263

Recording Requested by
City of Modesto

When Recorded Mail To:
City of Modesto
City Clerk
P. O. Box 642
Modesto, California 95353

EASEMENT DEED
Individual

JOHN H. DOE and MARY K. DOE, trustees of the J & M DOE Living Trust as to an undivided 1/2 interest as tenants in common, and JOE G. DOE and LAURA K. DOE, husband and wife as joint tenants as to an undivided 1/2 interest,

GRANTS and dedicates to the CITY OF MODESTO, a municipal corporation, an easement for public right of way purposes, including but not limited to the right to construct, operate, maintain, replace, remove and renew a public street, sidewalk, utilities, street trees and appurtenances thereto, over, under, upon and across the following described real property in the State of California, County of Stanislaus, City of Modesto.

description

Containing xxx Sq. Ft., more or less.

Dated:

JOHN H. DOE, TRUSTEE

JOE G. DOE

Dated:

MARY K. DOE, TRUSTEE

LAURA K. DOE

This is to certify that the interest in real property conveyed by this deed is hereby accepted by order of the Modesto Municipal Code Section 7-1.701(d), adopted April 13, 1993, and the grantee consents to recordation thereof.

Date:

By:

GLEN LEWIS, City Engineer
City of Modesto

EXAMPLE B

1008 Petaluma Drive
PLANTING EASEMENT
Lot 16 Block 5306
APN 029-4081

Recording Requested by
City of Modesto

When Recorded Mail To:
City of Modesto
City Clerk
P. O. Box 642
Modesto, California 95353

EASEMENT DEED
Individual

JOHN DOE and JANE DOE, husband and wife, as joint tenants,

GRANTS to the CITY OF MODESTO, a municipal corporation, an easement for the planting, maintenance, and removal of existing and new street trees, together with the right of ingress and egress therefrom, over, across, and under the real property in the State of California, County of Stanislaus, City of Modesto, described as follows:

description

Dated:

JOHN DOE

JANE DOE

This is to certify that the interest in real property conveyed by this deed is hereby accepted by order of the Modesto City Council Resolution No. 96-331, adopted June 11, 1996, and the grantee consents to recordation thereof.

Date:

By:

GLEN LEWIS, City Engineer
City of Modesto

EXAMPLE C

FLOYD AVENUE
EASEMENT FOR PUBLIC UTILITIES
Portion Block 11371
APN 052-2312

Recording Requested by:

City of Modesto

When Recorded Mail To:

City of Modesto
City Clerk
P. O. Box 642
Modesto, CA 95353

EASEMENT DEED
Corporation

XYZ VENTURE, a joint venture composed of ABC CORPORATION, a California Corporation, and JACKS, Inc., a California Corporation,

GRANTS to the CITY OF MODESTO, a municipal corporation, an easement for public utilities to construct, operate, maintain, replace, remove and renew the facilities and appurtenances together with the right of ingress thereto and egress therefrom over, under and across the following described real property in the State of California, County of Stanislaus, City of Modesto:

description

ABC CORPORATION,
A California corporation

JACKS,
A California Corporation

By _____ Date _____

By _____ Date _____

(Typed Name) (Office)

(Typed Name) (Office)

By _____ Date _____

By _____ Date _____

(Typed Name) (Office)

(Typed Name) (Office)

This is to certify that the interest in real property conveyed by this deed is hereby accepted by order of the Modesto City Council Resolution No. 96-331, adopted June 11, 1996, and the grantee consents to recordation thereof.

Date: _____

By: _____
GLEN LEWIS, City Engineer
City of Modesto

APPENDIX L

MODESTO WATER OUTSIDE CITY LIMITS

1.01 GENERAL

With the City of Modesto's acquisition of the Del Este Water System, the City of Modesto has accepted the responsibility to provide water to customers outside the city limits. To help provide quality service and direction for the development community, the following specifications were developed. These specifications give only an outline of the design, fees, and processing requirements for water service outside the city limits. Please refer specific questions to our utilities division, ph. (209) 571-5102 or city building permits at ph (209) 577-5232.

1.02 DESIGN

The design requirements are identical to the City Modesto Standard Specifications except for horizontal location. These locations are dictated by the local agency in charge of public right-of-way. A signature block shall be provided on the cover sheet of development plans for the City of Modesto Utilities Division.

All improvement plans shall contain at least the following water notes on the cover or second sheet of the improvement plans:

WATER NOTES:

1. WATER LINE MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF MODESTO STANDARD SPECIFICATIONS.
2. WATER LINE CROSSINGS SHALL MEET STATE HEALTH STANDARDS.
3. ALL WATER LINES SHALL BE TESTED AND DISINFECTED IN CONFORMANCE WITH THE CITY OF MODESTO STANDARDS PRIOR TO FINAL ACCEPTANCE.
4. CONTRACTOR SHALL STAMP A "W" AT THE FACE OF SIDEWALK DIRECTLY OVER THE SERVICE LATERAL.
5. ALL CONNECTIONS TO THE EXISTING WATER FACILITIES SHALL BE MADE BY THE CITY OF MODESTO'S WATER SERVICE CREWS.
6. FIRE HYDRANT ASSEMBLIES TO MEET THE LOCAL FIRE DEPARTMENT STANDARDS. (*Design consultant shall note the type of assembly*). TESTING OF FIRE HYDRANTS SHALL CONFORM TO THE LOCAL FIRE DEPARTMENT'S AND/OR AGENCY'S STANDARDS.

7. CONTRACTOR SHALL OBTAIN A CITY OF MODESTO ENCROACHMENT PERMIT PRIOR TO THE START OF WATERLINE CONSTRUCTION. CONTRACTOR SHOULD VERIFY THE CITY OF MODESTO HAS RECEIVED ITS SETS OF IMPROVEMENT PLANS BEFORE COMING TO CITY HALL FOR AN ENCROACHMENT PERMIT (ph (209) 577-5264). CONTRACTOR MAY OBTAIN AN ENCROACHMENT PERMIT BY PHONE/FAX.
8. ALL WATERLINE CONSTRUCTION MUST BE INSPECTED BY THE CITY OF MODESTO CONSTRUCTION INSPECTION - ph (209) 577-5452.

1.03 FEES

The following fees apply:

- A. Systems Fee (based on net sf - may or may not apply depending on area) - Pays for development of wells and transmission mains (12" or larger main).
- B. Connection Charge (mandatory charge) - City crews will perform the tap into main.
- C. Meter Charge (mandatory charge) - Charge for future meter installation.
- D. Plan Check - Pays for city utility engineer to review plans and sign the improvement plans. Paid based on current fee schedule. Paid with the city inspection fee.
- E. City Inspection Fee - Pays for city inspectors to inspect the construction of the pipeline, certify the testing and chlorination of the water line, and provide the governing agency a letter of acceptance after all tests are completed and the city inspection and plan check bill has been paid.
- F. Lateral Fee (may or may not apply depending on area and type of connection) - Fee to connect to an existing line based on the lot frontage. Most subdividers install their own lateral and do not pay this fee.
- G. Reimbursement Agreement - A written agreement between the city and the developer to secure reimbursement for a line extended by the developer to serve his/her subdivision at his/her cost which may benefit other developers in the future. This agreement has a 10-year life. Any developer connecting up to this line will pay a fee, which will be transferred to original developer. No interest or cost index may be attached to the construction costs.
- H. Local agency fees to include inspection, soils compaction testing, and pavement patching fees.

1.04 PROCESS

The following process is involved for the water utility's approval. This process is in addition to the governing agency's due process.

- A. Developer secures agreement from the utility or water board to serve water in this area. This may or may not be an issue.
- B. Submit plans to the City of Modesto Utilities Division for approval. A signature block for the utility must be provided on the cover sheet of the improvement plans.
- C. After approval of the plans, develop pulls permits from City of Modesto Building Department for payment of the various fees except inspection. Building Department will notify the water department when fees are paid. Contractor must schedule the water crews to make any connection to an existing water line.
- D. In addition to any local jurisdiction's encroachment permit, the developer or contractor shall pull a City of Modesto encroachment permit to construct the water line. Contractor to provide 4 prints of the cover sheet and water plan sheet(s) prior to receiving an encroachment permit. Scans of the prints shall be provided on compact disk. Scans to be at 200 dpi and converted to an Adobe PDF file (single file). Contractor shall notify City of Modesto inspection before start of waterline construction. A telephone number is provided on the encroachment permit. City of Modesto reserves the right to reject pipeline construction done without inspection.
- E. After contractor receives a final inspection of the waterline, the developer will be billed for the inspection and plan check. Developer must pay the invoice before a letter of acceptance is provided to the developer and governing agency.

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APPENDIX M

CRITERIA FOR THE SEPARATION OF WATER MAINS AND SANITARY SEWERS

1.01 GENERAL

The following criteria has been extracted form the State of California's Department of Health Standards. In this section, the Department of Health clarifies Section 64630, Title 22, of the California Administrative Code for water and sewer separation.

The City has also received clarification from the State Department of Health that storm drain and irrigation pipes shall be treated with the same respect as sanitary sewers.

The engineer of developer has the option to reverse the following cases by re-constructing an existing facility while constructing a new facility. The final product will require any gravity operated system to remain a gravity system.

A. PUBLIC HEALTH CONSIDERATIONS

Waterborne disease outbreaks attributed to the entry of sewage-contaminated groundwater into the distribution systems of public water supplies continue to be a problem in the United States. A community with its buried water mains in close proximity to sanitary sewers is vulnerable to waterborne disease outbreaks.

Sanitary sewers frequently leak and saturate the surrounding soil with sewage. This is caused by primarily by structural failure of the sewer line, improperly constructed joints, and subsidence or upheaval of the soil encasing the conduit. A serious public health hazard exists when the water mains are depressurized and no pressure or negative pressures occur. The hazard is further compounded when, in the course of installing or repairing a water main, existing sewer lines are broken. Sewage spills into the excavation and, hence, enters into the water main itself. Additionally, if a water main fails in close proximity to a sewer line, the resultant failure may disturb the bedding of the sewer line and cause it to fail. In the event of an earthquake or man-made disaster, simultaneous failure of both conduits often occurs.

The water supplier is responsible for the quality of the water delivered to consumers and must take all practical steps to minimize the hazard of sewage contamination to the public water supply. Protection of the quality of the water in the public water system is best achieved by the barrier provided by the physical separation of the water mains and sewer lines.

This document sets forth the construction criteria for the installation of water mains and sewer lines to prevent contamination of the public water supplies from nearby sanitary sewers.

B. BASIC SEPARATION STANDARDS

The "California Waterworks Standards" sets forth the minimum separation requirements for water mains and sewer lines. These standards, contained in Section 64630, Title 22, California Administrative Code, specify:

- a) Parallel Construction: The horizontal distance between pressure water mains and sewer lines shall be at least 10 feet.
- b) Perpendicular Construction (Crossing): Pressure water mains shall be at least one foot above sanitary sewer lines where these lines must cross.
- c) Separation distances specified in (a & b) shall be measured from the nearest edges of the facilities.
- d) Common Trench: Water mains and sewer lines must not be installed in the same trench.

When water mains and sanitary sewers are not adequately separated, the potential for contamination of the water supply increases. Therefore, when adequate physical separation cannot be attained, an increase in the factor of safety should be provided by increasing the structural integrity of both the pipe materials and joints.

C. EXCEPTIONS TO BASIC SEPARATION STANDARDS

Local conditions, such as available space, limited slope, existing structures, etc., may create a situation where there is no alternative but to install water mains or sewer lines at a distance less than that required by the Basic Separation Standards. In such cases, alternative construction criteria as specified in Section E should be followed, subject to the special provisions in Section D.

Water mains and sewers of 24 inches diameter or greater may create special hazards because of the large volumes of flow. Therefore, installation of water mains and sewer lines 24 inches of diameter or larger should be reviewed and approved by the health agency prior to construction.

D. SPECIAL PROVISIONS

- 1. The Basic Separation Standards are applicable under normal conditions for sewage collection lines and water distribution mains. More stringent requirements may be necessary if conditions, such as, high groundwater exist.
- 2. Sewer lines shall not be installed within 25 feet horizontally of a low head (5 psi or less pressure) water main.

3. New water mains and sewers shall be pressure tested where the conduits are located ten feet apart or less.
4. In the installation of water mains or sewer lines, measures should be taken to prevent or minimize disturbances of the existing line. Disturbance of the supporting base of this line could eventually result in failure of this existing pipeline.
5. Special consideration shall be given to the selection of pipe materials if corrosive conditions are likely to exist. These conditions may be due to soil type and/or the nature of the fluid conveyed in the conduit., such as a septic sewage which produces corrosive hydrogen sulfide.
6. Sewer Force Mains
 - a) Sewer force mains shall not be installed within ten feet (horizontally) of a water main.
 - b) When a sewer force main must cross a water line, the crossing should be as close as practical to the perpendicular. The sewer force main should be at least one foot below the water line.
 - c) When a new sewer force main must cross under an existing water main, all portions of the sewer force main within ten feet (horizontally) of the water main shall be enclosed in a continuous sleeve.
 - d) When a new water main crosses over an existing sewer force main, the water main shall be constructed of pipe materials with a minimum rated working pressure of 200 psi or equivalent pressure rating.

E. ALTERNATE CRITERIA FOR CONSTRUCTION

The construction criteria for sewer lines or water mains where the Basic Separation Standards cannot be attained are shown in Details Sections 500 and 600. There are two situations encountered:

Case 1 – New sewer line – new or existing water main.

Case 2 – New water main – existing sewer line.

For Case 1, the alternate construction criteria apply to the sewer line.

For Case 2, the alternate construction criteria may apply to either or both the water main and sewer line.

The construction criteria should apply to the house sewer laterals that cross above a pressure water main but not those house laterals that cross below a pressure water main.

CASE 1: New Sewer Being Installed (Details Section 500)

<u>Zone</u>	<u>Special Construction Required for Sewer</u>

- A. Sewer lines parallel to water mains shall not be permitted in this zone without approval from the responsible health agency and water supplier.
- B. A sewer line placed parallel to a water line shall be constructed of:
 - 1. Extra strength vitrified clay pipe with compression joints.
 - 2. Plastic sewer pipe with rubber ring joints (per ASTM D3034) or equivalent.
 - 3. Cast or ductile iron pipe with compression joints.
 - 4. Reinforced concrete pressure pipe with compression joints (per AWWA C302-74).

CASE 2: New Water Mains Being Installed (Details Section 600)

<u>Zone</u>	<u>Special Construction Required for Sewer</u>

- A. No water mains parallel to sewers shall be constructed without approval from the health agency.
- B. If the sewer paralleling the water main does not meet the Case 1, Zone B, requirements, the water main shall be constructed of:
 - 1. Ductile iron pipe with hot dip bituminous coating.
 - 2. Dipped and wrapped one-fourth-inch-thick welded steel pipe.
 - 3. Class 200, Type II, asbestos-cement pressure pipe.
 - 4. Class 200 pressure rated plastic water pipe (DR 14 per AWWA C900) or equivalent.
- C. Reinforced concrete pressure pipe, steel cylinder type, per AWWA (C300-74 or C301-79 or C303-70).
- D. If the sewer crossing the water main does not meet the Case 1, Zone C, requirements, the water main shall have no joints in Zone C and be constructed of:
 - 1. Ductile iron pipe with hot dip bituminous coating.
 - 2. Dipped and wrapped one-fourth-inch-thick welded steel pipe.

3. Class 200 pressure rated plastic water pipe (DR 14 per AWWA C900) or equivalent.
4. Reinforced concrete pressure pipe, steel cylinder type, per AWWA (C300-74 or C301-79 or C303-70).

1.02 NOTES AND DEFINITIONS:

1. Health Agency – The Department of Health Services. For those water systems supplying fewer than 200 service connections, the local health officer shall act for the Department of Health Services.
2. Water Supplier – “Person operating a public water system” or “supplier of water” means any person who owns or operates a public water system.
3. Low Head Water Main – Any water main which has a pressure of five psi or less at any time at any point in the main.
4. Dimensions are from outside of water main to outside of sewer line or manhole.
5. Compression Joint – A push-on joint that seals by means of the compression rubber ring or gasket between the pipe and a bell or coupling.
6. Mechanical Joints – Bolted joints.
7. Rated Working Water Pressure or Pressure Class – A pipe classification system based upon internal working pressure of the fluid in the pipe, type of pipe material, and the thickness of the pipe wall.
8. Fused Joint – The jointing of sections of pipe using thermal or chemical bonding processes.
9. Sleeve – A protective tube of steel with a wall thickness of not less than one-fourth inch into which a pipe is inserted.
10. Ground Water – Subsurface water found in the saturation zone.
11. House Lateral – A sewer connection the building drain and the main sewer line.

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APPENDIX N
CITY OF MODESTO

PLANNING DOCUMENTATION
REQUIREMENTS
FOR THE
SWPPP

EXAMPLE OF COVER SHEET

Storm Water Pollution Prevention Plan (SWPPP)

For

(Name of Subdivision or development)



Owner: *Name*
 Address
 Telephone No.

Developer: *Name*
 Address.
 Telephone No.

Responsible Person: *Name*

Date of Notice of Intent Filed: *Date*

State Water Resources Control Board Permit No.: *Issued number*

STORM WATER POLLUTION PREVENTION PLAN FOR THE CITY OF MODESTO

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 City of Modesto Self-Compliance Certification	
2.0 Project Description	
3.0 Construction Worksheets	
4.0 Site Maps & Exhibits	
Appendix A	Best Management Practices (BMPs)
Appendix B	Copy of Notice of Intent (NOI)
Appendix C	City of Modesto Site Inspection Checklist(s)
Appendix D	Journal for Amendments & Inspection Log
Appendix E	Contractor Notice Letter
	Optional Items
	State General Permit
	Soils Report
	Development Conditions
	Specific Plan (Facility Diagrams)

SECTION 1

COMPLIANCE CERTIFICATION CHECKLIST

SECTION 1

CITY OF MODESTO

COMPLIANCE CERTIFICATION CHECK LIST

DEVELOPMENT OR SUBDIVISION NAME:

Engineering Firm:

Contact Person:

Telephone Number:

Assessor's Parcel No(s):

Development Conditions Resolution Number:

Specific Plan Area:

Grading Zone per Erosion & Control Standards (Section 16):

1.01 COVER SHEET

- ___ 1. ID of document i.e. SWPPP
- ___ 2. Owner name, address, & phone number.
- ___ 3. Developer name, address, & phone number.
- ___ 4. Responsible person.
- ___ 5. Date of Notice of Intent (NOI) Filed.
- ___ 6. State Water Resources Control Board Permit No:

1.02 TABLE OF CONTENTS SHEET

- ___ 1. Min. of four chapters with appropriate titles & content.
- ___ 2. Min. of four appendices with appropriate titles & content.

1.03 SECTION ONE - COMPLIANCE CHECKLIST

- ___ 1. Completed by applicant & signed (may all be hand written; forms available for reprint from within City of Modesto Standard Specifications.)

1.04 SECTION TWO - PROJECT DESCRIPTION

- ___ 1. Narrative of project covers the following:
 - a. Location of project – Stanislaus County, Modesto, CA
 - b. Acreage of project
 - c. Type of project (Subdivision –number of lots, commercial, industrial)

- d. Proximity to basins, streams, creeks
- e. Purpose of the SWPP
- f. Contents within this document

1.05 SECTION THREE - CONSTRUCTION WORKSHEETS

- ___ 1. SWPPP forms w/supplemental data sheet.
- ___ 2. Selected BMPs on the worksheets are included in Appendix A and conform to City of Modesto Standard Specs.

1.06 SECTION FOUR – SITE MAPS & EXHIBITS (minimum of 4 maps)

1.06a SITE LOCATION MAP

- ___ 1. North arrow
- ___ 2. Shading or cross hatching of Project location

1.06b EXISTING TOPOGRAPHICAL MAP ON USGS MAP (may be integrated with grading plan)

- ___ 1. Shows area extending one-quarter mile beyond the property boundaries of the subdivision (USGS).
- ___ 2. Data required per Worksheet 2 of the SWPPP.

1.06c GRADING PLANS

- ___ 1. Conform to Grading Plan Checklist (see Modesto Standard Specs, App D-2)
- ___ 2. Show proposed hydro-seeding or other protection for exposed slopes greater than 5% unless part of a temporary basin.
- ___ 3. Provide notes to indicate a SWPPP is required and on-site. Provide at least one detail of a BMPs related to sediment control for catch basins after the pavement has been placed.

1.06d GENERAL COMPLIANCE SITE PLAN – exclude most of the grading TC data. The purpose of the Site Map requirement of the is to provide contractor area to draw on a plan for controlling his construction activity and to clarify exactly what BMPs are to be constructed and where.

- ___ 1. Direction of flow for drainage.
- ___ 2. Proposed BMP measures
- ___ 3. Any off-limit areas (detail any fencing of these areas).
- ___ 4. All access points to the construction site.
- ___ 5. Slopes greater than 3:1 & toe of slopes
- ___ 6. Legend

- ___ 7. North Arrow
- ___ 8. Scale
- ___ 9. Proposed concrete & mortar wash pit(s) (completed by contractor on the job)
- ___ 10. Proposed construction material storage areas (may be addressed by notes)

1.06e COPY OF SPECIFIC PLAN(s) OR FACILITY MASTER PLAN SHEETS RELATED TO THE STORM DRAINAGE FOR THE AREA

1.07 APPENDIX A – BEST MANAGEMENT PRACTICES (BMPs)

- ___ 1. At a minimum, selected BMPs from worksheets in Section 3 are included in this section. All BMP diagrams must have instructions of how it is constructed, the specifications of materials used, and a maintenance and inspection plan described.

1.08 APPENDIX B – COPY OF NOTICE OF INTENT (NOI)

1.09 APPENDIX C – CITY OF MODESTO SITE INSPECTION CHECKLIST

- ___ 1. At least one blank checklist to make the on-site personnel aware of what City & State inspectors will be requiring.
- ___ 2. Copies of inspections made by City inspectors or internal inspections made by the owner or contractor or any of their representatives.

1.10 APPENDIX D – JOURNAL OF AMENDMENTS, VISITORS LOG, & REMARKS

- ___ 1. Blank journal sheet is in the SWWP per form.

1.11 APPENDIX E – COPY OF LETTERS NOTIFYING CONTRACTOR/ SUBCONTRACTORS

SECTION 2

PROJECT DESCRIPTION

SECTION 2
PROJECT DISCRIPTION
EXAMPLE ONLY

PROJECT STORM WATER OVERVIEW

The Happy Acres Estates Subdivision, located in the Village Three Specific Plan, is a 150 lot residential development occupying 7 acres in north Modesto, Stanislaus County, California. The development is bounded by Sylvan Avenue on the south, Claus Road on the east, and agricultural lands on the north and south sides.

The parcel topography slopes from the northeast to the southwest. The drainage currently enters a roadside ditch along Sylvan and travels almost 2 miles to an inlet at Sylvan and Oakdale. During severe storms, drainage sheet flows across Sylvan and enters the inlets along Sylvan. These inlets contribute to the Central basin in Village One. Drainage entering either the Sylvan or Village drainage areas and sent to detention basins and, in severe conditions, are pumped to Modesto Irrigation District (MID) Canals. The canals will eventually dump the water into the Tuolumne River.

The Specific plan calls for a master detention basin located approximately 6000 feet west of this site (see Chapter 4). Detention basins have the requirement to settle out solids and aid in re-charging the water table. In severe flood situations, the basins have the ability to pump excess water into a MID canal for release to the Tuolumne River. Currently, the basin is still only in the planning stages and will not be ready for this project.

This project will utilize a temporary storm drainage basin built to the City of Modesto Standard Specifications. The standards call for percolation of the onsite storm drainage basin. If the capacity is exceeded, the storm water will eventually make it into another detention basin system with percolation before entering any navigable waterway of the US. Construction which occurs before the completion of the storm drain system will make its way to one of the aforementioned basin areas before entering any creeks, steams, or rivers.

PURPOSE AND SCOPE OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

The purpose of the SWPPP is to:

- Identify pollutant sources that may affect the quality of discharges of storm water associated with the construction activities of the project.

- Identify, construct, and implement storm water pollution control measures to reduce pollutants in storm water discharges from the construction site during construction and after construction.

In this case, we will analyze how to prevent our sources of pollution from entering either Dry Creek or the Tuolumne River.

Chapters 3 and 4 contain all the analysis to the selection of the Best Management Practices (BMPs). Chapter 3 works through worksheets that provide the analysis and selects Best Management Practices (BMPs) to be implemented during this project. The City of Modesto Standard Specifications and Erosion and Sediment Control Standards and Specifications for Construction Activities in the City of Modesto are the minimum required resources for development of this SWPPP. Chapter 4 provides graphical data for the analysis and implementation of the SWPPP.

The SWPPP will be amended whenever there is a change in construction or operations which may affect the discharge of significant quantities of pollutants into receiving waters. The SWPPP will also be amended if it is violation of any condition of the Permit or has not achieved the general objective of reducing pollutants in storm water discharges.

Note: Shaded text added as boiler plate language to all SWPPPs

SECTION 3

CONSTRUCTION WORKSHEETS

REVISIONS	DATE

NOI attached?

☐ Yes

☐ No

Storm Water Pollution Prevention Plan (SWPPP) Worksheet California Construction General Permit

Worksheet 1. Project Information

Project Name: _____

Project Location: Street Address (or Equivalent): _____

City: _____ County: _____ Zip Code: _____

Project Owner: _____

Contact Person: _____ Phone No.: _____

Owner's Mailing Address: Street Address (or Equivalent): _____

City: _____ County: _____ Zip Code: _____

☐ Identify responsible personnel:

☐ Implementing and revising the SWPPP: _____

☐ Inspecting equipment: _____

☐ Regular inspections of BMPs: _____

☐ Training employees about BMPs affecting their job: _____

List all Contractors and Subcontractors responsible for implementing SWPPP for the project:

NAME	CONTACT PERSON	DATE WORK BEGINS	DATE WORK ENDS

Worksheet 2. Project Site Map Requirements

Please Check the Boxes, and provide supporting information as requested:

☐ Topographic Base Map Attached? Map shows:

- ☐ An area extending one-quarter mile beyond the property boundaries of the construction site:
- ☐ The boundary of the construction site. Construction Area = _____ Acres.
- ☐ Nearby surface water bodies, including water courses, wetlands, springs and wells.
- ☐ The location(s) where storm water drains onto or off of the property.
- ☐ Boundary of off-site areas that drain into the construction site.

☐ Site map(s) attached? Maps show:

- ☐ Temporary storm water structures used during construction.
- ☐ Areas used to store soils and construction waste.
- ☐ Areas of cut and fill.
- ☐ Drainage patterns and slopes anticipated after major grading activities, including the location of storm water structures to be constructed on the property (e.g., storm drains, detention ponds, channels).
- ☐ Areas of soil disturbance.
- ☐ Locations of potential soil erosion requiring BMPs during construction.
- ☐ Existing and proposed paved areas and buildings.

Existing Area: _____ percent of site

Proposed Area: _____ percent of site

- ☐ Estimated runoff coefficient before construction: _____ after construction: _____
(See the local municipality for approved runoff coefficients for your community.)
- ☐ Locations where storm water structures and controls will be built to control storm water pollution after construction is complete.
- ☐ The boundary of the drainage area upstream of each location where storm water leaves the property.
- ☐ Any vehicles storage and service areas.
- ☐ Areas of existing vegetation.

Worksheet 3. Inventory of Contractor's Activities and Special Site Conditions

Provide a description of contractor's activities that could result in the discharge of pollutants in the storm water runoff from the site. In addition, provide a description of the special site conditions that may impact pollutants in storm water discharges.

Contractor's Activities

- ☐ Describe toxic materials that are known to have been stored, disposed, spilled or leaked in significant quantities onto the construction site:

- ☐ Describe the construction materials, equipment and vehicles that comes in contact with storm water:

- ☐ Describe construction material loading, unloading and access areas/activities:

- ☐ Describe equipment storage, cleaning and maintenance areas/activities:

- ☐ Describe storage and disposal of construction materials (on-site and off-site):

Special Site Conditions

- ☐ Describe storm water structures and controls on the site prior to construction and how these structures/controls will be integrated into the SWPPP to reduce sediment and other pollutants in storm water discharges:

- ☐ List materials/waters other than storm water which will flow from the site during dry weather, the approximate amount of flow, and methods for preventing other dry weather flows:

Worksheet 4. BMPs for Contractor Activities

Provide a list of BMPs selected to reduce pollutants associated with contractor activities (see Worksheet 3). For each BMP selected, identify the pollution(s) of concern (see Table 1.1). Attach modified BMP fact sheets and/or appropriate information for the BMP selected. (See Chapter 4, BMPs for Contract or Activities.)

Contractor Activities (Worksheet 3)	Construction Practices			Materials Management			Waste Management					Vehicle & Equipment Management			Primary Pollutant(s) of concern
	CA1	CA2	CA3	CA10	CA11	CA12	CA20	CA21	CA22	CA23	CA24	CA30	CA31	CA32	
1. Toxic material on-site															
2. Construction material equipment & vehicles in contact with storm water															
3. Material loading, unloading and access areas/activities															
4. Equipment storage cleaning, and maintenance areas/activities															
5. Storage and disposal of construction materials (on- site and off-site)															

Worksheet 5. BMPs for Erosion and Sedimentation Control

[] Describe the source and composition of the existing soil and fill material
(Soil Report attached? Yes ____ No ____)

[] Provide a site map showing locations where BMPs for erosion and sediment control are placed. This map should be update when BMPs are revised to meet evolving construction conditions. Provide a brief description of BMP selected, and, if appropriate, attach modified fact sheets or additional information for erosion and sedimentation control BMPs.

√	BMPs SELECTED	DESCRIPTION OF BMPs FOR EROSION & SEDIMENTATION CONTROL
SITE PLANNING CONSIDERATIONS		
	Scheduling	
	Preservation of Existing Vegetation	
EROSION CONTROL		
	Hydroseeding	
	Mulching	
PHYSICAL STABILIZATION		
	Geotextiles and Mats	
	Dust Control	
	Temporary Stream Crossing	
	Construction Road Stabilization	
	Stabilized Access EC-8	
DIVERSION OF RUNOFF		
	Earth Dike	
	Temporary Drains and Swales	
	Slope Drain	
VELOCITY REDUCTION		
	Outlet Protection	
	Check Dams	
	Slope Roughening/Terracing	

√	BMPs SELECTED	DESCRIPTION OF BMPs FOR EROSION & SEDIMENTATION CONTROL
SEDIMENT TRAPPING/FILTERING		
	Silt Fence EC-4, 5	
	Straw Bale Barrier EC-1	
	Sand Bag Barrier	
	Rock or Brush Filter	
	Storm Drain Inlet Protection	
	Sediment Trap EC-6, 7	
	Sediment Basin	
	Inlet Filter EC-3, 9	
	Inlet Filter Bag EC-10	
	Filter Bale Barrier	

Worksheet 6. Post-Construction BMPs

Provide a site map locating treatment control BMPs which will be constructed as part of this project to reduce storm water pollution after construction is complete. Selection of these and other post-construction BMPs may be guided using the Municipal BMP Handbook of the Best Management Practice Handbooks and must consider site-specific and seasonal conditions. Provide on the worksheet below the BMP selected, the responsible party for maintenance and operation, and source for funding the operation and maintenance.

√	BMPs SELECTED	MAINTENANCE RESPONSIBILITY	FUNDING SOURCE FOR O & M
	TREATMENT CONTROL BMPs (See Chapter 5, Municipal Handbook)		
	Infiltration		
	Wet Ponds		
	Constructed Wetlands		
	Vegetated Swales and Strips		
	Extended Detention Basins		
	Media Filtration		
	Oil/Water Separators and Water Quality Inlets		
	Multiple Systems		
	SOURCE CONTROL BMPs (See Chapter 4, Municipal Handbook)		
Describe other measures which will be employed on the project site to control storm water pollution after construction is complete, and steps to be taken by the current owner to ensure that these measures are conducted.			

Worksheet 7. Monitoring, Inspection and Maintenance Plan

[] Describe maintenance/repair efforts to ensure BMPs are in good and effective condition:

[] Describe inspection procedures and record keeping efforts:

[] Annual Inspection:

[] Pre-storm Inspection:

[] Post-storm Inspection:

[] Describe training program/material for site personnel responsible for installing, inspecting, and maintaining BMPs:

Sample Maintenance, Inspection, and Repair Program

<i>The contractor shall use the following guidelines for maintenance, inspection, and repair of erosion and sediment control BMPs.</i>		
<i>CONTROLS</i>	<i>INSPECTION FREQUENCY</i>	<i>MAINTENANCE/REPAIR MEASURES</i>
Stabilization of Graded Areas	• Bi-weekly • Prior to a forecast storm • After precipitation that causes runoff • At 24 hour intervals during extended precipitation events	Regrade and reapply seed, straw and tack. Cover with plastic if necessary.
Silt Fences		Replace torn sections, remove piled up debris, re-key bottom of fences
Straw Bales		Replace straw bales as necessary.
Diversion Berms		Regrade any eroded areas, re-install berms/sandbags, remove accumulated debris.
Inlet Protections		Remove accumulated debris and repair bales/gravel bags as required.
Construction Entrances		Remove excessive soil accumulation on top gravel entrances.
Outlet Structures		Remove sediment in pipes. Reinstall sandbags as Structures necessary.
<i>The contractor shall use the following guidelines for maintenance, inspection, and repair of non-storm water management and waste management and disposal BMPs.</i>		
Covered Areas	• Bi-weekly • Prior to a forecast storm • After precipitation that causes runoff • At 24 hour intervals during extended precipitation events	Cover up any exposed areas.
Concrete Wash-Outs		Remove accumulated debris. Replace straw bales and replace lining as necessary.
Waste Containers		Refuse contractor to pickup. Remove unacceptable materials. Segregate waste. Repair leaks. Replace as necessary.
Vehicle Storage Areas		Remove leaked material. Replace drip pans. Restock spill materials.

SECTION 3
CITY OF MODESTO
SUPPLEMENTAL CONSTRUCTION WORKSHEET
Storm Water Pollution Prevention Plan (SWPPP) Worksheet

Cut & Fill Quantities:

Import & Export from site (if any):

List of Contractors/Subcontractors not included in SWPPP Worksheet 2

Contractor/Subcontractor	Name of Responsible Person	Phone Number

Construction Schedule:

Start Date:

Estimated Completion Date:

Major Activities	Estimated Start Date	Estimated Completion Date
Initial Clearing & Grubbing		
Rough Grading		
Underground		
Final Grading & Subgrade & Rocking		
Concrete		
Asphalt		
Landscaping		

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name _____ Title _____

Signature _____ Date _____

This SWPPP was prepared by:

Name _____ Title _____

Signature _____ Date _____

SECTION 4

SITE MAPS & EXHIBITS

APPENDIX A

BEST MANAGEMENT PRACTICES

(BMPs)

APPENDIX B

COPY OF THE

NOTICE OF INTENT (NOI)

State of California
State Water Resources Control Board
NOTICE OF INTENT
TO COMPLY WITH THE TERMS OF THE
GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH CONSTRUCTION ACTIVITY (WQ Order No. 92-08-DWO)

302387



MARK ONLY ONE ITEM	1. ☐ Ongoing Construction	3. ☐ Change of Information
	2. ☒ New Construction	WDID # _____

I. OWNER

Name <u>CALTRANS</u>	Contact Person <u>SYLVIA VEGA</u>
Local Mailing Address <u>2501 PULLMAN</u>	Title <u>SENIOR EP</u>
City <u>SANTA ANA</u>	State Zip <u>CA 92705</u>
	Phone <u>714-724-2242</u>

II. CONSTRUCTION SITE INFORMATION

A. Developer <u>TRACY E. RYDER</u>	Contact Person <u>JIM TRACY</u>
Local Mailing Address <u>22421 GILBERTO SUITE A</u>	Title <u>OWNER</u>
City <u>RANCHO SANTA MARGARITA</u>	State Zip <u>CA 92688</u>
	Phone <u>714-858-7002</u>
B. Site Address <u>COSTA MESA FWY 19th to BRISTOL</u>	County <u>ORANGE</u>
City <u>COSTA MESA</u>	State Zip <u>CA</u>
	Phone <u></u>
Is the construction site part of a larger common plan of development or sale? ☐ Yes ☒ No	
If yes, name of plan or development _____	
D. Construction commencement date MM D D Y Y <u>052693</u>	E. Projected construction completion date MM D D Y Y <u>122394</u>

III. BILLING ADDRESS

Send to: ☒ OWNER ☐ DEVELOPER ☐ OTHER (Enter information at right)	Name <u>CALTRANS</u>
	Mailing Address <u>2501 PULLMAN STREET</u>
	City <u>SANTA ANA</u>
	State Zip <u>CA 92705</u>

IV. RECEIVING WATER INFORMATION

A. Does your construction site's storm water discharge to: (Check one)	
1. ☒ Storm drain system - Enter system owners name <u>CITY OF CALIFORNIA-CALTRANS</u>	
2. ☐ Directly to waters of U.S. (e.g., river, lake, creek, ocean)	
3. ☐ Indirectly to waters of U.S.	
B. Name of closest receiving water <u>NEWPORT BAY</u>	

STATE USE ONLY

WDID: <u></u>	8 30S302387 REGION:8 ISSUED:08/20/92 NPDES:CAS000002 ORDER:92-008 \$250 DATE: 06/09/93	id: _____ Received: _____
NPDES Permit Number: <u>CA</u>	Or CK#:729730 - \$250.00 PERMIT ISSUED	

NOI-7
8/20/9

V. TYPE OF CONSTRUCTION (Check all that apply)

1. ☐ Residential 2. ☐ Commercial 3. ☐ Industrial 4. ☐ Reconstruction 5. ☒ Transportation
6. ☐ Utility 99. ☐ Other (Please List)

VI. MATERIAL HANDLING/MANAGEMENT PRACTICES

A. Types of materials that will be handled and/or stored at the site: (Check all that apply)

1. ☐ Solvents 2. ☐ Metal 3. ☐ Petroleum Products 4. ☐ Plated Products
5. ☐ Asphalt/Concrete 6. ☐ Hazardous Substances 7. ☐ Paints 8. ☐ Wood Treated Products

99. ☒ Other (Please list)

IRRIGATION PVC PIPING

B. Identify proposed management practices to reduce pollutants in storm water discharges: (Check all that apply)

1. ☐ Oil/Water Separator 2. ☒ Erosion Controls 3. ☒ Sedimentation Controls 4. ☐ Overhead Coverage
5. ☐ Detention/Desiltation Pond 99. ☒ Other (Please list)

POLLUTION PREVENTION PLAN

VII. SITE INFORMATION

A. Total size of construction site:

10 Acres

B. Percent of site impervious: (Including rooftops)

Before construction 20 % After construction 20 %

VIII. REGULATORY STATUS

Is the site subject to a locally approved erosion/sediment control plan ? ☐ Yes ☒ No

If yes, name of local agency

IX. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the provisions of the permit, including the development and implementation of a Storm Water Pollution Prevention Plan and a Monitoring Program Plan, will be complied with.

Printed Name:

Sylvia Vega

Signature:

Sylvia Vega

Date:

5/25/93

Title:

Senior Environmental Planner

NOI-2
8/20/92

APPENDIX C

CITY OF MODESTO

SITE INSPECTION CHECKLIST

City of Modesto

NPDES Construction Site Inspection Checklist

Inspected by:

Project:

Contractor:

Date:

Owner/Developer's Responsible Person:

Check "Yes" or "no" or "N/A" if not applicable

#	ITEM	YES	NO	N/A
1	Has there been rain within the last 24 hours?			
2	Do any sandbags, straw bales, and silt fences in-place in accordance with the erosion control plan need to be repaired or modified to function properly?			
3	If present, do all significant erodible slopes need to be protected from erosion through the implementation of acceptable soil stabilization practices?			
4	If present, do any desilting basins need to be repaired or modified in order to function properly (if applicable)?			
5	Do material handling and storage areas need to be modified in order to be reasonably clean and free of spills, leaks, or other deleterious materials?			
6	Do all the equipment storage and maintenance areas need to be modified in order to be reasonably clean and free of spills, leaks, or any other deleterious materials?			
7	Do all materials and equipment need to be properly covered?			
8	Do the discharge points need to be modified to be reasonably free of any noticeable pollutant discharges?			
9	Do the discharge points need to be modified to be reasonably free of any significant erosion or sediment transport?			
10	Do the BMPs identified on the SWPPP, installed in the proper locations and according to the specifications for the plan, need to be modified or repaired?			
11	Do any structural practices require repair or clean-out to maintain adequate function?			
12	Are construction on-site traffic routes, parking, and storage of equipment and supplies outside of the areas specifically designed for those users?			
13	Are locations of temporary soils stockpiles or construction materials outside of their approved areas?			

#	ITEM	YES	NO	N/A
14	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding, or mulching?			
15	Is there any evidence that sediment is leaving the site?			
16	Is there any evidence of erosion to cut or fill slopes?			
17	Is there any evidence of sediment, debris, or mud on public roads at intersections with site access roads?			
18	Does the SWPPP require revisions? If yes, explain below.			

If you answered “yes” to any of the above questions, describe any corrective action which must be taken to remedy the problem and when the corrective action is to be completed and notify the Stormwater Division in a timely manner.

APPENDIX D

JOURNAL FOR AMENDMENTS

&

INSPECTION LOG

INSPECTION LOG

Project Name: _____ Project: _____

Date	Inspector	Comments
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
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_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

SWPPP AMENDMENT LOG

Project Name: _____

Project: _____

Amendment No.	Date	Brief Description of Amendment	Prepared By

APPENDIX E

CONTRACTOR NOTICE LETTER

SAMPLE

Contractor & Subcontractor Notification Letter

[DATE]

[Contractor's Name]

[Company]

[Address]

[City, State]

Dear [Contractor's Name]

Please be advised that the California State Water Resources Control Board has begun formal implementation of the National Pollutant Discharge Elimination System (NPDES)

In short, the purpose of this system is to eliminate pollutants from entering into the storm drain systems and eventually into our lakes, streams, and ocean. Pollutants include, but are not limited to oil, grease, trash, sediment, asphaltic emulsions, and cement wastes.

[Engineer] and [Developer] have developed a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the State and City of Modesto requirements.

You, as a contractor, are required to comply with the SWPPP and the General Permit for any work done on this site.

Any person or group who violates any condition of the General Permit may be subject to substantial penalties in accordance with the law. You are encouraged to advise each of your employees working on this project of the SWPPP.

A copy of the General Permit and the SWPPP developed for this site are being provided to you to maintain on site during all construction activity. You are encouraged to advise each of your employees and subcontractors working on the project of the SWPPP. You shall also amend the SWPPP to meet your current working conditions and write in the assigned responsible person for each phase of the project.

Please call if you have any questions.

Sincerely,

APPENDIX O

FIBER OPTICS

SAMPLE OF CITY PERMIT LETTER & AGREEMENT

3 February 2000

Fiber Company

1000 Anywhere Court, Ste. 390

Anytown, CA 95000

SUBJECT: Proposed Encroachment Permit for Fiber Optics – Permit Agreement & Conditions

Dear Applicant:

PART I: AGREEMENT CONDITIONS

1. Permitted Uses. This Agreement only permits those uses of the Telephone System which California law specifically preempts the City from franchising. Company represents that it will use the Telephone System for the sole purpose of providing the services specifically described in its Certificate of Convenience and Necessity and for the following uses: FIBER OPTICS DATA COMMUNICATIONS. This Agreement does not authorize the use of the Telephone System to provide cable television service or open video system service, or other similar video services. Company represents and warrants that it will not use, or permit the use, of the Telephone System for cable television service, open video system service or similar video services without obtaining a separate franchise from City. Company agrees that in any agreement with any entity to use the Telephone System, Company will include a provision prohibiting such entity from using or permitting the use of the Telephone System for cable television service, open video system service or similar video services without obtaining a separate franchise from City, and agrees to take all reasonable actions necessary to enforce such a provision. Company shall notify City in writing at least three (3) months prior to any proposed change in use of the Telephone System. Company shall not provide any services over the Telephone System beyond those described above without the express written agreement of City.
2. Lease or Sale. Company agrees that it will not lease, sell or otherwise transfer (“Transfer”) any interest in any conduit, fiber, wire, cable or capacity in such fiber, wire or cable installed pursuant to this Agreement without the express written agreement of City, unless the Transferee is a Telephone Corporation that has obtained a Certificate of Public Convenience and Necessity from the California Public Utilities Commission and enters into a written agreement with City to be bound by the terms of this Agreement. Company shall notify City in writing at least three (3) months prior to any proposed Transfer.
3. Removal Due to City Project. Upon receipt of a demand from City, Company, at its sole cost and expense, shall remove and relocate any Telephone System facilities installed, used and/or maintained by Company under this agreement when such removal or relocation is made necessary

or convenient due to any work being done by or on behalf of City or other applicable governmental agency, including but not limited to any change of grade, alignment or width of any street, sidewalk or other public facility, installation of curbs or gutters, installation of landscaping, and/or construction, maintenance or operation of any underground or aboveground facilities by City. Company shall complete the removal or relocation within ninety (90) days of receipt of notice from City. Notwithstanding the foregoing, the City Engineer may require a shorter period due to exigent circumstances and may authorize a longer period if it will not delay the City's project. If Company fails to remove or relocate the facilities within the prescribed time period, City may remove the facilities at the expense of Company, and Company shall promptly reimburse the City any and all expenses, including administrative overhead. Any removal or relocation work by Company shall only be done pursuant to an encroachment permit.

4. **Undergrounding.** Upon the receipt of a demand of City, Company shall replace any or all of its aerial facilities with underground facilities in accordance with all applicable laws.
5. **Abandonment.** If the Telephone System, or any part thereof, is abandoned or not used for service for a period of six (6) months or more, Company shall notify City and shall promptly vacate and remove the Telephone System or the abandoned part thereof at Company's sole expense. Alternatively, City may allow, in its sole discretion, Company to abandon the Telephone System in place and convey it to City. If Company fails to remove the Telephone System as required by City within ninety (90) days after receipt of notice from City, City may, in its sole discretion, (a) remove the Telephone System at Company's sole expense, which Company shall promptly reimburse to City, or (b) deem the Telephone System, or any part thereof, to have been conveyed to City.
6. **Repair of Right-of-Way.** Whenever the removal or relocation of facilities is required under this Agreement, Company shall promptly repair and return the public right-of-way and adjacent property to a safe and satisfactory condition to City in accordance with its usual standards. If Company fails to do so, City shall have the option to perform such work at Company's sole expense, which Company shall promptly reimburse to City.
7. **General.** City reserves any and all rights it may have now or in the future to legally regulate or otherwise condition the use of the Telephone System and related activities. Any authority granted to Company by this Agreement shall be construed narrowly. City reserves any and all rights it may have now or in the future to franchise, impose rent or franchise fees on, or tax the Telephone System or any use thereof. Unless specifically prohibited by State or Federal law, City may impose a fee or other requirement for compensation for use of the public right-of-way by Company at any time on a prospective basis. Company agrees to either pay such compensation or to abandon the Telephone System. Company reserves any right it may have to challenge such compensation in court.
8. **Uses Subordinate.** This Agreement is not a grant by City of any property interest. This Agreement shall not create a vested right of any nature of Company to use the public right-of-way. This Agreement is subject and subordinate to the prior and continuing right of City and its assigns

to use any and all of the public right-of-way for any lawful use. It is further subject to all deeds, easements, dedications, conditions, covenants, restrictions, encumbrances and claims of title which may affect the public right-of-way. Company shall be solely responsible for obtaining all necessary permits and approvals from all public and private entities.

PART II: ENCROACHMENT PERMIT CONDITIONS

1. The City of Modesto Permits Office has reviewed the plans for installing fiber optic cables under various intersections within the City of Modesto. The following are comments and conditions regarding the plans and installation of this facility.
2. Contractor may not block a lane of traffic during peak traffic hours: between 7:30 am to 8:30 am, and between 4:30 pm to 5:30 pm.
3. If traffic plans become necessary, traffic plans and traffic controls shall be designed and maintained by a designated individual qualified in this responsibility. Evidence of qualification may be Certification of Completion of a course titled "Safety Through Maintenance and Construction Zones", issued by ITE.
4. If contractor must block any portion of the ROW (right-of-way), the contractor shall provide and deliver by hand a written notice to each homeowner or business owner located adjacent to the job site, 48 hours prior to the start of work. The notice shall describe the work, the anticipated duration of the work, the name and address of the contractor, and the city telephone number to call for more information (577-5452).
5. Contractor shall coordinate his work within public ROW with the city's inspector on a daily basis. Only the work under or in the Public ROW will need coordination.
6. When warranted, traffic control must be provided per CalTrans Standards and as required by the city's inspector.
7. The Contractor applying for the permit and installing the fiber optics must have liability and workmens compensation insurance on file with the City Clerks Office. Contact the City Clerks Office at (209) 577-5397.
8. The encroachment permit fees will be based on staff time to review and process the application and to inspect construction
9. Prior arrangements must be made 48 hours in advance with the city's inspector to work outside the normal work week (Monday through Friday 7:00 am to 4:30 pm).
10. All overtime and weekend inspection work will be billed at a Time and Materials rate of \$___/hr. _____ company shall provide a \$ _____ deposit. This is based on the following calculations:

Description	Quantity	Hourly Rate	Total
Plan Review			
Application			
Pre-job			
Inspection			
Trench Cut Fee			
		TOTAL COST	

11. If the deposit is insufficient to defray the actual cost, Fiber Company shall pay the difference between the deposit and actual expense. If any overtime is anticipated, an additional \$ 100/per day will be required on the deposit.
12. Before issuing the permit, a pre-construction meeting with the contractor will be required. The contractor will need to contract me to set up a date and time for this meeting.
13. A final as-built set of plans will be provided. Fiber Company shall provide both the CAD file and redlined prints by DATE. Until Fiber Communications provides this data, we will issue no more permits. CAD file shall be in the State Coordinates, NAD 83. The City has previously supplied a base map with all our utilities drawn on. Adding a layer with Fiber Communications work to this map will be sufficient. If another base map is required, please contact this office. Depth of the conduit at crossings and size of casing shall be noted at all the crossings. If a slope on the casing is used, then each end of the casing elevation shall be noted on the plans..
14. Contractor will install one 1-1/2 inch conduit , for the City of Modesto, along the X STREET. City will furnish a pull box at each end for the contractor to install.
15. Contractor and owner will design and construct facilities in accordance with the Modesto City Standard Specifications (Design Section 8: Non-city Utilities and Appendix O –fiber optics)
16. If these conditions are acceptable to you, please have an authorized representative Fiber Company sign this letter where designated and return to this office. If you have any questions regarding this matter, please contact me at 209-577-5259.

Sincerely,

CITY OF MODESTO

Name, Permit Manager

Acceptance of Conditions:

FIBER OPTICS COMPANY

By: _____
John Doe
Vice President and
General Counsel

Date: _____
Fiber Company
1000 Anywhere Court, Ste. 390
Anytown, CA 95000
Ph (916) 888-0707
Fax (916) 888-0715

CONTRACTOR

By: _____
John Doe
Vice President and
General Counsel

Date: _____
Construction XZ Company
P.O. Box 0007
Salida, CA 95000
Ph (299) 888-0707
Fax (299) 888-0715

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Fiber Optic Encroachment Questionnaire

Please answer the questions to the best of your knowledge. No permits will be processed until this questionnaire is returned and the signed encroachment agreement is returned.

General Information

1. Name, address, phone, and fax numbers of the applicant. _____

2. Name, address, phone, and fax numbers of the agent. _____

3. Name, address, phone, and fax numbers of the contact person. _____

4. Contractor license class: _____
5. Contractor license number: _____
6. Explain the authority of the applicant to excavate the rights-of-way _____

7. Is the applicant a Telephone Corporation in California? Yes ☐ No ☐
8. If the answer to Question 7 is "Yes", please attach a copy of applicant's Certificate of Public Convenience and Necessity ("CPCN") from the California Public Utilities Commission **and** the Negative Declaration adopted in conjunction with the CPCN.
9. In an attachment hereto, identify any and all direct and indirect affiliates of applicant.
10. Does the applicant have an open video system "OVS" license issued by the FCC?
Yes ☐ No ☐ If yes, please attach a copy of the license.

11. Will the applicant use the telecommunications facilities, including cable television facilities, requested herein to carry traffic or information for:

	Yes	No
a. An affiliated company	☐	☐
b. Another certificated telephone company	☐	☐
c. A competitive access provider	☐	☐
d. A cable television or other entertainment company	☐	☐
e. Other (Identify in an attachment hereto)	☐	☐

12. If the answer to any part of Question 11 was "Yes", please explain the nature of the traffic to be carried and identify the companies involved in an attachment hereto.

13. Will the applicant sell or lease capacity, conduit, fiber or other facilities to any other person or entity?

14. If the answer to Question 13 was "Yes", please explain in an attachment the nature of the use by the other persons or entities, state whether such persons or entities are a LEC, CLEC, CAP, OVS operator, or cable operator, and identify all such persons or entities.

15. If the applicant intends to provide services to persons, residences, businesses, or others within the City, please explain the nature of the services and provide a general description of the intended customers.

16. Will the facilities proposed to be installed by the applicant be used by the applicant or any other person or entity for:

	Yes	No
a. Cable television or video entertainment services	☐	☐
b. An Open Video System under FCC rules	☐	☐
c. Any service not specifically authorized by applicant's CPUC Certificate	☐	☐

17. If any part of Question 16 was answered "Yes", in an attachment hereto, please provide a full explanation of the services to be carried, the companies involved and the intended customers.

18. List below the application or permit numbers of all pending applications and permits issued by the City to applicant (or a related company) which relate directly or indirectly to this application.

Application/Permit No.	Date Filed	Date Issued
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Application/Permit No.

Date Filed

Date Issued

19. If applicant intends to attach any part of the telecommunications, including cable television infrastructure which is the subject, in whole or in part, of this application to a pole, please describe the pole attachment plans below, including route, schedule, equipment to be used, etc.

20. Attach an appropriate scale map to show the route that the telecommunications infrastructure will take through the City. Using colors and a clear legend to show the following: (1) the infrastructure that is proposed in the application, (2) overhead plant that will be installed, even if it is not subject to the application, (3) existing infrastructure owned by applicant (or its affiliate) to which the new plant will be attached or integrated, (4) to the extent known at the time of filing, the entire infrastructure that is planned for the City. If the map scale is too small to show the information clearly, the applicant will be required to supply a larger map.

Proposed Telecommunications Infrastructure

21. Describe the conduit that will be installed as part of the construction proposed in the application. Include size, number of conduits, nature of inner duct (if any), material (HDPE, PVC, etc.), manufacturer.

22. Indicate the number of conduits/inner ducts that will be occupied initially by applicant's cable.

23. Provide the following information on any conduit that will be installed as part of the construction proposed in this application.

	Yes	No
Will applicant use directional boring to install conduit?	☐	☐
Will applicant direct bury (trench) the conduit?	☐	☐
Will conduit be installed for other parties during this construction?	☐	☐
Is applicant willing to lease conduit to other parties?	☐	☐
Is applicant going to participate in joint trench?	☐	☐
Is applicant willing to participate in joint trench?	☐	☐

24. Describe the pull boxes, splice boxes and other vaults and pedestals to be installed by applicant (include size, model number, and manufacturer):_____

25. Describe the type and amount of cable (fiber-optic, twisted-pair copper, coaxial, etc.) that will be installed by applicant as part of, or as a result of the construction proposed in this application.

Impact on County Resources and Quality of Life

26. Assuming that a qualified party, such as a CLEC or a national CAP, approached the applicant about sharing facilities on economic terms that were reasonable, would the applicant be willing to share facilities:

	Yes	No
In general?	☐	☐
Share available conduit or inner duct?	☐	☐
Share fiber strands in a fiber cable?	☐	☐
Share splice boxes?	☐	☐
Share trenching costs in a joint construction project?	☐	☐

27. In order to minimize the impact of applicant's proposed construction, has the applicant:

	Yes	No
Checked pending applications and recently granted permits in the City to determine whether the opportunity to construct using joint trench, or the opportunity to share facilities is available?	☐	☐
Checked street resurfacing schedules?	☐	☐
Proposed to use directional boring in areas where it would minimize the impact on traffic, residents and businesses?	☐	☐
If no directional boring is proposed, please explain why below:		

Applicant agrees to comply with the City's land use and planning process (including public notification) for the location of any structures or facilities to be placed in or adjacent to the City's public rights-of-way. The applicant further agrees to provide all necessary information requested by the City including required documentation to conduct applicable CEQA review.

I declare under penalty of perjury that the foregoing information is true and correct.

Applicant: _____
(owner of the facilities to be installed in the public rights-of-way)

Printed Name, Title and Company

SECTION 8A

FIBER OPTIC DESIGN

These specifications shall cover some of the design and installation fiber optics within the City of Modesto. Any cost incurred in conforming to these standards will not be reimbursed by the City.

8.01A DESIGN

- A. General: To facilitate the CAD design, the owners design staff or consultant should purchase a CD of the City utilities and centerline file (NAD 83 coordinate system) for design layout and ultimate submittal of the as-built plans in digital format. The designer must also reference Section 8 section should be

- B. Location of Lines.

Location of lines shall be per section 8 of these standard specifications. Fiber optic lines may also be installed under an existing sidewalk parallel to the centerline. In fully developed areas, fiber optics shall be installed by horizontal boring.

All Telecommunications Facilities shall be installed within existing underground ducts or conduits whenever excess capacity is available on reasonable terms.

Whenever existing Telecommunications Facilities or electric utility facilities are located underground along a particular street or public way, new Telecommunications Facilities must be installed underground along that street or public way.

Whenever any new or existing Telecommunications Facilities or electric utility lines are located or relocated underground along a particular street or public way, the Telecommunications Operator shall relocate its Telecommunications Facilities underground concurrently with the other lines at its sole expense to the full extent permitted by law.

Whenever new Telecommunications Facilities will exhaust the capacity of a street or otherwise make the installation of future Telecommunications Facilities impractical, the Telecommunications Operator installing the new Telecommunications Facilities shall provide additional ducts, conduits, manholes and other facilities designated by the Community Development Department for reasonable nondiscriminatory access by other Telecommunications Operators.

8.02A LAYOUT OF FIBER OPTICS

The distribution system, whenever possible, shall be undergrounded in the dedicated public utility easement (P.U.E.). All new fiber optic shall become part of the joint trench where practical and the facility undergrounding is consistent with California Public

Utilities Commission Rule 20. Where it is necessary to construct underground facilities in, on, over, under, along, through or across any portion of a surfaced street, the same, where practicable and economically reasonable shall be done by a tunnel or bore so as not to disturb the surfaced street; and in the event that the same cannot be so done, such street work shall be done under an excavation permit to be granted by the City Engineer.

8.03A VERTICAL ALIGNMENT

Conduits shall be installed a minimum of 36" under the existing ground as well as the final grade in the P.U.E. When installing conduits for crossings through existing streets, a minimum of 42" of cover is required. Conduits installed in undeveloped areas of future streets shall be installed at a depth which will provide a minimum of 42 inches from the top of the conduit to finished grade or a minimum of 24 inches from the top of conduit to the street subgrade, whichever is greater.

8.04A HORIZONTAL ALIGNMENT

Alignments shall be parallel to the street centerline wherever possible. In new developments, the horizontal alignment of joint trench shall be parallel to the centerline within the P.U.E. Where a P.U.E. is not available or in existing urbanized and built-up areas Table 15.1 gives guidance.

A Street Cut Mitigation Measures.

Street Cut mitigation fees have been adopted or are about to be adopted. The purpose of this fee is to encourage coordinating utility work, create more joint trench sharing, and selling of empty conduits in areas where fiber companies have already installed conduits.

All open cutting of pavement will be scrutinized. The City Engineer must make a finding that boring is infeasible before allowing open cutting of asphaltic streets. Horizontal boring will be encouraged.

B. Surplus Conduit Requirements.

The greatest cost in installing underground lines is labor, not materials. As a result, companies are encouraged to install empty surplus conduit for potential future uses along side the conduit they use immediately. Per the permit agreement for fiber optics in the City of Modesto, one additional conduit shall be installed and identified for City use. Permit fees will be reduced to reflect this contribution.

C. Cabinets and Pedestals

No cabinets or pedestals shall be installed above ground without specific authorization from the city engineer. When it is determined that an above-ground cabinet or pedestal is necessary, the cabinet shall be camouflaged behind existing landscaping just behind the

sidewalk. The City Engineer reserves the authority to determine where the cabinets may be located.

8.05A ENCROACHMENT PERMIT REQUIREMENTS

A. General

The review and negotiations time period for an encroachment permit is generally 30 days. During this time period the applicant must:

1. Provide 2 sets of plans for review
2. Provide the contractors name and submit contractors insurance per City Clerk's Requirements.
3. Owner shall answer the preliminary questionnaire
4. Owner shall provide an in-briefing of its business plan to City Staff.
5. Provide 3 sets of plans and a compact disk of the scanned plans for the final set of construction plans. Scanning to be at 300 dpi and saved in an Adobe PDF format, single file.
6. Plan sets shall be a reduced size plan set (11x17)
7. For final acceptance, provide one as-built plan set and a compact disk of the scanned plans with the permits and agreements scanned with the plans. Final scanned documents to be at 300 dpi and saved in an Adobe PDF format, single file.

B. Permit Agreement

Appendix O gives a sample of the permit agreement. The owner and the contractor must sign the permit agreement. The questionnaire should be provided at the time of plan set submittal for review. The plan set typically takes two weeks to review and the agreement takes an additional week to complete. The insurance and payment of the fees must be submitted prior to the permit being issued.

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APPENDIX P

OUTDOOR VEHICLE AND EQUIPMENT WASHING & STEAM CLEANING

1.01 GENERAL

All commercial and industrial vehicle washing and steam cleaning facilities shall comply with the following minimum standards. These standards have been developed with assistance from the federal and state best management practices of the National Pollution and Discharge Elimination Statutes (NPDES). Supporting regulations can be found in the Modesto Municipal Code.

MMC 5-6.216 requires out-door wash and steam cleaning facilities to install gravity separation interceptors.

MMC 5-6.203 prohibits stormwater surfaces runoff discharges to the City sewer system.

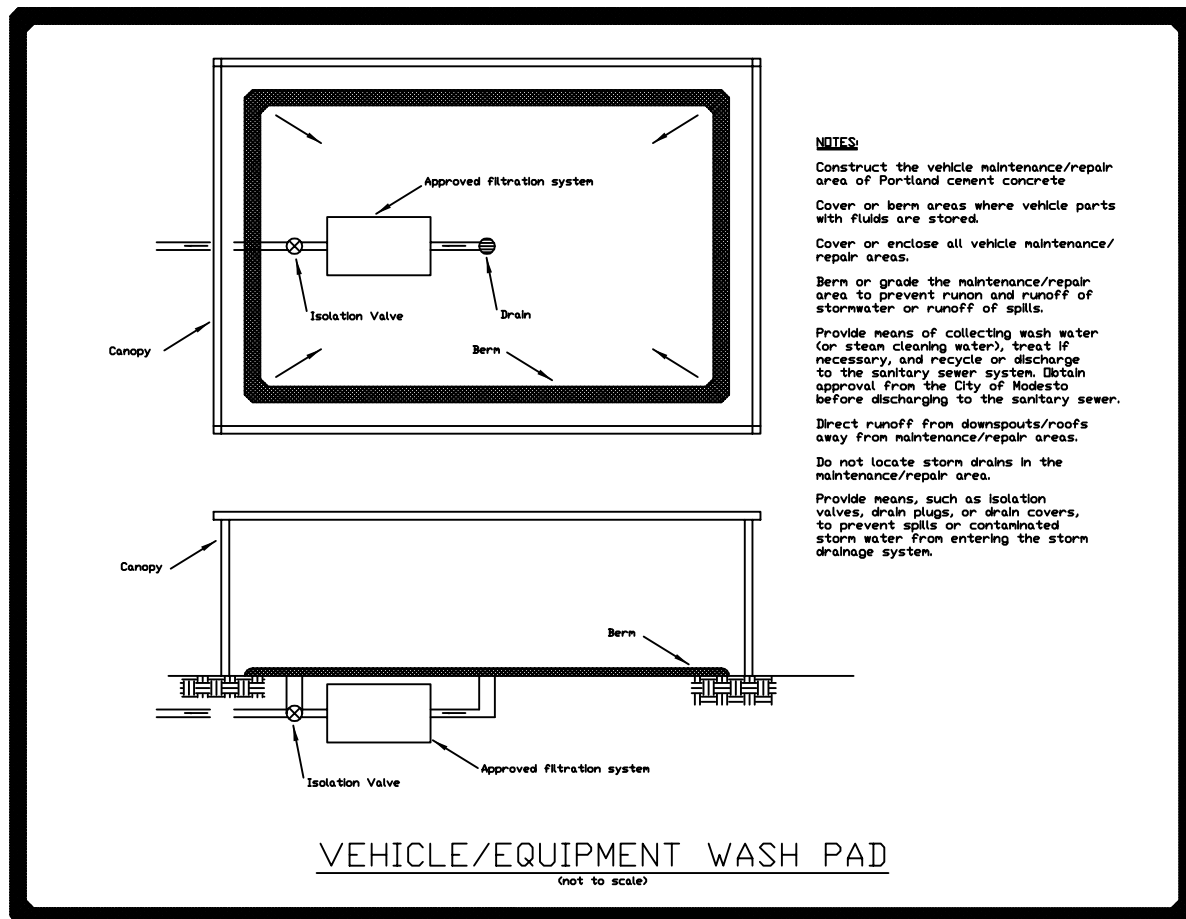
MMC 5-10.301(a) prohibits non-stormwater discharges to the City storm drain system.

MMC 5-6.220 prohibits restaurant surface discharges to the City storm drain system.

1.02 MINIMUM DESIGN CRITERIA

- a. Pad and berm shall be constructed of a reinforced Portland cement concrete with a minimum 28-day strength of 3000 psi.
- b. Pad to be constructed in a single monolithic pour to include the pad and berm. Multiple bays may have expansion joints constructed under the separation wall, at a high point.
- c. Concrete pads must be of sufficient size to capture over-spray. The dimensions of the wash pad and cover will vary. Size will be dependent on amount and size of equipment, expected usage, and other factors.
- d. Pads shall have a minimum slope of .5% toward an interceptor drain(s).
- e. Pad finished floor elevation shall be a minimum of 0.5' over any storm catch basin or Rock well on-site.
- f. Construct "speed bump" type berms at wash-pad entry and exit locations.
- g. The area outside of the wash pad shall be sloped away from the wash pad.
- h. The wash pad must be covered. The overhead cover shall have sufficient over-hang to prevent storm water from entering the wash pad.
- i. Wash pad drain must be connected to a properly sized gravity separation interceptor.

Figure P.1 WASH PAD DETAIL



APPENDIX Q

DIGITAL FILE SUBMISSION REQUIREMENTS FOR CITY CONTRACTORS/CONSULTANTS

1.01 GENERAL

All original computer files that make up the work being submitted as the finished product shall be submitted on compact disc (CD) to the city prior to final payment. The contractor or consultant must also provide a single Adobe Acrobat Portable Document File (PDF) that combines the entire published product into a single document. The PDF will allow city staff to distribute files to printing companies in one complete, printable format and post documents to the web. The City may also require creation of some documents for publishing to the Internet in XML, SGML, HTML, or other Internet publishing format. No digital documents created by the contractor/consultant will be scanned to fulfill this requirement. All text must be searchable.

The contractor/consultant will also provide all printer drivers for the specific printers used to create the files. This will aid in maintaining formatting when changes are being made during the life of the document.

1.02 SOFTWARE & FILE SPECIFICS

- A. Fonts for digital files: Not all fonts are convertible to the Adobe PDF format. At a minimum the following fonts are searchable: Aerial, Courier, Helvetica, Symbol, Times, and Zapf Dingbats. If the contractor/consultant uses a different font than these, he/she should check the results in the Adobe Reader to ensure the text is searchable before submitting the final document.
- B. Footers: Each page of the document shall have footer. The footer shall be as follows:
 - 1. Bottom left side: Revision number and date of revision to track changes to each page.
 - 2. Bottom center: Section or chapter with a page number.
 - 3. Bottom right side: folder name and file name with file type extension. The folder and file name shall be consistent with the CD submitted.

A good example of this format is being used in these Standard Specifications.

- C. Adobe Acrobat File Format – The Adobe File shall be compatible with the Adobe Reader Version 4. The table of contents shall be linked to the specific pages, figures, and diagrams within the document. All referrals to web addresses and email accounts within the document shall be linked in the final PDF to the Internet. The contractor/consultant shall convert all report files using the print resolution Adobe setting. All brochures and renditions should be converted using the press resolution setting in Adobe Acrobat.

- D. CAD Format – All AutoDesk files shall be saved in DWG format, California State Plane, Zone III coordinates, and NAD 83 datum. If the software being used is not AutoDesk's AutoCAD ver 12-14, 2000 or higher, then the file output shall be a DXF out California State Plane, Zone III coordinates, and NAD 83 datum. The City also requires that, as much as possible, the drawing be created in a single file. Each individual rendition or diagram should be created from the file using paper space and freezing layers. City staff should be able to import the CAD file into the city GIS without any rotation or conversion of points. The labeling within a CAD file must also be of standard font type acceptable to the Adobe Acrobat Format. Consultant will also provide a description (metadata) of the CAD layering names.

For CAD work the contractor/consultant is directed to use the standards set forth in Appendix A of these Standard Specifications.

- E. Office Suite Format – The most important piece of information to replicating the same output at the city as the contractor/consultant has done, will be the printer default setting (type of printer driver used). Staff has experienced formatting problems when the default printer cannot produce as few or many characters per inch as the printers used in-house. The use of either the Microsoft Suite or Corel Suite is irreverent. The City has standardized on the Microsoft Suite. If the submission is in the Corel Suite, files saved out of Corel shall be saved to the Word version using the Save As File Type function found in the Corel software.
- F. Specialized Programs (PhotoShop, Adobe PageMaker, & Other Specialized Software) – The contractor/consultant may use this proprietary software in the creation of brochures or very specific renditions within the document. The majority of the document shall be in a Word processing software.
- G. Printer Drivers – The contractor/consultant shall limit the printer drivers to at most three devices such as a HP1055 plotter, Epson color printer, and HP4 printer. All printer drivers used in the creation of the final product shall be placed on the CD for future use making changes to the document without completing losing the formatting.
- H. GIS Format: The City standard for GIS software is ESRI's Arc View (shape file). AutoCAD Map format is an acceptable alternative to this format.
- I. Scanned Format: Some data must be scanned or will have a secondary requirement to be scanned. If the paper being scanned is 18"x 24" or smaller, the scanning resolution will be 300 dpi. For prints greater than 18"x 24", scans shall be 200 dpi or no higher. Black and white scans shall be saved in a single Adobe PDF file format. Color scanning shall be saved in JPG format at high quality (95).

1.04 META DATA

The contractor/consultant shall provide a metadata worksheet for all the work submitted. Figure Q.01 gives an outline for the minimum requirements for the metadata. Each layer, graph, rendition, and map shall provide Meta data.

1.05 CITY DATA

Contractors and consultants may request electronic data from the city for completing their work. You will be required to sign a waiver release for the data accuracy and a GIS agreement for ownership rights to the data (See Figure Q.03). Figure Q.02 is a summary of the most common data requested. This list is constantly growing. Contractors/consultants should contact the city GIS coordinator for updates to the list. Most GIS data can be converted to CAD, Shape, image, and data base format. Also, the GIS coordinator can provide metadata for the current archive of files and layers.

1.06 CD SUBMITTAL

The final electronic format submitted on CD shall contain an index created in a spreadsheet and saved into an HTML format. The legend shall provide links to the various files for reading and downloading. The legend shall be similar to the example found in Figure Q.04.

FIGURE Q.01 SAMPLE METADATA REQUIREMENTS

Project Name: Kiernan Business Park **City Project Manager:** Brian Smith, CDD
Resolution for Acceptance: No. 97-159

Consultant: John Dempsy Consulting, 1530 Sacramento Blvd., Sacramento, CA 95484, ph (916) 489-9878, Fax (916) 489-9898

Project Mgr: John Dempsy

Contract No.: CIP 090-3243-K685 **Date of Contract:** 4-11-96

Word Processing: Corel Word Perfect 6.1

CAD: Autodesk AutoCAD version 11, NAD 83.

Spreadsheet: Quatro Pro 5.0

DATA Sources:

City of Modesto General Plan 1995

City of Modesto Storm Water Masterplan, 1990

City of Modesto Base Map, CAD, 3/11/96

City of Modesto Aerial, Feb. 1980, Contact Print

FIGURE Q.02
CITY OF MODESTO COMMON DATA LAYERS

DATA	Type	OWNER	TYPE FILE
Aerial – County 1998 (2 foot pixel)	Raster	County	ECW, JPG, TIF
Aerial – City Sphere 1997 (6” pixel)	Raster	City	SID, TIF, ECW
Annexations (City)	Vector	City	SHP, DWG,
Annexations (City)	Raster	City	TIF, PDF
Assessor Parcels	Vector	County	DWG, SHP (DBF)
Assessor Plats	Raster	County	TIF, PDF
Comprehensive Planning Districts	Vector	City	SHP, DWG, PDF
FEMA (100 yr & 500 yr)	Vector	County	SHP, DWG
Parcel Maps	Raster	City	PDF, TIF
Park Districts	Vector	City	SHP, DWG
Quads	Raster	County	TIF
Railroad	Vector	County	DWG, SHP
Rivers, Lakes, Streams	Vector	County	DWG, SHP
Road Classifications (City)	Vector	City	DBF
Road Classifications (Cal Trans)	Vector	County	SHP, DWG
Standard Details	Vector/Raster	City	PDF, DWG
Standard Specifications	Raster	City	PDF, DOC
Street Centerline	Vector	County	SHP, DWG
Subdivision Improvement Plans	Raster	City	PDF, TIF
Subdivision Maps	Raster	City	PDF, TIF
Utilities – Sewer	Vector/Raster	City	DWG, TIF, PDF, SHP
Utilities – Storm Drain	Vector/Raster	City	DWG, TIF, PDF, SHP
Utilities – Water	Vector/Raster	City	DWG, TIF, PDF, SHP
Utilities – Fiber Optic	Vector/Raster	City	DWG, TIF, PDF, SHP
Water Districts	Vector	County	DWG, SHP

FIGURE Q.03

AGREEMENT FOR CITY OF MODESTO GIS DATA

This Agreement is made by and between the City of Modesto, Stanislaus County, and _____, hereinafter referred to as "Contractor."

WHEREAS, the CITY OF MODESTO Engineering & Transportation Department, has a public project requiring the inclusion of GIS data, and,

WHEREAS, this data has been created in support of the City of Modesto GIS; and,

WHEREAS, it is to the mutual benefit of both Stanislaus County, City of Modesto, and Consultant to share information so that our primary goal of preparing Community Plan updates can be maximized; and,

WHEREAS, the Stanislaus County and City of Modesto GIS are willing to share GIS data with Contractor to further this mutual goal.

THE PARTIES AGREE AS FOLLOWS:

1. The City of Modesto GIS will provide Contractor with digital copies of GIS data and associated databases.
2. Contractor will use the GIS data as a reference and tool to prepare public plans. Contractor agrees that the digital data copies are for the sole use of Contractor and agrees not to distribute, transfer, copy or allow others to distribute, transfer, copy or allow other to distribute, transfer or copy, in any form, the GIS data without prior written approval of the Stanislaus County GIS Steering Committee and City of Modesto. This does not include the creation of temporary computer files incidental to the operation of the GIS software, nor does it include printouts of reports or maps.
3. Neither the City of Modesto nor Stanislaus County make any warranty whatsoever, whether expressed or implied, as to the condition or accuracy of the GIS data nor its suitability for any specific purposes. Contractor agrees that it will hold harmless,

indemnify, and upon request, defend the City of Modesto and Stanislaus County, its officers, employees, and agents from any and all claims, losses, and costs, including the cost of defense, if necessary arising from Contractor's use of the GIS data.

4. This Agreement, unless terminated, remains in force until canceled by either Stanislaus County, City of Modesto, or Contractor. Notice of Cancellation shall be in writing and shall take effect immediately upon receipt of such notice. Upon termination or cancellation, the GIS data shall be immediately returned to Stanislaus County and City of Modesto.
5. There is no charge to Contractor for using the GIS data under the terms of this agreement.

STANISLAUS COUNTY

Name

George Stillman, Director
Public Works Department

Date: _____

Date: _____

CITY OF MODESTO

Robert Beckler, GIS Coordinator
Information Services Division

Date: _____

FIGURE Q.04
CD LEGEND

Description	Software	File Link	Size	Printer
Kiernan Business Park Specific Plan Supporting files	Acrobat 4.0	KB_Park.pdf	6.9 mb	
Cover	Word 97	Chap_1-4.doc	0.4 mb	HP4
I. Introduction	Word 97	Chap_1-4.doc	0.4 mb	HP4
II. Description of Specific Plan Area	Word 97	Chap_1-4.doc	0.4 mb	HP4
III. Land Use	Word 97	Chap_1-4.doc	0.4 mb	HP4
IV. Circulation & Access	Word 97	Chap_1-4.doc	0.4 mb	HP4
V. Public Facilities	Word 97	Chap_5.doc	0.2 mb	HP4
Appendices/				
A. Ownership & Parcelization	CAD ver 14	Owner_map.dwg	0.4 mb	HP650
B. Backbone Infrastructure Unit Cost Information	Excel 97	Infrastructure.xls	0.6 mb	HP4
List of Figures				
II-1. Project Location	CAD ver 14	Location.dwg	0.5 mb	HP4
II-2. Existing Sphere of Influence and City Limits	CAD ver 14	City.dwg	1.5 mb	HP4
II-3. Existing Land Use	CAD ver 14	City.dwg	1.5 mb	HP4
List of Tables				
III-1. Relevant General Plan Land Use Goals and Policies	Word 97	Land_use.doc	0.6 mb	HP4
III-2. Land Use Summary	Excel 97	Use_sum.xls	0.5 mb	HP4
IV-1. Relevant General Land Use Goals and Policies	Word 97	Land_use.doc	0.6 mb	HP4

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**CITY OF MODESTO
INDEX**

CONSTRUCTION STANDARDS

SECTION

PAGE

1. SAFETY

1.01	General.....	1-1
1.02	Traffic Control.....	1-1
1.03	Signs	1-4
1.04	Barricades.....	1-4
1.05	Flasher Supports.....	1-4
1.06	Delineators	1-4
1.07	Flagmen.....	1-5
1.08	Warning Lights.....	1-5
1.09	Street Closures.....	1-5
1.10	Rules and Regulations	1-6
1.11	Underground Service Alert	1-6

2. PERMITTING

2.01	General.....	2-1
2.02	Insurance Requirements	2-1
2.03	Plan Requirements.....	2-1
2.04	Signs	2-2
2.05	Pre-job Requirements.....	2-2
2.06	Standard Encroachment Permit Conditions	2-3
2.07	Construction Notes.....	2-9

3. STREET CONSTRUCTION

3.01	Engineering Fabrics.....	3-1
3.02	Aggregate Subbase.....	3-3
3.03	Aggregate Base	3-3
3.04	Asphalt Concrete.....	3-3
3.05	Concrete Curb, Gutter, Sidewalk & Driveways	3-5
3.06	Striping and Pavement Markings	3-8
3.07	Header Board.....	3-9
3.08	Shoulder Backing.....	3-10

4. STORM DRAINAGE

4.01	Description.....	4-1
4.02	Materials	4-1
4.03	Testing.....	4-4
4.04	Measurement and Payment	4-5

5. SANITARY SEWERS

5.01	Description.....	5-1
5.02	Materials	5-1
5.03	Installation.....	5-6
5.04	Measurement and Payment	5-16

6. WATER DISTRIBUTION

6.01	Description.....	6-1
6.02	Materials	6-1
6.03	Installation.....	6-5
6.04	Measurement and Payment	6-11

7. STREET LIGHTING ELECTRICAL WORK

7.01	Descriptions.....	7-1
7.02	Materials	7-1
7.03	Installation.....	7-3
7.04	Acceptance	7-6
7.05	Measurement and Payment	7-7

8. UTILITY TRENCHING AND BACKFILL

8.01	Description.....	8-1
8.02	Maximum Length of Open Trench.....	8-1
8.03	Maximum and Minimum Width of Trench.....	8-1
8.04	Bracing Excavations.....	8-2
8.05	Bedding	8-2
8.06	Backfill.....	8-3
8.07	Densification Methods: Mechanically Compacted Backfill.....	8-4
8.08	Backfill Placement Requirements	8-5
8.09	Backfill Materials.....	8-5
8.10	Restoring Surface	8-6
8.11	Measurement and Payment	8-7

9. SECTION REMOVED AND/OR RELOCATED

SECTION

PAGE

10. SECTION REMOVED AND/OR RELOCATED

11. EARTHWORK

11.01	Description.....	11-1
11.02	Grade Tolerance	11-1
11.03	Relative Compaction.....	11-1
11.04	Stripping Original Ground	11-1
11.05	Subgrade Stability/Deflection Test	11-1
11.06	Disposal of Excess Material.....	11-1
11.07	Slopes	11-2
11.08	Import Borrow.....	11-2
11.09	Tree Obstructions	11-2

12. LANDSCAPE PLANTING

12.01	Description.....	12-1
12.02	General.....	12-1
12.03	Materials	12-3
12.04	Agronomic Soils Test.....	12-8
12.05	Planting.....	12-9
12.06	Cleaning Up.....	12-12
12.07	Watering.....	12-12
12.08	Inspection.....	12-13
12.09	Preliminary Inspection to the Maintenance Period	12-13
12.10	Landscape Maintenance Period.....	12-14
12.11	Final Inspection and Acceptance.....	12-15
12.12	Guarantee	12-16
12.13	Measurement and Payment	12-16

13. IRRIGATION

13.01	Description.....	13-1
13.02	Rules and Regulations	13-1
13.03	Materials	13-2
13.04	Installation.....	13-4
13.05	Testing.....	13-8
13.06	Guarantee	13-9
13.07	As-Built Drawings.....	13-9
13.08	Measurement	13-10
13.09	Payment.....	13-10

14 SECTION REMOVED AND/OR RELOCATED

15 SECTION REMOVED AND/OR RELOCATED

SECTION**PAGE****16 SECTION REMOVED AND/OR RELOCATED****17. ADJUSTMENT OF MANHOLES AND WATER VALVES**

17.01	Description.....	17-1
17.02	Adjustment.....	17-1
17.03	Measurement and Payment	17-1

18. TRAFFIC SIGNALS

18.01	Description.....	18-1
18.02	Order of Work.....	18-1
18.03	Maintenance Existing & Temporary Electrical Systems	18-1
18.04	Removing, Reinstalling or Salvaging Electrical Equip.....	18-2
18.05	Materials and Installation.....	18-2
18.06	Testing.....	18-8
18.07	Measurement and Payment	18-9

19. EMERGENCY VEHICLE DETECTOR SYSTEM

19.01	System Description.....	19-1
19.02	Matched System Components.....	19-1
19.03	System Component Specifications.....	19-2
19.04	Reliability.....	19-11
19.05	Qualifications	19-12
19.06	Responsibilities	19-12
19.07	Guaranteed Warranty.....	19-12
19.08	Certificate of Insurance	19-13
19.09	User Support Services	19-13
19.10	Certification.....	19-13

TABLES AND FIGURES

Figure 2.1	Pre-job Meeting for Encroachment Permit Applicants.....	2-4
Figure 2.2	Developer/Contractor Information.....	2-5
Figure 2.3	Permit Application.....	2-6
Figure 2.4	Standard Insurance Requirements.....	2-7
Figure 2.5	Closing a Permit.....	2-8
Table 5.1	Air Pressure Test	5-14
Figure 6.1	Acceptable Water Service Materials by Vendor.....	6-4
Table 6.1	Calcium Hydrochlorite Granules	6-9
Table 6.2	Calcium Hydrochlorite Tablets	6-10

CITY OF MODESTO SECTION 1

SAFETY

1.01 GENERAL

This Safety Section is intended to establish general principles of traffic control, worker protection and public safety measures to be taken in the performance of all work covered by the Standards.

No specification contained herein shall be deemed to create a legal standard of conduct or duty toward the public nor shall it limit the City in the exercise of powers conferred by law in modifying these specifications under special conditions.

The requirements of the current edition of the State of California, Department of Transportation, "Manual of Traffic Controls For Construction and Maintenance Work Zones", herein referred to as the State Traffic Manual, shall take precedence over the requirements of this Safety Section.

1.02 TRAFFIC CONTROL

The safe movement of traffic through construction areas depends upon communicating concise and proper information to the public by signs, barricades, delineators, flagmen and warning lights. All such devices necessary shall be furnished.

The size, shape and color of such devices as shown herein shall be as required by the State of California, Department of Transportation. **Prior to any lane closure on a collector or major street, a traffic control plan shall be prepared and accepted by the Engineer. The applicant shall provide a traffic control plan a minimum of 48 hours in advance of approval. Any complete road closure will require posting on the anticipated closure a minimum of 7 days prior to closure.**

Traffic controls through the construction zone shall be designed and maintained by a designated individual qualified in this responsibility. Evidence of qualification may be a Certificate of Completion of a course titled "Safety Through Maintenance and Construction Zones," issued by ITE.

Traffic Control for Ingress and Egress: Delineators shall be furnished and installed as directed by the City Engineer at each driveway or other point of ingress or egress. They shall be maintained, and removed when no longer required in accordance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the State Standard Specifications and these special provisions.

Temporary Pavement Delineation: Temporary pavement delineation shall be furnished, placed, maintained and removed in accordance with the provisions in Section 12-3.01, "General," of the State Standard Specifications and these special provisions. Nothing in these special provisions shall be construed as to reduce the minimum standards specified in the Manual of Traffic Controls published by the Department or as relieving the Contractor from his responsibility as provided in Section 7-1.09, "Public Safety," of the State Standard Specifications.

1. GENERAL - Whenever the work causes obliteration of pavement delineation, temporary or permanent pavement delineation shall be in place prior to opening the traveled way to public traffic. Laneline or centerline pavement delineation shall be provided at all times for traveled ways open to public traffic. On multilane roadways (freeways and expressways) edgeline delineation shall be provided at all times for traveled ways open to public traffic.

All work necessary, including any required lines or marks, to establish the alignment of temporary pavement delineation shall be performed by the Contractor. Surfaces to receive temporary pavement delineation shall be dry and free of dirt and loose material. Temporary pavement delineation shall not be applied over existing pavement delineation or other temporary pavement delineation. Temporary pavement delineation shall be maintained until superseded or replaced with a new pattern of temporary pavement delineation or permanent pavement delineation.

Temporary pavement markers and removable traffic-type tape which conflicts with a new traffic pattern or which is applied to the final layer of surfacing or existing pavement to remain in place shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

2. TEMPORARY LANELINE AND CENTERLINE DELINEATION - Whenever lanelines and centerlines are obliterated, the minimum laneline and centerline delineation to be provided shall be temporary reflective raised pavement markers placed at longitudinal intervals of not more than 24 feet. The temporary reflective raised pavement markers shall be the same color as the laneline or centerline the markers replace. Temporary reflective raised pavement markers shall be, at the option of the Contractor, one of the temporary pavement markers listed for short-term day/night use (14 days or less) or long-term day/night use (6 months or less) in "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions.

Temporary reflective raised pavement markers shall be placed in accordance with the manufacturer's instructions and shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used to place pavement markers in areas where removal of the markers will be required.

Temporary laneline or centerline delineation consisting entirely of temporary reflective raised pavement markers placed on longitudinal intervals of not more than

24 feet, shall be used on lanes opened to public traffic for a maximum of 14 days. Prior to the end of the 14 days the permanent pavement delineation shall be placed. If the permanent pavement delineation is not placed within the 14 days, the Contractor shall provide, at his expense, additional temporary pavement delineation. The additional temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent pavement delineation for the area, as determined by the Engineer.

Full compensation for furnishing, placing, maintaining, and removing the temporary reflective raised pavement markers, used for temporary laneline and centerline delineation for those areas where temporary laneline and centerline delineation and for providing equivalent patterns of permanent traffic lines for such areas when required; shall be considered as included in the contract prices paid for the items of work that obliterated the laneline and centerline pavement delineation and no separate payment will be made therefor.

3. TEMPORARY EDGELINE DELINEATION - Whenever edgelines are obliterated, the edgeline delineation to be provided for that area adjacent to lanes open to public traffic shall consist of, at the option of the Contractor, either solid 4-inch wide traffic stripe of the same color as the stripe the temporary edgeline delineation replaces, or shall consist of traffic cones, portable delineators or channelizers placed at longitudinal intervals not to exceed 50 feet.

Four-inch wide traffic stripe placed for temporary edgeline delineation, which will require removal, shall consist of temporary removable construction grade striping and pavement marking tape listed in "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions. Temporary removable construction grade striping and pavement marking tape when used shall be applied in accordance with the manufacturer's recommendations. Where removal of 4-inch wide traffic stripe will not be required, painted traffic stripe used for temporary edgeline delineations shall conform to "Paint Traffic Stripes and Pavement Markings" of these special provisions, except for payment and the number of coats shall be, at the option of the Contractor, either one or two coats. The quantity of painted traffic stripe used for temporary edgeline delineation will not be included in the quantities of paint traffic stripe to be paid for.

The lateral offset for traffic cones, portable delineators or channelizers used for temporary edgeline delineation shall be as determined by the Engineer. If traffic cones or portable delineators are used as temporary pavement delineation for edgelines, the Contractor shall maintain the cones or delineators while they are in use.

Channelizers used for temporary edgeline delineation shall be surface mounted type and shall be orange in color. Channelizer bases shall be cemented to the pavement in the same manner provided for cementing pavement markers to pavement in the section of these special provisions entitled "Pavement Markers," except epoxy adhesive shall not be used to place channelizers on the top layer of pavement.

Channelizers shall be, at the Contractor's option, one of the surface mount types (365") listed in "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions.

Temporary edgeline delineation shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

Full compensation for furnishing, placing, maintaining, and removing temporary edgeline delineation shall be considered as included in the contract prices paid for the items of work that obliterated the edgeline pavement delineation and no separate payment will be made therefor.

1.03 SIGNS

The types of signs shown in Standard Details #100-106 are typical under normal conditions.

Warning signs used for nighttime conditions shall be reflectorized or illuminated. The use of orange flags in conjunction with signs is permitted if they do not, at any time, interfere with a clear view of the sign face.

Reflectorized signs fastened to barricades or similar supports shall have the face of the sign vertical and normal to the direction of traffic for effective visibility.

Signs are to be used only as long as necessary and then removed. During periods when the signs are temporarily unnecessary, they shall be removed or have their message covered.

1.04 BARRICADES

Barricades are intended to impose an obstacle to or close off the normal flow of travel. Approved barricades are shown on Standard Detail #100.

Barricades shall not be used unless they are needed to separate the motorist from objects of greater hazard than the barricades themselves. Barricades should never be used primarily for delineation. The use of nonstandard types of barricades, such as drums, buckets, sandbags, etc., can be hazardous and their use is prohibited.

1.05 FLASHER SUPPORTS

Portable flasher supports shall be as required by the State Traffic Manual.

1.06 DELINEATORS

The function of delineators is to channelize traffic. They shall consist of post and paddle type markers of cylindrical or cone shaped objects 18 to 48 inches in height as shown in Standard Detail #101.

Delineators should be uniformly positioned laterally and longitudinally relative to the line of traffic and they must be maintained in an erect position.

Delineators for nighttime use shall be reflectorized or illuminated to be visible from 500 feet under normal atmospheric conditions.

When placed in proximity to the edge of a traffic lane, delineators should be made of a material that will withstand impact without damage to them or the striking vehicle. Consideration must also be given to the necessity for stability against knockdown from wind or the wash of passing traffic.

1.07 FLAGMEN

Flagmen shall be required as necessary for safe conduct of the traffic through the construction area or as directed by the City Engineer. Flagmen shall not be used as a substitute for other warning signs and devices. Standard hand signals shall be used as shown in the State Traffic Manual.

1.08 WARNING LIGHTS

Warning lights shall be electric lanterns, electric markers or flashers provided to indicate an obstruction or restriction during periods of low visibility. Warning lights shall be placed to mark the location of obstructions. Motion may be imparted to warning lights.

Flashing lights for delineating the path traffic is to follow shall be uniformly spaced as approved by the City Engineer.

Warning lights may be fastened to signs, barricades and portable flasher supports in a manner satisfactory to the City Engineer.

1.09 STREET CLOSURES

For any temporary street closure on all or part of a residential street, the street closure shall be made as shown in the State Traffic Manual. Prior to any street closure on a collector or major street, a traffic control plan shall be prepared and accepted by the City Engineer. In addition, a copy of the accepted traffic control plan shall be on the site at all times. One lane for each direction of through traffic must be maintained except where flagmen are provided to control traffic; then one lane may serve both directions. When trenching is necessary across intersecting streets, the work shall be done in such a manner as to maintain two-way traffic on cross streets at all times.

Where the trench line crosses an entrance to private property, access to the property shall be maintained at all times by means of a suitable bridge, until the trench may be backfilled. Such bridges shall be properly guarded and illuminated at night. Where any crosswalk is cut by the trench, suitable bridging shall be constructed. Such bridging shall be at least 4 feet in width, have suitable hand railing, be properly guarded and be illuminated at night.

The complete closure of a street is allowed only when authorized in writing by the City Engineer, as provided by Section 7-2.14 of the Modesto Municipal Code. Such closure shall be accomplished only through the use of Type III barricades as shown in the State Traffic Manual.

Permanent closures and temporary closures in new developments at dead end streets and where pavement narrows at the edge of the development shall be made as shown in Standard Details #712-714.

1.10 RULES AND REGULATIONS

All work performed and all materials used shall comply with the State Labor Code, the California Administrative Code, Construction Safety Order, Title 8, Subchapter 4, and all other applicable Federal, State and Local laws and regulations.

Specifically, the Contractor shall furnish, install and maintain all shoring, bracing and sheeting. Any damage resulting from a lack of adequate shoring, bracing or sheeting shall be repaired.

Additional requirements may be imposed by the City Engineer in the interest of public safety.

1.11 UNDERGROUND SERVICE ALERT - USA

USA is a "One Call Notification Center" used for identifying any underground facilities prior to digging. The Developer or City Contractor shall call USA at 800-642-2444 at least 48 hours prior to the start of any excavation within the City Limits. All participating members, including the City of Modesto, will be informed by USA of the location, date, time and description of the proposed excavation.

Any existing underground facilities will then be located and marked in the field by the appropriate USA member organization(s). Requests for field meetings shall be included in the initial call to USA. For further information, contact the City of Modesto at 577-5326.

All excavation shall be in compliance with Section 1540(a)(1) of the Construction Safety Orders (Title 8, California Administrative Code Section 1540) which states:

"Prior to opening an excavation, effort shall be made to determine whether underground installation; i.e., sewer, water, fuel, electric lines, etc., will be encountered and, if so, where such underground installations are located. When the excavation approaches the approximate location of such an installation, the exact location shall be determined by careful probing or hand digging; and, when it is uncovered, adequate protection shall be provided for the existing installation. All known owners of underground facilities in the area concerned shall be advised of proposed work at least 48 hours prior to the start of actual excavation."

The Contractor shall be responsible for the preservation of, and any damage to, both private and public property in accordance with current State Standards - Section 7-1.11.

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CITY OF MODESTO
SECTION 2

PERMITTING

2.01 GENERAL

Permits for work in the Public Right-of-way are the responsibility of the Permits Division of the Engineering and Transportation Department. The time required to process a permit will vary by the complexity of the issues presented. In general, permits for a single residential driveway, sidewalk, or sewer repair or sewer tie-in can be obtained immediately if insurance is on file and the fees are paid.

Obtaining a permit for a commercial project will vary by the amount of work contemplated. For smaller commercial developments such as a mini-market or restaurant, staff will calculate and collect an inspection fee with the issuance of the permit. For larger commercial projects such as the construction of a Target or Costco, staff inspection services will be billed on a time and materials basis.

Residential and commercial subdivisions inspection fees will be billed to the developer on a time and material basis.

2.02 INSURANCE REQUIREMENTS

To obtain a permit, the applicant's company must have workman's compensation and liability insurance on file with the City of Modesto City Clerk's Office. Homeowners working on their own concrete work may have the insurance requirement waived. No homeowner may work on sewer pipes in the public right-of-way without the proper state contractors license. Insurance requirements may be found on page 2-6.

2.03 PLAN REQUIREMENTS

In general, unless the permit is a repair to an existing facility or adding a single residential driveway, plans are required. A commercial project may use the architectural drawings in lieu of creating civil engineering drawings to obtain a permit for minor concrete related work. A civil engineer stamp will be required when constructing underground utilities beyond a simple sewer and water tie-in or when sidewalk grade design is required. See Design Appendix E for the submittal package requirements.

Traffic control plans will be required prior to closing a single lane. If the entire road is being closed for the project, an application for a permit must be approved at least 3 weeks prior to the road closure dates. The contractor will also be required to post notification signs at least 10 days prior and distribute leaflets to property tenants or owners within 300 feet of the closure. Contractor shall follow Section 1.09 Street Closures of this manual.

For developments 5 acres or greater, the developer will also need to provide a storm water pollution prevention (SWPP) plan to the state and the contractor. By city ordinance, a developer must provide a copy of the notice of intention (NOI) filed to the state before picking up a grading or encroachment permit. A copy of the SWPP plan must be on-site during the contractor's work.

2.04 SIGNS

Signs posted for a road closure must meet the Construction Standards Section 1 and Caltrans specifications. The advanced closure signage will have the dates on the sign and must be re-adjusted two days prior to any extension granted.

2.05 PRE-JOB REQUIREMENTS

Residential Subdivisions and large commercial projects will require a pre-job meeting with city permits and inspection staff. This meeting is to help communicate the areas of responsibility. Please make a copy of the form in Figure 2.2 and fill-in as much as possible prior to the pre-job. Staff will review the submittal requirements found in figure 2.1 and give the contractor a list of required submittals.

All developments greater than five (5) acres shall submit a copy of the Notice of Intent (NOI) with the State Water Resources Control Board and show proof of a Storm Water Pollution Prevention Plan (SWPPP) to Storm Drainage Administration & Monitoring (See Appendix N for a sample SWPPP). Developments less than five (5) acres or adjacent to Dry Creek or the Tuolumne River shall be required to utilize Best Management Practices as documented in the Erosion and Sediment Control Standards and Specifications for Construction Activities in the City of Modesto and other state guidelines.

Developments, regardless of location and size, shall develop and execute a Erosion and Sediment Control Plan. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for a Erosion and Sediment Control Plan. Regardless of the size of a project, all developments shall implement Best Management Practices (BMPs).

Figure 2.1 PRE-CONSTRUCTION MEETING REQUIREMENTS FOR ENCROACHMENT PERMIT APPLICANTS (used on subdivisions and large projects exceeding \$100K in public improvements)

1. Encroachment Permit Number: N_____
2. Improvement Plan Number: _____
3. Subcontractor/Developer Information Sheet Submitted? Y N
4. Copy of Notice of Intent filed State Water Resources Control Board (SWPP)? Y N
5. Insurance on File: Workmans Compensation? Y N Liability? Y N
6. Construction Inspector: _____ Ph. 577-5452 Fax 577-4302
 NPDES Coordinator: Blair Bradley ph. 577-6249
 Water Connection: Permits, ph. 571-5569
 Encroachment Permits: ph 571-5569
 Building Permits: ph 577-5232
7. Inspections Required (48 hour notice required) for Grading, Subgrade, Utilities, Concrete, Rocking, Paving, Traffic control: lane & road closures, and all other work required by the inspector to be inspected.
8. Additional Permits Required for Road Closures, major CFD financed items, & Landscaping.
9. Changes to approved plans may require engineers & city's approval. Inspector's discretion.
10. Submittals required for:

Pipe & fittings (mfg literature)	Y	N
city utility appurtenances (CB, MH, etc.)	Y	N
AB & AC & Concrete	Y	N
street lights, pull boxes, & conduit	Y	N
traffic signals (if required)	Y	N
pump stations (if required)	Y	N

ATTENDEES:

Name	Job	Company	Phone
	Encroachment Permits	Permits, City	577-5264
	Construction Inspector	City	577-5452

Figure 2.2 DEVELOPER/CONTRACTOR INFORMATION

Subdivision Name: _____ Plan No. _____

Encroachment Permit No. _____ Date Issued: _____

Developer Co. Name: _____

Individuals Name: _____

Billing Address: _____

Phone: _____ Fax: _____

Email: _____

Civil Engineer Design Firm: _____

Address: _____

Phone: _____ Fax: _____

Email: _____

Contractors Work Items: Grading, Paving, Concrete, Water, Sewer, Storm, Landscaping, Street lights, Traffic Signal, Lift Station, etc.

Primary Contractor : _____ Work Items: _____

Address: _____

Phone: _____ Fax: _____

Email: _____

Subcontractor 1: _____ Work Items: _____

Address: _____

Phone: _____ Fax: _____

Email: _____

Subcontractor 2: _____ Work Items: _____

Address: _____

Phone: _____ Fax: _____

Email: _____

Subcontractor 3: _____ Work Items: _____

Address: _____

Phone: _____ Fax: _____

Email: _____

Subcontractor 4: _____ Work Items: _____

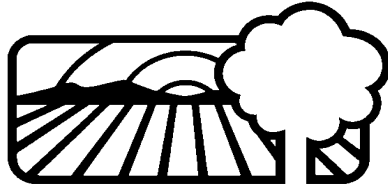
Address: _____

Phone: _____ Fax: _____

Email: _____

PERMIT NO. N

Valid From : _____ To: _____



CITY OF MODESTO

Engineering & Transportation, Development Services (Suite 3100)

1010 Tenth Street

P.O. Box 642

Modesto, CA 95353

Permits Tel. No. (209) 571-5669

Permits Fax: (209) 491-5969

Inspection: (209) 577-5452

Owner: _____ email: _____
 Attn: _____ email: _____
 Street Address: _____ ph: _____
 City, State, & Zip Code: _____ fax _____

Contractor: _____ email: _____
 Street Address: _____ ph: _____
 City, State, & Zip Code: _____ fax _____

LOCATION:

Plans:

Description	Location	Qty	Unit	Unit Cost	Total	Accounts
					0	
					0	
					0	
					0	
					0	
					0	

TOTAL 0

ADMINISTRATIVE CHECKS

- ☐ Over 5 acres (NOI required)
- ☐ Point Discharge Systems
- ☐ Workmans Comp
- ☐ Liability Insurance
- ☐ Engineering plans

SAFETY

- ☐ Traffic Controls
- ☐ Detour Plan
- ☐ Police Notification
- ☐ Fire Notification
- ☐ Public Release

FEES/REIMBURSEMENTS

- ☐ CFF Fee
- ☐ CFD Fee
- ☐ CFF Reimbursement
- ☐ CFD Reimbursement
- ☐ Sewer Reimbursement
- ☐ Water Reimbursement

- ☐ Canal District Fee
- ☐ Storm District Fee
- ☐ Trench Cut Ordinance

PERMIT ISSUED BY: _____

Date: _____

Permit Distribution:

ASSIGNED INSPECTOR: _____

CFF, CFD, Util

File

INSPECTOR'S ACCEPTANCE: _____ DATE: _____

CAO

Laura

Mapping

Applicant

2.06 STANDARD ENCROACHMENT PERMIT CONDITIONS

The following conditions are from the City standard encroachment permit:

1. Call the inspector 48 hours before starting work and for final inspection – 577-5452
2. Perform work according to City of Modesto Standard Specifications and MMC Sec. 7-2.01 et seq and Sec 7-1.105 et seq
3. Call USA at 800-642-2444 and 800-227-2600 and MID at 209-526-7373 for utility locations at least 48 hours before digging. Other companies not listed include PG&E, Pacific Bell, Cable One, GST, Level Three Communications, Williamson Cable, Adelphia, and Alta Vista Cable.
4. Provide a copy of these permit conditions to all contractors doing work covered under this permit.
5. Call Fire and Police at 572-9679 before closing any part of the street or alley.
6. Open all traffic lanes during peak hours: Mon-Fri: 7:30 – 8:30 AM; 4:30 – 5:30 PM.
7. Construct subdivision improvements in accordance with approved plan set. Inspection fees to be reimbursed in accordance with Subdivision Agreement and/or Modesto Municipal Code (MMC).
8. Partial street closures may be coordinated with the inspector and will not require a separate permit. Partial street closures may be limited in time to 8:30 am to 4:30 pm. All construction traffic control shall follow the Caltrans manual.
9. Full street closures will require a separate permit. Street closure permits will be conditioned to post all streets converging to this location with public warning signs of the pending closure. The traffic plan shall be approved a minimum of 2 weeks prior to pending closure. The traffic plan will address the detour of traffic. The permit will minimize the amount of time the closure is in effect.
10. Prior to receiving any water taps, the developer shall pay the water service connection charges.
11. Prior to issuance of the permit, the contractor or developer shall provide the Developer/Contractor Information and a copy of the Notice of Intent (NOI) filed with the Water Resources Board. In compliance with the Water Resources Board, the Stormwater Pollution Prevention Plan is required to be onsite. A copy of the NOI shall be in this binder.
12. A copy of the City of Modesto Erosion and Sediment Control and Standard Specifications for Construction Activities is available at Kinko's or by email.
13. At a minimum, even in summer conditions, an aggregate pad shall be constructed at each ingress and egress point to existing pavement. See attached detail.
14. Off-site inlets adjacent to your project shall have filter screens placed in the grates to prevent silt contamination. These shall be maintained during the entire duration of the project, to include home building on Rose.
15. All CFD, CFF and reimbursable utility line construction work shall be permitted by separate permits. No work shall be done on these items until the reimbursement agreement is executed, a notice to proceed is issued, and a permit is issued specifically for the items of reimbursable work.
16. Landscaping work is **not** permitted unless specifically listed in the permitted items of work.

ADDITIONAL COMMENTS

APPLICANTS SIGNATURE: _____ DATE: _____

FIGURE 2.4 STANDARD INSURANCE REQUIREMENTS

The permittee/licensee shall provide, at its own expense, and maintain at all times the specified insurance policies with insurance companies licensed in the State of California and with an acceptable Best's rating of A:VII or with approval of the City's Risk Manager. The policies or certificates thereof shall provide that thirty (30) days prior to cancellation or material change in the policy notices of same shall be given to the City Clerk of the City by registered mail, return receipt requested.

1. **Workers' Compensation** – in compliance with the statutes of the State of California, plus employer's liability with a minimum limit of liability of \$500,000.
2. **General Liability** insurance with a minimum limit of liability per occurrence of \$500,000 for bodily injury and \$50,000 for property damage or \$500,000 combined single limit.* This insurance shall indicate on the certificate of insurance the following coverages and indicate the policy aggregate limit applying to: premises and operation; broad form contractual; and products and completed operations.

The Certificate of Insurance:

The Certificate shall indicate the City of Modesto to be a Certificate holder and additional insured.

The Certificate shall contain the provision that the issuing company shall mail a 30-day written notice to the City Clerk, City of Modesto, prior to any intent to cancel, non-renew, or reduce coverage. Statements such as "Will endeavor to notify" or "Failure to mail such notice shall impose no obligation..." cannot be accepted. Please have your insurance agent cross out those phrases if they are printed on the certificate form.

The Certificate of Insurance must include the policy's expiration date or an indication that it is continuous. The Certificate must also include a policy number. "Binders" are unacceptable.

* The limits of liability required may vary, depending on the type of permit or contract. If there are any question pertaining to the above, please call the Risk Management Department at (209)577-5411.

CITY OF MODESTO
Office of City Clerk
(209)577-5396 FAX (209)571-5152

Figure 2.5 CLOSING A PERMIT (Acceptance of improvements)

GENERAL: No permit will be closed by the inspector without a final inspection. Contractors must call for final inspection after all work is completed and the site is cleaned up. On final inspection, the inspector will either sign-off on the permit and forward the signed off copy to permits or develop a punch list of corrections required prior to acceptance.

SUBDIVISION IMPROVEMENTS: By ordinance, permitted subdivision improvements must be formally accepted by City Council. To be accepted by City Council the following must be completed:

- Developer's contractor must complete the punch list to the satisfaction of the inspector
- Developer must submit and have approved warranty bonds
- Developer must pay all outstanding invoices to include inspection and water service fees
- Developer must have complied with all conditions placed on the subdivision map
- Developer's engineer must submit a set of "as-builts" or "Record Drawings" and a compact disk with the scans and CAD file

COMMERCIAL IMPROVEMENTS: Most commercial improvements do not have to be formally accepted by City Council. To have improvements accepted the following must be completed:

- Developer's contractor must complete the punch list to the satisfaction of the inspector
- Developer must pay all outstanding invoices
- Developer must have complied with all conditions placed on the development

2.07 **CONSTRUCTION NOTES**

A. GENERAL

1. All material and work shall conform to City of Modesto Specifications and Plans. The improvements are subject to the inspection and approval of the **Engineering & Transportation Department**. Contact the Construction Administration Office at 577-5452 two working days (48 hours) prior to the start of any work to arrange for inspection.
2. Contractor or developer shall obtain an encroachment permit prior to the start of any work. No work can begin without an approved and signed set of improvement plans.
3. Prior to excavating near any underground utilities, call U.S.A. at least forty-eight (48) hours in advance at phone (800) 642-2444 or (800) 227-2600.
4. These plans have been checked by the City of Modesto and/or its authorized representative, but such checking and/or approval does not relieve the developer and contractor from his/her responsibility to correct errors, omissions or make changes required by conditions discovered in the field during the course of construction.
5. Contractor shall control dust at all times during construction as required by the City of Modesto and the Regional Air Quality Control Board.
7. Relocation of designed utility systems more than 25' must be reviewed by the **Engineering & Transportation Department** prior to construction and shall be accurately shown on revised plans stamped and signed by City staff prior to the installation of the improvements.
8. All construction staking for curb, gutter, and sidewalk, sanitary sewers, storm drains, water lines, fire hydrants, electroliers, etc. shall be done under the direction of a registered civil engineer or licensed land surveyor.
9. All existing **underground** utilities may **not** be shown. The contractor shall take precautionary measures to protect these utilities. The contractor shall do no excavation until all utility **companies** and the City of Modesto have been notified and have been given the opportunity to mark their facilities in the field.
10. House services, fire hydrant laterals, gas and telephone lines, and all other underground utilities shall be installed prior to curb, gutter, and sidewalk construction and street paving.
11. All lines abandoned during construction shall be removed.
12. For all projects, regardless of size, the Contractor shall implement best management practices to eliminate or minimize pollution discharge caused by construction (see Section 16).

12. **Material Testing:**

- a) All independent material testing and inspection called for by the City Engineer shall be furnished and paid for by the developer or contractor.
 - b) Subgrade testing for R-values are required prior to the installation of base rock.
 - c) Contractor shall furnish material certifications of pre-manufactured material when called for by City Engineer.
13. Street striping shall include stop bars, centerline striping or markers, crosswalks and all other markings required by the City Engineer. Striping shall be done with thermoplastic and reflective markers.
14. All trenches shall be backfilled in accordance with City standards.
15. When widening the pavement on an existing road, the existing pavement shall be cut to a neat line and removed back to an existing adequate structural section, or to the original road section. An exploratory trench, or pot-holing, may be required to determine the limits of pavement removal.
16. Existing curb and sidewalk within the project limits that are damaged or displaced, even though they were not to be removed, shall be repaired or replaced per City Standard Details even if damage or displacement occurred prior to any work performed by the contractor.
17. Asbestos Cement Pipe (ACP) or fittings shall not be used within the City of Modesto.
18. Prior to trenching for any sewer, water, or storm drain pipe, the contractor shall verify, in the field, the size and location of the existing pipe at the point of connection. Any deviation from the plans shall be resolved by the design engineer prior to trenching.
19. Manholes, valves, cleanouts, etc. shall be brought to finish grade by the underground contractor after the final paving course is placed.
20. For pipes greater than 30" on sewer and 36" on storm drain, 60" inside diameter, manholes shall be used.
21. Street closure or lane closure will require a traffic control plan and the designation of a qualified individual for its implementation and safe maintenance.

B. WATER

- 1. All water lines shall be pressure-tested, disinfected, flushed, and tested for bacteria in conformance with the City of Modesto specifications prior to final acceptance by the City.

2. All water services shall be 1" minimum. Water service shall be connected to water mains with two-strap bronze saddles. City shall make all taps on existing water mains only.
3. All valves, tees and crosses to be flanged to their respective fittings. Water valves to be resilient seat only.
4. Water mains at the end of future streets shall have two half-lengths of pipe between gate valve and blow-off. Deflection of water lines shall not exceed 80% of manufacturer's specifications.
5. Water mains shall be as per city standards and fire hydrants shall be Jones J-4040, Long Beach 425, Clow 850, AVK 2470 or approved equal and shall conform to the latest AWWA Specifications, C-503, for wet-barrel fire hydrants. All hydrants shall be painted with Caterpillar Yellow Polyurethane high duty industrial enamel. No lead based paints may be used.
6. All valve stems must be brought to a minimum of four feet (4') below finish grade with stem extension units.
7. Thrust blocks shall be provided at all required locations on water line in accordance with the City of Modesto Specifications and Details.

C. STORM DRAIN

1. Storm drain pipe sizes shall not be changed without the approval of the City Engineer.
2. Storm drain pipe alternatives:
 - a) Reinforced concrete pipe class III (unless otherwise noted).
 - b) Cast-in-place concrete pipe, City of Modesto Standard (36" or larger).
3. Catch basins to be constructed per City Standard Details.
4. For all construction projects, Contractor shall file a Notice of Intention (NOI) to the State Water Quality Board. This is part of the NPDES permit process. Contractor shall also be in compliance with Chapter 10 of Title V of the Modesto Municipal Code. The Contractor may file for a notice of exemption with the State Water Quality Board.
5. All construction site activities, regardless of size, shall conform to Section 16 of these Specifications and the State Water Resources Control Board, National Pollution Discharge Elimination System (NPDES), Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity.

D. SANITARY SEWER

1. Sanitary sewer pipe shall be V.C.P. extra strength (ASTM C-700).
2. All sanitary sewer mains shall be television inspected, flushed with an approved sewer ball and pass a leakage test in conformance with City of Modesto Standard Specifications prior to acceptance by the City. All testing shall be performed after the compaction for street base rock and prior to paving.
3. One 4" V.C.P. sanitary sewer lateral shall be installed to each lot at location shown on the plan. A cleanout shall be placed at right-of-way line per standard plan #509. Cover on lateral at property line to be 3' minimum to 5' maximum except as noted on plans.
4. All manholes constructed on a trunk main shall be PVC lined and tested in conformance with City of Modesto Standard Specifications.

SECTION 3

STREET CONSTRUCTION

3.01 ENGINEERING FABRICS

A. Description

This work shall include furnishing all the labor, materials, tools and equipment necessary to place the engineering fabrics in accordance with the approved plans and these specifications.

Engineering fabrics shall include pavement reinforcing fabric and light-duty road stabilization fabrics. A Certificate of Compliance from the product manufacturer for each type of engineering fabric used shall be furnished to the Engineer. Engineering fabrics shall be furnished in protective covers to shield against ultraviolet rays, abrasion, and water.

B. Pavement Reinforcing Fabric

1. Materials

Pavement reinforcing fabric shall be manufactured from polyester, polypropylene, or polypropylene-nylon material. The fabric shall be non-woven heat bonded on the top side, and shall conform to the following:

<u>Property</u>	<u>Minimum Requirements</u>	<u>Test Method</u>
Grab Strength (lbs.)	90	ASTM D4632
Elongation at Break (%)	40	ASTM D4632
Asphalt retention (gal/sy)	0.2	TF25 #8
Thickness (mils.)	30 to 100	ASTM D461
Melting Point (F)	300	ASTM D276

2. Installation

Pavement reinforcing fabric shall be installed in accordance with Section 39-4.03 of the State Specifications.

C. Road Stabilization Fabric

1. Materials

Road stabilization fabric shall be for light duty applications and shall be manufactured from polyester, nylon, or polypropylene material, or any combination thereof.

The fabric shall be non-woven, permeable, and shall conform to the following:

<u>Property</u>	<u>Minimum Requirements</u>	<u>Test Method</u>
Grab Strength (lbs.)	90	ASTM D4632
Puncture Strength (psi)	30	ASTM D751-69
Trapezoidal Tear (lbs)	30	ASTM D4533
Burst Strength (psi)	145	ASTM D751-68 IST 180, 5-84

2. Installation

The subgrade to receive the geotextile fabric, immediately prior to placing, shall conform to the compaction and grade requirements as specified in Section 11 of these specifications and as shown on the Plans.

Geotextile fabric shall be handled and placed in accordance with manufacturer's recommendations.

The fabric shall be aligned and placed in a wrinkle-free manner.

Adjacent borders of the fabric shall be overlapped a minimum of 12 inches or stitched. The preceding roll shall overlap the following roll in the direction the material is being spread or shall be stitched. When the fabric is joined by stitching, it shall be stitched with yarn of a contrasting color. The size and composition of the yarn shall be as recommended by the fabric manufacturer. The stitches shall number 5 to 7 per inch of the seam.

Within 24 hours after the fabric has been placed, it shall be covered with aggregate base material as shown on the plans.

During spreading and compaction of the aggregate base material a minimum of 6 inches of such material shall be maintained between the fabric and the Contractor's equipment. Equipment or vehicles shall not be operated or driven directly on the fabric.

D. Measurement and Payment

Engineering fabric will be measured by the square yard of area covered, excluding additional fabric required for overlap.

Payment for engineering fabric shall be based on the contract unit price and quantity installed as described above. The contract unit price shall include furnishing all labor, materials, tools, equipment, and incidentals and for performing all the work involved in installing the engineering fabric, as specified in these specifications and as directed by the City Engineer.

3.02 AGGREGATE SUBBASE

A. Description

Aggregate subbase shall conform with Section 25 of the State Specifications and shall be Class 3 ASB. Thickness shown on the plans shall be the minimum section allowed.

B. Measurement and Payment

Aggregate subbase shall be measured by the cubic yard as placed on the street, driveways, and other areas designated by the City Engineer.

Quantities of aggregate subbase will be paid at the contract unit price cubic yard. The above prices and payments shall include full compensation for furnishing all labor, materials (or processing selected materials), tools, equipment, and incidentals and for doing all the work involved in hauling and constructing aggregate subbase, complete in place as shown on the plans, and as specified in these specifications and the special provisions, and as directed by the City Engineer.

3.03 AGGREGATE BASE

A. Description

Aggregate base shall conform with Section 26 of the State Specifications and shall be Class 2, 3/4-inch maximum AB. Thickness shown on the plans shall be the minimum section allowed.

B. Measurement and Payment

Quantities of aggregate base to be paid for by the cubic yard will be calculated on the basis of the dimensions shown on the plans adjusted by the amount of any change ordered by the City Engineer. No allowance will be made for aggregate base placed outside said dimensions unless otherwise ordered by the City Engineer.

Quantities of aggregate base will be paid at the contract unit price cubic yard for the class or classes involved. The above prices and payments shall include full compensation for furnishing all labor, materials (including water in the material at the time of weighting as provided in Section 26-1.06 of the State Standard Specifications, "Measurement"), tools, equipment, and incidentals and for doing all the work involved in hauling and constructing aggregate base, complete in place as shown on the plans, and as specified in these specifications and the special provisions, and as directed by the City Engineer.

3.04 ASPHALT CONCRETE

A. Description

Asphalt Concrete shall conform with Section 39 of the State Specifications and shall be Type A Asphalt Concrete using AR4000 paving asphalt. Aggregate used in all but the final course shall be 3/4-inch maximum, medium grading.

Aggregate used in the final course shall be as follows:

Expressway, Arterial, Collector and Industrial Streets – Type A, 3/4 inch maximum, medium grading

Residential Streets – Type B, 1/2 inch maximum, medium grading
Asphalt for 0.1' overlays shall be as specified in the Special Provisions for each project.

Asphalt concrete shall be spread to Section 39-6.01 of the State Specifications.

B. Paving Spread

The following rules shall apply to all paving in public streets:

1. The final course shall be paved starting from the curb and paving toward the centerline of the street.
2. When paving the final surfacing course, there shall be a minimum of two rakers and one screed person per paving machine.
3. Vibratory rollers may be used as approved by the City Engineer.
4. The surface course shall be laid with a paving machine except when permitted otherwise by the City Engineer.
5. Paving machines shall have automatic joint control.
6. Extensions or wings shall not be permitted except as approved by the City Engineer.

C. Penetration Treatment, Prime and Tack Coats (when required by conditions or specifications)

<u>TYPE</u>	<u>ASPHALT GRADE</u>	<u>RATE gals./yd.</u>
Prime	SC-250	0.25
Tack	CSS-1 (slow setting)	0.02 to 0.10

Tack coat may be required between asphalt concrete lifts when traffic has utilized the paving surface.

D. Adjustment of Utility Covers

All utility covers structures including manholes, cleanouts, blow-offs and water valve boxes shall be lowered prior to any pavement planning and shall be brought to finish grade after the final pavement lift has been installed.

E. Mix Design

Contractor shall insure the asphalt concrete suppliers have an approved current (calendar year) mix design on file with the City of Modesto prior to any paving.

F. Spreading and Compacting Equipment

Spreading and compacting equipment shall be as specified in Section 39-5 of the State Specifications. The State Specifications are amended to allow use of a motorized latent box for projects involving less than 50 tons of asphalt concrete.

G. Measurement and Payment

Asphalt concrete shall be measured by the ton as placed on the street, driveways, and other areas designated by the City Engineer.

Payment shall be made as per Section 39-8.02 of the State Standard Specifications.

3.05 CONCRETE CURB, GUTTER, SIDEWALK & DRIVEWAYS

A. Description

Work shall conform with Section 73 and Section 90 of the State Specifications with the following additions. Curb, gutter and sidewalk shall be constructed of 5 sack (2500 psi) portland cement concrete. Materials - Type I or Type II cement, 4" maximum slump, 1" maximum size Aggregate.

Traffic, parking and street name signs on city streets which require relocation because of the work will be relocated by the City but two working days advance notice is required. Traffic signs on state highways and stop signs on streets entering state highways must be relocated by Cal Trans. Utility poles which require relocation because of the work shall be relocated by the utility company owning the poles.

B. Installation

1. Subgrade Preparation

The finished subgrade immediately prior to placement of aggregate base shall be compacted to 90% relative compaction @ 3% over optimum moisture content for a depth of 0.5 feet.

2. Cushion (if specified)

Shall be mechanically compacted Class 2 Aggregate Base.

3. Forms

Lumber used for forms must be smooth on the side placed next to the concrete and shall not be less than 1-1/2 inches thick. Warped forms and forms not having a smooth, straight upper edge shall not be used. Benders or thin planks, rigidly placed, may be used on curves, grade changes, or the curb returns.

All forms shall be clean and coated with a light oil to prevent the concrete from adhering to them. All forms must be carefully set to proper alignment and grade and shall be rigidly held in place by the use of steel or wooden stakes. Clamps, spreaders and braces shall be used where required to insure rigidity in the forms.

Forms shall not vary from vertical grade by more than 0.02 foot and from horizontal alignment by more than 0.05 foot within the distance not to exceed 25 feet. All forms shall have smooth even lines in both the horizontal and vertical plane. A windrow of earth placed against the forms prior to placing concrete may be required to prevent them from bulging.

Except for vertical curb forms, all forms shall remain in place for at least 12 hours after the concrete is placed.

4. Extruded Sidewalk, Curb and Gutter

Use of an extrusion machine is allowed. A test pour may be required by the City Engineer prior to approval.

5. Placing and Finishing

No concrete shall be placed or finished in the rain. It shall be the Contractor's responsibility to schedule his operations such that concrete will not be placed or finished in the rain.

At the end of each day's pour, when work is terminated, or when a delay of more than 30 minutes occurs, the joint shall be made vertical and square ended. In no case shall the end of a day's pour terminate in a driveway.

a) Curb & Gutter

Expansion joints shall be constructed in conformance with Section 303 5.4.2 “Expansion Joints” of the Standard Specifications for Public Works Construction (SSPWC), at the end of each curb return and at intervals not to exceed two hundred (200) feet. Where the existing sidewalk and curb is cut to install new driveways and approaches, expansion joints shall be constructed on each side of the driveway or approach.

Weakened plane joints shall be constructed in conformance with Section 303-5.4.3 “Weakened Plane Joints” of SSPWC at eight (8) foot intervals and at each end of the driveway approaches.

Weakened plane joints shall be constructed at a maximum of 20’, with expansion joints at each side of structure and at curb returns.

When curb, gutter and sidewalk are poured monolithically, scoring lines in conformance with Section 303-5.5.3 “Walk” of the SSPWC shall be placed along the back of the curb.

When making new curb cuts, replacing existing curb, or placing new concrete curb in existing asphalt, the asphalt shall be cut a minimum of 6 inches from the lip of the curb.

b) Sidewalk

Expansion joints for new construction shall be located opposite the expansion joints as placed for curbs and gutters.

Expansion joints placed in sidewalks where curbs and gutters exist shall be placed to match the expansion joints in existing curbs and gutters.

Sidewalk score lines shall conform to score lines of existing sidewalks when new construction is placed contiguous and in line with existing sidewalk or as indicated on the contract plans or standard plans for sidewalk.

Weakened plane joints shall be constructed at a maximum interval of 8 feet for 4-foot sidewalk, 10’ for other widths. Depth of weakened plane joint shall be a minimum of 25% of the thickness of the concrete.

Concrete shall be scored at equal intervals between weakened plane joints to approximate squares. Concrete surface shall be finished with a medium broom finish.

c) Driveways/Approaches

When back of approach is poured against existing concrete a 1/4" premolded expansion joint filler shall be placed against the existing concrete.

Score lines shall correspond with the score lines of adjacent sidewalk.

d) Exposed Aggregate Sidewalk

Exposed aggregate sidewalk shall conform to sidewalks of these Standards for concrete sidewalk except for the surface finish.

Exposed aggregate sidewalk may be seeded with ½ inch maximum aggregate embedded in the surface of the concrete by tapping or rolling. A standard mix with 60% Min. - 70 % Max. aggregate content and ½ inch Min. - 1 inch Max. aggregate screening may be used. The aggregate shall be exposed by washing away the surface mortar with water.

The finished surface shall contain 40 to 60 percent exposed, rounded aggregate.

e) Services and Lot Lines

Contractor shall clearly mark a “W” for water service, a “S” for sewer service and a “+” for lot line extensions to the curb in the wet concrete at the location of perpendicular crossings.

6. Testing

The finished concrete shall be in conformance with the tolerances as stated in Section 40-1.135 of the State Standard Specifications and attain a minimum 28-day compressive strength of 3000 psi. Core testing of substandard concrete will not be permitted.

After construction, gutters shall be checked by flowing water. The Engineer or his/her representative must be present during the flow test. Any high spots or depressions revealed by the flow test (which exceed 0.02 foot) shall be repaired by removing that section of concrete and replacing it to the correct grade.

Finished face of curb shall not vary by more than an aggregate total of 0.05 foot from the design alignment within a distance not to exceed 25 feet.

C. Measurement and Payment

Quantities of concrete in curbs, gutters, sidewalks, and driveways shall be measured and payment made at the bid price per unit as shown on the bid sheet. Curbs shall be measured continuous through driveways (approaches). Approaches shall be measured to the “back of curb line” when payment is made by the square foot. Payment shall include full compensation for the furnishing, placing and curing of the concrete together with the excavation, cushion material and all incidentals.

3.06 STRIPING AND PAVEMENT MARKINGS

A. Description

Traffic striping and pavement markings work shall conform to the provisions in Sections 15, 84, and 85 "Existing Highway Facilities," "Traffic Stripes and Pavement Markings," and "Pavement Markers" of the California Standard Specifications, dated July 1992, applicable sheets of the California Standard Plans, dated July 1992, the details and notes as shown on the Plans, and these special provisions.

B. Thermoplastic Traffic Stripes and Pavement Markings

This work shall consist of applying thermoplastic traffic stripes (traffic lines) and pavement markings, including applying glass spheres, at the locations shown on the plans in conformance with Section 84-1 "General," and 84-2 "Thermoplastic Traffic Stripes and Pavement Markings," of the State Standard Specifications and these special provisions.

C. Pavement Markers

This work shall consist of furnishing and placing raised pavement markers at the locations shown on the plans in conformance with Section 85 "Pavement Markers," of the State Standard Specifications and these special provisions.

D. Painted Traffic Stripes and Pavement Markings

Painted traffic stripes and pavement markings shall only be used where the roadway is to be resurfaced within one year. This work shall consist of applying painted traffic stripes (traffic lines) and pavement markings, including glass spheres, at locations shown on the plans in conformance with Section 84-1 "General" and 84-3 "Painted Traffic Stripes and Pavement Markings" of the Standard Specifications and these special provisions.

E. Removal of Traffic Stripes and Pavement Markings

This work shall consist of removing existing traffic stripes (traffic lines) and pavement markings at the locations shown on the plans in conformance with Sections 15-1 "General," and 15-2 "Miscellaneous Highway Facilities" of the State Standard Specifications and these special provisions.

3.07 HEADER BOARD

A. Description

Header Boards shall be constructed to protect the edges of the asphalt concrete where streets are partially completed.

B. Materials

All header boards shall be either redwood or Douglas fir with an American Wood Preservers Bureau stamp indicating its use for ground contact and application of LP22 waterborne preservative or approved equal.

The boards shall be 2 inch x 6 inch nominal dimensioned of appropriate material.

C. Backfill

Backfill shall be native material, mechanically compacted.

D. Measurement and Payment

Measurement will be per the plans at a lineal foot.

Full compensation for conforming to the requirements of this section shall be considered as included in the unit price bid for the header board.

E. Header Board Substitution

When a header board is being installed as part of a half-street construction, the contractor shall have the option to extend the full pavement section an extra two feet from the specified dimension. This assumes there is sufficient right-of-way to extend the pavement section an additional two feet.

3.08 SHOULDER BACKING

A. Description

Shoulder backing shall be required on all roadways, parking lots, and header board applications where no curb or barrier is installed to prevent vehicles from straying onto a shoulder.

B. Materials

Unless specified in the plans and specifications as an aggregate base rock, the materials shall be compacted native material.

C. Backfill

The top 12" of shoulder for a minimum distance of four feet from edge of pavement shall be scarified and recompact to 95% at 3% over optimum moisture content.

D. Measurement and Payment

No measurement is necessary.

Full compensation for conforming to the requirements of this section shall be considered as included in the unit price bid for the roadway or parking lot.

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SECTION 4

STORM DRAINAGE

4.01 DESCRIPTION

This work shall include the furnishing of all labor, materials, tools and equipment to construct and complete, in an efficient and workmanlike manner, the installation of the storm drainage system in accordance with the approved plans, these specifications and the City Standard Details.

These Standards cover storm drainage facilities to be constructed in the public right of way. The drainage system may be rock wells or be a positive collection system discharged into a natural waterway (positive drainage) or retention/detention, dual use or infiltration basin.

4.02 MATERIALS

A. Pipe

1. Reinforced Concrete Pipe shall conform to the specifications of A.S.T.M. designation C76 and shall be Class III, IV or V, unless otherwise specified on the plans. Reinforcing shall be the minimum requirements for circular reinforcing wire mesh cages as specified in A.S.T.M. designation C76. Portland Cement used in the manufacture of reinforced concrete pipe shall conform to the requirements of the specifications for Type II Portland Cement, A.S.T.M. designation C150.

The following chart lists the minimum allowable classes of RCP. For use in this chart, cover is defined as the distance from the outside top of pipe to either the top of curb or finished grade, whichever is applicable.

<u>Cover in Feet</u>	<u>Minimum Class, RCP</u>
Less than 2.5	Class IV (2000 D)
2.5 to 14.5	Class III (1350 D)
14.6 - 23.0	Class IV (2000 D)
23.1 - 37.0	Class V (3000 D)

Any storm drain pipe which lies wholly or in part within the structural section of a street shall be Class V.

Tests on reinforced concrete pipe shall be required to determine conformance with "D" load and reinforcing requirements of these specifications.

Pipe samples for testing shall be furnished, without charge, by the Contractor one week in advance of construction. The cost of testing the pipe shall be borne by the Contractor. One section of pipe from each lot to be used shall be tested in accordance with the procedures outlined in A.S.T.M. C76. Lots tested shall be marked with the date made as

well as by lot number for shipment to the specific project for which that lot has been tested. Any pipe arriving on the job without the appropriate markings shall be rejected and sent back to the supplier until such lot or lots can be tested and accepted for use.

In lieu of the above testing of reinforced concrete pipe, the Contractor may submit to the City Engineer the manufacturers "Certificate of Compliance" guaranteeing the requirements of A.S.T.M. C76.

2. Cast-In-Place Concrete Pipe shall require prior approval of the City Engineer and shall conform to the requirements of Section 63 of the State Standard Specifications except that the concrete shall be placed around the full circumference in one operation. Concrete shall be a minimum of 4000 psi.
3. Non-Reinforced Concrete Pipe shall not be allowed.
4. Asbestos Cement Storm Drain Pipe shall not be allowed.

B. Laying Pipe

The pipe shall be laid in conformity with the prescribed lines and grades, which shall be obtained by means of a laser beam or by measuring from a tightly stretched line parallel with the grade and supported on at least 3 points over the center line of the pipe. The Contractor shall field verify the depth and alignment of any existing storm drain line prior to construction. If the existing storm drain line is not exactly as shown on the improvement plans, the Contractor shall obtain the approval of the City Engineer before proceeding. All adjustments of pipe to line and grade shall be made by scraping away or filling in and tamping under the body of the pipe and not by blocking or wedging. All pipes shall be laid with bell end upstream and shall be laid upstream from structure to structure.

C. Manhole and Junction Boxes

For storm drains of less than 48 inches in diameter, precast reinforced concrete manholes shall be used. Manholes shall conform to the specifications of sanitary sewer manholes.

In easement areas (i.e. outside surfaced public road), the casting grade shall conform to the surrounding surface unless special elevations are required. If the future use of the area may require lowering the grade for streets or parking areas. A minimum of 24" of grade rings shall be used.

A forty-eight inch (48") diameter barrel may be used for pipe up to 36" in diameter; Sixty inch (60") diameter barrel for pipe up to 54" in diameter; Seventy-two inch (72") diameter barrel for pipe up to sixty inch (60") diameter; Custom designed box structures for pipe over sixty inch (60") in diameter. Concrete shall be furnished, mixed, placed, and cured in accordance with the provisions of Section 90 of the State Standard Specifications and shall be 4000 psi with 1½ inch maximum aggregate size. The inside dimension of manholes and

junction boxes shall be such as to provide a minimum of 3 inches clearance on the outside diameter of the outfall pipe and the minimum wall thickness shall be 6 inches.

D. Catch Basins

1. Storm drain catch basins shall be cast-in-place conforming to the Standard Details. Concrete shall be 3000 psi with 1½-inch maximum aggregate size.
2. Catch Basins shall be constructed as shown in the Standard Details.
3. The structural channel iron shall be galvanized to conform to the requirements of Section 75-1.05 of the State Standard Specifications. Damaged galvanizing shall conform to Section 66-3.05 of the State Standard Specifications.

E. Headwalls, Wingwalls, Endwalls, and Railings

All headwalls, wingwalls, and endwalls shall be of 3000 psi reinforced Portland Cement Concrete constructed in accordance with the plans and Section 51 of the State Standard Specifications. Temporary bank protection may be provided by sack concrete rip-rap in accordance with Section 72 of the State Standard Specifications.

F. Drainage Pump Stations

Drainage pump stations may be allowed on an individual basis with the specific approval of the City Engineer.

G. Rock wells

Standard rock wells shall conform to Standard Detail #403A or the Turlock Well Standard Detail #404 and to section 4.08 of the Design section (yellow pages) of these Standard Specifications. The depth of rock well shall extend to a level where it penetrates at least 10 feet of continuous coarse sand stratum at a minimum depth of 35 feet or more below the surface of the street. The Modesto rock well shall extend to 50 feet unless a soils and percolation test has determined a shallower depth. Turlock rock wells shall penetrate to a minimum depth of 50 feet but not exceed 70 feet unless a soils and percolation test has determined a shallower depth.

The contractor shall submit to the City Engineer a well drilling log as soon as possible after drilling is completed and prior to acceptance of the improvements by the City Engineer. Modesto rock wells shall conform to the gradation of the State Standard Specifications Section 90-3.02, 1.5-inch X ¾ inch. Turlock rock wells shall use ¾" Pea Gravel.

All City of Modesto standard rock wells are to have an 8" diameter SDR 35 PVC core pipe installed. The 8" diameter SDR 35 PVC pipe is specified as follows:

1. 8" SDR 35 PVC Sewer Pipe, 20' long, installed Bell-up.

2. Perforations- consist of 4 rows of 1/2" diameter holes at 90 degrees apart, on 6" centers vertically, to within 6 inches of each end.

Turlock rock wells shall use a 12" diameter, 12 ga. (min.) steel perforated casing core pipe (see standard detail drawings).

A rock well shall have at least 250 linear feet of gutter to pond in the street before releasing to another drainage structure. The catch basin shall be located at the low point of the 250 linear feet of gutter, but not at either end.

H. Service Connections

Private on-site development shall not drain into the public right of way unless the right of way has positive storm drain pipes with sufficient capacity to handle additional runoff. Under no circumstances can development tie into an existing off-site rock wells.

Service connections include lines from drain inlets in the public right of way, private lines from drain inlets on private property, and private lines from roof drains of private buildings.

Service lines from drain inlets and roof drains on private property shall be constructed to an on-site catch basin or junction structure before entering the R.O.W. Tie-ins are restricted to catch basins, junction boxes or manholes.

4.03 TESTING

A. Rock wells

Testing shall consist of flooding with water until a static head is obtained at the well inlet. Rock wells shall absorb this static water within 24 hours. If the maximum practical input flow has been applied continuously for 1 hour without obtaining a static head, the rock well will be approved. Testing shall be done under the direction of the City Engineer and at Contractor's expense.

B. Storm Drain Pipes

The contractor shall inspect all new lines with closed circuit television and furnish a tape to the city. The Contractor shall give the City Engineer at least 2 working days notice prior to performing the TV work so a city representative can verify the work.

The Contractor shall clean all lines of dirt and other debris, clean manholes, remove pipe crowns, compact trench, raise manhole rims to grade, and correct all visible infiltration, leaks, and deficiencies prior to inspection. Areas adjacent to manholes shall be leveled and made accessible to the television trailer. All inspection, equipment time, and costs for inspection shall be the responsibility of the developer.

All defects and deficiencies discovered in this inspection shall be corrected by the Contractor to the satisfaction of the City Engineer and at the Contractor's expense.

Measuring devices and depth tolerances for trapped water shall be:

<u>Device</u>	<u>Depth Tolerance</u>
12" & Larger	Depth tolerance = 10% of pipe area

Broken, cracked or damaged ends of pipe shall be rejected. Minor chipped ends of 1/4 inch or less shall be permitted provided cracking and excessive damage is not evident.

If the City suspects any damage or break in the line, the televised inspection may be repeated within the one-year warranty period. All defects discovered in this inspection as well as the cost of the televised inspection shall be corrected by the Contractor at his/her expense.

4.04 MEASUREMENT AND PAYMENT

A. Pipe

Payment for storm drain pipe complete in place shall be per linear foot measured from center of manhole to center of manhole or catch basin, or from center of manhole to wall of outlet structure as the case may be. Measurement shall be along a line parallel to the grade of the storm drain.

Payment shall include the furnishing of all labor, materials, water, tools, and equipment required to construct and complete, in an efficient and workmanlike manner, the installation of storm drain pipe in accordance with the plans and these specifications.

Full compensation for all incidentals arising from this work shall be considered as included in the price paid per linear foot measure and no further compensation shall be allowed.

B. Structures, Manholes and Catch Basins

The unit of measure for payment shall be per each unit. Payment shall be made at the bid price per item for each structure complete in place and shall include the cost of excavation, backfill, frames, covers, plates or reinforcing steel where required.

Full compensation for all incidentals, arising from this work shall be considered as included in the price paid per each unit and no further compensation shall be allowed.

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SECTION 5

SANITARY SEWERS

5.01 DESCRIPTION

This work shall include the furnishing of all the labor, materials, tools and equipment to construct and complete, in an efficient and workmanlike manner, the installation of the sanitary sewer mains and laterals in accordance with the approved plans, standard details and these specifications. All work shall be done in an orderly and workmanlike manner and under the direction and to the satisfaction of the City Engineer.

5.02 MATERIALS

A. General

The source and supply of materials shall be approved by the City Engineer. Compression joints shall be used for all pipe and shall conform to the current standard specifications of the A.S.T.M. C425.

B. Gravity Sewer Pipe

1. Vitrified Clay Pipe shall be extra strength, bell and spigot end compression joint pipe, conforming to A.S.T.M. Designation C700 as it applies to unglazed vitrified clay pipe.
2. Cast Iron Pipe shall conform to the current standard specifications of the American National Standards Institute (ANSI) A21.6, and shall be Class 150, with bell and spigot joints. Cast Iron fittings shall conform to ANSI/AWWA C110-77. In areas of minimum cover, (typically 2 to 3 feet), No-Hub Cast Iron Pipe and fittings conforming to CISPI 301 and 310 may be used. However, all No-Hub Cast Iron Pipe and fittings, including services, shall be hydrostatically tested in accordance with Section 5.03 of these standards. The hydrostatic test shall be performed after the pipe and fittings have passed the television inspection.
3. Ductile Iron Pipe shall be Class 350 and shall conform to the current standard specifications of the ANSI/AWWA C151/A21. All DIP shall be protected by a polyethylene encasement meeting the requirements of AWWA C105. All fittings shall conform to ANSI/AWWA C110/A21.10. Ductile Iron Pipe for use in sewer systems shall be lined with 'Protecto 401 Ceramic Epoxy Liner'.
4. PVC Lined Reinforced Concrete Pipe. Reinforced Concrete Pipe shall conform to the specifications of A.S.T.M. Designation C76 and shall be Class III, unless otherwise specified on the plans. Reinforcing shall be the minimum requirements for circular reinforcing wire mesh cages as specified in A.S.T.M. Designation C76. Portland

Cement used in the manufacture of reinforced concrete pipe shall conform to the requirements of the specifications for Type II Portland Cement, A.S.T.M. Designation C150. PVC Liner shall conform to APWA Specifications Section 210-2, "Plastic Liner" and Section 311-1, "Plastic Liner Installation". The PVC lining shall be three hundred and sixty (360) degrees of the inside circumference.

C. Pressure Sewer Pipe

Whenever the design of a sanitary sewer system includes the necessity of a sewage lift station and pressure mains, types of pipe shall be approved by the City Engineer for each specific case.

D. Joints and Couplings

1. Vitrified Clay Joints shall be resilient material conforming to the requirements of A.S.T.M. Designation C425.
2. Banded Rubber Couplings shall conform to the requirements of A.S.T.M. Designation C425.

E. Fittings

All fitting shall be manufactured of the same materials as the pipe and installed in accordance with City Standard Details.

F. Laterals

1. Pipe shall be of the same type and class as that used for the main.
2. Joints and Couplings for laterals shall be the same type and specifications as those used for the main.

G. Connections

1. Vitrified Clay Pipe (V.C.P.)

For 6-inch VCP mains, a cut-in clay wye or tee shall be used with plain ends along the "run" of the pipe, and a bell branch end may be used. The stainless steel shear bands shall be placed a minimum of 18" from the cut-in wye's bell and spigot.

For 8 inch or 10 inch VCP mains, only a cut-in wye is acceptable. The stainless steel shear bands shall be placed a minimum of 18" from the cut-in wye's bell and spigot

When cutting in a wye or tee, well graded, crushed stone or crushed gravel, meeting the requirements of ASTM Designation C33, Gradation 67 (3/4 to No. 4) shall be placed under the main line and the sewer service lateral within the right of way line.

When joining the cut ends of the existing main to the wye or tee, a “BAND SEAL” with stainless steel shear type sewer repair coupling, or approved equal, shall be used. Calder couplings or plastic will not be permitted on the “run” of the pipe.

When connecting a sewer lateral directly from the manhole to the right of way line, Cast Iron Pipe shall be inserted into the manhole and extended a minimum of 2 feet from the manhole housing. The VCP shall then be cut, and joined to the remaining sections of the service lateral with a clay caulder coupling with shear bands.

Connections for 12 inch and larger VCP mains shall be at manholes only. The manholes shall be PVC lined per these specifications.

2. Cast Iron Pipe (C.I.P.)

Only Cast Iron wyes and tees shall be used for connection to Cast Iron sewer mains, and shall conform to the current standard specifications of the American National Standards Institute (ANSI) C110-77. No-Hub Cast Iron wyes and tees shall be used for connections to No-Hub Cast Iron wyes and tees shall be used for connections to No-Hub Cast Iron sewer mains.

Only Class 50 Cast Iron straight pipe, elbows and fittings shall be used from the sewer main to the right of way line. Cast Iron Pipe shall be furnished with “Tyton Joints”, “Ty-Seal Joints”, or approved equal. Cast Iron transition couplings shall be installed in accordance with the manufacturer’s specifications for pipe size.

When connecting a sewer lateral directly from the manhole to the right of way line, Cast Iron Pipe shall be inserted into the manhole and brought to the right of way line.

3. Ductile Iron Pipe (DIP)

Connections to Ductile Iron Pipe sewer mains shall be at manholes only.

Only Cast Iron straight pipe, elbows and fittings shall be used from the sewer main to the right of way line. Cast Iron Pipe shall be furnished with “Tyton Joints”, “Ty-Seal Joints”, or approved equal. Cast Iron transition couplings shall be installed in accordance with the manufacturer’s specification for each pipe size.

When connecting a sewer lateral directly from the manhole to the right of way line, Cast Iron Pipe shall be inserted into the manhole and brought to the right of way line.

5. PVC Lined Concrete Pipe

Connections to PVC Lined Concrete pipe sewer mains shall be at manholes only. The manholes shall be PVC lined per these specifications.

H. Manholes

1. Standard Precast

Sanitary sewer manholes shall be of precast reinforced concrete conforming to A.S.T.M. Designation C478 except that the Portland Cement shall be Type II modified cement. The manhole base, riser and cone shall have a minimum compressive strength of 4,000 psi at 28 days. Manholes shall be constructed in accordance with the Standard Details.

2. PVC Lined Manholes

All manholes on trunk sewers and main lines identified by the City Engineer shall be PVC lined. All PVC liner shall have integral locking extensions or ribs. The lining shall be mechanically and permanently imbedded in the concrete and shall be impermeable to sewage gasses and liquids and shall not promote bacterial or fungal growth. Where liner with locking extensions cannot be installed, the use of flat liner sheets with adhesive will be permitted only with prior shop drawing submittal and approval from the City Engineer. Flat liner sheets shall be attached to embedded liner sheets with PVC weld strips.

3. Manhole Castings

Iron castings for manhole covers and frames shall conform to A.S.T.M. Designation A48, Class 25 and be of the dimension shown on the Standard Details.

All castings shall be sound and free from shrinkage cracks, blow holes, and other defects. All fins and burnt sand must be removed. Excessive porosity and spongy surfaces will constitute causes for rejection. The City Engineer shall be the judge as to whether the defects are sufficient to cause rejection.

The manhole cover shall seat evenly and firmly in the frame. Cast iron frames and covers shall be dipped or painted with asphalt, which will form a tough, tenacious, non-scaling coating which does not have a tendency to become brittle when cold or sticky when hot.

All manholes constructed on trunk mains (12" or larger pipe) shall be PVC lined (T-Lock).

A 48" diameter barrel manhole may be used on pipe sizes up to 33" in diameter. All pipe diameters 36" to 48" shall use 60" diameter barrels for manholes. Pipe diameters 54" to 60" shall use 72" barrels for manholes. All larger pipes shall have custom made boxes with 48" diameter barrels and a manhole cone extending to the surface.

I. Cleanouts

Cleanouts shall be constructed in the back of sidewalk or at property line in accordance with the Standard Details. If the cleanout will not be constructed until the building contractor starts construction of the building pad, the site contractor shall construct the riser pipe a minimum of 2' above the finished grade and install a cap. The developer shall bond for the cleanout installation and the building contractor shall cut the pipe and install boxes before constructing the bathrooms in the building.

J. Conductor Pipe

Pipe used as a conductor pipe under a highway or railroad shall be welded steel pipe. The protective lining and coating if any, shall be as shown on the plans or specified in the Special Provisions.

Welded steel pipe shall be manufactured of steel meeting the requirements of A.S.T.M. Designation A570, Commercial Grade. The method by which the pipe is manufactured shall comply with one or more of A.S.T.M. Specifications: A-134, A-135, or A-139. The pipe shall be welded by either the electric-resistance or electric-fusion process, with either spiral seam welded joint or straight seam welded joint. All joints shall be butt-welded.

When the conductor pipe is to be installed by boring and jacking, the wall thickness shall be 1/4 inch for sizes up to and including 24 inches in diameter, and 5/16 inch for sizes 27 inches to 36 inches in diameter, unless otherwise specified.

K. Valves for Wastewater Applications

1. Plug Valves

Plug valves shall be Dezurik Fig 118,F,7,RS16,AGG6H8, with ANSI 125/150 lb. flanges. Actuator shall be mounted 180 degrees from standard. All fasteners shall be stainless steel with anti-galling compound, and plug valves shall be installed with the plug horizontal and rotating to the top when open.

Check Valves

Valves shall be swing check valves, which allow flow in one direction only, and close tightly without slamming when discharge pressure exceeds inlet pressure. When open, the valve shall provide a flow area equal or greater than the pipeline. Valves shall include a lever and weight. Valves larger than 12" shall include provision for alternative (spring or hydraulic actuators if specified).

Check Valves shall conform to AWWA C508 and the following:

Hinge shaft and internal bushings shall be Stainless Steel. Shaft shall be sealed with adjustable compression type packing, Teflon-V packing or equal. Simple O-Ring shafts seals are not acceptable. Disc seat shall be stainless steel and field replaceable. Seat Ring shall be Buna-N. All fasteners shall be ASTM A276, Type 304 or 316 stainless steel. The use of Grades B and C Bronze are prohibited as described in Section 2.2.2.4 of the AWWA Standard. The manufacturer shall furnish all the data described in Section 1.3 of AWWA C508, including part numbers and material for each component.

L. Air vacuum relief valves shall be installed on force mains at all high points.

5.03 INSTALLATION

- A. Sanitary Sewer Installation - All sanitary sewer pipe installations shall be accomplished as specified herein except where modified by the requirements specific to the various types of pipeline materials specified under Section 5.02.

All sewer pipe shall be laid with a minimum of 12 inches vertical clearance from water and 6 inches clearance from all other improvements and utilities, unless otherwise approved by the City Engineer. Refer to the pipe cover requirements in Section 5.04 of the Design Standards for minimum cover requirements. All pipe shall be laid to conform to the prescribed line and grade as shown on the plans and each pipe length checked to the grade line which the Contractor establishes from the grade stakes.

The grade line shall be established before any pipe is laid in the trench. For pipes with slopes greater than 1%, the string line set for trenching purposes may be used as the grade line. For pipes with slopes less than 1%, either (1) a grade line shall be established in the bottom of the trench such that the top of each bell will touch the line when the pipe has been properly positioned, or (2) a grade line shall be established above the trench on firmly secured batter boards from which the grade of each pipe can be checked by using a grade pole.

Alternate use of commercial LASER grade setting systems in lieu of string lines specified herein are acceptable when the following requirements and conditions are met:

1. The Contractor shall have the responsibility of providing an instrument operator who is qualified and trained in the operation of the LASER and said operator must adhere to the provisions of the State of California Construction Safety Orders issued by the Division of Industrial Safety. Attention is particularly directed to Sections 1516, 1800, and 1801 of said Orders for applicable requirements.
2. All LASER control points shall be established benchmarks or construction offset stakes identified on cut sheets and set in the field for the work. LASER set up points shall be these control points or points set directly from them by instrument.

Each length of pipe shall be laid on compacted, approved bedding material as specified and shall have full bearing for its entire length between bell holes excavated in said bedding material to allow for unobstructed assembly of all bell and spigot joints.

“Stabbing”, “Swinging In”, or “Popping On” spigot ends of pipe into bell ends will not be permitted. After jointing is accomplished, all annular spaces between pipe and bell holes shall be packed with bedding material, taking care not to damage, move or lift the pipe from its bedding support.

All cast iron and ductile iron pipe sewer main shall be marked with Pipe ID tape which reads “Sanitary Sewer”. Tape shall be buried within 6” of the top of pipe.

Adjustments of pipe to line and grade shall be made by scraping away or filling in and tamping approved material under the body of the pipe. No wedging or blocking to support the pipe will be permitted.

A sewer line, unless otherwise approved by the City Engineer, shall be laid, without break, upgrade from point of connection to existing sewer and with the bell end forward or upgrade. Pipe shall not be laid when the City Engineer determines that the condition of the trench or the weather is unsuitable. When pipe laying is not in progress, the forward end of the pipe shall be kept effectively closed with an approved temporary plug or cap.

Sewer pipes, branches, stubs, or other open ends which are not to be immediately connected, shall be plugged or capped with a standard watertight plug or cap, as approved by the City Engineer for use in the particular installation. The plug or cap shall be placed on a standard end.

Pipe entering or leaving manholes or other structures shall have joints within 2½ feet of the manhole base.

In all cases, flexibility of joints in or at the manhole base shall be preserved to prevent damage to the pipe by differential settlement.

All sewer line connections to manholes, trunk sewers, main sewers, or side sewers shall be left uncovered until after the inspection has been made. After approval of the connection, the trench shall be backfilled as specified. The City Engineer may, at his/her

discretion, require special pipe to be laid in areas that are potentially unstable or subject to settlement.

If the sewer is to be laid in an area that is to be filled, and the cover prior to filling is less than 5 feet, the pipe shall not be laid until the area has been filled to a level 5 feet above the proposed pipe and compacted to 90% relative compaction, unless otherwise authorized by the City Engineer.

When a new sewer is extended from other than an existing manhole and the first new manhole upstream of the connection establishes conditions prescribed in Section 5.02 of the Design Standards, the Contractor installing such new facilities shall also be responsible for installing backwater prevention devices in conformance with said section on existing side sewers so affected.

B. Laterals

Attention is directed to the Standard Details for additional details and requirements pertinent to lateral installations.

Wye or tee: (for 6 inch VCP main and all Cast Iron or Ductile mains)

1. Excavate sewer main to a point 6 inches below required depth.
2. Make three (3) initial cuts in the main, 2 to 6 inches apart, and remove the rings. Cut the main to the required length to insert wye or tee.
3. Place 6 inches of well graded, crushed stone or crushed gravel, meeting the requirements of ASTM Designation C33, Gradation 67 (3/4 to No. 4) under the main line and the sewer service lateral within the right of way.
4. Install wye or tee as per standard detail #512. Tee shall be used if main is 10 feet or deeper.

Whenever lateral lines are to be installed as part of the Contract for the construction of the sewer main, the use of saddles will not be permitted.

That portion of any lateral line to be placed under an existing curb and gutter and/or sidewalk shall be done by boring or cutting and replacing the existing curb and gutter and/or sidewalk.

The lateral line shall have a clean-out at back edge of sidewalk as shown on the Standard Details. A cover box shall be installed as noted on detail. Said cleanout shall consist of a combination wye and eighth bend. Laterals and cleanouts shall not be located in the driveway.

The wye branches, unless otherwise specified, shall be inclined at any angle not greater than 45 degrees from the horizontal.

The end of the lateral service shall extend a maximum of 48 inches and a minimum of 24 inches beyond the rear edge of the sidewalk in streets having sidewalks adjacent to the curb and shall extend a maximum of 12 inches and a minimum of 6 inches beyond the back edge of the curb for sidewalks that are separated from the curb by a planter strip and in commercial sidewalks.

The location of every sewer service shall be marked with an "S" directly above the service on the top of curb, the "S" to be 1½ inches in height and 1/4 inch in depth.

When a backwater prevention device is required under Section 5 of the Engineering Design Standards, such installations shall be made after final grading around the building has been completed and at a location where sewage can overflow without serious property damage on adjacent areas. It shall be the responsibility of the Contractor installing backwater prevention devices to see that informational notices, for present and future owners, regarding the importance of such devices are conspicuously posted upon the device and on the structure by said device.

C. Manholes

Precast Manhole Construction - Excavation and backfill for all precast manholes shall be in conformance with the requirements of Section 19-3 of the State Specifications and installed as specified herein. All embedment materials under, around and at least 3 inches over all pipelines located within five feet of structure bases shall be compacted without jetting prior to barrel section placements. All precast manholes shall be constructed to subgrade prior to setting adjoining sewer pipeline trench and/or structure backfill where such method of compaction is permitted and used.

All joint surfaces of precast sections and face of manhole base shall be thoroughly clean prior to setting precast sections. These various sections shall be set in preformed plastic sealing gaskets of material conforming to the requirements of FEDERAL SPECIFICATION SS-S-00210.

1. Installation of gaskets - Apply one coat of primer to clean, dry joint surface (both tongue and groove) and of the two-piece wrapper on the gasket. The outside paper will protect the gasket and assure against stretching. Before setting the manhole section in the trench, attach the plastic gasket strips end-to-end to the tongue or groove of each joint, forming a continuous gasket around the entire circumference of the manhole joint.
2. Handling of barrel sections after the plastic gasket has been affixed shall be carefully controlled to avoid bumping the gasket and thus displacing it or contaminating it with dirt or other foreign material. Any gaskets so disturbed shall be removed and replaced if damaged and repositioned if displaced.

3. Care shall be taken to properly align the manhole section with the previously set section before it is lowered into position.
4. During cold or wet weather, pass direct heat over the concrete joint surface lightly until ice, frost and moisture are removed and surface to be primed is dry and warm immediately before application of primer. Direct heat shall also be passed over plastic gasket strips immediately prior to attaching them to joint surfaces and immediately prior to insertion of tongue into groove.

The cast-in-place base shall be 4,000 psi, 28-day concrete with 1½-inch maximum size aggregate. It shall rest on firm, undisturbed soil, and shall be of the dimensions shown on the Standard Details. Where sewer lines pass through manholes, the pipe shall be laid continuously as a whole pipe. After the manhole base and precast sections have been placed and sufficient time has elapsed to allow all concrete and grout to set, the top half of pipe within the manhole shall be carefully cut off and the sides mortared. All channels so formed shall be checked with a template and shall form a smooth flowing channel at all flow depths.

Temporary covers of 3/8-inch steel plate of sufficient size to adequately cover the opening shall be placed on the cone until the base is complete and the manhole casting shall then be installed. Suitably located ribs shall be welded to the underside of the cover to hold it in place during any grading operations.

The throat of the manhole shall be made of precast concrete rings of the proper inside diameter. The minimum depth of throat permitted shall be one 3-inch ring between the cone and the frame. The maximum depth permitted shall be 12 inches of rings between the cone and frame.

When adjusting the manhole frame and cover to grade, the frame shall be wired to a 2" x 4" of sufficient length to span the excavation and the throat completed to the right level. Whenever the space between the bottom of the frame and the top of a ring is less than three inches, the void may be filled with concrete, poured against a suitable form on the inside of the structure.

When adjusting an existing manhole to grade and the total depth of the throat from the top of the frame to the bottom of the throat exceeds 24 inches, the upper portion of the manhole shall be removed to the first full-size manhole section. The upper portion shall then be reconstructed as outlined above.

Connections to existing manholes shall be made by carefully breaking out an opening in the wall of the manhole, inserting the end of the pipe through the opening, and packing the opening around the pipe with a stiff mix of cement mortar thoroughly compacted. The mortar shall be composed of one part Type II Portland Cement and three parts clean sand. Connections shall be watertight.

Before any work is started on adjusting or repairing a manhole, the channels in the base shall be covered with strips of wood, and the entire base covered with a heavy piece of canvas. This cover shall be kept in place during all work. Upon completion of the work the wood strips and the canvas shall be removed from the manhole, allowing no debris to fall or remain in the manhole.

D. PVC Lined Manholes

Installation of the PVC lining shall conform to the requirements in Section 311-1, "Plastic Liner Installation" of the APWA. Prior to installation, the Contractor shall submit to the Engineer the proposed layout of liner sheets, including location and type of field welds.

Field Joints (TL-010). All joints between lined pipe and lined structures shall be either Type C-1 or Type C-2 as defined in Section 311-1 of the APWA specifications. Field joints between sections of lined pipe shall be Type P-1 as defined in Section 311-1 of the APWA specifications. When transitioning between lined and unlined pipe, a factory "turn back" shall be used or a type 316 stainless steel band and neoprene gasket/termination secured with type 316 stainless steel wedge anchors provided at the transition for the full pipe circumference. Contractor shall provide transition details to the Engineer for review prior to installation. Unless shown otherwise, field joints in lined structures shall be one of the following types defined in the APWA Specifications: Type C-1, Type C-2 or Type C-3.

Field Welding and Testing. Field welding and testing of the lining of structures and between pipe and structures shall be made in strict conformance with lining manufacturer's instructions and recommendations. All PVC weld strips shall be securely adhered for their full length to the liner sheet and constructed in a neat orderly manner. All filed welds shall be tested for holidays or flaws. The surface of the liner shall be cleaned to permit visual inspection and spark testing using a 20,000 Volt Tinker and Razor Spark Tester, Model No. AP-W, with power pack or equal. All areas of liner plate failing to meet the field test shall be satisfactorily repaired and retested. All tests shall be performed by the contractor in the presence of the City inspector. The inspector shall be notified at least 24 hours in advance of a scheduled test.

Flat PVC Liner Sheets (exception) Where flat liner sheets are approved versus integrated locking extensions, the following construction procedures shall be followed.

Surface Preparation. All surfaces to be lined shall be waterblasted to removed of all deteriorated concrete, oil, grease or existing coating to produce a good firm, clean concrete. All new concrete surfaces shall be grit blasted to provide proper adhesion of coating system.

Waterblasting equipment shall be a minimum pressure of 5000 psi and shall not include detergent or other chemical cleaning solvents in the process.

All debris produced from the blasting operation shall be removed from the structure prior to coating. No debris shall be allowed to enter the sewer system. The concrete surfaces shall be air dried prior to installation of the liner.

All unnecessary holes in structure shall be sealed prior to lining with acid resistant sealant recommended for surfaces being sealed.

Lining Material: The lining material shall be an epoxy base coat under a polyurethane finish coat. The material shall be Sancon 100 or equal.

Lining Installation: The lining application shall be performed only by workmen trained and experienced with the specified material. The lining shall be applied by high pressure airless equipment approved by the lining manufacturer. The equipment shall be in good working order to insure correct proportioning and mixing of the components.

The epoxy base coating shall be applied to a thickness of 5 mils.

The polyurethane shall be applied to a thickness of 125 mils (1/8") in one continuous coat, without seams, free from any holes or defects. The lining shall be installed over dry concrete below the water level by using appropriate bypass equipment.

During the lining application the Contractor shall take wet gage thickness readings as required to insure correct lining thickness.

The finished coating shall be free from porosity, without bubbles or pinholes and uniform in color. All areas in question shall be removed and reworked to the satisfaction of the Engineer.

Application of the lining shall not take place when exposed to rain, fog or high winds. It is the Contractor's responsibility to insure protection of the work from the above mentioned conditions.

Lining System Warranty: Lining System shall be warranted for five years against any type of failure. Contractor shall remove and replace all failures at his expense.

E. Inspection

The City Engineer shall at all times have access to the work during its construction, and the Contractor shall provide proper and safe facilities for such access and inspection. City Engineer shall be furnished with every reasonable facility for ascertaining that the materials and the workmanship are in accordance with the requirements and intentions of these specifications. All work done and all materials furnished shall be subject to his/her inspection and approval.

The work shall be done under the supervision and to the complete satisfaction of the City and in accordance with the laws of the State of California.

The inspection of the work shall not relieve the Contractor of any of his/her obligations to fulfill his/her contract as prescribed, and defective work shall be made good and unsuitable materials may be rejected, notwithstanding that such defective work and materials have been previously overlooked by the City Engineer and accepted or estimated for payment.

The Contractor shall, at any time when requested, submit to the City Engineer properly authenticated documents or other satisfactory proof as to his/her compliance with the requirements of these Specifications.

F. Testing of Sewer Lines

All leakage tests shall be completed and approved after backfilling and prior to placing of permanent resurfacing.

1. Cleaning and Flushing

Prior to performing a leakage test, the pipe installation shall be thoroughly cleaned. Cleaning shall be performed by the Contractor by means of an inflatable rubber ball. The ball shall be of a size that will fit snugly into the pipe to be flushed. The ball shall be placed in the last cleanout or manhole on the pipe to be cleaned, and water introduced behind it. The ball shall pass through the pipe with only the pressure of the water impelling it. All debris flushed out ahead of the ball shall be removed at the first manhole where its presence is noted. If any wedged debris or damaged pipe shall stop the ball, the Contractor shall remove the obstruction. When a new sewer is connected to an existing line, cleaning and flushing shall be carried out to the first existing manhole downstream from the point of connection.

2. Low-Pressure Air Test

After completing backfill of a section of sewer line, the Contractor shall at his/her expense, conduct a Line Acceptance Test using low-pressure air. The test shall be performed using the equipment listed below, according to stated procedures and under the supervision of the City Engineer.

PROCEDURE: The section of pipe to be tested shall be isolated by completely blocking all outlets in the section under test. Careful attention must be given to the bracing of all plugs, as the line will be under pressure. One of the plugs used at the manhole must be equipped for an air inlet to fill the line from the air compressor. The air compressor which feeds air into the pipe section must be equipped to control the air entry rate and to prevent the pressure from exceeding 5.0 psig. The air compressor shall be fitted with a blow-off valve to operate at 5.0 psig to prevent an increase in pressure which could be hazardous to the pipeline.

After the pipe has been wetted, the air shall be allowed to slowly fill the pipeline until a constant pressure of 4.0 psig is maintained. At this point, the air compressor shall be controlled so that the internal pressure in the line is maintained between 4.0 and 3.5 psig for at least two minutes to permit the temperature of the entering air to equalize with the temperature of the pipe wall. If it is necessary to bleed off the air to repair a faulty plug, a new two-minute interval must be allowed when the line has been refilled.

When the temperature of the air has reached equilibrium with that of the pipe wall, the air source shall be disconnected. Before disconnecting the air supply, the pressure shall be at 4.0 psig. The gauge is then watched until the air pressure reaches 3.5 psig. When the pressure has reached 3.5 psig, a stopwatch will be started and stopped when the pressure has reached 2.5 psig. The time required, as shown on the watch, for the loss of 1.0 psig drop shall be in accordance with ASTM C 828 or NCPI Low Pressure Air Tables for Sanitary Sewer. The portion of line being tested shall be termed "Acceptable" if the time required in minutes for the pressure to decrease from 3.5 to 2.5 psig is not less than the time shown for the given diameters in the following table:

TABLE 5.1
AIR PRESSURE TEST

Main Line		4" House Connection				
Diameter (inches)	Length (feet)	House Connection Length				
		0 ft.	100 ft.	200 ft.	300 ft.	400 ft.
8	0	0	20	40	50	70
	50	40	50	70	90	80
	100	70	90	100	100	90
	150	110	120	110	100	100
	200	140	120	110	110	100
	300	140	130	120	110	110
	400	140	130	120	120	110

Main Line		6" House Connection				
Diameter (inches)	Length (feet)	House Connection Length				
		0 ft.	100 ft.	200 ft.	300 ft.	400 ft.
8	0	0	40	80	100	100
	50	40	70	110	110	110
	100	70	110	120	110	110
	150	110	120	120	120	110
	200	140	130	120	120	120
	300	140	130	120	120	120
	400	140	130	130	120	120

Time in Seconds for Pressure to Drop from 2.5 to 1.5 psi Gage Pressure

The air test shall be performed after the completion of backfill and compaction and prior to final paving and pouring of the curbs, gutters and sidewalks.

The Contractor shall furnish all equipment needed to complete this test.

If the installation fails to meet this requirement, the Contractor shall, at his/her own expense, determine the source of leakage. He/she shall then repair or replace all defective materials and/or workmanship and perform the air test as many times as necessary to achieve an acceptable test.

3. Televised Inspection

The contractor will inspect all new lines with closed circuit television and furnish a tape to the city. The Contractor shall give the City Engineer at least 2 working days notice prior to performing the TV work so a city representative can verify the work.

The Contractor shall clean all lines of dirt and other debris, clean manholes, remove broken pipe, compact trench, raise manhole rims to grade, and pass the air test prior to television inspection. Areas adjacent to manholes shall be leveled and made accessible to the television trailer.

Defects such as high and low spots, joint separations, offset joints, chipped ends, cracked or damaged pipe, infiltration points and debris in lines shall be corrected by the contractor at his/her expense. For joint separations, low spots and chipped ends, the following maximum acceptable limits will apply for eight and ten inch pipes:

Joint separations - 1/2 inch

Low spots - 6"	-	1/2" (.04')	Depth tolerance of trapped water
8"	-	3/4" (.06')	
10"	-	1" (.08')	
12" & larger		depth tolerance = 10% of pipe area	

Chipped ends - 1/4 inch

For pipe larger than 10 inches, specific maximum limits will be specified by the City for each Project.

F. Cleanouts

Back of sidewalk cleanouts shall be constructed in accordance with the Standard Details.

Concrete shall be Grade B conforming to Section 3.05 and have a 28-day compressive strength of 2500 psi.

Cleanout frames and covers shall be manufactured, tested and otherwise furnished in accordance with the Standard Specification of Fray Iron Castings A.S.T.M. serial designation A48, Class 30. The contact surfaces of frames and cover shall be machine surfaced to eliminate rattling and other movement under traffic. Castings shall be equal in materials and construction to cleanout assemblies Christy F14, or approved equal.

5.04 MEASUREMENT AND PAYMENT

A. Pipe

Payment for sanitary sewer pipe complete in place shall be per lineal foot measured from center of manhole to center of manhole following a line parallel to the grade of the sewer. Payment shall include the furnishing of all labor, materials, water, tools, and equipment required to construct and complete in an efficient and workmanlike manner the installation of the sewer pipe in accordance with the plans and these specifications.

Full compensation for all incidentals arising from this work shall be considered as included in the price paid per unit of measure and no further compensation shall be allowed.

B. Structures & Manholes

The unit of measure for payment shall be per each unit. Payment shall be made at the bid price per item for each structure complete in place and shall include the cost of excavation, backfill, frames, covers, plates, or reinforcing steel where required.

Full compensation for all incidentals arising from this work shall be considered as included in the price paid per unit of measure and no further compensation shall be allowed.

C. Valves

The unit of measure for payment shall be per each unit. Payment shall be made at the bid price per item for each valve complete in place and shall include the cost of all fittings and shop work.

Full compensation for all incidentals arising from this work shall be considered as included in the price paid per unit of measure and no further compensation shall be allowed.

SECTION 6

WATER DISTRIBUTION

6.01 DESCRIPTION

This work shall include the furnishing of all the labor, materials tools and equipment to construct and complete in an efficient and workmanlike manner the installation of the water distribution system in accordance with the approved plans, these specifications and the Standard Details.

6.02 MATERIALS

Materials to be Furnished and Installed by Contractor:

The Contractor shall furnish all labor, material, equipment and appliances required to complete the water mains and services specified, with exception to those items listed in these Standards.

Materials to be Furnished and Installed by City:

All connections to existing "live" lines, including service taps, shall be made by city crews.

Tapping sleeves and valves

1½ inch or larger water service

Meters, single check valves and meter boxes, unless otherwise listed in a previous section of these standards.

A temporary tie-in for the extension of a water main into a subdivision will be installed by the City at the developer's expense. Only one temporary tie-in, including water meter, will be allowed for each subdivision during construction. Any remaining tie-ins will be installed by the City upon acceptance of the waterlines. The Contractor shall provide at least 4 working days notice prior to installation of the temporary tie-in.

A. Pipe

1. Ductile Iron Pipe (DIP)

Ductile iron pipe Class 350 Pressure may be substituted for Polyvinyl Chloride Pipe (P.V.C.) through 12". Ductile iron pipe shall conform to the A.W.W.A. C151. Water pipe materials with diameters over 12" shall be specified by the City Engineer.

Ductile iron pipe shall have "Tyton Joints", "Ty-Seal Joints", or approved equal and shall be cement lined in conformance with latest A.W.W.A. Specification C-104. All

ductile iron pipe shall be protected by a polyethylene encasement in conformance with A.W.W.A. C105.

2. Polyvinyl Chloride Pipe (P.V.C.)

Polyvinyl chloride pressure pipe shall be Class 150 DR 18, and shall conform to AWWA C-900. Polyvinyl chloride pipe shall be Pacific Western, John Mansville, Certainteed or approved equal. All polyvinyl chloride pipe shall be twenty (20) foot laying lengths and shall have cast iron outside diameters (C.I.O.D.'s).

Joints of Polyvinyl Chloride pipe shall have elastomeric-gasket bell ends or couplings. The bell ends shall be integral thickened bell end or integral sleeve-reinforced bell end. The bell end joints shall have a minimum wall thickness of the bell or sleeve-reinforced bell, equal at all points to the Standard Dimension Ratio (S.D.R.) requirements for the pipe. The minimum wall thickness in the ring groove and bell-entry sections shall be equal to or exceed the minimum wall thickness of the pipe barrel.

If belled pipe is not used, one Polyvinyl Chloride coupling, manufactured of the same material and by the same manufacturer as the pipe, shall be furnished with each length of pipe together with 2 rubber rings.

Butterfly valves may be installed on Class 150 Polyvinyl Chloride Pipe main runs but shall not be used on Class 200 or greater.

B. Fitting and Thrust Blocking

Bends, tees and other fittings shall be Ductile Iron, Class 150, for use with Cast Iron Pipe and Ductile Iron Pipe (Flange Fittings -A.W.W.A. 110, Mechanical Fittings - A.W.W.A. 111). All fittings for Polyvinyl Chloride Pipe shall be mechanical joints except fittings with valves shall be mechanical joints by flange. Fittings shall be handled and jointed as specified for pipe installation herein before. Reaction or thrust blocking shall be constructed at bends, tees, dead ends and where changes in pipe diameter occur. Blocking shall be made of 3,000 psi concrete, and shall be placed between undisturbed ground and the fitting to be anchored. The area of bearing on the pipe and on the ground shall be that required by City Standard Details. The blocking shall be placed so that the joints of the pipe and fittings will be accessible for repair.

C. Valves and Valve Boxes

All valves shall be Mueller resilient seat gate valve, American Darling compression resilient seat valve, M & H 3067 AWWA resilient seat gate valve, Kennedy resilient seat gate valve, AVK resilient seat gate valve, Clow resilient seat gate valve or approved equal, and shall be the rubber-seated, tight-closing type conforming to the current AWWA Specifications C-509. Valves shall open left and be equipped with a 2 inch

AWWA operating nut. Dresser "450" butterfly valve conforming to the current AWWA Specifications C-504, or approved equal, may be installed on main runs only. Valve boxes shall be Christy G5 with Christy Cast Iron cover or approved equal. The following materials may be used for extensions: concrete, 8 inch Poly-Vinyl Chloride Pipe. All valve boxes shall be installed to finished grade as per the City Standard Detail.

D. Water Service Materials

Plastic Pipe shall be used for all 1-inch water services.

Polyvinyl Chloride Pipe Schedule 40 shall be used for all water services larger than 1 inch and smaller than 4 inches.

Polyvinyl Chloride Pipe C-900 shall be used for all 4 inch or larger water services.

1. 1 Inch Water Service With Meter Box

All 1-inch water services, including meter and meter boxes, shall be installed in accordance with the Standard Detail. The following materials shall be used:

Plastic Pipe: All Plastic Pipe shall be ultra-high molecular weight polyethylene flexible pipe; Class 160 psi or 200 psi for Class 200 mains; PE 3408 for potable water; 1 inch iron pipe size (I.P.S.); outside diameter from 1.310 inches to 1.370 inches per latest A.W.W.A. Specification C901 with inserts.

Manufacturer shall be: YARDLEY - 02223; DRISCOPIPE - 5100 or WESFLEX - PE 3408

Curb Stop, Meter Box, and Related Materials: The curb stop shall be a 1-inch ball valve Ford BA13-444W-LA86-44 or Jones J-1971W.

Meter adaptor: 1 inch Meter coupling, Ford SP3 or approved equal

Meter idler: Schedule 80 PVC 10-3/4 inch x 1-1/4 inch threaded.

Meter: Developer shall pay for the meter installation. Contractor will install the meter box and idler. City forces will remove the idler and install a meter.

Meter box: Christy #B12, 12 inch x 20 inch with G20 cover/cast iron lid or Brooks 1017 with hinged cast iron lid in pedestrian areas, only.

For drive approaches and vehicular traffic areas, a Christy cover shall be provided as follows:

Residential: Cast-iron traffic cover
Commercial or Industrial: Steel checker plate

Figure 6.1 Acceptable Water Service Materials by Vendor

	Jones	Ford	Mueller	McDonald
Service Saddle	C-965 C-969	101B, 101BS 202B, 202BS	BR2-B BR2-S	3805 3806
Corp Stop w/o Pack	J1943	FB-500	B-20046	3121
Corp Stop w/Pack	J1936	FB-1101	B25029	4704B-33 H704B-44
Curb Stop 90	J-1971W J4202	BA-13-444	B24265 B244286	4604-B 4644-B
Curb Stop w/Pack	J-1979-W	BA-63444-W	H24259 H24276	4602B-22 4642B-3T
Eighth Bend Coup.	J-2636	LA86-44		4779-44
Pack Joint Connector	J2608SGP	LA86-44	H15429	4754-33 4754-44
Adapter	J-129 J-132B	C-31-44	H-14215	4637-3/4 4637-1 610-F

2. Water Main Taps

Service taps on lines not yet accepted by the City shall be made by the Contractor, after approval by the City Engineer.

The Polyvinyl Chloride water mains shall be tapped with a hole saw. Saddles shall be bronze full body Mueller, Jones, Ford or Clow. Corporation stops shall be Ford FB1101 (1") or FB1100 (1½" and 2") or Jones J3402 (1") or J1397 (1½" and 2").

3. Backflow Prevention Device:

An approved backflow prevention device shall be installed at all connections to the City water main at Contractor's expense. The approved backflow prevention device shall be approved by the City Engineer prior to installation.

All backflow prevention devices shall be of the type approved by the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California.

All backflow prevention devices shall be installed according to manufacturers' specifications, unless otherwise approved by the City Engineer.

All backflow prevention devices shall be inspected and approved by the City of Modesto.

4. Pipe Locating Wire for Non-Conductive Water Mains:

Tracer wire shall be solid #10 AWG copper wire, soft drawn.

5. Air Release Valve

Air release valves shall be APCO or equal and conform to the Standard Details.

6.03 INSTALLATION

A. Handling of Pipe and Accessories

Proper implements, tools, equipment and facilities satisfactory to the City Engineer shall be provided and used by the Contractor for the safe and efficient execution of the work. All pipe, fittings, valves, hydrants and accessories shall be lowered into the trench in such a manner as to prevent damage to pipe fittings. Under no circumstance shall pipe or accessories be dropped or dumped into the trench. Special care shall be exercised so that the coating on pipe, valves and fittings will not be damaged. If such damage should occur, the coating shall be repaired to the satisfaction of the City Engineer. Chain slings will not be permitted. Pipe loaded on trucks or stacked one upon another shall be supported on wooden blocking. Pipe handled sideways shall not be skidded or rolled against pipe already on the ground. All foreign matter or dirt shall be removed from the interior of pipe before lowering into position in the trench. Pipe shall be kept clean by means approved by the City Engineer during and after laying. All pipe and accessories shall be inspected for defects prior to lowering into trench. Any defective, damaged or unsound pipe or accessory shall be repaired or replaced at the Developers' or Contractors' expense

B. Laying Pipe

The Contractor shall field verify the depth and alignment of any existing water line prior to construction. If the existing water line is not exactly as shown on the improvement plans, the Contractor shall obtain approval of the City Engineer before proceeding.

When waterlines are being installed in new subdivision, mainline pipe and the fire hydrant runs shall be installed prior to the installation of curb, gutter, and sidewalk. The services shall be installed after the curb, gutter, and sidewalk. Pipe shall be installed in accordance with manufacturer's recommendations. Uniform bearing shall be developed under the full length of the barrel of the pipe. Bell holes shall be provided at each joint, but shall be no larger than necessary for joint assembly.

All pipe for water mains and laterals shall be laid to line and grade as shown on the approved plans and at such depths as to provide 42 inches minimum cover from the top of the pipe to ultimate finish street grade. The Contractor shall be responsible for verifying ultimate finish grade by requesting this information from the City Engineer. When curved alignment is shown on the plans the maximum deflection at any joint shall not exceed the manufacturer's recommendation for the type of pipe and joint being used.

Thrust blocks of 3,000 psi concrete shall be cast-in-place at all bends, reducers, behind each tee, or each cross which is valved in such a manner that it can act as a tee, and at the back of fire hydrants. The thrust block shall extend from the fitting to undisturbed soil, shall be kept clear of the joints, and shall be of such bearing area as to assure adequate resistance to the force to be encountered. In lieu of the above, movement may be prevented by the use of pipe collars and stainless steel rods and other joint restraint devices approved by the City Engineer. When straps are used to secure thrust blocks, they shall be stainless steel.

Whenever pipe laying is discontinued for short periods, or when work is stopped at the end of the day, the open ends of all mains shall be closed with watertight plugs or bulkheads. The plug or bulkhead shall not be removed unless or until the trench is dry.

Valves shall be set plumb and properly fitted to the adjacent sections of the main. A valve box shall be installed over each valve.

Tracer (locating) wire shall be laid on top of the P.V.C. pipe and connected at valves per the Standard Details. Tracer tape will not be accepted.

C. Installation of Service Lines

Installation of the services shall consist of the following basic steps:

- (a) Excavation of the entire service trench.
- (b) Thoroughly clean the water main.
- (c) Place and make tap as shown on the Standard Drawing.
- (d) Open tap valve immediately after making tap to flush material from the main line.
- (e) Insert stainless steel sleeves in the plastic pipe and tighten service line connections as per manufacturer's recommendation.
- (f) Place the service line at right angles to the water main.
- (g) Use boring or pushing methods, but not washing methods, to place pipe under curb and sidewalk.
- (h) Backfill and compact the dirt above the service line.
- (i) Service location to be marked by chiseling a "X" on curb face.

- (j) Curb stop, stainless steel insert, meter idler, meter adaptor, service plug for SP3 unit, meter box with a brick at each corner, and lid to be placed at correct depth and distance from sidewalk.

Plastic service pipe shall not be heat-flared. Because of the variation in the outside diameter of the pipe, a saddle tap in lieu of the Quiktap may be required.

Special care shall be exercised to insure proper compaction is made under curb stop so it is vertical and the meter idler is level. Compaction shall be made under and around the meter box so it remains level and at the finished sidewalk grade.

D. Fire Hydrants (See Standard Detail #606)

Fire hydrants shall be Jones J-4040, Long Beach Model 425, Clow Model 850, AVK 2470 or approved equal and shall conform to the latest AWWA Specifications, C-503, for wet-barrel fire hydrants. All hydrants shall be painted with "Caterpillar Yellow" Polyurethane High Duty Industrial Enamel.

E. Temporary Blow-Offs (See Standard Detail #610)

The final length of pipe, prior to the blow-off, shall be 18 to 39 inches. All salvaged temporary blow-offs shall become the property of the Developer or Contractor and shall be removed from the job site before completion.

F. Connections with Existing Waterlines

THE CITY WILL MAKE ALL CONNECTIONS TO THE EXISTING WATERLINES UNLESS SPECIFICALLY APPROVED OTHERWISE BY THE CITY ENGINEER.

When work is done by the Contractor, the Contractor shall make all excavations and furnish, install and maintain such shoring, bracing and sheeting necessary for these connections. The Contractor shall install the water line within 6 inches vertically and with a 10-foot separation from the tie-in to the existing system.

Connections shall be made at such times as designated by the City Engineer and in such a manner as to insure the least inconvenience to water users. No connection shall be made until the new work has been tested and disinfected as specified hereinafter. The Contractor shall be responsible for safeguarding the existing system from all damage and possible contamination in the performance of the work. The City shall furnish the pipe and materials necessary to make the tie-in with the existing system.

G. Testing of Water Mains

After the pipe has been backfilled to 12 inches over the top, each section of the pipe to be tested shall be slowly filled with water and all air shall be expelled from the pipe. The

release of the air can be accomplished by opening hydrants and service line cocks at the high points of the system and the blow-offs at the dead ends. The valves controlling the admission of water into the section of pipe to be tested should be opened wide before shutting the hydrants or blow-offs. After the system has been filled and pressurized to the service pressure of 50 psi with water and all air expelled, all valves controlling the section to be tested shall be closed and the line be allowed to set pressurized for a period of not less than 24 hours.

The pipe shall then be refilled, if necessary, and subjected to a pressure of not less than 150 pounds per square inch or the service pressure plus 50 pounds, whichever is greater, for a period of not less than 1 hour. Curb stops, idler fittings and SP3 units shall also be included in the hydrostatic test.

Pipe installation will not be accepted if leakage exceeds the following:

Allowable Leakage per 100 Couplings

<u>Pipe Diameter in Inches</u>	<u>Maximum Gallons per Hour</u>
6	1.84
8	2.45
10	3.07
12	3.68
14	4.28
16	4.89
18	5.52
20	6.12
24	7.34

The Developer or Contractor shall perform the test prior to connecting to the existing system. The Developer or Contractor shall furnish and install temporary caps, plugs for SP3 units, thrust blocks and other necessary materials needed to hold pressures on sections of line being tested.

Water for testing may be taken from the nearest blow-off, fire hydrant or other approved source. All pipe, fittings, valves, couplings, and other materials needed to fill the test lines with water shall be supplied and installed by the Developer or Contractor. Care shall be taken not to contaminate the existing system. The pump, gauge, pipe connection, and all necessary apparatus and equipment needed for the test shall be supplied by the Developer or Contractor.

The Developer or Contractor shall permanently stop all leaks. All pipe or joints which prove defective shall be replaced and the lines on which such defect or defects occur shall be tested again to determine final acceptability of the installation.

H. Disinfecting Water Mains:

Water mains shall be disinfected using one of the following methods: the Tablet Method, the Continuous Feed Method or the Slug Method. The Continuous Feed and Slug Methods shall be performed in conformance with AWWA Standard C651-92, Section 5. The Tablet Method consists of placing calcium hypochlorite granules and tablets in the water main as it is being installed and filling the water main with potable water when the installation is completed. This method may be used only if the pipes and appurtenances are kept clean and dry during construction. This method can not be used on solvent-welded plastic or on screwed-joint steel pipe because of the danger of fire or explosion from the reaction of the joint compounds with the calcium hypochlorite.

The Tablet Method shall be performed as follows:

Placing of calcium hypochlorite granules: During construction, calcium hypochlorite granules shall be placed at the upstream end of the first section of pipe, at the upstream end of each branch main and at 500 foot intervals along the pipe length. The quantity of granules shall be as shown in Table 1.

TABLE 6.1
Calcium Hydrochlorite Granules
 Ounces (oz.) of Calcium Hypochlorite Granules to be Placed at Beginning of Main
 and at each 500 foot interval.

<u>Pipe Diameter</u> <u>(in.)</u>	<u>Calcium Hypochlorite</u> <u>Granules (oz.)</u>
4	0.5
6	1.0
8	2.0
12	4.0
16 and larger	8.0

Placing of calcium hypochlorite tablets: During construction, 5 gram (g) calcium hypochlorite tablets shall be placed in each section of pipe and also one such tablet shall be placed in each hydrant, hydrant branch and other appurtenances. The number of 5-gram (g) tablets required for each pipe section shall be calculated based on the formula $0.0012 d^2 L$, where d is the inside pipe diameter, in inches, and L is the length of the pipe section, in feet. The result shall be rounded to the next higher integer. Table 2 shows the number of tablets required for commonly used sizes of pipe.

TABLE 6.2
Calcium Hypochlorite Tablets
 Number of 5-gram (g) Calcium Hypochlorite Tablets
 Required for Dose of 25 Milligrams per Liter (mg/L)*

	<u>Length of Pipe Section (ft)</u>				
<u>Pipe</u>	13	18	20	30	40

Diameter (in.)	or less	Number of 5 g Calcium Hypochlorite Tablets				
4	1	1	1	1	1	1
6	1	1	1	2	2	2
8	1	2	2	3	4	4
10	2	3	3	4	5	5
12	3	4	4	6	7	7
16	4	6	7	10	13	13

* Note: Number of tablets is based on 3.25 grams available chlorine per tablet and any portion of a tablet is rounded to the next higher whole number.

The tablets shall be attached by a food-grade adhesive "Permatex Form-A-Gasket No. 2" or "Permatex Clear RTV Silicone Adhesive Sealant". There shall be no adhesive on the tablet except on the broad side attached to the surface of the pipe. All tablets shall be attached inside and at the top of the main, with approximately equal numbers of tablets at each end of a given pipe length. If the tablets are attached before the pipe section is placed in the trench, their position shall be marked on the section so it can be readily determined that the pipe is installed with the tablets on top.

When installation is completed, the main shall be filled with water at a rate such that water within the main will flow at a velocity no greater than 1 foot per second. Precautions shall be taken to assure that air pockets are eliminated. This water shall remain in the pipe for at least 24 hours. If the water temperature is less than 41 degrees Fahrenheit (5 degrees centigrade), the water shall remain in the pipe for at least 48 hours. Valves shall be positioned so that the strong chlorine solution in the treated main will not flow into water mains in active service. Valves and hydrants shall be opened and closed while the system is being disinfected. Treated water shall be retained at least 24 hours after which time it shall be tested for residual chlorine. If less than 5 parts per million is indicated, additional chlorine in solution shall be added until disinfection satisfactory to the City Engineer is obtained. When disinfection has been completed and approved by the City Engineer, the system shall be flushed and filled with clear water. The clear water shall then be flushed into a sewer manhole, using an approved backflow prevention device or approved technique, until all foreign material has been removed from the lines.

The City Engineer shall test the water after refilling the line and, if not found to be of safe bacteriological quality, he shall require the Contractor to re-chlorinate the line until the quality of the water is proven to be satisfactory.

I. Sample Stations

In accordance with the Coliform Rule as mandated by the State of California, sampling stations shall be installed by the Contractor at Contractor's expense, where located by the City Engineer, approximately 1 sampling station for every 1/4 square mile.

Sampling stations shall be served by a 1-inch service installed as shown in the Standard Details, except that a meter idler assembly is not required. The testing nozzle shall be threadless and shall be between 36 - 48 inches in height.

All sampling stations shall be installed as shown in the Standard Details. The piping from the curb stop to the nozzle shall be of brass, copper or Schedule 40 Polyvinyl Chloride Pipe. All piping that is above grade shall be insulated with foam pipe insulation. All station housings shall be "Kupferle Foundry - Mainguard 91", "Koraleen Enterprises - Station Guard", "Max Fusion", or approved equal.

6.04 MEASUREMENT AND PAYMENT

Water main shall be measured horizontally by the linear foot through valves and fittings. Valves greater than 12" shall each be measured as one completed installed unit in operable condition including valve, anchor block, valve box and riser. Valves 12" and smaller shall be considered in the unit price per lineal foot of pipe. Fire hydrants shall each be measured as one complete installed unit in operable condition including hydrant, break-off riser, bury thrust block, 6 inch valve, and piping from main to bury. Air relief and blow-off assemblies shall each be measured as one complete unit in operable condition including valve, valve box, curb stop, corporation stop, service clamp and any other necessary fittings. Fittings, anchors, and thrust blocks shall not be measured for payment.

The contract price for water main and appurtenances shall constitute full compensation for all labor, materials, and tests necessary to furnish and install the main and appurtenances in accordance with the drawings and specification.

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SECTION 7

STREET LIGHTING ELECTRICAL WORK

7.01 DESCRIPTION

This work shall include the furnishing of all labor, materials, tools and equipment to construct and complete in an efficient and workmanlike manner the installation of the traffic signal system in accordance with the approved plans, these specifications, the City Standard Details, and the State Specifications and Standard Plans.

Electrical equipment shall conform to the requirements of the National Electrical Manufacturers Association and material and work shall conform to the requirements of the National Electrical Code, the Electrical Safety Orders of the Division of Industrial Safety, Department of Industrial Relations of the State of California; Rules for Overhead Line Construction G.O. 95, State of California, Public Utilities Commission, the Standards of the American Society for Testing Materials and the American National Standards Institute.

7.02 MATERIALS

A. Poles and Arms - All street light poles and arms shall be hot-dip galvanized steel. Poles shall be foundation mounted and shall not be painted. Twenty-eight (28') foot poles with 15-foot arms shall be Ameron Catalog No. N-2815-2 or an approved equal. Twenty-five (25') foot poles with 15-foot arms shall be Ameron Catalog No. N-2515-2 or an approved equal. Pole tops and base covers shall be furnished and installed with each pole. Where the pole is not located at the back of the sidewalk, the length of the luminaire arm shall be as directed by the City Engineer. Poles shall have hand-holes near their bases.

B. Luminaires - The luminaires shall be as follows or an approved equal:

200 watt I.E.S. Type III	I.T.T. 113-62J3 G.E. M2RR20S1A2GMS2 Hubbell RM GT 15 S31 071 0 3 4 0
150 watt I.E.S. Type II, II-4, or Type III	I.T.T. 113-56262 G.E. M2RR15S1M2GMS2 Hubbell RM GT 15 S31 061 0 3 4 0
100 watt I.E.S. Type II or Type III	I.T.T. 113-56262 G.E. M2RR10S1M2GMS2 Hubbell RM GT 10 S31 061 0 3 4 0

Luminaires shall have high-pressure sodium vapor lamps, glass refractors, built-in receptacles for photoelectric cells, and regulator or auto-regulator type ballasts with a power factor of not less than 92%.

- C. Foundations - Street light foundations shall be constructed of concrete. The concrete shall have a minimum 28-day compressive strength of 3000 psi.
- D. Conductors - Conductors shall be No. 10 AWG copper or larger, THWN single conductor, Underwriters Laboratory approved.
- E. Conduit - Conduit and fittings shall be rigid metal or intermediate metal in locations where approved by National Code, 1-inch minimum diameter, as shown on Standard Detail #702. All fittings installed in concrete shall be of the concrete tight type.

Conduit shall be zinc-coated by the sheradizing, hot-dip or electro-plating process. Each length shall bear the label of the Underwriters Laboratory, Inc.

- F. I.D. Number - All street lights and park trail lights shall have an identification number on the pole. The identification number shall be installed per the Standard Details.
- G. Wood Pole Mount - Where use of existing wood poles is approved by the Engineer, brackets for street lights mounted on wooden utility poles shall be Ameron Catalog No. 961-15N2 or approved equal. Brackets shall be 15 feet in length.
- H. Pull Boxes - All pull boxes shall be Christy N-30 concrete, Brooks Series 38 or approved equal. All pull box lids shall identify the circuit as Street Lights, Traffic Signal, etc.. Traffic lids shall be used when pull boxes are placed in areas traveled by vehicles. The traffic lids shall be 1/4 inch galvanized steel plate with 1/2-inch diameter light hole and bolt holes to match standard stud bolts.
- I. Ballast - All streetlights shall have regulator ballasts and shall be multi-tap 120-277 volt operational.
- J. Trenching - Trenching for streetlights shall be in a separate trench. Depth of trenching shall be per Standard Details.
- K. Photo Electrical Control - Photoelectric cells shall be adjustable, compatible with related equipment and adequate for the load. They shall be Fisher Price No. 6690B or an approved equal.
- L. In-Line Fuse Holders - Fused splice connectors shall be installed in pull boxes at the power source adjacent to an electrolier. All splices shall be made with wire connections, ITT No. 10-604, 10-606 or 10-6010 or approved equal.
- M. Fuses – All fuses to be rated at thirty (30) Amp unless otherwise directed by the City Engineer. Fuse shall be the slow blowing type.

- N. Anchor Bolts - Anchor bolts shall be 1 inch in diameter, 40 inches long with a 4-inch "L" bend at the bottom end. Anchor bolts shall conform to ASTM Designation A 307.
- O. Service Connections - Materials needed to connect street lighting circuits to Modesto Irrigation District power shall be supplied by the developer and forwarded to the Modesto Irrigation District. These materials will be from the power source on the pole to the fuse holder in the pull box.

7.03 **INSTALLATION**

A. Foundations

Foundations shall be constructed of Portland cement concrete per State Specifications and shall be located per the Standard Details. Foundations shall rest on firm ground. The area around each foundation shall be backfilled and compacted per Standard Details.

Foundations shall be placed monolithically to within 4 inches of sidewalk grade. After pole is installed, a 36-inch square cap shall be placed to bring the foundation to sidewalk grade.

In areas of reconstruction, all work on foundations must conform to Section 15-2.05, 86-2.02 and 86-2.03 of the State Standards. Sidewalk grade may be lowered a maximum of 2 inches. In no case shall the base of the standard be permitted to be more than 2 inches above grade. Where the new grade will be higher than the original established grade, the standards may be raised as permitted by unused threads on the anchor bolts. In all cases, a full nut of threads must be maintained. Welding shall not be performed on the body of high strength anchor bolts. Base of standards may never be left below grade. Where these Standards can not be met, a new pole foundation must be installed.

Where steel poles are to be served by an aerial drop from an overhead source, the foundations shall include a concrete-encased grounding electrode complying with Article 250-81(c) of the National Electrical Code.

B. Conduit

All conductors shall be run in conduit. Conduit to be installed underground shall be rigid metal type conforming to article 346 of the Electrical Code and Section 4.3, "Conduit," of the City Standards, or concrete encased Schedule 40 PVC. Schedule 80 PVC plastic conduit shall be used on wood poles.

Conduit terminating in each standard or pull box shall be electrically connected to each other with a copper ground strip equivalent in area to No. 8 AWG copper wiring using insulating bushings with the facilities to connect ground wire.

Metallic conduit shall be installed at all street crossings and planting strips. Conduit shall be jacked or trenched with an earth saw. Conduit depth shall be 30 inches minimum.

Metallic conduit may be jacked through the ground from one excavation to another with not more than one length being driven by impact blows or hammering.

An alternate method of placing conduit, as approved by the Director of Engineering and Transportation, pertaining to straight line runs of Schedule 40 PVC conduit may be in street area only as follows:

Conduit shall be placed under existing pavement in a trench approximately 2 inches wider than the outside diameter of the conduit to be installed. Trench width shall not exceed 6 inches. The top of the installed conduit shall be a minimum of 15 inches below finish grade.

Install street light conduit:

- Six inches (6") behind curb where no sidewalk exists,
- Behind five foot (5') sidewalk except on major streets
- Six inches (6") behind curb on major streets with or without sidewalk,
- Or as directed by the City Engineer.

The outline of all areas of pavement to be removed shall be cut to a minimum depth of 3 inches with an abrasive type saw or with a rock cutting excavator specifically designed for this purpose. Cuts shall be neat and true with no shatter outside the removal area.

The conduit shall be placed in the bottom of the trench and the trench shall be backfilled with commercial quality concrete, containing not less than 564 pounds of cement per cubic yard, to not less than 0.20-foot below the pavement surface for asphalt surfaced roadways and 0.50-foot below the pavement surface for portland cement concrete surfaces. The top 0.20-foot of asphalt surfaced roadways shall be backfilled with asphalt concrete produced from commercial quality paving asphalt and aggregates, and the top 0.50-foot of portland cement concrete surfaced roadways shall be backfilled with commercial quality concrete containing not less than 705 pounds of cement per cubic yard and accelerating admixtures or other provisions for high early strength. Calcium chloride shall not be used in concrete which will be in contact with metal conduit. Conduit installed under street crossings, sidewalks, into pull boxes and foundations shall be Rigid Metal. Connections to PVC conduit shall be by approved fittings.

Exposed Conduit Installation. Run exposed conduits at right angles or parallel to structural members. Rigid metal conduit shall be installed the first ten feet (10') up a utility pole. Conduits shall be securely fastened in place. Conduits one (1) inch and smaller may be secured with one hole malleable iron straps. Conduits 1-1/4 inches and larger shall be secured with conduit hangers or two hole galvanized straps. All straps shall be stand-off type. Plumbers tape shall not be used to secure conduits. Provide junction or pull boxes where required for pulling conductors due to excessive numbers of bends or length of conduit runs. All unused conduit openings shall be plugged or capped. Caulking compound or wooden plugs shall not be used.

Where factory bends are not used, conduit shall be bent without crimping or flattening using the longest radius practicable. In no case shall the bend radius be less than six times the

inside diameter of the conduit. Light conduit connection locations on M.I.D. poles to be determined by M.I.D.

C. Conductors

Conductors for 120 volt lighting shall be No. 10 AWG THW copper, THWN copper wire, or as shown on the plans. The neutral conductor shall be identified. A U.L. listed lubricant shall be used in placing conductors in conduit.

Conductors shall be identified with street light pole number in the service box. Identification shall be by direct labeling, tags, or bands and shall be weatherproof.

No conductors shall be drawn into the conduit until the conduit run is complete and the conduit is free of debris. If the conduit is installed in a pole foundation, the conductors shall not be drawn into the conduit for at least 3 days after placement of the foundation concrete.

Conductors shall not be spliced except in pole bases (or in pull boxes when approved by the City Engineer). The splices shall be made as follows:

1. In pole bases, all splices shall be made with wire connections, ITT No. 10-604, 10-606 or 10-6010 or approved equal.
2. Where specifically approved by the City Engineer, splices in pull boxes shall be made using Ilson IK8 10 STP - 8 STP split bolt or approved equal to connect wire ends. Split bolt shall be wrapped first with Plymouth Bishop 122 Rubber Tape (splicing compound) #2002 or approved equal and then with 3M "33+" electrical tape or approved equal. The entire splice shall be coated with 3M "Scotchkote" electrical coating or approved equal.

D. Poles

Poles shall not be installed until the foundation has set at least 5 days. Poles shall be plumbed by adjusting the leveling nuts; leveling shims shall not be used. The poles shall be grounded to conform to the provisions of the National Electrical Code.

E. Connection to Electrical Distribution System

Where lighting circuit and energy source meet, the circuit shall terminate in Modesto Irrigation District's service box or pull box, as shown in the Standard Plans. The circuit shall terminate with a Bussman TRON fuse-holder, with 30 Amp cartridge fuse, type HEB-AB or approved equal. All connection points shall be waterproofed.

For City projects, the fuse shall be taped to the cable and there shall be 4 feet of slack conductor coiled in service box. For private development of new subdivisions, deliver fuses and the fuse holders for the streetlights to Modesto Irrigation District's Electric Maintenance Division at 929 Woodland Avenue (ph 209-526-7660).

The Modesto Irrigation District shall make service connections for light standard in pull box. Where service is from an overhead source, the Modesto Irrigation District shall supply and install conduit and cable on utility pole and make connections in pull box located at base of pole as per Standard Detail #702. Where service is from a Modesto Irrigation District transformer, and no service or pull box exists, Contractor shall furnish and install a pull box at transformer location, as shown on the Standard Plans. Contractor shall furnish and install conduit and conductors from pull box into Modesto Irrigation District transformer. Entrance into Modesto Irrigation District transformer shall be coordinated with, and supervised by the Modesto Irrigation District.

The connection to either an overhead or underground energy source will be made by the Modesto Irrigation District, upon receipt of request for service by City. All necessary wiring, conduit, etc. to an existing and available power source shall be installed prior to acceptance by the City. Request for service is made upon completion of work by Contractor or upon development of adjacent property.

Unless otherwise requested by the City Engineer, the Contractor shall deliver to the City refractors, lamps and photoelectric cells in lieu of installing them in the electroliers. Advance arrangements shall be made to schedule delivery.

When light is to be mounted on a wooden utility pole, Contractor shall furnish all materials as specified herein, including all conduit, conductors, through bolts, lag bolts, etc. for installation by City or Modesto Irrigation District. The cost for installation shall be included in the cost for inspection of improvements.

7.04 ACCEPTANCE

Acceptance test - Upon completion of the installation of a circuit, the contractor shall notify the City Engineer, who will make the necessary insulation and ground tests. The system will be further tested by 2 weeks of operation prior to the acceptance of the contract. The street light system from the service point to the electroliers shall be tested for the following items:

- A. Identification of light distribution patterns.
- B. Acceptability of the ballasts, fixtures, and lamps for electrical and noise standards.
- C. Verification that all connections are electrically and mechanically sufficient.
- D. Conductors shall move, with minimal effort, within the conduit.

7.05 MEASUREMENT AND PAYMENT

- A. Street Lights - Street lights shall each be measured and paid for as one complete installed unit in operable condition including concrete foundation, pole with mast arm(s), luminaire complete with ballast and lamp, photoelectric control, conductors in the pole and grounding.
- B. Conduit and Conductors – Conduit plus all conductors to be paid for by the linear foot of conduit.
- C. Pull Boxes - Pull boxes shall be measured and paid for as one complete installed unit, including the base and lid.

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SECTION 8

UTILITY TRENCHING AND BACKFILL

8.01 DESCRIPTION

A trench is defined as an excavation in which the depth is greater than the width of the bottom of the excavation.

Excavation for appurtenant structures such as but not limited to, manholes, transition structures, junction structures, vaults, valve boxes, catch basins, thrust blocks, and boring pits shall be deemed to be in the category of trench excavation.

All utilities shall obtain an encroachment permit prior to commencement of work. The request shall be accompanied by a plan showing location and sizes of all underground work in existing right of way and easements including new subdivisions and parcel splits. The encroachment permit must be obtained from the City Engineer prior to commencement of work.

Excavation for the installation of conduit shall be by open trench unless otherwise specified or shown on the drawings. However, should the contractor elect to tunnel or bore and jack any portion not so specified, he/she shall first obtain written approval from the City Engineer.

8.02 MAXIMUM LENGTH OF OPEN TRENCH

The maximum length of open trench where prefabricated pipe is to be laid shall be the distance necessary to accommodate that amount of pipe which can be installed in a single day, or 400 feet, whichever is less. The distance is the collective length at any location, including open excavation, pipe laying and appurtenant construction and backfill which has not been temporarily resurfaced. Use of steel plates as open trench covers shall be allowed only with prior approval of the City Engineer.

8.03 MAXIMUM AND MINIMUM WIDTH OF TRENCH

The maximum clear width of the trench at the top of the pipe shall not be more than the outside diameter of the pipe at any point plus 2 feet. A greater width of trench at the top of the pipe shall be permitted only on written approval by the City Engineer. In no case shall the free working space on each side of the pipe be less than 6 inches.

If the maximum trench width is exceeded, the contractor shall provide additional bedding, another type of bedding, or a higher strength of pipe, as shown on the plans or as approved by the City Engineer, at no additional cost to the City.

8.04 BRACING EXCAVATIONS

All trenches shall be shored or protected in accordance with OSHA and other state and federal safety codes, regulations, and ordinances. The manner of bracing excavations shall be as set forth in the rules, orders, and regulations of the Division of Industrial Safety of the State of California. In addition, the Contractor shall utilize shoring methods as necessary to prevent undermining of adjacent roadways, fences, utilities, and structures.

After the pipeline has been installed and sufficiently backfilled to protect the pipe, all shoring, bracing and sheeting shall be removed. All voids left by the removal of such bracing shall be carefully filled with suitable material compacted in place.

The Contractor shall also comply with Sections 1.10 “Rules & Regulations” and 7.12. “Public Convenience and Safety” of these specifications.

8.05 BEDDING

Bedding shall be defined as that material supporting, surrounding and extending to one foot above the top of pipe, but not exceeding an overall depth of 40 inches.

Bedding zone material shall be sand, aggregate base, controlled density fill (approved slurry mix), or native free draining material which conforms with the requirements of Section 8.09. If, in the opinion of the Engineer may require testing (at the contractors expense) of the native material for conformance to Section 8.09. The bedding shall be free of rocks or clods greater than 3 inches in diameter and shall be free of organic or other the unsuitable material.

If soft, spongy, unstable, or similar other material is encountered upon which the bedding material or pipe is to be placed, this unsuitable material shall be removed to a minimum depth of 4” below the pipe. The 4” depth shall be backfilled with pervious material (as defined in section 8.09) or approved bedding material suitably densified. Sufficient pervious material shall be installed to provide a stable base approved by the engineer prior to installation of the utility, pipe, or structure.

Bedding material shall first be placed so that the pipe is supported for the full length of the barrel with full bearing on the bottom segment of the pipe equal to a minimum width equal to 40% of the outside diameter of the barrel. The remainder of the bedding shall be carefully placed to the proper depth.

Bedding material shall be compacted to a relative density of 90%. Bedding material shall meet the specifications listed under Section 8.09, “Bedding & Backfill Materials.”

Where pipe is to be installed in new embankment, the embankment shall first be constructed to a height of 12 inches above the top of pipe and for a distance on each side of the pipe location of not less than 5 times the diameter of the pipe, after which the trench shall be excavated with sides nearly vertical and the pipe installed.

When water is encountered, the trench shall be kept dry until laying and jointing of the pipe and placing of the bedding material has been completed, inspected, and approved. The contractor shall place a minimum of 6 inches of pervious material and de-water the trench in a manner which has received prior approval of the City Engineer.

When installing water line pipe, the open pipe ends of the pipe shall be closed by approved means to prevent entrance of water or dirt into the line. Whenever water is excluded from the pipe, adequate backfill shall be deposited on the pipe to prevent floating. Any pipe which has floated shall be removed from the trench and re-laid as directed by the City Engineer.

All existing gas pipes, water pipes, conduits, sewers, drains, fire hydrants and other structures shall be carefully supported and protected from damage which may be a result of dewatering by the Contractor, and in case of damage, they shall be restored by him/her, without additional compensation, to their original condition.

8.06 BACKFILL

Backfill shall be defined as that material which lies above the pipe bedding or conduit bedding.

Backfill, for cast-in-place structures such as, but not limited to, manholes, transition structures, junction structures, vaults, valve boxes and reinforced concrete box conduits shall start at the surface upon which the base of the structure rests.

Whenever it is necessary to cross an existing irrigation pipe, the backfill shall be densified with a pneumatic tamper. The entire area under the irrigation pipe, 2 feet on either side and 6 inches on top of the pipe shall be tamped to 95% compaction.

Backfill material shall be native material or select backfill. Native material shall be free of all organic material, rubbish, debris, large rocks, clay chunks, and other objectionable material. When satisfactory compaction of the native material cannot be obtained, "select backfill" shall be required.

Except where the pipe must remain exposed for force main leakage tests and subject to the provisions herein, the contractor shall proceed as soon as possible with backfilling operations. Care shall be exercised so that the conduit will not be damaged or displaced.

The Contractor shall not place backfill against or over the top of any cast-in-place pipe or structures for a period of ten days. Following the expiration of the ten-day period, backfill shall not be placed unless and until the concrete has attained a compressive strength equal to or greater than 85% of the specified design strength.

Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects, the voids remaining after the removal of the boulders shall be backfilled as specified herein, or as otherwise approved by the City Engineer.

- A. Where the void is below the subgrade for bedding conduits or structures, backfill shall be thoroughly densified bedding material.
- B. Where the void is in the side of the trench, it shall be backfilled with suitable material and densified as approved by the City Engineer.

It shall be understood that the removal of all boulders or other interfering objects and the backfilling of voids left by such removals shall be at the expense of the contractor and no direct payment for the cost of such work will be made. The cost of such work shall be included in the prices bid for the various items of work.

After the placing of backfill has been started, the contractor shall proceed as soon as practicable with densification.

8.07 DENSIFICATION METHODS: MECHANICALLY COMPACTED BACKFILL

- A. Backfill shall be mechanically compacted by means of tamping rollers, sheepsfoot roller, pneumatic rollers, vibrating rollers, or other mechanical tampers. All such equipment shall be of a size and type approved by the City Engineer.

Permission to use specific compaction equipment shall not be construed as guaranteeing or implying that the use of such equipment will not result in damage to adjacent ground, existing improvements, or improvements installed under the contract. The contractor shall make his/her own determination in this regard.

Tests for compaction shall be made in accordance with N-Cal-Test Method 216 or 231. Backfill material in undeveloped streets shall be free of objectionable matter, such as vegetation, large clods and asphaltic paving material.

Material for mechanical compacted backfill shall be placed in lifts which, prior to compaction, shall not exceed the depths specified below for the various types of equipment:

1. Impact, free-fall, or "stomping" equipment shall not be used as a means of compaction.
2. Vibratory equipment, vibratory smooth-wheel rollers, and vibratory pneumatic-tired rollers - maximum lift depth 2 feet.
3. Rolling equipment, including sheepsfoot (both vibratory and non-vibratory), grid, smooth-wheel (not vibratory), pneumatic tired (non-vibratory), and segmented wheels - maximum lift depth of 1 foot.
4. Hand-directed mechanical tampers, including vibratory plates - maximum lift depth of 8 inches.

Mechanically compacted backfill shall be placed in horizontal layers of such depths (not exceeding those specified above) compatible to the material being placed and the type of equipment being used. Each layer shall be evenly spread, moistened (or dried, if necessary), and then tamped or rolled until the specified relative compaction has been attained.

B. Jetting

Ponding or jetting **will not be permitted** in the public right-of-way.

8.08 BACKFILL PLACEMENT REQUIREMENTS

A. Method "A":

Method "A" as shown in Detail No. 800 shall be used for all trenches in existing streets.

B. Method "B":

Method "B" as shown in Detail No. 801 is to be used within the public right-of-way in previously undeveloped land (new construction).

C. Method "C":

Method "C" is to be used in unimproved or non-street right-of-way areas. The area of the trench between the bedding zone and the top of trench shall be backfilled with **approved** native material. Compaction shall be done mechanically in uniform lifts not exceeding 6 feet so as to attain a minimum relative compaction of 90%.

8.09 BACKFILL MATERIALS

Bedding

<u>Sieve Size</u>	<u>Polyvinyl Chloride Pipe % Passing</u>	<u>All Other Pipe % Passing</u>
3/4"	100	100
3/8"	-	100
#4	35 – 55	70 – 100
#30	-	20 – 100
#200	3 – 9	0 - 15
Sand Equivalent	30 min	30 min
Minimum Dry Density	-	80 lb/cu ft
R -- Value	78 min	-
Coefficient of Permeability	1.4 in/hr	1.4 in/hr

Backfill Native backfill as specified in section 8.06

<u>Select Backfill</u>	<u>Sieve Size</u>	<u>% Passing</u>
	3"	100
	#4	35 – 100
	#30	20 – 100
Sand Equivalent to be 20 Min.		
Minimum Dry Density 110 lb./cu. ft.		

<u>Pervious Material</u>	<u>Sieve Size</u>	<u>% Passing</u>
	1"	100
Washed coarse crushed	¾"	90 - 100
aggregate, conforming to	½"	60-85%
the		
following gradation	3/8"	20-55%
	#4	0 – 15%
	#8	0 – 5%

8.10 RESTORING SURFACE

Initial cut in street pavement shall be equal to the width of the trench with the option of being jack hammered or saw cut. Drop hammer shall not be used to cut pavement. Final cut in street pavement shall be 12" wider than the trench width (6" each side) and shall be saw cut in neat parallel lines.

The surface of all trenches shall be filled and compacted so that the surfaces will conform to the condition of the surrounding ground. The repaving requirements of the plans shall be met regardless of type of existing surfacing.

All trenches shall be backfilled and temporarily paved at the end of each working day.

Aggregate base shall be Class II compacted to 95% relative compaction. Aggregate base shall have 3/4-inch maximum combined grading.

Asphalt concrete shall be Type B, AR 4000 with ½ inch maximum aggregate, medium grading. A paint binder of asphaltic emulsion shall be applied to all surfaces in conformance with Section 39-4 of the State Standards

A. Temporary Trench Pavement

The contractor shall install and maintain a temporary trench pavement wherever excavation is made through the pavement, sidewalk, or driveway. The temporary trench pavement shall be placed and compacted with a vibratory plate or steel drum roller to grade immediately following trench backfill. Wheel rolling will not be allowed.

Temporary bituminous surfacing (cut back) shall be placed and mechanically compacted immediately above the trench following compaction and approved by the City Engineer. Temporary trench pavement shall be at least 2 inches thick in traffic areas and maintained to the grade of the adjacent pavement by the contractor until permanent pavement is placed. Material, which is placed by the contractor for convenience, shall be at no cost to the City.

B. Permanent Trench Pavement

Final paving above the trench section shall be placed within 14 days of its backfill and compaction. Extension may be granted by the City Engineer due to weather conditions. In the event permanent paving is not done within 14 days, the City will consider this as incomplete work and will take necessary action in accordance with the prevailing City ordinances and policies.

Temporary cut back shall be removed before placement of final paving. Final paving shall be placed on undisturbed previously inspected and compacted aggregate base or approved slurry mix/controlled density fill. Re-compaction shall be required for any disturbed base or surface.

All asphalt concrete shall conform with Section 3.04 of these specifications.

Asphalt Concrete: Permanent asphalt concrete pavement section shall consist of asphalt concrete over aggregate base per plans, compacted to 95% relative compaction. If the existing pavement is thicker, the contractor shall match the existing thickness.

Portland Cement Concrete: Unless noted on the plans, permanent concrete pavement, where required for alley approaches, driveways, and valley gutters, shall consist of 8 inches of concrete over 16 inches of aggregate base compacted to 95% relative compaction. Concrete shall conform to the requirements of Section 3, "Street Construction", of the city of Modesto Standard Specifications, Construction Standards.

8.11 MEASUREMENT AND PAYMENT

Utility trenching and backfill shall include all equipment, material, and labor required for the excavation, dewatering, bedding, backfilling, and compaction required for the installation of various utilities.

Full compensation for utility trenching and backfill shall be included in the contract price for the utility pipe, conduit, or structure being installed and no additional payment shall be made therefore.

Full compensation for providing and placing pervious rock or additional bedding material required to stabilize the bottom of the trench is included in the contract price paid for the utility and no additional payment will be made therefore.

Full compensation for temporary trench pavement and permanent trench pavement shall be included in the contract price for each individual item of work.

SECTION 11

EARTHWORK

11.01 DESCRIPTION

All Grading shall be designed in accordance with the soils report and Chapter 70 of the latest Uniform Building Code. Work shall conform with Section 19 of the State Standard Specifications except as noted herein.

11.02 GRADE TOLERANCE

Immediately prior to placing subsequent layers of material, the grading plane of the basement material shall not vary more than 0.05 foot above or below the design grade.

11.03 RELATIVE COMPACTION

Relative compaction shall be measured in accordance with Caltrans Test Method No. 216 or 231. Relative compaction of not less than 95% shall be obtained within all paved roadway and curb areas according to the following table:

<u>TI</u>	<u>Depth of 95% Relative Compaction</u>
4 – 8.5	0.5 foot below grading plane
9 - 11	0.5 foot below grading plane or 2.5 feet from finished grade, whichever is greater.

11.04 STRIPPING ORIGINAL GROUND

The Contractor will be required to strip and compact only the top 6 inches of original ground, except where design TI is 9 or more.

11.05 SUBGRADE STABILITY/DEFLECTION TEST

The Contractor shall be required to furnish loaded trucks for the purpose of testing the load bearing capacity of the finished basement material or ditch backfill. Total gross load per rear axle shall be 16,000 pounds. Tire pressure must be over 65 pounds. If the tested surface shows a visible deflection extending more than 6 inches from the wheel track at the time of loading, or a visible crack remains after loading, the Contractor shall take corrective measures.

The Contractor may use a test roller of size and weight to meet the City Engineer's approval to pass over the finished subgrade to ensure that there are no soft or spongy areas.

11.06 DISPOSAL OF EXCESS MATERIALS

The Contractor shall obtain a disposal site for all excess material not used on the job site in accordance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right-of-Way," of the State Standards. A letter showing permission and conditions for use of the disposal site shall be filed. The Contractor shall control dust at the disposal site and keep any streets used for disposal haul free of excess material.

11.07 SLOPES

Park strips and fill areas shall be shaped and cut slopes shall be rounded. No slopes shall exceed 3:1 without prior approval from the City Engineer.

11.08 IMPORT BORROW

All import borrow shall be non-expansive engineered fill having a maximum percentage passing the #200 sieve of 40, a maximum plasticity index of 98 and a minimum "R" value of 55 unless otherwise specified in the Special Provisions. Tests for "R" value shall be made in accordance with Caltrans Test Method.

11.09 TREE OBSTRUCTIONS

When an existing City street tree(s) is within 15 feet of a proposed improvement project, a Tree Evaluation Report must be obtained from the Parks and Recreation Department and submitted to the City Engineer prior to commencement of work.

SECTION 12

LANDSCAPE PLANTING

12.01 DESCRIPTION

Landscaping shall be installed to conform to these Standards by Contractor holding an appropriate license for such work under the provisions of the State of California Business and Professional Code.

Furnish all labor, materials, supplies, tools and transportation and perform all operations in connection with and incidental to the complete installation of all plantings as shown on the Drawings. The work shall include, but shall not necessarily be limited to the following:

- A. Finish grading (fine).
- B. Soil preparation.
- C. Tree supports.
- D. Furnishing plants and planting.
- E. Fertilizer, iron sulfate and soil amendment.
- F. Watering.
- G. Landscape Establishment Period: 30 calendar days
- H. Landscape Establishment Period: 60 calendar days
- I. Cleanup, inspection and approval.

Work Not Included in This Section:

- A. Rough grading.
- B. Finish grading.
- C. Irrigation system.

12.02 GENERAL

- A. Samples, if required

The Contractor shall submit to the City Engineer, fourteen (14) days prior to installation, samples of materials for approval. For standard products, the manufacturer's analysis will be acceptable.

B. Verification of Material

The Contractor shall, upon demand, produce records to verify the ordering and delivery of specified quantities and types of material for this job.

C. Personnel

Planting and seeding shall be performed by personnel familiar with planting procedures and under the supervision of a qualified planting foreman. The planting foreman shall be on the job site whenever planting is in progress.

D. Weather

No planting shall occur during weather conditions which will adversely affect materials or when soil is in a muddy condition.

E. Abbreviations

o.c. – on center
g.c. – gallon can

F. Approvals

All irrigation work, except for placement of polyethylene lines, shall be inspected and approved before starting any work of this section.

All landscape planting shall be installed and approved prior to the commencement of the plant establishment period.

G. Preservation of Property

The planting operations shall be conducted in such a manner that no damage shall result to existing site improvements and plantings. The Contractor shall be responsible for any damage resulting from his/her operations, and shall repair or replace such damage at his/her own expense. Vehicles of any kind shall not be allowed to pass over curbs, sidewalk, planting areas, etc., unless proper protection is provided.

H. Landscape Establishment and Landscape Maintenance

Landscape Establishment is the establishment of all landscape elements, such as trees, shrubs, groundcover and turf. The landscape establishment period will be considered complete when all new plantings are in good health and have been in the ground for a minimum of 30 calendar days, all turf areas have achieved an even, close stand of grass, and all areas have been reviewed and approved by the City Engineer. This work is to be completed within the stated contract period.

Landscape Maintenance will consist of a period of 60 calendar days which will begin after completion of the Landscape Establishment period and notification by the City Engineer.

12.03 MATERIALS

A. Imported Topsoil

Topsoil shall be an imported fertile, friable soil of loamy character containing a normal amount of organic matter. It shall be obtained from well-drained stable land and shall be free from refuse, roots, heavy or stiff clay and stones larger than 1 inch in size. Soil shall, by particle examination, contain the following percentages: sand – between 45 and 52; Silt – between 26 and 50; Clay between 6 and 26. Sands shall range from 2 to 0.05 millimeters in diameter; silt from 0.05 to 0.002 millimeter; and clay less than 0.002 millimeters.

B. Soil Amendment

Soil amendment shall be an organic material composted from wood and plant material under optimum conditions to destroy viable weed seeds and pathogens (i.e. 4-8 weeks at temperature of 130-150 degrees Fahrenheit with moisture levels of 35-50%, and turned with a commercial compost turner to thoroughly mix and incorporate all the product to ideal temperature and moisture conditions). Final product shall be screened to ½ inch and cured to stabilize.

Soil amendment shall be dark brown, fine texture, and shall have a minimum of 1% available nitrogen content (% dry weight). Submit complete analysis of the proposed soil amendment to the City Engineer for approval. Prior to amending soil, the landscape contractor shall review the results of the soils test and report recommendations to the City Engineer. The soils report recommendations shall take precedence over the minimum amendment and fertilizer application rates specified on the plans only when they exceed the specified minimums.

C. Fertilizer

1. Planting Tablets

Tightly compressed, long-lasting, slow-release fertilizer tablets weighing 21 grams, with a potential acidity of not more than 5 percent by weight and having an analysis of 20-10-5 derived from the sources listed in the following guaranteed analysis:

Guaranteed Analysis

Total Nitrogen (N).....20%
Derived from urea-formaldehyde
7.0% water soluble Nitrogen, 13.0% water insoluble Nitrogen

Available Phosphoric Acid (P ₂ O ₅)	10%
Derived from calcium phosphate	
Soluble Potash (K ₂ O)	5%
Combined Calcium (Ca)	2.60%
Derived from calcium phosphates	
Combined Sulfur (S).....	1.60%
Derived from ferrous and potassium sulfates	
Iron (expressed as elemental Fe).	35%
Derived from ferrous sulfate	
Potential Acidity: 5% or 100 lbs. Calcium Carbonate Equivalent per ton	

2. Fertilizer 16-7-12

Fertilizer shall be a long lasting, slow-release fertilizer compound having an N-P-K ratio of 16-7-12 (+ Iron), and shall be derived from the sources listed in the following analysis and be a blend of coated prills (which supply controlled release nitrogen, phosphorus, and potassium) and uncoated, rapidly soluble prills containing nitrogen and phosphorus.

Guaranteed Analysis

Total Nitrogen (N).....	16%
8.5% Ammoniacal Nitrogen	
Derived from Ammonium Nitrate, Ammonium Phosphates, and Ammonium Sulfate	
Available Phosphoric Acid (P ₂ O ₅).....	7%
Derived from Ammonium and Calcium Phosphates	
Soluble Potash (K ₂ O)	12%
Derived from Potassium Sulfate and Potassium Nitrate	
Combined Sulfur (S).....	5%
Derived from Potassium Sulfate and Iron Sulfates	
Iron (Fe) expressed as Elemental.....	2.5%
Derived from Iron Sulfates	
Potential Acidity: 5% or 100 lbs 800 Calcium Carbonate Equivalent per ton	

3. Fertilizer 12-12-12

Fertilizer shall be rapidly soluble prills containing equal amounts of nitrogen, phosphorous, and potash plus sulfur and calcium and derived from the following sources:

Guaranteed Analysis

Total Nitrogen (N). 12%
As Ammoniacal derived from Ammonium Sulfate and
Ammonium Phosphate

Available Phosphoric Acid (P_2O_5). 12%
Derived from Ammonium Phosphate

Soluble Potash (K_2O) 12%
Derived from sulfate of potash

Sulfur (S) expressed as elemental..... 15%
Derived Sulfate

Calcium (Ca) 2.10%
Derived from Gypsum

- D. Ammonium Sulfate: Conforming to the requirements of the Agricultural Code of the State of California.
- E. Iron Sulfate: Ferric sulfate or ferrous sulfate in pellet or granular form containing not less than 18.5% iron expressed as metallic iron, and shall be registered as an agricultural mineral with the State Department of Agriculture in compliance with Article 2, “Fertilizing Materials,” Section –1030 of the Agricultural Code.
- F. Rock Cobbles: Rock shall be a rounded cobble with the following percentage larger than:
- 10 lb = 0 - 5%
5 lb = 25 - 75%
1 lb = 90 – 100%
- G. Metal Edging: All metal edging shall be ¼” thick – Reyerson, or approved equal. (Reyerson phone number: 510-653-2933)
- H. Top Dress: “Modesto Gro Pro” or approved equal: Top dress shall be wood chips and/or plant material ground and composted for at least one month at moisture levels of 30-50% and temperatures of 130-150 degrees F. The product shall be dark brown throughout,

screened at a maximum of 1" to remove all contaminants, such as plastic or other debris, and with a minimum of 1% nitrogen to prevent nitrogen deficiency in plant material. Material to be applied at a minimum layer of 3 inches.

I. Trees and Shrubs:

1. Quality and size. Plants shall be vigorous and of normal habit of growth and shall be free of girdling roots, sun scald, abrasions, disease, insects, insect eggs and larvae. Plants shall equal or exceed the standards as outlined by the American Standards for Nursery Stock and to applicable California Agricultural Codes.
2. Nursery grown. Plants shall be nursery grown under climatic conditions similar to those in the locality of the project for a period of one (1) year prior to planting on site.
3. Substitutions are not desired. When substitutions are allowed, all requirements of the plant shall be met, and in no case shall substitutions be made without the written approval of the City Engineer or his qualified representative.
4. Boxed trees shall be well established in boxes before delivery to job.
5. Trees shall have straight trunks with the leader and side limbs intact, unless otherwise specified. All abrasions and cuts shall be completely calloused over.
6. Plants not approved are to be removed from site immediately and replaced with suitable plants.
7. Inspection and approval of specimens required before delivery to site; all others on delivery. City may reject entire lot of plants represented by defective samples. Random samples will be inspected for root condition.
8. Staking material:

Stakes for trees shall be round, of Lodge Pole pine, made from the entire bole of the tree with bark removed and completely treated in a solution of pentachlorophenol. They shall be at least 2" or 2-1/2" in diameter, conically pointed at one end, 10" long tapered point and chamfered at the other end.

Tree ties shall be as noted on drawings.

9. No plants shall be transported to the planting area that are not thoroughly wet throughout the ball of earth surrounding the roots. Plants should not be allowed to dry out, nor shall any roots be exposed to the air except during the act of Placement. Any plants that, in the opinion of the City Engineer, are dry or in a wilted condition when delivered or thereafter, whether in place or not, will not be accepted and shall be replaced at the Contractor's expense.

10. Plant material for back-up lot landscaping shall be low-maintenance, require minimal use of irrigation water once established, and shall be appropriate for the landscape situation:

1. Evergreen shrubs, 3 – 4 feet high in 3' X 10" planters with vines planted so as to cover the wall.
2. Plant material must be appropriate to full sun, part sun, or shade locations.
3. Street tree varieties shall be selected by the City arborist.

J. Herbicide

Submit written chemical weed control program prepared by a licensed pest control advisor for approval by the City Engineer.

K. Seed

Seed mixture shall be 98 percent pure, not to exceed .20 other crop, both noxious and weed free, with a minimum of 88 percent Germination. Seed variety or mix shall be as specified on the plans or in the special provisions. All seed shall be re-cleaned Grade A "new crop" seed, delivered in the original unopened containers, and shall bear a guaranteed analysis and dealer's label. The dealer may mix the seed provided a guaranteed statement of composition of mixture and percentages of purity and germination of each variety is attached to the sealed container. The seed shall be pre-treated with a pre-emergence fungus preventative such as "Thiram" or approved equal in accordance with manufacturer specifications. The seed containers shall be stored immediately in a dry, weather and damp proof structure. Any transit or storage will not be acceptable. Supplier shall be approved by the City Engineer prior to delivery.

L. Hydromulch Seed

1. Seed – as specified, on the plans or in the special provisions.
2. Fertilizer – use 16-7-12, 870 lbs. per acre.
3. Cellulose: The mulch shall be a green colored, fibrous, wood cellulose mulch containing no growth or germination inhibiting factors. It shall be manufactured in such a manner that, after addition and agitation in slurry tanks with fertilizer, seed, water, and other approved additives, the fibers in the material will become uniformly suspended to form a homogeneous slurry, and that when hydraulically sprayed on the ground, the material will form a blotter-like ground cover impregnated uniformly with seed and, which after application, will allow the absorption of moisture and allow the rainfall to percolate to the underlying soil. Cellulose shall be certified to indicate that laboratory and field testing of the product has been accomplished and that it meets all of the foregoing requirements. Weight specification of this material from suppliers and for all applications shall refer only to air dry weight of the fiber material. Each package of the

cellulose fiber shall be marked by the manufacturer to show the air dry weight content, 1800 lbs. per acre.

4. Water: Water for hydromulching shall be clean, potable and added to the slurry mixture in sufficient amount to spread uniformly the required quantity of hydromulch solids (approximately 3,000 gallons per acre).
5. Equipment: Hydromulching equipment used for the application of the seed, fertilizer and slurry of prepared wood pulp shall be of the type as approved by the City Engineer. This equipment shall have a built-in agitation system and operating capacity sufficient to agitate, suspend and homogeneously mix a slurry containing up to 40 pounds of fiber plus combined total of 70 pounds fertilizer solids and seed for each 100 gallons of water. The slurry distribution lines shall be large enough to prevent stoppage. This discharge line shall be equipped with a set of hydraulic spray nozzles which will provide a continuous non-fluctuating discharge and delivery of the slurry in the prescribed quantities uniformly, without misses, waste, or erosion. The slurry tank shall have a minimum capacity of 1,000 gallons and shall be mounted on a traveling unit which may be either self-propelled or drawn. The City Engineer may authorize equipment with smaller tank capacity provided that the equipment has the necessary agitation system and sufficient capacity to spray the slurry in a uniform coat.

M. Mulch

Mulch shall be a fibrous, woody bark mixture called “Walk-on-bark” as distributed by Sun-up Forest Products, Inc. or approved equal.

12.04 AGRONOMIC SOILS TESTS

Prior to soil preparation and water tests, the Contractor shall obtain agronomic soils tests for all planting areas. Tests shall be performed by an approved agronomic soils testing laboratory and shall include a fertility and suitability analysis with written recommendations for soil amendment, fertilizer, and chemical conditioner application rates for soil preparation, planting backfill mix, auger hole requirements, and post-maintenance fertilization program.

Recommendations from approved soil labs shall supercede those guidelines herein described in Section 12.03 and 12.05.

Soil found to be unsuitable for sustaining healthy plant growth, i.e. soil contaminated with sterilants, excessive construction materials, etc., shall be removed and replaced with suitable topsoil as directed by the City Engineer.

Where sod installation is required, both the soil median being planted as well as the sod will be tested for compatibility. Testing of the sod will include both sod soil median and plant tissue analysis.

Recommended agronomic lab facility is:

CIR
1745 Celeste Drive San Mateo, CA 94402
Telephone (650) 574-6900 Fax (650) 574-5515
Drawings to include identification of actual value locations as programmed/installed at controller.

12.05 **PLANTING**

A. Soil Preparation and Fine Grading

Before any planting operations start in any area, all trash and deleterious materials on the surface of the ground shall be removed and disposed of. After completion of fine grading and prior to soil preparation, the Contractor shall review Agronomic Soils Test and Report recommendations as required. The soils report recommendations shall take precedence over the minimum amendment and fertilizer application rates specified on the plans only when they exceed the specified minimums.

All weed growth within the areas to receive planting shall be removed. Areas containing common Bermuda grass shall be fumigated with materials approved by the City Engineer.

All planting areas shall be cultivated until the soil is brought to a loose friable condition to a depth of 12 inches. Remove all debris and rocks which are greater than one inch in any dimension. Evenly distribute soil amendment and fertilizer over all areas at the following rates:

1. Soil Amendment – 6 cubic yards per 1,000 square feet
2. Fertilizer – 20 pounds per 1,000 square feet of 12-12-12 or approved equal.

After approval of amendment and fertilizer applications by the City Engineer, incorporate into top 12 inches of soil by repeated rotary-hoe cultivation.

When rough grading and soil conditioning have been completed, all areas to receive planting shall be finish graded. Grading shall be done when soil is at optimum moisture content for working. The finish grade shall be smooth, uniform, and free of abrupt grade changes and depressions to ensure surface drainage.

The finish grade below adjacent paving, curbs or headers shall be 4 inches in shrub or ground cover areas prior to placing a 3-inch layer of top dress.

Finished grades shown on plans are given in feet and decimals of feet. Slope uniformly between given spot elevations. Planting areas, including lawns, shall be true to grade within one inch when tested in any direction with a 10-foot straightedge.

Grades not otherwise indicated shall be uniform levels or slopes between points where elevations are given, or between points established by walks, paving, curbs, or catch basins. Finish grades shall be smooth, even and on a uniform plane with no abrupt change of surface. Minor adjustments of finish grades shall be made at the direction of the City Engineer if required.

All grades shall provide for natural runoff of water without low spots or pockets. Flow line grades shall be accurate and shall not be less than 2 percent gradient wherever possible unless otherwise indicated.

Finished grade of all shrub, annual, and ground cover areas shall be 1 inch below top of adjacent pavement, headers, curbs or walls unless otherwise indicated on the drawings. Finished grade of lawn areas shall be $\frac{3}{4}$ inch below top of adjacent pavement, curbs, and headers.

Tops and toes of all slopes shall be rounded to produce a gradual and natural-appearing transition between relatively level areas and slopes.

Tree Supports: All trees shall be supported at time of planting as called for on planting plan.

B. Planting

All trees and shrubs shall be planted, staked and tied as noted:

Rock and/or other underground obstructions shall be removed to a depth necessary to permit proper planting, if possible. Note drainage requirements for plant pits. Plant locations which interfere with underground construction or where obstruction cannot be removed shall be adjusted and the new location approved by the City Engineer.

Tree and shrub locations as shown on planting plan are relative, and the City Engineer reserves the right to make adjustments in the location of trees and shrubs in order to achieve the intended results. No planting shall be done without prior approval of location by City Engineer. The Contractor shall locate trees no closer than 10 feet to sidewalks and 15 feet to mow strips and curbing.

Tree holes shall at all times be in accordance with standard tree planting specifications of City of Modesto.

Place backfill in bottom of plant hole after making sure base of hole is loose enough for good drainage. Place approximately one cup of bone meal in bottom of planting hole and mix to a depth of 6 inches prior to placing of tree.

Soil excavated from holes may be reused for planting operations.

Proper drainage of tree and shrub pits is necessary. Any subsoil conditions causing the retention of water in plant holes for more than 24 hours shall be brought to the attention of the City Engineer with proposals for correction before the planting proceeds. When extensive hard pan conditions are encountered, a 6' x 6' tapered pit must be provided for tree plantings.

Glazed sides of augured holes shall be scarified.

Trees and shrubs shall be carefully removed from containers. All tin containers, other than knockout cans, shall be cut on two sides to facilitate removal of plants with as little disturbance as possible to the root ball. Cans shall be cut with an approved type of can cutter or similar equipment. In no case shall cans be broken open with an axe, mattock, or similar article.

Trees and shrubs shall be set true and plumb with the top of the plant ball, as grown in the nursery can container, set approximately one inch above the finish grade of the planting area. The Contractor shall be responsible for any settling and shall raise and replant any tree whose crown settles below the finish grade.

Form a "berm" or ridge of soil at drip line of plant in a neat circle to facilitate watering and hold top mulch.

Pruning of 10 percent of trees and shrubs to be done in field as directed by City Engineer. No pruning to be done without inspection and approval of City Engineer.

Install planting tablets as follows:

1 gallon plant	1 tablet
5 gallon plants	3 tablets
15 gallon plants	5 tablets

Specimen Plants: Use one tablet for each ½ inch of tree trunk diameter or for each one foot of height. Sink tablets 6 to 8 inches deep evenly spaced around the drip line.

Position the plant in the hole and backfill no higher than halfway up the root ball. Place the recommended number of tablets evenly around the perimeter of, and immediately adjacent to, the root ball at a depth which is between the middle and bottom of the root ball. Complete the backfilling, tamp and water.

After thoroughly watering in all plant material, apply a 3-inch layer of top dress to all planter areas having new plant material. Keep mulch away from root ball of plant.

C. Hydromulch Seeding

Preparation: The slurry preparation shall take place on the site. The slurry preparation shall begin by adding water to the tank when the engine is at half throttle. When the water level has reached the height of the agitator shaft, good recirculation shall be established; and at

this time, the seed shall be added. Fertilizer shall then be added, followed by wood pulp. The wood pulp shall only be added to the mixture after the seed.

The engine throttle shall be opened to full speed when the tank is half filled with water. All the wood pulp shall be added the time the tank is two-thirds to three-fourths full. Spraying shall commence immediately when the tank is full.

Application: All areas to receive hydromulch shall be sprayed with a uniform, visible coat by using the green color of the wood pulp as a guide. The slurry shall be applied in a sweeping motion, in an arched stream, so as to fall like rain on each other until a good coat is achieved, and the material is spread at 1,800 pounds wood fiber per acre plus seed and fertilizer. Hydromulch shall not be allowed to fall on the ground cover and shrub areas.

Time Limit: Any slurry mixture which has not been applied to the slopes within four hours after mixing will be rejected by the City Engineer and shall be removed from the project at the Contractor's expense.

D. Sod Planting

Care should be given to prevent heel or foot prints in the grade as the sod is planted. Unroll the sod fitting each strip tightly to the preceding strip. Do not stretch the sod. Force each strip together as tightly as possible. Stagger the strips of sod as a bricklayer places bricks to prevent the seams from matching.

As soon as sod is placed, roll it with a light roller, making certain that no air space is left under the sod. After the first rolling moisten the sod lightly and then allow the grass to dry off before the second rolling. The second rolling should be at a cross-angle from the first rolling.

Upon completion of the rolling, apply sufficient water to wet the sod and soil to a depth of 6 inches. Sod shall be kept moist for the next ten days. At the end of the ten-day period, mow to a height of not less than 2 inches. Care should be taken to leave no footprints in the sod.

12.06 CLEANING UP

The Contractor shall at all times keep the premises from accumulations of waste material or rubbish caused by his/her employees or work, or the employees or work of any subcontractor and at the completion of the work he/she shall remove all rubbish from and about the site and all his/her and his/her subcontractor's tools, scaffolding, and surplus materials.

12.07 WATERING

Apply water to all plants during operations and thereafter, until acceptance of work.

Plants which cannot be watered efficiently with the existing irrigation system shall be watered by means of a hose.

Immediately after planting, apply water to each tree and shrub. Apply water in a moderate stream in the planting hole until the material about the roots is completely saturated from the bottom of the hole to the top of the ground.

Apply water in sufficient quantities and as often as seasonal conditions require to keep the planted areas wet at all times, well below the root system of plants.

12.08 INSPECTION

- A. No planting shall be done until all materials have been approved for quality and placement by the City Engineer.
- B. A daily log of maintenance at the park site shall be kept by the landscape contractor. Entries to log shall commence with plant establishment and end upon final acceptance of project. Log shall be legible and include man-hours at job site, equipment and materials used. A copy of this log shall be given to the City Engineer prior to final acceptance of project
- C. Certificates of Inspection to accompany shipments of plant material shall be furnished as may be required by the City (such as Pinto Tag). Written certifications required which are to be submitted to the City Engineer upon delivery to the job site include:
 - Quantity of commercial fertilizer used.
 - Quantity of soil amendments.
 - Quantity of iron sulfate.
 - Quantity of soil sulfur.
 - Quantity of seed.
 - Quantity of hydromulch materials.

12.09 PRELIMINARY INSPECTION TO THE MAINTENANCE PERIOD

A written notice requesting an inspection should be submitted to the City Engineer at least ten (10) days prior to the anticipated date. Prior to this inspection, the site must be thoroughly cleaned up and all excess material and debris removed.

Prior to the start of the 90-calendar day plant establishment and project maintenance period, the Contractor will be required to have a complete inspection and approval of all landscape construction items.

The following inspections are required:

- At 30th calendar day.
- At 60th calendar day.

- At completion of the maintenance period.

12.10 LANDSCAPE MAINTENANCE PERIOD

The Landscape Maintenance Period shall begin after the 30-day Plant Establishment Period, and shall last a total of 60 calendar days. The contractor must notify the inspector, in writing, seven (7) days prior to the anticipated date of inspection to establish the end of the Plant Establishment Period.

During the Landscape Maintenance Period, the site shall be kept free of all weeds, debris and trash. During this period, plants found to be missing or unhealthy by the City Engineer must be replaced by the contractor within five (5) working days. The five-day period will begin when the inspector notifies the contractor of the existing condition in writing. If for any reason replacement is not made, the Landscape Maintenance Period will be considered void and will start over again when all plant material is in healthy condition.

Landscape maintenance work shall consist of applying water (except initial watering of plants), weeding, caring for plants, sweeping walks, litter pickup, and performing all general project maintenance.

During the Landscape Maintenance Period, all plants and planted areas shall be kept well watered and kept weed free at all times. Weeds, Dallas and Johnson grass, and Bermuda grass shall be removed and disposed of.

The Contractor shall keep project site reasonably free of rodents as required to maintain healthy plant material.

In order to carry out the project maintenance work, the Contractor shall maintain a sufficient number of men and adequate equipment to perform the work herein specified from the time any planting is done until the end of the Landscape Maintenance Period or until the final approval.

The Contractor may be relieved from maintenance work required in these special provisions when the project maintenance work has been satisfactorily completed and accepted in writing by the Agency.

Lawn shall be mowed as specified herein. Clippings and debris shall be removed from the site. Lawn shall be trimmed at the edges of curbs, paving, drains, and headers. Lawn areas which fail to germinate shall be re-seeded at maximum 10-day intervals until a vigorous, even stand of turf is established. Lawn areas shall be kept free of weeds by hand pulling, or may be sprayed with the approved selective chemical herbicide before they exceed 2 inches in height. Lawn shall be mowed for the first time after establishment of a vigorous, uniform stand of turf has reached a height of 3 inches. Lawn shall be mowed a second time when it again reaches a 3-inch height, except that the second cutting shall be performed no sooner than 10 days after the first. Mowing shall take place thereafter at maximum one-week intervals until final acceptance. After second mowing of grass, apply second application of fertilizer. Apply

fertilizer (12-12-12) at a rate of 6 lbs. per 1000 square feet uniformly over turf area. Apply again at the same rate just prior to final inspection.

Plants installed shall be properly maintained by regular watering, cultivating, weeding, re-mulching, repair of stakes, pruning, and treatment of insects and pests. During the maintenance period, any plants which are vandalized, diseased, dead, or in an unhealthy condition shall be replaced by the Contractor at his/her expense within five (5) days after notification from the City Engineer. Any lawn or plants damaged by herbicide shall be replaced by the Contractor at his/her expense. Maintenance shall also include treatment for fungus, diseases, rodents, and insects, the requirements for approval being the same for herbicide.

Weed all areas at intervals of not more than ten (10) days. Rocks, clods, and debris which appear on the surface shall be removed. Heaved, settled, or eroded areas shall be restored by excavating, filling, finish grading, rolling, and re-seeding as required.

Maintenance includes all items constructed under the contract. All items shall be maintained in an optimum working condition. The site shall be kept free of debris, including emptying of trash containers, by means of a general clean up twice a week.

12.11 FINAL INSPECTION AND ACCEPTANCE

Final inspection will be conducted at the end of the maintenance Period. Notice requesting final inspection shall be submitted by the Contractor to the City Engineer at least 7 days prior to the anticipated date.

Acceptance of the project by the City will be contingent upon proper maintenance and the establishment of a vigorous, uniform stand of turf over all areas seeded. Any portion thereof which does not show a vigorous, uniform stand shall make all lawn areas subject to continued maintenance at the Contractor's expense.

Prior to the final inspection, the Contractor shall also have performed weeding, repair or touch-up of paving, equipment, and structures, and the thorough cleaning of the site.

Just prior to the final inspection, 16-6-8 granular form commercial fertilizer shall be applied as follows:

Specimen	1 pint
15 g.c. plants	1 cup
5 g.c. plants	½ cup
1 g.c. plants	¼ cup
Ground cover	10 lbs./1000 square feet
Lawn Areas	6 lbs./1000 square feet

Fertilizer shall be spread around plant base and thoroughly watered.

At the final inspection, the City Engineer will determine the condition of improvements, planting, and lawn. Plants which are missing, vandalized, dead, or unhealthy shall be replaced by the Contractor at his expense with the same species and sizes originally specified. The Contractor shall make replacements within two weeks after final inspection, and maintain plants for an additional 30 days.

If project improvements, corrective work, and maintenance have not been performed as specified and to the satisfaction of the City Engineer, maintenance shall continue at the Contractor's expense until such time as work has been successfully completed. Should work have been performed as specified and to the City Engineer's satisfaction, the City will assume maintenance responsibilities following the final inspection.

12.12 GUARANTEE

All grass areas are to be guaranteed against any defects for one hundred twenty (120) calendar days, 15-gallon trees for one (1) year, shrubs for one (1) year and groundcover for one hundred twenty (120) calendar days after completion of the landscape maintenance period.

Any trees or other plant materials that die back and lose the form and size originally specified shall be replaced, even though they have taken root and are growing after the dieback.

Within 15 days of written notification by the City, remove and replace all guaranteed plant materials which, for any reason, fail to meet requirements of guaranty. Replacements shall be made to same specifications as required for original materials and shall carry the same guaranty from the time they are replaced.

12.13 MEASUREMENT AND PAYMENT

The landscaping shall be measured and payment made at the contract lump sum or unit price and shall include full compensation for furnishing all labor, materials, tools, equipment, incidentals and for doing all work in landscaping and planting areas and tree areas including staking as shown on the plans and as specified in these specifications and as directed by the City Engineer.

SECTION 13

IRRIGATION

13.01 DESCRIPTION

Irrigation System shall be installed to conform to these Standards by Developer or Contractor holding an appropriate license for such work under the provisions of the State of California Business and Professional Code and shall conform to Section 20-5.03A of the State Standards.

Furnish all labor, materials, supplies, tools, and transportation and perform all operations in connection with and incidental to the complete installation of the irrigation system in accordance with the approved plans and these specifications. The work shall include, but shall not necessarily be limited to the following:

- A. Ordering materials to complete the irrigation system.
- B. Trenching, stockpiling excavation materials and refilling and compacting trenches.
- C. Furnishing materials and installation for complete system including piping, valves, fittings, sprinklers, bubblers, emitters, backflow prevention assemblies, controllers, and final adjustment of valves and pressure regulators to ensure proper operation of irrigation system.
- D. Replacement of unsatisfactory materials.
- E. Tests.
- F. As-built drawings.
- G. Cleanup, inspection and approval.
- H. All work of every description mentioned in the specification and/or addenda thereto, and all other labor and materials incidental to the satisfactory completion of the work, including cleanup of the site as directed by the City Engineer.

13.02 RULES AND REGULATIONS

All work and materials shall be in full accordance with the latest rules and regulations of the Uniform Plumbing Code, published by the Western Plumbing Officials Association, and other applicable State or local laws or regulations. Nothing in these Drawings or Specifications is to be considered to permit work not conforming to these Codes.

- A. When the specifications call for materials or construction of a better quality or larger size than required by the above-mentioned rules and regulations, the provision of the Specifications shall take precedence over the requirements of the said rules and regulations.

- B. The Contractor shall furnish without any extra charge any additional material and labor when required by the compliance with these rules and regulations, though the work be not mentioned in these particular Specifications as shown on the Drawings.
- C. The contractor shall erect and maintain barricades, guards, warning signs, and lights as necessary or required by OSHA regulation for the protection of the public or workers.
- D. Any existing buildings, equipment, domestic water piping, pipe covering, sewers, storm drains, electrical wiring, sidewalks, landscaping, etc., damaged by the Contractor during the course of his work shall be replaced or repaired by the Contractor in a manner satisfactory to the City Engineer and at the Contractor's own expense, and before final payment is made. The Contractor shall be responsible for damage caused by leaks in the piping systems, being installed or having been installed by him. He/she shall repair, at his/her expense, all damage so caused, in a manner satisfactory to the City Engineer.

Supervision and Workmanship: The Contractor, personally or through an authorized and competent representative, shall supervise the work constantly, and shall as far as possible, keep the same foreman and workers on the job from commencement to completion. The workmanship of the entire job must in every way be first class, and only experienced and competent workers will be allowed on the job.

Layout of Work: The Contractor shall stake out the irrigation system as shown on the Drawings, using a different color flagging for: heads, valves, tie-in point and trench. These areas shall be checked by Contractor and City Engineer before construction is started. Any changes, deletions, or additions shall be determined at this check. Trenching shall be started only after layout has been checked by the City Engineer. The Contractor shall be responsible to provide uniform and complete coverage of the entire landscaped area.

13.03 MATERIALS

General

Certain numbers on the Drawings and in the Specifications are taken from the catalogs of the manufacturer named. Equipment equal in quality and utility will be accepted, upon approval by the City Engineer in writing.

Materials

- A. Main line (from point of connection to RCVs) shall be PVC 1120 Schedule 40. Use schedule 40 PVC couplings.
- B. Lateral lines (non-pressure) shall be 1120-200 psi PVC plastic pipe with Schedule 40 Type 1, Grade 1, PVC solvent weld fittings. Lateral lines under sidewalk shall be PVC 1120 Schedule 40. Lateral lines no smaller than 1 ¼" on turf rotors and 1" on spray heads or drip systems. Velocity not to exceed 5 feet per second.

- C. Connections between main lines and RCVs shall be of Schedule 80 PVC nipples and fittings.
- D. Riser stock shall be as follows:
 - 1. Risers connecting PVC lateral line to drip branch line. Shall be Dura FMM007 Flex Hose (MIPT x MIPT) or approved equal.
 - 2. Risers shall in no case be of smaller nominal diameter than the IPS size of joint provided on the sprinkler or QCV to be installed.
- F. Control wire shall be copper with UL-approved for direct burial in ground. Common ground wire shall have white insulating jacket; control wires shall have jacket of color other than white. Common ground and control wire shall be #12-1 AWG-UF and control wire shall be #14-1 AWG-UF. Splices shall be made with Rainbird Pentite connector or with 3M-DBY connectors. Run one extra valve wire to each group of two or more valves.
- G. Emitters shall be of the types listed on the Drawings or approved equal.
- H. Controllers shall conform to the Standard Details. Controller shall not be mounted on access control wall. Electrical service and meter shall be mounted in a pedestal-type cabinet. With the approval of the City Engineer, the controller and the meter may be mounted in a single pedestal type cabinet. Controller must be 120 Volt automatic and have a moisture sensing capability. The controller must have the potential of 8-hour continuous irrigation and be installed in a vandal- resistant case. Controller to be Rainbird ESP-MC only unless otherwise specified and approved by City of Modesto Parks Division representative. Controller shall be suitable for future connection to MaxiCom system. A flow sensor, master valve, cluster control unit and related equipment may be required, at the request of the City Engineer.
- I. Remote Control Valves (RCV) shall be globe glass filled nylon body and bonnet pattern with brass flow stem and manual bleed petcock. Sizes of remote control valves shall be as listed on the Drawings.
- J. Rain sensor shall be Rain Guard WCS with vandal-resistant bracket No. RGVR-S. Mount to side of irrigation controller as per manufacturer's instructions and as shown on Drawings.
- K. Gate valves 2-1/2" and smaller shall be bronze construction with operating wheel and screwed connections. Three-inch and larger shall be cast iron and operating nut (2" square) and "O" ring connections for PVC plastic pipe. Install in 8" diameter concrete valve box with cast iron lid marked "IRRIGATION" as detailed, Brooks 1R or approved equal.

- L. Backflow prevention device shall be the reduced pressure type with gate valves, check valves, test cocks reduced pressure chamber and air vent. It shall be U.S.C. approved and conform to the Standard Details. It shall consist of 2 check valves, an automatic operated differential relief valve located between the 2 check valves, a tightly closing shut-off valve on each side of the check valve assembly, and equipped with necessary test costs for testing. Components of the device shall be factory matched. Remote control valves shall be sized as required by flow of irrigation circuit. They shall be brass and have a flow range of 5 to 50 gallons per minute, and pressure regulation from 15 to 70 pounds per square inch as shown in Drawing No. 910. Install 12" above finish grade.
- M. Filter strainer shall have a plastic housing, 1" Female (NPT) with removable screen. Rainbird No. RBY-100-150 with 150 mesh stainless steel screen or approved equal.
- N. Pressure reducing valve shall have a plastic housing, with a preset outlet pressure of 25 psi, Rainbird NO. PSI-HMB-25 or approved equal.
- O. Boxes for RC valve/filter/strainer/PRV assembly in area subject to vehicle traffic shall be concrete 17" x 30" with concrete body, bolt down steel traffic cover marked "IRRIGATION" and 6" extension, Brooks 66 series or approved equal.
- P. Sprinklers and quick coupler valves shall be of the types listed on the drawings or an approved equal. Provide two (2) quick coupler valve keys for each project.
- Q. Miscellaneous installation materials:
 - 1. Solvent cement and primer for solvent weld joints shall be of marked and type approved by the manufacturer(s) of pipe.
 - 2. Lubricant for assembling rubber rings and seal joints shall be of make and type recommended by manufacturer(s) of pipe.
 - 3. Pipe joint compound shall be non-hardening, non-toxic materials designed specifically for use on threaded connections in water carrying pipe. Performance shall be same as Teflon, or approved equal.

13.04 INSTALLATION

- A. Preparation: Schedule and coordinate placement of materials and equipment in a manner to effect earliest completion of work in conformance with construction and progress schedule.
- B. Handling and Storage:
 - 1. Protect work and materials from damage during construction and storage.
 - 2. Plastic pipe. Handle carefully; protect from prolonged exposure to sunlight.

C. Layout:

1. Lay out work as correctly as possible in accordance with diagrammatic drawings.
2. Where site conditions do not permit locating piping, valves and heads where shown, notify the City Engineer immediately and determine relocation in joint conference.
3. Run pipelines and automatic control wiring in common trenches wherever practical.
4. A minimum spray/rotor pattern overlap of 115% (pattern of each head's radius to overlap all adjacent heads by minimum of 15%) shall be measured. If pattern fails this test additional heads are to be installed or existing heads relocated to conform to this standard.
5. All heads to have matched precipitation rates. Documentation to be provided by Contractor.

D. Excavating and trenching:

1. Excavation shall be in all cases ample in size to permit the pipes to be laid at the elevations intended and to permit ample space for joining.
2. Make trenches for pipelines deep enough to provide minimum cover from finish grade as follows:
 - a. 24" minimum cover over main lines to control valves and quick coupling valves.
 - b. 24" minimum cover over control wires from controller to valves.
 - c. 18" minimum cover over RCV-controlled lines (lateral) to sprinkler heads and emitter branches.

E. Assembling pipelines:

1. All pipe shall be assembled free from dirt and pipe scale. Field cut ends shall be reamed only to full pipe diameter with rough edges and burrs removed. All pipe labeling to be installed facing upward.
2. Solvent weld joint:
 - a. Prepare joint by first making sure the pipe end is square, then deburring the pipe end and cleaning pipe and fittings of dirt, dust, and moisture.
 - b. Dry-insert pipe into fitting to check for mis-sizing. Pipe should enter fitting 1/3 to 2/3 depth of socket.

- c. Coat the inside socket surface of the fitting and the external surface of the male end of the pipe with primer. Then, without delay, apply solvent cement lightly to the inside of the socket. At this time, apply a second coat of cement to the pipe end.
 - d. Insert pipe immediately into fitting and turn $\frac{1}{4}$ turn to distribute cement and remove air bubbles. The pipe must seat to the bottom of the socket and fitting. Check alignment of the fitting. Pipe and fitting shall be aligned properly without strain to either.
 - e. Hold joint still for approximately thirty (30) seconds and then wipe the excess cement from the pipe and fitting.
 - f. Cure joint a minimum of thirty (30) minutes before handling and at least six (6) hours before allowing water in the pipe.
3. Threaded joints:
- a. All threaded PVC and /or plastic joints to be made using Teflon tape. All threaded brass and/or galvanized joints to be made using pipe compound. Apply compound to male threads only.
 - b. All threaded joints shall be made up with pipe joint compound. Apply compound to male threads only.
 - c. Where assembling to threaded plastic fitting, take up joint no more than one full turn beyond hand tight.
 - d. Where assembling threaded plastic fittings, use strap-type friction wrench only; do not use metal jawed wrench.
4. Cap or plug openings as pipeline is assembled to prevent entrance of dirt or obstruction. Remove caps or plugs only when necessary to continue assembly.
5. Where pipes or control wires pass through sleeves, provide removable non-decaying plugs at ends of sleeve to prevent entrance of earth.
6. PVC plastic main lines not having control wire running in same trench shall have 2" plastic coated metallic tape running continuously on top of pipe for future detection.

F. Remote control valves:

- 1. Install where shown and group together where practical. Limit one RCV per box (below grade valves only).

2. Install valves no farther than 12" from main line unless absolutely necessary.
3. Locate valves adjacent to walkways, pads, mow strips, but no closer than 12" from edge of concrete. Locate RCV's and QCV's outside future construction areas.
4. Thoroughly flush main line before installing valve.
5. Provide 4" of pea gravel in bottom of valve box. No soil shall be in contact with RCV.
6. Support valve box with four (4) bricks (one at each corner). Maintain a minimum of 2" clearance between PVC pipe and valve box (below grade valves only).
7. Label control line wire at each RCV with a 2 1/4" x 2 3/4" Polyurethane I.D. Tag, indicating identification number of valve (controller and station number). Attach label to control wire and place next to solenoid.

G. Automatic control wiring:

1. Connections shall be made with brass connectors and sealing with Pentite or 3M-DBY connectors.
2. If splicing is required between controller and remote control valve, splices shall be located in valve box and so noted on as-built drawings.
3. All splices and connections to include 3' of excess wire shaped into a coil.

H. Backfilling:

1. Backfill only after piping has been inspected and approved.
2. Backfill material shall be the earth excavated from trenches, free from rock, concrete chunks, and other foreign or coarse materials. If additional backfill material is needed, it shall be import material to match existing soil. Carefully select backfill that is to be placed next to plastic pipe to avoid any sharp objects which may damage pipe.
3. Place backfill materials in 6" layers and compact by tamping to a minimum compaction of 90% of original soil.
4. Dress off areas to obtain finish grades and remove excess soil, rocks, or debris remaining after backfill is completed.
5. If settlement occurs along trenches and adjustments in pipes, valves, sprinkler heads, soil, sod or paving are necessary to bring the system, soil, sod or paving to the proper

level of the permanent grade, the Contractor, as part of the work under this Contract, shall make all adjustments without extra cost to the City.

6. Install a 2-inch wide continuous flexible metal or direct burial irrigation wire. Detection tape or wire shall be used on all main lines that do not have control wire sharing a common trench.

I. Emitters:

1. Thoroughly flush lines before installing emitters.
2. Locate emitters as shown in plan and detail.

J. Sprinkler Heads

1. Thoroughly flush lines before installing heads.
2. Locate heads as shown in plan and detail.
3. Adjust sprinkler heads for proper distribution and trim.
4. Use Teflon tape on all swing joints. No pipe compounds are to be used.

K. Testing:

Perform tests as specified. Remake any faulty joints with all new materials. Use of cement or caulking to seal leaks is absolutely prohibited.

13.05 TESTING

After the entire sprinkling system has been completely installed, complete test of the entire installation shall be made by the Contractor in the presence of a representative of the City Engineer before final acceptance of the system by the City. The Contractor shall perform testing at his/her own expense.

- A. Testing of Service Lines and Irrigation Main – Service lines and irrigation main shall be tested in accordance with applicable provisions of the Water Distribution Specifications.
- B. Testing Plastic Pipe – After all new sprinkler piping and risers are in place and connected, and all necessary division work has been completed and prior to the installation of sprinkler heads, control valves shall be opened and a full head of water used to flush out the system. After the system is thoroughly flushed, risers shall be capped off and the system pressure tested.

Request the presence of the City Engineer in writing at least 72 hours in advance of Testing. All Testing shall be in the presence of the City Engineer or his/her representative. Center load piping with small amount of backfill to prevent arching or slipping under pressure. No fitting shall be covered. Apply a continuous static water pressure when welded plastic joints have cured at least 24 hours and with the risers capped as follows:

1. Test main lines and submains at 125 psi for 4 hours.
2. Test lateral lines at line pressure for 4 hours.
3. Repair leaks resulting from tests. Pressure testing shall continue until no leakage or loss of pressure is shown over the entire prescribed test period. At the conclusion of the pressure test, the heads shall be installed and tested for operation in accordance with design requirements under normal operating pressure.

C. Testing of Electrical System

Prior to acceptance of the work the Contractor shall cause the following tests to be made:

1. For continuity of each circuit.
2. For grounds in each circuit.
3. A megger test on each circuit.
4. A functional test in which it is demonstrated that each and every part of the system functions as specified or intended herein.

13.06 GUARANTEE

It shall be the responsibility of the irrigation contractor to fill and repair all depressions and replace all ground cover and planting lost due to the settlement of irrigation trenches for one (1) year following completion and acceptance of the job. The Contractor shall also guarantee all materials, equipment and workmanship and shall agree to replace at his/her expense, at any time within one (1) year after installation is accepted, and all defective parts that may be found.

13.07 AS-BUILT DRAWINGS

- A. The Contractor shall maintain in good order in the field office one complete set of black line prints of all sprinkler Drawings which form a part of this Contract, showing all water lines, sprinklers, valves, controllers, and stub-outs. In the event any work is not installed as indicated on the Drawings, such work shall be corrected and dimensioned accurately from sidewalks, fence posts or other permanent park elements on these as-built drawings.
- B. All underground stub-outs for future connections, gate valves and remote control valves shall be located and dimensioned accurately from sprinkler heads, walks, on all as-built drawings.
- C. As-built plans must be accurate and up-to-date with the approval of the City Inspector before each progress payment will be made.
- D. Upon completion of the work, obtain reproducible mylars from the City of Modesto and neatly correct the mylars to show the as-built conditions.

13.08 MEASUREMENT

The work performed under these specifications will be measured by the unit or lump sum as designated in the contract item for constructing an irrigation system.

If measured by unit, quantities of sprinkler heads, quick coupling valves, backflow preventers, etc. will be determined from actual count of the items in place in the completed work. Quantities of conduit and the various sizes of pipe will be measured by the lineal foot in place in the completed work.

13.09 PAYMENT

Payment will be made at the lump sum or unit price for sprinklers, sprinkler heads, bubbler heads, quick coupling valves, backflow preventers, control valves, control assemblies, or turning unions and the contract prices per linear foot for the various sizes and types of pipe. Full compensation for furnishing and installing swing joints and pipe used for risers shall be considered as included in the price paid for the contract item requiring the riser or swing joint and riser and no separate payment will be made therefore.

When there are no separate contract items for spray nozzles, valve protectors, valve boxes or any other materials necessary to complete the irrigation system, such materials shall be furnished and installed. Full compensation for this work and materials shall be considered as included in the prices paid for the various contract items of the irrigation system and no separate payment will be made therefore.

The above prices and payments shall include full compensation for furnishing all labor, materials tools, equipment, and incidentals, and for doing all the work involved in installing the irrigation systems, complete in place, as shown on the plans, and specified in these specifications and the special provisions, and as directed by the City Engineer, including any structure excavation, structure backfill and water involved.

SECTION 17

ADJUSTMENT OF MANHOLES, SUREVEY MONUMENTS, AND VALVE BOXES

17.01 DESCRIPTION

This work shall consist of adjusting manholes and water valve boxes to conform with the new elevation of the street and in conformance with the Standard Specifications and Details.

17.02 ADJUSTMENT

Manholes, cleanouts, blow-offs, survey monuments, and water valve boxes shall be brought to finish grade after the final pavement lift has been installed. The contractor shall replace old triangular style water valve boxes with Christy G-5 boxes or equal. The manhole openings shall be temporarily covered by suitable means. For street reconstructions or asphalt repairs on existing streets, manholes and valves shall be raised and asphalt concrete placed within 10 working days after permanent pavement wearing course has been placed. The necessary portions of the subgrade, base and pavement shall be neatly cut away, the manhole built up, and the frames set to a grade flush with the surface of the adjacent pavement. The surrounding area from which the pavement, base or subgrade has been removed shall be back-filled to within 2 inches of the surface with Portland Cement Concrete. Per detail, the remaining 2 inches shall be backfilled with ½ inch maximum asphalt concrete and compacted. The work shall be performed so as to present a neat and thoroughly workmanlike appearance upon completion.

17.03 MEASUREMENT AND PAYMENT

Unless specifically shown as an item of work on the proposal form, the adjustment of manholes, cleanouts, blow-offs, survey monuments, and adjustment and/or replacement of water valve boxes shall be considered included in other items of work and no additional compensation will be made for labor, materials or equipment needed in adjusting utility appurtenances.

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SECTION 18

TRAFFIC SIGNALS

18.01 DESCRIPTION

This work shall include the furnishing of all labor, materials, tools and equipment to construct and complete in an efficient and workmanlike manner the installation of the traffic signal system in accordance with the approved plans, these specifications, the City Standard Details, and the State Standard Specifications and Standard Plans.

18.02 ORDER OF WORK

Order of work shall conform to the provisions in Section 5-1.05, "Order of Work," of the State Standard Specifications, Section 8.02, "Progress of the Work" of the General provisions in the City Standard Specifications, and any Special Provision provided with the bid documents.

The first order of work shall be to place the order for the traffic signal equipment. The Contractor shall furnish the City Engineer with a statement from the vendor that the order for said equipment has been received and accepted by said vendor.

No signal standard shall be delivered on-site until Contractor has all signal materials at hand.

18.03 MAINTAINING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS

See Section 4.20 for Construction schedule requirements.

One "STOP AHEAD" sign and one "STOP" sign shall be placed for each direction of traffic. For two-lane approaches, two "STOP" signs shall be placed. Location of the signs shall be as directed by the Engineer.

"Stop Ahead" and "Stop" signs shall be furnished by the Contractor and shall conform to the provisions in Section 12-3.06, "Construction Area Signs," of the State Standard Specifications except that the base material for the signs shall not be plywood.

18.04 REMOVING, REINSTALLING OR SALVAGING ELECTRICAL EQUIPMENT

Salvaged electrical materials shall be hauled to City of Modesto Electrical Division, 501 N. Jefferson Street, Modesto, California, and stockpiled.

Full compensation for hauling and stockpiling electrical materials shall be considered as included in the lump sum contract price or prices paid for traffic signal and lighting work, and no additional compensation will be allowed therefor.

18.05 MATERIALS AND INSTALLATION

- A. Standards, Steel Pedestals and Posts: Paragraph four of Section 86-2.04, “Standards, Steel Pedestals and Posts,” of the State Standard Specifications is amended by adding the following after the second subparagraph:

Standards with an outside diameter of 12 inches or less shall be round. Standards with an outside diameter of greater than 12 inches shall be round or multi-sided. Multi-sided standards shall have a minimum of 10 sides which shall be convex and shall have a minimum bend radius of 4 inches.

Section 86-2.04, “Standards, Steel Pedestals and Post,” of the State Standard Specifications is amended by adding the following after paragraph eleven:

All galvanized nuts, used on assemblies with a specified pre-load or torque, shall be lubricated in accordance with the requirements specified for galvanized Grade DH nuts in ASTM Designation: A 563. The twelfth paragraph in said Section 86-2.04 of the State Standard Specifications is amended to read:

The sign mounting hardware, as shown on Detail U of Standard Plan ES-6T, shall be installed at the locations shown on the plans.

Where the plans refer to the side tenon detail at the end of the signal mast arm, the applicable tip tenon detail may be substituted.

Standards, steel pedestals and posts shall have ornamental base covers.

Standards, steel pedestals and posts shall be galvanized.

- B. Solid-state Traffic Actuated Controller: The Contractor shall furnish one Model 170E controller assembly consisting of Model 170E controller unit, one wired Model 332 cabinet and all auxiliary equipment required to control the signal indications as shown on the Plans, and as specified in these Special Provisions. The controller shall be furnished complete with all equipment conforming to the requirements in the “Traffic Signal Control Equipment Specifications,” issued by the State of California. Controllers, cabinets, equipment, and all modifications thereto shall be type approved by the State of California Testing Laboratory, and shall have California State Quality Product listing.

The controller unit shall be supplied with BI Tran System Program #200SA. One diagnostic PROM module with C1 and C2 wraparound plugs compatible with and of the same manufacture as the controller units shall also be provided. The diagnostic PROM modules and intersection programs shall be accompanied by an operation/instruction manual.

The controller cabinet layout and component locations shall conform to the requirements for Model 332 cabinet in said “Traffic Signal Control Equipment Specifications,” and addendum thereto.

The controller shall have four ACIA capability. Four ACIA's shall be integral to the controller unit.

The controller memory modules shall be model 412C as described in the Caltrans specification and provide for 32K EPROM (27256), 16K RAM, and 8K zero power RAM (memory method 2, memory select 4).

All compression connectors that terminate inside controller cabinet for low voltage circuits shall be soldered.

The controller shall be supplied with a Model 400 modem with anti-streaming capability module complete with terminal block and cable to connect to controllers ACIA port. The Contractor shall install terminal block and all cabinet wiring except incoming communication lines.

The cabinets shall be wired and fully equipped for traffic actuation and phasing shown on the Plans.

Cabinet shall be aluminum. Cabinet shall have the additional following items installed:

1. Fluorescent light with door switches
2. Auto/manual control with police panel cord.
3. Pull-out drawer/shelf assembly
4. Communications panels
5. To open cabinet doors, handles shall turn away from lock.

The Contractor shall arrange to have a signal technician, qualified to work on the controller units and employed by the controller unit manufacturer or his representative, present at the time the equipment is turned on.

The convenience receptacle shall have ground-fault circuit interruption as defined by the Code. Circuit interruption shall occur on 6 milliamperes of ground-fault current and shall not occur on less than 4 milliamperes of ground-fault current.

Model 332 cabinets shall be furnished with a Corbin lock, keyed "State #2."

Contractor shall deliver all signal equipment to be installed within controller cabinet including cabinet to City Electrical shop thirty (30) days before installation for testing. Contractor shall deliver equipment from City Electrical shop to job site. If any component fails, the 30-day testing time will restart after the replacement part is received at the City Electrical shop.

- C. Vehicle Signal Faces and Signal Heads: Signal housings shall be polycarbonate manufactured from virgin material using lexan polycarbonate black in color.

Backplates shall be polycarbonate material black in color.

Reflectors shall be mounted with mechanical fasteners; adhesive mounting shall not be used.

Glass lenses shall be used.

All signals shall have tunnel visors and backplates **black in color**. All sections of all signals shall be 12”.

All red indications shall have Light Emitting Diode (LED's) signal modules that meet the latest Caltrans Specifications.

All lamps for traffic signal units will be Contractor-furnished, 130-volt 1950 lumin 25TS 8000 HR lamps.

Top openings of signal heads shall be sealed with neoprene gaskets.

- D. **Pedestrian Signals and Pedestrian Push Buttons:** Pedestrian signals shall be Type A **black in color**. International symbol indications shall be provided. The pedestrian signal faces (International Hand Symbol) shall have LED's signal modules orange in color. Pedestrian push buttons shall meet ADA requirements with rain covers. The push sign shall be porcelain enameled metal.

The following type of screen shall be provided:

A 1 ½-inch deep eggcrate-type screen either of 0.020-inch maximum thickness 3003 H14 aluminum alloy or of 0.030-inch nominal thickness polycarbonate. The assembly shall be mounted in a frame constructed of 0.040-inch minimum thickness aluminum alloy or polycarbonate **black in color**.

The eggcrate-type screen shall be installed parallel to the face of the message plate and shall be held in place by the use of stainless steel screws.

The hood described in Section 86-4.05C, “Visors,” of the State Standard Specifications is not required.

The screen and frame shall be anodized flat black or may be finished with flat black enamel as specified in Section 91-4.01, “Enamel: Traffic Signal Lusterless Black,” of the Standard Specifications. Said enamel shall be applied in the shop at the Contractor's expense.

Alternate methods may be substituted for the above screening providing the results are equal to or superior to those obtained with the above-specified screen as determined by the City Engineer.

- E. Luminaires: Glare shields are not required.

Luminaires shall be 200 watt, with high-pressure sodium, General Electric C265N579, ITT 133-62J3, Hubbel RM GT 20 S31 071 0340.

- F. Photoelectric Controls: Photoelectric controls shall be Type IV.
- G. Emergency Vehicle Detector System: The Contractor shall provide and install a 3M Emergency Vehicle Detector System per the plans and these Special Provisions with two phase selectors inside the controller cabinet compatible with optically activated receiver units and Model 170E controller. The Contractor shall provide and install optically activated receiver units with optical detector cable as shown on the plans. The phase selectors, optical emitter, optically activated receiver units, and optical detector cable shall meet specifications in Attachment 1.

The Contractor shall be responsible for making the optical Emergency Vehicle Detector System operational, as per supplier's requirements.

- H. Terminal Compartment: Slip-fitters and terminal compartments shall be cast bronze.
- I. Detectors: Loop wire shall be Type 1.

Detector loops shall be six feet by six feet in size unless otherwise noted on the Plans.

Unless shown otherwise, each loop shall consist of three turns of loop conductor.

Conductor of each loop shall be run continuous, without splice, to the termination pull box where splice to detector lead-in cable is made. Conductors from loop to termination pull box shall be twisted together three turns per foot, before inserting in the saw cut slot and conduit.

Each loop shall be installed with the conductor wound in a clockwise rotation. Each individual conductor shall be banded "Start" and "End" in the termination pull box.

Each pair of loop conductors shall be identified and banded together in pairs, by lane, in the termination pull box. A minimum of five feet of loop conductors shall be provided, after splicing, in a termination pull box.

All banding shall be of the permanent, waterproof type.

Upon completion of the loop, and prior to connecting the loop to the lead-in cable, each loop shall be megohm tested and tested for continuity in the presence of the City Engineer. The insulation resistance of the loop conductors, lead-in cable, and splices shall not be less than 100 megohms.

Final loop connections shall be made such that each loop section is wound in the opposite rotation to an adjacent loop, whether such loop is in the same lane or in the adjacent lane.

The loops shall be joined in combination of series-parallel so that optimum sensitivity is obtained at the detector sensor unit, and shall be in accordance with the detector unit manufacturer's recommendation regarding series-parallel combinations.

Final splices between loops and lead-in cable shall not be made until the operation of the loops under actual traffic conditions is approved by the City Engineer.

Loop detector lead-in cable shall be Type B. Splices to lead-in cable shall be soldered, insulated and in a **heat-shrinking tubing**, or approved equal.

Each loop detector lead-in cable shall be identified and banded in each pull box and in the controller cabinet.

Detectors shall be Indicator Controls Corporation Series 3DLD with built-in loop diagnostics, transmission programs and serial port interface, or approved equal. Detectors shall have automatic reset capability and shall not require manual resetting upon opening and closing of loop circuit.

The sealant for filling slots shall be an **ELASTOMERIC SEALANT**, and shall conform to State Standard Specification 86-5.01A(5), 3M detector sealant, black 5000.

- J. **Conductors and Wiring:** Subparagraphs 2, 4, and 5 of the first paragraph of Section 86-2.09D, "Splicing," of the State Standard Specifications is deleted.

Splices shall be insulated by "Method B", except detector lead-in cables.

Conductors shall be cabled in bundles, by phase, and identified by phase with permanent labels in the controller cabinet and at terminal pull boxes.

Multiple lighting conductors, signal light grounded conductors, and bonding conductors only, may be spliced.

"C" shaped compression connectors, as shown on the Plans, shall be used.

Insulation shall be THW rated, and shall comply with Section 86-2.08B of the State Standard Specifications.

- K. **Fused Splice Connectors:** Fused splice connectors will not be required.

- L. **Bonding and Grounding:** Grounding jumper shall be attached by a 3/16 inch or larger brass bolt in the signal standard or controller pedestal and shall be run to the conduit, ground rod or bonding wire in adjacent pull box.

Grounding jumper shall be visible after cap has been poured on foundation.

Equipment grounding conductors will not be required in conduit containing loop lead-in cables only.

Green Wire #6 (cabinet ground) shall have a separate ground rod in pull box nearest to cabinet, with no other wire attached.

- M. Conduit: Conduit shall be rigid galvanized metal.

When a standard coupling cannot be used for coupling metal-type conduit, a UL listed threaded union coupling, as specified in the third paragraph in Section 86-2.05C, "Installation," of the State Standard Specifications, or a concrete-tight split coupling or concrete-tight set screw coupling shall be used.

Insulated bonding bushings will be required on metal conduit. All conduit shall be grounded together in all pull boxes and cabinets by means of a grounding jumper.

Conduit to be installed under pavement shall be installed by bore and jacking, directional drilling, or other approved methods which do not damage pavement.

After conductors have been installed, the ends of conduits terminating in pull boxes, and in service and controller cabinets shall be sealed with an approved type of sealing compound.

- N. Pull Boxes and Handholes: Pull boxes shall be precast reinforced concrete with "Traffic Signal" stamped on lids. Handholes shall be Type A.

The bottoms of pull boxes shall be grouted. Contractor's attention is directed to Section 86-2.06C of the State Standard Specifications.

Recesses for suspension of ballasts will not be required.

Pull boxes shall be State #5 minimum. Larger sizes shall be installed where required by the National Electrical Code or where shown on the Plans.

- O. Foundations: Portland cement concrete shall conform to Section 90-10, "Minor Concrete," of the State Standard Specifications and shall contain no less than 470 pounds of cement per cubic yard, except concrete for reinforced pile foundations shall contain not less than 564 pounds of cement per cubic yard.
- P. Signs: Signs shall be furnished and installed by the Contractor as shown on the Plans and as specified in the State of California Traffic Manual, issued March 1987.

The G7 street name signs shall be on a diamond grade reflective sheeting.

Street name text shall be white, 10-inch upper case, D font, on a green background. Block numbers and arrows shall be white, four inches high, on a green background. Block numbers and arrow shall be located on the right hand side of the sign. Arrows shall be

orientated toward the highest block number. The block shall be located above the arrow, see detail on the plans. Messages shall be on both sides of the signs unless otherwise indicated on the plans. G7 signs shall be provided as follows:

STREET NAME (Two G7 Signs)
BLOCK NUMBERS with arrow pointing as indicated on the plans.

The Contractor shall provide and install signs as called for on the plans.

Two wraps of stainless steel Band-It-Band strapping $\frac{3}{4}$ " thick shall be used to hang all overhead signs. Band-It-Band buckles type 201 stainless steel shall be used with strapping.

18.06 TESTING

- A. Testing: The Contractor shall make the signals fully operational including entering timing settings provided by the Public Works and Transportation Department in the controller and peripheral equipment.

The Contractor shall have present, a qualified field technician, who shall be qualified to perform testing and servicing on all systems of the installation.

Prior to scheduled turn on, the field technician shall perform all testing assignments. This testing shall include measurement of each loop installation utilizing a field loop tester/analyzer. Based on the measurement of each loop, the final loop configuration shall be established in such manner as to generate a unique frequency for each adjacent loop system, (detector channel). This unique frequency shall be set such that in the natural state and in the detect state, the frequency does not enter the frequency range of any adjacent loop system. In addition to the frequency setting and adjustments, the loop configuration shall be such that peak tuning characteristics shall be maximized; i.e., the detect state shall be a minimum of a 3.0 reference value based on natural state reference. For loops rated less than a 3.5 reference value, the loops shall be configured to maximize the sensitivity of the loop closest to the stop bar.

The Contractor shall provide the City Engineer with the detector test report as provided. This report shall include each detector as labeled on the drawing, and shall show the final loop configuration, the natural state frequency, the detect frequency, and the calculated reference value of each loop system.

The Contractor shall flash test all circuits of each signal phase and both circuits of each pedestrian phase to confirm that the signal is wired properly before the signal is requested to be energized. The Contractor shall provide the Engineer with the signal flash report.

- B. Signal Energizing: The Contractor, after fully testing the new traffic signal equipment, will contact the City Inspector to schedule signal energizing. Signals will only be allowed to be put into operation on Tuesdays, Wednesdays or Thursdays. The Contractor will have the signal fully tested at least 24 hours before the signal is energized.

- C. Functional Testing: The first paragraph in Section 86-2.14B, "Field Testing," of the State Standard Specifications is amended to read:

Prior to start of functional testing, the Contractor shall perform the following tests on all circuits, in the presence of the Engineer.

The functional test for each lighting system shall consist of not less than 14 days. If unsatisfactory performance of the system develops, the conditions shall be corrected and the test shall be repeated until the 14 days of continuous, satisfactory operation is obtained.

18.07 MEASUREMENT AND PAYMENT

The Contractor shall furnish all labor, materials and equipment necessary to complete the work as shown on the Plans, as specified in these standard provisions and any special provisions provided by the project, and in strict accordance with the conditions of the Contract. All incidental work not shown on the Plans or specified herein which is necessary to complete the work necessary to provide the system described, or shown, shall be furnished and installed as part of this contract at no additional cost to the City. The work shall be complete and ready for service as shown on the Plans and/or specified to the satisfaction of the City Engineer.

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SECTION 19

OPTICALLY ACTIVATED, DATA-ENCODED, TRAFFIC SIGNAL PRIORITY CONTROL SYSTEM

19.01 SYSTEM DESCRIPTION

The required priority control system will employ data-encoded optical communication to identify the presence of designated priority or probe vehicles. A record of the vehicle by classification and identification number shall be created. In priority vehicle mode, the data-encoded optical communication will request the traffic signal controller to advance to and/or hold a desired traffic signal display selected from phases normally available. In probe vehicles mode, no traffic signal priority is requested-only a record of the probe vehicle's presence is generated.

The priority control system will consist of a matched system of optical emitters, optical detectors, optical detector cable, phase selectors and system software.

The emitter will generate an infrared, data-encoded optical signal. The optical signal will be detected and recognized by the optical detectors at or near the intersection over a line-of-sight path of up to 2,500 feet (762m) under clear atmospheric conditions. The phase selector will process the signal from the detector to ensure that the signal (1) is valid base frequency, (2) is correctly data-encoded, and (3) is within user-settable range. If these conditions are met, the phase selector will generate a priority control request (i.e., a green light) for the approaching priority vehicles, or record the presence of approaching probe vehicles by classification and identification number.

The system will require no action from the vehicle operator other than to turn the emitter on. The system will operate on a first-come, first-served basis. Higher priority (Command) requests will override lower priority (Advantage) requests. The system will interface with most traffic signal controllers and will not compromise normal operation or existing safety provisions.

19.02 MATCHED SYSTEM COMPONENTS

The required priority control data-encoded optical communications system will be comprised of five basic matched components: optical emitter, optical detector, detector cable, phase selector and system software. To ensure system integrity, operation and compatibility, all components will be from the same manufacturer. The system will offer compatibility with most signal controllers, e.g., electromechanical, NEMA (National Electrical Manufacturers Association), 170. Interfacing to an electromechanical controller may require the use of an interface card.

- A. Data-Encoded Emitter. The data-encoded emitter will trigger the system. It will send the encoded infrared signal to the optical detector. It will be located on the priority or probe vehicle.

- B. Optical Detector. The optical detector will change the infrared signal to an electrical signal. It will be located at or near the intersection. It will send the electrical signal, via the optical detector cable to the phase selector.
- C. Optical Detector Cable. The optical detector cable will carry the electrical signal from the detector to the phase detector.
- D. Phase Selector. The phase selector will accommodate data-encoded communication and will validate, identify, classify and record the signal from the detector. It will be located within the controller cabinet at the intersection. It will request the controller to provide priority to the requesting vehicle and/or record presence of a probe vehicle.
- E. Card Rack. The card rack will provide simplified installation of a phase selector into controller cabinets that do not already have a suitable card rack.
- F. System Software. The system software will be a Windows™ 95 compliant program. It supports system configuration and gathering of operational information.
- G. Electromechanical Card. The electromechanical card shall provide electrical interface between the phase selector and electromechanical-type traffic controllers.

19.03 SYSTEM COMPONENT SPECIFICATIONS

- A. Data-Encoded Optical Emitter
 - 1. The required data-encoded emitter will generate the optical signal, which serves as the trigger to the rest of the priority control system. The optical signal generated by the emitter will be a series of data-encoded flashes from a single light source. The flash signal will consist of a fixed frequency base signal and a coded overlay signal that can be used to transmit information.
 - 2. The data-encode emitter will be powered by the DC voltage supplied from the vehicle's battery, 10 to 16 volts DC.
 - 3. The flash sequence generated by the data-encoded emitter will carry three types of information:
 - a. The first type will be the base frequency of either 9.63855HZ+/-0.0014HZ for an Advantage priority emitter, or 14.03509HZ +/-0.003HZ for a Command priority emitter.
 - b. The second type of information generated by the data-encoded emitter will be a vehicle classification and identification code that is interleaved into the base frequency flashes. Setting the vehicle classification and identification code will be accomplished through four, 10-position rotary switches located in the power supply of the data-encoded emitter. Each data-encoded emitter will be capable of setting a

minimum of 10 different classifications with 1,000 different identification numbers per class for Command priority and an equal number for Advantage priority, for a total of 10,000 codes for each priority.

- c. The third type of information generated by the data-encoded emitter will be reserved for the intersection detection range. The system will enable the Traffic Engineer to manually activate the range code from his/her vehicle using an emitter ON/OFF switch equipped with a special SET RANGE push button. The system configured with a clear lens, will accommodate setting a separate range from 200 feet (61m) to 2,500 feet (762m) for both Command or Advantage priority signals. The system, configured with a visible light filter, will accommodate setting a separate range from 200 feet (61m) to 1,800 feet (549m) for both Command or Advantage priority signals.
4. While operating, the data-encoded emitter will conduct self-diagnostics designed to check for data transmission integrity. Any failures of the self-diagnostic tests shall be displayed by flashing of the indicator light.
5. Each data-encoded emitter will be supplied with ON/OFF switch. The switch will be equipped with an indicator light providing internal diagnostics that will assist in troubleshooting. The indicator light will operate as follows:
 - a. Steady on when the data-encoded emitter is operating.
 - b. Flash at 0.5HZ rate when the data-encoded emitter is disabled.
 - c. Flash at a 4HZ rate when the emitter is missing pulses.
6. The data-encoded emitter will be supplied complete with all cables needed for installation. The cable that connects the flash head to the power supply will be pre-assembled with connectors for both ends; it will be available in two lengths, 4 feet (1.2m) and 15 feet (4.6m). The cable that connects the power supply to the vehicle battery will have a connector on the power supply end and no connector on the battery end; it will be at least 25 feet (7.6m) in length.
7. The data-encoded emitter will be equipped with a disable input that, when activated, will cease unit operation, thereby eliminating the possibility of inadvertent signal transmission after the priority vehicle has arrived at its destination. The unit will start up with a disable input active.
8. The data-encoded emitter will operate over a temperature range of -30°F (-34°C) to $+140^{\circ}\text{F}$ ($+60^{\circ}$).
9. The data-encoded emitter will operate over a relative humidity range of 5% to 95%.

B. Optical Detector

1. The required optical detector will be a lightweight, weatherproof device capable of sensing and transforming pulsed optical energy into electrical signals for use by the phase selection equipment.
2. The optical detector will be designed for mounting at or near an intersection on mast arms, pedestals, pipes or span wires.
3. Each optical detector will be supplied with mounting hardware to accommodate installation on mast arms. Additional hardware shall be available for span wire installations.
4. The optical detector design shall include adjustable tubes to enable their reorientation for span wire mounting without disassembly of the unit.
5. The optical detector will accept optical signals from one or two directions and will provide single or dual electrical output signal(s).
6. The optical detector will be available in three configurations:
 - a. Uni-directional with one output channel.
 - b. Bi-directional with one output channel
 - c. Bi-directional with two output channels.
7. The optical detector will allow aiming of the two optical sensing inputs for skewed approaches or slight curves.
8. The optical detector will have a built-in terminal block to simplify wiring connections.
9. The optical detector will receive power from the phase selector and will have internal voltage regulation to operate from 18 to 37 volts DC.
10. The optical detector will respond to a clear lens data-encoded optical emitter at a distance of 2,500 feet (762m) under clear atmospheric conditions. If the emitter is configured with a visible light filter, the detector will respond at a distance of 1,800 feet (549m) under clear atmospheric conditions. The noted distances shall be comparable day and night.
11. The optical detector will deliver the necessary electrical signal to the phase selector via an optical detector cable up to 1,000 feet (305m) in length.

C. Optical Detector Cable

1. The optical detector cable shall deliver sufficient power from the phase selector to the optical detector and will deliver the necessary quality signal from the detector to the phase selector over a non-spliced distance of 1,000 feet (305m).
2. The cable will be of durable construction to satisfy the following installation methods:
 - a. Direct burial
 - b. Conduit and mast arm pull.
 - c. Exposed overhead (supported by messenger wire).
3. The outside diameter of the optical detector cable will not exceed 0.3 inches (7.62mm).
4. The insulation rating of the optical detector cable will be 600 volts minimum.
5. The temperature rating of the optical detector cable will be +167° (+75C) minimum.
1. The conductors will be shielded with aluminized polyester and have an AWG #20 (7 x 28) stranded and individually tinned drain wire to provide signal integrity and transient protection.
7. The optical detector will allow aiming of the two optical sensing inputs for skewed approaches or slight curves.
 - a. Orange for delivery of optical detector power (+).
 - b. Drain wire for optical detector power return (-).
 - c. Yellow for optical detector signal #1.
 - d. Blue for optical detector signal #2.
8. The characteristic impedance of the detector cable shall be:
0.6ohms/1000”
14.3uF/1000’
9. The shield wrapping will have a 20% overlap to ensure shield integrity following conduit and mast arm pulls.

D. Phase Selector

1. The phase selector, designed to be installed in the traffic controller cabinet, will accommodate data-encoded signals and is intended for use directly with numerous

controllers. These include California/New York Type 170 controllers with compatible software, NEMA controllers, or other controllers along with the system chassis and suitable system interface equipment and controller software.

2. The phase selector will be a plug-in, two or four channel, multiple-priority device intended to be installed directly into a card rack located within the controller cabinet.
3. The phase selector will be powered from 115 volt (95 volts AC to 135 volts AC), 60Hz mains and will contain an internal, regulated power supply that supports up to twelve optical detectors.
4. Programming the phase selector and retrieving the data stored in it will be accomplished using an IBM PC-compatible computer and the system interface software. The connection can be made either directly, via the computer's communication (COM) port, or remotely via a modem. The communication port on the phase selector will be an RS232 interface located on the front and back of the unit.
5. The phase selector will have the capability of storing up to 1,000 of the most recent priority control call. When the log is full, the phase selector will drop the oldest entry to accommodate the new entry. The phase selector will store the record in non-volatile memory and will retain the record if power terminates. Each record entry will include nine points of information about the priority call, as follows:
 - a. Classification: Indicates the type of vehicle.
 - b. Identification number: Indicates the unique ID number of the vehicle.
 - c. Priority level: Indicates whether Command or Advantage priority, or Probe frequency is requested by the vehicle.
 - d. Director: Channel A, B, C, or D: Indicates the vehicle's direction of travel.
 - e. Call duration: Indicates the total time in seconds the priority status is active.
 - f. Final greens at end of call: Indicates which phases are green.
 - g. Duration of final greens: Indicates the total time of priority greens.
 - h. Time and date call ended: Indicates the time a priority status ended; provided in second, minute, hour, day, month, year.
 - i. Maximum signal intensity: Indicates the strongest signal intensity measured by the phase selector during call.
 - j. Priority output active: Indicates if the phase selector requested priority from the controller for the call.

6. The phase selector will include several control timers that will limit or modify the duration of a priority control condition, by channel, and can be programmed from a PC-type computer. The control timers will be as follows:
 - a. MAX CALL TIME: Will set the maximum time a channel is allowed to be active. It will be settable from 120 to 65,535 seconds in one-second increments. Its factory default must be the maximum time.
 - b. CALL EXTENSION TIME: Will set the time a call is held on a channel after the priority signal is no longer being received. It will be settable from one to 255 seconds in one-second increments. Its factory default must be six seconds.
 - c. CALL DELAY TIME: Will set the time a call must be recognized before the phase selector activates the corresponding output. It will be settable from zero to 255 seconds in one-second increments. Its factory default must be zero seconds.
7. The phase selector's default values shall be re-settable by the operator using an IBM PC-compatible computer, or manually using the switches located on its front.
8. The phase selector will be capable of three levels of discrimination of data-encoded optical signals as follows:
 - a. Verification of the presence of the base optical signal of either 14.03509Hz for Command priority, 9.63855Hz for Advantage priority or 11.25870Hz ± 0.0114 Hz for Probe frequency.
 - b. Determination of when the vehicle is within the predetermined range.
 - c. Validation of the optical signal data-encoded pulses.
9. The phase selector's card edge connector will include primary optical detector inputs and power outputs. Two additional detector inputs per channel will be provided on a front panel connector.
10. The phase selector will include one opto-isolated NPN output per channel that provides the following electrical signal to the appropriate pin on the card edge connector:
 - a. 6.25HZ ± 0.1 HZ 50% on/duty square wave in response to an Advantage priority call.
 - b. A steady ON in response to a Command priority call.

11. The phase selector will accommodate three methods for setting the high and low priority optical sensitivity (emitter range):
 - a. Using an encoded emitter with range-setting capability.
 - b. Using any optical emitter by manipulating the front panel switches.
 - c. Inputting the information via the communication port.
12. The phase selector will have a solid state POWER ON LED indicator that flashes to indicate unit diagnostic mode and illuminates steadily to indicate proper operation.
13. The phase selector will have internal diagnostics to test for proper operation. If a fault is detected, the phase selector will use the front panel LED indicators to display fault information.
14. The phase selector will have a Command (High) and Advantage (Low) solid state LED indicator for each channel to display active calls.
15. The phase selector will have a test switch for each channel to test proper operation of Command or Advantage priority.
16. The phase selector will properly identify a Command priority call with the presence of 10 Advantage priority data-encoded emitter signals being received simultaneously on the same channel.
17. The phase selector will have write-on pads to allow identification of the phase and channel.
18. The phase selector will have a test for each channel to test proper operation of Command or Advantage priority.
19. The phase selector shall provide one isolated confirmation light control output per channel. These outputs are user configurable through software for a variety of confirmation light sequences.
20. The NEMA model of the phase selector shall have outputs for the control of NEMA controllers that lack internal preemption capability. The function shall be accomplished through the use of Manual Control Enable, Interval Advance and Phase Omit signals.
21. The phase selector shall have the capability of recording the presence of a vehicle transmitting at the specified Probe frequency. The phase selector shall at no time attempt to modify the intersection operation in response to the Probe frequency.

22. The phase selector shall have the capability of providing Advantage priority in a mode where the output to the controller is gated or controlled by timing relationships within the controller cycle.
23. The phase selector shall have the capability to assign a relative priority to a call request within Command or Advantage priority. This assignment is based on the received vehicle ID class.
24. The phase selector shall have the capability to discriminate between individual ID codes, and allow or deny a call output to the controller based on this information.
25. The phase selector shall have the capability to log call requests by unauthorized vehicles.
26. The phase selector shall have the ability to command an emitter to relay a received code to the next intersection.
27. The selector shall have the capability of functionally testing connected detector circuits and indicating via front panel of LED's non-functional detector circuits.
28. The phase selector shall incorporate a precision real time clock synchronized to the utility AC power line frequency.
29. The phase selector shall include an auxiliary interface panel to facilitate interconnections between the phase selector and traffic cabinet wiring.

E. Card Rack

1. The required card rack will provide simplified installation of a phase selector into controller cabinets that do not already have a suitable card rack.
2. The card rack will be factory wired to one connector, located under the card slot, and a terminal block, located next to the phase selector slot, on the front of the card rack.
3. The card rack connector on the front, will provide for all connections to the traffic controller.
4. The card rack will provide labeled terminal blocks for connecting the primary optical detectors to a phase selector.

F. Interface Card for Electromechanical Controllers

1. The required interface card for electromechanical controllers will provide electrical and logic interface between the phase selector and an electromechanical-type controller.
2. The inputs to the interface card for electromechanical controllers will be connected to the outputs of the phase selector.

3. The outputs of the interface card for electromechanical controllers will be connected to the Hand Control Switch or Police Panel where the dial motor and its self-generated solenoid advance pulses are disconnected from the cam/solenoid assembly and replaced by pulses generated by the action of the Hand Control Switch in the electromechanical-type controller.
4. The interface card for electromechanical controllers will decode the outputs of the phase selector(s) and advance the controller to the phase that is set for that channel by sensing the traffic controller signal indications.
5. The interface card for electromechanical controllers will have one input to disable the interface card.
6. The interface card for electromechanical controllers will include the following switches:
 - a. Channel 1 Green Time: 16-position rotary switch; Controls timing between advance pulses, in seconds, when in Phase 1 green.
 - b. Channel 2 Green Time: 16-position rotary switch; Controls timing between advance pulses, in seconds, when in Phase 2 green.
 - c. Channel 3 Green Time: 16-position rotary switch; Controls timing between advance pulses, in seconds, when in Phase 3 green.
 - d. Channel 4 Green Time: 16-position rotary switch; Controls timing between advance pulses, in seconds, when in Phase 4 green.
 - e. NON Green Time: 16-position rotary switch; Controls timing between advance pulses, in seconds, when no indications are green.
 - f. Power Switch.

G. Interface Software

1. The priority control interface software will be provide on 3.5", 1.44MB diskettes to interface with the phase selector. It must run on most IBM-compatible computers equipped with at least 512 KB RAM, Windows™ 95 and color VGA display capability.
2. The priority control interface software must accommodate:
 - a. Setting up and presenting user-determined system parameters.
 - b. Viewing and changing settings.
 - c. Viewing activity screens.

- d. Displaying and/or downloading records of previous activity showing class, code, priority, direction, call duration, final greens at end of call, duration of final greens, time call ended in real time plus maximum signal intensity (vehicle location information). This information may be used to reconstruct the route taken by a priority (or probe) vehicle to track the vehicle.
- 3. The priority control interface software must accommodate operation via a mouse or via the keyboard, or in combination.
- 4. The priority control interface software must provide menu displays to enable:
 - a. Setting of valid vehicle ID classes and codes.
 - b. Establishing signal intensity thresholds (detection ranges), modem initialization, intersection name and timing parameters.
 - c. Setting of desired green signal indications during priority control operation and upload and download capability to view.
 - d. Resetting and/or retrieving logged data and priority vehicle activity.
 - e. Addressing for each card in a multi-drop connected system.
 - f. Confirmation light configuration.
 - g. NEMA Control Parameters.

19.04 RELIABILITY

- A. All equipment supplied as part of the optical priority control system intended for use in the controller cabinet will meet the following electrical and environmental specifications spelled out in the NEMA Standards Publication TS2 1992, Part 2.
 - 1. Line voltage variations per NEMA TS2 1992, Paragraph 2.1.2.
 - 2. Power source frequency per NEMA TS2 1992, Paragraph 2.1.3.
 - 3. Power source noise transients per NEMA TS2 1992, Paragraph 2.1.6.1.
 - 4. Temperature range per NEMA TS2 1992, Paragraph 2.1.5.1.
 - 5. Humidity per NEMA TS2 1992, Paragraph 2.1.45.2.
 - 6. Shock test per NEMA TS2 1992, Paragraph 3.13.9.
 - 7. Vibration per NEMA TS2 1992, Paragraph 3.13.8.

- B. Each piece of equipment supplied as part of the priority control system intended for use in or on priority vehicles will operate properly across the entire spectrum of combinations of environmental conditions (temperature range, relative humidity, vehicle battery voltage) per the individual component specifications.

19.05 QUALIFICATIONS

- A. The manufacturer of the required optical priority control system will verify the proven, safe operation of the system's optical communication technology. Upon request, the manufacturer will produce a list of 20 user agencies having two years or more experience interfacing priority control equipment with electromechanical, solid-state and programmable controller types.
- B. The manufacturer will demonstrate the ability to finance ongoing technical support, written product warranties, and responsibility for product failure.
- C. Upon request, the manufacturer will produce a copy of its last full year and four previous years' corporate financial statements.
- D. The manufacturer will have an independent quality department that has complete authority to control product integrity and is answerable only to the senior officer of the organization.

19.06 RESPONSIBILITIES

- A. The manufacturer of the required optical priority control system and/or the manufacturer's representative will provide responsive service before, during and after installation of the priority control system. The manufacturer and/or the manufacturer's representative, as consultants to the installer, will provide certified, trained technicians having traffic systems industry experience and operational knowledge of priority control systems.
- B. The lowest fully responsive bidder will be required to supply working production components specified in the Specifications with 14 calendar days from the bid opening date. Failure to do so will render the bid non-responsive.
- C. Paragraph B will not be required if, prior to the bid opening, the bidder demonstrated to the City that the equipment bid meets these specifications.

19.07 SUBSTANTIATED WARRANTY

- A. The manufacturer of the required optical priority control system will warrant that, provided the priority control system has been properly installed, operated and maintained, component parts of a matched component system (see Section II) that prove to be defective in workmanship and/or material during the first five years from the date of shipment from the manufacturer will be covered in a documented system-protection plan, plus an added five-

year warranty for repair or replacement at a fixed deductible charge for a total of 10 years of product coverage.

- B. In addition, upon request, the manufacturer will provide documentation proving ability to financially support the 10-year provisions of the warranty. Documentation will include appropriate financial reports for the previous five business years.
- C. The protection plan will warrant that component parts of a matched component system that prove to be defective in workmanship and/or material during the first five years from the date of shipment from manufacturer will be repaired at no charge, and that extended coverage with a fixed repair deductible will be available for an additional five years.
- D. In total, the warranty coverage must assure that system components will be available to allow system operation during the 10-year warranty period.
- E. A copy of the manufacturer's written warranty outlining the conditions stated above will be supplied with the bid.

19.08 CERTIFICATE OF INSURANCE

The manufacturer of the required optical priority control system will provide a certificate of product liability insurance protection for \$5,000,000 assuring the priority control user that the manufacturer is insured against civil damages if proven to be at fault for an accident due to equipment failure within the system of matched priority control components. This certificate, however, need not, and is not meant to provide liability insurance protection to the priority control system dealer, installer or user.

19.09 USER SUPPORT SERVICES

The manufacturer of the required optical priority control system will offer support programs to assist the purchase and implementation of a priority control system program, including:

- A. A preferred lease program to finance purchase of a system.
- B. Public relations assistance to promote the system within the user community.
- C. Intersection survey service to document appropriate equipment interfaces.
- D. Customized proposals to assist the procurement process.

19.10 CERTIFICATION

The manufacturer of the required priority control system will certify that all component products are designed, manufactured and tested as a system of matched components and will meet or exceed the requirements.

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CITY OF MODESTO

INDEX

DETAILS

SECTION

DETAIL NO.

100 - Traffic Safety:

Construction Barricades	100
Traffic Cones and Lane Closure Tapers.....	101
Construction Signs (Appearance)	102
Construction Signs (Description).....	103
Traffic Controls Multi-Lane Conventional Highway:	
Taper Length, Buffer Space and Advance Warning Sign Spacing	104
Height & Lateral Location of Signs	105
Lane Closure on Low Volume Two-Lane Road.....	106
Lane Closure Near Side of Intersection	107
Right Lane Closure Far Side of Intersection.....	108
Half Road Closure Far side of Intersection.....	109
Sidewalk Closures	110
Lane Closure on Local Street.....	111
Work on Shoulders.....	112
Shoulder Work with Minor Encroachment	113
Work in Center of Low-Volume Road	114
Left Lane Closure Far Side of Intersection.....	115
Crosswalk Closures and Pedestrian Detours.....	116
Interior Lane Closure on MultiLane Street	117

200 – Engineering:

Typical Layout for Improvement Plans (Diagram).....	200
Alternate Layout for Improvement Plans (Diagram).....	200B
Typical Layout for Improvement Plans (Legend).....	201
Typical Title Strip for City Projects	202
Typical Title Strip for Improvement Plans.....	202B
Approval Blocks for Improvement Plans.....	202C
Design Revisions Format	203
Revision Block.....	203B
Drafting Standards (Lettering).....	204
Drafting Standards (Symbols).....	205
Autocad Standards (Text Types).....	206

300 – Streets:

Street Sections.....	300
Structural Section Requirements	301
Traffic Taper Detail Locator	302
No Parking Area - Collector/Arterial Intersection	303
No Parking Area - Collector/Collector Street Intersection.....	304
Pork Chop Island Detail at Street Intersection.....	305
Major Street Section.....	306
Minor Collector/Industrial Street Section	307
Expressway (Except Briggsmore Avenue).....	308
Local Street Section.....	309
Cul-De-Sac Street Section - Curb/Easement	310
Cul-De-Sac Street Section - Design Layout/Types	311
Alignment for 90° Street Intersection Knuckle	312
Walk-Thru Cul-De-Sac Section.....	313
Open-Ended Cul-De-Sac (1).....	314

SECTIONDETAIL NO.**300 – Streets (continued):**

Open-Ended Cul-De-Sac (2).....	315
Downtown Streetscape (1).....	316
Downtown Streetscape (2).....	317
Downtown Streetscape (3).....	318
Downtown Streetscape (4).....	319
Downtown Streetscape (5).....	320
Downtown Exposed Aggregate Sidewalk	321
Standard Pavement on Existing Street Section.....	322
Street Exaction Policy (text)	323
Street Exaction Policy (diagram).....	323A
Part-Width Street Section	324
Mid Block Bus Turnout.....	325
Far-side Bus Turnout	326
Nearside Bus Turnout	327
Median Detail	328
Thru Drain Detail for Medians	329
Curb Sections	330
Curb Modification for Existing Tree	331
Curb Drain Under Sidewalk	332
Curb Drain Under Sidewalk (Multiple)	333
Sidewalk Modification for Tree at Property Line	334
Sidewalk Modification for Tree at Curb.....	335
Sidewalk Widening for Obstructions	336
Tree Block Out.....	337
Concrete And Aggregate Sidewalk.....	342

SECTIONDETAIL NO.**300 – Streets (continued):**

Curb Ramp - Case B and Case E.....	345
Curb Ramp - Case C.....	346
Curb Ramp - Case A and Case D.....	347
Curb Ramp - Notes and Details	348
Curb & Sidewalk Returns w/Transitions	349
Valley Gutter.....	350
Class C 4-Lane Expressway at a Minor Collector.....	353
Class B & C 4-Lane Expressway at a Major Collector.....	354
Class B & C 4-Lane Expressway at a Principal and Minor Arterial	355
Claribell Expressway.....	355A
Class C 4-Lane Landscaped Expressway at a Minor Collector	356
Class B & C-Ln Land. Expressway at a Principal and Minor Arterial....	357
Class B and C 4-Lane Landscaped. Expressway at a Major Collector..	358
Class C 6-Lane Expressway at a Minor Collector.....	359
Pelandale Ave – Class C 6-Ln Expressway.....	359A
Class B & C 6-Lane Expressway at a Major Collector.....	360
Class B & C 6-Lane Expressway at a Principal and Minor Arterial	361
Pelandale Expressway at a Principal and Minor Arterial	361A
Class C 6-Lane Landscaped Expressway at a Minor Collector	362
Class B & C 6-Ln Land Expressway at a Principal and Minor Arterial..	363
Class B & C 6-Lane Landscaped Expressway at a Major Collector	364
84' Wide Major Collector at a Minor Collector.....	365
96' Wide Major Collector at a Minor Collector.....	366
Class B 4-Lane Expressway at a Minor Collector.....	367
Class B 4-Lane Landscaped Expressway at a Minor Collector	368

SECTIONDETAIL NO.**300 - Streets (continued):**

Class B 6-Lane Expressway at a Minor Collector.....	369
Class B & C 4-Ln Expressway at a Class B & C 6-Ln Expressway.....	370
Class B 6-Lane Landscaped Expressway at a Minor Collector	371
Class B & C 6-Ln Expressway at a Class B & C 4-Ln Expressway.....	373
Class B & C 4-Lane Expressway.....	374
Class B & C 6-Lane Expressway.....	375
Pelandale Ave – 6-Ln Expressway.....	375A
Minor Collector at a Minor Collector.....	376
Local Street at a Minor Collector	377
Local Street at a Major Collector	378
Minor Arterial at a Minor Collector	379
Minor Arterial at a Major Collector	380
Major Collector at a Major Collector	381
Principal Arterial at a Minor Collector.....	382
Principal Arterial at a Major Collector	383
Minor Arterial at a Principal Arterial and a Major Arterial.....	384
Class B&C 4-Ln Land. Expressway at a Class B&C 6-Ln Expressway	387
Typical Roundabout	388
Typical Roundabout (Details)	388A
Typical Roundabout Landscape Plan.....	389
Typical Roundabout Irrigation Plan.....	390

400 - Storm Drain:

Rain Intensity - Frequency Curves	400
Drainage Basin.....	401
Drainage Basin Outlet.....	402

SECTIONDETAIL NO.**400 - Storm Drain (continued):**

Temporary Rockwell & Typical Locations	403
Rockwell Assembly w/ Type I Catch Basin.....	405
Frame & Grate Detail.....	406
Rockwell for Vehicular Traffic Areas	407
Rockwell Frame & Cover and Screen Cover.....	408
Type II Catch Basin w/ 3AC top or equal.....	409
Type II Catch Basin	410
Drive-Over Curb Transition for Curb Inlet.....	411
Junction Box.....	412
Lateral Manhole	413
Precast Trunk Manhole	414
Cast-In-Place-Trunk Manhole.....	415
Manhole Cover and Frame.....	416

500 - Sanitary Sewer:

California Health Department Requirements	500
California Health Department Requirements	500A
Lateral, Subtrunk or Small Trunk Manhole.....	501
“Precast Trunk” Manhole	502
Backwater Device.....	503
Site Layout for Std. Sewer Lift Station.....	504
Terminal Manhole	505
Manhole Cover and Frame.....	506
Temporary Lamphole	507
Sewer Fly-Line Construction.....	508
House Sewer Line Repair – Cost-Share Program	509

SECTIONDETAIL NO.**500 - Sanitary Sewer (continued):**

Sewer Service.....	510
Service Riser.....	511
Cut-In Service	512
Sand & Grease Interceptor	513
Existing House Lateral Relocation.....	514

600 - Water:

California Health Department Requirements	600
California Health Department Requirements	600A
Standard Water Service Taps 1" - 2" & Tap Excavation Requirements..	601
Pipe Locating Wire for Non-Conductive Water Mains	602
Fire Protection System Standards.....	603
Typical Fire Sprinkler Line with Post Indicator Valve	604
Fire Hydrant Location.....	605
Fire Hydrant Installation.....	606
Blue Reflective Marker Placement	607
Valve Box Installation.....	608
Thrust Blocking.....	609
Blow-Off	610
Layout for 3" or Larger Meter By-Pass Installation	611
1" Water Service with Meter Box.....	612
Schedule of Metered Services	613
Backflow Prevention Device.....	614
Air & Vacuum Release Valve	615
Sample Station.....	616

SECTIONDETAIL NO.**700 - Lighting & Traffic:**

Locations of 25' Poles.....	700
Locations of 28' Poles.....	701
Installation Layout	702
Pull Box	703
Pole Foundation.....	704
Trench Section.....	705
Sign Posts	706
Street Name Sign.....	707
Street Sign Location.....	708
Typical Overhead Street Name Signs	709
Curb Numbers.....	710
Clear Vision Triangle.....	711
Dead End Street Barricade.....	712
Street Width Transition Barricade.....	713
Information on Dead End Barricade.....	714
Removeable Bollard Detail.....	715

800 - Utilities, SD, SS, W:

Trench Backfill - Existing Streets	800
Trench Backfill - Undeveloped Streets.....	801
Trenching and Resurfacing (page 1 of 2).....	802
Trenching and Resurfacing (page 2 of 2).....	803
Standard Locations for Residential.....	804
Street Crossing for Residential.....	805
Storm Drain Design Horizontal Alignment	805A
Trenching in the Street.....	806

SECTION

DETAIL NO.

800 - Utilities, SD, SS, W (continued):

Adjusting Street Facilities to Grade.....	807
Utility Location w/o Ultimate ROW	808
Joint Trench Locations - Cases A-C.....	809
Joint Trench Locations - Cases D-E.....	810
PVC Sewer Trench Backfill - Undeveloped Streets	811V
PVC Sewer Trench Backfill - Existing Streets.....	812V

900 - Survey:

Survey Monument.....	900
Monument for Private Utility Line Crossing ROW.....	901
Monument for Private Utility Line Crossing ROW.....	902
Monument for Private Utility Line Crossing ROW.....	903

1000 - Driveways:

Driveway Design Standards.....	1000
Driveway Design Standards.....	1001
Residential Driveways	1002
Non-Residential Driveways	1003
Apartment / Commercial Driveways	1004
Industrial Driveways.....	1005
Access Design	1006
Median Design.....	1007
Deceleration Lanes for Driveways	1008
Driveway Details, Utilities.....	1009
Construction Details for Alley Flared Driveways	1010
Construction Details for Commercial Flared Driveways.....	1011
Construction Details for Residential Flared Driveways.....	1012

SECTIONDETAIL NO.**1000 – Driveways (continued):**

Construction Details for Drop Approach Driveways.....	1013
Drop Curb Approach Ramps and Grades.....	1014
Drop Curb Approach Profile View.....	1015

1100 - Grading:

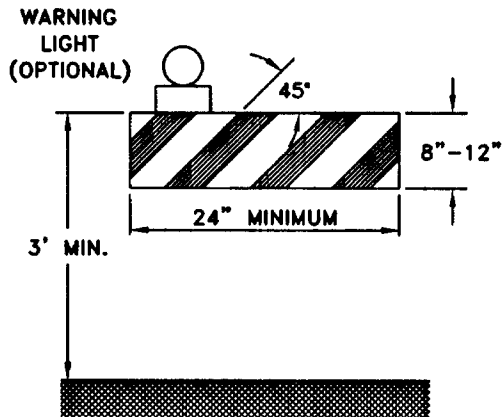
Typical Finished Lot Grading.....	1100

1200 - Landscaping:

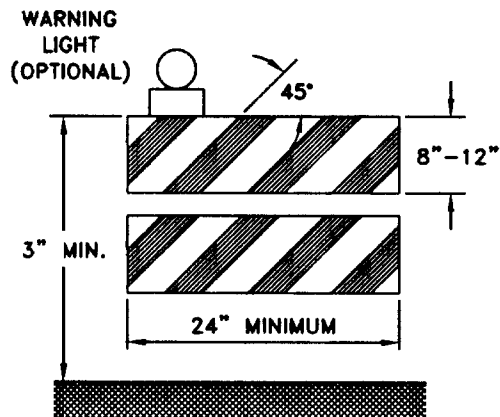
Typical Tree Staking	1200
Planter Detail	1201
Solenoid Valve Detail.....	1202
Gate Valve Assembly.....	1203
Irrigation Controller.....	1204
Typical Wire Connection.....	1205
Street Tree Block Out - Typical Bubbler Detail.....	1206
Bubbler Detail.....	1207
Irrigation Layout - Typical Back-Up Lot Planting.....	1208
Reduced Pressure Principle Backflow Prevention Assembly for 3 inch & Larger	1209
Reduced Pressure Principle Backflow Prevention Assembly 1 to 2 inch Size	1210
Typical Concrete Thrust Block.....	1211
Typical Trenching.....	1212
Access Control Wall	1213
7 Foot Access Control Wall.....	1214
Chain Link Fence & Gate.....	1215
Fence Standards (Building Department).....	1216

BARRICADE CHARACTERISTICS

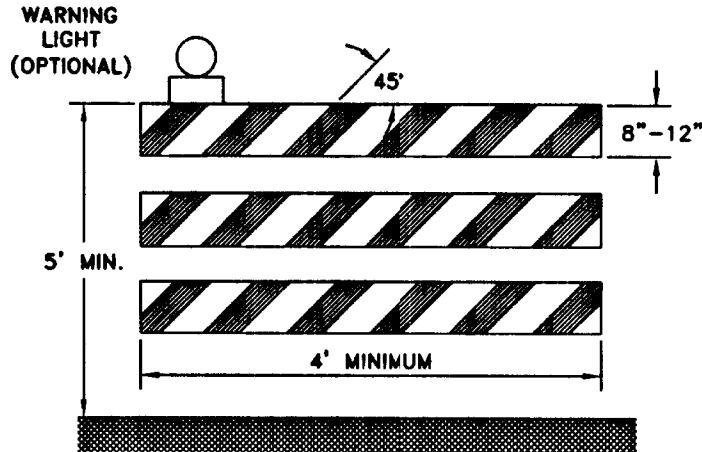
TYPE *	I	II	III
NUMBER OF REFLECTORIZED RAIL FACES	2 (ONE EACH DIRECTION)	4 (ONE EACH DIRECTION)	3-IF FACING TRAFFIC IN ONE DIRECTION. 6-IF FACING TRAFFIC IN TWO DIRECTIONS.



TYPE I BARRICADE**



TYPE II BARRICADE**



TYPE III BARRICADE**

- (*) NOMINAL LUMBER DIMENSIONS ARE SATISFACTORY FOR BARRICADE RAIL WIDTH DIMENSIONS.
 (**) RAIL STRIPE WIDTHS SHALL BE 6 INCHES EXCEPT WHERE RAIL LENGTHS ARE LESS THAN 3 FEET, THEN 4 INCH WIDE STRIPES MAY BE USED. THE SIDES OF BARRICADES FACING TRAFFIC SHALL HAVE WHITE AND ORANGE RETROREFLECTIVE RAIL FACES.

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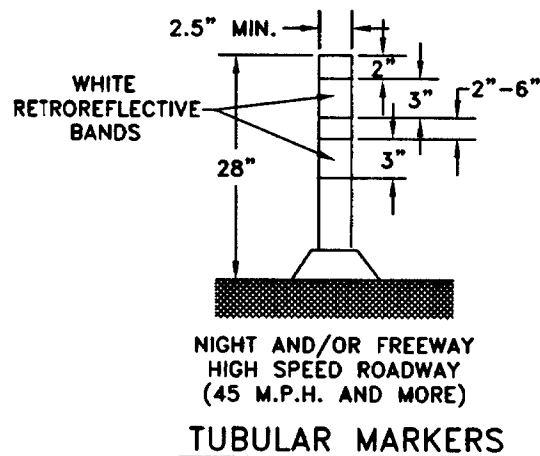
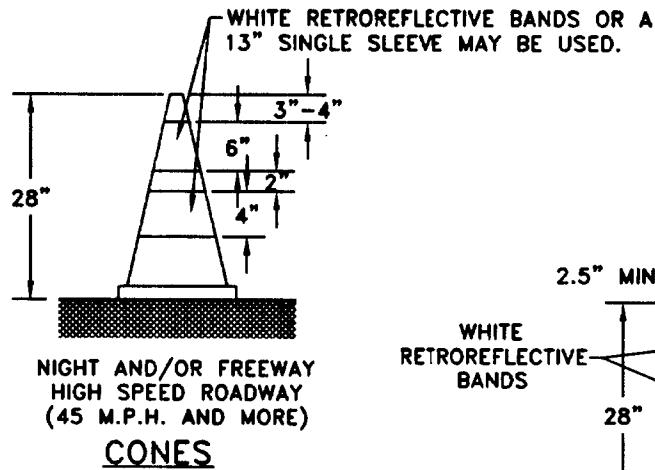
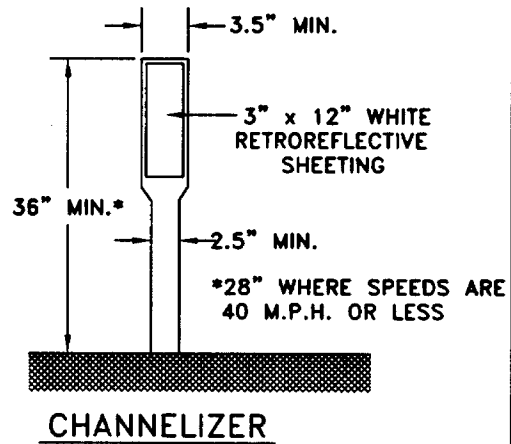
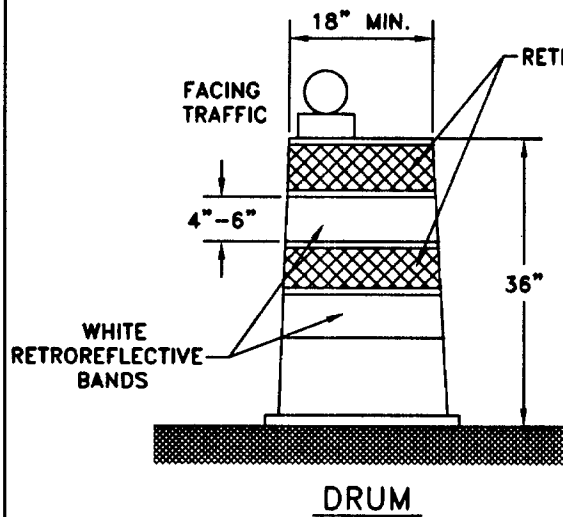
TRAFFIC SAFETY CONSTRUCTION BARRICADES

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
100



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TRAFFIC SAFETY

TRAFFIC CONES AND LANE CLOSURE TAPERS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
101



C1
48"x48"



C9A
48"x48"



C19
48"x48"



C2
48"x30"



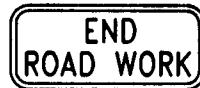
C13
60"x24"



C20
48"x48"



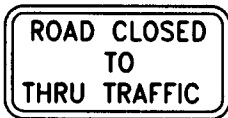
C3
48"x24"



C14
42"x18"



C22B
30"x30"



C3A
48"x24"



C15
48"x48"



C23
30"x30"



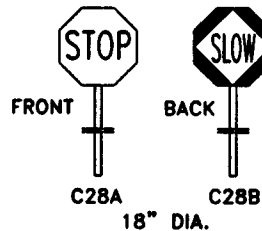
C5
48"x18"



C7
30"x18"



C18
48"x48"



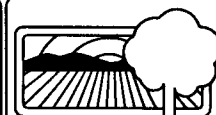
C27
24"x24"

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TRAFFIC SAFETY CONSTRUCTION SIGNS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
102

CONSTRUCTION SIGNS

CODE	LEGEND	COLOR	SIZE	LETTER HEIGHT
C1	DETOUR AHEAD	B ON O	48" x 48"	8"
C2	ROAD CLOSED	B ON W	48" x 30"	8"
C3	ROAD CLOSED AHEAD	B ON W	48" x 24"	5" - 4" - 3"
C3A	ROAD CLOSED TO THRU TRAFFIC	B ON W	60" x 30"	3" - 5"
C5	DETOUR (AVAILABLE LEFT OR RIGHT)	B ON O	48" x 18"	6"
C6	LOOSE GRAVEL	B ON O	30" x 30"	5"
C7	END DETOUR	B ON O	30" x 18"	5"
R7	OBSTRUCTION (SYMBOL)	B ON W	24" x 30"	5"
C9	FLAGMAN AHEAD	B ON O	48" x 48"	8"
C9A	FLAGMAN AHEAD (SYMBOLIC)	B ON O	48" x 48"	--
C13	END CONSTRUCTION	B ON O	60" x 24"	6"
C14	END ROAD WORK	B ON O	42" x 18"	5"
C16	ONE LANE ROAD AHEAD	B ON O	48" x 48"	7"
C18	ROAD CONSTRUCTION AHEAD	B ON O	48" x 48"	8"
C19	ROAD CLOSED AHEAD	B ON O	48" x 48"	7"
C20	(LEFT, RIGHT, CENTER) LANE CLOSED AHEAD	B ON O	48" x 48"	6"
C22	MEN WORKING	B ON O	30" x 30"	5"
C22B	MEN WORKING (SYMBOLIC)	B ON O	36" x 36"	--
C23	ROAD WORK AHEAD	B ON O	30" x 30"	5"
C24	SHOULDER WORK AHEAD	B ON O	30" x 30"	4"
C27	OPEN TRENCH	B ON O	24" x 24"	4"
C28A-B	FLAGMAN HAND PADDLE	W ON R B ON O	18" DIA.	6"
TYPE N	9 AMBER REFLECTORS	B ON O	18" x 18"	--

COLOR: B-BLACK R-RED, W-WHITE- Y-YELLOW, O-ORANGE

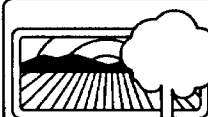
NOTE: FOR CURRENT AND/OR ADDITIONAL INFORMATION ON SIGNAGE AND DETOUR PLANS, REFER TO THE CALTRANS MANUAL OF TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE WORK ZONES, MOST CURRENT EDITION.

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TRAFFIC SAFETY CONSTRUCTION SIGNS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
103

LENGTH OF TAPER 'L' IN FEET

SPEED IN MILES PER HOUR*	WIDTH OF OFFSET**	
	11 FEET	12 FEET
20	73	80
25	115	125
30	165	180
35	225	245
40	293	320
45	495	540
50	550	600
55	605	660
60	660	720

*USE ACTUAL TRAFFIC SPEED,
NOT THE POSTED OR DESIGN SPEED

LENGTH OF LONGITUDINAL BUFFER SPACE

SPEED IN MILES PER HOUR*	LENGTH OF BUFFER SPACE IN FEET
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415

*USE ACTUAL TRAFFIC SPEED,
NOT THE POSTED OR DESIGN SPEED

ADVANCE WARNING SIGN SPACING 'A'

ROAD TYPE	DISTANCE BETWEEN SIGNS IN FEET*
URBAN-25 MPH OR LESS	200
URBAN-30 MPH OR MORE	350
RURAL	500
EXPWY/FWY	1000

*THESE ARE SUGGESTED
DISTANCES FOR ADVANCE
WARNING SIGNS, ADEQUATE
SIGHT DISTANCES AND
PROXIMITY TO OTHER ROADWAY
FEATURES MAY DICTATE THE
NEED FOR ADJUSTMENTS WHEN
PLACED.

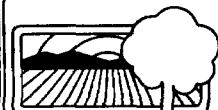
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TRAFFIC SAFETY

TAPER LENGTH, BUFFER SPACE AND ADVANCE WARNING SIGN SPACING

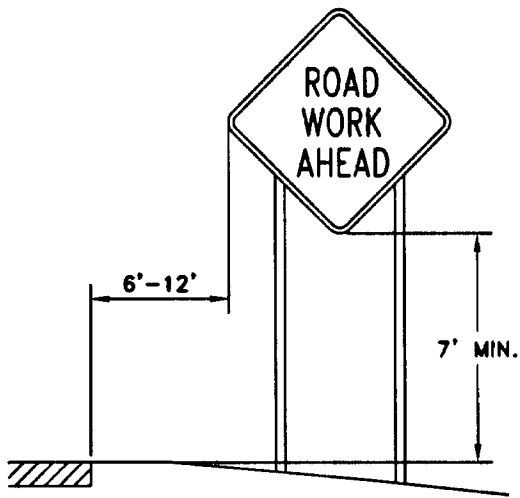
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DEPARTMENT



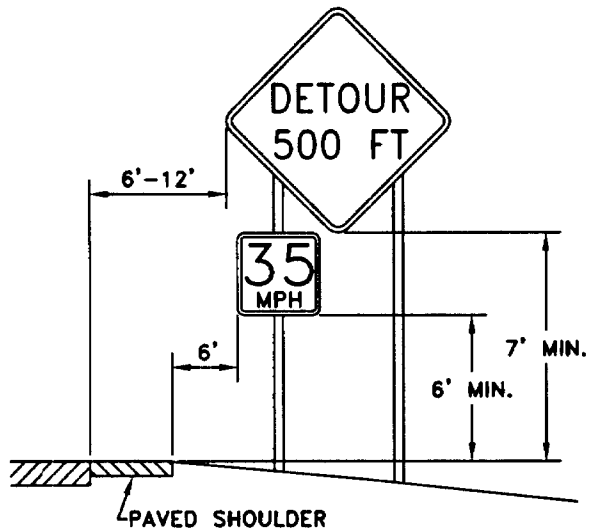
CITY of MODESTO

DETAIL NO.

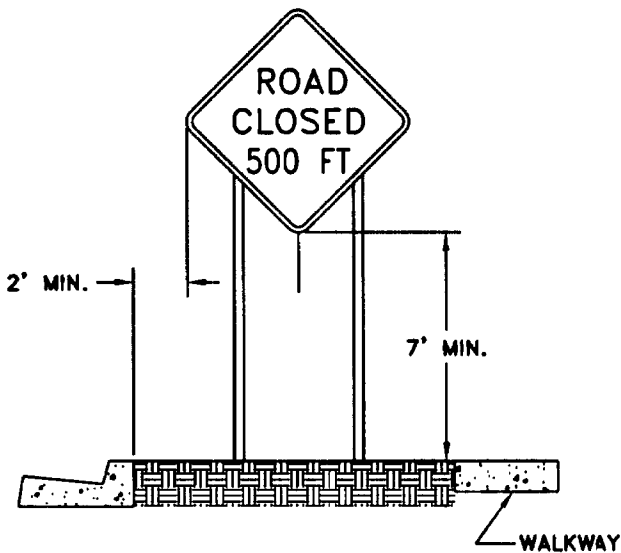
104



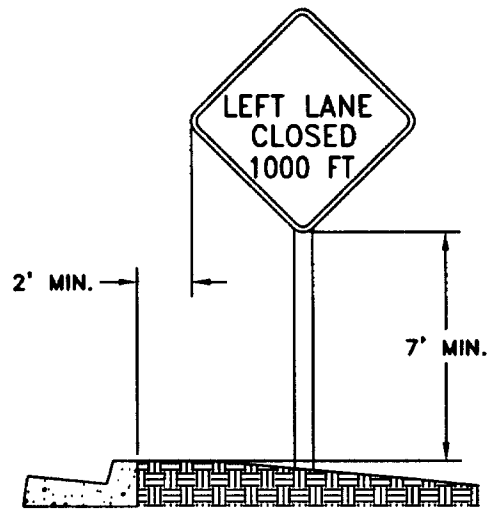
RURAL DISTRICT



RURAL DISTRICT WITH
ADVISORY SPEED PLATE



URBAN DISTRICT



URBAN DISTRICT

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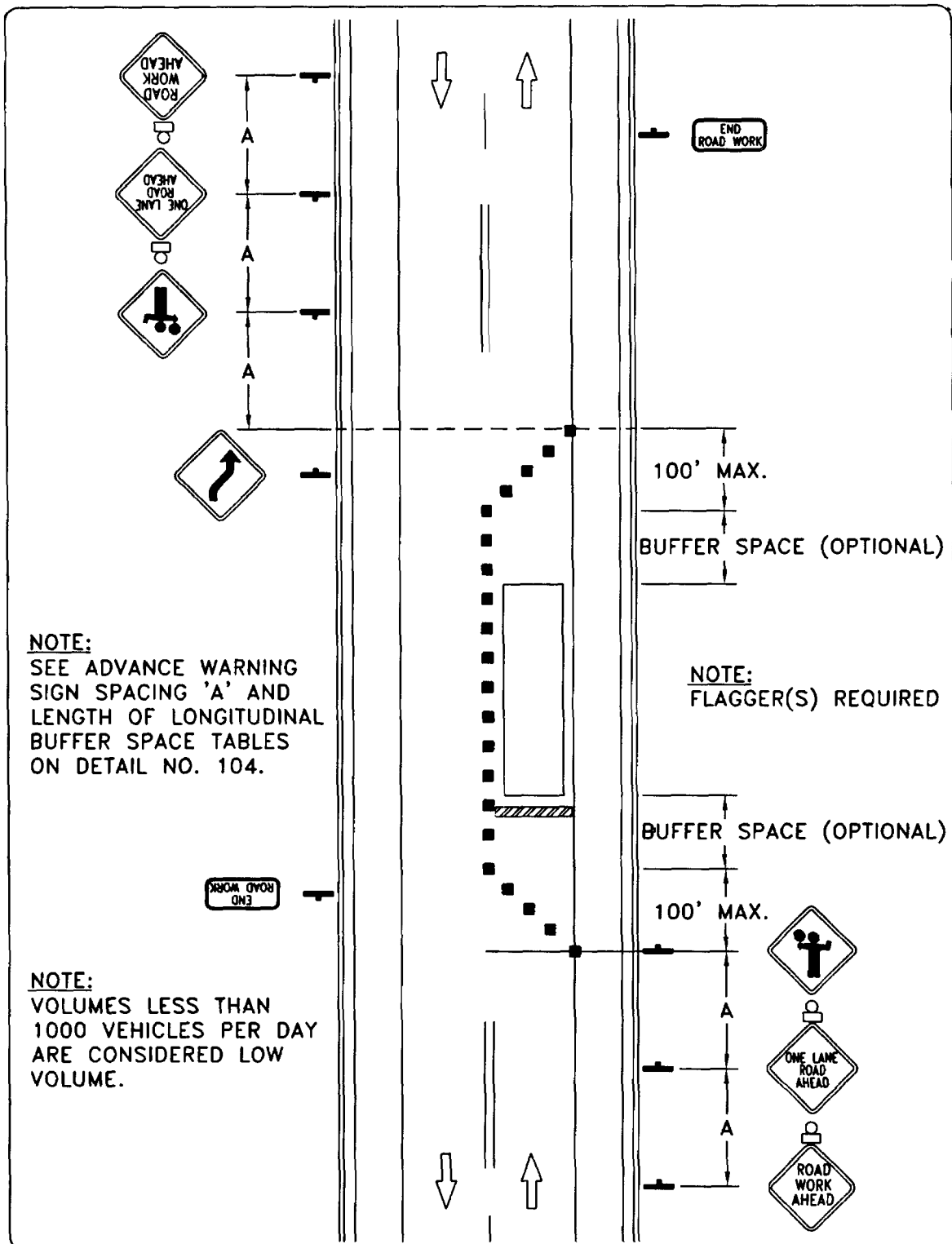
**TRAFFIC SAFETY
HEIGHT & LATERAL
LOCATION OF SIGNS**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

**DETAIL NO.
105**



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**TRAFFIC SAFETY
LANE CLOSURE
ON TWO LANE
MINOR COLLECTOR**

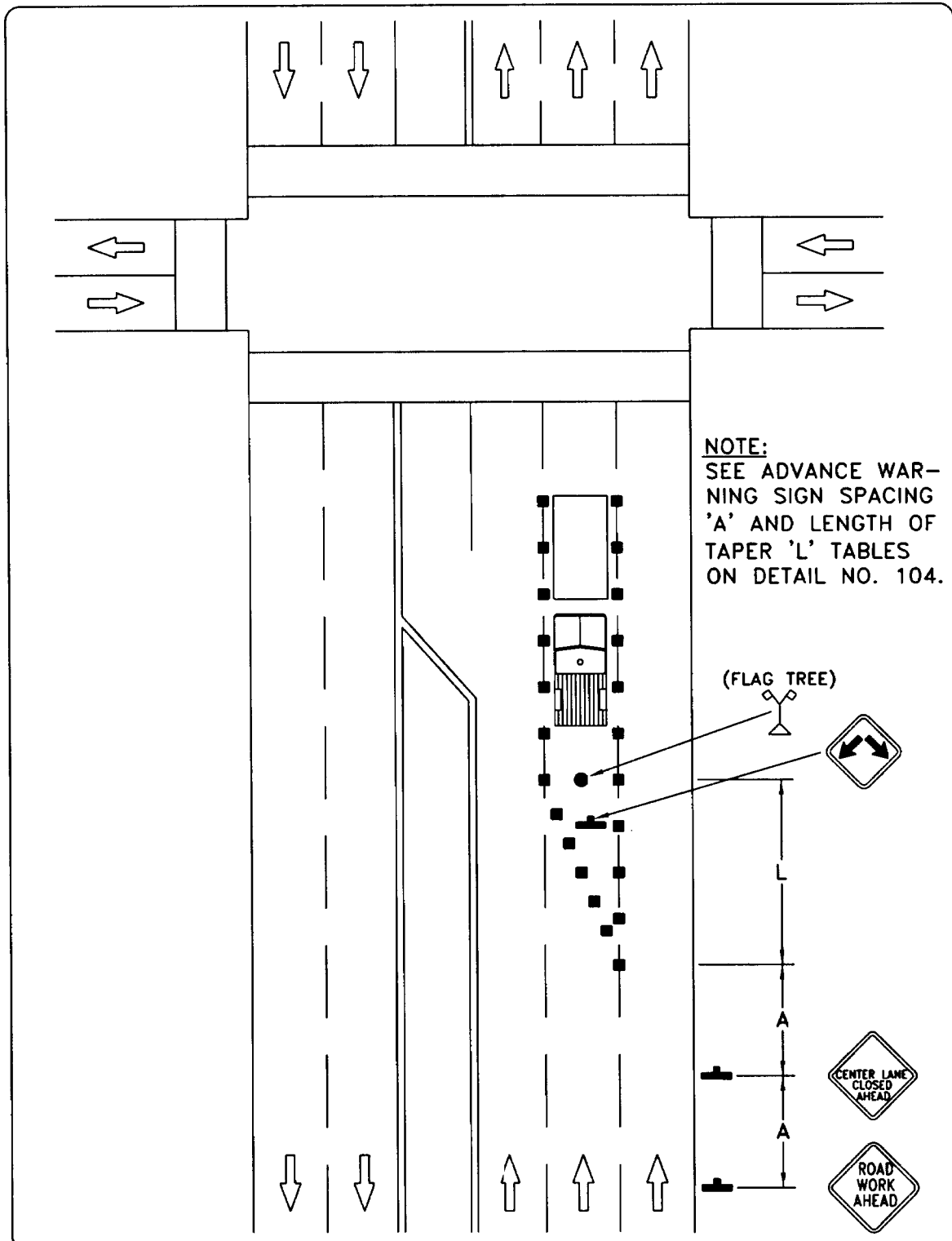
**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.

106

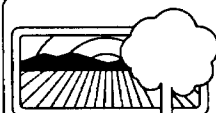


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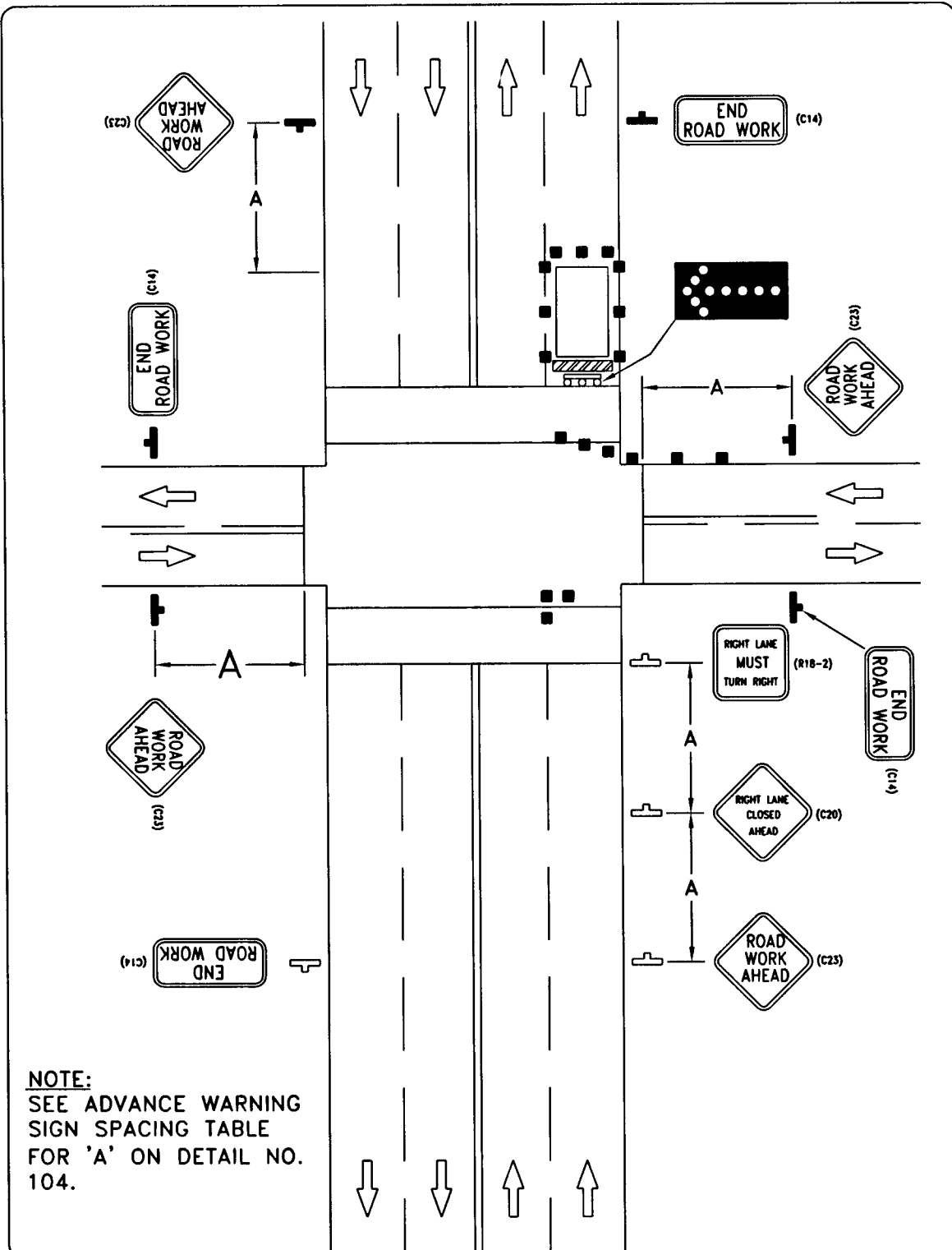
TRAFFIC SAFETY
LANE CLOSURE
NEAR SIDE OF
INTERSECTION

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
107

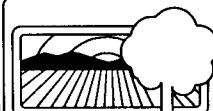


APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

TRAFFIC SAFETY
RIGHT LANE CLOSURE
FAR SIDE OF
INTERSECTION

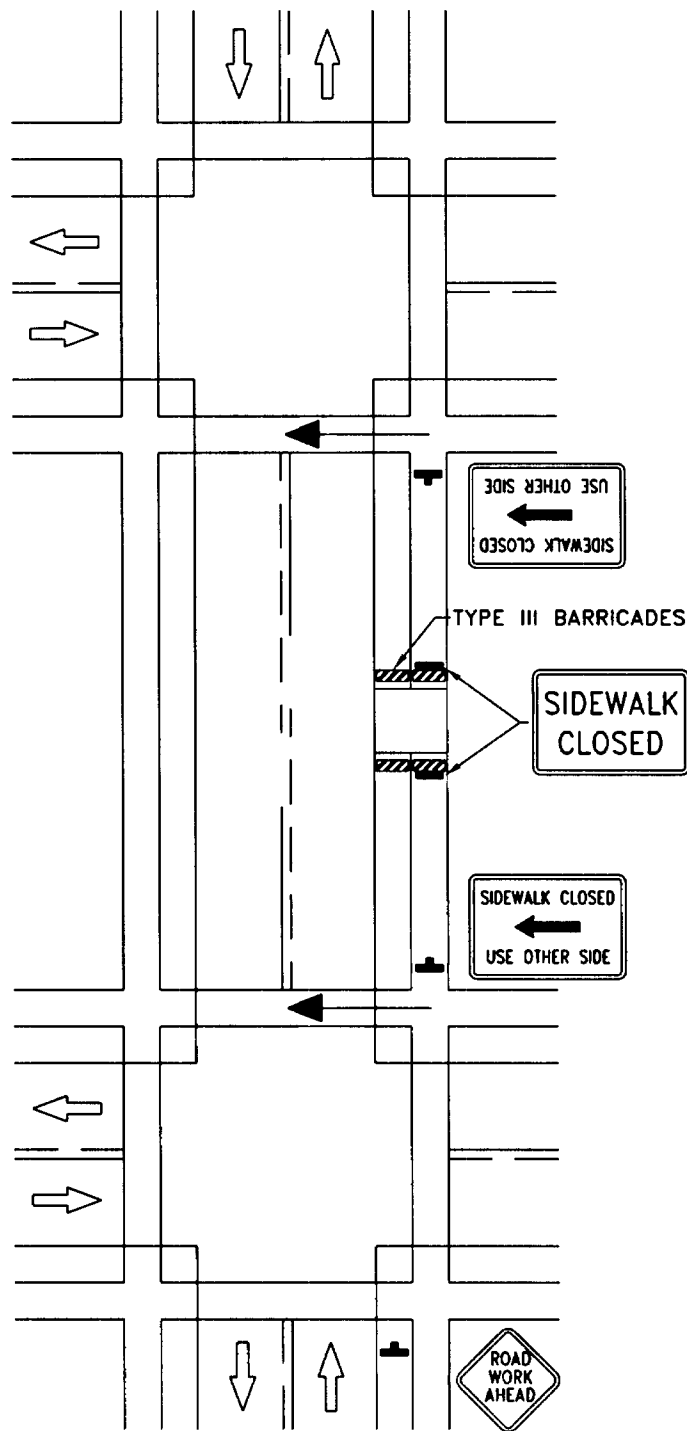
**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.

108



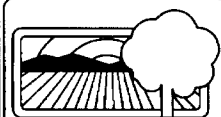
PEDESTRIAN DETOUR

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

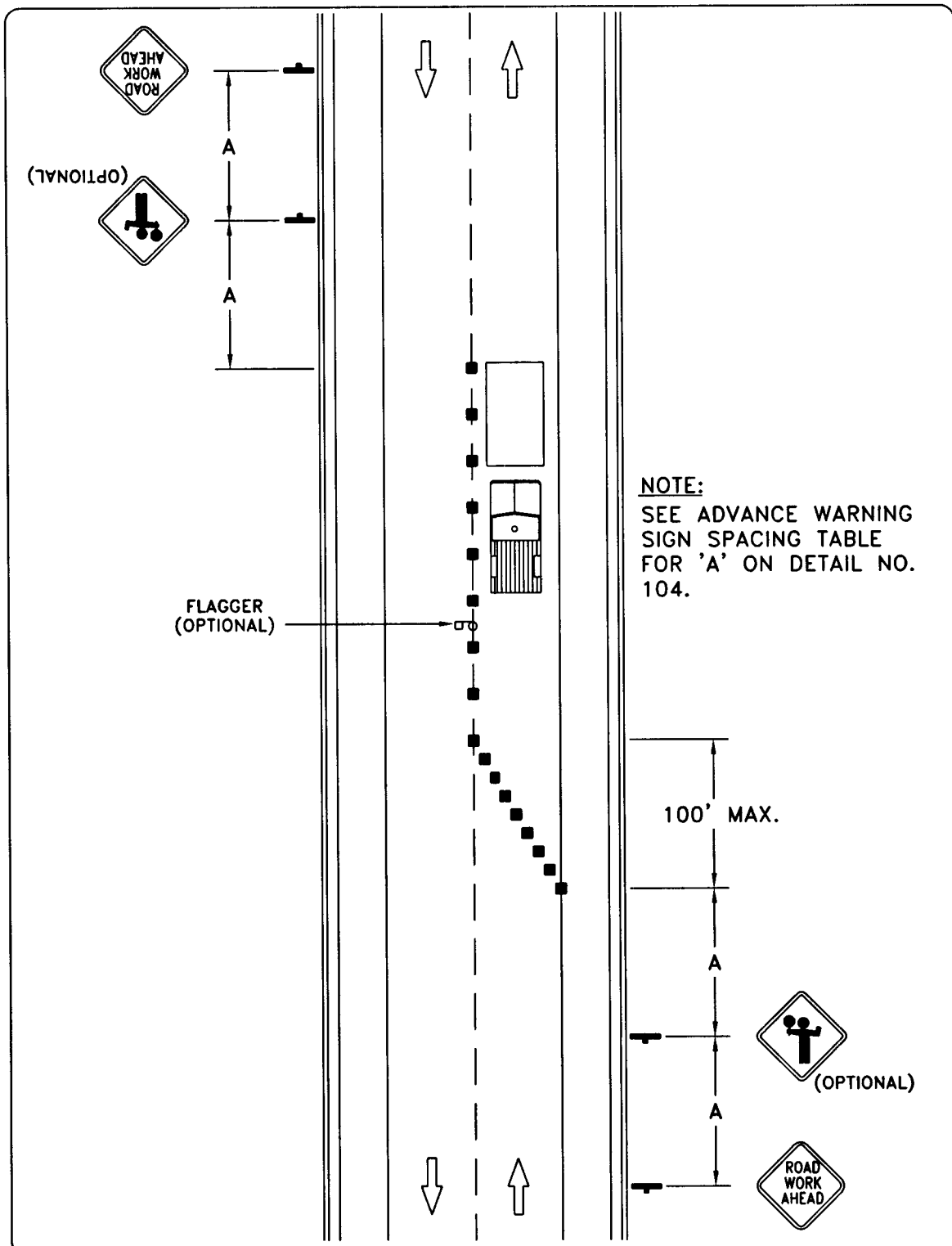
TRAFFIC SAFETY
SIDEWALK CLOSURES
AND
BYPASS WALKWAY

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
110



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RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

TRAFFIC SAFETY
LANE CLOSURE
ON LOCAL STREET

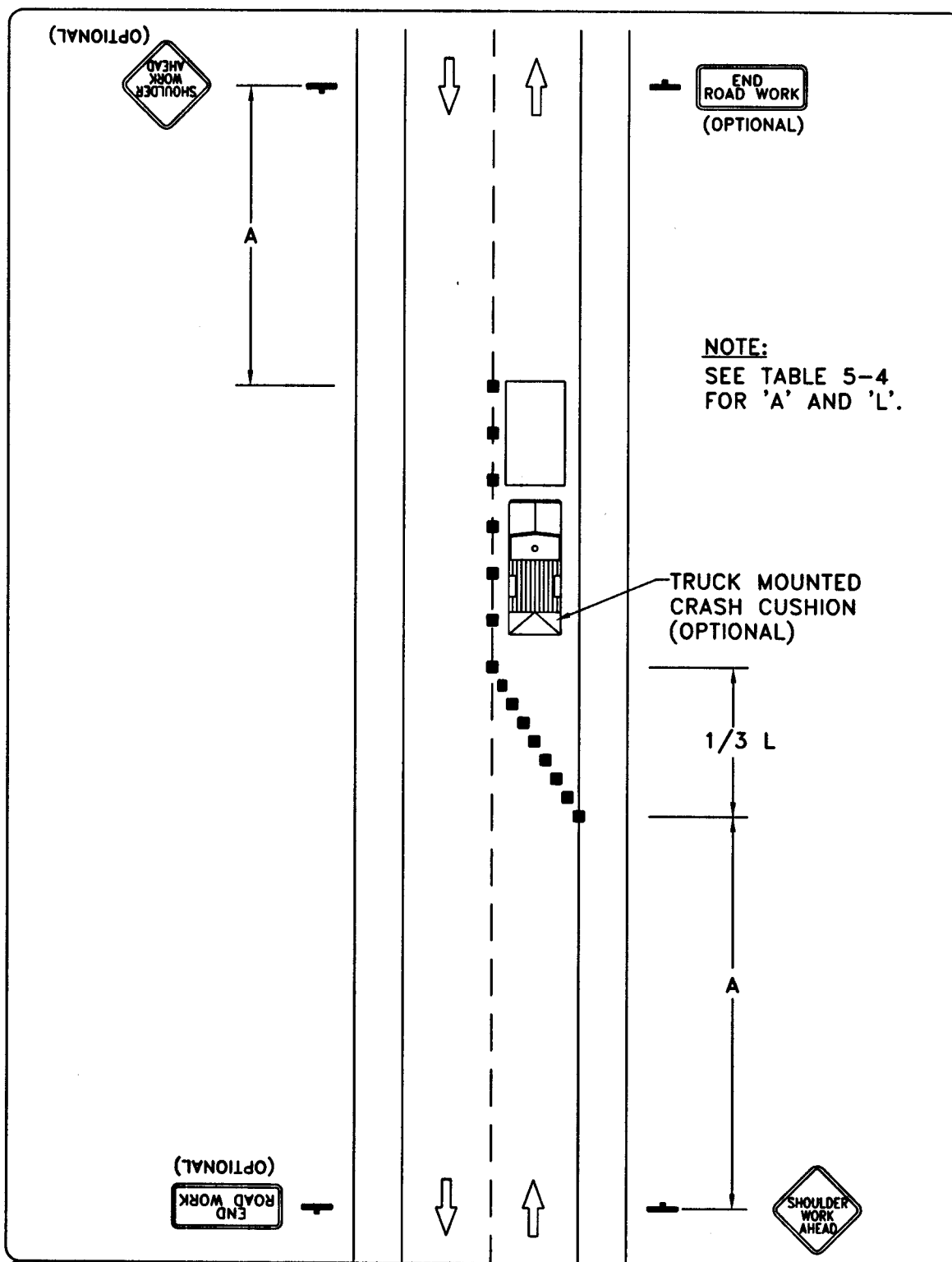
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
111

112

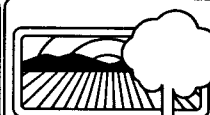


APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

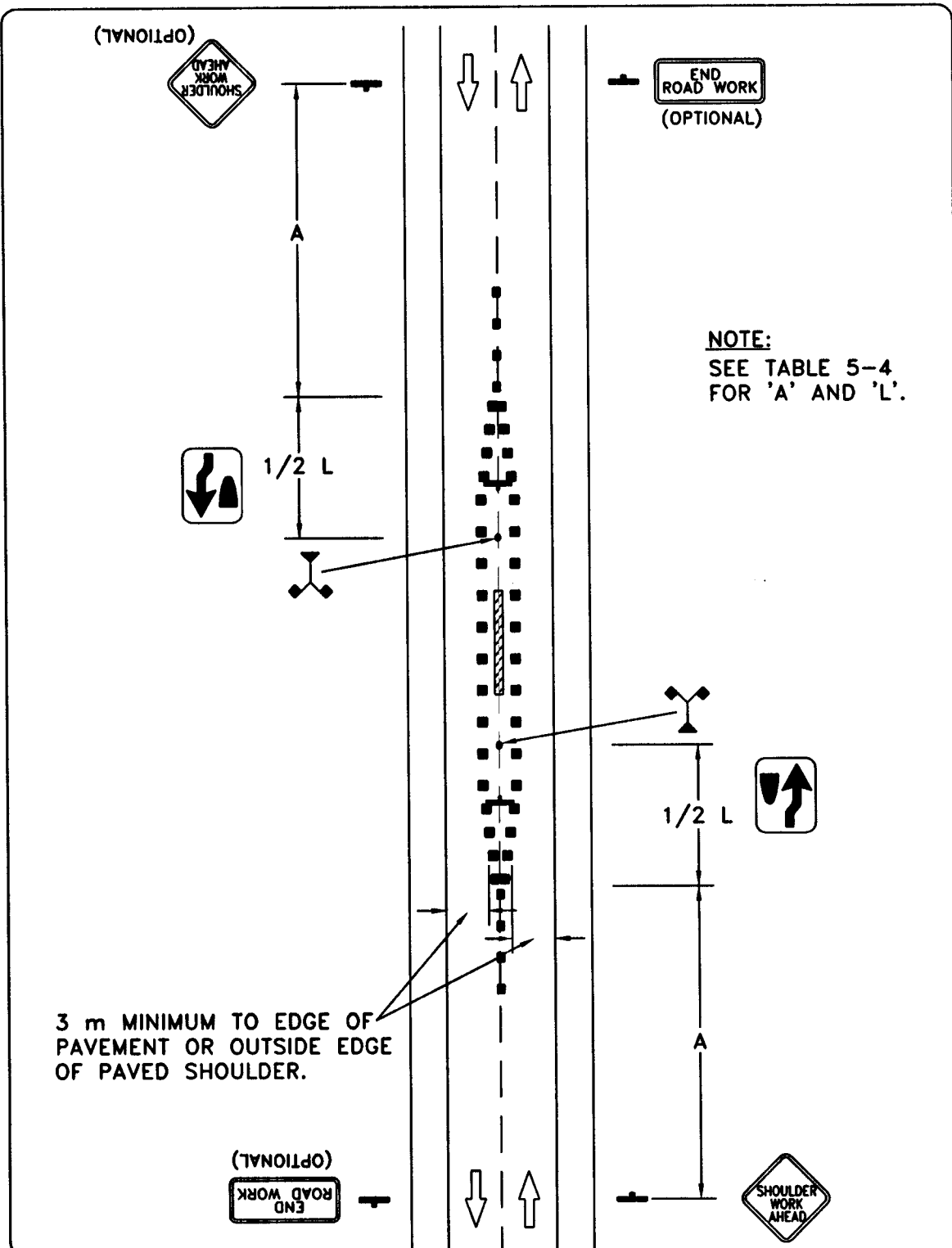
TRAFFIC SAFETY
SHOULDER WORK
WITH MINOR
ENCROACHMENT

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
113



APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

TRAFFIC SAFETY

WORK IN CENTER OF LOW-VOLUME ROAD

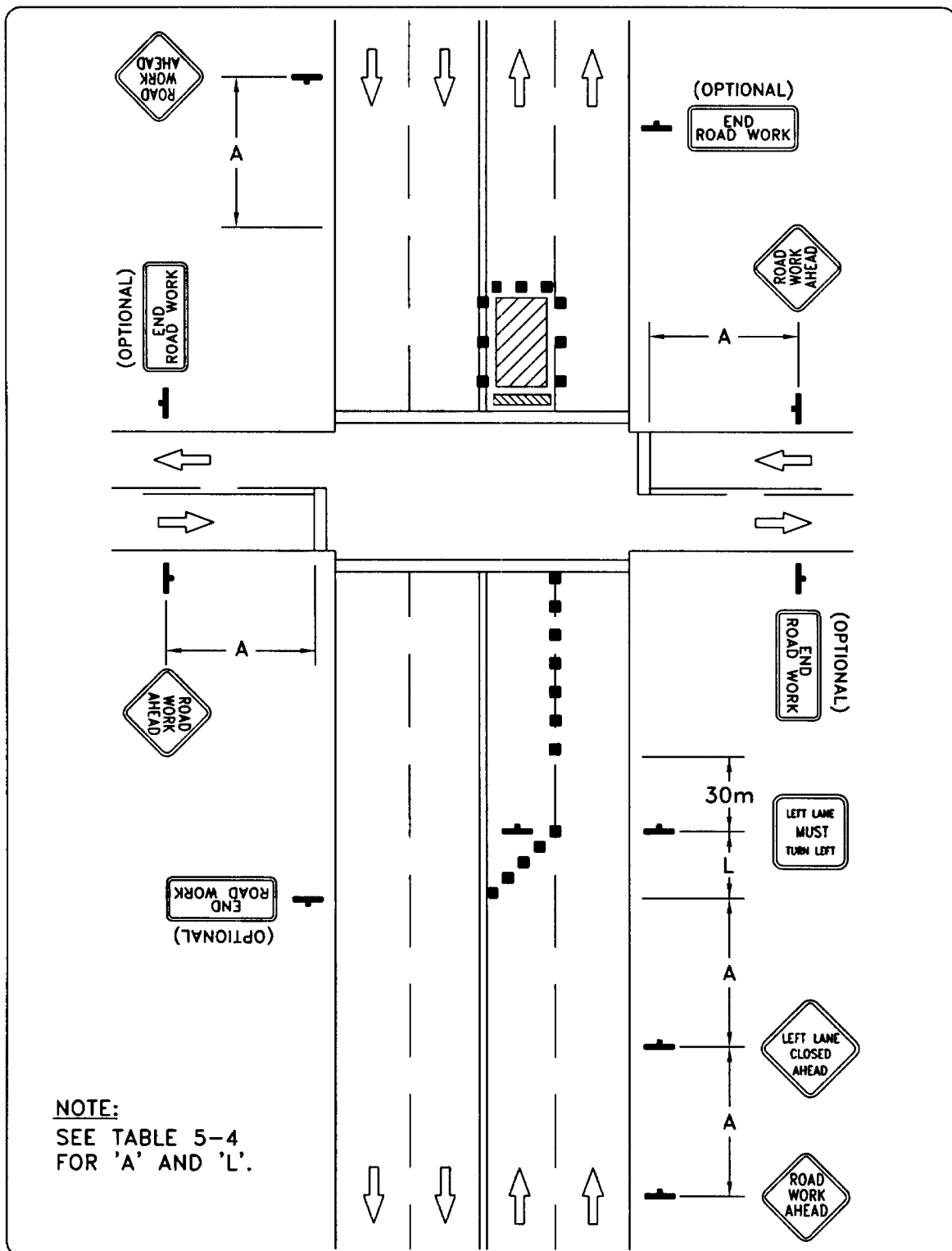
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

114

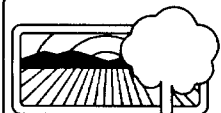


APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

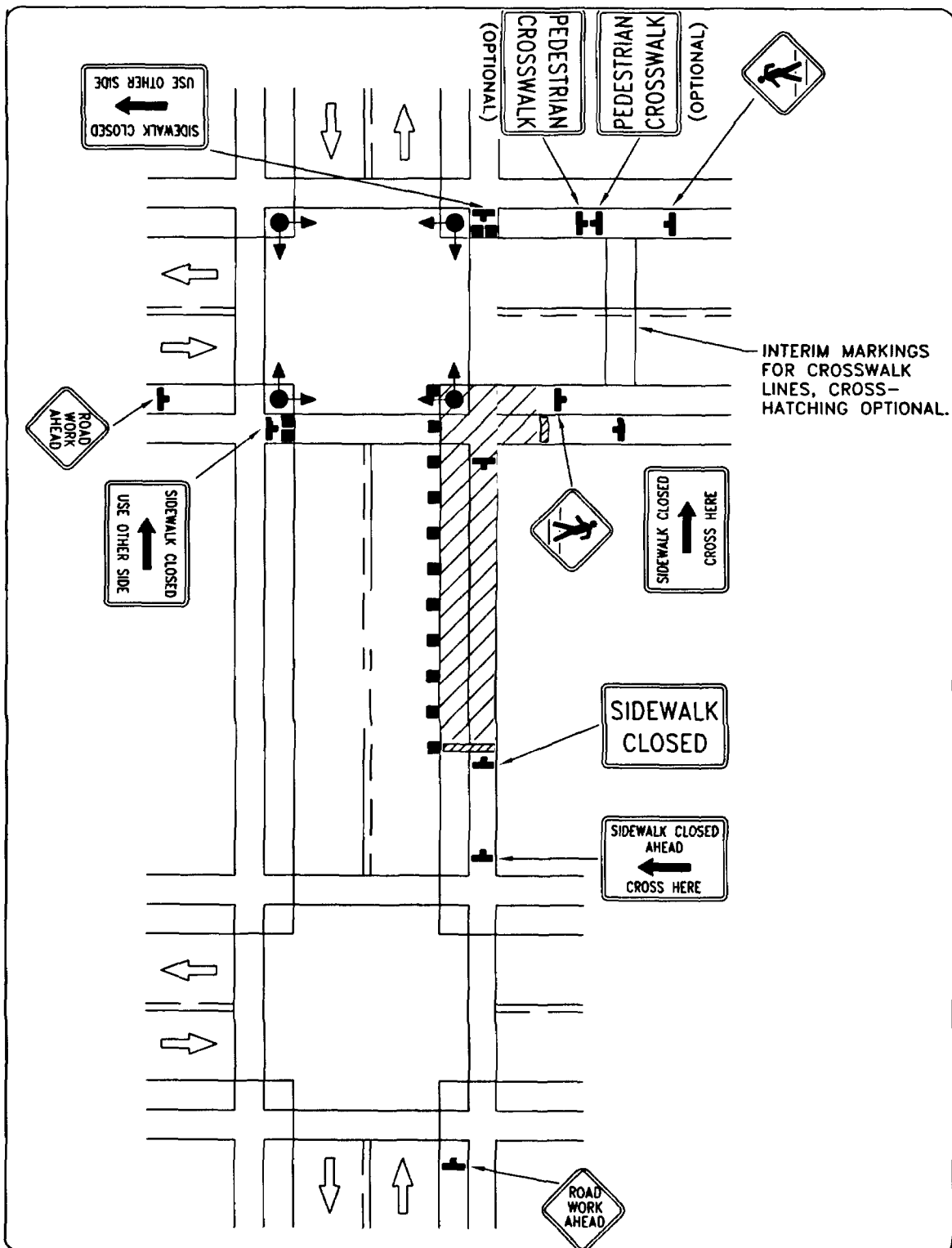
TRAFFIC SAFETY LEFT LANE CLOSURE FAR SIDE OF INTERSECTION

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

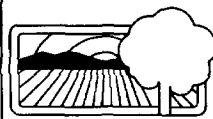
DETAIL NO.
115



APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

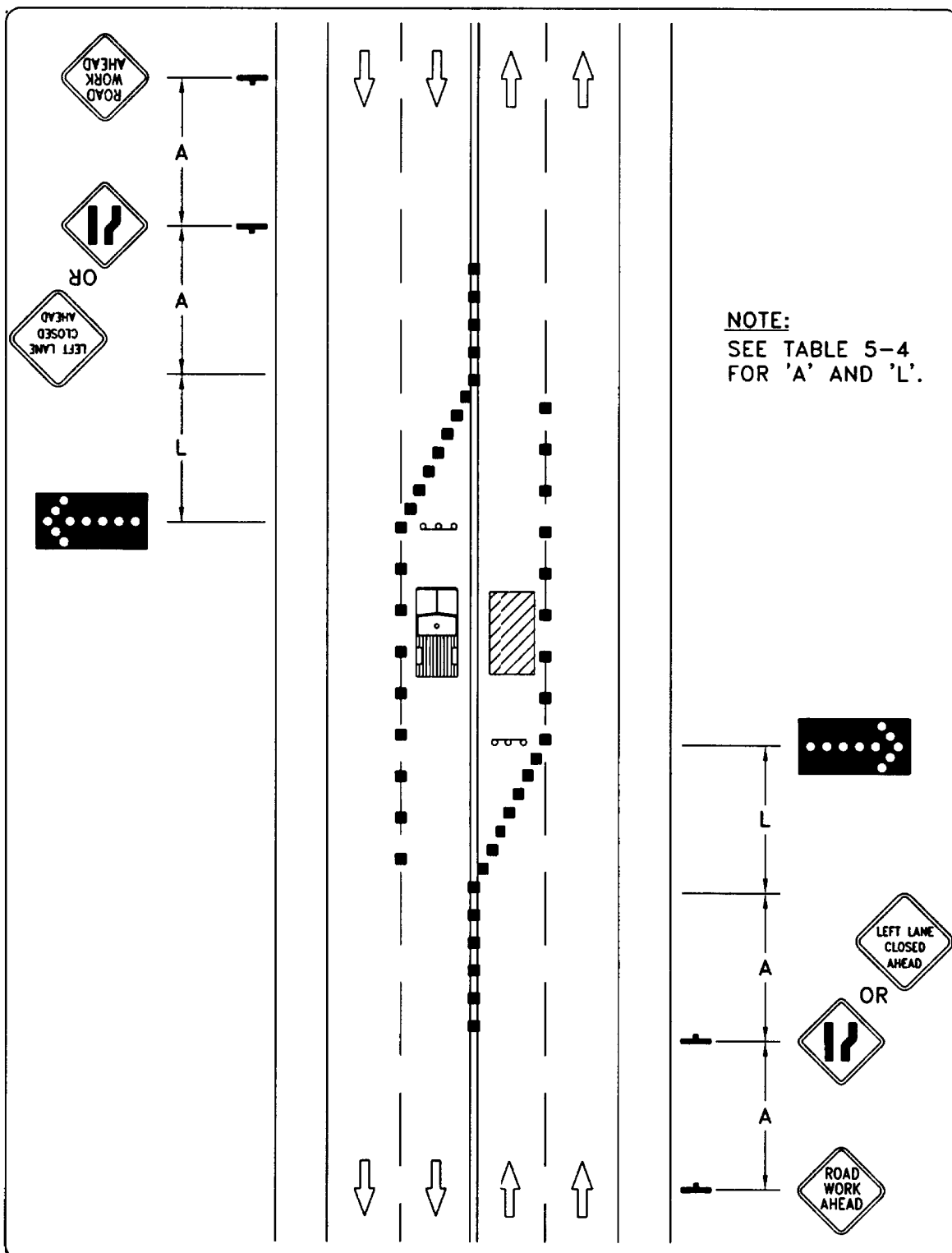
TRAFFIC SAFETY
CROSSWALK CLOSURES
AND
PEDESTRIAN DETOURS
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

116

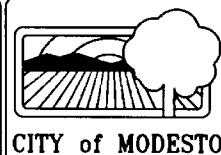


APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

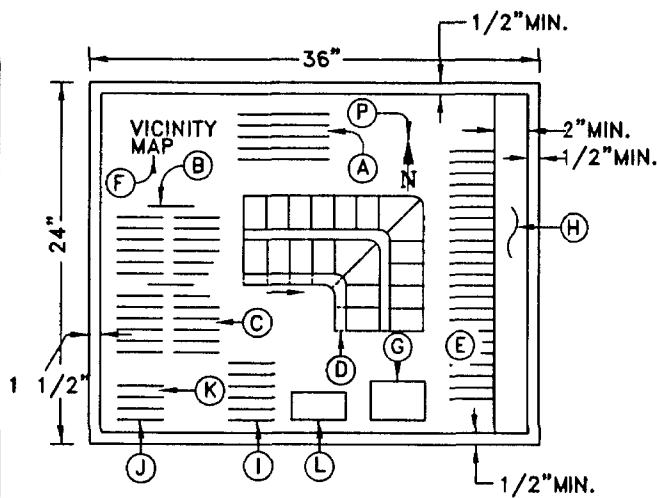
ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

TRAFFIC SAFETY
INTERIOR LANE
CLOSURE ON
MULTILANE STREET

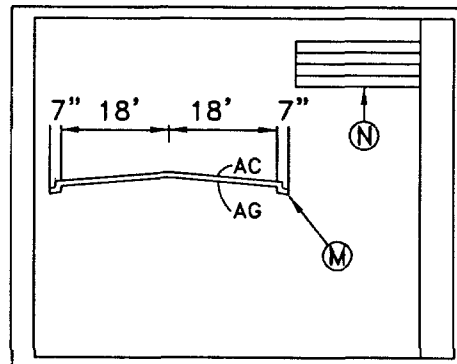
ENGINEERING & TRANSPORTATION
DEPARTMENT



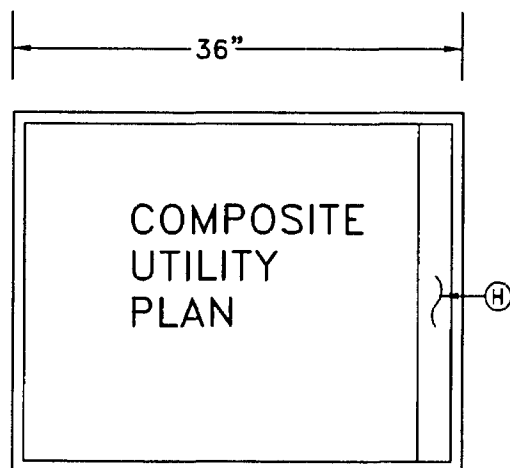
DETAIL NO.
117



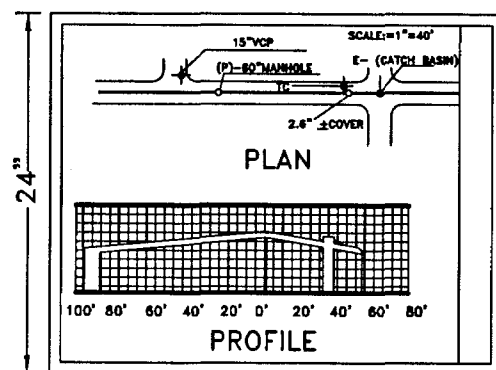
SHEET NO. 1



SHEET NO. 2



SHEET NO. 3



SHEET NO. 4

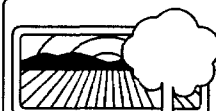
APPROVED BY CITY COUNCIL
RESOLUTION NO 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

ENGINEERING

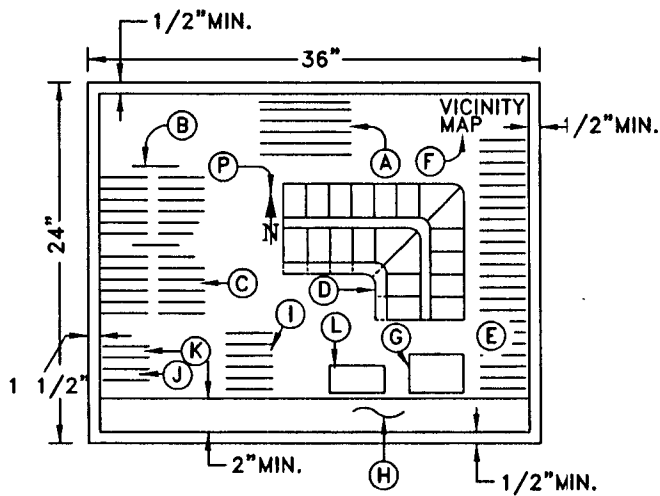
TYPICAL LAYOUT FOR
IMPROVEMENT PLANS

ENGINEERING & TRANSPORTATION
DEPARTMENT

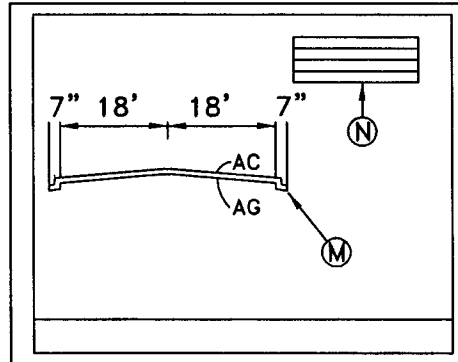


CITY of MODESTO

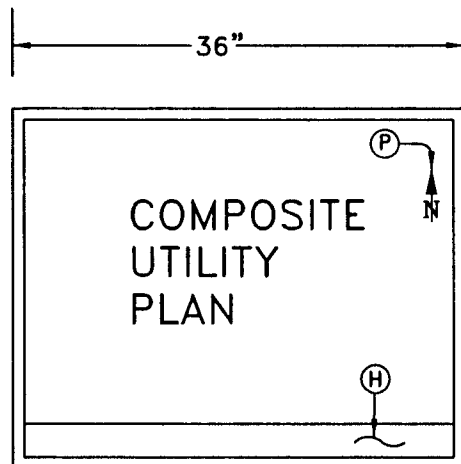
DETAIL NO.
200



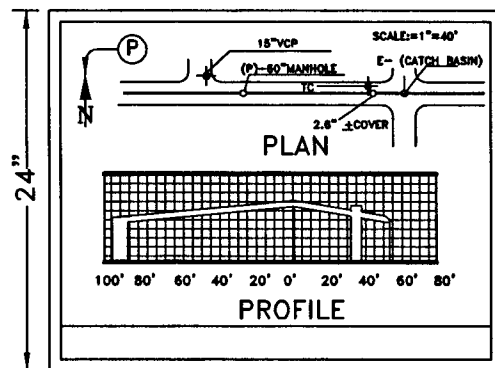
SHEET NO. 1



SHEET NO. 2



SHEET NO. 3

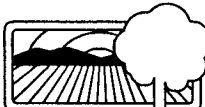


SHEET NO. 4

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

ENGINEERING
ALTERNATE LAYOUT FOR
IMPROVEMENT PLANS
ENGINEERING & TRANSPORTATION
DEPARTMENT


CITY of MODESTO
DETAIL NO.
200B

COMPOSITE UTILITY PLAN SHALL INCLUDE SEWER, WATER AND STORM DRAIN PIPE LENGTH AND SIZE. MAINTENANCE HOLES SHALL BE NUMBERED TO CORRESPOND WITH MAINTENANCE HOLE NUMBERS ON MASTER PLANS AND PLAN AND PROFILE.

SHEETS 1 THROUGH 3 MAY BE COMBINED ON 1 OR 2 SHEETS DEPENDING ON THE SIZE OF THE PROJECT. THE COMPOSITE UTILITY PLAN MUST BE AT 1"=100' SCALE. SUBSEQUENT SHEETS SHALL BE AT: HORIZONTAL 1"=40' OR 1"=20' AND VERTICAL 1"=4' OR 1"=2'.

LEGEND

- A PROJECT TITLE
- B SYMBOLS LEGEND
- C ABBREVIATIONS
- D ENTIRE PROJECT INCLUDING OFFSITE
- E STD. CONSTRUCTION NOTES
- F VICINITY MAP
- G CONCURRENCE BY OTHER DEPARTMENTS
- H TITLE STRIP
- I INDEX OF SHEETS
- J RESOLUTION NO. / APPROVING CONDITIONS REFERENCE
- K BENCH MARK
- L SOILS ENGINEER
- M TYPICAL CROSS SECTIONS
- N PAVEMENT THICKNESS TABLE FOR ALL STREETS WITHIN PROJECT
- P NORTH ARROW AND SCALE

NOTES:

1. DETAILS MAY BE PLACED ON ANY SHEET AND REFERENCED IN THE PLAN AND PROFILE SHEET.
2. SUBDIVISIONS SHALL INCLUDE A GRADING PLAN. HORIZONTAL SCALE MAY BE 1"=10' TO 1"=50'.
3. TRAFFIC DRAWINGS, IF REQUIRED, SHALL BE LOCATED AT THE END OF THE IMPROVEMENT PLANS.
4. ALL PLANS FOR WORK IN THE PUBLIC RIGHT OF WAY SHALL INCLUDE THE CITY'S STANDARD NOTES AS FOUND IN THE DESIGN SECTION, APPENDIX B OF THE MODESTO CITY STANDARD SPECIFICATIONS.
5. ALL PLAN SHEETS SHALL HAVE A TITLE STRIP AS DEFINED IN THE CITY STANDARD SPECIFICATIONS.

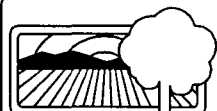
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

ENGINEERING

TYPICAL LAYOUT FOR IMPROVEMENT PLANS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
201

1 1/2" MIN. 2" MIN. 1/2" MIN. 36"	DATE: NOV. 1995 SCALE: H:1"=40' V:1"=4' DRAWN BY: K.J.B. DESIGNED BY: M.T.L. CHECKED BY: H.L.U. XYZ ENGINEERING 1234 ZIGGY STREET MODESTO, CA 95355 (209) 577-3404 PLAN AND PROFILE DAVIS STREET STA 1+00 TO 3+50 PLAN FOR THE IMPROVEMENT OF PARKER PLACE - UNIT NO. 1 MODESTO CALIFORNIA (LEAVE BLANK FOR CITY DWG #) SHEET 3 OF 10 PROJECT NO. 1245609	REVISIONS STR. LIGHTS 2/3/96 WATER 2/5/96	24" 1/2" MIN.

NOTES:

1. TITLE STRIPS SHALL BE USED ON ALL PAGES OF THE PLAN SET.
2. THE TITLE STRIP MAY BE HORIZONTAL OR VERTICAL TO THE PAGE, AS LONG AS THE TITLE AND REVISION BLOCKS ARE PLACED IN THE LOWER RIGHT-HAND CORNER.
3. THE MINIMUM CONTENTS ON THE TITLE STRIP ARE SHOWN IN THE EXAMPLE. THEY ARE AS FOLLOWS:
 - A. SHEET NUMBER AND PROJECT NUMBER.
 - B. TITLE OF PROJECT, LEAVE A MINIMUM BLANK AREA 3" WIDE BY 1/2" HIGH FOR CITY DRAWING NUMBER.
 - C. CITY AND STATE OF PROJECT
 - D. TYPE OF SHEET I.E. TITLE, DETAIL, PLAN AND PROFILE (IF MORE THAN ONE SHEET IS NEEDED TO COVER THE STREET THAN STATION NUMBERS SHALL ALSO BE ANNOTATED.)
 - E. DESIGN COMPANY OR AGENCY NAME, ADDRESS AND PHONE NUMBER.
 - F. DATE OF DRAWING, SCALE AND INITIALS OF THE DRAFTER, DESIGNER AND SUPERVISOR CHECKING THE DRAWINGS.
 - G. REVISION BLOCK WITH NUMBER, DESCRIPTION AND DATE OF REVISIONS.

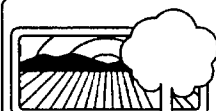
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

ENGINEERING

TYPICAL TITLE STRIP FOR CITY PROJECTS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
202

* IF STREET NO. IS NOT KNOWN,
USE FRONTING STREET & NEAREST
CROSS-STREET

SHEET ____	NAME OF PROJECT STREET ADDRESS* (IF KNOWN)	1/2" MIN.
		3" MIN.
OF ____	LEAVE BLANK	1/2" MIN.

1/2" MIN.	NAME OF PROJECT STREET ADDRESS* (IF KNOWN)	SHEET ____
		OF ____
	LEAVE BLANK	3" MIN.

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

ENGINEERING
TITLE BLOCK
FOR
IMPROVEMENT PLANS
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
202B

**CITY ENGINEER APPROVAL BLOCK
FOR PUBLIC IMPROVEMENTS**

APPROVED BY THE CITY ENGINEER
CITY OF MODESTO, CALIFORNIA
FOR PUBLIC IMPROVEMENTS ONLY
(SHEETS 1 THRU _____)

BY _____ DATE: _____

**CITY ENGINEER APPROVAL BLOCK FOR
WATER LINES OUTSIDE OF CITY LIMITS**

APPROVED BY THE CITY ENGINEER
CITY OF MODESTO, CALIFORNIA
FOR CITY OF MODESTO WATER LINES ONLY
(SHEETS _____ THRU _____)

BY _____ DATE: _____

NOTE. CITY ENGINEER SIGNATURE BLOCK MUST CONTAIN THE VERBAGE
FOUND IN ASSIGN SECT. 2.05.

MODESTO IRRIGATION DISTRICT APPROVAL BLOCKS

APPROVED BY THE MODESTO IRRIGATION
DISTRICT, ELECTRICAL DEPARTMENT
(FOR STREET LIGHTING SERVICE
LOCATION ONLY)

BY _____ DATE: _____

APPROVED BY THE MODESTO IRRIGATION
DISTRICT, IRRIGATION DEPARTMENT
(FOR IRRIGATION FACILITIES ONLY)

BY _____ DATE: _____

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

ENGINEERING
APPROVAL BLOCKS
FOR IMPROVEMENT PLANS

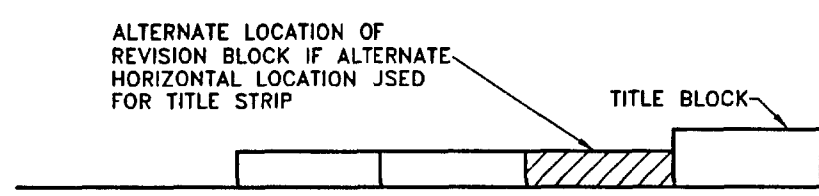
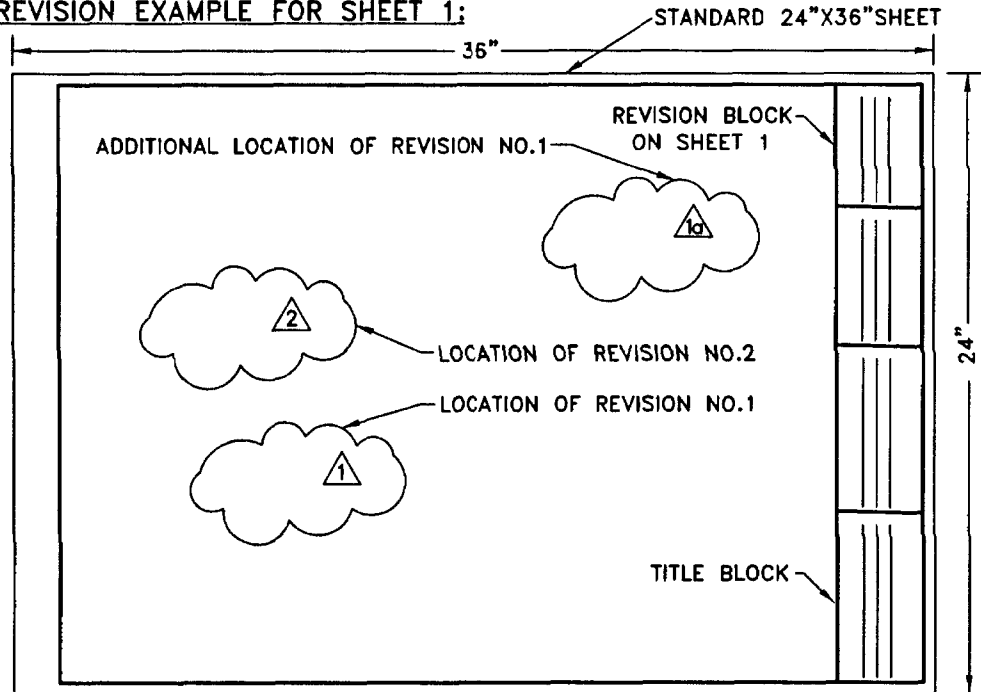
**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
202C

REVISION EXAMPLE FOR SHEET 1:



NOTES:

1. SHEET 1 SHALL CONTAIN A REVISION BLOCK AS SHOWN ON DETAIL #203A. THE REMAINING SHEETS AFFECTED BY THE REVISION SHALL BE NOTED AS IN THE EXAMPLE ON DETAIL #203A.
2. EACH DESIGN SHALL BE NUMBERED CONSECUTIVELY WITH THE NUMBER PLACED IN A TRIANGLE THUS:  AND DESCRIBED IN THE REVISION BLOCK.
3. FOR LOCATION OF THE RELATED REVISION*, I.E.  SHALL BE PLACED AROUND THE ITEMS) TO BE REVISED. A REVISION TRIANGLE (NOTE 1). SHALL BE PLACED WITHIN THE CLOUD TO IDENTIFY THE REVISION NUMBER. I.E.  (SEE SAMPLES ABOVE).
4. WHEN A REVISION APPEARS AT MORE THAN ONE PLACE ON A SHEET, LETTERS SHALL BE USED IN ADDITION TO THE NUMBERS IN ORDER TO ACCURATELY DETERMINE THE SPECIFIC LOCATION OF EACH IDENTICAL CHANGE. (SEE EXAMPLE ABOVE).
5. IF MASSIVE REVISIONS OCCUR THAT COULD RENDER THE DRAWING UNREADABLE, AN ADDITIONAL SHEET MAY BE USED AS APPROVED BY THE CITY ENGINEER.

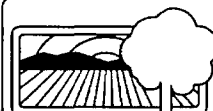
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

ENGINEERING

DESIGN
REVISIONS FORMAT

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
203

REVISION BLOCK FOR TITLE SHEET (SHEET #1)

REVISION NO.	DESCRIPTION	SHEETS AFFECTED	DATE	BY	APPROVED BY C.E.	DATE
1	BRIEF DESCRIPTION OF CHANGE #1 TO PLANS.					
2	BRIEF DESCRIPTION OF CHANGE #1 TO PLANS.					

CITY ENGINEER APPROVAL

REVISION NOTES FOR ALL OTHER AFFECTED SHEETS AFTER THE TITLE SHEET

NOTES:

- 1 INCLUDE A BRIEF DESCRIPTION AND REASON FOR CHANGE #1 ON THE APPROVED PLANS.
- 2 INCLUDE A BRIEF DESCRIPTION AND REASON FOR CHANGE #2 ON THE APPROVED PLANS.

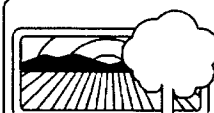
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

ENGINEERING

REVISION BLOCK

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
203B

DRAFTING STANDARDS

ALL SUBDIVISION PLANS, CONSTRUCTION DRAWINGS, +PROPERTY PLATS SUBMITTED TO THE CITY ENGINEER FOR CONSIDERATION SHALL CONFORM TO AND BE PREPARED IN ACCORDANCE WITH THE FOLLOWING STANDARDS:

- 1.- ALL LETTERING, OTHER THAN THAT HEREIN SPECIFIED OR SHOWN BELOW, SHALL BE A MINIMUM OF 0.100 INCH IN HEIGHT USING A NO.0 RAPIDOGRAPH PEN, OR EQUAL. VERTICAL OR SLANTED LETTERING MAY BE USED.

2.- SUBDIVISION PLANS

SUBDIVISION OUTLINE	=====	NO. 3 RAPIDOGRAPH
BLOCK OUTLINE	=====	NO. 2 RAPIDOGRAPH
LOT LINES	=====	NO. 1 RAPIDOGRAPH
EASEMENT LINES	-----	NO. 0 RAPIDOGRAPH
STREET CENTER LINES	=====	NO. 0 RAPIDOGRAPH
RADIAL BEARING LINES	=====	NO. 00 RAPIDOGRAPH
MONUMENTS SET	○	
MONUMENTS SET IN MONUMENT BOX.....	◎	
MONUMENTS FOUND	●	
MONUMENTS FOUND IN MONUMENT BOX..	◎	

STREET NAMES..... NAME LETTERS 0.175" HIGH
NO. 2 RAPIDOGRAPH

LOT NUMBERS 36 LETTERS 0.175"
NO. 2 RAPIDOGRAPH

BEARING, DISTANCES, CURVE DATA LETTERS 0.175" HIGH
COORDINATES, ECT. NO. 1 RAPIDOGRAPH

ADJACENT SUBDIVISIONS LETTERS 0.100" HIGH
NO. 0 RAPIDOGRAPH
SHADOW LETTERING

ADJACENT LOT NUMBERS LETTERS 0.175" HIGH
NO. 0 RAPIDOGRAPH
DOTTED LETTERING

TITLE BLOCK AND OTHER RELATED LETTERING SHALL BE IN ACCORDANCE WITH STANDARD ACCEPTED ENGINEERING PRACTICE. BUT IN NO CASE SHALL THE LETTERING BE LESS THAN 0.100" IN HEIGHT AND USING A NO. 0 RAPIDOGRAPH PEN.

3.- IMPROVEMENT PLANS

DESCRIPTION	PROPOSED	EXISTING
SANITARY SEWER	— 6"S —	--6"S--
STORM SEWER	— 8"D —	--8"D--
GAS LINE	— 4"G —	--4"G--
WATER LINE	— 8"W —	--8"W--
TELEPHONE.....	— T —	--T --
CABLE TELEVISION.....	— TV —	--TV --
GAS VALVE	— G —	--G --
WATER VALVE	— W —	--W --
ELECTRICAL CONDUIT.....	— E —	--E --
MATCH LINE	STA. 5+00	

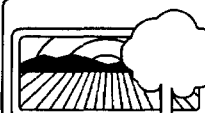
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

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AND TRANSPORTATION

ENGINEERING

DRAFTING
STANDARDS

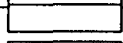
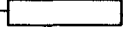
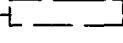
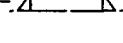
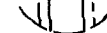
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
204

IMPROVEMENT PLANS (CONTINUED)

DESCRIPTION	TO BE CONSTRUCTED	EXISTING
MAINTENANCE HOLE		
CATCH BASIN		
GAS METER		
WATER METER		
CURB AND GUTTER		
SIDEWALK		
DRIVEWAY		
PAVEMENT BUTT JOINT OR REMOVAL		
FIRE HYDRANT		
SIGN		
SANITARY SEWER CLEAN OUT		
UTILITY POLE		
GUARD RAIL		
BARRICADE		
FENCE		
RAILROAD		
WHEELCHAIR RAMP		
SANITARY SEWER SERVICE		
LAMP POLE		
TRAFFIC SIGNAL		

THE FOREGOING SYMBOLS SHALL BE USED IN CONNECTION WITH ALL IMPROVEMENTS AND CONTRACT PLANS.

ANY ABBREVIATIONS USED SHALL CONFORM TO THE STANDARD ABBREVIATIONS AS SET FORTH IN SECTION 1-1.03 OF THE CITY OF MODESTO STANDARD SPECIFICATIONS.

ALL LETTERING SHALL CONFORM TO ACCEPTED ENGINEERING PRACTICE. BUT IN NO CASE SHALL THE LETTERING BE LESS THAN 0.100" IN HEIGHT AND USING A NO. 0 RAPIDOGRAPH PEN.

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

ENGINEERING

DRAFTING
STANDARDS

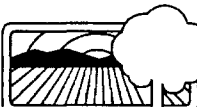
ENGINEERING & TRANSPORTATION
DEPARTMENT

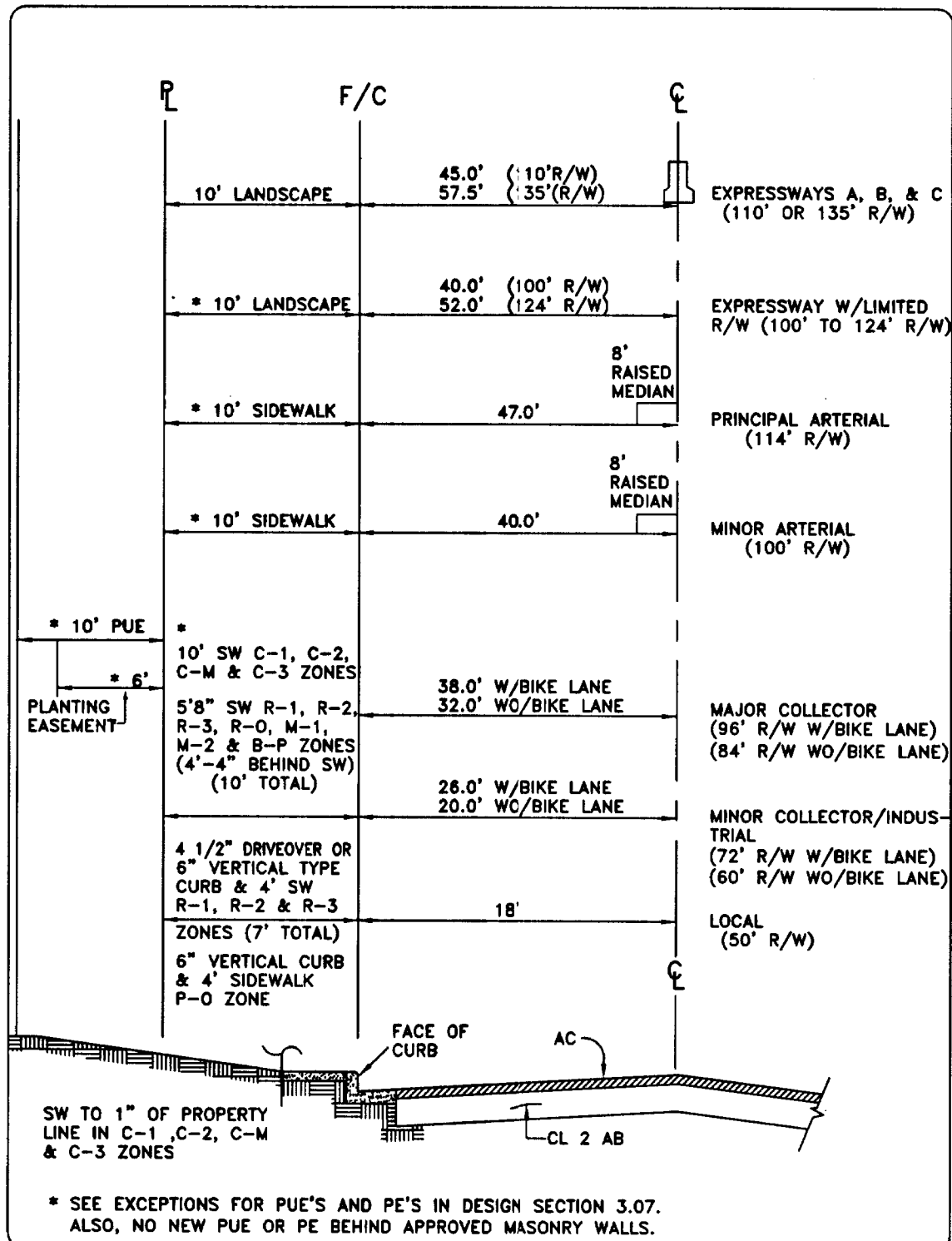


CITY of MODESTO

DETAIL NO.
205

TXT	AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz 1234567890
MONOTXT	AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz 1234567890
ROMANS	AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz 1234567890
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ROMANT	AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz 1234567890
ITALICC	<i>AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz 1234567890</i>
ITALICT	<i>AaBbCcDdEeFfGgHhIiJjKkLlMmNnOoPpQqRrSsTtUuVvWwXxYyZz 1234567890</i>

APPROVED BY CITY COUNCIL RESOLUTION NO. 2001-560	ENGINEERING		 CITY of MODESTO
ORIGINAL APPROVED BY THE DIRECTOR OF ENGINEERING AND TRANSPORTATION	AUTOCAD STANDARDS (TEXT TYPES)		
	ENGINEERING & TRANSPORTATION DEPARTMENT		DETAIL NO. 206



APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

STREET SECTIONS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
300

STRUCTURAL SECTION REQUIREMENTS

Tl	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00	
	WITHOUT SAFETY FACTOR (5.0-8.0)									
R-VALUE	REQUIRED AC THICKNESS (FEET)									
5	0.20	0.20	0.20	0.25	0.40	0.45	0.50	0.55	0.60	REQUIRED AB THICKNESS (FEET)
10	0.20	0.20	0.20	0.25	0.40	0.45	0.50	0.55	0.60	0.60 0.95 1.25 1.45 1.50 1.70 1.95 2.20 2.40
15	0.20	0.20	0.20	0.25	0.40	0.45	0.50	0.55	0.60	0.55 0.85 1.15 1.35 1.35 1.60 1.80 2.00 2.20
20	0.20	0.20	0.20	0.25	0.40	0.45	0.50	0.55	0.60	0.50 0.80 1.05 1.25 1.25 1.45 1.65 1.85 2.05
25	0.20	0.20	0.20	0.25	0.40	0.45	0.50	0.55	0.60	0.40 0.70 1.00 1.15 1.15 1.30 1.50 1.70 1.85
30	0.20	0.20	0.20	0.25	0.40	0.45	0.50	0.55	0.60	0.35 0.65 0.90 1.05 1.00 1.20 1.35 1.55 1.70
35	0.20	0.20	0.20	0.25	0.40	0.45	0.50	0.55	0.60	0.35 0.55 0.80 0.95 0.90 1.05 1.20 1.40 1.50
40	0.20	0.20	0.20	0.25	0.40	0.45	0.50	0.55	0.60	0.35 0.50 0.70 0.85 0.80 0.95 1.10 1.20 1.35
45	0.20	0.20	0.20	0.25	0.40	0.45	0.50	0.55	0.60	0.35 0.40 0.65 0.75 0.65 0.80 0.95 1.05 1.15
50	0.20	0.20	0.20	0.25	0.40	0.45	0.50	0.55	0.60	0.35 0.35 0.55 0.65 0.55 0.65 0.80 0.90 1.00
55	0.20	0.20	0.20	0.25	0.40	0.45	0.50	0.55	0.60	0.35 0.35 0.45 0.55 0.45 0.55 0.65 0.75 0.80
60	0.20	0.20	0.20	0.25	0.40	0.45	0.50	0.55	0.60	0.35 0.35 0.35 0.45 0.35 0.40 0.50 0.60 0.65
	0.20	0.20	0.20	0.25	0.40	0.45	0.50	0.55	0.60	0.35 0.35 0.35 0.35 0.35 0.35 0.35 0.40 0.45

NOTE 1:

THE MINIMUM T.I. USED TO DETERMINE THE STRUCTURAL SECTION FOR A MAJOR - MAJOR INTERSECTION SHALL BE T.I. 11 AND AN INDUSTRIAL - INDUSTRIAL INTERSECTION SHALL BE T.I. 10.

NOTE 2:

THE FOLLOWING CONDITIONS APPLIED TO FORMULATING THE ABOVE STRUCTURAL DESIGNS:

- THE CHART UTILIZED THE R-VALUE DESIGN METHOD USED BY THE CALIFORNIA DEPARTMENT OF TRANSPORTATION AS DETAILED IN THE "HIGHWAY DESIGN MANUAL" AND THE "FLEXIBLE PAVEMENT STRUCTURAL SECTION DESIGN GUIDE FOR CALIFORNIA CITIES AND COUNTIES", THIRD EDITION (JANUARY 1979)
- THE FOLLOWING CONDITIONS APPLIED TO THE DESIGN GUIDELINES:
 - USED A SAFETY FACTOR FOR A TRAFFIC INDEX (T.I.) OF 8.0 OR GREATER.
 - ADJUSTED RESULTING AB THICKNESSES TO CONFORM TO THE CITY'S ACCEPTABLE MINIMUM AB THICKNESS OF .35'.
 - MAXIMUM ACCEPTABLE R-VALUE USED IN CALCULATING STREET PAVEMENT WAS R-VALUE 60.

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS
STRUCTURAL SECTION
REQUIREMENTS
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
301

	Local Street	Minor Collector (60' and 72')	Major Collector (84' and 96')	Minor Arterial	Principal Arterial	Class B 4-Lane Expressway	Class B 4-Lane Landscaped Expressway	Class B 6-Lane Expressway	Class B 6-Lane Landscaped Expressway	Class C 4-Lane Expressway	Class C 4-Lane Landscaped Expressway	Class C 6-Lane Expressway	Class C 6-Lane Landscaped Expressway
Local Street		377	378										
Minor Collector (60' and 72')	377	376	365/6	379	382	367	354	369	368	371	356	359	362
Major Collector (84' and 96')	378	365/6	381	380	383	354	358	360	358	354	358	360	364
Minor Arterial		379	380	384	384	355	357	361	363	355	357	361	363
Principal Arterial		382	383	384	385	355	357	361	363	355	357	361	363
Class B 4-Lane Expressway		367	354	355	355	374	374	370	370	374	374	373	370
Class B 4-Lane Landscaped Expressway		368	358	357	357	374	374	387	384	374	374	387	387
Class B 6-Lane Expressway		369	360	361	361	370	387	375	375	373	387	375	375
Class B 6-Lane Landscaped Expressway		371	364	363	363	370	384	375	374	374	370	375	375
Class C 4-Lane Expressway		353	354	355	355	374	374	373	370	374	374	370	370
Class C 4-Lane Landscaped Expressway		356	358	357	357	374	374	387	387	374	374	387	387
Class C 6-Lane Expressway		359	360	361	361	370	387	375	375	370	387	375	375
Class C 6-Lane Landscaped Expressway		362	364	363	363	370	387	375	375	370	387	375	375

Note: In the event the title on the detail does not reflect a specific application, the above chart will supercede.

Note: For details on the Pelandale-Claratina Class C Expressway, see Details No. 355, 359, 360, 361, 373 and 375.

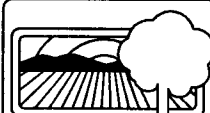
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RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
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AND TRANSPORTATION

STREETS

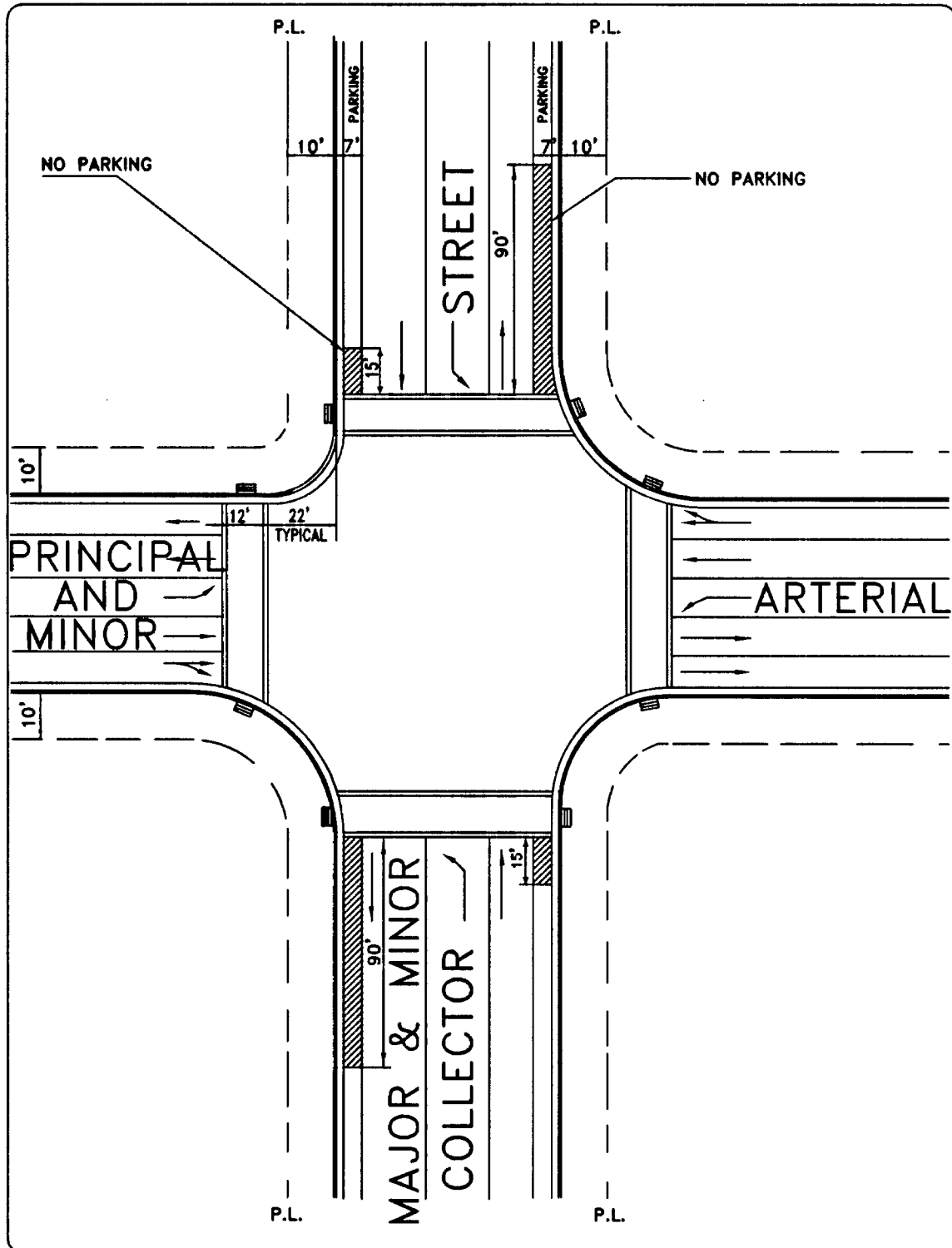
INTERSECTION DETAILS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
302



APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

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AND TRANSPORTATION

STREETS

NO-PARKING AREA COLLECTOR/ARTERIAL INTERSECTION

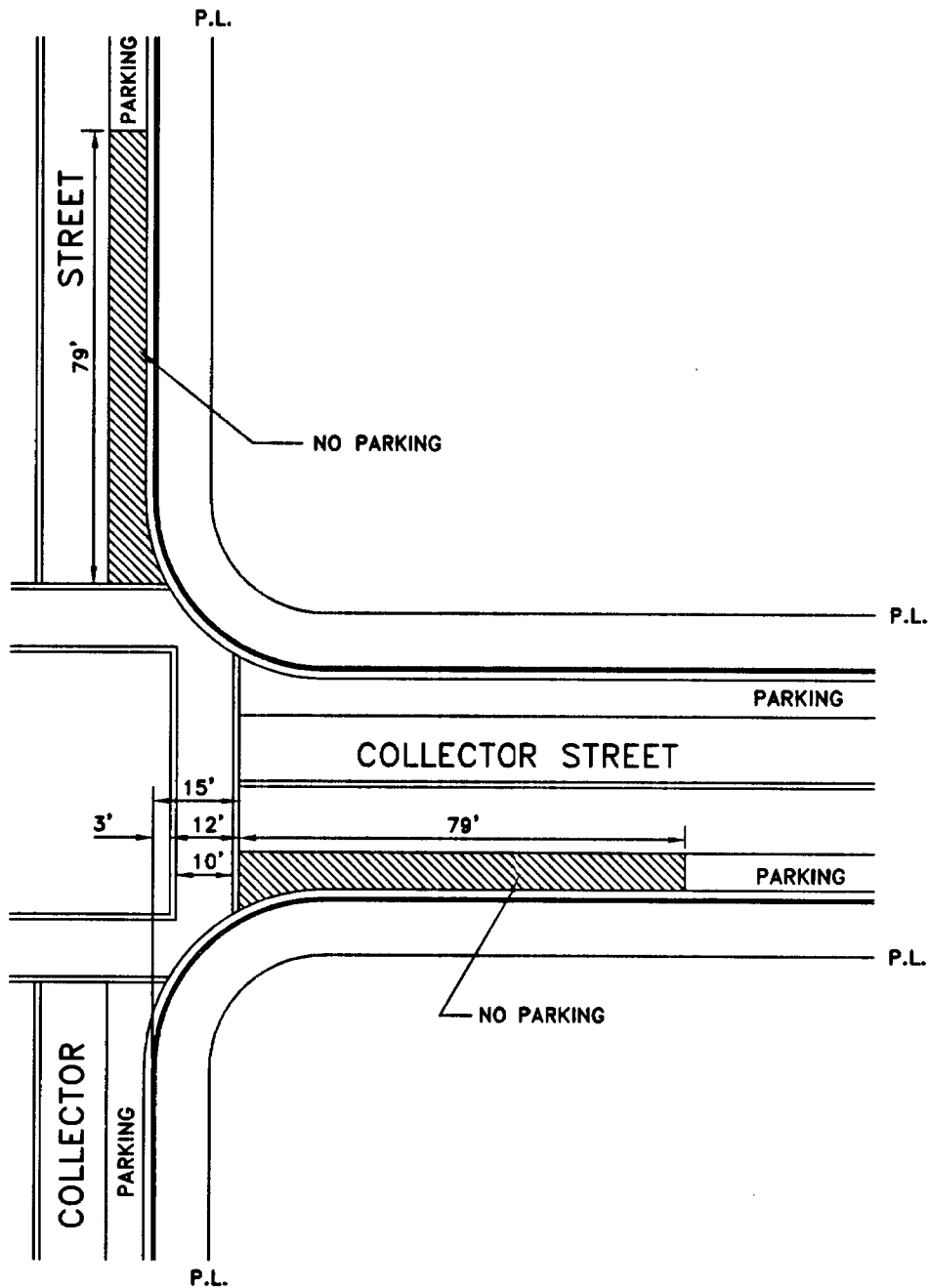
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

303



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RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
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AND TRANSPORTATION

STREETS

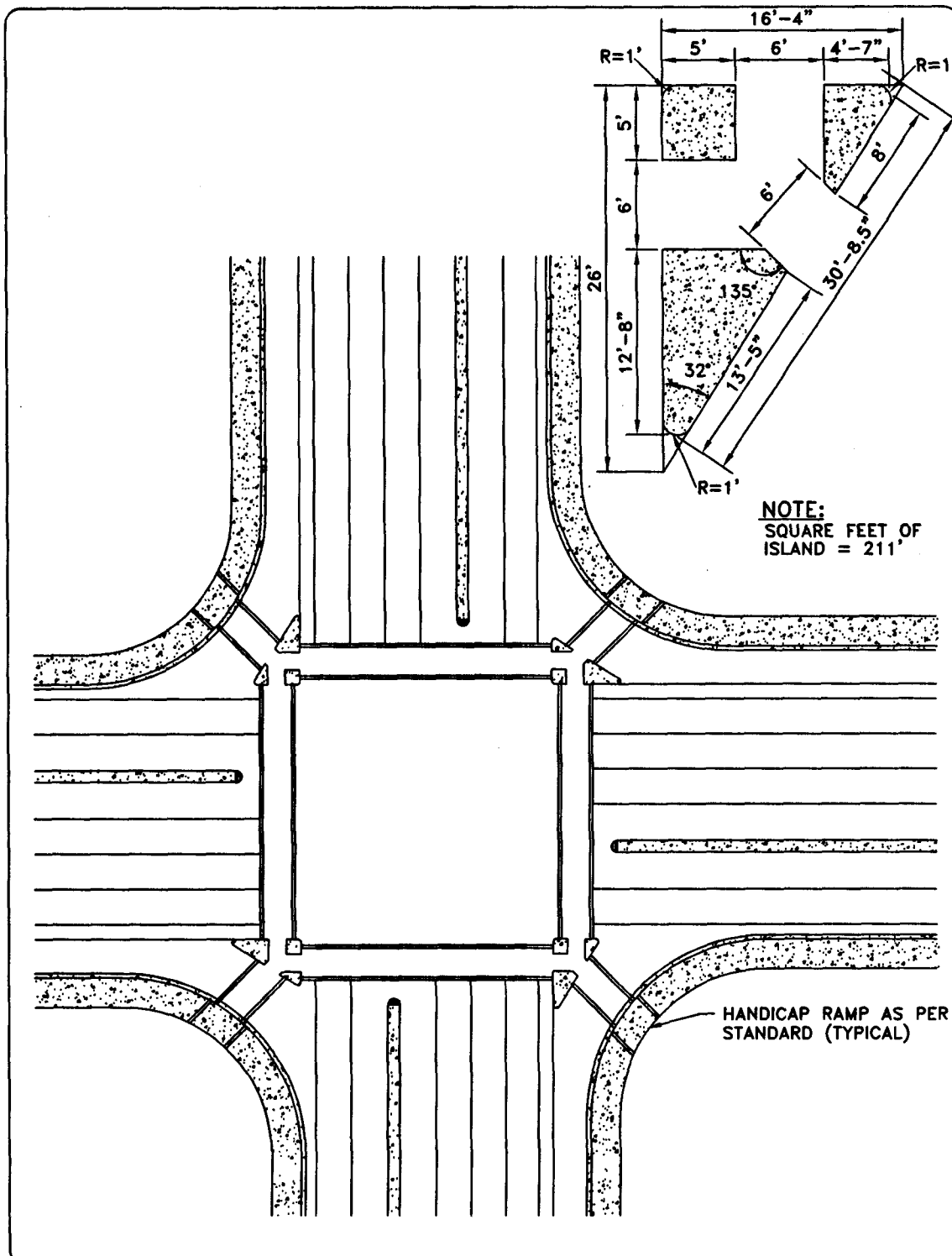
**NO PARKING AREA
COLLECTOR/COLLECTOR
STREET INTERSECTION**

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

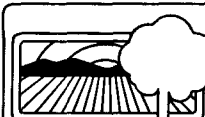
DETAIL NO.
304



APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

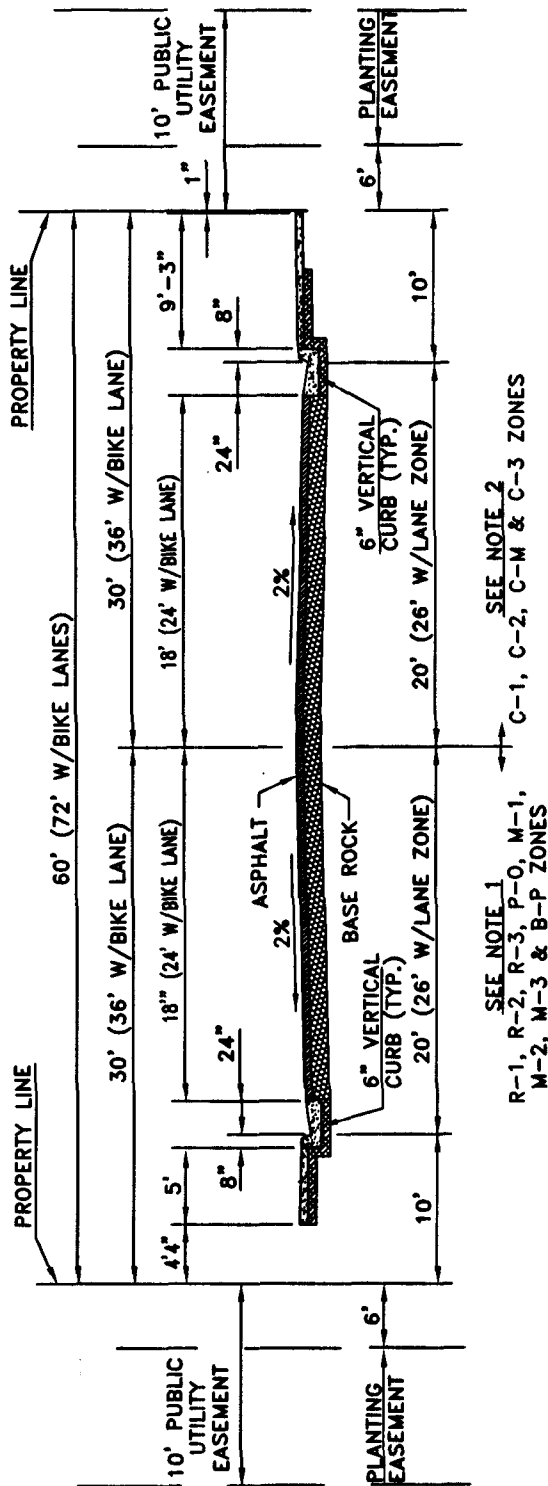
STREETS
INTERSECTION PEDESTRIAN
ISLAND DETAIL AT
STREET INTERSECTION
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
305

DETAIL NO.
306



NOTE 1:

6" VERTICAL CURB AND 5' WIDE SIDE-TO BE INSTALLED IN R-1, R-2, R-3 P-O, M-1, M-2, M-3 AND B-P ZONES.

NOTE 2:

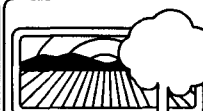
6" VERTICAL CURB AND SIDEWALK INSTALLED IN C-1, C-2, C-M AND C-3 ZONES TO BE EXTENDED TO WITHIN 1" OF THE PROPERTY LINE. (WIDTH MAY BE DETERMINED BY USE OR BY EXISTING CONDITIONS. IF SPECIFICALLY APPROVED IN WRITING BY THE CITY ENGINEER.) SEE STANDARD DETAIL #337 FOR STREET BLOCK OUT ON FULL WIDTH STREET.

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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

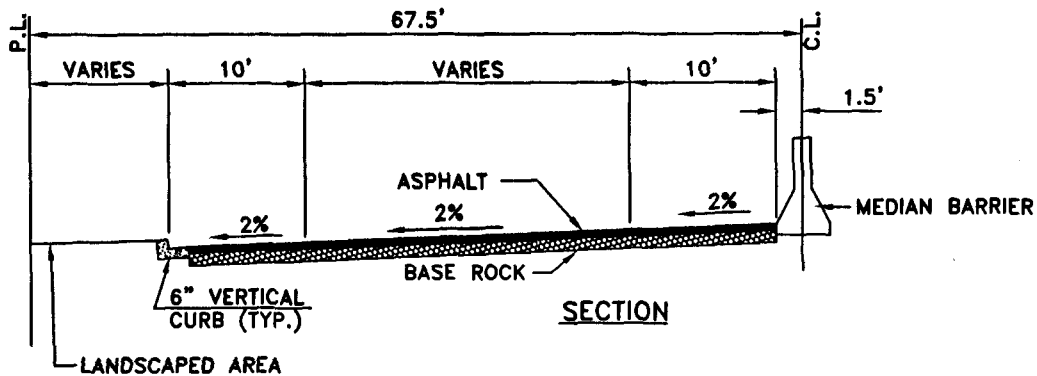
**STREETS
MINOR COLLECTOR/
INDUSTRIAL STREET
SECTION**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

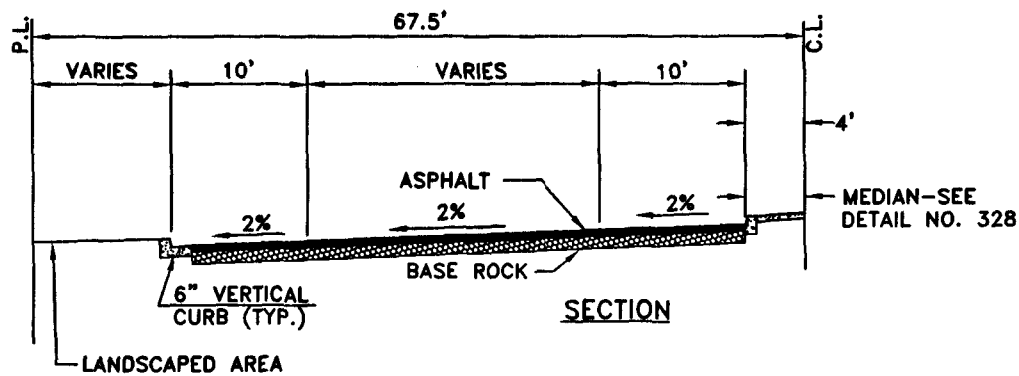
DETAIL NO.
307



NOTE:

LANDSCAPING AND IRRIGATION SHALL BE AS APPROVED BY THE LANDSCAPE DESIGNER.
NOT APPROVED FOR BRIGGSMORE AVE.

135' RIGHT OF WAY
(WITH MEDIAN BARRIER)



NOTE:

LANDSCAPING AND IRRIGATION SHALL BE AS APPROVED BY THE LANDSCAPE DESIGNER.
NOT APPROVED FOR BRIGGSMORE AVE.

135' RIGHT OF WAY
(WITH MEDIAN)

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

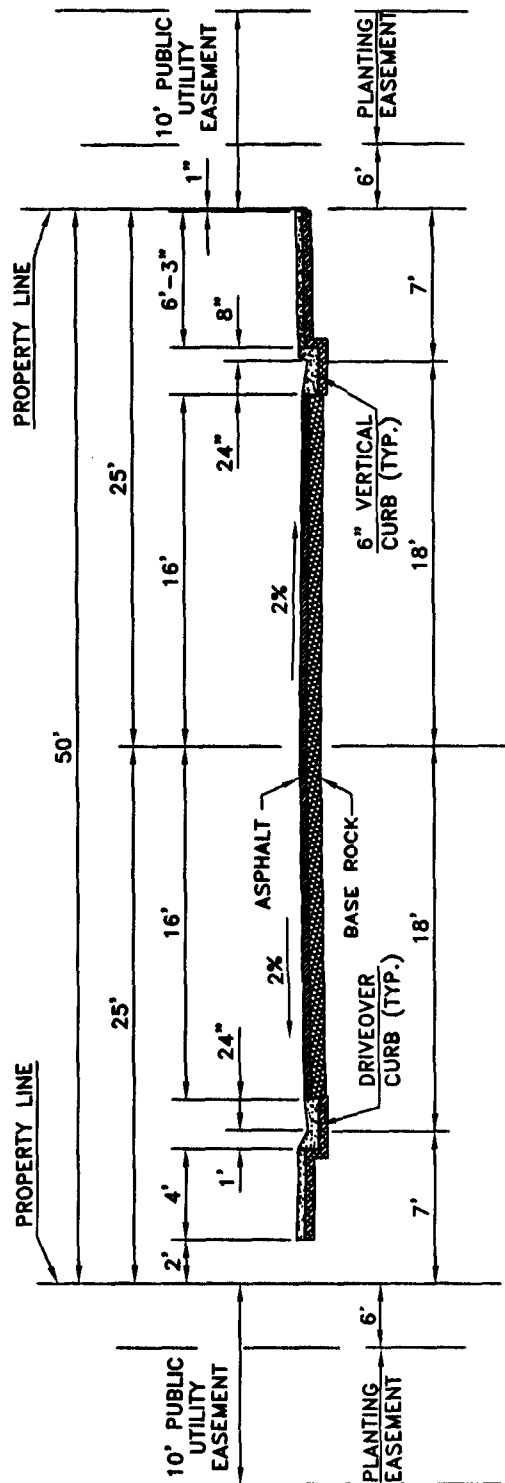
**EXPRESSWAY
STREET SECTION**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

**DETAIL NO.
308**



NOTE:
4-1/2" DRIVEOVER OR 6" VERTICAL CURB AND 4' WIDE SIDEWALK TO BE INSTALLED IN R-1, R-2, AND R-3 ZONES.

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
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AND TRANSPORTATION

STREETS

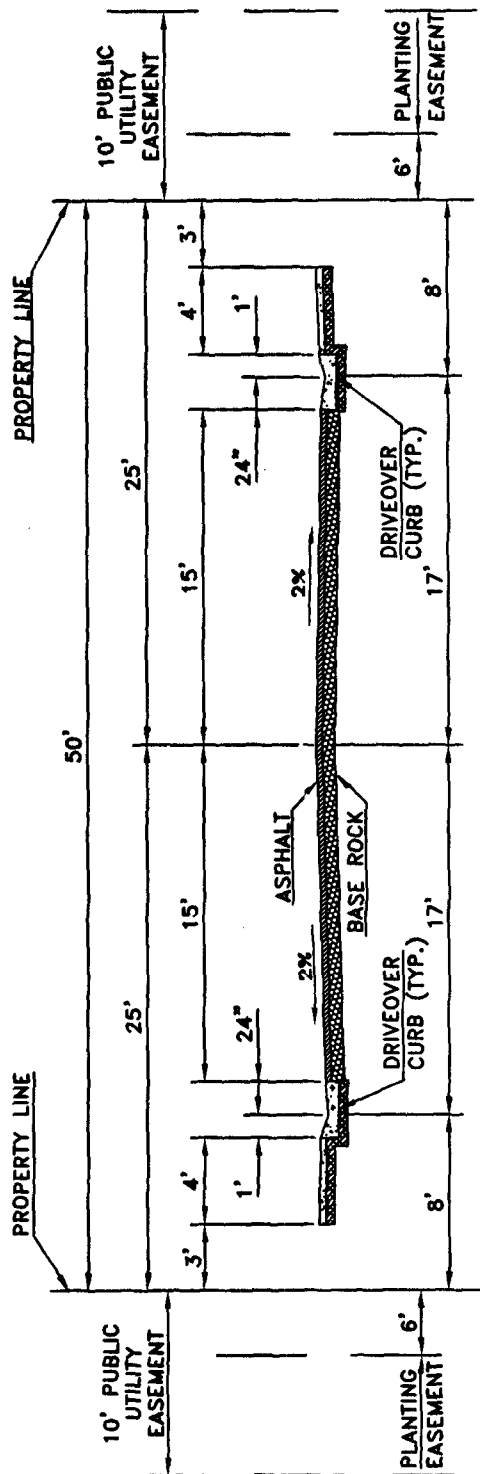
LOCAL
STREET SECTION

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
309



APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

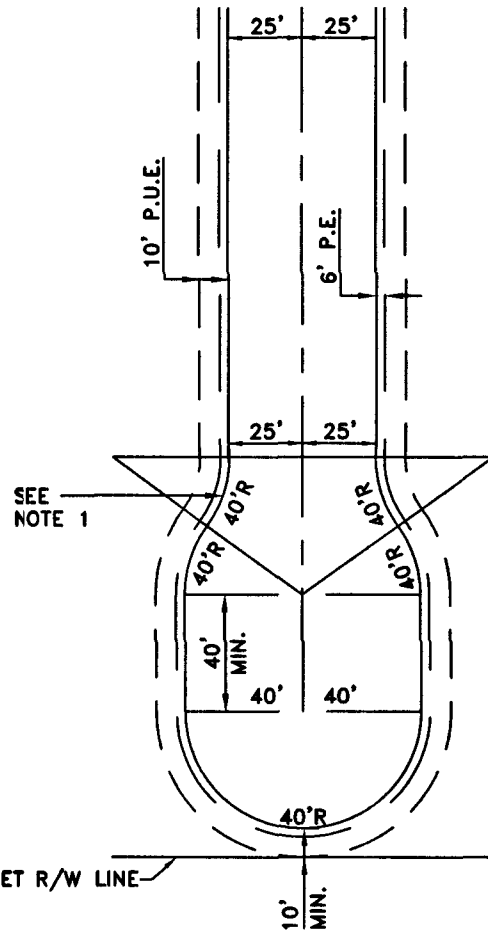
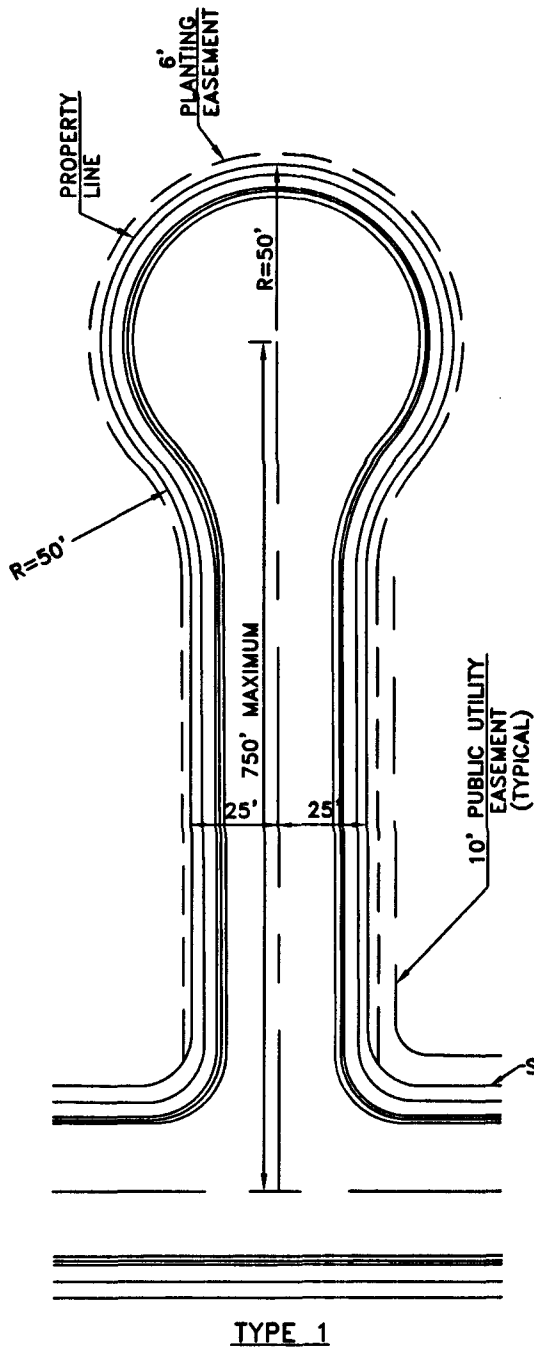
CUL-DE-SAC STREET SECTION

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
310



NOTE:

RADII OTHER THAN 40 FEET
SHALL BE AS APPROVED BY
THE CITY ENGINEER.

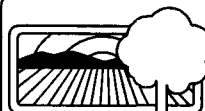
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

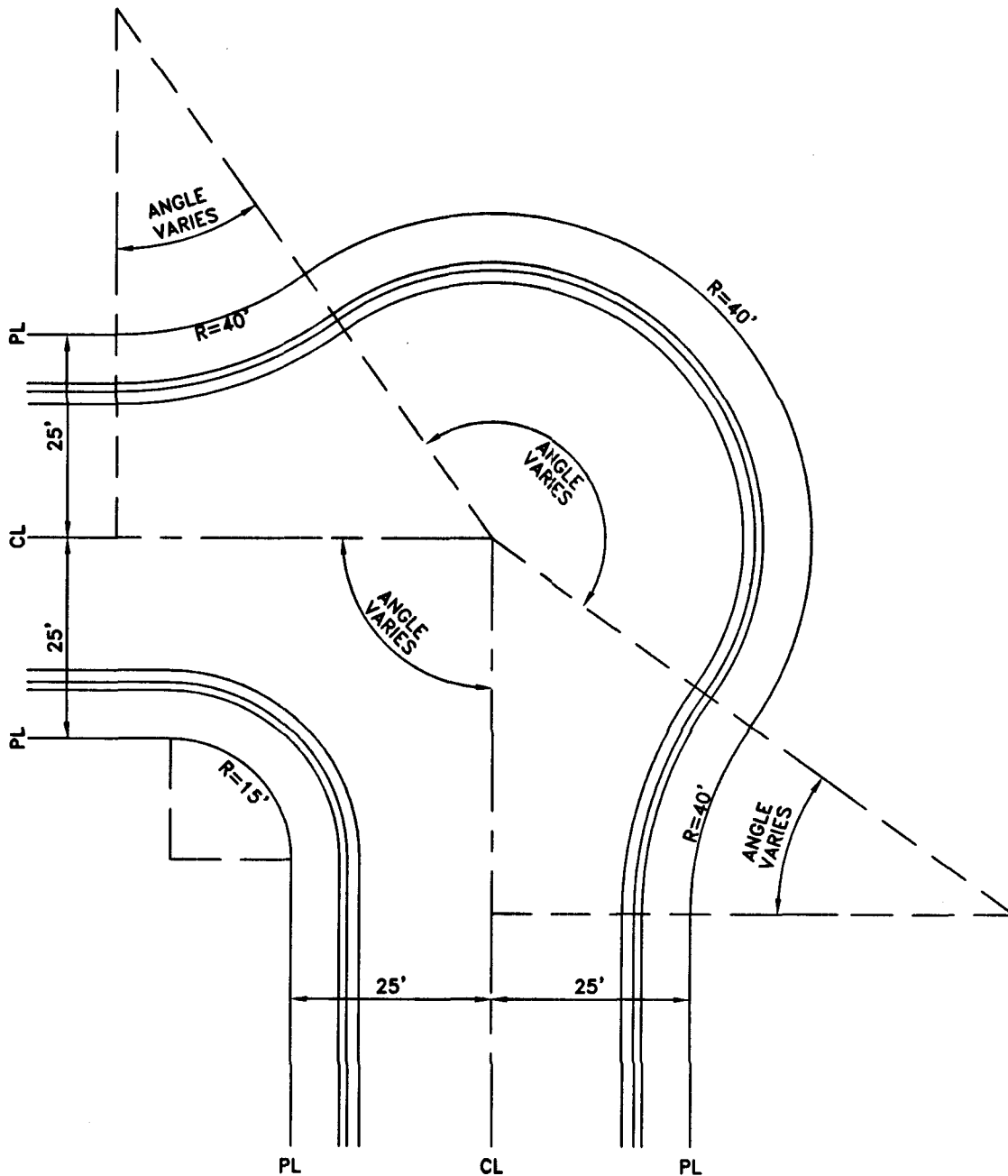
**CUL-DE-SAC
STREET SECTION**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
311



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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

STREETS ALIGNMENT FOR 90° STREET INTERSECTION KNUCKLE

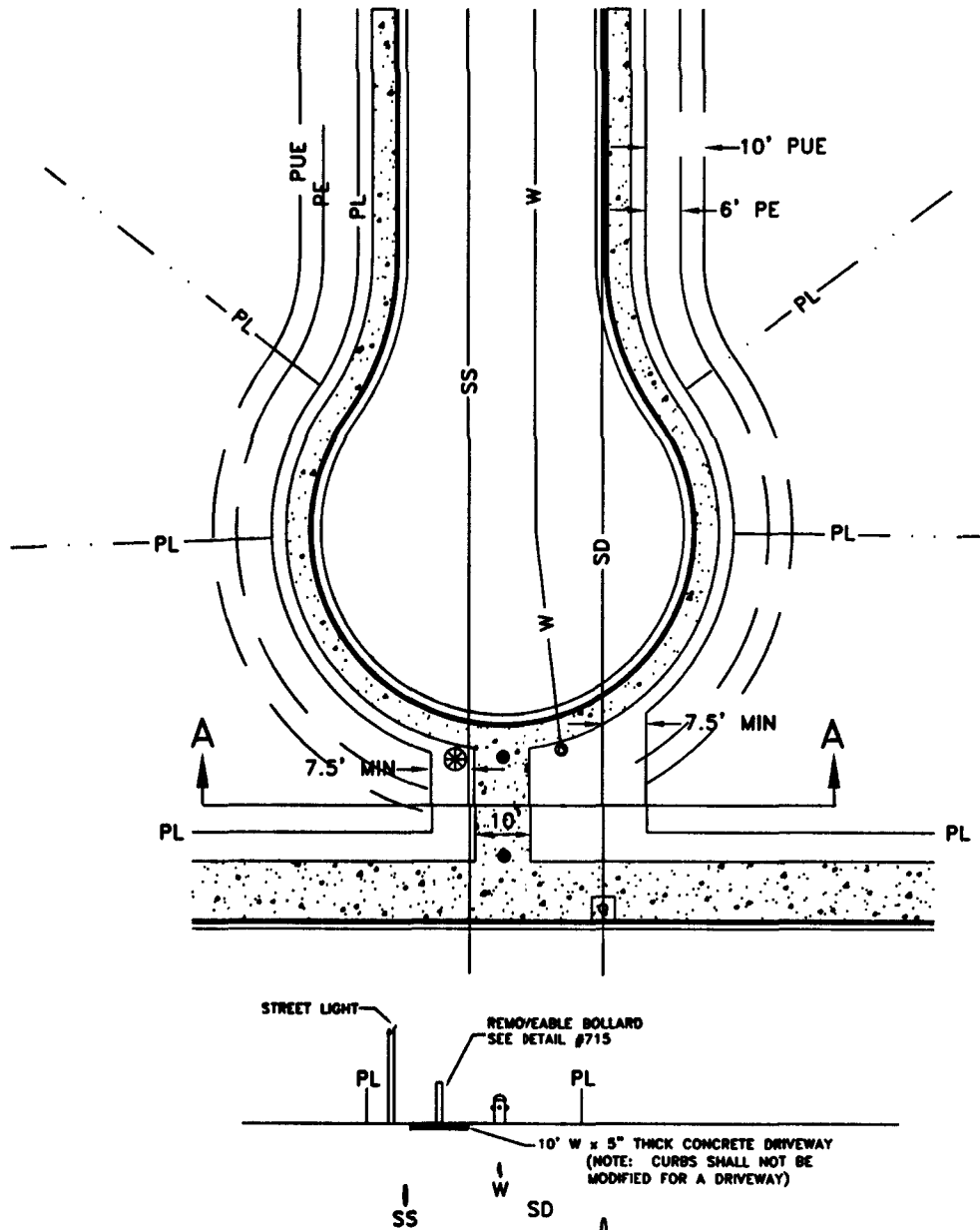
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

312



SECTION A-A
TYPICAL UTILITY SECTION

SECTION A-A
NTS

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RESOLUTION NO. 2001-560

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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

**WALK-THRU
CUL-DE-SAC SECTION**

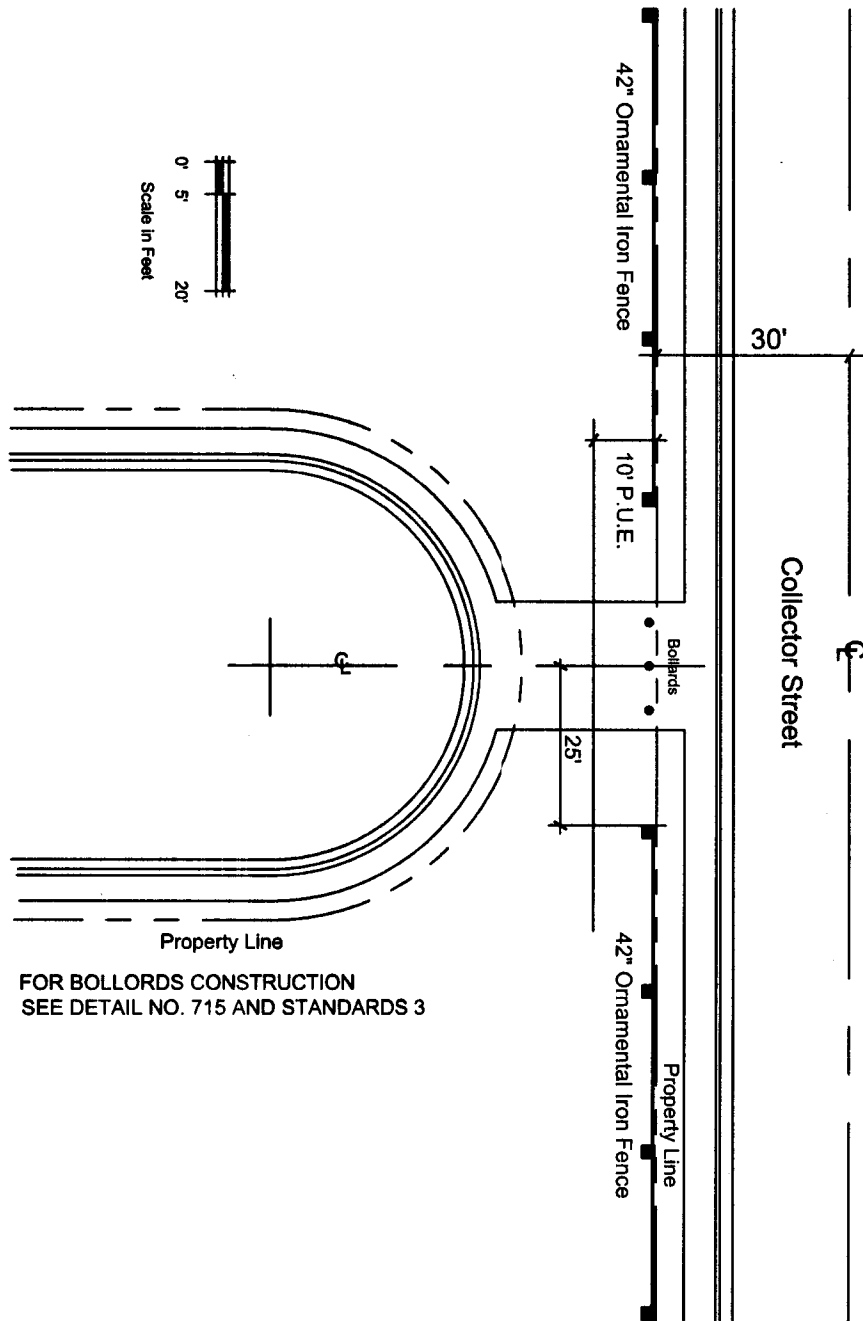
**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.

313



FOR BOLLARDS CONSTRUCTION
SEE DETAIL NO. 715 AND STANDARDS 3

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

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AND TRANSPORTATION

STREETS

OPEN-ENDED CULDESAC

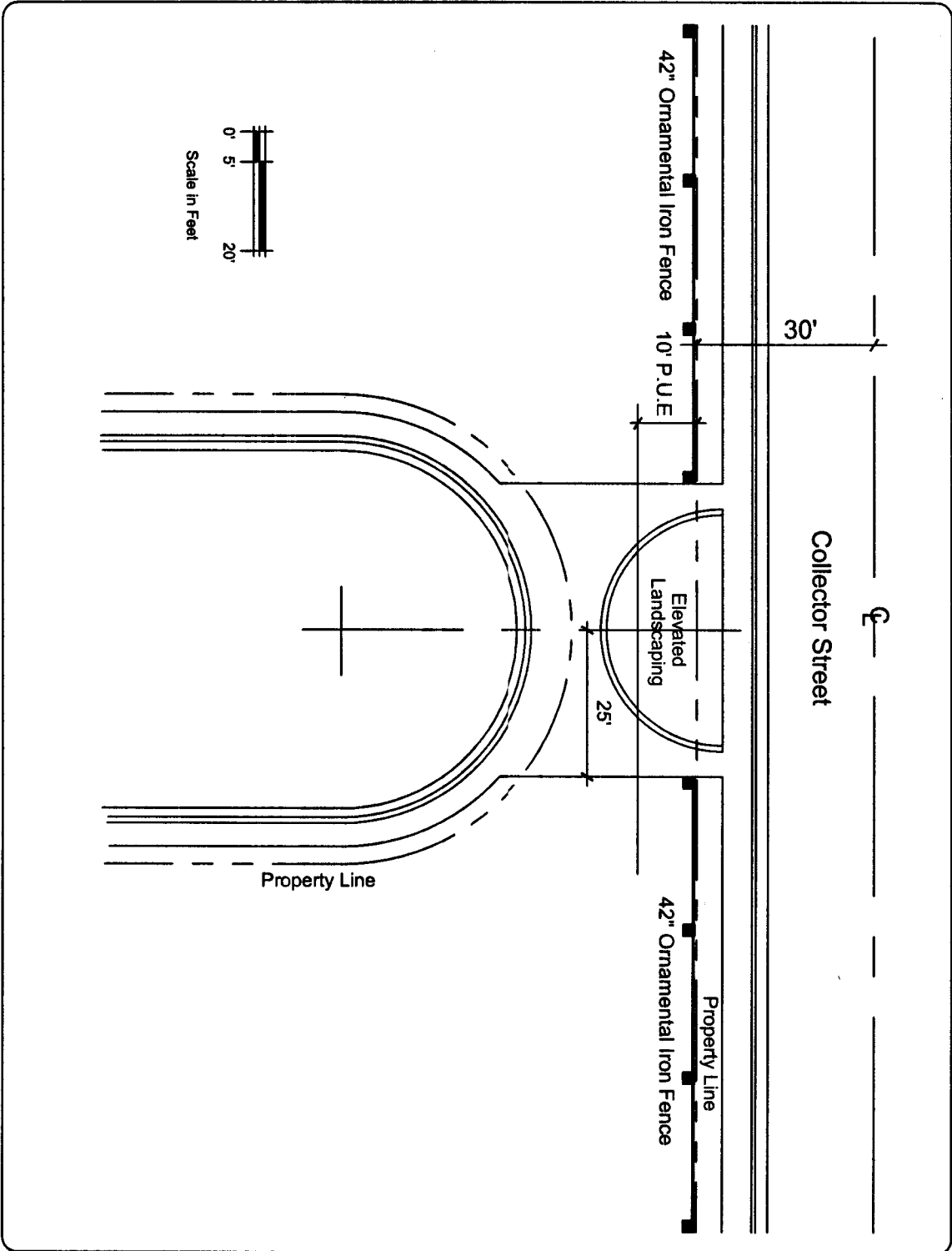
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

314



APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

OPEN-ENDED CULDESAC

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

315

CITY OF MODESTO STREETSCAPE PROJECT:

The purpose of the Modesto Streetscape Prototype is to provide a consistent standard for The Plaza Project and potentially for all future streetscape improvements in the Downtown Area. Consistent and uniform streetscape improvements will enhance the visual character and the pedestrian environment throughout the Downtown. This prototype has been created through an interactive process which first began with citizen input and manifested itself in a day long design workshop involving members of the Citizen Redevelopment Commission Design Committee and the general public. The goals, ideas and drawings produced during the workshop shaped this streetscape prototype.

The workshop produced the following goals:

Streetscape Design Goals:

1. To create a "Timeless" streetscape character for downtown Modesto. The streetscape should not be too "historical" or reflect a specific style or era that will become "dated" in its appearance.

Handicap Ramps to Meet Existing City Standards
Pedestrian "Bulb-out" Option on Major Intersections and Mid-Block Locations
Subject to Traffic Levels

Street Names Stamped or "Etched" in Concrete Bands at Corner

2. To create a streetscape environment that will be "pedestrian friendly", have a sense of place, and allow for a variety of "street activities".

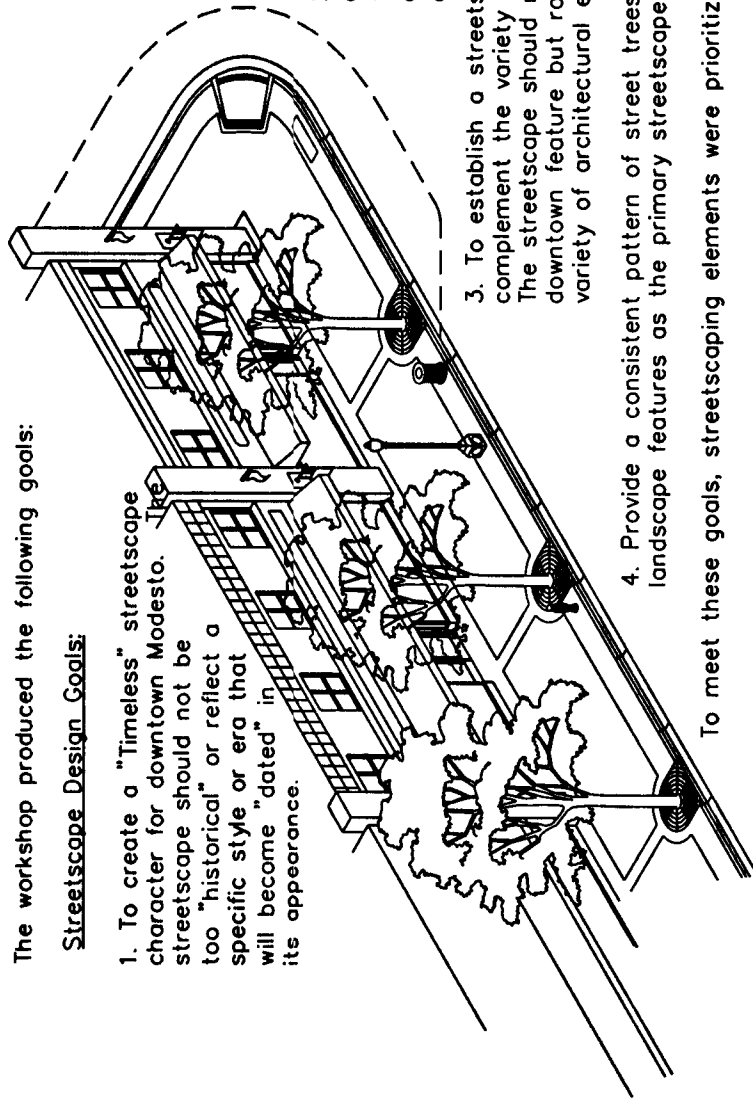
3. To establish a streetscape prototype that will complement the variety of buildings found in downtown. The streetscape should not become the dominant downtown feature but rather should serve to unify the variety of architectural elements throughout downtown.

4. Provide a consistent pattern of street trees and incorporation of other landscape features as the primary streetscape elements.

To meet these goals, streetscaping elements were prioritized:

Streetscape Priorities:

1. Landscaping: street trees and other landscape features
2. Street lighting: new and existing—restore historic lighting standards
3. Paving surfaces: similar to current standard, but improve uniformity of finished product
4. Site furniture: benches, trash receptacles, bike racks, etc.



APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
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STREETS DOWNTOWN STREETSCAPE

ENGINEERING & TRANSPORTATION
DEPARTMENT

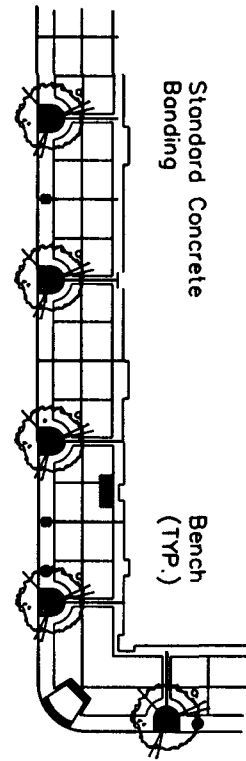


CITY of MODESTO

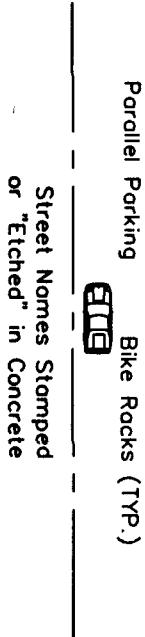
DETAIL NO.
316

Streetscape Amenities:

1. Pedestrian "bulb-outs" on sidewalks should be used at key intersections and at mid-block crosswalks when appropriate to encourage pedestrian connections.
2. Discourage the use of bollards. Round landscaped planters may be used in lieu of bollards especially at "bulb-outs" or other special use areas for pedestrian safety.
3. Shop owners/merchants should be allowed and encouraged to place additional site furnishings (including benches, tables, and planters) in front of their storefronts. Maintenance of the same will be the responsibility of individual property owners/merchants.



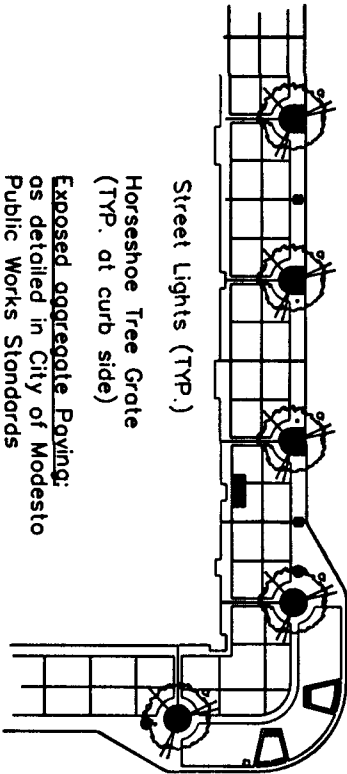
4. With any new streetscape construction, provisions should be made for installation of automatic irrigation systems for the street trees and other landscape features. In addition, electrical outlets/junction boxes should be placed at regular intervals in tree wells to help facilitate any street fairs or other public activities and accent lighting of the streetscape.



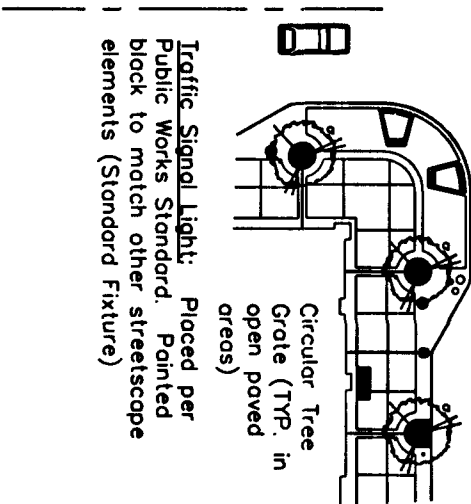
Handicap Ramp

Landscape Pots

Optional Pedestrian "Bulb-out"



Exposed aggregate Paving:
as detailed in City of Modesto
Public Works Standards
section 3.27



Traffic Signal Light: Placed per
Public Works Standard. Painted
black to match other streetscape
elements (Standard Fixture)

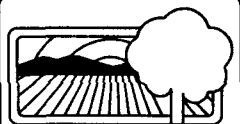
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

**DOWNTOWN
STREETSCAPE**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
317

Signage:

1. Guidelines should be created and implemented for storefront awnings and signage. Awnings should be encouraged if kept consistent with the streetscape character. Storefront signage should be provided at the pedestrian level (i.e. signs hanging perpendicular to sidewalks). Allow for variety, but unsightly colors and fonts should be strongly discouraged.
2. Storefront signage should be limited to a maximum of two identification signs per business – one to be located horizontally on the building face, the other to be located perpendicular to the building face, projecting from the building. Horizontal signage may occur directly above or below the awning or on the outer awning edge. Perpendicular signage should not exceed six square feet and should be located below the awning, with a minimum clearance from sidewalk of 8 feet.
3. Public domain signage (i.e., "parking", directional, kiosks, etc.) should remain consistent in color and style to the chosen streetscape furniture and the streetscape character as a whole. The city should develop a detailed Public Domain Signage Program addressing specific size, color and style. Signs should identify key project features with names and arrows including but not limited to: parks, public features, Civic Center, neighborhoods, shopping areas, etc.
4. Street tree selection (species, type, size, etc.) should take into account the visibility of storefront signage with the goal to minimize obstruction of visibility from the street.

Streetlights:

Streetlights (Visco VI-X-1-OF or comparable) will be placed 60' O.C., beginning 25' from the corner property line of each block. Existing lighting should be retrofitted with matching luminaries to minimize amount of new lighting being installed. All lighting, including existing and future lights and poles, shall be painted black to match other site furnishings.

I Street: Twin luminaries shall be utilized along I Street and other selected prominent circulation routes. Light standards shall match the style throughout downtown and be placed as noted above.

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RESOLUTION NO. 2001-560

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STREETS

DOWNTOWN
STREETSCAPE

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

318

Bike Rocks:

Bike racks (TimberForm CycLoops 2172) should be placed maximum four per block side, within the three foot band running parallel with the street. They should be painted black to match all other site furniture.

Trash Receptacles:

Trash cans (DuMor, Inc. Model 86) shall be placed toward each intersection, with a maximum of one per street frontage at corners. They should be placed within the three foot band that runs next to the street opposite the locations of benches. The style matches that of the specified bench. They should also be painted black to match all other site furniture.

Benches:

Sidewalk benches should be placed two per block side, located toward each corner. The exact location will be determined by the configuration of the adjacent building façade. The specific bench type to be used is Model 93 by DuMor, Inc. and shall be painted black to match other site furnishings.

Signage:

Public domain signage (i.e., "parking", directional signage, kiosks, etc.) should be placed at key intersections and plaza areas. This prototype is intended to suggest character and not a specific design. All signage should be kept consistent in style and color with the "timeless" character of the chosen streetscape furnishings.

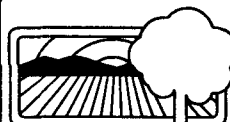
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

DOWNTOWN
STREETSCAPE

ENGINEERING & TRANSPORTATION
DEPARTMENT



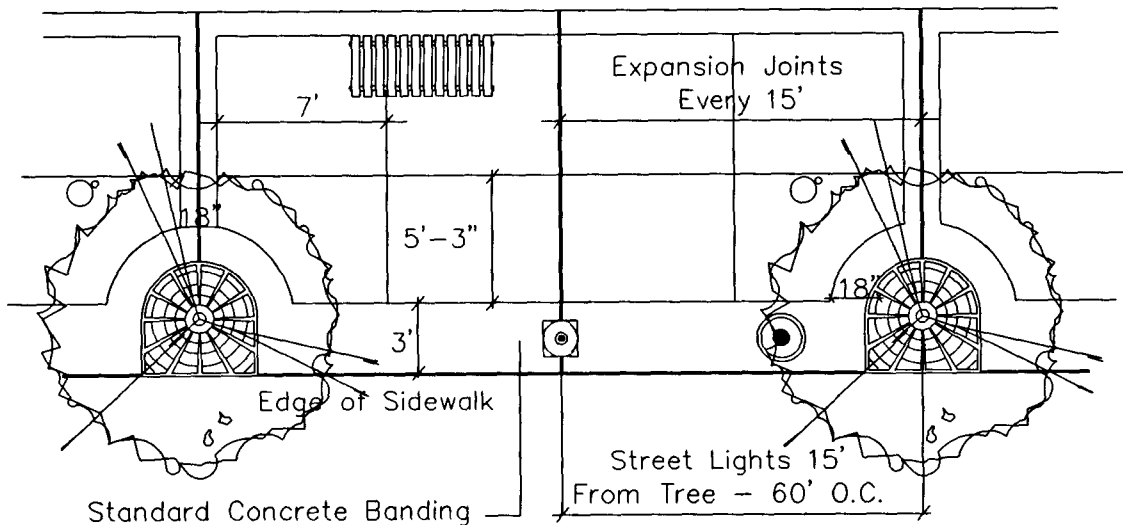
CITY of MODESTO

DETAIL NO.

319

Street Trees:

Street trees should be placed at 30' on center, beginning 10' in from the corner of the property lines. Specimen trees should be placed at the corners to highlight key intersections. A horseshoe tree grate (combination Round/Square tree grate - Neenah R-8713-A and R-8838) shall be used against the curb and a full circle tree grate (Neenah R-8838) will be used in open paved areas. See signage guideline number four (4) for further characteristics.



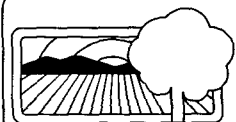
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

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STREETS

DOWNTOWN
STREETSCAPE

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

320

THESE STANDARDS SHALL BE MANDATORY WITHIN THE AREA
AS SHOWN IN FIGURE 1, EXCEPT THAT EXPOSED AGGREGATE
SIDEWALKS SHALL NOT BE REQUIRED ON THE STREETS
BORDERING THE AREA.

EXPOSED AGGREGATE SIDEWALK AREA BOUNDARY



FIGURE 1

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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

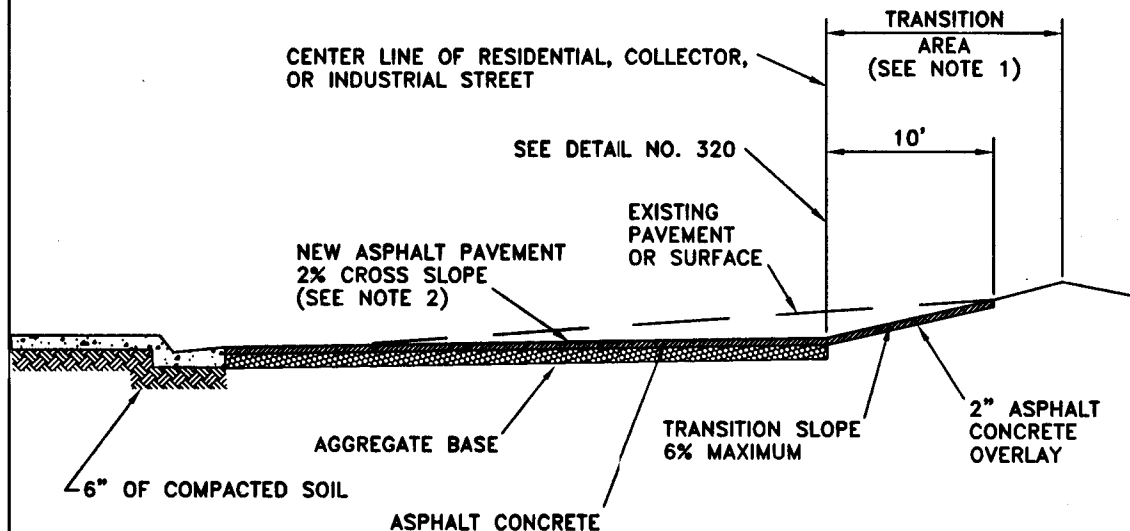
**DOWNTOWN EXPOSED
AGGREGATE SIDEWALK**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
321



NOTES:

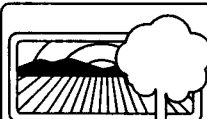
1. TRANSITIONS REQUIRING WORK BEYOND THE CENTER LINE SHALL BE DONE BY THE DEVELOPER.
2. WITH WRITTEN PERMISSION FROM THE CITY ENGINEER, A MAXIMUM CROSS SLOPE OF 4% MAY BE PERMITTED.
3. WHERE EXISTING GRADES CANNOT BE MET, THE CITY ENGINEER MAY APPROVE ALTERNATE PROPOSALS SUCH AS DEVELOPER POSTING A CASH BOND FOR THAT PORTION OF THE STREET ADJACENT TO PROJECT.
4. THE MAXIMUM WIDTH OF STANDARD IMPROVEMENTS REQUIRED SHALL BE 40 FEET. THE MAXIMUM WIDTH OF TRANSITION PAVEMENT SHALL BE 10' (FEET) FOR SLOPES BETWEEN 4% & 6%.
5. NOT APPLICABLE TO SINGLE FAMILY, DUPLEX, TRIPLEX, AND FOURPLEX LOTS CREATED BY PARCEL MAPS IN EXISTING DEVELOPED AREAS.

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STREETS
STANDARD PAVEMENT
ON EXISTING STREET
SECTION

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
322

Proposed Streets Exactions Policy

1. Residential streets to development shall be dedicated and improved by the developer.
2. All other streets with the exception of expressways:
 - a) A width of 40 feet shall be dedicated and improved (40 feet dedication, 30 feet from face of curb improvement, 10 feet behind curb improvement).

30 feet of paved width provides sufficient width for one parking lane and two-way travel.

b) In some cases, initial development of added width may be necessary. Such additional dedication and improvement would be subject to reimbursement.

c) In existing circumstances, where at least 40 feet of dedication and improvements have previously been made and standards change requiring additional right-of-way, such additional right-of-way shall be acquired with reimbursement.

d) Any extra facilities required specifically for the development (e.g. decel/accel lanes, slip ramps) shall be provided by and at the expense of the developer.

3. Expressways:

40 feet of right-of-way shall be dedicated with development. additional right-of-way shall be acquired with reimbursement.

No expressway improvements shall be required to be dedicated. where interim improvement facilitate current development are required pending future expressway development, such improvements shall be provided by the developer.

The reduced requirement for expressways (no improvement requirement) recognizes the fact that fronting development is not the primary contributor to use of the facility.

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AND TRANSPORTATION

STREETS

EXACTIONS POLICY

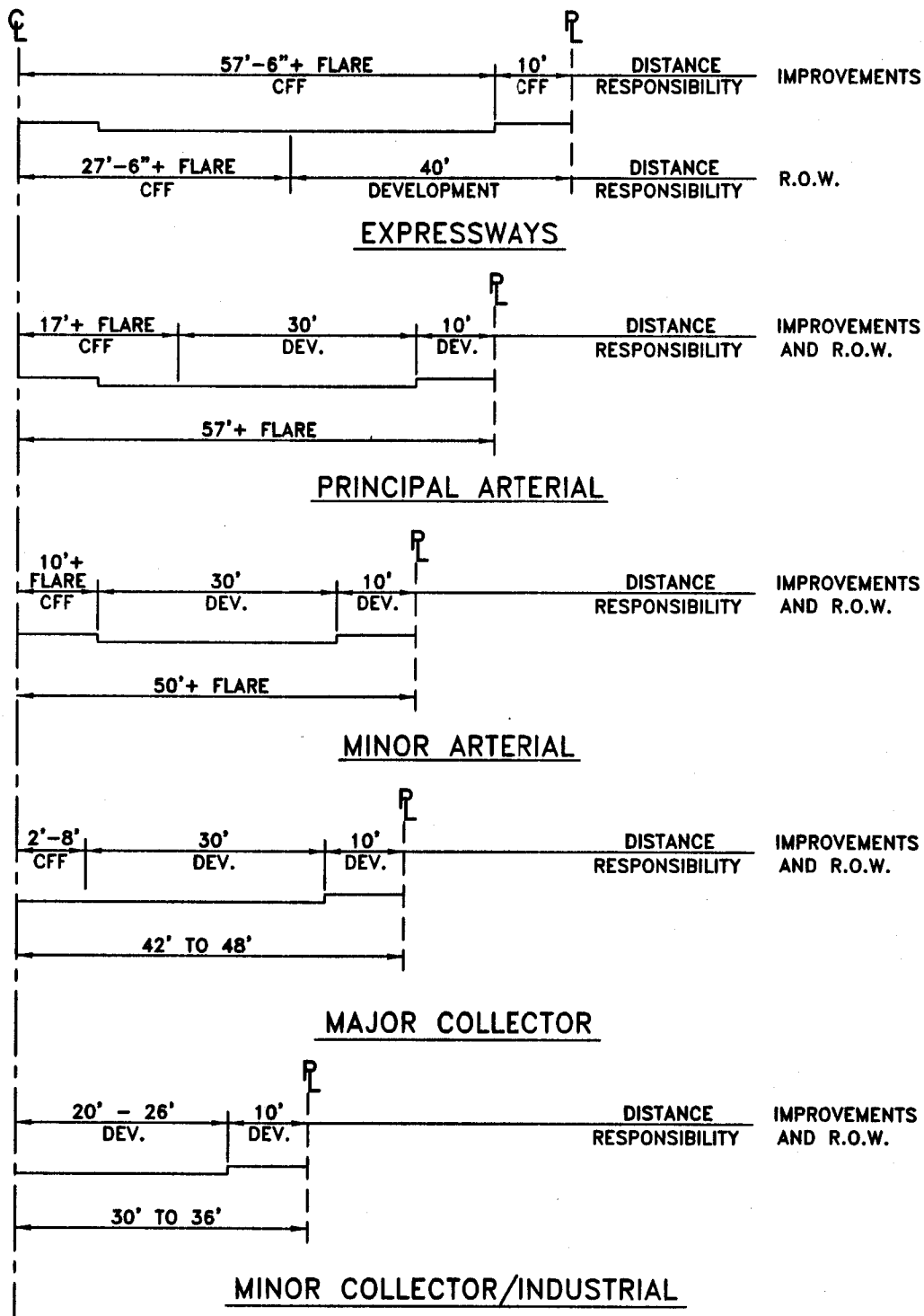
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

323



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RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
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AND TRANSPORTATION

STREETS

STREET EXACTIONS POLICY

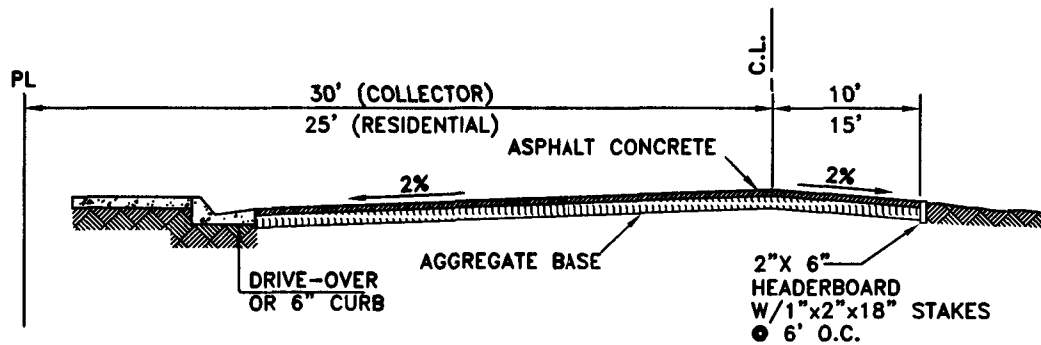
ENGINEERING & TRANSPORTATION
DEPARTMENT



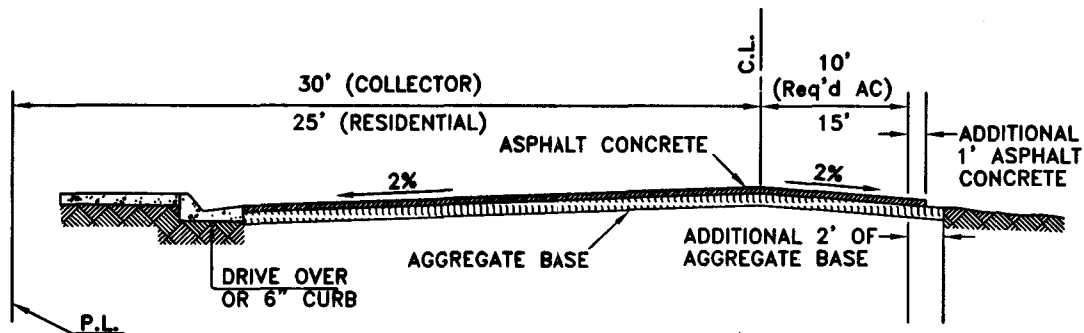
CITY of MODESTO

DETAIL NO.

323A



SECTION



ALTERNATIVE SECTION

NOTE:

1. THE PART-WIDTH STREET IS ONLY PERMITTED ON A FRONTAGE WHERE THE DEVELOPER DOES NOT HAVE OWNERSHIP OR CONTROL OF THE RIGHT OF WAY FOR A FULL WIDTH STREET IMPROVEMENT.
2. THE ALTERNATIVE SECTION CONSISTS OF AN ADDITIONAL WIDTH OF 1' OF ASPHALT CONCRETE AND 2' OF AGGREGATE BASE AT THE SAME DEPTH AND COMPACTION AS THE REST OF THE STREET.
3. WHEN THE REMAINING STREET SECTION IS CONSTRUCTED, THE AC MUST BE SAW-CUT IN A STRAIGHT LINE, BACK TO A POINT SUCH THAT THE STREET SECTION IS STABLE, AS REQUIRED BY THE CITY ENGINEER.

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RESOLUTION NO. 2001-560

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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

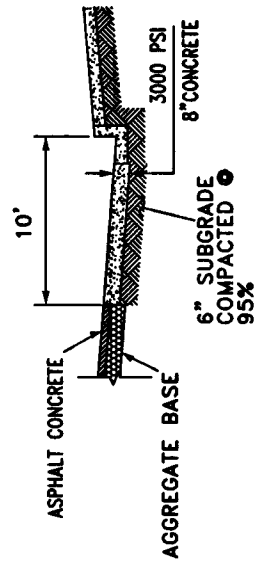
PART-WIDTH STREET SECTION

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
324



SECTION A-A
NTS

NOTES:

1. NO EXTRA SHELTER PAD NEEDED FOR SIDEWALKS WIDER THAN 10'.
2. SHELTER PAD & SHELTERS MUST BE WIDE ENOUGH TO MEET ADA REQUIREMENTS' 40"x30" CLEAR FLOOR AREA WITHIN SHELTER PERIMETER.

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RESOLUTION NO. 2001-560

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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

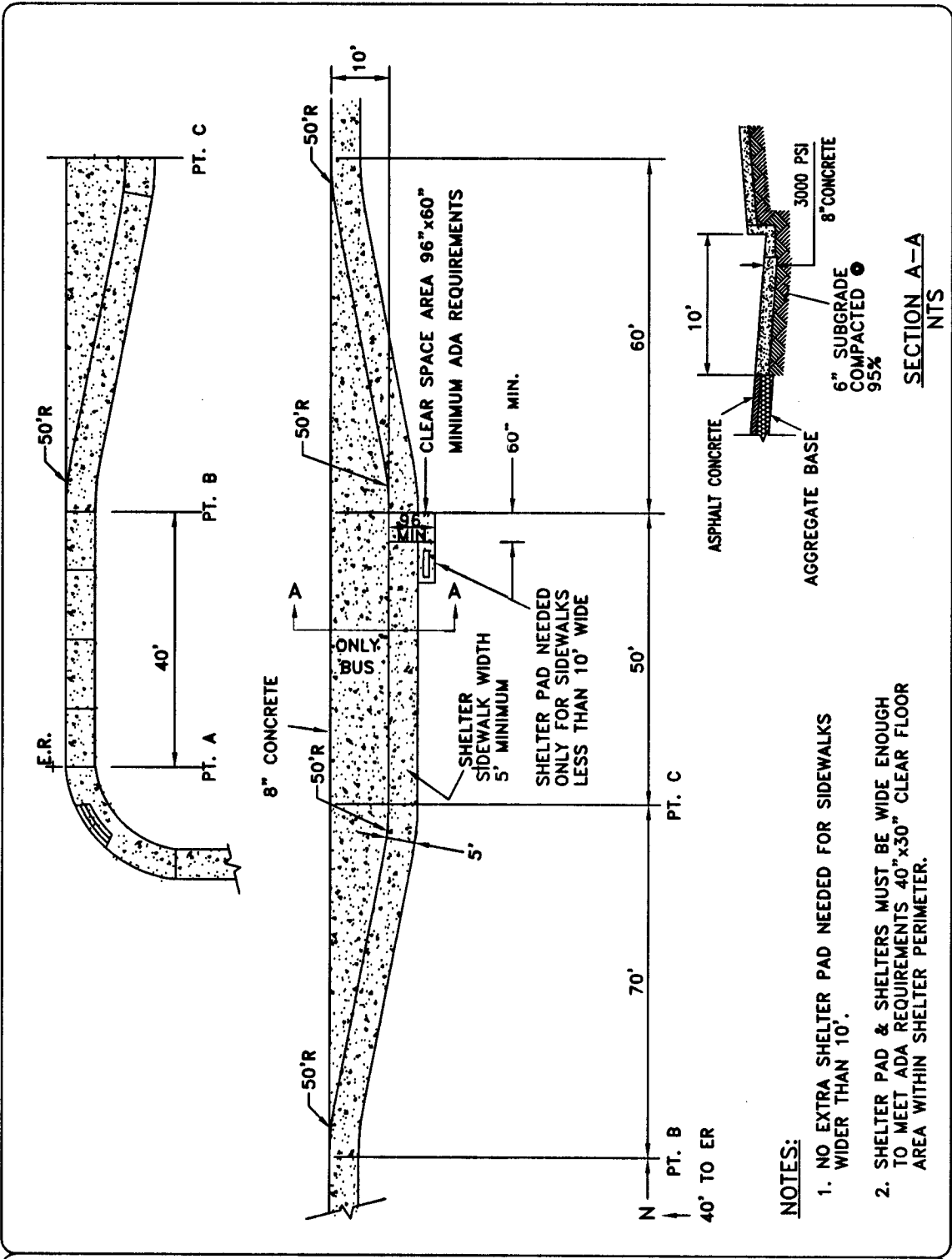
MID BLOCK BUS TURNOUT

**ENGINEERING & TRANSPORTATION
DEPARTMENT**

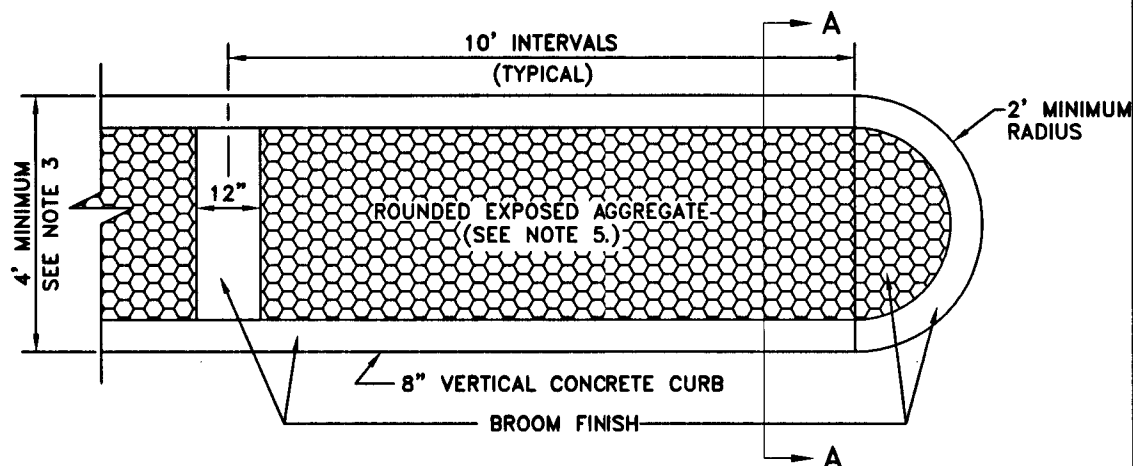


CITY of MODESTO

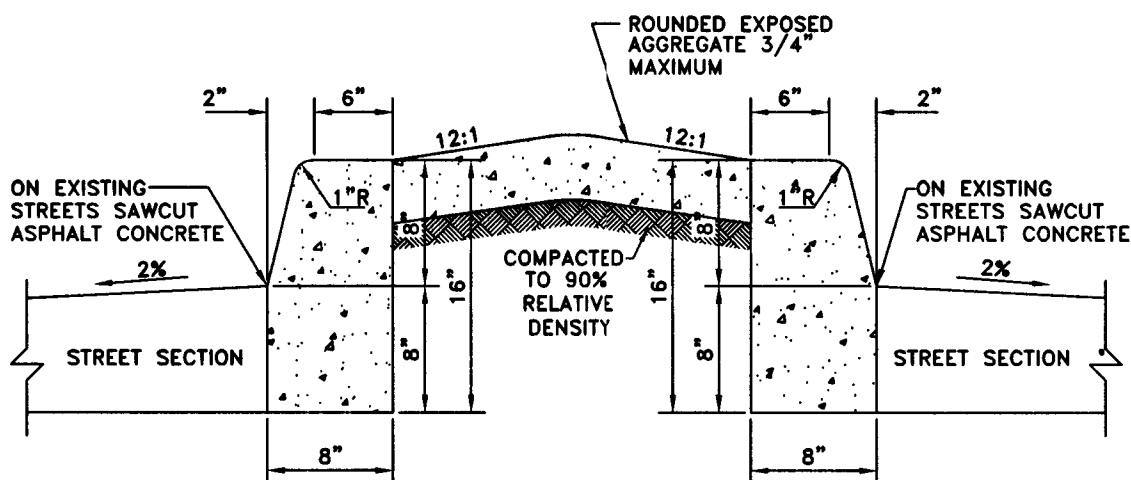
DETAIL NO.
325



APPROVED BY CITY COUNCIL RESOLUTION NO. 2001-560	STREETS FARSIDE BUS TURNOUT	 CITY of MODESTO
ORIGINAL APPROVED BY THE DIRECTOR OF ENGINEERING AND TRANSPORTATION	ENGINEERING & TRANSPORTATION DEPARTMENT	DETAIL NO. 326



PLAN



SECTION A-A

NOTES:

1. ON LANDSCAPED MEDIANS, CURB SHALL EXTEND TO BOTTOM OF AGGREGATE BASE.
2. PROVIDE WEAKENED PLANE JOINTS IN ACCORDANCE WITH CONSTRUCTION STANDARDS (3.05B) AND AT END OF RETURNS.
3. MEDIANS GREATER THAN 6 -FEET SHALL BE LANDSCAPED.
4. MEDIANS SHALL BE CONTINUOUS FROM START AT AN INTERSECTION FOR A MINIMUM DISTANCE OF 300 FEET. ALL DRIVEWAYS WITHIN THIS DISTANCE SHALL BE RIGHT-IN AND RIGHT-OUT ONLY. MEDIANS SHALL EXTEND A MINIMUM OF 100 FEET FROM THE FURTHEST EDGE OF ANY DRIVEWAY LOCATED WITHIN THE FIRST 300 FEET OF A STREET MEASURED FROM THE START POINT OF THE MEDIAN AT AN INTERSECTION.
5. MEDIANS ON PRINCIPAL ARTERIALS AND ABOVE AND LESS THAN 6-FEET IN WIDTH SHALL BE PAVED WITH COLORED STAMPED CONCRETE WITHOUT 12-INCH BROOM FINISH AREAS.

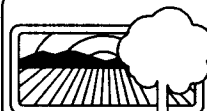
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

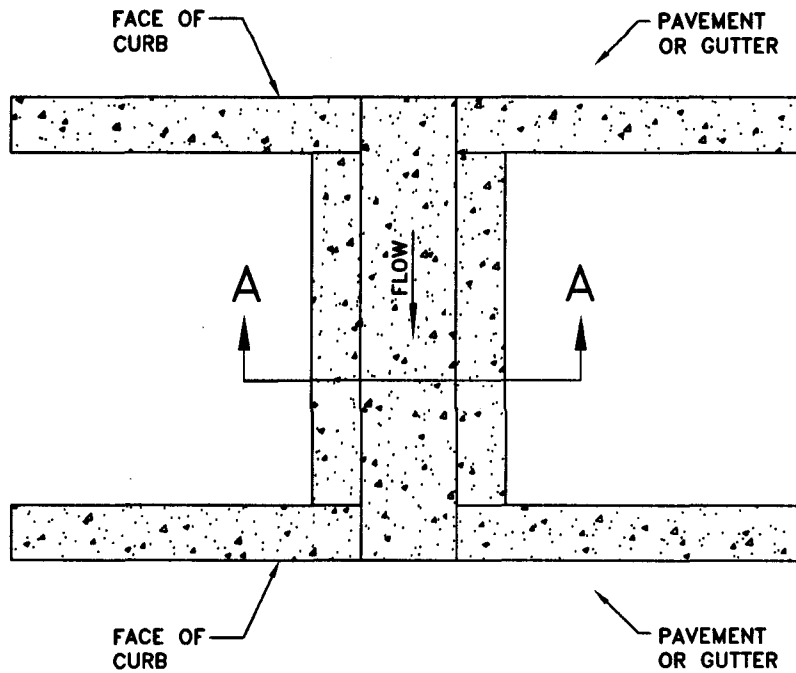
**MEDIAN
DETAIL**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**

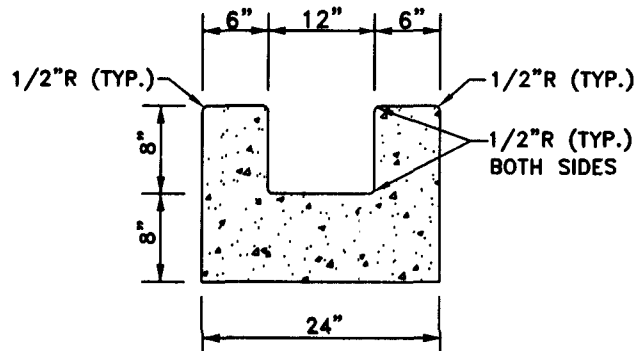


CITY of MODESTO

DETAIL NO.
328



PLAN
NTS



SECTION A-A
NTS

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

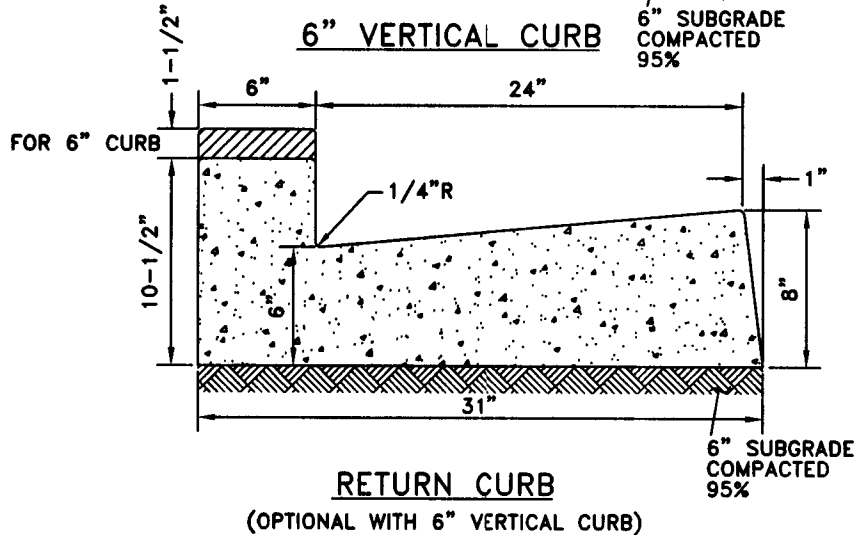
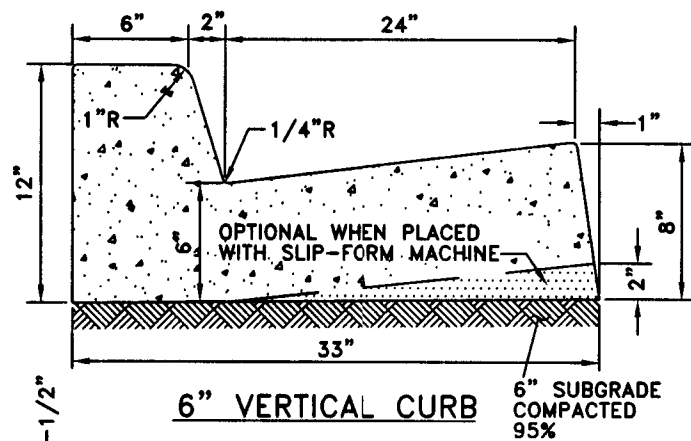
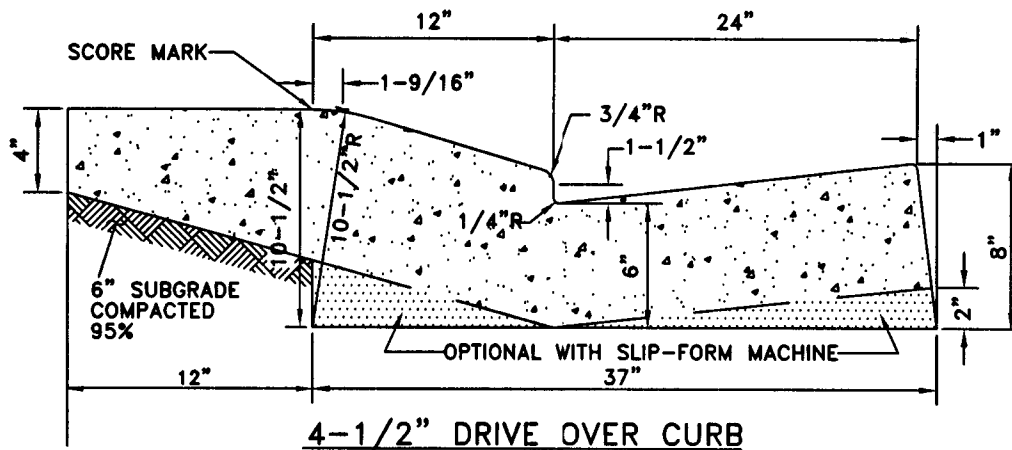
**THRU DRAIN
DETAIL FOR MEDIANS**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
329



NOTE:

6" OF SUBGRADE SHALL BE COMPACTED TO 92% AT 3% OPTIMUM MOISTURE CONTENT PRIOR TO PLACEMENT OF CONCRETE.

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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

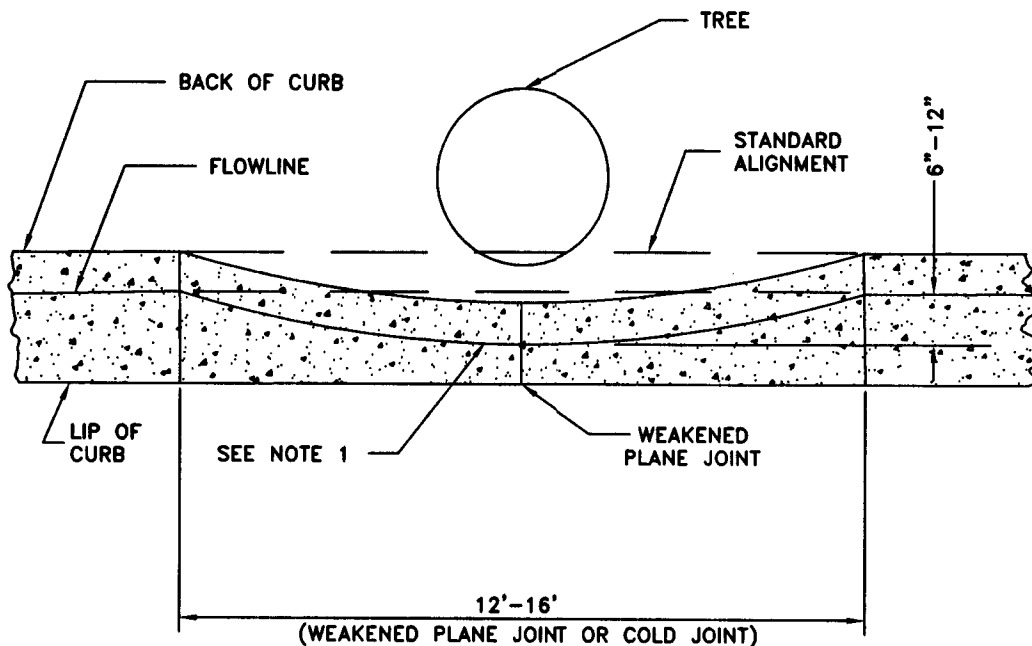
STREETS

**CURB
SECTIONS**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



DETAIL NO.
330



NOTES:

1. CURB ALIGNMENT SHALL BE MODIFIED WITH FLOWLINE GRADE MAINTAINED.
2. TREE ROOTS ARE TO BE CUT AT EDGE OF WALK TO 10" BELOW FINISH GRADE, AS DETERMINED BY THE CITY ENGINEER.

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RESOLUTION NO. 2001-560

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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

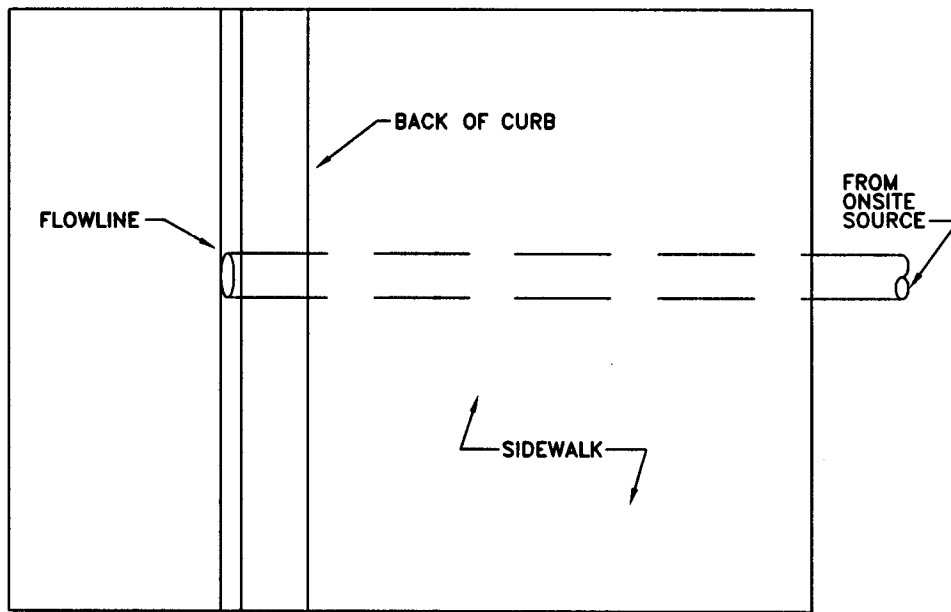
**CURB MODIFICATION
FOR EXISTING TREE**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



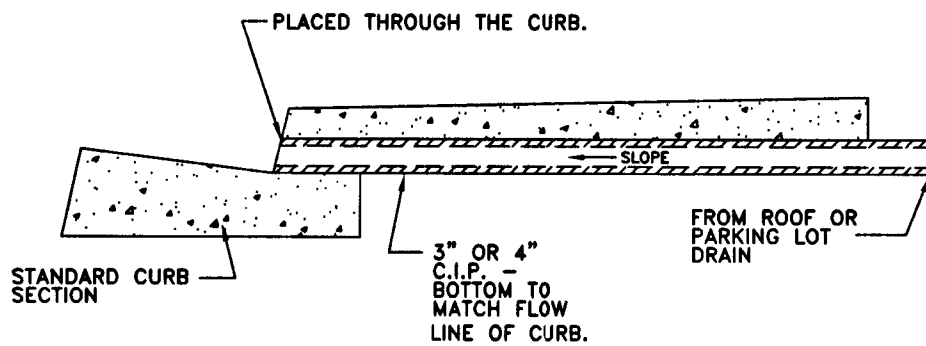
CITY of MODESTO

DETAIL NO.
331



FIBERMESH OR WIRE MESH
TO BE ADDED TO THE CONCRETE

PLAN



SECTION

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RESOLUTION NO. 2001-560

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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

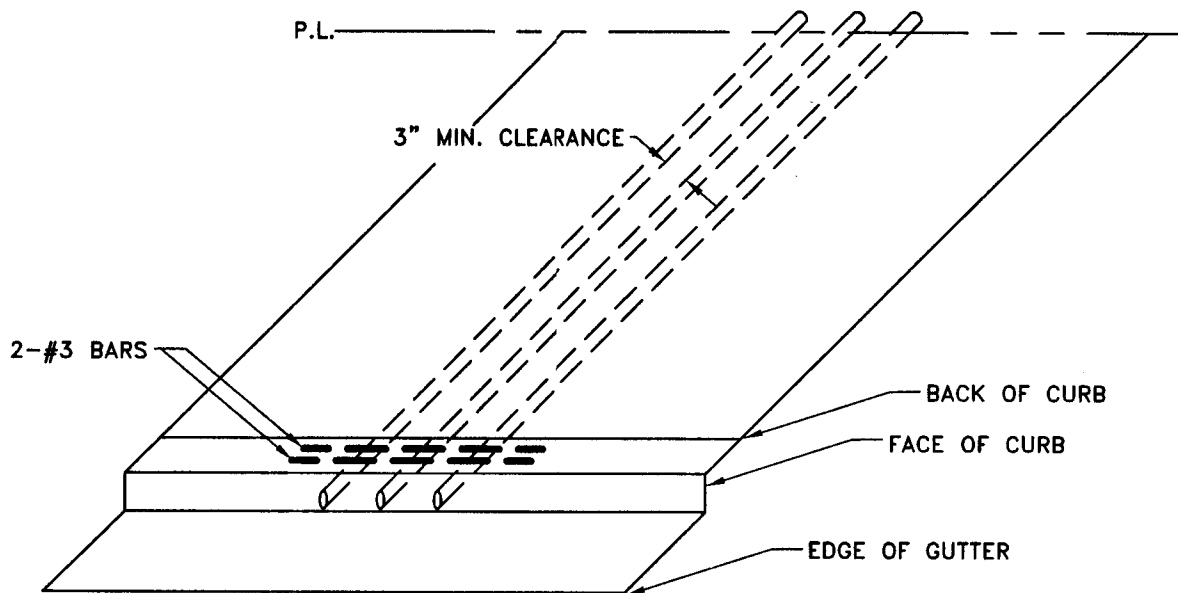
CURB DRAIN
UNDER SIDEWALK

ENGINEERING & TRANSPORTATION
DEPARTMENT

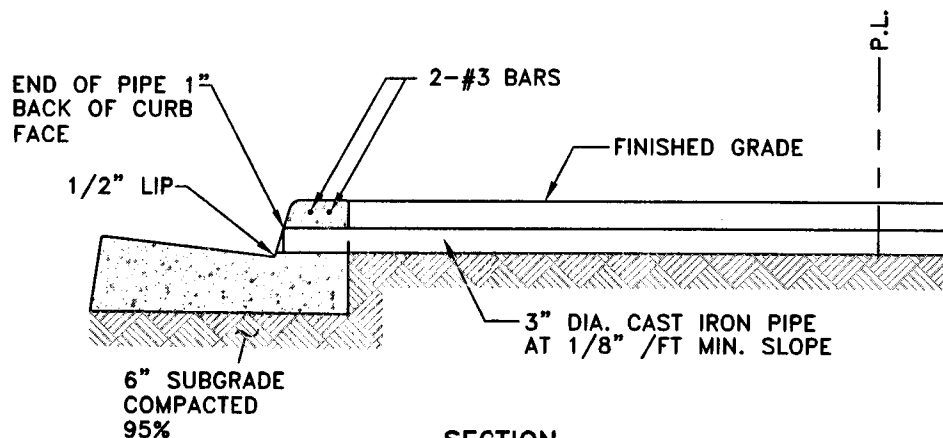


CITY of MODESTO

DETAIL NO.
332



PLAN



SECTION

NOTES:

1. PIPES WILL NOT BE MAINTAINED BY THE CITY.
2. ANGLE AT 90° TO CURB UNLESS APPROVED BY CITY ENGINEER.
3. THE NUMBER OF PIPES AT ANY LOCATION SHALL NOT EXCEED 4.
4. LAY FIBER MESH OR WIRE MESH REINFORCEMENT OVER DRAIN PIPES PRIOR TO CONCRETE POUR FOR SIDEWALK.

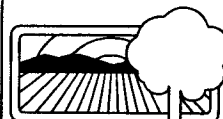
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

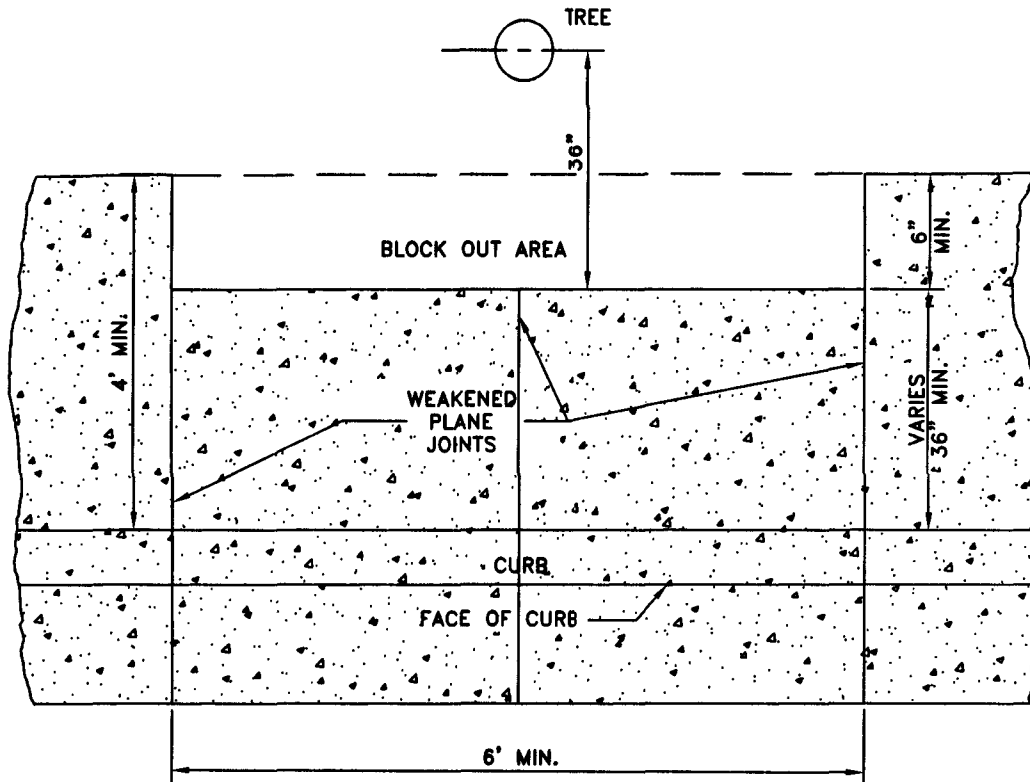
**CURB DRAIN UNDER
SIDEWALK (MULTIPLE)**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
333



NOTES:

1. TREE ROOTS ARE TO BE CUT AT EDGE OF WALK TO 10" BELOW FINISH GRADE, AS DETERMINED BY THE CITY ENGINEER.
2. IF TREE IS 6" OR LESS IN DIAMETER (20" GIRTH) AND IT'S CENTER IS 12" - 36" FROM BACK EDGE OF FULL WALK, PLACE CONCRETE IN BLOCK-OUT AREA, WITH COLD JOINTS OR REDWOOD STRIPS AT THE EDGES (SEE DETAIL #337).

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AND TRANSPORTATION

STREETS

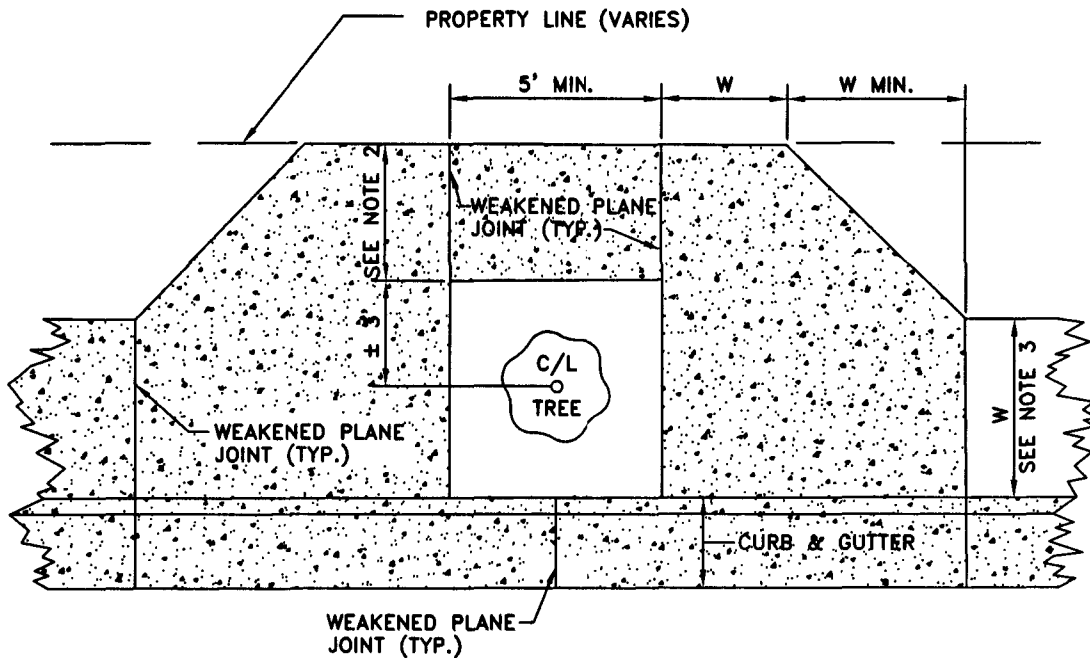
**SIDEWALK MODIFICATION
FOR TREE AT
PROPERTY LINE**

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
334



NOTES:

1. TREE ROOTS ARE TO BE CUT AT EDGE OF WALK TO 10" BELOW FINISH GRADE, AS DETERMINED BY THE CITY ENGINEER.
2. THE DISTANCE BETWEEN THE BACK OF THE TREE BLOCK-OUT AND THE BACK OF THE SIDEWALK SHALL BE A MINIMUM OF 36" IN R-1 AND R-2 ZONES AND A MINIMUM OF 60" IN ALL OTHER ZONES, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
3. W = PROPOSED OR EXISTING SIDEWALK WIDTH.

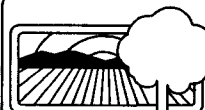
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RESOLUTION NO. 2001-560

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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

**SIDEWALK MODIFICATION
FOR TREE AT CURB**

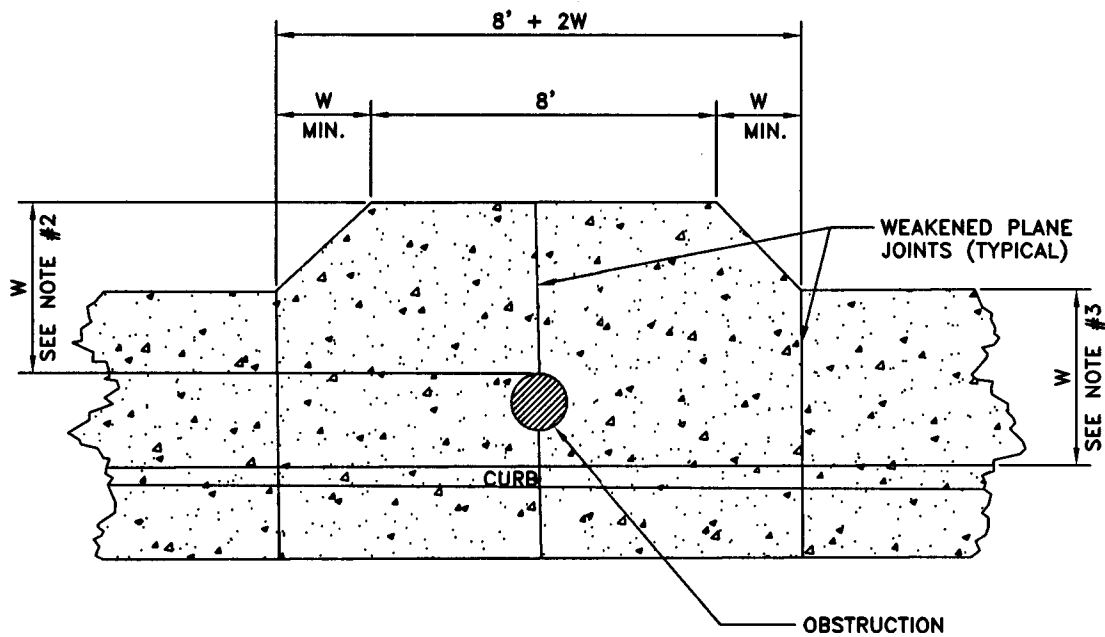
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

335



NOTES:

1. NO WIDENING IS NEEDED WHEN SPACE BETWEEN BACK OF CURB AND FACE OF OBSTRUCTION IS 36" OR MORE.
2. BACK OF WIDENED SIDEWALK SHALL REMAIN WITHIN THE STREET RIGHT OF WAY.
3. W = PROPOSED OR EXISTING SIDEWALK WIDTH.

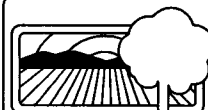
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RESOLUTION NO. 2001-560

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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

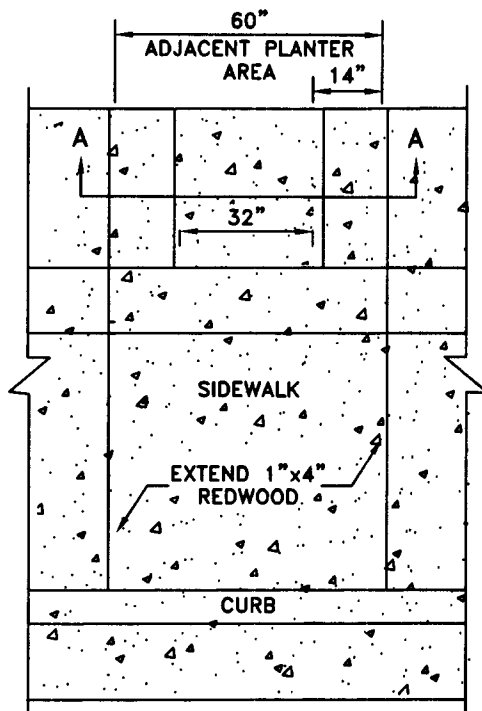
**SIDEWALK WIDENING
FOR OBSTRUCTIONS**

ENGINEERING & TRANSPORTATION
DEPARTMENT

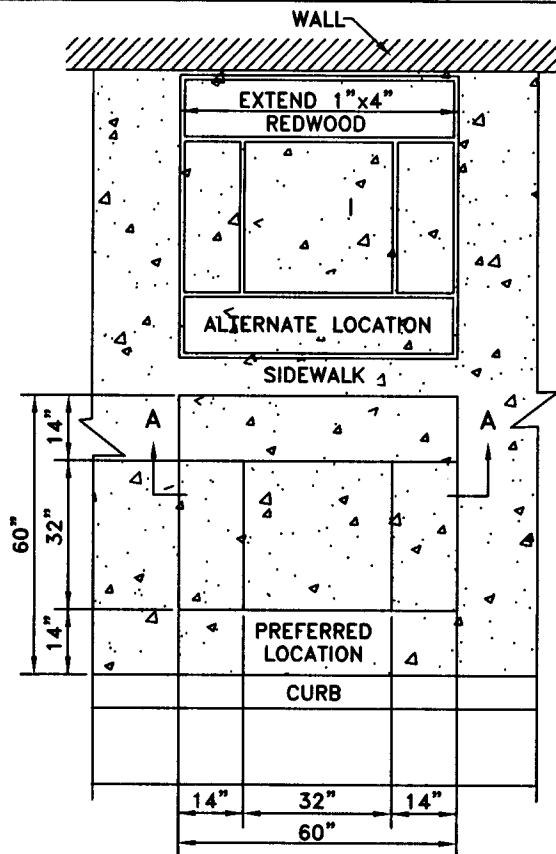


CITY of MODESTO

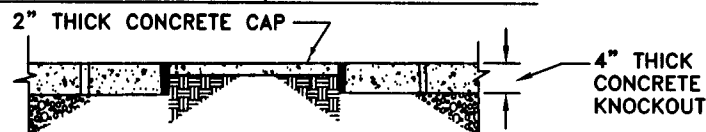
DETAIL NO.
336



SIDEWALK WITH ADJACENT LANDSCAPING
PLAN



SIDEWALK WITH ADJACENT
ACCESS WALLS OR BUILDINGS
PLAN



SECTION A-A

NOTES:

1. BLOCK-OUTS SHALL BE SPACED AT 40' INTERVALS (APPROXIMATELY).
2. THE URBAN FORESTRY SUPERINTENDENT SHALL DETERMINE THE FINAL PLACEMENT OF STREET TREE BLOCK-OUTS AND MUST BE CONTACTED AT 342-2249 AT LEAST 24 HOURS PRIOR TO PLACEMENT OF CONCRETE WALKWAYS OR DRIVEWAYS.
3. USE 1" X 4" REDWOOD OR CEDAR FORMS.
4. THOSE AREAS THAT HAVE EXISTING STREET IMPROVEMENTS AND EXISTING STREET TREES ON ADJACENT PARCELS SHALL BE EVALUATED ON AN INDIVIDUAL BASIS BY THE URBAN FORESTRY SUPERINTENDENT PRIOR TO INSTALLATION OF THE TREE BLOCK-OUT.
5. IN COMMERCIAL AREAS, TREES MAY BE REQUIRED TO BE LOCATED AT THE BACK OF SIDEWALK AS DIRECTED BY THE ENGINEER, ON A CASE BY CASE BASIS. IN SUCH CASES, A PLANTING EASEMENT CAN BE REQUIRED AT THE BACK OF SIDEWALK.

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STREETS

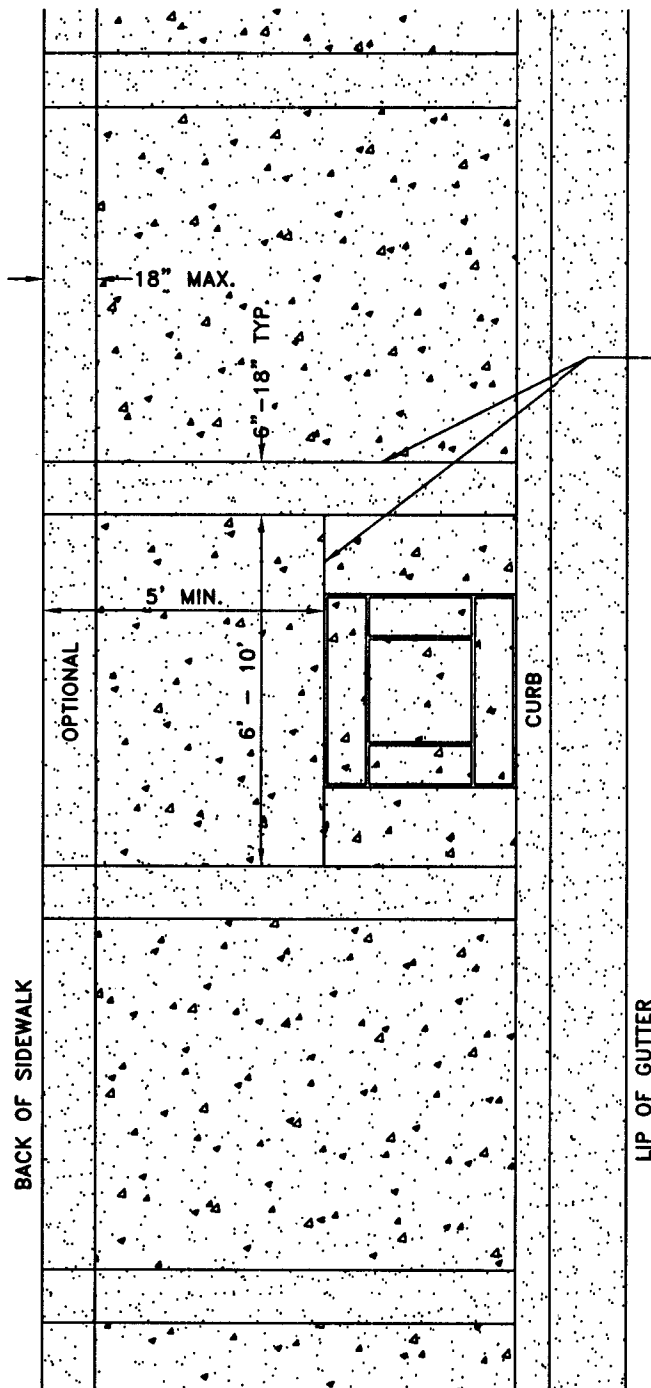
**TREE BLOCK OUTS
FOR FULL WIDTH
SIDEWALK**

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
337



EXPOSED AGGREGATE
FINISH



STANDARD CONCRETE
FINISH

WEAKENED PLANE
OR COLD JOINT
(TYPICAL)

NOTES:

1. FOR FULL WALK EXPANSION,
MATERIAL SHALL BE PLACED
ADJACENT TO STRUCTURE.
2. FOR ALTERNATE LOCATION OF
BLOCK OUT, SEE DETAIL
NO. 337.

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STREETS

CONCRETE AND
AGGREGATE SIDEWALK

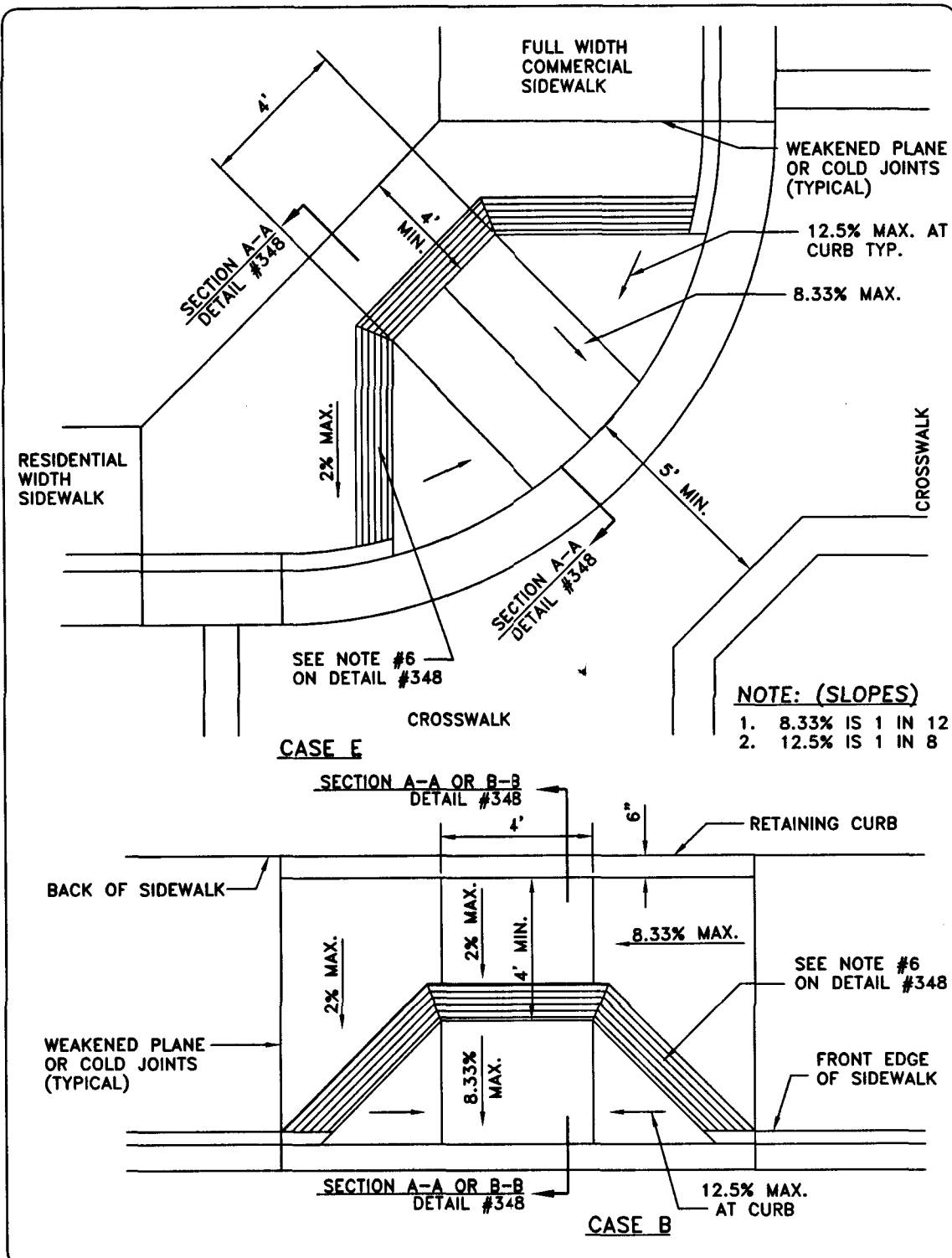
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

342



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RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
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AND TRANSPORTATION

STREETS

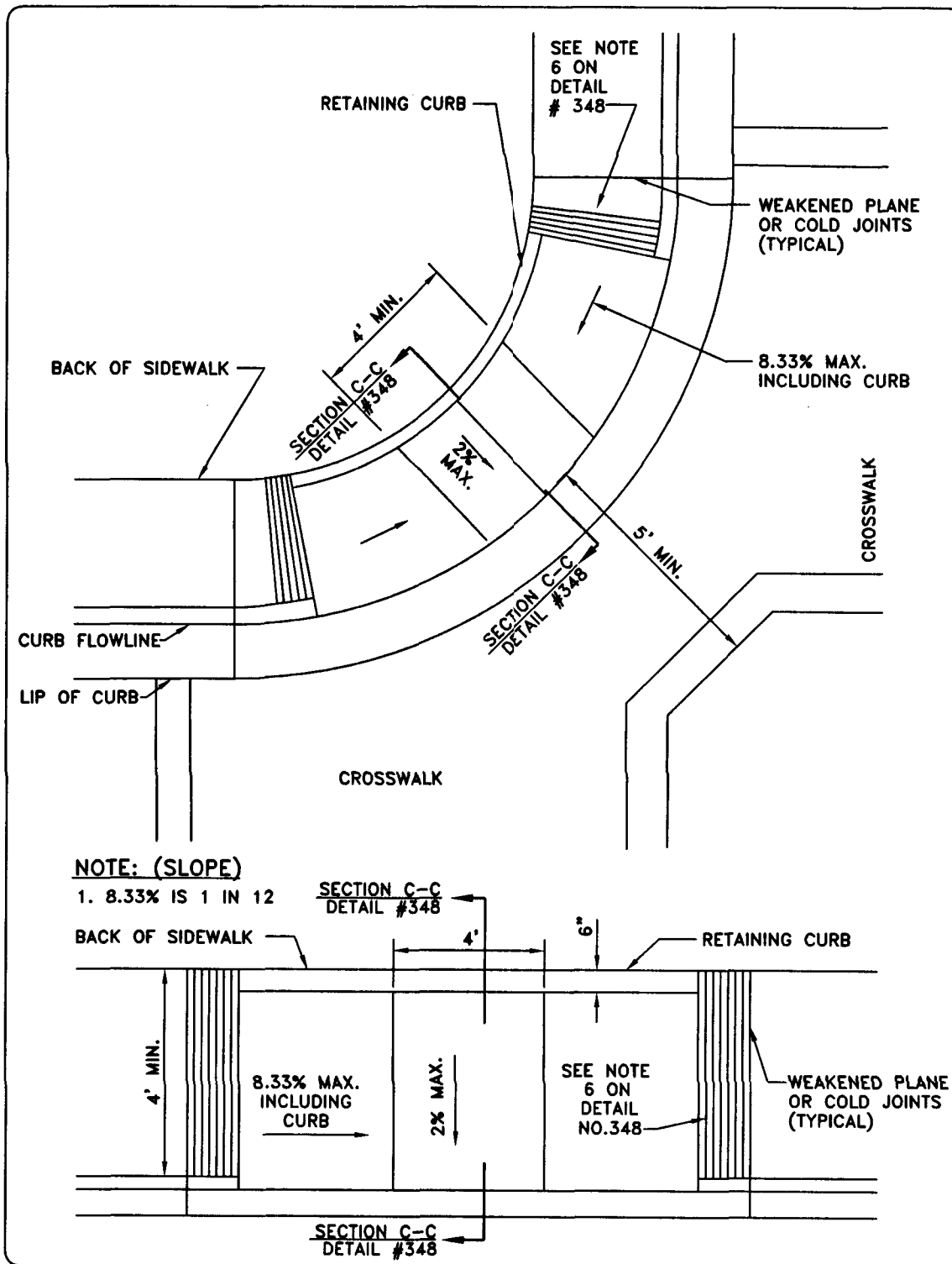
CURB RAMP CASE B & CASE E

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
345



APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
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AND TRANSPORTATION

STREETS

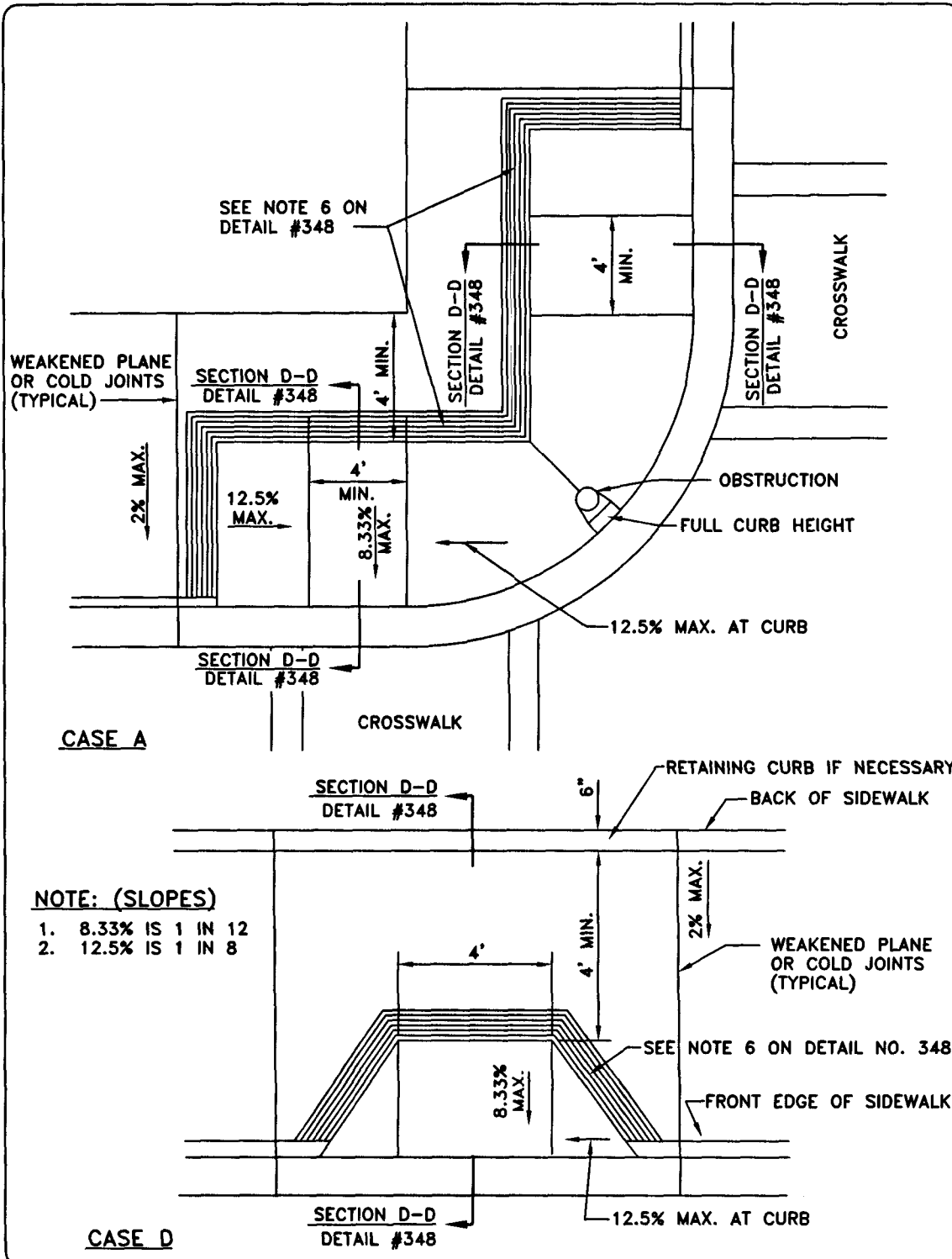
CURB RAMP CASE C

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
346



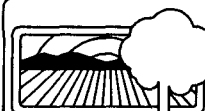
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
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AND TRANSPORTATION

STREETS

CURB RAMP CASE A AND CASE D

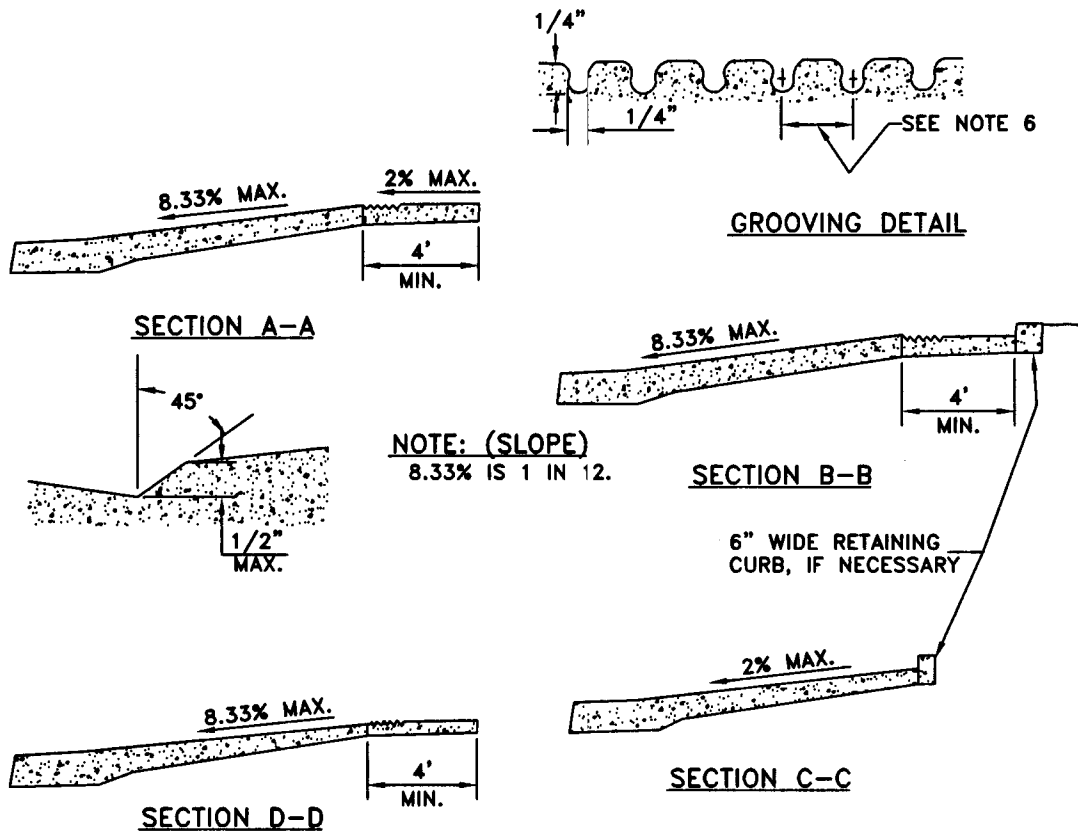
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

347



NOTES:

1. THE LOWER END OF EACH RAMP SHALL BE FLUSH WITH GUTTER FLOWLINE
2. IF DISTANCE FROM CURB TO BACK OF SIDEWALK IS TOO SHORT TO ACCOMMODATE RAMP AND 4' PLATFORM AS IN CASE, THE SIDEWALK MAY BE DEPRESSED LONGITUDINALLY AS IN CASE B OR C OR MAY BE WIDENED AS IN CASE D.
3. IF SIDEWALK IS LESS THAN 5' WIDE, THE FULL WIDTH OF THE SIDEWALK SHALL BE DEPRESSED AS SHOWN IN CASE C.
4. WHEN RAMP IS LOCATED IN CENTER OF CURB RETURN, CROSSWALK CONFIGURATION MUST BE SIMILAR TO THAT SHOWN ON THE PLAN TO ACCOMMODATE WHEELCHAIRS.
5. IF LOCATED ON A CURVE, THE SIDES OF THE RAMP NEED NOT BE PARALLEL, BUT THE MINIMUM WIDTH OF THE RAMP SHALL BE 4'.
6. THE RAMP SHALL HAVE A 12" WIDE BORDER WITH 1/4" GROOVES APPROXIMATELY 3/4" O.C. (SEE GROOVING DETAIL). THE SURFACE OF THE RAMP SHALL HAVE A TRANSVERSE BROOMED SURFACE TEXTURE ROUGHER THAN THE SURROUNDING SIDEWALK EXCEPT WHEN LOCATED IN THE CENTER OF CURB RETURN.
7. SEE DETAIL #349 FOR ADDITIONAL INFORMATION.

APPROVED BY CITY COUNCIL
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STREETS

**CURB RAMP
NOTES AND DETAILS**

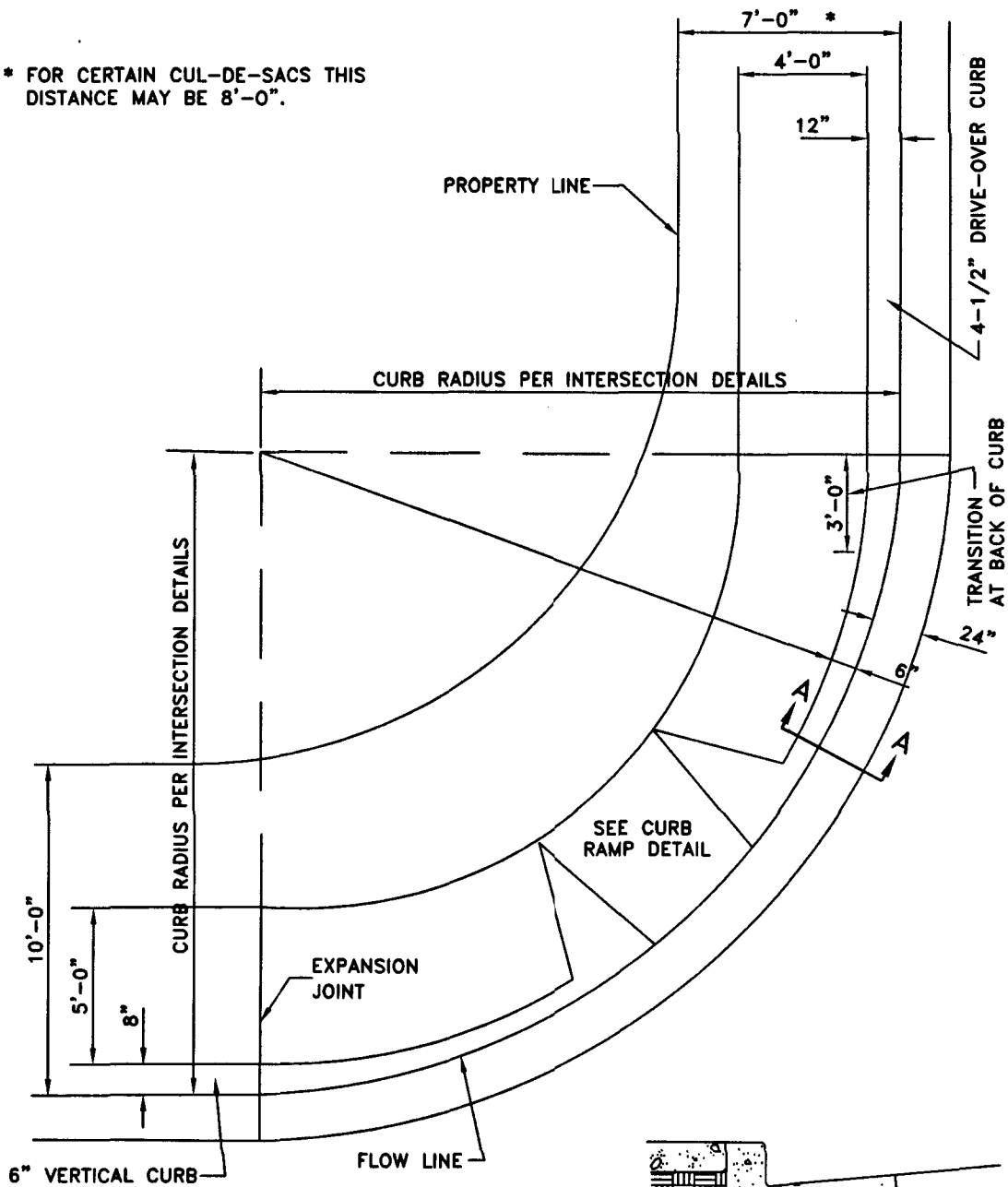
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
348

* FOR CERTAIN CUL-DE-SACS THIS DISTANCE MAY BE 8'-0".



NOTE:

DRIVE APPROACHES SHALL NOT ENCROACH IN RETURNS.

4-1/2" OR 6" RETURN CURB
SECTION A-A

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AND TRANSPORTATION

STREETS
CURB & SIDEWALK
RETURNS
WITH TRANSITIONS

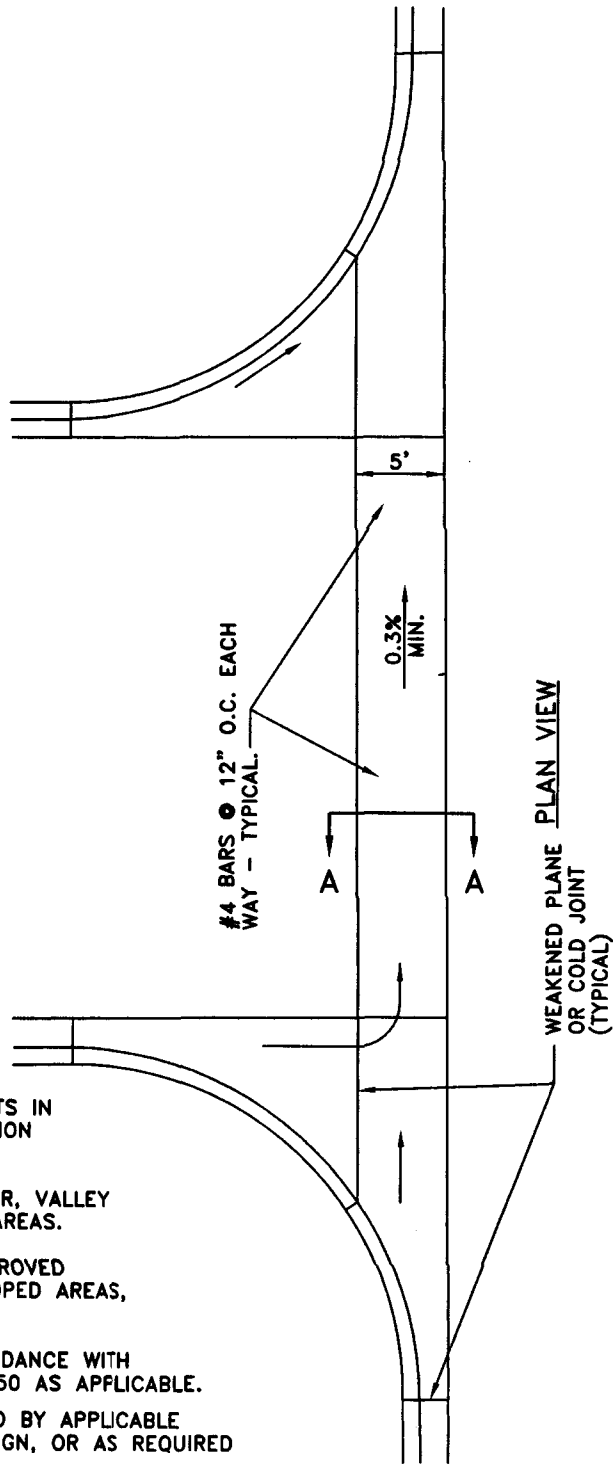
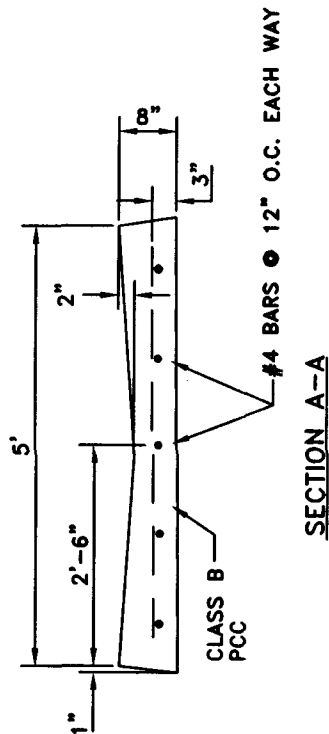
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

349



NOTES:

1. ADDITIONAL WEAKENED PLANE JOINTS IN ACCORDANCE WITH THE CONSTRUCTION STANDARDS (SECTION 3.05 B).
2. IF APPROVED BY THE CITY ENGINEER, VALLEY GUTTER MAY BE USED IN IN-FILL AREAS.
3. VALLEY GUTTERS WILL NOT BE APPROVED ACROSS STREETS IN NEWLY DEVELOPED AREAS, EXCEPT CUL-DE-SACS.
4. CONSTRUCT CURB RAMPS IN ACCORDANCE WITH CURB RAMP DETAILS #345 THRU 350 AS APPLICABLE.
5. SPECIFY CURB RADIUS AS REQUIRED BY APPLICABLE STANDARD DETAIL FOR STREET DESIGN, OR AS REQUIRED BY CITY ENGINEER.

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STREETS

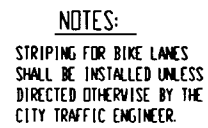
VALLEY
GUTTER

ENGINEERING & TRANSPORTATION
DEPARTMENT

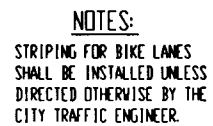


CITY of MODESTO

DETAIL NO.
351

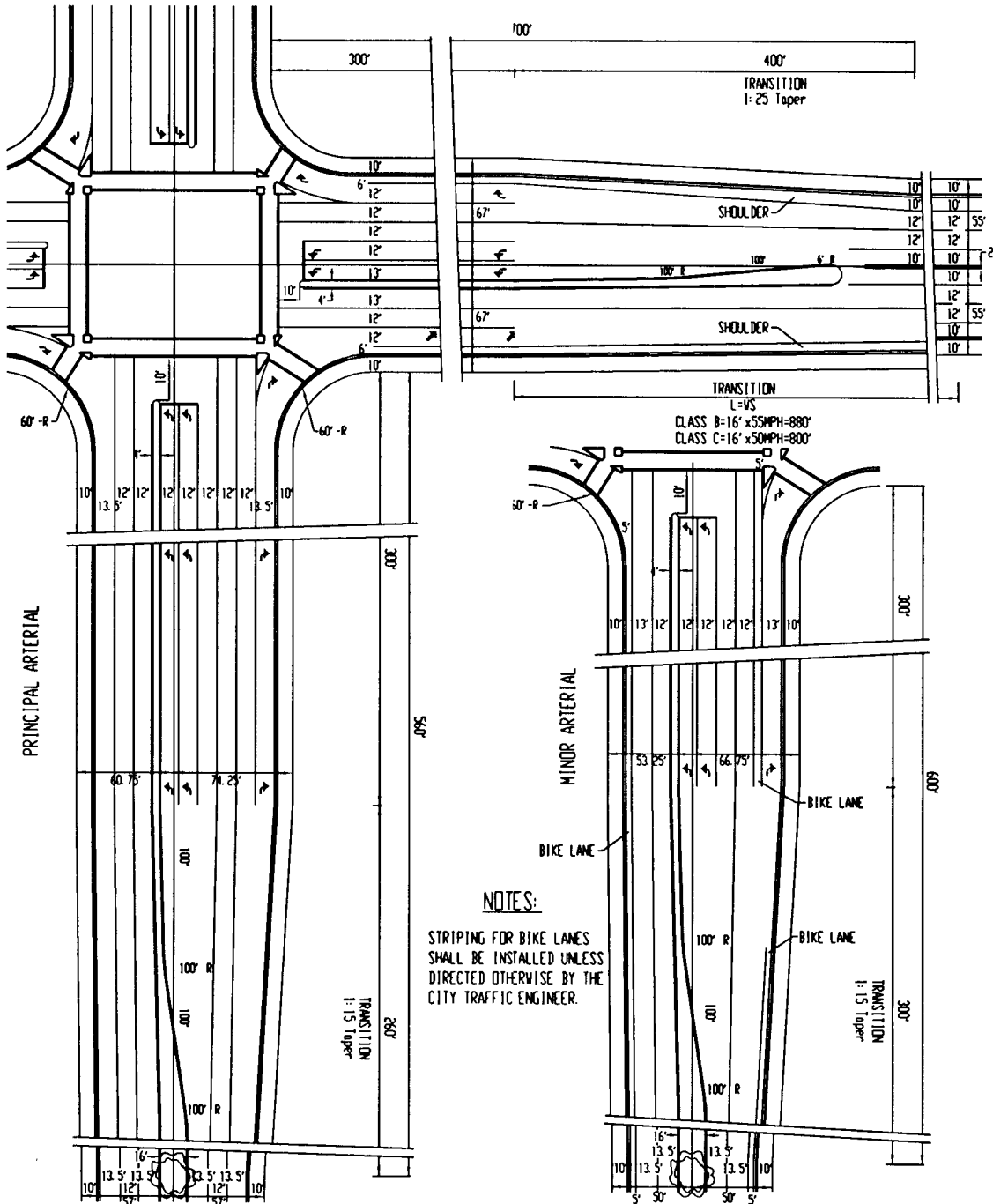


353



DETAIL NO.
354

CLASS B & C 4-LANE
EXPRESSWAY



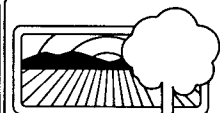
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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

STREETS

CLASS B & C 4-LANE
EXPRESSWAY AT A
PRINCIPAL AND MINOR ARTERIAL

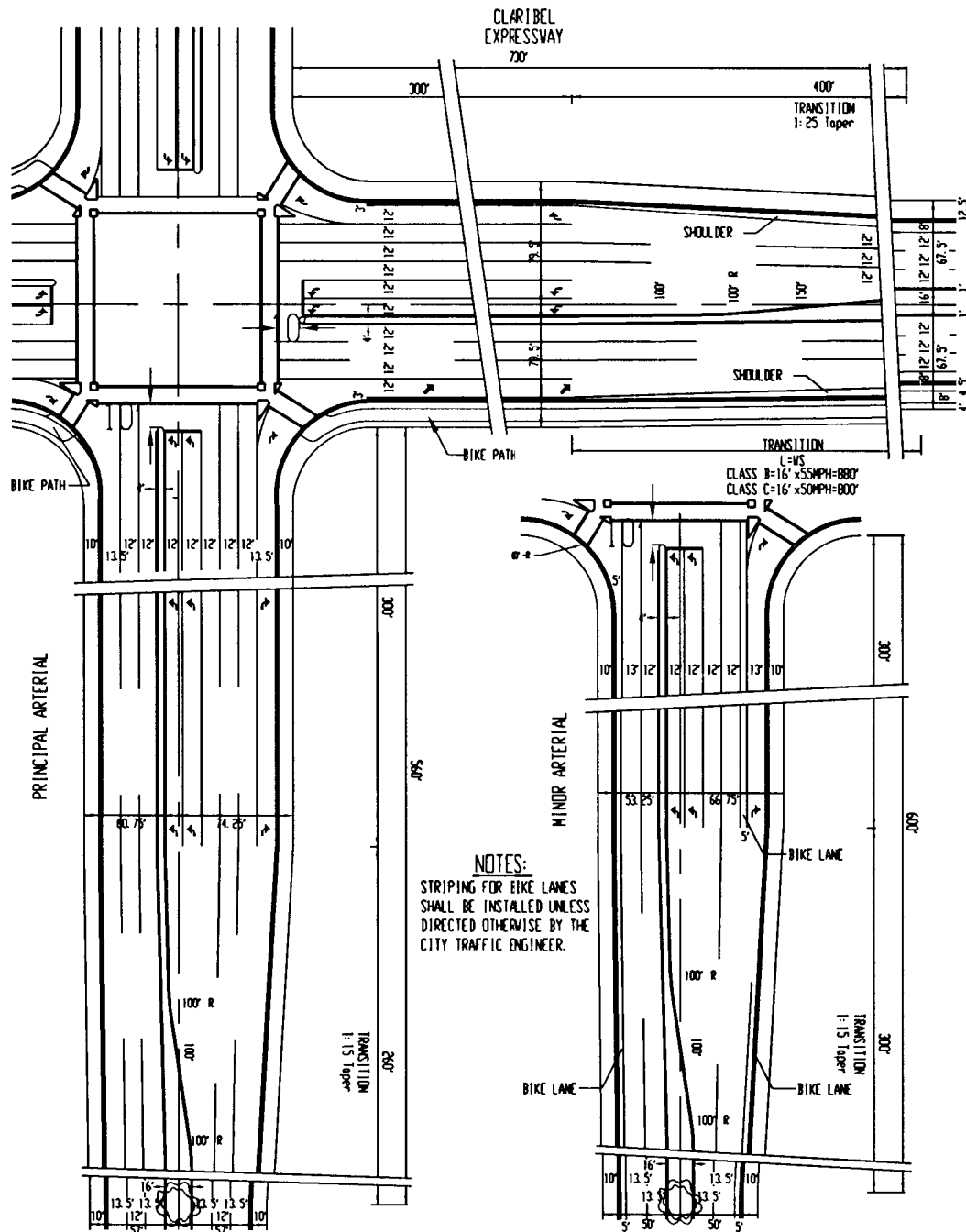
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

355



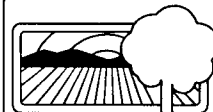
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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

STREETS

CLARIBELL EXPRESSWAY

ENGINEERING & TRANSPORTATION
DEPARTMENT

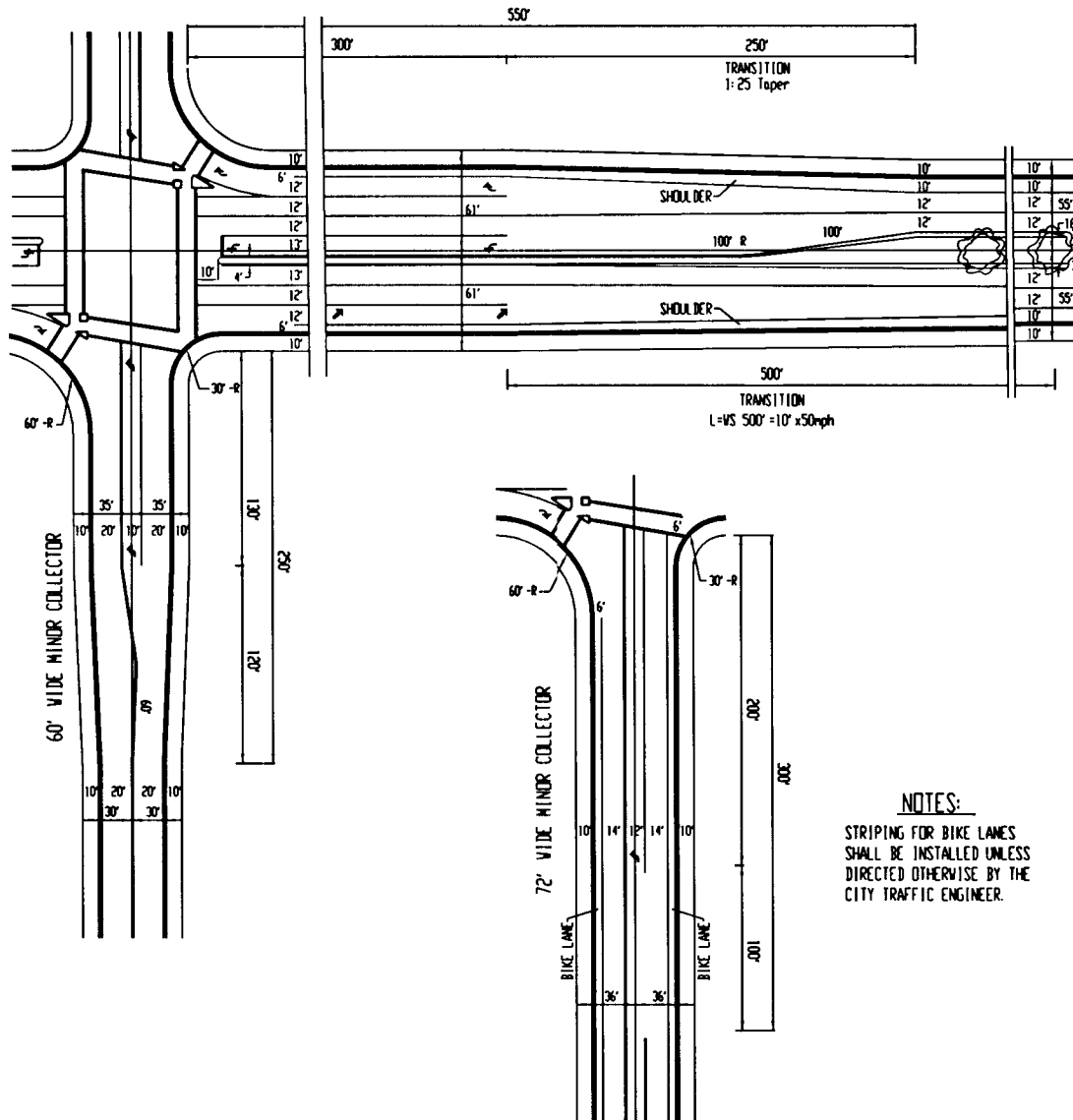


CITY of MODESTO

DETAIL NO.

355A

CLASS C 4-LANE
LANDSCAPED EXPRESSWAY



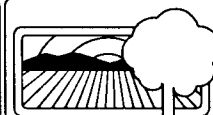
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

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AND TRANSPORTATION

STREETS

CLASS C 4-LANE
LANDSCAPED EXPRESSWAY AT A
MINOR COLLECTOR

ENGINEERING & TRANSPORTATION
DEPARTMENT

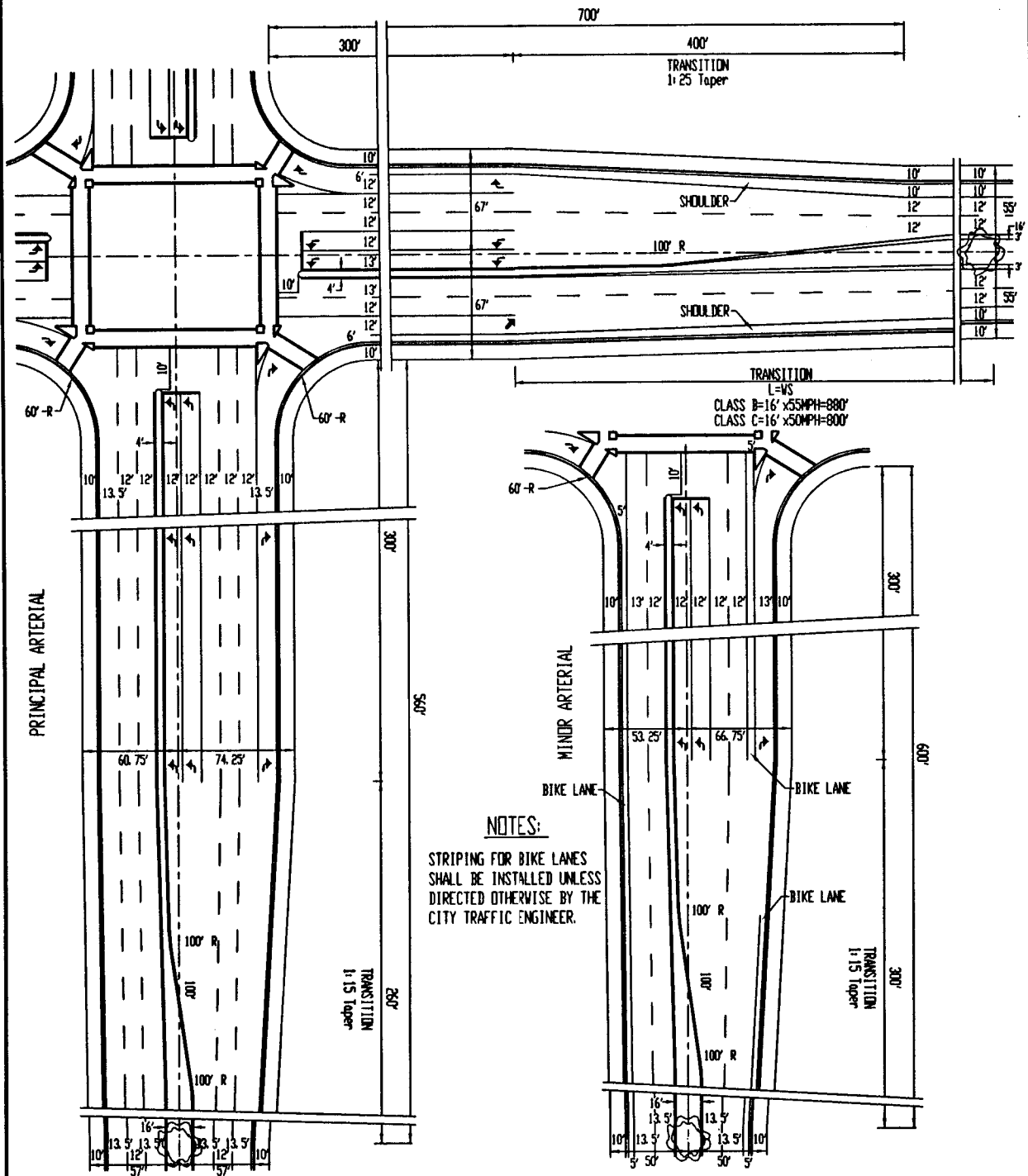


CITY of MODESTO

DETAIL NO.

356

CLASS B & C 4-LANE
LANDSCAPED EXPRESSWAY



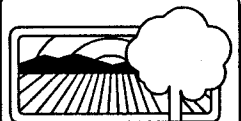
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

CLASS B & C 4-LANE
LANDSCAPED EXPRESSWAY AT A
PRINCIPAL AND MINOR ARTERIAL

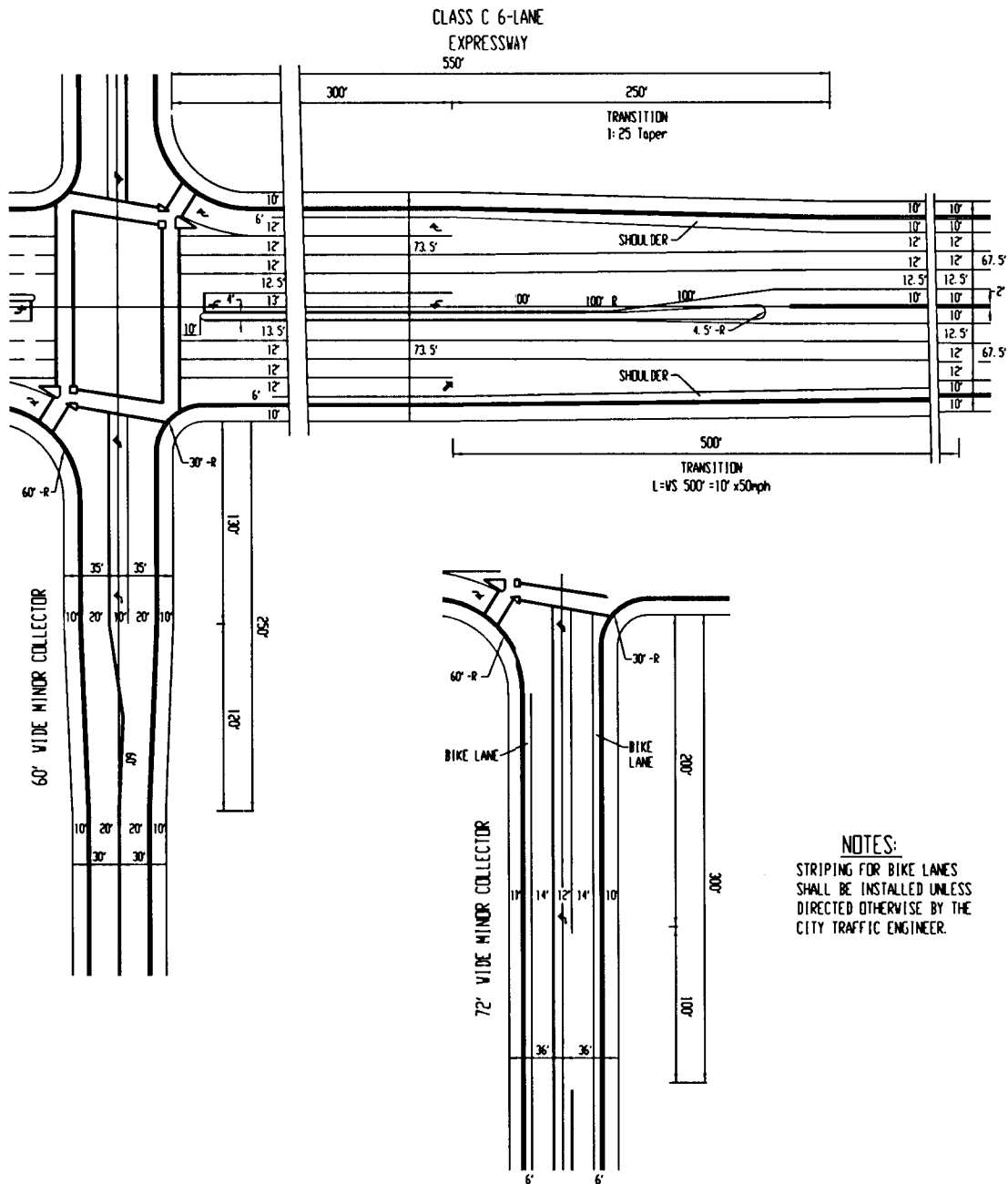
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

357



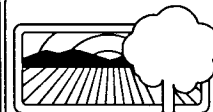
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STREETS

CLASS C 6-LANE EXPRESSWAY AT A MINOR COLLECTOR

ENGINEERING & TRANSPORTATION
DEPARTMENT

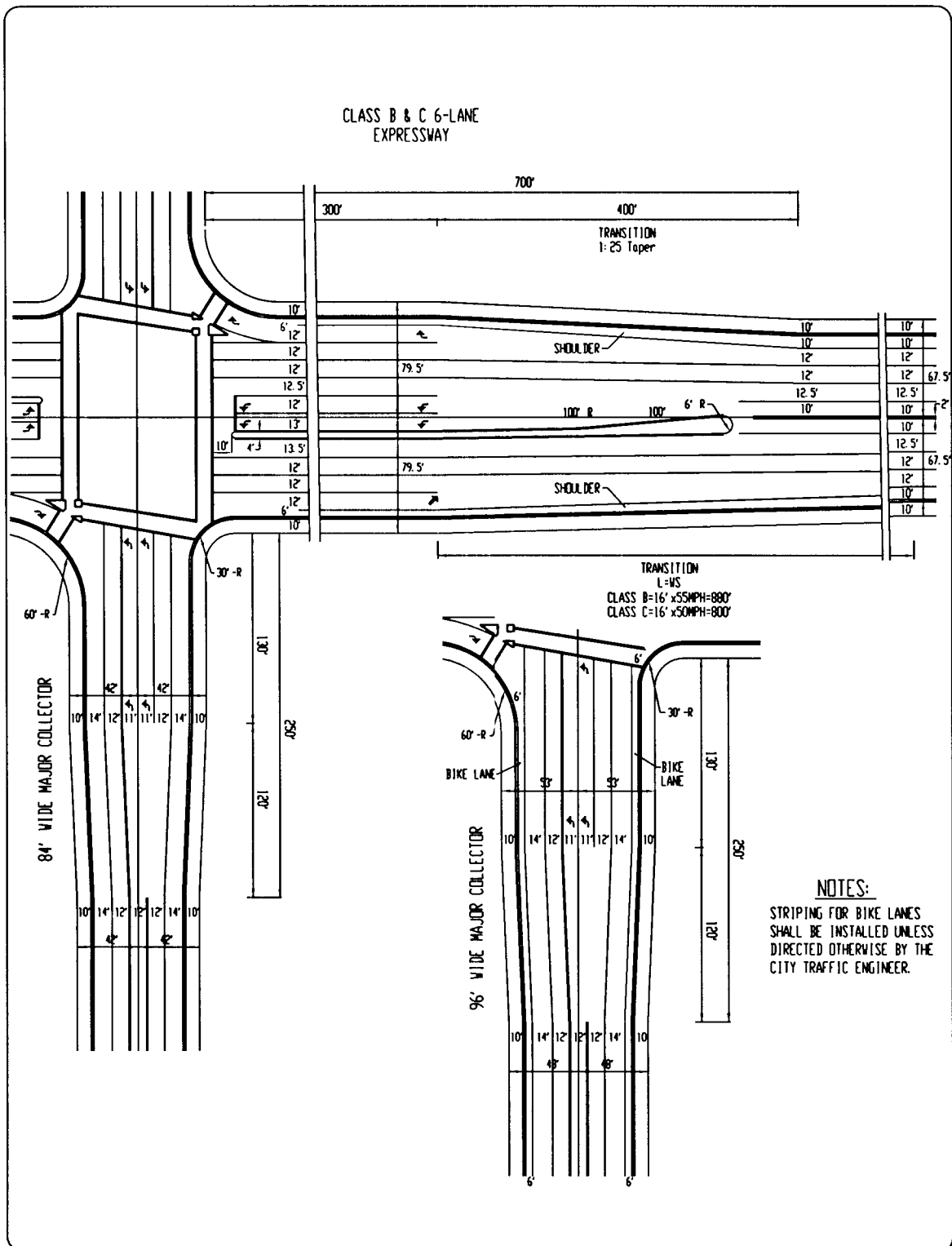


CITY of MODESTO

DETAIL NO.

359

359A



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AND TRANSPORTATION

STREETS

CLASS B & C 6-LANE EXPRESSWAY AT A MAJOR COLLECTOR

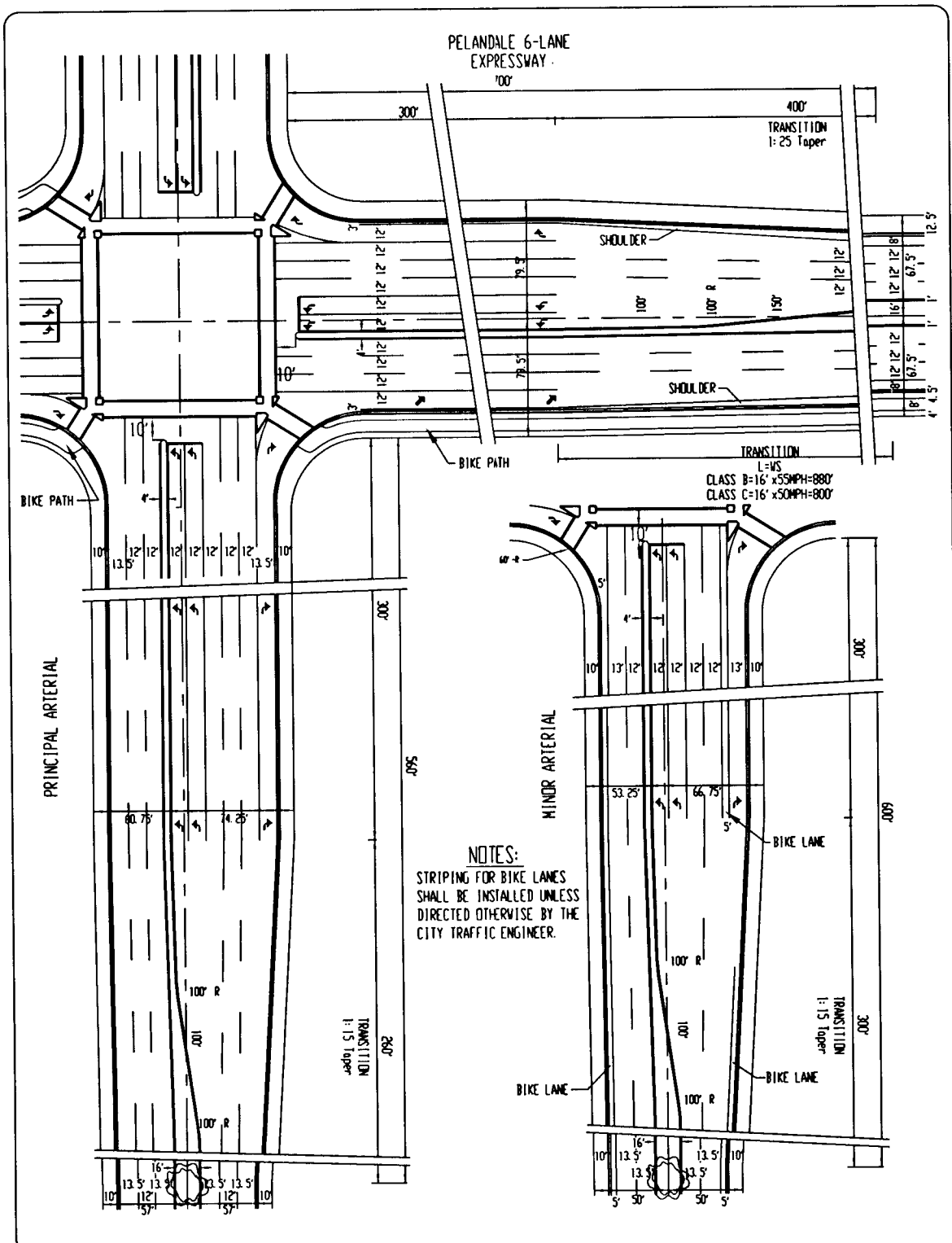
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

360



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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

STREETS

PELANDALE EXPRESSWAY AT A PRINCIPAL AND MINOR ARTERIAL

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

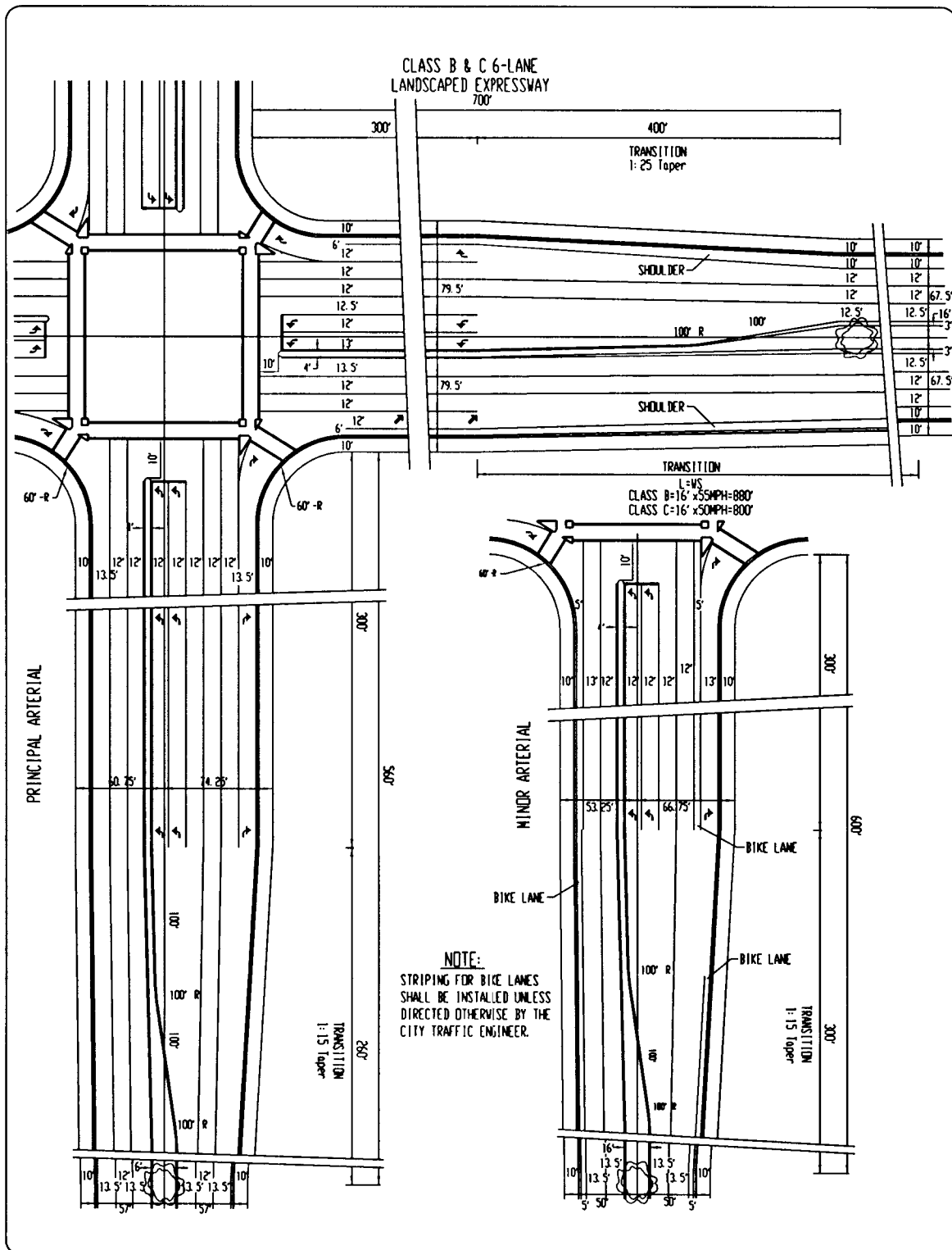
DETAIL NO.

361A

[illegible]

CITY of MODESTO

DETAIL NO.
362



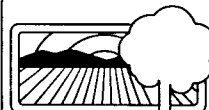
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RESOLUTION NO. 2001-560

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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

CLASS B & C 6-LANE
LANDSCAPED EXPRESSWAY AT A
PRINCIPAL AND MINOR ARTERIAL

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

363

84' WIDE MAJOR COLLECTOR

96' WIDE MAJOR COLLECTOR

BIKE LANE

BIKE LANE

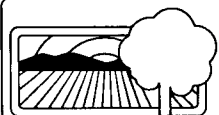
TRANSITION
1:25 Taper

TRANSITION
L=US
CLASS B=16'x55MPH=880'
CLASS C=16'x30MPH=800'

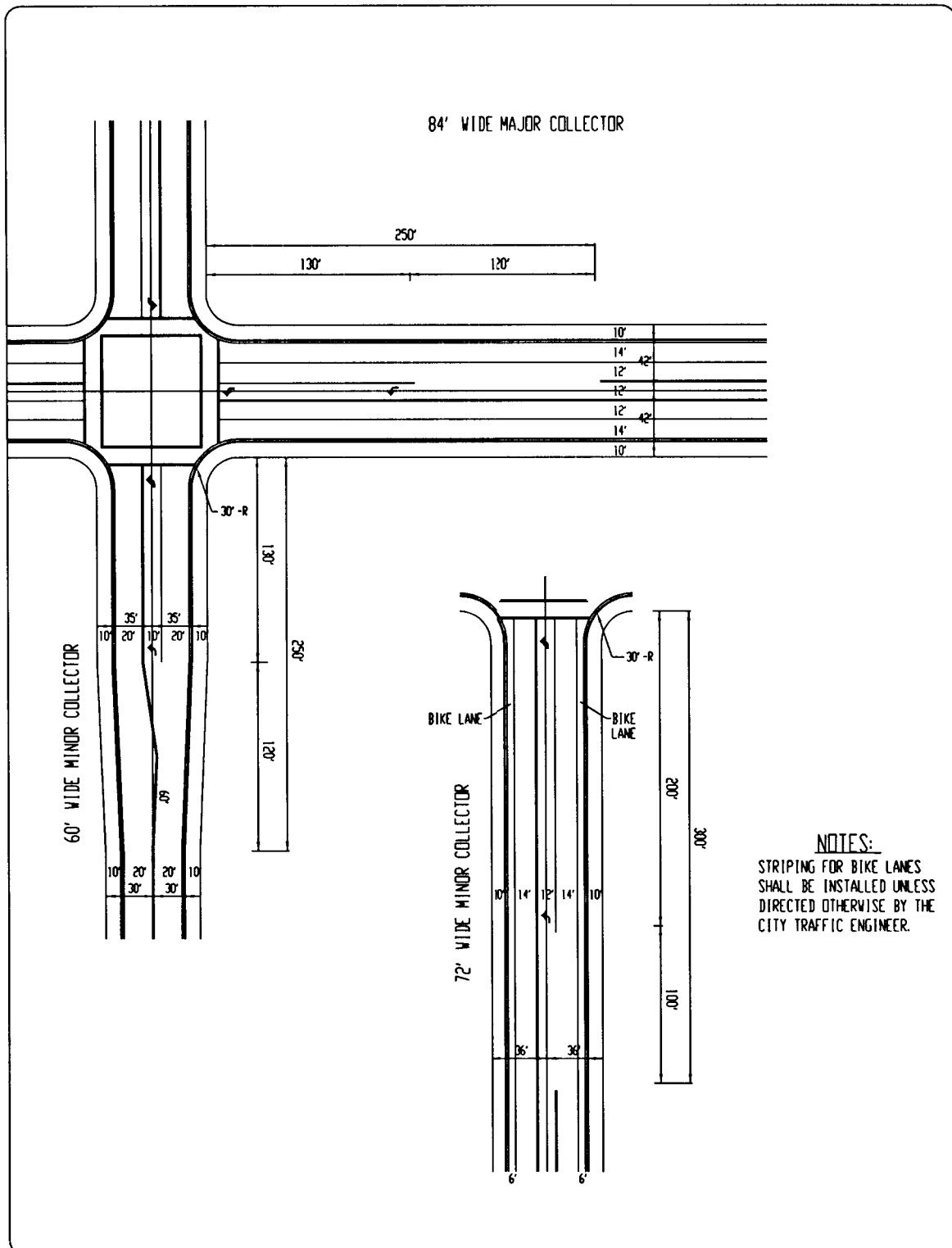
NOTES:
STRIPING FOR BIKE LANES
SHALL BE INSTALLED UNLESS
DIRECTED OTHERWISE BY THE
CITY TRAFFIC ENGINEER.

NOTES:
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SHALL BE INSTALLED UNLESS
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CITY TRAFFIC ENGINEER.

STREETS
CLASS B & C 6-LANE LANDSCAPED EXPRESSWAY AT A MAJOR COLLECTOR
ENGINEERING & TRANSPORTATION DEPARTMENT



DETAIL NO.
364



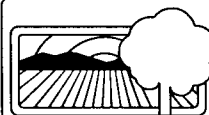
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

84' WIDE MAJOR COLLECTOR AT A MINOR COLLECTOR

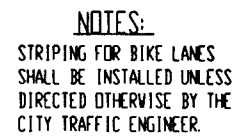
ENGINEERING & TRANSPORTATION
DEPARTMENT



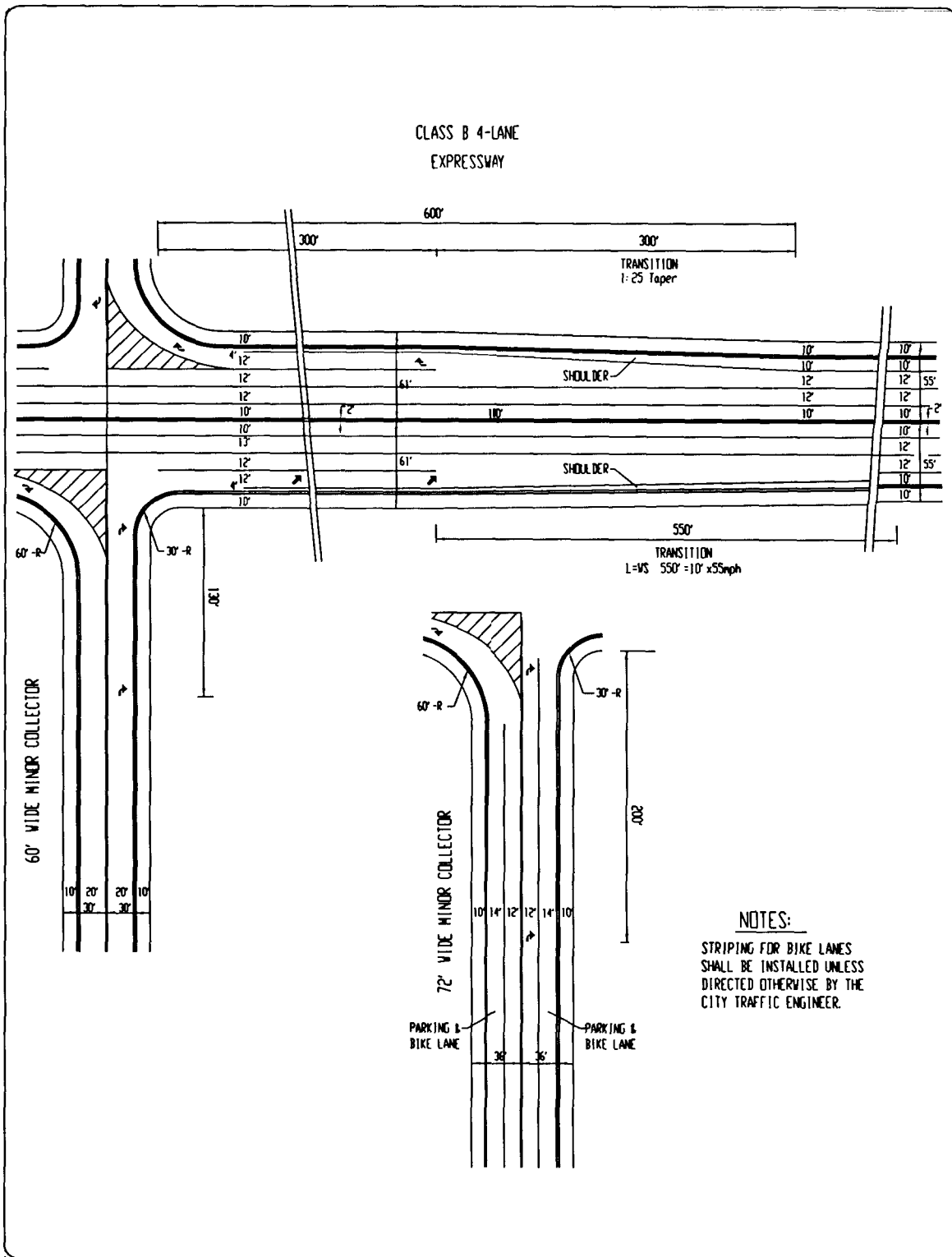
CITY of MODESTO

DETAIL NO.

365



366



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AND TRANSPORTATION

STREETS

CLASS B 4-LANE EXPRESSWAY AT A MINOR COLLECTOR

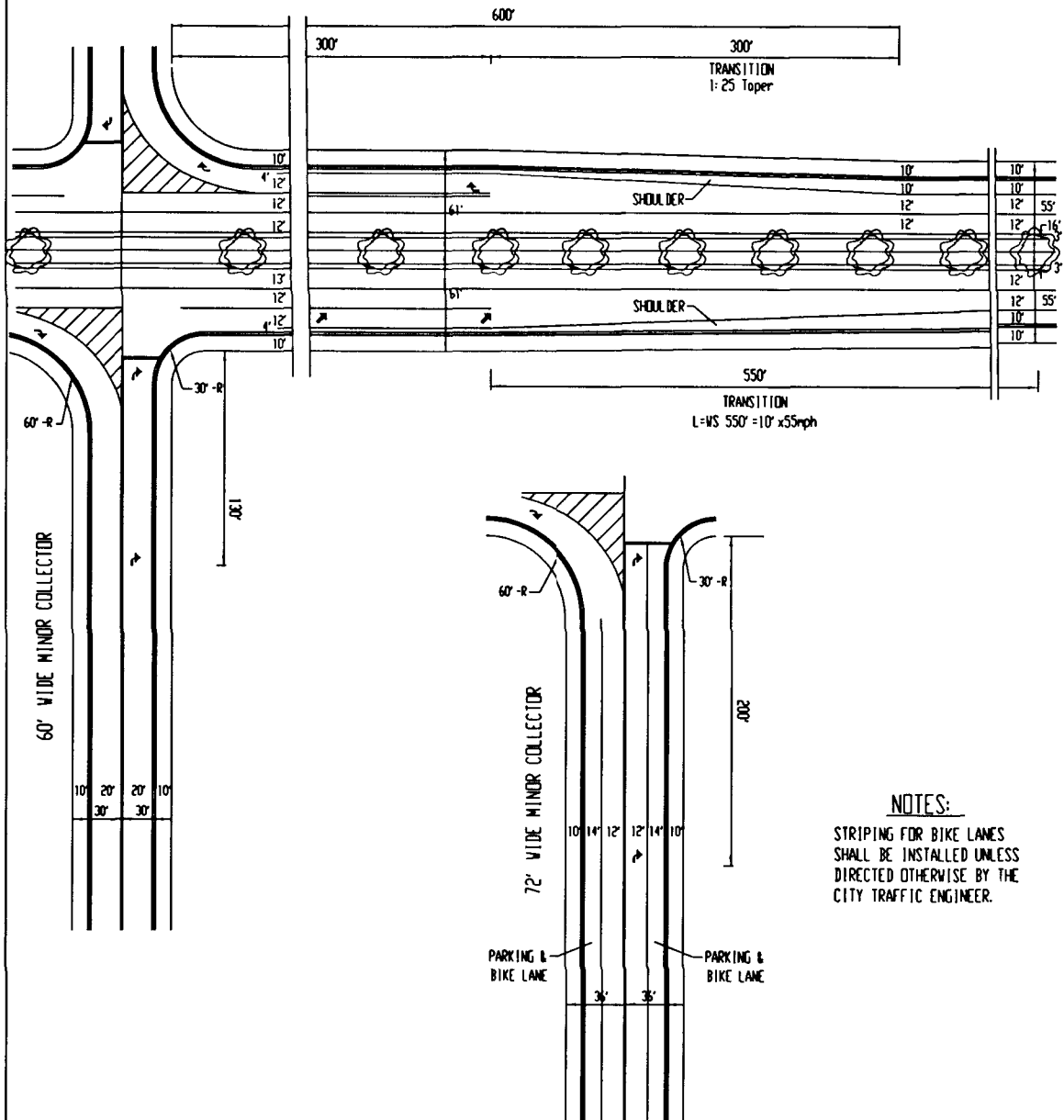
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
367

CLASS B 4-LANE
LANDSCAPED EXPRESSWAY



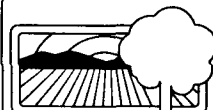
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RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

CLASS B 4-LANE
LANDSCAPED EXPRESSWAY
AT A MINOR COLLECTOR

ENGINEERING & TRANSPORTATION
DEPARTMENT



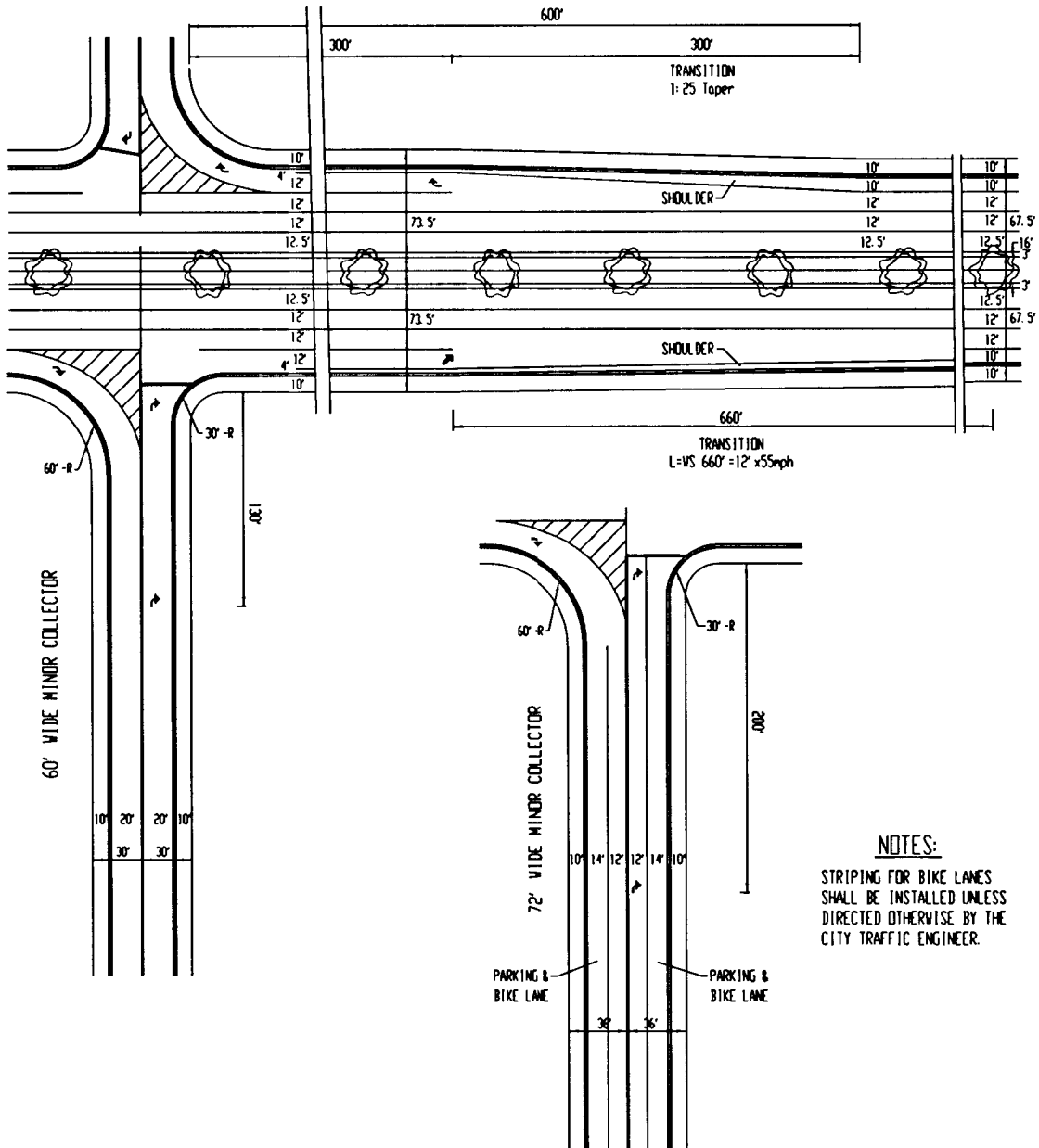
CITY of MODESTO

DETAIL NO.

368

369

CLASS B 6-LANE
LANDSCAPED EXPRESSWAY



NOTES:

STRIPING FOR BIKE LANES
SHALL BE INSTALLED UNLESS
DIRECTED OTHERWISE BY THE
CITY TRAFFIC ENGINEER.

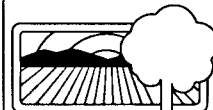
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

CLASS B 6-LANE
LANDSCAPED EXPRESSWAY
AT A MINOR COLLECTOR

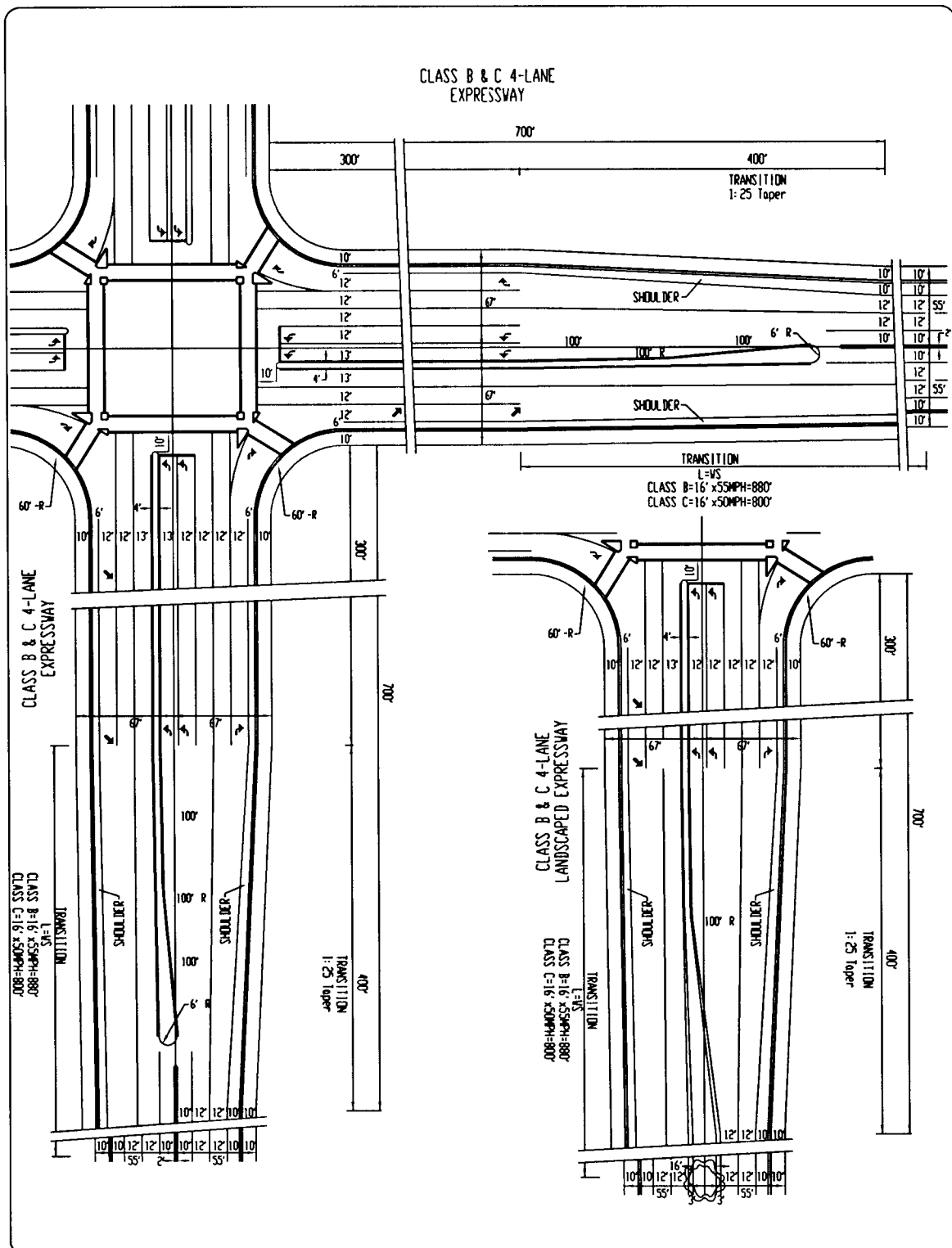
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

371



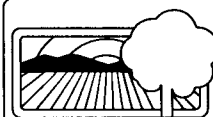
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RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

CLASS B & C 4-LANE EXPRESSWAY

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
374

DETAIL NO.
375

The image contains two technical diagrams of road cross-sections, labeled '60' WIDE MINOR COLLECTOR' and '72' WIDE MINOR COLLECTOR'.

60' WIDE MINOR COLLECTOR:

- Top View:** Shows a road cross-section with a total width of 300'. The lanes from left to right are: 10', 20', 35', 10', 10', 20', 30', and 10'. The total width is 300'. The right side of the road is labeled 'BIKE LANE' and '30' - R'.
- Side View:** Shows a road cross-section with a total width of 300'. The lanes from left to right are: 10', 20', 35', 10', 10', 20', 30', and 10'. The total width is 300'. The right side of the road is labeled 'BIKE LANE' and '30' - R'.

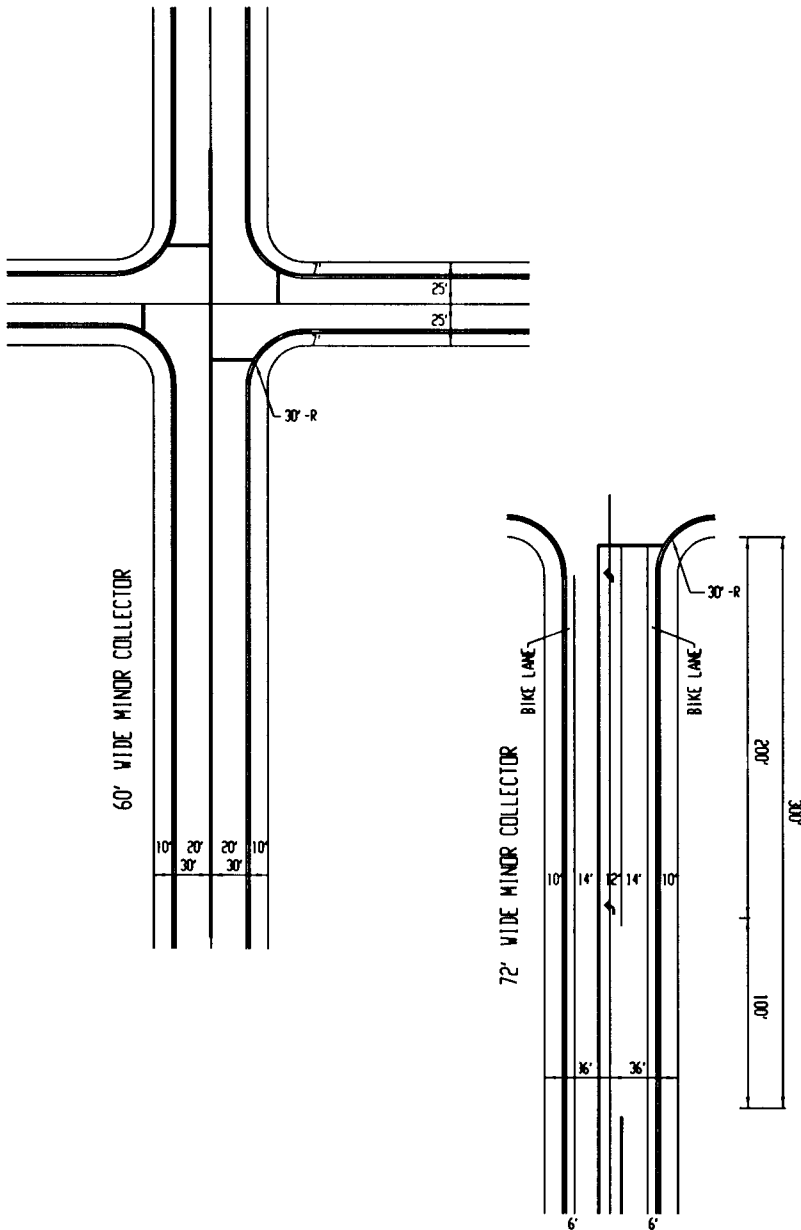
72' WIDE MINOR COLLECTOR:

- Top View:** Shows a road cross-section with a total width of 300'. The lanes from left to right are: 10', 14', 14', 10', 36', and 36'. The total width is 300'. The right side of the road is labeled 'BIKE LANE' and '30' - R'.
- Side View:** Shows a road cross-section with a total width of 300'. The lanes from left to right are: 10', 14', 14', 10', 36', and 36'. The total width is 300'. The right side of the road is labeled 'BIKE LANE' and '30' - R'.

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376

LOCAL STREET



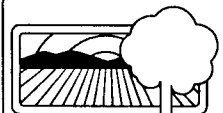
NOTES:
STRIPING FOR BIKE LANES
SHALL BE INSTALLED UNLESS
DIRECTED OTHERWISE BY THE
CITY TRAFFIC ENGINEER.

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

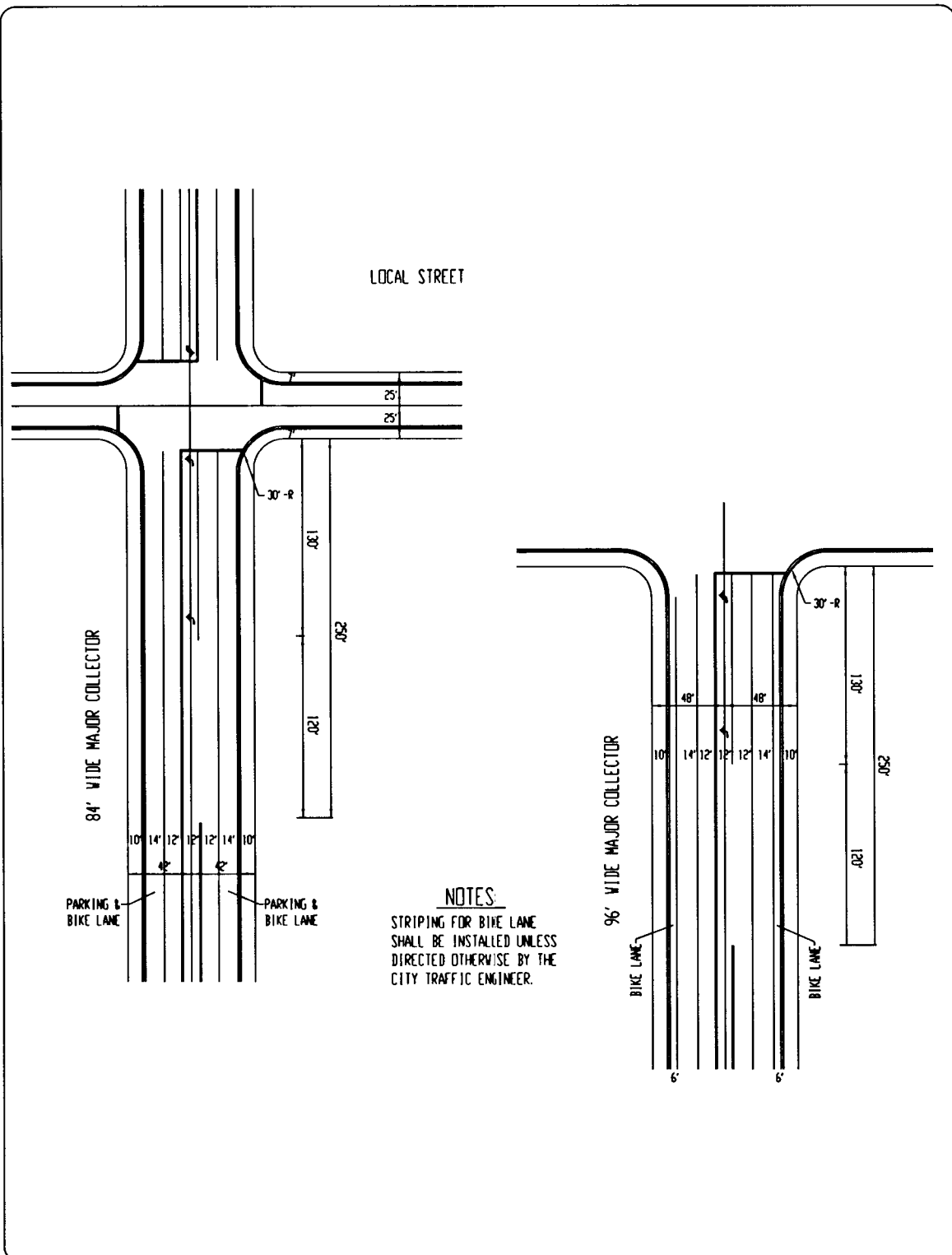
STREETS
LOCAL STREET
AT A
MINOR COLLECTOR

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
377

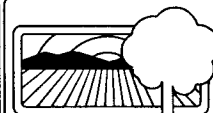


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STREETS
LOCAL STREET
AT A
MAJOR COLLECTOR

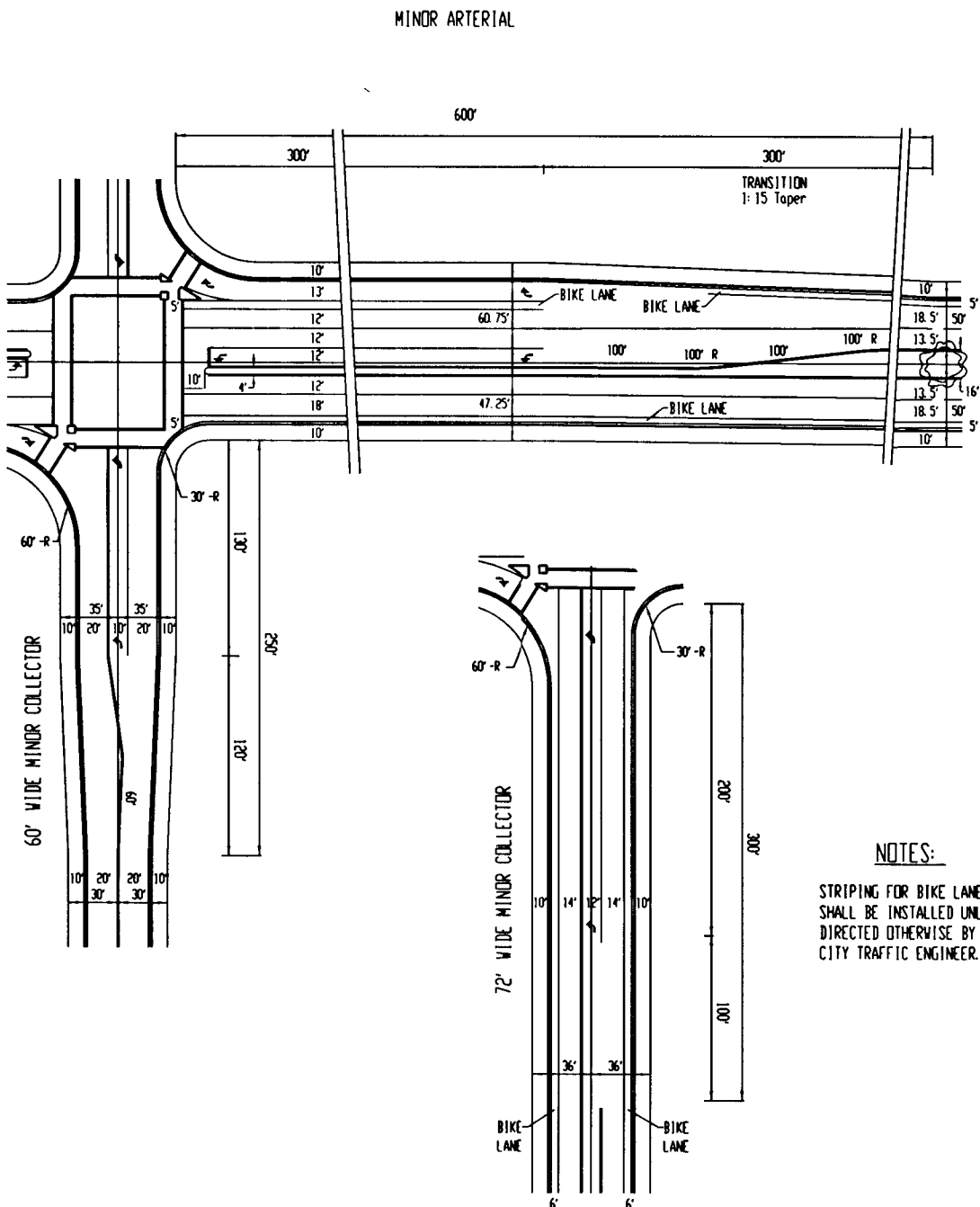
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

378



NOTES:

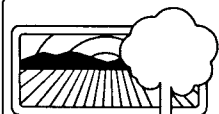
STRIPING FOR BIKE LANES SHALL BE INSTALLED UNLESS DIRECTED OTHERWISE BY THE CITY TRAFFIC ENGINEER.

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RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
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AND TRANSPORTATION

STREETS
MINOR ARTERIAL
AT A
MINOR COLLECTOR

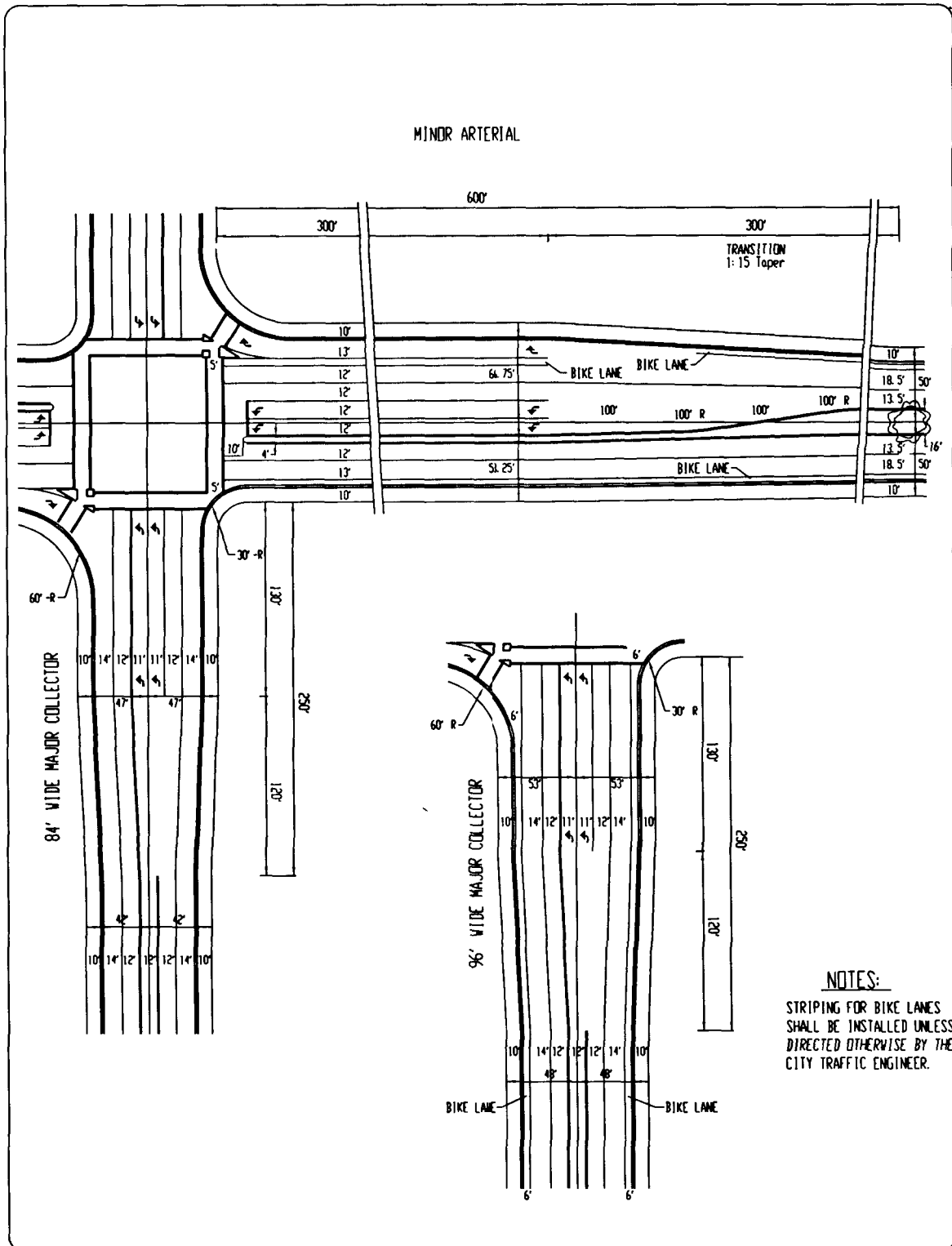
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

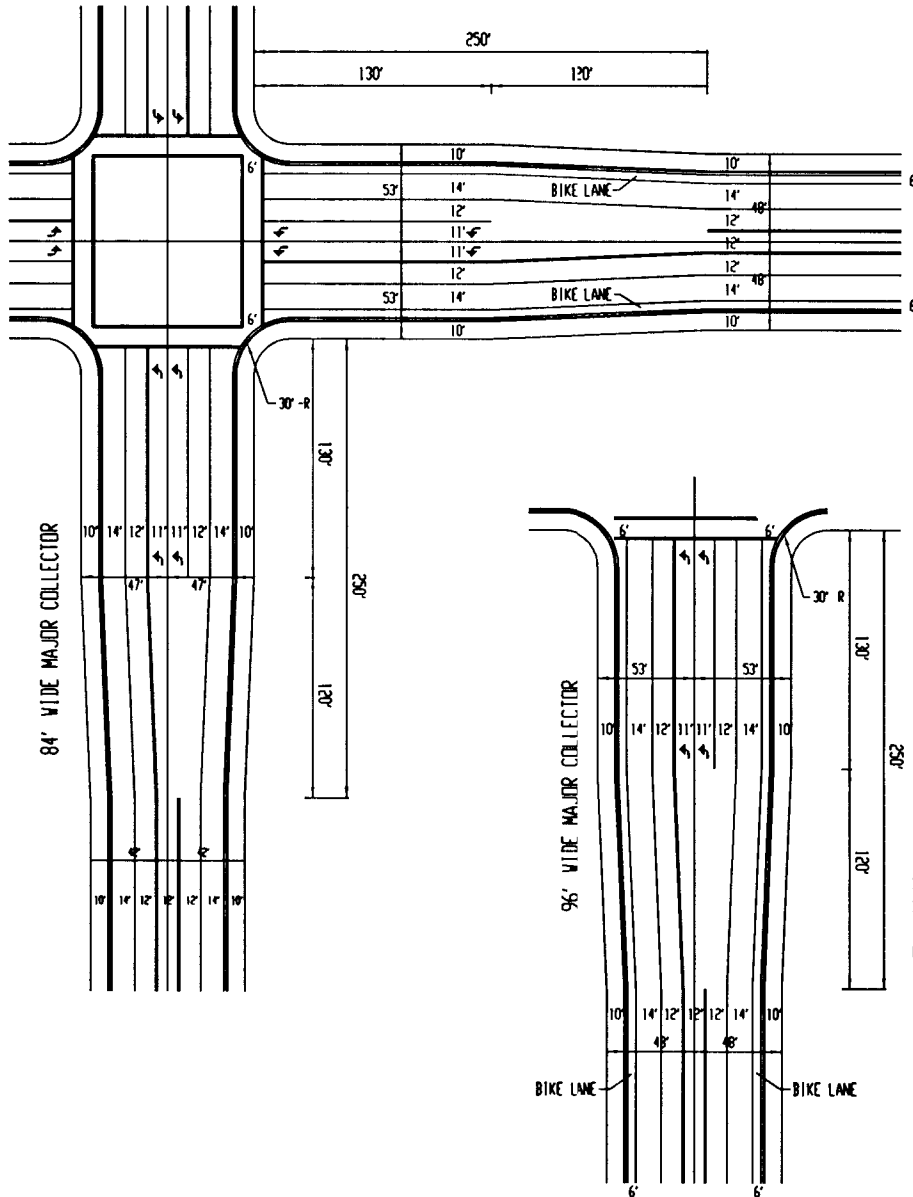
379



NOTES:
 STRIPING FOR BIKE LANES
 SHALL BE INSTALLED UNLESS
 DIRECTED OTHERWISE BY THE
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APPROVED BY CITY COUNCIL RESOLUTION NO. 2001-560	STREETS MINOR ARTERIAL AT A MAJOR COLLECTOR	 CITY of MODESTO
ORIGINAL APPROVED BY THE DIRECTOR OF ENGINEERING AND TRANSPORTATION		

96' WIDE MAJOR COLLECTOR



NOTES:

STRIPING FOR BIKE LANES SHALL BE INSTALLED UNLESS DIRECTED OTHERWISE BY THE CITY TRAFFIC ENGINEER.

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STREETS
MAJOR COLLECTOR
AT A
MAJOR COLLECTOR

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
381

Technical drawing of a road intersection, showing plan and elevation views with dimensions and notes.

Plan View (Top):

- Overall width: 560'
- Overall length: 260'
- TRANSITION 1: 15 Taper
- Dimensions along the intersection: 10', 13.5', 12', 12', 12', 12', 13.5', 10', 10', 100', 100' R, 100', 100' R.
- Dimensions along the side: 10', 13.5', 12', 12', 13.5', 10'.

Elevation View (Bottom):

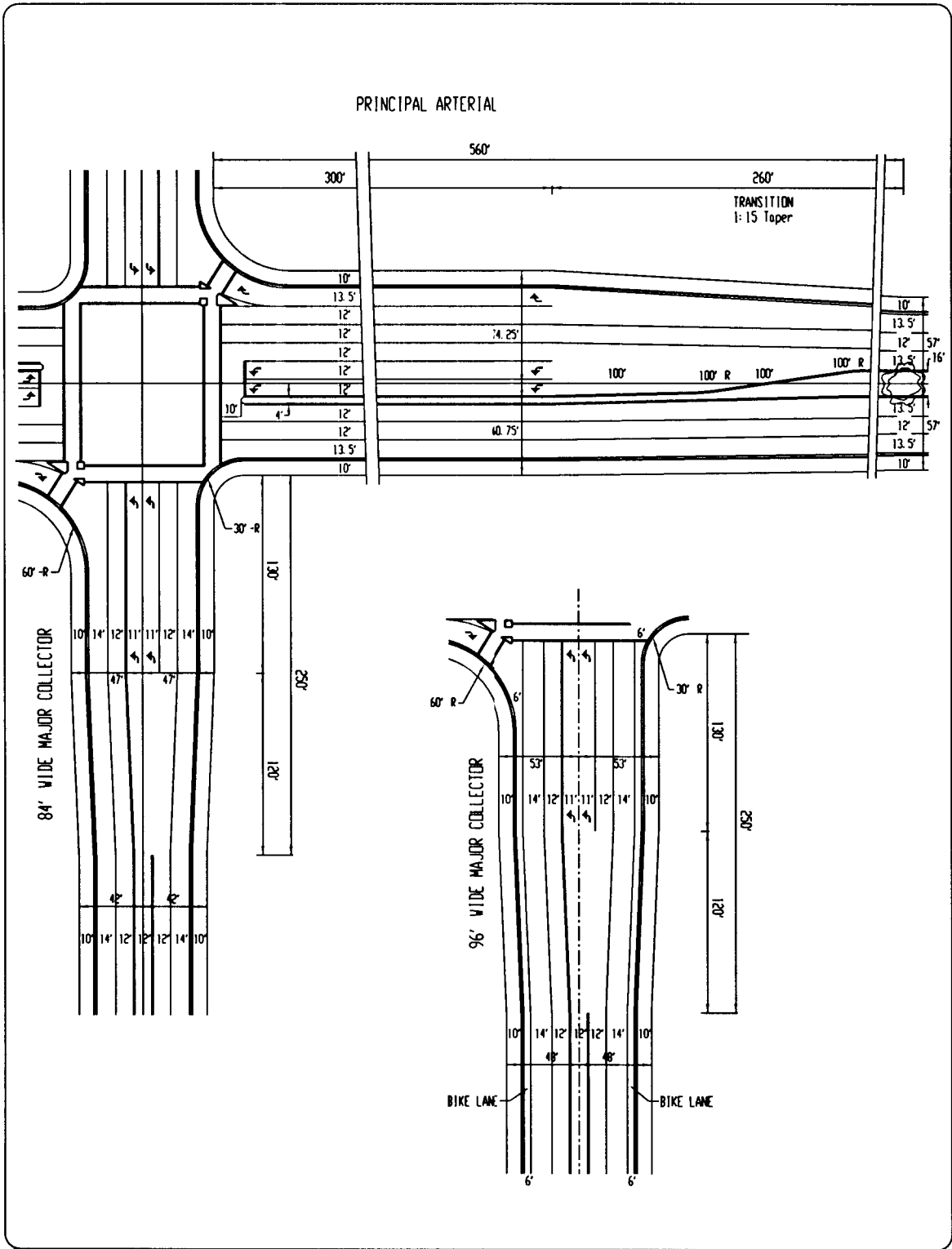
- Overall width: 72' WIDE MINOR COLLECTOR
- Overall length: 300'
- Dimensions along the intersection: 10', 14', 12', 14', 10'.
- Dimensions along the side: 10', 20', 20', 10'.
- Dimensions along the bottom: 36', 36'.
- Labels: BIKE LANE, BIKE LANE.

NOTES:

STRIPING FOR BIKE LANES SHALL BE INSTALLED UNLESS DIRECTED OTHERWISE BY THE CITY TRAFFIC ENGINEER.

STRIPING FOR BIKE LANES
SHALL BE INSTALLED UNLESS
DIRECTED OTHERWISE BY THE
CITY TRAFFIC ENGINEER.

DETAIL NO.
382



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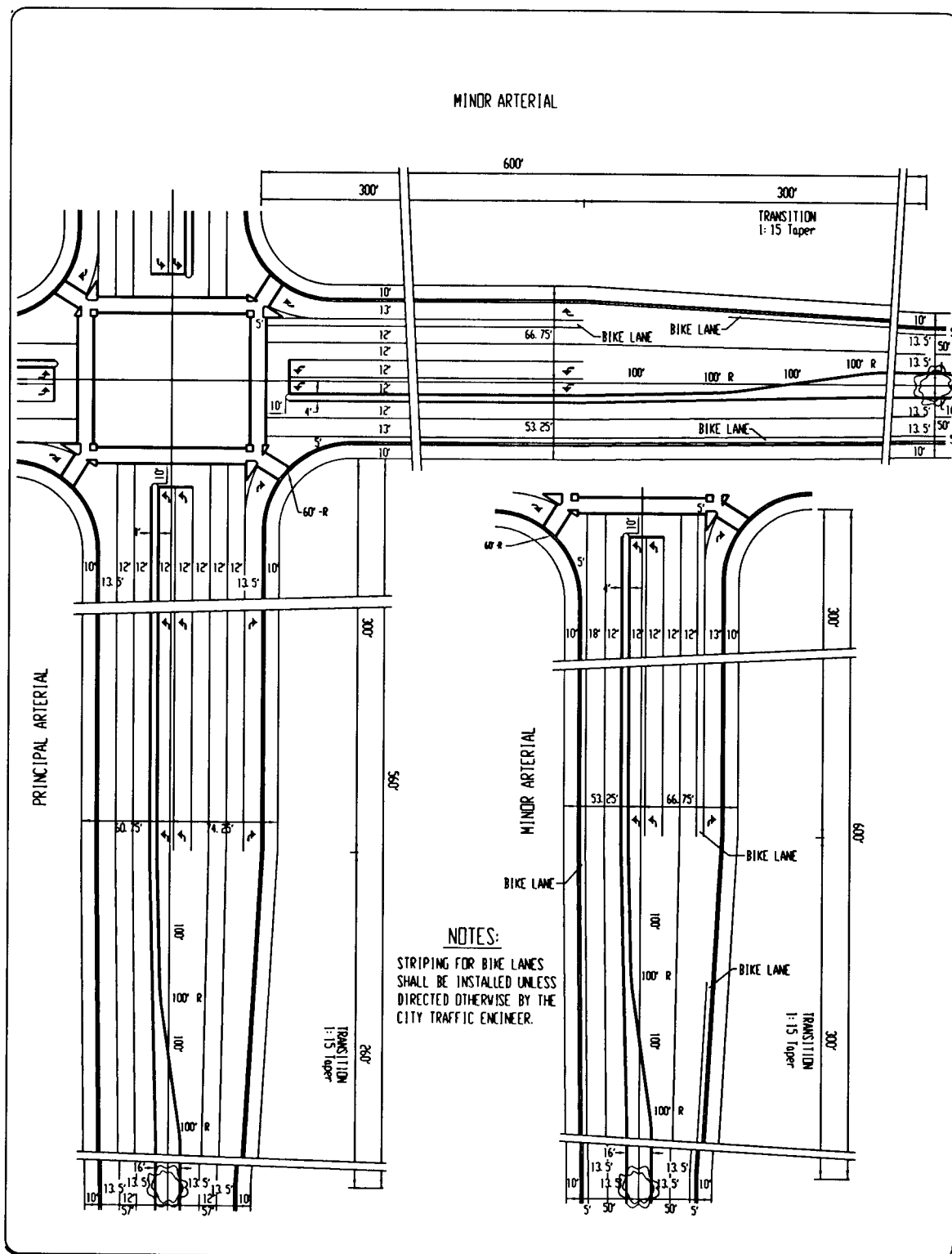
STREETS
PRINCIPAL ARTERIAL
AT A
MAJOR COLLECTOR

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
383



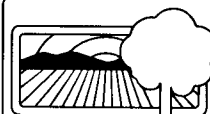
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STREETS

MINOR ARTERIAL AT A PRINCIPAL ARTERIAL AND A MAJOR ARTERIAL

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

384

[illegible]

387

ROUNDABOUT IS
OPTIONAL FOR
COLLECTOR/COLLECTOR
INTERSECTIONS

SPLITTER ISLAND
SEE DETAIL A

TYPICAL 150W H.P.S.
STREET LIGHT

TYPICAL CURB RAMP
PER CITY STANDARDS

8" SOLID YELLOW
3' FROM CURB

R30'

23'

R45' (TYP.) YIELD LINE
BROKEN WHITE (12" WIDE)

DETAIL 25A

DETAIL 23, 50' LONG

29'

20'

12'

8'

35'

12'

74'

27'

12'

74'

10'

20'

20'

10'

7'6" TRUCK
APRON

2%

6"

46' LANDSCAPED CENTRAL ISLAND

3" TOP DRESS

6"

2%

7'6" TRUCK
APRON

NOTE 3

NOTE 1

NOTE 2

NOTE 3

NOTE 4

NOTE 5

NOTE 1: 8" JOINTED REINFORCED CONCRETE WITH NO. 4 REBAR, 12" O.C. BOTH WAYS, MIX NO.6 MODIFIED (HIGH EARLY STRENGTH) WITH STAMPED CONCRETE FINISH. REMOVE EX. A.C. PAVEMENT PRIOR TO CONCRETE INSTALLATION.

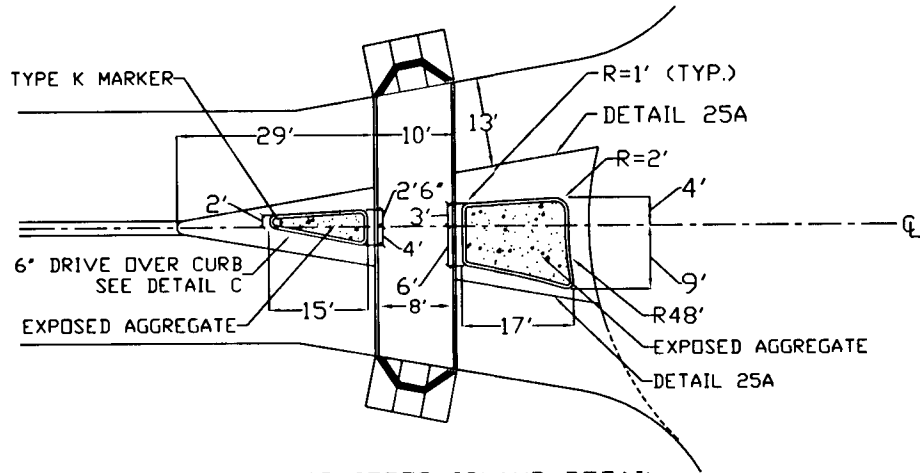
NOTE 2: LONGITUDINAL TIE NO. 4 REBAR AT 24' SPACING CENTER TO CENTER WITH 2' HOOKS OUT OF 90° BENDS ON EACH END 24' LONG.

NOTE 3: 3 1/2" DENSE GRADED AGGREGATE BASE

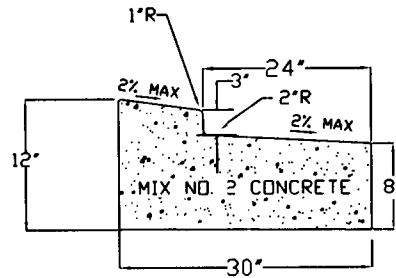
NOTE 4: COMBINATION CURB AND GUTTER (SEE DETAIL B)

NOTE 5: EXCAVATE TO REMOVE EXISTING SOIL (2" MIN) BACKFILL WITH AGENCY APPROVED TOPSOIL. ALLOW FOR 3' TOP DRESS, 1" FREE BOARD AT CURB.

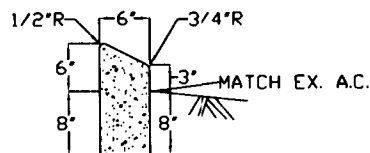
DETAIL NO.
388



DETAIL A - SPLITTER ISLAND DETAIL



DETAIL B - COMBINATION CURB AND GUTTER



DETAIL C - 6' CURB

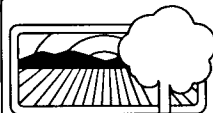
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

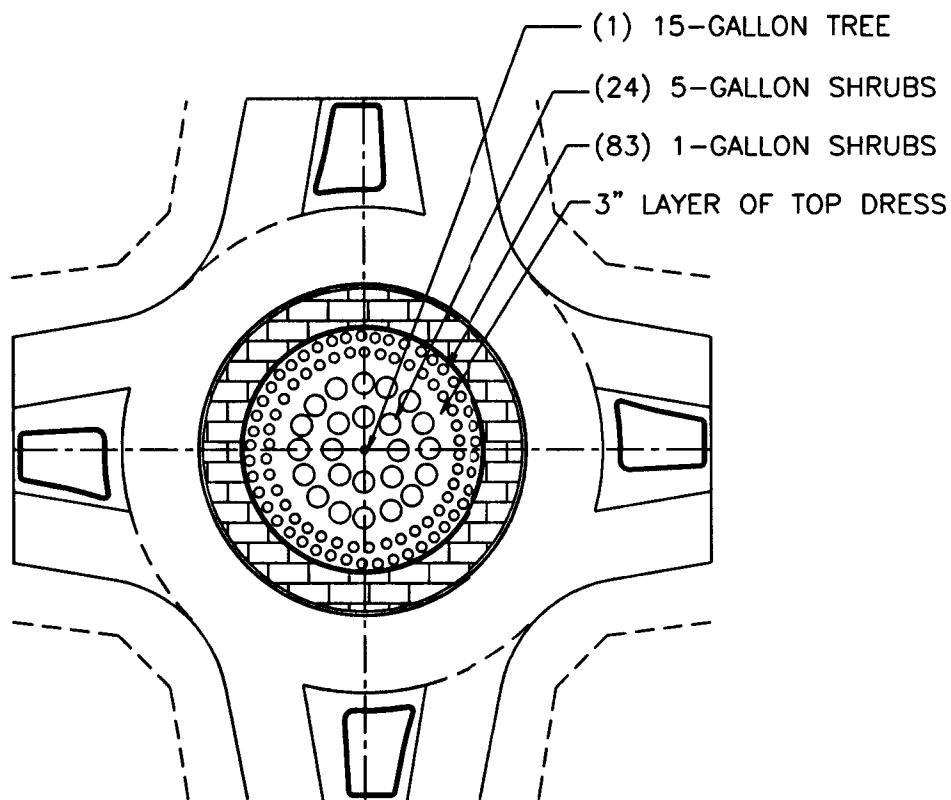
TYPICAL
ROUNABOUT

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
388A



AGENCY APPROVED PLANT MATERIALS LIST *

1-GALLON SHRUBS:

Nandina domestica 'Nana Purpurea'
Myrtus communis 'Compacta'
Trachelospermum asiaticum
Artemisia stellerana
Ilex crenata (dwarf varieties)

15-GALLON TREES:

Lagerstroemia indica 'Cheorokee' or 'Catawba' or
 'Tuscarora' or 'Muscogee' or 'Natchez'
Cercis canadensis 'Forest Pansy' or 'Oklahoma'
Tristania laurina 'Elegant'
Ginkgo biloba 'Fairmont' or 'Autumn Gold'

5-GALLON SHRUBS:

Raphiolepis indica 'ballerina'
Spiraea bumalda 'Anthony Waterer'
Cotoneaster apiculatus
Escallonia 'Newport Dwarf'
Abelia grandiflora 'Edward Goucher'

*VARIATIONS FROM THE APPROVED LIST WOULD BE
 AT THE DISCRETION OF THE COMMUNITY SERVICES
 AND NEIGHBORHOOD CONNECTIONS DEPARTMENT

MATERIALS AND INSTALLATION OF LANDSCAPE
 PLANTING SHALL BE AS PER CITY STANDARD
 SPECIFICATIONS SECTION 12.

SEE CITY STANDARD DETAILS FOR THE FOLLOWING:
 NO. 1200: TREE PLANTING

APPROVED BY CITY COUNCIL
 RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
 DIRECTOR OF ENGINEERING
 AND TRANSPORTATION

STREETS

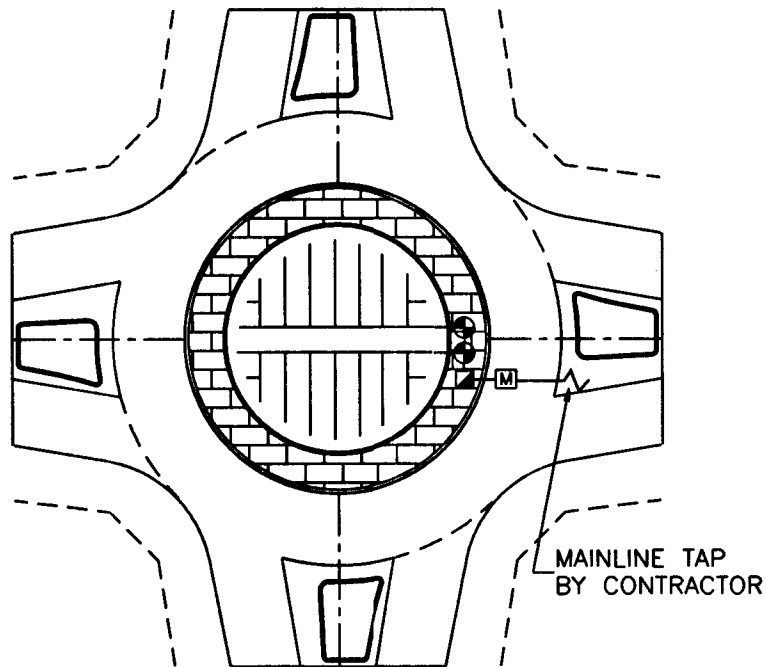
TYPICAL ROUNDABOUT
 LANDSCAPE PLAN

ENGINEERING & TRANSPORTATION
 DEPARTMENT



CITY of MODESTO

DETAIL NO.
 389



IRRIGATION LEGEND

- 1" SCH. 40 PVC FROM MAINLINE TAP TO BACKFLOW AND VALVES
- CLASS 200 PVC LATERAL LINES—SIZE AS NOTED
- RAINBIRD NO. 1402 BUBBLERS
- RAINBIRD NO. PEB 1" IRRIGATION VALVE WITH INIK NO. K-80100 CONTROL MODULE IN CONCRETE VALVE BOX WITH LOCKING METAL LID.
- AGENCY-APPROVED 1" REDUCED-PRESSURE BACKFLOW DEVICE
- Ⓜ WATER MAIN TAP AND METER BY CONTRACTOR

MATERIALS AND INSTALLATION OF IRRIGATION SYSTEM SHALL BE AS PER CITY STANDARD SPECIFICATIONS SECTION 13.

SEE CITY STANDARD DETAILS FOR THE FOLLOWING:

- NO. 1202: VALVE IN VALVE BOX
- NO. 1207: BUBBLER
- NO. 1210: BACKFLOW DEVICE

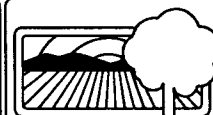
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

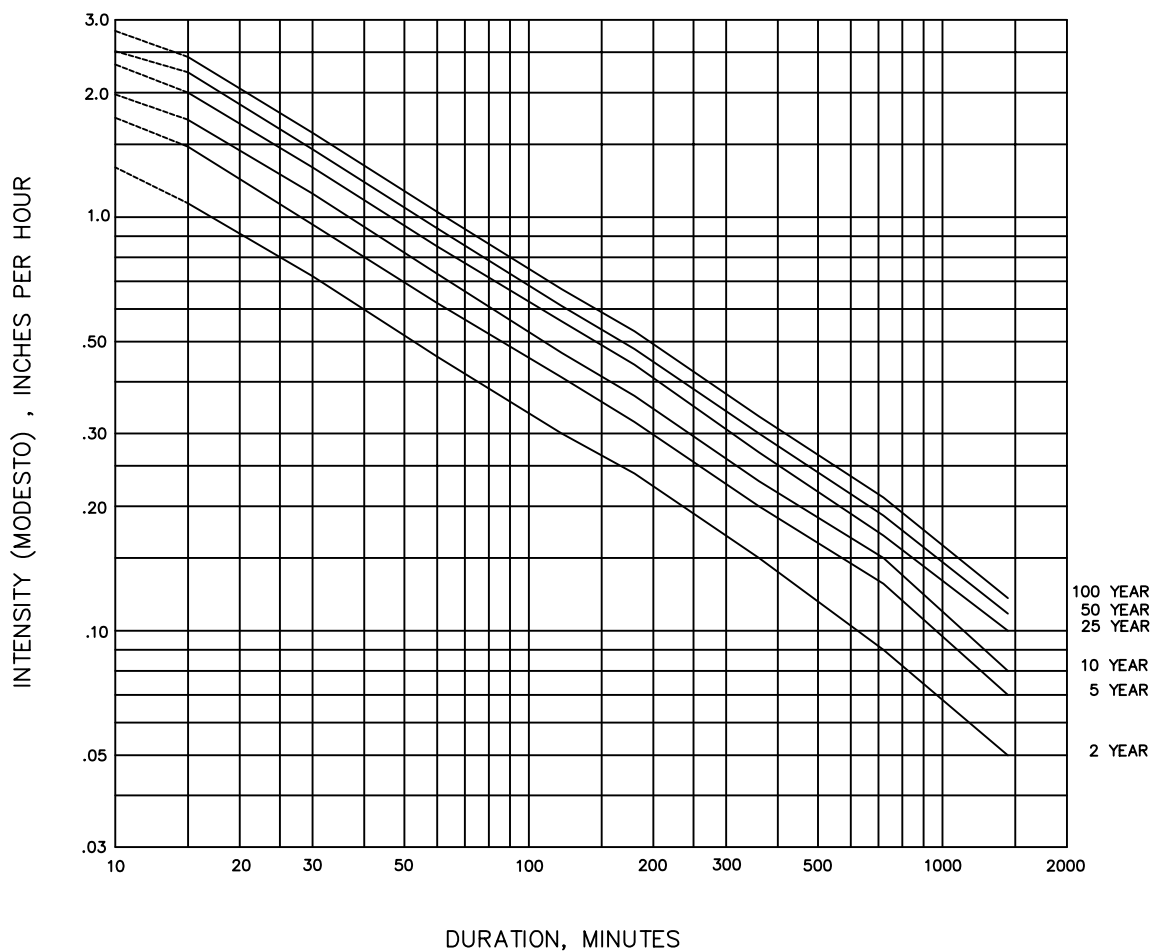
TYPICAL ROUNDABOUT IRRIGATION PLAN

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
390



THESE CURVES ARE BASED ON CALIFORNIA DEPARTMENT OF WATER RESOURCES DATA FROM THE MODESTO RAINFALL GAGING STATION. (MEAN ANNUAL PRECIPITATION = 11.95") TO OBTAIN INTENSITIES FOR LOCATIONS OTHER THAN MODESTO, MULTIPLY INTENSITY ON THIS CHART BY MEAN ANNUAL PRECIPITATION AT THE POINT IN QUESTION DIVIDED BY 11.95.

DWR #B00 5741 00
DATA THROUGH 1998
\\USP\PROJECTS\DON\RAIN_IDF2.DWG

DASHED LINE INDICATES EXTRAPOLATED CURVE BASED ON 1942 - 1971 DATA

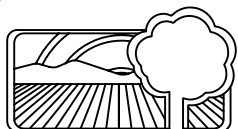


FIGURE NO.
2B

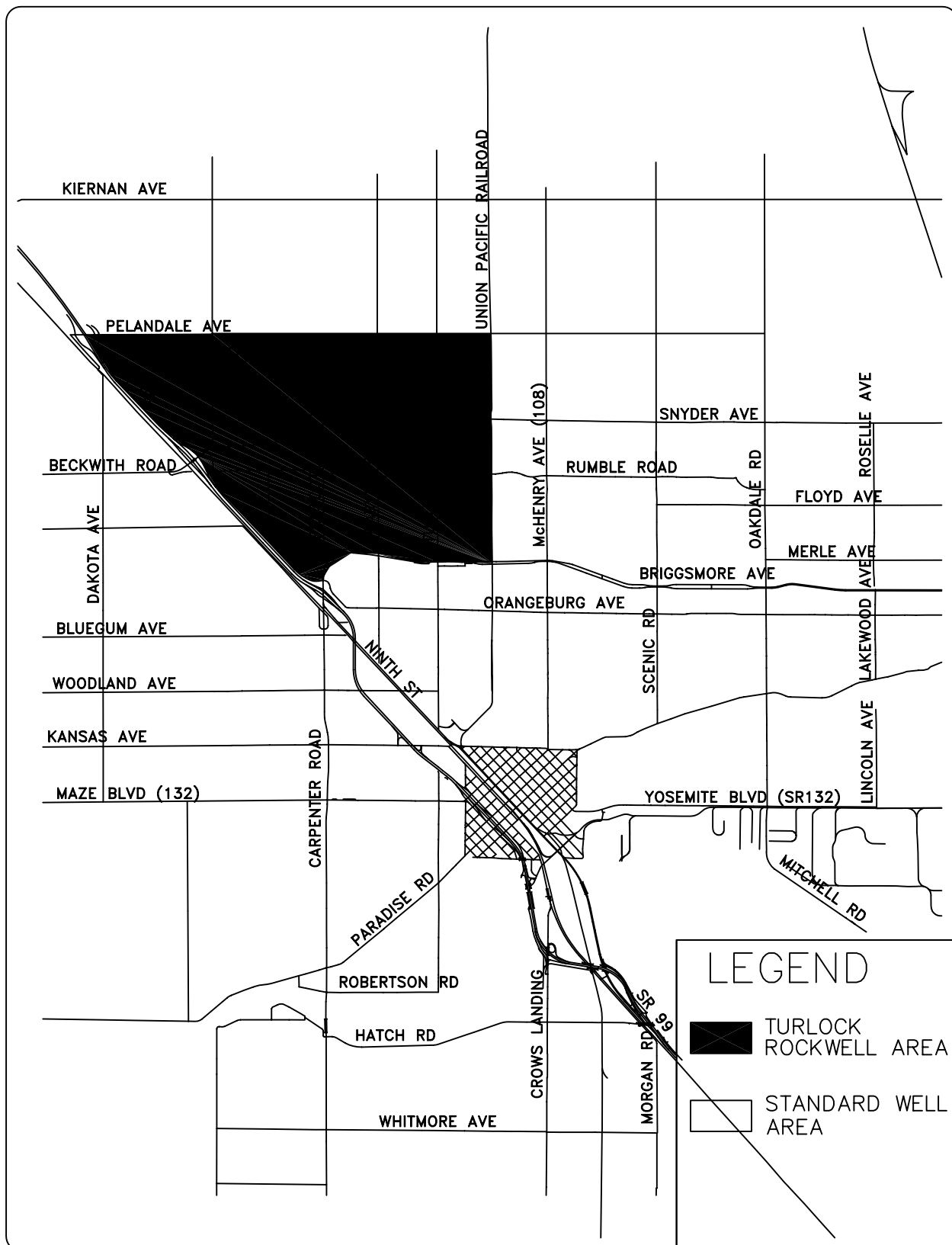
CITY OF MODESTO
RAINFALL CURVE

DEPARTMENT OF PUBLIC WORKS
AND TRANSPORTATION

PROPOSED
RAIN INTENSITY
FREQUENCY CURVES

REVISED: _____ DATE: _____

DRAWN: J.LOFTON FILE NO.
DATE: 04/11/00 FILE NAME: rain_idf2.dwg



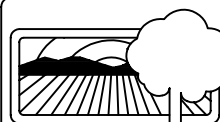
APPROVED BY CITY COUNCIL
RESOLUTION NO. 00-0000

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

ROCK WELL SERVICE AREA

TURLOCK AND CITY STANDARD
ROCK WELLS

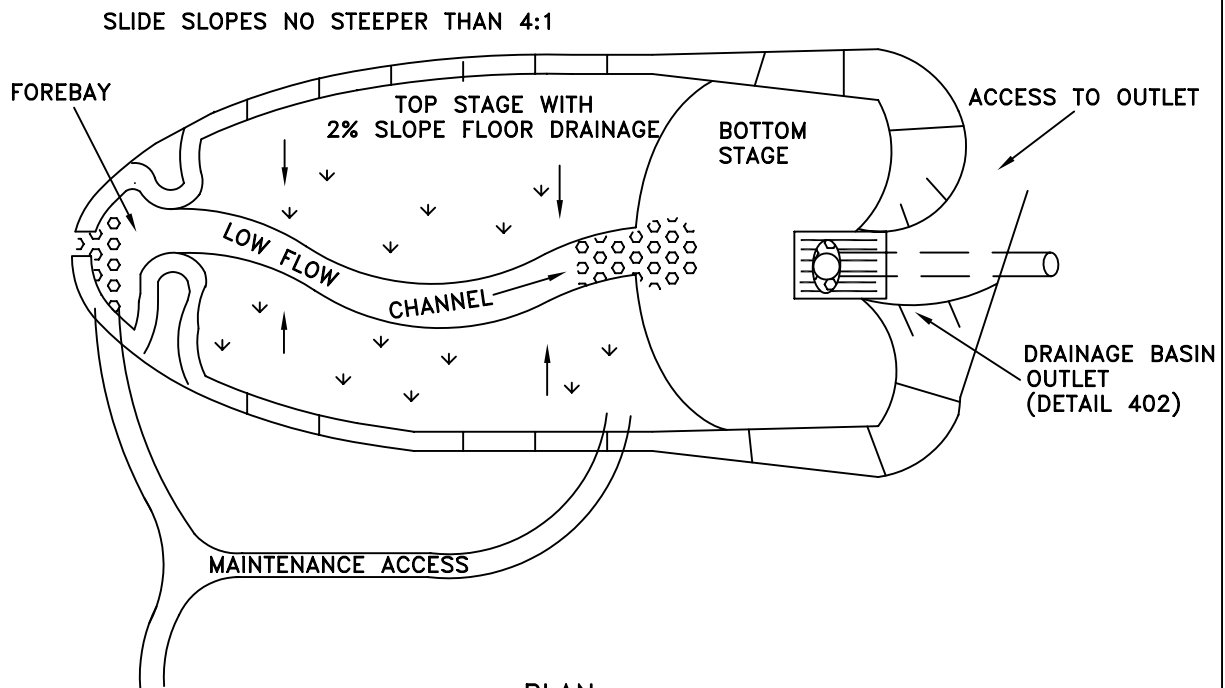
ENGINEERING & TRANSPORTATION
DEPARTMENT



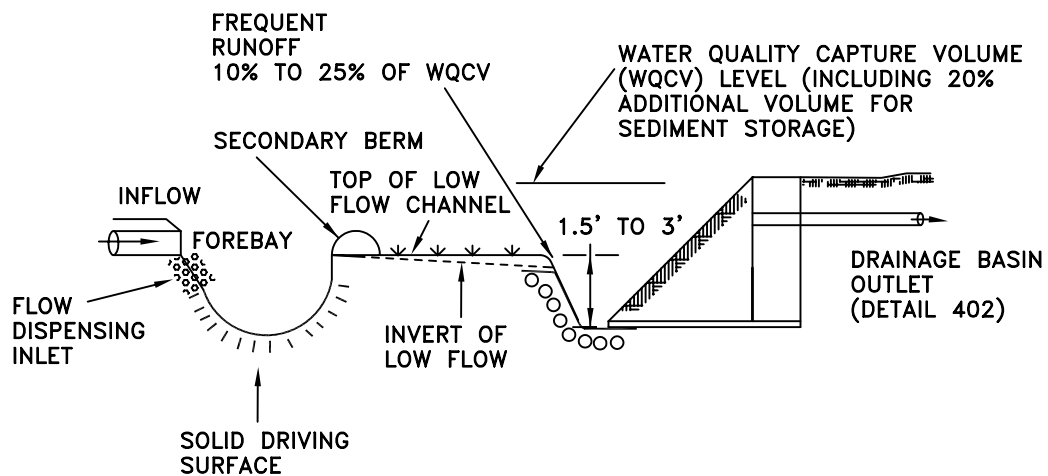
CITY of MODESTO

DETAIL NO.

400B



PLAN
NOT TO SCALE



SECTION
NOT TO SCALE

LOW FLOW CHANNELS AND GUIDANCE TO DESIGNING BASINS SHOULD FOLLOW GUIDELINES ESTABLISHED IN THE BMP'S (BEST MANAGEMENT PRACTICES) FOUND IN FIGURE 5A. PLAN AND SECTION OF AN EXTENDED DETENTION BASIN.

NOTE:

REFER TO GUIDANCE MANUAL FOR NEW DEVELOPMENT STORM WATER QUALITY CONTROL MEASURES

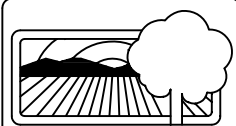
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STORM DRAINS

DRAINAGE BASIN

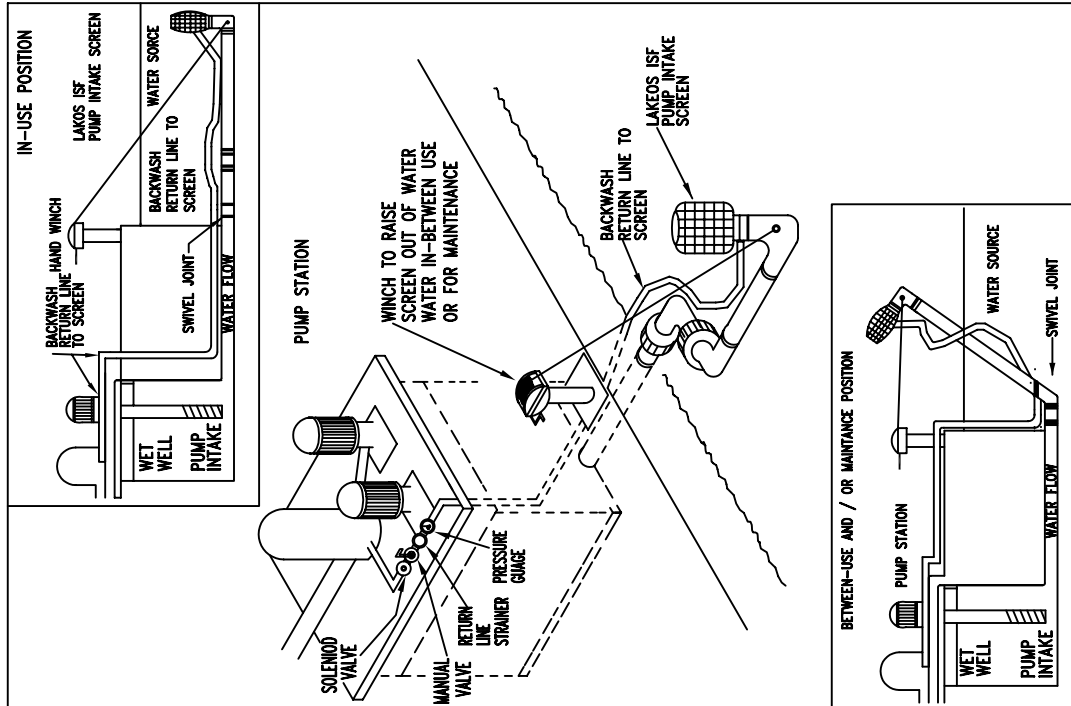
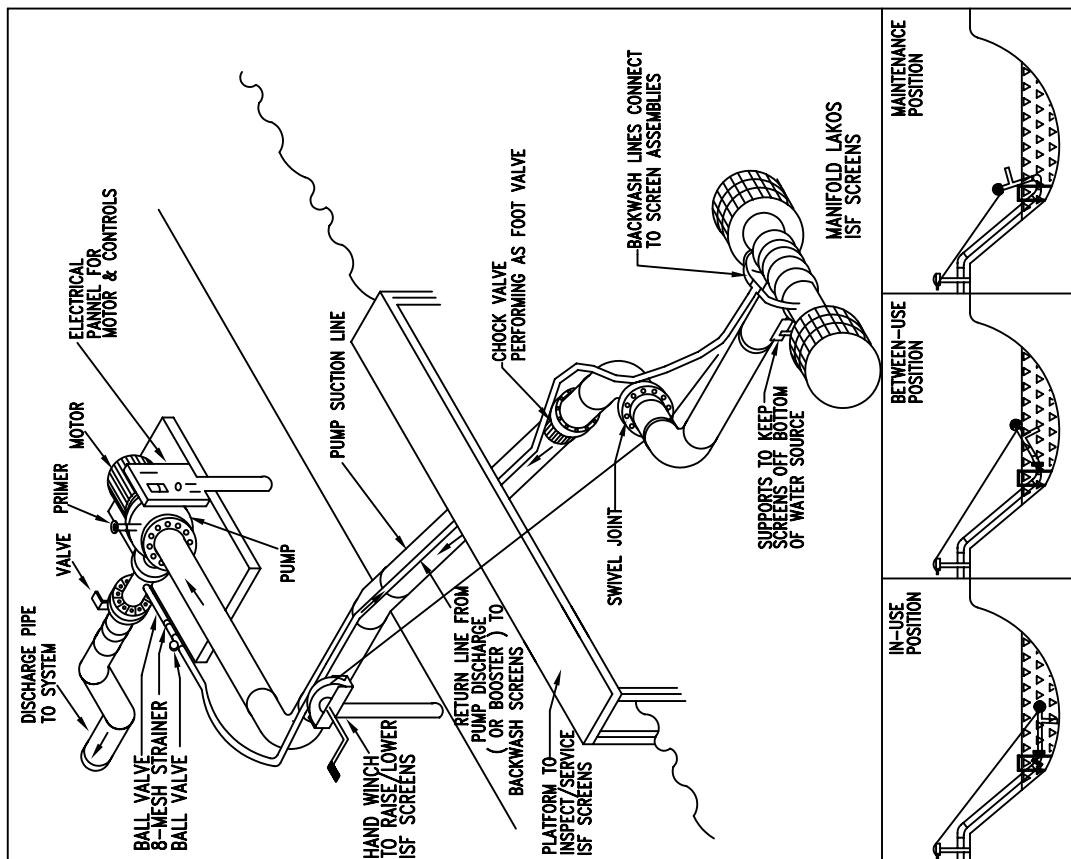
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
401

SAMPLE INSTALLATIONS



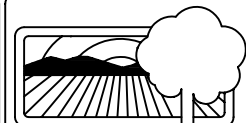
PROFILE

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STORM DRAINS DRAINAGE BASIN OUTLET

ENGINEERING & TRANSPORTATION
DEPARTMENT



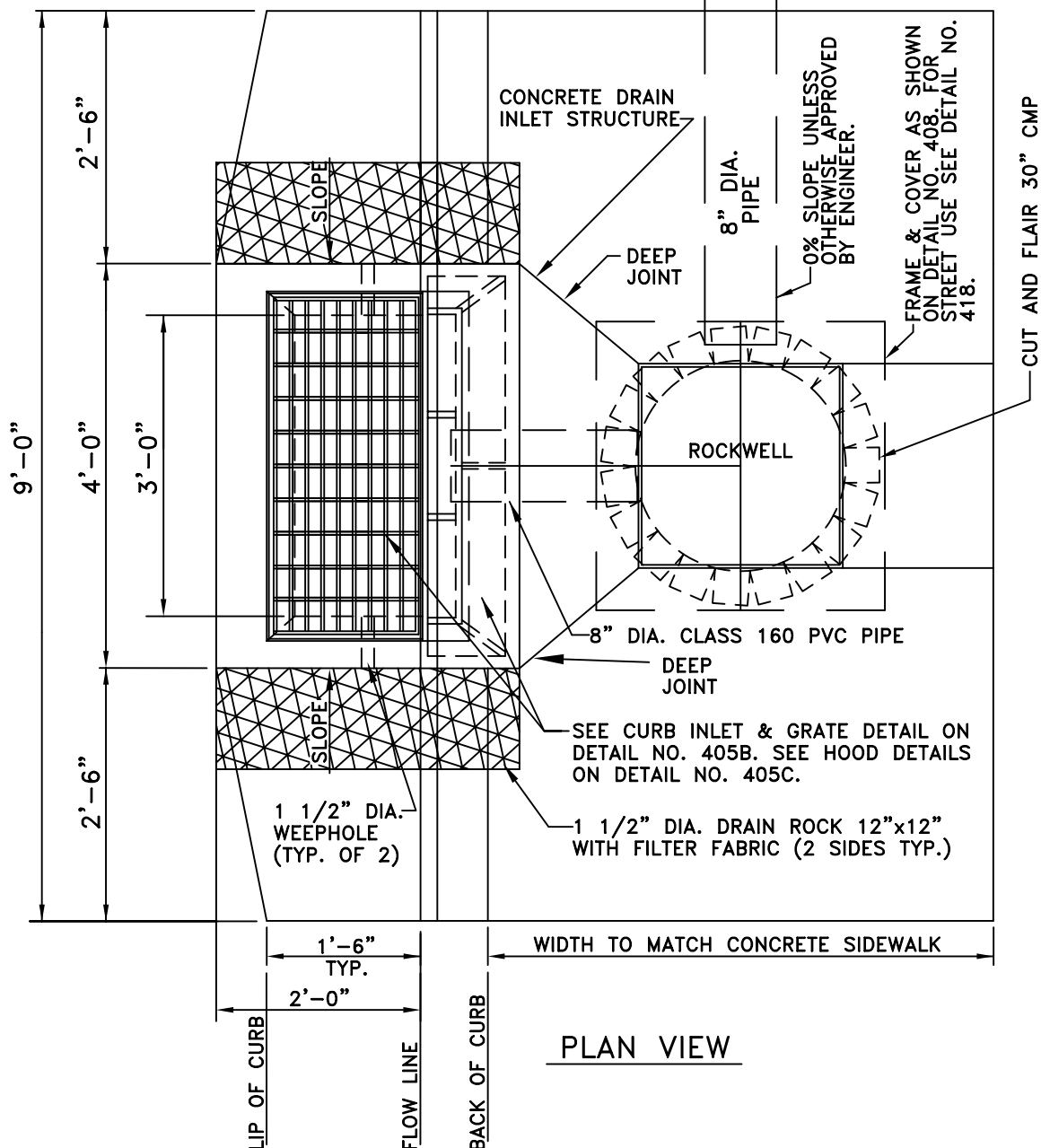
CITY of MODESTO

DETAIL NO.
402

NOTE:

FOR MULTIPLE WELL SYSTEM IN THE STREET AREA C900 PVC PIPE OR CLASS 150 DR 18, IN 20 FOOT LENGTHS, IS REQUIRED. ELEVATION OF PVC PIPE SHALL MATCH 8" DIAMETER PIPE FROM CATCH BASIN. SEE STANDARD DETAIL #418.

FOR MULTIPLE WELL SYSTEM BEHIND CURB, CLASS 160 PVC PIPE, IN 20 FOOT LENGTHS IS REQUIRED. ELEVATION OF PVC PIPE SHALL MATCH 8" DIAMETER PIPE FROM CATCH BASIN.

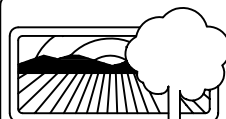


PLAN VIEW

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

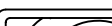
ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

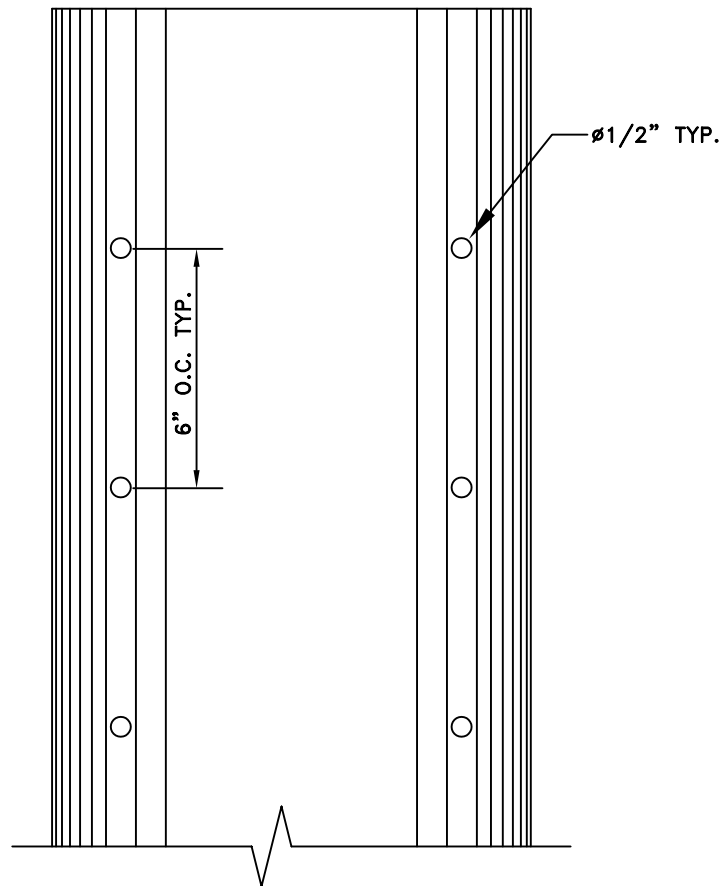
STORM DRAINS
ROCKWELL ASSEMBLY
WITH
TYPE 1-CATCH BASIN
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
403

APPROVED BY CITY COUNCIL RESOLUTION NO. 2002-558	STORM DRAINS ROCKWELL ASSEMBLY WITH TYPE 1-CATCH BASIN	 CITY of MODESTO
ORIGINAL APPROVED BY THE DIRECTOR OF ENGINEERING AND TRANSPORTATION	ENGINEERING & TRANSPORTATION DEPARTMENT	DETAIL NO. 403A



SPECIFICATIONS:

CITY OF MODESTO STANDARD ROCKWELLS SHALL HAVE A 20' LONG, 8" DIAMETER, SDR 35 PVC PERFERATED CORE PIPE. THE PERFERATIONS SHALL BE 1/2" DIAMETER HOLES, AT 90°. THERE SHALL BE 4 ROWS OF PERFERATIONS VERTICALLY AT 6" O.C. AND 6" FROM EITHER END. CORE PIPES SHALL BE INSTALLED BELL END UP.

NOT TO SCALE

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

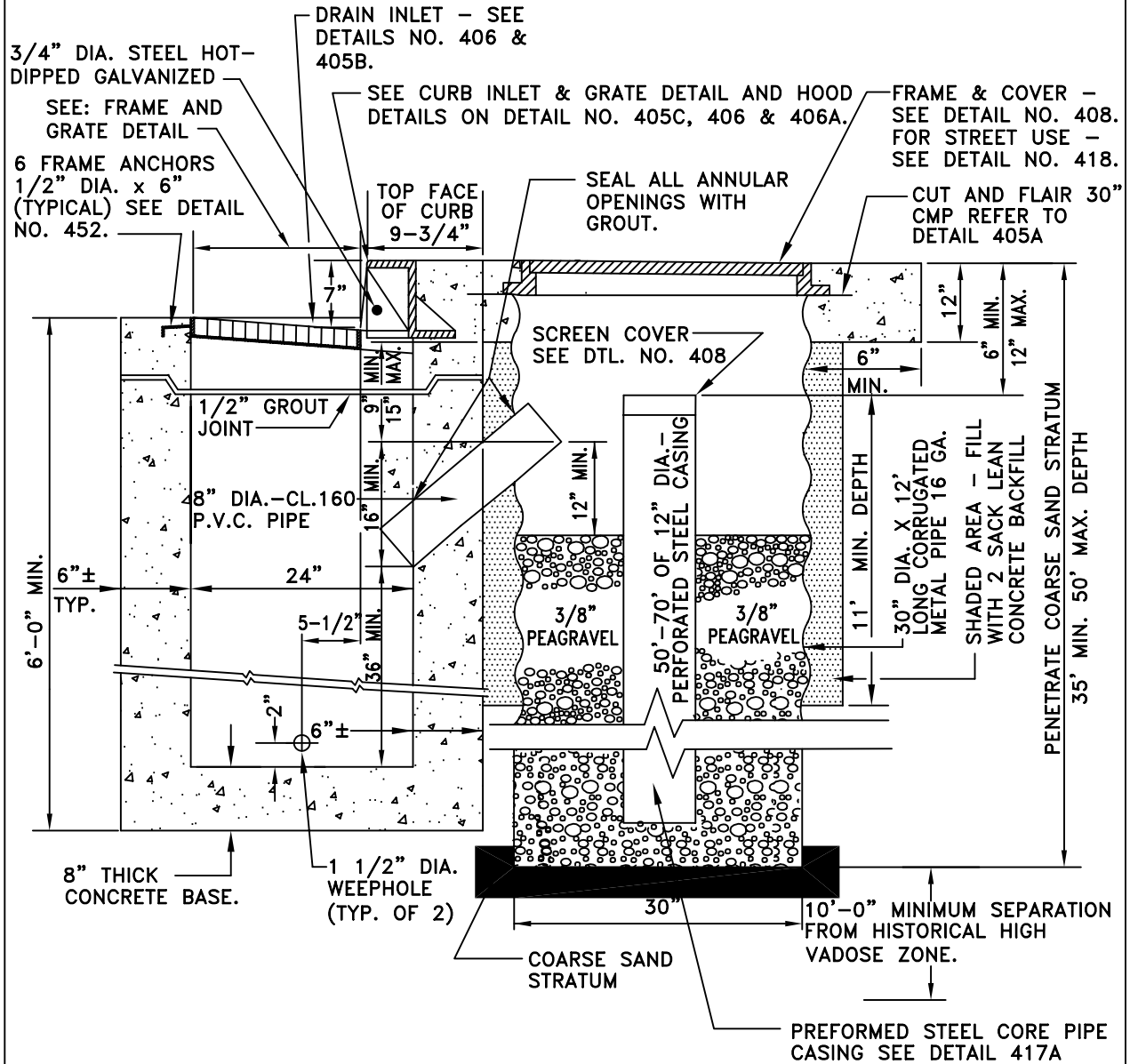
**STORM DRAIN
CORE PIPE FOR
STANDARD CITY
ROCKWELL**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

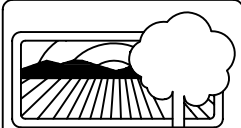
**DETAIL NO.
403B**



APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

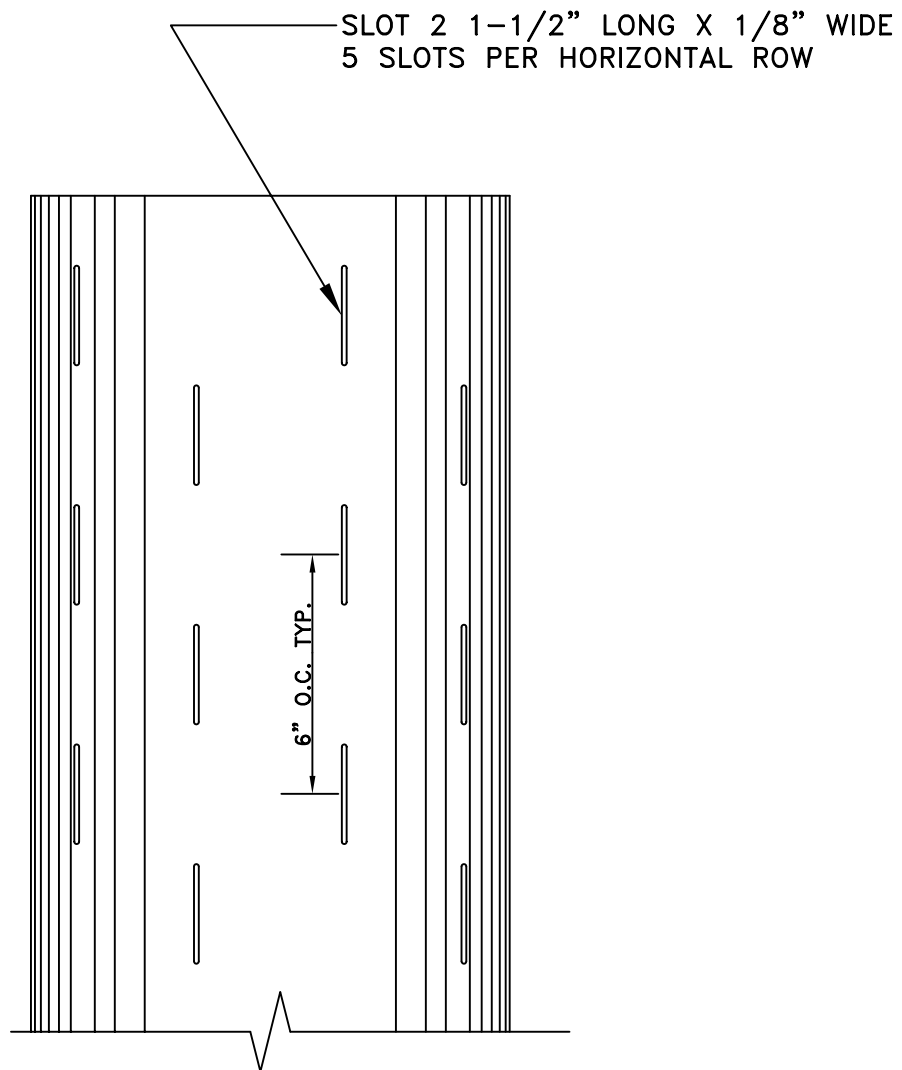
ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STORM DRAINS
TURLOCK ROCKWELL
ASSEMBLY FOR
TYPE 1-CATCH BASIN
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
404



SPECIFICATIONS:

PERFORATED PATTERN FOR 12-3/4" O.D., 12GA (MIN.) STEEL CASING.
 10 ROWS 6" O/C X 2-1/2" LONG., 1/8" (0.120") WIDE SLOTS
 TOTAL NUMBER OF SLOTS PER FT. = 20
 TOTAL OPEN AREA PER FT. = 6.24 SQ. IN.

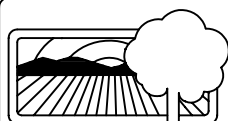
NOT TO SCALE

APPROVED BY CITY COUNCIL
 RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
 DIRECTOR OF ENGINEERING
 AND TRANSPORTATION

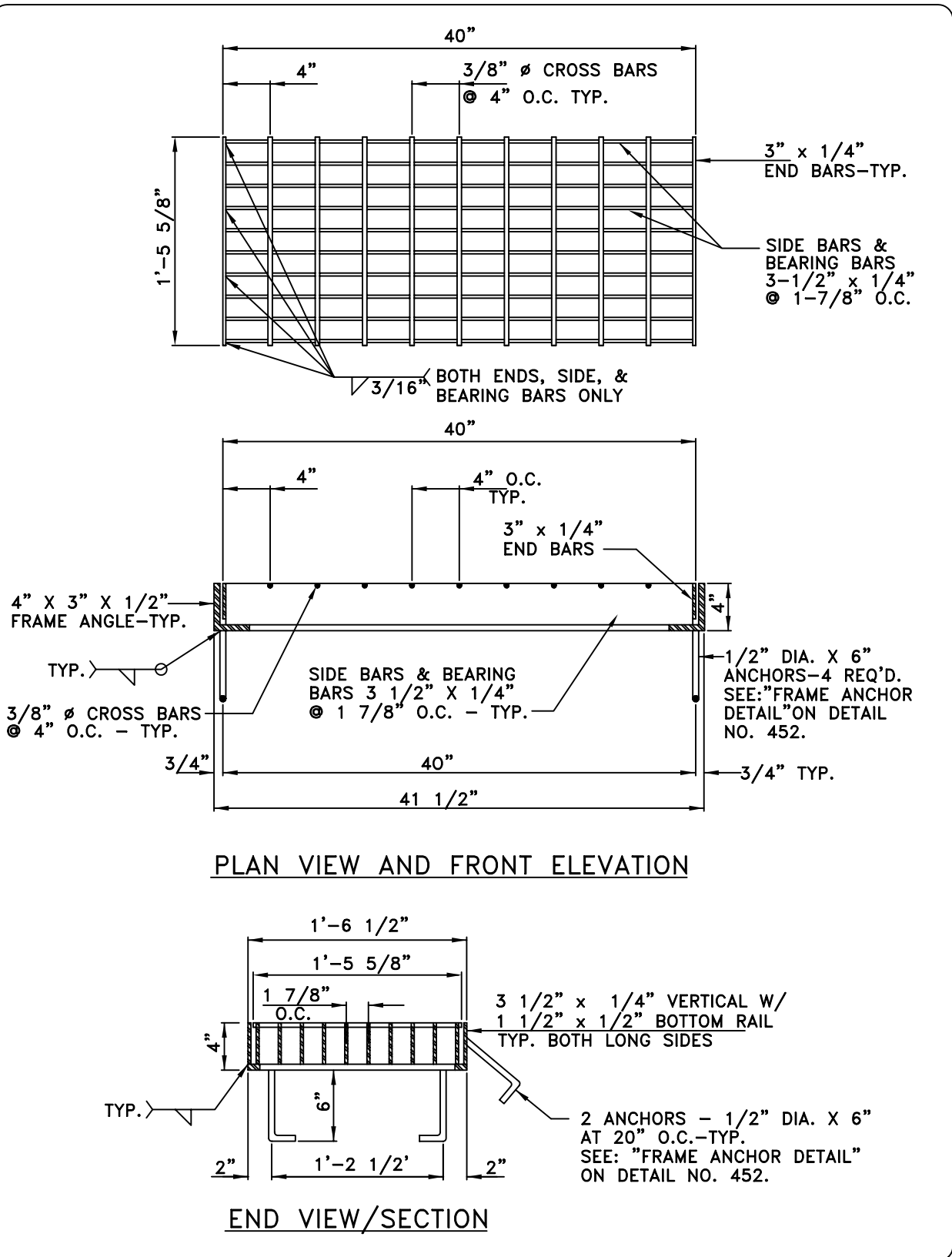
STORM DRAIN
 CORE PIPE FOR
 TURLOCK
 ROCKWELL

ENGINEERING & TRANSPORTATION
 DEPARTMENT



CITY of MODESTO

DETAIL NO.
 404A



APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

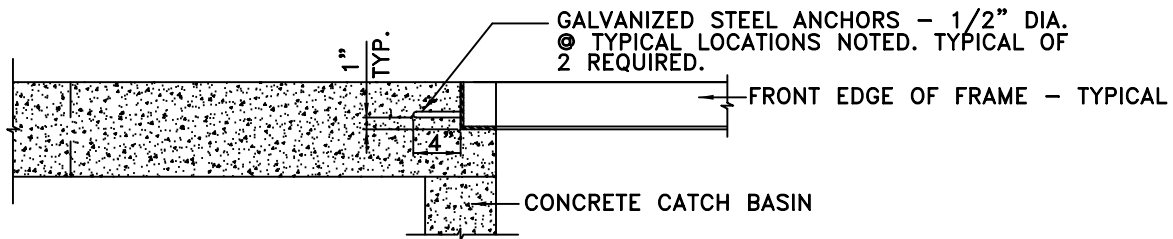
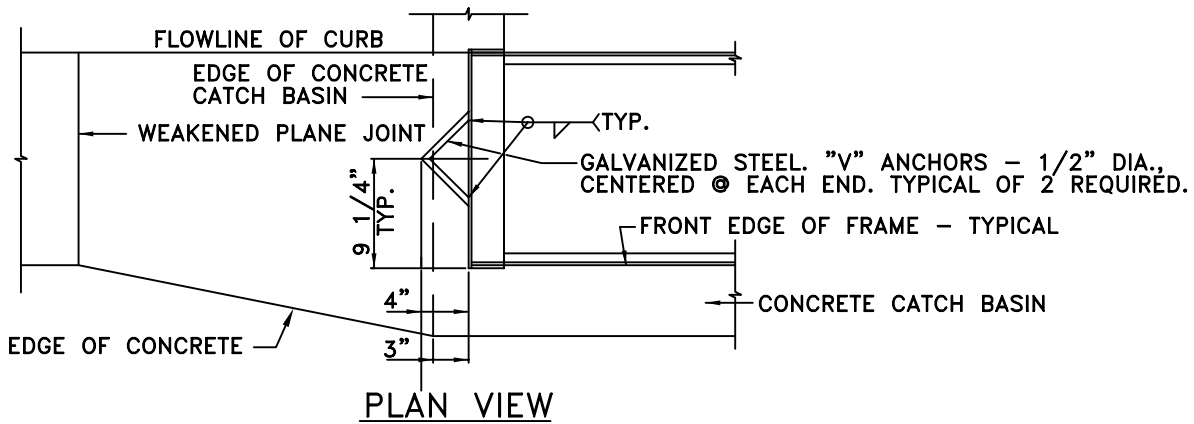
ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STORM DRAINS
FRAME & GRATE
FOR
TYPE 1-CATCH BASIN
ENGINEERING & TRANSPORTATION
DEPARTMENT



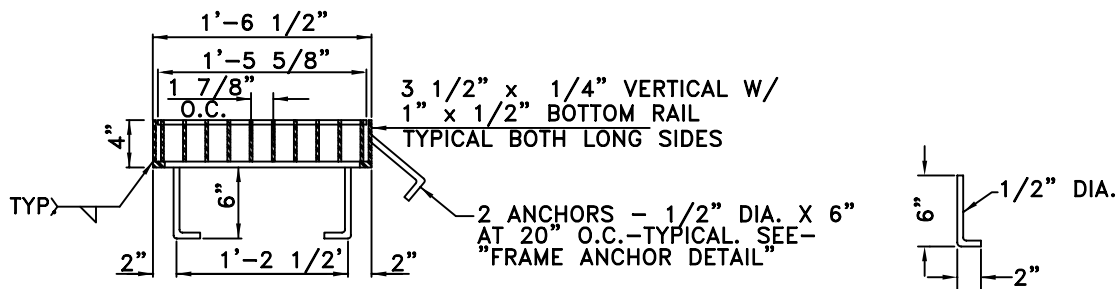
CITY of MODESTO

DETAIL NO.
405A



TYPICAL SECTION

OPTIONAL "V" FRAME ANCHORS



END VIEW/SECTION

TYPICAL STANDARD FRAME ANCHOR (6 REQ'D)

NOTES:

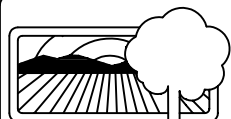
1. MATERIAL SHALL BE A-36 STEEL.
2. GRATE SHALL BE RATED FOR H-20 LOADING.
3. FRAME, GRATE AND HOOD ASSEMBLY SHALL BE HOT DIPPED GALVANIZED.
4. GRATE SHALL BE BICYCLE PROOF.
5. INSTALLED GRATE SHALL BE PERMANENTLY SECURED TO ONE CORNER OF THE INLET FRAME WITH A 12" LENGTH OF 1/4" GALVANIZED CHAIN.
6. LOCATE FRAME ANCHORS TO PROVIDE A MINIMUM OF 2" CLEAR COVER.
7. CLEARANCE BETWEEN CATCH BASIN FRAME AND GRATE SHALL BE A MINIMUM OF 1/8" AND NO GREATER THAN 1/4", AS SHOWN.

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STORM DRAINS ROCKWELL CATCH BASIN ANCHORS

ENGINEERING & TRANSPORTATION
DEPARTMENT



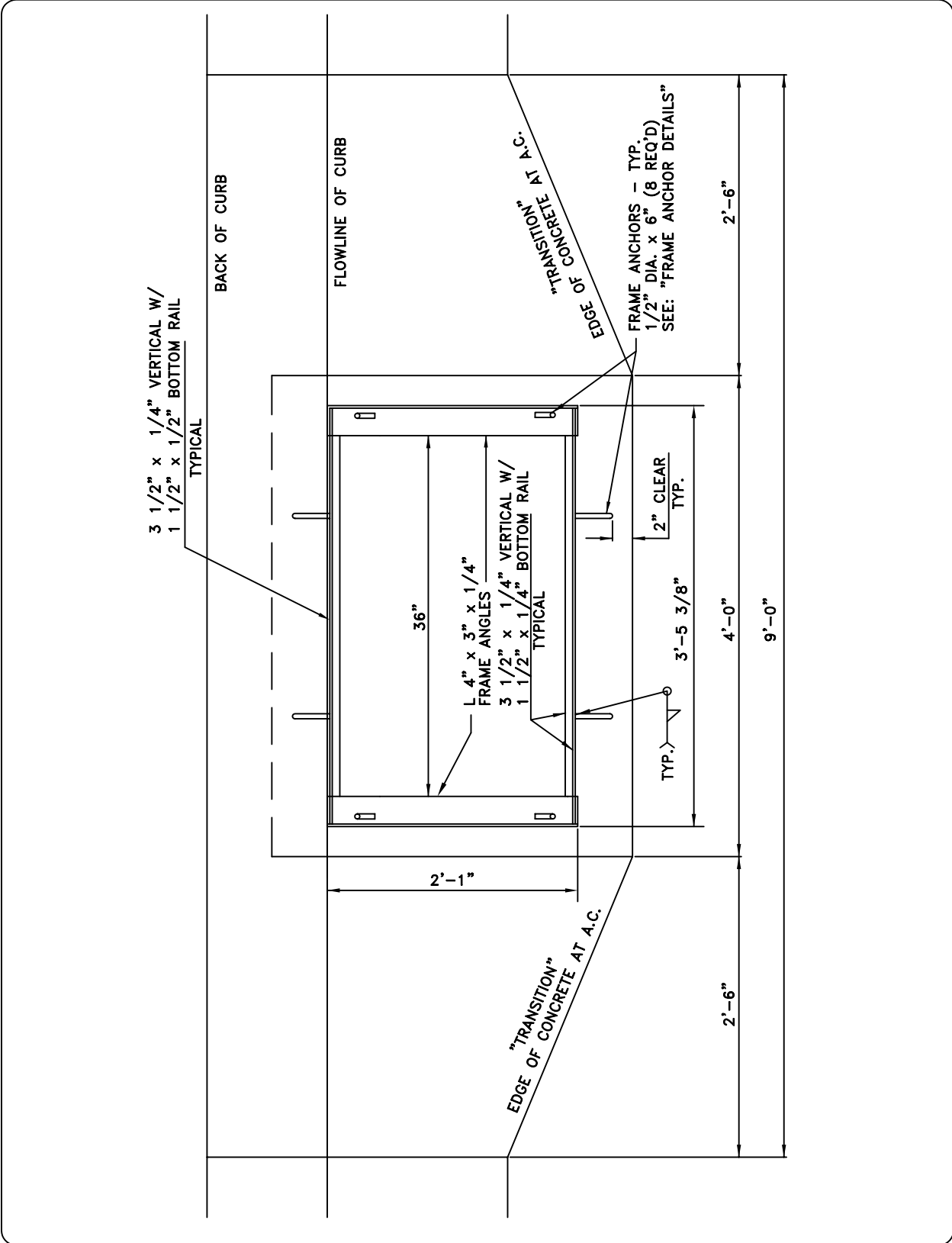
CITY of MODESTO

DETAIL NO.
405B



1. MATERIAL SHALL BE A-36 STEEL.
2. HOOD SHALL BE RATED FOR H-20 LOADING.
3. HOOD SHALL BE HOT DIPPED GALVANIZED.
4. 8" FOR 6" HIGH CURB, 10" FOR 8" CURB.

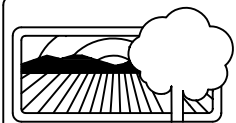
DETAIL NO.
405C



APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STORM DRAINS
CATCH
BASIN AND FRAME
(DRIVE OVER CURB)
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
406

VERIFY THAT ADEQUATE CLEARANCE IS MAINTAINED TO PROVIDED FOR INSTALLATION AND REMOVAL OF THE GRATE PRIOR TO THE INSTALLATION OF THE FRAME.

STANDARD 4 1/2" DRIVEOVER CURB SECTION - TYPICAL

TRANSITION TO FRAME AND GRATE

2" CLEAR TYP.

SEE FRAME AND GRATE DETAIL FOR 4 1/2' DRIVE-OVER CURB AND CATCH BASIN.

WALLS OF STANDARD CONCRETE CATCH BASIN STRUCTURE

STANDARD FRAMING ANCHOR. SEE DETAIL FOR OPTIONAL "V" FRAMING ANCHORS

TRANSITION FROM LIP OF CURB TO CATCH BASIN.

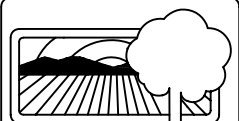
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STORM DRAINS

CATCH BASIN GRATE DETAIL (DRIVE-OVER CURB)

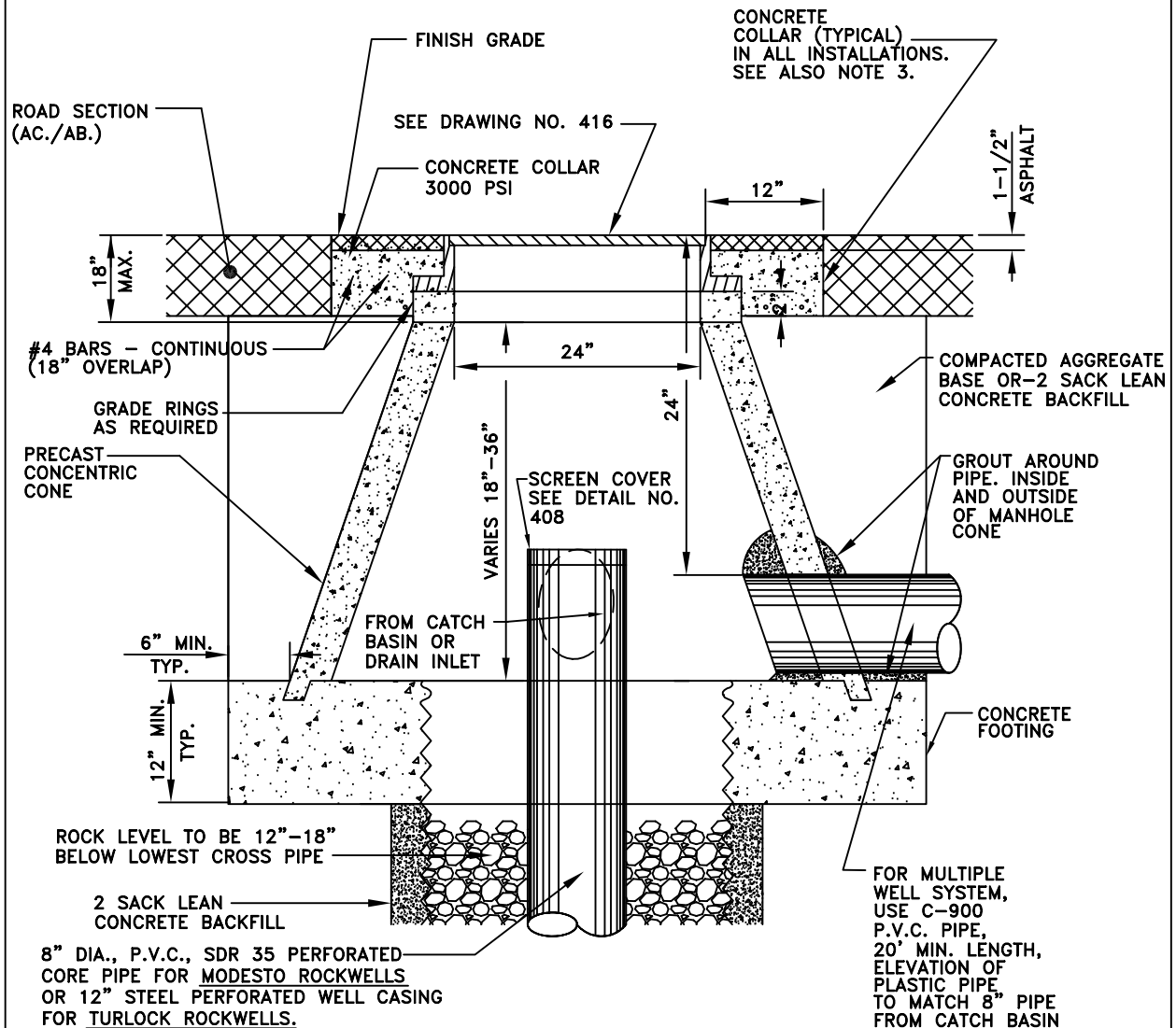
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

406A



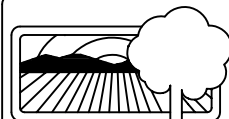
NOTES:

1. ADJUST FRAME TO GRADE AFTER PAVING.
2. IN TRAFFIC AREAS CONCRETE COLLAR SHALL BE MADE WITH HIGH EARLY STRENGTH CONCRETE. BARRICADES SHALL BE REMOVED IN 24 HOURS.
3. ALL PRECAST CONCRETE SHALL BE DESIGNED TO WITHSTAND H-20 LOADING.

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

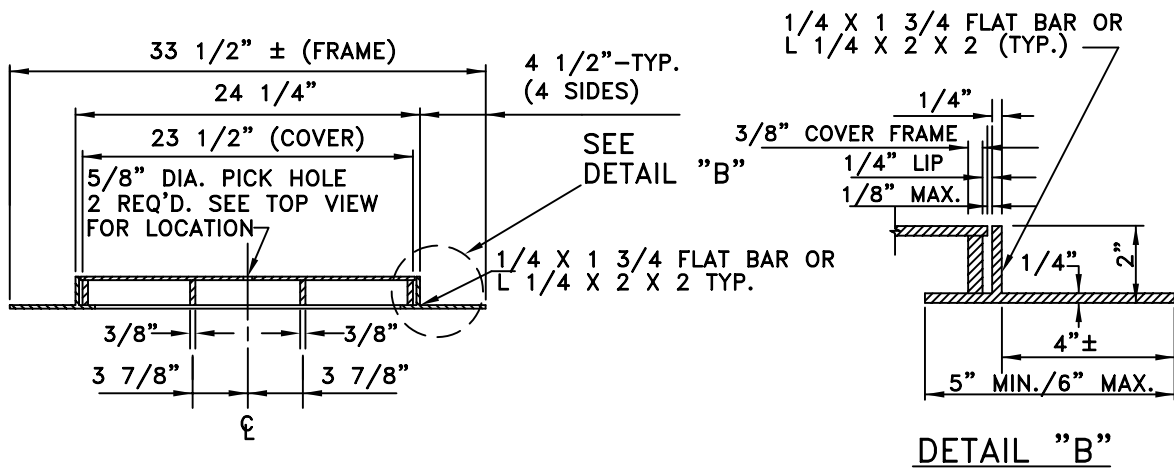
ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STORM DRAINS
**MANHOLE CONE FOR
ROCKWELL IN VEHIC-
ULAR TRAFFIC AREAS**
ENGINEERING & TRANSPORTATION
DEPARTMENT

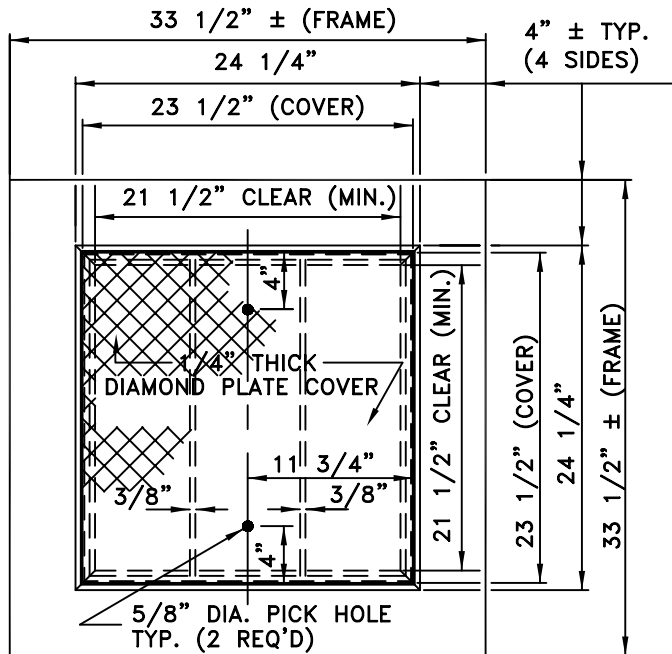


CITY of MODESTO

DETAIL NO.
407

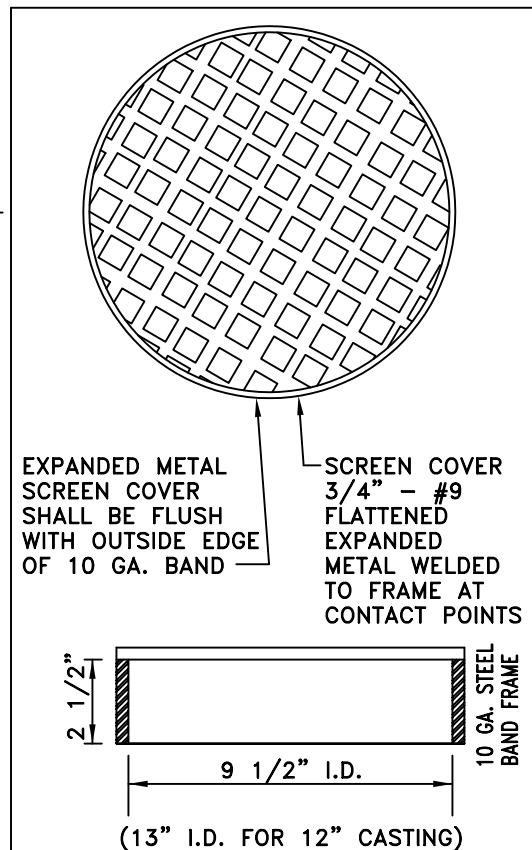


SECTION A-A



NOTE: TOP VIEW

1. FRAME AND COVER TO BE HOT DIPPED GALVANIZED AFTER MANUFACTURE.
2. FRAME SHALL HAVE A MINIMUM CLEAR OPENING OF 21"+ TO ROCKWELL FOR MAINTENANCE.



NOTE:

UNIT TO BE HOT DIPPED GALVANIZED
AFTER MANUFACTURE.

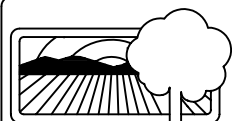
SCREEN COVER DETAIL

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

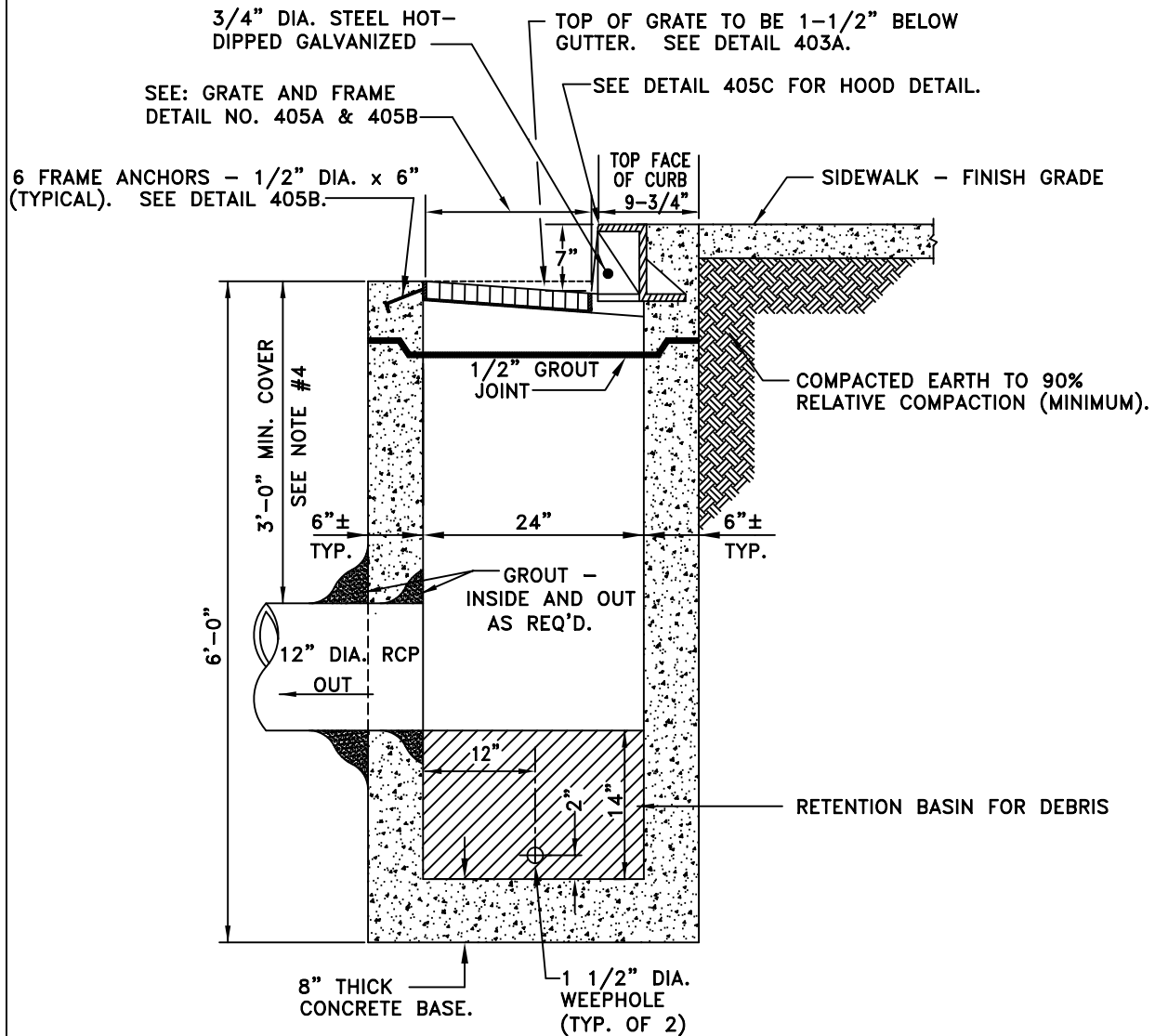
STORM DRAINS ROCKWELL FRAME AND COVER AND SCREEN COVER

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
408



TYPICAL SECTION

NOTE:

1. REFER TO CITY STANDARD DRAWINGS 403, 403A, 405, 405A, AND 405C FOR THE CONSTRUCTION OF THE CITY OF MODESTO STANDARD CATCH BASIN/DRAIN INLET COMPLETE IN PLACE.
2. CATCH BASIN/DRAIN INLET GRATE, FRAME AND HOOD SHALL BE FABRICATED FROM A-36 STEEL AND HOT-DIPPED GALVANIZED COATED.
3. TYPICAL DRAIN INLET BASE SECTION MAY BE PRECAST OR CAST IN PLACE TO SUIT CONSTRUCTION CONDITIONS.
4. OUTLET PIPE SHALL BE 12" DIA. RCP WITH A MINIMUM VERTICAL COVER OF 3'. WHEN VERTICAL COVER IS LESS THAN 3', ENGINEERED BACKFILL, DUCTILE IRON PIPE OR A COMBINATION OF BOTH SHALL BE REQUIRED AND APPROVED BY THE CITY ENGINEER.
5. SEE DETAIL 403 FOR PLACEMENT OF 1 1/2" DRAIN ROCK.

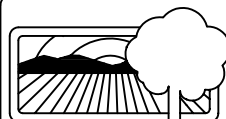
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STORM DRAINS

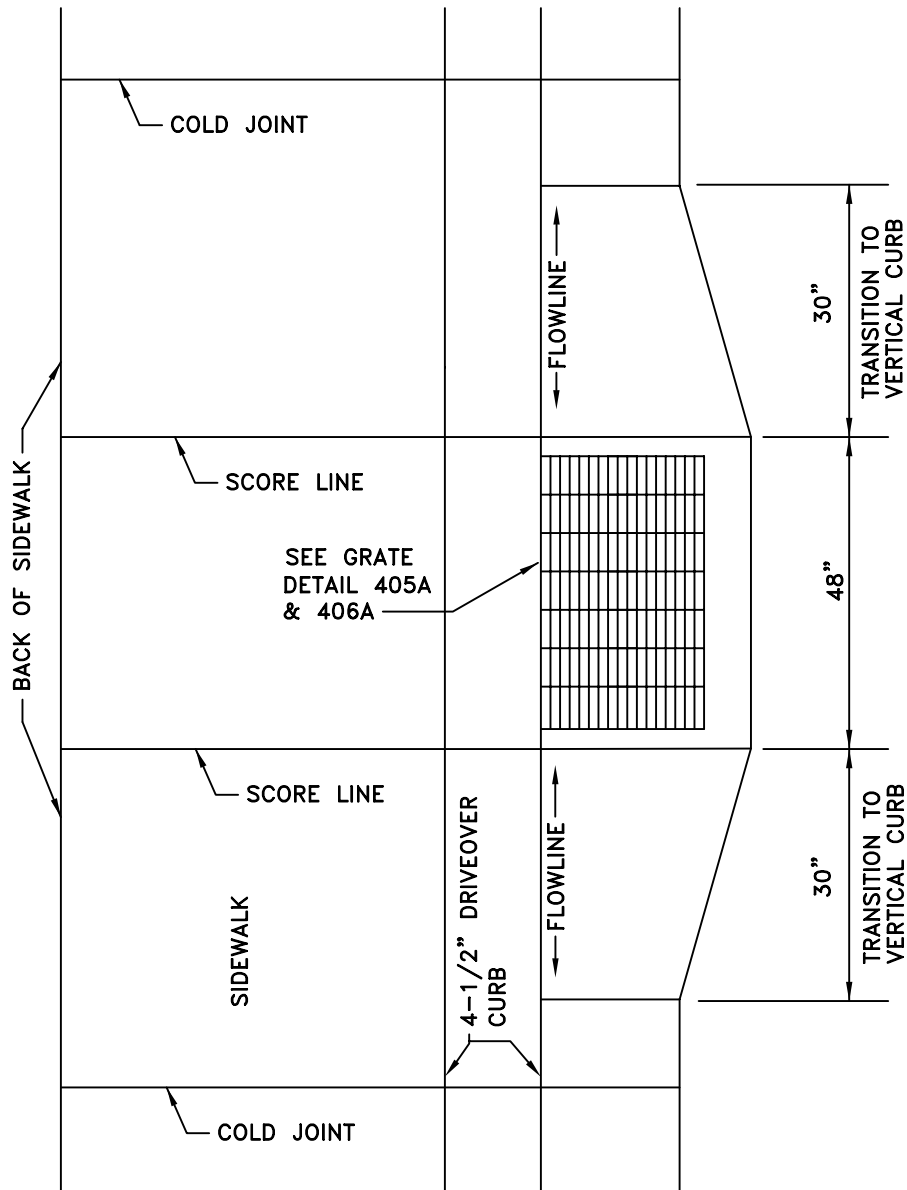
TYPE I CATCH BASIN W/ RETENTION BASIN

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
409



NOTE:

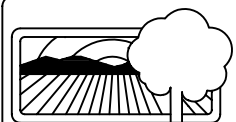
1. THIS TYPE OF CATCH BASIN MAY BE USED ONLY IN POSITIVE STORM DRAIN AREAS WHERE A SETTLING BASIN OR SEPARATOR IS USED TO PREVENT LEAVES FROM ENTERING OUR STREAMS OR RIVERS.
2. STORM DRAINAGE LINES RUN PARALLEL WITH THE CENTERLINE OF THE STREET, WITH THE CENTERLINE OF THE PIPE DIRECTLY UNDER THE FACE OF THE VERTICAL CURB AND CENTERED UNDER DRIVE-OVER CURB. ALTHOUGH DEFLECTION INTO AND OUT OF TYPE II CATCH BASINS WILL BE NECESSARY, UNNECESSARY MEANDERING AND ANGULAR CHANGES SHALL BE AVOIDED. PIPE CURVATURE SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATIONS.

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STORM DRAINS
DRIVE-OVER CURB
FOR CURB INLET

**ENGINEERING & TRANSPORTATION
DEPARTMENT**

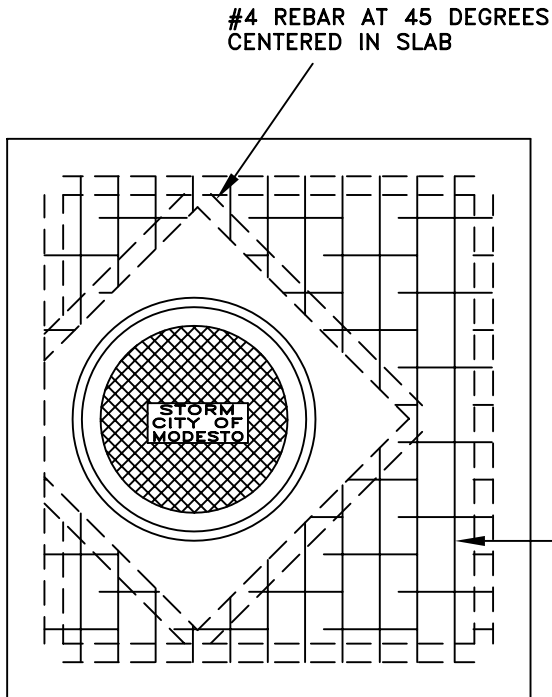


CITY of MODESTO

DETAIL NO.
411

NOTES:

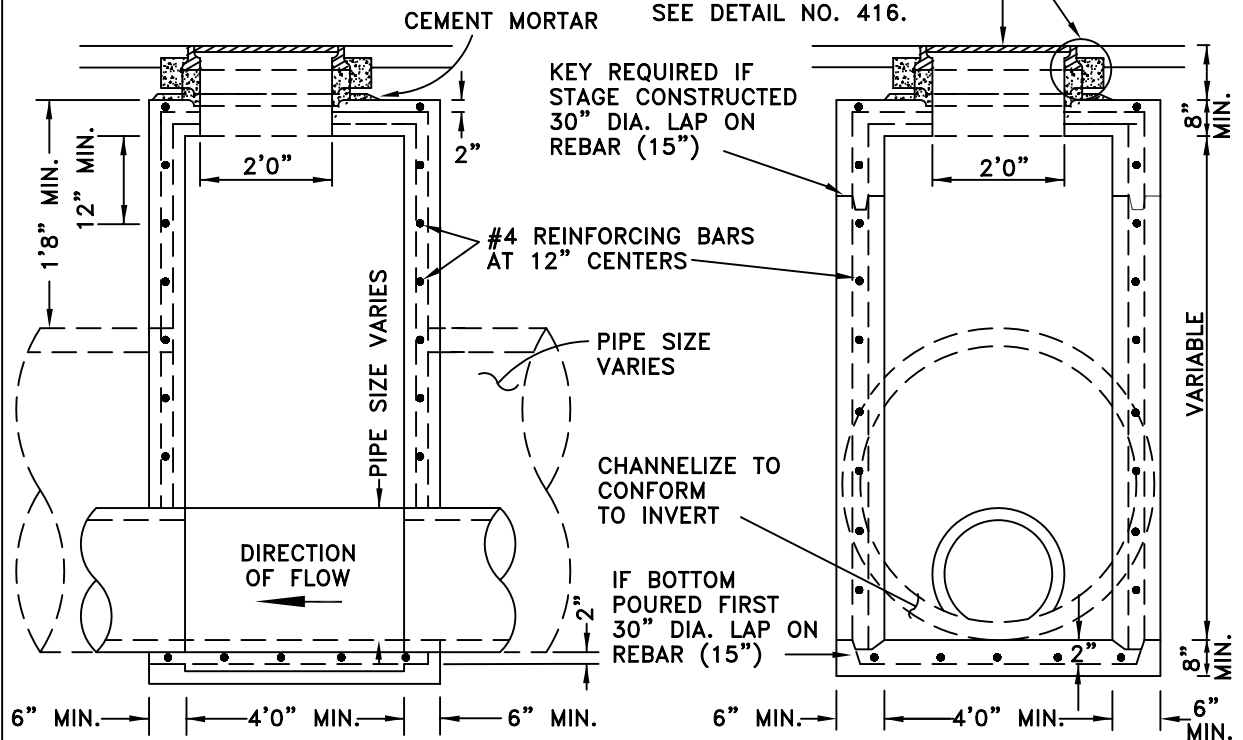
1. THIS INSTALLATION SHALL BE USED ON EXISTING MANHOLES ONLY WHERE THE DIFFERENCE IN ELEVATION BETWEEN THE TOP OF THE OUTLET PIPE AND THE INVERT OF THE FEEDER OR COLLECTOR SEWER EXCEEDS 24".
2. 12" MAX. FOR 8" PIPE, 24" MAX. FOR PIPES LESS THAN 8".
3. FLEXIBLE JOINT - BALL AND SPIGOT OR COULDER COUPLING. SOLVENT WELDED JOINT NOT PERMITTED.
4. ADJUST FRAME TO GRADE AFTER PAVING.
5. ALL PRECAST CONCRETE SHALL BE DESIGNED TO WITHSTAND H2O LOADING.
6. IN TRAFFIC AREAS CONCRETE SHALL BE MADE WITH 3000 PSI PCC HIGH-EARLY STRENGTH. BARRICADES SHALL BE REMOVED IN 24 HOURS.



#4 REINFORCING BARS
AT 12" CENTERS, TOP
AND BOTTOM OF SLAB.

DETAIL A ON
DETAIL NO. 414

STANDARD FRAME & COVER
SEE DETAIL NO. 416.



APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STORM DRAINS

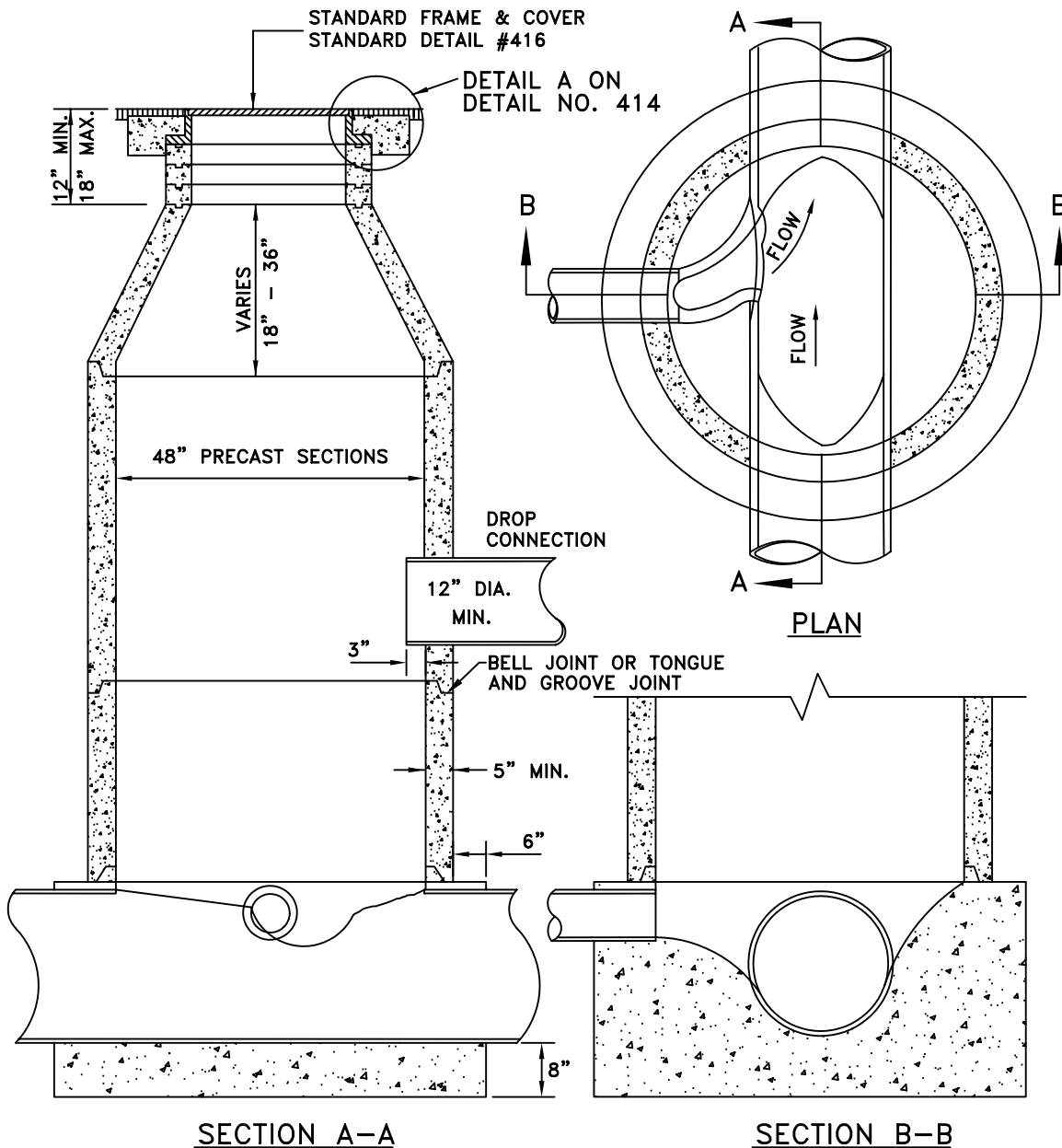
JUNCTION
BOX

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
412



NOTES:

1. PIPE TO BE LAID THROUGH MANHOLE AND TOP PORTION REMOVED AFTER CONCRETE HAS SET.
2. MORTAR ALL JOINTS.
3. INCOMING SMALLER PIPES SHALL MATCH CROWNS OF THE LARGER PIPE.
4. ADJUST FRAME TO GRADE AFTER PAVING.
5. ALL PRECAST CONCRETE SHALL BE DESIGNED TO WITHSTAND H2O LOADING.
6. IN TRAFFIC AREAS CONCRETE COLLAR SHALL BE MADE WITH 3000 PSI PCC, HIGH-EARLY STRENGTH. BARRICADES TO BE REMOVED IN 24 HOURS.

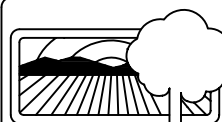
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STORM DRAINS

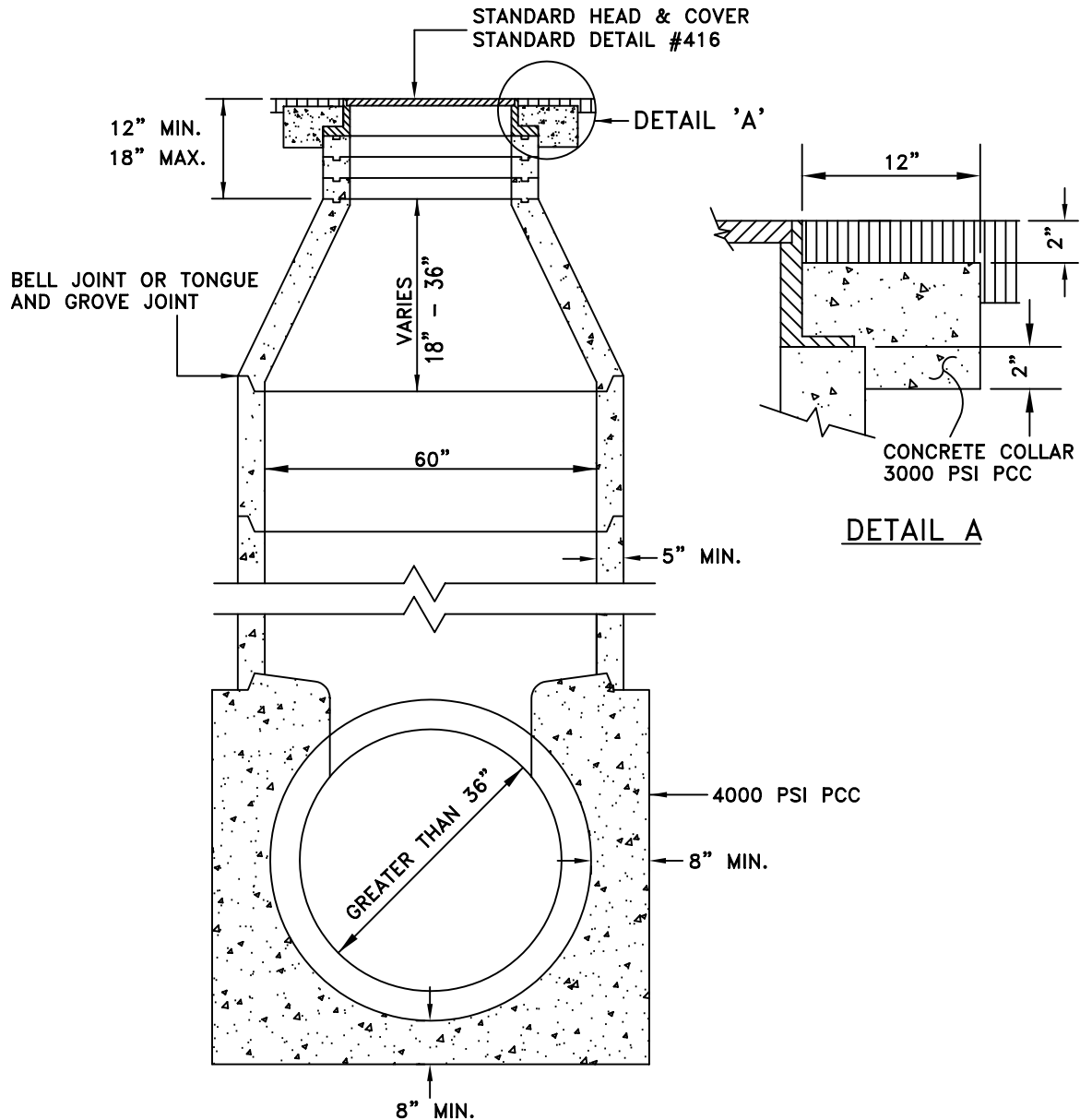
**LATERAL
MANHOLE**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

**DETAIL NO.
413**



NOTES:

1. PIPE TO BE LAID THROUGH MANHOLE AND TOP PORTION REMOVED AFTER CONCRETE HAS SET.
2. MORTAR ALL JOINTS.
3. INCOMING SMALLER PIPES SHALL MATCH CROWNS OF THE LARGER PIPE.
4. ADJUST FRAME TO GRADE AFTER PAVING.
5. ALL PRECAST CONCRETE SHALL BE DESIGNED TO WITHSTAND H₂O LOADING.
6. IN TRAFFIC AREAS, CONCRETE COLLAR SHALL BE MADE WITH 3000 P.S.I. PCC, HIGH-EARLY STRENGTH. BARRICADES SHALL BE REMOVED IN 24 HOURS.

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

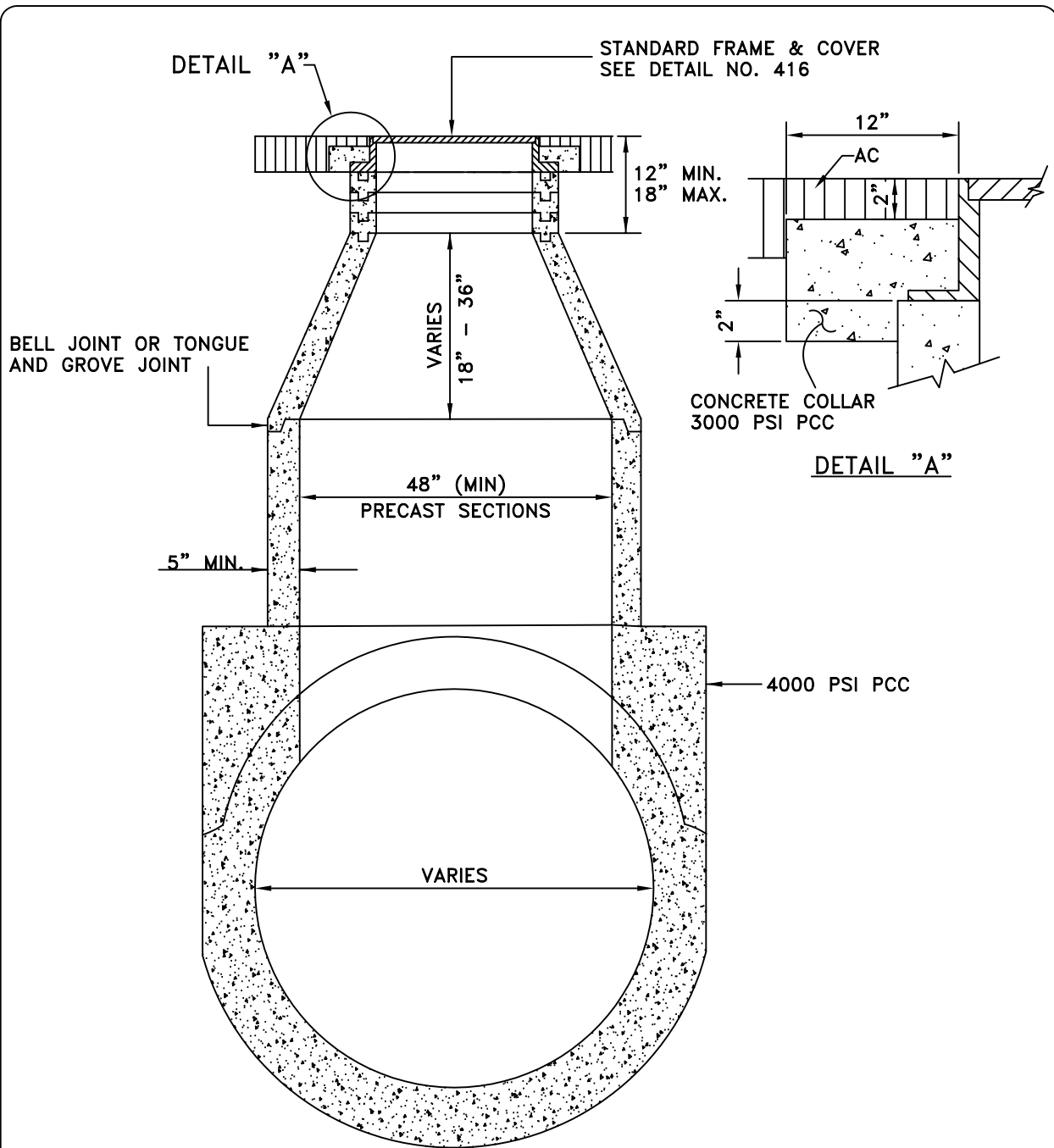
STORM DRAINS
"PRECAST TRUNK"
MANHOLE

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
414



NOTES:

1. MAKE MANHOLE OPENING IN TOP OF PIPE BEFORE CONCRETE SETS AND PLACE BARREL WITHIN 7 DAYS.
2. MORTAR ALL JOINTS.
3. ADJUST FRAME TO GRADE AFTER PAVING.
4. ALL PRECAST CONCRETE SHALL BE DESIGNED TO WITHSTAND H2O LOADING.
5. IN TRAFFIC AREAS, CONCRETE COLLAR SHALL BE MADE WITH 3000 P.S.I. PCC, WITH HIGH-EARLY STRENGTH CEMENT. BARRICADES TO BE REMOVED IN 24 HOURS.

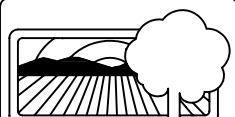
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STORM DRAINS

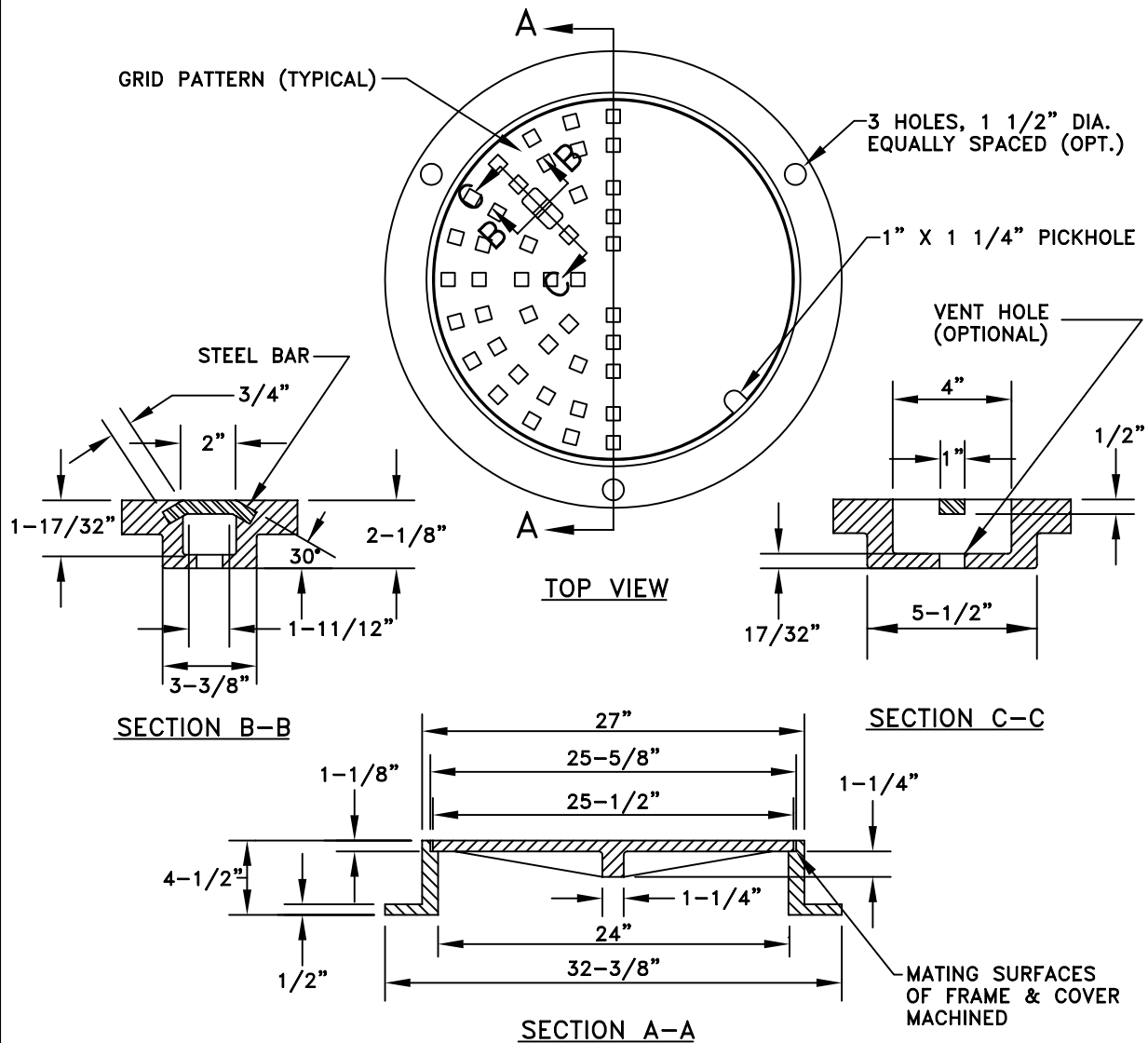
CAST-IN-PLACE TRUNK MANHOLE

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
415



NOTES:

1. DIMENSIONS FOR FRAME AND COVER SHALL MATCH. MATING SURFACES OF FRAME AND COVER SHALL BE MACHINED TO INSURE NO-ROCK FIT.
2. COVER SHALL HAVE VERTICAL SIDES. NO TAPERED COVERS SHALL BE INSTALLED.
3. WEIGHT OF COVER SHALL BE NO LESS THAN 130 POUNDS. WEIGHT OF FRAME SHALL BE NO LESS THAN 140 POUNDS.
4. SOUTH BAY FOUNDRY SBF A-515 W/624 COVER OR APPROVED EQUAL.
5. EACH MANHOLE COVER SHALL BE STAMPED "CITY OF MODESTO" WITH 1" TO 2" LETTERING.

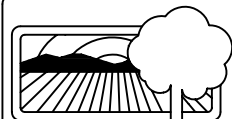
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2002-558

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STORM DRAINS

**MANHOLE COVER
AND FRAME**

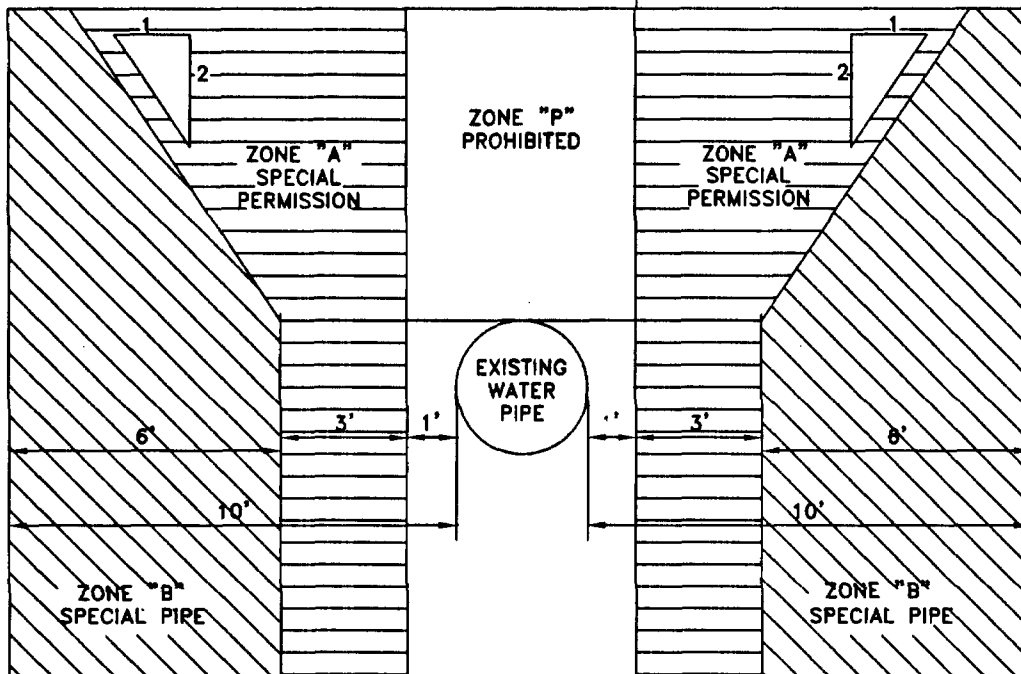
**ENGINEERING & TRANSPORTATION
DEPARTMENT**



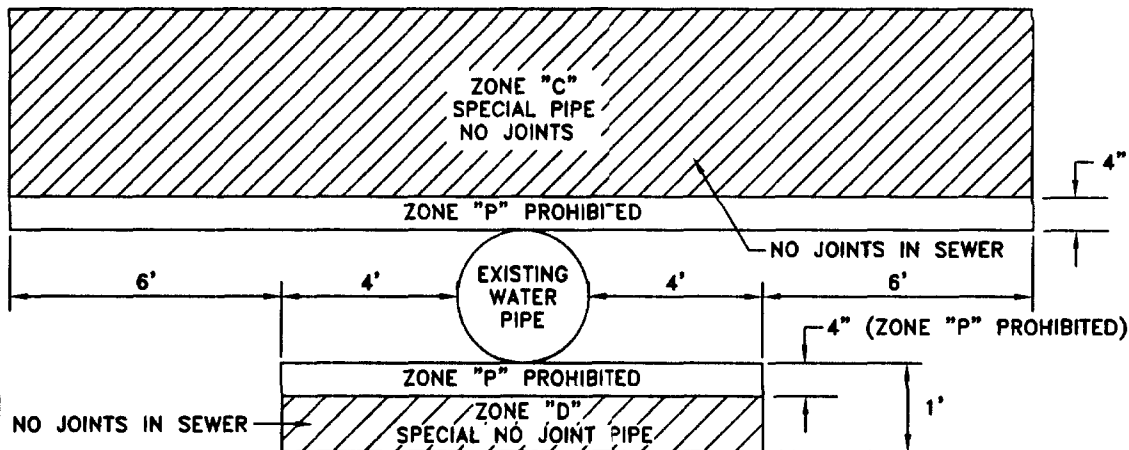
CITY of MODESTO

**DETAIL NO.
416**

SPECIAL CONSTRUCTION REQUIREMENTS
 (TO BE USED ONLY WHERE REQUIRED SEPARATION CANNOT BE OBTAINED)
CASE 2-NEW SEWER LINE BEING INSTALLED



PARALLEL CONSTRUCTION



PERPENDICULAR CONSTRUCTION

NOTES:

1. ZONE "P" IS A PROHIBITED CONSTRUCTION ZONE.
2. ZONE "C", SPECIAL PIPE, SHALL BE DUCTILE IRON, STEEL CASING PIPE OR APPROVED EQUAL.

APPROVED BY CITY COUNCIL
 RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
 DIRECTOR OF ENGINEERING
 AND TRANSPORTATION

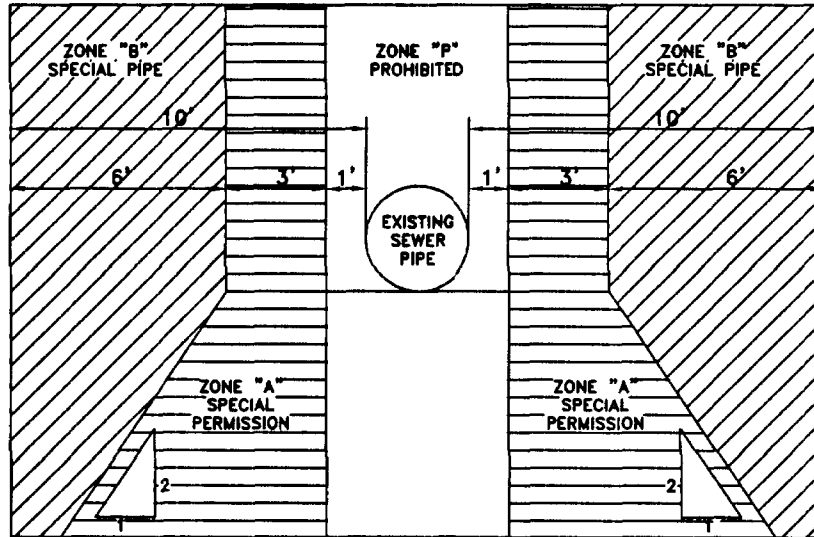
SEWERS
CALIFORNIA HEALTH
DEPARTMENT
REQUIREMENTS
 ENGINEERING & TRANSPORTATION
 DEPARTMENT



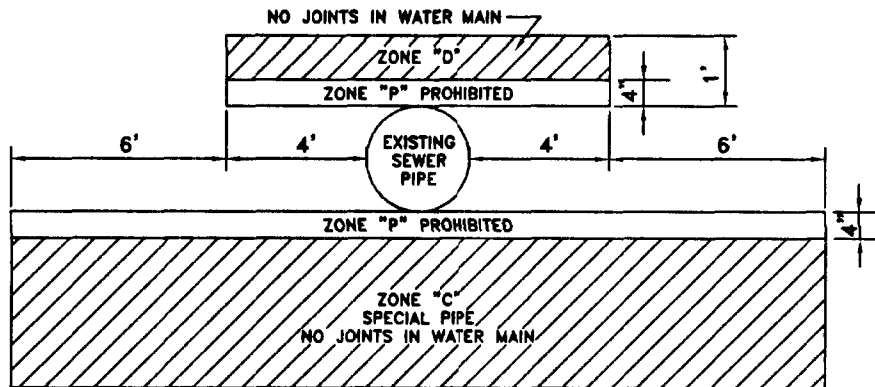
CITY of MODESTO

DETAIL NO.
500

SPECIAL CONSTRUCTION REQUIREMENTS
 (TO BE USED ONLY WHERE REQUIRED SEPARATION CANNOT BE OBTAINED)
CASE 2-NEW WATER LINE BEING INSTALLED



PARALLEL CONSTRUCTION



PERPENDICULAR CONSTRUCTION

NOTES:

1. ZONE "P" IS A PROHIBITED CONSTRUCTION ZONE.
2. ZONE "C", SPECIAL PIPE, SHALL BE PVC CLASS 200 PER AWWA C900 OR APPROVED EQUAL.

APPROVED BY CITY COUNCIL
 RESOLUTION NO. 00-test

ORIGINAL APPROVED BY THE
 DIRECTOR OF ENGINEERING
 AND TRANSPORTATION

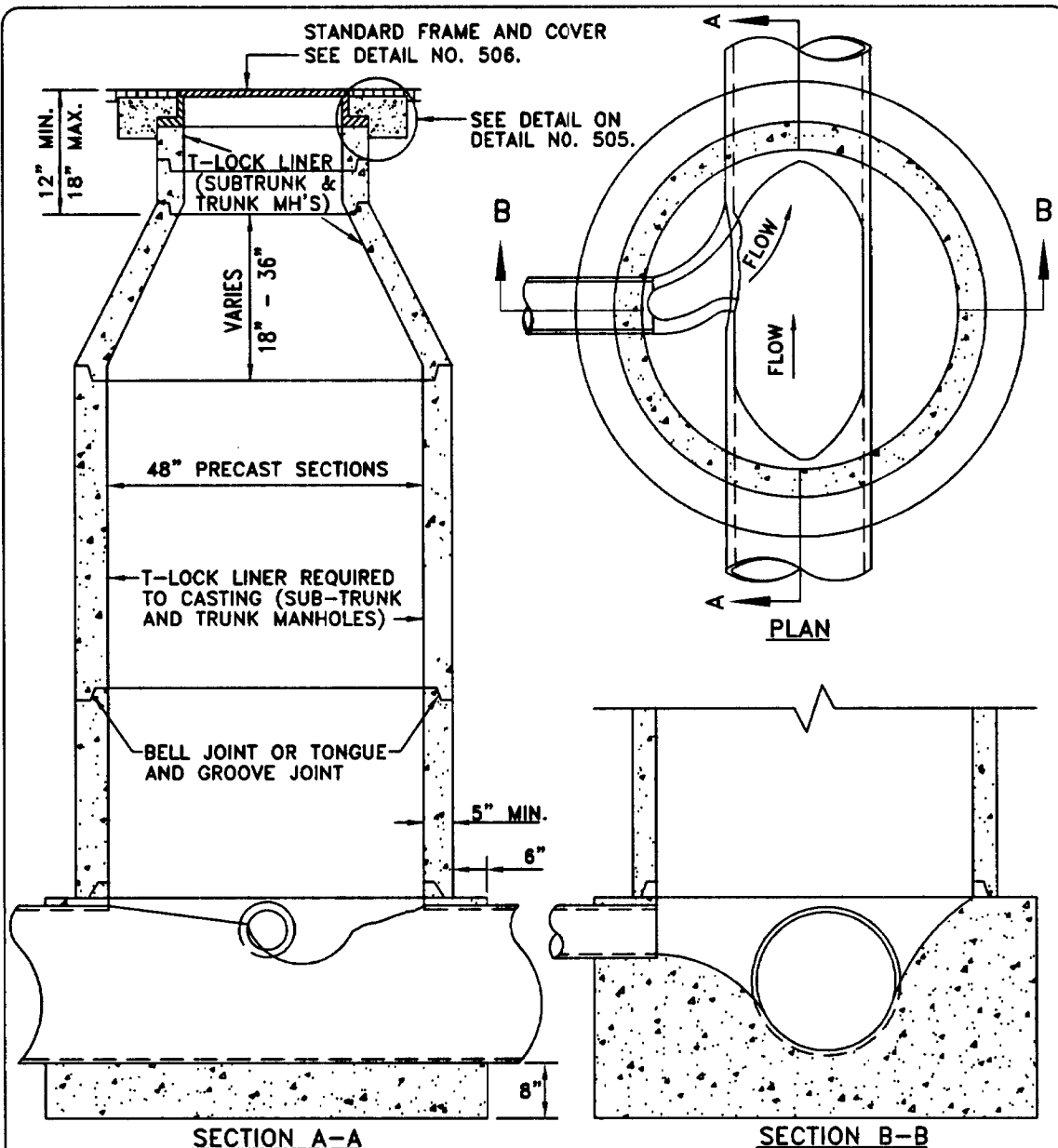
SEWERS
CALIFORNIA HEALTH
DEPARTMENT
REQUIREMENTS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
500A



NOTES:

1. PIPE TO BE LAID THROUGH MANHOLE AND TOP PORTION REMOVED AFTER CONCRETE HAS SET.
2. MORTAR ALL JOINTS.
3. INCOMING SMALLER PIPES SHALL MATCH CROWNS OF THE LARGER PIPE.
4. A CHANGE IN DIRECTION OF FLOW IN A MANHOLE REQUIRES A .10' FALL (MIN.).
5. ADJUST FRAME TO GRADE AFTER PAVING.
6. ALL PRECAST CONCRETE SHALL BE DESIGNED TO WITHSTAND H₂O LOADING.
7. IN TRAFFIC AREAS CONCRETE COLLAR SHALL BE MADE WITH 3000 PSI PCC, HIGH EARLY STRENGTH. BARRICADES SHALL BE REMOVED IN 24 HOURS.
8. ALL INTERIOR SURFACES OF THE PRECAST MANHOLE SECTIONS FOR SUBTRUNK AND TRUNK MANHOLES SHALL BE LINED WITH A POLYVINYL CHLORIDE LINING SYSTEM (PVC LINER).

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

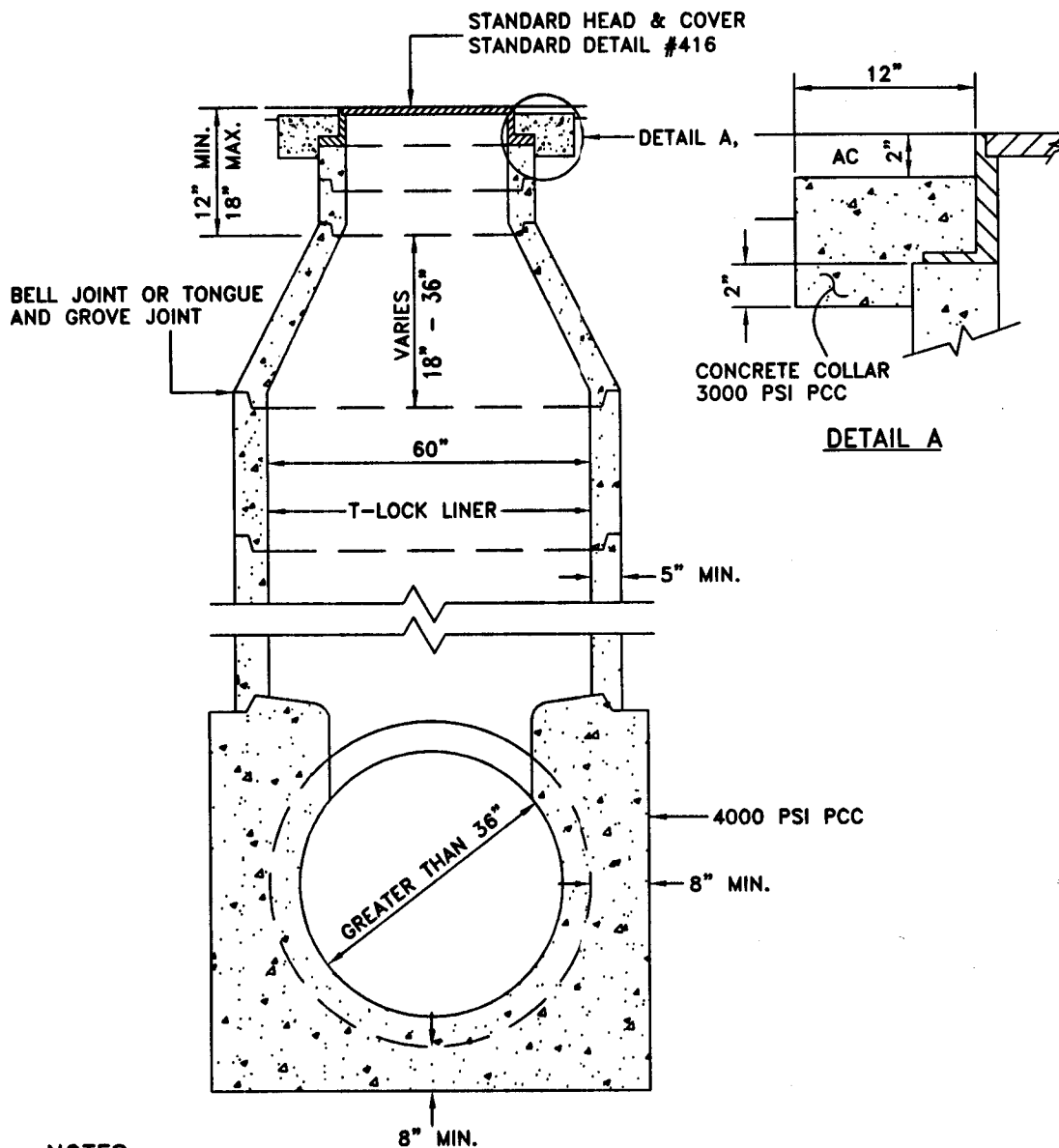
SEWERS
LATERAL, SUB TRUNK
OR SMALL TRUNK
MANHOLE

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
501



NOTES:

1. PIPE TO BE LAID THROUGH MANHOLE AND TOP PORTION REMOVED AFTER CONCRETE HAS SET.
2. MORTAR ALL JOINTS.
3. INCOMING SMALLER PIPES SHALL MATCH CROWNS OF THE LARGER PIPE.
4. ADJUST FRAME TO GRADE AFTER PAVING.
5. ALL PRECAST CONCRETE SHALL BE DESIGNED TO WITHSTAND H2O LOADING.
6. IN TRAFFIC AREAS, CONCRETE COLLAR SHALL BE MADE WITH 3000 P.S.I. PCC, HIGH-EARLY STRENGTH. BARRICADES SHALL BE REMOVED IN 24 HOURS.
7. ALL INTERIOR SURFACES OF THE PRECAST MANHOLE SECTIONS SHALL BE LINED WITH A POLYVINYL CHLORIDE LINING SYSTEM (PVC LINER)

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

SEWER

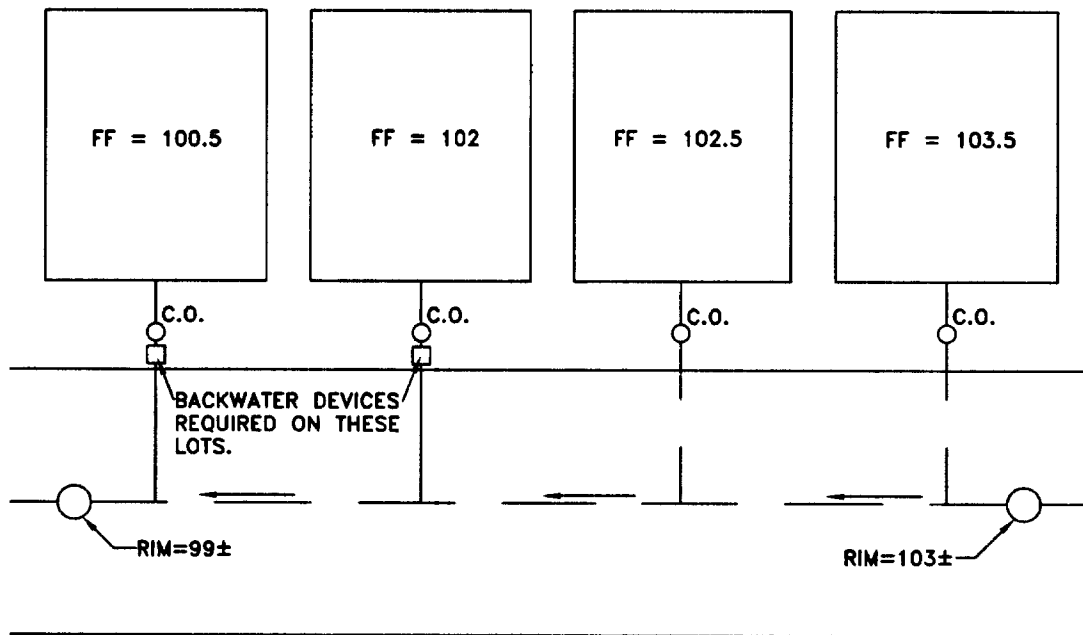
PRECAST TRUNK
MANHOLE

ENGINEERING & TRANSPORTATION
DEPARTMENT

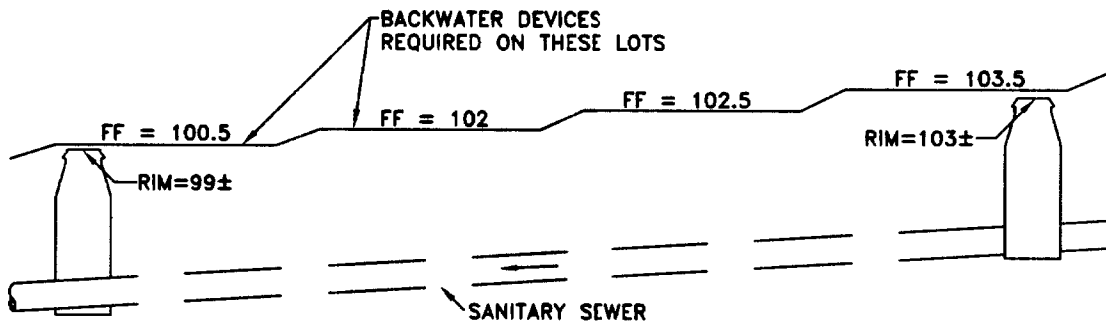


CITY of MODESTO

DETAIL NO.
502



PLAN VIEW



SECTION

NOTES:

1. BACKWATER DEVICE SHALL BE INSTALLED WHEN FINISHED FLOOR (FF) ELEVATION IS 12" OR MORE BELOW NEAREST UPSTREAM STRUCTURE (MANHOLE).
2. BACKWATER DEVICE SHALL BE INSTALLED AT R.O.W. ADJACENT TO CLEAN-OUT.

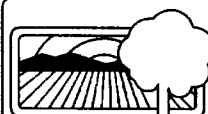
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

SEWERS

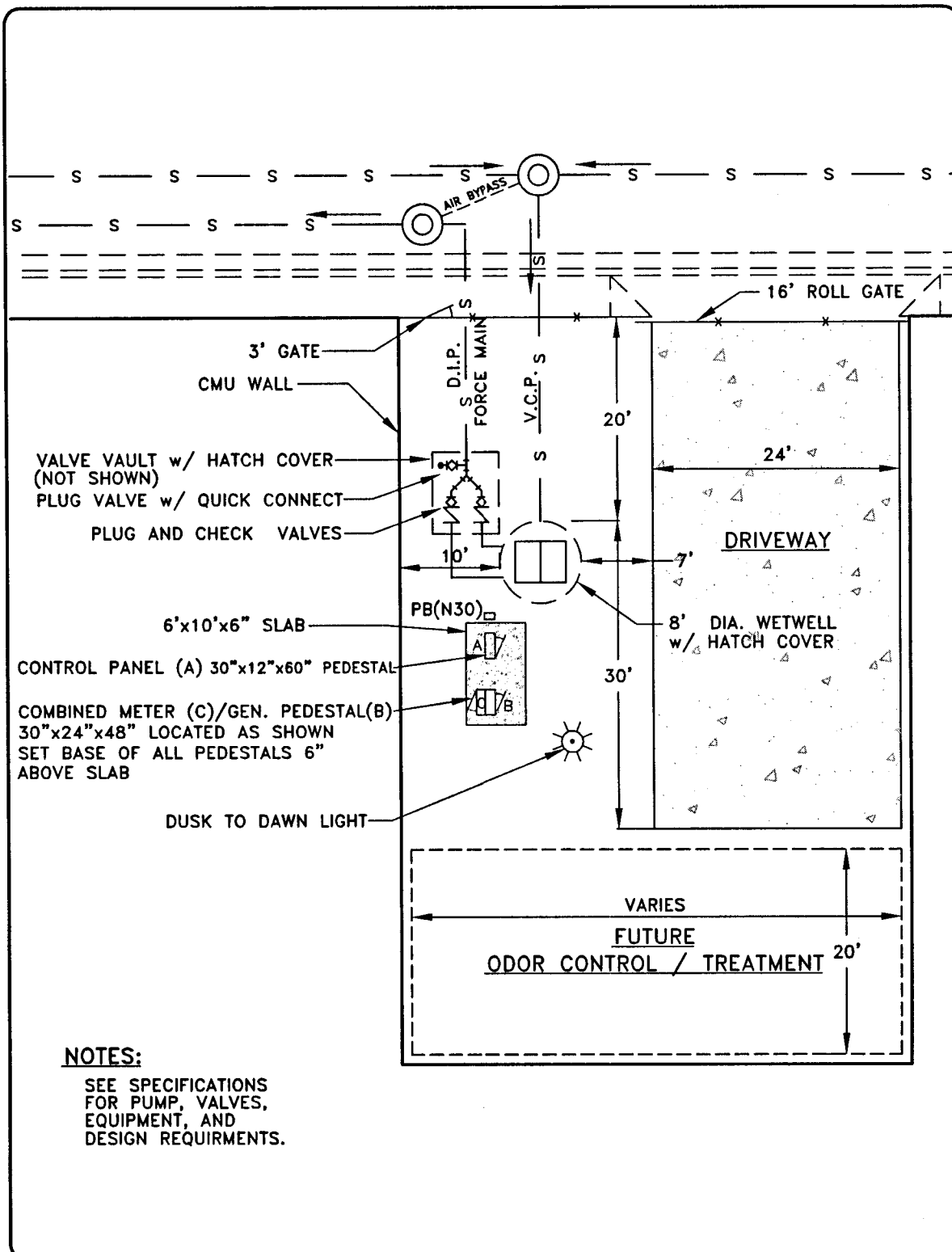
BACKWATER
DEVICE

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
503



APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

SEWERS

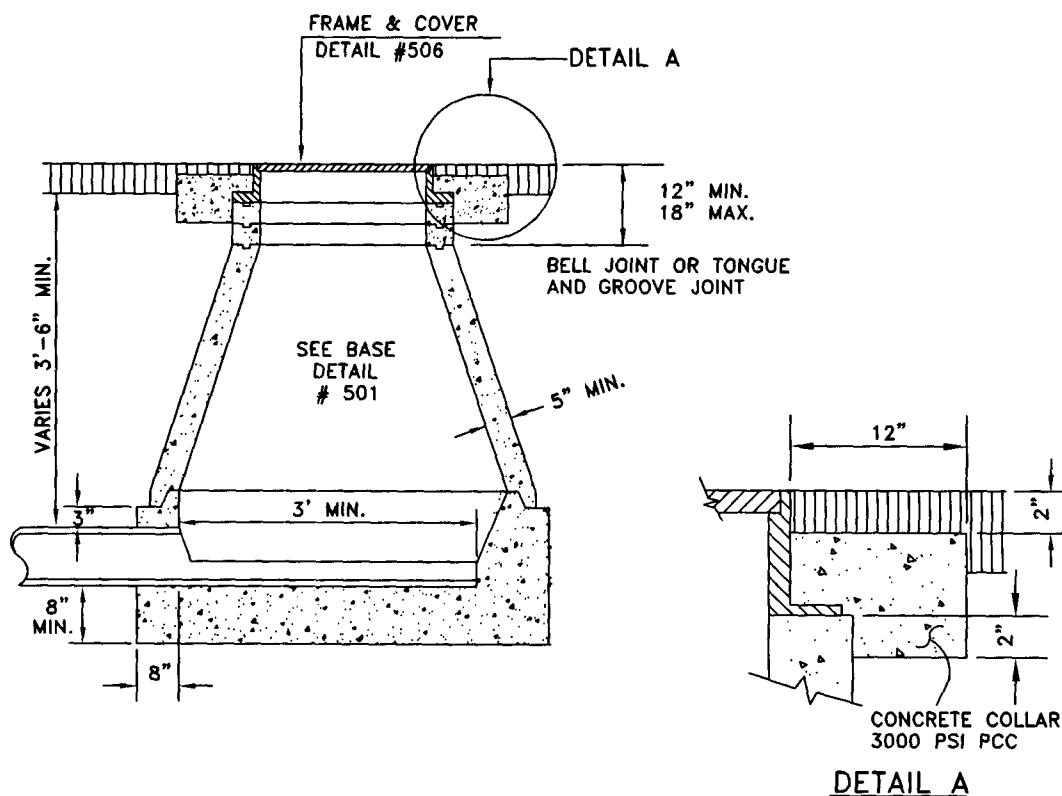
SITE LAYOUT
FOR STANDARD
SEWER LIFT STATION

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
504



NOTES:

1. PIPE TO LAID THROUGH MANHOLE AND TOP PORTION REMOVED AFTER CONCRETE HAS SET.
2. MORTAR ALL JOINTS.
3. INCOMING SMALLER PIPES SHALL MATCH CROWNS OF THE LARGER PIPE.
4. A CHANGE IN DIRECTION OF FLOW IN A MANHOLE REQUIRES A .10' FALL (MIN.).
5. ADJUST FRAME TO GRADE AFTER PAVING.
6. ALL PRECAST CONCRETE SHALL BE DESIGNED TO WITHSTAND H2O LOADING.
7. IN TRAFFIC AREAS CONCRETE COLLAR SHALL BE MADE WITH 3000 PSI PCC, HIGH EARLY STRENGTH. BARRICADES SHALL BE REMOVED IN 24 HOURS.
8. FLEXIBLE JOINT-BELL & SPIGOT OR ADJUSTABLE REPAIR COUPLING. SOLVENT WELDED JOINT NOT PERMITTED.
9. 12" MAX. FOR 8" OR LARGER PIPE. 24" MAX. FOR PIPES LESS THAN 8".

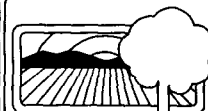
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

SEWERS

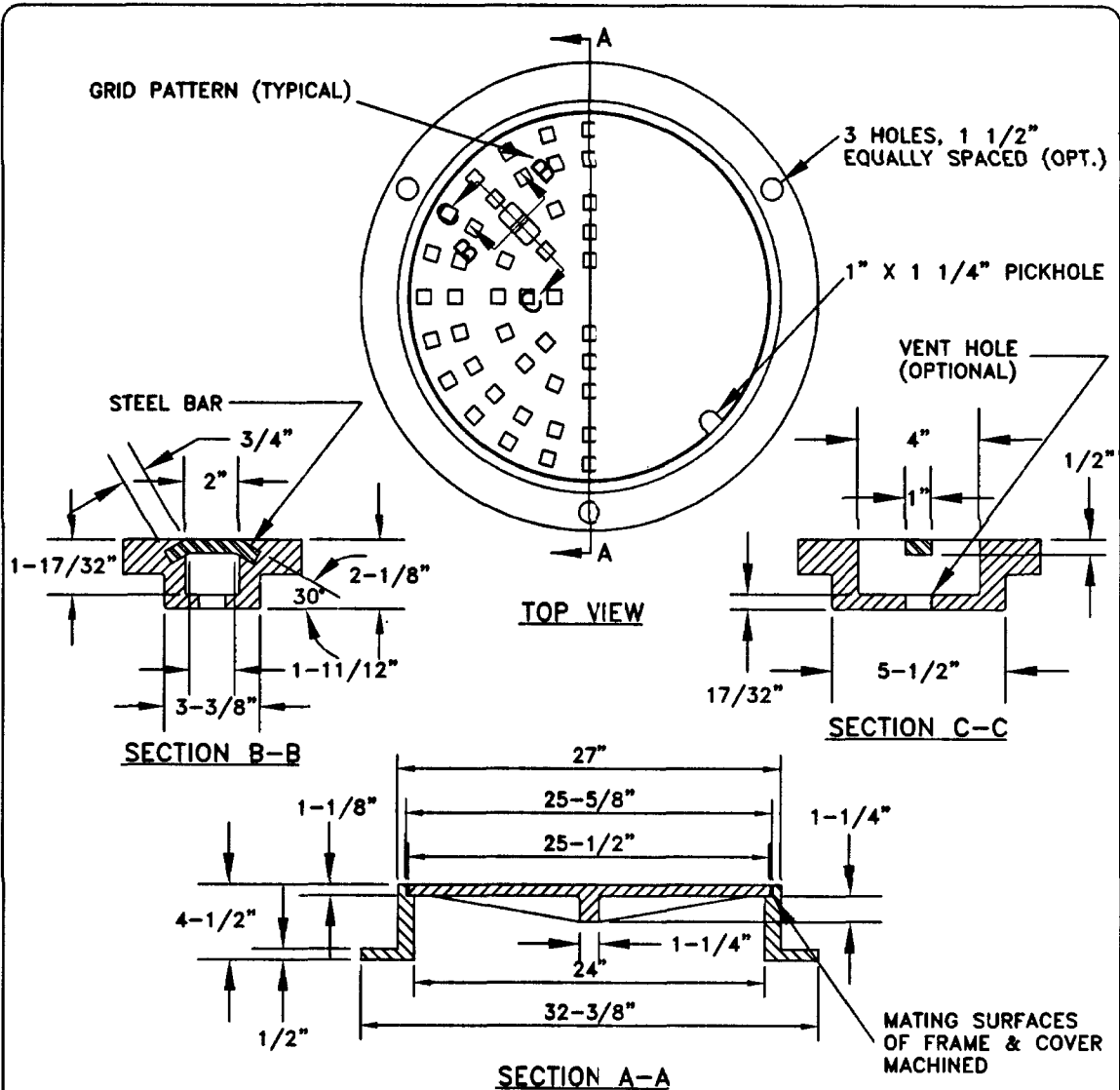
TERMINAL
MANHOLE

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
505



NOTES:

1. DIMENSIONS FOR FRAME AND COVER SHALL MATCH. MATING SURFACES OF FRAME AND COVER SHALL BE MACHINED TO INSURE NO-ROCK FIT.
2. COVER SHALL HAVE VERTICAL SIDES. NO TAPERED COVERS SHALL BE INSTALLED.
3. WEIGHT OF COVER SHALL BE NO LESS THAN 130 POUNDS. WEIGHT OF FRAME SHALL BE NO LESS THAN 140 POUNDS.
4. SOUTH BAY FOUNDRY SBF A-515 W/624 COVER OR APPROVED EQUAL.
5. EACH MANHOLE COVER SHALL BE STAMPED "SEWER" AND "CITY OF MODESTO" WITH 1" TO 2" LETTERING.

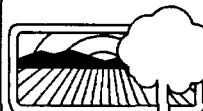
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

SEWERS

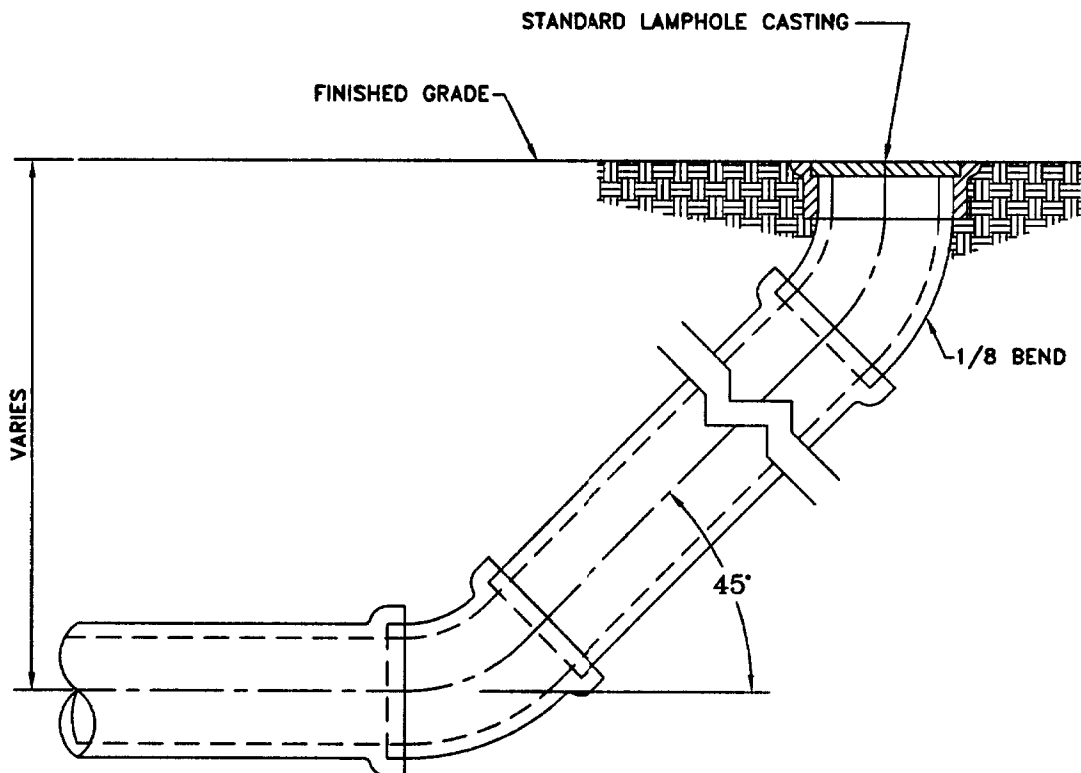
MANHOLE COVER
AND FRAME

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
506



NOTES:

1. USE OF A LAMPHOLE IS RESTRICTED TO PHASED DEVELOPMENT WHERE A MAXIMUM OF ONLY 200' AND /OR A MAXIMUM OF 3 SERVICES ARE ON THE LINE EXTENDING FROM THE LAST MANHOLE TO THE LAMPHOLE. WYES WILL NOT BE ACCEPTED.
2. LAMPHOLE CASTING SHALL BE CAST IRON.

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

SEWERS

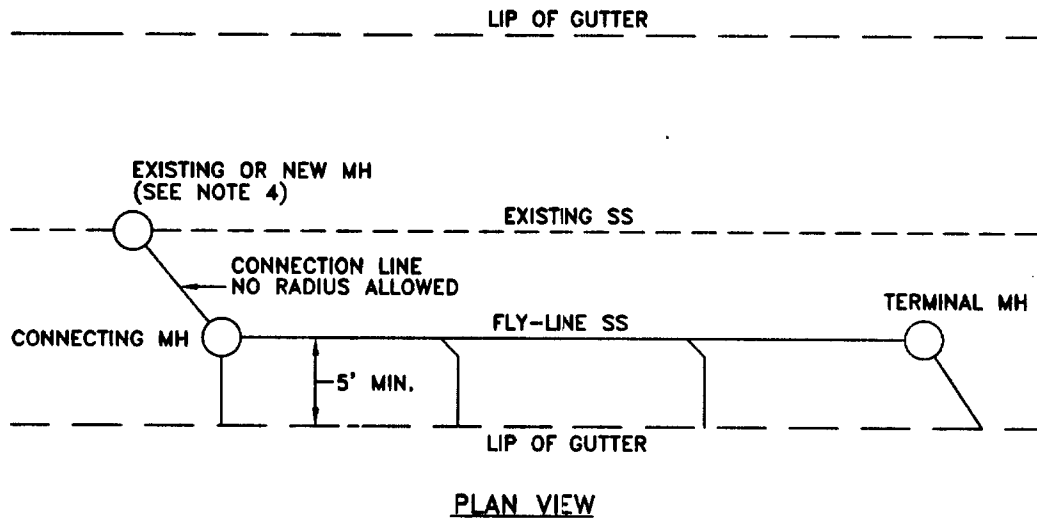
TEMPORARY
LAMPHOLE

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
507



NOTES:

1. FLY-LINE PIPE SHALL FOLLOW STREET ALIGNMENT, BUT SHALL NOT HAVE A RADII LESS THAN 200' (FEET).
2. FLY-LINES TO BE CONSTRUCTED PARALLEL TO CENTERLINE OF A ROAD OR PARALLEL TO THE EXISTING TRUNK LINE.
3. CONTRACTOR SHALL CONSTRUCT A MINIMUM OF TWO MANHOLES PER FLY-LINE, TERMINAL MANHOLE AND CONNECTING MANHOLE ADJACENT TO THE EXISTING LINE. NO RADIUS MAY BE INSTALLED BETWEEN THE CONNECTING MANHOLE AND EXISTING MANHOLE.
4. NO CLEANOUTS OR LAMP HOLES WILL BE ACCEPTED ON A FLY-LINE IN A PUBLIC R/W OR EASEMENT.
5. FLY-LINE TO BE CONSTRUCTED IN THE R/W NO CLOSER THAN 5' FROM THE LIP OF GUTTER.
6. FLY-LINE TO HAVE A MINIMUM SEPARATION OF 5', MEASURED OUTSIDE BELL TO OUTSIDE BELL, FROM ANY OTHER PARALLEL UTILITY LINE EXCEPT WATER. A 10' SEPARATION BETWEEN PARALLEL SEWER AND WATER LINES IS REQUIRED.
7. FLY-LINE MINIMUM SIZE SHALL BE 8".

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

SEWERS

SEWER FLY-LINE CONSTRUCTION

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
508

WHERE IS MY HOUSE SEWER LINE?

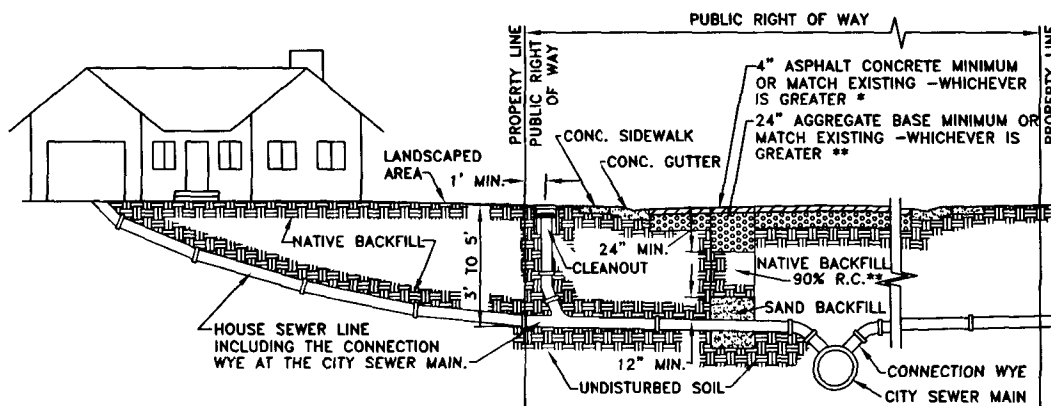
A PICTURE OF A HOUSE SEWER LINE IS SHOWN BELOW. YOU CAN SEE THAT IT STARTS AT YOUR HOUSE AND ENDS AT THE SEWER MAIN NEAR THE MIDDLE OF A STREET OR ALLEY. IT IS THE PROPERTY OWNER'S RESPONSIBILITY TO MAINTAIN AND REPAIR THE ENTIRE LENGTH OF THE HOUSE SEWER LINE, INCLUDING THE CONNECTION WYE AT THE MAIN.

WHAT DOES THIS PROGRAM DO?

THE CITY OF MODESTO OFFERS THIS PROGRAM TO ASSIST THE PROPERTY OWNERS IN THE COST OF REPLACING THE PAVEMENT AND/OR CONCRETE WHEN REPAIRING THAT PORTION OF THEIR HOUSE SEWER LINE THAT IS LOCATED UNDER A SIDEWALK, PAVED STREET OR PAVED ALLEY AND INSTALLATION OF A CITY STANDARD CLEANOUT IF NONE CURRENTLY EXISTS, IF YOUR HOUSE SEWER LINE IS BROKEN OR BLOCKED.

HOW CAN I APPLY?

IF YOU ARE HAVING A SEWER PROBLEM, CALL THE CITY FIRST AT 577-6200. THE CITY WILL CHECK TO SEE IF THE MAIN SEWER LINE IN THE STREET OR ALLEY IS BLOCKED. IF THE MAIN SEWER LINE IS CLEAR, THE CITY CREW WILL INFORM YOU THAT YOU SHOULD CONTACT A PLUMBER TO FIND OUT IF YOUR HOUSE SEWER LINE IS BROKEN UNDER THE SIDEWALK, PAVED STREET OR PAVED ALLEY. IF THE LINE NEEDS TO BE REPAIRED UNDER ANY OF THESE AREAS, THEN CALL THE CITY OF MODESTO FOR MORE INFORMATION ON THIS PROGRAM AT: (209) 577-5264.



GENERAL DIAGRAM OF HOUSE SEWER LINE REPAIR
AND TRENCH SECTION IN PUBLIC RIGHT OF WAY

* FOR RESIDENTIAL STREET, USE DETAIL #800 FOR ALL OTHERS.

** NATIVE BACKFILL MAY ONLY BE USED IF SOIL IS SUITABLE.

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

SEWERS

HOUSE SEWER LINE REPAIR - COST- SHARE PROGRAM

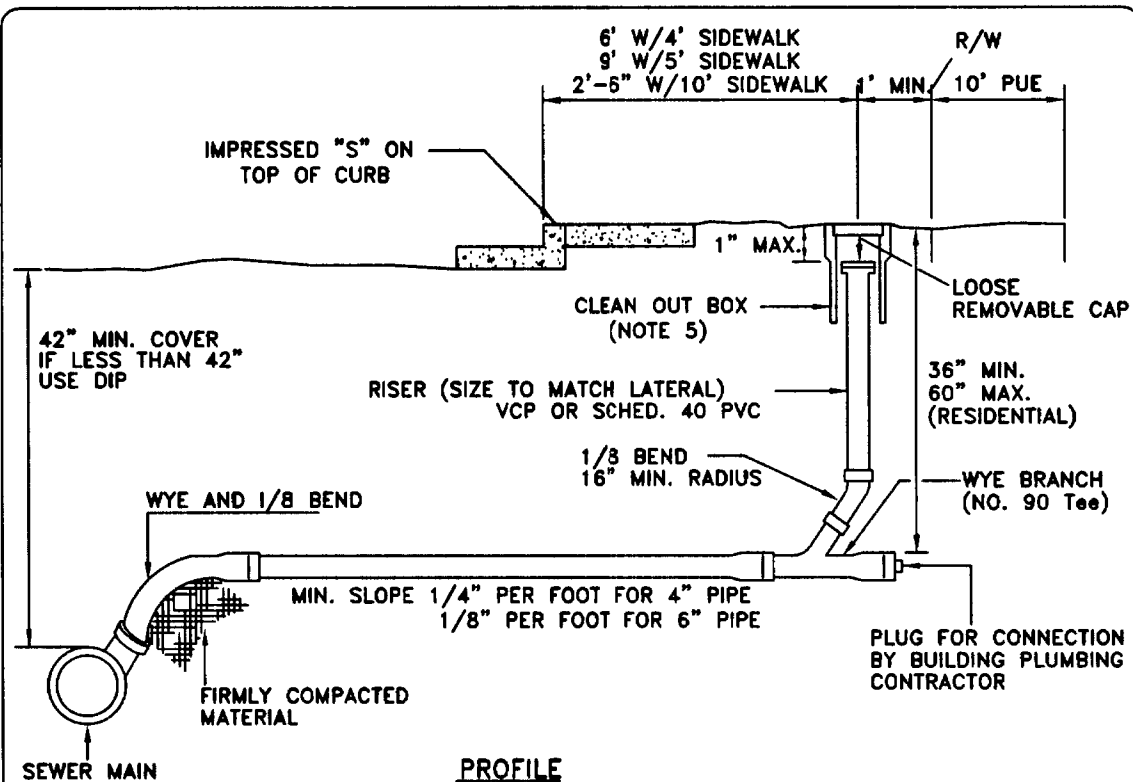
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

509



PROFILE

NOTES:

1. NO CLEANOUTS SHALL BE LOCATED IN DRIVEWAYS.
2. IF THE SIDEWALK IS SEPARATE FROM THE CURB, THE CLEANOUT RISER SHALL BE INSTALLED IN THE APPROXIMATE CENTER OF THE PLANTING STRIP.
3. HOUSE CONNECTION SHALL BE MADE UNDER THE SUPERVISION OF THE CITY INSPECTOR.
4. SEWER LATERAL SHALL BE CONSTRUCTED WITH A STRAIGHT GRADE AND ALIGNMENT FROM THE MAIN TO THE PROPERTY LINE UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
5. CLEANOUT BOX SHALL BE A CHRISTY F8, OR APPROVED EQUAL, WITH CAST IRON COVER MARKED "C.O.".
6. PIPE SLOPE MAY BE INCREASED TO ACCOMMODATE DEEP SEWERS AND PROVIDE A MINIMUM 36" COVER AT RIGHT OF WAY.
7. SEWER LATERAL SHALL BE EXTRA STRENGTH VCP WITH COMPRESSION JOINTS.
8. PROPERTY OWNER WILL BE RESPONSIBLE FOR MAINTAINING THE LATERAL FROM THE CONNECTION AT THE MAIN TO THE HOUSE.
9. LATERAL SHALL BE INSPECTED BY CONTRACTOR'S TV; INSPECTION REQUEST TO CITY WITH 48 HOUR NOTICE.
10. THE HOUSE LATERAL MAY BE PLACED UNDER EXISTING CURB AND SIDEWALK BY DRILLING 8" (MAX. DIA.) TUNNEL AND PLACING PIPE WITH NEOPRENE BANDED JOINTS.
11. TO MARK THE SERVICE LOCATION TO A PROPERTY, AN IMPRESSED "S" SHALL BE STAMPED IN WET CONCRETE OR CHISELED IN EXISTING CONCRETE ON TOP OF CURB.

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

SEWERS

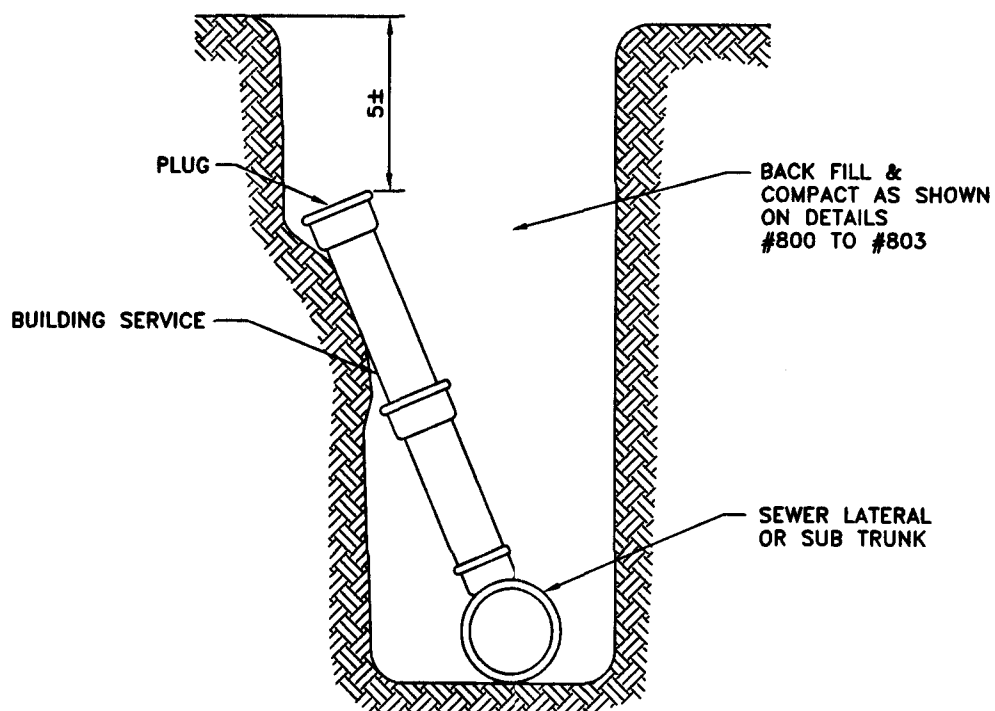
**SEWER
SERVICE**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
510



SECTION

APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

SEWERS

**SERVICE
RISER**

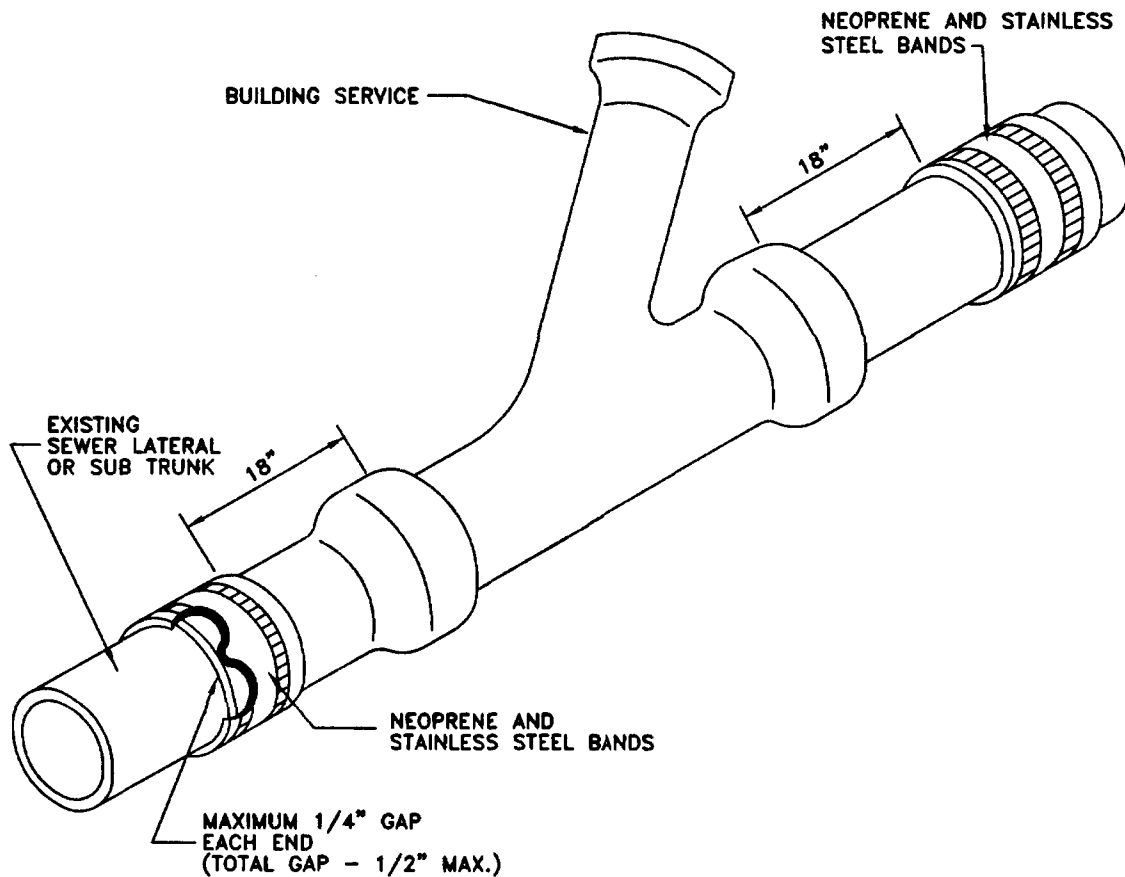
**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
511

NOTE: TEES AND WYES INSTALLED IN MAINS UNDER CONSTRUCTION SHALL BE INSTALLED CONCURRENTLY WITH THE MAIN. ALL FITTINGS, INCLUDING THE JOINTS, SHALL BE OF THE SAME TYPE AND MATERIAL AS THE MAIN. CUT-IN TEES AND WYES WILL NOT BE PERMITTED ON A MAIN UNDER CONSTRUCTION.



NOTES:

1. CUTS ARE TO BE MADE WITH A PIPE CUTTING TOOL.
2. THERE SHALL BE NO MORE THAN TWO BANDS IN FIVE FEET OF LATERAL OR SUB TRUNK RUN.
3. SHEAR BANDS OF A TYPE APPROVED BY THE ENGINEER SHALL BE INSTALLED ON ALL JOINTS.
4. CUT-IN TEE SHALL BE USED FOR SEWER MAINS 5' OR DEEPER.

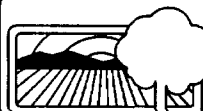
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RESOLUTION NO. 2001-560

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SEWERS

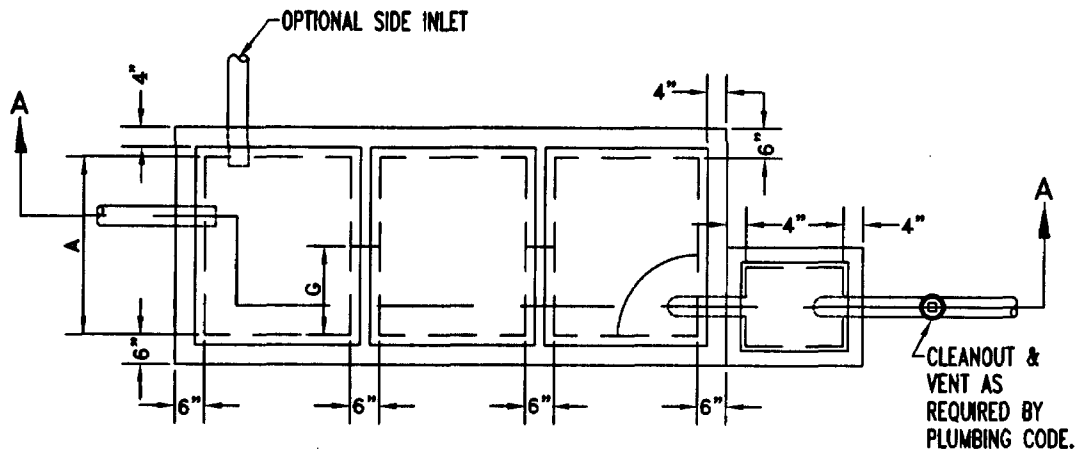
CUT-IN
SERVICE

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
512



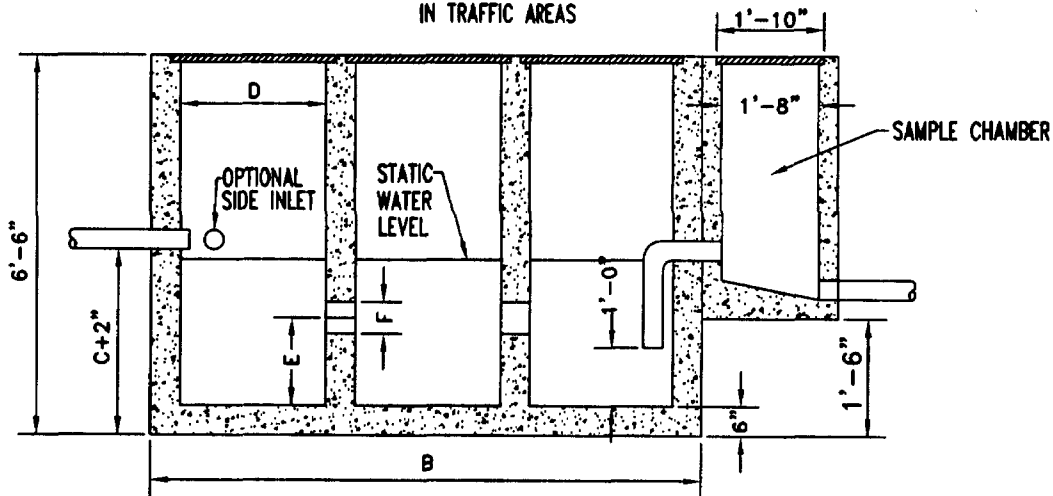
NOTE:

AN ACCEPTED ALTERNATE IS P&L
CONCRETE PRODUCTS PRECAST
GREASE TRAP WITH ADDED SAMPLE
CHAMBER ON OUTLET END AS
SHOWN ON THIS DRAWING.

PLAN VIEW

NOTE:

TRAFFIC LIDS TO BE INSTALLED
IN TRAFFIC AREAS



SECTION A-A

CAPACITY GALLONS	DIMENSIONS							COVER SIZE	METAL COVERS	PIPE SIZE
	A	B	C	D	E	F	G			
510	3'-0"	9'-6"	3'-0"	2'-6"	1'-6"	4 1/2"	1'-6"	2'-10"x3'-4"	1/4" STEEL PLATE	4"
866	3'-5"	10'-3"	4'-0"	2'-5"	2'-0"	0'-6"	1'-9"	3'-10"x3'-10"	3/8" ALUMINUM PLATE	4"
1260	4'-0"	12'-6"	4'-0"	3'-6"	2'-0"	0'-6"	2'-0"	3'-10"x4'-4"	3/8" ALUMINUM PLATE	4"

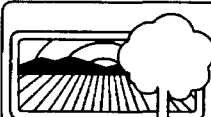
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SEWERS

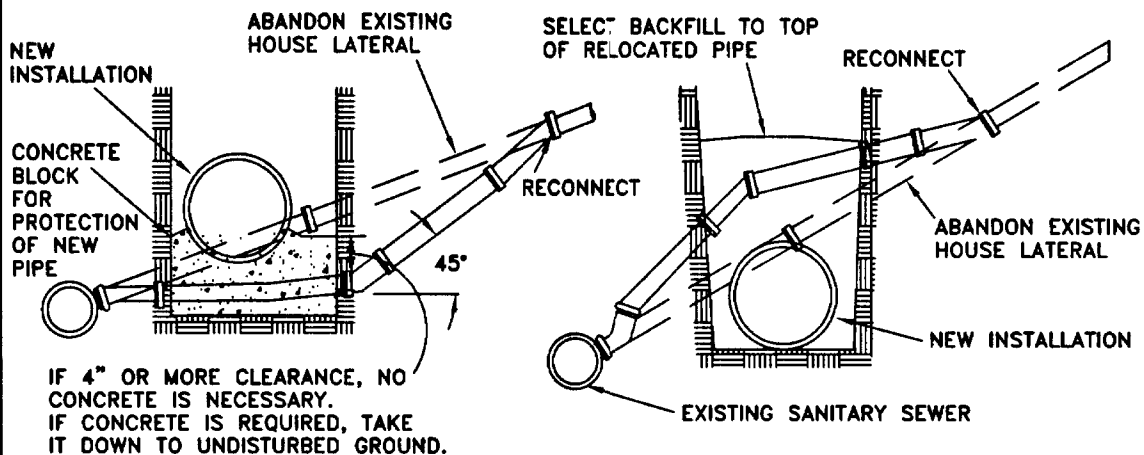
**SAND & GREASE
INTERCEPTOR**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



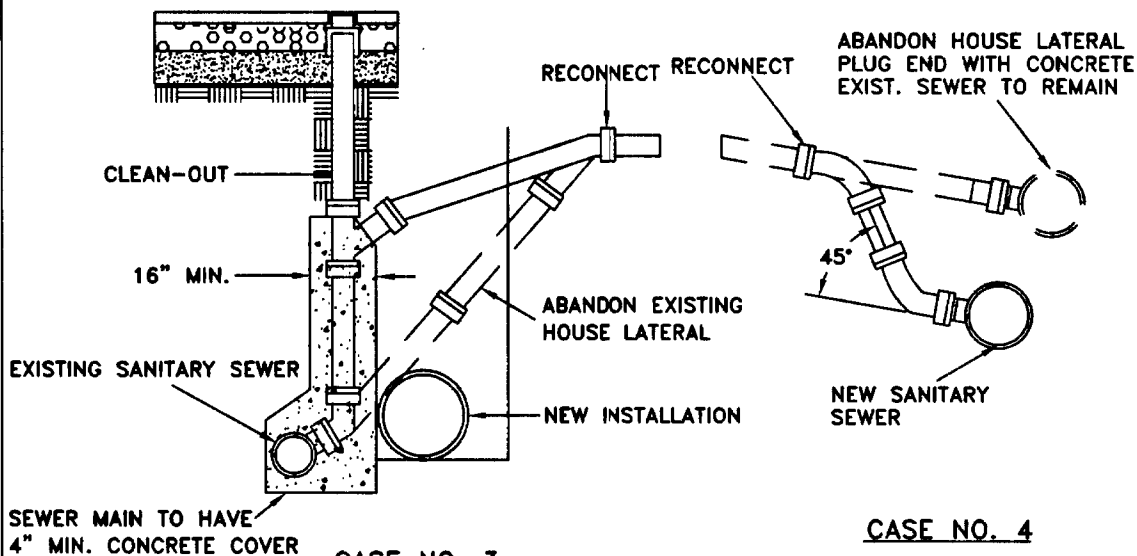
CITY of MODESTO

DETAIL NO.
513



CASE NO. 1

CASE NO. 2



CASE NO. 3

CASE NO. 4

NOTES:

1. ALL HOUSE LATERALS SHALL BE THICKNESS CLASS 22 CAST IRON PIPE WITH FLEXIBLE WATERTIGHT JOINTS.
2. THE MINIMUM SLOPE FOR HOUSE LATERALS SHALL BE 1/4" PER FOOT FOR 4" PIPE, 1/8" PER FOOT FOR 6" PIPE.
3. Y'S MAY BE LAID "FLAT" UPON SPECIAL APPROVAL FROM THE CITY ENGINEER. CASE NO. 3 SHALL BE USED ONLY WHEN CASE NO. 1 HAS LESS THAN REQUIRED SLOPE.
4. ALL MATERIALS SHALL BE AS DESIGNATED OR APPROVED EQUAL.

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SEWERS

**EXISTING HOUSE
LATERAL RELOCATION**

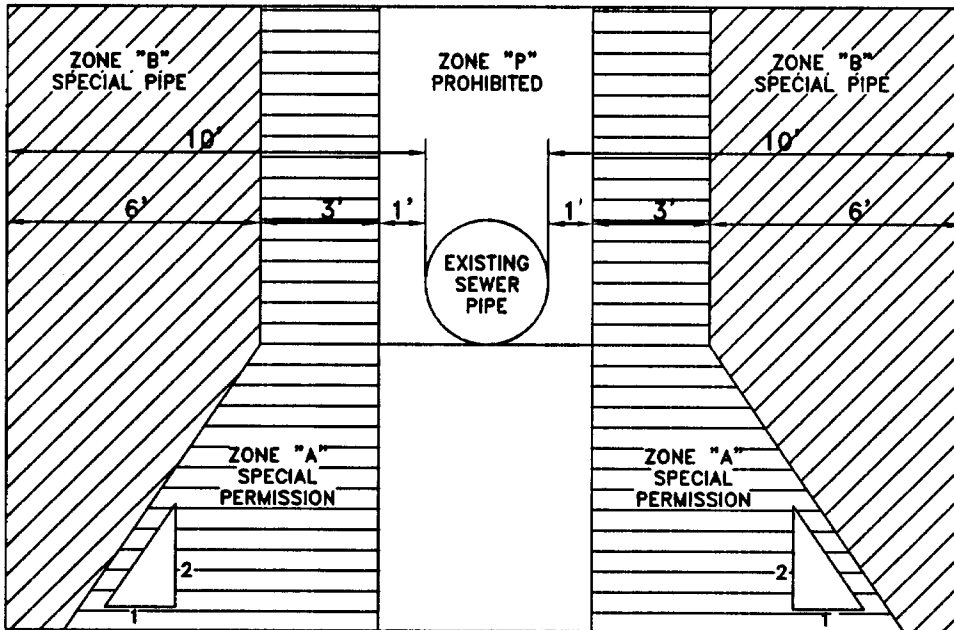
ENGINEERING & TRANSPORTATION
DEPARTMENT



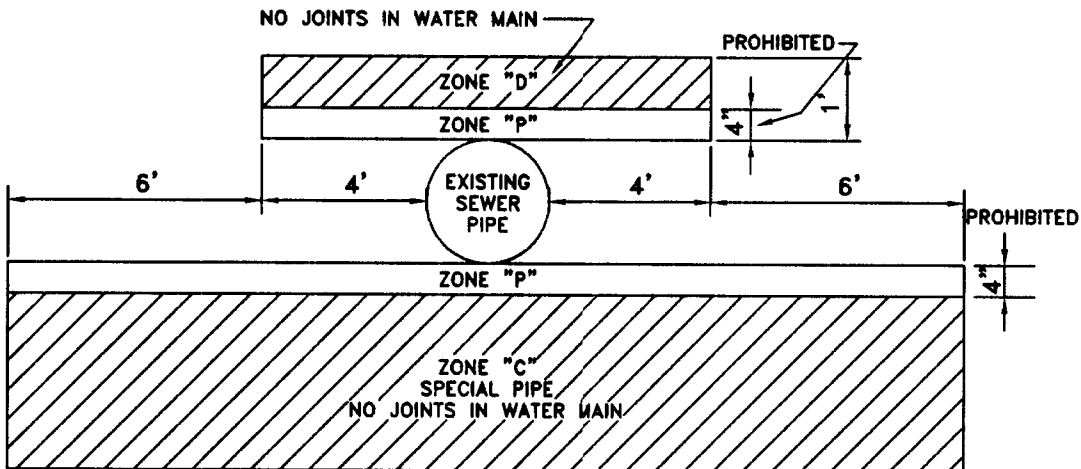
CITY of MODESTO

DETAIL NO.
514

SPECIAL CONSTRUCTION REQUIREMENTS
 (TO BE USED ONLY WHERE REQUIRED SEPARATION CANNOT BE OBTAINED)
CASE 2-NEW WATER LINE BEING INSTALLED



PARALLEL CONSTRUCTION



PERPENDICULAR CONSTRUCTION

NOTES:

1. ZONE "P" IS PROHIBITED CONSTRUCTION ZONE.
2. ZONE "C", SPECIAL PIPE, SHALL BE PVC CLASS 200 PER AWWA C900 OR APPROVED EQUAL.

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 RESOLUTION NO. 2001-560

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 DIRECTOR OF ENGINEERING
 AND TRANSPORTATION

WATER
CALIFORNIA HEALTH
DEPARTMENT
REQUIREMENTS

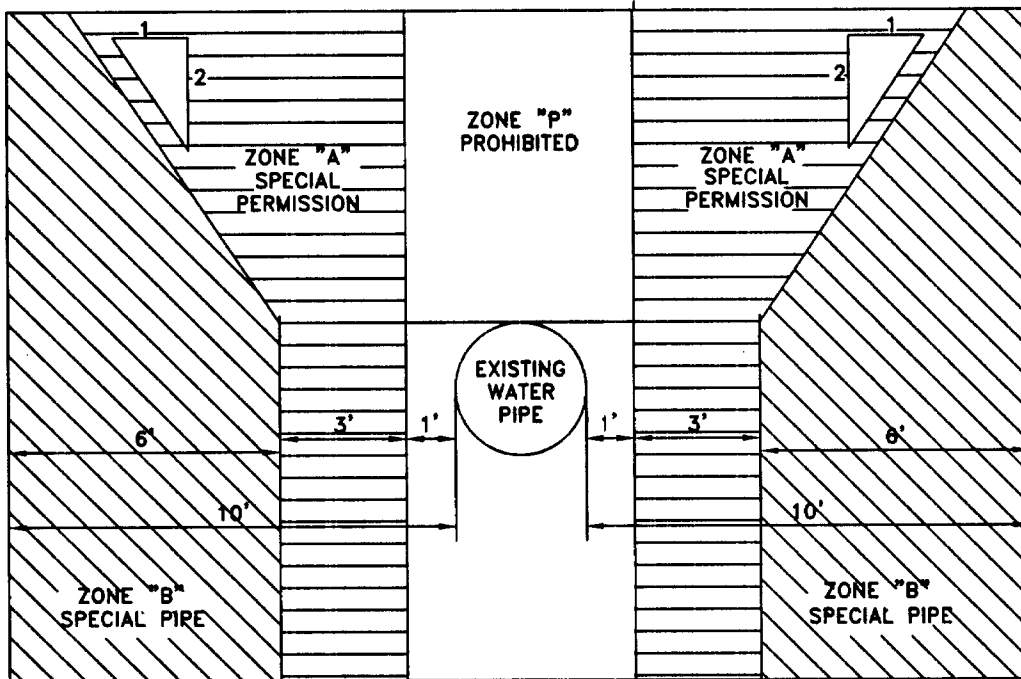
ENGINEERING & TRANSPORTATION
DEPARTMENT



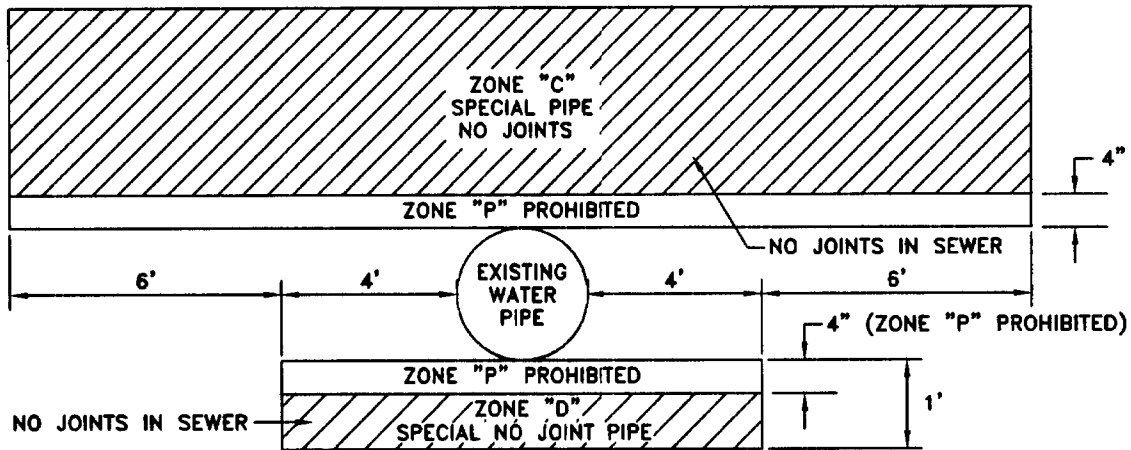
CITY of MODESTO

DETAIL NO.
600

SPECIAL CONSTRUCTION REQUIREMENTS
 (TO BE USED ONLY WHERE REQUIRED SEPARATION CANNOT BE OBTAINED)
CASE 2-NEW SEWER LINE BEING INSTALLED



PARALLEL CONSTRUCTION



PERPENDICULAR CONSTRUCTION

NOTES:

1. ZONE "P" IS A PROHIBITED CONSTRUCTION ZONE.
2. ZONE "C", SPECIAL PIPE, SHALL BE DUCTILE IRON, STEEL CASING PIPE OR APPROVED EQUAL.

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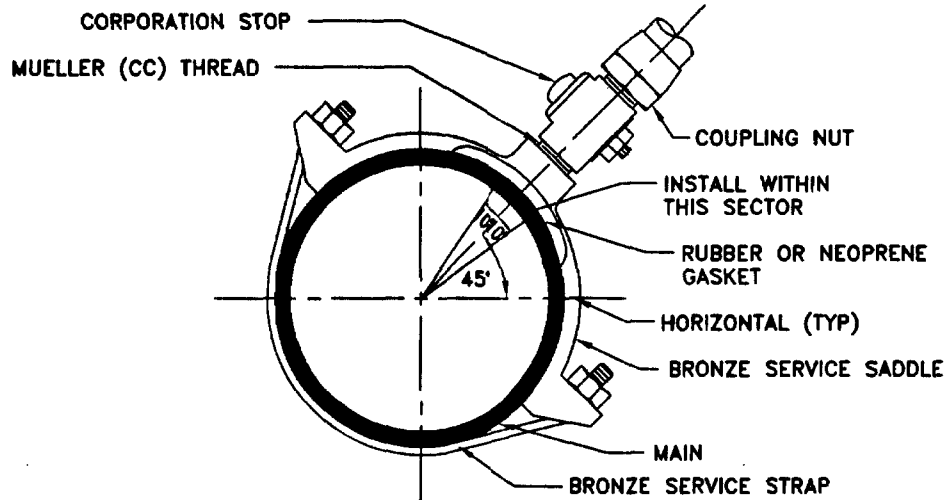
WATER
CALIFORNIA HEALTH
DEPARTMENT
REQUIREMENTS

ENGINEERING & TRANSPORTATION
DEPARTMENT

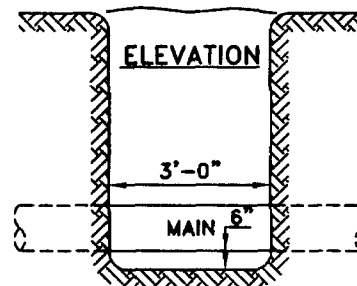
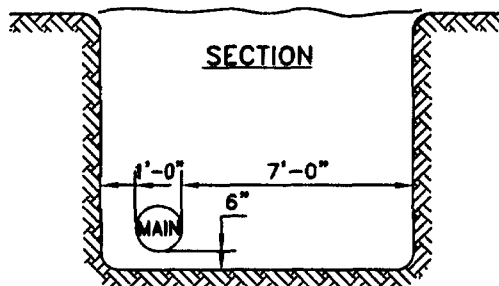


CITY of MODESTO

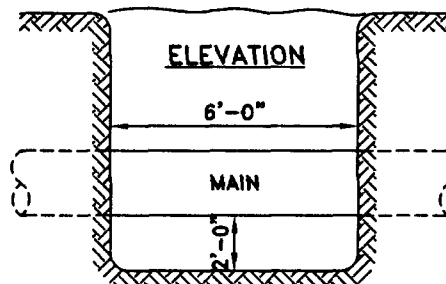
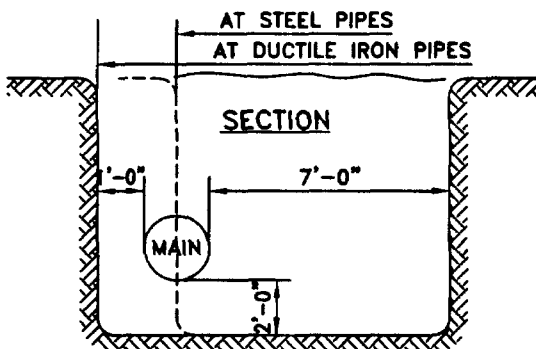
DETAIL NO.
600A



TYPICAL TAP WITH REQUIRED SERVICE SADDLE



TAP EXCAVATION REQUIREMENTS FOR EXISTING MAINS 4" THRU 12"



TAP EXCAVATION REQUIREMENTS FOR EXISTING MAINS OVER 12"

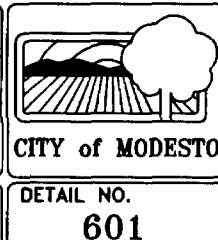
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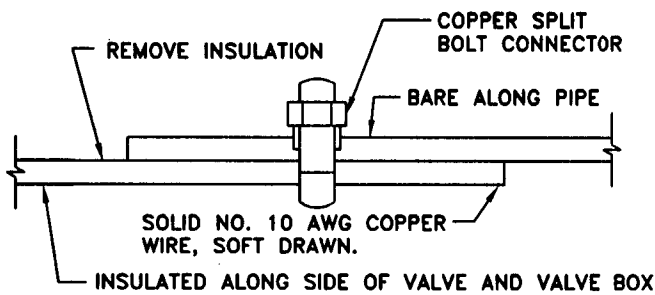
1. ALL CORPORATION STOPS TO HAVE A.W.W.A. STANDARD CORPORATION STOP THREAD (MUELLER CC) ON INLET END. OUTLET TO BE USED WITH FLARED OR COMPRESSION FITTING.
2. CONTACT ENGINEER FOR APPROVED LIST OF WATER SERVICE CONNECTION MATERIALS.
3. A BRONZE DOUBLE STRAP SERVICE SADDLE IS REQUIRED ON ALL WATER SERVICE TAPS 1" THRU 2" EXCEPT C-900.

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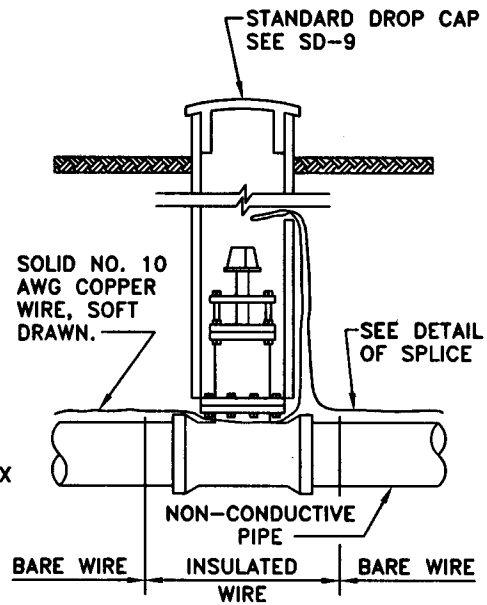
WATER
STANDARD WATER SERVICE
TAPS 1" THRU 2" & TAP
EXCAVATION REQUIREMENTS
ENGINEERING & TRANSPORTATION
DEPARTMENT



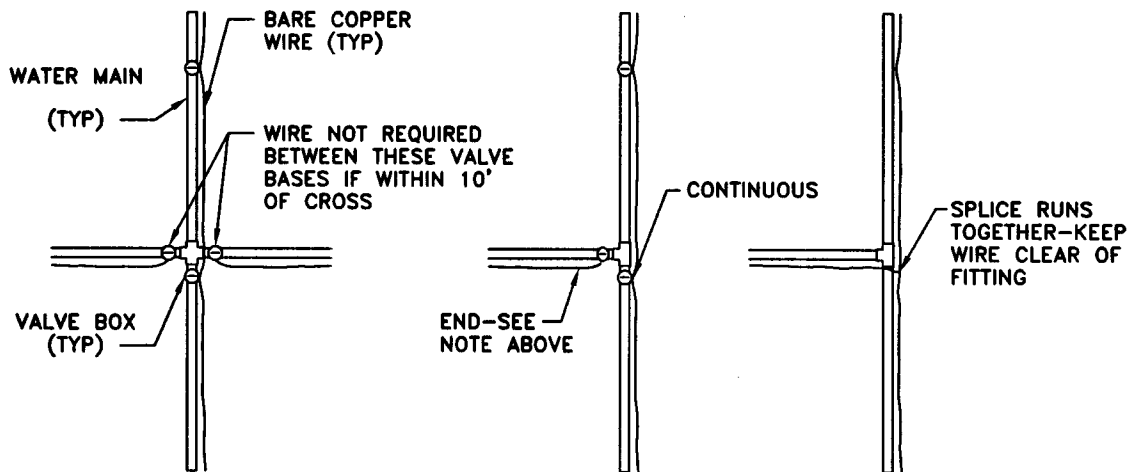


NOTE: IF WIRE ENDS AT VALVE BOX, RUN SINGLE INSULATED LEAD UP TO 10' BELOW GROUND.

DETAIL OF CONNECTION



INSTALLATION AT VALVE BOX



TYPICAL PLACING AT MAIN INTERSECTIONS

NOTES:

1. WIRE TO BE CONTINUOUS BETWEEN VALVE BOXES, EXCEPT WHERE BOXES ARE WITHIN TEN (10') FEET OF PIPE INTERSECTION.
2. BARE WIRE NOT TO TOUCH VALVE OR FITTINGS. (COATED WIRE ONLY)
3. LOCATING WIRE TO BE LAID AT TOP OF PIPE.

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AND TRANSPORTATION

WATER
PIPE LOCATING WIRE
FOR NON-CONDUCTIVE
WATER MAINS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
602

GENERAL:

1. ALL PRIVATE FIRE SYSTEMS CROSS-CONNECTED TO UNAPPROVED WATER SOURCES AND CONNECTED TO DOMESTIC WATER MAINS SHALL HAVE BACKFLOW PREVENTION AS REQUIRED BY AWWA M-14 FOR CLASSES III, IV, V AND VI FIRE SYSTEMS. PLANS SHALL BE SUBMITTED TO AND APPROVED BY THE FIRE DEPARTMENT AND CITY OF MODESTO WATER DIVISION CROSS-CONNECTION SPECIALISTS PRIOR TO CONSTRUCTION. "AS BUILT" DRAWINGS SHALL BE PROVIDED PRIOR TO CONNECTION TO THE PUBLIC WATER SYSTEM.
2. ALL FIRE PROTECTION SYSTEMS SHALL BE DISINFECTED PRIOR TO CONNECTION TO PUBLIC WATER SYSTEM IN ACCORDANCE WITH THE CITY OF MODESTO STANDARD SPECIFICATIONS.
3. WITHIN THE CITY WATER SERVICE AREA ALL ON-SITE FIRE HYDRANT SYSTEMS SHALL HAVE A DETECTOR CHECK WITH CHECK VALVE LOCATED AT THE PROPERTY LINE IMMEDIATELY DOWN-STREAM OF THE MAIN SHUT OFF VALVE. PLANS AND SPECIFICATIONS SHALL BE SUBMITTED FOR APPROVAL BY THE BUILDING INSPECTION DIVISION OF THE BUILDING AND DEVELOPMENT SERVICES DIVISION OF THE COMMUNITY DEVELOPMENT DEPARTMENT.

INSTALLATION REQUIREMENTS:

1. FIRE HYDRANTS, ON-STREET AND/OR ON-SITE, SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF MODESTO STANDARD SPECIFICATIONS. INSPECTION APPROVAL BY THE FIRE MARSHALL IS REQUIRED PRIOR TO ANY BACKFILL. WITNESSED PRESSURE TEST, 150 P.S.I. FOR 2 HOURS, IS REQUIRED FOR ALL ON-SITE SYSTEMS. FIRE DEPARTMENT PLAN LOCATION APPROVAL REQUIRED PRIOR TO CONSTRUCTION. COMBINED SYSTEMS--SPRINKLER AND HYDRANT--SHALL BE TESTED AT 200 POUNDS FOR TWO HOURS.
2. AUTOMATIC SPRINKLER SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH NFPA #13 STANDARD. PRIOR TO CONSTRUCTION, DETAILED PLANS SHALL BE SUBMITTED FOR FIRE DEPARTMENT APPROVAL. PRESSURE AND FLOW TESTING OF BOTH ABOVE GROUND AND UNDERGROUND SYSTEMS SHALL BE AT 200 POUNDS FOR TWO HOURS AND OBSERVED BY THE FIRE DEPARTMENT. A FINAL INSPECTION OF THE COMPLETED SYSTEM SHALL BE CONDUCTED BY THE FIRE DEPARTMENT TO INSURE THAT THE EQUIPMENT AND INSTALLATION CONFORMS TO THE APPROVED PLANS.
3. ALL STANDPIPE SYSTEMS (WET OR DRY) SHALL BE INSTALLED ACCORDING TO NFPA #14 STANDARDS. PRIOR TO CONSTRUCTION DETAILED PLANS SHALL BE SUBMITTED FOR FIRE DEPARTMENT APPROVAL. TESTING AND INSPECTION SHALL CONFORM TO SPRINKLER SYSTEM INSTALLATIONS.

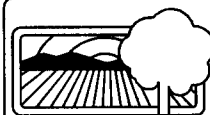
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RESOLUTION NO. 2001-560

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WATER

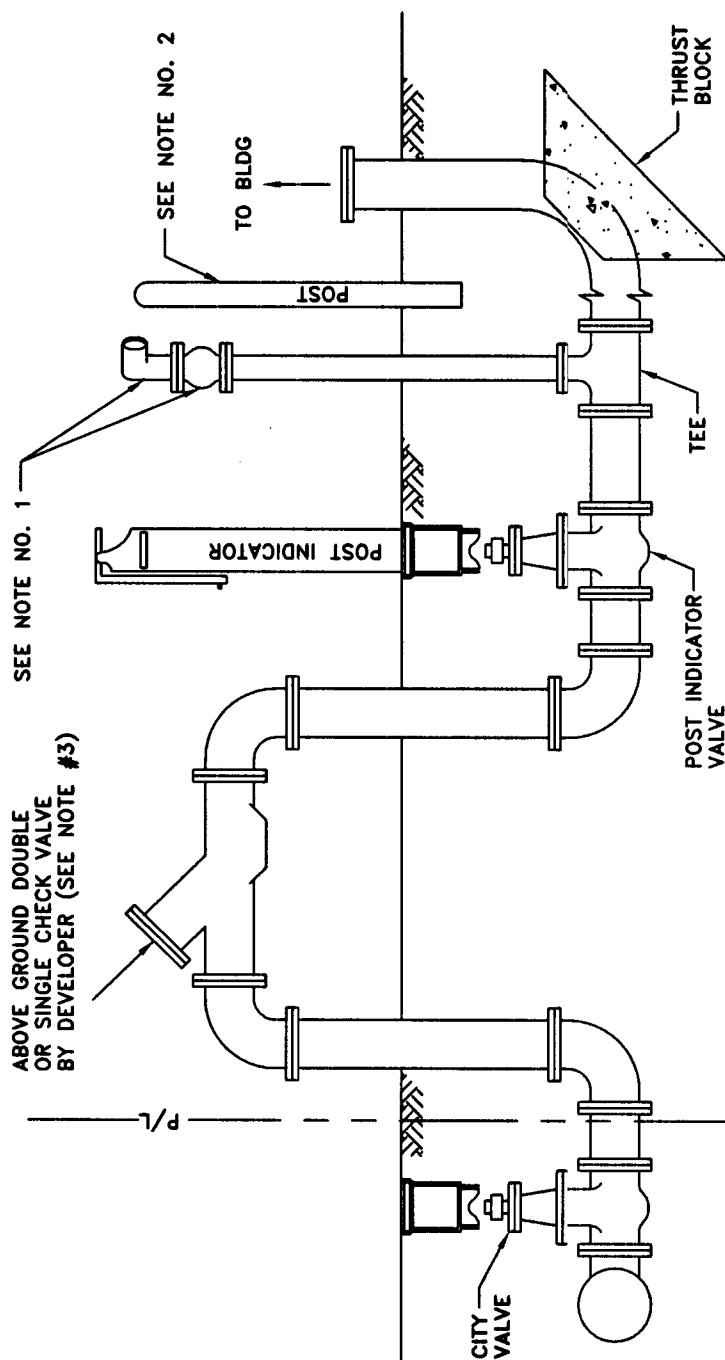
FIRE PROTECTION
SYSTEM STANDARDS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
603



NOTES:

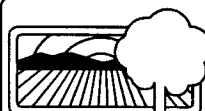
1. LISTED AND APPROVED FIRE DEPT. CONNECTION WITH CHECK VALVE PER CITY OF MODESTO FIRE DEPT. REQUIREMENTS.
2. GUARD POSTS AS REQUIRED.
3. DOUBLE OR SINGLE CHECK VALVE DETERMINED BY FIRE SPRINKLER DESIGNER WITH APPROVAL BY THE CITY CROSS CONNECTION SPECIALIST. A MINIMUM OF A SINGLE CHECK VALVE REQUIRED FOR FIRE HYDRANTS ON PRIVATE PROPERTY.
4. CLASS 3-6 FIRE SPRINKLER SYSTEMS MAY REQUIRE DOUBLE CHECK VALVE ASSEMBLY OR REDUCED PRESSURE DEVICE. PLANS SHALL BE APPROVED BY THE CROSS CONNECTION SPECIALIST.

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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

WATER
TYPICAL FIRE
SPRINKLER WITH POST
INDICATOR VALVE

ENGINEERING & TRANSPORTATION
DEPARTMENT

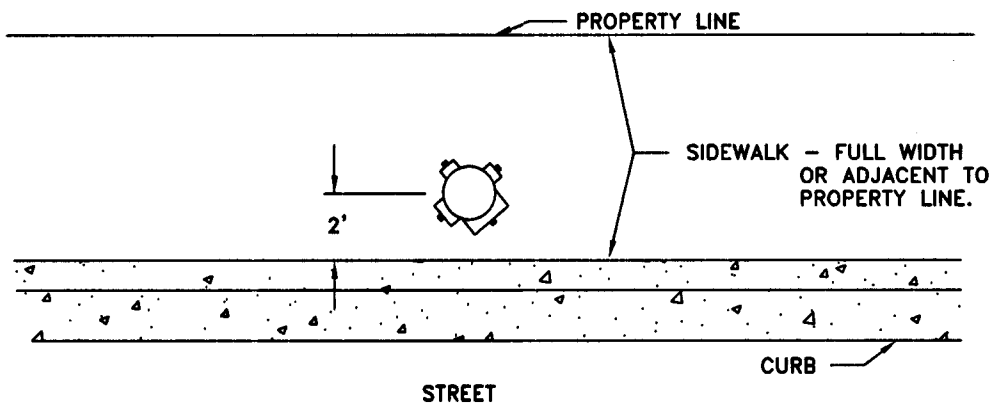
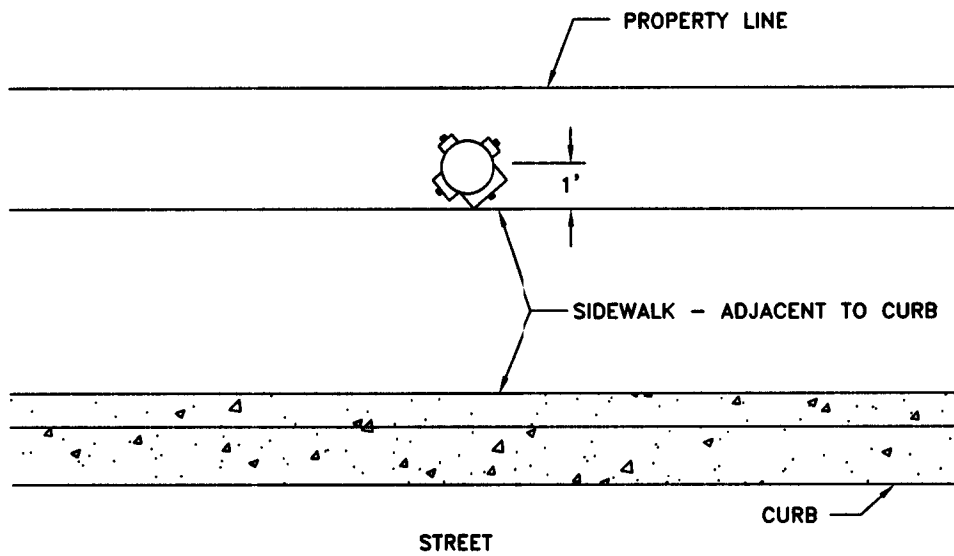
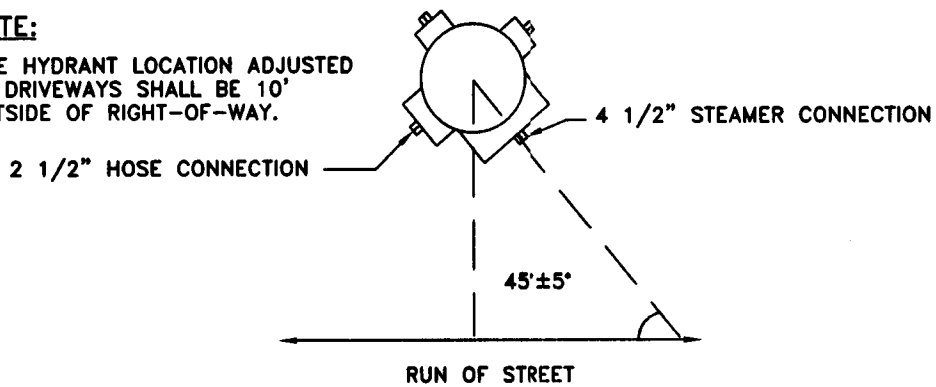


CITY of MODESTO

DETAIL NO.
604

NOTE:

FIRE HYDRANT LOCATION ADJUSTED
TO DRIVEWAYS SHALL BE 10'
OUTSIDE OF RIGHT-OF-WAY.



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WATER

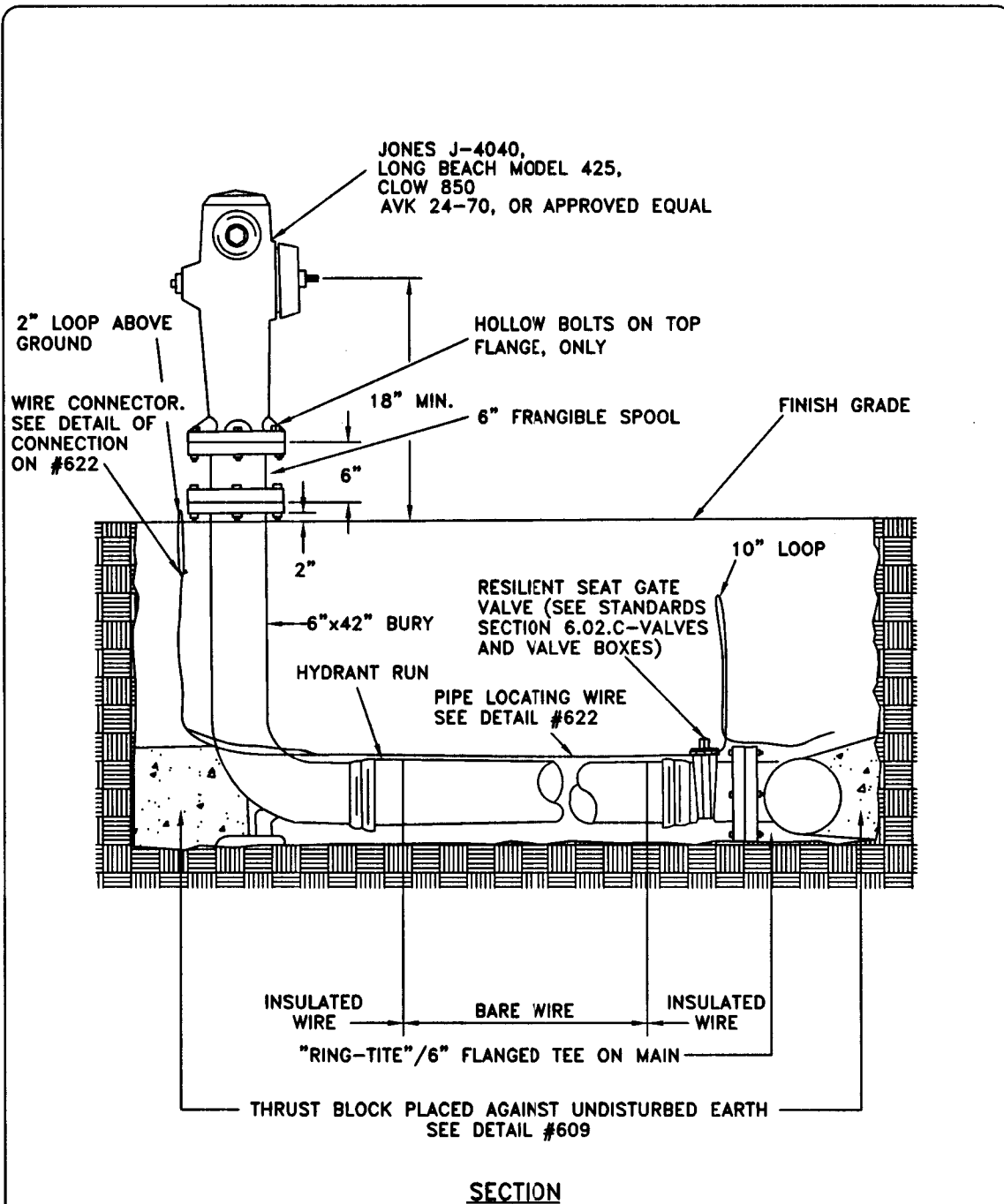
**FIRE HYDRANT
LOCATION**

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
605



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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

WATER

FIRE HYDRANT INSTALLATION

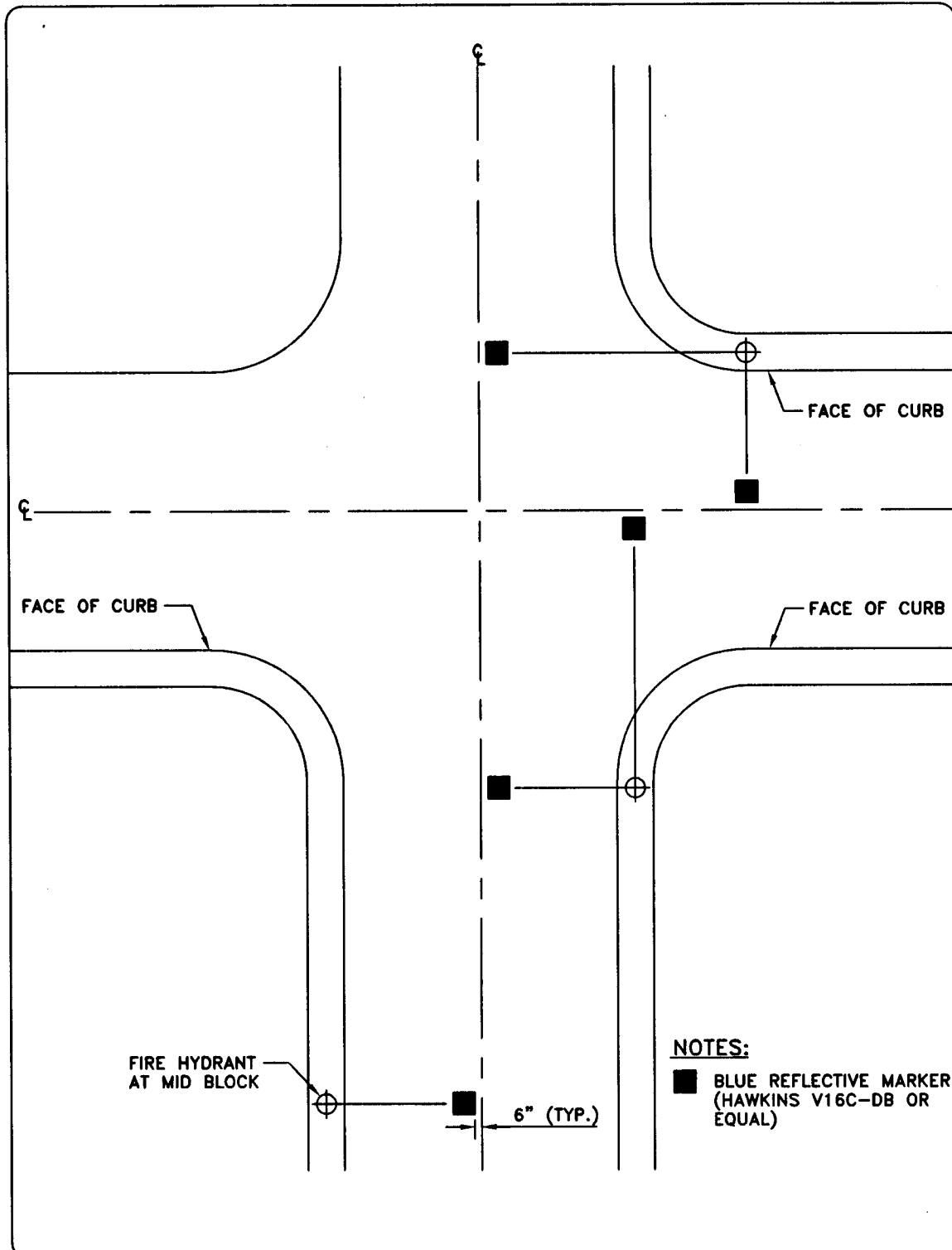
**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.

606



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AND TRANSPORTATION

WATER

BLUE REFLECTIVE
MARKER PLACEMENT

ENGINEERING & TRANSPORTATION
DEPARTMENT



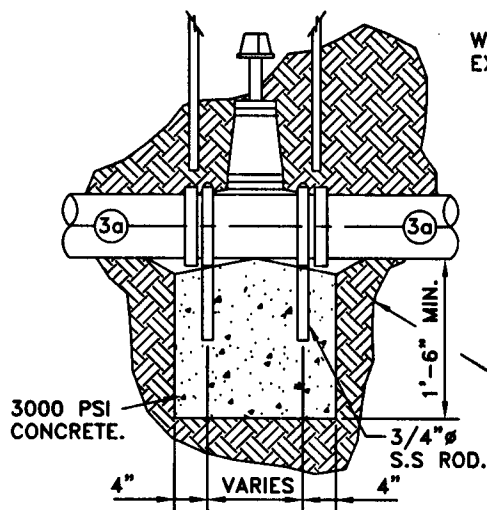
CITY of MODESTO

DETAIL NO.

607

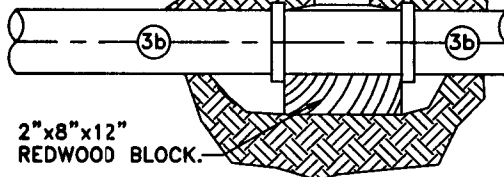
CHRISTY

VALVE BOX AND COVER



2'-6" DIAMETER—
MINIMUM ENCASEMENT
3000 PSI CONCRETE.
REMOVE BARRICADES
AFTER 24 HOURS.

WHITE PVC DEPTH
EXTENSION.



TYPICAL SECTION 12" VALVE AND SMALLER

TYPICAL SECTION GREATER THAN 12" VALVE

NOTES:

1. VALVE BOX AND COVER SHALL BE CHRISTY CONCRETE PRODUCTS NO. G-5 OR EQUAL WITH DEPTH EXTENSIONS AS REQUIRED.
2. ALL VALVES SHALL HAVE FLANGED CONNECTIONS AT ALL TEES AND CROSSES.
3. ALL VALVES SHALL BE SEPARATED FROM COLLARS AS NOTED:
 - A. 6'6" (1/2 SECTION)
 - B. 3'3" (1/4 SECTION)
4. VALVE SHALL BE RESILIENT SEAT GATE (12" OR LESS) OR BUTTERFLY (GREATER THAN 12") PER CITY SPECIFICATION.
5. CLEAN INSIDE OF EXTENSIONS SO STEM IS CLEAN OF DIRT.
6. SET VALVE BOX TO FINISH GRADE.
7. COMPACT EARTH AROUND BASE WITH MECHANICAL TAMPER TO 95% RELATIVE COMPACTION AND ENCASE IN 8" OF CONCRETE.
8. AFTER CONCRETE SETS, PATCH WITH 2" AC.
9. VALVE BOXES IN DIRT OR UNDEVELOPED AREAS SHALL HAVE CONCRETE ENCASEMENT POURED TO GRADE (NO 2" AC).

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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

WATER

**VALVE BOX
INSTALLATION**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
608

**MINIMUM THRUST BLOCK AREAS
(IN SQUARE FEET)**

PIPE SIZE	TEE	90° BEND	45° BEND	22 1/2° BEND	DEAD END
4"	1.5	2	1.5	1	1.5
6"	3	4.5	2.5	1.5	3
8"	5	7	4	2	5
10"	8.5	11.5	6.5	3.5	8.5
12"	11.5	16.5	9	4.5	11.5

NOTES:

1. AREAS ARE FOR 150 POUNDS PER SQUARE INCH WATER PRESSURE AND SANDY SOIL. AREAS SHALL BE DOUBLED FOR CLAYEY SOIL.
2. BLOCKING SHALL BE MADE OF CLASS B CONCRETE AND SHALL BE PLACED BETWEEN UNDISTURBED GROUND AND THE FITTING TO BE ANCHORED. THE BLOCKING SHALL BE PLACED SO THAT THE JOINTS OF THE PIPE AND FITTINGS WILL BE ACCESSIBLE FOR REPAIR.
3. THRUST BLOCKS SHALL BE CONSTRUCTED AT PIPE DIAMETER CHANGES AND AT OTHER FITTINGS NOT LISTED, AND SHALL BE PLACED AS DIRECTED BY THE ENGINEER.

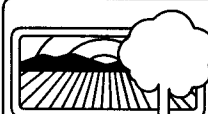
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AND TRANSPORTATION

WATER

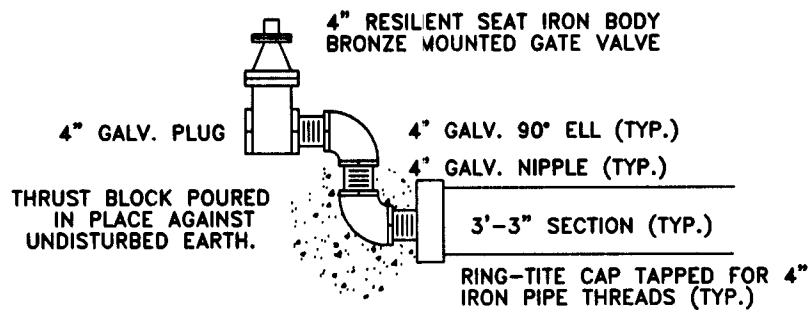
THRUST BLOCKING

**ENGINEERING & TRANSPORTATION
DEPARTMENT**

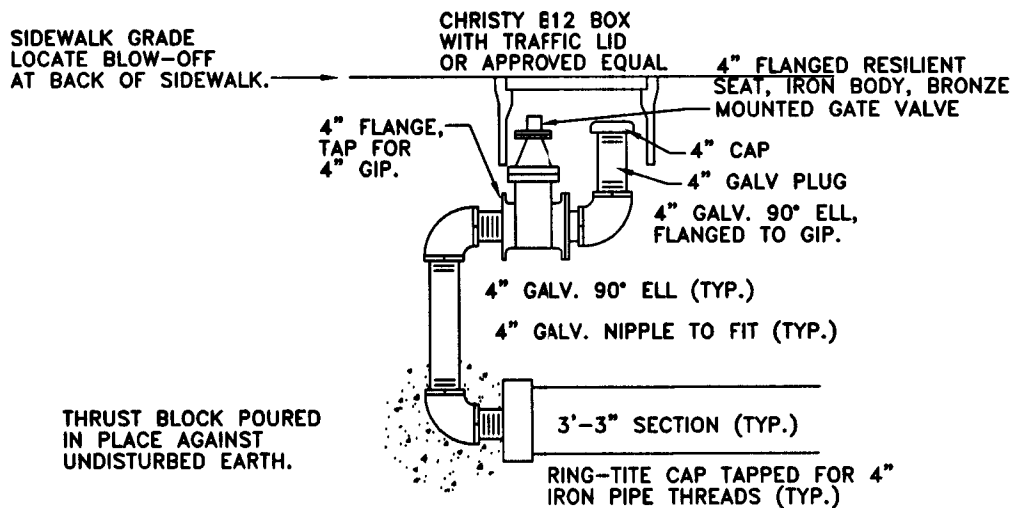


CITY of MODESTO

DETAIL NO.
609



TEMPORARY BLOW-OFF



PERMANENT BLOW-OFF

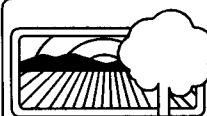
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WATER

BLOW-OFF

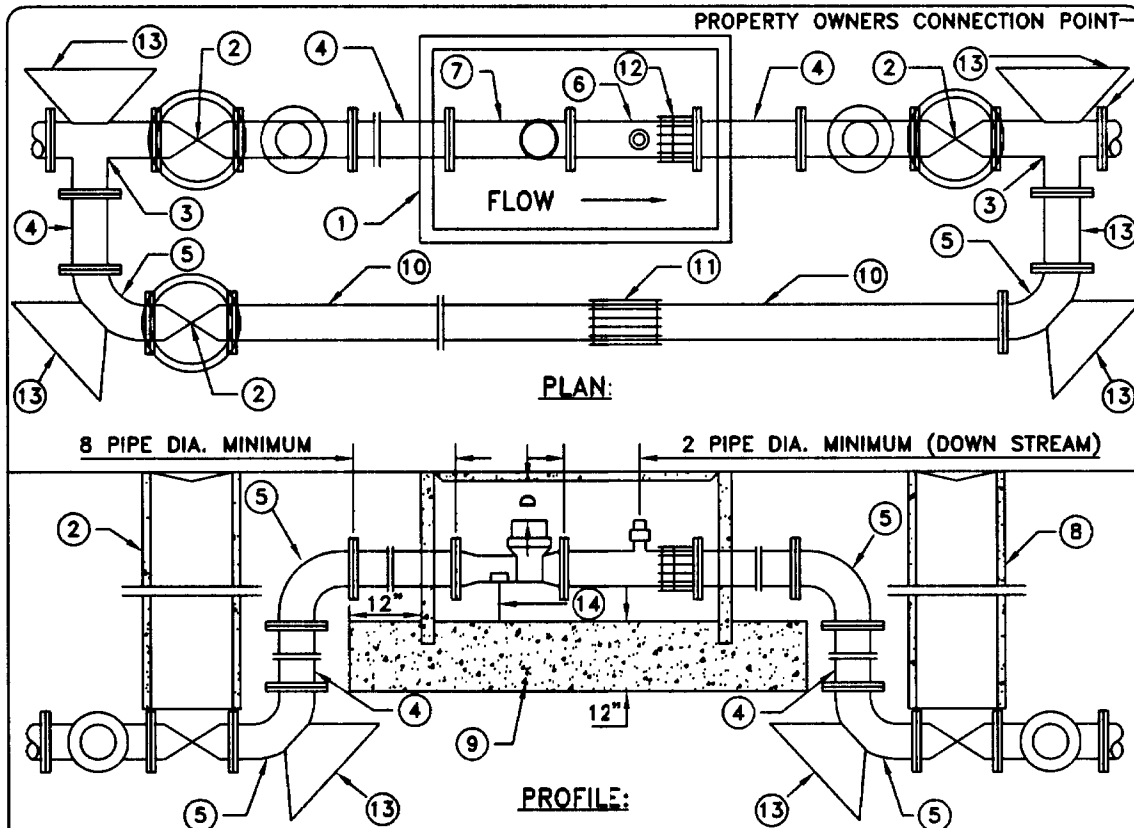
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

610



COMPONENTS FOR 4" OR LARGER METER INSTALLATIONS:

1. SIZE OF METER VAULT SHALL BE DETERMINED BY METER SIZE. VAULT COVERS SHALL BE 2 OR 3 PIECE METAL WITH READING LID CUT-IN POSITIONED OVER REGISTER.
2. VALVE - SEE STANDARD SPECIFICATION 76-1,02D.
3. CLASS 125 CAST IRON TEE.
4. CLASS 125 CAST IRON SPOOL.
5. CLASS 125 CAST IRON 90° LONG RADIUS ELBOW.
6. CAST IRON TAPPED SPOOL OR TEE, FLANGE BY PLAIN END, WITH 2" BLIND FLANGED ACCESS.
7. METER AS SPECIFIED BY CITY WATER DIVISION.
8. CHRISTY G-5 VALVE BOX OR BROOKS NO. 1-RT VALVE BOX. BOTH WITH CAST IRON COVERS.
9. 5 SACK CONCRETE FOOTING, 3000 P.S.I.
10. FLANGED BY PLAIN END CAST IRON PIPE.
11. FLEX COUPLING - ROCKWELL 411 STEEL COUPLING OR EQUAL.
12. FLANGED COUPLING ADAPTER - ROCKWELL 912 OR EQUAL.
13. THRUST BLOCKS - SEE DETAIL #609.
14. METER AND PIPE SUPPORTS AS REQUIRED.

NOTES:

- A. DETAILED DESIGN WILL BE REQUIRED AND SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO INSTALLATION.
- B. BY-PASS REQUIREMENTS WILL BE DETERMINED BY THE WATER SUPERINTENDENT OR THE CITY ENGINEER.
- C. "D" DIMENSION SHALL BE 12"-24" MAXIMUM.
- D. DIMENSION WILL VARY WITH METER AND SERVICE SIZE.
- E. USE MATERIALS LISTED ABOVE AND/OR APPROVED EQUAL.
- F. ALL METERED SERVICES AND TAPS SHALL BE INSTALLED BY CITY CREWS.

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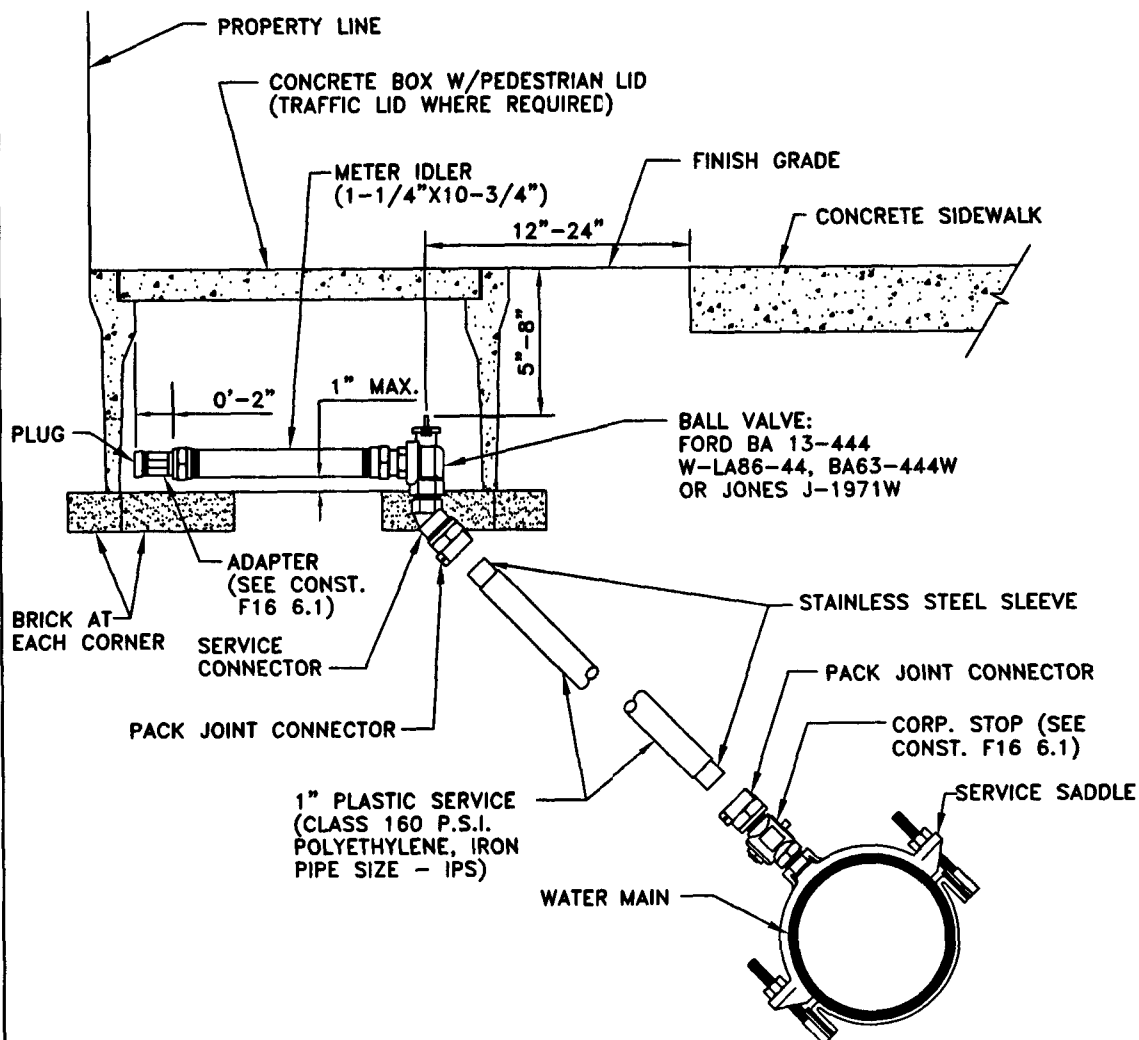
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AND TRANSPORTATION

WATER
LAYOUT FOR 4" OR
LARGER METER
BY-PASS INSTALLATION
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
611



NOTES:

1. CITY CREWS SHALL FURNISH AND INSTALL ALL WATER SERVICES GREATER THAN 1" IN DIAMETER.
2. IF THE SERVICE TRENCH IS IN EXISTING PAVING, THE PAVEMENT SHALL BE REPLACED AS PER MAIN LINE TRENCH.
3. SERVICE SHALL BE A MINIMUM OF 24" BELOW BOTTOM OF CURB.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO CURB, GUTTER AND SIDEWALK INCLUDING DAMAGE FROM SETTLING OF THE TRENCH.
5. CURB, GUTTER AND SIDEWALK TO BE INSTALLED BEFORE WATER SERVICE INSTALLATION UNLESS OTHERWISE NOTED.

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AND TRANSPORTATION

WATER

1" WATER SERVICE WITH METER BOX

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
612

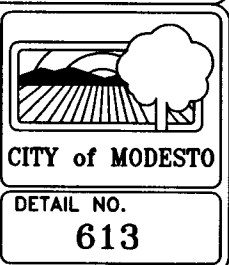
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RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

WATER

**SCHEDULE OF
METERED SERVICES**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



USE FLOW MAX GPM*	DOMESTIC ONLY (B)		FIRE ONLY		FIRE & DOMESTIC	
	DESCRIPTION (C)	APPLICATION DWELLING UNITS	SIZE	DESCRIPTION	APPLICATION	
50	1"	1-2			APARTMENTS, OFFICE BUILDINGS MOBILE HOME PARKS, ETC.	
100	1 1/2"	3-10				
160	2"	10-20				
500	4" WITH SCREENS	20-100				
1000	6" WITH SCREENS	100-200	6"	STANDBY FIRE SERVICES REQUIRE DETECTOR CHECKS ONLY.	FIRE FLOWS WILL NORMALLY DETERMINE SIZE OF SERVICE REQUIRED.	
1600	8" WITH SCREENS	200 +	8" OR 6" (D)	6" FULL FLOW (E) 8" OR 6" (D) FULL FLOW (E)		
1600*	10" WITH SCREENS		10" OR 8" (D)	10" OR 8" FULL FLOW (E)		

NOTES:

(A) COMMERCIAL OR INDUSTRIAL USERS SHALL SUBMIT FLOW DATA WHEN REQUIRED.

(B) OFFICE BUILDING AND SIMILAR TYPE USES TO BE CALCULATED ON THE BASIS OF TWO CLOSETS OR URINALS EQUAL ONE DWELLING UNIT.

(C) CITY SERVICE AND METER SIZE. CUSTOMER MAY CHANGE SIZE BEYOND METER AS PERMITTED BY BUILDING CODE.

(D) WHERE SYSTEM CAN BE LOOPED, (I.E. TWO CONNECTIONS TO CITY SYSTEM.)

(E) A BACKFLOW PREVENTION DEVICE MAY BE REQUIRED.

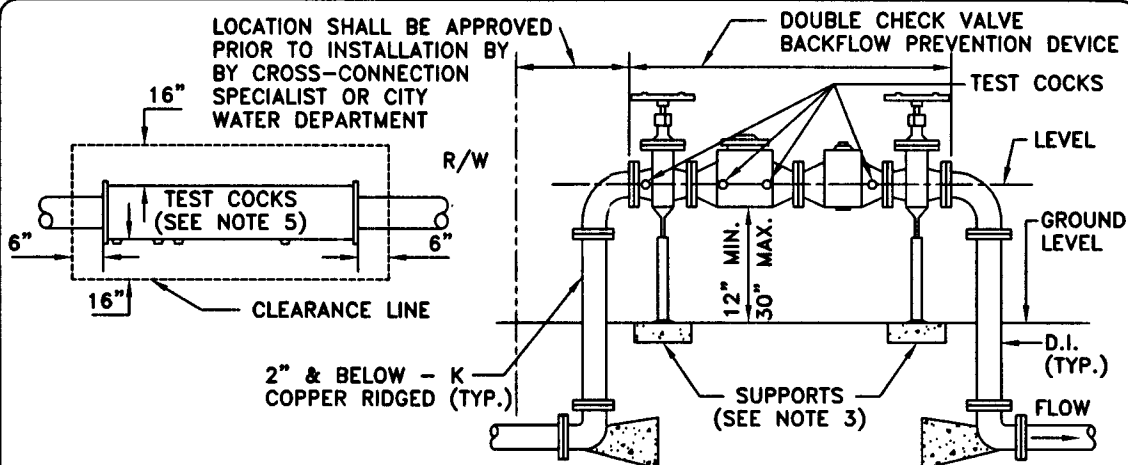
(F) STRAINERS FOR 3" AND ABOVE.

(G) MUST MEET ALL AWWA STANDARDS FOR METERED SERVICE.

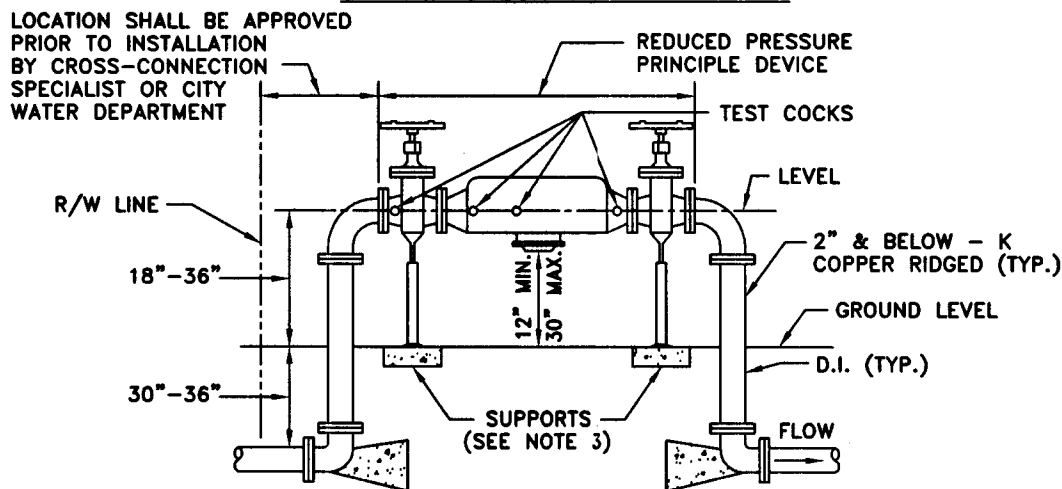
* MAX. GPM FOR SHORT PERIODS ONLY (NORMAL USE).

NOTES:

- (A) COMMERCIAL OR INDUSTRIAL USERS SHALL SUBMIT FLOW DATA WHEN REQUIRED.
 - (B) OFFICE BUILDING AND SIMILAR TYPE USES TO BE CALCULATED ON THE BASIS OF TWO CLOSETS OR URINALS EQUAL ONE DWELLING UNIT.
 - (C) CITY SERVICE AND METER SIZE. CUSTOMER MAY CHANGE SIZE BEYOND METER AS PERMITTED BY BUILDING CODE.
 - (D) WHERE SYSTEM CAN BE LOOPED, (I.E. TWO CONNECTIONS TO CITY SYSTEM.)
 - (E) A BACKFLOW PREVENTION DEVICE MAY BE REQUIRED.
 - (F) STRAINERS FOR 3" AND ABOVE.
 - (G) MUST MEET ALL AWWA STANDARDS FOR METERED SERVICE.
- * MAX. GPM FOR SHORT PERIODS ONLY (NORMAL USE).



DOUBLE CHECK VALVE ASSEMBLY



REDUCED PRESSURE ASSEMBLY

NOTES:

1. BACKFLOW PREVENTION DEVICE SHALL CONSIST OF APPROVED REDUCED PRESSURE PRINCIPLE DOUBLE CHECK VALVE OR BACKFLOW PREVENTION DEVICE AS REQUIRED BY TITLE 17 OF THE CALIF. DEPT. OF HEALTH SERVICES AND THE MODESTO MUNICIPAL CODE, SECTION 11-1.14 AND MODEL OF BACKFLOW DEVICE TO BE DETERMINED FOR EACH INSTALLATION, DEPENDING ON THE TYPE OF HAZARD AND UPON ALLOWABLE HEAD LOSS. WHERE BACKFLOW PREVENTION DEVICE IS INSTALLED IN COMBINATION WITH FIRE AND DOMESTIC SERVICE IT SHALL BE APPROVED BY THE FIRE CHIEF.
2. BARRIER POST SHALL BE LOCATED TO PROTECT PIPING AND VAULTS. CURB AND PARKING BARRIERS CAN BE CONSIDERED PROTECTION IF EFFECTIVELY LOCATED.
3. BACKFLOW PREVENTION DEVICE 3" OR LARGER SHALL BE SUPPORTED. USE GRINELL FIG. 264, WITH 4" THICK, 12" SQUARE CONCRETE FOOTING.
4. WATER SUPPLY - NO CONNECTIONS OR TEES WILL BE ALLOWED BETWEEN METER AND DEVICE.
5. DEVICE SHALL BE ACCESSIBLE FOR TESTING AND MAINTENANCE.
6. CERTIFICATION REQUIRED PRIOR TO ACCEPTANCE.
7. ALL DESIGN PLANS ARE TO BE SUBMITTED TO THE CROSS-CONNECTION SPECIALIST FOR APPROVAL AND A CROSS CONNECTION SURVEY IS TO BE COMPLETED TO EVALUATE HAZARDS THAT POSSIBLY EXIST.
8. ALL BACKFLOW PREVENTION DEVICES INSTALLED SHALL BE INSPECTED AND TESTED ANNUALLY.

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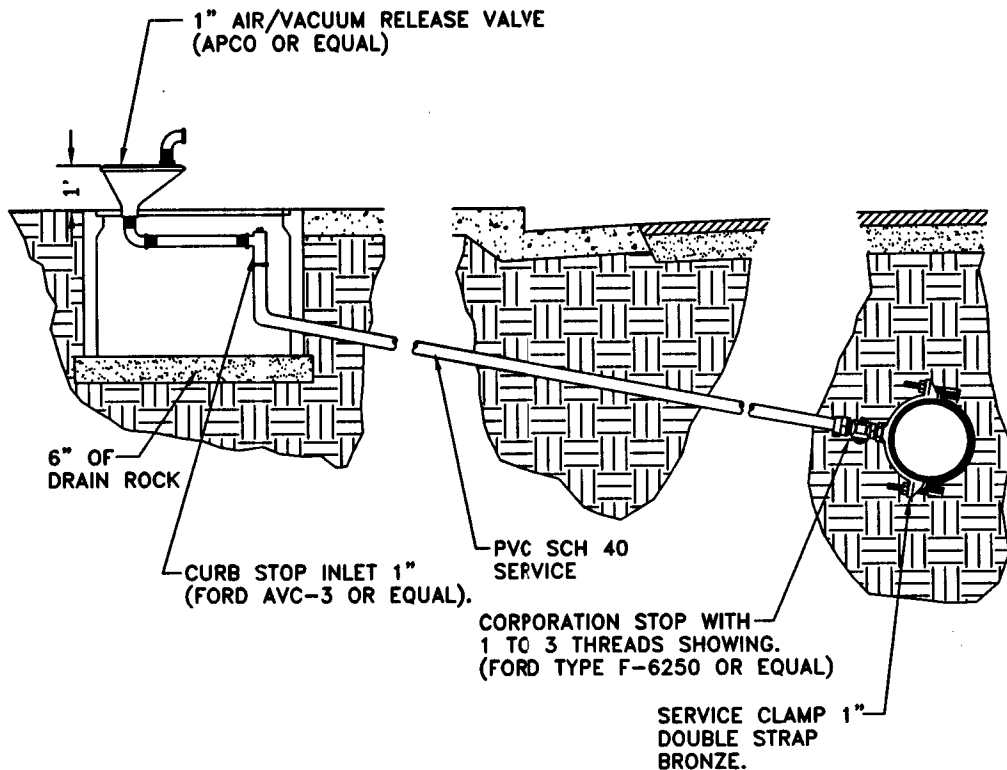
WATER
BACKFLOW PREVENTION
DEVICE

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
614



AIR & VACUUM RELEASE VALVE

NOTES:

1. AIR RELEASE VALVE SHALL HAVE CHRISTY B-36 METER BOX AND CHRISTY E-70 LID.
2. PLACE 6 INCHES OF DRAIN ROCK UNDER BOX.
3. ALL FITTINGS AND NIPPLES TO BE BRASS OR COPPER.
4. 1" ARV FOR 6" THROUGH 16" PIPE. 2" ARV FOR 18" AND GREATER.
5. FIRE HYDRANT IS PREFERRED AT HIGH POINTS.

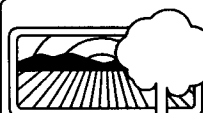
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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

WATER

AIR & VACUUM
RELEASE VALVE

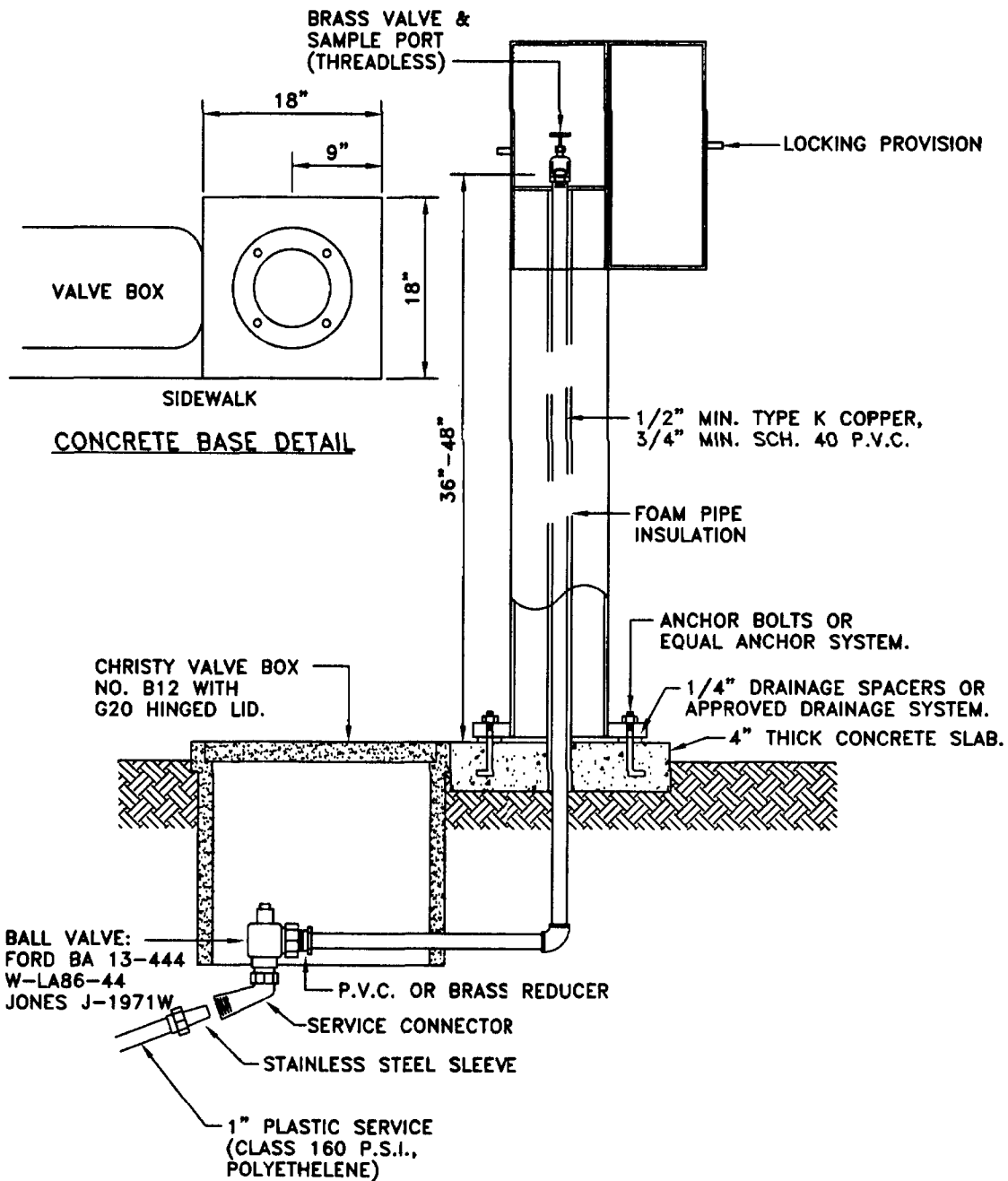
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

615



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WATER

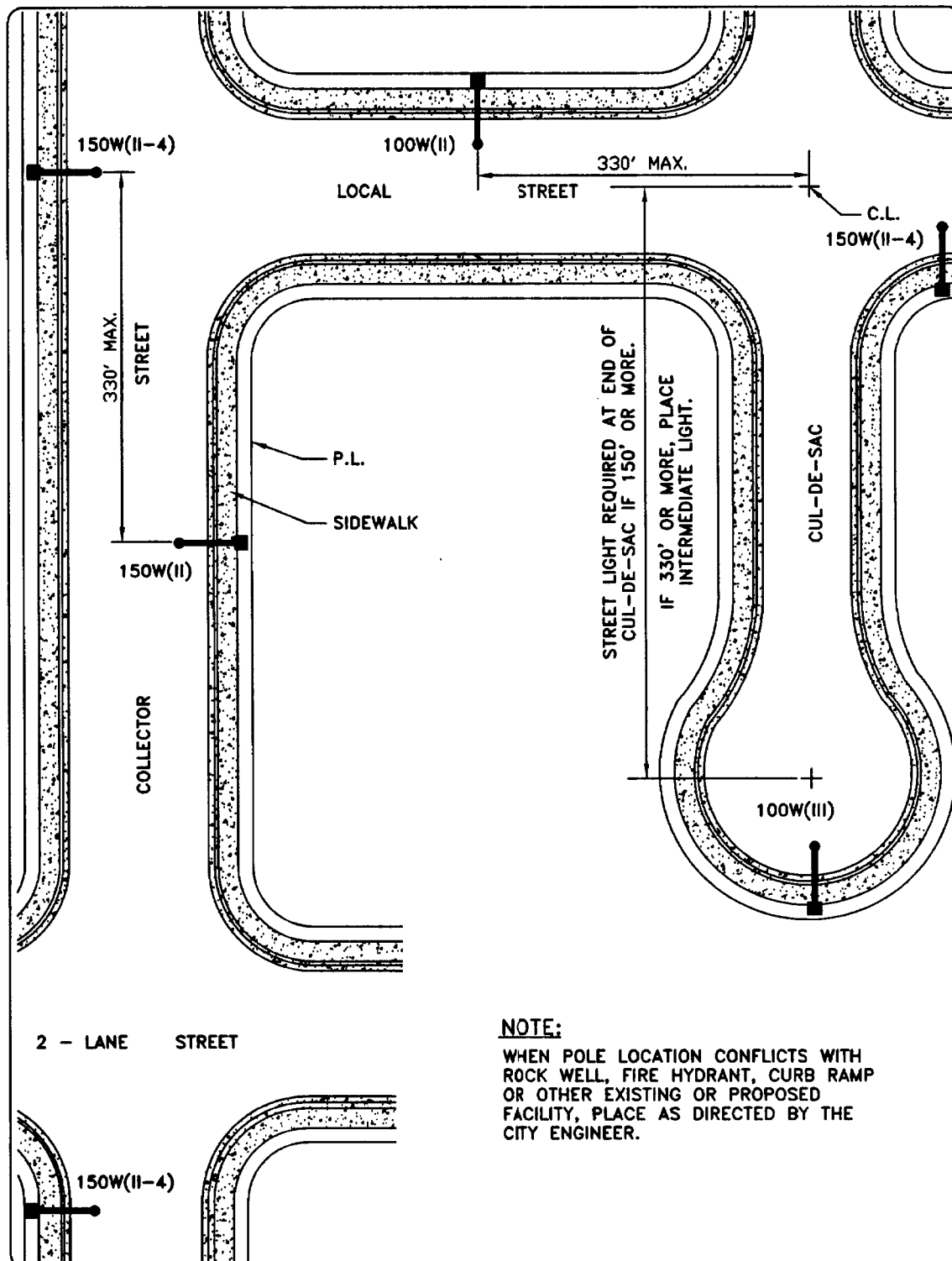
SAMPLE STATION

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
616



NOTE:

WHEN POLE LOCATION CONFLICTS WITH ROCK WELL, FIRE HYDRANT, CURB RAMP OR OTHER EXISTING OR PROPOSED FACILITY, PLACE AS DIRECTED BY THE CITY ENGINEER.

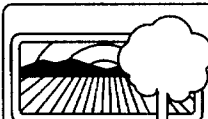
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AND TRANSPORTATION

LIGHTING & TRAFFIC

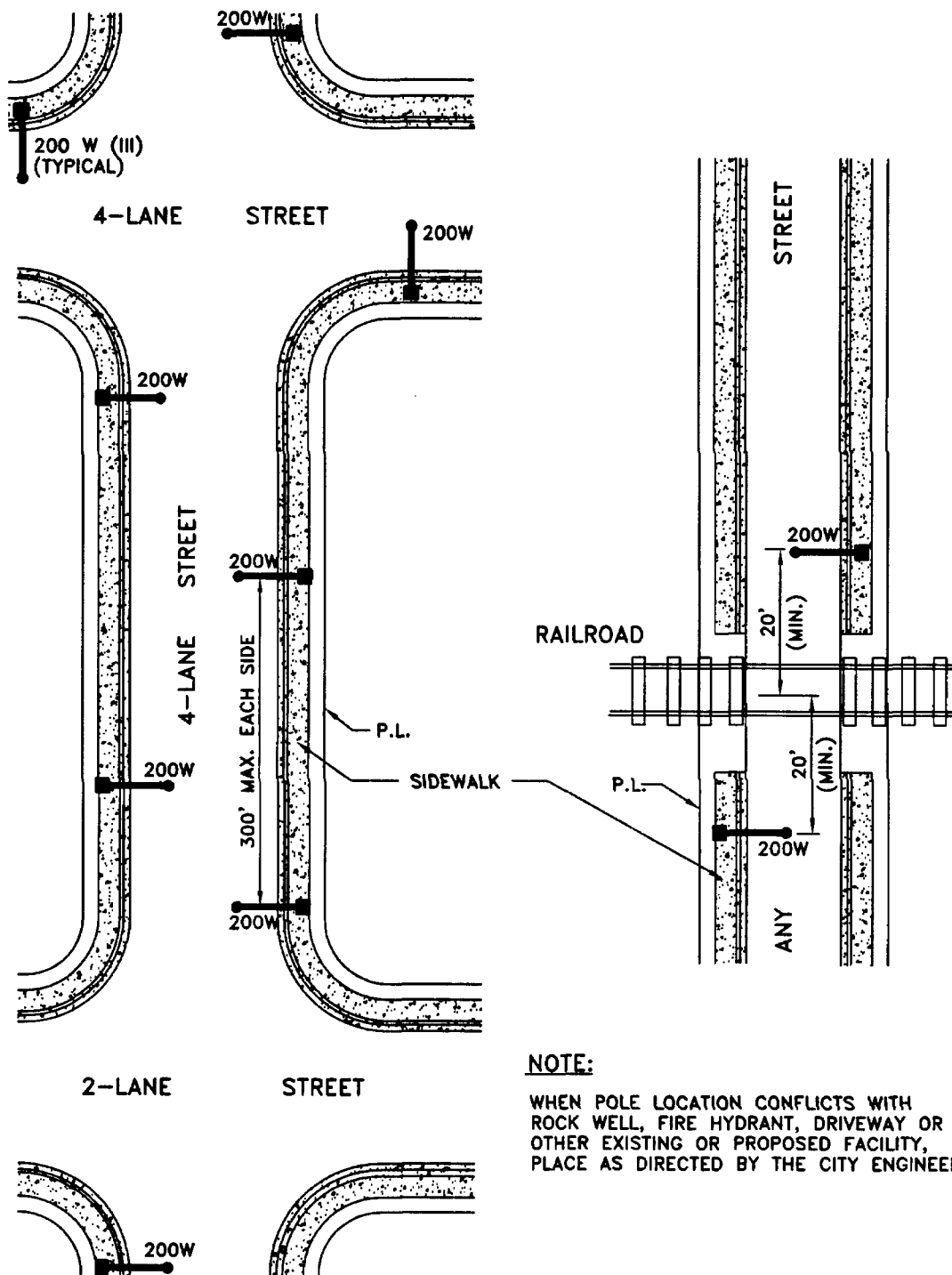
**LOCATIONS
OF 25' POLES**

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
700



NOTE:

WHEN POLE LOCATION CONFLICTS WITH
ROCK WELL, FIRE HYDRANT, DRIVEWAY OR
OTHER EXISTING OR PROPOSED FACILITY,
PLACE AS DIRECTED BY THE CITY ENGINEER.

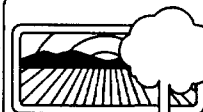
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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

LIGHTING & TRAFFIC

**LOCATIONS
OF 28" POLES**

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
701

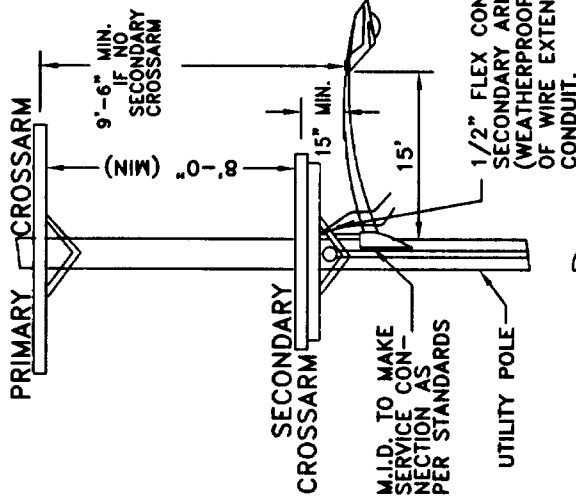
NOTE:
LIGHTING FIXTURE AND
STANDARD BY DEVELOPER
OR CITY CONTRACTOR.

LUMINAIRE

100W OR 150W FOR 25' POLE
200W FOR 28' POLE

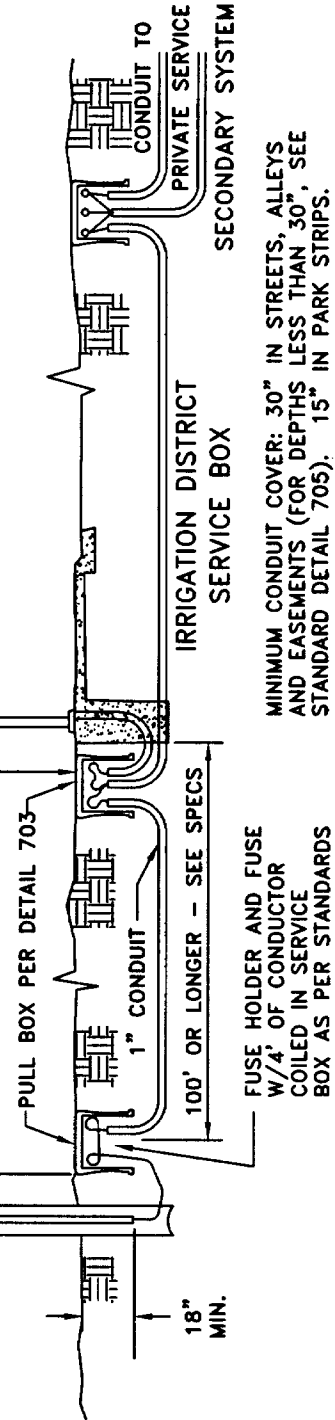
NOTES:

1. LUMINAIRES SHALL BE 120V OR AS DIRECTED BY THE CITY ENGINEER, WITH BUILT-IN PHOTOELECTRIC CELLS.
2. CONTACT M.I.D. PRIOR TO ENTERING UNDERGROUND SERVICE BOX, OR PRIOR TO ATTACHING ANY MATERIAL TO M.I.D. POLES ABOVE 8'0" FROM GRADE.
3. M.I.D. WILL COMPLETE CONNECTION OF 120V CIRCUIT UPON RECEIPT OF SIGNED APPLICATION FOR SERVICE FROM THE CITY OF MODESTO.
4. CONDUIT IN POLE SHALL BE WITHIN 3" BELOW THE BOTTOM OF THE HANDHOLES



NOTE:
DEVELOPER TO SUPPLY
ALL MATERIALS AS PER
STANDARDS WHEN SER-
VED FROM AN UNDER-
GROUND SOURCE.

M.I.D. TO SUPPLY AND
INSTALL CONDUIT & CABLE
& MAKE CONNECTIONS AS
PER STANDARDS WHEN
SERVED FROM AN OVERHEAD
SOURCE.



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LIGHTING & TRAFFIC

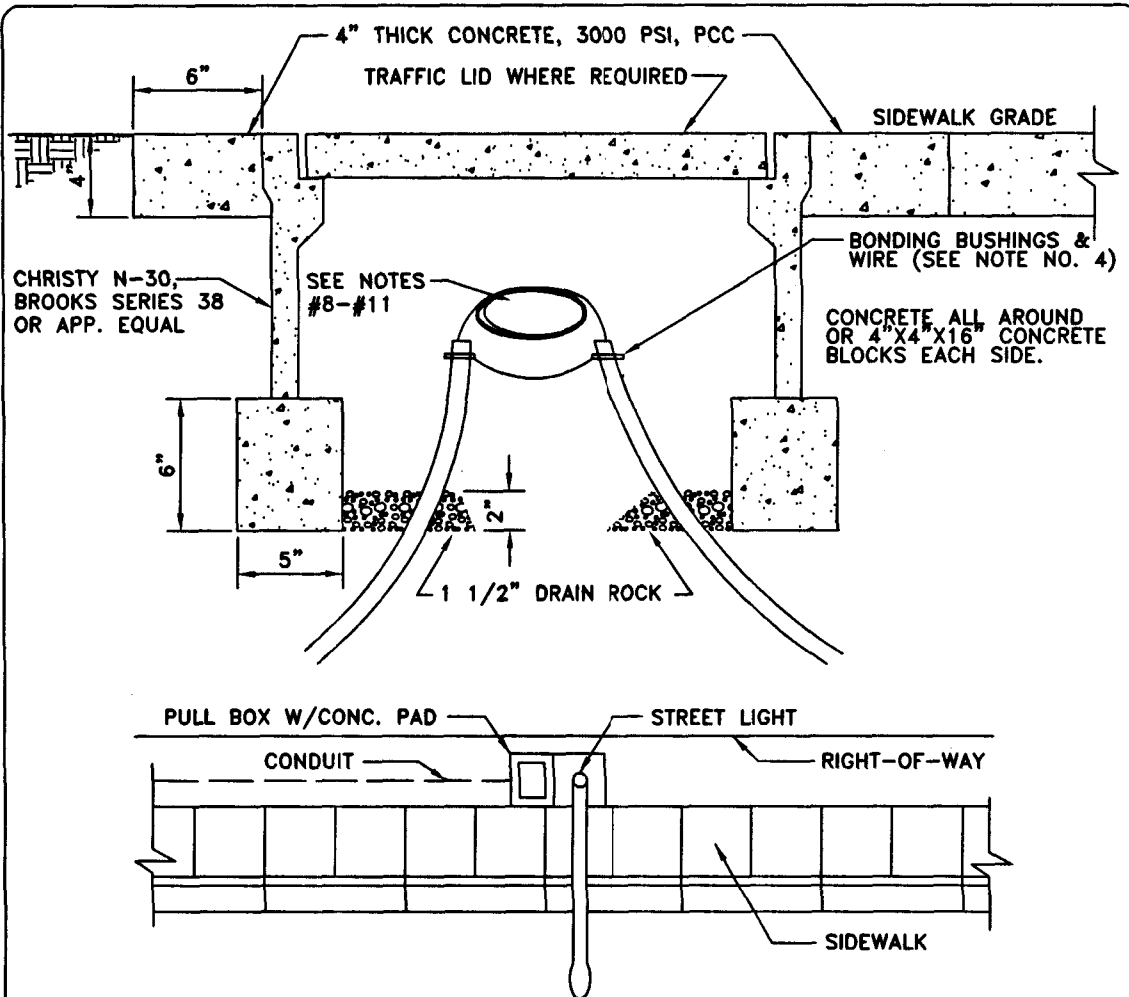
INSTALLATION
LAYOUT

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
702



NOTES:

1. CONDUIT SHALL BE A MINIMUM DEPTH OF 15" BELOW SIDEWALK GRADE IN PARK STRIPS, AND 30" BELOW TOP OF CURB GRADE IN STREETS, ALLEYS AND EASEMENTS NOT ADJACENT TO CURB OR SIDEWALK. DEPTH SHALL NOT EXCEED 48".
2. CONDUIT MAY BE INSTALLED AT DEPTHS LESS THAN 30" IN STREETS, ALLEYS AND EASEMENTS WITH PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER. SUCH APPROVAL MAY BE GRANTED ONLY UPON SPECIFIC REQUEST FROM THE DEVELOPER OR CITY CONTRACTOR. CONCRETE-ENCASED PVC CONDUIT MAY ALSO BE APPROVED UPON SPECIAL REQUEST.
3. WHERE SIDEWALK IS AGAINST PROPERTY LINE, THE CONDUIT SHALL BE PLACE 6" BEHIND CURB.
4. FOR BACKFILL & COMPACTION REQUIREMENTS, SEE STANDARD DETAILS #800 TO #803.
5. TURLOCK IRRIGATION DISTRICT (TID) CONDUIT TO BE PLACED AT A DEPTH OF 24".
6. REPLACE SOD IN LAWN AREA.
7. PULL BOX MAY BE SET ADJACENT TO OR BEHIND POLE IN THE RIGHT-OF-WAY.
8. IF PULL BOX IS MID-CIRCUIT, LEAVE 4' OF SLACK CONDUCTOR IN BOX.
9. IF PULL BOX IS A CIRCUIT TERMINUS AT POWER SOURCE, INSTALL FUSE HOLDER (PER SPEC.) WITH 4' OF SLACK CONDUCTOR. TAPE FUSE TO CONDUCTOR IN BOX.
10. CONDUIT ENTERING IRRIGATION DISTRICT SERVICE BOX SHALL CONFORM TO DISTRICT SPECIFICATIONS. (SEE DRAWING 4-F)
11. THE BONDING WIRE SHALL BE AT LEAST THE SAME GAUGE AS THE LARGEST CIRCUIT CONDUCTOR. (MIN. OF NO. 8 AWG COPPER WIRE)

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RESOLUTION NO. 2001-560

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LIGHTING & TRAFFIC

PULL BOX

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.

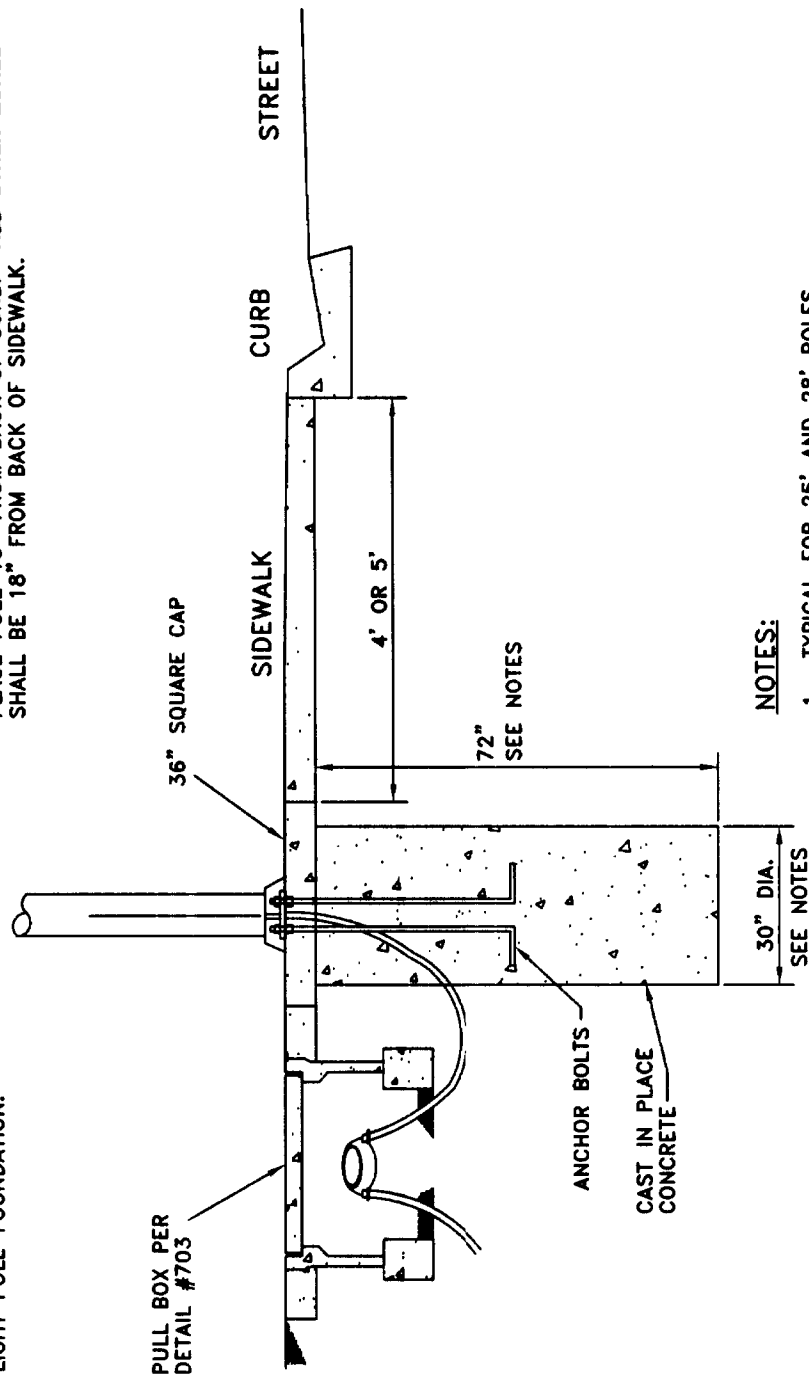
703

NOTE:

PULL BOX MAY BE LOCATED BEHIND OR ADJACENT TO LIGHT POLE FOUNDATION.

NOTE:

WHERE WALK IS SEPARATED FROM CURB & GUTTER OR A 10' SIDEWALK IS INSTALLED IN BACK OF CURB & GUTTER, PLACE POLE 18" FROM BACK OF CURB. ALL OTHER ZONES SHALL BE 18" FROM BACK OF SIDEWALK.



NOTES:

1. TYPICAL FOR 25' AND 28' POLES.
2. FOUNDATIONS MAY BE 36" SQUARE AND 60" DEEP.
3. CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH.
4. EACH LIGHT POLE MUST HAVE A PULL BOX.

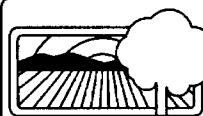
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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

LIGHTING & TRAFFIC

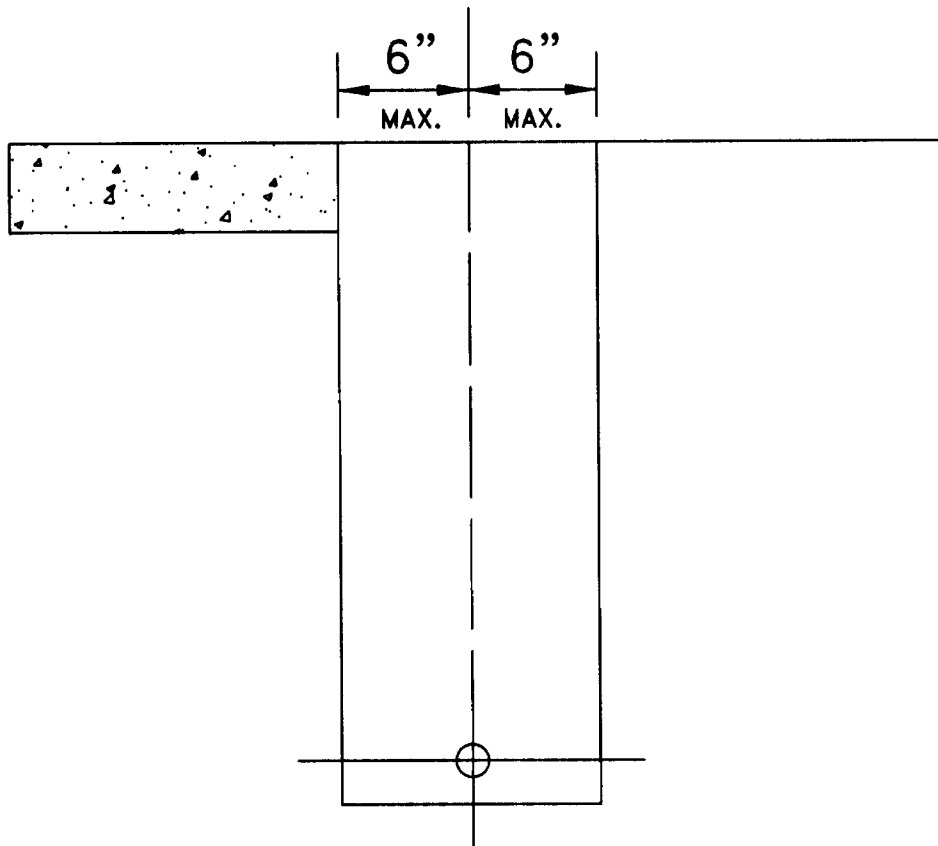
POLE FOUNDATION

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
704



NOTES:

1. CONDUIT SHALL BE A MINIMUM OF 24" BELOW SIDEWALK GRADE IN PARK STRIPS, AND 30" BELOW TOP OF CURB GRADE IN STREETS, ALLEYS AND EASEMENTS NOT ADJACENT TO CURB OR SIDEWALK. DEPTH SHALL NOT EXCEED 48".
2. CONDUIT MAY BE INSTALLED AT DEPTHS LESS THAN 30" IN STREETS, ALLEYS AND EASEMENTS WITH PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER. SUCH APPROVAL MAY BE GRANTED ONLY UPON SPECIFIC REQUEST FROM THE DEVELOPER OR CITY CONTRACTOR. CONCRETE-ENCASED PVC CONDUIT MAY ALSO BE APPROVED UPON SPECIAL REQUEST.
3. WHERE SIDEWALK IS AGAINST PROPERTY LINE, THE CONDUIT SHALL BE PLACED 6" BEHIND CURB.
4. FOR BACKFILL & COMPACTION REQUIREMENTS SEE STANDARD DETAILS #800 TO #803.
5. TURLOCK IRRIGATION DISTRICT (TID) CONDUIT TO BE PLACE AT A DEPTH OF 24".
6. REPLACE SOD IN LAWN AREA.

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LIGHTING & TRAFFIC

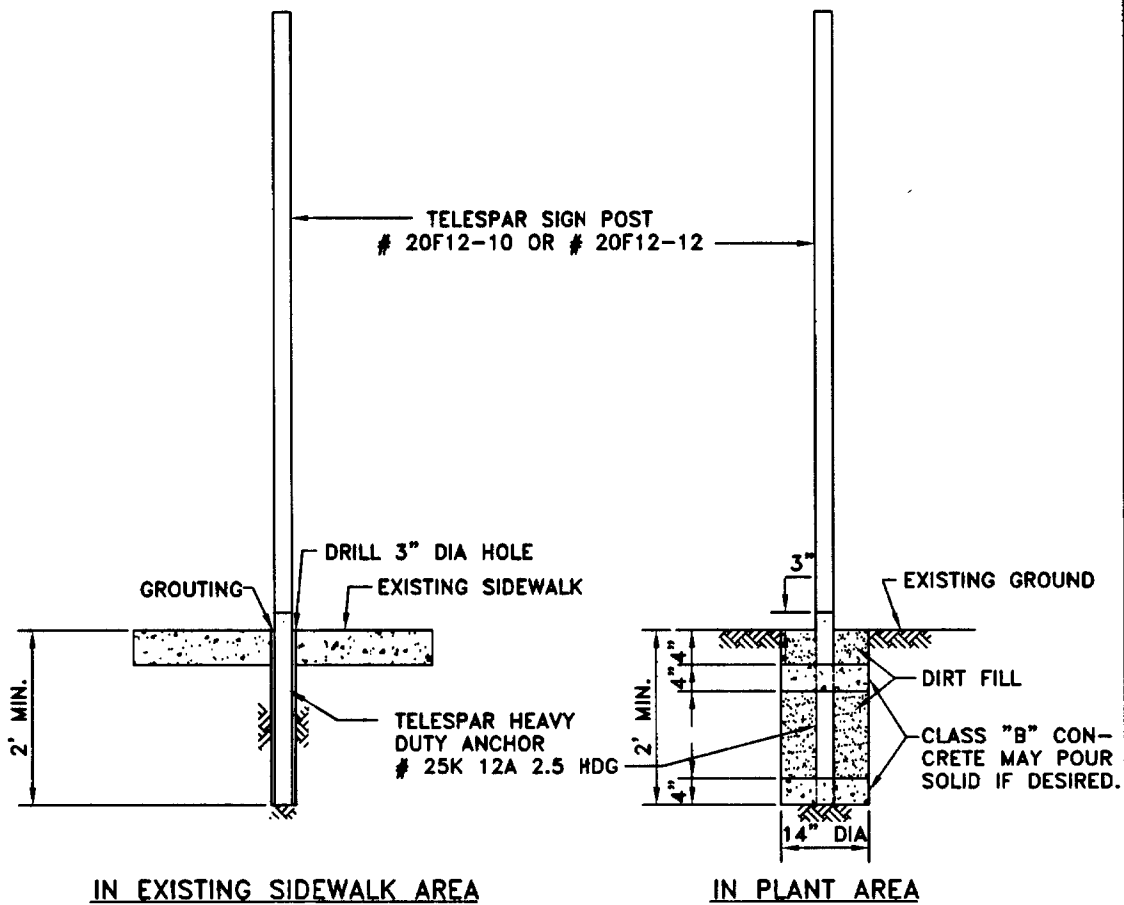
TRENCH SECTION

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
705



NOTE:

ANCHOR TO BE DRIVEN OR PLACED WITH 3" MAXIMUM ABOVE GROUND LEVEL.

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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

LIGHTING & TRAFFIC

SIGN POST

ENGINEERING & TRANSPORTATION
DEPARTMENT

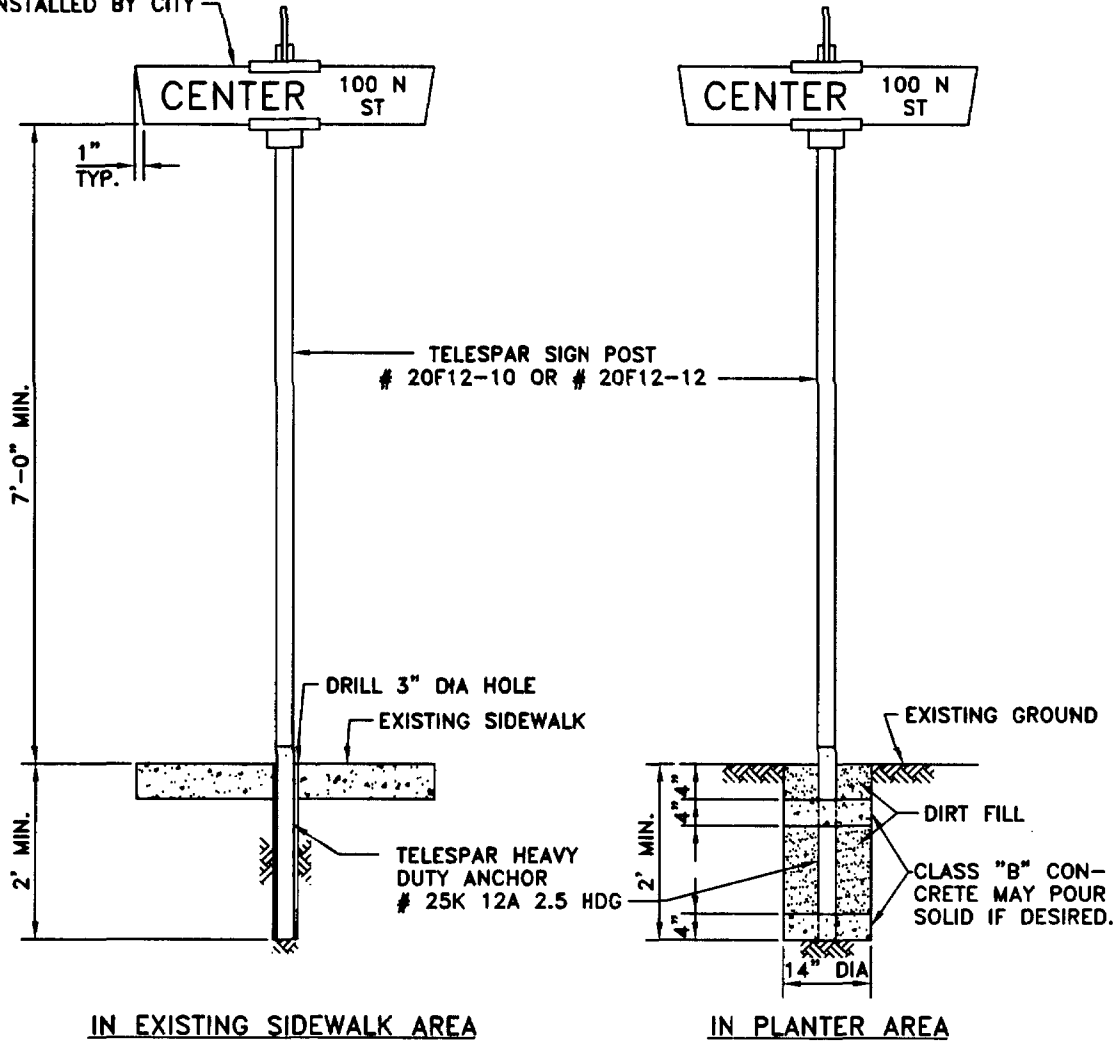


CITY of MODESTO

DETAIL NO.

706

STREET NAME SIGNS TO BE
INSTALLED BY CITY



NOTES:

1. SEE DRAWING OF STANDARDS FOR LOCATION OF STREET NAME SIGNS.
2. ANCHOR OT BE DRIVEN OR PLACED WITH 3" MAXIMUM ABOVE GROUND LEVEL.

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RESOLUTION NO. 00-0000

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AND TRANSPORTATION

LIGHTING & TRAFFIC

**STREET NAME
SIGN**

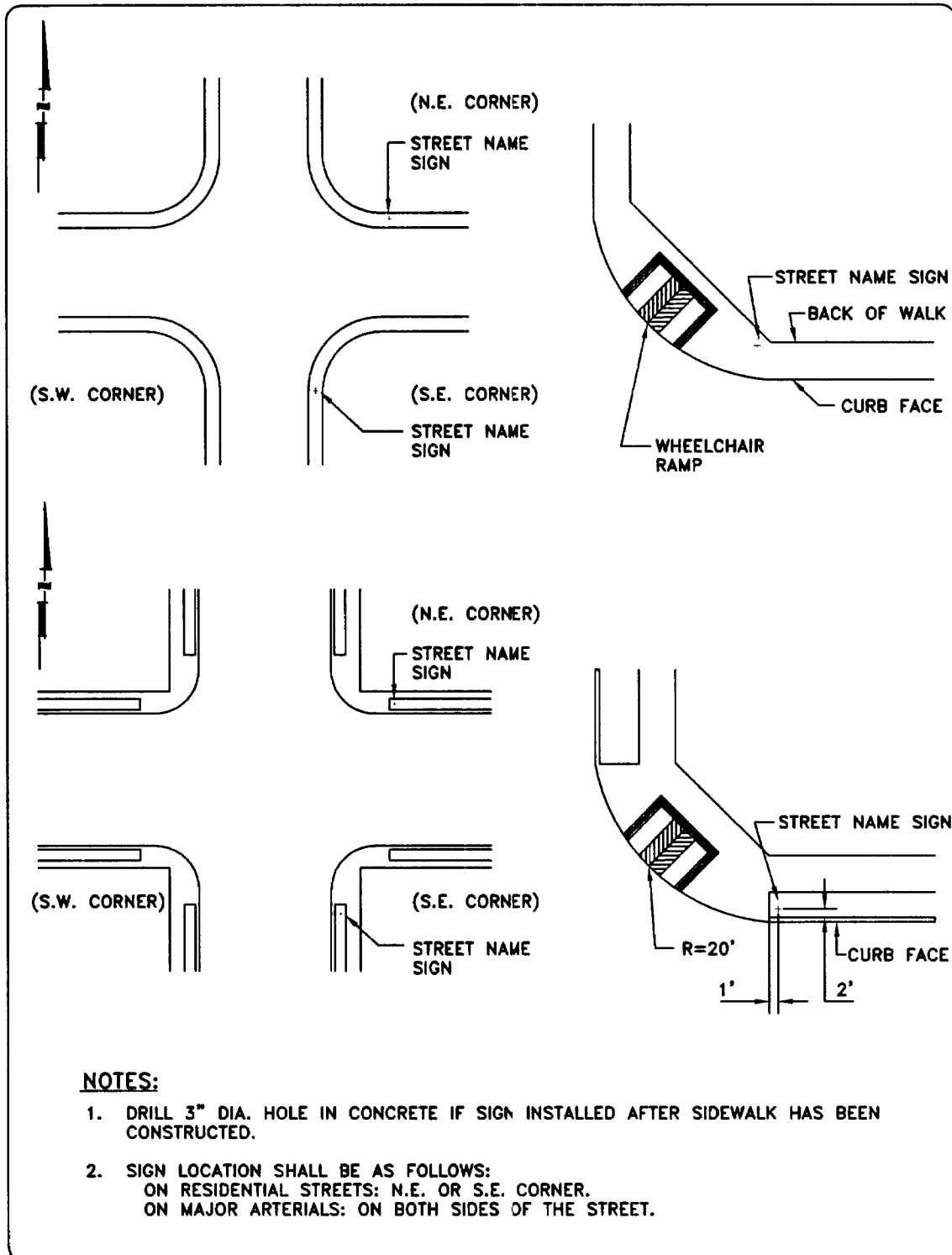
**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.

707



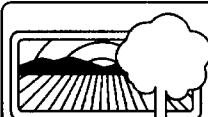
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LIGHTING & TRAFFIC

STREET SIGN
LOCATION

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
708

TYPICAL OVERHEAD STREET NAME SIGNS

FRONT VIEW



BACK VIEW



NOTES:

1. ALL LETTERS SHALL BE 10" CAPS FOR STREET NAME.
2. ALL BLOCK NUMBERS SHALL BE 4" NUMBERS.
3. ALL ARROWS SHALL BE 4" WIDE.
4. ALL TEXT SHALL BE SERIES "D".
5. SIGNS SHALL BE WHITE ON A GREEN BACKGROUND.
6. SIGNS SHALL BE DIAMOND GRADE SHEETING.

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AND TRANSPORTATION

LIGHTING & TRAFFIC

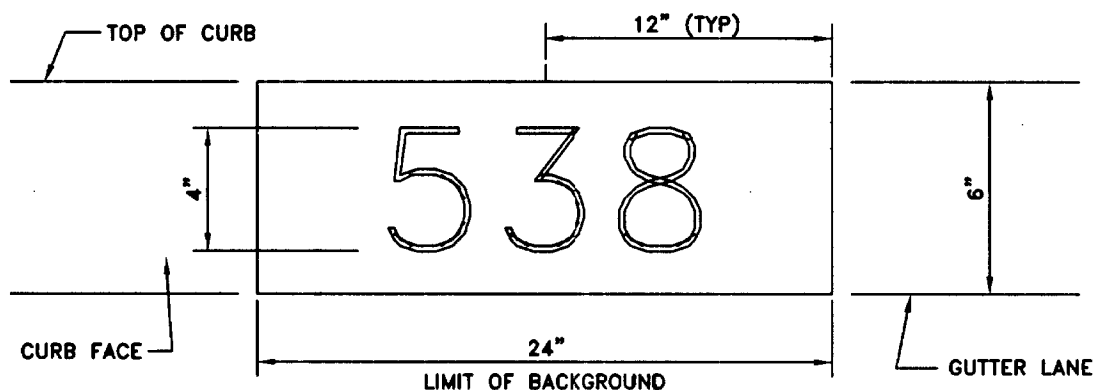
TYPICAL OVERHEAD
STREET NAME SIGNS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
709



CURB PAINTING STANDARD

NOTES:

1. BUILDING NUMBERS MAY BE PAINTED ON CURB SURFACES IN ACCORDANCE WITH CITY COUNCIL POLICY AND THIS STANDARD DRAWING.
2. NUMBERS SHALL BE PAINTED WITH BLACK 4" BLOCK LETTERS HAVING A 1/2" STROKE ON A WHITE REFLECTORIZED BACKGROUND.
3. NUMBERS SHALL BE PAINTED WITHIN 2 FT. OF THE DRIVEWAY TO THE PROPERTY.
4. AN APPROVED ENCROACHMENT PERMIT FROM THE OFFICE OF THE CITY ENGINEER SHALL BE OBTAINED BEFORE CURBS MAY BE PAINTED.
5. PAINT MUST BE APPROVED BY THE CITY ENGINEER.
6. PAINTING CONTRACTOR MUST HAVE A VALID BUSINESS LICENSE IN THE CITY OF MODESTO.
7. A SPECIFIED FEE SHALL BE CHARGED FOR WORK PERFORMED (NO DONATIONS).
8. APPROVAL IN WRITING OF THE PROPERTY OWNER PRIOR TO PAINTING SHALL BE SUBMITTED TO THE CITY ENGINEER.
9. NUMBER SHALL BE CENTERED ON 24" BACKGROUND.

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LIGHTING & TRAFFIC

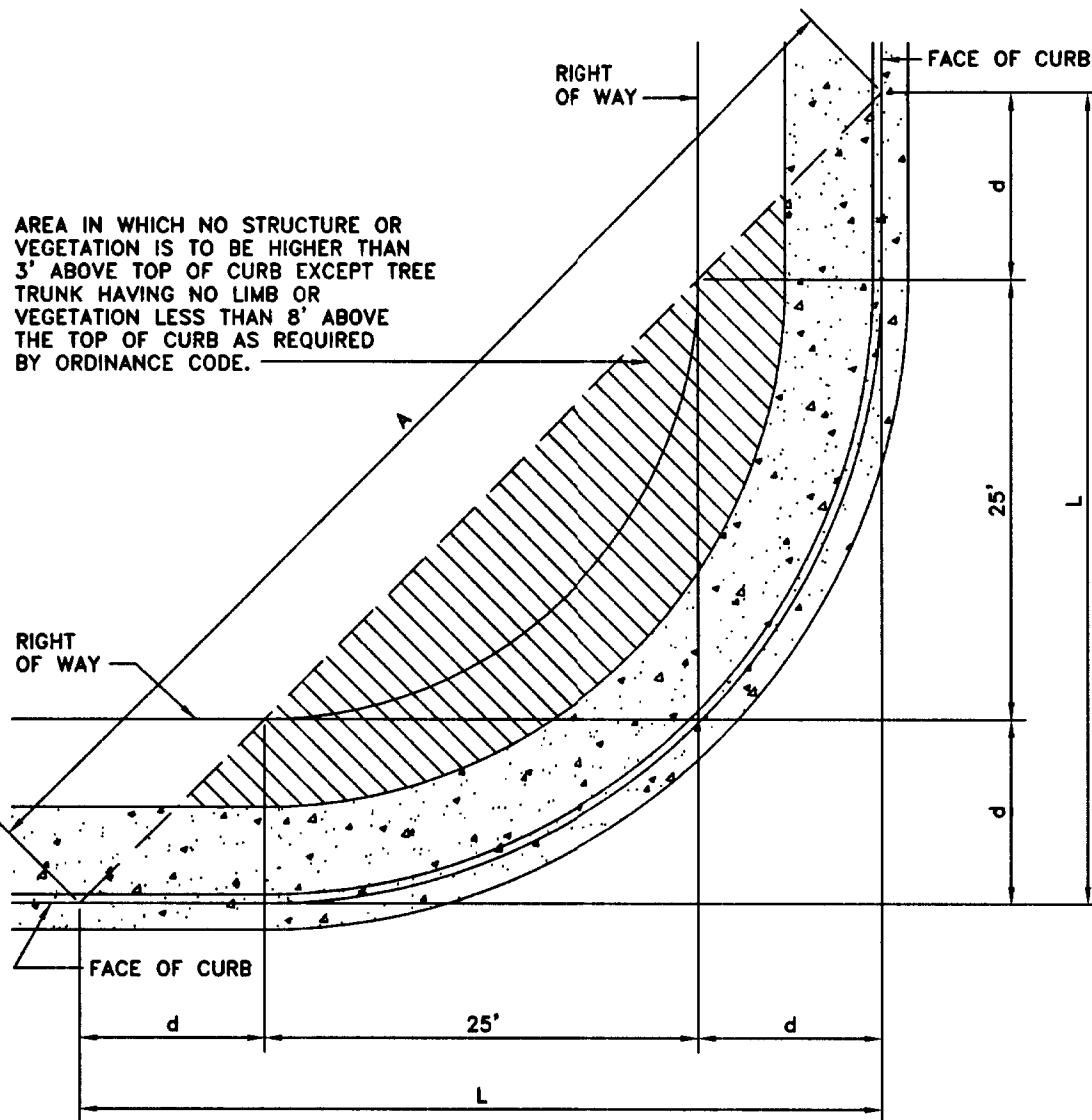
CURB
NUMBERS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
710



TOTAL DISTANCE (L) = 25 + 2d

EXAMPLE: $L = 25' + 2(10') = 45'$
 $A = 1.412 \times L$
 $A = 1.412 \times 45' = 63.5'$

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AND TRANSPORTATION

LIGHTING & TRAFFIC

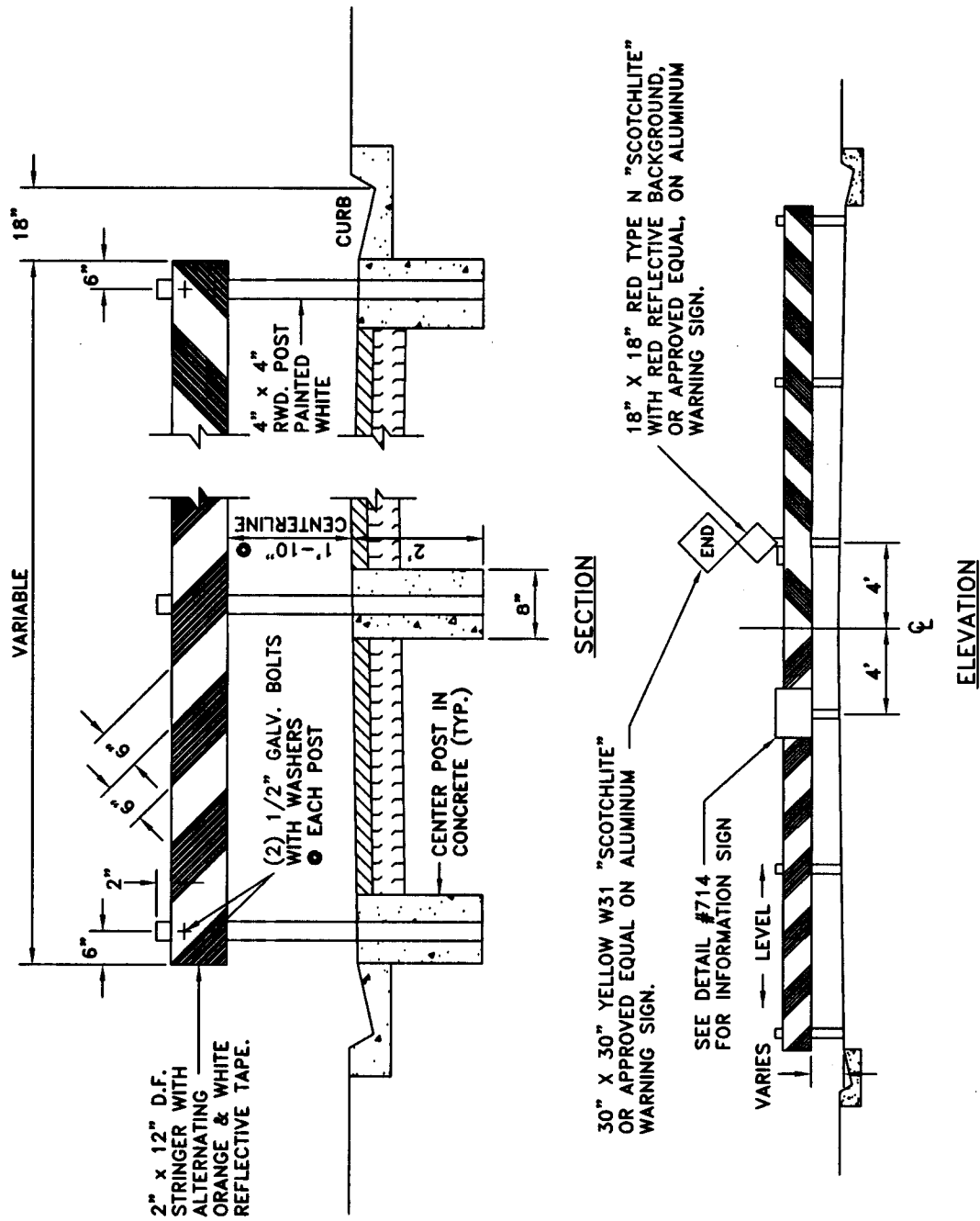
CLEAR VISION
TRIANGLE AREA

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
711



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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

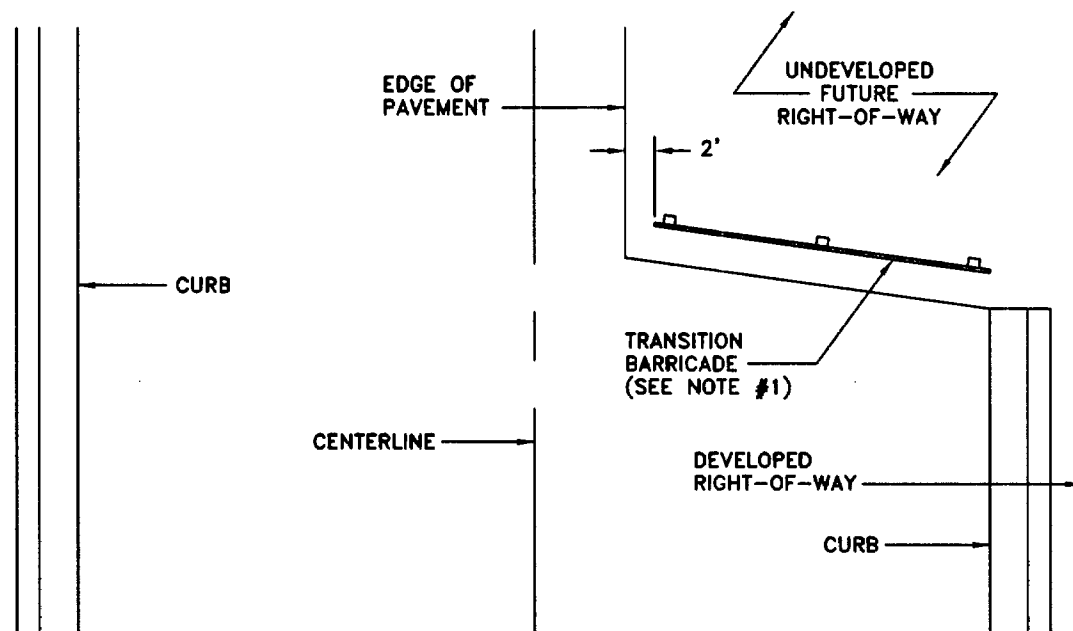
LIGHTING & TRAFFIC DEAD END STREET BARRICADE

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

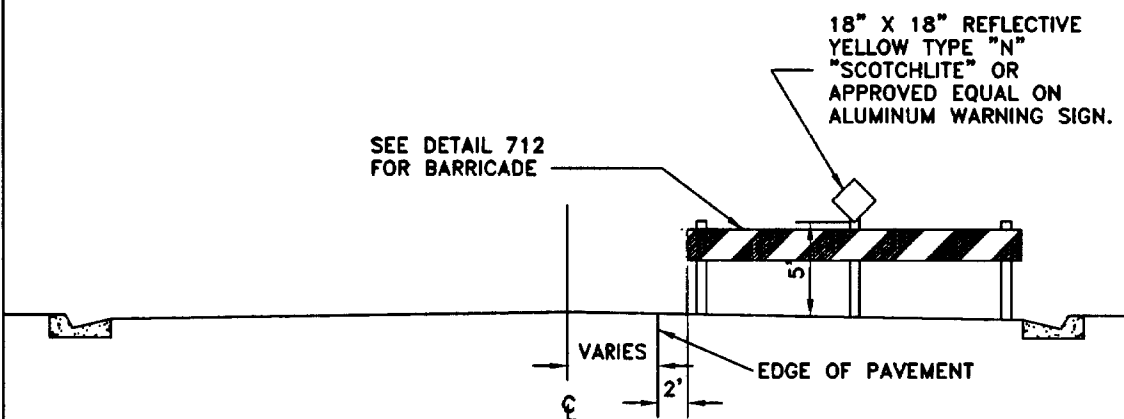
DETAIL NO.
712



PLAN

NOTE:

1. ALTERNATE LOCATION SHALL BE AS APPROVED BY THE CITY ENGINEER.



PROFILE

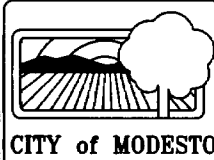
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
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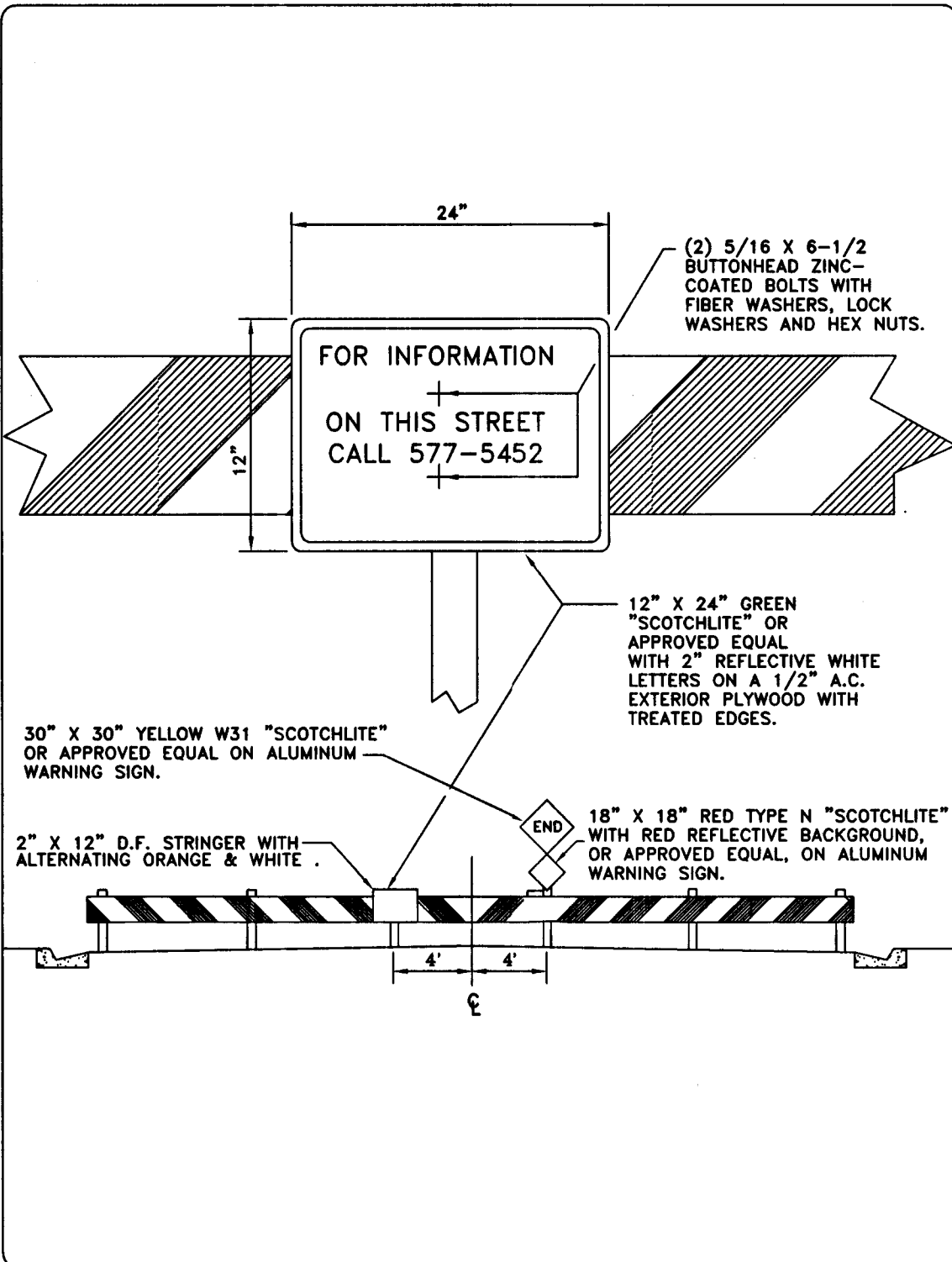
LIGHTING & TRAFFIC

**STEET WIDTH
TRANSITION BARRICADE**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



DETAIL NO.
713

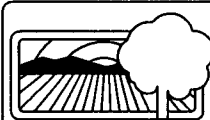


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AND TRANSPORTATION

LIGHTING & TRAFFIC
INFORMATION ON
DEAD END BARRICADE

ENGINEERING & TRANSPORTATION
DEPARTMENT

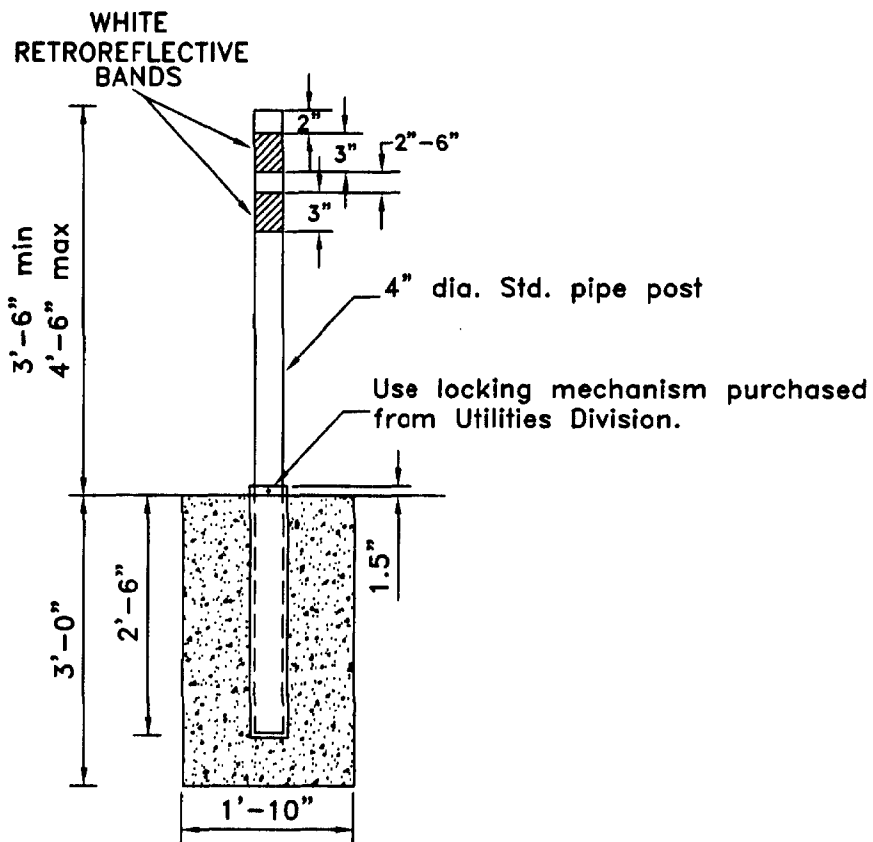


CITY of MODESTO

DETAIL NO.
714

NOTES:

1. See design section 3.08 for information on location.
2. Galvenieod steel sleeve to be constructed with a diameter $1/10"$ larger than post. Wall thickness to be same as post or larger.
3. Contractor may submit alternative details for approval by the City Engineer.



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TRAFFIC SAFETY

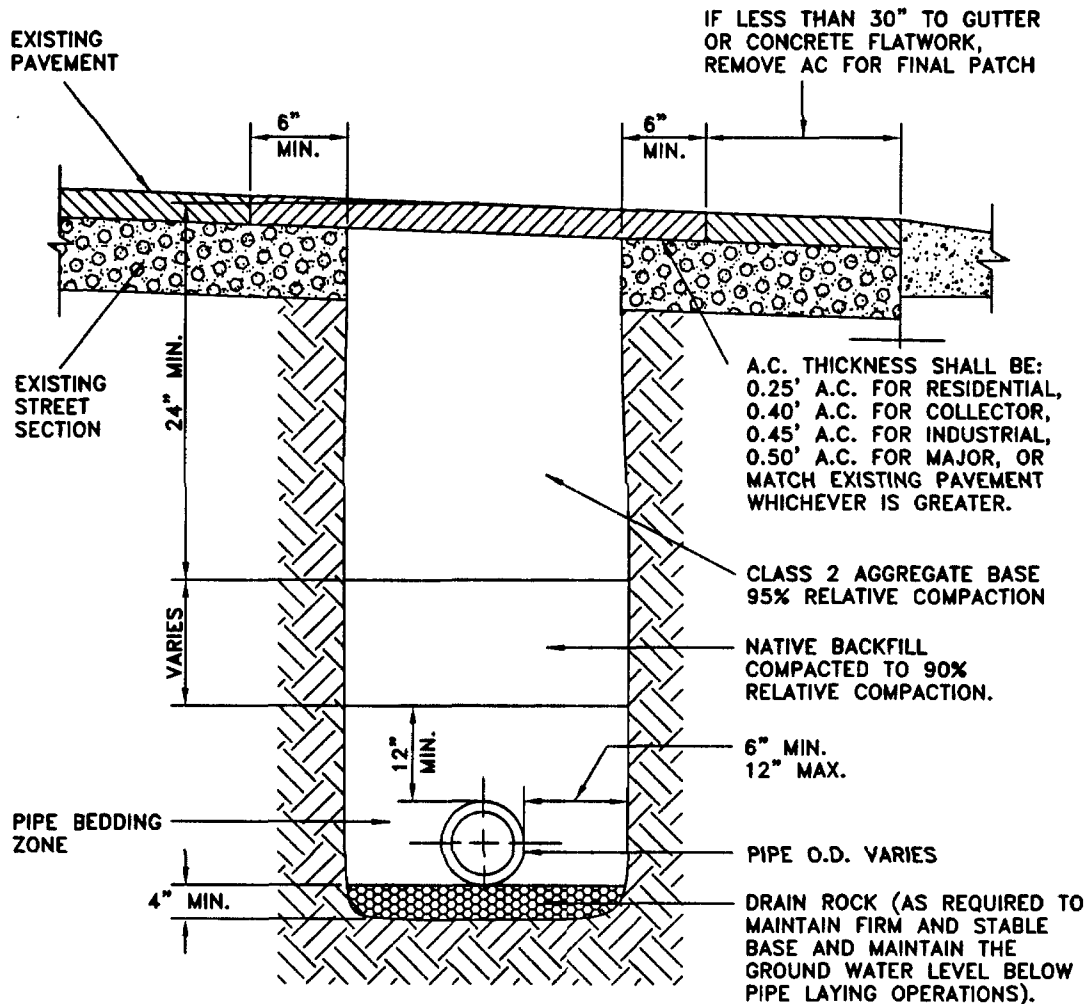
**REMOVEABLE BOLLARD
DETAIL**

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
715



SECTION

NOTES:

1. TRENCH SECTION SHALL BE BACKFILLED AND MECHANICALLY COMPACTED TO GRADE.
2. IN EXISTING PAVEMENT, CONTRACTOR SHALL FURNISH 2" TEMPORARY PAVEMENT, TO BE INSTALLED AND COMPACTED AS DIRECTED BY THE CITY ENGINEER.
3. ON INDUSTRIAL STREETS OR WHERE T.I. IS 10 OR ABOVE, THE DEPTH OF RELATIVE COMPACTION SHALL BE DETERMINED BY THE CITY ENGINEER.
4. IF TRENCH IS WITHIN 3' OF EXISTING GUTTER OR CONCRETE FLATWORK, CONTRACTOR SHALL REMOVE AC AND PAVE TRENCH AND ADJACENT PIECE.
5. PRIME COAT REQUIRED ABOVE AGGREGATE BASE.
6. BACKFILL MATERIAL FOR THE PIPE BEDDING ZONE SHALL BE SAND, CLASS 2 AGGREGATE BASE OR A CONTROLLED DENSITY BACKFILL (SLURRY MIX). SEE SECTION 9 OF THE CONSTRUCTION STANDARDS.

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UTILITIES

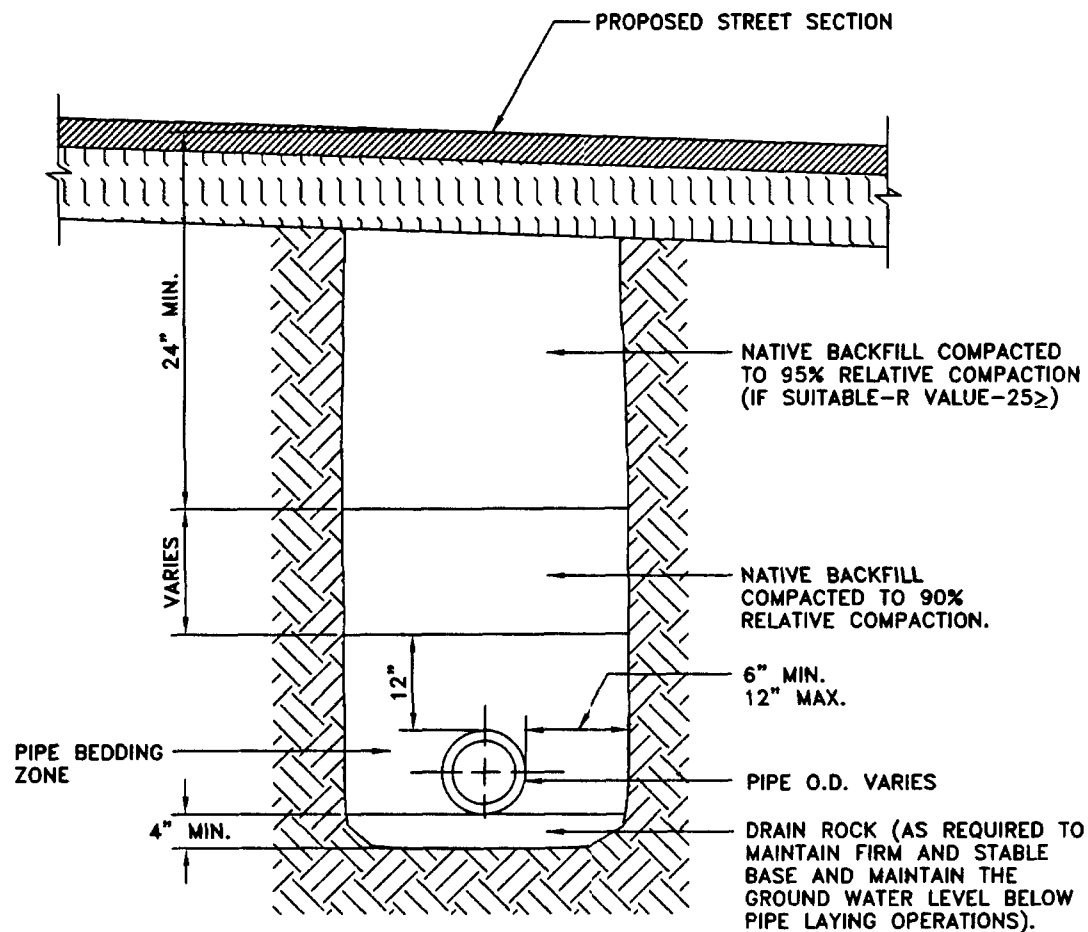
TRENCH BACKFILL EXISTING STREETS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
800



SECTION

NOTES:

1. TRENCH SECTION SHALL BE BACKFILLED AND MECHANICALLY COMPACTED TO GRADE.
2. THE CLEAR WIDTH OF THE TRENCH SHALL BE A MAXIMUM OF THE PIPE O.D. PLUS 2 FEET. IF THE MAXIMUM TRENCH WIDTH MUST BE EXCEEDED OR IF THE PIPE IS INSTALLED IN A COMPACTED EMBANKMENT, THEN EMBEDMENT SHALL BE COMPACTED TO A POINT OF AT LEAST 2 1/2 PIPE DIAMETERS FROM THE PIPE ON BOTH SIDES OF THE PIPE OR TO THE TRENCH WALLS, WHICHEVER IS LESS.
3. IN LANDSCAPED AREAS, THE NATIVE BACKFILL SHALL BE COMPACTED TO 85% RELATIVE COMPACTION.

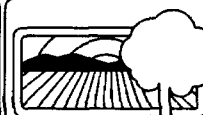
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UTILITIES

TRENCH BACKFILL UNDEVELOPED STREETS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
801

NOTES:

1. UNSTABLE SUBGRADE MATERIAL SHALL BE EXCAVATED AND STABILIZED WITH #3 ROCK (PER ASTM 33 OR APPROVED EQUAL) OR WITH CEMENT SLURRY/CONCRETE AS APPROVED BY THE CITY ENGINEER.
2. ALL TRENCHES SHALL BE SHORED OR PROTECTED IN ACCORDANCE WITH OSHA AND OTHER STATE AND FEDERAL SAFETY CODES, REGULATIONS AND ORDINANCES.
3. FOR EXISTING STREETS, BACKFILL MATERIAL SHALL BE AGGREGATE BASE (95% RELATIVE COMPACTION 2'-0" BELOW THE PAVEMENT SURFACE) AND NATIVE BACKFILL (90% RELATIVE COMPACTION FOR THE REMAINING DEPTH TO THE PIPE BEDDING).
4. PLACEMENT OF AGGREGATE BASE SHALL BE IN 12" LIFTS EVENLY PLACED AND MECHANICALLY COMPACTED TO RELATIVE DENSITY AS SPECIFIED. COMPACTION TESTS SHALL BE REQUIRED AT THE DISCRETION OF THE CITY ENGINEER. ALL COSTS RELATED TO THESE TESTS SHALL BE BORNE BY THE OWNER/CONTRACTOR/UTILITY COMPANY WHEN SUCH TESTS ARE REQUIRED. IF RESULTS OF THESE TESTS DO NOT MEET SPECIFIED REQUIREMENTS, BACKFILL SHALL BE EXCAVATED, REPLACED, COMPACTED AND RETESTED. IN CASE OF ONE SACK SLURRY MIX OR CONTROLLED DENSITY FILL, NO COMPACTION TEST WILL BE REQUIRED.
5. DROP HAMMER SHALL NOT BE USED TO CUT PAVEMENT.
6. ALL TRENCHES SHALL BE BACKFILLED AND TEMPORARILY PAVED AT THE END OF EACH WORKING DAY. THE USE OF STEEL PLATES MUST BE APPROVED BY THE CITY ENGINEER AT LEAST 48 HOURS IN ADVANCE.
7. MINIMUM 24 HOUR NOTICE SHALL BE REQUIRED FOR ALL CITY INSPECTIONS. CALL CITY OF MODESTO CONSTRUCTION ADMINISTRATION OFFICE AT 577-5316.
8. INITIAL CUT IN STREET PAVEMENT SHALL BE EQUAL TO THE WIDTH OF THE TRENCH WITH THE OPTION OF BEING JACK HAMMERED OR SAW CUT.
9. FINAL CUT IN STREET PAVEMENT SHALL BE 12" WIDER THAN THE TRENCH WIDTH AS SHOWN IN THE DETAIL AND SHALL BE MADE BY SAW CUTTING ONLY.
10. TEMPORARY BITUMINOUS SURFACING (CUT BACK) SHALL BE PLACED AND COMPACTED IMMEDIATELY ABOVE THE TRENCH FOLLOWING COMPACTION AND APPROVED BY THE CITY ENGINEER. MINIMUM DEPTH OF CUT BACK SHALL BE 2" OR AS SPECIFIED BY THE CITY ENGINEER. CUT BACK SHALL BE MAINTAINED IN A CONDITION SATISFACTORY TO THE CITY ENGINEER UP TO THE TIME THE FINAL PAVING IS PLACED ON TRENCH IN ACCORDANCE WITH NOTE #11.
11. FINAL PAVING ABOVE THE TRENCH SECTION SHALL BE PLACED WITHIN 14 DAYS OF ITS BACKFILL AND COMPACTION. EXTENSION MAY BE GRANTED BY THE CITY ENGINEER DUE TO WEATHER CONDITIONS. IN THE EVENT PERMANENT PAVING IS NOT DONE WITHIN 14 DAYS, THE CITY WILL CONSIDER THIS AS INCOMPLETE WORK AND WILL TAKE NECESSARY ACTION IN ACCORDANCE WITH PREVAILING CITY ORDINANCES AND POLICIES.
12. TEMPORARY CUT BACK SHALL BE REMOVED BEFORE PLACEMENT OF FINAL PAVING. FINAL PAVING SHALL BE PLACED ON UNDISTURBED PREVIOUSLY INSPECTED AND COMPACTED AGGREGATE BASE OR ONE SACK SLURRY MIX/CONTROLLED DENSITY FILL. RECOMPACTION SHALL BE REQUIRED FOR ANY DISTURBED BASE OR SURFACE.

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UTILITIES

**TRENCHING &
RESURFACING**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

**DETAIL NO.
802**

NOTES:(CONT.)

13. FOR A PARALLEL TRENCH LONGER THAN ONE HALF LENGTH OF THE BLOCK, A SLURRY SEAL SHALL BE REQUIRED ON THE ENTIRE HALF WIDTH OF THE STREET ON THE TRENCH SIDE AS DIRECTED BY THE CITY ENGINEER.
14. PROPER TRAFFIC CONTROLS AND COVERING OF TRENCHES SHALL BE MAINTAINED IN ACCORDANCE WITH THE CITY OF MODESTO STANDARD SPECIFICATIONS.
15. NO TRENCH SHALL BE OPENED IN ANY STREET FOR THE PURPOSE OF LAYING PIPES OR CONDUITS MORE THAN SIX HUNDRED (600) FEET AT A TIME.
16. ASPHALT CONCRETE SHALL BE IN ACCORDANCE WITH THE CITY OF MODESTO STANDARD SPECIFICATIONS.
17. TRENCHING SHALL NOT BE ALLOWED ON ANY STREET WHICH HAS BEEN RECONSTRUCTED OR REPAVED WITHIN THE PAST 3 YEARS NOR ON SLURRY SEALED STREETS FOR A PERIOD OF EIGHTEEN (18) MONTHS.

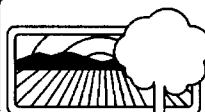
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UTILITIES

**TRENCHING &
RESURFACING**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**

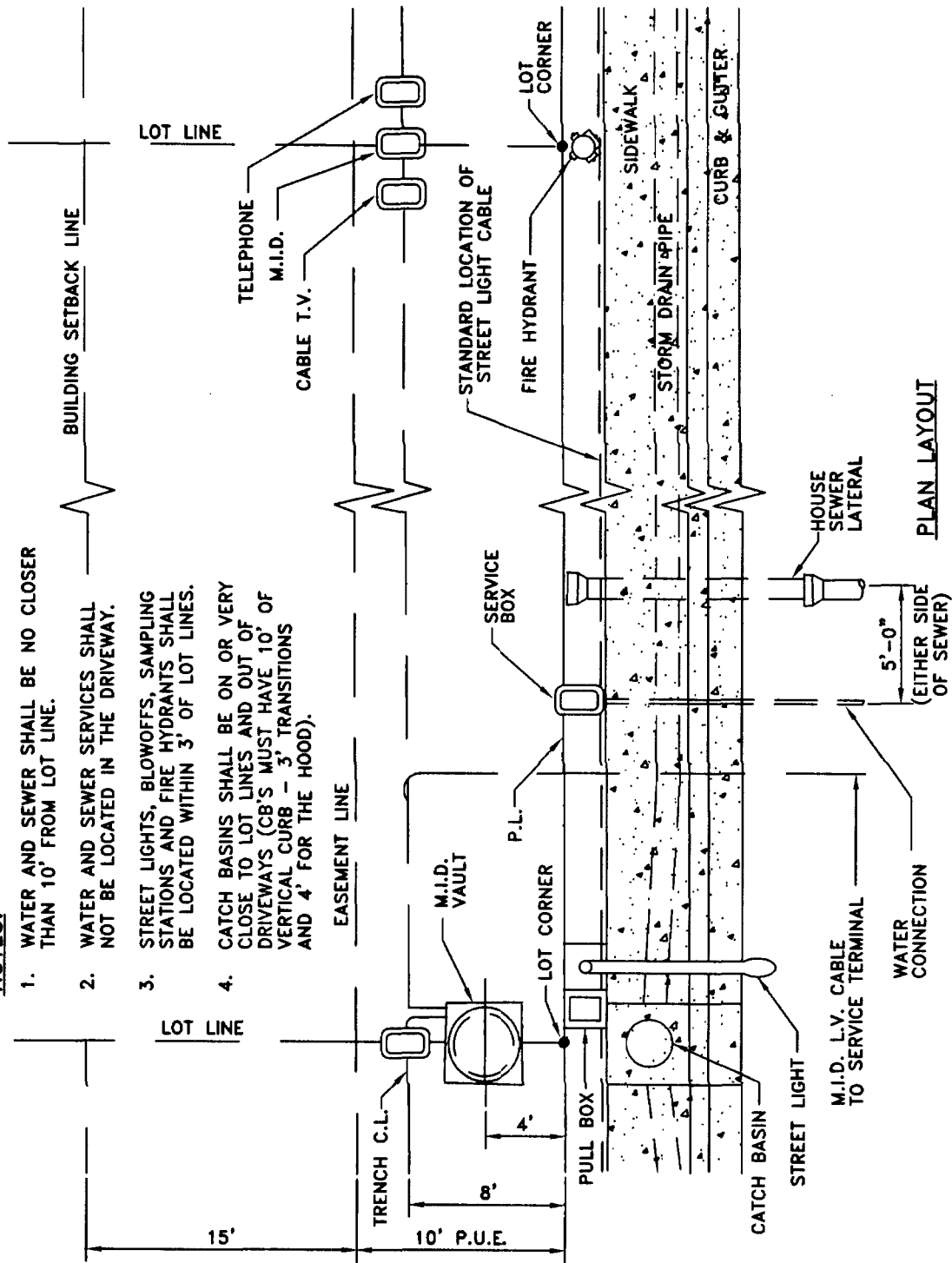


CITY of MODESTO

**DETAIL NO.
803**

NOTES:

1. WATER AND SEWER SHALL BE NO CLOSER THAN 10' FROM LOT LINE.
2. WATER AND SEWER SERVICES SHALL NOT BE LOCATED IN THE DRIVEWAY.
3. STREET LIGHTS, BLOWOFFS, SAMPLING STATIONS AND FIRE HYDRANTS SHALL BE LOCATED WITHIN 3' OF LOT LINES.
4. CATCH BASINS SHALL BE ON OR VERY CLOSE TO LOT LINES AND OUT OF DRIVEWAYS (CB'S MUST HAVE 10' OF VERTICAL CURB - 3' TRANSITIONS AND 4' FOR THE HOOD).



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UTILITIES

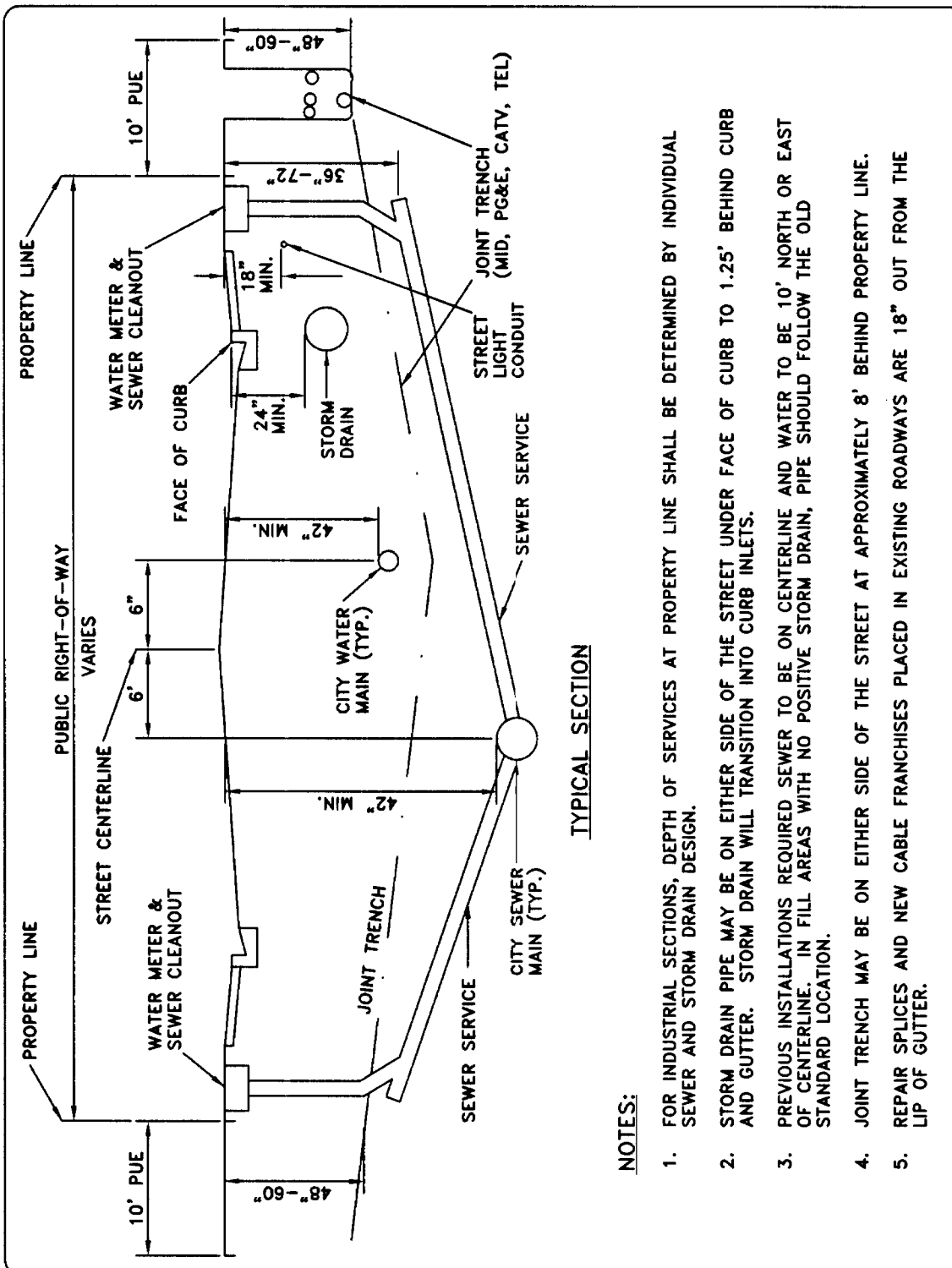
**STANDARD LOCATIONS
FOR RESIDENTIAL**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
804



NOTES:

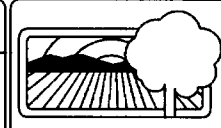
1. FOR INDUSTRIAL SECTIONS, DEPTH OF SERVICES AT PROPERTY LINE SHALL BE DETERMINED BY INDIVIDUAL SEWER AND STORM DRAIN DESIGN.
2. STORM DRAIN PIPE MAY BE ON EITHER SIDE OF THE STREET UNDER FACE OF CURB TO 1.25' BEHIND CURB AND GUTTER. STORM DRAIN WILL TRANSITION INTO CURB INLETS.
3. PREVIOUS INSTALLATIONS REQUIRED SEWER TO BE ON CENTERLINE AND WATER TO BE 10' NORTH OR EAST OF CENTERLINE. IN FILL AREAS WITH NO POSITIVE STORM DRAIN, PIPE SHOULD FOLLOW THE OLD STANDARD LOCATION.
4. JOINT TRENCH MAY BE ON EITHER SIDE OF THE STREET AT APPROXIMATELY 8' BEHIND PROPERTY LINE.
5. REPAIR SPLICES AND NEW CABLE FRANCHISES PLACED IN EXISTING ROADWAYS ARE 18" OUT FROM THE LIP OF GUTTER.

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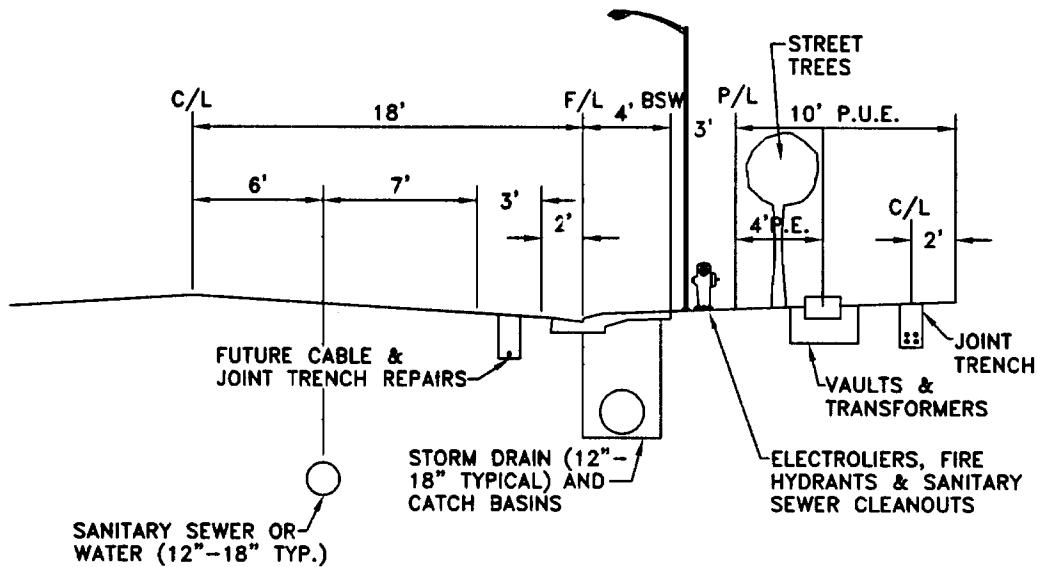
UTILITIES
STREET CROSSING
FOR RESIDENTIAL

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
805



NOTE:

UNNECESSARY MEANDERING AND ANGULAR CHANGES SHALL BE AVOIDED.
PIPE CURVATURE SHALL NOT EXCEED MANUFACTURER'S RECOMMENDATION.

TYPICAL HALF STREET RESIDENTIAL

	STREET R.O.W. 64' OR LESS	STREET R.O.W. GREATER THAN 64'
12" TO 30" PIPE	24" BEHIND CURB & PARALLEL TO THE CENTERLINE OR AT LEAST 3' FROM LIP OF GUTTER IN THE STREET. MAINTAIN A MINIMUM SEPARATION FROM OTHER UTILITIES OF 5' AND 10' FROM POTABLE WATER.	24" BEHIND CURB & PARALLEL TO THE CENTERLINE OR AT LEAST 3' FROM LIP OF GUTTER IN THE STREET. MAINTAIN A MINIMUM SEPARATION FROM OTHER UTILITIES OF 5' AND 10' FROM POTABLE WATER.
33" & GREATER	AT LEAST 3' FROM LIP OF GUTTER IN THE STREET. MAINTAIN A MINIMUM SEPARATION FROM OTHER UTILITIES OF 5' AND 10' FROM POTABLE WATER.	AT LEAST 3' FROM LIP OF GUTTER IN THE STREET. MAINTAIN A MINIMUM SEPARATION FROM OTHER UTILITIES OF 5' AND 10' FROM POTABLE WATER.

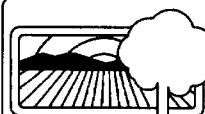
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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

UTILITIES

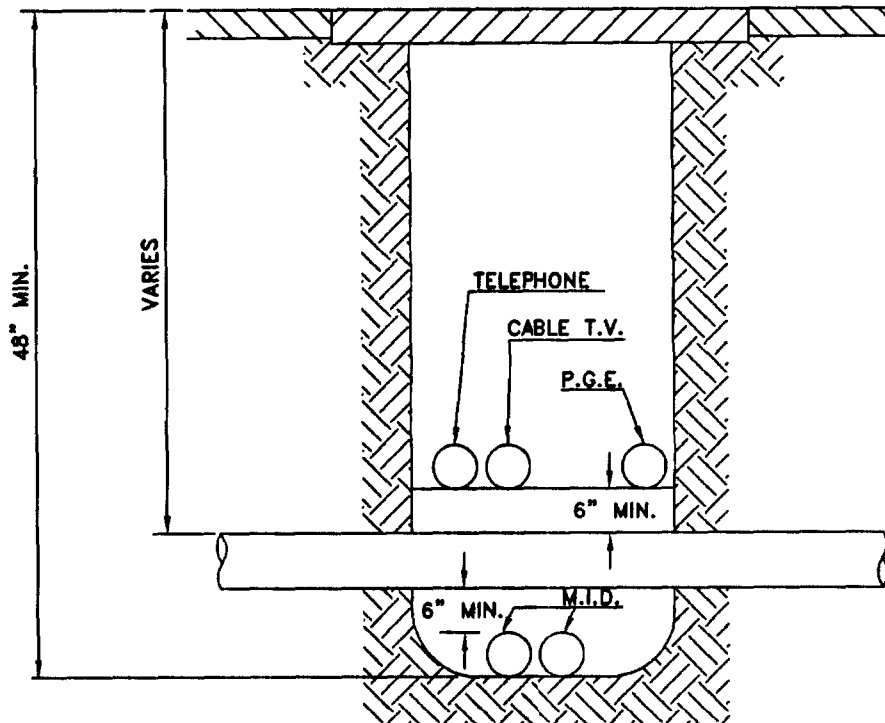
**STORM DRAIN DESIGN
HORIZONTAL ALIGNMENT**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
805A



SECTION

NOTES:

1. A SINGLE UTILITY MAY BE PLACED IN A 4" MINIMUM WIDTH TRENCH. SINGLE UTILITY TRENCH PARALLEL TO THE STREET SHALL BE NEXT TO THE LIP OF GUTTER, UNLESS APPROVED OTHERWISE.
2. FOR BACKFILL AND COMPACTION REQUIREMENTS SEE DETAILS #800-#803.

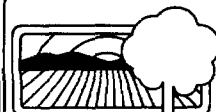
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UTILITIES

TRENCHING IN THE STREET

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
806

PROPOSED GRADE OF MANHOLE FRAME,
VALVE BOX FRAME OR MONUMENT
COVER FRAME.

1-1/2" TO 2" OF
ASPHALT CONCRETE

LINE CUT OR SAW CUT.

RISER RING

6"

ASPHALT CONCRETE

AGGREGATE BASE

PORTLAND CEMENT CONCRETE
COLLAR AROUND FRAME

ADJUSTING EXISTING FRAMES

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UTILITIES

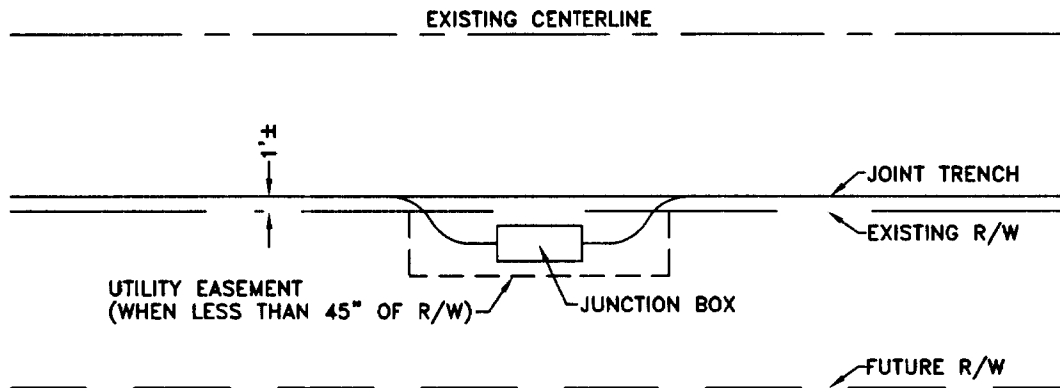
ADJUSTING STREET
FACILITIES TO GRADE

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
807



UTILITY LOCATIONS WHEN NO DEDICATED P.U.E. EXISTS

EXISTING RIGHT OF WAY (R/W)

LESS THAN 40' R/W

40'-45' R/W WITHOUT

45' OR MORE

UTILITY LOCATION

UTILITY MUST OBTAIN ITS OWN EASEMENT.

IN NON-URBANIZED CONDITIONS, UTILITY PLACED 1'± FROM EXISTING R/W. UTILITY MUST OBTAIN CONSTRUCTION EASEMENT AS WELL AS ITS OWN EASEMENT FOR ANY JUNCTION BOXES. IN URBANIZED AREAS, CITY ENGINEER SHALL ENGINEER A LOCATION BASED ON EXISTING AND PROPOSED UTILITIES.

UTILITY LOCATED AS FAR AS POSSIBLE TOWARD EDGE OF THE R/W. EVERYTHING LOCATED WITHIN CURRENT R/W.

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UTILITIES

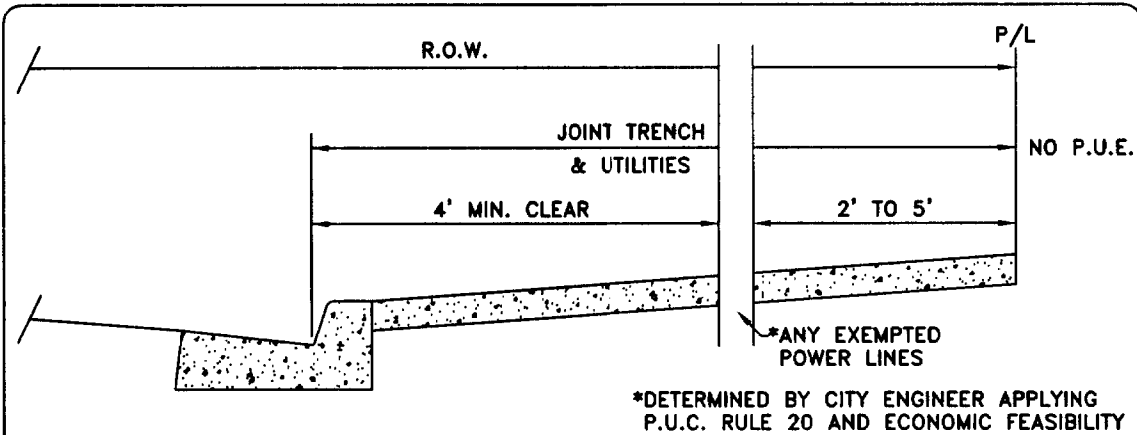
UTILITY LOCATION W/O ULTIMATE R/W

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DEPARTMENT

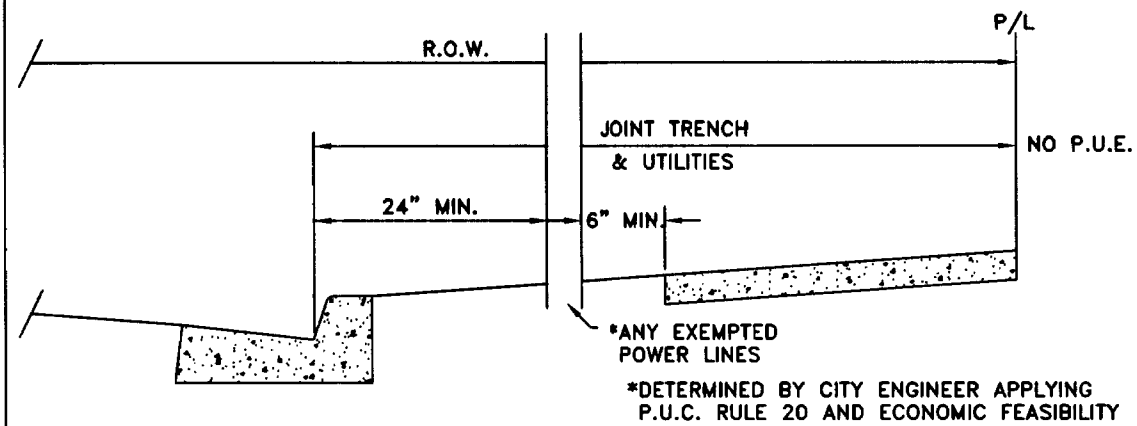


CITY of MODESTO

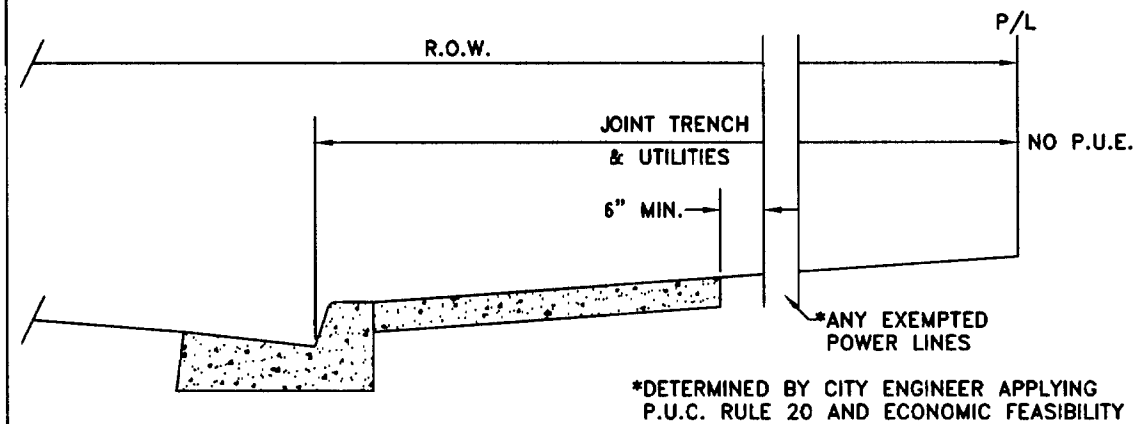
DETAIL NO.
808



CASE A



CASE B



CASE C

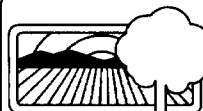
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UTILITIES

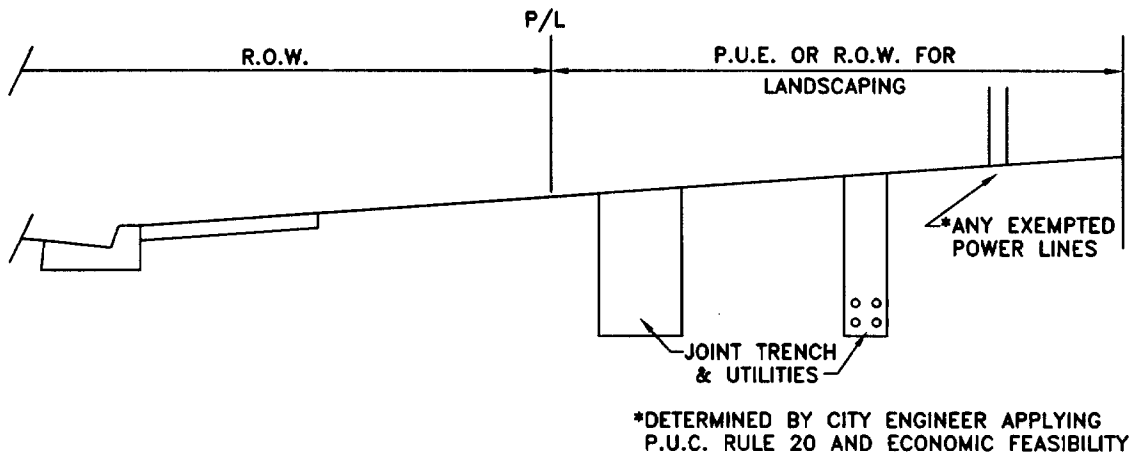
JOINT TRENCH LOCATIONS CASE A, B + C

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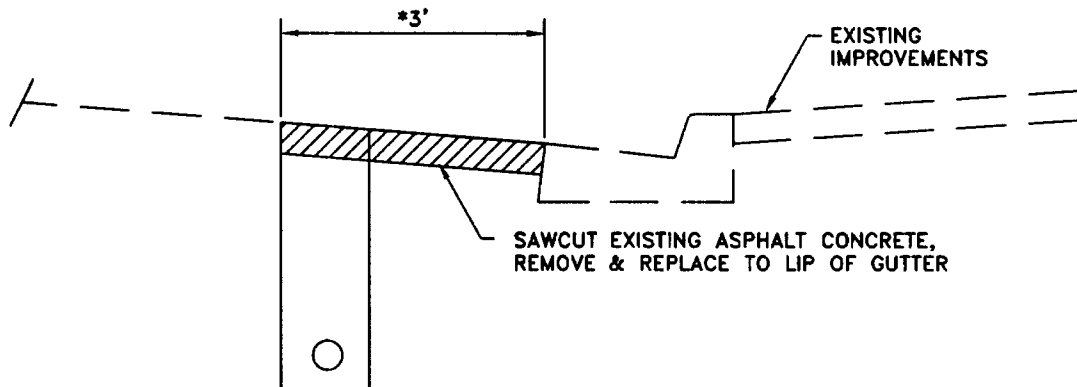


CITY of MODESTO

DETAIL NO.
809



CASE D



CASE E

NOTES:

1. A MINIMUM OF 3' SEPARATION REQUIRED BETWEEN ANY EXISTING SEWER, WATER OR STORM DRAIN AND A NEW UTILITY SERVICE (OUTSIDE WALL OR CONDUIT TO OUTSIDE WALL OF CONDUIT.)
2. NO POLE RELOCATION MAY BE PLACED INTO AN EXISTING SIDEWALK UNLESS THERE IS NO P.U.E. AND THE SIDEWALK COVERS THE R.O.W. BEHIND THE CURB. IN THIS CASE, THE POLE SHALL BE PLACED BETWEEN 2' AND 5' FROM THE EDGE OF THE EXISTING R.O.W..
3. WHEN INSTALLING ANY UTILITY TRENCH PARALLEL TO THE EXISTING LIP OF GUTTER IN THE EXISTING PAVEMENT, ALL PAVEMENT SLIVERS LESS THAN 3' FROM THE TRENCH TO LIP OF GUTTER SHALL BE REMOVED AND PATCHED WITH THE TRENCH PATCHING.

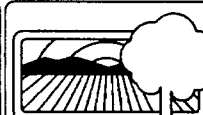
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UTILITIES

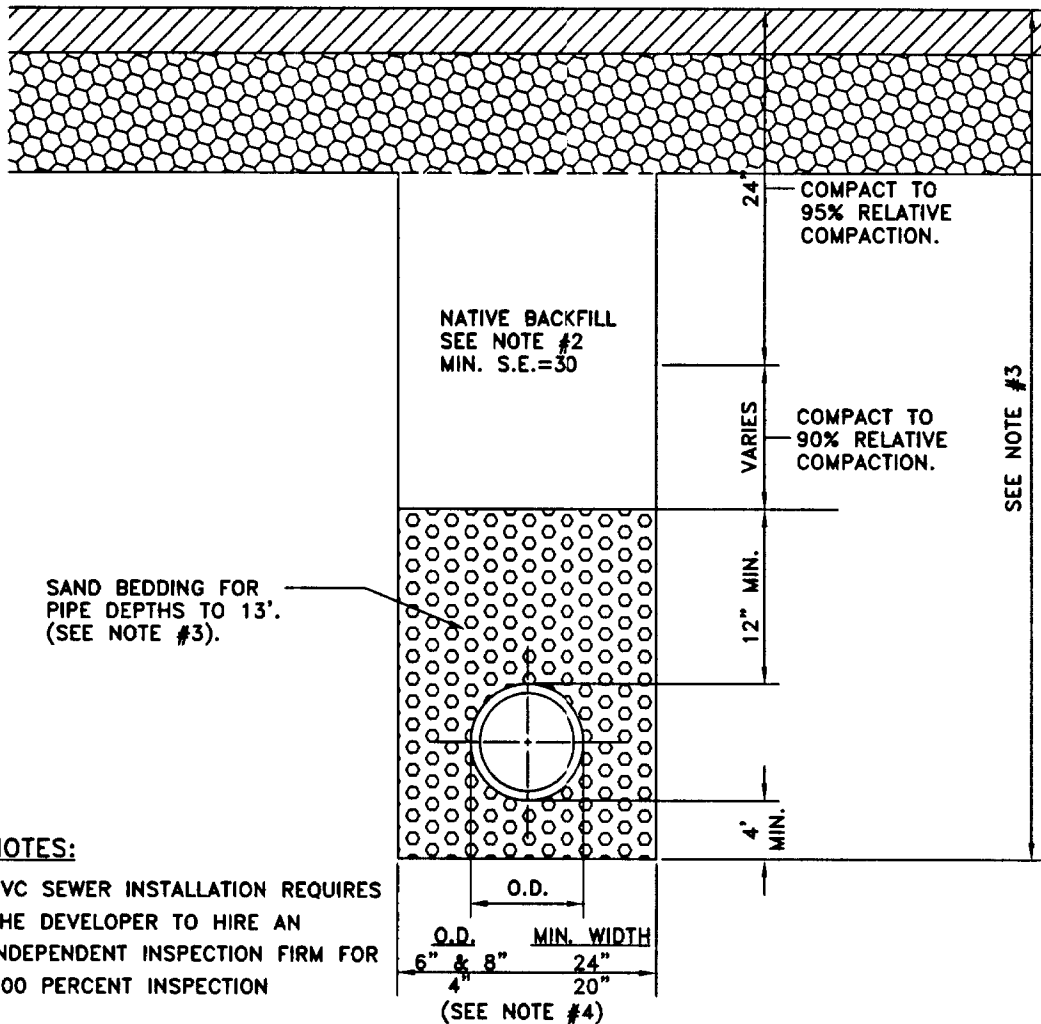
JOINT TRENCH LOCATIONSCASES D&E

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
810



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RESOLUTION NO. 2001-560

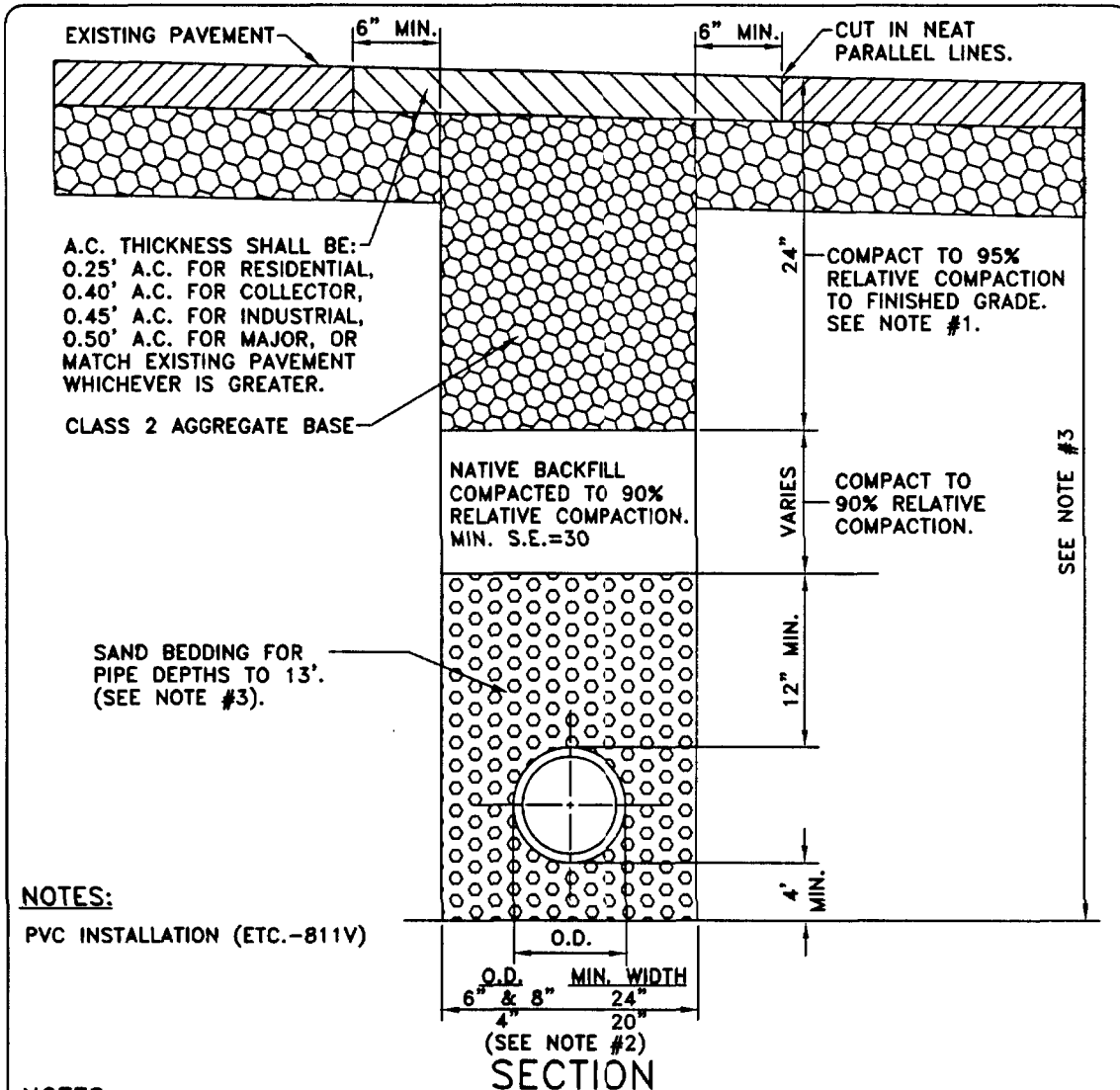
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AND TRANSPORTATION

SEWERS
P.V.C. SEWER
TRENCH BACKFILL
UNDEVELOPED STREETS
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
811V



NOTES:

1. TRENCH SECTION SHALL BE BACKFILLED AND MECHANICALLY COMPACTED TO GRADE. (NO JETTING).
2. TRENCH WIDTH SHALL BE A MINIMUM WIDTH OF NOT LESS THAN THE GREATER OF EITHER THE PIPE OUTSIDE DIAMETER PLUS 16 IN. (400mm) OR THE PIPE OUTSIDE DIAMETER TIMES 1.25 PLUS 12 IN. (300mm).
3. MAXIMUM COVER WITH SAND BEDDING IS 13 FEET. MAXIMUM COVER WITH CLASS 1B BEDDING IS 16 FEET.
4. ON INDUSTRIAL STREETS OR WHERE THE T.I. IS 10 OR ABOVE. THE DEPTH OF RELATIVE COMPACTION SHALL BE DETERMINED BY THE CITY ENGINEER.
5. IN EXISTING PAVEMENT, CONTRACTOR SHALL FURNISH 2" TEMPORARY PAVEMENT.
6. EXCAVATIONS THAT LEAVE 3 FEET OR LESS OF EXISTING SURFACE SHALL HAVE THE REMAINING SURFACING REMOVED AND REPAVED WITH THE SAME MATERIAL AS THE TRENCH SECTION.

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SEWERS

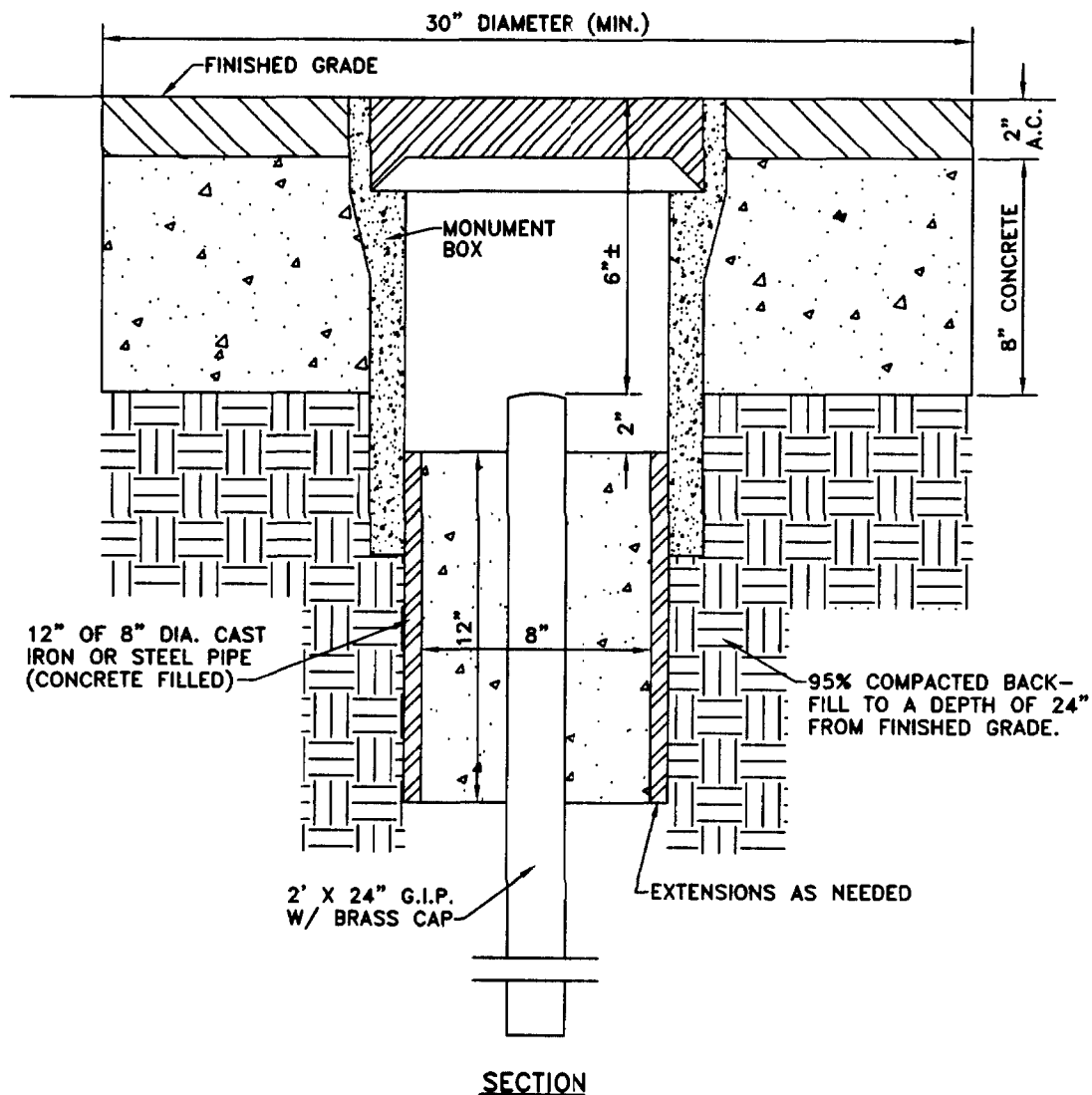
**P.V.C. SEWER
 TRENCH BACKFILL
 EXISTING STREETS**

**ENGINEERING & TRANSPORTATION
 DEPARTMENT**



CITY of MODESTO

**DETAIL NO.
 812V**



NOTES:

1. MONUMENT BOXES SHALL BE CHRISTY G5 WITH CHRISTY IRON COVER OR APPROVED EQUAL.
2. SET MONUMENT BOX TO FINISH GRADE.
3. COMPACT EARTH AROUND BASE WITH MECHANICAL TAMPER TO 95% RELATIVE COMPACTION AND ENCASE IN 8" OF CONCRETE.
4. AFTER CONCRETE SETS, PATCH WITH 2" A.C.
5. IN TRAFFIC AREAS, CONCRETE SHALL BE MADE WITH TYPE III HIGH EARLY STRENGTH CEMENT. BARRICADES SHALL BE REMOVED IN 24 HOURS.

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SURVEY

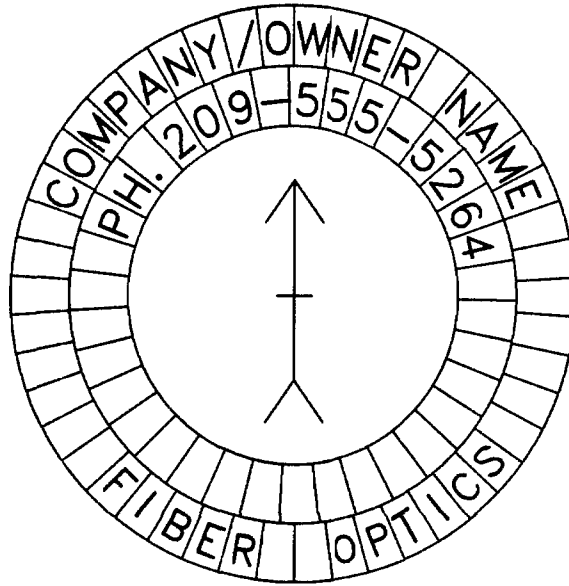
**SURVEY
MONUMENT**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



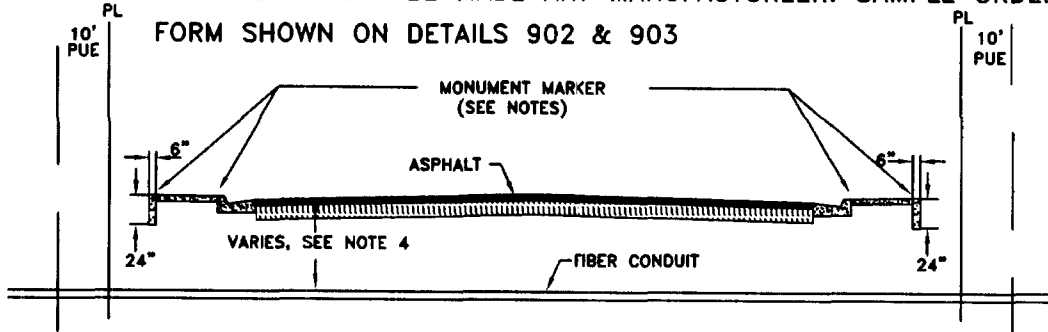
CITY of MODESTO

DETAIL NO.
900



NOTES:

1. LOCATION OF CONDUIT SHALL BE MONUMENTED BY PLACING 2 MONUMENT CAPS WITH DIRECTIONAL ARROWS POINTING OUT THE CONDUIT ALIGNMENT AS WELL AS THE OWNER'S NAME AND PHONE NUMBER.
2. THE MONUMENT CAPS SHALL BE A MINIMUM OF 3" IN DIAMETER.
3. MONUMENT ANCHOR SHALL BE A MINIMUM OF 2 1/2" INTO THE CONCRETE. PLACEMENT MAY BE ON THE CURB OR IN A SEPARATE 6"x6"x24" DEEP MONUMENT CONCRETE POUR BEHIND THE SIDEWALK. NO MONUMENTATION SHALL BE PLACED WITHIN THE SIDEWALK.
4. A MINIMUM OF 42" OF COVER REQUIRED OVER CONDUIT.
5. CONDUIT SHALL CROSS STREET AS CLOSE TO PERPENDICULAR ANGLE AS POSSIBLE.
6. MONUMENT CAPS CAN BE MADE ANY MANUFACTURER. SAMPLE ORDER



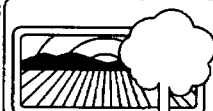
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SURVEY

**MONUMENT FOR
PRIVATE UTILITY LINE
CROSSING ROW**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

DETAIL NO.
901

NOTE: Drawings may not be to scale

Berntsen

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Madison, WI 53708-8670
PHONE TOLL FREE 1-800-356-7388

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(Make your check payable to Berntsen International, Inc.)
Sorry, no C.O.D. on PERMAMARK products.

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My Credit Card
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Date

Is this your first order from us?

☐ Yes ☐ No

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Telephone

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(Signature of Duty Authorized Official)

Fax or Mail Order Form

TOLL FREE FAX 1-800-249-9794

Sales Tax Exemption

The undersigned is exempt from tax

Name

State Exempt Tax No.

Is certificate on file? ☐ Yes ☐ No

If not, please send with order

SHIP TO (Shipments must have street or highway address)

Type or Print

Same as Charged

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Attention

(Title)

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• Prices DO NOT include freight charges.

• Price List is based on stamped lettering only. Please call for quotation on custom cast lettering and designs.

• NO stamping charges on 11+ caps (\$30.00 stamping set up charge for 1-10 caps).

• Prices are in U.S. Dollars

Office hours are 8am to 4:30pm Central Time (M-F). Answering machine operates at all other times. 24 hour FAX line: 1-800-249-9794.

CUSTOM CAST MONUMENTS: Call for quotations on all custom cast monuments and markers. Camera ready art may be required.

CUSTOM MONUMENTS: Berntsen welcomes the opportunity to offer a quotation on custom survey monuments to meet your specifications.

TERMS: Terms and prices subject to change without notice. Because product innovation is a continuing endeavor at Berntsen, specifications and prices are subject to change without notice.

Price list P-43 supersedes all previous price lists

The unique design and layout of this brochure and the products depicted herein, and the arbitrary, distinctive numbering system for Berntsen products all originated with Berntsen International, Inc. and are the result of years of research by Berntsen to determine not only exactly what our customers wanted, but to best present our customers with the wide range of products available from Berntsen. No copying or reproduction of the format of this brochure or any of the designs, layouts, drawings, or combinations of designs or parts manufactured by Berntsen is permissible without the express written consent of Berntsen. Many Berntsen products are protected by U.S. Patents including 243,159; 243,319; 4,087,945; 4,502,258; 3,748,795; 4,625,473. Other patents pending.

Quantity	Item Number	Item Description	Unit Price	Total Price

Use standard layouts on reverse side for personalized markers.

Price list P-43 contains most of the more popular items offered by Berntsen International, Inc. All items are priced F.O.B. SHIPPING POINT (Madison, WI for Berntsen items or Carson City, NV for most Carsonite items).

January
1996

*Add 10% for shipping and handling on Berntsen & Permamark products for delivery in the 48 states (not including Alaska and Hawaii) or call for shipping charges to your destination anywhere in the world

Sub Total	
10% Shipping & Handling	
Sub Total	
Tax (WI, AR)	
Total US\$	

☐ Check here and we'll send our FREE catalog.

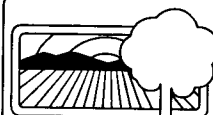
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SURVEY

MONUMENT FOR
PRIVATE UTILITY LINE
CROSSING ROW

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
903

TABLE 13.1 DRIVEWAY DESIGN STANDARDS

REQUIREMENTS	STREET CLASS	RESIDENTIAL DRIVEWAY	APARTMENT-COMMERCIAL DRIVEWAY	INDUSTRIAL DRIVEWAY
DRIVEWAY THROAT WIDTH ¹	LOCAL MINOR COLLECTOR MAJOR COLLECTOR MAJOR & LARGER	10'-28' 10'-28' 12'-28' 12'-28'	24'-36' 24'-36' 24'-36' 30'-36'	24'-45' 30'-45' 35'-45' 40'-45'
DRIVEWAY CURB RADIUS (DROP APPROACH TYPE ONLY)	LOCAL MINOR COLLECTOR MAJOR COLLECTOR MAJOR & LARGER	N/A ² N/A ² 10'-15' 15'	N/A ² 15'-20' 15'-20' 20'-30'	10'-20' 15'-20' 20'-25' 20'-30'
MINIMUM CENTERLINE DRIVEWAY ³ SPACING ALONG ROADWAY	LOCAL MINOR COLLECTOR MAJOR COLLECTOR MAJOR & LARGER	15' 15' 100' 100'	100' 150' 200' 250' ⁴	100' 150' 200' 250' ⁴
DRIVEWAY ANGLE ⁵	ALL	70° - 90°	90°	90°
MINIMUM DISTANCE ⁶ FROM DRIVEWAY TO INTERSECTION ALONG:	LOCAL MINOR COLLECTOR MAJOR COLLECTOR MAJOR & LARGER	30' 50' 100' ⁷ 150' ⁸	75' 150' 250' ⁷ 350' ⁸	75' 150' 250' ⁷ 350' ⁸
MAX. APPROACH GRADE ⁹ (DROP APPROACH ONLY)	LOCAL & MINOR COL. ALL OTHERS	+9% +6%	+6% +3%	+6% +3%
MINIMUM DISTANCE TO PROPERTY LINE ¹⁰	ALL	2' ¹⁰	2'	2'
MINIMUM APPROACH LENGTH ¹¹ (DROP APPROACH ONLY)	LOCAL & MINOR COL. ALL OTHERS	6' 9'	9' 17'	9' 17'

SEE NOTES ON STANDARD DETAIL #1001

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DRIVEWAYS

DRIVEWAY DESIGN STANDARDS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
1000

NOTES:

1. THE REQUIREMENTS FOR DRIVEWAY THROAT IS STANDARD FOR UNDIVIDED TWO-WAY OPERATION AND MAY BE VARIED BY THE CITY ENGINEER IF, IN THAT PERSON'S DISCRETION, TRAFFIC VOLUMES, TRUCK USAGE, SHARED DRIVEWAYS AND OTHER FACTORS WARRANT THE VARIANCE. NOT MORE THAN 50% OF THE FRONTAGE OF ANY PARCEL SHALL BE DEVOTED TO DRIVEWAYS. LOTS FRONTING ON A CUL-DE-SAC ARE EXEMPT FROM THIS REQUIREMENT.
2. DRIVEWAYS MAY ONLY BE FLARED OR DRIVE OVER CURB IN THESE AREAS.
3. THE MINIMUM DISTANCE BETWEEN DRIVEWAYS SERVING THE SAME PARCEL SHALL NOT BE LESS THAN 20 FEET AS MEASURED BETWEEN THE ENDS OF THE DRIVEWAY FLARE OR CURB RETURN.
4. DRIVEWAYS ON MAJOR COLLECTORS AND LARGER, SERVED BY DECELERATION LANES MAY BE SPACED AT TWO HUNDRED FOOT (200') MINIMUM INTERVALS.
5. MEASURED AS INTERSECTION OF THE TANGENT CENTERLINE OF DRIVEWAY WITH THE TANGENT PORTION OF THE PUBLIC STREET CURB LINE, EXTENDING A MINIMUM OF TWENTY FEET (20') FROM THE FUTURE CURB LINE.
6. DISTANCE MEASURED FROM THE INTERSECTION AS MEASURED FROM THE INTERSECTION R.O.W. LINE TO THE DRIVEWAY CENTERLINE. (SEE STANDARD DETAILS #1002, #1004 & #1005)
7. IF THE DRIVEWAY HAS TO BE LOCATED LESS THAN 150' FROM AN INTERSECTION WITH A MAJOR STREET FACILITY R.O.W. LINE, THE APPROACH SHALL BE PLACED AT OR NEAR THE FARTHEST PROPERTY LINE FROM THE INTERSECTION AND A ONE HUNDRED AND FIFTY FOOT (150') LONG RAISED MEDIAN FROM THE STOP BAR AT THE INTERSECTION SHALL BE INSTALLED BY THE DEVELOPER AT THE DEVELOPER'S EXPENSE.
8. IF THE DRIVEWAY HAS TO BE LOCATED LESS THAN 300' FROM AN INTERSECTION WITH A MAJOR STREET FACILITY R.O.W. LINE, THE APPROACH SHALL BE PLACED AT OR NEAR THE FARTHEST PROPERTY LINE FROM THE INTERSECTION AND A THREE HUNDRED FOOT (300') LONG RAISED MEDIAN FROM THE STOP BAR AT THE INTERSECTION SHALL BE INSTALLED BY THE DEVELOPER AT THE DEVELOPER'S EXPENSE.
9. THE PERCENT OF SLOPE MEASURED ALONG THE CENTERLINE OF THE DRIVEWAY FROM THE FLOW LINE OF THE FUTURE CURB LINE.
10. THE MINIMUM DISTANCE OVER WHICH THE MAXIMUM APPROACH GRADE MUST BE MAINTAINED MEASURED FROM THE FLOW LINE OF THE PRESENT CURB OR A KNOWN FUTURE CURB, AS DETERMINED BY THE CITY ENGINEER, OR HIS DESIGNEE.
11. DRIVEWAY LOCATIONS FOR A SINGLE FAMILY PROPERTY SHALL NOT BE PERMITTED WITHIN TWO FEET OF A PROPERTY LINE UNLESS A PROPERTY FRONTS ON A CUL-DE-SAC BULB IN WHICH CASE A DRIVEWAY MAY BE CONSTRUCTED UP TO THE PROPERTY LINE. SHARED DRIVEWAYS OR UNUSUAL SITUATIONS MAY BE APPROVED BY THE CITY ENGINEER.

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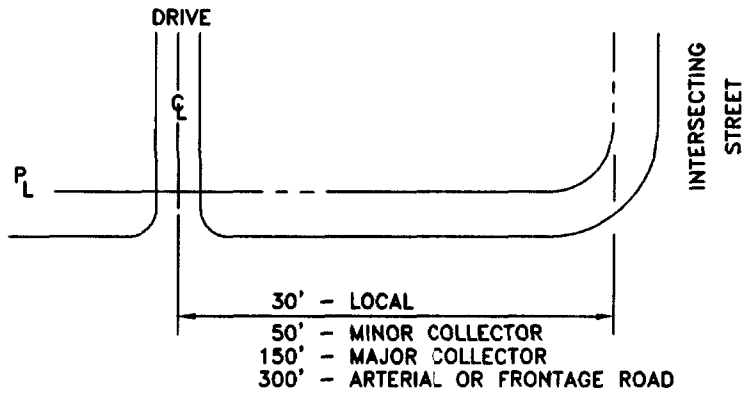
DRIVEWAYS
DRIVEWAY DESIGN
STANDARDS

ENGINEERING & TRANSPORTATION
DEPARTMENT

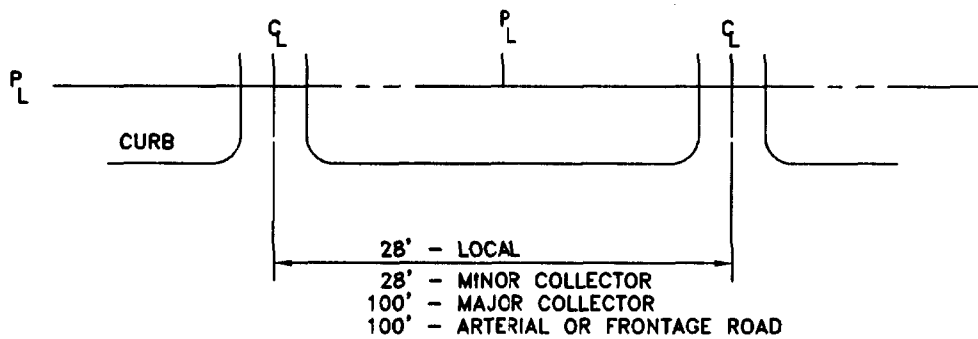


CITY of MODESTO

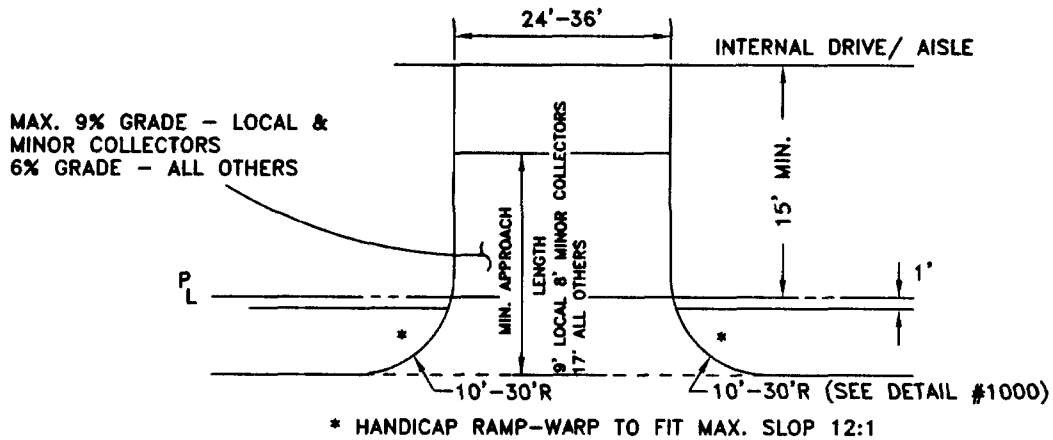
DETAIL NO.
1001



MINIMUM DISTANCE FROM INTERSECTION



MINIMUM SPACING



TYPICAL DESIGN

NOTE:

TYPICAL RESIDENTIAL DRIVEWAY SHALL BE DRIVEOVER CURB. RESIDENTIAL PROPERTIES FACING ON COLLECTORS SHALL BE DRIVEOVER CURB OR FLARED DRIVEWAYS. RESIDENTS ON MAJOR STREET FACILITIES SHALL BE DROP APPROACH OR FLARED DRIVEWAYS.

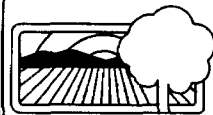
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DRIVEWAYS

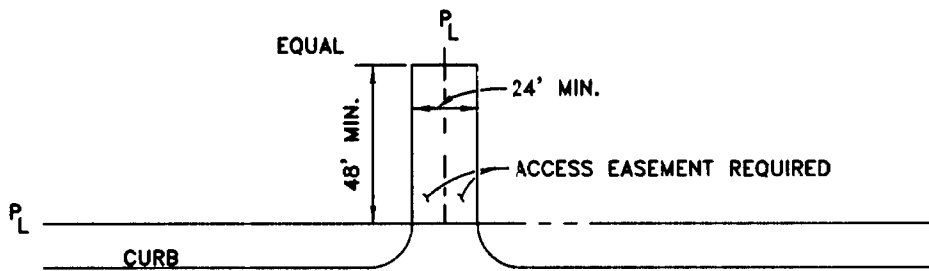
RESIDENTIAL DRIVEWAYS

ENGINEERING & TRANSPORTATION
DEPARTMENT

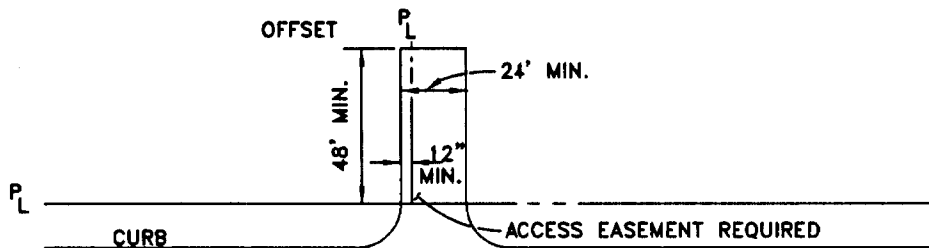


CITY of MODESTO

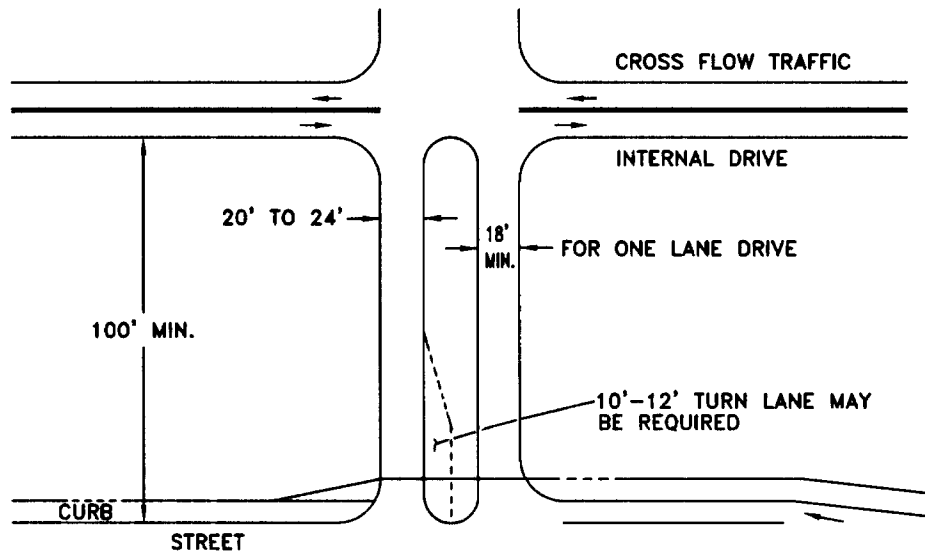
DETAIL NO.
1002



DROP APPROACH OR FLARED DRIVEWAY



SHARED DRIVEWAYS



DROP APPROACH ONLY FOR LARGE VOLUME DRIVEWAYS
(OVER 5,000 VEHICLES/DAY)

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DRIVEWAYS

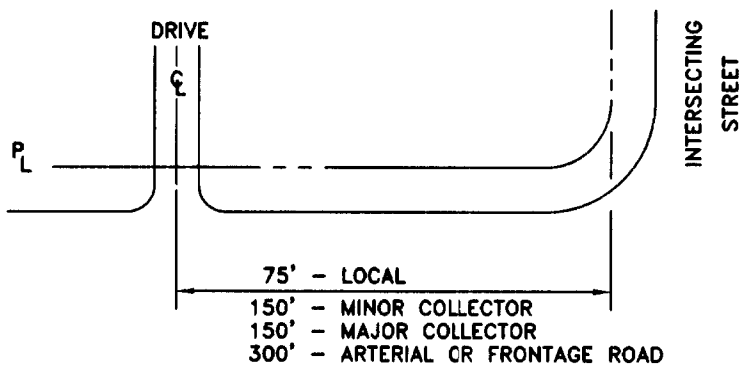
NON-RESIDENTIAL DRIVEWAYS

ENGINEERING & TRANSPORTATION
DEPARTMENT

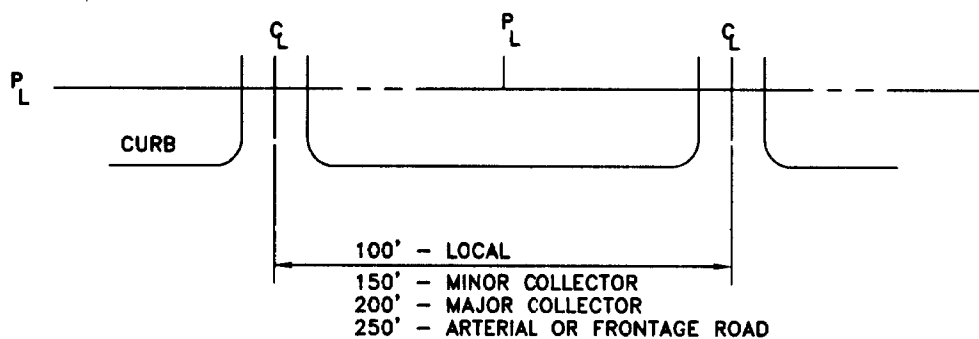


CITY of MODESTO

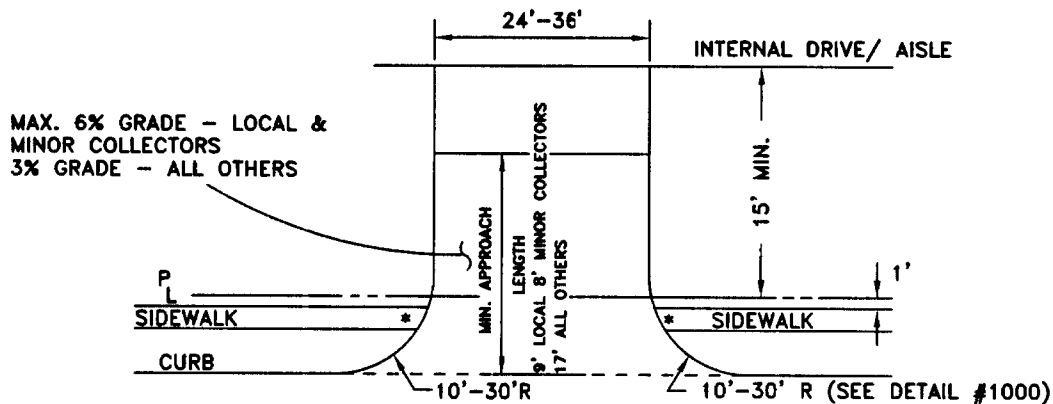
DETAIL NO.
1003



MINIMUM DISTANCE FROM INTERSECTION



MINIMUM SPACING



* HANDICAP RAMP-WARP TO FIT MAX. SLOP 12:1

TYPICAL DESIGN

NOTE:

TYPICAL DESIGN MAY BE DROP APPROACH OF FLARED DRIVEWAY DEPENDING ON DRIVEWAY COUNTS AND LEVEL OF SERVICE ON THE ROAD WHERE THE DRIVEWAY CONNECTS.

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RESOLUTION NO. 2001-560

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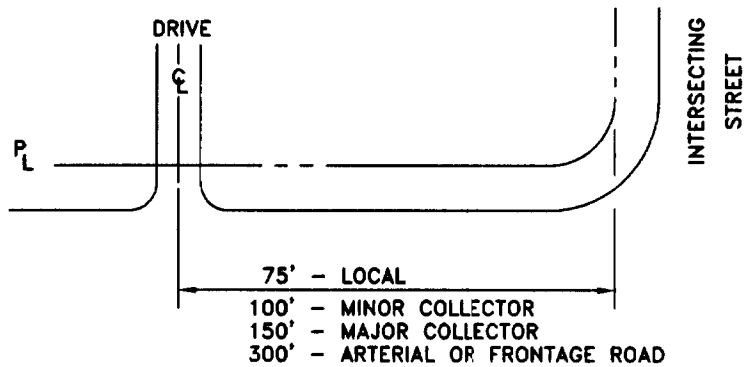
DRIVEWAYS
**APARTMENT/
COMMERCIAL
DRIVEWAYS**

ENGINEERING & TRANSPORTATION
DEPARTMENT

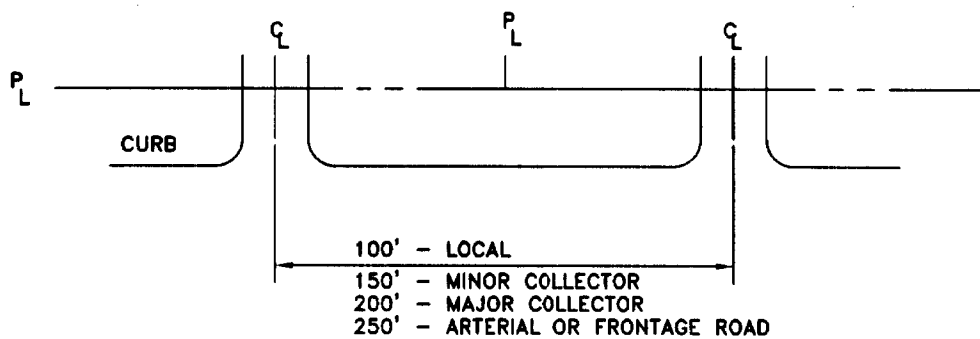


CITY of MODESTO

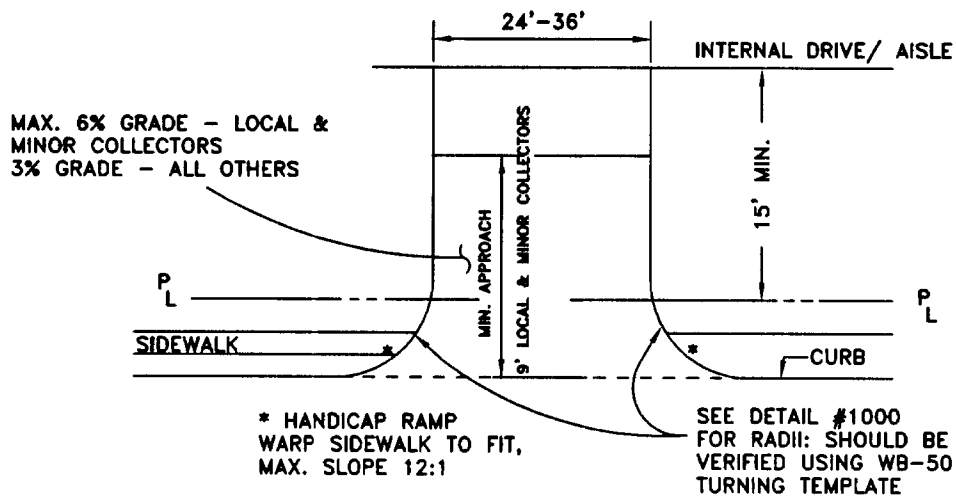
DETAIL NO.
1004



MINIMUM DISTANCE FROM INTERSECTION



MINIMUM SPACING



DROP APPROACH TYPICAL DESIGN

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DRIVEWAYS

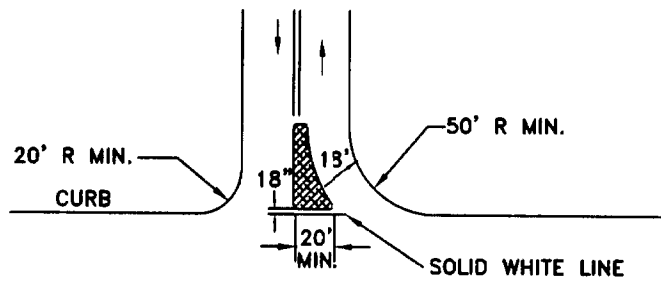
INDUSTRIAL DRIVEWAYS

ENGINEERING & TRANSPORTATION
DEPARTMENT

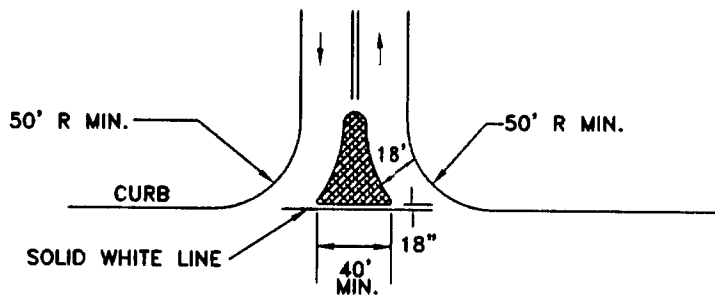


CITY of MODESTO

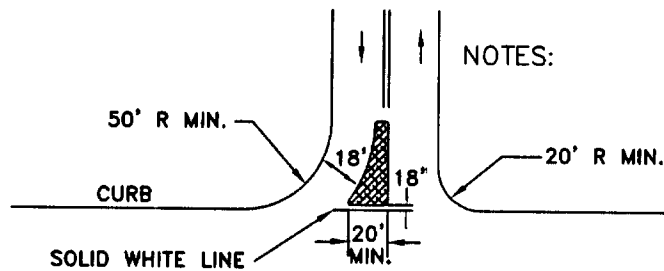
DETAIL NO.
1005



RIGHT-IN, RIGHT-OUT, LEFT-OUT
ACCESS DESIGN



RIGHT-IN, RIGHT-OUT
ACCESS DESIGN



RIGHT-IN, RIGHT-OUT, LEFT-IN
ACCESS DESIGN

NOTES:

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DRIVEWAYS

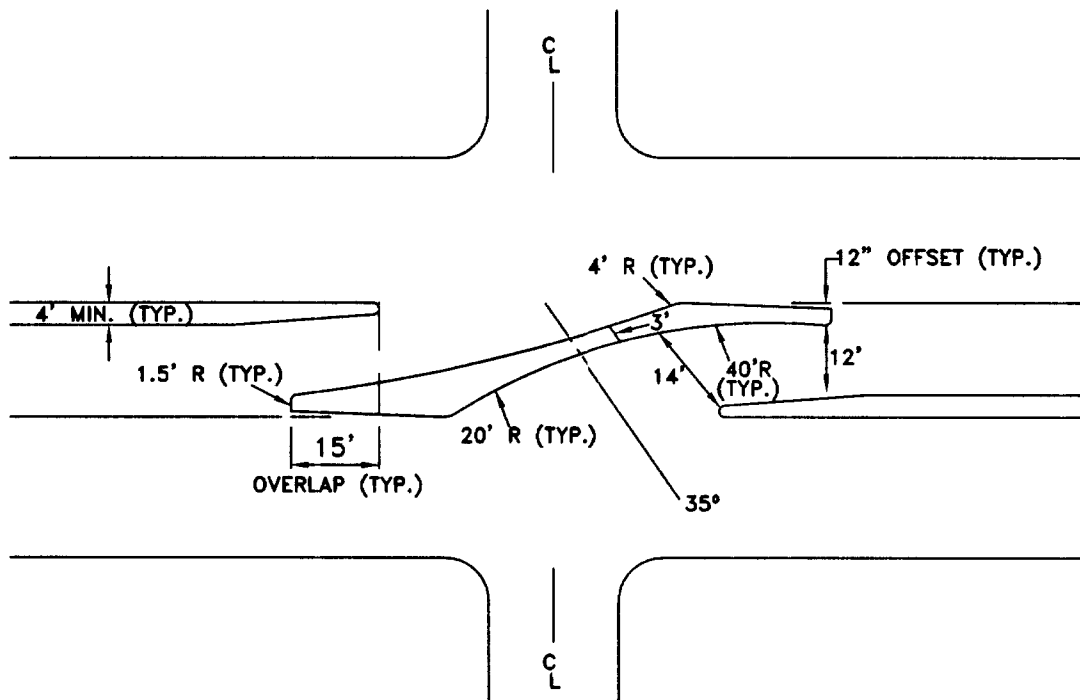
ACCESS DESIGN

ENGINEERING & TRANSPORTATION
DEPARTMENT

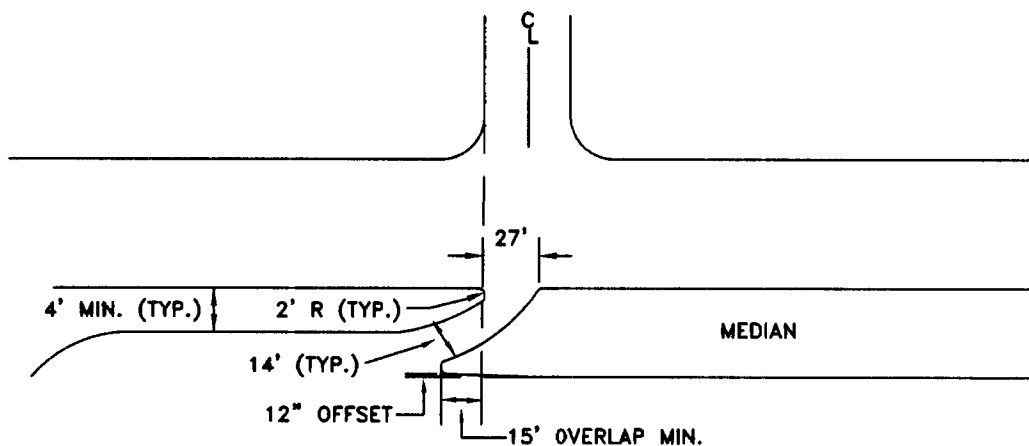


CITY of MODESTO

DETAIL NO.
1006



LEFT-IN ONLY MEDIAN DESIGN



MEDIAN DESIGN TO RESTRICT EXITING LEFT TURNS

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DRIVEWAYS

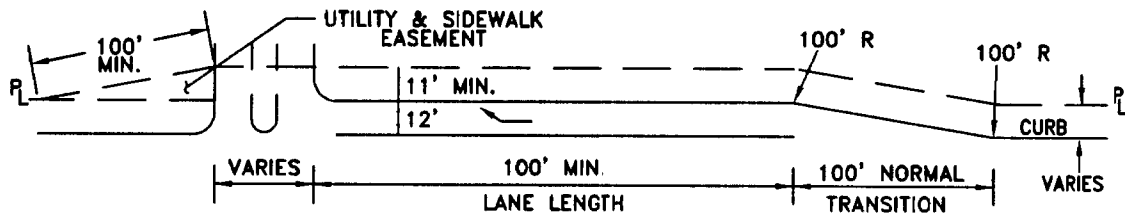
MEDIAN DESIGN

ENGINEERING & TRANSPORTATION
DEPARTMENT

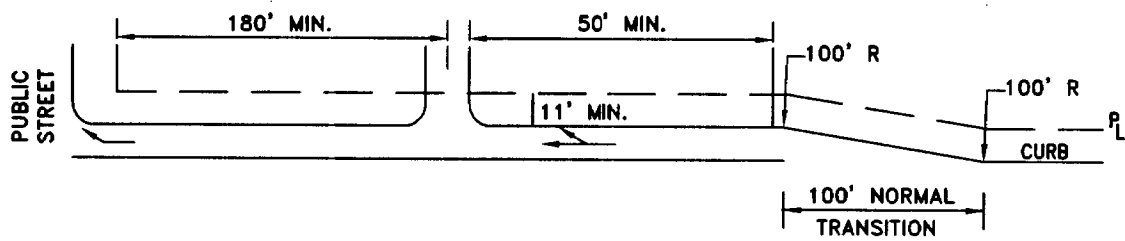


CITY of MODESTO

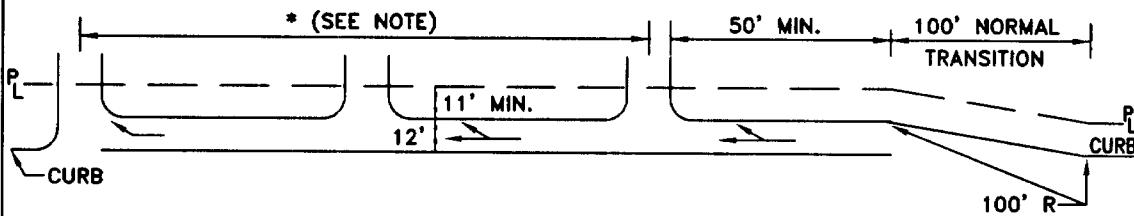
DETAIL NO.
1007



TYPICAL



IN INTERSECTION RIGHT TURN LANE



CONTINUOUS DECELERATION LANE

NOTE:

A MAXIMUM OF THREE DRIVEWAYS CAN BE CONNECTED WITH A CONTINUOUS DECELERATION LANE, UNLESS THE LANE IS AN EXTENSION OF A RIGHT TURN LANE AT AN INTERSECTION. THE MAXIMUM LENGTH OF A COMBINATION DECELERATION-RIGHT TURN LANE IS 1,320 FEET. DRIVEWAY SPACING SHALL BE AS SHOWN IN DETAIL #1000.

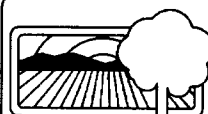
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DRIVEWAYS

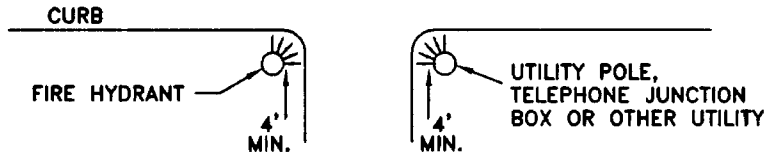
**DECELERATION LANES
FOR DRIVEWAYS**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**

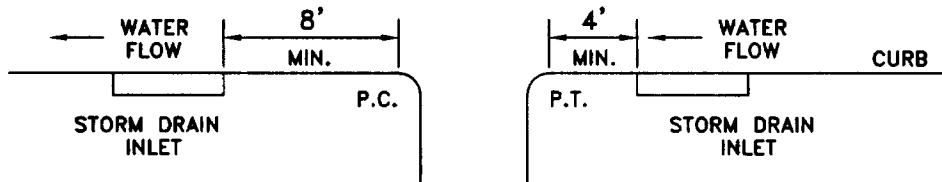


CITY of MODESTO

**DETAIL NO.
1008**



ABOVE GROUND UTILITIES



STRAIGHT CURB INLET

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DRIVEWAYS

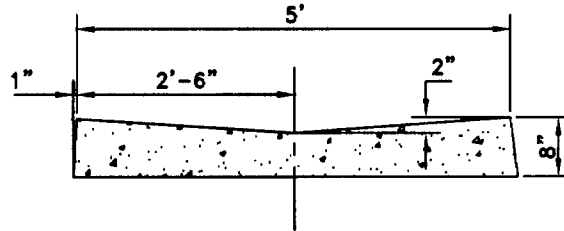
DRIVEWAY DETAILS, UTILITIES

ENGINEERING & TRANSPORTATION
DEPARTMENT

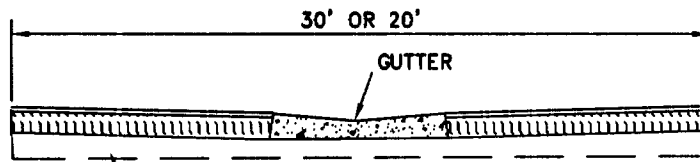


CITY of MODESTO

DETAIL NO.
1009

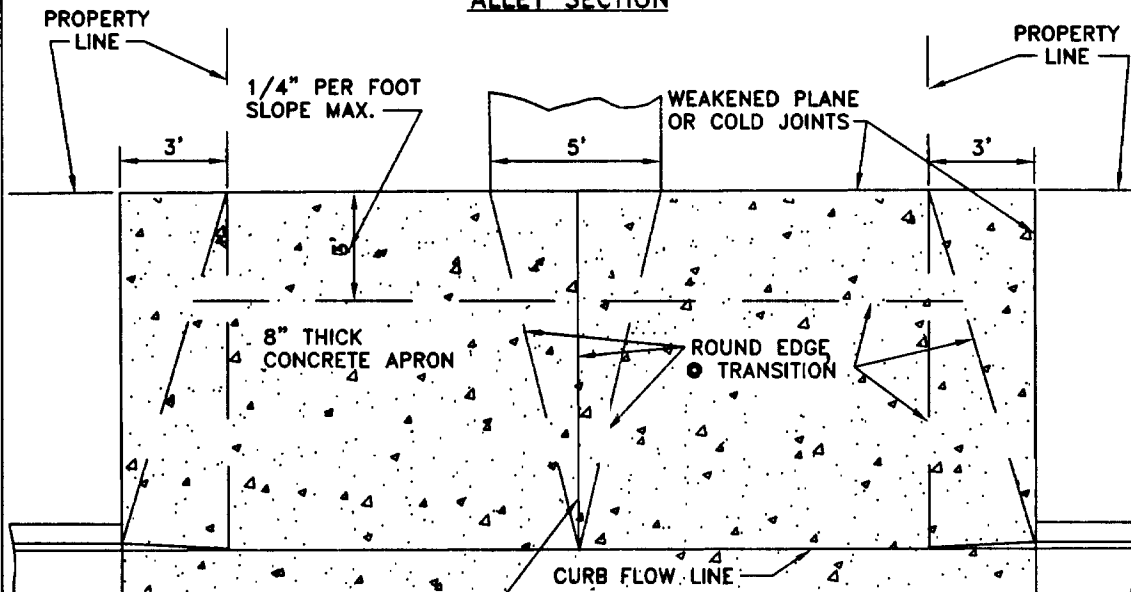


**CONCRETE GUTTER
DETAIL**



6" SUB-BASE; SCARIFY &
COMPACT TO 95% R.C.

ALLEY SECTION



SEE NOTE

PLAN

NOTE:

INTERMEDIATE WEAKENED PLANE JOINT.

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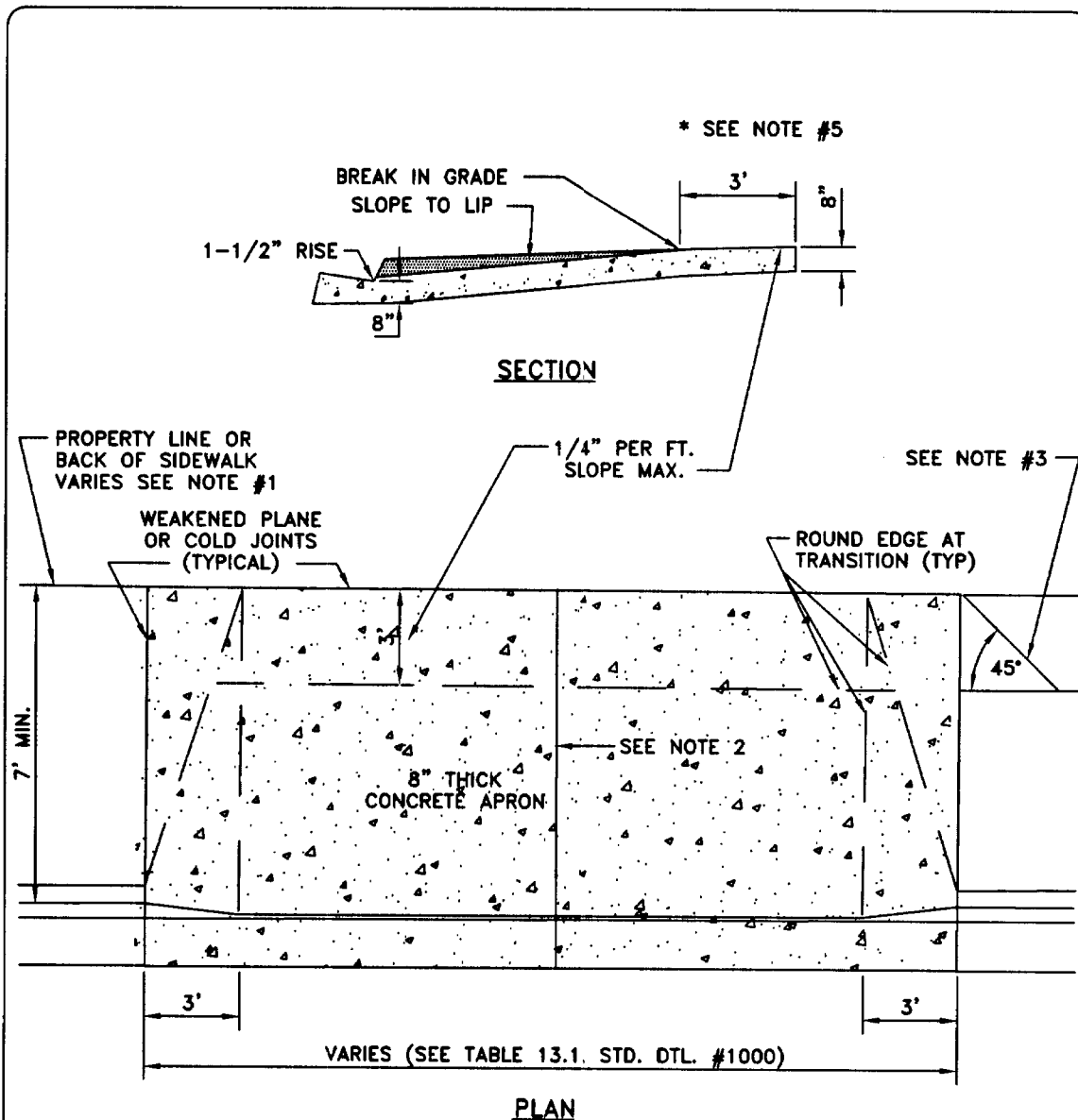
**DRIVEWAYS
CONSTRUCTION DETAILS
FOR ALLEY
FLARED DIVEWAYS**

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
1010



NOTES:

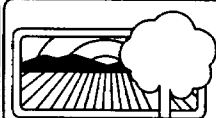
1. REFER TO TYPICAL STREET SECTIONS OR CALL THE ENGINEERING & TRANSPORTATION DEPARTMENT AT 577-5264 FOR PROPERTY LINE LOCATION.
2. INTERMEDIATE WEAKENED PLANE JOINT IN ACCORDANCE WITH CONSTRUCTION STANDARDS (SECTION 8.01 E).
3. PROVIDE TRANSITION FOR SIDEWALKS THAT ARE LESS THAN FULL WIDTH.
4. IN RETROFIT AREAS, ASPHALT SHALL BE CUT A MINIMUM OF 6" FROM LIP OF CURB.
5. OPTIONAL IN P-O AND M ZONES.

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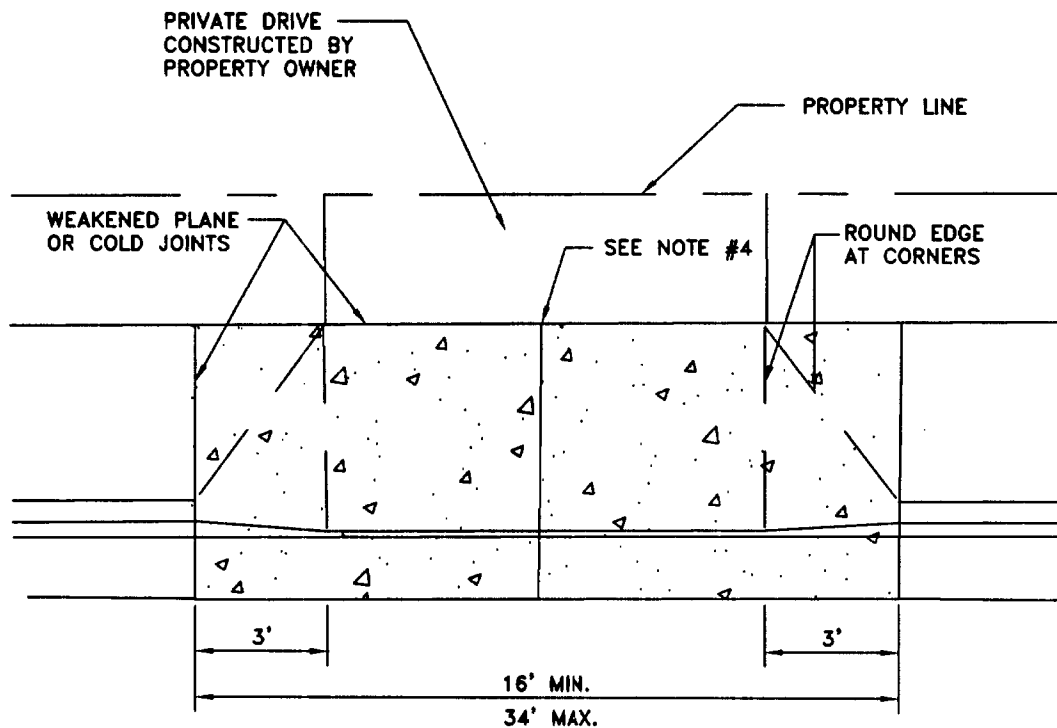
DRIVEWAYS CONSTRUCTION DETAILS FOR COMMERCIAL FLARED DRIVEWAYS

ENGINEERING & TRANSPORTATION
DEPARTMENT

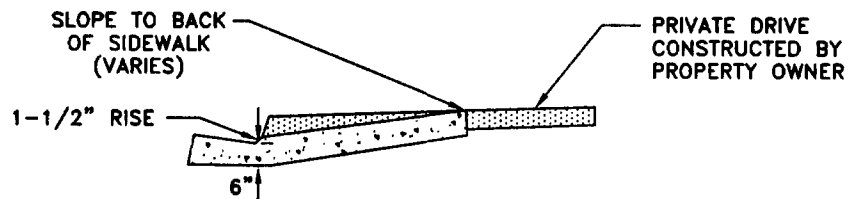


CITY of MODESTO

DETAIL NO.
1011



PLAN



SECTION

NOTES:

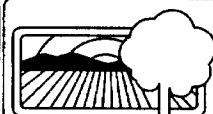
1. UNSUITABLE SOIL SHALL BE REMOVED AND REPLACED WITH SAND.
2. NON-MONOLITHIC DRIVEWAY APPROACHES MAY BE CONSTRUCTED WHERE DEPRESSED CURB EXISTS OR WHERE CURB IS PLACED WITH A SLIP FORM MACHINE.
3. IN RETROFIT AREAS, THE WIDTH OF THE STREET PATCH SHALL BE A MINIMUM OF 6".
4. INTERMEDIATE WEAKENED PLANE JOINTS IN ACCORDANCE WITH THE CONSTRUCTION STANDARDS (8.01 E).

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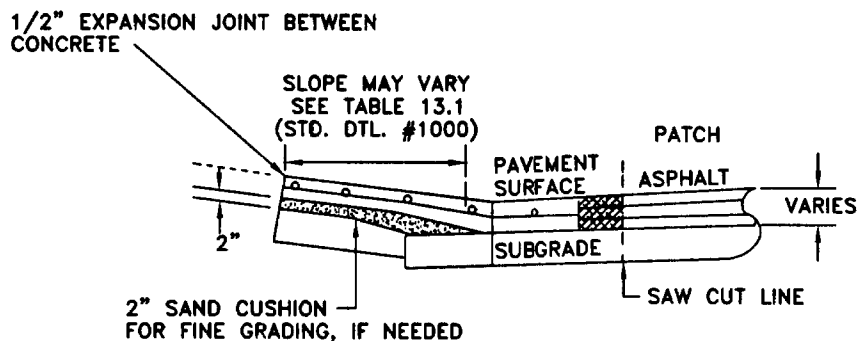
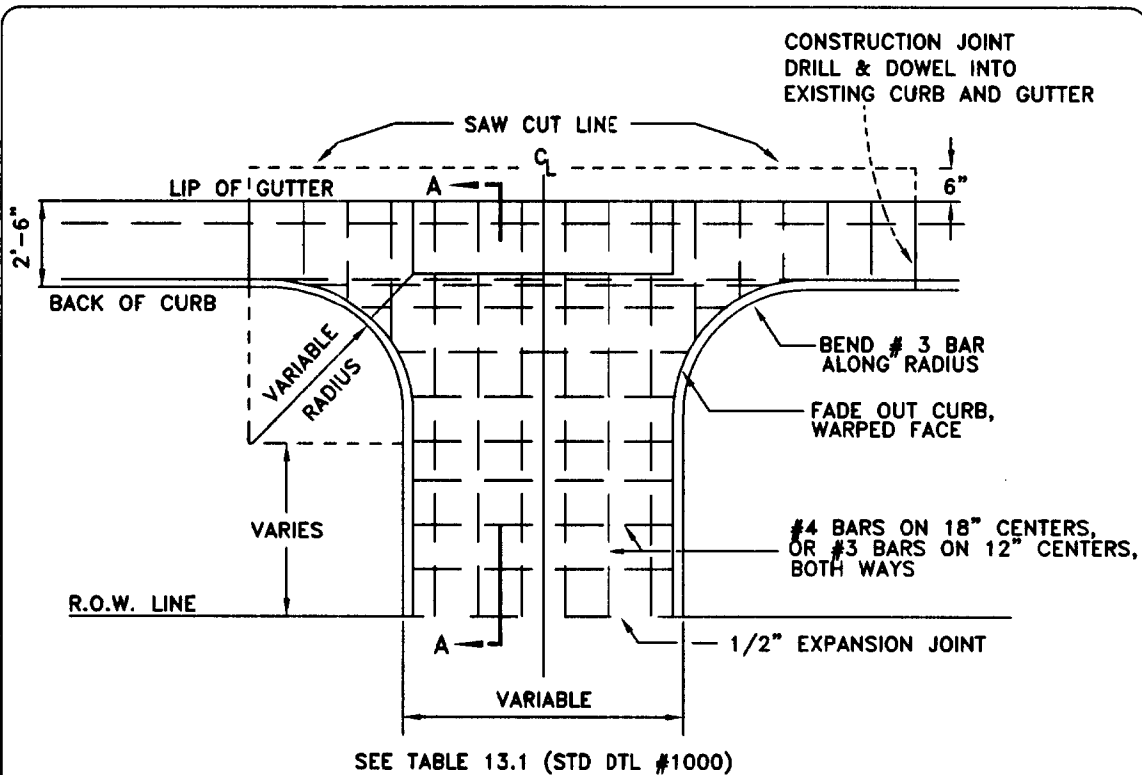
DRIVEWAYS
CONSTRUCTION DETAILS
FOR RESIDENTIAL
FLARED DRIVEWAYS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
1012



SECTION A-A

DESIGN CRITERIA

DRIVEWAY TYPE

SLAB THICKNESS

STEEL

RESIDENTIAL

6"

NONE

ALL OTHERS

6"

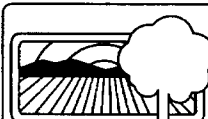
#4 BAR ON 18" CENTERS OR
#3 BAR ON 12" CENTERS, BOTH WAYS
OR 8" PCC W/NO STEEL

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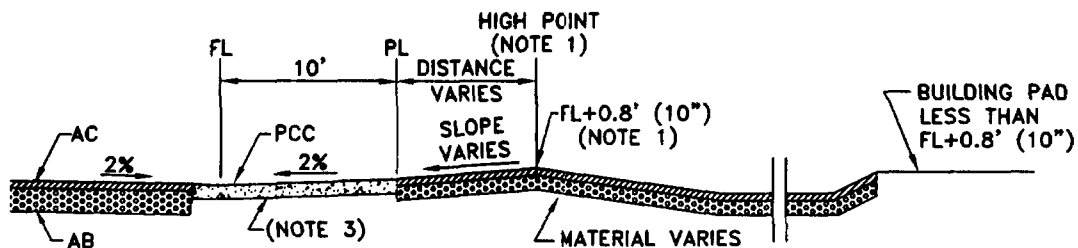
DRIVEWAYS CONSTRUCTION DETAILS FOR DROP APPROACH DRIVEWAYS

ENGINEERING & TRANSPORTATION
DEPARTMENT

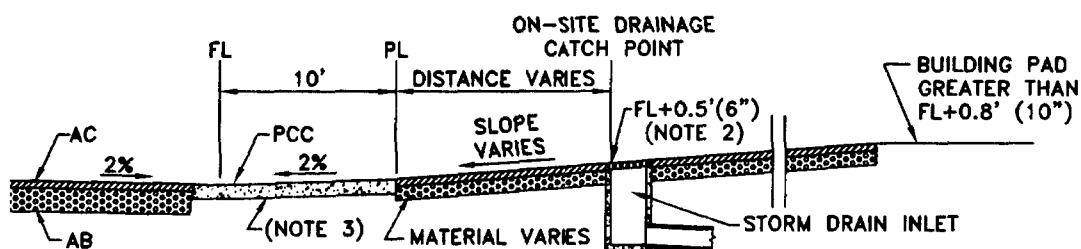


CITY of MODESTO

DETAIL NO.
1013



SECTION A-A
DROP APPROACH - CASE 1



SECTION A-A
DROP APPROACH - CASE 2

NOTES:

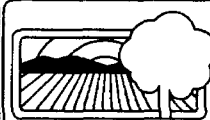
- CASE 1 - LOT/PAD ELEVATION EQUAL TO OR LESS THAN TEN (10) INCHES (0.8') ABOVE FLOWLINE.
- CASE 2 - LOT/PAD ELEVATION GREATER THAN TEN (10) INCHES (0.8') ABOVE FLOWLINE.
- NOTE 1 - HIGH POINT ESTABLISHED AT 0.8' ABOVE FLOW LINE TO CONTROL STREET FLOODING AND LOT FLOODING. CITY ENGINEER MAY LOWER STANDARD IN POSITIVE DRAINAGE AREAS.
- NOTE 2 - CATCH POINT FOR ON-SITE DRAINAGE AT A MINIMUM OF 0.5' ABOVE FLOWLINE TO CONTROL ON- AND OFF-SITE FLOODING. CITY ENGINEER MAY LOWER STANDARDS IN POSITIVE DRAINAGE AREAS.
- NOTE 3 - CONCRETE DRIVEWAY TO EXTEND TO LIMITS OF SIDEWALK WIDTH UNLESS THIS IS A SIGNALIZED DRIVEWAY WITH TRAFFIC LOOPS. SIGNALIZED DRIVEWAYS SHALL HAVE A 6' WIDE VALLEY GUTTER.

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DRIVEWAYS
DROP CURB
APPROACH
PROFILE VIEW

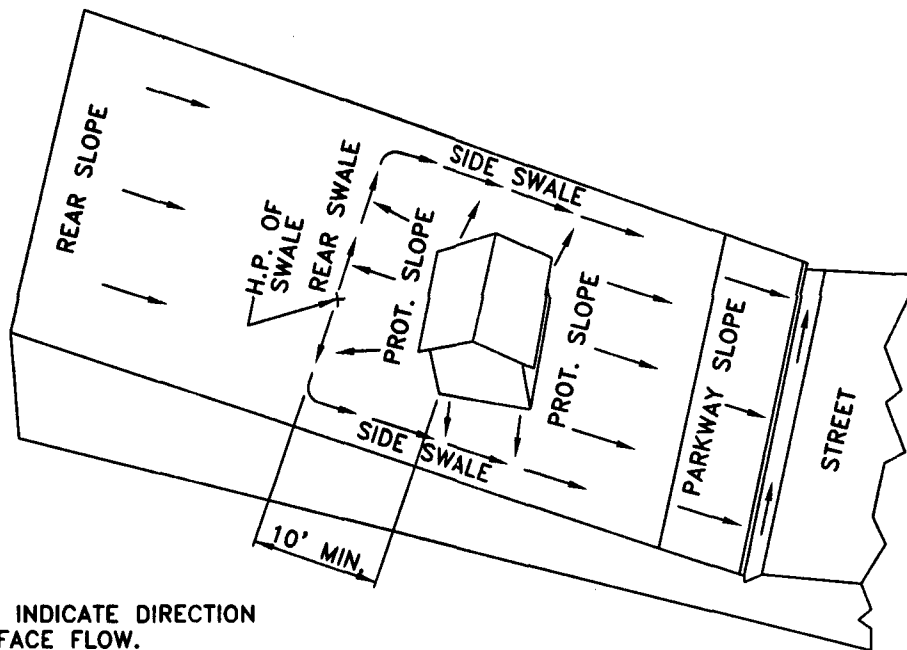
**ENGINEERING & TRANSPORTATION
DEPARTMENT**



CITY of MODESTO

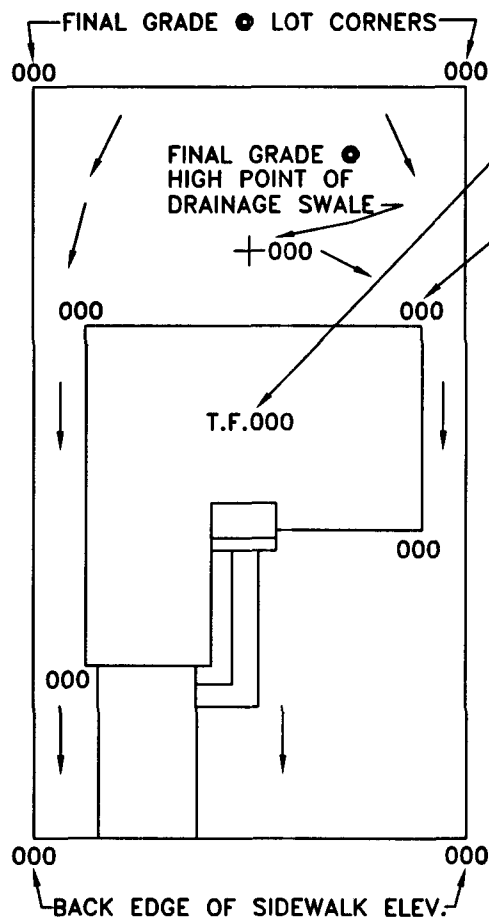
DETAIL NO.

1015



NOTE:

ARROWS INDICATE DIRECTION OF SURFACE FLOW.



FINAL TOP OF FOUNDATION ELEVATION MINIMUM 8" ABOVE PROTECTIVE SLOPE.

FINAL ELEVATION PROTECTIVE SLOPE • FOUNDATION, SAME ALL CORNERS.

GENERAL NOTES:

- (1.) FINISHED GRADING IS TO BE COMPLETED BY OTHERS AFTER HOUSE CONSTRUCTION.
- (2.) PAD ELEVATIONS ARE DESIGNED FOR 12" SLAB & BASE ROCK FOUNDATION SECTIONS.
- (3.) PAD ELEVATIONS ARE DESIGNED SUCH THAT THE PAD ELEVATION SPECIFIED WILL ACCOMMODATE REAR AND SIDE SWALES TO BE GRADED AT A MINIMUM GRADIENT OF 1% IN ACCORDANCE WITH CITY STANDARDS.
- (4.) ACTUAL LOT GRADING IS TO BE DESIGNED WITH THE HOUSE PLOT PLAN AND MAY VARY FROM THIS TYPICAL DETAIL DEPENDING ON HOW THE HOUSE IS PLOTTED.

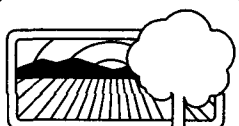
APPROVED BY CITY COUNCIL
RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

STREETS

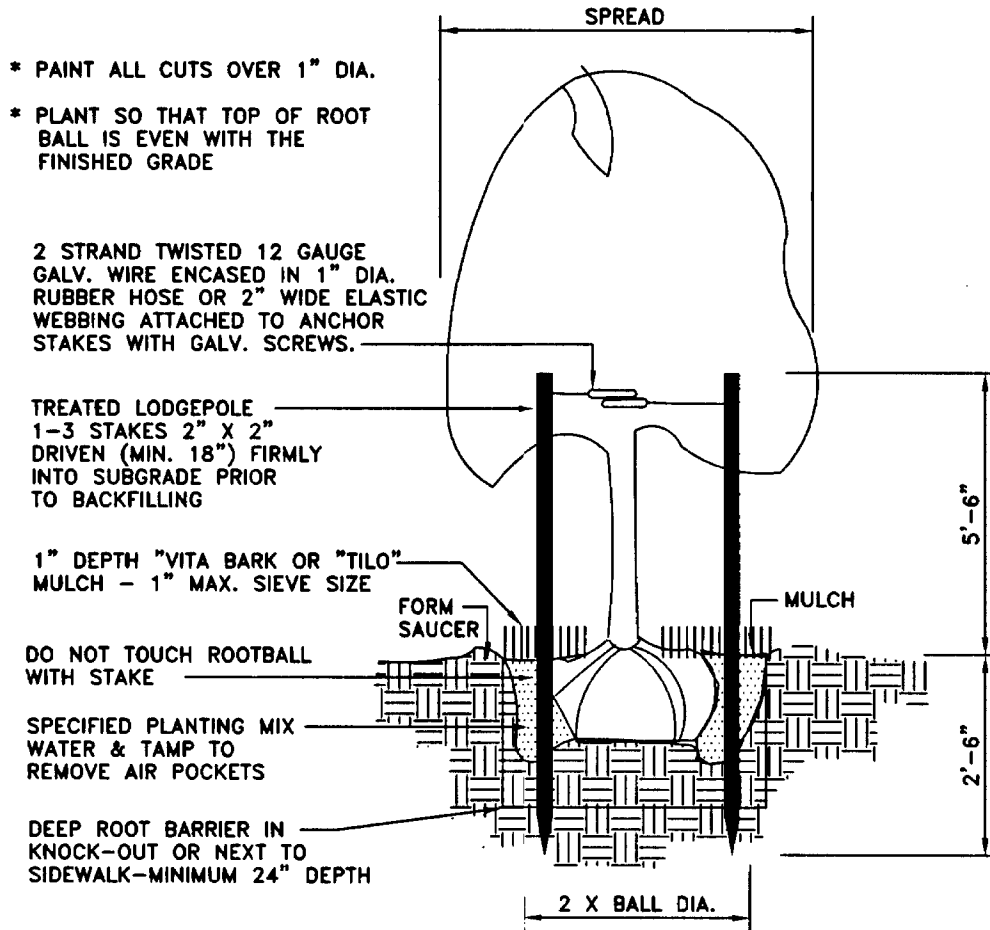
**TYPICAL FINISHED
LOT GRADING**

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
1100



NOTES:

1. TOP SUPPORT OF TREES SHOULD BE AS LOW ON THE TRUNK AS POSSIBLE BUT HIGH ENOUGH THAT THE TREE WILL RETURN TO UPRIGHT AFTER DEFLECTION. TO FIND THE PROPER HEIGHT, HOLD THE TRUNK IN ONE HAND, PULL THE TOP TO ONE SIDE AND RELEASE. THE HEIGHT AT WHICH THE TRUNK WILL JUST RETURN TO UPRIGHT WHEN THE TOP IS RELEASED IS THE HEIGHT AT WHICH TO ATTACH THE TIES.
2. A LINE DRAWN BETWEEN THE ANCHOR STAKES SHOULD BE AT TIGHT ANGLES TO THE WIND DIRECTION.
3. TOP-MOST LOOP IS TIED FIRST TO HOLD THE TRUNK IN THE DESIRED POSITION. THE LOWER TIE IS THEN SECURED TO MAINTAIN THE TRUNK FIRMLY IN THE UPPER LOOP.

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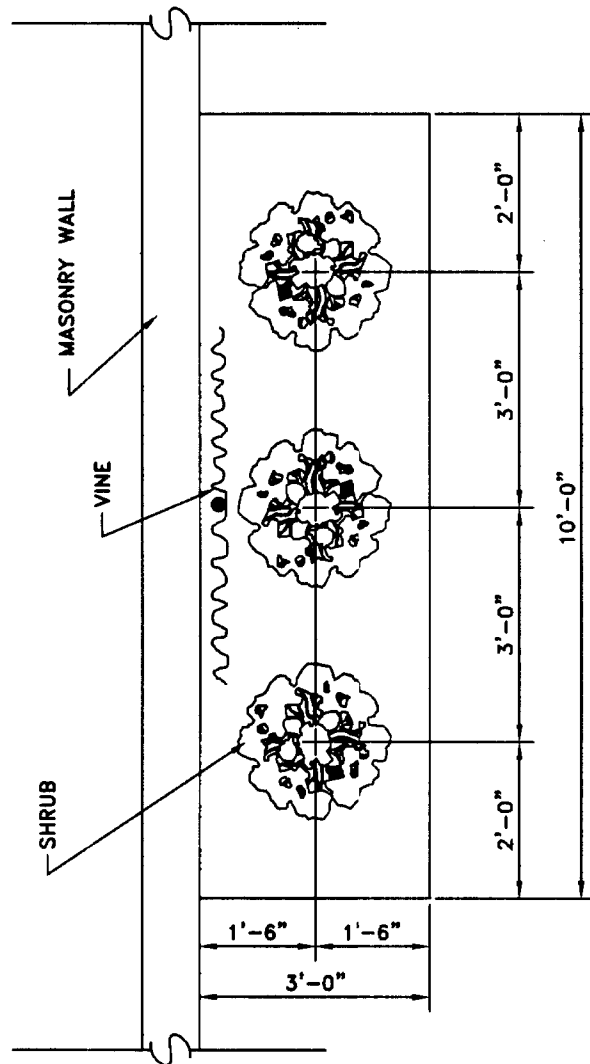
LANDSCAPING
TYPICAL
TREE STAKING

ENGINEERING & TRANSPORTATION
DEPARTMENT



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DETAIL NO.
1200



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AND TRANSPORTATION

LANDSCAPING

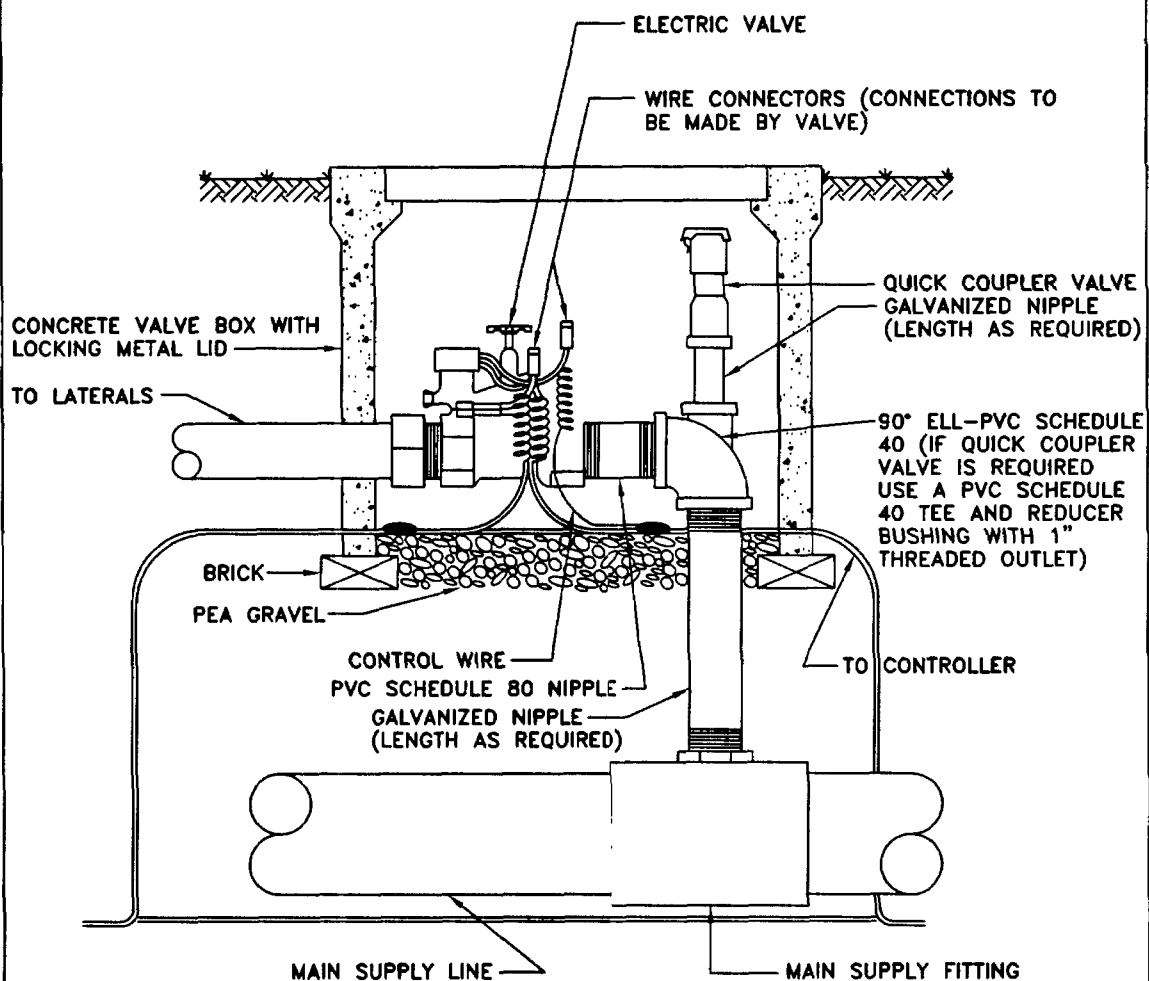
PLANTER
DETAIL

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
1201



NOTES:

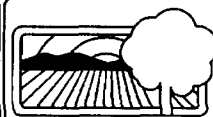
1. ALL WIRE TO BE INSTALLED AS PER LOCAL CODE.
2. TAPE AND BUNDLE WIRE EVERY TEN FEET.
3. PROVIDE EXPANSION COILS AT EACH WIRE CONNECTION IN VALVE BOX.
(WRAP AROUND 1/2" PIPE 15 TIMES)
4. COMPACT SOIL AROUND VALVE BOX TO SAME DENSITY AS UNDISTURBED ADJACENT SOIL.
5. ALL THREADED CONNECTIONS TO BE COATED WITH "RECTORSEAL NO. 5."

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AND TRANSPORTATION

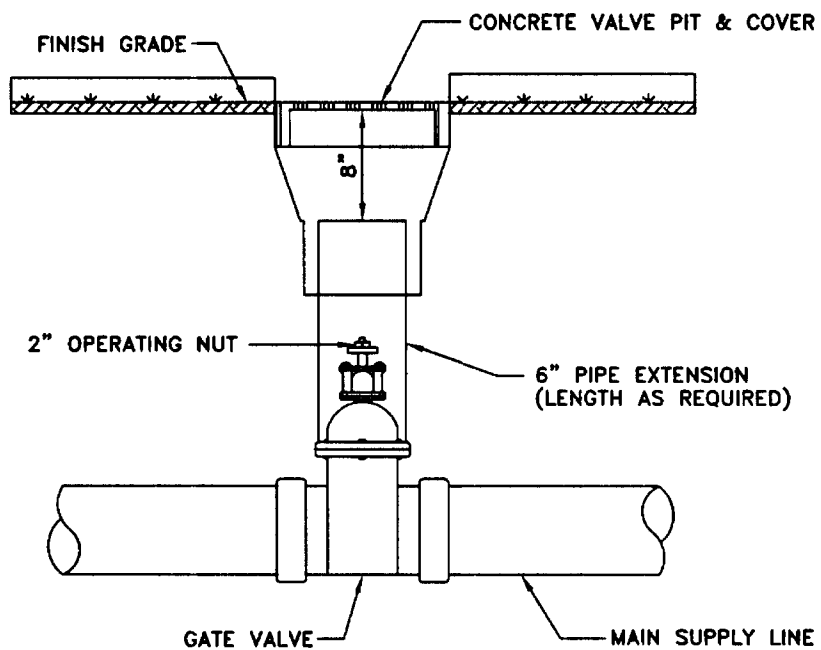
LANDSCAPING
**SOLENOID
VALVE DETAIL**

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
1202



NOTE:

COMPACT SOIL AROUND CONTROL VALVE PIT ASSEMBLY
TO SAME DENSITY AS UNDISTURBED ADJACENT SOIL.

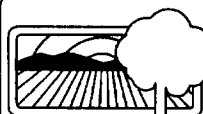
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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

LANDSCAPING

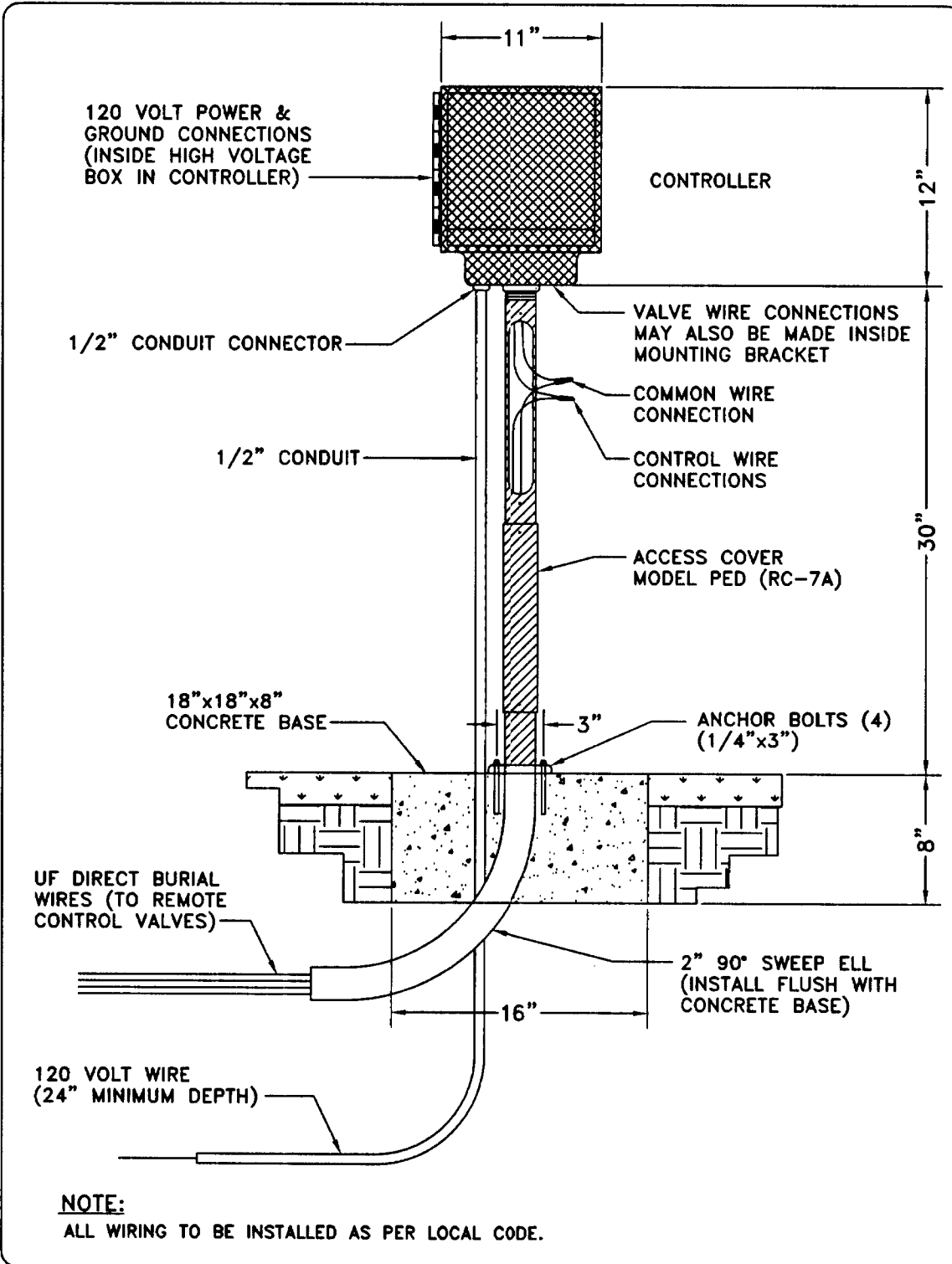
GATE VALVE
ASSEMBLY

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DEPARTMENT



CITY of MODESTO

DETAIL NO.
1203



APPROVED BY CITY COUNCIL
RESOLUTION NO. 00-test

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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

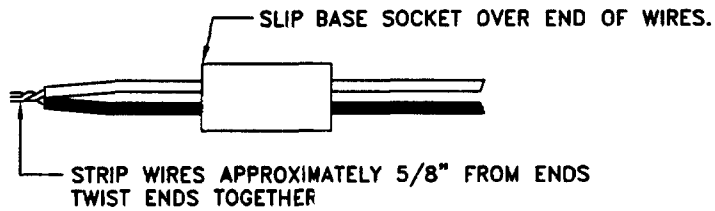
LANDSCAPING
IRRIGATION
CONTROLLER

ENGINEERING & TRANSPORTATION
DEPARTMENT

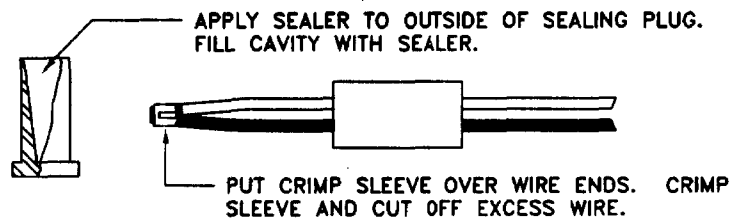


CITY of MODESTO

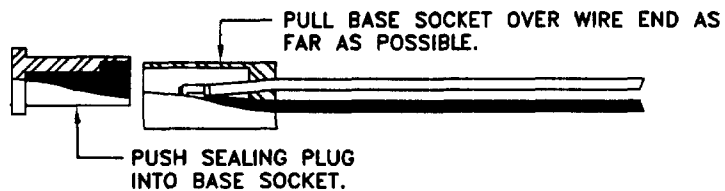
DETAIL NO.
1204



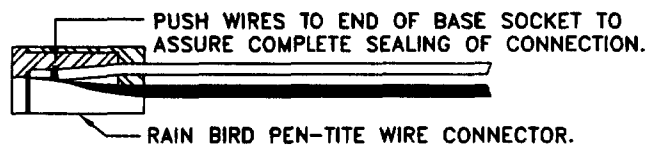
STEP 1



STEP 2



STEP 3



STEP 4

NOTES:

1. FOR WIRE SIZES NO. 14, NO. 12 AND NO. 10.
2. WIRING SHALL BE DIRECT BURIAL WIRE

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LANDSCAPING

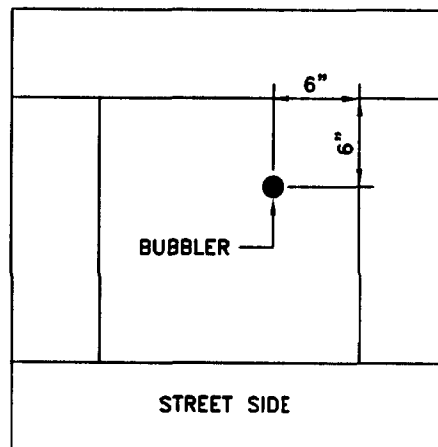
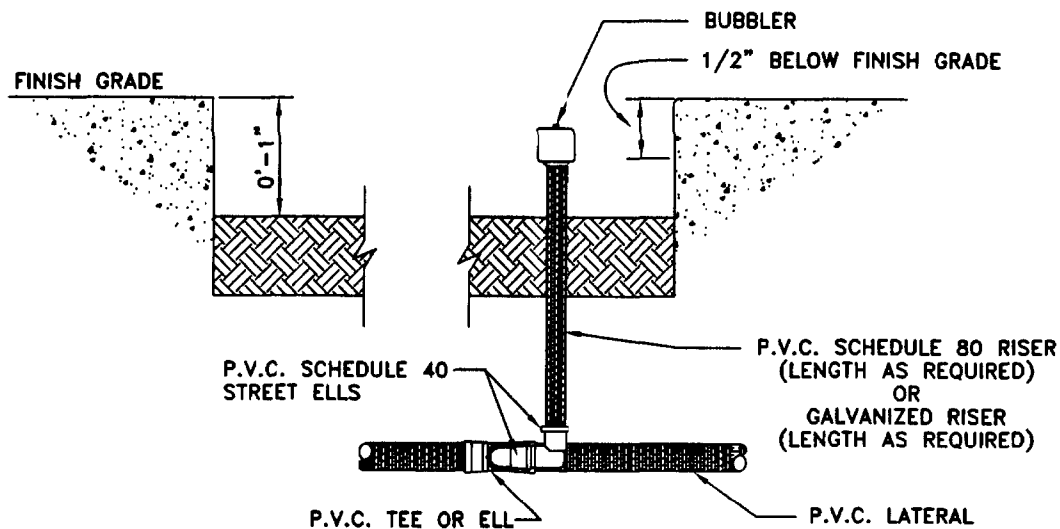
TYPICAL WIRE CONNECTION

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
1205



STREET TREE KNOCKOUT DETAIL
PLAN VIEW
N.T.S.

NOTES:

1. USE RAINBIRD 1402 PRESSURE COMPENSATING FULL CIRCLE BUBBLERS.
2. USE "TEFLON TAPE" ON ALL GALVANIZED PIPE CONNECTIONS.
3. P.V.C. THREADED CONNECTIONS TO BE COATED WITH "RECTORSEAL NO. 5."
4. REFER TO STD. DRAWING #3-N FOR KNOCKOUT DETAIL.
5. BUBBLER TO BE REMOVED AND REPLACED WITH CAP IF CITY STREET TREE IS NOT PLANTED.

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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

LANDSCAPING

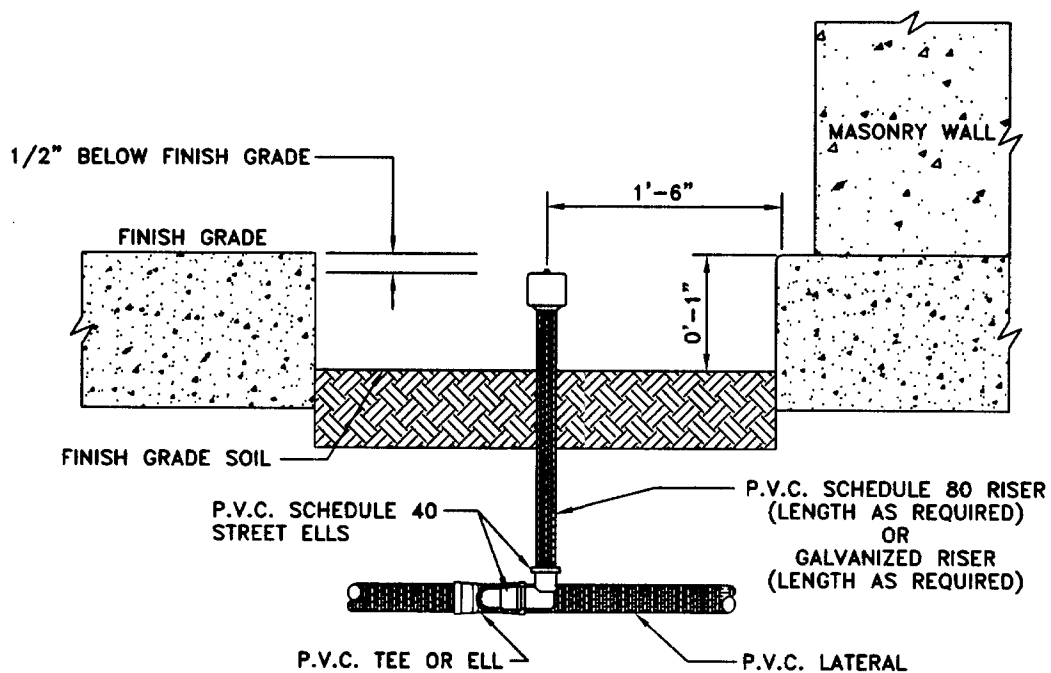
**STREET TREE BLOCK OUT
TYPICAL BUBBLER DETAIL**

**ENGINEERING & TRANSPORTATION
DEPARTMENT**



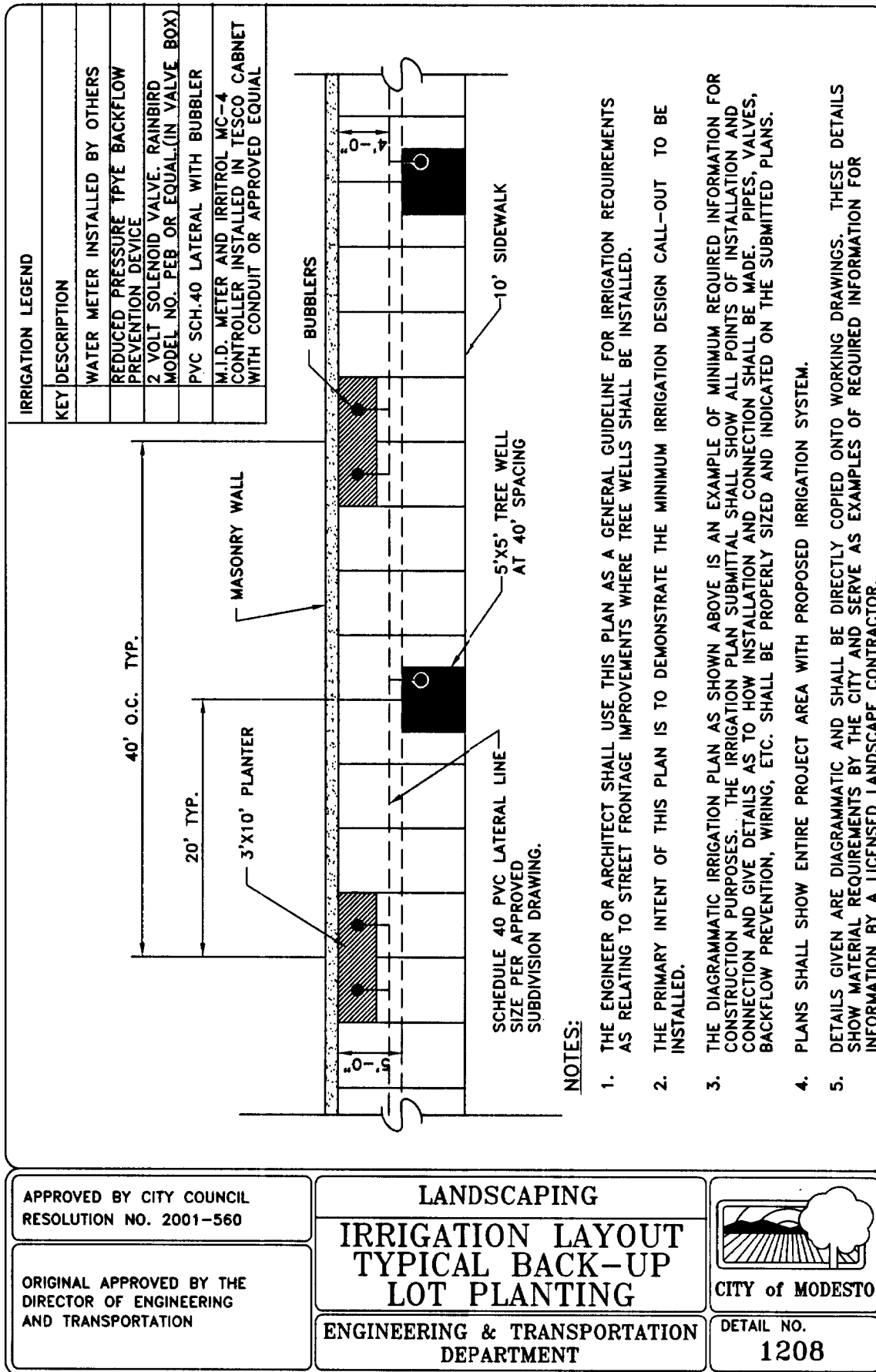
CITY of MODESTO

DETAIL NO.
1206



1. USE RAINBIRD 1402 PRESSURE COMPENSATING FULL CIRCLE BUBBLERS.
2. USE "TEFLON TAPE" ON ALL GALVANIZED PIPE CONNECTIONS.
3. P.V.C. THREADED CONNECTIONS TO BE COATED WITH "RECTORSEAL NO. 5."

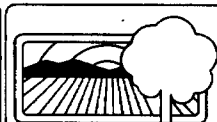
DETAIL NO.
1207



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RESOLUTION NO. 2001-560

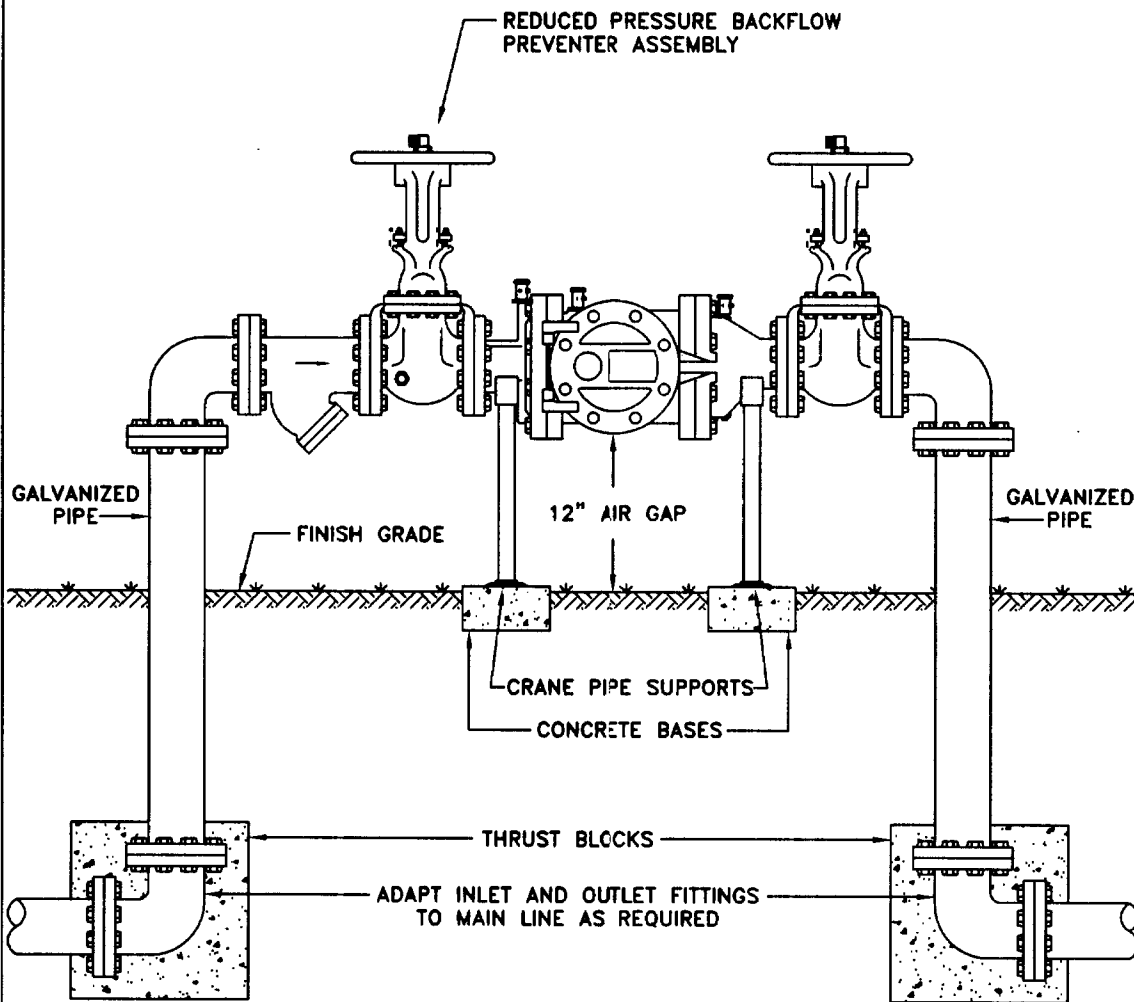
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AND TRANSPORTATION

LANDSCAPING
IRRIGATION LAYOUT
TYPICAL BACK-UP
LOT PLANTING
ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
1208



NOTES:

1. INSTALL 12" AIR GAP MINIMUM (CONSULT LOCAL CODE)
2. ALL CONNECTIONS ON ASSEMBLY TO BE FLANGED.

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AND TRANSPORTATION

LANDSCAPING

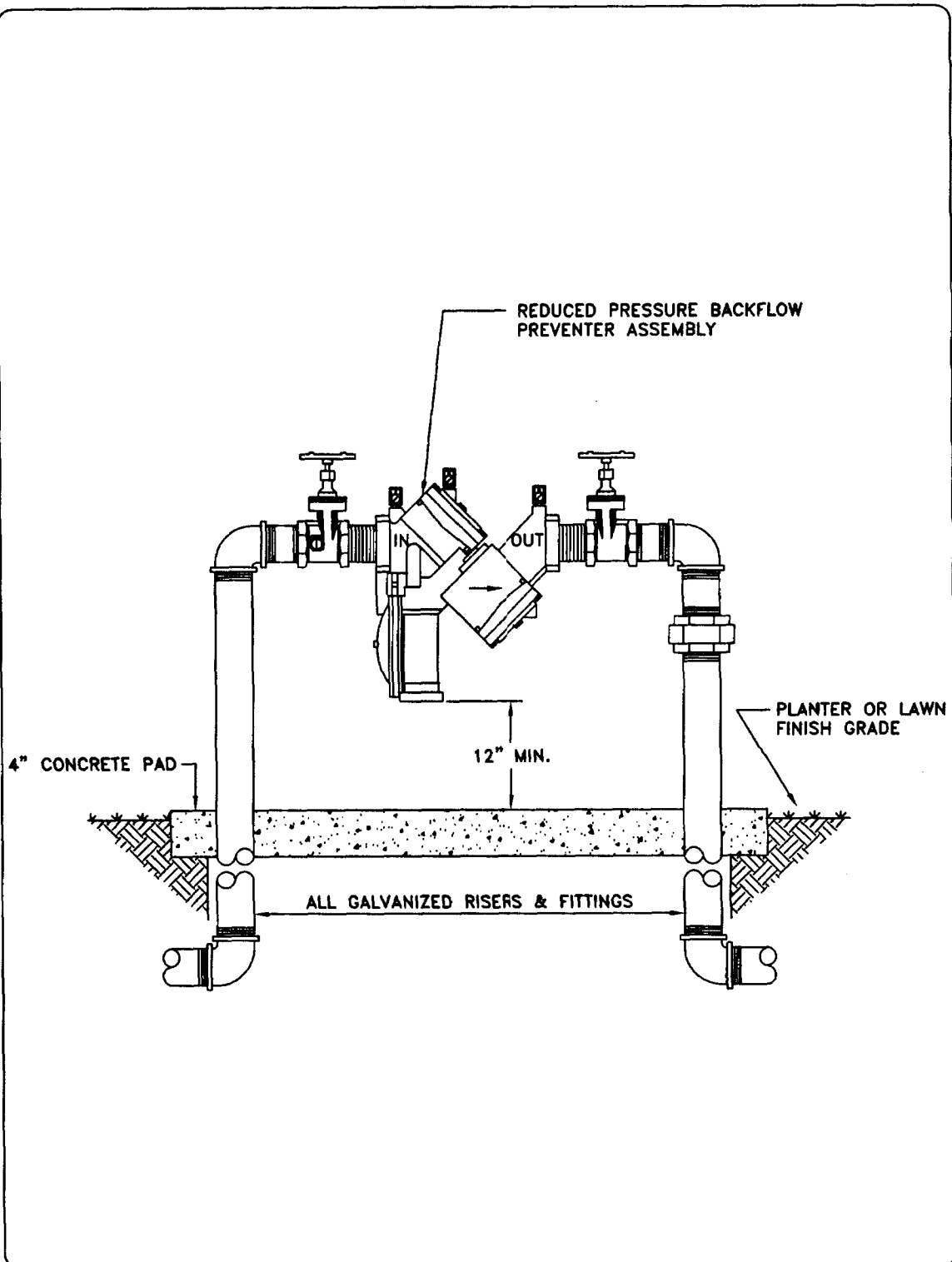
**REDUCED PRESSURE PRINCIPLE
BACKFLOW PREVENTION
ASSEMBLY FOR 3" & LARGER**

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DEPARTMENT**



CITY of MODESTO

**DETAIL NO.
1209**



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RESOLUTION NO. 2001-560

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AND TRANSPORTATION

LANDSCAPING

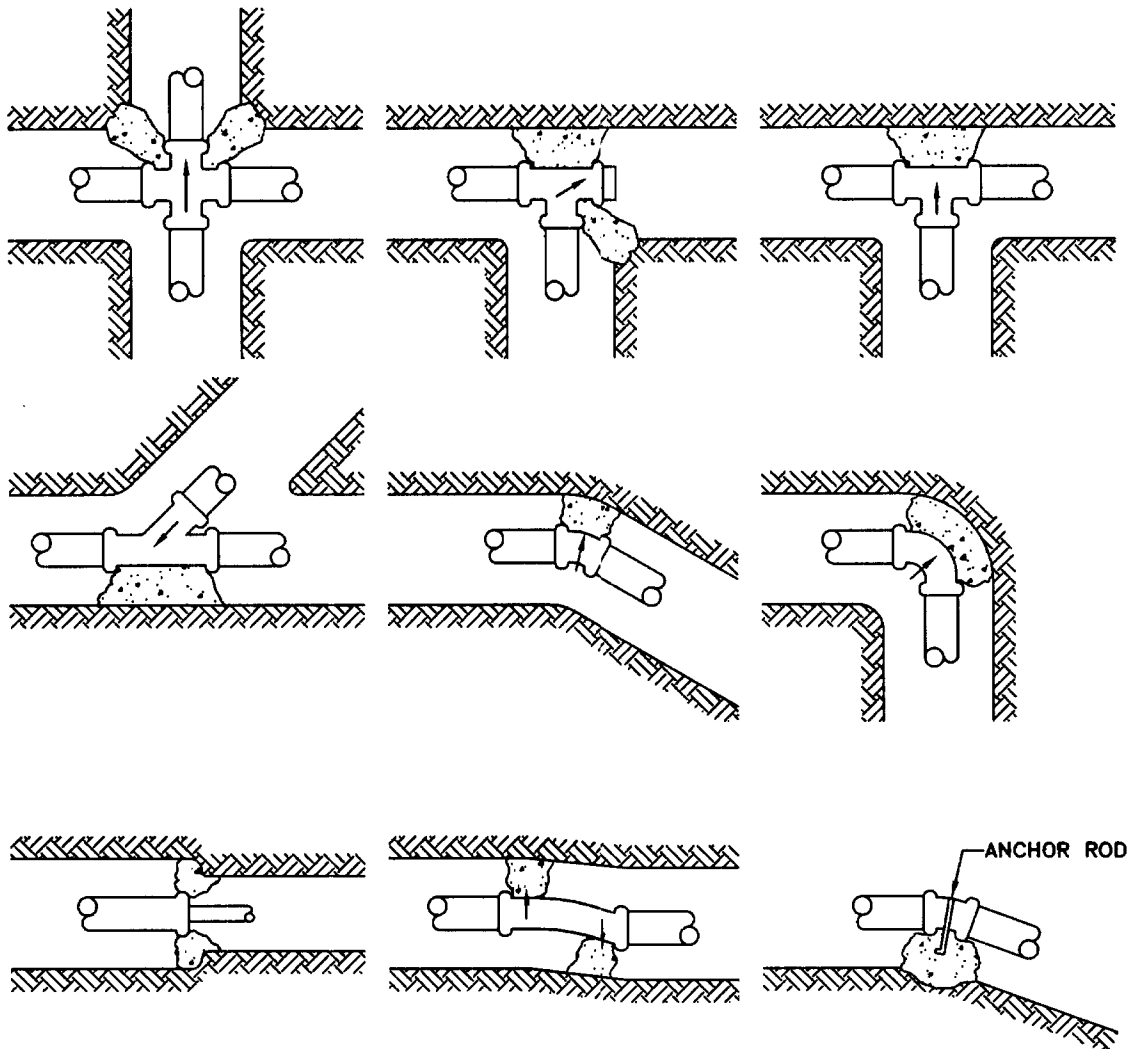
REDUCED PRESSURE PRINCIPLE
BACKFLOW PREVENTION ASSEMBLY
1" TO 2-1/2" SIZE

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
1210



NOTES:

1. CONTRACTOR SHALL ARRANGE FOR SERVICES OF MANUFACTURER'S QUALIFIED INSTRUCTOR.
2. SIZES OF ANCHOR AND THRUST BLOCKS SHALL BE AS RECOMMENDED BY PIPE MANUFACTURER.
3. ANCHOR AND THRUST BLOCKS SHALL BEAR AGAINST UNDISTURBED SOIL.
4. CONCRETE SHALL ATTAIN 2000 PSI COMPRESSIVE STRENGTH.
5. ANCHOR RODS SHALL BE 1/2" DIA. REINFORCING STEEL, ENCASED IN CONCRETE.
6. KEEP CONCRETE CLEAR OF ALL PIPE OPENINGS.

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AND TRANSPORTATION

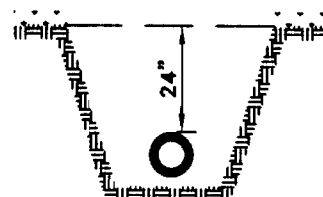
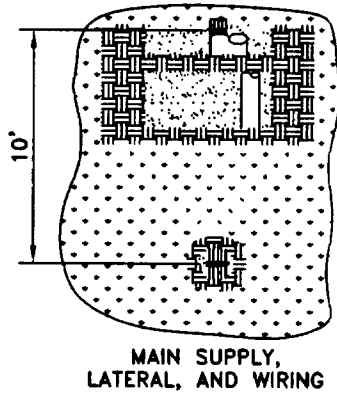
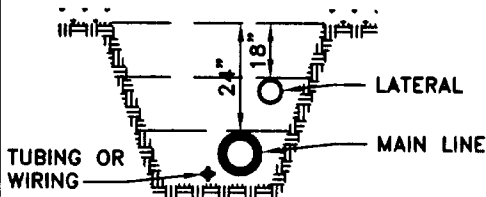
LANDSCAPING TYPICAL CONCRETE THRUST BLOCK

ENGINEERING & TRANSPORTATION
DEPARTMENT

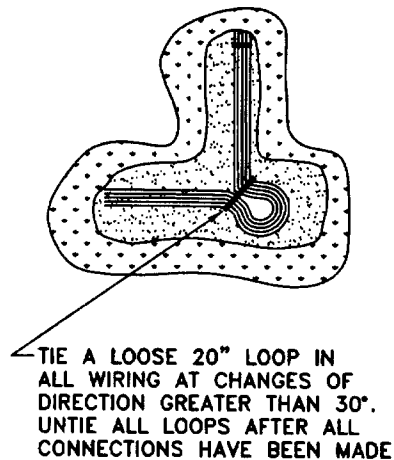
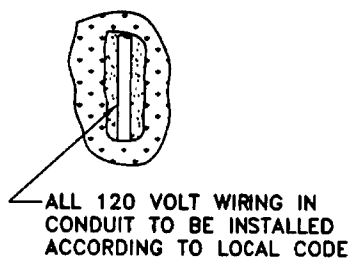
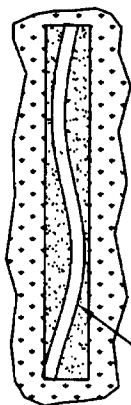
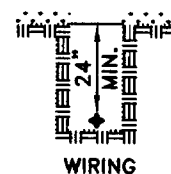
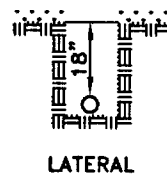
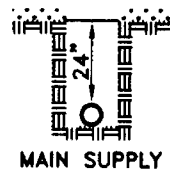


CITY of MODESTO

DETAIL NO.
1211



ALL MAIN SUPPLY LINES TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION SPECIFICATIONS



NOTE:

IN LANDSCAPED AREAS COMPACT BACKFILL TO 85% RELATIVE COMPACTION

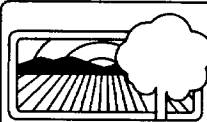
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RESOLUTION NO. 2001-560

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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

LANDSCAPING

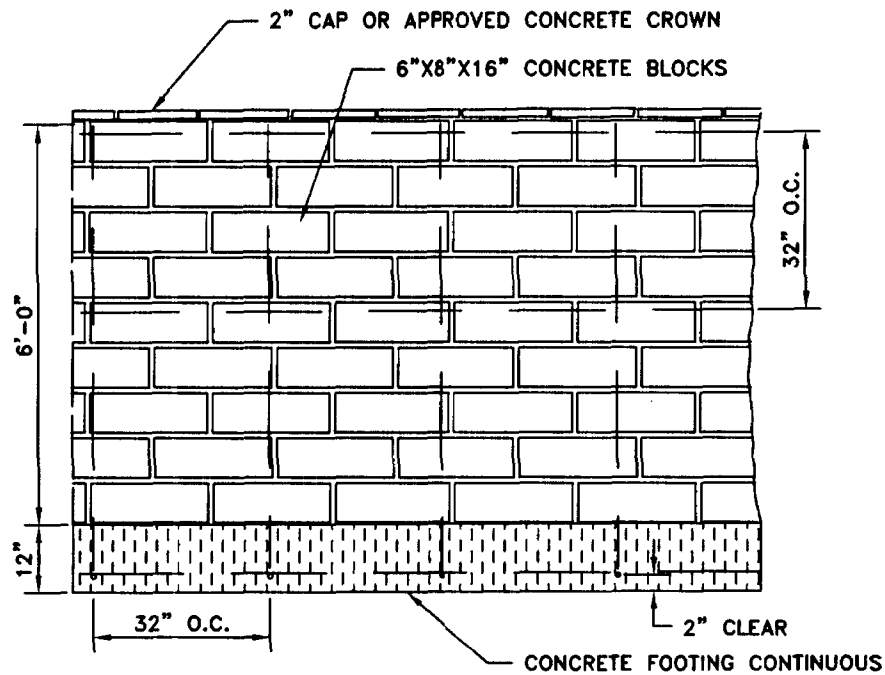
TYPICAL
TRENCHING

ENGINEERING & TRANSPORTATION
DEPARTMENT

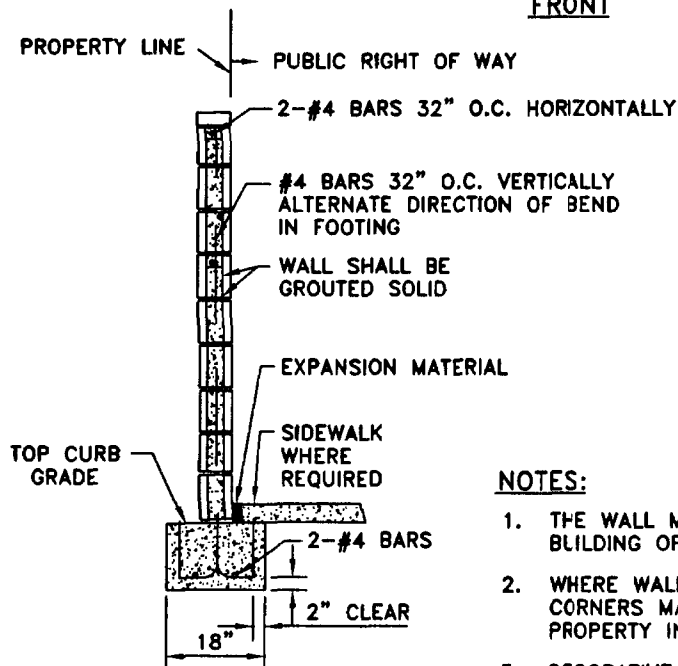


CITY of MODESTO

DETAIL NO.
1212



FRONT



SECTION

NOTES:

1. THE WALL MUST BE APPROVED BY THE CHIEF BUILDING OFFICIAL.
2. WHERE WALLS ARE CONSTRUCTED, WITNESS CORNERS MAY BE PLACED 3 FEET INSIDE PROPERTY IN LIEU OF PROPERTY CORNER.
3. DECORATIVE FEATURES SHALL BE AS REQUIRED BY THE CHIEF BUILDING OFFICIAL.

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RESOLUTION NO. 2001-560

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

LANDSCAPING

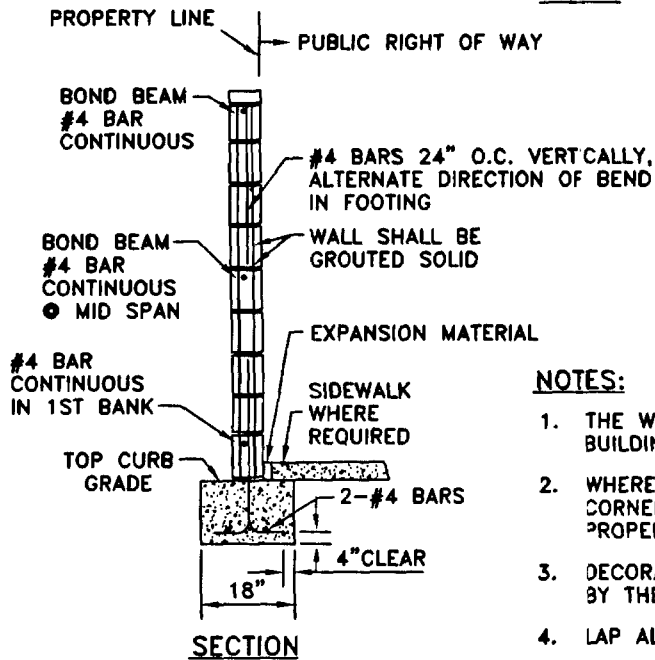
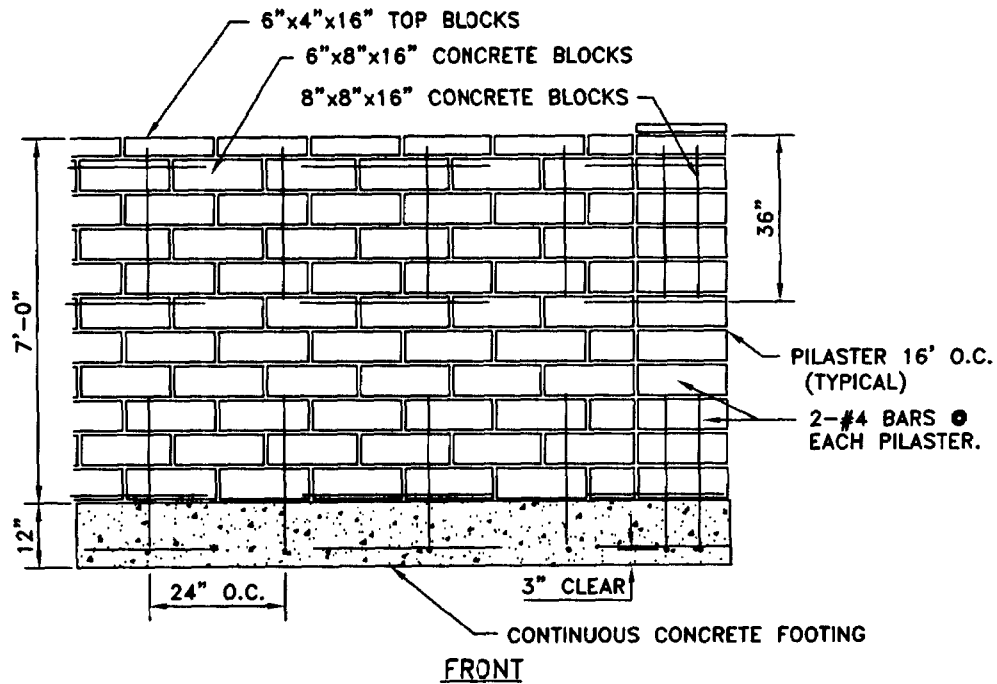
ACCESS CONTROL
WALL

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
1213



NOTES:

1. THE WALL MUST BE APPROVED BY THE CHIEF BUILDING OFFICIAL.
2. WHERE WALLS ARE CONSTRUCTED, WITNESS CORNERS MAY BE PLACED IN LIEU OF PROPERTY CORNER.
3. DECORATIVE FEATURES SHALL BE AS REQUIRED BY THE CHIEF BUILDING OFFICIAL.
4. LAP ALL STEEL SPLICES 12" MINIMUM.
5. PILASTER ENCROACHES INTO SIDEWALK.
6. ALTERNATIVE WALL CONSTRUCTION SHALL BE APPROVED IN WRITING BY THE CITY ENGINEER.

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ORIGINAL APPROVED BY THE
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AND TRANSPORTATION

LANDSCAPING

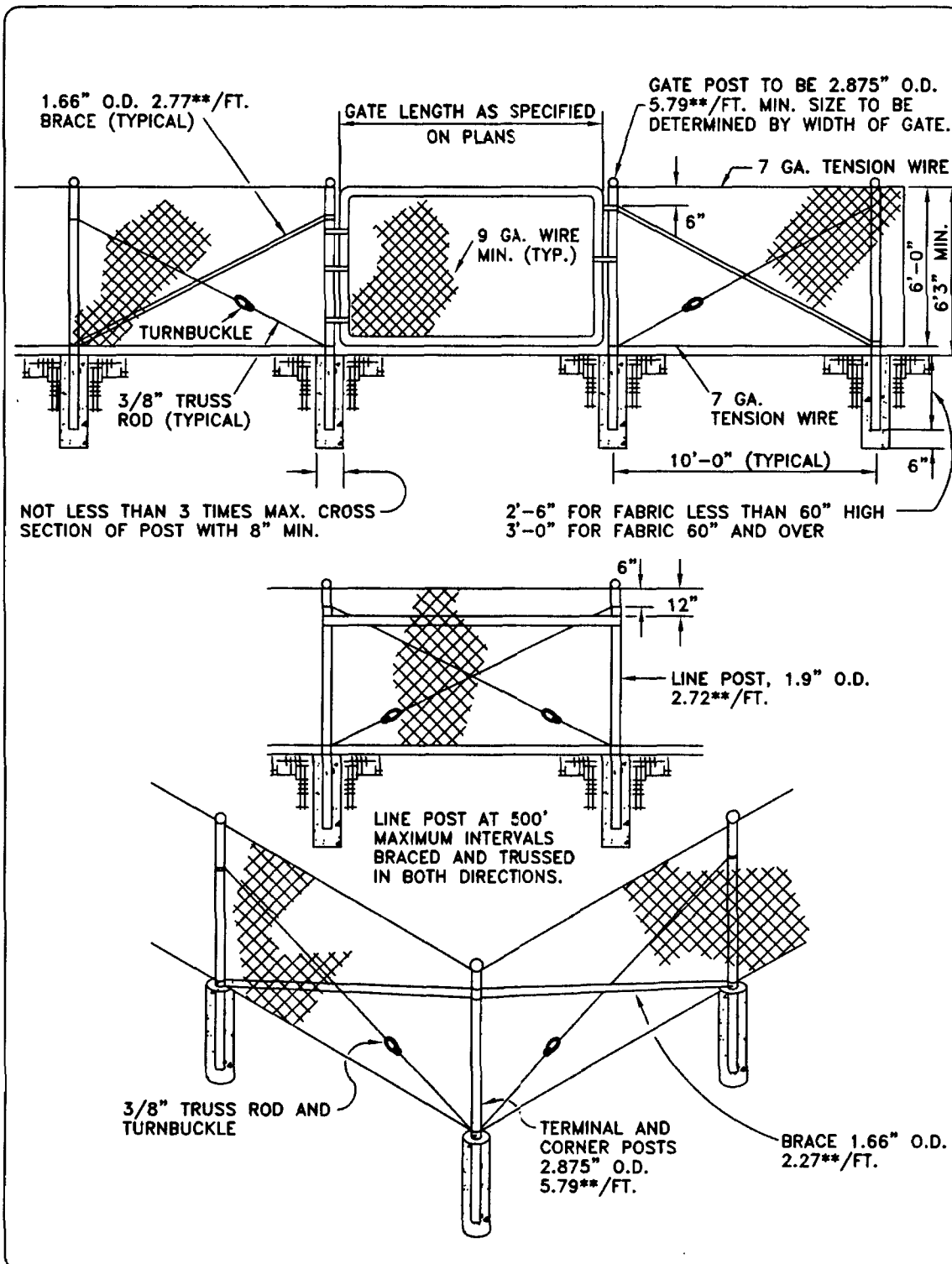
7 FOOT ACCESS CONTROL WALL

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
1214



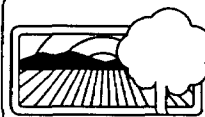
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DIRECTOR OF ENGINEERING
AND TRANSPORTATION

LANDSCAPING

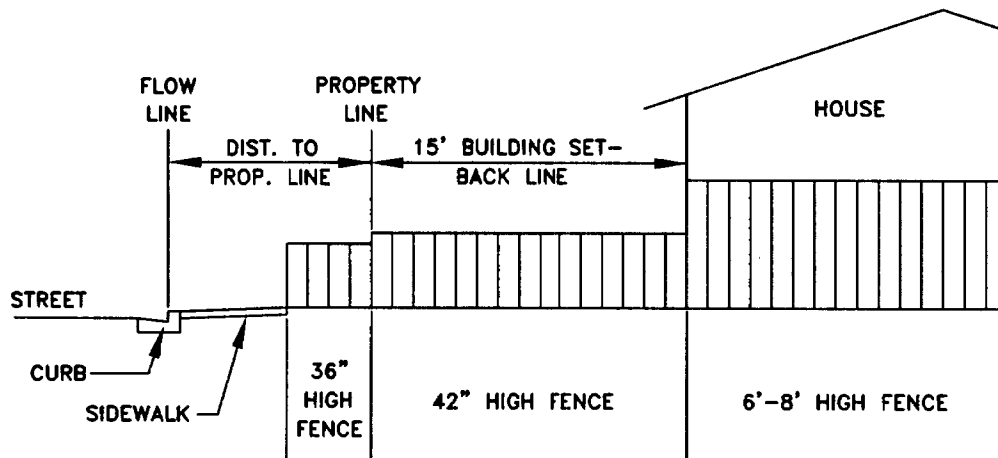
CHAIN LINK
FENCE & GATE

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
1215



ELEVATION

NOTES:

1. NO PERMIT IS REQUIRED FOR 6' HIGH FENCE.
2. ENGINEERING BY A LICENSED ENGINEER AND A PERMIT IS REQUIRED FOR FENCES EXCEEDING 6' IN HEIGHT BUT NOT TO EXCEED 8' IN HEIGHT.

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RESOLUTION NO. 00-test

ORIGINAL APPROVED BY THE
DIRECTOR OF ENGINEERING
AND TRANSPORTATION

LANDSCAPE

FENCE STANDARDS

ENGINEERING & TRANSPORTATION
DEPARTMENT



CITY of MODESTO

DETAIL NO.
1216

CITY OF MODESTO

INDEX

GENERAL PROVISIONS

<u>SECTION</u>	<u>PAGE</u>
1. DEFINITIONS AND TERMS.....	1-1
2. AWARD AND EXECUTION OF CONTRACT	
2.01 General Terms.....	2-1
2.02 Award of Contract.....	2-1
2.03 Contract Bonds.....	2-2
2.04 Execution of Contract.....	2-3
2.05 Subcontractors.....	2-3
3. NATURE OF CONTRACT/CHANGES IN WORK	
3.01 Alterations	3-1
3.02 Limited City Power	3-1
3.03 Extra Work	3-1
3.04 Changes in Work.....	3-2
3.05 Unit Price Bid Items.....	3-2
3.06 Guarantee	3-3
3.07 Disputed Work	3-3
4. CONTROL OF WORK	
4.01 Authority of the Engineering and Transportation Director.....	4-1
4.02 Plans and Specifications	4-1
4.03 Plans	4-2
4.04 Conformity with Plans and Allowable Deviations.....	4-2
4.05 Coordination of Plans, Specifications and Special Provisions	4-2
4.06 Interpretation of Plans and Specifications.....	4-3
4.07 Superintendence	4-3
4.08 Surveying.....	4-3
4.09 Inspection.....	4-4
4.10 Compaction Tests.....	4-4
4.11 Authority of Inspectors	4-4
4.12 Removal of Defective or Unauthorized Work	4-5
4.13 Beneficial Use	4-5
4.14 Final Inspection.....	4-6

4. CONTROL OF WORK (cont'd)

4.15	Additional and Emergency Protection.....	4-6
4.16	Conferences.....	4-6
4.17	Subsurface Data.....	4-7
4.18	Differing Site Conditions	4-7
4.19	Hours of Work.....	4-8
4.20	Construction Schedule.....	4-9

5. CONTROL OF MATERIALS

5.01	Samples and Tests	5-1
5.02	Submittal.....	5-2
5.03	Protection of Work and Materials	5-3
5.04	Defective Materials	5-3
5.05	Certificates of Compliance	5-3
5.06	Disposal of Excess Material.....	5-3
5.07	Substitutions.....	5-3
5.08	As-Built Plans	5-4
5.09	Maintenance Manuals	5-4

6. UTILITIES

6.01	Location.....	6-1
6.02	Protection.....	6-1
6.03	Notification.....	6-2
6.04	Removal.....	6-2
6.05	Relocation.....	6-2
6.06	Delays.....	6-2
6.07	Cooperation.....	6-2
6.08	Existing Utilities.....	6-3
6.09	Utility Companies	6-3

7. LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC

7.01	Laws to be Observed.....	7-1
7.02	Employment	7-1
7.03	Hours of Labor.....	7-2
7.04	Prevailing Wages (When required by Special Provisions)	7-2
7.05	Permits and Licenses.....	7-4
7.06	Patent Fees and Royalties.....	7-4
7.07	Cooperation and Collateral Work	7-4
7.08	Use of Premise	7-5
7.09	Project Site Maintenance.....	7-5
7.10	Temporary Light, Power, and Water.....	7-7

7. LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC (cont'd)

7.11	Protection and Restoration of Existing Improvements	7-7
7.12	Public Convenience and Safety.....	7-7
7.13	Hold Harmless Agreement.....	7-9
7.14	Insurance Requirements	7-9
7.15	Verification of Coverage	7-11
7.16	Subcontractors.....	7-11
7.17	Contractor's Responsibility for Work.....	7-11
7.18	Advertising.....	7-12
7.19	Risk of Loss.....	7-12
7.20	Hazardous Materials.....	7-12
7.21	Control of Fugitive Dust	7-12
7.22	Control of Storm Water.....	7-13

8. PROSECUTION AND PROGRESS

8.01	Subletting and Assignment.....	8-1
8.02	Progress of the Work.....	8-2
8.03	Character of Workers.....	8-3
8.04	Temporary Suspension of Work	8-3
8.05	Time of Completion and Liquidated Damages.....	8-4
8.06	Suspension of Contract.....	8-6
8.07	Rights-of-Way.....	8-6
8.08	Delays by the City of Modesto.....	8-7

9. MEASUREMENT AND PAYMENT

9.01	Measurement	9-1
9.02	Scope of Payment.....	9-1
9.03	Extra and Force Account Work.....	9-2
9.04	Progress Payments.....	9-3
9.05	Final Payment & Claim.....	9-4
9.06	Increased or Decreased Contract Quantities	9-5
9.07	Substitution of Securities for Withheld Payments	9-6
9.08	Rights to Withhold Amounts.....	9-6
9.09	Dispute Resolution.....	9-7

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**CITY OF MODESTO
GENERAL PROVISIONS**

SECTION 1

DEFINITIONS AND TERMS

Whenever in these specifications, or in any documents or instruments where these specifications govern, the following terms or pronouns in place of them are used, the intent and meaning will be interpreted as follows:

AGREEMENT - See Contract.

ASTM - American Society for Testing and Materials.

AWWA - American Water Works Association.

ADDENDA - Written or graphic instruments issued prior to the opening of bids which clarify, correct or change the bidding documents or the contract documents.

BID - The offer of a proposal of the bidder submitted on the prescribed form setting forth the prices for the work to be performed.

BIDDER - Any individual, firm or corporation submitting a proposal for the work contemplated, acting directly or through a duly authorized representative.

BIDDER'S GUARANTY - The cash or certified check or cashiers check or bidders bond accompanying the proposal submitted by the bidder as a guaranty that the bidder will enter into a contract with the City of Modesto for the construction of the work if awarded to him or her.

BONDS - Bid, performance and payment bonds and other instruments of security.

CHANGE ORDER - A document which is signed by the Contractor and City and authorizes an addition, deletion or revision in the work, with possible adjustment in the contract price or the contract time, issued on or after the effective date of the Contract.

CITY - City of Modesto, California

CITY ENGINEER - Director of **Engineering** and Transportation, Engineering, City of Modesto, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

CITY STANDARDS - The Standard Specifications of the City of Modesto, Department of Engineering and Transportation, copies of which are available at the office of the Engineering and Transportation Director.

CONTRACT - The written agreement covering the performance of the work and the furnishing of labor and materials in the construction of the work.

CONTRACTOR - The person or persons, partnership or corporation, private or municipal, who have entered into a contract with the City of Modesto or their legal representatives.

COUNCIL - The City Council of the City of Modesto.

DAYS - Days shall mean calendar days unless otherwise specified.

DEFECTIVE - An adjective which when modifying the word Work refers to work that is unsatisfactory, faulty or deficient, or does not conform to the contract plan and specifications, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the contract plans and specifications, or has been damaged prior to the Engineers' recommendations of final payment.

DEPARTMENT OF ENGINEERING AND TRANSPORTATION - Department of Engineering and Transportation of the City of Modesto.

DIRECTOR OF ENGINEERING AND TRANSPORTATION - The Director of Engineering and Transportation of the City of Modesto acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

EASEMENTS - A recorded document in which the land owner gives the City permanent rights to construct and maintain water mains, sanitary sewers, storm drains and/or facilities across private property.

ENGINEER - See City Engineer

ENGINEERING AND TRANSPORTATION DIRECTOR – See Director of Engineering and Transportation.

HOLD HARMLESS - Agreement by one party to indemnify and defend a second party when the second party is sued by a third party as a result of the first party's actions or inactions.

LIQUIDATED DAMAGES - The amount of dollars assessed for each and every calendar day required to complete the contract in excess of the contract time.

PLANS - The official plans, typical cross-sections, general cross-sections, working drawings and supplemental drawings, or reproductions thereof, which show the location, character, dimensions and details of the work to be done, and which are to be considered as a part of the contract supplementary to these specifications.

PROPOSAL - The offer of the bidder for the work when completed and submitted on the prescribed proposal form, properly signed, and guaranteed.

PROPOSAL FORM - The approved form on which the City of Modesto requires formal bids be prepared and submitted for the work.

REFERENCE SPECIFICATIONS - Those standards, rules, method of tests or analysis, codes, and specifications of other agencies, engineering societies, or industrial associations referred to in the contract documents. These refer to the current edition of amendments in effect at the time of advertising the project unless specifically referred to by edition, volume or date.

SHOP DRAWINGS - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for the Contractor to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a supplier and submitted by the Contractor to illustrate material or equipment for some portion of the Work.

SPECIAL PROVISIONS - The Special Provisions are specific clauses of the Specifications setting forth conditions or requirements peculiar to the particular work called for by the plans and specifications.

SPECIFICATIONS - The textual directions, provisions and requirements contained herein.

STANDARD DETAILS - Details of City standard construction of the various items of work indicated and/or referred to on the plans, specifications of special provisions.

STANDARD SPECIFICATIONS - City of Modesto Standard Specifications.

STATE - State of California

STATE STANDARDS - The Standard Specifications of the State of California, Department of Transportation, a current copy of which is on file in the office of the Engineering and Transportation Director.

SUPERINTENDENT - The executive representative of the Contractor present on the project at all times during progress, authorized to receive and fulfill instructions from the Engineering and Transportation Director.

SURETY - Any individual, firm or corporation, bound with and for the contractor for the acceptable performance and completion of the work and the satisfaction of all obligations incurred.

SURVEYOR - A land surveyor licensed in the State of California.

TESTING AGENCY - The commercial laboratory designated by the Engineer to test materials involved in the contract.

SECTION 2

AWARD AND EXECUTION OF CONTRACT

2.01 GENERAL TERMS

It is the intent of the Contract to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result will be supplied whether or not specifically called for. When words, which have a well-known technical or trade meaning are used to describe the work, materials or equipment, such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the Laws or Regulations of any governmental authority, whether such reference is specific or implied, shall mean the latest standard specification, manual, code or Laws or Regulations in effect at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated. However, no provisions of any referenced standard specifications, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of City, Contractor or Engineer, or any of their consultants, agents or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority of supervising or directing the furnishing or performance of the Work or any duty or authority of undertaking responsibility for the Contractor. Clarifications and interpretations of the Contract Documents shall be issued by Engineer.

2.02 AWARD OF CONTRACT

A. Notice of Award.

The City reserves the right to reject any and all proposals. The award of the contract, if it is awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed. The award, if made, will be made within sixty (60) days after the opening of the proposals.

All bids will be compared on the basis of the Engineers' estimate of the quantities of work to be done.

B. Delivery of Signed Contract, Project Bonds, Insurance.

Within ten (10) working days of the date of receipt of the Notice of Award, the Contractor shall obtain and deliver the required project bonds and insurance, acceptable to the City, and return two copies of signed Contract to the City.

C. Notice to Proceed.

A preconstruction conference must be held prior to starting any work on the project. The City will contact the Contractor no later than five (5) working days from the date the contract is signed by the City Manager to set up the preconstruction conference, which shall be held no later than ten (10) working days from the contract signing date. The Notice to Proceed shall be issued at the preconstruction conference.

D. Commencement of Work.

Work shall commence as soon as possible from the date of the Notice to Proceed and shall be diligently prosecuted to completion within the time provided in the Special Provisions.

No work shall commence before contract bonds and insurance certificates have been filed with the City and the contract has been signed by the City Manager.

E. Return of Bidders Guaranty.

The proposals of the two (2) lowest bidders will be considered in awarding the contract. All other proposal guarantees will be returned promptly by the City Clerk after tabulation of bids has been made. The proposal guarantees retained will be returned after the successful bidder has executed the contract and the bonds accompanying the same are approved and filed.

2.03 CONTRACT BONDS

The Contractor shall furnish two (2) good and sufficient bonds. These bonds shall be in the amount and for the purpose specified below. They shall be surety bonds issued by corporations duly and legally licensed to transact business in the State of California. All bonds shall be issued only by companies listed in the latest edition of the publication titled "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds" published by the U.S. Department of the Treasury. They shall be issued at the expense of the Contractor, and shall be maintained by him or her at his or her expense during the entire life of the contract. All surety companies shall be approved by the City.

One bond shall be in the amount of one hundred percent (100%) of the contract price and shall guarantee faithful performance of the contract and insure the City during the life of the contract.

One bond shall be in the amount of one hundred percent (100%) of the contract price and shall secure the obligations set forth in Section 3248 of the Civil Code of the State of California.

2.04 EXECUTION OF CONTRACT

The contract shall be signed by the successful bidder and returned, together with the contract bonds and insurance certificates as required under Section 7.14 of these specifications within ten (10) working days after the bidder has received notice that the contract has been awarded. No proposal shall be considered binding upon the City of Modesto until the execution and return to the City of the contract and the filing of the contract bonds and insurance certificates with the City.

Failure to execute and return a contract and file acceptable bonds and insurance as provided herein within ten (10) working days after the bidder has received notice that the contract has been awarded shall be just cause for the annulment of the award and the forfeiture of the proposal guaranty to the City of Modesto.

Upon the failure or refusal of the successful bidder to execute and return the contract and file acceptable bonds and insurance, the award may be made to the second lowest responsible bidder and should he or she fail or refuse to execute and return the contract and file acceptable bonds and insurance, the award may be made to the third lowest responsible bidder. On the failure or refusal of the second or third lowest responsible bidders to whom the contract is awarded to execute and file the contract and file acceptable bonds and insurance, their bidders' guarantees shall be likewise forfeited to the City of Modesto.

2.05 SUBCONTRACTORS

In accordance with the Subletting and Subcontracting Fair Practices Act, commencing with Section 4100 of the Public Contract Code, each bidder for the work specified shall set forth in his or her bid:

- (a) The name and the location of the place of business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under a subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of one percent (0.5%) of the prime contractor's total bid.
- (b) The portion of the work which will be done by each such subcontractor. The prime contractor shall list only one subcontractor for each such portion as is defined by the prime Contractor in his or her bid.

If a prime contractor fails to specify a subcontractor or if a prime contractor specifies more than one subcontractor for the same portion of work to be performed under the contract in excess of one-half of one percent (0.5%) of the prime contractor's total bid or, in the case of bids or offers for the construction of streets or highways, including bridges, in excess of one-half of 1 percent of the prime contractor's total bid or ten thousand dollars (\$10,000),

whichever is greater, he or she agrees that he or she is fully qualified to perform that portion himself or herself, and that he or she shall perform that portion himself. If his or her bid is accepted, he or she shall not be permitted to subcontract any portion of the work which he or she is required to perform himself or herself, to substitute any person as subcontractor in place of the subcontractor listed in the original bid, or to permit any such subcontract to be voluntarily assigned or transferred or allow it to be performed by anyone other than the original subcontractor listed in the original bid, except under the conditions set forth in the Subletting and Subcontracting Fair Practices Act.

Should the prime contractor violate any of these provisions, his or her so doing will be deemed a violation of his or her contract and the City may exercise the option, in its own discretion, of (1) canceling his or her contract or (2) assessing the prime contractor a penalty in an amount of not more than ten percent (10%) of the amount of the subcontract involved. The funds recovered through the application of this penalty shall be deposited in the fund out of which the prime contract is awarded.

The Contractor agrees that he or she is as fully responsible to the City for the acts and omissions of his or her subcontractors and of persons either directly or indirectly employed by them, as he or she is for the acts and omissions of persons directly employed by him. The City will deal directly with, and make all payments to the Contractor only.

The Contractor shall be responsible for the coordination of all trades, subcontractors, and suppliers engaged upon the work. Neither the City nor the Engineer will undertake to settle any differences between the Contractor and his/her subcontractors or between subcontractors.

When the subcontracted work is not being prosecuted in a manner satisfactory to the Engineer, the Contractor shall be notified to take corrective action within a specified time. If timely correction is not made, on receipt by the Contractor of written instructions from the Engineer the subcontractor shall be removed immediately from the work. He/she shall not be re-employed on the work.

Nothing contained in the contract documents shall create any contractual relation between any subcontractor and the City.

SECTION 3

NATURE OF CONTRACT/CHANGES IN WORK

3.01 ALTERATIONS

By mutual consent in writing of the parties signatory to the contract, alterations or deviations, increases or decreases, additions or omissions in the plans and specifications may be made and the same shall in no way affect or make void the contract.

3.02 LIMITED CITY POWER

The Contractor recognizes that the City is a public agency and that it can act only through its duly authorized agents, and in this regard agrees that only written change orders, executed as specifically authorized by the governing body of the City either directly or through properly authorized agents, shall be valid. The Consulting Engineer shall have no authority to issue a change order unless so specifically authorized, and no person shall have authority to issue any oral change order. Unless a valid change order is issued therefor, all changes in the work performed by the Contractor shall be at his own risk, and he/she shall not be entitled to any additional compensation on account thereof, and he/she may be required to make the work conform to the Specifications. No act or series of acts by the City during the course of the contract shall be deemed to constitute a waiver of the right of the City to rely upon the provisions of this subparagraph.

3.03 EXTRA WORK

New and unforeseen work will be classed as extra work when such work cannot be covered by any of the various items, or combination of items for which there is a bid price. If extra work orders are given, such work shall be considered a part hereof and subject to each and all of its terms and requirements.

The Contractor shall do no extra work except upon written order from the **Engineering** and Transportation Director. For such extra work the Contractor shall receive payment as previously agreed upon in writing, or he or she shall be paid on force account.

In case of neglect or refusal by the Contractor to perform any extra work which may be authorized by the **Engineering** and Transportation Director or to make satisfactory progress in the execution of the same, the City may employ any person or persons to perform such work and the Contractor shall not in any way obstruct, interfere with, or molest the person or persons so employed.

3.04 CHANGES IN WORK

A. Changes in Accordance with Specifications.

Each change ordered shall be performed in accordance with the Specifications insofar as they may be applied without conflict with the conditions set forth in the change order.

B. Changes Requested by the Contractor.

Changes in the plans and specifications, requested in writing by the Contractor, which do not materially affect the work and which are not detrimental to the work or to the interests of the City, may be granted to facilitate the work, when approved in writing by the Engineer.

If such changes are granted, they shall be made at a reduction in cost or at no additional cost to the City. Nothing herein shall be construed as granting a right to the Contractor to demand acceptance of such changes.

C. Changes Initiated By the City.

At any time during the progress of the work, and without in any way rendering void the contract, the City may order alterations in, additions to, or deductions from the work, and when so ordered in writing, the Contractor shall proceed with the changes directed in such order.

The Contractor shall not be entitled to any extension of time for the completion of the work by virtue of any change order unless, with respect to a change order executed by the Contractor, the change order specifically provides therefore, or, with respect to a change order not so executed, the Contractor, within five days after receipt of the order, files a written claim therefore with the Engineer, in which event he/she shall be entitled to a reasonable extension of time as determined by the Engineer.

The Contractor and the City may agree upon unit prices or lump sums which shall be used to increase or decrease the contract price on account of any change ordered. In the absence of any such agreement, the contract price shall be adjusted as hereinafter provided.

3.05 UNIT PRICE BID ITEMS

Unit prices for individual bid items are used by the City when the exact quantity of an item to be constructed cannot be determined. The Engineer will provide an estimated quantity for purposes of evaluating the bid. Payment for each item will be based upon the actual work completed.

Whenever an item of work or materials is specified in the contract by unit prices and is changed, but by not more than twenty-five percent of the Engineers' estimate of that bid item quantity as specified in the Bid Form, then the contract price shall be increased or decreased by the application of the unit prices so specified.

Whenever said contract item increases or decreases in quantity by more than twenty-five percent, the addition or subtraction from the contract price shall be established in accordance with Section 4-1.03 of the State Standard Specifications.

3.06 GUARANTEE

Except as otherwise expressly provided in the Specifications, and excepting only items of routine maintenance, ordinary wear and tear and unusual abuse or neglect, Contractor guarantees all work executed by him and all supplies, materials and devices of whatsoever nature incorporated in, or attached to the work, or otherwise delivered to City as a part of the work pursuant to the Contract, to be absolutely free of all defects of workmanship and materials for a period of one year after final acceptance of the entire work by the City Council. Contractor shall repair or replace any or all such work or material, together with all or any other work or material which may be displaced or damaged in so doing, that may prove defective in workmanship or material within said one year guarantee period without expense or charge of any nature whatsoever to City. If subsequent repairs are required, the repaired items will be guaranteed free of defects for an additional year from the date of repair.

In the event that Contractor shall fail to comply with the conditions of the foregoing guarantee within ten (10) calendar days time after the date of written notification of the defect, City shall have the right, but shall not be obligated to repair, or obtain the repair of, the defect and Contractor shall pay to City on demand all costs and expense of such repair. Notwithstanding anything herein to the contrary, in the event that any defect in workmanship or material covered by the foregoing guarantee results in a condition which constitutes an immediate hazard to the health or safety, or any property interest, or any person, City shall have the right to immediately repair, or cause to be repaired, such defect, and Contractor shall pay to City on demand all costs and expense of such repair. The foregoing statement relating to hazards to health, safety or property shall be deemed to include either temporary or permanent repairs which may be required as determined in the sole discretion and judgment of City.

3.07 DISPUTED WORK

If the Contractor and the Engineer are unable to reach agreement on disputed work, the Engineering and Transportation Director may direct the Contractor to proceed with the work. Payment shall be as later determined by Section 9.03.

Although not to be construed as proceeding under extra work provisions, the Contractor shall keep and furnish records of disputed work in accordance with Section 9.03.

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SECTION 4

CONTROL OF WORK

4.01 AUTHORITY OF THE ENGINEERING AND TRANSPORTATION DIRECTOR

The Engineering and Transportation Director shall decide any and all questions which may arise as to the quality or acceptability of materials furnished and work performed and as to the manner of performance and rate of progress of the work; all questions which arise as to the interpretation of the plans and specifications; all questions as to the acceptable fulfillment of the contract on the part of the Contractor; and all questions as to claims and compensations.

Any decision of the Engineering and Transportation Director shall be final and he or she shall have executive authority to enforce and make effective such decisions and orders as the Contractor fails to carry out promptly.

4.02 PLANS AND SPECIFICATIONS

The Contractor shall keep at the worksite a copy of the plans and specifications, to which the Engineer shall have access at all times.

The plans, specifications and other contract documents will govern the work. Standard Specifications and plans which are referenced in the drawings or specifications are a part of the contract documents.

While the City has endeavored to accurately represent the physical conditions which may affect the cost of the proposed work shown on the plans or indicated in the specifications, the City does not warrant the completeness or accuracy of such information. It is the Contractor's responsibility to ascertain the existence of any such conditions affecting the cost of the work which would have been disclosed by reasonable examination to the site.

No test, investigation, statement or estimate of a factual situation not incorporated in the contract shall be relied on by the Contractor. Any test, investigation, statement or estimate of fact incorporated in the contract shall be considered by the Contractor to be a suggestion only, and he/she may request equal access to the underlying or background informative material or source and shall arrive at his own opinion thereon, including his/her determination of how reliable might be any conclusion appearing in (or inferred from) the contract.

The Contractor may not rely on "drawings of record" or similarly final or accepted drawings or maps of facilities constructed on public or private property for or under inspection by the City. Such information may be used for reference only. Actual locations and depths shall be determined by field investigations by the Contractor.

The General and Special Provisions apply with equal force to all the work, including extra work authorized.

For convenience, these Specifications are arranged in the several sections indicated, but such separation shall not be considered as the limits of the work required of any separate trade. The terms and conditions of such limitations are wholly between the Contractor and his/her subcontractors.

In general, the drawings will indicate dimensions, position and kind of construction, and the written Specifications will indicate qualities and methods. Work not particularly detailed, marked or specified, shall be as similar parts that are detailed, marked or specified.

4.03 PLANS

All work shall conform to the approved plans.

It is mutually agreed, however, that approval by the Engineering and Transportation Director of the Contractor's working plans does not relieve the Contractor of any responsibility for accuracy of dimensions and details and that the Contractor shall be responsible for agreement and conformity of his or her working plans with the approved plans and specifications.

4.04 CONFORMITY WITH PLANS AND ALLOWABLE DEVIATIONS

Finished surfaces in all cases shall conform to the dimensions shown on the approved plans. Deviations from the approved plans as may be required by the exigencies of construction will be determined in all cases by the Engineering and Transportation Director and authorized in writing.

4.05 COORDINATION OF PLANS, SPECIFICATIONS AND SPECIAL PROVISIONS

During the review of the contract plans, special provisions, or standard specifications, the Contractor and each of his/her subcontractors shall make a written report to the Engineer describing any conflicts, deficiencies, errors or omissions detected, which may create construction problems. The report will enable the Engineer to resolve the items in the report prior to the start of construction.

During the progress of construction, if any further errors, omissions, conflicts or discrepancies are detected, it shall be the Contractor's duty to immediately report them to the Engineer and obtain written instructions resolving deficiencies prior to proceeding with affected work.

Should the Contractor deliberately proceed with any portion or phase of construction which is obviously incorrectly indicated in the contract plans or documents, he/she shall be responsible for any corrective measures required to make adequate repairs or adjustments.

These specifications, the plans, special provisions, and all supplementary documents are essential parts of the contract and a requirement occurring in one is as binding as though occurring in all. They are intended to be cooperative, to describe and to provide for a complete work.

4.06 INTERPRETATION OF PLANS AND SPECIFICATIONS

In case of conflicts between Plans and Specifications, the Specifications control quality, materials and installation requirements; the Plans control size, location and quantity. Should it appear that the work to be done, or any matter relative thereto is not sufficiently detailed or explained in these specifications, plans and the special provisions, the Contractor shall apply to the **Engineering** and Transportation Director for such further explanations as may be necessary and shall conform to such explanation or interpretation as part of the contract, so far as may be consistent with the intent of the original specification.

In the event of any discrepancy between any drawing and the figures written thereon, the figures shall be taken as correct.

4.07 SUPERINTENDENCE

The Contractor shall personally supervise the work under the contract or shall designate in writing to the **Engineering** and Transportation Director the name of his or her representative who shall at all times be present at the site of the work. The authorized representative shall have full authority to direct the work and shall receive and obey orders from the **Engineering** and Transportation Director. Contractor shall provide the Director one week's written notice of change to authorized representative.

4.08 SURVEYING

The Engineer will lay out the work and stake the necessary control points for the Contractor's operations. The Contractor shall give at least **two (2) working days** notice in advance of the time he or she will require staking of any portion of work and he or she shall furnish such facilities and labor necessary for marking and maintaining points set by the Engineer.

The Contractor shall preserve all stakes and points set for lines, grades, or measurements of the work in their proper places until authorized to remove them by the Engineer. All expenses incurred in replacing stakes that have been removed without proper authority shall be paid by the Contractor. This charge will be deducted from monies due or to become due the Contractor.

A. Permanent Survey Markers

The contractor shall notify the Engineer at least **7** days before starting work. This allows the Engineer to take necessary measures to ensure the preservation of survey monuments and benchmarks. The contractor shall not disturb permanent survey monuments or bench marks without the consent of the Engineer. The contractor also shall bear the expense of replacing any that may be disturbed without permission. **Replacement shall be done only by the Engineer.**

When a change is made in the finished elevation of the pavement of any roadway in which a permanent survey monument is located, the contractor shall adjust the monument cover to the new grade unless otherwise specified.

4.09 INSPECTION

The **Engineering** and Transportation Director shall at all times have access to the work during construction and shall be furnished with every reasonable facility for ascertaining that the materials used and employed and the workmanship are in accordance with the requirements and intentions of these specifications. All work done and all materials furnished shall be subject to inspection. Work covered without the favorable review of the Director shall, if required by the Director, be uncovered for inspection at the Contractor's expense.

Whenever the Contractor varies the period during which work is carried on each day, he or she shall give due notice to the **Engineering** and Transportation Director so that proper inspection may be provided. Any work done without proper inspection will be subject to rejection.

The inspection of the work shall not relieve the Contractor of any of his or her obligations to fulfill the contract as prescribed.

If work is to be completed after normal business hours, Contractor shall call the inspector 48 hours in advance to schedule an inspection to be made after normal business hours. Work shall not be covered without inspection.

4.10 COMPACTION TESTS

All compaction tests required by the Engineer shall be by the testing agency currently under contract to the City of Modesto to provide such services. The City shall pay for only the tests which were successfully passed. Any failed test shall be paid for by the Contractor. City shall require re-testing until all required tests are successfully passed.

The testing program, including the numbers and location of tests, shall be under the direction of the Engineer. All compaction test sites deeper than five (5') feet below grade shall be properly shored by the Contractor to protect the testing personnel.

4.11 AUTHORITY OF INSPECTORS

Properly authorized inspectors shall be considered to be the representatives of the City, limited to the duties and powers entrusted to them. It will be their duty to inspect materials and workmanship of those portions of the work to which they are assigned, either individually or collectively under instructions from the **Engineering** and Transportation Director and to report any and all deviations from the drawings, specifications, and other contract provisions which may come to their notice. Any inspector may be considered to have the right to order the work subject to his or her inspection stopped, if in his or her opinion such action becomes necessary, until the **Engineering** and Transportation Director is notified and has determined and ordered that the work may proceed in due fulfillment of all contract requirements.

4.12 REMOVAL OF DEFECTIVE OR UNAUTHORIZED WORK

All work which is defective in its construction, or deficient in any of the requirements of these specifications, shall be remedied or removed and replaced by the Contractor in an acceptable manner, and no compensation will be allowed for such correction.

Any work done beyond the lines and grades shown on the plans, or established by the Engineering and Transportation Director, or any extra work done without written authority, will be considered as unauthorized and will not be paid for.

Upon failure on the part of the Contractor to comply forthwith with any order of the Engineering and Transportation Director made under the provisions of this article, the Engineering and Transportation Director shall have the authority to cause defective work to be remedied or removed and replaced, and unauthorized work to be removed and to deduct the costs thereof from any monies due or to become due to the Contractor.

4.13 BENEFICIAL USE

As a condition to partial payments made hereunder, the City shall have the right to make beneficial use of completed portions of the work. The Contractor shall provide proper access to the work for this purpose, but such use and operation shall not constitute an acceptance of the work until the entire work under this contract is finally accepted by the City Council. The City shall perform normal maintenance on approved portions of work placed in service. Nothing in this section shall be construed as relieving the Contractor from full responsibility for correcting defective work or materials.

Such action by the City will not relieve the Contractor of responsibility for injury or damage to said completed portions of the improvement resulting from use by public traffic or from the action of the elements or from any other cause, injury or damage resulting from the Contractor's operations or negligence. The Contractor will be required to re-clean such portions of the improvement before field acceptance.

4.14 FINAL INSPECTION

Before final inspection of the work, the Contractor shall clean the project site and all ground occupied by him in connection with the work of all rubbish, excess materials, false work, temporary structures and equipment. All parts of the work shall be left in a neat and presentable condition. Full compensation for final cleaning up will be considered as included in the prices paid for the various contract items of work and no separate payment will be made therefor.

Upon completion of the final inspection, when the work is found to be in compliance with these specifications, the Engineering and Transportation Director will recommend to the City Council acceptance of the completed work. The work is not complete until accepted by the City Council.

4.15 ADDITIONAL AND EMERGENCY PROTECTION

Whenever, in the opinion of the Engineering and Transportation Director, the Contractor has not taken sufficient precautions for the safety of the public or the protection of the works to be constructed under this contract, or of adjacent structures on property which may be injured by processes of construction on account of such neglect, and whenever, in the opinion of the Engineering and Transportation Director, an emergency shall arise and immediate action shall be considered necessary in order to protect public or private, personal or property interests, then and in that event, the Engineering and Transportation Director, with or without notice to the Contractor, may provide suitable protection to the said interests by causing such work to be done and such material to be furnished as shall provide such protection as the Engineering and Transportation Director may consider necessary and adequate.

The cost and expense of such work and material so furnished shall be borne by the Contractor and if the same shall not be paid on presentation of the bills therefor, then such costs shall be deducted from any amounts due or to become due the Contractor. The cost shall be determined in accordance with a schedule of fees approved by the City Council for encroachment permits.

The performance of such emergency work under the direction of the Engineering and Transportation Director shall in no way relieve the Contractor from any damages which may occur during or after such precaution has been taken by the Engineering and Transportation Director.

4.16 CONFERENCES

A preconstruction conference will be held prior to commencing work. The City shall designate a date and time for a preconstruction conference. The Contractor shall, at the preconstruction conference or within five calendar days after Notice To Proceed, whichever occurs first, present a project construction schedule and traffic control plan.

Prior to commencing work and at any time during the progress of the work, the Engineering and Transportation Director shall have authority to call meetings with the Contractor and any of his employees or subcontractors on this project as deemed necessary to discuss details of construction or interpretation of contract documents. No additional compensation for attendance at such meetings shall be allowed.

The Engineers' approval will be given only if he/she is satisfied that the Contractor's construction schedule is sufficiently detailed to show clearly the work to be completed during each month and, if adhered to, will be adequate to assure the completion of the work within the time for completion set forth in the Special Provisions.

4.17 SUBSURFACE DATA

All soil and test soil data, water table elevations, and soil analyses included or referred to in the Contract Documents apply only at the location of the test holes and to the depths

indicated. Soil test reports for test holes which have been drilled are available for inspection at the office of the Engineer. Any additional subsurface exploration shall be done by bidders or the Contractor at their own expense.

The indicated elevation of the water table is that existing at the date the test hole data was determined. It is the Contractor's responsibility to determine and allow for the elevation of ground water at the date of project construction. A difference in elevation between ground water shown in soil boring logs and ground water actually encountered during construction will not be considered as a basis of extra work.

4.18 DIFFERING SITE CONDITIONS

During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the contract, are encountered at the site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before they are disturbed and before the affected work is performed.

Upon written notification, the Engineer will investigate the conditions, and if the Engineer determines that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, an adjustment, excluding loss of anticipated profits, will be made and the contract modified in writing accordingly. The Engineer will notify the Contractor of his determination whether or not an adjustment of the contract is warranted.

Pursuant to Section 25914.2 of the California Health and Safety Code, in the event the contractor encounters on the site materials he or she reasonably believes to be asbestos or a hazardous substance, and the asbestos or hazardous substance has not been rendered harmless, the contractor may continue work in unaffected areas reasonably believed safe and shall immediately cease work on the area affected and report the condition to the Engineer in writing. If the Engineer determines that asbestos or hazardous substances which were not disclosed in the bid are present on the site, all work regarding the removal of those substances will be performed pursuant to a separate contract.

No contract adjustment which results in a benefit to the Contractor will be allowed unless the Contractor has provided the required written notice.

No contract adjustment will be allowed under the provisions specified in this section for any effects caused on unchanged work.

Any contract adjustments warranted due to differing site conditions will be made in accordance with Section 9.03 or Section 9.06

4.19 **HOURS OF WORK**

a) General Hours of Work

Work areas will be available for performance of the contract between 7:00 am and 5:00 pm, excluding Saturday, Sunday and Holidays. Work performed during hours and /or on days other than specified above shall be the subject of a written request to the City. If permission is granted, the Contractor shall bear all additional expenses of City's personnel and inspection services created by change to extraordinary work hours.

b) Signal System Shutdowns

Signal system shutdowns shall occur only between the hours of 9:00 a.m. and 3:00 p.m. Unless waived by the City, Signal shutdowns will be limited to those hours. Contractors working on signals outside these hours shall pay a signal system shutdown penalty.

Signal System Shutdown Penalty: It is agreed by the parties to the contract or encroachment permit that in case signal system shutdowns occur during hours other than the hours between 9:00 a.m. and 3:00 p.m., damage will be sustained by the City of Modesto, and that is and will be impracticable to determine the actual damage which the City of Modesto will sustain, in the event of any, by reason of such signal system shutdowns that occur before 9:00 a.m. or after 3:00 p.m. and it is therefore agreed that the Contractor will pay to the City of Modesto the sum of One Hundred and no/100ths Dollars (\$100.00) per every hour (60 minutes), or part thereof, of signal system shutdown before 9:00 a.m. or after 3:00 p.m. The Contractor or permittee agrees to pay such liquidated damages as herein provided, and in case the same are not paid, agrees that the City of Modesto may deduct the amount thereof from any money due the Contractor under the contract.

The Signal System Shutdown Penalty as provided for herein may be waived by the City of Modesto if the Contractor installs a temporary traffic signal system for signal system shutdowns which occur during hours other than the hours between 9:00 a.m. and 3:00 p.m.

The installation of a temporary traffic signal system by the Contractor as provided for herein shall require prior written authorization by the City Engineer. Prior to installation, the Contractor shall submit a supplemental Equipment List and Drawings to the City Engineer for approval of each such temporary traffic signal system and any modification thereto, including, but not limited to, equipment and location.

Full compensation for furnishing, installation, maintaining and removing temporary traffic signal equipment shall be considered as included in the contract lump sum price for the signal item involved and no additional compensation will be allowed therefor.

4.20 CONSTRUCTION SCHEDULE

Prior to the start of any work, the Contractor shall submit a proposed construction schedule to the Engineer. The construction schedule shall be in the form of a tabulation, chart, or graph and shall be in sufficient detail to show chronological relationship of all activities of the project. These include, but are not limited to, estimated starting and completion dates of various activities, submittal of shop drawings, procurement of materials, and scheduling of equipment. The construction schedule shall be consistent in all respects with the time and order of work requirements of the contract.

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SECTION 5

CONTROL OF MATERIALS

5.01 SAMPLES AND TESTS

At the option of the Engineering and Transportation Director, the source of supply of all materials furnished by the Contractor shall be approved by the Engineering and Transportation Director before delivery is started and before such material is used in the work. Representative preliminary samples of the character and quality prescribed shall be submitted by the Contractor or producer of all materials to be used in the work for testing or examination as desired by the Engineering and Transportation Director.

All tests of materials furnished by the Contractor shall be made in accordance with commonly recognized industry standards and such special methods and tests as are prescribed in these specifications.

The Contractor shall furnish without charge such samples of materials as are required by the Engineering and Transportation Director. No material shall be used until it has been approved by the Engineering and Transportation Director. Samples will be secured and tested whenever necessary to determine the quality of the materials.

The Contractor shall be responsible for, and shall pay for, all source quality control and all offsite tests of materials required, except laboratory work for soil relative compaction testing and concrete strength testing during construction. The City Engineer shall have the right to witness all offsite tests and the Contractor shall furnish adequate notice of when tests will be made.

The City shall furnish and pay for all initial onsite-testing services required by the Contract Documents. When initial tests indicate non-compliance with the Contract Documents, all subsequent re-testing occasioned by the non-compliance shall be performed by the same testing laboratory and the cost thereof will be deducted from the Contract Sum.

Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor. Functional testing of mechanical and electrical equipment shall be the sole responsibility of the Contractor.

When, in the opinion of the City Engineer, additional tests or inspections are required because of the manner in which the Contractor executes his work, such tests and inspections shall be paid for by the City, but will be deducted from the Contract Sum. Examples of such tests and inspections are tests of materials substituted for previously accepted materials or substituted for specified materials, re-tests made necessary by failure of materials to comply with the requirements of the Specifications, load tests made necessary because of portions of the structure not fully meeting Specifications or plan requirements, etc.

5.02 SUBMITTAL

Contractor shall submit shop drawings, product literature, etc., as required in the specifications, for review by the City Engineer. Prior to the commencement of work, the Contractor shall submit seven (7) copies of all equipment and material that are to be furnished to the project, including all substitutions in accordance with Section 5.07 for approval by the Engineer. Shop drawings shall be submitted at least 21 calendar days before approved drawings will be required for the work. Submitted materials may not be used in the work until favorably reviewed by the City Engineer. Shop drawings shall be of a size and scale to clearly show all necessary details. Submittals will be marked as follows:

A. No Exceptions Taken:	Accepted subject to its compatibility with future submissions and additional partial submissions for portions of the work not covered in this submission. Does not constitute approval or deletion of specified or required items not shown in the partial submission.
B. Make Corrections Noted: (No Re-submittal Required)	Same as "A", except that minor corrections as noted shall be made by the Contractor.
C. Amend and Resubmit:	Rejected because of major inconsistencies or errors which shall be resolved or corrected by the Contractor prior to subsequent review by the Engineer.
D. Rejected - Resubmit:	Submitted material does not conform to plans and specifications in major respect, i.e.: wrong size, model, capacity or material.

Items "A" and "B" above (no re-submittal required) are considered "favorable review" of a submittal. Items "C" and "D" above (correction and re-submittal required) are considered "unfavorable review."

Favorable review by the City Engineer will not constitute acceptance by the City Engineer of any responsibility for the accuracy, coordination and completeness of the shop drawings or the items of equipment represented on the drawings. Accuracy, coordination, and completeness of shop drawings shall be the sole responsibility of the Contractor, including responsibility to back-check comments, corrections, and modifications from the City Engineers' review before fabrications.

Preparation of re-submittal of unfavorably reviewed submittals will not be reason for additional compensation.

5.03 PROTECTION OF WORK AND MATERIALS

The Contractor shall provide and maintain storage facilities and employ such measures as will preserve the specified quality and fitness of materials to be used in the work. Stored materials

shall be reasonably accessible for inspection. The Contractor shall also adequately protect new and existing work and all items of equipment for the duration of his/her contract. The Contractor shall not, without the City's consent, assign, sell, mortgage, hypothecate, or remove equipment or materials which have been installed or delivered and which may be necessary for the completion of the contract.

5.04 DEFECTIVE MATERIALS

All materials not conforming to the requirements of these specifications shall be considered as defective, and all such materials, whether in place or not, shall be rejected and shall be removed immediately from the site of the work unless otherwise permitted or directed by the Engineering and Transportation Director. No rejected materials, the defects of which have been subsequently corrected, shall be used until approved in writing by the Engineering and Transportation Director.

Upon failure on the part of the Contractor to comply with any order of the Engineering and Transportation Director made under the provisions of this article, the Engineering and Transportation Director shall have authority to remove and replace defective material and to deduct the cost of removal and replacement from any monies due or to become due to the Contractor.

5.05 CERTIFICATES OF COMPLIANCE

A Certificate of Compliance shall be furnished prior to the use of any materials for which these specifications require that such a certificate be furnished. In addition, when so authorized in these specifications, the City Engineer may permit the use of certain materials or assemblies prior to sampling and testing if accompanied by a Certificate of Compliance. The certificate shall be signed by the manufacturer of the material or the manufacturer of assembled materials and shall state that the materials involved comply in all respects with the requirements of the specifications. A Certificate of Compliance shall be furnished with each lot of material delivered to the work and the lot so certified shall be clearly identified in the certificate.

All materials used on the basis of a Certificate of Compliance may be sampled and tested at any time. The fact that material is used on the basis of a Certificate of Compliance shall not relieve the Contractor of responsibility for incorporating material in the work which conforms to the requirements of the plans and specifications and any such material not conforming to such requirements will be subject to rejection whether in place or not.

5.06 DISPOSAL OF EXCESS MATERIAL

Excess material shall be disposed of in a legal manner. Disposal on private property will be done only with the prior written consent of the property owner.

5.07 SUBSTITUTIONS

If the Contractor desires to make a substitution, he shall submit complete product information to document the equipment or material being offered as being equal to that specified. No substitutions will be allowed until requested and approved in writing. Only equipment and/or materials approved by the City Engineer may be substituted. The City Engineer reserves the right to require the originally specified equipment and/or materials.

Shop drawings shall be submitted in a complete package. Partial or incomplete submittals will not be considered.

The specified contract completion time shall not be affected by any circumstance developing from the provisions of this subsection.

Installation of an approved substitution shall be the Contractor's responsibility, and any revisions necessary for the installation of approved substituted materials and/or equipment shall be made without additional expense to the City of Modesto.

5.08 AS-BUILT PLANS

The Contractor shall maintain one set of full size prints and mark thereon any deviations from plan dimensions, elevations, or orientations, and shall submit same in good condition to the City Engineer upon completion of the job as a condition of acceptance of the project. Marked prints shall be updated at least once each week and shall be available to the City Engineer for review as to currency prior to developing partial payment estimates.

5.09 MANUALS

The Contractor shall furnish in a three-ring binder a manual for all contractor installed components requiring maintenance manuals. These shall include electronic products such as traffic signals, vehicle detector systems, amplifiers, and various controllers as well as mechanical items. The manuals may be combined into one manual. The manual or combined manuals shall be submitted at the time the controllers are delivered for testing or, if ordered by the City Engineer, prior to purchase. The manual shall include, but need not be limited to, the following items:

- a. Specifications
- b. Design characteristics
- c. General operations theory
- d. Function of all controls
- e. Trouble shooting procedure (diagnostic routine)
- f. Block circuit diagram
- g. Geographical layout of components
- h. Schematic diagrams
- i. List of replaceable component parts with stock numbers

SECTION 6

UTILITIES

6.01 LOCATION

The City will search known records and indicate on the plans those utilities, except service connections, which may affect the work. Any available information regarding removal, relocation, or disconnection of utilities, or installation of new utilities, will be furnished to prospective bidders before the receipt of bids. The Contractor shall immediately report to the City Engineer those utilities omitted from the plans or found substantially at variance with the location shown.

At least two (2) working days prior to commencing work, the Contractor shall request utility owners to mark or otherwise indicate the location of their substructures. The location of utilities as shown on the plans are approximate and are not to be construed as certainty. It shall be the Contractor's responsibility to determine the true location and depth of all utilities and service connections affecting or conflicting with the work, prior to the performance of the work. He/she shall also familiarize himself/herself with the type, material, age and condition of any utility which may be affected by the work.

6.02 PROTECTION

The Contractor shall not interrupt the service function or disturb the supporting base of any utility, without authority from the utility owner or order from the City Engineer.

Where protection is required to insure support of utilities located substantially as shown on the plans or in accordance with other information furnished bidders prior to receipt of bids, or for underground service connections, the Contractor shall, unless otherwise provided, furnish and place the necessary protection at his/her expense.

Upon learning of the existence and location of any utility omitted from or shown incorrectly on the plans, the Contractor shall notify the owner and be fully responsible for protecting such utility.

The Contractor shall immediately notify the City Engineer and the utility owner if he disturbs, disconnects or damages any utility. If the utility is located substantially as indicated on the plans or as marked in the field, the Contractor shall bear the costs of repair or replacement.

When placing concrete around or contiguous to any utility, the Contractor shall at his expense, furnish and install a cushion of expansion joint material, clear opening, or sleeve, or by other suitable means shall prevent embedment in or bonding with the concrete.

6.03 NOTIFICATION

The Contractor shall give written 48-hour advance notice to all customers who will be affected during an outage of any utility.

6.04 REMOVAL

Unless otherwise specified, the Contractor shall remove all portions of interfering utilities shown on the plans as “abandoned” or “to be abandoned in place”. Before starting removal operations, the Contractor shall ascertain from the utility owner whether abandonment is complete. The costs involved in the removal and disposal shall be absorbed in the Contractor’s bid.

6.05 RELOCATION

When feasible, the owners of utilities within the area affected by the work will complete their necessary installations, relocations, repairs, or replacements before commencement of work by the Contractor. When the Special Provisions or plans indicate that a utility is to be relocated, altered or constructed by others, the City will conduct all negotiations with the owners and the work will be done at no cost to the Contractor.

Utilities, found by the Engineer to interfere with the permanent project work after award of the contract, will be relocated, altered, or reconstructed by the utility owners, or the Engineer may order changes in the work to avoid interference. Such changes will be paid for in accordance with Section 3.

When the plans or specifications provide for the Contractor to alter, relocate, or reconstruct a utility, all costs for such work shall be absorbed in the Contractor’s bid. Temporary or permanent relocation or alteration of utilities desired by the Contractor for his own convenience shall be his/her responsibility, and he/she shall make all arrangements and bear all cost. The Contractor may, for his/her own convenience or to expedite the work, agree with the owner of any utility to disconnect and reconnect interfering service connections. The City shall not be involved in any such agreement.

6.06 DELAYS

The Contractor is responsible for notifying utility owners in time to prevent delays attributable to utility relocations or alterations as called for in the Contract Documents. The Contractor shall not be entitled to damages or additional payment if such delay does occur. The Engineer will determine the extent of the delay on the project as a whole, and any commensurate extension of time.

6.07 COOPERATION

When necessary, the Contractor shall so conduct his/her operations as to permit access to the worksite and provide time for utility work to be accomplished during the progress of the contract work.

6.08 EXISTING UTILITIES

In case it shall be solely convenient for the Contractor to remove any telephone, telegraph or electric power transmission poles, gas pipes, water pipes, electrical conduits, or underground structures of any character, or any portion thereof, the owner thereof or their agents or superintendents, upon proper application of the Contractor shall be notified by the Engineering and Transportation Director to remove same within a specified time, and the Contractor shall not interfere with said structures until the time specified in the said notice shall have expired.

Any charges levied for such removal by the utility shall be at the sole expense of the Contractor.

The right is reserved to municipal corporations, county authorities, and to water, gas, telephone, telegraph and electric power transmission utilities, to enter upon any public highway, road or right of way, for the purpose of making repairs and changes that have become necessary by reason of the improvement thereof.

It shall be the sole responsibility of the Contractor to maintain in operating condition any ditches, canals, pipes, conduits, wires, diversion boxes, and other appurtenances therefor during such times as the same may be in use for irrigation or conveying and distributing irrigation water. Contractor shall make any necessary arrangements with the distributors of such irrigation water to coordinate his or her construction under these specifications with said irrigation so as to cause no interruption thereof.

Any such irrigation works damaged or removed by the Contractor shall be repaired or replaced by him at his or her sole expense and to the satisfaction of the Engineering and Transportation Director.

The Contractor is responsible for determining the exact location of all existing utilities and for the protection of and repair of damage to them. Contact Underground Service Alert, 1-800-642-2444 or 1-800-227-2600, 48 hours before work is to begin.

6.09 UTILITY COMPANIES

The following utilities may be effected during construction and it shall be the Contractor's responsibility to contact each, prior to commencement of the work and at such other times that it becomes necessary during construction:

1. City of Modesto
2. Pacific Telephone
3. Modesto Irrigation District
4. Pacific Gas and Electric
5. Post Newsweek Cable
6. Fiber Optics Companies (Level 3, Adelphi, GST, Williams Communication, 360 Networks, FiberCom, All Star, and others)

The Contractor shall locate, preserve and protect from damage all surface and underground utilities within the area of construction. Call Underground Service Alert (USA), 1-800-642-2444, forty-eight (48) hours prior to start of construction for locating lines of member utilities.

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SECTION 7

LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC

7.01 LAWS TO BE OBSERVED

The Contractor shall comply with:

- (a) all state and federal laws and regulations including, but not limited to, Occupational Safety and Health Acts,
- (b) all municipal ordinances and regulations of the City of Modesto,
- (c) all orders and decrees of bodies or tribunals having any jurisdiction or authority,
- (d) National Electrical Code, Uniform Building Code, Uniform Plumbing Code,
- (e) Section 504 of the Rehabilitation Act of 1983 as incorporated in the Revenue Sharing Act. Each bidder shall submit with his or her bid, certification that he or she is in compliance with this Act as specified in Section 51.55 of the General Sharing Regulations, summarized in the City of Modesto policy statement on nondiscrimination of the handicapped, which laws, ordinances, regulations, orders or decrees in any manner affect those engaged or employed in the work or material used in the work, or which in any way affect the conduct of the work.

All Contractors working on signal standards shall apply and receive Special Dispensation from the California Occupational Safety and Health Administration to conduct operations no closer than 6 feet, but within 10 feet of a high voltage line prior to erecting signal standards.

7.02 EMPLOYMENT

Nondiscrimination -

In connection with the performance of work under this contract, the Contractor agrees that neither he or she nor any subcontractor who performs any work or labor or renders any service pursuant hereto shall discriminate against any employee or applicant for employment because of race, sex, creed, color, national origin or handicapped status.

Affirmative Action Program Certification -

Each bidder shall submit with his or her bid, certification that he or she is in compliance with the Civil Rights Act of 1964, Executive Order No. 11246, the California Fair Employment Practices Act, and any other applicable federal and state laws and regulations relating to equal opportunity employment.

The Contractor shall submit a statement each month while the project is in progress certifying that he or she is in compliance with the above laws and regulations. The certification shall be on a form approved by the City. The project is considered as being in progress upon issuance of the Notice to Proceed and until the project is accepted by the City Council.

If, on or before the 25th of any month, the Contractor has not submitted the required certificate for the current month, the City will retain from the monthly estimate an amount equal to two percent (2%) of the estimated value of the work performed during the month, except that such retention shall not exceed Two Thousand Dollars (\$2,000.00) nor be less than Five Hundred Dollars (\$500.00). Retentions for failure to submit a certificate shall be in addition to all other retentions provided for in this contract. After the required certificate is received, the retention for that certificate will then be released with the next monthly partial payment which is made.

Apprentices -

The Contractor and all subcontractors shall comply with the provisions of Section 1777.5 et seq of the California Labor Code. The responsibility for compliance with these provisions is fixed with the prime contractor for all apprenticeable occupations.

If the prime contract involves less than Thirty Thousand Dollars (\$30,000.00) or twenty (20) days, Labor Code Section 1777.5 shall not apply.

7.03 HOURS OF LABOR

The Contractor shall forfeit as penalty to the City of Modesto, Twenty-five Dollars (\$25.00) for each worker employed in the execution of the contract by him or her or by any subcontractor, for each calendar day during which any worker is required or permitted to labor more than eight (8) hours in violation of the provisions of the Labor Code, and in particular, Sections 1810 to Section 1815. However, work performed by any worker in excess of 8 hours per day shall be permitted upon compensation for all hours worked in excess of eight hours a day at not less than one and one-half times the basic rate of pay as provided in the Labor Code.

7.04 PREVAILING WAGES (WHEN REQUIRED BY SPECIAL PROVISIONS)

Bidders are hereby notified that pursuant to Section 1770 et seq. of the Labor Code of the State of California, the Director of the Department of Industrial Relations of the State of California has ascertained the general prevailing rate of hourly wages and rates for overtime, Saturday, Sunday and holiday work in the locality where this work is to be performed for each craft or type of worker or mechanic needed to execute the contract which will be awarded the successful bidder. Refer to "GENERAL WAGE DETERMINATION MADE BY THE DIRECTOR OF INDUSTRIAL RELATIONS PURSUANT TO CALIFORNIA LABOR CODE PART 7, CHAPTER 1, ARTICLE 2, SECTIONS 1770, 1773, and 1773.1" which is on

file in the office of the City Clerk, City Hall, 801 Eleventh Street, Modesto, California, and is available to any interested party on request. The Contractor shall post a copy of the prevailing wage rates at each job site.

The Contractor and all subcontractors shall comply with the provisions of Section 1776 of the California Labor Code, regarding payroll records. Compliance with said Section 1776 shall be the Contractor's responsibility.

The Contractor shall comply with the provisions of Labor Code Section 1775. In accordance with said Section 1775, the Contractor shall forfeit, as a penalty to the City of Modesto, Twenty-five Dollars (\$25.00) for each calendar day, or portion thereof, for each worker paid less than the stipulated prevailing rates for such work or craft in which such worker is employed for any public work done under the contract by him or by any subcontractor under him. In addition to said penalty, the Contractor shall pay to each worker the difference between the stipulated prevailing wage rate and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate.

The Contractor may pay compensation to workers in excess of the prevailing wage rate as determined above; however, such payments shall not be the basis for any claim for additional compensation to the Contractor by the City. The possibility of wage increases is one of the elements to be considered by the Contractor in determining his or her bid, and will not under any circumstances be considered as the basis for any claim for additional compensation by the City to the Contractor.

The **Engineering** and Transportation Director will require submittal of Certified Payrolls from the Contractor when in his or her opinion they are needed to verify that the Contractor is in compliance with the State Labor Code or when needed to confirm the cost of work being done or the cost of proposed changes on the project. The payrolls shall be on a form and at a frequency as required by the **Engineering** and Transportation Director.

If certified payrolls are requested and if, on or before the 20th of the month the Contractor has not submitted satisfactory certified payrolls for all work performed during the monthly period ending on or before the 6th of that month, the City will deduct an amount equal to 10 percent (10%) of the estimated value of the work performed during the month from the next monthly estimate, except that such deduction shall not exceed \$10,000 nor be less than \$1,000 for each month. Deductions for failure to submit satisfactory certified payrolls shall be in addition to all other deductions/retentions provided for in this contract or by State/Federal law. The deduction for failure to submit certified payrolls for each monthly period will be released for payment on the monthly estimate for partial payments next following the date that all the satisfactory certified payrolls for which the deduction was made are submitted. The total of all deductions being held for certified payroll record submittal can be more than the aforementioned limits, since each month's deduction stands on its own, and consequently, can accumulate beyond the \$10,000 limit.

7.05 PERMITS AND LICENSES

The Contractor shall procure all permits and licenses, pay all charges and fees and give all notices necessary and incidental to the due and lawful prosecution of the work.

7.06 PATENT FEES AND ROYALTIES

The Contractor shall absorb in his/her bid, the patent fees or royalties on any patented article or process which may be furnished or used in the work. The Contractor shall indemnify and hold the City harmless from any legal action that may be brought for infringement of patents

7.07 COOPERATION AND COLLATERAL WORK

The Contractor shall be responsible for ascertaining the nature and extent of any simultaneous, collateral and essential work by others. The City, its workmen and contractors, and others, shall have the right to operate within or adjacent to the worksite to perform such work.

The City reserves the right to award other contracts in connection with the total project, the work under which may proceed simultaneously with the work to be done under this contract. The Contractor shall coordinate his/her operations with those of other contractors.

Cooperation will be required in the arrangement for the storage of materials, and in the detailed execution of the work. The Contractor, including his/her subcontractors, if any, shall keep himself/herself informed of the progress and the detail work of other contractors and shall notify the Engineer immediately of lack of progress or defective workmanship on the part of other contractors, where such delay or such defective workmanship will interfere with his/her operations. Failure of the Contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by him/her of the status of the work as being satisfactory for proper coordination with his/her own work. The Contractor and each other contractor shall adjust, correct and coordinate his/her work with the work of others, so that no discrepancies shall result in the whole work.

If the Contractor or any of his subcontractors or employees cause loss or damage to any separate contractor on the work, the Contractor, by agreement or arbitration, if he/she deems it necessary, will settle any claim for such loss or damage. If such separate contractor shall sue the Owner, on account of any loss so sustained, the Owner shall notify the Contractor, who shall indemnify and save harmless the Owner against any loss or damage arising therefrom, including the cost and expense of defending any such suit.

The City, the Contractor, and each of such workmen, contractors, and others, shall coordinate their operations and cooperate to minimize interference.

The Contractor shall absorb in his/her bid all costs involved in his/her part as a result of coordinating his/her work with others. The Contractor will not be entitled to additional

compensation from the City for damages resulting from such simultaneous, collateral and essential work. If necessary to avoid or minimize such damage, or delay, the Contractor shall redeploy his/her work force to other parts of the work.

Where work of one trade joins or is on other work, there shall be no discrepancy when same is completed. In engaging one kind of work with another, marring or damaging same will not be permitted. Should improper work of any trade be covered by another which results in damage or defects, the whole work affected shall be made good by the Contractor without expense to the City.

7.08 USE OF PREMISES

Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Project site and land and areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, right-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereto or of any land or areas contiguous thereof, resulting from the performance of the Work. Should any claim be made against the City by any such owner or occupant because of the performance of the Work, Contractor shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim by arbitration or at law. Contractor shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold City harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of engineers, architect, attorneys and other professional and court and arbitration costs) arising directly or consequentially out of any action, legal or equitable, brought by any such other party against City to the extent based on claim arising out to Contractor's performance of the Work.

7.09 PROJECT SITE MAINTENANCE

Cleanup and Dust Control. Throughout all phases of construction, including suspension of work, and until final acceptance of the project, the Contractor shall keep the work site clean and free from rubbish and debris. The Contractor shall also abate dust nuisance by cleaning, sweeping, and sprinkling with water, or other means as necessary. The use of water resulting in mud on public streets will not be permitted as a substitute for sweeping or other methods.

The Contractor shall be required to apply water for dust control at all times. This includes Saturdays, Sundays and holidays. If dust control is not adequate in the opinion of the Engineer, the Engineer will have this work done by others and will deduct such cost from the local contract price.

When construction operations cause dirt to be deposited on public streets, the Contractor shall furnish and operate a self-loading motor sweeper with spray nozzles at least once each working day to keep paved areas clean whenever construction, including restoration, is incomplete.

Materials and equipment shall be removed from the site as soon as they are no longer necessary. Upon completion of the work and before final inspection the entire worksite shall be cleared of equipment, unused materials, and rubbish so as to present a satisfactory clean and neat appearance. All cleanup costs shall be absorbed in the Contractor's bid. All traffic signs and street signs within the limit of work necessarily removed during the various phases of operations shall be temporarily re-set by the Contractor at or near the original location upon completion of each phase of construction operations. Prior to removal of all traffic, street and traffic control signs, the Contractor shall take photographs of the site which show the existing location of these signs, so that upon completion the photographs will aid in resetting the signs at or near their original location. Traffic control signs and street signs will be replaced upon completion of the work and the cost of removal and replacement will be included in various bid items no separate payment will be made as such. Rural type mail boxes shall be maintained by the Contractor in a manner satisfactory to the property owner and postal service, and the Contractor shall relocate same as soon as possible to a permanent location in accordance with postal regulations and in a location acceptable to the property owner.

Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately and the area cleaned.

Excess excavated material from catch basins or similar structures shall be removed from the site immediately. Sufficient material may remain for use as backfill if permitted by the specifications. Forms and form lumber shall be removed from the site as soon as practicable after stripping.

Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

Earth dams will not be permitted at catch basin openings, local depressions, or elsewhere, except in time of emergency. Temporary dams of sand bags, asphaltic concrete or other acceptable material may be permitted when necessary to protect the work, provided their use does not create a hazard or nuisance to the public. Such dams shall be removed from the site as soon as their use is no longer necessary.

Failure of the Contractor to comply with the Engineers' cleanup orders may result in an order to suspend work until the condition is corrected. No additional compensation will be allowed as a result of such suspension.

Vermin Control - At the time of acceptance, structures entirely constructed under the contract shall be free of rodents, insects, vermin and pests. Necessary extermination work shall be arranged and paid for by the Contractor as part of the contract work within the contract time and shall be performed by a licensed agency in accordance with requirements of governing authorities. The Contractor shall be liable for injury to persons or property and responsible for the elimination of offensive odors resulting from extermination operations.

Sanitation - The Contractor shall provide and maintain enclosed toilets for the use of employees engaged in the work. These accommodations shall be maintained in a neat and sanitary condition. They shall also comply with all applicable laws, ordinances and regulations pertaining to the public health and sanitation of dwelling and camps.

Sewage flows shall not be interrupted. Should the Contractor disrupt existing sewer facilities, sewage shall be conveyed in closed conduits and disposed of in a sanitary sewer system. Sewage shall not be permitted to flow in trenches or be covered by backfill.

7.10 TEMPORARY LIGHT, POWER, AND WATER

The Contractor shall at his or her own expense, furnish, install, maintain, and remove all temporary light, power, and water, including piping, wiring, lamps, and other equipment, necessary for the work. The Contractor shall not draw water from any fire hydrant, except to extinguish a fire, without first obtaining the necessary permits and metering devices. Contractor shall make prompt payment for use of temporary utilities.

7.11 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS

The Contractor shall be responsible for the protection of public and private property adjacent to the work and shall exercise due caution to avoid damage to such property.

Unless otherwise provided, the Contractor shall repair or replace all existing improvements (e.g., curbs, sidewalks, driveways, fences, signs, utilities, street surfaces, structures, etc.) damaged or removed as a result of his/her operations. Repairs and replacements shall be at least equal to existing improvements, and shall match them in finish and dimension.

Trees, lawns, and shrubbery not designated for removal shall be protected from damage or injury. If damaged or removed because of the Contractor's operations, they shall be restored or replaced in as nearly the original condition and location as is reasonably possible. Lawns shall be reseeded and covered with suitable mulch.

All costs to the Contractor for protecting, removing, and restoring existing improvements shall be absorbed in his/her bid.

7.12 PUBLIC CONVENIENCE AND SAFETY

- A. The Contractor shall so conduct his or her operations as to cause the least possible inconvenience to the general public and residents of the vicinity. Public convenience and safety shall conform to Section 7-1.08 "Public Convenience" and Section 7-1.09, "Public Safety of the State Standards," and the Cal Trans Manual of Traffic Control. Where lane or street closures are required for the prosecution of the work, the Contractor shall submit a traffic control plan to the Engineer for approval 72 hours before closure.

Traffic controls through the construction zone shall be designed and maintained by a designated individual qualified in this responsibility. Evidence of qualification may be a

Certificate of Completion of a course titled "Safety Through Maintenance and Construction Zones," issued by ITE.

The Contractor shall furnish, erect, and maintain such fences, barriers, lights and signs as are necessary to give adequate warning to the public at all times that the work is in progress and of any dangerous conditions to be encountered as a result thereof, and he or she shall also erect and maintain such warning signs as may be required by the City of Modesto. Temporary traffic controls and markings shall be removed when no longer needed.

- B. Before excavating any trench 5 feet or more in depth, the Contractor shall submit a detailed plan to the City Engineer showing the design of shoring, bracing, sloping, or other provisions to be made for the workers' protection from the hazard of caving ground during the excavation of such trench. If the plan varies from the shoring system standards, the plan shall be prepared by a registered Civil Engineer. No excavation shall start until the City Engineer has accepted the plan and the Contractor has obtained a permit from the State Division of Industrial Safety. A copy of the permit shall be submitted to the City Engineer.
- C. Notice to Agencies - The Contractor shall notify in writing all agencies having jurisdiction at least forty-eight (48) hours, excluding holidays and weekends, prior to instituting any lane closure or detour. At the end of each day's work, the Contractor shall inform the ambulance services, police and fire departments of the status of all detours and/or lanes or road closures. The Contractor shall cooperate with the U.S. Postal Service as well as the various parties involved in collection and removal of trash and garbage and the Bus Services to maintain existing schedules for these services.
- D. Emergency Vehicle Access Through Detours - During all detours and/or street closures the Contractor shall provide for movement of emergency vehicles through the work area. It is essential that the Contractor's work and equipment does not impede egress from any fire or police station to other areas of their service area.
- E. Access to Private Property - The Contractor shall schedule operations to minimize disruption of access to private property. Prior to blocking access to any private driveway or parking lot entrance, the Contractor shall notify the resident or business owner or tenant of pending closure and allow residents to remove vehicles. During non-working hours no driveway, house or parking lot shall be denied access to a public roadway.
- F. Night Detours - The Contractor shall not be permitted to maintain any lane closure or road closure during non-working hours without first obtaining written approval of the Engineer. During non-working hours the Contractor shall restore travel lanes to their original alignment and configuration by means of backfilling and temporary pavement or bridging. The Contractor shall place "ROUGH ROAD" signs conforming to the Manual of Traffic Control at uneven temporary pavement or bridging.

- G. Parking Restrictions - The Contractor shall post approved "No Parking" signs at all locations necessary to establish work areas and detour traffic. Signs shall read: "NO PARKING - CONSTRUCTION TOW-AWAY ZONE," show hours of parking restriction and indicate telephone number of police agency having jurisdiction. Signs shall be placed at least 24 hours in advance of restriction.
- H. Bridging Over Trenches and Excavations - Bridging shall be placed across all trenches and excavations of existing streets and at driveways when work is not in progress. Bridging for vehicular traffic shall be of sufficient width to accommodate the required number of travel lanes. Bridging shall be designed to support H-20 vehicular traffic. All bridging shall be set flush with travel surface or a satisfactory transition from travel surface to top of bridging shall be provided.

A satisfactory transition shall mean a change in elevation between the levels of not less than twelve (12) inches horizontal to one (1) inch vertical.

Transition may be accomplished by means of temporary pavement.

- I. Temporary Traffic Lanes - Temporary traffic lanes shall be at least 10 feet wide. Provide an additional two (2) feet of clearance from curbs. The length of temporary lanes should be limited to the area under construction and the distance necessary to divert traffic.
- J. The Contractor will provide his/her own staging areas.

7.13 HOLD HARMLESS AGREEMENT

The Contractor shall hold the CITY, its agents, officers, employees, and volunteers, harmless from and save, defend and indemnify them against any and all claims, losses, liabilities and damages from every cause, including but not limited to injury to person or property or wrongful death, with the indemnity to include reasonable attorney's fees, and all costs and expenses, arising directly or indirectly out of any act or omission of Contractor relating to or during the performance of its obligations under this Agreement.

7.14 INSURANCE REQUIREMENTS

Insurance requirements for Contractors - Bidders' attention is directed to the insurance requirements below. **It is strongly recommended that bidders confer with their respective insurance carriers and/or brokers to determine in advance of bid submission the availability of insurance certificates and endorsements as prescribed and provided herein.** If an apparent low bidder fails to comply strictly with the insurance requirements, that bidder may be disqualified from award of the contract. These insurance requirements are considered a material element of any contract to be made and failure to effect, maintain, renew, or provide proper proof of coverages may be treated as a material breach of any such contract. The City reserves the right to alter, amend, or otherwise modify these requirements as the City may deem necessary.

The Contractor shall provide at its own expense and maintain at all times the following insurance with insurance companies licensed in the State of California and shall provide evidence of such insurance to the CITY as may be required by the Risk Manager of the CITY. The policies or certificates thereof shall provide that, thirty (30) days prior to cancellation or material change in the policy, notices of same shall be given to the Risk Manager of the CITY by registered mail, return receipt requested, for all of the following stated insurance policies.

- A. Workers' Compensation - in compliance with the statutes of the State of California, plus employer's liability with a minimum limit of liability of \$500,000.
- B. General Liability insurance with a minimum limit of liability per occurrence of \$1,000,000 for bodily injury and \$100,000 for property damage or \$1,000,000 combined single limit. This insurance shall indicate on the certificate of insurance the following coverages and indicate the policy aggregate limit applying to: premises and operations; broad form contractual; independent contractors and subcontractors; products and completed operations.
- C. Automobile Liability insurance with a minimum limit of liability per occurrence of \$1,000,000 for bodily injury and \$100,000 for property damage or \$1,000,000 combined single limit. This insurance shall cover any automobile for bodily injury and property damage.
- D. Course of Construction insurance with a minimum limit of the complete project, if required by the Special Provisions.

If at any time any of said policies shall be unsatisfactory to the CITY, as to form or substance or if a company issuing such policy shall be unsatisfactory to the CITY, the Contractor shall promptly obtain a new policy, submit the same to the Risk Manager for approval and submit a certificate thereof as hereinabove provided. Upon failure of the Contractor to furnish, deliver or maintain such insurance and certificates as above provided, this Agreement, at the election of the CITY, may be forthwith declared suspended, or terminated. Failure of the Contractor to obtain and/or maintain any required insurance shall not relieve the Contractor from any liability under this Agreement, nor shall the insurance requirements be construed to conflict with or otherwise limit the obligations of the Contractor concerning indemnification. The CITY, its agents, officers, employees, and volunteers shall be named as an additional insured on all insurance policies required herein, except Workers' Compensation. The Workers' Compensation insurer shall agree to waive all rights of subrogation against the CITY, its agents, officers, employees, and volunteers for losses arising from work performed by Contractor for the CITY. The Contractor's insurance policy(ies) shall include a provision that the coverage is primary as respects the CITY; shall include no special limitations to coverage provided to additional insured; and, shall be placed with insurer(s) with acceptable Best's rating of A:VII or with approval of the Risk Manager.

7.15 VERIFICATION OF COVERAGE

Contractor shall furnish the City with Certificates of Insurance and with original endorsements effecting coverages required. The certificates and endorsements are to be signed by a person authorized by the insurer to bind coverage. The certificates and endorsements are to be on forms approved by the City. All certificates and endorsements are to be received and approved by the City prior to the commencement of any work. The City reserves the right to require complete, certified copies of all required insurance policies at any time.

7.16 SUBCONTRACTORS

Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor evidencing coverages for each subcontractor in form and amount meeting all the requirements herein.

7.17 CONTRACTOR'S RESPONSIBILITY FOR WORK

Until the formal acceptance of the work by the City Council, the Contractor shall be responsible for and have care, custody, and control of the work and of the materials to be used therein, including materials delivered to the work site, materials for which partial payment has been received, and materials which have been furnished by the City; and the Contractor shall bear full risk of loss, injury or damage to any part of the work and materials by action of the elements, or from any other cause, whether arising from the execution or non-execution of the work. The Contractor shall rebuild, repair, restore and make whole all loss or damage to any portion of the work or materials before final acceptance and shall bear the expense thereof, except for such loss or damage occasioned by acts of the Federal Government or the public enemy, or by an act of God as defined in Section 4150 of the California Government Code.

Suspension of the work for any cause whatever shall not relieve the Contractor of his or her responsibility for the work and materials as herein specified.

The Contractor shall be responsible for and must make good any defects arising through faulty, improper or inferior workmanship or materials arising or discovered in any part of the work during one (1) year after the completion and acceptance of the same.

The Contractor shall be responsible for any damage his activities cause to adjacent public or private improvements. The Contractor shall take all measures necessary to protect adjacent natural areas from runoff, sedimentation, debris, or other damage resultant from the project activities. On projects over five (5) acres in area, the Contractor shall comply with all provisions of the Storm Water Pollution Prevention Plan prepared for the project. A copy of this document is available for review at City, 801 - 11th Street, Modesto, 2nd Floor, Engineering and Transportation Department, Engineering Division.

7.18 ADVERTISING

The names of contractors, subcontractors, architects, or engineers, with their addresses and designation of their particular specialties, may be displayed on removable signs. The size and location of such signs shall be subject to the Engineers' approval.

Commercial advertising matter shall not be attached to or painted on the surfaces of buildings, fences, canopies, or barricades.

7.19 RISK OF LOSS

Until the completion and formal acceptance of the completed work by the City Council, the Contractor shall have the charge and care thereof and shall bear all risks of injury or damage to or destruction of, the work or any part or parts thereof, or any materials or equipment delivered to the site thereof, by fire, earthquake, windstorm or other action of the elements, vandalism, or from any other cause, including loss by theft, from the date of commencement of construction to the date of such formal acceptance. The Contractor shall rebuild, repair, restore and make good all injuries or damage to any portion of the work, and shall bear the entire expense thereof, except such injuries or damages as are caused by riot, insurrection, or acts of the Federal or State Government or a public enemy in time of war.

7.20 HAZARDOUS MATERIALS

If the Contractor encounters conditions or materials which he has reason to believe may be hazardous, as defined in Section 25117 of the Health and Safety Code, he shall immediately so notify the Engineer both verbally and in writing. Work on the immediate area of the suspected hazardous material shall be suspended until the Engineer authorizes it to be resumed. If such suspension delays the current controlling operation, the Contractor may be granted a time extension as provided in Section 8.08.

The City reserves the right to use other forces for exploratory work to identify and determine the extent of such material, and for removing hazardous material from such area.

The Contractor shall be held responsible for the proper handling, use, storage, and disposal of hazardous materials used in the construction of the project.

7.21 CONTROL OF FUGITIVE DUST

The Contractor shall comply with all applicable provisions of Regulation VIII of the San Joaquin Valley Unified Pollution Control District. The regulation is scheduled to become effective December 10, 1993. The Contractor is hereby alerted to the fact that this regulation imposes specific restrictions and requirements on the Contractor related to the construction activities at the site. The Contractor assumes full responsibility for conforming to the requirements of this regulation.

In the event the regulatory agency levies any fine or charge against the City as a result of the Contractor's failure to comply with this regulation, the Contractor shall reimburse the City

upon demand the full amount of said fine or charge. The City shall have the right to deduct funds from monies due the Contractor should the Contractor fail to reimburse the City as stated above. Copies of Regulation VIII may be obtained by contacting:

San Joaquin Valley Unified Air Pollution Control District
4230 Kiernan Avenue, Suite #130
Modesto, CA 95356
(209) 545-7000

7.22 CONTROL OF STORM WATER

The Contractor shall comply with all applicable federal, state, and municipal regulation for the control of storm water pollution from construction activities. The Contractor is hereby alerted to the fact that these regulations impose specific restrictions and requirements on the Contractor related to the construction activities at the site. The Contractor assumes full responsibility for conforming to the requirements of these regulations.

In the event the regulatory agency levies any fine or charge against the City as a result of the Contractor's failure to comply with this regulation, the Contractor shall reimburse the City upon demand the full amount of said fine or charge. The City shall have the right to deduct funds from monies due the Contractor should the Contractor fail to reimburse the City as stated above.

The Contractor's attention is directed to the Construction Best Management Practices (BMPs) Handbook for specific guidance on selecting best management practices for reducing pollutants in storm water discharges from construction activities.

The Contractor's attention is directed to Section 16 in the Engineering Design Section of the City Standard Specifications. The Contractor shall be responsible for conforming to all provisions of Section 16 with the exception that a City of Modesto grading and erosion control permit will not be required on City of Modesto Public Works projects under the control of the City's Construction Administration Office. The Contractor shall prepare a Storm Water Pollution Prevention Plan (SWPPP) and submit a Notice of Intent (NOI) when required by the State's General Storm Water Permit. The Contractor shall submit a copy of the SWPPP and the NOI to the Engineer prior to starting any grading on the project. The Contractor shall be responsible for implementing and maintaining the measures indicated in the SWPPP throughout the project duration.

Regardless of project size, the contractor shall be required to apply Best Management Practices (BMPs) to the construction site. The City of Modesto Standard Specifications, Erosion and Sediment Control Standards and Specifications for Construction Activities in the City of Modesto, and other state NPDES guidelines should be utilized to plan your BMPs.

Failure to comply with the above may result in temporary suspension of work or suspension of the contract as detailed in Section 8 of these General Conditions. Such failure to comply shall not be justification for a time extension.

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SECTION 8

PROSECUTION AND PROGRESS

8.01 SUBLETTING AND ASSIGNMENT

The Contractor shall give his or her personal attention to the fulfillment of the contract and shall keep the work under his or her control, including the work of all subcontractors.

The Contractor shall perform, with its own organization, contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the City. In order to meet the 30 percent requirement, contractor may propose to contract for direct payment by its own organization for any element or combination of elements of the original contract price, including, but not limited to, materials, manufactured products, labor, equipment rental, tools and incidentals, but excluding "specialty items" defined in (B) below, totaling not less than 30 percent of the original price. Specialty items may be performed by subcontract and the amount of any such specialty items so performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization.

- A. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of subcontractor, assignee, or agent of the prime contractor.
- B. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract. Only those items of work specifically designated as "Specialty Items" on the contract proposal form shall be considered as such.

The contract amount upon which the requirement set forth above is computed includes the cost of materials and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the Engineer determines is necessary to assure the performance of the contract.

No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the Engineer and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the Engineer has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

Where a portion of the work sublet by the Contractor is not being prosecuted in a manner satisfactory to the Engineering and Transportation Director, the subcontractor shall be removed immediately on the request of the Engineering and Transportation Director and shall not again be employed on the work.

8.02 PROGRESS OF THE WORK

The Contractor shall begin work as soon as possible after receiving the Notice to Proceed from the City and shall diligently prosecute the same to completion as hereinbefore specified. No work shall commence before contract bonds and insurance certificates have been filed with the City and the contract has been signed.

A preconstruction conference must be held prior to starting any work on the project. The City will contact the Contractor no later than five (5) working days from the date the contract is signed by the City Manager to set up the preconstruction conference which shall be held no later than ten (10) working days from the contract signing date. The Notice to Proceed shall be issued at the preconstruction conference.

The Contractor shall provide the City Engineer with a typewritten project schedule at the preconstruction meeting. The contractor shall submit a construction schedule in accordance with Section 4.20.

Subsequent to the time that submittal of a progress schedule is required in accordance with these specifications, no progress payments will be made for any work until a satisfactory schedule has been submitted to the Engineer.

At any time during the project when, in the opinion of the Engineer, the project falls more than 20 working days behind the current schedule, the Engineer may request a revised schedule. The Contractor shall comply with this request at no additional cost to the City.

The Engineer shall review the proposed schedule for completeness and reasonableness. If in the opinion of the Engineer the proposed schedule is incomplete or unreasonable, the schedule shall be revised at no additional cost to the City.

Failure to comply with the above provisions shall entitle the City to withhold an additional ten percent (10%) of the amount due on progress payments until the contractor complies with these provisions.

8.03 CHARACTER OF WORKERS

If any person employed by the Contractor shall fail or refuse to carry out the direction of the Engineering and Transportation Director, or shall appear to the Engineering and Transportation Director to be incompetent or to act in a disorderly or improper manner, that person shall be discharged immediately on the request of the Engineering and Transportation Director, and such person shall not again be employed on the work.

8.04 TEMPORARY SUSPENSION OF WORK

The Engineering and Transportation Director shall have the authority to suspend the work wholly or in part for such period as he or she may deem necessary due to unsuitable weather, or to such other conditions as are considered unfavorable for the suitable prosecution of the work, or for such time as he or she may deem necessary, due to the failure on the part of the Contractor to carry out orders given, or to perform any provisions of the work. The Contractor shall immediately obey such order of the Engineering and Transportation Director and shall not resume the work until ordered to do so in writing by the Engineering and Transportation Director.

In the event that a suspension of work is ordered as provided above, and should such suspension be ordered by reason of the failure of the Contractor to carry out orders or to perform any provision of the contract, or by reason of weather conditions being unsuitable for performing any item or items of work, which work, in the sole opinion of the Engineer, could have been performed prior to the occurrence of such unsuitable weather conditions had the Contractor diligently prosecuted the work when weather conditions were suitable, the Contractor, at his expense, shall do all the work necessary to provide a safe, smooth, and unobstructed passageway through construction for use by public traffic during the period of such suspension as provided in Sections 7-1.08, "Public Convenience," and 7-1.09, "Public Safety," of the State Standards and as specified in the special provisions for the work. In the event that the Contractor fails to perform the work above specified, the City will perform such work and the cost thereof will be deducted from monies due or to become due the Contractor.

If the Engineer orders a suspension of all of the work or a portion of the work which is the current controlling operation or operations, due to unsuitable weather or to such other conditions as are considered unfavorable to the suitable prosecution of the work, the days on which the suspension is in effect shall not be considered working days as defined in Section 8.05, "Time of Completion." If a portion of work at the time of such suspension is not a current controlling operation or operations, but subsequently does become the current controlling operation or operations, the determination of working days will be made on the basis of the then current controlling operation or operations.

If a suspension of work is ordered by the Engineer due to the failure on the part of the Contractor to carry out orders given or to perform any provision of the contract, the days on which the suspension order is in effect shall be considered working days if such days are working days within the meaning of the definition set forth in Section 8.05, "Completion Time."

In the event of a suspension of work under any of the conditions set forth in this Section 8.04, such suspension of work shall not relieve the Contractor of his responsibilities as set forth in Section 7, "Legal Relations and Responsibility."

8.05 TIME OF COMPLETION AND LIQUIDATED DAMAGES

It is agreed by the parties to the contract that in case all the work called for under the contract is not completed before or upon the expiration of the time limit as set forth in these specifications, damage will be sustained by the City of Modesto, and that it is and will be impracticable to determine the actual damage which the City of Modesto will sustain, in the event of any, by reason of such delay, and it is therefore agreed that the Contractor, his or her heirs, assigns, and sureties, will pay to the City of Modesto the sum of Five Hundred Dollars (\$500.00) per day for each and every calendar day's delay beyond the time prescribed to complete the work; and the Contractor agrees to pay such liquidated damages as herein provided, and in case the same are not paid, agrees that the City of Modesto may deduct the amount thereof from any money due or that may become due the Contractor under the contract.

It is further agreed that in case the work called for under the contract is not finished and completed in all parts and requirements within the time specified, the Engineering and Transportation Director shall have the right to extend the time for completion or not, as may seem best to serve the interest of the City of Modesto; and if he or she decides to extend the time limit for the completion of the contract, he or she shall further have the right to charge the Contractor, his or her heirs, assignees, or sureties, and to deduct from final payment for the work, all or any part, as he or she may deem proper, of the actual cost of engineering, inspection, superintendence, and other overhead expenses which are directly chargeable to the contract, and which accrue during the period of such extension except that the cost of final surveys and preparation of final estimate shall not be included in such charges.

Liquidated damages shall not be assessed, nor shall the cost of engineering and inspection during any delay in the completion of the work caused by Acts of God or of the public enemy, acts of the Federal Government, City, fire, floods, epidemics, severe weather, or delays of subcontractors due to such causes; provided, that the Contractor shall within ten (10) days from the beginning of such delay notify the Engineering and Transportation Director in writing of the causes of delay, who shall ascertain the fact and extent of the delay, and his or her finding of the facts thereon shall be final and conclusive.

No extension of time will be granted for a delay caused by a shortage of materials unless the Contractor furnishes to the Engineer documentary proof that he has made every effort to obtain such materials from all known sources within reasonable reach of the work in a diligent and timely manner, and further proof in the form of supplementary progress schedules, as required in Section 8.02 "Progress of the Work," that the inability to obtain such materials when originally planned, did in fact cause a delay in final completion of the entire work which could not be compensated for by revising the sequence of the Contractor's operations. The term "Shortage of materials," as used in this section, shall apply only to materials, articles,

parts or equipment which are standard items and are to be incorporated in the work. The term "shortage of materials" shall not apply to materials, parts, articles or equipment which are processed, made, constructed, fabricated or manufactured to meet the specific requirements of the contract. Only the physical shortage of material will be considered under these provisions as a cause for extension of time. Delays in obtaining materials due to priority in filling orders will not constitute a shortage of materials.

It is the intention of the above provisions that the Contractor shall not be relieved of liability for liquidated damages or engineering and inspection charges for any period of delay in completion of the work in excess of that expressly provided for in this Section 8.05.

The Contractor shall complete the work within the number of calendar days or working days set forth in the Special Provisions.

A working day is defined as any day, except Saturdays, Sundays and legal holidays and days on which the Contractor is specifically required by the special provisions to suspend construction operations and except days on which the Contractor is prevented by inclement weather or conditions resulting immediately therefrom adverse to the current controlling operation or operations for at least 60 percent of the total daily time being currently spent on the controlling operation or operations.

Legal holidays are as follows: New Years' Day, Martin Luther King Jr. Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, the day after Thanksgiving, and Christmas Day.

The current controlling operation(s) is to be construed to include any feature of the work (e.g., an operation or activity, or a settlement or curing period) considered at the time by the City Engineer which, if delayed or prolonged, will delay the time of completion of the contract.

Determination that a day is a non-working day by reason of inclement weather or conditions resulting immediately therefrom shall be made by the City Engineer. The Contractor will be allowed 15 days from issuance of the Weekly Statement of Working Days in which to file a written protest, setting forth in what respects he/she differs from the City Engineer. Otherwise the decision of the City Engineer shall be deemed to have been accepted by the Contractor as correct. The City Engineer will furnish the Contractor a weekly statement showing the number of working days charged to the contract for the preceding week, the number of working days of time extensions being considered or approved, the number of working days originally specified for the completion of the contract and the number of working days remaining to complete the contract and the extended date for completion thereof, except when working days are not being charged in accordance with the provisions in Section 8.04, "Temporary Suspension of Work."

Should the Contractor prepare to begin work at the regular starting time in the morning of any day on which inclement weather, or the conditions resulting from the weather, or the condition of the work, prevents the work from beginning at the usual starting time and the

crew is dismissed as a result thereof and the Contractor does not proceed with at least 75 percent of the normal labor and equipment force engaged in the current controlling operation or operations for a least 60 percent of the total daily time being currently spent on the controlling operation or operations, the Contractor will not be charged for a working day whether or not conditions should change thereafter during said day and the major portion of the day could be considered to be suitable for such construction operations.

8.06 SUSPENSION OF CONTRACT

If at any time, in the opinion of the City Manager, the Contractor has failed to supply an adequate working force or material of proper quality, or has failed in any other respect to prosecute the work with the diligence and force specified and intended in and by the terms of the contract, notice thereof in writing will be served upon him, and should he or she neglect or refuse to provide means for a satisfactory compliance with the contract, as directed by the Engineering and Transportation Director, within the time specified in such notice, the City Manager in any such case shall have the power to suspend the operation of the contract. Upon receiving notice of such suspension, the Contractor shall discontinue said work, or such parts of it as the City Manager may designate.

Upon such suspension, the Contractor's control shall terminate and thereupon the City Manager or his or her duly authorized representative may take possession of all or any part of the Contractor's materials, tools, equipment, and appliances upon the premises, and use the same for the purpose of completing said contract and hire such force and buy or rent such additional machinery, tools, appliances, equipment and supplies at the Contractor's expense as may be necessary for the proper conduct of the work and for the completion thereof, or may employ other parties to carry the contract to completion, employ the necessary workmen, substitute other machinery or materials and purchase the materials contracted for in such manner as the City Manager shall deem proper or the City Manager may annul and cancel the contract and re-let the work or any part thereof. Any excess cost arising therefrom over and above the contract price will be charged against the contractor and his or her sureties, who will be liable therefore. In the event of such suspension, all monies due the Contractor or retained under the terms of the contract shall be forfeited to the City of Modesto, but such a forfeiture will not release the Contractor or his or her sureties from liability or failure to fulfill the contract. The Contractor and his or her sureties will be credited with the amount of money so forfeited toward any excess cost over and above the contract price arising from the suspension of the operations of the contract and the completion of the work by the City of Modesto as above provided and the Contractor will be so credited with any surplus remaining after all just claims for such completion have been paid.

In the determination of the question whether there has been any such noncompliance with the contract as to warrant the suspension or annulment thereof, the decision of the City Manager shall be binding on all parties to the contract.

8.07 RIGHTS OF WAY

Rights of way or easements for work to be constructed will be provided by the City of Modesto. The Contractor shall make his or her own arrangements and pay all expenses for

additional area required by him outside of the limits of rights of way or easements unless otherwise especially provided. In the event of delay on the part of the City of Modesto, its officers, agents or employees in obtaining any such rights of way or easements for the work to be constructed, then the Contractor shall have time for the completion of his or her contract for the period or periods caused by such delay or delays, but shall have no damages against the City of Modesto, its officers, agents or employees.

8.08 DELAYS BY THE CITY OF MODESTO

Any act or omission of anything required to be done by the City of Modesto, its officers, agents or employees, which shall cause the Contractor delay in the completion of the work shall be grounds for extension of time on the part of the Contractor to complete the work, but shall give the Contractor no damages for such delay.

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SECTION 9

MEASUREMENT AND PAYMENT

9.01 MEASUREMENT

All work to be paid for at a contract price per unit of measurement shall be measured by the Engineering and Transportation Director in accordance with the United States Standard Measurements. A ton shall consist of two thousand (2,000) pounds avoirdupois. Material paid for by the ton shall be weighed on platform scales furnished by and at the expense of the Contractor, or on public scales. If weighed on scales furnished by the Contractor, said scales shall be satisfactory to the Engineering and Transportation Director and shall be sealed by a representative of the State Division of Weights and Measures, at the expense of the Contractor, as often as the Engineering and Transportation Director may deem necessary to insure their accuracy. If weighed on public scales, the Contractor shall furnish Weighmaster's Certificates to the Engineering and Transportation Director. (If material is shipped by rail, car weight will be accepted provided that actual weight of material only will be paid for.) Trucks used to haul material to be paid for by weight shall be weighed empty daily at such times as the Engineering and Transportation Director directs, and each truck shall bear a plainly legible identification mark.

Where payment is to be made on the basis of lump sum amounts bid for the various items shown on the proposal form and included in the contract as awarded, no measurement will be made of included items for payment. Measurement to check compliance with the plans will be made.

9.02 SCOPE OF PAYMENT

The Contractor shall accept the compensation as herein provided, as full payment for furnishing all materials, labor, tools, and equipment necessary to complete the work and for performing all work contemplated and embraced under the contract; also, for loss or damage arising from the nature of the work, or from the action of the elements, except as hereinbefore provided, or from any unforeseen difficulties which may be encountered during the prosecution of the work until the final acceptance by the City Council and for all risks of every description connected with the prosecution of the work; also, for all expenses incurred in consequence of the suspension or discontinuance of the work as herein specified; and for completing the work according to the plans and specifications. Neither the payment of any estimate, nor of any retained percentage, shall relieve the Contractor of responsibility for faulty workmanship or materials and unless otherwise specified, he or she shall remedy any defects due thereto and pay for any damage to other work resulting therefrom, which shall appear within a period of one (1) year from the date of the Notice of Completion and acceptance by the City Council. The City shall give notice of defects with reasonable promptness. All questions arising under this section shall be decided by the Engineering and Transportation Director.

9.03 **EXTRA AND FORCE ACCOUNT WORK**

Extra work as described in Section 3.03, when ordered and accepted, shall be paid for under a written change order in accordance with the terms therein provided. Payment for extra work will be made at the unit price or lump sum previously agreed upon by the Contractor and the Engineering and Transportation Director or by force account.

If the work is done on force account, the Contractor shall receive the actual cost of the materials furnished by him or her as shown by his or her paid vouchers, plus fifteen percent (15%) less all available cash, trade, and other discounts. However, the City of Modesto reserves the right to furnish such materials as it deems expedient, and the Contractor shall have no claim for profit on the cost of such material. For all labor, and equipment that is necessary, Contractor shall receive the current prices in the locality, which shall have been previously determined and agreed to in writing by the Engineering and Transportation Director and by the Contractor, plus a twenty percent (20%) markup for labor and a fifteen percent (15%) markup for equipment. Equipment or tools having a replacement value of \$50.00 or less, whether or not consumed by use, shall be considered small tools and no payment will be made therefor. The actual cost of rental for use of such items of equipment must have an individual value in excess of fifty (\$50.00) dollars, preauthorized by the City in writing and shall not exceed rental rates established by the current State of California (Cal Trans) Labor Surcharge and Equipment Rental Rates Manual. When extra work to be paid for on a force account basis is performed by a subcontractor, an additional markup of 5 percent will be added to the total cost of said extra work including all markups specified in this section. Said additional 5 percent markup shall reimburse the Contractor for additional administrative costs, and no other additional payment will be made by reason of performance of the extra work by a subcontractor.

The cost of labor, whether the employer is the Contractor, subcontractor, or other forces, will be the sum of the following:

- A. Actual Wages - The actual wages paid including the pro-rata cost of foremen continuously employed on the work, but not the salary, or any part thereof, of the Contractor's superintendent. Wages shall include any employer payments to or on behalf of the workers for health and welfare, pension, vacation, and similar purposes.
- B. Labor Surcharge - To the actual wages, will be added a labor surcharge which shall constitute full compensation for all payments imposed by State and Federal laws and for all other payments made to, or on behalf of, the workers; other than actual wages and subsistence and travel allowance. The labor surcharge will be as set forth in the California Department of Transportation publication entitled "Equipment Rental Rates and General Prevailing Wage Rates".
- C. Subsistence and Travel Allowance - The actual subsistence and travel allowance paid to such workers.

All extra work done on force account shall be recorded daily on report sheets made available by the Engineering and Transportation Director and signed by the Contractor. Daily reports shall thereafter be considered the true record of the extra work done. In the event of a dispute

or failure of the Contractor to sign the daily reports, the Contractor shall have seven (7) calendar days to make a claim to the Engineering and Transportation Director in writing or said daily reports shall be the basis for payment.

When extra work is performed by subcontractors, the Contractor shall reach agreement with them as to the distribution of the payments made by the City, including the above percentages. No additional payment therefor will be made by the City by reason of the performance of the work by a subcontractor or other forces.

The above markups shall constitute full compensation for all overhead costs which shall be deemed to include all items of expense not specifically designated as a direct cost. The total payment made as provided above shall be deemed to be the actual cost of such work and shall constitute full compensation therefor.

9.04 PROGRESS PAYMENTS

Between the 20th and the 25th day of each month, the Engineering and Transportation Director will make an approximate estimate of the value of the work done under the specifications during the month. Whenever the said estimate or estimates of work done since the last previous estimate exceeds One Thousand Dollars (\$1,000.00) in amount, ninety percent (90%) of such estimated sum will be paid the Contractor on or before the 10th day of the month next following.

The estimated value of work done may include seventy-five percent (75%) of the net invoice value of acceptable nonperishable material delivered to the work. The Contractor shall furnish to the Engineering and Transportation Director such detailed information as he or she may request to aid him as a guide in the preparation of the estimate.

The City shall retain ten percent (10%) of estimate value of the work done and nonperishable material delineated to the work, as part security for the fulfillment of the contract by the Contractor.

It is understood that the estimates from month to month will be approximate only and all monthly estimates and payments will be subject to correction in subsequent estimates, and the making of progressive payments shall not in any respect be taken as an admission of the City of the amount of work done or of its quality or sufficiency, nor as an acceptance of the work or release of the Contractor of any of his or her responsibility under the contract.

The Contractor will be allowed fifteen (15) days in which to protest in writing the correctness of the statement; otherwise the statement shall be deemed to have been accepted by the Contractor as correct.

No such estimate or payment shall be required to be made when, in the judgment of the Engineering and Transportation Director, the work is not proceeding in accordance with the provisions of the contract, or when in his or her judgment the total value of the work done since the last estimate amounts to less than One Thousand Dollars (\$1,000.00).

When the contract is a lump sum contract, the Contractor shall submit a cost breakdown for the Engineers' approval before the first progress payment will be prepared.

9.05 FINAL PAYMENT & CLAIM

The Engineering and Transportation Director shall, after completion of the contract, make a final estimate of the amount of work done thereunder and the value of such work. The City of Modesto shall pay ninety percent (90%) of such value after deducting therefrom all previous payments and all amounts to be retained under the contract. The payment of the retained amount shall be due and payable thirty-five (35) days after recording the notice of completion.

The final estimate shall be conclusive and binding against both parties to the contract on all questions relating to the performance of the contract and the amount of work done thereunder and compensation therefor, except in the case of gross error.

The Contractor agrees that the payment of the final amount due under the contract and the adjustment and payment of any work done in accordance with any alternation of the same, shall release the City of Modesto and its employees or agents, from any and all claims or liability on account of work performed under the contract or any alteration thereof.

The Contractor shall submit written approval of the proposed final estimate or a written statement of all claims arising under or by virtue of the contract so that the Engineer receives such written approval or statement of claims no later than close of business of the thirtieth day after receiving the proposed final estimate. If the thirtieth day falls on a Saturday, or Sunday or legal holiday, then receipt of such written approval or statement of claims by the Engineer shall not be later than close of business of the next business day.

Claims filed by the Contractor shall be in sufficient detail to enable the Engineer to ascertain the basis and amount of said claims. If additional information or details are required by the Engineer to determine the basis and amount of said claims, the Contractor shall furnish such further information of details so that the information of details are received by the Engineer no later than the fifteenth day after receipt of the written request from the Engineer. If the fifteenth day falls on a Saturday, Sunday or legal holiday, then receipt of such information or details by the Engineer shall not be later than close of business of the next business day. Failure to submit such information and details to the Engineer within the time specified will be sufficient cause for denying the claim.

The Contractor shall keep full and complete records of the costs and additional time incurred for any work for which a claim for additional compensation is made. The Engineer or any designated claim investigator or auditor shall have access to those records and any other records as may be required by the Engineer to determine the facts or contentions involved in the claims. Failure to permit access to such records shall be sufficient cause for denying the claims.

Claims submitted by the Contractor shall be accompanied by a notarized certificate containing the following language:

Under the penalty of law for perjury or falsification and with specific reference to the California False Claims Act, Government Code Section 12650 et. seq., the undersigned

_____,
(Name)

_____ of

(Title)

_____,
(Company)

hereby certifies that the claim for the additional compensation and time, if any, made herein for the work on this contract is a true statement of the actual costs incurred and time sought, and is fully documented and supported under the contract between parties.

Dated _____

Subscribed and sworn before me this _____ day of

_____.

Notary Public

My Commission Expires _____

Failure to submit the notarized certificate will be sufficient cause for denying the claim.

Any claim for overhead type expenses or costs, in addition to being certified as stated above, shall be supported by an audit report of an independent Certified Public Accountant. Any such overhead claim shall also be subject to audit by the City at its discretion.

Any costs or expenses incurred by the City in reviewing or auditing any claims that are not supported by the Contractor's cost accounting or other records shall be deemed to be damages incurred by the City within the meaning of the California False Claims Act.

The Engineering and Transportation Director will make the final determination of any claims. A board or person designated by said Director will review such claims and make a written recommendation thereon to the Engineering and Transportation Director. The Contractor may meet with the review board or person to make a presentation in support of such claims.

9.06 INCREASED OR DECREASED CONTRACT QUANTITIES

Whenever an item of work or materials is specified in the contract by unit prices and is changed, but by not more than twenty-five percent of the Engineers' estimate of that bid item quantity as specified in the Bid Form, then the contract price shall be increased or decreased by the application of the unit prices so specified.

Whenever said contract item increases or decreases in quantity by more than twenty-five percent, the addition or subtraction from the contract price shall be established in accordance with Section 4-1.03 of that State Standard Specifications.

9.07 SUBSTITUTION OF SECURITIES FOR WITHHELD PAYMENTS

Except as otherwise prohibited by law, the Contractor may elect to receive all payments due under the contract pursuant to Sections 9.04 and 9.05 without any retention. As provided in Section 22300 of the California Public Contract Code, at the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the City, or with a State or federally chartered bank as the escrow agent. Alternatively, the contractor may request and the City shall make payment of retentions earned directly to an escrow agent in accordance with the provisions of Section 22300 of the California Public Contracts Code. Upon satisfactory completion of the contract, the securities shall be returned to the Contractor. The term "satisfactory completion of the contract" shall include the filing of a notice of completion and the retention of the securities for a period of thirty (30) days thereafter.

Any of the following securities, which shall be approved by the City's Director of Finance, are eligible for investment under Section 22300 of the California Public Contracts Code.

- A. Securities eligible for investment under Government Code Section 16430, or
- B. Certificates of deposit issued by banks authorized to transact business in California which are members of the Federal Deposit Insurance Corporation, or by Savings and Loan Associations authorized to transact business in California which are members of the Federal Savings and Loan Insurance Corporation, or
- C. Interest bearing demand deposit accounts, or
- D. Standby letters of credit.

9.08 RIGHT TO WITHHOLD AMOUNTS

In addition to the amount which the City may otherwise retain under the Contract, the City may withhold a sufficient amount or amounts of any payment or payments otherwise due the Contractor, as in its judgment may be necessary to cover:

- A. Payments which may be past due and payable for just claims against the Contractor or any subcontractor for labor or materials furnished for the performance of this Contract.
- B. For defective work not remedied.
- C. For failure of the Contractor to make proper payments for the use of temporary utilities.
- D. Failure of the Contractor to make proper submissions, as herein specified.
- E. Failure to submit certified payrolls, when requested.
- F. Failure to submit, revise, resubmit or otherwise conform to the requirements herein for work scheduling.

When the above reasons for withholding amounts are removed, payment will be made to the Contractor for amounts withheld because of them on the next regularly scheduled progress payments.

The City in its discretion may apply any withheld amount or amounts to the payment of valid claims. In so doing, the City shall be deemed the agent of the Contractor for these purposes only, and any payment so made by the City shall be considered as a payment made under the contract by the City to the Contractor, and the City shall not be liable to the Contractor for such payment made in good faith. Such payments may be made without prior judicial determination of the claim or claims. The City will render to the Contractor a proper accounting of such funds disbursed on behalf of the Contractor.

9.09 DISPUTE RESOLUTION

All claims, controversies, or disputes, including claims, controversies, or disputes asserted by City against Contractor pursuant to the False Claims Act, Government Code Section 12650 et seq., not settled by the Director of Engineering & Transportation pursuant to Section 4.01, arising out of, or relating to the contract, or the breach, termination, enforcement, interpretation, or validity of the contract, including the determination of the scope or applicability of this specification shall be determined by binding arbitration in Modesto, California by one arbitrator. The arbitrator is specifically empowered to determine any and all claims, controversies, or disputes asserted by City against Contractor pursuant to the False Claims Act. The American Arbitration association shall administer the arbitration under its' Construction Industry Arbitration Rules then in effect, subject to the modifications of those rules contained in this specification. This agreement to arbitrate shall be specifically enforceable under the prevailing law of any court having jurisdiction, and the award rendered by the arbitrator may be entered in any court having jurisdiction. The appropriate venue for any arbitration under this specification shall be in Stanislaus County, California.

This specification is not intended to and does not waive the claim filing requirements found in California Government Code Section 900 et seq. In the event that a timely and legally sufficient, arbitrable claim is filed by Contractor with City, and the claim is rejected in whole or in part by City, this specification shall result in the conclusive, final, and binding resolution of all the issues presented in the claim so long as any issues presented by the claim are arbitrable. Claims rejected by City or by operation of law, shall be submitted by Contractor to arbitration pursuant to the Construction Industry Arbitration Rules of the American Arbitration Association within ninety (90) days after mailing of the written rejection by City to Contractor. Otherwise, the claim or claims shall be deemed waived in their entirety. Contractor may submit to arbitration by advising the City Clerk in writing of its' desire to arbitrate within the 90 day period, and thereafter following Association rules in good faith.

The "fast track" rules of the American Arbitration Association shall apply to any claim or counterclaim less than ONE HUNDRED FIFTY THOUSAND AND 00/100 (\$150,000.00) DOLLARS. In arbitration not proceeding under the "fast track" rules, the arbitrator shall have the power to order that depositions be taken and other discovery be made. Both City and Contractor shall have the right, upon written notice, to take no more than three (3) depositions of the other as a matter of right in an arbitration not proceeding under the "fast track" rules.

Whether or not City and Contractor may be engaged in interstate commerce, any controversy or dispute mentioned above shall be determined by, and the parties shall be bound by, the substantive law of the State of California, and not the Federal Arbitration Act at 9 USC Section 1 et seq.

The arbitrator may grant any remedy or relief deemed by the arbitrator just and equitable under the circumstances, whether or not such relief could be awarded in a court of law. The arbitrator shall be empowered to award monetary sanctions against a party. The arbitrator shall, in the written award, allocate all the costs of the arbitration, including the fees of the arbitrator and the reasonable attorney fees of the prevailing party, against the party who did not prevail. The prevailing party shall be the party in whose favor the majority of the central issues in the case are resolved.

Notwithstanding anything in this specification to the contrary, the arbitrator shall have no power to award punitive damages or other damages not measured by the party's actual damages (excluding litigation costs and fees) against any party. This limitation of the arbitrators' powers under this Agreement shall not operate as an exclusion of the issue of punitive damages from this Agreement to Arbitrate sufficient to vest jurisdiction in a court with respect to that issue.

Contractor shall include in all subcontracts a specification whereby the subcontractor consents to being joined in an arbitration between Owner and Contractor involving the work of the subcontractor to be joined. Contractor's failure to do so shall be a breach of the **Engineering and Transportation** contract.

The parties to any contract of which this specification is made a part by reference or otherwise shall, and hereby do, waive any rights provided by Title 9.2 of the California Code of Civil Procedure, Section 1296. The arbitrators' award shall be deemed final, conclusive and binding to the fullest extent allowed by California law.

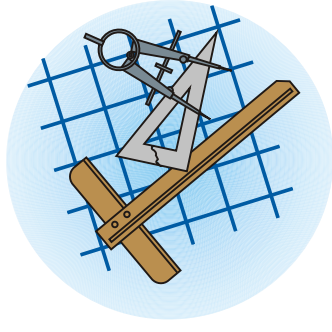
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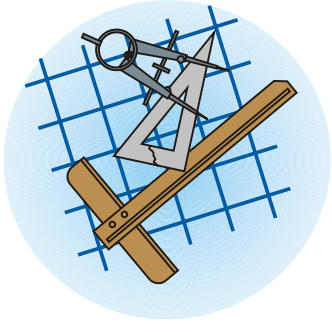
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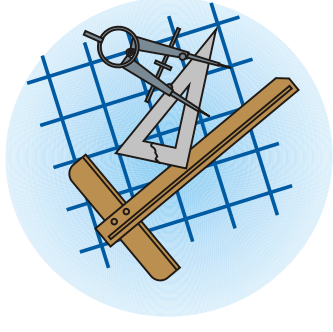
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