



## **DEPARTMENT OF PUBLIC WORKS STANISLAUS COUNTY**

### **STANDARDS AND SPECIFICATIONS 2014 EDITION**

For Development Services, Encroachment/Transportation Permits, and Transit:

1010 10<sup>th</sup> Street, Suite 4204, Modesto, CA 95354

PHONE: (209) 525-4311 • FAX: (209) 525-6507

Office Hours: Monday – Friday, 8:00 a.m. – 4:30 p.m. (excluding legal holidays)

For Engineering Design, Traffic, Roads & Bridges, Construction, and Administration:

1716 Morgan Road, Modesto, CA 95358

PHONE: (209) 525-4130 • FAX: (209) 541-2505

Office Hours: Monday – Friday, 8:00 a.m. – 5:00 p.m. (excluding legal holidays)

Visit us on the web: [www.stancounty.com/publicworks](http://www.stancounty.com/publicworks)





**DEPARTMENT OF PUBLIC WORKS**

**Matt Machado, PE, LS**  
**Director, County Surveyor**

**Chris Brady, PE**  
**Deputy Director - Construction/Roads/Bridges**

**Colt Esenwein, PE**  
**Deputy Director - Engineering/Survey/Fleet**

**David Leamon, PE**  
**Deputy Director - Development/Traffic**

**Kathy Johnson**  
**Assistant Director - Finance/GIS/HR/Transit**

[www.stancounty.com/publicworks](http://www.stancounty.com/publicworks)

**From:** Paul Saini - Associate Civil Engineer, QSD/QSP, MBA  
**To:** Current Improvement Standard Holders  
**Date:** July 2, 2014

**Subject: Stanislaus County 2014 Standards & Specifications Update**

To whom it may concern:

The current Standards and Specifications were originally adopted in February 2007. In January 2014, County Public Works staff completed an update to the County Standards and Specifications. This update was in response to suggestions from the development community and County staff.

The purpose of the County Improvement Standards and Specifications is to establish minimum design requirements for the construction of improvements in the public rights-of-way, residential subdivisions, commercial developments, industrial developments, and other types of development projects that are subject to the approval of the Department of Public Works or are to be dedicated to the County for maintenance and/or operations.

The recent update to the current standards were undertaken to meet current conditions, incorporate new requirements mandated by state and federal law, consolidate formatting, and reflect up-to-date reference information with the following process goals in mind:

1. To update the Standards and Specifications with the intent to make them a valuable tool for the development and construction industries;
2. To improve overall user-friendliness;
3. To provide greater efficiency and consistency in the design and construction of public improvements;
4. To bring the Standards and Specifications into compliance with the Circulation Element of the County General Plan that is currently being updated;
5. To bring the Standards and Specifications into compliance with the new National Pollutant Discharge Elimination System (NPDES) General Construction Permit 2009-0009-DWQ requirements; and

6. To bring the Standards and Specifications into compliance with the new NPDES General Permit and Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4) Order No. 2013-0001-DWQ requirements.

The Standards and Specifications were reviewed internally by various County departments, including: Consolidated Fire, Environmental Resources, Planning and Community Development, and Public Works (Engineering, Road and Bridge Maintenance, Traffic, Development Services, and Surveying). Department comments, suggestions, and recommendations were incorporated into the document to form an Administrative Draft. After the changes were incorporated, the Administrative Draft was submitted to members of the public, including but not limited to: engineering consulting firms, contractors, developers, and various city & county agencies to review the proposed changes. County staff received valuable feedback through the public review process.

In March 2014, the Administrative Draft Standards and Specifications document was distributed to the Building Industry Association (BIA) for final review and comment. Comments that were received from the BIA were incorporated into the final Standards and Specifications.

If you have any questions, comments, or need additional information, please contact Paul Saini at 209-658-8458 or send e-mail to [paul.saini@stancounty.com](mailto:paul.saini@stancounty.com)

## **SUMMARY OF UPDATES**

The following items are a summary of significant updates that have been made in the 2014 Standards & Specifications.

### **CHAPTER 1: GENERAL PROVISIONS**

1. Section 1.2: Definitions for Groundwater, Groundwater Basin, Groundwater Elevation, and Groundwater Surface have been defined.

### **CHAPTER 2: TEMPORARY TRAFFIC CONTROL AND SAFETY**

1. Section 2.10: Road closure and traffic control requirements describing traffic control plan and traffic delay notification & coordination have been incorporated into the Standards to help enhance public safety.
2. Section 2.12: The section on asphalt concrete has been updated to be in general conformance to the Caltrans Section 39 PG 64-10 asphalt concrete design requirements (Caltrans Standard Plans and Specifications 2010 edition).

### **CHAPTER 3: ROADS**

1. Section 3.2: County road classification have been revised and updated to conform to the County General Plan Chapter 3 Circulation Element, latest edition of the Highway Design Manual (HDM), and the American Association of State Highway and Transportation Officials (AASHTO) standards.
2. Section 3.11: The section on Prime Coat for roadways has been removed.
3. Section 3.16: The County adopts the State Std. A2-6 curb & gutter (A87A) that requires 1 inch slope for 24 inches of width of gutter to help eliminate pavement warps that may result in ponding in front of handicap ramps.
4. Section 3.17: Driveway approach requirements have been expanded and new/revised construction details have been provided to help enhance public safety.
5. Section 3.20: Disabled access curb ramps have been updated for ramp slopes, truncated dome requirements, installation, and testing to meet current ADA regulations.
6. Section 3.20 Truncated Domes has been updated in conformance of ADA regulations: The truncated dome tiles comply with the new ADA requirements related to Dome Alignment, Size, Spacing, Color, Tile Size and Location.
7. Section 3.30: Trench Construction Details have been updated. Trench Detail 3-H3, 3-H4, and 3-H4 have been added (Potholing for Design & Construction and General Trench Construction Notes).
8. Section 3.32: Minimum cover of six (6) feet for all major gas main lines added.
8. Section 3.35: Recommended intersection lane configurations are specified to help enhance public safety.
9. Section 3.38: Bicycle lane requirements have been added to accommodate and encourage bicycle use along the County roadways.
10. Section 3.39: Driveway access and design have been added and enhance to ensure driveway standards from public roads are met to protect the public health, safety, and welfare.

## CHAPTER 4: STORM DRAINAGE

1. Section 4.2: All storm drainage retention and detention facilities within Stanislaus County shall be designed using a 100-year, 24-hour storm with a rainfall intensity of 2.88”.

A retention basin facility shall be designed to empty the design storm within 48 hours by outlet facilities providing positive drainage or through percolation & evaporation. If percolation method is used, the percolation rates shall be based on a minimum of two (2) soils test conducted at the design depth of the retention basin. Retention basins shall be designed in accordance to Section 4.4 of this Chapter.

All storm drainage detention facilities within Stanislaus County shall be designed using a 100-year, 24-hour storm. The volume of the basin shall be determined with no allowance for percolation. A detention basin shall be designed to empty a 100-year, 24-hours storm event within 48 hours by outlet facilities providing positive drainage or through pumping. Detention basins shall be designed in accordance to Section 4.5 of this Chapter. If pumping is used to empty the detention basin, pump design calculations shall be submitted in accordance to Section 4.12 of this Chapter.

These design changes are summarized in the table below:

Design Area	Design Method	Design Return	Design Section/Comments:
<b>Retention Basins</b> <b>Detention Basins</b> <b>Rock Wells &amp; Horizontal Drains</b>	$V = CAR/12$	Storage Requirements for a 100-Year, 24-hours design storm  $R = 2.88''$  Note:  Drainage facilities shall be sized to empty the design volume of a 100-year, 24-hour storm within 48 hours	Refer to Section 4.4 for Retention Basins.  Refer to Section 4.5 for Detention Basins (initial settlement time required for storm water quality control).  Refer to Section 4.6 for Rock Wells (pre-approval and a permit from Department of Environmental Resources is required to construct Rock Wells).
<b>Pipelines</b>	Manning's Equation	10-Year, 24-hour for pipeline/conveyance  $R = 1.88''$	Refer to Section 4.8 and Section 4.9

2. Section 4.4 and 4.6: Minimum separation from drainage retention facilities to ground water table has been increased to 10 feet from 5 feet to help protect stormwater and groundwater quality.
3. Section 4.7 Pump Station Force Mains specifies Galvanized Steel/Welded Steel Pipe or Class 235 DR-18 (originally classified as Class 150) or Class 305 DR-14 (originally Class 200) has the preferred pipe type for use in designing pump station force mains.
4. Section 4.10: Minor correction was made to help differentiate retention and detention basin.
5. Section 4.18: Section on Stormwater Quality requirements have been added per State/Federal mandates related to the new NPDES General Construction and MS4 Phase II Permit requirements.

## **CHAPTER 5: LIGHTING**

1. Section 5.9: The section on electroliers/street lights has been updated to include LED luminaires/LED lamps to help enhance energy efficiency.
2. Section 5.17: The requirements for energizing street lights and formation of lighting districts have been updated.

## **CHAPTER 6: MISCELLANEOUS**

1. Section 6.2: Emergency access road design requirements have been updated.

## **CHAPTER 7: GRADING**

1. This chapter has been updated to help reduce erosion and sediment problems resulting from the development process and the increase of urban runoff from developed land within the County jurisdiction. This section has been updated to assist developers in processing permits in Stanislaus County. The general purpose of this Chapter is to safeguard the health, safety, property, and public welfare by regulating grading, excavation and earthwork construction activities in the unincorporated areas of Stanislaus County.

This chapter is based on the California Building Standards Commissions and is designed in conformance to Appendix J (Grading) of the California Building Code (Title 24 Part 2, Volume 1 & 2) and Sections 4.106 & 5.106 (Mandatory Measures for Residential and Non-residential Site Development) of the California Green Building Standards Code (California Code of Regulations Title 24, Part 11).

## **CHAPTER 8: PORTLAND CEMENT PERVIOUS CONCRETE PAVEMENT**

1. This is a new Chapter that is introduced into the 2014 Standards and Specifications and provides general guidelines to developers, contractors, and design professional on Portland Cement Pervious Concrete Pavement. This type of concrete is gaining popularity with Low Impact Development and Post-Development Storm Water design standards to help protect storm water quality and recharge the County's groundwater.

## **CHAPTER 9: NPDES GENERAL CONSTRUCTION PERMIT & STORMWATER QUALITY**

1. This is a new Chapter on Storm Water Quality. Stanislaus County is required by State and Federal regulations to develop programs to control the discharge of pollutants to the municipal storm drain system or to surface water bodies of the State, including the discharge of pollutants from construction sites. As a result, all construction projects are subject to the State mandated requirements designed to improve stormwater quality under the Clean Water Act. The new State requirements include such things as: expanded plan check and review; site control measures; source control measures; increased site construction inspection, post-development standards; stormwater treatment control measures.

The primary purpose of this new chapter is to help protect the quality of storm water.



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## **CHAPTER 1: GENERAL PROVISIONS**

### **1.1 GENERAL:**

The purpose of these improvement standards is to establish minimum design standards for the construction of improvements in the public rights-of-way, residential subdivisions, commercial development, industrial development, and other types of development projects that are subject to the approval of the Department of Public Works or are to be dedicated to the County for maintenance and/or operations. The County recognizes, however, that it has a responsibility to assure that certain other owned improvements (private streets, private utilities, etc) also meet minimum standards. County Standards may be applied to privately owned and maintained improvements that affect public health and safety.

These Standards include the specifications and plates as contained herein. All work done in the unincorporated area of Stanislaus County (public or private) that is subject to the approval of the Department of Public Works and/or are to be dedicated to the County for maintenance, shall conform to these Standards and the Stanislaus County Code. Any variances and exceptions to these standards shall be reviewed and approved by the Engineer.

In addition to these standards, the licensed Civil Engineer preparing the improvement plans is encouraged to use generally accepted engineering practices.

The Public Works Director, or his/her appointee (Engineer), shall be the final authority on all questions which may arise as to the interpretation of these Standards. The Engineer's decision shall be final and they shall have authority to enforce and make effective such decisions.

A copy of the latest version of Standards may be downloaded at the Stanislaus County Department of Public Works web site: [www.stancounty.com/publicworks](http://www.stancounty.com/publicworks). While there may be more than one version of the Standards available on the web site, the most recent version of Standards will be enforced by Stanislaus County

These standards can also be viewed and downloaded from the County's web site located at <http://www.stancounty.com/publicworks/>. Then click on "Standards and Specifications 2014" in "Helpful Links" on the right hand side of the screen. Changes and updates are applicable as of the date signed by the Engineer. Developers are advised to have their representatives contact the Department of Public Works during design to insure conformance with these Standards.

Work requiring plans prepared by a registered engineer such as public improvements for subdivisions, parcel maps, planned developments, building permits, etc. shall conform to these Standards.

Work not requiring plans prepared by a registered engineer shall conform to these Standards, and it shall be the responsibility of the developer or encroachment permit applicant to determine the requirements.

Subdivision improvements shall be completed according to these Standards or shall be bonded pursuant to the requirements of the Stanislaus County Code.

When privately owned and maintained improvements are to be installed, the County will require inspection of the improvements to ensure that they have been constructed in accordance with these standards to protect the general public. To achieve this protection, all privately owned and maintained improvements shall be inspected by the County to ensure minimum standards are met as outlined in this manual. An inspection Agreement will be entered between the developer of the private improvements and the County Engineer.

## **1.2 DEFINITIONS:**

The following definitions shall apply to these Standards:

Acceptance of Improvements: The Board of Supervisors' formal approval and acceptance of the Improvements. This includes:

- a. The installation of all of the approved subdivision improvements has been made and accepted by the Director of Public Works, prior to the recording of the final map. In this case, the Board of Supervisors could accept the dedication of the right-of-way and the improvements during the same board meeting, along with authorizing the recording of the final map.

OR

- b. The final map is recorded prior to the installation of all of the approved subdivision improvements. In this instance, a Subdivision Improvement Agreement will be entered into between the developer and the county. This will include either bonding for the improvements through a bond, instrument of credit, or a cash deposit for the value of the improvements to be installed per county code. Upon certification of the Director of Public Works, that all the work covered by the surety has been satisfactorily completed, the Board of Supervisors can then

release the surety and accept the improvements and roadway dedications.

Air Quality Planning: Stanislaus County falls within the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The federal Clean Air Act and federal transportation conformity rule require each transportation improvement program to demonstrate conformance with the federal air quality attainment plans. Information can be found at [www.valleyair.org](http://www.valleyair.org).

Approved Plans: Improvement plans that have been reviewed and approved by the County and other agencies, and signed by the Engineer.

Conditions and Specifications: Includes the Improvement Plans, the latest version of County of Stanislaus Department of Public Works Improvement Standards and References, the Stanislaus County Code, all applicable laws, rules, regulations, ordinances, policies, resolutions, mitigation measures, development standards, zoning restrictions, and conditions of approval.

County: The County of Stanislaus.

Department: Stanislaus County Department of Public Works.

Design Engineer: A person, firm, or corporation legally registered to perform civil engineering in the State of California.

Developer: Subdivider, Developer, property owner, Utility, Registered Engineer or Contractor proposing to design work or do work in the County public rights-of-way or privately owned and maintained rights-of-way in which the County requires approval.

Engineer: Director of Public Works and/or authorized representative.

Engineer's Estimate: The list of estimated quantities of work items for the project and the estimated cost to perform the work. It shall be dated, signed and stamped by the Design Engineer and approved by the County.

Fire Chief: Chief of a fire protection district or Fire Warden.

Fire Inspector: The authorized representative of the Fire Chief assigned to inspect on-going construction projects in conformance to Federal, State, and Local fire codes.



Groundwater: Water that occurs beneath the land surface and fills the pore spaces of the alluvium, soil, or rock formation in which it is situated.

Groundwater Basin – An alluvial aquifer or a stacked series of alluvial aquifers with reasonably well-defined boundaries in a lateral direction and having a definable bottom.

Groundwater Elevation – The elevation to which water in a tightly cased well screened at a given location will rise. Other terms that may be used include groundwater level, hydraulic head, piezometric head, and potentiometric head.

Groundwater Surface – The highest elevation at which groundwater physically occurs in a given location in an aquifer (i.e., top of aquifer formation in a confined aquifer and the groundwater level or water table in an unconfined aquifer. Since groundwater elevation may vary by season, the 'seasonal high groundwater elevation' shall be used when determining the 10 foot minimum vertical separation distance between the basin bottom and the groundwater surface.

HDM: Highway Design Manual as published by Caltrans with CA amendments.

Health Department: Stanislaus County Department of Environmental Resources.

Inspector: Any person employed by the County under the authority of the Engineer to inspect on-going construction projects.

Laboratory: Any testing agency or testing firm which is acceptable to the Department.

Maintenance Period: The one year period in which the developer shall maintain all improvements commencing on the date of the acceptance of improvements within the county right-of-way. This also applies to the applicants of other types of Stanislaus County's Encroachment Permits.

Parks Department: Stanislaus County Department of Parks and Recreation.

Plans: Improvement Plans prepared by the Developer for a specific project.

Record Drawings: An original set of plans showing the actual work as completed in the field, also known as "as-built" drawings, signed and stamped by the Registered Civil Engineer.

Special Provisions: Specific clauses setting forth conditions or requirements particular to the work and supplementary to the Standards as a part of the contract documents.

Specifications: Directions, provisions, and requirements contained in this manual. The specifications pertain to the method and manner of performing the work and the quality and quantity of materials involved.

Standards: These Improvement Standards of the County of Stanislaus including the text and drawings contained in this manual.

State Standards: The current edition of the State of California Standard Specifications, the Standard Plans, the Highway Design Manual, the Manual of Uniform Traffic Control Devices, the California Manual of Uniform Traffic Control Devices, Construction Manual, and Materials Testing Manual.

Subdivision Improvement Agreement: One or more agreements which are entered into by the County to secure the construction of such public or private improvements as required by an adopted Resolution by the Board of Supervisors or agreements between the developer and the County.

Surveyor: A person, firm, corporation, partnership or agent thereof, legally licensed to perform land surveys in the State of California.

Utility: Public sewer, public storm drain, public water, irrigation districts, gas companies, power companies, water companies, telephone companies, television cable companies, community services districts, railroads and any company holding a franchise to occupy road right-of-way within Stanislaus County.

### **1.3 PLANS:**

Improvement Plans for prints shall be prepared by the Developer and shall be submitted to the Engineer. Plans shall be approved by the Engineer prior to commencement of any work. The approved plans shall be on a translucent (i.e., plastic film, mylar etc) medium 24 inches by 36 inches with a minimum 1 inch border on the left side with ½ inch border on all other sides.

#### **a. Datum:**

All Plans shall be based on the North American Vertical Datum (NAVD 88). Only benchmarks on file with the Department shall be used. The

entire project shall be based on the California State Plane Coordinate System (NAD 1983), Zone 3. Horizontal control for the project must be aligned with at least two state plane coordinate control points.

b. Scale:

The plans shall be scaled to sufficiently show the necessary details when reproduced and to construct the project. Generally, use a horizontal scale of 1 inch = 10 feet or 1 inch = 20 feet on mild slopes. On steeper slopes or highly detailed plan drawings and on larger projects, a horizontal scale of 1 inch = 40 feet or 1 inch = 50 feet may be used. On profile sheets, the vertical scale should be 1/10th the scale of the horizontal scale.

c. Title Block:

Each sheet of the Plans shall have a title block showing the project name; sheet title; date of the drawing and revisions; scale of the drawings; page number; the Design Engineer's name, address and telephone number; registration stamp showing the engineer's name, registration number, expiration date and the date the plan was signed; and the Design Engineer's signature.

d. Orientation and Stationing:

If practical, arrange the design and drawings so that the north direction points to the top or left edge of the sheet. Stationing should be positive in the north and east directions. If practical, the stationing on the plan and profile sheet shall read from left to right or from bottom to top. A north arrow shall be placed on all appropriate sheets. Negative stationing should be avoided.

e. Format:

Plans should consist of the following: Title sheet, topographical sheet (unless exempted by the Engineer), grading and drainage sheet, utility sheet, plan and profile sheet, detail sheet, construction detour plan, traffic handling plan, quantity sheet, storm water pollution prevention plan, and striping plan. Plans shall also show sufficient data to enable the design to be reviewed for conformance to County Standards and for the project to be constructed.

f. Title Sheet:

The first sheet or title sheet shall contain, but not be limited to:

1. The layout of the entire project drawn to an appropriate scale including road names and lot numbers, centerline monuments and bearings and distances. The bearing, distance and the basis of bearing from an established monument of record to a proposed project monument in the subdivision.
2. A vicinity map and north arrow.
3. An index of sheets (if more than one sheet).
4. A legend of symbols.
5. The location, description, elevation, and datum of the reference benchmark.
6. The location of the project by township, range, section, and Assessor's Parcel Number. Also include reference to any permits that regulate the project.
7. A signature block for all approving agencies is required on the title sheet. Individual sheets may also require signature blocks for Stanislaus County Department of Environmental Resources, Stanislaus County Department of Fire Safety, Department of Planning and Community Development, a W.I.D. number or other County Departments, or Utilities.
8. Applicable typical cross section(s).

g. Topographical Sheet:

A topographical survey sheet(s) (when not exempted by the Engineer) may be required showing, but not limited to:

1. Spot elevations at appropriate intervals, drainage system details, fences, structures, pipelines, ditches, utility poles, driveways, roads, pavement, right-of-way (both sides of the road), signs and pavement markings, trees, easements and any other feature which may affect the project.
2. The topographical survey extending a minimum of 300 feet past the limits of the project or such distance as may be appropriate to show specific impacts to the project design. The survey must show the full existing and proposed right-of-way for that length.

h. Plan Quantity Sheet:

A Plan Quantity Sheet(s) shall be included, showing each item and the quantity to be used for the project. An item description column, plan sheet number, station to station, a quantity column, and a final quantity column shall be shown. Final quantities will be shown on the as-built plans.

i. Grading and Drainage Sheet:

The Plans shall include an overall grading and drainage sheet(s) showing, but not limited to:

1. A typical lot grading detail. Typical lot grading detail may be placed on detail sheet.
2. The proposed lot corner elevations as well as any elevation differential between the project boundaries and the adjoining properties and finished elevation or building pad elevation for each lot.
3. Gutter or ditch flow arrows and slopes, drainage courses (existing and proposed), drains, grade breaks, storm drainage pipe sizes and slopes, manholes, valley gutters, catch basins and grate elevations, sufficient top of curb elevations to show drainage patterns, retention basin location and a separate sheet for details, location of lift stations, location of any retaining walls, culverts, inlets, and headwalls, location and size of easements and any other items affecting grading and drainage.
4. Where soil borings are performed for drainage purposes, the location of the soil borings and the soil boring results shall be shown on the plans.
5. Construction plans shall also show temporary water pollution control devices, erosion control devices, contour grading, and drainage details.

j. Utility Sheet:

The Plans shall include utility sheet(s) showing, but not limited to:

1. Streets lights, conduit runs and power source for each street light circuit, water wells, fire hydrants, water lines, valves, blow-offs, sanitary sewer lines and manholes, leach fields and waste system

appurtenances, clean outs, sewer and water service locations, power lines, gas lines, television cable lines, utility boxes, telephone lines, driveways if locations are known, utility easements and any other utility items at or near the project location.

2. All sheets shall contain a note about contacting USA prior to excavation.
3. A signature block for any agency or Utility whose facilities shall be installed, made part of, or connected to, as part of the improvements.
4. The Designer or Engineer shall utilize the Caltrans policy on high and low risk underground facilities with highway right-of-ways. See Appendix LL of the Project Development Procedures Manual.

k. Plan and Profile Sheet:

The Plans shall include a plan and profile sheet(s) showing the existing and proposed profiles of all roadways. They shall include, but not be limited to:

1. All elevations necessary to accurately describe the work. This shall include any super elevation or crown for the roadway. A super elevation diagram shall be submitted when necessary.
2. A cross section of the roadway along with the traffic index and soil R-value used in design including the design speed for each road.
3. Grade breaks, centerline, vertical curves, percent slope, road stationing and survey data, original ground at centerline and right-of-way, top of curb profile, storm drainage lines, water lines, sewer lines, the station of the nearest cross street for mid-block improvements, any areas of possible conflict between underground utilities, indicate length and type of pipe between manholes and catch basins, elevations of pipe inverts, grate elevations of catch basins, drain inlets, manholes, and all other pertinent data. Pipelines and underground utility lines shall be shown on both the plan and profile portion of the sheet.
4. All sheets shall contain a notation about contacting USA prior to excavation.

l. Construction Detail Sheet:

A complete detail sheet(s) showing a typical detail for each

construction item applicable to the project shall be clearly shown on the plans and not referenced only by a plate number.

On the detail sheet(s), reproduce the Standards in this manual that apply to the project and identify by plate number. Modifications to the Standards shall be clearly marked.

The required sheets may be combined into a single sheet as long as the work to be performed is clearly defined.

m. Traffic Signing and Striping Plan:

The traffic signing and striping plan shall contain, but not be limited to:

1. An overall plan of the project showing the new roadways and the surrounding existing roadways. The plan shall show both sides of the road, all traffic lanes, edges of pavement and handicap ramps.
2. Existing traffic signs, pavement markings and striping.
3. Proposed traffic signs, pavement markings and striping.
4. Traffic signs shall be identified by type, size, and by Caltrans designation.
5. Detail style designations are encouraged.
6. Sufficient data shall be shown on the Plans to identify the placement of signs, striping and pavement markings.

On uncomplicated street improvement plans the striping and signing details may be incorporated into another sheet with the concurrence of the Engineer.

n. Supplemental Information:

1. When the Plans mention products like pumps, motors, street lights, etc., the Design Engineer shall provide the manufacturers' specifications, operations manuals, and maintenance manuals.
2. Design calculations for storm drainage systems including watershed area calculations, hydraulic pipeline flow calculations, required storage volume calculations, percolation calculations, pumping plants, structures, etc. shall be provided in a separate storm drainage report. All design calculations shall be stamped

and signed by the Design Engineer. The calculations shall clearly reveal, using figures and diagrams, how the result was obtained. If the result is computer generated, the Design Engineer shall provide the means to verify the result to the Department.

3. Quantities and the Design Engineer's estimate shall show a detailed itemized estimate of cost, including contingencies. The estimate shall be signed and stamped by the Design Engineer.
4. A geotechnical soil's report (prepared by a person, firm, or corporation licensed to prepare such report) shall be submitted with the plans. The soils report shall include, but not be limited to: "R-value" tests of sub-grade soil, structural section design based on County approved Traffic Index, percolation rates taken at appropriate elevations, water table elevations, and logs of the soil profiles.
5. All landscaping and irrigation plans, when required, shall be designed and constructed in accordance with the requirements of Department of Planning and Community Development, the Department of Parks and Recreation, and the Caltrans Highway Design Manual (for sight visibility and clearance requirements).
6. Where the improvement plans are for a portion of a larger development, a tentative map or master plan, including all infrastructure for the ultimate development, shall be submitted along with the plans.
7. Plan check fees shall be paid prior to receiving signed and approved plans or recording a final map or parcel map. A deposit fee may be required prior to plan or map check at the discretion of the Road Commissioner.
8. Copies of utility and will-serve letters shall be provided as required by the Engineer.
9. Where existing pavement is being joined and widened, the plan submittal shall include cross sections of the existing pavement from crown line to a minimum of 10 feet outside the right of way at 50 feet maximum intervals, and showing the proposed widening. Design elevations of proposed edge of pavement or lip of gutter and/or top of curb shall be shown along with existing elevations. The cross slope of the existing pavement to remain and proposed new pavement cross slope shall be calculated and shown for each section.
10. A set of design calculations with supporting information for the



proposed project shall be submitted at the time of plan submittal.

o. Departmental Review:

The Design Engineer shall present two sets of plans to the Engineer for the initial plan review.

Plans being resubmitted shall consist of two sets of revised plans. On one set of the revised plans, the Design Engineer shall highlight all changes. The original plan set previously marked for correction must also be submitted. If the previously marked plan set is not submitted with the re-submittal check set, the plan review time shall be extended.

A revised engineer's estimate, revised design calculations, and any other submittal or supporting information required by the Engineer shall accompany all plan re-submittals.

The Engineer may require additional sets of improvement plans, as deemed necessary, to complete the review and inspection.

The Department shall be the last agency to sign the Plans for final approval. The Design Engineer shall present the final Plans with all required agency signatures. If there are required changes during construction after the Plans have been signed by the Engineer, the changes shall be properly documented on the record drawing. Said changes shall be in accordance with Engineer's written approval.

Signed Plans shall be reproduced on 3-mil mylar at Developers expense and provided to the Department. The mylar drawings shall become the property of the County and retained in the Department of Public Works. In addition to a set of mylars, four copies of the final approved and signed improvement plans shall be submitted prior to applying for a permit (grading, encroachment, building, etc) or prior to starting any construction work.

Plans will not be considered approved nor construction authorized until the Engineer has signed the original drawings. Grading, encroachment, and building permits shall not be issued without approved improvement plans. These permits shall be accompanied with a plan showing the extent of the proposed improvement and/or grading.

No grading activity shall be performed without obtaining the necessary grading permits by the Applicant and his/her Contractor. Where County developments drain into a storm drain system located within a

City Sphere of Influence, the developments shall comply with the requirements of that particular agency, the National Pollutant Discharge Elimination System (NPDES) Program, and the Construction General Permit (CGP).

The plan approval is valid for 12 months after the date of approval. Should construction not begin within the twelve month period, the approval shall expire and the plans and engineer's estimate shall be resubmitted for review and re-approval. A request for an extension may be filed prior to expiration, and approved on a case by case basis. An additional plan check fee may be incurred for re-approval of plans.

p. Plan Revisions During Construction:

Should changes become necessary during construction, the Design Engineer shall first obtain the approval of the County Inspector for any plan revisions.

Changes that become necessary during construction may also need to be reviewed and approved by the Planning and Community Development Department. Any changes that have the potential to affect conditions of approval or development standards for the project, such as landscaping or parking, shall first be reviewed and approved by the Planning and Community Development Department for zoning compliance.

Revisions to the plans shall be made in the following manner:

1. The Design Engineer shall indicate the revisions on a blue line print and submit it for review by the County Engineer. Upon agreement of the revisions, the County Engineer will issue the plan revisions to the contractor for construction.
2. The original design shall not be deleted in the plans but shall be lined out.
3. In the event that eradicating the original design is necessary to maintain clarity of the plans, approval must first be obtained from the County Inspector.
4. The changes shall be clearly shown on the plans with the changes and approval noted on the revision signature block. The Design Engineer and the County Inspector shall both initial the revision block to confirm responsibility and approval.

5. The changes shall be identified by the revision number in a triangle delineated on the plans adjacent to the change and on the revision signature block.
6. The Engineer may order changes in the plans in order to complete the necessary facilities. Changes in the plans ordered by the Engineer shall conform to all of the above.

q. Record Drawings:

1. The Design Engineer shall keep an accurate record of all approved deviations from the plans and shall provide a copy of these records to the Engineer upon completion of the work. "As-built", "as-constructed" or "record" plans, known as "Record Drawings", shall be provided to the Department prior to acceptance of the improvements.
2. Record drawings shall be on 3-mil mylar and stamped "Record Drawings" with the Design Engineer's registration stamp and signature on each sheet. Approved deviations shall be recorded on the original approved plans, not reproducible copies. The original plans shall not be removed from the Department of Public Works for preparation of "Record Drawings" without approval of the Engineer. A work area will be available for making additions or corrections.
3. Portions of the plans replaced by changes during construction shall not be erased but simply crossed off or lined out.
4. All utilities not shown on the construction plans shall be drawn on the record drawings.
5. Street light conduit runs, power source and pull boxes shall be shown on the record drawings.
6. All lettering must be clear and legible.
7. Extensive unclear changes must be shown clearly on a supplemental sheet.
8. Record drawings shall become the property of the Department.
9. Electronic files of the as-built (in standard PDF format at 400 dpi minimum resolution settings and CAD DWG or DXF format) shall be provided in addition to the original as-built mylars. After review

of the data, departmental staff may comment prior to final acceptance.

10. Prior to accepting the as-built, county staff shall review the Record Drawings and electronic files to confirm that they reflect what has actually been constructed.

r. Disclaimer:

The following statement shall be placed with the approval block, on the cover sheet:

“These plans have been checked by the Stanislaus County Department of Public Works and/or an authorized representative, but such checking and/or approval does not relieve the contractor from his/her responsibility to correct errors, omissions, or make changes required by conditions discovered in the field during the course of construction”.

**1.4 PRIORITY OF WORK:**

All underground utilities shall be constructed and accepted prior to surfacing of roads or rights-of-way. The Developer shall be responsible for making arrangements, as necessary, with utility companies to insure that the necessary underground utilities are constructed.

**1.5 STAKING:**

The Developer is responsible for providing all required construction staking. Additionally, a copy of the staking notes shall be submitted along with the as-builts.

**1.6 INSPECTION:**

The Inspector shall perform inspection of all work and materials furnished to ensure conformance with these Standards on the approved plans. The cost of all inspections shall be paid by the Developer.

The Developer shall request inspections a minimum of 48 hours in advance to permit scheduling of inspection by the Inspector.

All work not accepted by the Inspector shall be remedied, removed or replaced by the Developer. Any work done beyond that shown on the Plans approved by the Engineer may be ordered removed, by the Engineer or Inspector, at the Developer's expense.

Materials proposed for use and not specified herein shall be submitted for approval by the Engineer prior to ordering such material.

Underground work shall not be backfilled or covered until an inspection by the Inspector has been made and the work accepted. Any work that is backfilled or covered without inspection shall be uncovered, at Developer's expense, upon the request of the Inspector.

The Inspector shall have access to the work at all times and shall be furnished every reasonable facility for ascertaining that the work done, materials used and workmanship performed are in accordance with the requirements and intentions of these Standards and the approved Plans and Specifications. Failure of the Inspector to note faulty material or workmanship during construction or on material submittals shall not relieve the Developer of the responsibility for correcting such deficiencies at Developer's expense. The inspection of the work or materials shall not relieve the Developer of any obligations to fulfill the contract. Work or materials not meeting these Standards or approved Plans may be rejected.

Improvements that are to be relinquished to the County will be accepted for maintenance only after the Engineer receives written notice from all agencies (such as the sanitary sewer district, water district, fire district, irrigation district, environmental resources, planning, parks and recreations, and any other governmental agencies as may be required) stating that all pertinent work has been completed to their satisfaction and has been accepted for maintenance. The project will then be submitted to the Board of Supervisors for their approval, per Stanislaus County code.

#### **1.7 CONCRETE:**

Portland cement concrete, unless otherwise approved by the Engineer, shall be as defined in the State Standards. The concrete shall consist of a 6 sack mix minimum (3,500 pounds per square inch minimum compressive strength rating) with aggregates graded pursuant to State Standards with a maximum size gradation of 3/4 inch. All mix design shall be approved by the Engineer prior to use.

#### **1.8 DUST CONTROL:**

Dust control shall be the responsibility of the Developer and shall be implemented in accordance with applicable federal, state, and local guidelines.

## **1.9 SURFACE RESTORATION:**

Work in easement areas must be confined to the easement and the surface of the work area shall be restored to its original condition.

Written agreements must be made between the Developer and the property owners if work or equipment is outside the easement. The surface of the area outside the easement must be restored to the satisfaction of the property owner. Said agreements are the responsibility of the Developer.

In the case of paved areas, excavations, or trenches that leave less than six feet of existing surfacing, the remaining surface shall be removed, and the full section replaced in accordance with the design drawings and/or Standards.

Excavations in the shoulder area located within three feet of the edge of pavement shall be restored with a minimum of eight inches of aggregate base material.

Prior to paving, all uneven or loose edges shall be saw-cut in true and even lines parallel with the centerline of the work. See Section 3 for paving details.

## **1.10 CLEAN UP:**

Developer shall clean up the dirt and debris caused by the construction, including adjacent roads affected by his work. All sidewalks, curbs, approaches, crosswalks, existing and new drain inlets, lawns, etc., shall be kept free of excess dirt and rubbish and kept in a clean and neat condition. Public roads shall be cleaned daily, or as needed, with the minimum being once per day.

Before a final inspection of a project is requested, the following shall be completed:

- a. All of the right-of-way, adjacent property, adjacent roads and alleys and all areas used by the Developer in connection with the project shall be cleared of all debris and excess material and left in a neat and presentable condition.
- b. All paved areas shall be free of dirt and dust.
- c. All concrete surfaces shall be free of excess concrete, paving materials, dirt and dust. All expansion joints shall be trimmed flush with the concrete.

- d. All old and new storm drain inlet bottoms and outlet pipes shall be free of all dirt and debris. Care shall be taken to keep sand and silt out of storm drains, catch basins, manholes or horizontal drains. Any storm drains, catch basins, manholes or horizontal drains affected by the work shall be cleaned by the Developer.
- e. All manhole bottoms shall be cleaned of all foreign matter and covers shall be raised to grade and have all excess asphalt removed.

The Developer shall not remove temporary warning, regulatory and guide signs prior to formal acceptance by the County. Such signs shall be removed as directed by the Engineer.

#### **1.11 DESIGN EXCEPTIONS:**

These Standards are intended to be minimum standards which apply to all new construction. Any design exceptions from these Standards are to be specifically approved in writing by the Engineer.

For in-fill construction projects, the Engineer may approve design exceptions, variations, and modifications from these Standards as necessary, due to conditions of, and the compatibility with, existing improvements adjacent to the construction.

#### **1.12 GUARANTEE:**

The Developer, Contractor, or utility shall inspect and repair all defects on his constructed improvements in the public right-of-way for a period of one year from the date the work is accepted as complete by the County.

#### **1.13 MONUMENTS:**

All existing road survey monuments within the area of construction shall be placed in monument wells and raised to grade or shall be surfaced with a minimum of three reference monuments established outside of the construction area. With the exception of "Government Corners", the monuments shall be 3/4 inch (inside diameter) x 24 inches in length, and shall be galvanized iron pipe or approved equal.

Government Corners, (section corners, quarter corners, etc) shall be a minimum of 2 inches (inside diameter) by 30 inches in length, if set in roadway. If set in open area, above ground, it shall be 48 inches in length. Government Corners shall be galvanized iron pipe, or approved equal, with an appropriately marked brass or aluminum cap as per the BLM Manual of Survey Instructions, 2009. A minimum of three reference

monuments shall be established with bearing and distance ties referenced. A corner record shall be filed for each Government Corner.

Pursuant to Government Code 27583: The Board of Supervisors shall furnish all necessary pipe or stakes for monuments in the County on demand and without cost.

At least one exterior boundary of the map shall be monumented prior to recording the final map. Interior monuments need not be set at the time the map is recorded if the engineer or surveyor certifies on the map that the monuments will be set on or before a specific date, and if the subdivider furnishes to the legislative body security guaranteeing the payment of the cost of setting monuments.

Final maps shall show the position of all monuments to be set as per the requirements of the Land Surveyors Act and the Subdivision Map Act.

- a. Road Monuments: Road survey monuments shall be 3/4 inch (inside diameter) by 24 inches long or approved equal. The Monument shall be tagged as per the requirements of the Land Surveyors Act. If set in a monument well, it shall be installed in conformance with the Road Monument Plate contained in these Standards. If surfaced, then a minimum of three fully referenced and monumented ties (azimuth and distance) shall be established for each monument and a corner record filed for each monument so set. It shall also be set as referenced in the Monument Guide Plate contained in these standards. Road monuments shall be set at each of the following locations:

1. Intersection of the road centerline;
2. Beginning and end of curves;
3. Any change of direction; and,
4. Any other points deemed necessary by the County Surveyor.

Road monuments shall be 3/4 inch inside diameter x 24 inches long galvanized iron pipe or approved equal. The monument shall be tagged as required by the State of California Land Surveyors' Act.

- b. Boundary Monuments: Boundary monuments, if not existing, shall be placed on the exterior boundary at the following locations:
  1. Any changes of direction;
  2. Beginning and end of curves;
  3. Block corners and alley corners; and,
  4. Any other points required by the Subdivision Map Act or Land Surveyors Act.



Boundary monuments shall be 3/4 inch inside diameter x 24 inches long, galvanized iron pipe with the exception that R-1 lots may be 1/2 inch inside diameter by 24 inches, galvanized or iron pipe or approved equal. The monument shall be tagged as required by the Professional Land Surveyors Act.

c. Lot Corner Monuments: Lot corner monuments shall be placed in the subdivision at the following locations:

1. At each corner except as otherwise provided by this section;
2. Any other lot corners deemed necessary by the Subdivision Map Act. Monuments shall not be located under footings or structures.

Lot corner monuments shall be 3/4 inch inside diameter x 24 inches long galvanized iron pipe. The monument shall be tagged as required by the State of California Land Surveyors' Act. The top shall be at least one foot below the ground surface.

On standard R-1 lots, the monuments may be 1/2 inch inside diameter x 24 inches long galvanized iron pipe or approved equal.

#### **1.14 BENCHMARK:**

A minimum of one benchmark shall be established (on a brass cap) within each subdivision. The location and elevation shall be shown on the record drawings. If possible, the benchmark shall be set at the base of a street light standard. National Geodetic Survey vertical (elevation) datum shall be used. When available, 1988 data or most recent datum shall be used.

When developing within the City of Modesto Sphere of Influence, the development shall tie the proposed property into the City of Modesto High Precision GPS Record of Survey 22-S-51 per City standards.

A benchmark card shall be filed with the County Surveyor for each established subdivision benchmark.

#### **1.15 ENGINEERING AND CONSTRUCTION COMPLIANCE REQUIREMENTS:**

The County requires strict compliance with the Professional Engineers Act of the California Business and Professions Code. All plans, specifications, reports, and documents required by the County shall be signed and stamped with the seal of a Registered Civil Engineer, currently licensed and able to practice in the State of California.

All work performed to meet these standards shall be constructed by Contractors holding a current valid license issued by the Contractors State License Board, Department of Professional and Vocational Standards, State of California. The Contractor must be licensed appropriately for the type of work to be performed.

#### **1.16 FINANCIAL GUARANTEE:**

The County shall require security for performance on projects without a Subdivision Improvement Agreement as follows:

Faithful Performance Security: Applicants shall provide the County with an acceptable irrevocable letter of credit, cash deposit, certificate of deposit, or other suitable financial guarantee acceptable to the County from a financial institution authorized to do business in the State of California, and such authorization shall be valid for one full year after the project is accepted by the County. The security shall be in the amount of 100% of the County approved engineer's estimate.

The purpose of the Faithful Performance Security is to provide protection to the County for any expenses it may incur as a result of:

- a. Failure by the Contractor to complete the installation.
- b. Necessary repairs caused by poor installation techniques.
- c. Necessary repairs caused by the installation of defective material.
- d. Failure by the Contractor to perform in accordance with the approved plans and specifications.
- e. Material liens against the County.

#### **1.17 GUARANTEE OF WORKMANSHIP, MATERIALS AND EQUIPMENT:**

The Applicant and/or Developer shall guarantee that the project installed by the Contractor be free from any and all defects in materials and workmanship for a period of one year after final acceptance by the County. This guarantee shall be based on the Design Engineer's approved construction cost estimate, or other amount determined by the County. The County may make any necessary repairs and charge the surety in the event the developer or contractor fails to correct the defects.

Contractors performing work for the applicant shall be competent with adequate manpower and equipment to accomplish the work in accordance with the approved plans and specifications and licensed in the State of California. A representative of the Applicant and the Contractor shall be present at the job site whenever work is being conducted by subcontractors.

### **1.18 DEVELOPMENT WITHIN A CITY'S SPHERE OF INFLUENCE:**

Within the Spheres of Influence of any city, roadway improvements, dedications, building setbacks, and road reservations shall meet the development standards of the appropriate city. This shall be consistent with the Spheres of Influence Policy in the Land Use Element of the General Plan, except in those areas subject to an individual city/county agreement. These requirements may change from time-to-time through the adoption or revision of local land use plans or standards. To ensure consistency with a city's development standards, additional right-of-way may be required for each of the roadway classifications described within these Standards. Where design and access requirements of a city differ from those established by the County, development shall be required to meet the standards of the city. The design engineer and/or developer shall consult with the city prior to the construction of improvements within its sphere of influence to ensure consistency with the standards of that city.

### **1.19 ENCROACHMENT PERMITS:**

Before the Department of Public Works will issue an encroachment permit for any construction within the County's public right-of-way, the following must be submitted.

- a. A set of improvement plans signed and approved by the Design Engineer for the construction of street improvements or pipelines running longitudinally within the right-of-way must be submitted showing the location and type of encroachment. If a trench is to be dug, a cross-section must be shown labeling depth, width, pipe diameter, and backfill specification.
- b. A Certificate of Insurance showing proof of General Liability in the amount of \$100,000,000 (minimum) for the person signing the encroachment permit. The owner can not sign for a contractor or vice-versa.
- c. Appropriate fees shall be paid and an encroachment permit obtained prior to performing any construction activities.
- d. Call the Inspector 48 hours before starting work and for final inspection at (209) 525-4130.
- e. Perform work according to County Standards and Specifications.
- f. Call USA North at 800-642-2444 for utility locations at least 48 hours before digging. Other utility companies may need to be

contacted:(including, but not limited to PG&E, SBC, MID, TID, Comcast, Charter, etc). Provide a copy of these permit conditions to all Contractors doing work covered under the encroachment permit.

- g. Construct subdivision improvements in accordance with approved plan set and conditions of approval and/or development standards.
- h. Prior to receiving any water taps or sewer connections, the Developer shall pay the service connection charges to the appropriate water or sewer agency.
- i. Prior to issuance of the permit for a project over one acre, the Contractor or Developer shall provide the County the Stormwater Pollution Prevention Plan and a copy of the Notice of Intent (NOI) filed with the State Water Resources Control Board. In compliance with the State Water Resources Control Board, the Storm Water Pollution Prevention Plan is required to be on-site. A copy of the NOI shall be attached to the encroachment permit.
- j. Off-site inlets adjacent to the proposed project shall have filter screens placed in the grates to prevent silt contamination. These shall be maintained during the entire duration of the project.
- k. No landscaping work is permitted unless plans are approved by the Department of Parks and Recreation and/or the Department of Planning and Community Development.
- l. Open all traffic lanes during peak hours: Mon-Fri: 7:30 – 8:30 AM; 4:30 – 5:30 P.M.
- m. Full street closures will require a separate permit. Street closure permits will be conditioned to post all streets that are affected with the closure. The traffic plan shall be approved a minimum of two 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. Please contact Stanislaus County Public Works Traffic Engineer at (209) 525-4130 for traffic plan approval.
- n. Partial street closures may be coordinated with the inspector. Partial street closures may be limited in time to 8:30 am to 4:30 p.m. All construction traffic control shall follow the Caltrans Manual of Temporary Traffic Controls.

## **CHAPTER 2: TEMPORARY TRAFFIC CONTROL AND SAFETY**

### **2.1 GENERAL:**

This Traffic Control and Safety Section is intended to establish general principles of safety and traffic control while in the performance of any work covered by these 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 County in the exercise of powers conferred by law in modifying the specification under special conditions.

The requirements of the latest edition of the State of California Department of Transportation, California Manual on Uniform Traffic Control Devices, herein referred to as the "CAMUTCD", shall take precedence over the requirements of this Safety Section.

### **2.2 TRAFFIC CONTROL:**

The safe movement of traffic through construction areas depends upon communicating concise and proper information to the public by signs, channelizing devices, barricades, markings, lighting devices and control of traffic through work zones. All such devices necessary during construction shall be furnished by the Developer. The size, shape and color of such devices shall be as required by the CAMUTCD. No traffic control devices shall be altered or removed from the construction site without prior approval of the Engineer.

### **2.3 CONSTRUCTION SIGNS:**

All signs shall conform to Chapter 2 (Signs) and Chapter 6 (Temporary Traffic Control Elements) of the latest edition of the CAMUTCD.

Signs used for night-time 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.

### **2.4 CHANNELIZING DEVICES:**

The function of channelizing devices is to guide and alert drivers of hazards created by construction or maintenance activities in or near the traveled way and to guide and direct drivers safely passed the hazards. Channelizing devices shall conform to Part 6 of the CAMUTCD.

Channelization devices should be uniformly positioned laterally and longitudinally relative to the line of traffic and they must be maintained in an erect position. Consideration must also be given to the necessity for stability against knock-down from wind or from the wash of passing traffic.

Channelization devices for night-time use shall be reflectorized to be visible from 500 feet under normal atmospheric conditions.

## **2.5 BARRICADES AND PORTABLE BARRIERS:**

The function of barricades is to separate workers or motorists from objects or unusual situations created by construction or maintenance activities in or near the traveled way. All barricades shall conform to Part 6 of the CAMUTCD.

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 but to help enhance safety. The use of non-standard types of barricades, such as drums, buckets, sandbags, etc., can be hazardous and their use is prohibited unless they are temporarily used for cushioning devices.

## **2.6 MARKINGS:**

Pavement markings in conformance with Part 6 of the CAMUTCD shall be required if field conditions warrant their use. Additional markings may be required at the discretion of the Inspector.

## **2.7 LIGHTING DEVICES:**

Construction and maintenance activities create conditions on or near the traveled ways that are potentially hazardous, particularly at night when the ability of drivers to see is sharply reduced from daytime conditions. It may be necessary to supplement the reflectorized signs, barriers and channelizing devices with lighting devices. All lighting devices shall conform to Part 6 of the CAMUTCD.

## **2.8 CONTROL OF TRAFFIC THROUGH WORK ZONES:**

The primary function of traffic control procedures is to move traffic safely and expeditiously through or around work zones. All hand signal devices, flaggers, flagging procedures, flagger stations, one-way traffic control, flagger control, flag-carrying or official car, pilot car and traffic control signals shall conform to Part 6 of the CAMUTCD.

Flaggers shall be required, as necessary, for safe conduct of the traffic

through the construction zone or as directed by the Engineer.

## **2.9 PRINCIPLES OF WORK ZONE TRAFFIC CONTROL:**

In work zones, the work and traffic controls must be coordinated to provide safe and expeditious movement of traffic and pedestrians, while allowing the work to progress as rapidly, safely and efficiently as possible. Placement of all work zone traffic control signs and devices shall conform to Part 6 of the CAMUTCD.

## **2.10 ROAD CLOSURES:**

The County does not support full road closures unless under special circumstances based on case by case bases and as approved by the Engineer.

The purpose of a road closure is to protect and promote the health, safety and general welfare of the citizens of Stanislaus County by controlling full road closures within Stanislaus County networks of roadways. It is intent of Stanislaus County Public Works to accommodate the motoring public to the fullest extent without compromise of safety. Encroachment Permits shall allow lane closures with complete and detailed one-way flagging or other traffic control devices to allow traffic safely through the construction zone. Full road closures, as a rule, are not to be used. Full road closures with detours will only be permitted under the conditions found in this standard. The granting of a temporary road closure or crossing by the Stanislaus County Road Commissioner is a privilege and not a right to private entities.

### **a. Full Road Closure Requirements**

A full road closure shall only be allowed in situations where the closure is the least disruptive option to traffic. The following steps must be completed to the satisfaction of the Department. The final approval will be by the Road Commissioner or Board:

- i. Encroachment Permit and Application Submitted with a Project Description**
  1. The applicant shall pay to Stanislaus County when the agreement is executed \$500/day per 1,000 Average Daily Traffic that the road is closed.
  2. If the applicant is not a public utility and the road closure includes the installation of a trench across the County maintained roadway, a Pipeline Maintenance Agreement shall be taken out by the applicant. The applicant will be

responsible for all future maintenance of the pipeline and the trench.

- ii. Purpose and Need of the Closure
- iii. Develop 2 Alternatives (minimum) plus a 'no closure' alternative
- iv. Develop a Detailed Schedule
- v. Develop a Stakeholders List, Including All Media Outlets (stakeholders to include adjacent landowners, emergency responders, and public agencies)
- vi. Notify All Businesses Within ½ mile of Project Site (including agricultural businesses)
- vii. Conduct One Public Information Meeting (minimum)
- viii. Obtain Final Approval From the Director or Board
- ix. Publish Findings of Outreach Meeting (approval and notice of closure to all media outlets as defined in step 5).

b. Road Closure Approval

The Road Commissioner shall have the authority to approve the road closure application and agreement for roadways that have an average daily traffic count of less than 7,000 trips per day. If the proposed road closure is on a roadway with more than 7,000 trips per day, the Board shall approve the closure prior to implementation.

c. Traffic Control Plan

A minimum of seven working days prior to any temporary road closure a traffic control plan (detour plan) prepared by the Developer shall be submitted to the Engineer for review and approval. After Engineer's approval of the traffic control plan, the Developer shall obtain an Encroachment Permit pursuant to Section 1460 et. seq. of the California Streets and Highway Code. The permit shall be obtained a minimum of two working days prior to the actual road closure. The Encroachment Permit may require a cash guarantee at the time of issuance to ensure that all requirements of the road closure are met. The Inspector must be notified by the Developer 48 hours prior to the road closure and must be kept informed of closure status. The California Highway Patrol, Stanislaus County Sheriff's Department, Stanislaus County Fire Warden, Stanislaus County all Emergency Dispatch, and the local school districts shall be notified by the Developer of the road closure a minimum of 24 hours prior to the closure. This is part of the County's Traffic Delay Notification program (see Section 2.10.d below).

A copy of the Encroachment Permit and approved traffic control plan shall be provided to the Inspector. All barricades, warning lights, traffic signs and any other safety devices required by the traffic



control plan shall be provided and maintained by the Developer. At the discretion of the Inspector, and based on field conditions, additional safety devices may be required. Protective barricades shall be provided on each side of, and parallel to, an open trench crossing a road when the trench will remain uncovered or when work on the trench ceases.

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. However, roads less than twenty feet in width shall be used for detouring only one direction of traffic unless the Engineer's approval for use has been previously obtained. 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. When detouring a four lane road onto a detour route of less than four lanes in width, parking may be prohibited on the detour route at the Engineer's discretion.

Where the trench line crosses an entrance to private property, until the trench is backfilled, access to the property shall be maintained at all times. Such bridges shall be properly guarded and illuminated at night.

Where any crosswalk is cut by the trench, and said trench is left open, suitable bridging shall be constructed. Such bridging shall be at least four feet in width, shall be properly guarded and shall be illuminated at night.

d. Traffic Delay Notification

A Traffic Delay Notification (TDN) shall be submitted when a traffic control plan requires either a lane closure or a complete road closure that will delay traffic in one or both directions of travel for a period of time during the construction period.

The TDN shall be submitted as part of the Encroachment Permit process. At a minimum, the TDN shall show the Encroachment Permit number; the location of the construction project; the application date, the proposed construction start date, the proposed construction end date, the type of work to be performed, a description of the detour that will be set up, and contract information for the responsible party to which the TDN will be issued.

The TDN must be submitted to the Traffic Division at least 48 hours prior to the lane or road closure occurring. As a result, it is imperative that the Traffic Control Plan be approved ahead of the

planned lane or road closure and the Encroachment Permit issued in time to allow at least 48 hours prior to the planned lane or road closure to submit the TDN. This provides necessary time Public Works staff to transmit the TDN to interested parties that need to be notified about the planned closure.

e. Liquidated Damages

The applicant shall pay the sum of \$500/day per 1,000 Average Daily Traffic as liquidated damages to Stanislaus County for every day the road is not reopened following the road closure agreement. The applicant shall also be required to pay the County's reasonable attorney's fees, court costs, and reasonable expenses of litigation brought by Stanislaus County to compel compliance with the reopening of the County roads.

**2.11 RULES AND REGULATIONS:**

All work performed and all materials used by the Developer shall comply with the following: 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 Developer 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 at the Developer's expense.

Additional requirements may be imposed by the Inspector in the interest of public safety.

**2.12 UNDERGROUND SERVICE ALERT (USA):**

USA is a "One-call Notification Center" used for identifying underground facilities prior to digging. The Developer shall call USA at least 48 hours prior to the start of any excavation.

Request for field meetings shall be included in the initial call to USA.

All excavations shall be in compliance with Section 1541-b(1) of the Construction Safety Orders, (Title 8, California Administrative Code), which states:

"(1) The approximate location of subsurface installations, such as sewer, telephone, fuel electric, water lines, or any other subsurface installations that reasonable may be expected to be encountered during excavation work, shall be determined by the excavator prior to opening an excavation.

A. Excavation shall not commence until:

1. The excavation area has been marked as specified in Government Code Section 4216.2 by the excavator; and
2. The excavator has received a positive response from all known owner/operators of subsurface installations within the boundaries of the proposed project; those responses confirm that the owner/operators have located their installations, and those responses either advise the excavator of those locations or advise the excavator that the owner/operator does not operate a subsurface installation that would be affected by the proposed excavation.”

The Developer shall be responsible for the preservation of and any damage to, both private and public property in conformance with Section 7-1.11, Preservation of Property of the State Standards.

#### **2.13 MAINTAINING VERTICAL AND HORIZONTAL CLEARANCES:**

The Design Engineer shall ensure that their design complies with all vertical and horizontal clearance standards and are in conformance with the latest edition of the Highway Design Manual (HDM). Special attention shall be given to the vertical clearance remaining following any street overlays. Efforts should be made to avoid decreasing the existing vertical clearance whenever possible, and consideration should be given to the feasibility of increasing the vertical clearance even where it currently exceeds minimum standards. The engineering design analysis should also include consideration of other vertical clearances (existing and future) along the route, and available routing around any such reduced clearance structure. All projects, including new construction, shall meet the appropriate minimum clearance design standard for the type of facility, as shown in Index 309.2 of the HDM.

## **CHAPTER 3: ROADS**

### **3.1 GENERAL:**

Road improvements in the public right-of-way shall be designed in accordance to the latest edition of the Highway Design Manual (HDM) and minimum American Association of State Highway and Transportation Officials (AASHTO) standards. Road improvements in the public right-of-way shall be constructed by the Developer to conform to these Standards, the latest edition of the Caltrans Standard Specifications and Standard Plans, and to the Circulation Element of the General Plan (Chapter 2).

Only a Contractor with an appropriate license and required insurance may perform the work described herein. Any road improvement damaged by the Contractor shall be repaired by the Developer as required by the Engineer.

When land is subdivided or otherwise divided into smaller parcels in Stanislaus County, or when buildings are constructed, existing zoning and subdivision regulations provide for the dedication of land for eventual public road use within or adjacent to the development. It is required that sufficient land be dedicated to provide the width necessary for the ultimate road right-of-way based on the road classification of specific street plans. This dedication is based on the presumption that any development will intensify use of the property and of the streets, which provide access thereto.

### **3.2 ROAD CLASSIFICATION:**

A hierarchy of adequately sized roads will be required to provide access to facilitate the movement of people and goods throughout the County, provide access to future development within the unincorporated area and between cities, and maintain acceptable Levels of Service (LOS). The General Plan Circulation Diagram depicted in Figure 3-1 identifies the functional classification of key routes and distinguishes between existing and proposed future roads. The Circulation Plan may change due to land use and development activities over time. The Director of Public Works may determine that some classifications can be downsized to meet existing conditions without a general plan amendment for the purposes of conditioning projects. The classifications as well as their required design and access standards are defined below:

- a. **Freeway:** The function of a Freeway is to provide for the safe and efficient movement of large volumes of interregional, inter-city, and urban traffic at high-speeds. Freeways have no direct land service function. Access is restricted to roads via interchanges, and typically to Expressways and Arterials. Parking is not permitted on freeways. Freeways in Stanislaus County are typically planned, constructed, and operated by Caltrans.

Interstate 5 and State Route 99 are the only Freeways that traverse Stanislaus County.

- b. **Expressway:** The function of an Expressway is to move high volumes of people and goods between urban areas within the county at higher speeds depending upon the level of access control. Direct access to abutting property is specified within the standard for each expressway class. Expressways serve a similar function to that of Freeways - the fast and safe movement of people and goods within the county - and provide access to the interregional freeway system. On-street parking is not permitted on Expressways.

The design features of Expressways are determined by the level of access control. The number of lanes designated for each expressway route segment is shown in Figure 3-2.

**Class A Expressways** are fully access-controlled roads with grade separated interchanges at intervals of approximately one mile at other Expressway, Other Principal Arterial, Minor Arterial, or Major Collector roads.

- c. **Other Principal Arterial (Rural and Urban):** The function of Other Principal Arterials is to move high volumes of people and goods between urban areas within the county at higher speeds depending upon the level of access control. Direct access to abutting property is specified within the standard for each expressway class. Other Principal Arterials serve a similar function to that of Expressways and Freeways - the fast and safe movement of people and goods within the county - and provide access to the interregional freeway system. On-street parking is not permitted on Other Principal Arterials except under very special and rare circumstances where the Department of Public Works has determined that traffic flow and safety conditions allow on-street parking. The design features of Other Principal Arterials are determined by the level of access control and the number of lanes designated for each Other Principal Arterial route segment (see Figure 3-2). The number of lanes that are required will be determined at project build time for the 20-year design life. Both 4 and 6 lane cross sections require the same amount of right-of-way. In terms of Expressways, the access restrictions of Other Principal Arterials are defined as:

**Class B Expressways** are partially access-controlled roads with traffic-controlled intersections at Principal and Minor Arterials. Collectors and Local roads are permitted right-in, right-out access only at 1/4- to 1/2-mile intervals. The typical right-of-way is 135 feet (4 or 6 lanes, respectively). On limited rights-of-way, Class B Expressways may be 124 feet for six lanes.

**Class C Expressways** are limited access-controlled roads with traffic-controlled intersections at Expressways and other Principal or Minor Arterials. Intersections at Collectors and Locals may or may not be controlled by a traffic signal. The typical right-of-way is 135 feet (4 or 6 lanes, respectively). On limited rights-of-way, Class C Expressways may be 124 feet for six (6) lanes.

Driveways for existing residences and businesses along Class C Expressways shall be right-in and right-out only.

- d. **Minor Arterial (Rural and Urban)** The function of a Minor Arterial is to carry moderate- to high-volume traffic to and from Collectors to other Minor Arterials, Principal Arterials, Expressways, and Freeways with a secondary function of land access. Minor Arterials located within areas zoned for heavy or light industrial or that are expected to carry large or heavy trucks shall be constructed to Industrial Major Collector standards. Limited direct access is provided to abutting property. On-street parking will be permitted only where the Department of Public Works has determined that traffic flow and safety conditions allow on-street parking.
- e. **Major Collector (Rural, Urban, and Industrial)** Major Collectors serve a dual function by providing both access to abutting property and movement of moderate volumes of people and goods for medium length trips in Urban, Rural and Industrial zones. Major Collectors serve as transition facilities, carrying traffic from lower to higher-level roads. Most Major Collectors are two-lane roads, but may be up to four-lane facilities where traffic dictates it to be necessary. On-street parking will be permitted only where the Department of Public Works has determined that traffic flow and safety conditions allow on-street parking.

Within industrial zones in the County, the 110 foot Industrial Major Collector shall be the standard for the Major Collectors. The industrial Major Collectors serve as transition facilities carrying traffic from lower to higher level roads.

- f. **Minor Collector**. Minor Collectors serve a dual function by providing both access to abutting property and movement of light to moderate volumes of people and goods for short to medium length trips in Urban, Rural, and Industrial zones. Minor Collectors serve as connection facilities, carrying traffic from local roads to Major Collector roads. Most Minor Collectors are two-lane roads. On-street parking will be permitted only where the Department of Public Works has determined that traffic flow and safety conditions allow on-street parking.

In industrial zones within the County, the 70 foot Industrial Minor Collector shall move goods by providing local access to abutting properties. This is the minimum sized local access road in the County's industrial zones.

In urban residential subdivisions, roads not shown on the General Plan Circulation Diagram or as an Official Plan Line that will serve more than 50 dwelling units, when the maximum density and full extent of the development is considered, shall be deemed Minor Collectors. In some instances, the Department of Public Works may determine that project design features dictate that a road serving as few as 20 urban dwelling units be deemed a Local.

Under certain circumstances, 80 feet of right-of-way may be required to accommodate drainage and to improve safety due to limited visibility or other safety hazards.

- g. **Local (Rural)** Local roads serve as land access facilities in the agricultural areas of the County by providing both direct access to abutting property and movement of small volumes of people and goods for medium length trips. Locals are two-lane roads with a typical right-of-way of 60 feet to safely accommodate drainage, utilities, and other physical improvements that may be located within the public right-of-way. In agricultural areas of the county, roads not shown on the General Plan Circulation Diagram or as an Official Plan Line shall be considered Locals. This classification also includes cul-de-sac and dead-end roads in agricultural areas of the county. The Federal Highway Administration classifies "Locals" with the classification "Local".

- h. **Local (Urban)** Local roads serve as land access facilities in the Urban Zones of the County by providing direct access to abutting property and movement of small volumes of people and goods for short trips.

In urban subdivisions, roads not shown on the General Plan Circulation Diagram or as an Official Plan Line, shall be deemed Locals unless otherwise designated by the Department of Public Works. Local roads are two-lane roads. Locals located within areas zoned for heavy or light industrial or which are expected to carry large or heavy trucks shall be constructed to Industrial Minor Collector standards. This classification also includes cul-de-sac and dead-end roads in urban and industrial areas of the County. The Federal Highway Administration classifies "Local (Urban)" with the classification "Local".

Unless a Subdivision Ordinance exception is granted, no existing or proposed local street shall be designed or altered in such a way that would create a dead-end street longer 500 feet.

- i. **Private.** Private roads serve as land access facilities and are not maintained by the County. Two types of Private roads are permitted in the County. These roads are generally not shown on the General Plan Circulation Diagram.

Agricultural access easements, providing access to parcels 20 acres or more, are included primarily to conform to state-mandated standards for private access roads in the State Responsibility Area as designated by the California Department of Forestry and Fire Protection. New roads under

this category shall not exceed a 12% slope nor be less than 30 feet in width.

Private roads may also be approved by the Planning Commission or Board of Supervisors as an exception to the Subdivision Ordinance to provide access to parcels in an urban or planned development when it is determined that such a request serves a public purpose and that future divisions of land requiring road access to or through the development would not occur due to topographic features, physical barriers, existing development, and other physical constraints of the development and the adjacent lands. If approved, these roads shall be constructed to the same standards as County-maintained roads or other standard approved by the Department of Public Works.

Within the Spheres of Influence of any city, roadway improvements, dedications, building setbacks, and road reservations shall meet the development standards of the city consistent with the Spheres of Influence Policy in the Land Use Element of the General Plan, except in those areas subject to an individual city/county agreement.

These requirements may change from time-to-time through the adoption or revision of local land use plans or standards. To ensure consistency with a city's development standards, additional right-of-way may be required for each of the roadway classifications described above. Where design and access requirements of a city differ from those established by the County, development shall be required to meet the standards of the city.

The County will consult with the city prior to the construction of transportation improvements within its sphere of influence to ensure consistency with the standards of that city.

The formation of a Community Service Agency (CSA) or Home Owners Association (HOA) will be required as determined by the Engineer.

### **3.3 GEOMETRIC DESIGN:**

Road right of way widths shall conform to the street classification and the corresponding construction plate details as shown in Table 3-1, "Street Classification and Plate No."

The gutter slope shall not be less than 0.20%.

The maximum vertical grade for all public roadways in Stanislaus County shall be 10%. However, due to conditions, design constraints or environmental issues, the Engineer may approve an increase in the maximum allowed grade from 10% to 12%.



When required by the Engineer, a truck auxiliary lane shall be installed.

The cross slope of County roadways shall be 2.0% for new construction. When matching existing pavement and/or other restrictions, the cross slope may vary between 1.0% and 4.0% upon prior approval from the Engineer.

Vertical and horizontal alignment shall be designed in accordance with the most recent edition of the California Highway Design Manual (HDM).

Table 3-4 lists the minimum design speed and radii for various types of roadway.

### **3.4 INTERSECTIONS:**

Road intersections shall be as close as possible to right angles. Where required by topographic conditions, the angle of intersection of two local roads may be less than perpendicular but must always be 70° or greater. Opposing roads entering upon any given road shall have their center lines directly opposite each other. If center lines are not opposite each other, then opposing roads intersecting Minor, Local, or Collector roads shall be separated by at least 250 feet. Opposing roads intersecting arterial and expressway roads (unless restricted by a raised concrete median) shall be separated by at least a quarter-mile (1,320 feet).

Roadway with curb and gutter shall have a curb ramp constructed at all curb returns. At "T" intersections with curb and gutter, curb ramps shall be constructed at the near side corner of the terminating road.

Access roads (non-maintained County roads) or driveways that intersect a roadway which has a pipeline or canal structure, shall have its centerline (of the access road) no less than 85 feet from the closest end of the structure.

Driveways along arterial roads and expressways may be restricted as deemed by the Engineer.

Only collector or arterial roads may intersect an arterial road or expressway. Arterial and collector roads may only intersect an expressway road as provided in the access management provisions for the expressway class.

Additional right-of-way shall be acquired to accommodate right-turn lanes and left turn pockets per this manual. Table 3-6 illustrates the recommended intersection lane configurations for each street classification.

Geometric design of intersections shall accommodate traffic for the 20-year design life. The 20-year period shall be measured from the date the improvements are accepted by the County for maintenance.

### **3.5 EXISTING ROADWAYS:**

The following will be required whenever pavement widening is to be done on an existing roadway unless special conditions require otherwise as determined by the Engineer.

- a. The existing edge of pavement shall be saw-cut at a uniform distance parallel with the centerline prior to placement of the paveout.
- b. The pavement structural section thickness shall be per Section 3.7, "Structural Design", of this chapter.
- c. When the Engineer determines a paveout will be temporary, a thinner structural section may be considered for approval by the Engineer.

### **3.6 PART WIDTH ROADS:**

A part width road shall be defined, for the purpose of these Standards, as a new or existing road on the edge of a subdivision, development or improvement not contained entirely within the parcel boundaries of the subdivision or development. The part width road shall be fully developed on the side adjacent to the development plus 12 feet or more of pavement on the opposite side of centerline and shall be marked as "No Parking" until such time as it is fully developed. Part width roads shall be constructed to comply with fire access road standards.

Part width roads shall be constructed:

- a. On new or existing roads bordering new subdivisions or developments.
- b. If the pavement width on the opposite side of the road adjacent to the improvement or subdivision is inadequate for the safe flow of traffic.
- c. When grade differences or existing profiles create an uneven crown or cross slope.

Any above-ground utilities along the part width road on the side opposite the improvements shall be relocated to the side of the improvements when inadequate right-of-way exists on the opposite side of the part width road as determined by the Engineer.

### **3.7 STRUCTURAL DESIGN:**

The R-value design method contained in the State Standards shall be used as the basis to determine the structural section of the roads.

The Traffic Index (TI) is based on a 20-year design life. The minimum TI used to determine the structural section for various roadbeds and intersections shall be based on Table 3-3, "Minimum TI-Values for Streets and Intersections."

The limits of an intersection TI shall be 50 feet beyond the projection of the flow lines.

These values may be adjusted for those roads designated as bus routes or with significant truck traffic, as determined by the Engineer. The Engineer may approve a specific TI, other than the minimum, based on an engineering study including a site specific twenty four (24) hour vehicle classification count to verify the TI.

The Developer shall be responsible for obtaining soil R-value tests, specifically supervised by a registered engineer, in sufficient quantity to establish the quality of the soil and to provide a basis for the design of the structural section. R-value tests shall be taken at Developer's expense. In order to establish the design, R-value tests will be required at the road subgrade elevation. On roads where the frontage is less than 500 feet, two R-value tests shall be made. On roads where the frontage exceeds 500 feet, a minimum of one R-value test shall be taken at each 500-foot interval. Exact locations and number of the R-value tests shall be as approved by the Engineer. The Developer shall stake the field test locations and shall provide an existing ground and finish grade elevation for each test location. The Developer shall provide the results of the R-value tests to the Engineer. The test results shall include a verification signed by a registered engineer that the R-value tests were taken at the depth and locations(s) as shown on the approved plan.

The minimum allowable structural pavement section for County's street classification shall be as shown in Table 3-3, "Minimum Structural Pavement Section."

### **3.8 CLEARING AND GRUBBING:**

All work shall be done in accordance with Section 16 "Clearing and Grubbing" of the State Standards.

### **3.9 EARTHWORK:**

Earthwork shall be performed as set forth in Section 19 "Earthwork" of the State Standards.

Relative compaction shall be determined by California Test 231 utilizing the nuclear gauge. California Test 231 shall be modified to use 30-second or one-minute counts at the option of the Engineer. Five 30-second warm-up counts shall be used instead of ten one-minute counts for testing with 30-second counts.

Section "B" of California Test 231 shall be amended as follows:

"At the discretion of the Engineer, a guide plate measuring approximately 9-3/4 inches x 14 inches x 3/16 inch may be substituted for standard plate. Additionally, a sliding sleeve impact hammer which incorporates a 13/16-inch diameter pin, and is manufactured specifically for use with a nuclear gauge and guide plate, may be used in lieu of standard driving pin."

The Developer shall obtain a disposal site for all of the roadway excavation not used on the job-site. The Developer shall obtain and file with the County a letter showing permission and conditions for use of the disposal site. The Developer shall control dust at the disposal site in conformance with San Joaquin Valley Air Pollution Control District regulations, and keep any roads used free of excess material.

### **3.10 AGGREGATE BASE:**

The aggregate base material shall conform to the requirements of Section 26 "Aggregate Bases" of the State Standards for Class 2, 3/4 inch maximum combined grading.

### **3.11 PRIME COAT - SECTION REMOVED**

### **3.12 ASPHALT CONCRETE:**

The asphalt concrete shall conform to the requirements of Section 39 "Hot Mix Asphalt (HMA)" of the latest edition of the Caltrans State Standards and shall meet the following minimum design requirements:

- a. Hot Mix Asphalt shall be Type A.
- b. The maximum aggregate size for HMA mix design shall be based upon the minimum design thickness required for the roadway. Lift thickness shall be four times the normal maximum aggregate size unless otherwise approved by the Engineer.

**Example:            Determine rock size for HMA mix design for a three inch HMA mix design overlay**

Thickness        = 4 x Rock Size

Rock Size        = Thickness / 4  
                      = 3/4 inch  
                      = 3/4 inch - normal maximum aggregate

- c. The HMA Mix design requirements shall be in accordance to Section 39-1.03B and as approved by the Engineer.
- d. Method process shall be used for all tonnages unless otherwise approved by the Engineer. Material quality control and assurance testing shall be paid for by the Developer out of deposit for inspection and testing services.
- e. The use of recycled material (RAP) may allow the County to receive Leadership in Energy and Environmental Design (LEED) credits for green initiatives or use of recycled products. Recycled materials in HMA mix design shall not exceed 15% unless otherwise approved by the Engineer. Recycled asphalt shingles (RAS) will not be allowed in HMA.
- f. The asphalt grade shall be PG 64-10 in conformance with Section 92 of the State Standards, unless otherwise approved by the Engineer. PG 70-10 may be required for special conditions per State Standards and as directed by the Engineer.
- g. The final surface course shall be paved in the number of passes approved by the Engineer starting from the curb and paving toward the centerline.
- h. Compacting equipment shall conform to the requirements of Section 39 of "Asphalt Concrete" of the State Standards. Vibratory rollers may be used as approved by the Engineer.
- i. The surface course shall be laid with a self propelled paving machine.
- j. Left turn pockets, tapers, and returns shall be paved independently from the main line paving. Main line paving shall take precedence over any other portion of the roadway paving.

### **3.13 ASPHALT PAINT BINDER:**

An asphalt paint binder shall be applied in conformance with Section 39 "Asphalt Concrete" of the State Standards to all existing vertical surfaces and construction joints prior to placing asphalt concrete.

### **3.14 SEAL COAT:**

A seal coat complying with the requirements of Section 37 "Bituminous Seals" of the State Standards shall be applied to the finished surface of the asphalt concrete for all new street construction and subdivisions at end of the warranty period and prior to final acceptance of improvements.

### **3.15 HEADER BOARDS:**

Header boards shall be installed to protect the edges of the asphalt concrete where roads are partially completed in conformance with the plate 3-A8.

The boards shall be Douglas Fir with an American Wood Preservers Bureau stamp indicating its use for ground contact and an application of an approved preservative or redwood.

The boards shall be nominal 2 inches x 4 inches, dimensioned of appropriate material.

### **3.16 CONCRETE CURBS AND SIDEWALKS:**

Concrete curb and sidewalks shall be constructed and repaired in conformance with the Plates contained in these Standards. Construction shall conform to Section 73 "Concrete Curb and Sidewalks" of the State Standards. However, where concrete is to be placed on basement material, all soft or spongy material shall also be removed to a depth of not less than 1/2 feet below subgrade elevation for sidewalk and curb ramps.

All concrete surfaces shall have a light broom finish.

All earthwork shall conform to Section 19 "Earthwork" of the State Standards.

Weakened plane joints shall have a maximum interval of 10 feet and shall be constructed in conformance with the plates. Weakened plane joint intervals for curbs shall match adjacent sidewalk. Depth of weakened plane joint shall be a minimum of 1 inch. Concrete shall be scored at equal intervals between weakened plane joints to approximate 5 foot squares.

All gutters shall be water tested under the supervision of the Inspector.

All sidewalks shall be placed adjacent to curb unless otherwise approved by the Engineer.

All sidewalks placed adjacent to drive over curb shall be 5-1/2 inches thick.

Sidewalk subgrade shall be compacted to not less than 95% relative compaction for a minimum depth of 12 inches. When removing curb, the asphalt shall be cut a minimum of 18-24 inches from the lip of curb, unless otherwise directed by the Engineer.

Sidewalks shall have a cross slope toward the curb face at no more than 2% cross slope and shall meet current ADA requirements, unless otherwise approved by Engineer.

When matching 6 inch vertical curb sections, the curb return shall also be 6 inch vertical curb.

Unless poured monolithic, all curbs shall be doweled to adjacent sidewalk with No. 4 rebar at intervals not exceeding 5 feet. The rebar shall extend 6 inches into the sidewalk and 3 inches into the curb.

Transitions between different types of curb and different widths of sidewalk shall be constructed as shown on plates 3-D2, 3-D3, 3-D7, 3-F2, and 3-F7. All curb transitions shall occur outside curb returns.

Traffic, parking and road name signs on County roads which require relocation because of the work will be relocated by the Developer at locations approved by the County. Traffic signs on State highways and stop signs on roads entering State highways must be relocated by Caltrans. Utility poles which require relocation because of the work shall be relocated by the utility company owning the poles. The Developer shall be responsible for protecting the work against damage and insuring the safety of the public.

Sidewalks which are required against the property line shall be placed 1 inch from the property line to provide space for lot corner monuments.

### **3.17 APPROACHES:**

Approaches shall be constructed and repaired in conformance with the plates 3-F1 through 3-F8 and 3-G1 through 3-G7. The construction shall conform to Sections 73 "Concrete Curb and Sidewalks" and Section 19 "Earthwork" of the State Standards. The Engineer may require additional requirements where these Standards cannot be met.

All concrete surfaces shall have a light broom finish.

Weakened plane joints shall be constructed at a maximum interval of 10 feet and in conformance with the plates 3-F1 through 3-F8 and 3-G1 through 3-G7. Depth of weakened plane joint shall be a minimum of 1 inch deep.

The width of approaches serving a parcel of land shall conform to the following:

- a. Unless otherwise directed by the Engineer, the width of residential and commercial drive approaches shall conform to plates 3-F1 and 3-F2.
- b. The total maximum width of rural driveway approaches shall be the greater of 50% of the road frontage of the property or a single approach with a width conforming to plate 3-F5. In the case of corner lots, the limitations shall apply to each road frontage.

The minimum distance between approaches serving the same parcel of land shall be 30 feet. The distance between approaches on adjacent parcels may be less than 30 feet. Shared driveways/reciprocal accesses shall be used on limited access roads, where possible.

On-site improvements shall not restrict access to the approach.

Approaches shall be located so they will not interfere with intersecting sidewalks, traffic signals, light poles, fire hydrants or other public improvements unless specific approval is given by the Engineer and the necessary adjustments to the improvements are accomplished without cost to the County.

The number of commercial approaches on a parcel shall be kept to a minimum. See Table 3-1 for reference.

Drop curb approaches shall be required for neighborhood shopping centers or other comparable commercial, industrial or multiple-family uses with equal or greater than expected traffic. There shall be only one drop-curb approach for each frontage. In no case shall the approach be closer than 200 feet from the end of an intersection return.

Commercial approaches on arterial roads shall conform to the following:

Condition A:

Approach shall be located a minimum of 350 feet from the intersection as measured from intersection centerline to approach centerline.

Condition B:

When the above Condition A cannot be met due to lack of property width, the approach shall be placed at or near the farthest property line from the intersection and a curbed, full-width median extending 100 feet past approach return shall be installed by Developer at Developer's expense.

Commercial approaches on collector roads shall conform to the following:

Condition A:

Approach shall be located a minimum of 150 feet from the intersection as measured from intersection centerline to approach centerline.

Condition B:

When the above Condition A cannot be met due to lack of property width, the approach shall be placed at or near the farthest property line from the



intersection, or a shared driveway may be required.

The approach elevation at the ultimate right-of-way line shall be within 1 foot, either above or below the existing roadway centerline.

The approach shall have its centerlines as perpendicular as possible to the roadway centerline.

### **3.18 ALLEYS:**

Commercial and residential alleys shall be constructed in conformance with plates 3-F3 and 3-F4.

Residential R-1 Zone alleys shall be constructed, at a minimum, with a 2 inch crown and surfaced with 2 inches of asphalt over compacted native material.

Alleys used as access to new development shall be improved to a minimum width of 20 feet, unless otherwise approved by the Engineer.

### **3.19 VALLEY GUTTERS:**

Valley gutters designed to permit drainage across a road shall be constructed in conformance with plates 3-E1 and 3-E2.

### **3.20 DISABLED ACCESS CURB RAMPS:**

Disabled access curb ramps shall be constructed at all intersections in conformance with the requirements of the ADA, California Title 24, and plates 3-D4A through 3-D5.

All new curb ramps installed in the County shall be constructed with 1 ft x 1 ft truncated domes tiles. Truncated domes may be omitted when ramp slope exceeds 6.67%. Truncated dome tiles shall be furnished and installed as detectable warnings on the curb ramps, as shown on Detail 3-D4B. The tiles shall be either the 'Vitrified Polymer Composite (VPC) Cast-In-Place Tiles' manufactured by Armor-Tile Tactile Systems (1-800-682-2525), 'E-Z Set Ceramic Composite Detectable Warning Panels' manufactured by Detectable Warning Systems (1-866-999-7452), or approved equal. The tiles used must be uniform for all of the new curb ramps.

Prior to actual construction, the Contractor shall construct on the project site, a test detectable warning surface using the selected truncated dome tile for the project and shall be of a size not less than 36" x full width of ramp. The test surface shall be constructed to the satisfaction of the Engineer, before the selected tile and installation procedure will be accepted for the project.

The truncated dome tiles shall comply with the following specifications:

- a. Dome Alignment: Square grid pattern in the predominant direction of travel.
- b. Dome Size - Base diameter of 0.9" (22.9 mm) minimum to 0.92" (23.4 mm) maximum, a top diameter of 0.45" (11.4mm) minimum and 0.47" (11.9mm) maximum and a height of 0.18" (4.6mm) minimum and 0.22" (5.6mm) maximum.
- c. Dome Spacing - Center-to-center spacing of 2.3" (58 mm) minimum and 2.4" (61 mm) maximum, and a base-to-base spacing of 0.65" (16.5 mm) minimum, measured between the most adjacent domes on square grid.  
Dome Spacing Exception: Where installed in a radial pattern, truncated domes shall have a center-to-center spacing of 1.6" (41mm) minimum to 2.4" (61mm) maximum.
- d. Color: The tiles shall be provided in manufacturer specified yellow color Fed # 33538 of FED-STD-595 (per Table 4cf Std 595b of CA Title 24 1121b.3.8(a) and 1133b.8.5; ADA 4.29.2). The tiles shall be uniform in color for the entirety of the project.
- e. Tile Size and Location: The truncated dome tiles shall extend 36 inches in the direction of travel and the full width of the curb ramp as shown on the plans. The edge of the detectable warning surface nearest the back of curb line shall be 6 inches (150 mm) minimum and 8 inches (205 mm) maximum from the back of curb line.
- f. Installation: The truncated dome tiles shall be installed per the manufacturer's written recommendations. The tiles shall be flush with the surrounding surface of the curb ramp. The tiles shall be installed with precision, such that along with maintaining the slope of the curb ramp, the concrete surface surrounding the detectable warning area shall have the exact surface finish as if the truncated dome tiles were not installed. The ramp surface shall not have any concrete bulges or deposits associated with the installation of the tiles.
- g. Submittal: The Contractor shall submit a certificate of compliance for the truncated dome tiles, conforming to ADA requirements, strength requirements and warranty. The Contractor shall submit a certification from the tile manufacturer, certifying that the Contractor or the Contractor's subcontractor that will install the tile is qualified for installation, and who has successfully completed tile installations similar in material, design, and extent to that indicated for the project.
- h. Testing: The finished concrete shall be in conformance with the tolerances as stated in Section 40-1.135 of the State Standards and attain minimum 28-day

strength of 3000 psi. Core testing of substandard concrete will not be permitted.

- i. Existing areas: In existing areas where domes need to be added, a glue down and anchored option may be used if the existing ramp meets all current ADA ramp guidelines with the approval of the City Engineer.

### **3.21 FINAL ADJUSTMENT OF UTILITY COVERS:**

The covers for all manholes, lampholes, water valves and survey monuments existing at the time paving takes place shall be adjusted to final grade by the Developer within 10 working days after the pavement has been placed.

Where existing utility boxes are in the work area, their frames and covers shall be removed before subgrade compaction is made and a cover shall be placed to prevent dirt and loose material from entering the facility. Base and surface material shall be placed over the covers, after which the frames and covers shall be set to finish grade.

### **3.22 TESTING:**

Material testing required by the Engineer for work done under the provisions of this section shall be provided by the Developer and submitted to the Engineer for approval. Where approved by the Engineer, materials certificates of compliance may be submitted in lieu of actual tests.

### **3.23 INSPECTION:**

The Developer shall notify the County Inspector of any work performed in the County right-of-way.

The Developer shall request inspections a minimum of 48 hours in advance, as follows:

- a. Completion of subgrade preparation;
- b. Completion of forms installation;
- c. During placement of concrete;
- d. During placement of aggregate base;
- e. Completion of aggregate base grade;
- f. During placement of asphalt concrete;
- g. During drainage facility construction;
- h. During location of pavement markers, pavement markings and signage;
- i. Completion of final clean up;
- j. Trench requirements for all underground utilities and road crossings;
- k. Other inspections to cover special items shall be as determined by the Engineer as needed.

All underground utilities shall be inspected and approved by the governing utility prior to paving. The developer shall provide the Inspector with a letter from all applicable utility companies, approving their respective underground utilities prior to the contractor doing any paving.

### **3.24 ACCESS CONTROL WALL:**

A 6 foot access control wall shall be constructed between irrigation district laterals and adjacent subdivision lots. A 7 foot access control wall shall be constructed when the subdivision lots that back up to freeways, arterial roads and expressways. Access control walls for commercial and industrial developments, if required, shall be constructed as directed by the Engineer. Walls shall be as specified when required by a noise study. The wall height shall be measured from the highest adjacent finished grade.

The wall shall be shown on the Plans and, if the wall exceeds 6 feet in height, a building permit shall be obtained by the Developer from the Building Permits Division of the Planning and Community Development Department prior to commencement of work on the wall. For additional information regarding specific construction requirements for access control walls and fences, contact the County Building Permits Division

CMU masonry retaining walls, when required, shall be designed in accordance to CBC/IBC standards. Construction of CMU masonry walls that are 6 feet in height or more shall be designed and checked for minimum wind and seismic lateral load resistance.

### **3.25 CURBED MEDIANS:**

On existing roads of 70 feet from curb to curb or wider, an 8 inch high curbed median shall be installed at the intersection of an arterial road, at Developer's expense. Painted medians at intersections may be allowed at the discretion of the County Traffic Engineer on case-by-case bases.

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 or 8 feet with drought tolerant landscaping. Landscaping shall be designed in accordance with the requirements of the Parks and Recreation Department and shall not interfere with pedestrian or vehicle safety.

On new arterial and expressway roads or where part of a road is widened from 2 lanes to 4 or more lanes, a curbed median shall be installed for the full length of the new road or road widening at Developer's expense and shall conform to one of the following:

- a. A 4 foot wide curbed median without landscaping, surfaced with concrete, "Bomanite" or approved equal.
- b. A curbed median ranging in width from 8 feet to 16-1/2 feet with landscaping. A water barrier shall be installed 6 inches beneath the road structural section.

Breaks in curbed medians shall be at all arterial and collector roads with a minimum of 600 feet between breaks. Additional breaks shall be as approved by the Engineer.

Traffic lanes adjacent to curbed medians shall be 12-1/2 feet in width. Specific design of medians and traffic lanes shall be as directed by the Engineer.

### **3.26 BUS TURNOUT:**

- a. General

Bus turnouts may be required on arterial, collector, and expressway roads where there is a curbside travel lane or the probability of replacing curbside parking with travel lanes. Bus turnouts, if required, shall meet these minimum design requirements:

- i. Bus turn outs shall be placed approximately 1/4 mile (1,320 feet) apart, or as directed by the Transit Manager and approved by the Engineer.
- ii. Turnouts may be required at all 4 corners at arterial/arterial and arterial/collector road intersections where there is no parking lane or where the parking lane will be eliminated, as directed by the Transit Manager and approved by the Engineer.
- iii. To encourage multi-modal transportation in the County, the Developer shall install stationary bicycle racks near bus stops as directed by the Transit Manager and approved by the Engineer.
- iv. Unsuitable soil under the bus turn out area shall be removed and replaced with a bedding consisting of sand, pea gravel or an aggregate base bedding with a minimum thickness that can accommodate bus traffic and loading. Minimum thickness of bedding shall be approved by the Engineer and shall be based on the recommendations of a soil's report prepared by a Geotechnical Engineer.
- v. Bus turn out areas shall have #4 reinforcement rebar installed near the top and bottom of the concrete slab with a minimum 2-inches of cover. The rebars shall be spaced 12 inches on center in a square pattern. Refer to Plate Detail 3-M3 for typical cross section of bus turn out area.

- vi. Bus turnouts may be placed on the far side of the intersection in the travel direction. Other locations shall be as determined by the Engineer. Location of mid-block and nearside turnouts shall be as approved by the Engineer and Transit Department and shall only be approved if there is no intersection available to accommodate a turn-out within 1,000 feet.
- vii. The slope of the bus turn-out parallel with the roadway shall match the slope of the roadway, unless otherwise approved by the Engineer.
- viii. A maximum cross slope of 2% is allowed perpendicular to the roadway in the passenger loading area.

The following type of bus stops may be constructed within the County jurisdiction with the prior approval of the Transit Division:

b. Near-Side Bus Stops

Near-side bus stops are located immediately before an intersection, allowing for passenger unloading and loading while the vehicle is stopped at a red light, preventing double-stopping. When the bus is ready to reenter the traffic stream, the intersection is available to assist in pulling away from the curb and provides the driver with an opportunity to look for oncoming traffic and pedestrians. Near-side stops also allow passengers to board the bus immediately adjacent to the crosswalk, minimizing walk distances.

During peak periods, however, queued buses may block the through lane on the approach to the intersection, potentially disrupting traffic flow. The stop configuration also generates conflicts with right turning vehicles, and delays associated with loading and unloading may lead to unsafe driving in which right turning vehicles drive around the transit vehicle to make a right turn in front of a bus. Additionally, queued buses may restrict sight distances for crossing pedestrians. For these reasons, near-side bus stops shall be designed and coordinated with the County Traffic and Transit Division.

Near-Side bus stops shall be constructed in accordance to Standard Plate Detail 3-M1.

c. Far-Side Bus Stops

Far-side bus stops are located immediately after an intersection, allowing the vehicle to pass through the intersection before stopping for passenger loading and unloading. When the bus reenters the traffic stream, the upstream signal shall be designed to generate gaps in traffic to allow

buses to reenter the traffic lane. Far-side stops require shorter deceleration distances and provide for additional right turn capacity by eliminating bus blockage within the curb lane on the approach to the intersection.

Additionally, the location of the stop encourages pedestrians to cross behind the bus. For these safety and capacity benefits, far-side stops are preferred if traffic signal and geometry conditions allow.

Far-Side bus stops shall be constructed in accordance to Standard Plate Detail 3-M2.

d. Mid-Block Bus Stops

Mid-block bus stops are located between intersections, which are generally less congested locations than intersection stop locations. As pedestrian crossings are less common at mid-block stops, vehicle and pedestrian sight distance concerns are typically minimized, but the distance passengers must travel between the bus and a protected crosswalk is increased. These stops can be paired with major mid-block generators to reduce walking distances for the majority of transit users at the stop.

Mid-block stops should generally be used only under special circumstances. However, they increase walking distances for transit users crossing at the nearest intersection, and even encourage illegal mid-block street crossings. Additionally, mid-block stops require both deceleration and acceleration areas, requiring either additional no-parking restrictions or increased turnout construction costs compared intersection stops. Mid-block bus stops are generally not preferred and are allowed only with prior approval by the Transit department.

Mid-Block bus stops shall be constructed in accordance to Standard Plate Detail 3-M3.

### **3.27 BRIDGE AND CULVERT DESIGN:**

All bridge and culvert designs shall be in accordance with the California Department of Transportation's Bridge Design Specifications.

The minimum clear width of bridges and box culverts shall be the traveled way width plus the width of the graded shoulders of the existing or proposed road, whichever is greater, except an additional 3 feet of shoulder per side will be required where the bridge length exceeds 100 linear feet. In urban areas, the minimum width of bridges shall be sufficient to accommodate full curb-to-curb width plus standard sidewalks and railings on each side.

For pipe culverts, all headwalls or other appurtenant structures shall be located adjacent to the right-of-way. The maximum fill slope over culverts shall be 4 to 1 or flatter.

All fill below 2 feet above the 100-year flood ( $Q_{100}$ ) elevation shall be protected from erosion by slope protection as approved by the Engineer.

### **3.28 IRRIGATION FACILITIES:**

All existing irrigation lines within an area to be subdivided shall be removed or relocated outside of existing or proposed County right-of-ways into easements along lot lines. The irrigation lines shall be reinforced at road crossings and driveways. All irrigation lines or structures which are to be abandoned shall be removed. All work shall be done in accordance with the requirements of the Department of Public Works and the particular irrigation district.

### **3.29 BORING:**

Private and public facilities that go under a County road shall be bored if one or more of the following conditions exist:

- a. The road pavement is in average or better condition based on Department of Public Work's road maintenance records and/or field inspection of the Pavement Condition Index (PCI). Average condition shall be considered having a PCI value of at least 40.
- b. The road has been overlaid within the last 10 years or chip-sealed within the last 5 years.
- c. The road is designated as a "Minor Arterial", "Other Principal Arterial - OPA", or "Expressway" on the County General Plan or the road carries daily traffic exceeding 2,000 vehicles per day.
- d. Utility service lines and/or connections for placement under the roadway are 10 inches in diameter or less.
- e. The surface area of bore pit(s) excavated in the roadway does not exceed the surface area of a trench needed to perform the same task.

Any request for an exception to the boring requirement shall be in writing stating the reasons why a bore cannot be performed. Exceptions must be approved by the Engineer.



### **3.30 TRENCHING AND BACKFILL:**

Where trenching is allowed pursuant to the preceding Section 3.29, the following shall apply:

**a. Trenching:**

Trenching across existing County roadways requires prior approval from the Department. All requests for this approval shall be in writing.

All trenching shall conform to the Occupational Safety and Health Administration (OSHA) safety requirements and in accordance with the Trench Construction Safety Orders issued by the Division of Industrial Safety of the Department of Industrial Relations of the State of California.

When groundwater or unstable soil conditions are encountered in excavations, trenches shall be excavated below the subgrade. Aggregate base or other suitable materials shall be placed to provide a firm and stable base for the proposed pipe installation.

All trenching operations shall have adequate provision for the protection of the traveling public on all roads affected by the work.

Excess native excavated material and broken pavement shall become the property of the Contractor and shall be disposed of outside of the County right of way. The exact location will be determined by the Contractor and will be approved by the Inspector.

Where a trench crosses a roadway, the excavation and backfilling shall be completed prior to the end of the working day. In the event an excavation cannot be backfilled prior to the end of the working day, suitable bridging shall be provided to safely carry vehicular traffic over the excavation.

All work of excavating and backfilling in a public street shall be performed as quickly as possible. Not more than 600 linear feet of trench shall be opened ahead of any pipeline or conduit installation taking place in a street or alley except upon written permission of the Inspector. However trenches may be open for a distance of not more than 1,200 linear feet in areas where public traffic not affected by the trenches. Excavations or trenches for cast-in-place concrete pipe may remain for a period not to exceed 7 days providing said excavations or trenches are adequately barricaded and access is provided for abutting property owners and at all street intersections.

At the end of each working day, if a vertical difference of 0.15 foot or more exists between the elevation of the existing pavement and the elevation of

any excavation within 5 feet of the traveled way, then suitable engineered material as approved by the Engineer shall be placed and compacted against the vertical cuts adjacent to the traveled way.

The patch surface shall not deviate from the finished grade by more than 0.02 foot in elevation. The edges of the patch shall be straight.

If a longitudinal trench excavation damages or destroys more than 50% of the traffic lane width at any point in either lane, that entire lane, together with any part of the trench lying outside the lane, shall receive a 0.12 foot thick minimum finished course asphalt concrete overlay for at least the entire length of the trench, in addition to the full structural section otherwise required. The length of the overlaid areas as required shall be determined by the Engineer. If a longitudinal trench within a traffic lane has an edge 3 feet or less from the edge of that lane, then replace the structural section to the original edge of the lane.

The Contractor shall perform all excavations necessary or required to construct all manholes and all pipelines as specified by the Engineer and as approved on the plans. Excavation shall include the removal of all materials whatever nature encountered. Excavation shall be by open trench unless otherwise specified, following neat, parallel lines equidistance from the centerline. The maximum width of the trench at the level of the spring line of the pipe to be laid therein shall not exceed the width of the outside diameter of the barrel of the pipe plus a minimum of 10 inches as shown in Standard Plates 3-H1 and 3-H2. Such width shall be kept as small as practical while providing sufficient working space for joining the pipe and placing the backfill material. Any damage occurring to the saw cut after the cut has taken place will be corrected to the satisfaction of the Inspector at the Contractor's expense.

b. **Backfill:**

Where trenching is allowed pursuant to Section 3.30, the following shall apply: After the pipe has been properly laid and inspected, backfill material shall be placed around the pipe at a minimum depth of 12 inches above the top of the pipe and shall be thoroughly compacted to final density of at least 95% maximum density as shown in Standard Plates 3-H1 and 3-H2. This shall be done in such a manner as to not injure or disturb the pipe. All excavation within the existing street roadbed shall be backfilled and compacted until the relative compaction is not less 95 percent. Backfill material shall be placed in layers not to exceed 8 inches in depth and moistened as necessary before compaction. Each layer shall be thoroughly tamped, rolled or otherwise compacted and brought to grade. Backfill in trenches between the back of the curb and property lines shall be thoroughly consolidated to a final density of at least 90 percent of

maximum density. Compaction of backfill material by ponding, jetting, or flooding will not be permitted without the prior approval of the Engineer or County Inspector. Field density may be determined by California Test 231 method.

### **3.31 UTILITY PLOWING:**

Plowing is only permitted in dirt shoulder areas and not within 3 feet of the edge of pavement. No equipment shall be permitted to pull a plow from the paved portion of the roadway. No track laying equipment without pads is permitted on the road pavement.

All areas disturbed by plowing shall be compacted to 95% relative compaction.

No plowing is permitted during rainy weather or when the inspector has determined the conditions to be unsuitable.

### **3.32 UTILITIES:**

The location of all new utilities/facilities and the relocation of existing utilities/facilities are subject to the approval of the Department and shall meet the following minimum design standards:

- a. All at ground or above ground permitted utilities/facilities shall be placed in Public Utilities Easement (PUE). If no PUE exists, then place the above ground permitted utilities/facilities so that its roadside edge is within 2 feet of the right-of-way line. Place the at ground level utility/facility so that its roadside edge is within 3 feet of the right-of-way line. Refer to Plate 3-L for recommended utility locations.
- b. No underground pipelines, conduits, cables, etc., except for sewer, storm drain, and water lines shall be placed under a paved portion of the roadway.
- c. The minimum cover for all underground utilities and/or facilities outside the pavement area shall be the lower of:
  1. Two and one half (2.5) feet or more below the surface at the point of installation.
  2. Two and one half (2.5) feet or more below the edge of pavement of the corresponding station.
  3. Six (6) feet or more below the edge of pavement or surface at the point of installation for all major gas mains unless otherwise approved by the utility company.

- d. All utility backfills within 5 feet of the edge of pavement shall be backfilled with a material having a sand equivalent value of not less than 20 and shall be compacted to a relative compaction of not less than 95%. Other locations can use native material and shall be compacted to a relative compaction of not less than 90%. Compaction tests shall be taken at the rate of not less than 1 for each 250 feet of trench in a paved area and 1 for each 500 feet of trench in an unpaved area. The test results shall be filed with the Engineer.
- e. All above ground facilities (poles, pedestals, etc.) should be a minimum of 70 feet from any intersection centerline.
- f. All at-grade facilities (manholes, grates, etc.) in unpaved areas shall have an asphalt pad around them in conformance with Plates 3-O1 and 3-O2.
- g. The use of utility poles shall be avoided whenever possible. If above ground poles must be used, use poles already in existence where possible. Two sets of utility poles in the same location or along the same road shall not be allowed.
- h. Route alignment of new or relocated pole lines shall be reviewed and approved by the County prior to construction.
- i. Whenever an underground pipeline facility including, but not limited to water, sewer, irrigation, drainage, gas and petroleum products is being relocated or abandoned, the facility no longer being used shall be removed from the right-of-way, unless otherwise approved by the Engineer.
- j. All underground pipelines, conduits, and services shall include #12 copper tracer wire. The wire shall be connected to all valves and fittings.

### **3.33 SAW CUTTING EXISTING PAVED STREETS:**

When placing asphalt concrete adjacent to existing paved streets, the pavement at the edge of the existing structural section shall be vertically cut in a neat straight line by sawing. This shall be done to the limits shown on the plans and as directed by the Engineer.

Sawing shall be done with an approved saw capable of cutting a minimum of 3 inches in depth. It is the Contractor's responsibility to provide a clean, smooth, vertical surface for the depth of the proposed structural section. The sawing shall be done to the exact lines snapped with a chalk line.

Any damage occurring to the saw cut after the cut has taken place will be

corrected to the satisfaction of the Engineer at the Contractor's expense.

A crack seal of asphaltic emulsion shall be applied in accordance with the requirements of Section 37 of the Caltrans Specifications along all saw cut edges.

### **3.34 TURNING RADIUS**

The criteria for truck turning shall be designed in accordance to the latest edition of the Highway Design Manual (HDM), Topic 404 and the following general guidelines:

- a. Intersections should be evaluated to accommodate design vehicles. See HDM Topic 404.1 and HDM Index 405.8.
- b. The Design Engineer should inspect the ground adjacent to intersection curb returns for physical evidence of vehicle off-tracking and evaluate required upgrades as may be needed. Intersections shall be designed so that design vehicles begin and end their turn wholly within their lane.
- c. It may be impractical to provide for truck turning on local streets due to the infrequency of truck use at these locations. Where truck volumes are very low, bus turning may be a more appropriate application, especially if it is a school bus or transit route. Design exceptions may be granted where truck volume and bus volume are very low.
- d. At intersections, the California Design Vehicle template shall be used to evaluate the corner radius. Where STAA (Surface Transportation Assistance Act of 1982) is anticipated, the STAA Design Vehicle template shall be used (refer to Figure 404.2 in the HDM).

### **3.35 RECOMMENDED INTERSECTION LANE CONFIGURATIONS**

Additional lanes may be necessary at intersections to accommodate traffic making left-and right-turns. The recommended approach lane design at each intersection along these roadways is represented in Table 3-6. The Design Engineer shall review the precise intersection geometrics with Stanislaus County Engineering Services Traffic Division. The recommendations for the approach lane geometrics provided by the Traffic Division shall be used when establishing building setbacks and dedication requirements for development projects located in and around intersections, and may be modified in specific cases where the traffic impact analysis shows that additional approach lanes are needed to accommodate projected traffic.

### **3.36 OFFICIAL PLAN LINES**

Official Plan Lines have been prepared for a number of roads in the County and adopted by the Board of Supervisors (see Table 3-7). Adoption of Official Plan Lines shows the intent of the County to widen these streets to a specified width along a specified alignment or build a new road at some future time. Official Plan Lines are often used when it is undesirable or impractical to widen a road by requiring legal dedication on both sides of the existing centerline. Official Plan Lines are established to prevent any unnecessary removal of buildings or important natural features when the County is ready to build the road. Once adopted, building activity is prohibited inside the established setback lines although existing buildings may remain.

Identified ultimate road widths and alignments for the eventual widening or construction of a road have the important advantage of minimizing the cost to the County in the future. If new structures are permitted to be constructed in the proposed right-of-way, the County will be obligated to purchase portions of buildings and land lying within the proposed street line. It is also hoped that the disruption and dislocation of privately- owned improvements would also be minimized to reduce impacts on property owners. Adoption of Official Plan Lines or identification of ultimate street width requires foresight because the entire process of developing a transportation corridor is a slow one. A number of years may elapse before the last building, or even a majority of the buildings, are set back to the adopted line. Building setbacks may cause hardships to the first buildings that are required to be set back of the new line because they appear to be placed at the back of a parcel with old buildings projecting in front of them on both sides.

The process of adopting an Official Plan Line entails extensive technical studies and public outreach including a traffic analysis, environmental analysis, and detailed engineering studies to determine potential alignments and work with the affected property owners and the public to determine an appropriate alignment for each roadway. The Official Plan Lines adopted by the Board of Supervisors are listed in the Table 3-7. Some portions of these roads have been annexed into the spheres of influence or jurisdictional boundaries of the cities; therefore, city standards now apply to those areas. This element includes proposed streets and roads that are necessary to support development planned within the cities' general plans. Generally, these streets and roads will be planned, developed and constructed upon annexation to the city. If, however, a city develops an Official Plan Line for any of these roadways, the city may also wish to submit that Official Plan Line to the County for adoption to ensure it is applied to new development within the sphere of influence. Some of the plan lines may be outdated or may not be consistent with the new Circulation Element adopted by the County Board of Supervisors. Therefore, the Engineer shall make the final determination on which plan lines are applicable and apply to new planned developments.

### 3.37 CUL-DE-SAC AND DEAD END ROADS

Cul-de-sacs and dead-end roads shall not be longer than 500 feet.

### 3.38 BICYCLE LANES

The Developer shall provide adequate bicycle lane striping and paving in accordance with Caltrans HDM and AASHTO standards to safely accommodate bicycle travel whenever a roadway is constructed, widened, and, where adequate right-of-way exists, whenever a roadway is resurfaced, restored, or rehabilitated on all routes except Local urban roads.

Marked and/or signed bicycle lanes and paths shall be provided in accordance with the Non-Motorized Transportation Master Plan adopted by the Stanislaus Council of Governments (StanCOG) on September 18, 2013 and be reviewed and approved by the County Engineer. This plan can be viewed online at the following web address: <http://www.stancog.org/pdf/documents/bicycle/non-motorized-master-plan.pdf>

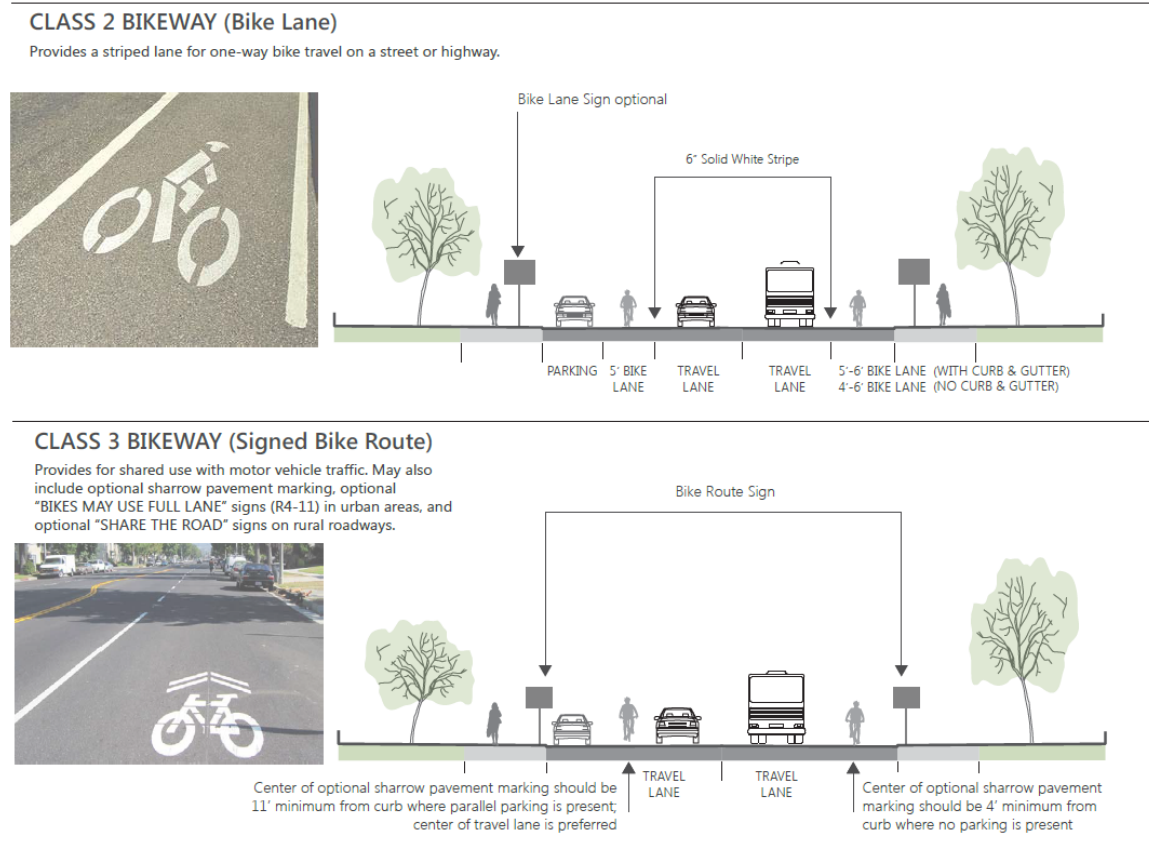


Figure 3.1: Typical Class 2 and Class 3 Bike Lane (Source: 2013 StanCog Non-Motorized Transportation Plan)

### 3.39 DRIVEWAY ACCESS AND DESIGN

#### a. General:

##### 1. Purpose:

The purpose of this 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 Engineer, in-fill developments will be required to match these standards. The 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.

##### 2. Driveway Design Definitions:

Auxiliary Lane - A separate right turn lane, left turn lane, deceleration lane or acceleration lane.

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 section, all properties other than residential or industrial shall be considered a commercial property.

Continuous Deceleration Lane - A deceleration lane that serves two to three driveways, public streets or combination thereof.

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.

Peak Hour - The one hour period with the highest volume of traffic on the roadway.

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.

Driveway Throat Width - The shortest distance between the parallel edges of a driveway.

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 feet back from curb line.

Flared Driveway - Driveway access requiring the curb to depress to street level and 3 foot flared aprons transition the sidewalk into the driveway. Driveway ends at the property line or at back of sidewalk. See Standard Plates 3-F1 through 3-F4.

Industrial Property - Property, regardless of zoning district, upon which all the structure(s) is used for warehousing or manufacturing.

Internal Driveway - A private road or access way on private property that connects buildings or abutting ground to the driveway.

Major Street Facility – Include any of the following:

- Freeway frontage road
- Principal or minor arterial street
- Major Collector Street

Median Type Driveway - A driveway having ingress and egress drives divided by a raised median.

Residential Property - Property that contains three or less dwelling units.

Shared Driveway - A driveway allowing access between two or more properties.

Street Class - The functional classification of a street as defined in the Circulation Element of the General Plan or as defined by the Engineer for those streets not shown in the General Plan.

### 3. Commercial and Industrial Driveways:

For commercial or industrial driveways on a arterial street facility, the 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 County's Traffic Study Procedures. This requirement may be waived if the Engineer determines that the driveway has been adequately analyzed in a previous traffic study.

4. Joint Private Access Easements:

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 Table 3-8 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 County may, but shall not be required to, assist in the acquisition of off-site 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 County may attempt to acquire these easements through negotiations. If the negotiations are unsuccessful, the request may be submitted to the Board 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 County elects not to acquire the property through condemnation, alternate driveway locations and designs in conformance with this standard shall be required.

5. Non-Standard Driveways:

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 these standards, the reconstruction, relocation or conformance of the access to these standards may be required. The County Engineer will require driveway revisions when one or both of the following access change conditions occurs:

- i. The existing use of the driveway is projected in the opinion of the County Engineer using generally accepted transportation engineering standards to increase in actual or proposed daily vehicular volume on the driveway by 20% or more.
- ii. 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."
- iii. "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.

6. Drainage:

Driveways shall not be constructed at such locations or in such a manner that water is diverted from the street onto private property, unless requested in writing and specifically approved in writing by the County Engineer. Likewise, the driveway may not be used as a drainage channel for the onsite runoff.

**b. Design:**

The values in Tables 3-8 thru 3-11 represent minimum and/or maximum standards to be applied in designing and locating driveways on streets in Stanislaus County. For each driveway, the County 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.

1. Flared driveways are required where some or all the following conditions exist:
  - i. On-street parking creates extra width to maneuver.
  - ii. The street facility is residential, minor collector or major collector.
  - iii. Traffic volume over the driveway is less than 1,000 vehicles per day.
2. Drop approaches are required where some or all the following conditions exist:
  - i. Traffic conditions are at a level of service "D" or "E",
  - ii. The street facility is rated major or above, and
  - iii. Traffic volume over the driveway is 1,000 or more vehicles per day.
3. Drop Approach Driveways
  - i. When a drop-type driveway approach is required for commercial or industrial property because of its connection to a major street facility, the driveway shall conform to Table 3-8 to Table 3-9 and Plate 3-F7 to 3-F8.

- ii. 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 15 feet past the right-of-way line. All driveways and median openings within 150 feet 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.
- iii. Handicap ramps not exceeding 12:1 slope shall be required on all driveway drop approaches.
- iv. Any driveway drop approach shall have an initial positive approach grade not to exceed the values shown in Table 3-8. The initial approach grade shall have a length equal to or greater than the appropriate minimum approach length value shown in Table 3-8, as measured from the present curb or any known future curb line, as determined by the County 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 8% grade.

#### 4. Residential Standards

- i. A circular residential driveway may be allowed provided that the minimum distance between driveways shall not be less than 50 feet as measured from the centerline of the driveways.
- ii. A residential driveway shared by two or three properties shall have a minimum throat width of 12 feet. A joint-use private access easement shall also be required.
- iii. 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 County 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.
- iv. Shared residential driveways may be required for adjoining residential lots on major street facilities to reduce the number of access points on those roadways.
  - v. To provide adequate vehicle storage and maneuvering area, a minimum 20 foot 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 15 foot driveway space will be allowed. A minimum 24 foot maneuvering space shall be required for all rear-entry garages, which may extend into an adjacent access easement or alley.

## 5. Auxiliary Lanes

- i. The County 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 50 vehicles in the peak hour of the street. If the existing or future speed limit on the street facility is equal or greater than 40 miles per hour (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 County 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 Plate 3-G6, unless authorized by the County Engineer.
- ii. When a driveway is approved within the separate right-turn lane of a public street intersection, the lane shall be extended a minimum of 150 feet in advance of the driveway. No driveway shall be permitted within the transition area of any separate right-turn or deceleration lane.
- iii. A continuous deceleration lane may be required as a condition of driveway permit when two or more driveways 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.

- iv. On undivided arterial and collector roadways, a left-turn lane and taper may be required as a condition of the driveway permit when the left-turn ingress volume (50 minimum) and the opposing volume per lane exceed 750 in any peak hour. In such cases, the County 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.
- v. The County Engineer may require a temporary auxiliary lane to be constructed on existing arterial roadways that are planned for future improvement.
- vi. In the event an applicant chooses to locate a driveway that requires an auxiliary lane to extend wholly or partially across one or more adjacent properties, the County Engineer may require the applicant to attempt to obtain any necessary right-of-way for such lane.
- vii. In the event the applicant is allowed to locate a driveway with deceleration lane within 100 feet of an arterial intersection, he/she shall be required to extend the deceleration lane to such intersection. The 100 feet shall be measured from the center of the driveway to the intersection of the extended right-of-way lines of the arterial intersection.
- viii. 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.

6. Signalized Driveways

- i. As a condition of a driveway permit on a major street facility, the County 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 County 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 on-site and off-site improvements necessary to provide proper alignment, adequate signal capacity, smooth traffic flow, and safety for the public street/driveway intersection.

- ii. If a driveway is installed at an existing or proposed signalized intersection, the applicant must provide a traffic signal access easement the width of the driveway, plus 10 feet on either side of the driveway by 60 feet deep must be provided to allow the County to install and/or maintain the signal detectors placed in the driveway.
- iii. If a driveway is permitted and installed at an existing signalized intersection, the applicant shall pay any costs necessary to modify the existing signal, striping and intersection to accommodate the new driveway.

#### 7. Special Driveway Designs

- i. 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.
- ii. All driveways on undivided arterial roadways having a projected exiting left-turn volume that will operate at a level of service "E" or worse shall 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, the County Engineer shall require a right-in/right-out driveway design.

#### c. **Construction**

- 1. Approaches shall be constructed and repaired in accordance with plates 3-F1 through 3-F5 and 3-G1 through 3-G6. The construction shall conform to Sections 73 "Concrete Curb and Sidewalks" and Section 19 "Earthwork" of the State Standards. The Engineer may enforce additional requirements where these Standards cannot be met.
- 2. All concrete surfaces shall have a light broom finish
- 3. Weakened plane joints shall be a minimum of 1 inch deep.

#### d. **Installation**

The following applies to all driveway types, including flared, drop approach, and 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 County. Said dedication shall be provided on the final plat of the subject properties or be filed by separate instrument with the County. 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 1 foot. The combined size of the access easement must be minimum of 10 feet wide and 15 feet deep for residential property, and a minimum of 24 feet wide and 48 feet 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 4 feet 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 either:
  - i. Four feet of the downstream edge, or 8 feet of the upstream edge of a straight curb inlet or inlet extension; nor
  - ii. Within ten feet of a recessed inlet without prior written permission of the County Engineer.
4. All vehicle maneuvering on commercial and industrial properties into a parking space, 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<3,000 Vehicles Per Day (VPD)).



**TABLE 3-1A**  
**TYPICAL STREET CROSS SECTION DETAIL AND PLATE NUMBERS**

<b>TYPICAL ROW WIDTH BASED ON STREET CLASSIFICATION</b>	<b>STANDARD PLATE NO:</b>	<b>TYPICAL PAVEMENT WIDTH (ft)</b>	<b>SIDEWALK WIDTH (ft)</b>
50 Ft Local (2 Lane Urban)	3-A1	32	5
60 Ft Minor Collector (2 Lane Urban)	3-A2	36	5
80 Ft Major Collector (2 Lane Urban)	3-A3	42	5
80 Ft Major Collector (4 Lane Urban)	3-A4	66	5
110 Ft Minor Arterial (4 Lane Urban)	3-A5	86	10
110 Ft Minor Arterial (6 Lane Urban)	3-A6	96	5
135 Ft Opa (4 Lane Urban Expressway)	3-A7	88	10
135 Ft Opa (6 Lane Urban Expressway)	3-A8	112	10
70 Ft Minor Collector (2 Lane Industrial)	3-A9	46	5
110 Ft Major Collector (4 Lane Industrial)	3-A11	90	5
60 Ft Local (2 Lane Rural)	3-A12	32	n/a
60 Ft Minor Collector (2 Lane Rural)	3-A13	40	n/a
80 Ft Major Collector (2 Lane Rural)	3-A14	40	n/a
80 Ft Major Collector (4 Lane Rural)	3-A15	60	n/a
110 Ft Minor Arterial (4 Lane Rural)	3-A16	78	n/a
135 Ft Opa (4 Lane Rural Expressway)	3-A18	80	n/a
135 Ft Opa (6 Lane Rural Expressway)	3-A19	104	n/a

Table 3-1A Notes:

1. All items shown in the Street Classification Index Table are minimum values only. Actual configuration may vary and/or be determined by the Engineer.
2. "Rural Areas" in the table refers to "Agricultural Areas" as identified in the Stanislaus County General Plan.
3. All items shown in are minimum values only. Actual configuration may vary based on project constraints, requirements, or as determined by the Engineer.
4. Pavement area width shown is measured from edge of pavement to edge of pavement.
5. Sidewalk width shown is measured from back of walk to flow line of gutter.

**TABLE 3-1B  
TYPICAL PAVEMENT WIDTH AND RIGHT-OF-WAY WIDTH AT INTERSECTIONS**

<b>STREET CLASSIFICATION</b>	<b>PAVEMENT WIDTH (ft)</b>	<b>ROW WIDTH (ft)</b>	<b>CURB RETURN RADIUS (ft)</b>	<b>SIDEWALK WIDTH (ft)</b>
50 Ft Local (2 Lane Urban)	44	60	25	5
60 Ft Minor Collector (2 Lane Urban)	72	90	35	5
80 Ft Major Collector (2 Lane Urban)	78	100	35	5
80 Ft Major Collector (4 Lane Urban)	114	130	35	5
110 Ft Minor Arterial (4 Lane Urban)	118	150	60	10
110 Ft Minor Arterial (6 Lane Urban)	142	160	60	5
135 Ft Opa (4 Lane Urban Expressway)	116	140	60	10
135 Ft Opa (6 Lane Urban Expressway)	152	180	60	10
70 Ft Minor Collector (2 Lane Industrial)	82	100	60	5
110 Ft Major Collector (4 Lane Industrial)	122	140	60	5
60 Ft Local (2 Lane Rural)	44	80	35	n/a
60 Ft Minor Collector (2 Lane Rural)	76	100	35	n/a
80 Ft Major Collector (2 Lane Rural)	76	120	35	n/a
80 Ft Major Collector (4 Lane Rural)	108	130	35	n/a
110 Ft Minor Arterial (4 Lane Rural)	112	150	60	n/a
135 Ft Opa (4 Lane Rural Expressway)	112	170	60	n/a
135 Ft Opa (6 Lane Rural Expressway)	147	180	60	n/a

Table 3-1B Notes:

1. All items shown are minimum values only. Actual configuration may vary based on project constraints, requirements, or as determined by the Engineer.
2. "Rural Areas" in this table refers to "Agricultural Areas" as identified in the Stanislaus County General Plan. (Continued)
3. Pavement area width shown is measured from edge of pavement to edge of pavement.
4. Sidewalk width shown is measured from back of walk to flow line of gutter.

**TABLE 3-2  
MINIMUM TI-VALUES FOR STREETS AND INTERSECTIONS**

<b>STREET CLASSIFICATION</b>	<b>TRAFFIC INDEX (STREETS)</b>	<b>TRAFFIC INDEX (INTERSECTION)</b>
50 ft Local (Urban, 2 Lanes)	5	6
60 ft Minor Collector (Urban, 2 Lanes)	6	7
80 ft Major Collector (Urban, 2/4 Lanes)	8	9
110 ft Minor Arterial (Urban, 4/6 Lanes)	10	11
135 ft Opa (Expressway B, C) (Urban, 4/6 Lanes)	11	12
70 ft Minor Collector (Industrial, 2 Lanes)	9	10
110 ft Major Collector (Industrial, 4 Lanes)	8	10
60 ft Local (Rural, 2 Lanes)	8	9
60 ft Minor Collector (Rural, 2 Lanes)	8	9
80 ft Major Collector (Rural, 2/4 Lanes)	8	9
110 ft Minor Arterial (Rural, 4 Lanes)	10	11
135 ft Opa (Expressway B, C) (Rural, 4/6 Lanes)	11	12

TABLE 3-2 Notes:

1. All items shown in the Street Classification Index table are minimum values only. Actual configuration may vary and/or be determined by the Engineer.
2. Traffic Index (TI) values and other minimum values shown in the table may be increased at the discretion of the Engineer if traffic warrants a higher value.
3. "Rural Areas" in this table refers to "Agricultural Areas" as identified in the Stanislaus County General Plan.

**TABLE 3-3  
MINIMUM STRUCTURAL PAVEMENT SECTION**

<b>STREET CLASSIFICATION</b>	<b>MINIMUM ASPHALT CONCRETE (FT)</b>	<b>MINIMUM AGGREGATE BASE (FT)</b>
50 ft Local (Urban, 2 Lanes)	0.25	0.35
60 ft Minor Collector (Urban, 2 Lanes)	0.35	0.50
80 ft Major Collector (Urban, 2/4 Lanes)	0.40	0.50
110 ft Minor Arterial (Urban, 4/6 Lanes)	0.50	0.65
135 ft Opa (Expressway B, C) (Urban, 4/6 Lanes)	0.60	0.70
70 ft Minor Collector (Industrial, 2 Lanes)	0.45	0.55
110 ft Major Collector (Industrial, 4 Lanes)	0.45	0.55
60 ft Local (Rural, 2 Lanes)	0.40	0.50
60 ft Minor Collector (Rural, 2 Lanes)	0.40	0.50
80 ft Major Collector (Rural, 2/4 Lanes)	0.40	0.50
110 ft Minor Arterial (Rural, 6 Lanes)	0.50	0.65
135 ft Opa (Expressway B, C) (Rural, 4/6 Lanes)	0.60	0.70

Table 3-3 Notes:

1. All items shown in the Street Classification Index are minimum values only. Actual configuration may vary and/or be determined by the Engineer.
2. If there is insufficient soils data to determine the structural thickness of the pavement asphalt and aggregate base, specifically R-values, then streets shall be designed using an assumed R-value of 5.0.
3. "Rural Areas" in this table refers to "Agricultural Areas" as identified in the Stanislaus County General Plan.

**TABLE 3-4****DESIGN SPEED BY STREET CLASSIFICATION**

<b>ROW and STREET CLASSIFICATION</b>	<b>DESIGN SPEED (MPH)</b>
50 ft Local (Urban, 2 Lanes)	25
60 ft Minor Collector (Urban, 2 Lanes)	30
80 ft Major Collector (Urban, 2/4 Lanes)	35
110 ft Minor Arterial (Urban, 4/6 Lanes)	45
135 ft Opa (Expressway B, C) (Urban, 4/6 Lanes)	55
70 ft Minor Collector (Industrial, 2 Lanes)	35
110 ft Major Collector (Industrial, 4 Lanes)	45
60 ft Local (Rural, 2 Lanes)	45
60 ft Minor Collector (Rural, 2 Lanes)	55
80 ft Major Collector (Rural, 2/4 Lanes)	55
110 ft Minor Arterial (Rural, 6 Lanes)	55
135 ft Opa (Expressway B, C) (Rural, 4/6 Lanes)	55

## Table 3-4 Notes:

1. The horizontal and vertical alignment shall be designed in accordance with the Caltrans Highway Design Manual and AASHTO standards.
2. All items shown in the Street Classification Index table are minimum values only. Actual configuration may vary and/or be determined by the Engineer.
3. "Rural Areas" in this table refers to "Agricultural Areas" as identified in the Stanislaus County General Plan.
4. On existing roadways, the prevailing speed may be required by the Engineer.

**TABLE 3-5**  
**LOCAL and MINOR ROADS REQUIRING 80-FEET OF RIGHT-OF-WAY \***

The following designated collector routes require at least 80 feet of right-of-way either because of hilly terrains or greater than average anticipated traffic flows:

<b>COLLECTOR ROUTES STREET NAME</b>	<b>STREET LIMIT (FROM – TO)</b>
Claribel Road	Oakdale-Waterford Highway To Tim Bell Road
Cooperstown Road	Warnerville Road To La Grange Road
Crabtree Road	Highway 132 To Warnerville Road
Del Puerto Canyon Road	Interstate 5 To Santa Clara County
Dunton Road	Milton Road To Highway 4
Eastman Road	26 Mile Road To 28 Mile Road
Emery Road	Warnerville Road To Fogarty Road
Fogarty Road	Wamble Road To Emery Road
Frankenheimer Road	28 Mile Road To Sonora Road
Hawkins Road	Lake Road To Keyes Road
Hazeldean Road	Highway 132 To Tim Bell Road
Hickman Road	East Avenue To Whitmore Avenue
Kennedy Road	Highway 108/120 To Sonora Road
Keyes Road	Santa Fe Avenue To Merced County Line
Lake Road	Hickman Road To Highway 132
Lancaster Road	Orange Blossom Road To Highway 108/120
Milnes Road	Claus To Oakdale-Waterford Highway
Milton Road	Highway 4 To Calaveras County Line
Orange Blossom Road	Highway 108/120 To Sonora Road
River Road	San Joaquin County Line To Highway 120
Rock River Road	Willms Road To Tuolumne County Line
Rodden Road	Highway 120 To Orange Blossom Road
Sisk Road	Kiernan Avenue North To End
Sonora Road	Milton Road To Highway 108/120
Tim Bell Road	Lone Oak Road To Warnerville Road
Twenty Eight Mile Road	Rodden Road To Sonora Road
Wamble Road	Fogarty Road To Orange Blossom Road
Warnerville Road	Albers Road To Cooperstown Road
Willms Road	Cooperstown Road To Highway 108/120

Table 3-5 Notes:

\*This list only contains those local and minor roadways that require 80 feet of right-of-way. All other routes are depicted in the Circulation Diagram depicted in Figure 3-2

**TABLE 3-6  
RECOMMENDED INTERSECTION LANE CONFIGURATIONS**

<b>FACILITY TYPE</b>	<b>INTERSECTING ROAD</b>	<b>LEFT</b>	<b>THROUGH</b>	<b>RIGHT</b>
<b>Expressway/ Other Principal Arterial</b>	Expressway/OPA	2 or 3	2 or 3	1
	Minor Arterial*	2 or 3	2 or 3	1
	Major Collector*	1 or 2	2 or 3	1
	Minor Collector*	1	2 or 3	1
	Local*	1	2 or 3	1
<b>Minor Arterial</b>	Expressway/OPA**	2 or 3	2 or 3	1
	Minor Arterial*	1 or 2	2 or 3	1
	Major Collector	1 or 2	2 or 3	1
	Minor Collector	1	2 or 3	1
	Local*	1	2 or 3	1
<b>Major Collector</b>	Expressway/OPA**	1 or 2	1 or 2	1
	Minor Arterial*	1 or 2	1 or 2	1
	Major Collector	1	1 or 2	1
	Minor Collector	1	1 or 2	1
	Local*	1	1 or 2	1
	Minor/Private	0	1 or 2	0
<b>Minor Collector</b>	Expressway/OPA**	1	1	1
	Minor Arterial*	1	1	1
	Major Collector	1	1	1
	Minor Collector	1	1	1
	Local*	1	1	1
	Minor/Private	0	1	0
<b>Local (Rural/Urban)</b>	Expressway/OPA**	1	1	1
	Minor Arterial*	1	1	1
	Major Collector*	1	1	1
	Minor Collector*	1	1	1
	Local	1	1	1
	Minor/Private	1	1	0
<b>Minor/Private</b>	Major Collector*	0	1	0
	Minor Collector*	0	1	0
	Local	0	1	0
	Minor/Private	0	1	0

\* When permitted, based on access policy for Expressway Class.

**TABLE 3-7  
ADOPTED PLAN LINES**

<b>STREET NAME</b>	<b>FROM</b>	<b>TO</b>
26 Mile Road	Dodds Road	Sonora Road
Carpenter Road	Crows Landing Road	Whitmore Avenue
Coffee Road	Sylvan Road	Patterson Road
Crows Landing	Whitmore Avenue	West Main Street
Fink Road	Interstate 5	State Route 33
Howard Road	Interstate 5	State Route 33
Mc Henry Avenue	Briggsmore Avenue	Stanislaus River
Orange Blossom Road	Rodden Road	Knights Ferry
Stuhr Road	Interstate 5	State Route 33



**TABLE 3-8  
DRIVEWAY DESIGN STANDARDS AND INSTALLATION**

<b>DRIVEWAY DESIGN REQUIREMENTS</b>	<b>STREET CLASSIFICATION</b>	<b>RESIDENTIAL DRIVEWAYS</b>	<b>COMMERCIAL DRIVEWAYS</b>	<b>INDUSTRIAL DRIVEWAYS</b>
<b>Driveway Throat Width <sup>1</sup></b>	Local Minor Collector Major Collector Arterial and Larger	10' - 28' 10' - 28' 12' - 28' 14' - 28'	24' - 36' 24' - 36' 24' - 36' 30' - 36'	24' - 45' 30' - 45' 35' - 45' 40' - 45'
<b>Driveway Curb Radius (Drop Approach Type Only)</b>	Local Minor Collector Major Collector Arterial and Larger	N/A <sup>2</sup> N/A <sup>2</sup> 10' - 15' 15'	N/A <sup>2</sup> 15' - 20' 15' - 20' 20' - 30'	10' - 20' 15' - 20' 20' - 25' 25' - 50'
<b>Minimum Centerline Driveway<sup>3</sup> Spacing Along Roadway</b>	Local Minor Collector Major Collector Arterial and Larger	28' 28' 100' 100'	100' 150' 200' 350' <sup>4</sup>	100' 150' 200' 350' <sup>4</sup>
<b>Driveway Angle<sup>5</sup></b>	All	70°- 90 °	90 °	90 °
<b>Minimum Distance<sup>6</sup> From Driveway to Intersection Along:</b>	Local Minor Collector Major Collector Arterial and Larger	30' 50' 150' <sup>7</sup> 350' <sup>8</sup>	75' 150' 150' <sup>7</sup> 350' <sup>8</sup>	75' 100' 150' <sup>7</sup> 350' <sup>8</sup>
<b>Maximum Approach Grade<sup>9</sup> (Drop Approach Only)</b>	Local and Minor Collector All Others	+9% +6%	+6% +3%	+6% +3%
<b>Minimum Distance to Property Line<sup>10</sup></b>	All	2' <sup>10</sup>	2'	2'
<b>Minimum Approach Length<sup>11</sup> (Drop Approach Only)</b>	Local and Minor Collector All Others	6' 9'	9' 17'	9' 17'

Table 3-8 Notes:

See the notes corresponding to Table 3-8 on the following page:

### Table 3-8 Notes:

1. The requirements for Driveway Throat is standard for undivided one-way and two-way operation and may be varied by the 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 3-2 for throat depth requirements.
2. Driveways may only be flared or drive over curb in these areas.
3. For residential parcels only, 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 streets served by deceleration lanes may be spaced at 200 foot minimum intervals.
5. Required driveway angle is measured as intersection of the tangent centerline of driveway with the tangent portion of the public street curb line, extending a minimum of 20 feet from the future curb line.
6. Distance measured from the intersection as measured from the intersection right-of-way line to the driveway centerline (see Standard Details 3-G3 and 3-G4.
7. If the driveway has to be located less than 150' from an intersection with a major street facility right-of-way line, the approach shall be placed at or near the farthest property line from the intersection and a 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 350 feet from an intersection with a major street facility right-of-way line, the approach shall be placed at or near the farthest property line from the intersection and 350 foot 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 feet 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 County 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 County Engineer.

**TABLE 3-9  
DRIVEWAY THROAT DEPTH**

LAND USE CLASSIFICATION	DRIVEWAY SIZE (SQ-FT)	MINIMUM THROAT LENGTH (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	<100,000 sq. ft.	25	75
	100,001-200,000 sq. ft.	50	100
	200,001-300,000 sq. ft.	75	125
	300,001-500,000 sq. ft.	100	150
	500,001-750,000 sq. ft.	125	200
	>750,000 sq. ft.	125	250
Supermarket	<20,000 sq. ft.	50	75
	>20,000 sq. ft.	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
	>100,001-200,000 sq. ft.	50	100
	200,001-500,000 sq. ft.	100	150
	>500,000 sq. ft.	125	250
Motel	<150 rooms	25	75
	>150 rooms	25	100

Table 3-9 Notes:

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

**TABLE 3-10  
STORAGE DEPTH FOR GATED COMMUNITIES**

<b>NUMBER OF DWELLING (UNITS)</b>	<b>STORAGE DEPTH (FT)</b>
2-10 units	25'
11-60 units	50'
61-150 units	75'
151-265 units	100'
266-325 units	125'
326-380 units	150'

Table 3-10 Notes:

1. Storage depths are measured from the street right-of-way line to the gate.
2. Greater than ten dwelling units shall provide a second lane for guest.
3. The storage depth outside of the gate shall be adequate for PM peak-hour traffic conditions. The entry vehicles shall not block any travel lane or shoulder.
4. A minimum length should be required at the front of the gate to allow vehicles to turn around and back onto the street.

**TABLE 3-11**  
**VEHICLE QUEUING REQUIREMENT FOR DRIVE-THROUGH FACILITIES**

<b>TYPE OF FACILITY</b>	<b>VEHICLE QUEUE (NUMBER OF SPACES)</b>
Drive-through Bank	10 spaces per window <sup>1</sup>
Drive-through Restaurant/Drink Stands	10 spaces per window <sup>2</sup>
Full-service Car Wash	10 spaces per wash line
Self-service Car Wash	3 spaces per wash line
Service Station	3 spaces per service position
Drive-through Retail	3 spaces per window <sup>2</sup>
Drive-through Lube Service	3 spaces per bay

Table 3-11 Notes:

1. For Drive-through banks, the ten spaces per window will be reduced to three spaces per window for savings and loan institutions and credit unions.
2. A maximum of 30 vehicle-stacking spaces will be required for banks with more than five drive-through windows.
3. The vehicle queue for Drive-through restaurants/Drink Stands and Drive-through retail is measured from the ordering location. For some types of restaurants, a shorter stacking distance may be permitted.
4. 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 County Engineer indicates that driveway sight distance may be insufficient, the applicant will be required to submit vertical and horizontal information to the County that verifies adequate sight distance is available for the proposed driveway location. The County 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.
5. Temporary driveways shall only be permitted when a contractual agreement is executed between the property owner and the County. Said agreement shall require annual reviews of driveway use, and the County may require removal of driveway at no cost to the County. The County Engineer may require an escrow fee be provided to the County for a maximum ten year period for the removal of the driveway and related expenses.
6. Any abandoned driveway shall be completely removed and replaced with standard sidewalk, curb, and gutter.
7. 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.

**TABLE 3-12  
ROADWAY SEGMENT LEVEL OF SERVICE CRITERIA**

	FACILITY TYPE	TOTAL LANES	LEVEL OF SERVICE THRESHOLDS (VEHICLES / PER DAY / PER LANE)				
			A	B	C	D	E
Urban	50 Ft Local (Urban)	2	350	950	1,700	2,950	5,000
	60 Ft Minor Collector	2	350	950	1,700	2,950	5,000
	80 Ft Major Collector	2	700	1,900	3,400	5,900	10,000
	80 Ft Major Collector	4	2,520	4,230	5,940	7,110	9,000
	110 Ft Minor Arterial	4	3,000	5,000	7,000	8,400	10,000
	110 Ft Minor Arterial	6	3,400	5,625	7,875	9,450	11,250
	135 Ft Other Principal Arterial	4	3,750	6,250	8,750	10,500	12,500
	135 Ft Other Principal Arterial	6	4,500	7,500	10,500	12,600	15,000
Industrial							
	70 Ft Minor Collector	2	350	950	1,700	2,950	5,000
	110 Ft Major Collector	2	700	1,900	3,400	5,900	10,000
Rural							
	60 Ft Local	2	350	950	1,700	2,950	5,000
	60 Ft Minor Collector	2	350	950	1,700	2,950	5,000
	80 Ft Major Collector	2	350	950	1,700	2,950	5,000
	80 Ft Major Collector	4	1,400	2,350	3,300	3,950	5,000
	110 Ft Minor Arterial	4	3,000	5,000	7,000	8,400	10,000
	135 Ft Other Principal Arterial	4	3,750	6,250	8,750	10,500	12,500
	135 Ft Other Principal Arterial	6	4,500	7,500	10,500	12,600	15,000

## **CHAPTER 4: STORM DRAINAGE**

### **4.1 GENERAL:**

This chapter shall be used in designing storm water facilities within the unincorporated areas of Stanislaus County. The criteria and guidelines set forth herein shall be followed in instances where the facilities are subject to review by the Department of Public Works.

Where County developments drain into a municipal storm drain system located within a City Sphere of Influence, the developments shall comply with the requirements of that particular agency. However, all drainage facilities constructed in and maintained by Stanislaus County shall be designed in accordance with accepted engineering principles, and shall conform to these minimum design standards.

Residential, commercial and industrial developments shall have surface drainage disposal accommodated in one or more of the following prioritized ways:

a. On-Site Drainage

New development projects (residential, commercial, and industrial properties) and re-development projects shall contain all storm drainage on-site unless the methods listed below are available and approved for use by the Department prior to submittal of the drainage plan.

b. Positive Drainage

Positive drainage is a gravity flow storm drainage collection and discharge system into a river, stream, creek, irrigation facility, municipal storm drain system, or other waterway.

c. Off-Site Retention/Detention Facility

Drainage retention and/or detention facilities may be used when positive drainage is not available. Adequate capacity in the off-site drainage facilities must be available.

d. Rock Well/French Drain

A rock well or french drain may be used only when above methods 4.1.b and 4.1.c are not feasible. Rock wells are typically not a standard design option due to groundwater quality impact concerns. Approval from the Department of Environmental Resources (DER) for the use of rock wells shall be obtained prior to submittal of the drainage plan.

## 4.2 STANDARD OF DESIGN:

The County will accept for maintenance two (2) different types of basins: retention (infiltration) and detention basins.

A retention basin is a basin with no outlet facilities for terminal drainage. A retention basin is capable of storing the required storm water runoff volume and is capable of emptying through percolation and evaporation over a specified time.

A detention basin is a basin which has the capacity to temporarily store storm water runoff and has outlet facilities capable of emptying the basin within a specified time into a terminal drain, typically through pumping or gravity flow.

The following table shall be used in designing storm drainage facilities:

Design Area	Design Method	Design Return	Design Section/Comments:
<b>Retention Basins</b> <b>Detention Basins</b> <b>Rock Wells &amp; Horizontal Drains</b>	$V = CAR/12$	Storage Requirements for a 100-Year, 24-hours design storm  $R = 2.88''$  Note:  Drainage facilities shall be sized to empty the design volume of a 100-year, 24-hour storm within 48 hours	Refer to Section 4.4 for Retention Basins.  Refer to Section 4.5 for Detention Basins (initial settlement time required for storm water quality control).  Refer to Section 4.6 for Rock Wells (pre-approval and a permit from Department of Environmental Resources is required to construct Rock Wells).
<b>&lt; 200 acres</b>	Rational Formula $Q = CIA$	10-year, 24-hours for pipeline/conveyance  $R = 1.88''$	Refer to Section 4.7
<b>&gt; 200 acres</b>	Unit Hydrograph, TR-55, or HEC-1	10-year, 24-hours for pipeline/conveyance  $R = 1.88''$	Refer to Section 4.7
<b>Pipelines</b>	Manning's Equation	10-Year, 24-hour for pipeline/conveyance  $R = 1.88''$	Refer to Section 4.8 and Section 4.9



The following minimum design requirements shall be met for storm water facilities constructed in Stanislaus County:

1. All storm drainage retention facilities within Stanislaus County shall be designed using a 100-year, 24-hour storm. A retention basin facility shall be designed to empty the design storm within 48 hours by outlet facilities providing positive drainage or through percolation & evaporation. If percolation method is used, the percolation rates shall be based on a minimum of two (2) soils test conducted at the design depth of the retention basin. Retention basins shall be designed in accordance to Section 4.4 of this Chapter.
2. All storm drainage detention facilities within Stanislaus County shall be designed using a 100-year, 24-hour storm. The volume of the basin shall be determined with no allowance for percolation. A detention basin shall be designed to empty a 100-year, 24-hours storm event within 48 hours by outlet facilities providing positive drainage or through pumping. If pumping is used, pump design calculations shall be submitted in accordance to Section 4.12 of this Chapter. Detention basins shall be designed in accordance to Section 4.5 of this Chapter.
3. All conveyance drainage facilities (such as pipes, culverts, channels) shall be designed for a 10-year, 24-hour storm or greater. Storm drain pipelines and conveyance facilities shall be designed in accordance to Section 4.8 and Section 4.9 of this Chapter.
4. All drainage facilities shall be designed to provide for public safety and there shall be no increased inundation of any building or roadway surface. All drainage facilities that are part of a Master Planned community shall comply with the Master Plan for that community.
5. All proposed storm drainage facilities shall include provisions for future upstream development. This would entail indicating on plans a storm drain pipe stub five feet beyond the development for pipe depths less than six feet and an additional one foot per foot of depth over six feet. All developments connecting to a pipe network discharging to the municipal storm drainage system or directly to a creek, river, or stream shall obtain the necessary regulatory discharge permits and shall not exceed the predevelopment storm release rates.
6. 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 Engineer for approval.
7. The diversion of natural drainage will be allowed only within the limits of a

proposed improvement. All natural drainage must replicate the site's pre-development natural drainage density and pattern and leave the improved area at its original horizontal and vertical alignment unless a special agreement, approved by the Engineer, has been executed with adjoining property owners.

8. Design storm methods shall be according to the Rational Method for design areas less than or equal to 200 acres. Storm runoff calculations for areas larger than 200 acres shall be computed using more advanced storm drain design methods (i.e. Unit Hydrograph Method as defined by the United States Army Corps of Engineers, Technical Release 55 (TR-55), HydroFlow, StormCADD, etc).

#### **4.3 DESIGN CALCULATIONS & DOCUMENTATION:**

Design calculations shall be presented at the time plans for storm drainage facilities are submitted for approval. Drainage calculations shall be done on standard form Figure 4.J, or a spreadsheet reproducing this information. Reports generated from software programs designed for hydrology output such as StormCAD will also be acceptable.

Submittal of drainage calculations shall include the following minimum items:

a. Pipe Sizing and Conveyance Calculations:

The standard design form as shown in Figure 4.J shall be used and shall show the following information:

1. Drainage area (in acres)
2. Time of concentration (in minutes)
3. Runoff coefficient for each area
4. Flow rate to each structure (in cubic feet per second)
5. Flow rate in each pipe (in cubic feet per second)
6. Flow velocity in each pipe (in feet per second)
7. Pipe diameter of each pipe segment (in feet)
8. Pipe length of each pipe segment (in feet)
9. Pipe slope of each pipe segment (in feet/feet)
10. Invert elevation of each pipe segment at structure (in feet)
11. Rim elevation of each storm drain manhole (in feet)
12. Hydraulic and energy grade line elevation (HGL & EGL) in feet.
13. Freeboard depth (measured from basin high water to lowest catch basin inlet grate elevation - shall be a minimum of 0.50 feet).
14. Depth and width of flow in gutters (in feet)
15. Depth of flow in open channels (in feet)
16. List of any assumptions, charts, tables, references, and list of method used.

b. Drainage Map:

A drainage map shall be provided that shows all lines and inlet point, drainage areas contributing to each inlet point, and designations for the items listed in Section 4.3.a above.

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 measured in cubic feet per second (cfs).

c. Topographic Map:

A map showing the relationship between the proposed development and the remainder of the watershed, including acreage of all sub-areas shall be provided.

d. Hydrologic and Hydraulic Analysis:

An analysis showing the results of the storm drainage system based on a 10-year, 24-hour design storm while assuming that the basin or storage facility is holding the 100-year, 24-hour design storage volume.

The analysis shall include hydrologic and hydraulic calculations, assumptions, charts, tables, references, and the design methodology used.

e. Storm Water Storage Calculations:

Design calculations for the proposed drainage detention/retention facilities shall be submitted for review and approval by the Engineer.

Storm drainage retention and detention facilities shall have the capacity to hold the total runoff from a 100-year, 24-hour frequency storm.

The volume shall be determined with no allowance for percolation or outlet facilities using the following basic formula:

$$V = CAR_{(100\text{-yr, 24-hour})} / 12$$

Where: V = Storm water storage volume (measured in acre-feet)  
C = Coefficient of Runoff (see Table 4-1 for coefficients)  
A = Drainage watershed area (measured in acres)

Where:  $R_{(100\text{-year, 24-hour})} = 2.88'' \times (M.A.P./10.9)$

The mean annual precipitation (M.A.P.) is expressed in inches of rainfall and can be extrapolated from Plate 4-B.

f. Storm Water Dewatering/Pump/Percolation Calculations:

Design calculations for the proposed drainage dewatering, percolation, and/or pumping facilities shall be submitted for review and approval by the Engineer.

Design calculations for dewatering the proposed drainage facilities shall be based on dewatering the 100-year, 24-hour frequency storm within 48 hours.

g. Post-Construction & Storm Water Quality Treatment Calculations

The County of Stanislaus is required by State and Federal regulations to develop programs to control the discharge of pollutants to the municipal storm drain system. As a result, all new development and redevelopment projects that are considered regulated, will be subject to requirements designed to protect storm water quality. These new regulations will now require expanded plan checks and reviews for storm water treatment design, source control measures, post-development standards, and Low Impact Development (LID) measures for projects deemed to be regulated.

To determine if your project is regulated and requires post development standard measures (such as site design, source control measures, LID, and/or volumetric & flow based treatment control measures), refer to the Post Construction Program Flow Chart located on Exhibit 4-1 in Section 4.18 of this Chapter.

All drainage projects shall be designed in accordance to the latest edition of the NPDES Municipal Separate Storm Sewer System (MS4) Phase II permit as it relates to storm water quality and treatment design requirements for regulated projects.

Information regarding these requirements can be found at [www.waterboards.ca.gov](http://www.waterboards.ca.gov)

Refer to Section 4.18 and Chapter 9 for additional storm water quality treatment requirements.

h. Erosion and Sediment Control Plan:

The Erosion and Sediment Control Plan shall be submitted for all development projects that involve grading and drainage. The plan shall include a vicinity map showing the location of the site in relationship to

the surrounding area's water courses, water bodies, and other significant geographic features; a site survey; suitable contours for the existing and proposed topography, area drainage, proposed construction and sequencing; proposed drainage channels; proposed erosion and sediment controls; dewatering controls where applicable; soil stabilization measures where applicable; maintenance controls; appropriate site specific BMPs; rationale for the selection of the BMPs; a list of all applicable permits; and any other information deemed necessary by the Engineer. Before the County can issue a grading permit, the project proponent must submit evidence to the County that all necessary permits have been obtained.

Any person performing land-disturbing activities at construction sites greater than or equal to one acre within a municipal separate sewer system area may submit to the Engineer the Storm Water Pollution Prevention Plan (SWPPP) used to comply with the State of California's General Permit for Discharges of Storm Water Associated with Construction Activity in lieu of an Erosion and Sediment Control Plan.

i. Groundwater Separation:

A minimum separation of ten (10) feet measured from the deepest portion of a drainage facility to the water table surface elevation shall be provided. The developer shall be responsible for providing a boring log prepared by a Geotechnical Engineer, to determine that there is 10 feet minimum separation between the bottom of the proposed drainage facility and the local groundwater table.

If design restrictions do not provide a ten (10) foot minimum separation from the basin bottom to average high ground water elevation, the Developer shall obtain prior written approval and authorization from Stanislaus County Department of Environmental Resources prior to construction.

j. Soil's Report and Percolation Test Results:

A comprehensive soils report shall be prepared for the proposed project. A licensed geotechnical engineer experienced in soil work shall prepare, stamp, and sign the report. It shall include R-values taken at the site with a map showing the locations and depths of the test samples. Additionally, it shall include percolation testing results, high ground water elevations, stripping and grading recommendations, determination if expansive soil is present, and structural pavement sections for access & maintenance roads based on various traffic index (T.I.) values.

Soil percolation testing shall be conducted for all drainage basins, rock

wells, horizontal wells, and other drainage facilities. The soils tests shall identify the infiltration rates and the surface area needed to fulfill the requirements for emptying a 100-year, 24-hour storm event within 48 hours. The actual design infiltration rates must be based on a minimum of two infiltration tests performed by a Geotechnical Engineer. The percolation tests shall be conducted at the actual drainage site location and at the design elevation of the drainage facility.

Clean water is typically used when conducting percolation tests. However, oil residue, silt, leaves, and other deleterious material will likely be included in the actual storm water. Variations in soil conditions within the drainage system will also likely affect percolation characteristics. Based on these variables, a minimum factor of safety of 2 must be applied to the percolation rate. Additional design safety factors shall be based on the recommendations of the Geotechnical Engineer and soil's report.

A minimum of two soil borings must be made to the depth of the project site's water table elevation or a minimum of 60 feet, the shallower of the two.

#### **4.4     RETENTION BASINS:**

Drainage retention facilities shall be designed in conformance with the guidelines contained in this Chapter and, as a minimum, shall comply with the criteria described below.

Compliance with these standards does not relieve the designer, owner or developer of the responsibility to apply sound professional judgment to protect the health, safety and welfare of the general public. Special site conditions and environmental constraints and considerations may require a greater level of protection than otherwise required under these standards.

Prior to final acceptance of improvements, the Developer/Owner of residential, commercial, and industrial projects shall be responsible for establishing a County Service Area (CSA) District, or annex into an existing CSA, that addresses maintenance of storm drain facilities. Storm drain facilities being maintained shall include, but not be limited to storm drain basins, pipelines, manholes, catch basins street sweeping, and maintenance of post-development best management practice (BMP) measures. The formation process may take between ninety and one hundred twenty days.

##### **a.     Storage Volume V:**

Retention basins shall be designed to store the entire volume of a 100-year frequency, 24-hour duration storm ( $R=2.88''$ ) and shall be capable of infiltrating, thus not requiring any pumping. The required storage

volume for retention basins shall be determined using the volume equation  $V = CAR/12$  as described in Section 4.3.e. Infiltration rates can vary significantly, depending on the soil types encountered at various depths. For this reason, percolation tests shall be submitted along with the volume sizing calculations in accordance to Section 4.3.j.

b. Elevation:

Drainage retention facilities shall be designed so that a hydraulic grade line (HGL) extended from the drainage retention facility's highest water surface elevation (Z) shall be at least six (6) inches below all tributary drainage inlets at their respective locations.

The HGL at a given point shall be calculated using the following formula:

$$\text{Hydraulic Grade Line} = \text{HGL} = Z + H_f$$

Where:

HGL = Hydraulic grade line elevation at a particular point measured in feet.

Z = The top of pipe elevation at the point of discharge or the high water surface elevation of a drainage basin measured in feet.

$H_f$  = Head loss due to friction loss from a pipe measured in feet. The friction loss shall be calculated using the following formula:

$$H_f = (3.022) (v)^{1.85} (L) / (C)^{1.85} (D)^{1.85}$$

Where:

v = Velocity of water in pipe (in feet per second and assuming the pipe is flowing full)

L = Length of pipe (measured in feet)

D = Inside diameter of pipe (measured in feet)

C = Design coefficient based on pipe material (per Table 4.2).

c. Dewatering:

The volume of a retention basin must be designed to empty a 100-year, 24-hour storm event within 48 hours by outlet facilities that provides positive drainage or through percolation. If percolation is used, the percolation rate shall not be assumed. The percolation rate shall be based on the results of a soil's report investigation performed by a

licensed Geotechnical Engineer. Percolation soil testing shall be done in accordance to Section 4.4.j of this Chapter.

Silt buildup in retention basins can severely restrict percolation through the basin sides and bottom. Vegetation growing within the basins can help reduce the sealing effect of silt buildup. The construction of horizontal drains in the bottom of the basin can be used to help increase the percolation capacity of the basin and help reduce the effect of silt. If vegetation will not be planted within the basin, the percolation rate may need to be further reduced and an aggressive schedule of disking of the slopes and bottom shall be planned to maintain the proper functioning of the drainage basin.

d. Infiltration Trench:

The infiltration trench shall be excavated to a depth such that 10 feet of sand strata is exposed to the sidewalls of the trench. The required soils test shall identify this depth. The preferred location of the infiltration trench shall be at the top of slope of basin walls.

The width of the trench shall be a minimum of 24-inches. The trench shall be lined with a 4-oz. woven filter fabric with 6-inch of overhang to wrap up the rock. Engineer rock 3-inch to 6-inch in size shall be used to backfill the trench.

The trench shall initially be filled to the surface, with the fabric overlapping the rock. An additional pile of rock 4 feet wide by 3 feet high shall be placed over this trench in the low basin. The trench floor shall be constructed a minimum of 10 feet above the highest recorded level of groundwater.

e. Maintenance Access Roadway:

A maintenance access roadway shall be provided from the top of the basin facility to the lowest lying portion of the basin to allow access for maintenance vehicles and facilitate periodic removal of sediments and other maintenance functions. Limited maintenance access roadway maybe considered on a site specific basis.

Requirements for maintenance access may include, but not be limited to the following:

1. A minimum access roadway width of 12 feet.
2. A maximum access roadway grade of 10%.
3. A minimum turning radii of 30 feet for maintenance vehicles.
4. A turn around area for maintenance vehicles.
5. Access roads shall be constructed with a minimum of 3 inches thick



asphalt concrete over 4-inch aggregate base or 5.5-inch of concrete.

#### **4.5 DETENTION BASINS:**

The volume of the detention basin shall be large enough to hold a 100-year, 24-hour frequency storm. The required storage volume for detention basins shall be determined using the equation  $V = CAR/12$  as described in Section 4.3.e.

The following minimum design criteria shall be followed for constructing detention basins:

- a. The Water Quality Volume, typically 1/2 inch (the 'first flush') shall be detained a minimum of 48 hours prior to pumping. The Developer shall obtain County and irrigation district approvals prior to pumping into the district's irrigation canal.
- b. The maximum depth of basin shall be 20 feet and basin bottom floor elevation shall be at least 10 feet above the existing water table. Ground water separation requirements shall be in accordance to Section 4.3.e of this Chapter. The basin floor shall be graded to direct the water to the inlet/outlet area where either gravity discharge or pumping will take place.
- c. The high water elevation in the detention basin shall be 6 inches below the lowest catch basin and/or gutter flow line elevation. The hydraulic grade line (HGL) elevation shall be determined in accordance to Section 4.4.b of this Chapter.
- d. All outlet designs shall incorporate preventative measures for trash accumulation and erosion at the outfall structure.
- e. Detention basins shall be constructed with headwalls placed on the inlet pipes. A 2 foot deep x 12-inch wide concrete cutoff wall shall be constructed at the outlet to prevent scouring. Engineering rock (20 lbs.+) with engineering fabric under the rock shall be installed to prevent erosion and vegetative growth.
- f. A gravity outflow structure (if used) shall be based on downstream drainage system grades. When downstream grades preclude the use of a gravity outflow structure, a pump station shall be constructed to drain the basin.
- g. The maximum side slopes for a basin shall be 4:1 or flatter to facilitate ease of mowing and maintenance. Side slopes of basins adjacent to public streets may require 6:1 or flatter slopes to facilitate improved security and visibility by law enforcement, fire, and emergency personnel.
- h. In general, fencing will be avoided in basin facilities. Limited fencing may

be considered on a site-specific basis in order to restrict public interaction with potentially hazardous situations such as frequently inundated areas.

The Engineer may require fencing around pump stations, pump inlets, pump outlets, basin inlets, basin outlets, and other structures in order to provide security, protection against vandalism, and to enhance public safety.

- i. Inflow and outflow structures shall meet Cal-OSHA Standards that will prevent access by small children, and also prevent clogging of structures. This shall include the installation of trash racks or rebar mesh grill across the open areas of said structures and pipes.
- j. The inlet and outlet location shall be at least 3 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 2%.
- k. Appropriate design guidelines and criteria pertinent to the development of dual-use open space/storm drain basin facilities shall be incorporated into all dual-use open space/basin facilities constructed in the County.

The City of Modesto's Design Standards for Dual Use Flood Control/Recreation Facilities shall be used to design dual use open space/basin facilities in the County areas.

This document can be viewed on the City's website at:

<http://www.modestogov.com/ced/pdf/engineering/general/modesto%20SW%20Guidance%20Manual.pdf>

Water quality storage elements, flood control storage elements, and recreation elements shall be employed in the design of dual-use open space/basin facilities, whenever possible.

Certain conditions for approval for dual use open space/basins may apply to the project as determined by Planning & Community Development and Parks & Recreation Departments. These may include, but not limited to the following:

1. All dual-use drainage basins shall be designed with an automatic irrigation system to include side slopes and floor. This is to produce grasses for preventing erosion and settling out pollutants found in storm water. The County's Parks & Recreation Department shall approve the irrigation system design.
2. Prior to the final map being recorded and improvements accepted, a

County Service Area (CSA) shall be formed to provide funds for personnel and equipment to maintain the park and/or the storm drain system and the landscaping areas. The developer shall provide all necessary documents and pay all fees associated with the formation of the CSA. The formation process may take between ninety (90) and one hundred twenty (120) days. In lieu of creating a CSA, the Developer can annex into an existing CSA, if available.

3. Prior to the final map being recorded and improvements being approved, all drawings and specifications for landscape improvements and amenities for parks shall be reviewed and signed off by the Parks & Recreation Department.
4. Prior to issuance of any grading or building permits, the owner/developer shall pay a per dwelling fee (see Park Land Dedication/In-Lieu-Of Fees Policy) to the County Department of Parks & Recreation, 3800 Cornucopia Way, Suite C, Modesto, CA 95358, to address the additional Parks & Recreation impact and responsibilities.
5. Dual-use retention basin credits as per the City of Modesto formula, adopted December 12, 2000 resolution No. 2000-632 may be allowed as determined by the County Department of Parks & Recreation.
6. Project must conform to the General Plan requirements of providing three acres of park land per 1,000 residents or pay in-lieu of fees (see Park Land Dedication/In-Lieu-Of fees Policy, General Plan Amendment No. 2003-02).

#### **4.6 ROCK WELLS/FRENCH DRAINS:**

Rock wells (vertical and horizontal), when approved by the Engineer, shall be constructed as shown on plates 4-D1 and 4-D2. The rock wells shall be located at least 150 feet from domestic water wells. Individual rock wells shall have a 20 foot minimum horizontal separation from all other vertical rock wells. All rock well floors shall be at least 10 feet above existing ground water elevation.

As part of the storm water quality design requirements (i.e. treating the 'first flush') and to help protect groundwater, this type of rapid infiltration associated with rock well and French drain construction should be used in conjunction with Low Impact Development design measures as described in the current Phase II MS4 NPDES Permit. Refer to Section 4.8 and Chapter 9 for general information regarding storm water quality and treatment design requirements.

Rock wells and horizontal drains shall be designed to store the volume from a 100-year, 24-hour frequency storm. Refer to Section 4.3.e for design volume sizing methodology. Rock wells and horizontal drains shall be designed to

perk the required storm design volume within 48 hours using the following methodology:

- a. Find Percolation Rate (PR): For design purposes this value shall not be assumed but must be determined by the Design Engineer by means of adequate percolation tests performed by a qualified testing firm. The test shall be taken at the intended location and depth of the proposed rock wells. The percolation rate shall be expressed in cubic feet per minute. The percolation rate shall be sufficient to completely percolate the 100-year, 24-hour design storm within 48 hours.
- b. Determine the Volume of Storm Water (V): See sizing methodology described in Section 4.3.e. The volume shall be determined with no allowance for percolation or outlet facilities.
- c. Determine the Storage Volume (SV): Storage may be a combination of surface, subsurface or aggregate voids. No portion of the paved roadway shall be used for storage. 35% of the void ratio can be assumed when determining the trench volume storage available in the rock aggregate (refer to Plate 4-D1 and 4-D2).
- e. Testing: Rock wells shall be tested for adequacy after their completion. Testing shall consist of flooding the rock well at a rate equal to its design percolation for a duration equal to the Peak Flow Time. If a static head is obtained then the rock well shall be allowed to drain for 1 hour, then refilled and its percolation rate then calculated.

The measured percolation rate of the rock well shall be compared to the design percolation rate. If the measured rate is less than the design rate, additional percolation area will be required.

- f. Permits: The Developer shall contact the Stanislaus County Department of Environmental Resources and obtain the necessary approval and permits necessary to construct rock wells, drywells, or horizontal French drains.
- g. The Contractor shall drill 1 geotechnical boring to groundwater or 60 feet, whichever is less, let stabilize 24 hours, then record and report groundwater elevation to the Engineer. This data shall be submitted to the Engineer a minimum of 10 days prior to construction of the rock well. The Engineer shall evaluate the data from each proposed site and make the final determination of rock well depth.

The rock well floor depth shall not be within 10 feet of groundwater. A single geotechnical boring shall represent underlying groundwater elevation for sites of 5 acres or less. For sites greater than 5 acres, additional geotechnical borings may be required, at the direction of the Engineer.

The Department of Water Resources website for historical groundwater elevations at [www.water.ca.gov/waterdatalibrary/](http://www.water.ca.gov/waterdatalibrary/) may be used to compare measured ground water elevation against historic elevations.

The Driller or Developer shall submit to the Engineer a well drilling log for each rock well after the drilling is completed and prior to approval or acceptance of the improvements.

- h. Rock wells shall be drilled to a standard depth of 50 feet, provided that groundwater levels are lower than 60 feet, unless otherwise determined by the Engineer. Where groundwater is less than 45 feet deep, horizontal drains in lieu of rock wells shall be constructed in accordance to Standard Detail 4-D1.
- i. 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 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 are strictly controlled and damaged rock wells are rejuvenated prior to acceptance.

Testing shall consist of flooding the rock well with water until static head is obtained. Rock wells shall absorb this static water head within 24 hours. If the maximum practical input flow has been applied continuously for one hour without obtaining a static head, the rock well will be approved.

#### **4.7 PEAK FLOW RATE:**

The peak flow rate shall be used to size pipes and culverts and shall be determined using the following rational formula:

$$Q = CIA$$

- Where: Q = Peak rate of flow measured in cubic feet per second (cfs).  
C = Coefficient of runoff; Values between 0.0 and 1.0 which are to be extrapolated from Table 4.1  
A = The total tributary area, expressed in acres, that will contribute runoff to the drainage system, regardless of the limits of the development under construction  
I = The average intensity of rainfall measured in inches per hour for a duration equal to the time of concentration ( $T_c$ ) using the following formula:

$$I = \frac{I_m \times M.A.P.}{10.9}$$

Where:

$I_m$  = Average intensity of rainfall measured in inches per hour for the Modesto rainfall gauging station. Coefficient is extrapolated from Plate 4-A using the calculated time of concentration ( $T_c$ ).

M.A.P. = The mean annual precipitation, expressed in inches, for the design area in question. Coefficient is extrapolated from Plate 4-B.

$T_c$  = The time of concentration, expressed in minutes, or the sum of the overland flow and conduit flow times. Table 4-3 provides minimum travel times to be used.

#### 4.8 CONVEYANCE CAPACITY:

The Manning equation shall be used to determine the capacity and friction losses of open channels and enclosed gravity conduits:

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

Where:

Q = Flow rate measured in cubic feet per second (cfs);

A = Cross sectional area of the flow measured in square feet (sf);

V = Flow velocity measured in feet per second (fps);

R = Hydraulic radius measured in feet (ft);

S = Slope of the hydraulic gradient measure in feet per foot (ft/ft);

n = Manning coefficient.

Values of the Manning coefficient for various pipes and open channels are given in the Table 4.4.

#### 4.9 PIPELINES:

The 10-year, 24-hour design storm used to design the conveyance drainage facilities shall not surcharge any conduit unless written approval is granted by the Engineer. Storm drain pipe shall be as shown on the plates contained in these Standards, and conform to the following minimum requirements:

- a. Material: The type of pipe used and it's intended use must conform to accepted engineering practice and must be approved by the Engineer.

The class of pipe to be used shall be clearly shown on the improvement plans and specified in the special provisions, if any. All pipes constructed in roadways must be traffic rated.

All pipe material shall conform to the following minimum standards outlined below:

1. Reinforced Concrete Pipe (RCP): Reinforced concrete pipe shall conform to the requirements as outlined in Section 65 of the State Standards. The use of rubber gasket joints will be required unless specified otherwise by the Engineer.
2. High Density Polyethylene Ribbed Pipe (HDPE): High Density Polyethylene Ribbed Pipe shall conform to the requirements of Section 64 of the State Standards. HDPE pipe shall be bell and spigot only with polyisoprene rubber gasket meeting or exceeding ASTM F-477 requirements. HDPE pipe shall have a smooth interior wall.
3. Pump Station Force Mains: Galvanized Steel/Welded Steel Pipe or Class 235 DR-18 (originally classified as Class 150) or Class 305 DR-14 (originally Class 200) shall be used as determined by the design engineer. Galvanized steel pipe shall conform to ASTM Designation A53/A 53M, Grade B.

All nominal pipe size designations shall be standard weight. Threaded fittings shall be galvanized malleable iron or steel. Welded steel pipe shall conform to the requirements in Section 70-3.01 of the State Standards, "Welded Steel Pipe Drainage Facilities".

- b. Size: All storm drain mains, trunk lines, cross culverts, or any other type of gravity flow storm drainage pipe, excluding catch basin laterals, shall be no less than 18 inches in diameter.

Catch basin laterals shall be no less than 12 inches in diameter.

1. Pipe curvature between manholes shall not exceed manufactures' recommendations.
  2. Pipes shall not decrease in size going down stream.
  3. Match pipe crowns when pipe sizes change (unless otherwise approved by the Engineer).
  4. 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.
  5. All pipes shall be smooth walled.
- c. Minimum Cover: Pipe alignment shall be designed to allow for a minimum cover of thirty (30) inches as measured from the natural ground or bottom portion of the structural pavement section to the outside top of pipe. If the minimum cover cannot be obtained due to design constraints, the pipe shall either be encased in concrete or provided with a concrete cover as approved by the Engineer.
  - d. Velocity: Pipes (for calculation purposes) shall be considered to be flowing full. Minimum velocity shall be a velocity sufficient to maintain a clean pipe

generally not less than two feet per second. For pump discharge lines, the velocity shall not exceed ten feet per second. Velocities in unlined open channels shall not exceed those values shown in Table 4.5 or the soils engineer's recommendation.

- e. Installation: The pipe shall be laid in conformity with the prescribed lines and grades.

The design engineer shall field verify the depth and alignment of existing storm drain lines prior to design. If the existing storm drain line depth, alignment and size is not as shown on the as-built improvement plans, the contractor shall notify the Design Engineer and make appropriate corrections before proceeding.

All adjustment of pipe to line 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 pipe sections shall be laid with bell end upstream and shall be laid upstream (from the lowest point to the highest point) and from structure to structure. Grade stakes shall be provided at 50 foot minimum intervals.

When directed by the Engineer or establishing grade stakes along small radius curves, stakes shall be provided at 25 foot minimum intervals. Each stake shall be used in establishing the grade for the pipe.

Every precaution shall be taken to protect the pipe against the entrance of foreign material before the pipe is placed in the trench.

At the close of the day's operations, the last section of pipe shall be plugged, capped or otherwise tightly closed to prevent entry of any foreign matter, animal, or small children.

- f. Alignment: Storm drainage pipe shall be parallel with the centerline of the street whenever possible. Pipe curvature shall not exceed manufacturer's recommendation. When appropriate, pipe shall be deflected before each curb inlet such that it enters in the center of the inlet.
- g. Backwater: All outlets shall take into account any backwater condition in the receiving channel.

#### **4.10    MANHOLES:**

Storm drain manholes shall be constructed as shown on Plates 4-F1 and 4-F2 or alternatively, pre-cast manholes, as approved by the Engineer.

- a. Manholes shall not be constructed within a gutter.



- b. Manholes shall be placed at junction points, changes in gradient, and changes in pipe size. On curved pipes with radii of 200 feet to 400 feet, manholes shall be placed at the beginning of the curve (BC) and at the ending of the curve (EC) and on 300 foot maximum intervals along the curve. On curves with a radii exceeding 400 feet, manholes shall be placed at the BC and EC of the curve and on 400 foot maximum intervals along the curve for pipes 24 inches and less in diameter and 500 foot intervals along the curve for pipes greater than 24 inches in diameter. Manhole locations on curves with radii less than 200 feet will be specified on an individual basis.
- c. Spacing of manholes shall not exceed 500 feet unless approved by the Engineer. Whenever possible spacing of manholes shall be equal.
- d. Manhole covers shall be constructed as shown on plate 4-F3.
- e. A 48" diameter barrel may be used for pipe up to 36" diameter, a 60" diameter barrel for pipe up to 54" diameter and a 72" diameter barrel for pipe up to a 60" diameter.
- f. A custom designed box structure for pipe over 60" in diameter shall be approved by the Engineer. Concrete shall be furnished, mixed, placed and cured in accordance with Caltrans Standards & Specifications and shall be 4,000 psi with 1" maximum aggregate size.

#### **4.11 CATCH BASIN:**

Catch basins shall be as shown in the plates of these Standards. Catch basins shall not be allowed to drain into or through other catch basins without the approval of the Engineer.

- a. The maximum total lineal feet of road right-of-way that may discharge into a catch basin is five hundred (500) feet. However, in no case shall the width of water flowing in the gutter from a 100-year, 24-hour design storm event be allowed to encroach into the traveled way of the nearest traffic lane.
- b. Metal parts of all catch basin grates and frames shall be hot dipped galvanized after manufacture.
- c. Catch basins shall be designed and spaced such that they intercept and fully contain the 10-year, 24-hour design storm event.
- d. A drain inlet must be placed at all gutter sag points. Inlets shall not be allowed within street crosswalks, handicap ramps, or driveways.

- e. For gutter slopes in excess of 5%, the length of catch basin grates shall be designed in accordance with the most recent Urban Drainage and Design Manual from the Federal Highway Administration (FHWA). This manual can be found at the FHWA website at [www.fhwa.dot.gov](http://www.fhwa.dot.gov)
- f. All storm drain catch basins and drain inlets shall be labeled with the County's approved storm water quality message markers prior to acceptance by the County ("Only Rain Down the Drain" markers).

#### **4.12 DRAINAGE PUMPS:**

Drainage pumps shall be used for emptying drainage detention facilities that have been designed to hold the 100-year, 24-hour storm. The pumps shall be designed to drain the detention basin within 48 hours. Criteria for pump station design including the electrical work shall be established on a case-by-case basis and submitted for approval by the Engineer. Inflow pumps shall not be allowed. See detail 4-I1 through 4-I7. If pumps are used to empty a drainage facility, the following criteria shall be incorporated into the design of the pump station:

- a. Pump station shall be designed within a securable facility.
- b. Drainage pumps shall be duplex, submersible, and be of the non-clog type capable of passing at least 3 inch spheres. Each installation shall have at a minimum two pumps that automatically operate on an alternating basis with all pumps operating together during times of heavy flow. The design pumping head shall be based on the maximum flood water elevation in the receiving facility. Pumps shall be rail mounted with auto disconnect.

Capacity shall be provided for the design storm with the largest pump out of service. Staged installation of pumps is allowed, providing space is provided for future installations. At dual-use basins, or where design flows exceed one (1) cfs, a low flow pump shall be provided in addition to the design rated pumps.

The low flow pump shall have a capacity of 5% - 10% of the design flow and shall operate as the lead pump. A separate discharge pipe shall be provided for the low flow pump. Pumps shall be designed for a minimum of 10 minutes cycling time.

Level control shall be ultrasonic level sensor with back-up float detectors, as approved by the Engineer.

- c. Performance curves shall be submitted for the pumps showing the diameter of the runner to be used, the pump capacity, total dynamic head, kilowatts, horse power, and efficiency of pump throughout the working range of the pumps.

- d. Lighting shall be provided at the pump station and wet well. Lights shall be switchable and shall be designed and constructed to operate with County generators during power failures and other emergency events.
- e. The wet well rim and electrical panel shall be a minimum of three (3) feet above the 100-year flood elevation.
- f. A securable NEMA weatherproof enclosure shall be provided for all outdoor controls, including lighting. Electric service shall be provided by underground conduit to the utility service pedestal. Spare parts are to be included, as recommended by the manufacturer. Three phase service shall be used.
- g. Controls shall be a solid state programmable controller with LED digital readout with purge and clean capacities and automatic pump alternating. Switches for manual operation of each pump shall be included.
- h. An on-site alarm with an automatic telephone dialer with message capability and exterior lights shall be installed. The alarm shall have a battery back-up and sensors that will respond to power failure, pump failure and high water levels. A telephone line connecting the automatic dialer is required.
- i. A paved access driveway and paved work area for the pump station shall be provided. The access and work area shall be paved with a minimum of three inches of asphalt concrete over four inches of aggregate bases or five and one-half inches of concrete.

A paved access driveway to the open-space/detention basin bottom shall be provided to allow maintenance vehicles safe access to the inlet/outlet structures. The paved access driveway shall be reviewed and approved by Department of Parks and Recreation and the Engineer prior to construction. The maximum driveway slope shall be 10% unless otherwise approved by the Engineer.

Refer to Section 4.4.e for additional maintenance access requirements.

- j. Trash racks shall be provided upstream from the pumps. The trash rack shall be designed to be easily cleaned.
- k. Emergency operation during power outages shall be provided by a manual transfer switch with connection for a County owned portable generator. A generator receptacle shall be furnished at the control panel. The receptacle shall be an "Arktite" Heavy Duty Receptacle assembly with a spring door (or equal as approved by the Engineer), 3 wire-4 pole, grounding style 2-metallic, 1-1/2" No. Area 10425, 2" No. AREA20426, or

3" No. AREA 40428. The contractor shall confirm receptacle hub size with the Engineer prior to installation.

- l. All electrical installations shall comply with the National Electric Code, NEMA, Division of Industrial Safety, and California Building Code. All local utility requirements shall be met. A building permit for the electrical service will be required from the County Building Official.
- m. The County shall be provided with three (3) complete sets of manufacturer's brochures, technical data, operation and maintenance manuals, schematics, wiring diagrams, warranties, etc. for all equipment and controls. Said data shall be provided to the Engineer organized with each set in its own three ring binder. The Developer shall provide on-site training for County maintenance personnel.
- n. Locks, keyed to the County master system, shall be provided at the access to the pump station and to the wet well. All pumps shall be equipped with locks and cam lock system for the suction and discharge lines.
- o. Submersible pumps shall be capable of running in air without damage. Moisture sensing circuit breakers in terminal changer shall be incorporated into submersible pumps.
- p. The pump station shall not be in County road right-of-way except with permission from the Engineer.
- q. Force mains shall be designed in accordance with good engineering practice. Maximum velocity shall not exceed 10 feet per second. Minimum velocity shall be 2 ft/sec. Provide suitable outfall structure and erosion protection.
- r. Above ground screening, fencing, and/or landscaping shall be provided for all above ground lift stations. Screening and landscaping standards shall meet the minimum requirements from the Planning Department and/or Parks and Recreation Department.
- s. The following items are required in the pump station plan submittal package. Each item must be included or the submitted package will be rejected and returned to the consultant without review or comment.
  - 1. Four sets of pump station plans including site plan.
  - 2. Plan review fee.
  - 3. Service area map.
  - 4. Design flow (Q) calculations.
  - 5. Wet well sizing calculations.
  - 6. Cycle time calculations.

7. Force main sizing calculations.
  8. System head calculations.
  9. Structural calculations.
  10. Buoyancy calculations.
  11. Emergency power narrative.
  12. Schematic showing system of force mains and pump stations from proposed pump station to electrical panel connections.
  13. Soil boring and geotechnical report.
  14. Pump selection catalog.
  15. Pump curve with system curves.
  16. Verification letter from electrical utility company for adequate electrical service to be provided.
  17. A minimum two-year warranty shall be provided.
- t. The Applicant and/or Developer shall guarantee that the pump station (complete) installed by the Contractor be free from any and all defects in materials and workmanship for a period of two (2) years after final acceptance by the County. This guarantee shall be based on the Design Engineer's approved construction cost estimate, or other amount determined by the County. The County may make any necessary repairs and charge the security in the event the Developer or Contractor fails to correct the defects.

#### **4.13 EXCAVATION AND BACKFILL:**

Excavation and backfill shall be as per plates 3-H1 and 3-H2. If a situation arises that is not covered, then the excavation and backfill shall be per State Standards.

#### **4.14 TESTING:**

Testing for proper compaction and for control of the concrete shall be as directed and observed by the Engineer. Testing shall be performed by the Developer unless otherwise directed by the Engineer. Certificates of Compliance, weigh master tags or other standard design data may be required by the Engineer in lieu of testing for proper concrete design. The cost of all testing shall be at the Developer expense.

#### **4.15 INSPECTION:**

All work shall be inspected by the Engineer prior to backfilling. After compaction has been completed all new lines shall be inspected with closed circuit television. The visual inspection method will be at the discretion of the Engineer.

If closed circuit television is used, the Developer shall give the Engineer at least two working days notice prior to televising the work. All dirt and other

debris shall be cleaned from the pipeline and manholes, trenches shall be compacted and manhole rims raised to grade. Infiltration, leaks and deficiencies shall be corrected prior to inspection. The suitability of the system for televising shall be at the discretion of the Engineer. The Engineer shall be present during the televising of the work.

The tape (in DVD or digital MPEG format) and tape logs shall be provided to the Engineer after the system has been televised.

The Developer shall repair all substandard work to the Engineer's satisfaction.

#### **4.16 STORM DRAIN EASEMENTS:**

Publicly owned drainage conduits 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 daylighting 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 Engineer prior to the approval of the improvement plans.

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

- a. Minimum width of any easement for a closed conduit shall be 16-ft.
- b. 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.
- c. Drainage easements for open channels shall have sufficient width to contain the open channel and a 12-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.

#### **4.17 MISCELLANEOUS ITEMS**

##### **a. Service Roads:**

A paved service road shall be provided within the boundary of all open channels and to drainage basins. The service road shall be a minimum of 16 feet wide, graded for maintenance vehicular traffic. The service road shall be free of all obstructions for its full width. Twelve feet of the road's width shall be paved surface type and structural section with a minimum unpaved shoulder width of 2 foot on each side of the roadway.

Service roads shall be constructed with a minimum of three inches of asphalt concrete over four inches of aggregate base, or per soil engineer's recommendation, whichever is greater. Service road grade shall not exceed 10.0% with 4:1 shoulder side slopes without prior approval of the Engineer.

Service roads may be required on both sides of the channel as determined by the Engineer.

b. Culvert Design:

Cross culvert conduits and box structures shall be designed to pass the peak flow from the 10-year, 24-hour design storm without damage to the roadway in accordance with normally accepted engineering practice based on good judgment and experience in design, construction, and maintenance. Culvert capacity may be determined on the basis of inlet and outlet control in accordance with generally accepted engineering practice.

c. Siphons:

Typically siphons are not acceptable but may be allowed at the discretion of the Engineer.

d. Inlets:

Storm inlets shall be sized to handle the peak design flow and in accordance with the manufacturer's recommendation. Inlets shall be spaced such that gutter flow does not spill over the curb or have a width that encroaches into the nearest traveled way. Inlets shall not connect to other inlets.

e. Service Connections:

Storm service connections shall meet the following minimum conditions unless otherwise approved by the Engineer:

1. Private on-site development shall not drain into the public right-of-way without prior approval from the Engineer and the right-of-way has gravity storm drain pipes with sufficient capacity to handle additional runoff. Under no circumstances can development tie into existing off-site rock wells.
2. 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.

3. Service lines from drain inlets and roof drains on private property shall be connected to an on-site catch basin or junction structure before entering the public right-of-way. Tie-ins are restricted to catch basins, junction boxes or manholes.

#### **4.18 NPDES CONSTRUCTION GENERAL PERMIT & STORM WATER QUALITY**

If the project is considered a “regulated project” as defined in the new NPDES MS4 Phase II permit, a site-specific post-construction control measures plan must be submitted during the plan check process.

Runoff calculations and other calculations demonstrating adequacy of drainage structures and selected best management practice (BMP) measures shall be included.

All regulated projects and projects that create or replace a certain threshold of impervious surface area shall meet the following post construction program requirements:

##### **a. Post Construction Applicability**

All new development and redevelopment projects shall be designed in conformance to the following minimum post construction program design requirements:

##### **1. Projects less than 2,500 ft<sup>2</sup> of impervious surface area:**

If your project does not create or replace more than 2,500 ft<sup>2</sup> of impervious surface area, then the project is not applicable to the Post Construction Program requirements

##### **2. Projects between 2,500 ft<sup>2</sup> to 5,000 ft<sup>2</sup> of impervious surface area:**

If your project creates or replaces between 2,500 ft<sup>2</sup> but under 5,000 ft<sup>2</sup> of impervious surface area, the Developer shall implement one or more of the following Site Design Measures and quantify the runoff reduction using the State Water Board’s SMARTS Post Construction Calculator:

- i. Stream Setbacks and Buffers
- ii. Soil Quality Improvement and Maintenance
- iii. Tree Planting and Preservation
- iv. Rooftop and Impervious Area
- v. Disconnection
- vi. Porous Pavement
- vii. Green Roofs
- viii. Vegetated Swales
- ix. Rain Barrels and Cisterns



3. Regulated Projects (new) more than 5,000 ft<sup>2</sup> of impervious surface area:

If your project is not listed as an exempt project type as shown below and creates or replaces more than 5,000 ft<sup>2</sup> of impervious surface area, the project is considered **A Regulated Project**.

Exempt Project Types:

The following types of projects are exempt from post construction program requirements:

- i. A detached single family home and not part of a larger project;
- ii. Interior remodel;
- iii. Routine maintenance; or a
- iv. Linear Underground Project (LUP).

New Development and non-redevelopment regulated projects shall be required to follow the CASQA BMP Handbook guidance if the project may have or may be subject the activities as shown in Exhibit 4-1.

4. Redevelopment Regulated Projects disturbing more than 5,000 ft<sup>2</sup> or more of impervious surface area:

If your project is considered a Regulated Project and is considered a Redevelopment Project, then your project will also be subject to storm water quality treatment requirements based on two scenarios shown below:

- i. Less than or equal to 50% increase of impervious surface area:

If your project does not increase more than 50% or more of existing impervious surface area, then the storm runoff from only the new or replaced impervious surface area must be treated.

- ii. Greater than 50% increase of existing impervious surface area:

If your project increases 50% or more of existing impervious surface area, then the storm runoff from the entire project must be treated.

b. Low Impact Design Standards:

Any remaining runoff after initial treatment with the Site Design Measures must be directed to one or more facilities that is sized to the SQDF or SQDV and is designed to infiltrate, evapotranspire,

and/or bioretain the storm runoff.

This control measure must be demonstrated to be at least as effective as a bioretention system having the following design parameters:

- i. Maximum surface loading rate of 5 inches per hour, based on the flow rates calculated. A sizing factor of 4% of tributary impervious area may be used.
- ii. Minimum surface reservoir volume equal to surface area times a depth of 6 inches.
- iii. Minimum planting medium depth of 18 inches. The planting medium must sustain a minimum infiltration rate of 5 inches per hour throughout the life of the project and must maximize runoff retention and pollutant removal. A mixture of sand (60%-70%) meeting the specifications of American Society for Testing and Materials (ASTM) C33 and compost (30%-40%) may be used.
- iv. Subsurface drainage/storage (gravel) layer with an area equal to the surface area and having a minimum depth of 12 inches.
- v. Underdrain with discharge elevation at top of gravel layer.
- vi. No compaction of soils beneath the facility, or ripping/loosening of soils if compacted.
- vii. No liners or other barriers interfering with infiltration.
- viii. Appropriate plant palette for the specified soil mix and maximum available water use.

The Design Engineer shall submit a copy of the NOI that displays the Waste Discharge identification Number (WDID) assigned to the regulated project, sizing calculations, design drawings, and a written operation and maintenance plan for the proposed LID and hydromodification control measures. The property owner shall perform annual assessments of the effectiveness and maintenance of the control measures and submit a self-certification report as may be required by the NPDES permit.

All Regulated Projects shall implement the following Low Impact Development (LID) measures:

1. Define the development envelope and protected areas, identifying areas that are most suitable for development and areas to be left undisturbed.
2. Concentrate development on portions of the site with less permeable soils and preserve areas that can promote infiltration.
3. Limit overall impervious coverage of the site with paving and roofs.
4. Set back development from creeks, wetlands, and riparian habitats.

5. Preserve significant trees.
6. Conform the site layout along natural landforms.
7. Avoid excessive grading and disturbance of vegetation and soils.
8. Replicate the site's natural drainage patterns.
9. Detain and retain runoff throughout the site.

The Design Engineer shall provide a map dividing the developed portions of the regulated project site into discrete drainage management areas (DMAs) and to manage runoff from each DMA using Site Design Measures, Storm Water Treatment Measures, and Baseline Hydromodification Measures.

Regulated Projects must select one or more of the following Site Design Measures to evapotranspire, infiltrate, harvest / re-use, or biotreat the storm water runoff:

1. Stream Setbacks and Buffers
2. Soil Quality Improvement and
3. Maintenance
4. Tree Planting and Preservation
5. Rooftop and Impervious Area
6. Disconnection
7. Porous Pavement
8. Green Roofs
9. Vegetated Swales
10. Rain Barrels and Cisterns

The Site Design Measure(s) must be sized using either the Storm Quality Design Volume (SQDV = 0.50-inch) for runoff detaining control measures or the Storm Quality Design Flow (SQDF = 0.20 inch/hour) for flow through control measures.

c. Hydromodification Requirements

For projects that create and/or replace one acre or more of impervious surfaces, the post-project runoff shall not exceed the estimated pre-project runoff for the 2-year, 24-hour storm design event as described in Exhibit 4-1. A project that does not increase the impervious surface area over the pre-project condition is not subject to this requirement.

d. County's Post Development Storm Water Quality Design Manual

A County document entitled "Post Development Storm Water Quality

Design Manual” is currently being developed to establish minimum requirements for storm water quality control measures and to provide guidance to the Developer, Contractor, and Engineer in selecting appropriate control measures. This document, once adopted, will be incorporated into these Standard Specifications by reference.

The Contractor and Developer shall assume full responsibility for conforming to the requirements stated in this Chapter. In the event of conflict between the requirements stated in this Chapter and the County’s Post Development standards, the most stringent of the requirements shall take precedence.

The California Storm Water Quality Association (CASQA) Storm Water Best Management Practice Handbook for New Development and Redevelopment also contain design standards and detailed information on storm water treatment and source controls. The CASQA handbook can be viewed online at: [www.cabmphandbooks.com](http://www.cabmphandbooks.com)

Refer to Chapter 9 for additional information on erosion control, sediment control, and storm water quality requirements. You may also contact the Development Services at (209) 525-4130 for information on the NPDES permit and storm water quality requirements for a specific project.

#### **4.19 DISCHARGE APPROVAL AND PERMITS:**

It shall be the responsibility of the Developer to obtain written approval and encroachment permits from all agencies controlling the discharge of drainage into the receiving waterways.

These agencies shall include, but not be limited to the following:

- a. Army Corps of Engineers
- b. US Coast Guard
- c. California Regional Water Quality Control Board
- d. Department of Fish and Game
- e. California State Lands Commission
- f. California Department of Water Resources
- g. Local regulatory irrigation districts

**TABLE 4.1**  
**COEFFICIENT OF RUNOFF**

<b>SURFACE DESCRIPTION</b>	<b>"C"</b>
Lawns, pasture and farmland	0.30
Compacted earth without pavement	0.80
Pavement & Roofs	0.95
Detention Basin/Drainage Swales	1.00

<b>LAND USE DESCRIPTION</b>	<b>"C"</b>
R-1 Single family residence:	
Over 1.5 acres	0.40
0.5 to 1.5 acres	0.45
6000 sf. to 0.5 acres	0.55
Less than 6000 sf.	0.60
R-2 Medium Density Residential/Multi-family:	
Apts., condos, duplexes, & town homes	0.70
R-3 High Density Residential (cluster housing)	0.85
Commercial and industrial	0.90
Schools (to be determined by Engineer)	TBD

**TABLE 4.2**  
**HAZEN-WILLIAMS ROUGHNESS COEFFICIENTS**

Reinforced Concrete Pipe (RCP)	100
Cast in Place Concrete Pipe (CIP)	100
Poly Vinyl Chloride Pipe (PVC)/Plastic	130
High Density Poly Ethylene Ribbed (HDPE)	130
Steel Welded and Seamless	100
Corrugated Metal Pipe (CMPC) - Coated	100
Corrugated Metal Pipe (CMPU) - Uncoated	130
Corrugated Metal Pipe (CMPG) - Galvanized	100

Note: \* Use of any other pipe material roughness coefficient not shown above must be in conformance with pipe manufacturer's recommendation and approved by the Engineer.

**TABLE 4.3**  
**TIME OF CONCENTRATION**

<b>Land Use Classification</b>	<b>Tc (minutes)</b>
Single family (0.5 to 1.0 acre)	30 min.
Single family (less than 0.5 acre)	20 min
Multi-family 20 min Commercial & Industrial	10 min
Gutters	1 ft. / Sec

**TABLE 4.4**  
**MANNING COEFFICIENTS**

<b>CLOSED CONDUIT MATERIAL *</b>	<b>MANNING COEFFICIENT</b>
Reinforced Concrete Pipe (RCP)	0.013
Cast Iron Pipe (CIP)	0.013
Poly Vinyl Chloride Pipe (PVC)	0.011
High Density Polyethylene Pipe (HDPE)	0.011
Steel Welded and Seamless	0.020
Corrugated Metal Pipe (CMP) – Coated	0.013
Corrugated Metal Pipe (CMP) – Uncoated	0.014
Corrugated Metal Pipe (CMP) – Galvanized	0.015

<b>OPEN CHANNELS</b>	<b>MANNING COEFFICIENT</b>
Lined Channels - Asphalt	0.015
Lined Channels - Concrete	0.015
Rubble or Rip Rap	0.030
Vegetated	0.040
Excavated or Dredged Earth, Straight & Uniform	0.030
Earth, Winding, Fairly Uniform	0.040
Unmaintained	0.100
Natural Channels (minor streams)	0.050
Fairly Regular Section	0.050
Irregular Section with Pools	0.100

Note: Use of any other pipe material not shown above must be approved by the Engineer. (Adapted and modified from Table XIV, ASCE Manual No. 37, 1970)

\* Manufacture's information may be used in lieu of these values.



**TABLE 4.5**

**ALLOWABLE VELOCITIES FOR UNLINED OPEN CHANNELS**

<b>CHANNEL MATERIAL</b>	<b>MAXIMUM ALLOWABLE VELOCITY (FPS)</b>
Fine Sand	2.0
Sandy Loam	2.5
Alluvial Silt	3.0
Firm Loam	3.5
Fine Gravel	4.0
Stiff Clay	4.5
Coarse Gravel	5.0

## **CHAPTER 5: LIGHTING**

### **5.1 GENERAL:**

Street lighting shall be installed to conform to these minimum Standards by a Contractor holding an appropriate license for such work under the provisions of the State of California Business and Professions Code. Alternative higher standards that may be adopted by the Planning Commission or Board of Supervisors shall be applied, as appropriate. In the development of the plans, the Engineer shall be consulted to ensure coordination with the electrical distribution systems as proposed by the Utility.

Electrical equipment shall conform to the requirements of the National Electrical Manufacturers' Association (NEMA) and material and work shall conform to the requirements of the National Electrical Code (NEC), the Electrical Safety Orders of the Division of Industrial Safety, Department of Industrial Relations of the State of California (DIR), Public Utilities Commission (PUC), the Standards of the American Society for Testing Materials (ASTM) and the American Standards Association (ASA).

### **5.2 DESIGN:**

The lighting system shall be designed to best serve the area and to minimize the length of service runs from the points of connection to the street lights.

All street lights to be installed shall be shown on the Plans. The Consulting Engineer shall submit three copies of the street light plans to the County for preliminary review in the initial submittal. The Consulting Engineer shall furnish plans and obtain approvals from the utility company. The Consulting Engineer will then obtain service locations and identification numbers from the utility company.

The location of the power source(s), the location of pull box(es) containing circuit fuse and of all conduit runs shall be shown on the Plans or on the final as-builts. The plans shall also include these following items:

- a. Location of electroliers in accordance with Plates 5-A1 and 5-A2.
- b. Intensity of luminaries (i.e. wattage).
- c. Location of service points.
- d. Location of pull boxes.
- e. Location of conduit runs.

The Design Engineer 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 County will not prepare a power application to energize service to the utility company unless the plans have obtained prior approval from the utility company.

The cost for all utility services shall be paid for by the Developer or Contractor. This shall include the utility connection charge for energizing street lights.

The Design engineer shall provide the final as-builts prior to final acceptance of the construction improvements and prior to having the street lights energized.

The circuit lengths and conductors shall be sized such that the maximum voltage drop between the source and any street light does not exceed 5% of the nominal circuit voltage.

The spacing and location for 25 foot poles and 28 foot poles shall be as shown on Plates 5-A1 and 5-A2.

### **5.3 CONDUIT:**

Conduit and fittings shall be rigid galvanized metal or intermediate metal or rigid PVC in locations where approved by National Code, 1 inch minimum diameter as shown in Detail 5-B. All fittings shall be of the concrete tight type.

All 90 degree elbows and raisers shall be rigid metal.

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.

For steel conduit, 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.

Conduits crossing an existing paved right-of-way shall be installed by the jacking or boring method and shall be installed 30 inches below flow line grade.

#### **5.4 CONDUCTORS:**

Conductors shall be No. 10 AVG copper or larger, THW single conductor and Underwriters Laboratory approved.

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 three days after placement of the foundation concrete.

Conductors shall not be spliced except in pole bases (or in pull boxes when approved by the Engineer). The splices shall be made as follows:

- a. In pole bases, all splices shall be made with wire connections, ITT No. 10-604, 10-606 or 10-6010 or approved equal.
- b. Where specifically approved by the 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.

Each light shall be individually fused (in accordance with Section 5.13) in the pull box at the base of the street light standard.

#### **5.5 PULL BOXES:**

Pull boxes shall be concrete and conform to a Chirsty N-30, Brooks Series 38, or approved equal. The pull box specification and installation shall conform with Plate 5-C and meet the following minimum requirements:

- a. One pull box shall be installed at the base of each street light.
- b. One pull box shall be located at each side of all street crossings, at or near the curb return.
- c. Where a utility company transformer is designated as the service point, a pull box shall be installed adjacent to the transformer with a fuse holder and fuse installed in this pull box.
- d. Additional pull boxes shall be installed in conduit runs as necessary so that no conduit run shall exceed 200 feet between pull boxes.

- e. Traffic pull boxes conforming to State specifications shall be used in areas subject to vehicular traffic.
- f. All pull box lids shall be marked "Street Lighting."
- g. 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.

## **5.6 FOUNDATIONS:**

Foundations for poles shall be constructed of Portland Cement Concrete per Caltrans State Specification 90-10 "Minor Concrete" and shall be located in conformance with Plate 5-D. 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.

Foundations shall rest on firm ground. The area around each foundation shall be backfilled and compacted per Standard Detail 5-E1. The concrete shall have a minimum 28-day compressive strength of 3,000 psi.

All work on foundations must conform to Section 15-2 "Miscellaneous Highway Facilities" and Section 86-2 "Materials and Installation" of the State Standards. Sidewalk grade shall conform to these Standards.

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 of anchor bolts is not allowed. Base of standards may never be left below grade. Where these standards cannot be met, a new pole foundation shall be installed.

Where steel poles are to be served by an overhead service, acceptable landing gear shall be provided and the foundations shall include a concrete-encased grounding electrode complying with Article 250-81(c) of the National Electrical Code.

## **5.7 ANCHOR BOLTS:**

Anchor bolts shall be 1 inch in diameter, 36 inches long with a 4 inch "L" bend at the bottom end and a minimum of 6 inches of threading at the top end. Anchor bolts shall conform to ASTM Designation A-307.

## 5.8 **POLES:**

All poles shall be hot-dip galvanized steel after manufacture.

The 28 foot poles with 15 foot arms shall be Ameron Catalog No. N-2815-2 or an approved equal.

The 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. Poles shall meet the following minimum standards:

- a. Poles shall not be installed until the foundation has set at least five 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.
- b. Poles shall have hand-holes near their bases. The hand covers shall have theft-proof bolts.
- c. When the pole is not located at the back of the sidewalk, the length of the luminaire arm shall be as directed by the Engineer.
- d. All poles shall have a single arm.
- e. Pole height and arm length shall be as shown on Plate 5-B.

## 5.9 **ELECTROLIERS:**

The electroliers shall be located according to size as shown on Plates 5-A1 and 5-A2. Streetlights shall be placed at street intersections and curves whenever possible. Additional lights may be added as required. The luminaires shall be as follows, or an approved equal:

<b>Wattage &amp; Type</b>	<b>Manufacturer</b>	<b>Model No.</b>
200 Watt IES Type III	Leotek	Leotek GC1-80C-MV-NW-3M-Gy 530 mA
200 Watt IES Type III	Beta	Beta STR-LNY-3M-HT-08-D-UL-525-43K-R
150 Watt IES Type II	Leotek	Leotek GC1-60C-MV-NW-2M-Gy 530 mA
150 Watt IES Type II	Beta	Beta STR-LWY-2M-HT-06-D-UL-525-43K-R
100 Watt IES Type II	Leotek.	Leotek GC1-40C-MV-NW-3M-Gy 530 mA
100 Watt IES Type II	Beta	Beta STR-LWY-2M-HT-04-D-UL-525-43K-R

Luminaires shall have LED lamps, acrylic refractors, built-in receptacles for photoelectric cells with a power factor of not less than 92%.

**5.10 PHOTOELECTRIC CELLS:**

Photoelectric cells shall be adjustable, compatible with related equipment and adequate for the load. They shall be General Electric No. C402G660, Fisher Pierce No. 6690B or an approved equal.

**5.11 INSTALLATION:**

The trench excavation shall be made by the Developer as shown on Plate 5-E. Trenches shall be straight and of even depth. Special locations or depths must be approved by the Engineer prior to excavation.

The conduit shall be laid in the trench as shown on Plate 5-E. Wherever possible, the conduit shall be placed adjacent to the sidewalk for protection from future excavation. Conduit shall be jacked or bored at existing street crossings.

**5.12 BACKFILL:**

The backfill shall be compacted as shown on Plate 5-E Standards.

**5.13 CONNECTION TO ELECTRICAL DISTRIBUTION SYSTEMS :**

Where lighting circuit and energy sources meet, the circuit shall terminate in the Utility service or pull box (see 5.5, "Pull Boxes"), as shown on Plates 5-C and 5-D. The circuit shall terminate with a Bussman TRON fuse-holder, with a 30 amp cartridge fuse, type HEB-AB or an approved equal. The fuse shall be taped to the conductor and there shall be 4 feet of slack conductor coiled in the service box.

The Utility shall make service connection for light standards in the pull box. Where service is from a Utility transformer, and no service or pull box exists, the Developer shall furnish and install a pull box at the transformer location, as shown on Plates 5-B. The Developer shall furnish and install conduit and conductors from the pull box into the Utility transformer. Entrance in the Utility transformer shall be coordinated with, and supervised by, the Utility.

A 120 volt service connection shall be provided for the lights as shown in Plate 5-B. The connection to either an overhead or underground energy source will be made by the Utility, upon receipt of request for service by the County. All necessary wiring, conduit or the like to an existing and available power source shall be installed prior to acceptance by the

County.

All utility identification numbers shall be installed in accordance with the Utility's Standards before the lights will be energized.

#### **5.14 TESTING:**

The street lights shall be tested in normal service for a minimum of 96 continuous hours before acceptance by the County.

Upon completion of the installation of a circuit, the Contractor shall notify the County Traffic Engineer, who will make the necessary insulation and ground tests. The system will be further tested by two weeks of operation prior to the acceptance of the contract. The street light system from the service point to the electrolier shall be tested for the following items:

- a. Identification of light distribution patterns.
- b. Acceptability of the LED and fixtures for electrical and nose standards.
- c. Verification that all connections are electrically and mechanically sufficient.
- d. Conductors shall move, with minimal effort, within the conduit.

#### **5.15 CONFLICT WITH UTILITIES:**

Developer shall be responsible for contacting other utilities to determine that locations for foundations and conduit runs are clear. Where conflicts exist, the locations may be altered with the approval of the Engineer.

#### **5.16 LOCATION OF STREETLIGHTS**

Street lights shall have the following spacing, intensity, and mounting heights according to the type of street they are to be installed on:

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 (See item 5.16.o below)

- a. Street lights shall be placed at street intersections and curves.



Additional lights may be added as required.

- b. Pole height and arm length shall be as shown in the Standard Details.
- c. If possible, streetlights shall be located within 3 feet of a property line.
- d. 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.
- e. On streets with monolithic curb, gutter, and standard 5 foot sidewalk, streetlights shall be located at the back of sidewalk. The edge of the pole foundation shall meet the back of sidewalk. On streets with 10 foot or larger sidewalks, streetlights shall be located directly behind curb.
- f. Where there is only curb and gutter, the center of the streetlight foundation shall be located 6-1/2 feet from the back of curb.
- g. T-intersections - A streetlight shall be located on the through street at within 12-1/2 feet of the projected centerline of the intersecting street (either direction).
- h. Cul-de-sac - Street lights shall be spaced at 330 feet maximum intervals. A streetlight shall be located at the end of the cul-de-sac.
- i. Four way intersection/major streets - Streetlights shall be located at all curb returns.
- j. Four way intersection/major and local street - Streetlights shall be located at the far right curb returns of the major street in the direction of travel.
- k. Four way intersection/local streets - A streetlight shall be located at one of the curb returns.
- l. Electroliers will normally be staggered on opposite sides of the street. In residential areas, electroliers shall be placed on the outer edge of curves. The placement of electroliers will be as determined by the Engineer in nonresidential areas.
- m. Electroliers are required at each knuckle. The electroliers shall be located on the outside of the knuckle.
- n. Electroliers shall be installed on breakaway bases on all roads except those classified as local or minor.

- o. Mounting height shall conform to overhead clearance specifications (at least 10 feet from high voltage lines).

## 5.17

### **ENERGIZING STREET LIGHTS AND LIGHTING DISTRICT ANNEXATION:**

Prior to acceptance of the improvements and/or recording of a final subdivision or parcel map, the Developer shall deposit the first year's operating and maintenance cost of the streetlights with the Department of Public Works. In order for the lights to be energized, the area being developed shall be annexed to a lighting district or a new lighting district shall be formed. A copy of the Petition Requesting the Formation of a Street Lighting District is found on page 5-11.

The Developer shall provide all necessary documents and pay all costs associated with the formation of a new lighting district or annexation district. The fees are calculated by the Engineering Support/Special Services division of the Department of Public Works. The following documents shall be required to form a new or annex into an existing district:

- a. A legal description of the project boundaries including total acreage.
- b. A map of the project boundaries that show all the street lighting with the appropriate spacing, wattage, height, and pole type clearly indicated.
- c. A petition or agreement form signed by all the current owners of the project property requesting either the formation or annexation of the lighting maintenance district of benefit. The wording and format of the petition shall be as shown in the exhibit on the following page (5-10):

The County will not submit a request to have the streetlights energized until the street lights have been approved by the County. The Developer shall pay all costs associated with having the streetlights energized.

## 5.18 **MEASUREMENT AND PAYMENT**

### a. General

All street lighting 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 street lighting and electrical system in accordance with the approved plans, these

specifications, the County Standard Details, and the State Specifications and standard Plans.

b. 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.

c. Conduit and Conductors

Conduit plus all conductors to be paid for by the linear foot of conduit.

d. Pull Boxes

Pull boxes shall be measured and paid for as one complete installed unit, including the base and lid.

# PETITION REQUESTING THE FORMATION OF A STREET LIGHTING DISTRICT

TO THE BOARD OF SUPERVISORS OF THE COUNTY OF STANISLAUS, STATE OF CALIFORNIA, the following residents and landowners believe that neighborhood streetlights deter crime, promote public safety and improve property values and, therefore, request the Board of Supervisors to adopt a resolution to initiate formation of a benefit assessment district to pay for the installation, operation and maintenance of streetlights in the unincorporated area \_\_\_\_\_, as shown on the attached map.

No.	Signature	Printed Name	Address	Landowner? Circle Yes or No
1				Yes No
2				
3				
4				
5				
6				
7				
8				
9				
10				

## **CHAPTER 6: MISCELLANEOUS**

### **6.1 OFF-STREET PARKING:**

- a. General: Each off-street parking space shall contain at least a rectangular area of a minimum width of 9 feet and a minimum length of 18 feet. A parallel parking space shall be a minimum width of 9 feet and a minimum length of 22 feet. If desired, 30% required parking stalls may be so sized and posted to be used for parking small cars. Small car stalls shall contain a rectangular area a minimum of 7-1/2 feet in width and a minimum of 15 feet in length. Small car spaces shall be identified by the words "small car" or "compact" marked on the pavement.

Any Driveway used for both ingress and egress to and from a parking lot and not directly serving parking stalls shall have a minimum width of 20 feet. Any driveway used only for either ingress or egress to or from a parking lot and not directly serving parking stalls shall be a minimum of 10 feet in width. All driveways connecting public rights-of-way to off-street parking lots shall comply with the regulations regarding driveways. See Chapter 3 of these standards.

All parking areas shall have internal circulation in which no backing movement, except that required to leave a parking space, is required. It shall also be possible to maneuver within a parking area without the use of street right-of-way. No parking area design shall require an exiting vehicle to back onto a street, except for parking serving single-family houses, duplexes, or triplexes.

Parking areas, including driveways to and from parking areas, shall be paved with a minimum of 2 inches of asphalt concrete surfacing or a minimum of 3-1/2 inches of concrete, and be graded and designed as to dispose of all surface water in accordance with Chapter 4 of these standards.

All parking areas shall be marked by either striping or buttons to delineate spaces. The spaces shall be double-striped with a painted line width of 4 inches. If buttons are used they shall be 3-1/2 inches to 4 inches in diameter, spaced no more than 3 feet on center. The lines shall be laid parallel to and 1 foot within each stall, 18 feet in length for a full-sized space and 15 feet in length for a small car space, not including the semicircular cap.

The number of parking spaces required shall be determined by the Planning and Community Development Department. Any changes made after the issuance of the building permit to the parking layout, curbing, or striping plan that may change the number or configuration of parking, or the location, size, or dimensions of tree wells or landscaped area(s) shall require the re-submittal of revised plans for review and approval by the Planning and Community Development Department prior to construction.

- b. Handicapped Parking: Parking area for nonresidential uses shall include spaces designed for use by the physically handicapped which shall be as close to the primary building entrance(s) as practical. These spaces shall be located so the handicapped person is not required to wheel or walk behind a parked car other than their own. Pedestrian ways accessible to the handicapped shall be provided from each space to the use served.

If one space is provided, it shall be 17 feet wide and lined to provide a 9 foot wide space and 8 foot wide loading and unloading area on the passenger side of the vehicle. Two spaces can share the loading/unloading area. If a walkway is used as a wheelstop (maximum 2-1/2) foot vehicle overhang permitted), the walkway must still have a net clear width of 4 feet.

All handicapped parking shall comply with the California State Accessibility Standards, Title 24 of the California Administrative Code.

A raised sidewalk serving as a wheelstop may be less than 6 inches high if necessary to accommodate a handicapped ramp.

Markings and signs shall be as required by state law, including signs at parking lot entrances regarding towing of cars for unauthorized parking in a space for the handicapped, signs at the spaces restricting use to handicapped persons, and pavement markings displaying the handicapped symbol. The minimum number of handicapped spaces that are required shall be based on Table 6-1.

In lots with less than five spaces, one space 17 feet wide must be provided. This space shall be striped to provide a 9 foot wide vehicle area and an 8 foot ramp area. However, this space need not be signed for or limited to exclusive use by the handicapped.

Surface slopes of parking spaces for the physically handicapped shall be the minimum possible and shall not exceed 1/4 inch per foot in any direction.

- c. Wheelstops: Every parking space that is not separated by a fence, wall or landscaped area from any alley property line upon which it abuts, shall be provided with a suitable concrete curb or timber barrier not less than six inches in height. The curb or barrier shall be located not less than 2-1/2 feet from the alley property line, and be securely installed and maintained.

Every parking space that abuts a fence, wall, or landscaped area shall be separated from them by a suitable wheelstop consisting of a concrete curb or timber barrier not less than 6 inches in height. The curb or barrier shall be located not less than 2-1/2 feet from the fence, wall, or landscaped area; and be securely installed and maintained. If low-lying plant materials that will permit a 2-1/2 foot vehicular overhang are specified in an approved landscaping plan, a 6 inch concrete curb can be utilized for a planter border as well as a wheelstop.

Every parking area with an aisle that abuts a fence, wall, or landscaped area shall have the aisle separated from them by a suitable wheelstop consisting of a concrete curb or timber barrier not less than 6 inches in height and not less than 4-1/2 feet from the fence, wall, or landscaped area. The curb or barrier shall be securely installed and maintained. If low-lying plant materials that will permit a 2-1/2 foot vehicular overhang are specified in an approved landscaping plan, a 6 inch concrete curb can be utilized for planter border as well as a wheelstop.

## **6.2 EMERGENCY ACCESS:**

- a. General: Road and street networks, whether public or private, shall provide for safe access for emergency fire apparatus and civilian evacuation concurrently, and shall provide unobstructed traffic circulation during an emergency. No parking, stopping, or standing of vehicles is allowed in emergency access lanes.

All roads shall be constructed to provide two-way traffic flow using a minimum of two 10 foot traffic lanes and an inside radius of 30 feet.

Access roads shall provide unobstructed access to fire apparatus. The surface must also be capable of supporting a 75,000 pound load. The grade for all roads, streets, private lanes, and driveways shall not exceed 10%, but may be up to 15% with alternative pavement, as approved by the Fire Marshall.

All roadways shall have a horizontal radius of curvature along the inside edge of pavement of no less than 50 feet. An additional

roadway width of 4 feet shall be added to curves of 50-100 feet radius and 2 feet to those from 100-200 feet.

The length of vertical curves in roadways, exclusive of gutters, ditches, and drainage structures designed to hold or divert water, shall be not less than 100 feet.

Turnarounds are required on driveways and dead-end roads as specified in plate 6-C and as approved by the Fire Marshall.

Turnouts shall be a minimum of 10 feet wide and 30 feet long with a minimum 25 foot taper on each end.

All driveway, road, street, and private lane roadway structures shall be constructed to carry at least the maximum load and provide a minimum vertical clearance of 13-1/2 feet.

Appropriate signing, including but not limited to weight or vertical clearance limitations, one-way road or single lane conditions, shall reflect the capability of each bridge.

All one-way roads shall be constructed to provide a minimum of one 10 foot traffic lane. All one-way roads shall connect to a two lane roadway at both ends, and shall provide access to an area currently zoned for no more than 10 dwelling units. In no case shall it exceed 2,640 feet in length. A turnout shall be placed and constructed at approximately the midpoint of each one-way road.

- b. Dead-end Roads: Cul-de-sac and dead-end roads can only be greater than 500 feet if a subdivision exception is approved by the Planning Commission or Board of Supervisors. Only agricultural parcels are allowed access easements up to one mile in length. The maximum length of a dead-end road, including all dead-end roads accessed from that dead-end road, shall also meet the requirements of the Stanislaus County Fire Marshall.
- c. Driveways: All driveways shall provide a minimum 10 foot traffic lane and unobstructed vertical clearance of 13-1/2 feet along its entire length.

Driveways exceeding 150 feet in length, but less than 800 feet in length, shall provide a turnout near the midpoint of the driveway. Where the driveway exceeds 800 feet, turnouts shall be provided no more than 400 feet apart.

A turnaround shall be provided at all building sites on driveways



over 150 feet in length. All portions of the building shall be located within 150 feet of a fire access road as measured by an approved route around the exterior of the building.

### **6.3 FIRE SAFETY:**

The fire system shall conform to the requirements of the fire district in which the development is located. The governing fire district and/or Stanislaus County Fire Marshal shall sign the improvement plans prior to the plans being approved by the County.

### **6.4 WATER:**

The water system shall conform to the requirements of the water district in which the development is located. The governing water district shall sign the improvement plans prior to the plans being approved by the County. If the development is located outside of a water district, then the water system shall be designed and constructed in conformance with the City of Modesto water standards. Compliance with the applicable water standards shall be certified by the design engineer.

At a minimum, the water system shall meet these design requirements:

- a. General: All improvements, including extensions, replacements and repairs of water facilities, shall conform to the requirements of the National Board of Fire Underwriters, American Water Works Association Standards, the Stanislaus County Fire Marshal, National Fire Protection Association and these Standard Specifications

All installations shall conform to regulations prescribed by the California Department of Public Health and Stanislaus County Department of Environmental Resources.

In all cases, water mains shall be of sufficient size to meet the demand plus fire flow Marshal District.

- b. Layout Of Mains: The distribution system, whenever possible, shall employ the "Grid 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 Engineer.
- c. Vertical Alignment: Water mains and services shall be installed at a depth which will provide a minimum of 30 inches from the top of the

pipe to the bottom of the street structural section grade as shown in Standard Details 3-H1 and 3-H2. 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", California Department of Public Health.

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. The Design engineer shall detail all crossings with a clearance less than 15 inches

- d. Horizontal Alignment: Alignment shall be parallel with the street centerline wherever possible. A horizontal clearance of 10 feet to a sanitary sewer or storm drain line shall be provided. Curved water mains are allowed in curved streets when curvature does not exceed 80% of the manufacturer's recommendations.
- e. 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 may be required as designated by a water master plan for future continuation or as directed by the water district and/or Stanislaus County Fire Marshal. Industrial and commercial areas may require installation of 12 inch mains. Minimum residual fire flow shall be 20 PSI.

For single-family residential areas, all water mains shall be sized to provide 1,000 gallons per minute fire flow from each of 2 adjacent fire hydrants flowing simultaneously with 20 PSI residual pressure.

For multi-family, commercial, and industrial areas, all water mains shall be sized to provide the demand plus fire flow as required by the Stanislaus County Fire Marshal, but shall provide not less than 1,500 gallons per minute from each of two adjacent fire hydrants flowing simultaneously with 20 PSI residual pressure.

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

- 1. Half-mile looped grid – 12-inch mains or larger
- 2. Quarter-mile looped grid – 8-inch mains
- 3. Distribution system, looped – 8-inch mains

Pipe materials may be ductile iron pipe (D.I.P.) or polyvinyl chloride pipe (P.V.C.).

- f. Water Service: The minimum size service is 1 inch. 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 County Engineer. Water services are not permitted to connect to a transmission main 14 inches 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 district 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 Chief's inspection. At a minimum, an above ground single check is required within view (usually within 30 feet of the property line) on any private fire system, including a single fire hydrant.

- g. 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 County Engineer and Fire Chief or unless located in a cul-de-sac.

Fire hydrant shall be installed in conformance with the governing water district's standard construction details.

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

Fire hydrant spacing and distribution shall be determined as follows:

1. R-1 & R-2 Residential Zones – 500 feet.
2. All other zones – 300 feet
3. 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.

4. On divided streets, planned divided streets or state highways, the above spacing shall apply to both sides of the street.
  5. A fire hydrant shall be located at the end of all cul-de-sacs in lieu of a blow-off.
- h. 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 inches in diameter shall have valves at 1,000 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 Fire Chief.

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

- i. 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.

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

- j. Thrust Blocks: Thrust blocks shall be designed and installed in conformance with City of Modesto Standard Detail #609
- k. Water Line Easement: Dedicated water mains outside the public right-of-way are discouraged. The design engineer should strive for a design to put them within the public right-of-way.
- l. Water Supply General Requirements: The following standards shall

apply for all water systems to residential, commercial, mobile home parks, and industrial subdivisions developed under these specifications.

When connection to a public water system is declared as not feasible by the Planning Commission, and all lots exceed 20,000 square feet in area, and adequate proof is furnished to show that an adequate and potable water supply is available for all lots, the Stanislaus County Department of Environmental Resources (DER) may authorize the use of individual wells.

These standards are supplemental to California Water Works Standards (CWWS) contained in Title 22, Chapter 16, California Code of Regulations, Section 64555 et. seq.

Plans, specifications, technical report (prepared, stamped, and signed by a qualified professional engineer), and a permit application must be submitted to and approved by the following agency, before construction of any water distribution or supply facilities:

1. California Department of Public Health for water systems greater than or equal to two hundred service connections.
2. Stanislaus County Department of Environmental Resources for water systems less than two hundred service connections.

A qualified professional engineer should typically possess at least three years experience in public water system design.

- m. Water Supply Design Standards: In the case of a subdivision with all lots exceeding 20,000 square feet or more in area, the water supply may be from individual wells provided the approval of the supply is first obtained from the Stanislaus County Department of Environmental Resources.

The following standards shall apply for water systems in subdivisions where lot size is less than 20,000 square feet whether the subdivision is for residential, commercial, mobile home parks, or industrial use:

1.  $P = N \times C \times f + F$  = formula for peak flow rate
2.  $R = 60 \times D \times P$  = required minimum supply

Where:

C = Flow constant in gallons per minute per service.  
D = Required minimum duration of peak flow (in hours).  
f = Diversity factor (number of units).  
F = Total fire flow rate in gallons per minute.  
N = Number of services.  
P = Peak demand rate (including fire and domestic) in gallons per day.  
R = Required minimum supply (also see C.W.W.S)

Wells and firm surface stream diversions, with documented water rights are the only sources of water supply to be considered in this section. Storage tanks and reservoir are not to be construed as a source of supply. Where industries using large quantities of water are included in the service area, their requirements must be considered separately and added to the requirements computed by the formula,  $R = 60 \times D \times P$ .

In no case shall "R" be less than 2,000 gallons per day per acres served by the system.

The distribution system must be capable of delivering at the peak demand rate. Minimum sizes for individually piped lines will be computed for the flow given by the formula for peak demand rate by using the portion of the system served by the pipeline whose size is to be determined. Use procedure in Plumbing Code for sizing lines for trailer parks.

In determining peak flow required by system ( $P = N \times c \times f + F$ ), use highest value of "F" required by system. In determining pipe size, try the fire flow "F" from each hydrant (or group of hydrants) in the system, one at a time, together with peak domestic flow. Use value of "F" for type of district in which each hydrant is located.

- n. Water Pressure: A minimum of 20 PSI residual pressure shall be maintained in the mains at all locations in the distribution system during required periods of flow at peak demand rates.
- o. Water Storage: Storage units include potable water reservoirs and tanks and elevated tanks. Storage in pipelines will not be taken into consideration in meeting minimum storage requirements.

Size of storage units will be computed from the lowest normal operating level to the highest normal operating level.

See CWWS, Section 64564 - Procedures for determining needed source capacity and needed storage volume.

- p. Water Well Lot Sizes: A minimum water well lot size of 100 feet by 100 feet shall be provided for all public water supply wells.
- q. Backflow Prevention Devices: Approved backflow prevention devices, where required on individual service connections, shall be installed and tested by an approved tester prior to acceptance of the water system improvements.
- r. Auxiliary Power Sources: Approved auxiliary power sources shall be installed onsite to adequately operate pumping facilities in the event of a power outage by the local power supplier.

## **6.5 SANITARY SEWER:**

The sewer system shall conform to the requirements of the sewer district in which the development is located. The governing sewer district shall sign the improvement plans prior to the plans being approved by the County. If the development is located outside of a sewer district, then the sewer system shall be designed and constructed in conformance with the City of Modesto sanitary sewer standards.

All calculations to verify the design of any portion of the sanitary sewerage system shall be submitted to the Department of Environmental Resources or the governing sewer district for review and approval. The calculations shall be based on rational methods generally accepted by the engineering profession and shall be neatly and legibly done in such form as to enable them to be readily checked. Literature and technical data concerning any of the materials and equipment proposed to be used may be required by the Director of Environmental Resources or the governing sewer district.

When the sewerage collection system is to become a part of an existing sanitation system, it shall meet the design requirements of the administrative agency controlling the system.

- a. Vertical Alignment: Sewer mains and services shall be installed at a depth which will provide a minimum of 30 inches from the top of the pipe to the bottom of the street structural section grade as shown in Standard Details 3-H1 and 3-H2. When crossing a water, storm or irrigation line, it is desirable that the sewer main be installed below the water, storm, or irrigation line with a clearance of 12 inches. The Design engineer shall detail all crossings with a clearance less than 15 inches.
- b. Horizontal Alignment: Alignment shall be parallel with the street centerline wherever possible. A horizontal clearance of 10 feet to a water line or storm drain line shall be provided.

**TABLE 6-1**

**MINIMUM NUMBER OF HANDICAP SPACES BASED ON TOTAL PARKING SPACES AVAILABLE**

<b>TOTAL SPACES IN LOT</b>	<b>NUMBER OF SPACES</b>
1-25	1
26-50	2
51-75	3
76-100	4
101-150	5
151-200	6
201-300	7
301-400	8
401-500	9
501-1,000	2% of total spaces
Over 1,000	20 spaces plus 1 space for every 100 spaces, or a fraction thereof, over 1,000



**TABLE 6.2****NUMERICAL VALUE OF WATER SUPPLY SYMBOLS**

<b>SYMBOL</b>	<b>DESCRIPTION OF NUMERICAL VALUE OF SYMBOL</b>
<b>C</b> <b>Flow Constant</b>	Five gallons per minute when services are individually metered. Nine gallons per minute when services are not individually metered.
<b>D</b> <b>Diversity Factor</b>	Two hours when N is less than 100. Three hours when N is from 100 to 250. Four hours when N is greater than 250. Four hours for commercial or industrial area.
<b>f</b> <b>Diversity Factor</b>	2.00 for systems with five services or less 1.33 for systems with 24 services. 1.00 for systems with 40 services. 0.75 for systems with 80 services. 0.50 for systems with 200 services. 0.33 for systems with 500 services or more. A straight-line interpolation shall be used for all intermediate values.
<b>F</b> <b>Fire Flow</b>	To be determined by Stanislaus County Fire Marshal or other regulatory fire agency.
<b>N</b> <b># of Service Connections</b>	Residential: Each single family home or lot shall be counted as one service. Each unit of an apartment, duplex or triplex building shall be counted as one service connection. Each acre of commercial or industrial district (including storage and parking areas) shall be counted as a minimum of five services. Agricultural land shall be counted as two services for each acre. Each trailer or mobile home space in a trailer park shall be counted as one-third service connection.

## **CHAPTER 7: GRADING PERMITS**

### **7.1 PURPOSE:**

This section has been provided to help reduce erosion and sediment problems resulting from the development process and the increase of urban runoff from developed land within the County jurisdiction. This section has been compiled to assist you in processing permits in Stanislaus County.

The purpose of this Chapter is to safeguard the health, safety, property, and public welfare by regulating grading, excavation and earthwork construction activities in the unincorporated areas of Stanislaus County.

An application for a Grading Permit shall be submitted to the Building Permits Division prior to the beginning of any grading, clearing, excavating, filling or other disturbance of natural terrain. The permit application shall be submitted to Stanislaus County Building Department, located at 1010 10<sup>th</sup> Street, Suite 3400, Modesto, CA 95354. They can be reached by phone at (209) 525-6557.

### **7.2 GENERAL GUIDELINES:**

No grading shall be performed without first having obtained a Grading Permit. A grading permit does not include the construction of utility trenches, retaining walls or structures. Construction of retaining walls or structures will require obtaining a Building Permit from the Chief Building Official. Construction of utility trenches shall be in accordance to Chapter 3, Section 3.30 of these Standards.

An application for a Grading Permit shall be submitted to the Building Permits Division prior to the beginning of any grading, clearing, excavating, filling or other disturbance of natural terrain. The permit application shall be submitted to Stanislaus County Building Permits Division, located at 1010 10th Street, Suite 3400, Modesto, CA 95354. This department can be reached by phone at (209) 525-6557.

All grading activities in Stanislaus County must follow these basic guidelines:

- a. Practice erosion control Best Management Practices as outlined in this section. The Stanislaus County Standards and Specifications and the State of California's Construction General National

Pollutant Discharge Elimination System (NPDES) Permit (CGP) requirements shall be followed.

- b. Drainage ways shall not be altered or obstructed in such a way as to create flooding or sediment problems outside the project area.
- c. Fill material must be at least 90% soil. No demolition material, household waste or other degradable material may be used. Yard waste may not be transported from another site. No on-site yard waste (brush, tree stumps, etc.) shall be used as fill material.
- d. All import fill soils should be nearly free of organic or other deleterious debris, essentially non-plastic soil, and less than 3 inches in maximum dimension.
- e. All plans and permits required by Stanislaus County and all other applicable agencies must be in place.
- f. Please note that approved grading and drainage permit does not imply compliance with any other building regulations.

### **7.3. SUBDIVISIONS:**

The zoning conformance approval must precede grading permit submittal, if applicable. Once the tentative map for a parcel or tract is approved and zoning approval cleared, a grading plan can then be submitted. Inspection fees (and in some cases, a bond) will be required prior to issuance of the final grading permit.

The Public Works staff shall review and approve the submittal for conformance against the requirements listed in the Permit Application Check List located in Section 7.5 of these standards. Should any questions arise regarding the application process, the applicant is encouraged to contact the Land Development Division at Stanislaus County Department of Public Works.

Inspection fees (and a bond, if required) must be paid prior to issuance of the grading permit. Inspection fees are calculated based on time and materials.

### **7.4 DESIGN STANDARDS:**

#### **a. General**

Building construction is regulated by the California Building

Standards Commissions and shall be designed in conformance to Appendix J (Grading) of the California Building Code (Title 24 Part 2, Volume 1 & 2) and Sections 4.106 & 5.106 (Mandatory Measures for Residential and Non-residential Site Development) of the California Green Building Standards Code (California Code of Regulations Title 24, Part 11). These codes are revised approximately every three years and can be viewed online at [www.bsc.ca.gov](http://www.bsc.ca.gov).

Grading activities in the County shall also be in conformance to the Planning regulations that are governed by the County's General Plan, Specific Plans, Land Use Plan, Zoning Plan, Subdivision Map Act, and the Stanislaus County Code.

All grading and improvement projects, whether public or private, shall be designed in accordance with the latest edition of the Stanislaus County Standards and Specifications.

Grading in excess of 5,000 cubic yards shall be performed in accordance with the approved grading plan prepared by a civil engineer, and shall be designated as "engineered grading." Grading involving less than 5,000 cubic yards shall be designated "regular grading" unless the permittee chooses to have the grading performed as engineered grading. If the building official determines that special conditions or unusual hazards exist, the grading shall conform to the requirements for engineered grading.

All applications for a grading permit shall be accompanied by two sets of plans and specifications, and supporting data consisting of a soils report and engineering geology report.

b. Drainage Design Requirements

All drainage facilities related to the grading site development, whether public or private, shall be designed in accordance with Chapter 4 (Drainage) of the latest edition of the Stanislaus County Standards and Specifications.

Drainage across property lines shall not exceed that which existed prior to grading. Excess or concentrated drainage shall be contained on site or directed to an approved drainage facility. Erosion of the ground in the area of discharge shall be prevented by installation of non-erosive down drains or other Best Management Practice (BMP) devices approved by California Stormwater Quality Association (CASQA).

Preservation and use of available natural resources shall be accomplished through evaluation and careful planning to minimize negative effects on the site and adjacent areas. Preservation of slopes, management of storm water drainage and erosion controls shall be considered for each grading permit application.

c. Construction General Permit & Storm Water Quality Requirements

All grading work requires erosion and sediment control either under the State's CGP or through the Stanislaus County Municipal Code requirements. For projects subject to the CGP, the Notice of Intent (NOI) and the Waster Discharger Identification number (WDID) are to be submitted as part of the grading plan review.

The erosion control plan shall be prepared in accordance with the Stanislaus County Municipal Code. Runoff calculations and other calculations demonstrating adequacy of drainage structures and selected BMPs shall be included. Inspection by the person preparing the plan and certification of proper installation of control measures may be required by the Engineer.

All grading projects shall be constructed in compliance with the Stanislaus County Municipal Code requirements.

Refer to Chapter 9 for additional information.

d. Soil's Report

A comprehensive soils report shall be prepared for each subdivision project in the County. A licensed Geotechnical experienced in soil work or Geotechnical Engineer must prepare the report. 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 traffic index (TI).

Geotechnical investigations shall be conducted in accordance to the following design requirements:

1. Classification: Soil materials identified in the geotechnical report shall be classified in accordance with ASTM D 2487.

2. Expansive soils: In areas likely to have expansive soil, the Chief Building Official shall require adequate soil tests to determine where such soils do exist. Soils meeting all four of the following provisions shall be considered expansive, except that tests to show compliance with Items i, ii, and iii shall not be required if the test prescribed in Item iv is conducted:
  - i. Plasticity Index (PI) of 15 or greater, determined in accordance with ASTM D 4318.
  - ii. More than 10% of the soil particles pass a No. 200 sieve, determined in accordance with ASTM D 422.
  - iii. More than 10% of the soil particles are less than 4 micrometers in size, determined in accordance with ASTM D 422.
  - iv. Expansive index greater than 20, determined in accordance with ASTM D 4829.

The geotechnical report shall include, but need not be limited to, the following information:

1. A plot showing the location of the soil investigations.
2. A complete record of the soil boring and penetration test logs and soil samples.
3. A record of the soil profile.
4. Elevation of the water table, if encountered, may impact storm drainage and storm retention facilities.
5. Recommendations for foundation type and design criteria, including but not limited to: bearing capacity of natural or compacted soil; provisions to mitigate the effects of expansive soils; mitigation of the effects of liquefaction, differential settlement and varying soil strength; and the effects of adjacent loads.
6. Expected total and differential settlement.
7. Deep foundation information.
8. Special design and construction provisions for projects located on expansive soils.

The design engineer shall include the above mentioned information in the geotechnical report for all grading projects and a copy of this report shall be supplied to the Engineer at the time when the applicant is filing for a grading permit.

## **7.5 PERMIT APPLICATION CHECK LIST - INITIAL SUBMITTAL REQUIREMENTS:**

After receiving a complete grading plan application, the Building Permits Division will issue a Building Permit Number for your project. Allow up to two weeks for plan checking (first submittal or re-submittal) then the County will contact the applicant for plan correction or plan approval and permit issuance.

Coverage by the CGP will be required for all construction projects involving the grading, filling, excavating, storage, or the clearing or grubbing of 1 acre or more; and for projects that are part of a larger common plan. If a project has soil disturbance, three complete hard copies and one complete pdf copy of the Erosion and Sediment Control Plan (ESCP) or Storm Water Pollution Prevention Plan (SWPPP) must also be provided as part of the initial plan review submittal requirements. The applicant shall also submit the WDID (Waste Discharge Identification Number) issued by the State of California prior to the issuance of the grading permit.

No final plans, calculations, or reports will be accepted unless they are signed and stamped by a Registered Civil Engineer.

The following items are required at the time of the initial grading and drainage permit application submittal to the County:

- a. Completed Excavation and Grading Permit Application (signed by applicant).
- b. Two blue line prints of grading plans fully dimensioned and drawn to scale (18 inches by 24 inches minimum to 24 inches by 36 inches maximum) prepared in accordance with Stanislaus County Standards and Specifications and signed by a Civil Engineer registered in the State of California. Minimum acceptable plan size is 8-1/2 inches by 11 inches. Maximum acceptable plan size 24 inches by 36 inches.
- c. Release from the Planning Department for submittal to engineering, if required.
- d. Plan check deposit (Cash or check). A permit application fee (non-refundable). Complete fee will be determined during permit processing.

- e. Two copies of the preliminary soils report prepared by an approved soils engineering firm, signed by a Geo-technical Engineer registered in the State of California.
- f. One copy of a current preliminary Title Report
- g. Two copies of hydrology and hydraulic calculations, if applicable, to be submitted to Public Works Engineering Department.
- h. Two copies of site grading plans. Grading site plan shall include, as a minimum, the following items:
  - 1. Property lines and bearings, existing and proposed topographic elevation contour lines of the parcel and the surroundings.
  - 2. Vicinity map, north arrow, scales used, County general grading notes, plan, wet stamp and signature by a Registered Civil Engineer.
  - 3. Location and dimensions of any easements.
  - 4. Utility Plan – if applicable - must show proposed onsite utility lines, e.g., sewer, water, gas and electricity.
  - 5. Location and dimensions of existing overhead and underground improvements on site and surroundings including: buildings, structures, utilities, slabs, berms, free standing or retaining walls, fences, landscaping, curb, gutter, sidewalk, poles, trees, bushes, etc.
  - 6. Location and dimensions of proposed improvements including: building-structure footprint, any other improvements, dimensions and elevations on parcel and on public right of way.
  - 7. Addresses, assessors parcel numbers, and legal description must be included on plans.
  - 8. Include any other information as required or applicable to the project.
  - 9. Grading plans for projects that include the building of new public road right of way shall include the following information: street right of way, centerline, basis of bearings, dimensions, cross intersection distances, roadway, street improvements, street name(s), etc.
  - 10. 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 Design 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 shall be provided in the grading plans.



- i. Two copies of cost estimate and quantities for all work to be completed as part of the grading plan, including:
  - 1. Grading (cut and fill).
  - 2. Private Improvements (Paving, drainage, etc).
  - 3. Public Street and Drainage Improvements, if applicable.
  - 4. Erosion Control Improvements.
- j. In addition to the items listed in Section 7, the following items may also be required to complete your application. You will be notified if they are needed after a pre-inspection of the site. Each item (if required) shall be stamped and signed by the appropriate design engineer licensed in the State of California.
  - 1. Two copies of structural calculations for retaining wall.
  - 2. Two copies of Soils report(s) addressing retaining wall design parameters.
  - 3. Two copies of Landscape and Irrigation Plans.
  - 4. Two copies of Approved EIR or Negative Declaration.
  - 5. Two copies of Precise Grading Plan.
  - 6. Two copies of Approved Tentative Map.
  - 7. Two copies of Final Map.
  - 8. Two copies of Street Improvement Plans.
  - 9. Two copies of N.P.D.E.S. application letter of receipt from Water Quality Control Board (if applicable).
  - 10. Two copies of Water Quality Management plan (if applicable).

**7.6      GRADING PLAN CHECK CORRECTION AND RE-SUBMITTAL CHECKLIST:**

If a plan correction is required, the applicant shall re-submit and pay any additional plan review fees (Cash or check) to cover plan checking expenses. The following items may be required for subsequent submittals:

- a. Submit previous check prints at time of re-submittal, if applicable.
- b. Submit previous hydrology and hydraulic comments, if applicable.
- c. Submit previous quantity calculations, if applicable.
- d. Submit previous cost estimates, if applicable.
- e. Two sets of revised Grading Plans prepared by a Civil Engineer, if applicable.
- f. Two copies of revised preliminary Soils Report, if applicable.
- g. Two copies of revised hydrology and hydraulics calculations, if

- applicable.
- h. Two copies of revised quantity calculations, if applicable.
- i. Two copies of revised cost estimate, if applicable.
- j. Three signed hard copies and one complete pdf copy of the ESCP or SWPPP, if applicable.

## **7.7 UNFORESEEN AND ENVIRONMENTALLY SENSITIVE ISSUES:**

The following additional items may be required prior to issuance of a final grading permit. Although the list appears to be comprehensive, most items may not be necessary except when developing projects within conflicting land use designations or environmentally sensitive areas (i.e. near rivers, wetlands, vernal pools, areas with endangered species or plants, etc.):

- a. Submit one set of plans to Planning to complete an initial study and obtain clearance (including retaining walls > 6 feet high).
- b. Planning sign off approving consistency of site plan with proposed plans.
- c. Comply with all project conditions of approval related to grading.
- d. The project conforms to the approved Tentative Map (if applicable).
- e. Fire department approval.
- f. Submit plan and questionnaire to California Department of Fish and Game, to obtain permit. (If applicable, review the site, EIR, and/or Negative Declaration).
- g. Submit plan to the Division of Dam Safety and obtain permit (if applicable).
- h. Submit plan to Army Corps. Of Engineers and obtain permit (if applicable).
- i. Submit a notarized letter of consent for grading on adjacent property. (Provide easement if applicable).
- j. Submit a record consent for drainage onto adjacent property (if applicable).
- k. Other Agency approvals (if applicable):
- l. Other requirements as indicated by the County Officials.
- m. Plan check items complete (hydrology, hydraulics, structural, grading and drainage, etc.) and approved by County plan checker.
- n. Approval of Engineer's cost estimate and Grading Plan.
- o. Provide to the County with a copy of certificate of insurance (general liability for \$1,000,000 and workmen's compensation) naming County of Stanislaus as additional insured and certificate holder, this must be submitted prior to issuance of permit.

## **7.8 ENFORCEMENT:**

No person shall do any grading or excavating without first having obtained a grading permit from the Stanislaus County Building Official. A separate permit shall be obtained for each site, and may cover both excavation and fills.

Any person, firm, association, or corporation who violates, disobeys, omits, neglects, or refuses to comply with or resists the enforcement of any of the provisions of Stanislaus County zoning ordinances may be cited. Stanislaus County Public Works, as well as Codes Administration personnel, may issue citations for erosion and sediment control violations. A violation of the standard may be punished by assessment of a civil penalty (amount to be determined per State and/or local ordinance).

## **7.9 PLAN REVIEW FEES AND GRADING INSPECTION FEES:**

The applicant of the grading permit shall pay the current Stanislaus County Public Works weighted labor rate for the plan review of the building and/or grading plan. The plans shall not be released until such time that all plan check fees have been paid. The applicant of the grading permit shall pay the current Stanislaus County Public Works weighted labor rate for the inspection of the grading and/or building plan. A deposit for the inspection shall be paid at the time the grading/building permit is obtained. Any fees left over from the deposit shall be returned to the applicant at the time of completion and acceptance of the work by Stanislaus County Public Works inspector. The permit shall not be sign off until such a time that all inspection fees have been paid.

## **CHAPTER 8: PORTLAND CEMENT PERVIOUS CONCRETE PAVEMENT**

### **8.1 GENERAL:**

- a. This specification for Portland Cement Pervious Concrete Pavement is provided as a guideline only.
- b. Pervious concrete pavement does not look or behave like typical concrete pavements. The finished surface is not tight and uniform, but is open and varied. Surface irregularities and minor amounts of surface raveling are normal. Traditional concrete testing procedures for strength and slump are not applicable. Pervious Concrete is tested instead for consistency, void content and thickness; methods which are outlined in this document to help assure a long life, drainable pavement.
- c. Owners, architects and engineers are strongly encouraged to visit locations where pervious concrete pavement has been installed before making the decision to use the material and to use an experienced installer and finisher.
- d. For the proper hydrological and structural design of a pervious concrete pavement, design engineers should reference the National Ready Mixed Concrete Association website at:  
<http://www.perviouspavement.org/design/index.html> and Chapter 4 of the County Standards and Specifications.

### **8.2 QUALITY ASSURANCE:**

- a. The Pervious Concrete Contractor shall submit evidence of two successful pervious concrete pavement projects including: the project name and address, owner's name, contact information and size of each project.
- b. The Pervious Concrete Contractor shall submit verification of current NRMCA Certification requirements described below:
- c. The Pervious Concrete Contractor shall meet, at the time of bidding: one of the following criteria for the minimum certification for each placement crew and submit verification of NRMCA Pervious Concrete Certification with the bid.  
([http://www.nrmca.org/Education/Certifications/Pervious\\_Contractor.htm](http://www.nrmca.org/Education/Certifications/Pervious_Contractor.htm))
  - i. The pervious concrete contractor shall employ no less than one NRMCA Certified Pervious Concrete Craftsman who must be onsite, actively guiding and working with each placement crew during all pervious concrete placement.
  - ii. The pervious concrete contractor shall employ no less than three

- iii. The pervious concrete contractor shall employ no less than three NRMCA Pervious Concrete technicians and one Pervious Installer who shall be onsite, actively guiding and working with each placement crew during all pervious concrete placement.
- d. Performance: Upon completion of the initial curing, the pervious concrete shall be tested for initial baseline infiltration in accordance with ASTM C1701. The rate shall be a minimum of 100 inches per hour.

### **8.3 SUBMITTALS:**

Before starting work, the contractor shall submit the following for County review and approval:

- a. Concrete materials:
  - i. Proposed concrete mixture proportions including all material weights, volumes, density (unit weight), water / cementitious ratio, and void content. The mix design shall not specify a compressive or flexural strength.
  - ii. Aggregate type, source and gradation.
  - iii. Cement, fly ash, ground granulated blast-furnace slag and admixture manufacturer certifications and proportions.
- b. Qualifications: Evidence of qualifications listed under Quality Assurance.
- c. Project Details: Specific plans, details, schedule, construction procedures and quality control plan.
- d. Test Panel:
  - i. The contractor shall construct test panel(s) to meet the requirements of the contract documents and this specification. Place a minimum one 225 square foot panel. Provide joints and curing using materials, equipment, and personnel proposed for the project. Coordinate location of test panels with Owner and Architect/Engineer.
  - ii. The test panel shall be tested for acceptance in accordance with section 9.1.3 Quality Control.
  - iii. An approved test panel will be used as quality control for the project and may be incorporated into the project if of acceptable quality.
  - iv. Remove and legally dispose of all materials used for test panels not approved and all excess materials.

#### **8.4 MATERIALS:**

- a. Cement: Portland cement Type II or V conforming to ASTM C150 or Portland cement Type IP or IS conforming to ASTM C595.
- b. Supplementary Cementitious Materials:
  - i. Class F Fly Ash: ASTM C618
  - ii. Ground Granulated Blast-Furnace Slag: ASTM C989
- c. Chemical Admixtures:
  - i. Air entraining agents shall comply with ASTM C260.
  - ii. Chemical Admixtures shall comply with ASTM C494.
  - iii. Latex bonding agents shall comply with ASTM C1438.
- d. Aggregates: Coarse Aggregate: ASTM C33. The maximum size and gradation shall meet the project criteria for surface appearance and void content.
- e. Water: ASTM C 1602.
- f. Isolation Joint Material: Shall comply with ASTM D994, D1751, or D1752.

#### **8.5 MIXTURE PROPORTIONS:**

The composition of the proposed concrete mixtures shall be submitted to the owner's representative for review and shall comply with the following provisions unless an alternative composition is demonstrated to comply with the project requirements. Conform with all requirements of Authorities Having Jurisdiction (AHJ) for pavements and walkways.

- a. Cementitious Content: Comply with the approved mix design.
  - i. Supplementary cementitious content:
    - 1. Fly ash: 25% maximum of the total cementitious material or in accordance with approved mix design.
    - 2. Slag: 40% maximum of the total cementitious material or in accordance with approved mix design.
- b. Water / Cementitious Ratio Shall range between 0.27 lb/lb and 0.31 lb/lb. or in accordance with approved mix design.
- c. Aggregate Content: As appropriate for approved mix design.

- d. Admixtures: Use in accordance with approved mix design.
- e. Mix Water: as appropriate for approved mix design.
- f. Color: Pigments to be selected by the architect.

#### **8.6 SUBGRADE:**

Verify subgrade preparation, grade, and conduct permeability and density tests for conformance to the project requirements to assure the soil type is acceptable for installation of pervious concrete.

- a. Material: The top 6 inches shall be composed of granular or gravelly soil that is predominantly sandy with no more than a moderate amount of silt or clay. Granular sub-base may be placed over the subgrade.
- b. Permeability: Subgrade shall be determined in accordance with ASTM D3385.
- c. Compaction: Compact sub-grade to a minimum 90% and a maximum 95%. Compaction shall be in accordance with ASTM D 1557.
- d. Fill: If fill material is required to bring the subgrade to final elevation, it shall be clean and free of deleterious materials. It shall be placed in 6-inch maximum layers, and compacted by a mechanical vibratory compactor to a minimum density of 90% and a maximum density of 95% in accordance with ASTM D 1557.
- e. Moisture: The subgrade moisture content shall be 1% - 3% above optimum as determined by ASTM D 1557.

#### **8.7 RECHARGE BASIN (DETENTION BASIN):**

When base material is used under pervious concrete for water recharge, it shall be composed of uniform sized aggregate conforming to ASTM C33, minimum size 6. For minimum void content, refer to civil or geotechnical contract documents.

#### **8.8 FORMWORK:**

Form materials: any material permitted by AHJ and of sufficient strength and stability to support mechanical equipment without deformation of plan profiles following spreading, strike-off and compaction operations.

## **8.9 MIXING AND HAULING:**

- a. Production: Pervious concrete shall be manufactured and delivered in accordance with applicable sections of ASTM C 94 or ASTM C 685.
- b. Mixing: Pervious concrete shall be produced in central mixers, transit mixers or in volumetric mixers.
- c. Delivery: Deliver pervious concrete directly from the mixer by means of conveyer as close as possible to final position.
- d. Discharge: Each truckload will be visually inspected for consistency of concrete mixture. Job site water additions are permitted to obtain and maintain the required mix consistency throughout the discharge. Discharge shall be a continuous operation. Concrete shall be deposited as close to its final position as practical and such that discharged concrete is incorporated into previously placed plastic concrete.

## **8.10 PLACING AND FINISHING:**

Shall comply with the content of the National Ready Mixed Concrete Association's 'Text Reference for Pervious Concrete Contractor Certification' with the following provisions:

- a. Internal vibration shall not be permitted. Use mechanical screed equipment. Do not use hand screeds except in confined and small areas. Cross roll compacted concrete to remove any screeding and compaction marks on the concrete surface.
- b. Compact to the required cross-section and shall not deviate more than + 3/8 inch in 10 feet from profile grade.

## **8.11 JOINTING:**

- a. Joints shall be installed at locations and to depths shown on the project plans.
- b. Control (contraction) joints shall be installed at regular intervals not to exceed 1.5 times the width of the placement or 20 feet, or in accordance with approved joint placement plan. The control joints shall be installed at 1/4 the thickness of the pavement but not to exceed 1-1/2 inch. These joints can be installed in the plastic concrete or saw cut after the concrete has hardened. New joints in plastic concrete or recently hardened concrete shall align with joints in older concrete. Joints abutting curbs and other fixed concrete shall be installed within 10 degrees of perpendicular to the older concrete as possible.



- c. Install joints to match approved sample.
- d. Transverse construction joints: Install whenever placing is suspended for 20 minutes or whenever concrete is no longer workable.
- e. Do not dowel longitudinal joints between successive placements.
- f. Isolation joints: Use when abutting fixed vertical structures. Place isolation material before concrete is placed and to the depth of the pavement section.

#### **8.12 CURING:**

- a. Final curing procedures shall begin no later than 20 minutes after the concrete has been discharged from the mixer. The pavement surface shall be covered with a minimum of 6 millimeters thick white or clear polyethylene sheet or other approved covering material. In cold weather black plastic may be used to aid in heat retention. The cover shall prevent air infiltration to the fresh concrete and shall overlap all exposed edges and shall be secured to prevent dislocation due to winds or adjacent traffic conditions.
- b. The curing cover shall remain securely in place for a minimum of 7 days. No vehicular traffic shall be permitted on the pavement until curing is complete and no truck traffic shall be permitted for at least 14 days.

#### **8.13 QUALITY CONTROL:**

- a. The owner shall employ a testing laboratory that conforms to the requirements of ASTM E329 and ASTM C1077. All personnel engaged in testing shall be certified by the American Concrete Institute as ACI Concrete Field Technicians or equivalent and shall be certified by NRMCA as a Pervious Concrete Technician.
- b. Prior to each placement, the formed thickness shall be at least the design thickness testing within -0 inch to +3/4 inch.
- c. Plastic concrete shall be sampled in accordance with ASTM C172 and density (unit weight) measured in accordance with ASTM C1688. The density (unit weight) of the delivered concrete shall be +/- 5 pcf of the design density (unit weight).
- d. Plastic void content shall be calculated as per ASTM C1688 Gravimetric Air Determination and compared to the void percentage required by the hydraulic design.

- e. Upon completion of initial curing, the pervious concrete shall be tested for a baseline infiltration rate of 100 inches per hour using ASTM C1701.

#### **8.14 REFERENCES:**

- a. American Concrete Institute: Concrete Field Testing Technician Grade I
- b. American Society for Testing and Materials
  - 1. ASTM C 29 "Test for Bulk Density (Unit Weight) and Voids in Aggregate"
  - 2. ASTM C33 "Specification for Concrete Aggregates"
  - 3. ASTM C 33 "Specification for Concrete Aggregates"
  - 4. ASTM C 94 "Specification for Ready-Mixed Concrete"
  - 5. ASTM C 150 "Specification for Portland Cement"
  - 6. ASTM C 260 "Specification for Air-Entraining Admixtures for Concrete"
  - 7. ASTM C 494 "Specification for Chemical Admixtures for Concrete"
  - 8. ASTM C 595 "Specification for Blended Hydraulic Cements"
  - 9. ASTM C 618 "Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete."
  - 10. ASTM C 685 "Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing"
  - 11. ASTM C 989 "Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars."
  - 12. ASTM C 1438 "Standard Specification for Latex and Powder Modifiers for Hydraulic Cement Concrete and Mortar."
  - 13. ASTM D 1557 "Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>)"
  - 14. ASTM C 1602 "Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete"
  - 15. ASTM C 1688 "Standard Test Method for Density and Void Content of Freshly Mixed Pervious Concrete"
  - 16. ASTM C 1701/C1701M "Standard Test Method for Infiltration Rate of In Place Pervious Concrete"
  - 17. ASTM C 1751 "Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)"
  - 18. ASTM C 1752 "Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction."
  - 19. ASTM D 3385 "Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer"
  - 20. ASTM D 994 "Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)"
  - 21. ASTM E 329 "Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction."
- c. National Ready Mixed Concrete Association: Text Reference for Pervious Concrete Contractor Certification

## **CHAPTER 9: NPDES CONSTRUCTION GENERAL PERMIT & STORM WATER QUALITY**

### **9.1 GENERAL**

Stanislaus County is required by State and Federal regulations to develop programs to control the discharge of pollutants to the municipal storm drain system or to surface water bodies of the State, including the discharge of pollutants from construction sites. As a result, construction projects having soil disturbance may be subject to the State mandated requirements designed to improve stormwater quality under the Clean Water Act. The new State requirements include such things as: expanded plan check and review; site control measures; source control measures; increased site construction inspection, post-development standards; stormwater treatment control measures; etc.

Generally, projects that disturb one or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the State of California's Construction General NPDES Permit (CGP). Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of a utility/facility.

To be covered by the CGP, the Developer must submit a Notice of Intent (NOI), a Storm Water Pollution Prevention Plan (SWPPP), and the appropriate fee to the State Water Resources Control Board. All developers shall submit a Notice of Intent (NOI) to the State Water Resources Control Board for all projects disturbing 1 acre or more. A copy of the NOI and the WDID number issued by the State shall be submitted to the Engineer prior to the commencement of any project's plan review. Three hard copies and one pdf copy of the SWPPP shall be provided to the County.

The Developer is responsible for compliance with all Federal, State, and local permits, rules, regulations, ordinances, statutes, and directions that apply to erosion, sediment, and water pollution control. Failure to obtain the required permit coverage or to comply with the requirements of the required permits could result in significant daily fines or penalties imposed by the State.

The minimum standards provided in the SWPPP do not relieve the Developer from liability of storm water pollution discharged caused by construction activities. The Developer shall implement best management

practices regardless of project size in accordance to all relevant rules, regulations, and laws of the governing agency.

## **9.2 GRADING ACTIVITY DISTURBING ONE ACRE OR MORE OF LAND**

CGP coverage will be required for all construction projects involving the grading, filling, excavating, storage, or the clearing or grubbing of 1 acre or more of land. Any projects with soil disturbance must submit copies of either an Erosion and Sediment Control Plan (ESCP) or a Storm Water Pollution Prevention Plan (SWPPP) as part of the initial plan review submittal requirements. The ESCP or SWPPP must comply with the preparation and submittal requirements as described in the Stanislaus County Municipal Code.

The applicant shall submit the WDID (Waste Discharge Identification Number) issued by the State of California prior to the issuance of the grading permit for any project subject to the CGP. A copy of the Notice of Intent (NOI) shall also be provided prior to plan approval and/or issuance of a grading permit.

The NOI can be filed using the State's online Storm Water Multiple Application and Report Tracking System (SMARTS). SMARTS has been developed to provide an online tool to assist dischargers in submitting their Notice of Intents (NOIs), Notice of Termination (NOTs), and Annual Reports, as well as, viewing/printing receipt letters, monitoring the status of submitted documents, and viewing application/renewal fee statements.

Additional assistance with the NPDES permit may be obtained from the California State Water Resources Control Board (SWRCB) by calling 866-563-3107 or visiting the following website:  
[www.swrcb.ca.gov/water\\_issues/programs/stormwater/construction.shtml](http://www.swrcb.ca.gov/water_issues/programs/stormwater/construction.shtml)

## **9.3 GRADING ACTIVITY DISTURBING LESS THAN ONE ACRE OF LAND**

All construction projects will be required to develop and implement an ESCP or SWPPP, regardless of the project size. At a minimum, the erosion & sediment control plan must have considered all of the following best management practices (BMPs) and incorporate those applicable to the project:

- a. Erosion control measures.  
Refer to CASQA Sections EC-1 to EC-16 and WE-1; and choose appropriate measures for project site and activities.
- b. Sediment control measures.  
Refer to CASQA Sections SE-1 to SE-14 and choose appropriate measures for project site and activities.
- c. Materials management measures.

- Refer to CASQA Sections WM-1 to WM-10 and choose appropriate measures for project site and activities.
- d. Stabilized entrance and egress from construction site.  
Refer to CASQA Sections TC-1, TC-2, & TC-3 and choose appropriate measures for project site and activities.
  - e. Non-storm water BMPs.  
Refer to CASQA Sections NS-1 to NS-16 and choose appropriate measures for project site and activities.
  - f. Any other BMPs necessary to control the discharge of pollutants from the construction site.

#### **9.4 STORMWATER BEST MANAGEMENT PRACTICES (BMPs)**

The California Stormwater Quality Association (CASQA) Stormwater Best Management Practice Handbook for Construction contains guidelines for the preparation of a SWPPP. The CASQA Handbook may be viewed online at [www.casqa.org/resources/bmp-handbooks](http://www.casqa.org/resources/bmp-handbooks)

Stanislaus County has adopted the Best Management Practices (BMPs) listed in the current edition of the California Stormwater Quality Association (CASQA) "Stormwater Best Management Practice Handbook for Construction". Developers, Contractors and Design Engineers are encouraged to use this publication in developing appropriate pollution control measures for individual construction projects.

The Developer shall implement and maintain, as a minimum, the following stormwater quality BMP practices:

- a. The Developer shall perform routine inspection and maintenance of BMPs. The Developer is solely responsible for preparing and maintaining inspection and monitoring records.
- b. The Developer shall immediately correct or replace any ineffective BMP. If the measures taken by the Developer are inadequate to effectively control water pollution, the Developer may need to revise the operations and water pollution control program.
- c. Ineffective BMP may restrict the construction work from being performed until the water pollution control measures are made adequate. Continued noncompliance may result in a Notice of Violation (NOV) and/or suspension of the work indefinitely. The Engineer reserves the right to take corrective action as needed to correct any noncompliance issues at the Developer's sole expense.
- d. Contractors (or other responsible party) shall conduct regular inspections and maintenance of stormwater BMPs on the construction site. Active construction sites may be visited at any time by County

inspection staff. Violations will be enforced as per the County Code 14-14 Section 180 titled, "Stormwater Management and Discharge Control, Violations".

- e. It shall be the responsibility of the owner and the permittee to ensure that erosion does not occur from any activity during or after project construction. Additional measures, beyond those specified, may be required as deemed necessary to control accelerated erosion.

## **9.5 STORM WATER QUALITY & POST DEVELOPMENT STANDARDS**

Stanislaus County is required by State and Federal regulations to develop programs to control the discharge of pollutants to the municipal storm drain system. As a result, all new development and redevelopment projects are subject to requirements designed to protect stormwater quality, such as expanded plan check & review, site control measures, source control measures, stormwater treatment measures, and Low Impact Development (LID) measures.

To determine if your project requires post development standard measures (such as site design, source control measures, LID, and/or volumetric & flow based treatment control measures), refer to the Stanislaus County Post Construction Program Flow Chart Exhibit 4-1 in Chapter 4.

Stanislaus County's 'Draft' Guidance Manual titled, Post-Development Storm Water Quality Design Manual contains guidelines for the design, construction and maintenance of stormwater treatment and source controls and Low Impact Development practices. This document can be viewed in the 2011-2012 Stormwater Management Annual Report located at the County's website:

<http://www.stancounty.com/publicworks/storm/index.shtm>

Contact the Development Services Division of Public Works for more information on stormwater quality requirements for a specific project at (209) 525-5264.

COUNTY SURVEYOR'S STATEMENT (OR CERTIFICATE)

THIS IS TO STATE (OR CERTIFY) THAT THE ACCOMPANYING MAP HAS BEEN EXAMINED AND THAT IT SUBSTANTIALLY CONFORMS TO THE TENTATIVE MAP, AND ANY APPROVED ALTERNATIONS THEREOF. THAT ALL PROVISIONS OF THE STATE SUBDIVISION MAP ACT, CHAPTER 2, AND TITLE 20, STANISLAUS COUNTY SUBDIVISION CODE HAVE BEEN COMPLIED WITH, AND THE MAP IS TECHNICALLY CORRECT.

I HEREBY ACCEPT, ON THE BEHALF OF THE PUBLIC , FOR PUBLIC USE, THE OFFER(S) OF DEDICATION OF THE (SIZE) AND/OR (DESCRIPTION) ROAD RIGHT OF WAY, AND/OR THE (SIZE) AND/OR (DESCRIPTION) PUBLIC UTILITY EASEMENT, ALONG (ROAD NAME).\*

DATED THIS \_\_\_\_\_ DAY OF \_\_\_\_\_ 20\_\_\_\_\_  
STANISLAUS COUNTY SURVEYOR



BY: \_\_\_\_\_  
COUNTY SURVEYOR (VERIFY), LS XXXX

NOTES:

THIS PART USED ONLY WHEN OFFERS OF DEDICATION ARE MADE FOR PUBLIC UTILITY EASEMENTS OR WIDENING OF EXISTING PUBLIC ROAD RIGHTS OF WAY, OR IRREVOCABLE OFFERS OF DEDICATION FOR POTENTIAL FUTURE ROADS, EXTENSION OR WIDENING OF EXISTING PUBLIC RIGHT OF WAY.

\* THE COUNTY SURVEYOR OR HIS DEPUTY MAY ALSO ACCEPT SUBJECT TO IMPROVEMENT, OR REJECT ANY OFFER OF DEDICATION IN LIEU OF ACCEPTANCE.

THIS STATEMENT IS APPLICABLE TO PARCEL MAPS ONLY.


	NO.	REVISED	BY	COUNTY SURVEYOR'S STATEMENT	APPROVED BY:  MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
	UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH			COUNTY OF STANISLAUS DEPARTMENT OF PUBLIC WORKS	DATE: JUNE 2, 2014
CHECKED BY: DAVID LEAMON, RCE				PLATE NO: 1-A1	



NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH		
CHECKED BY: DAVID LEAMON, RCE		

TYPICAL PARCEL MAP  
SHEET 1 OF 2

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:  MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS	
DATE: JUNE 2, 2014	PLATE NO: 1-B1

**OWNER'S STATEMENT (OR CERTIFICATION):**

WE, THE UNDERSIGNED, HEREBY STATE (OR CERTIFY) THAT WE ARE THE OWNERS OF, OR HAVE SOME RIGHT, TITLE, OR INTEREST OF RECORD IN THE LAND SHOWN ON THIS MAP, AND WE CONSENT TO THE MAKING AND FILING OF THIS MAP IN THE OFFICE OF THE COUNTY RECORDER OF STANISLAUS COUNTY, CALIFORNIA.

(NOTE: REFER TO SECTIONS 66436, 66439, AND 66477.5 OF THE SUBDIVISION MAP ACT FOR ADDITIONAL GUIDANCE IN THE PREPARATION OF THIS STATEMENT)

OWNERS:  
BY: \_\_\_\_\_

TRUSTEE (OR BENEFICIARIES):  
BY: \_\_\_\_\_

**NOTARY STATEMENT** }

STATE OF \_\_\_\_\_  
COUNTY OF \_\_\_\_\_  
ON \_\_\_\_\_ BEFORE ME \_\_\_\_\_ (NAME, TITLE OF OFFICER),  
A NOTARY PUBLIC, PERSONALLY APPEARED \_\_\_\_\_ WHO  
PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE  
PERSON(S) WHOSE NAME(S) IS/ARE SUBSCRIBED TO THE WITHIN  
INSTRUMENT, AND ACKNOWLEDGED TO ME THAT HE/SHE/HEY EXECUTED  
THE SAME IN HIS/HER/THEIR AUTHORIZED CAPACITY(IES), AND THAT BY  
HIS/HER/THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S) OR  
THE ENTITY UPON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED  
THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF  
THE STATE OF CALIFORNIA THAT THE FORGOING PARAGRAPH IS  
TRUE AND CORRECT.

WITNESS MY HAND \_\_\_\_\_

PRINCIPAL COUNTY OF BUSINESS \_\_\_\_\_

COMMISSION NO \_\_\_\_\_

EXPIRATION DATE \_\_\_\_\_

**CLERK OF THE BOARD OF SUPERVISOR'S CERTIFICATE**

THIS IS TO CERTIFY THAT THE OWNERS OF THE PROPERTY SHOWN  
ON THE ACCOMPANYING MAP HAVE FILED WITH THE BOARD OF  
SUPERVISORS:

CHECK ONE

☐ A. A BOND OR DEPOSIT APPROVED BY SAID BOARD  
TO SECURE THE PAYMENT OF TAXES AND  
SPECIAL ASSESSMENTS COLLECTED AS TAXED,  
WHICH ARE AT THE TIME OF FILING OF THIS  
MAP, A LIEN AGAINST SAID PROPERTY OR ANY  
PART THEREOF.

☐ B. RECEIPTED TAX BILL OR BILLS OR SUCH OTHER  
EVIDENCE AS MAY BE REQUIRED BY SAID BOARD  
SHOWING FULL PAYMENT OF ALL APPLICABLE TAXES.

DATED THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_\_\_

\_\_\_\_\_, CLERK OF THE  
BOARD OF SUPERVISORS STANISLAUS COUNTY, CALIFORNIA

BY: \_\_\_\_\_



**TAX COLLECTOR'S CERTIFICATE**

THIS TO CERTIFY THAT THERE ARE NO LIENS FOR ANY  
UNPAID STATE, COUNTY, SCHOOLS, MUNICIPAL, OR  
IRRIGATION TAXES, OR SPECIAL ASSESSMENTS, EXCEPT  
SPECIAL ASSESSMENTS OR TAXES NOT YET PAYABLE  
AGAINST THE LAND SHOWN ON THIS MAP.

AS TO STATE, COUNTY, SCHOOL, OR MUNICIPAL TAXES:  
DATED THIS \_\_\_\_\_ DAY OR \_\_\_\_\_ 20\_\_\_\_

\_\_\_\_\_, COUNTY TAX COLLECTOR

BY \_\_\_\_\_

DEPUTY \_\_\_\_\_

**OMITTED SIGNATURE:**

PURSUANT TO SECTION 66436 OF THE SUBDIVISION MAP  
ACT THE SIGNATURES OF THE FOLLOWING INTEREST  
HOLDERS OF RECORD HAVE BEEN OMITTED.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**NOTES:**

**AGRICULTURAL STATEMENT**

MANY PROCEDURES NORMAL AND NECESSARY TO THE  
OPERATION OF AGRICULTURAL USES SUCH AS FIELD CROPS,  
VINEYARDS, ORCHARDS, DAIRY AND POULTRY FARMS AND  
FEED LOTS RESULT IN NOISE, ODOR, DUST, SPRAYING,  
IRRIGATION OR OTHER POTENTIALLY DETRIMENTAL EFFECTS  
TO RESIDENTIAL USE OF ADJACENT PROPERTIES. ALL  
PERSONS PURCHASING LOTS WITHIN THE CONFINES OF THE  
APPROVED MAP FOR THE PURPOSE OF ESTABLISHING  
RESIDENCE SHOULD INVESTIGATE THE LIKELIHOOD OF SUCH  
CONFLICTS.

**COUNTY SURVEYOR'S STATEMENT (OR CERTIFICATE):**

THIS IS TO STATE (OR CERTIFY) THAT THE ACCOMPANYING  
MAP HAS BEEN EXAMINED AND THAT IT SUBSTANTIALLY  
CONFORMS TO THE TENTATIVE MAP AND ANY APPROVED  
ALTERATIONS THEREOF. ALL PROVISIONS OF THE STATE  
SUBDIVISION MAP ACT, CHAPTER 2, AND TITLE 20,  
STANISLAUS COUNTY SUBDIVISION CODE HAVE BEEN COMPLIED  
WITH, AND THE MAP IS TECHNICALLY CORRECT.

DATED THE \_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_\_\_

\_\_\_\_\_, BY \_\_\_\_\_  
COUNTY SURVEYOR TITLE



**COUNTY RECORDER'S STATEMENT:**

FILED THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_\_\_  
, AT \_\_\_\_\_ O'CLOCK \_\_\_\_\_ M, IN BOOK \_\_\_\_\_ OF  
PARCEL MAPS AT PAGE \_\_\_\_\_, STANISLAUS  
COUNTY RECORDS, AT THE REQUEST OF  
INSTRUMENT NO. \_\_\_\_\_ FEE \_\_\_\_\_ PAID.

COUNTY RECORDER

BY \_\_\_\_\_

DEPUTY \_\_\_\_\_  
(NAME & ADDRESS OF THE  
ENGINEER AND/OR SURVEYOR)

PARCEL MAP

A PORTION OF SECTION \_\_\_\_\_, T. \_\_\_\_\_ S.,  
R. \_\_\_\_\_ E., M.D.M., STANISLAUS  
COUNTY, CALIFORNIA

(MONTH), 20\_\_\_\_

COUNTY FILE NO. \_\_\_\_\_ SHEET 1 OF 2





# **GENERAL CHECKLIST FOR COUNTY PARCEL MAPS**

SEE CHECKLIST FOR ALL MAPS

- \_\_\_ 1. Does Parcel Map Guarantee match EXACTLY with Owner's/Trustee's/Beneficiary's names?
- \_\_\_ 2. Are all Owner's/Trustee's/Beneficiary's signatures dated and notarized properly?
- \_\_\_ 3. Does the date of Owner's/Trustee's/Beneficiary's signatures match the corresponding certificate?
- \_\_\_ 4. Has the Notary PRINTED his name under his signature and shown the expiration date of his Notary License?
- \_\_\_ 5. Does the Notary's Seal, if used, match certificate as to State/County and expiration date?
- \_\_\_ 6. Are ALL necessary Offers of Dedication to the Public for Public Use made? (i.e., Streets, Roads, right-of-way widenings, Public Utility Easements, etc.).
- \_\_\_ 7. Are all necessary Offers of Dedication to the local agency made? (i.e., Access rights, lot (No.), storm drain retention pond site, well site, pump station site, etc.); Certificate of Dedication required?
- \_\_\_ 8. Does the appropriate statement/certificate accepting or rejecting Offers of Dedication match EXACTLY the Offers of Dedication made by Owners?
- \_\_\_ 9. Are ALL Easements and Restricted Access Rights reflected in the Preliminary Title Report shown?
- \_\_\_ 10. Are all street widenings properly labeled? (i.e., 10' road right-of-way dedication).
- \_\_\_ 11. Are the parcels on the Parcel Map numbered or lettered?
- \_\_\_ 12. Is the unsurveyed remainder parcel noted as "DESIGNATED REMAINDER" with the grant deed reference noted?
- \_\_\_ 13. Are the net, road right-of-way and gross areas shown as applicable?
- \_\_\_ 14. Are all easements of record, including dedication Book and Page, shown and tied to Survey?
- \_\_\_ 15. Does original Submittal include:
  - A. 2 prints of map signed by Owners, and Trustees or Beneficiaries?
  - B. Map Checking Fee?
  - C. Parcel Map Guarantee?
  - D. Preliminary Title Report?
  - E. Boundary and Parcel Map closure Calc's?
  - F. Copies of any unfiled surveys used on map?
  - G. Copies of Deeds referenced on map and in Title Report?



NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH		
CHECKED BY: DAVID LEAMON, RCE		

PARCEL MAP CHECKLIST	
COUNTY OF STANISLAUS DEPARTMENT OF PUBLIC WORKS	

APPROVED BY:  MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
DATE: JUNE 2, 2014 PLATE NO: 1-B3

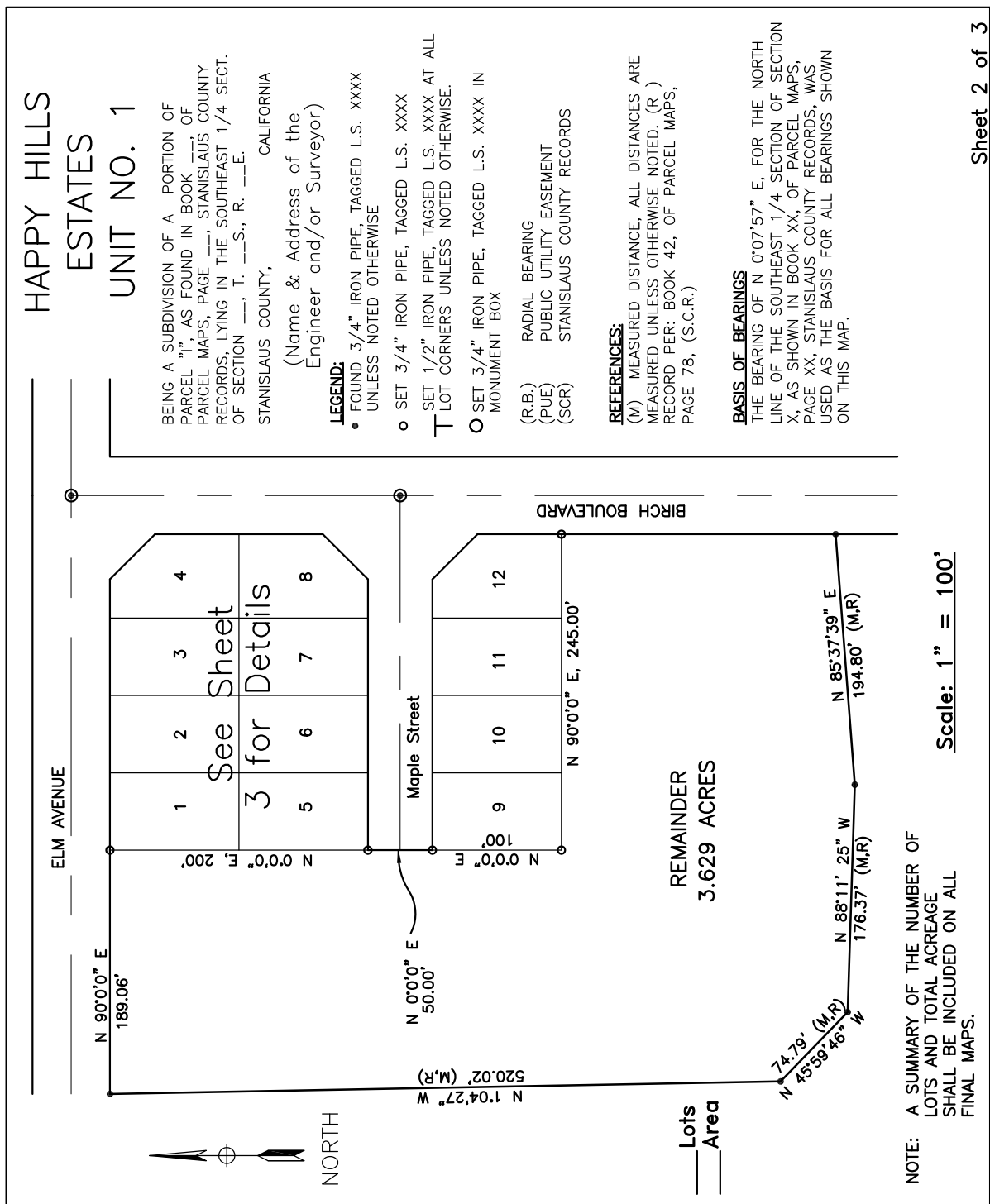




NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH CHECKED BY: DAVID LEAMON, RCE		

TYPICAL FINAL MAP  
 SHEET 2 OF 3  
 COUNTY OF STANISLAUS  
 DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
<i>Matthew Machado</i>
MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
DATE: JUNE 2, 2014
PLATE NO: 1-C2



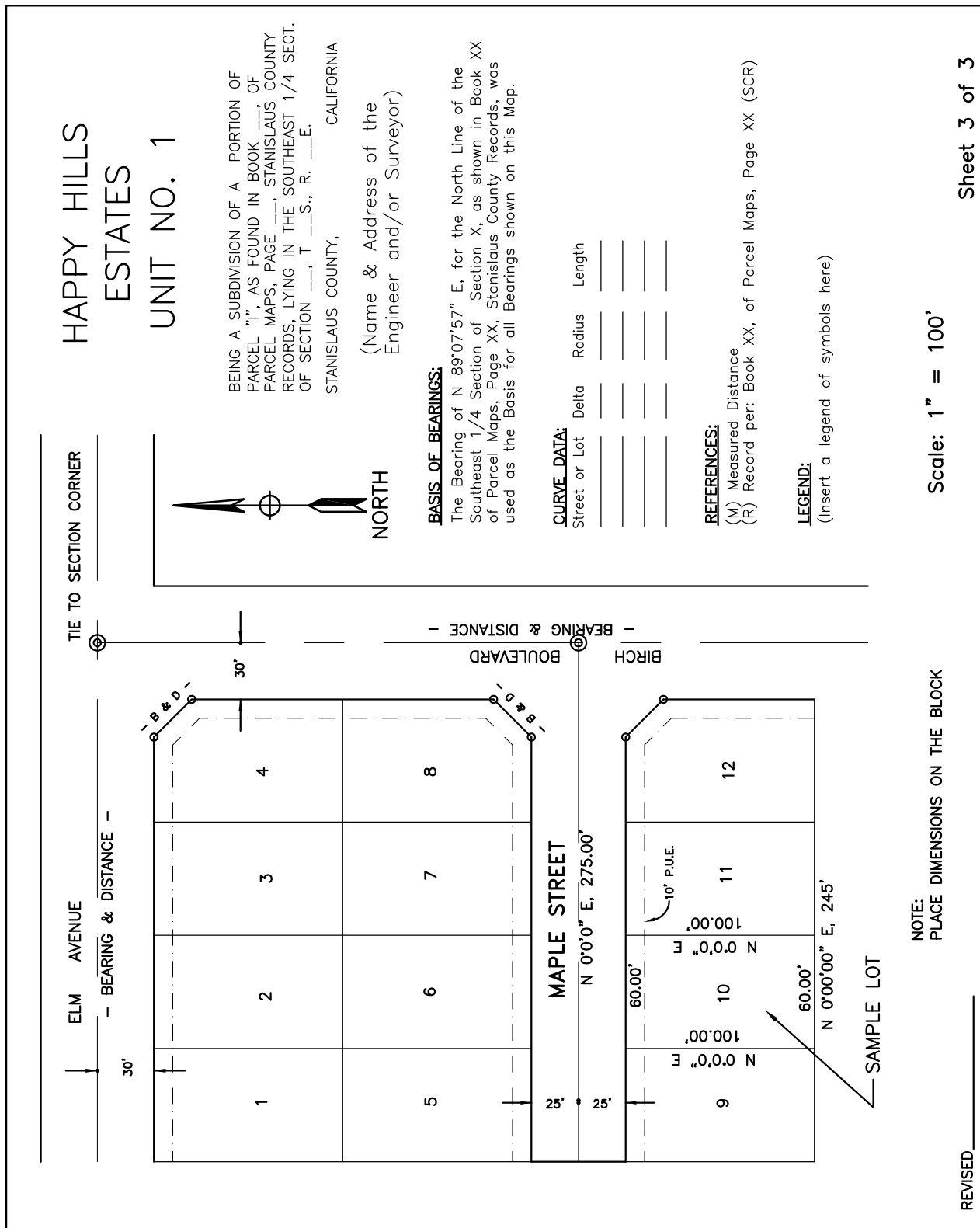


NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH CHECKED BY: DAVID LEAMON, RCE		

TYPICAL FINAL MAP  
SHEET 3 OF 3

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
DATE: JUNE 2, 2014
PLATE NO: 1-C3





# **GENERAL CHECKLIST FOR COUNTY FINAL MAPS**

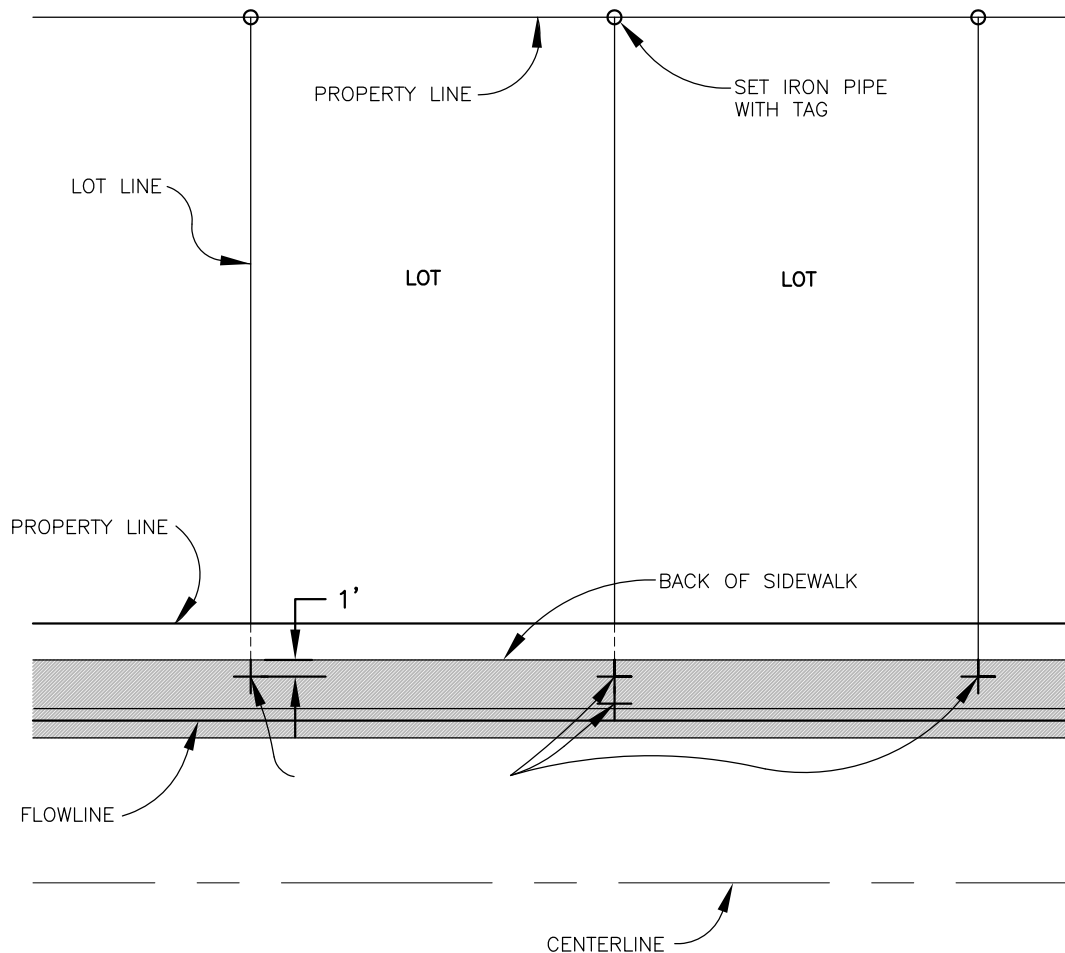
SEE CHECKLIST FOR ALL MAPS

- ☐ 1. Does Subdivision Guarantee match EXACTLY with Owner's/Trustee's/Beneficiary's names?
- ☐ 2. Are all Owner's/Trustee's/Beneficiary's signatures dated and notarized properly?
- ☐ 3. Does the date of Owner's/Trustee's/Beneficiary's signatures match the corresponding certificate?
- ☐ 4. Has the Notary PRINTED his name under his signature and shown the expiration date of his + Notary License?
- ☐ 5. Does the Notary's Seal, if used, match certificate as to State/County and expiration date?
- ☐ 6. Are ALL necessary Offers of Dedication to the Public for Public Use made? (i.e., Streets, Roads, right-of-way widenings, Public Utility Easements, etc.).
- ☐ 7. Are all necessary Offers of Dedication to the local agency made? (i.e., Access rights, lot (No.), storm drain retention pond site, well site, pump station site, etc.); Certificate of Dedication required?
- ☐ 8. Does the appropriate statement/certificate accepting or rejecting Offers of Dedication match EXACTLY the Offers of Dedication made by Owners?
- ☐ 9. Does the index (key) map show the overall subdivision and the portions thereof included on each sheet?
- ☐ 10. Does the index (key) map show all street names, lot numbers and sheet numbers?
- ☐ 11. Are ALL Easements and Restricted Access Rights reflected in the Preliminary Title Report shown?
- ☐ 12. Are all street widenings properly labeled? (i.e., 10' road right-of-way dedication).
- ☐ 13. Are the lots on the Final Map numbered consecutively beginning with 1?
- ☐ 14. Are all bearings and distances shown for boundary, blocks, lots and centerlines?
- ☐ 15. Are all the REQUIRED lot areas shown to the nearest square foot if less than 1 acre or to the nearest 1/100 of an acre, if more than 1 acre?
- ☐ 16. Are all easements of record, including dedication Book and Page, shown and tied to Survey?
- ☐ 17. Does original Submittal include:
  - A. 2 prints of map signed by Owners, and Trustees or Beneficiaries?
  - B. Map Checking Fee?
  - C. Subdivision Guarantee?
  - D. Preliminary Title Report?
  - E. Boundary closure Calc's?
  - F. Block & Lot closure Calc's?
  - G. 2-Street right-of-way closure Calc's incl. centerline?
  - H. California Coordinate System Calc's on grid?
  - I. Copies of any unfiled surveys used on map?
  - J. Copies of Deeds referenced on map and in Title Report?



NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH		
CHECKED BY: DAVID LEAMON, RCE		

FINAL MAP CHECKLIST		APPROVED BY:
		 MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
COUNTY OF STANISLAUS DEPARTMENT OF PUBLIC WORKS		DATE: JUNE 2, 2014 PLATE NO: 1-C4



NOTES:

WITNESS CORNER TO BE DRILLED HOLE WITH LEADED OR EPOXIED TACK OR NAIL AND TAGGED PER SECTION 8772 OF THE PROFESSIONAL LAND SURVEYOR'S (PLS) ACT.

WITNESS CORNER TO BE ON THE EXTENSION OF LOT LINE AND LOCATED 1 FOOT FROM BACK OF WALK OR LOCATED ON TOP OF CURB.

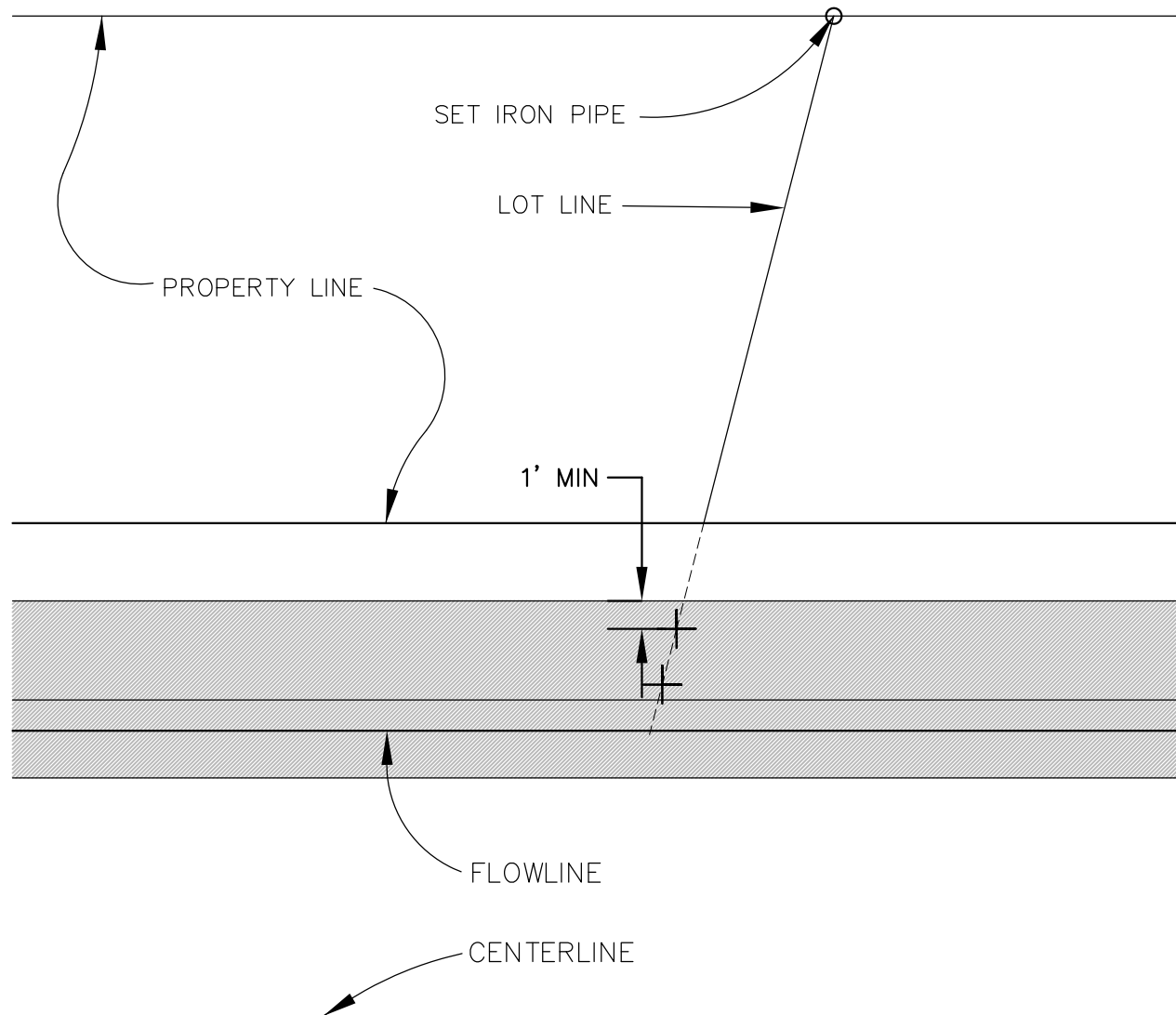


NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH CHECKED BY: DAVID LEAMON, RCE		

WITNESS CORNERS FOR  
90 DEGREE LOT LINES

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
<i>Matthew Machado</i>
MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
DATE: JUNE 2, 2014
PLATE NO: 1-D1



NOTES:

WITNESS CORNER TO BE DRILLED HOLE WITH LEADED OR EPOXIED TACK OR NAIL AND TAGGED PER SECTION 8772 OF THE PROFESSIONAL LAND SURVEYOR'S (PLS) ACT.

WITNESS CORNER TO BE ON THE EXTENSION OF LOT LINE AND LOCATED 1 FOOT FROM BACK OF WALK OR LOCATED ON TOP OF CURB.



NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH		
CHECKED BY: DAVID LEAMON, RCE		

WITNESS CORNERS FOR  
OTHER THAN 90 DEGREE  
LOT LINES

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

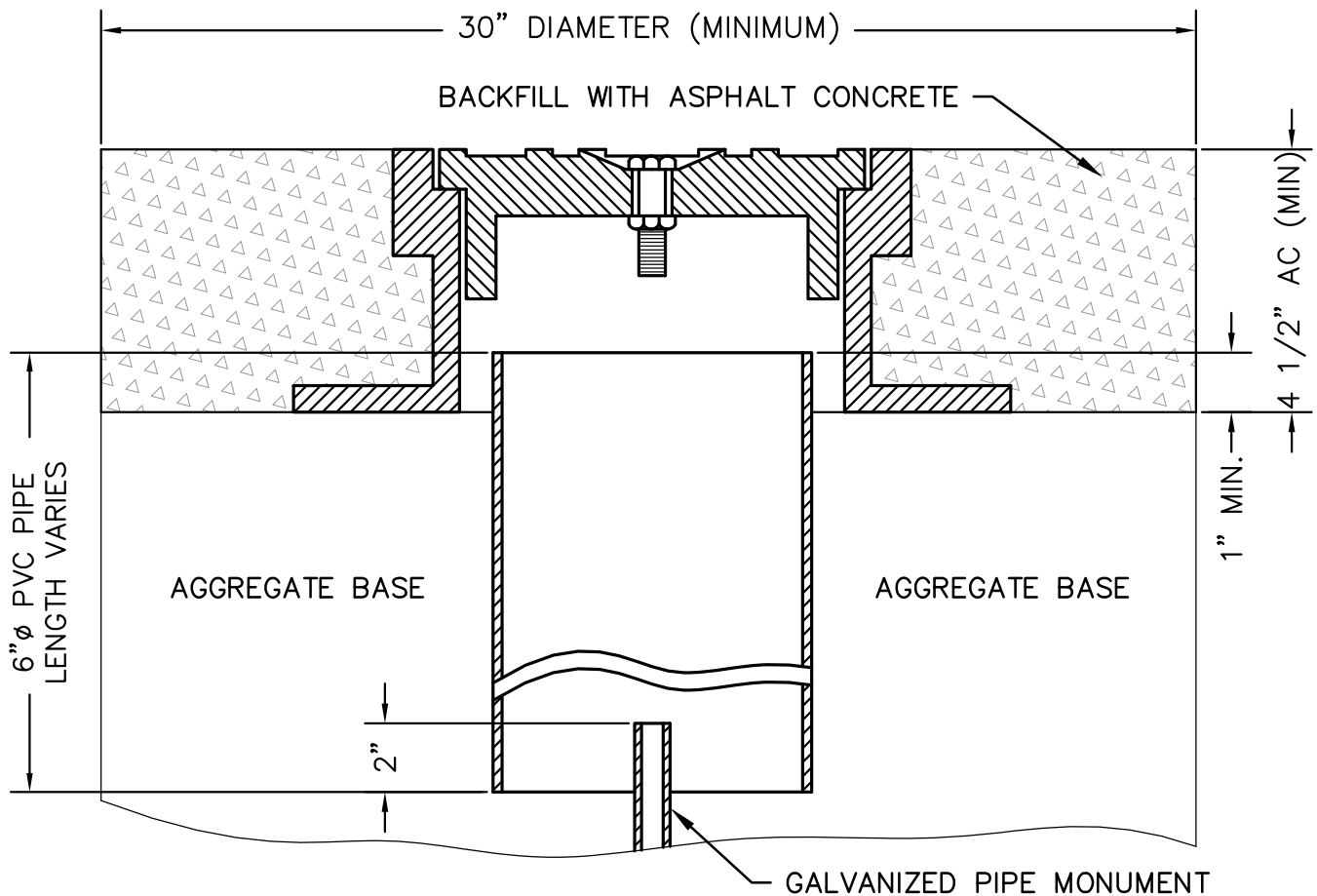
*Matthew Machado*

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 1-D2





#### NOTES:

1. MONUMENT BOX SHALL RESEMBLE CAST IRON COVER IN DETAIL 1-E2 OR APPROVED EQUAL.
2. MONUMENT COVER SHALL BE MARKED "MONUMENT".
3. THE MONUMENT SHALL BE A NEW 3/4 INCH X 24 INCH LONG GALVANIZED IRON PIPE.
4. THE MONUMENT SHALL BE TAGGED AND IDENTIFIED AS REQUIRED BY THE STATE OF CALIFORNIA LAND SURVEYOR'S ACT. REFER TO MANUAL OF INSTRUCTIONS FOR PLSS MOUNUMENTS.
5. ALL GOVERNMENT CORNERS SHALL BE 2 INCH X 24 INCH GALVANIZED IRON PIPE WITH IDENTIFICATION CAP. THE COUNTY WILL PROVIDE PIPE AND CAP UPON REQUEST.
6. MONUMENTS SHALL BE SET AT LEAST 1 FOOT BELOW THE FINISHED GRADE IN UNPAVED AREAS.



NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH		
CHECKED BY: DAVID LEAMON, RCE		

## ROAD MONUMENT SHEET 1 OF 2

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

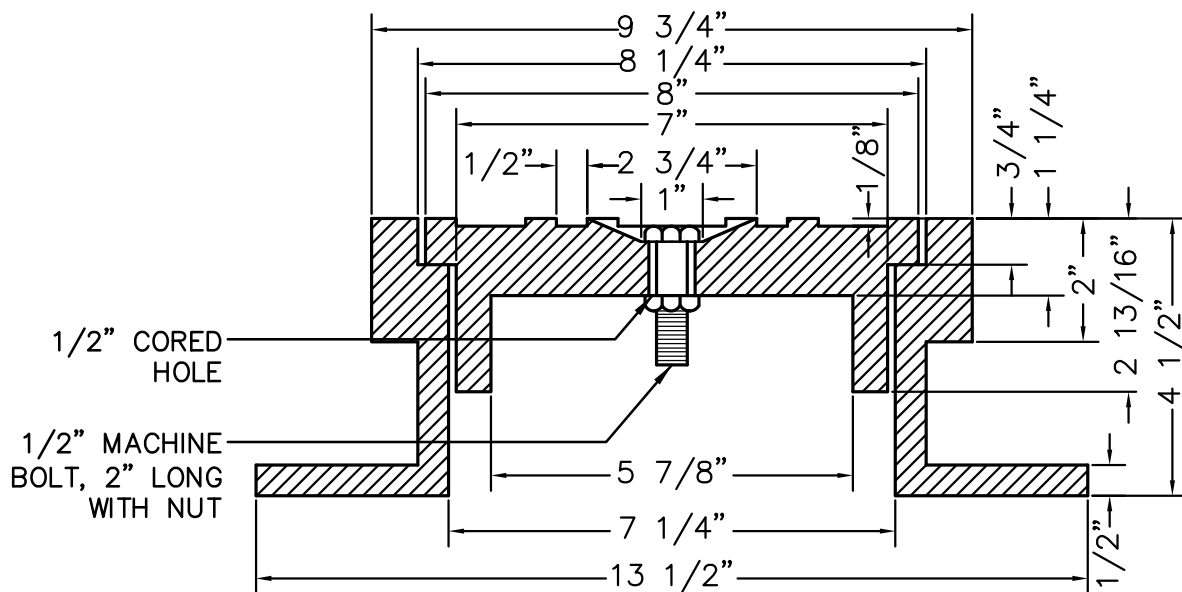
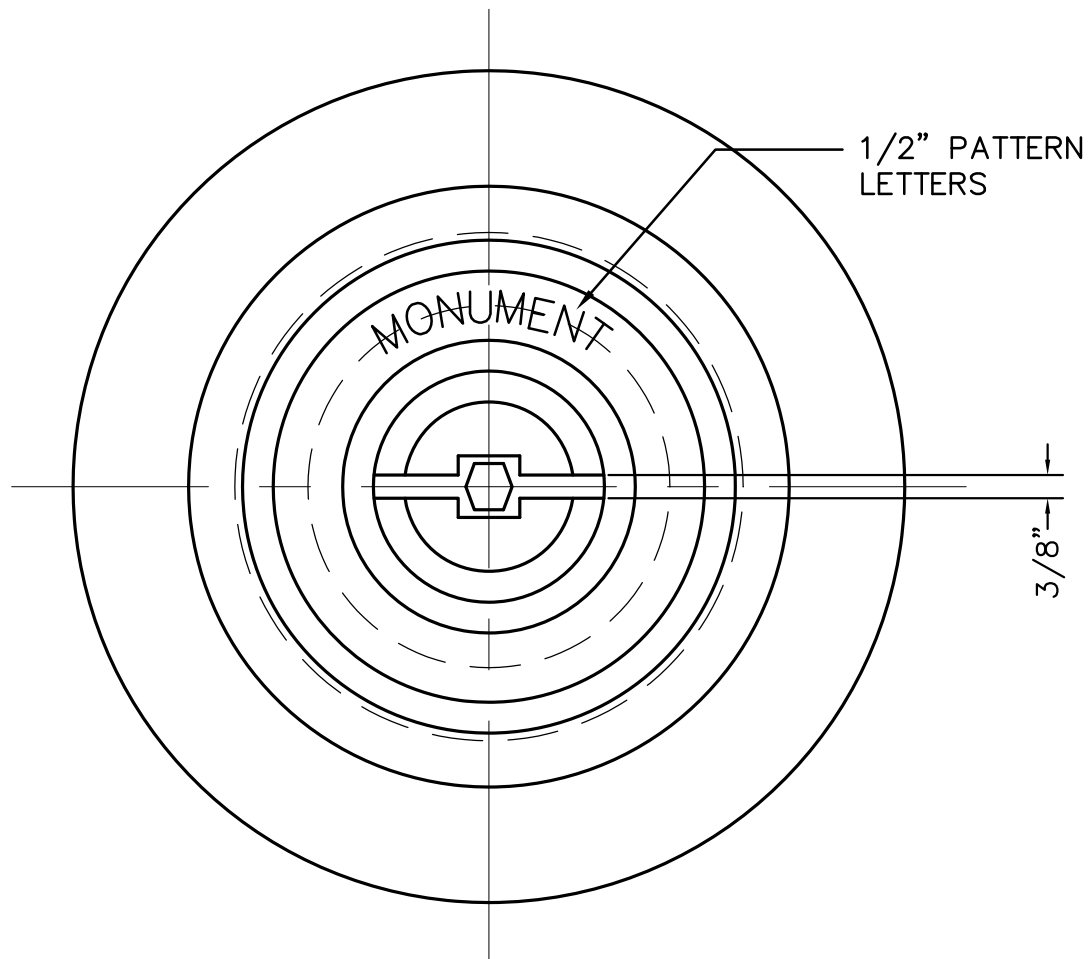
APPROVED BY:

*Matthew Machado*

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 1-E1

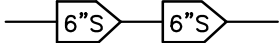
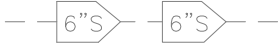
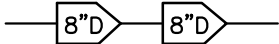
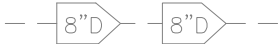
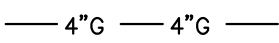

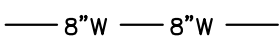

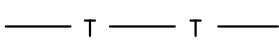

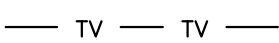





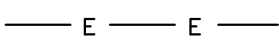









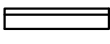



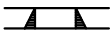
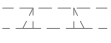




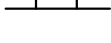



NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH CHECKED BY: DAVID LEAMON, RCE		

ROAD MONUMENT  
SHEET 2 OF 2

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
<i>Matthew Machado</i>
MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
DATE: JUNE 2, 2014
PLATE NO: 1-E2


DESCRIPTION	TO BE CONSTRUCTED	EXISTING
SANITARY SEWER . . . . .		
STORM SEWER . . . . .		
GAS LINE . . . . .		
WATER LINE . . . . .		
TELEPHONE . . . . .		
CABLE TELEVISION . . . . .		
GAS VALVE . . . . .		
WATER VALVE . . . . .		
ELECTRICAL CONDUIT . . . . .		
MATCH LINE . . . . .	STA. 5+00	
MANHOLE . . . . .		
CATCHBASIN . . . . .		
GAS METER . . . . .		
WATER METER . . . . .		
CURB AND GUTTER . . . . .		
SIDEWALK . . . . .		
DRIVEWAY . . . . .		
CONFORM PAVEMENT . . . . .		
FIRE HYDRANT . . . . .		
SIGN . . . . .		



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DRAFTING STANDARDS  
SHEET 1 OF 3

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
DATE: JUNE 2, 2014
PLATE NO: 1-F1

DESCRIPTION	TO BE CONSTRUCTED	EXISTING
SANITARY SEWER CLEANOUT . . . . .		
UTILITY POLE . . . . .		
GUARD RAIL . . . . .		
BARRICADE . . . . .		
FENCE . . . . .		
RAILROAD . . . . .		
WHEELCHAIR RAMP . . . . .		
SANITARY SEWER SERVICE . . . . .		
LAMPHOLE . . . . .		
STREET LIGHT TYPE A . . . . .		
STREET LIGHT TYPE B . . . . .		
STREET LIGHT TYPE C . . . . .		
POWER SOURCE FOR STREET LIGHT CIRCUIT		
PULL BOX WITH FUSE . . . . .		



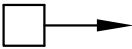

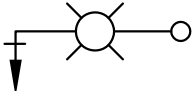
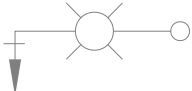
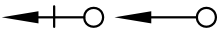

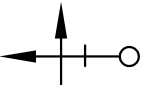
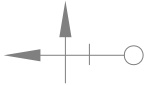
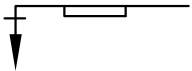

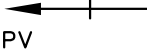











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DRAFTING STANDARDS  
SHEET 2 OF 3

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
DATE: JUNE 2, 2014
PLATE NO: 1-F2


DESCRIPTION	TO BE CONSTRUCTED	EXISTING
PULL BOX . . . . .		
PULL BOX WITH DETECTOR STUB IN CONDUIT		
COMBINATION TRAFFIC SIGNAL WITH BACKPLATE & LUMINAIRE		
VEHICLE SIGNAL WITH AND WITHOUT BACKPLATE		
COMBINATION TRAFFIC SIGNAL, GREEN ARROW AND BACKPLATE		
MASTARM SIGNAL WITH STREET NAME SIGN		
PROGRAMMED VISIBILITY HEAD WITH BACKPLATE	 PV	 PV
PEDESTRIAN SIGNAL FACE . . . . .		
PEDESTRIAN PUSH BUTTON AND ASSOCIATED VEHICLE PHASE	PPB Ø 6	PPB Ø 6
INDUCTIVE DETECTOR LOOP . . . . .		
TRAFFIC SIGNAL CONTROLLER CABINET WITH DOOR SWING AS SHOWN		
TYPE III OR III M SERVICE CABINET WITH DOOR SWING AS SHOWN		



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# DRAFTING STANDARDS SHEET 3 OF 3

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
DATE: JUNE 2, 2014
PLATE NO: 1-F3

AAN AMERICAN ASSOCIATION OF NURSERYMEN

AASHTO AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS

ACI AMERICAN CONCRETE INSTITUTE

ACPA AMERICAN CONCRETE PIPE ASSOCIATION

ADA AMERICAN WITH DISABILITY ACT

AISC AMERICAN INSTITUTE OF STEEL CONSTRUCTION

AISI AMERICAN IRON AND STEEL INSTITUTE

ANSI AMERICAN NATIONAL STANDARDS INSTITUTE

AREA AMERICAN RAILWAY ENGINEERING ASSOCIATION

ASA AMERICAN STANDARDS ASSOCIATION

ASCE AMERICAN SOCIETY OF CIVIL ENGINEERS

ASME AMERICAN SOCIETY OF MECHANICAL ENGINEERS

ASTM AMERICAN SOCIETY OF TESTING AND MATERIALS

AWG AMERICAN WIRE GAGE

AWS AMERICAN WELDING SOCIETY

AWWA AMERICAN WATER WORKS ASSOCIATION

CAC CALIFORNIA ADMINISTRATIVE CODE

CALTRANS CALIFORNIA DEPARTMENT OF TRANSPORTATION

CSAS CALIFORNIA STATE ACCESSIBILITY STANDARDS

EIA ELECTRONIC INDUSTRIAL ASSOCIATION

IEEE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

OSHA OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION

UBC UNIFORM BUILDING CODE

UPC UNIFORM PLUMBING CODE

UL UNDERWRITERS' LABORATORIES, INC.

USA UNDERGROUND SERVICE ALERT



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## STANDARD ABBREVIATIONS

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 1-G1

STANISLAUS COUNTY  
CONSTRUCTION NOTES

The following notes shall be placed on all improvement plans.

1. Prior to starting any work, the contractor shall obtain a encroachment permit from the Stanislaus County Department of Public Works. Forty Eight (48) hour advanced notice shall be provided to encroachment inspector prior to starting any work.
2. All material and work shall conform to Stanislaus County specifications and improvement standards. All improvements are subject to the inspection and approval of the Public Works Department.
3. The contractor shall take precautionary measures to protect all utilities. The contractor shall do no excavation until all utility agencies and the Stanislaus County Department of Public Works have been notified and have been given the opportunity to mark their facilities in the field. The contractor shall call U.S.A. at least forty-eight (48) hours prior to doing any excavating.
4. These plans have been checked by the Stanislaus County Department of Public Works and/ or authorized representative, but such checking and/or approval does not relieve the developer or contractor from his/her responsibility to correct errors, omissions or make changes required by conditions discovered in the field during course of construction.
5. The Contractor shall control dust at all times. Dust control shall be the responsibility of the Developer/Contractor and shall be implemented in accordance with applicable federal, state, and local guidelines (including, but not limited to the San Joaquin Valley Air Pollution Control District).
6. 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.
7. Unless otherwise approved, 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.
8. All lines abandoned during construction shall be removed.
9. All independent laboratory inspection requested by the County Engineer shall be paid for by the developer or contractor.
10. Street striping shall include stop bars, centerline striping , and lane line markers, crosswalks and all other markings required by the Engineer. Striping shall be done with thermoplastic and reflective markers.
11. All trenches shall be back filled in accordance with Stanislaus County Specifications and Improvements Standards.
12. When widening the pavement on an existing road, the existing pavement shall be cut (saw) 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.



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CONSTRUCTION NOTES  
SHEET 1 OF 2

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 1-H1

13. 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 Stanislaus County Standards even if damage or displacement occurred prior to any work performed by the contractor.
14. Asbestos Cement Pipe (ACP) or fittings shall not be used.
15. Prior to trenching for storm drain pipe, the contractor shall verify, in the field, the size and location of existing pipe at the point of connection. Any deviation from the plans shall be resolved by the design engineer and approved by the County prior to trenching.
16. Manholes, valves, clean outs, etc. shall be brought to finish grade by the Contractor after the final paving course is placed.
17. Storm drain pipe sizes shall not be changed without the approval of Stanislaus County.
18. All construction site activities shall conform to 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.
19. An approved SWPPP shall be submitted to the County and must be on-site during all construction activities.
20. All construction site activities shall comply with all conditions of approval, development standards, and/or mitigation measures adopted by the Planning Commission and/or Board of Supervisors for the specific project.
21. Prior to initiating any construction, the contractor/developer shall verify that all necessary federal, state, and local permits and/or authorizations have been obtained.



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## CONSTRUCTION NOTES SHEET 2 OF 2

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 1-H2

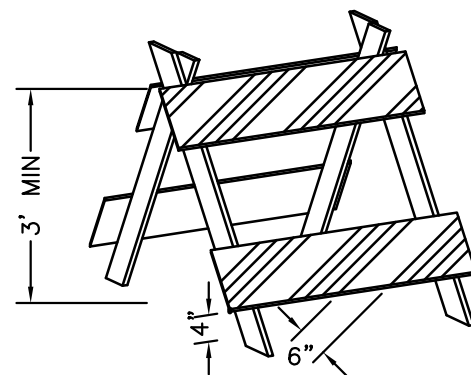
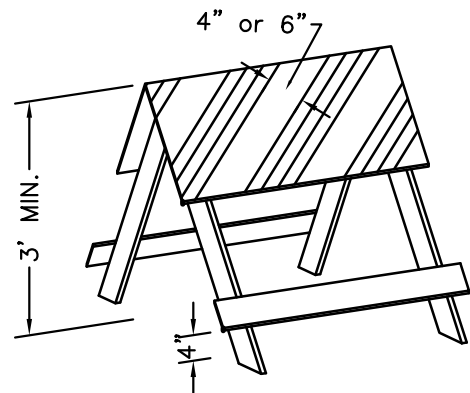
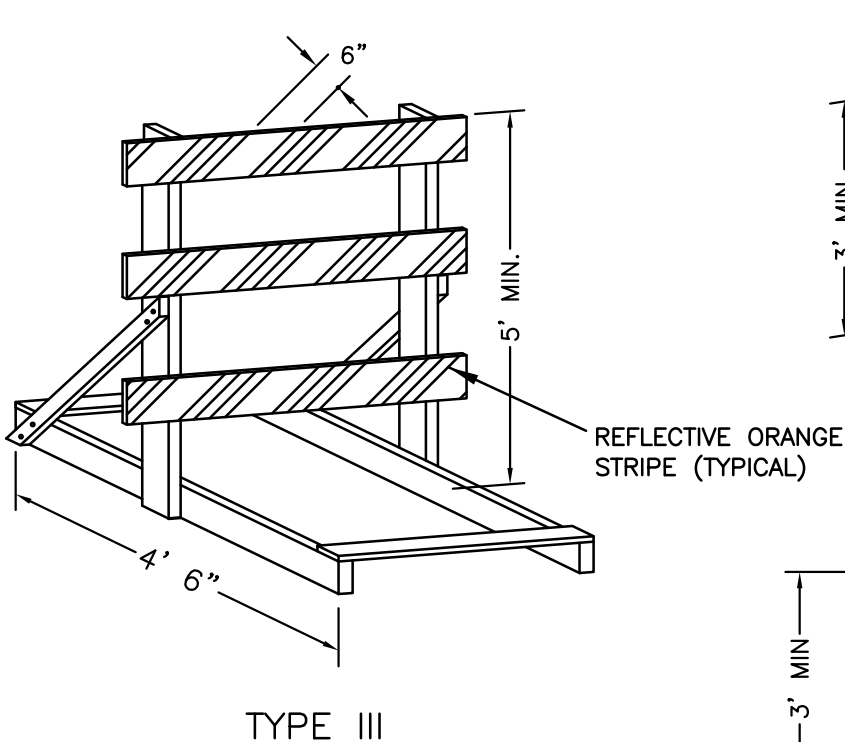


## BARRICADE CHARACTERISTICS

TYPE *	I	II	III
WIDTH OF RAIL *	8" MIN. – 12" MAX.		
LENGTH OF RAIL	2' MIN.		4' MIN.
WIDTH OF STRIPES**	6"		
HEIGHT	3' MIN.		5' MIN.
NUMBER OF REFLECTORIZED RAIL FACES PER SIDE	1	2	3

(\*) FOR WOODEN BARRICADES NOMINAL LUMBER DIMENSIONS WILL BE SATISFACTORY.

(\*\*) FOR RAILS LESS THAN 3 FEET LONG, 4 INCH WIDE STRIPES SHALL BE USED.



## TRAFFIC CONTROL AND SAFETY



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PROTECTIVE BARRICADE  
SHEET 1 OF 2

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

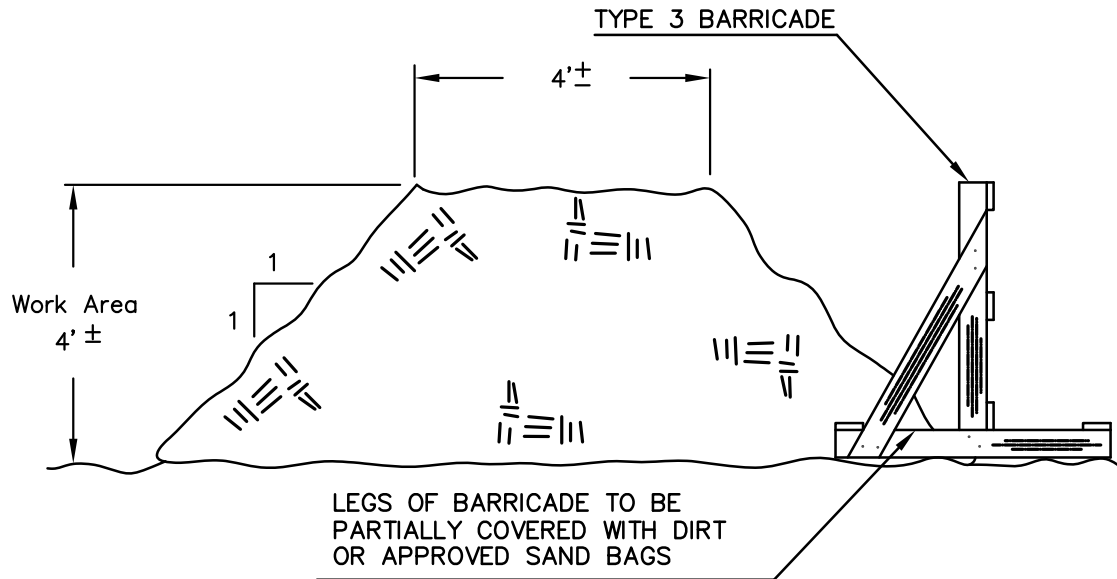
APPROVED BY:

*Matthew Machado*

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 2-A1



NOTES:

1. THE DEVELOPER SHALL CONSTRUCT AND MAINTAIN PROTECTIVE BARRICADES AT THE LOCATIONS SHOWN ON THE DETOUR PLAN APPROVED BY THE COUNTY.
2. AT A MINIMUM, EACH CLOSURE SHALL CONSIST OF THREE TYPE 3 BARRICADES, A RED TYPE N (CA) SIGN, TWO R11-2 (CA) SIGNS (BLACK ON WHITE. 48 INCH X 30 INCH, 8 INCH SERIES "D" LETTERS) PER CA MUTCD, AND FILL MATERIAL.
3. THE DEVELOPER SHALL SUBMIT TO THE ENGINEER PLANS FOR THE PROTECTIVE BARRICADE. PLACEMENT OF THE FILL MATERIAL AND TYPE 3 BARRICADES SHALL NOT BEGIN UNTIL THE DEVELOPER RECEIVES AN ENCROACHMENT PERMIT FROM THE COUNTY.

TEMPORARY BARRICADE AT ROAD END



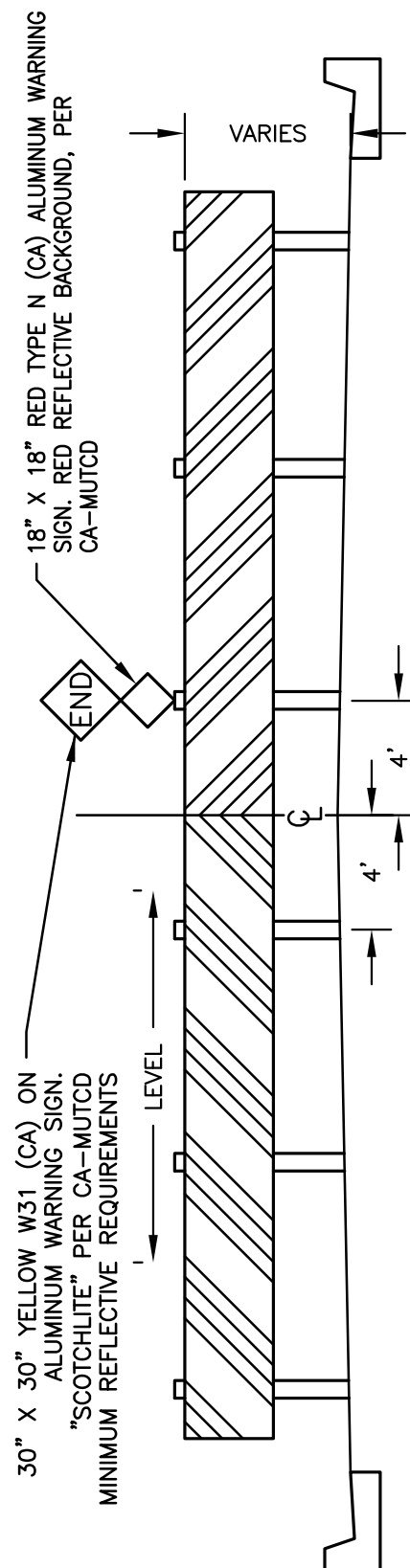
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PROTECTIVE BARRICADE  
SHEET 2 OF 2

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

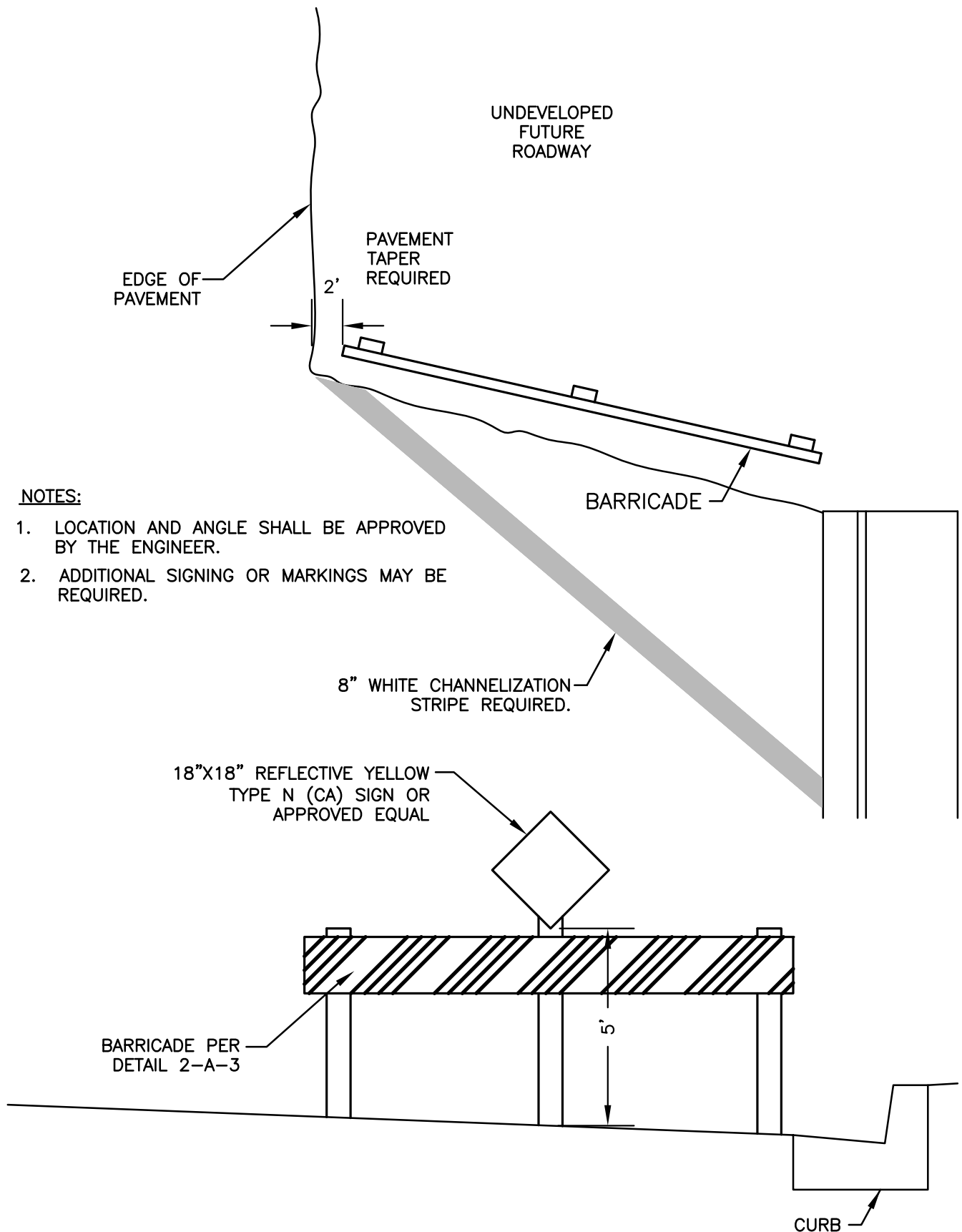
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DATE: JUNE 2, 2014
PLATE NO: 2-A2





CL



**NOTES:**

1. LOCATION AND ANGLE SHALL BE APPROVED BY THE ENGINEER.
2. ADDITIONAL SIGNING OR MARKINGS MAY BE REQUIRED.



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**BARRICADE ROAD  
WIDTH TRANSITION**

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

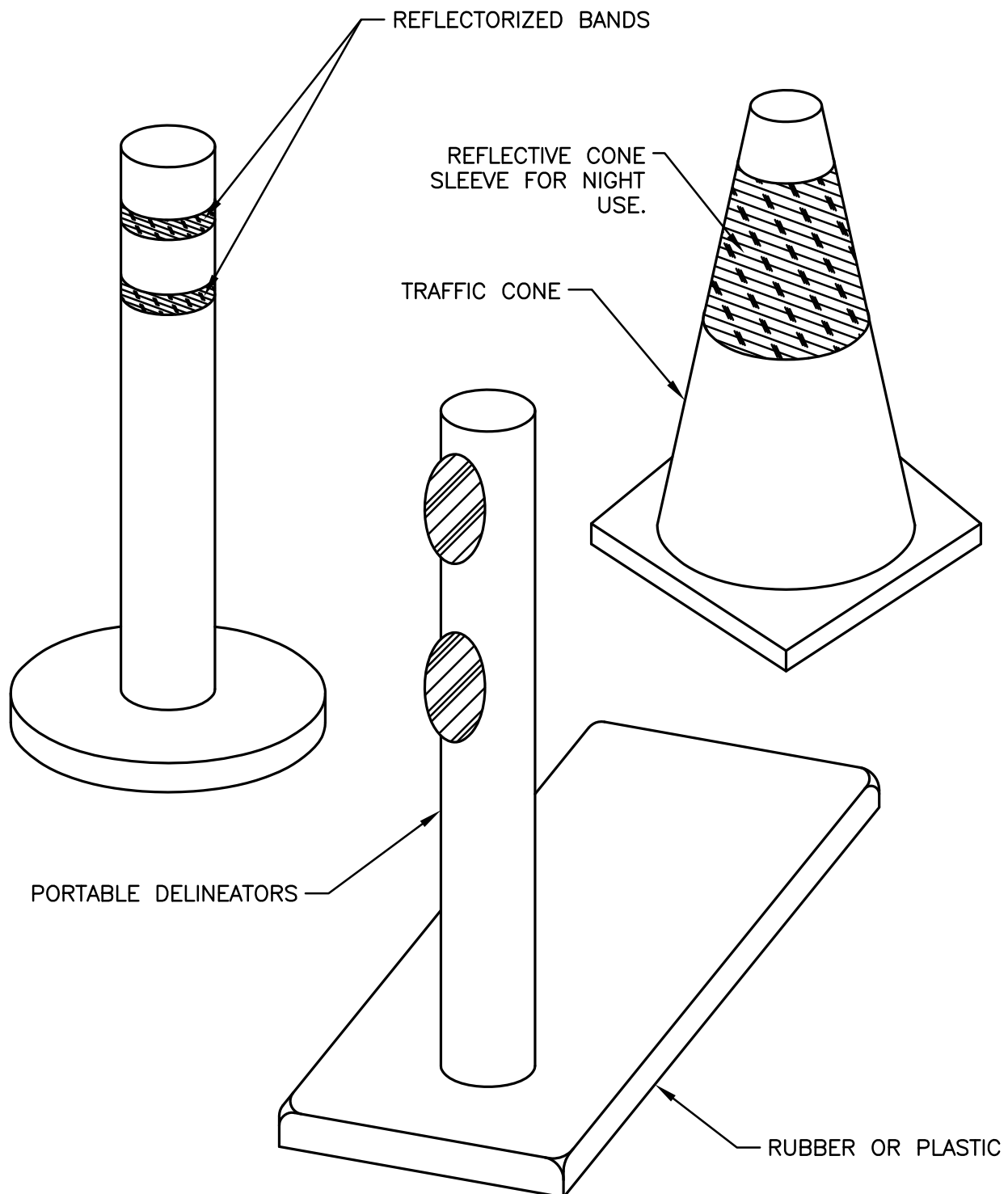
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MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 2-A5



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CHECKED BY: DAVID LEAMON, RCE		

## TRAFFIC CONTROL DELINEATORS

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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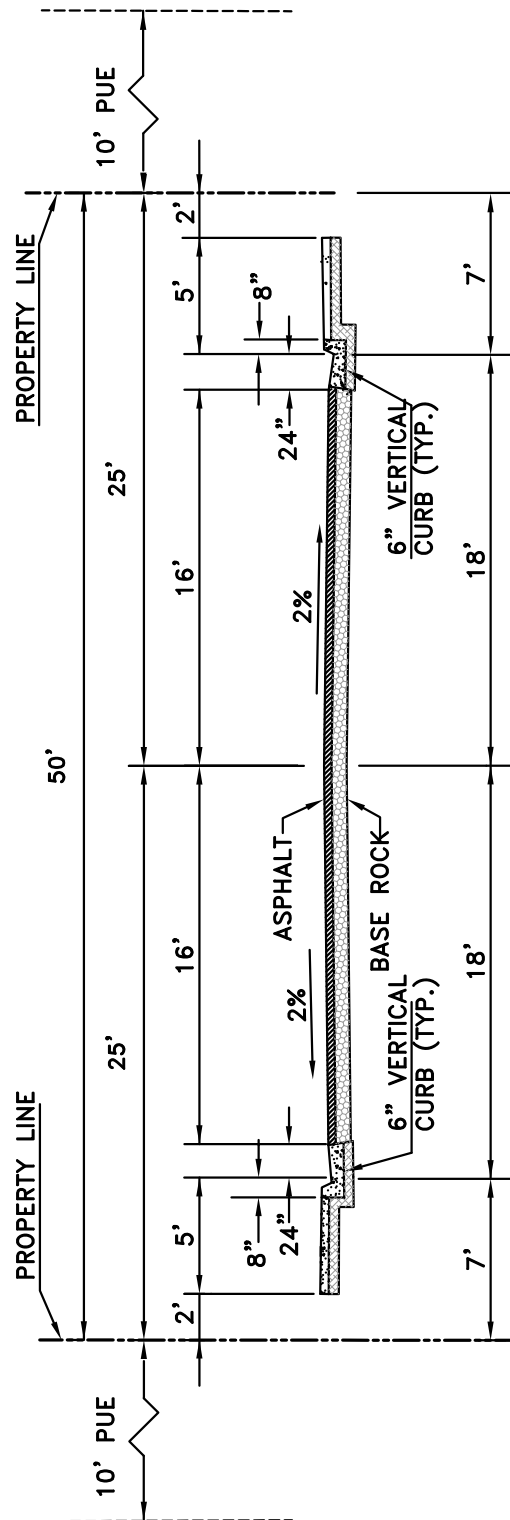
*Matthew Machado*

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 2-B1

# 50 FT LOCAL (2 LANE URBAN)



NOT TO SCALE

## NOTE:

1. THE 4-1/2" OR 6" VERTICAL CURB AND SIDEWALK TO BE INSTALLED IN R-1, R-2, AND R-3 ZONES.
2. SIDEWALK SLOPE = 1/4" PER FOOT MAX BETWEEN BACK OF CURB AND RIGHT-OF-WAY.
3. PAVEMENT CROSS SLOPE SHALL BE 2.0% MINIMUM ON NEW ROAD CONSTRUCTION.
4. INSTALL CONCRETE CURB PER DETAIL 3-D1.
5. INSTALL CONCRETE SIDEWALK PER DETAIL 3-D8.



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## 50 FT LOCAL (URBAN) 2 LANE URBAN

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

*Matthew Machado*

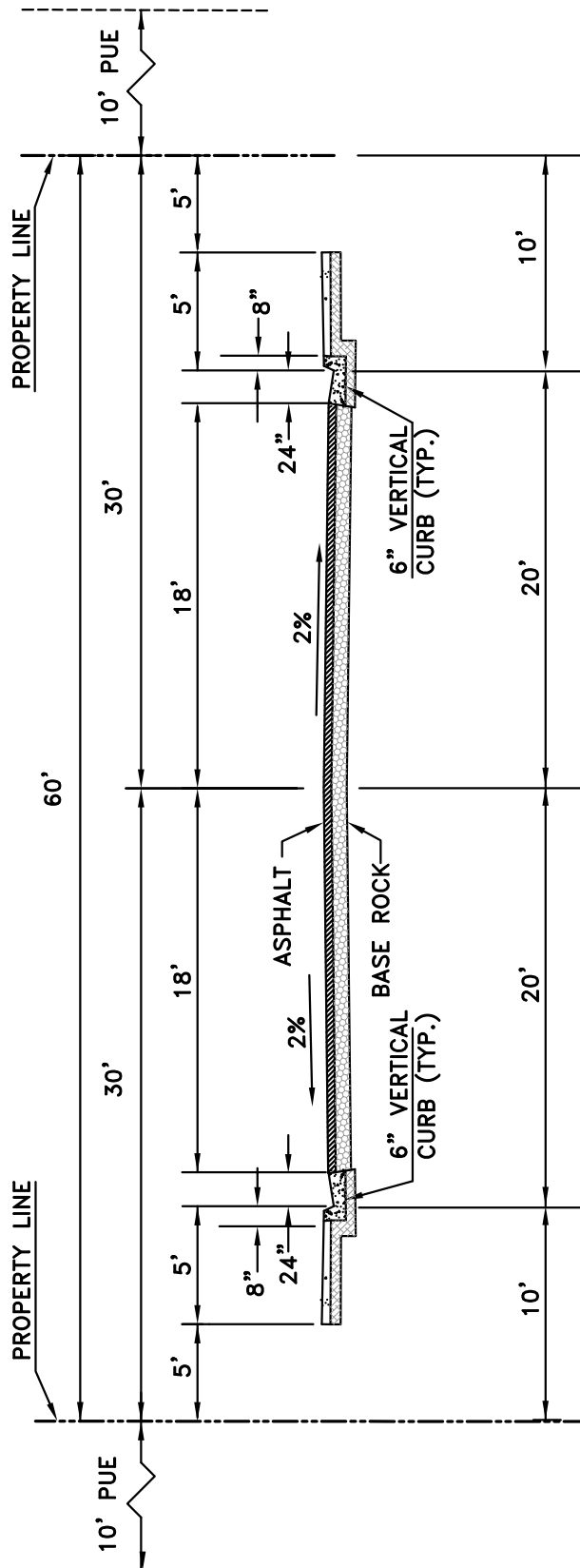
MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A1**

# 60 FT MINOR COLLECTOR (URBAN)



NOT TO SCALE

## NOTE:

1. SIDEWALK SLOPE =  $1/4"$  PER FOOT MAX BETWEEN BACK OF CURB AND RIGHT-OF-WAY.
2. PAVEMENT CROSS SLOPE SHALL BE 2.0% MINIMUM ON NEW ROAD CONSTRUCTION.
3. INSTALL CONCRETE CURB PER DETAIL 3-D1.
4. INSTALL CONCRETE SIDEWALK PER DETAIL 3-D8.
5. IN RESIDENTIAL AREAS, CURB PARKING IS ALLOWED. IN ALL OTHER CASES, INSTALL "NO STOPPING ANY TIME" SIGNS TWO FEET FROM FLOWLINE. SPACE SIGNS AT 300 FT APART FOR PROJECTS IN RURAL AREAS THAT ARE OVER 1,300 FT IN LENGTH. IN URBAN AREAS, SPACE THE SIGNS 100 FT APART.



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## 60 FT MINOR COLLECTOR (URBAN)

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

*Matthew Machado*

MATTHEW MACHADO

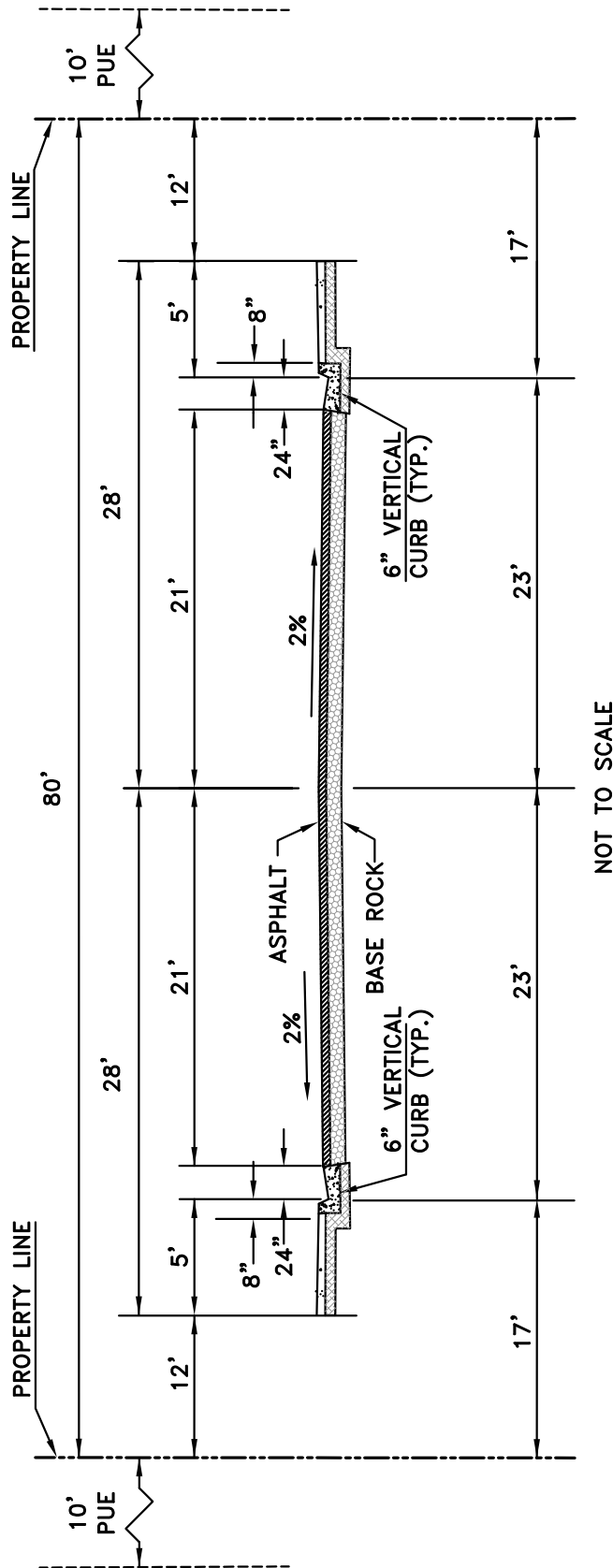
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A2**



# 80 FT MAJOR COLLECTOR (2 LANE URBAN)



## NOTE:

1. SIDEWALK SLOPE =  $\frac{1}{4}$ " PER FOOT MAX BETWEEN BACK OF CURB AND RIGHT-OF-WAY.
2. PAVEMENT CROSS SLOPE SHALL BE 2.0% MINIMUM ON NEW ROAD CONSTRUCTION.
3. INSTALL CONCRETE CURB PER DETAIL 3-D1.
4. INSTALL CONCRETE SIDEWALK PER DETAIL 3-D8.
5. INSTALL "NO STOPPING ANY TIME" SIGNS TWO FEET FROM FLOWLINE. SPACE SIGNS AT 300 FT APART FOR PROJECTS IN RURAL AREAS THAT ARE OVER 1,300 FT IN LENGTH. IN URBAN AREAS, SPACE THE SIGNS 100 FT APART.



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## 80 FT MAJOR COLLECTOR 2 LANE URBAN

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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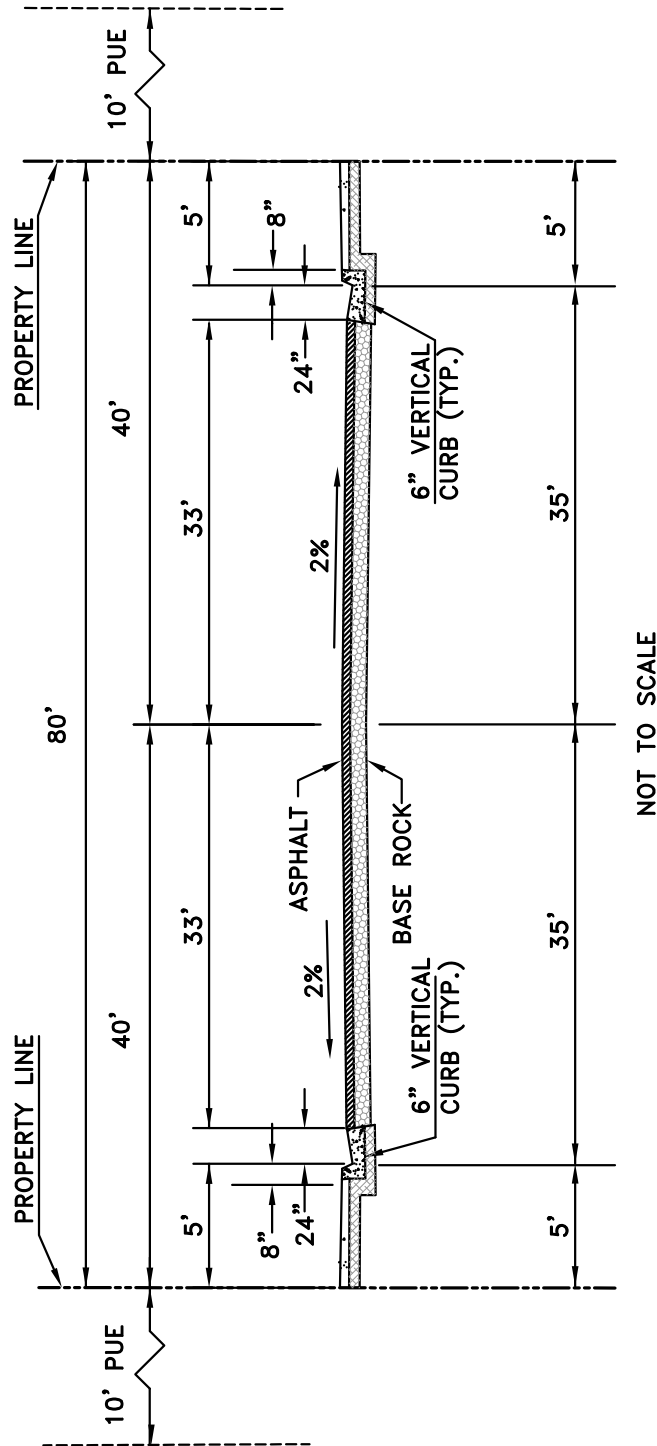
MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A3**

# 80 FT MAJOR COLLECTOR (4 LANE URBAN)



NOT TO SCALE

## NOTE:

1. SIDEWALK SLOPE =  $1/4"$  PER FOOT MAX BETWEEN BACK OF CURB AND RIGHT-OF-WAY.
2. PAVEMENT CROSS SLOPE SHALL BE 2.0% MINIMUM ON NEW ROAD CONSTRUCTION.
3. INSTALL CONCRETE CURB PER DETAIL 3-D1.
4. INSTALL CONCRETE SIDEWALK PER DETAIL 3-D8.
5. INSTALL "NO STOPPING ANY TIME" SIGNS TWO FEET FROM FLOWLINE. SPACE SIGNS AT 300 FT APART FOR PROJECTS IN RURAL AREAS THAT ARE OVER 1,300 FT IN LENGTH. IN URBAN AREAS, SPACE THE SIGNS 100 FT APART.



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## 80 FT MAJOR COLLECTOR 4 LANE URBAN

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

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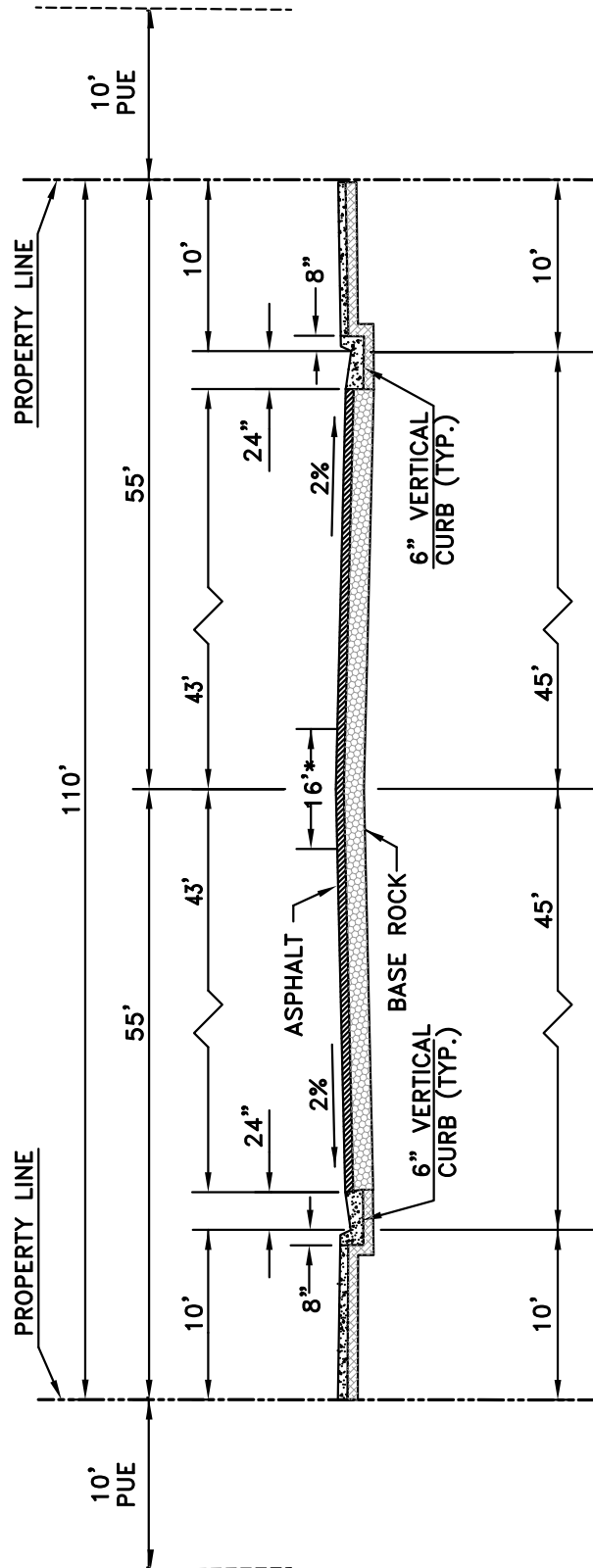
MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A4**

# 110 FT MINOR ARTERIAL (4 LANE URBAN)



## NOTES:

1. SIDEWALK SLOPE =  $1/4"$  PER FOOT MAX BETWEEN BACK OF CURB AND RIGHT-OF-WAY.
2. PAVEMENT CROSS SLOPE SHALL BE 2% MINIMUM ON NEW ROAD CONSTRUCTION.
3. INSTALL CONCRETE CURB PER DETAIL 3-D1.
4. INSTALL CONCRETE SIDEWALK PER DETAIL 3-D7.
5. 16' MEDIAN TO BE RAISED CONCRETE OR STRIPED AS DETERMINED BY COUNTY ENGINEER.



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## 110 FT MINOR ARTERIAL 4 LANE URBAN

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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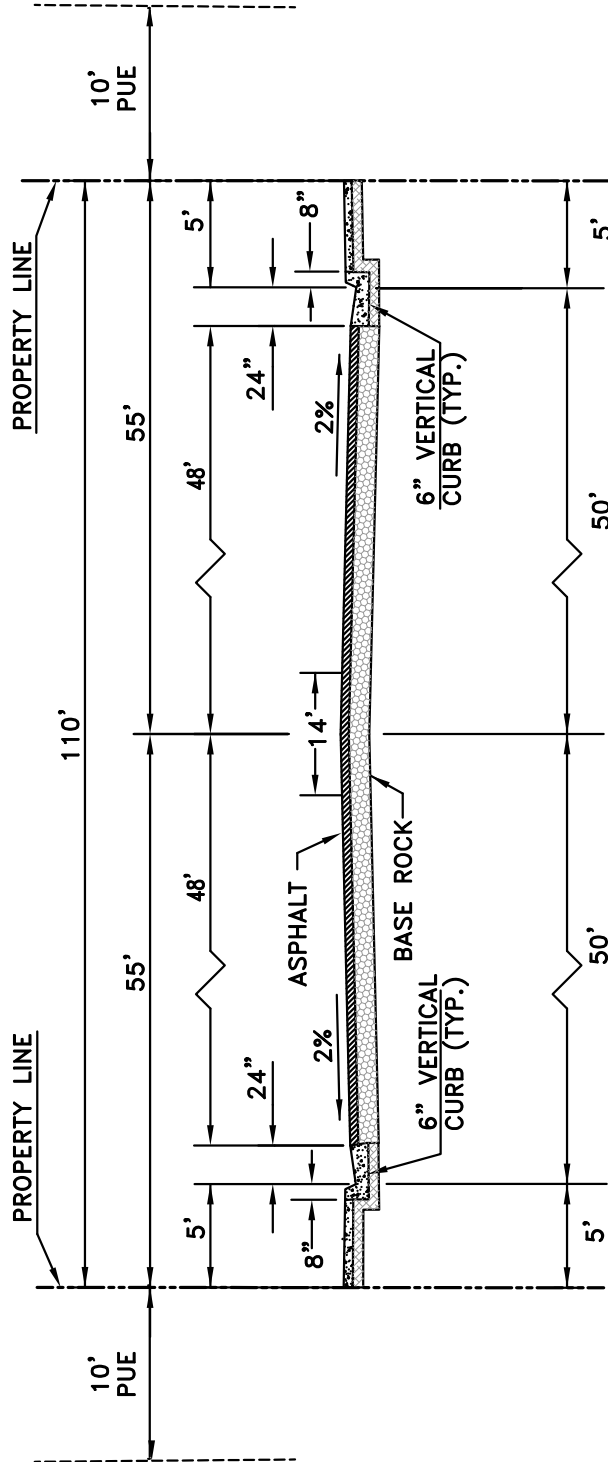
MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A5**

# 110 FT MINOR ARTERIAL (6 LANE URBAN)



## NOTES:

1. SIDEWALK SLOPE =  $1/4"$  PER FOOT MAX BETWEEN BACK OF CURB AND RIGHT-OF-WAY.
2. PAVEMENT CROSS SLOPE SHALL BE 2% MINIMUM ON NEW ROAD CONSTRUCTION.
3. INSTALL CONCRETE CURB PER DETAIL 3-D1.
4. INSTALL CONCRETE SIDEWALK PER DETAIL 3-D7.
5. 14' MEDIAN TO BE RAISED CONCRETE OR STRIPED AS DETERMINED BY COUNTY ENGINEER.



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## 110 FT MINOR ARTERIAL 6 LANE URBAN

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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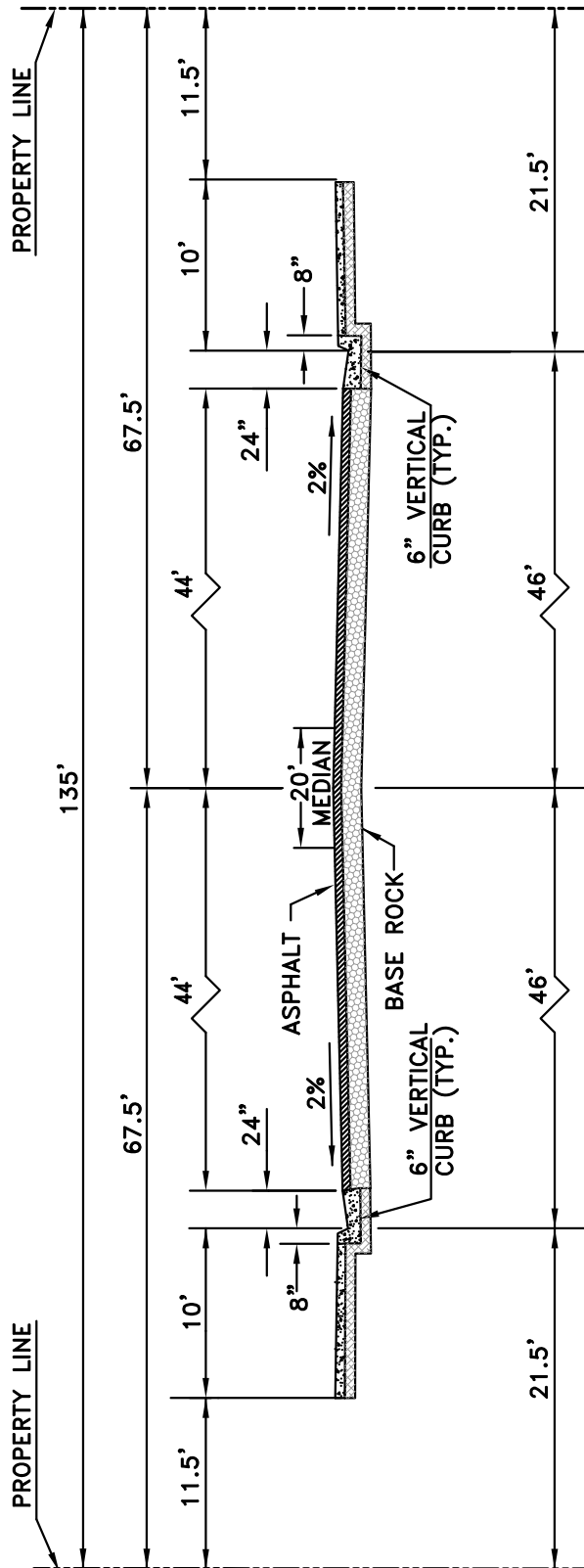
MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A6**

# 135 FT OTHER PRINCIPAL ARTERIAL (4 LANE URBAN EXPRESSWAY)



## NOTES:

1. SIDEWALK SLOPE =  $1/4$ " PER FOOT MAX BETWEEN BACK OF CURB AND RIGHT-OF-WAY.
2. PAVEMENT CROSS SLOPE SHALL BE 2% MINIMUM ON NEW ROAD CONSTRUCTION.
3. INSTALL CONCRETE CURB PER DETAIL 3-D1.
4. INSTALL CONCRETE SIDEWALK PER DETAIL 3-D7.
5. PAVEMENT SECTION INCLUDES 10' PAVED SHOULDER WITH 2% CROSS SLOPE.
6. 20' MEDIAN TO BE RAISED CONCRETE OR STRIPED AS DETERMINED BY COUNTY ENGINEER.



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UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH	
CHECKED BY: DAVID LEAMON, RCE	

## 135 FT OPA 4 LANES URBAN EXPRESSWAY

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

*Matthew Machado*

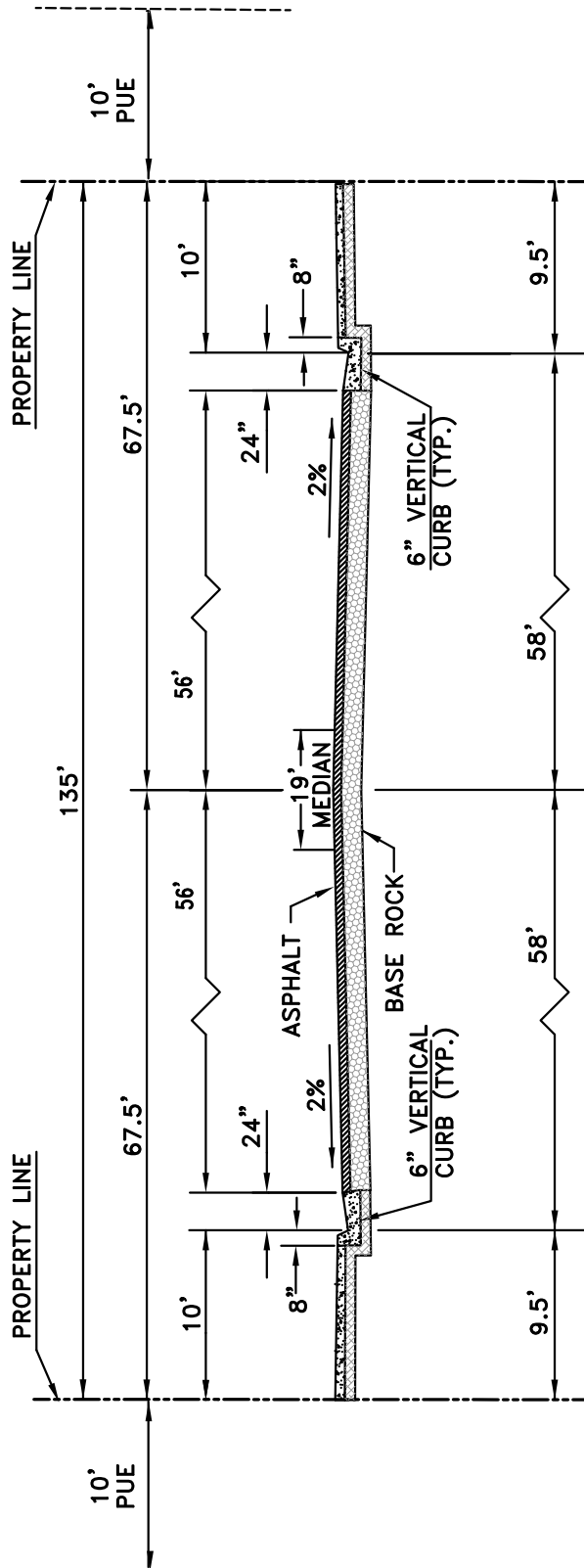
MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A7**

# 135 FT OTHER PRINCIPAL ARTERIAL (6 LANE URBAN EXPRESSWAY)



## NOTES:

1. SIDEWALK SLOPE =  $1/4$ " PER FOOT MAX BETWEEN BACK OF CURB AND RIGHT-OF-WAY.
2. PAVEMENT CROSS SLOPE SHALL BE 2% ON NEW ROAD CONSTRUCTION.
3. INSTALL CONCRETE CURB PER DETAIL 3-D1.
4. INSTALL CONCRETE SIDEWALK PER DETAIL 3-D7.
5. PAVEMENT SECTION INCLUDES 10' PAVED SHOULDERS WITH 2% CROSS SLOPE.
6. 20' MEDIAN TO BE RAISED CONCRETE OR STRIPED AS DETERMINED BY COUNTY ENGINEER.



Revised	By
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH	
CHECKED BY: DAVID LEAMON, RCE	

## 135 FT OPA 6 LANES URBAN EXPRESSWAY

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

*Matthew Machado*

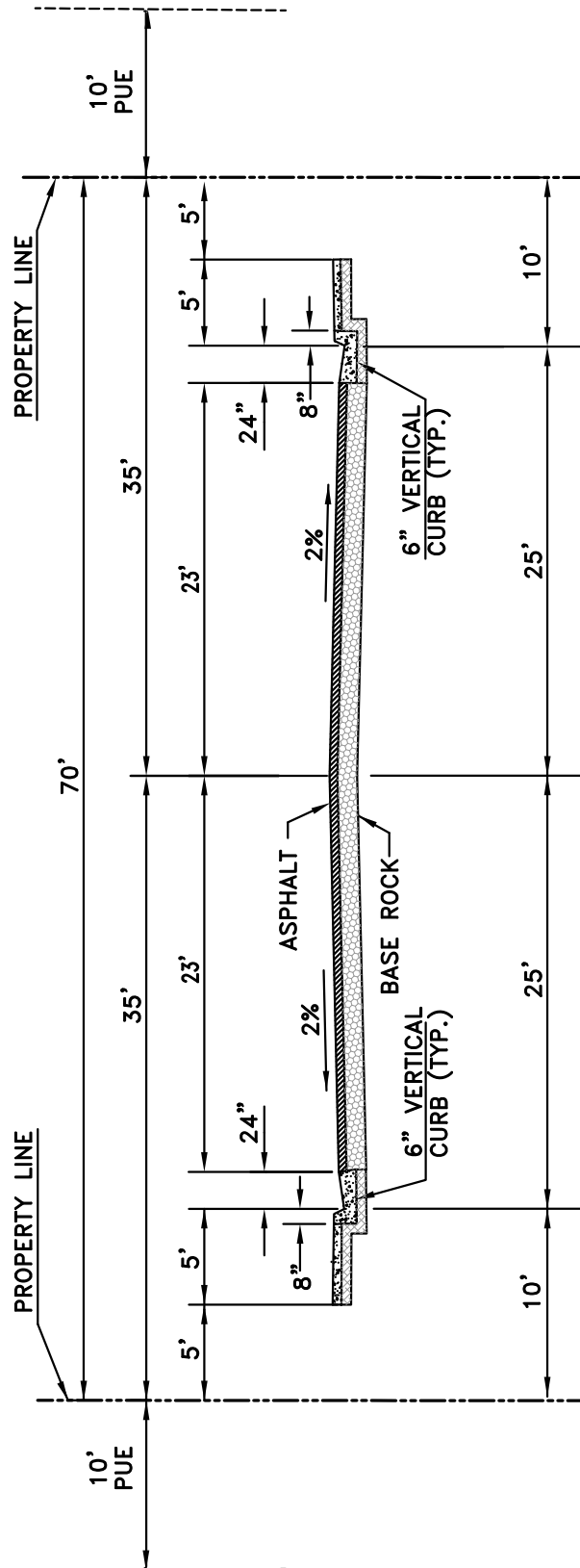
MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A8**

# 70 FT MINOR COLLECTOR (2 LANE INDUSTRIAL)



## NOTES:

1. SIDEWALK WIDTH MAY BE INCREASED TO 10 FT AT THE DISCRETION OF THE ENGINEER.
2. SIDEWALK SLOPE =  $1/4"$  PER FOOT MAX BETWEEN BACK OF CURB AND RIGHT-OF-WAY.
3. PAVEMENT CROSS SLOPE SHALL BE 2% MINIMUM ON NEW ROAD CONSTRUCTION.
4. INSTALL CONCRETE CURB PER DETAIL 3-D1.
5. INSTALL CONCRETE SIDEWALK PER DETAIL 3-D7.



Revised	By
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH	
CHECKED BY: DAVID LEAMON, RCE	

## 70 FT MINOR COLLECTOR 2 LANE INDUSTRIAL

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

*Matthew Machado*

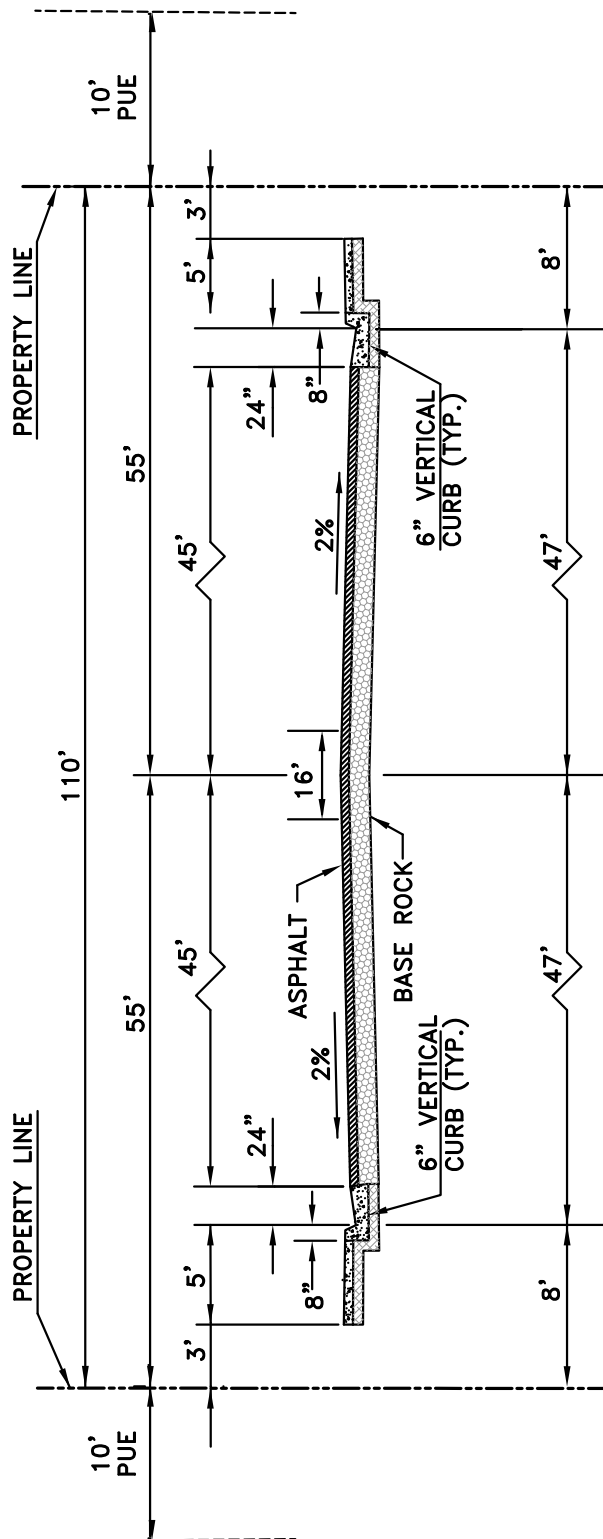
MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A9**

# 110 FT MAJOR COLLECTOR (4 LANE INDUSTRIAL)



## NOTES:

1. SIDEWALK WIDTH MAY BE INCREASED TO 8 FT AT THE DISCRETION OF THE ENGINEER.
2. SIDEWALK SLOPE =  $1/4"$  PER FOOT MAX BETWEEN BACK OF CURB AND RIGHT-OF-WAY.
3. PAVEMENT CROSS SLOPE SHALL BE 2% MINIMUM ON NEW ROAD CONSTRUCTION.
4. INSTALL CONCRETE CURB PER DETAIL 3-D1.
5. INSTALL CONCRETE SIDEWALK PER DETAIL 3-D7.
6. INSTALL 16 FT MEDIAN TO ACCOMMODATE FOR A TWO-WAY LEFT TURN LANE OR A RAISED CONCRETE MEDIAN AS DETERMINED BY COUNTY ENGINEER.



Revised	By
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH	
CHECKED BY: DAVID LEAMON, RCE	

## 110 FT MINOR COLLECTOR 4 LANE INDUSTRIAL

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

*Matthew Machado*

MATTHEW MACHADO

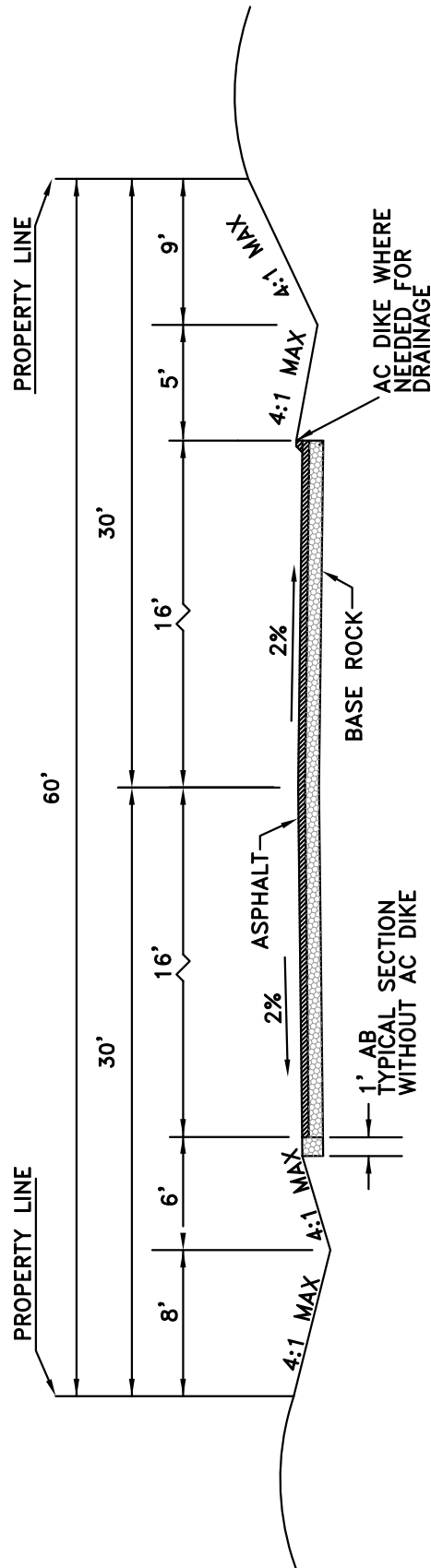
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A10**



# 60 FT LOCAL (2 LANE RURAL)



NOT TO SCALE

## NOTE:

1. PAVEMENT CROSS SLOPE SHALL BE 2.0% MINIMUM ON NEW ROAD CONSTRUCTION.
2. PAVEMENT WIDTH LESS THAN 16 FT MAY REQUIRE POSTING OF "NO PARKING" SIGNS AS DIRECTED BY ENGINEER.
3. ADDITIONAL SLOPE EASEMENTS MAY BE REQUIRED FOR ADEQUATE GRADING AND/OR DRAINAGE.
4. INSTALL AC DIKE WHERE REQUIRED FOR DRAINAGE, SEE CROSS SECTION ABOVE.
5. UNDERGROUND FRENCH DRAIN MAYBE REQUIRED IN THE SWALE AREA TO HELP CONTROL DRAINAGE AND ENHANCE SAFETY.



	Revised	By
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH		
CHECKED BY: DAVID LEAMON, RCE		

## 60 FT LOCAL 2 LANE RURAL

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

*Matthew Machado*

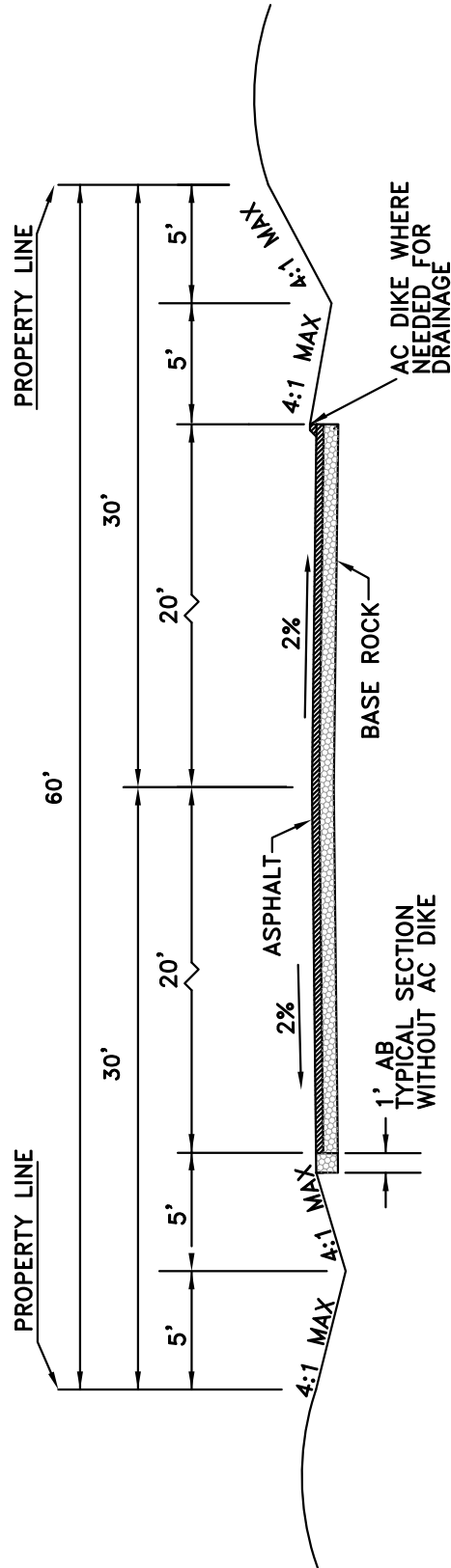
MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A11**

# 60 FT MINOR COLLECTOR (2 LANE RURAL)



NOT TO SCALE

## NOTE:

1. PAVEMENT CROSS SLOPE SHALL BE 2.0% MINIMUM ON NEW ROAD CONSTRUCTION.
2. PAVEMENT WIDTH LESS THAN 20 FT MAY REQUIRE POSTING OF "NO PARKING" SIGNS AS DIRECTED BY ENGINEER.
3. ADDITIONAL SLOPE EASEMENTS MAY BE REQUIRED FOR ADEQUATE GRADING AND/OR DRAINAGE.
4. INSTALL AC DIKE WHERE REQUIRED FOR DRAINAGE, SEE CROSS SECTION ABOVE.
5. UNDERGROUND FRENCH DRAIN MAYBE REQUIRED IN THE SWALE AREA TO HELP CONTROL DRAINAGE AND ENHANCE SAFETY.



Revised	By
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH	
CHECKED BY: DAVID LEAMON, RCE	

## 60 FT MINOR COLLECTOR 2 LANE RURAL

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

*Matthew Machado*

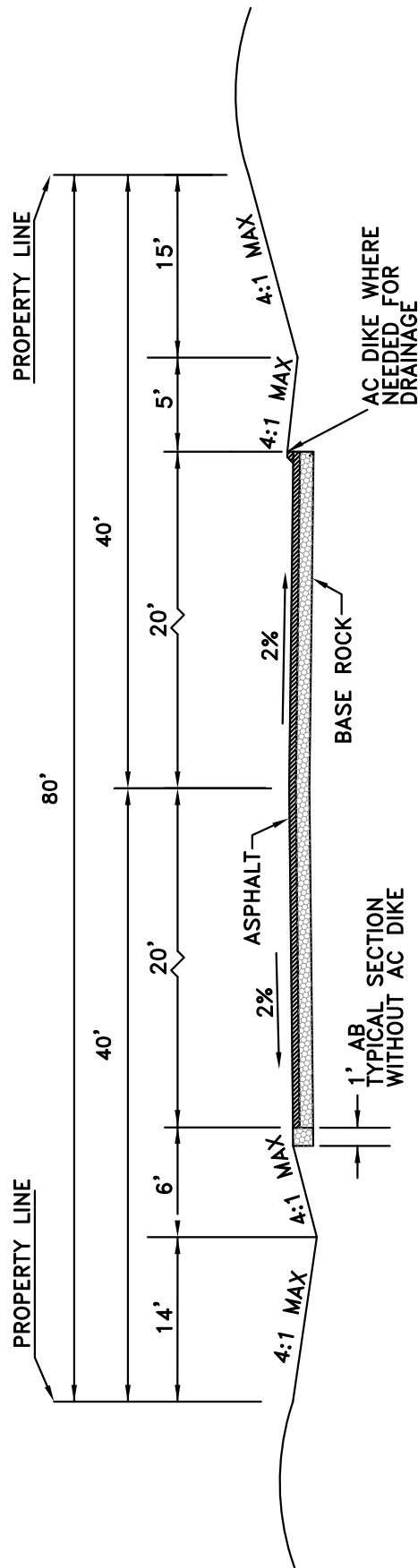
MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A12**

# 80 FT MAJOR COLLECTOR (2 LANE RURAL)



NOT TO SCALE

## NOTE:

1. PAVEMENT CROSS SLOPE SHALL BE 2.0% MINIMUM ON NEW ROAD CONSTRUCTION.
2. PAVEMENT WIDTH LESS THAN 20 FT MAY REQUIRE POSTING OF "NO PARKING" SIGNS AS DIRECTED BY ENGINEER.
3. ADDITIONAL SLOPE EASEMENTS MAY BE REQUIRED FOR ADEQUATE GRADING AND/OR DRAINAGE.
4. INSTALL AC DIKE WHERE REQUIRED FOR DRAINAGE, SEE CROSS SECTION ABOVE.
5. UNDERGROUND FRENCH DRAIN MAYBE REQUIRED IN THE SWALE AREA TO HELP CONTROL DRAINAGE AND ENHANCE SAFETY.



Revised	By
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH	
CHECKED BY: DAVID LEAMON, RCE	

## 80 FT MAJOR COLLECTOR 2 LANE RURAL

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

*Matthew Machado*

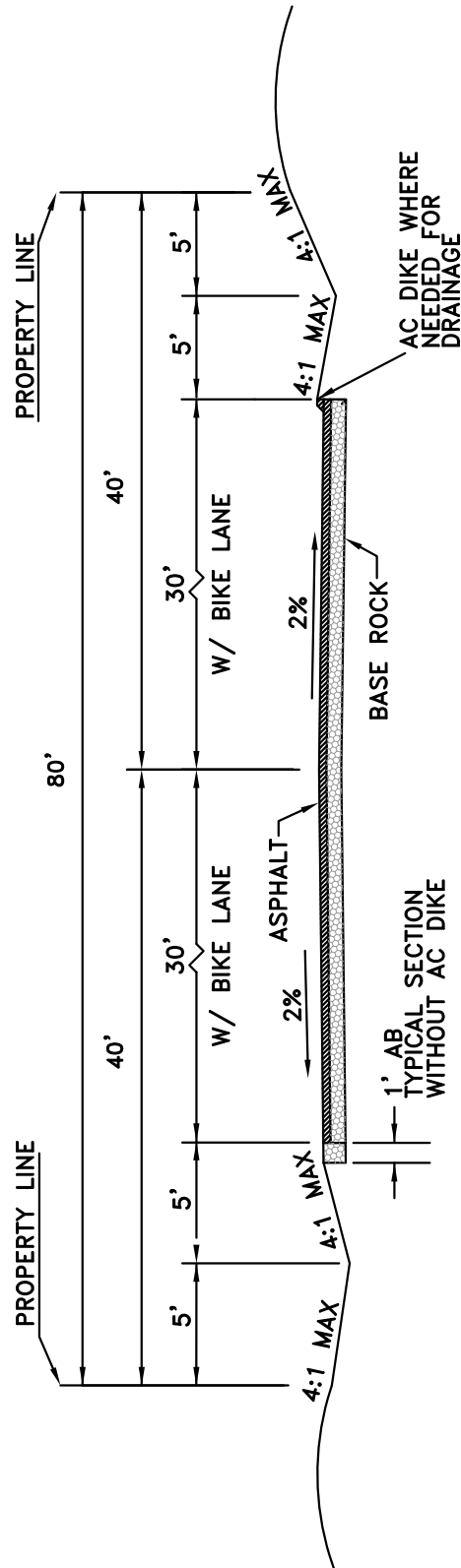
MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A13**

# 80 FT MAJOR COLLECTOR (4 LANE RURAL)



NOT TO SCALE

## NOTE:

1. PAVEMENT CROSS SLOPE SHALL BE 2.0% MINIMUM ON NEW ROAD CONSTRUCTION.
2. PAVEMENT WIDTH LESS THAN 16 FT MAY REQUIRE POSTING OF "NO PARKING" SIGNS AS DIRECTED BY ENGINEER.
3. ADDITIONAL SLOPE EASEMENTS MAY BE REQUIRED FOR ADEQUATE GRADING AND/OR DRAINAGE.
4. INSTALL AC DIKE WHERE REQUIRED FOR DRAINAGE, SEE CROSS SECTION ABOVE.
5. UNDERGROUND FRENCH DRAIN MAYBE REQUIRED IN THE SWALE AREA TO HELP CONTROL DRAINAGE AND ENHANCE SAFETY.



	Revised	By
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH		
CHECKED BY: DAVID LEAMON, RCE		

## 80 FT MAJOR COLLECTOR 4 LANE RURAL

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

*Matthew Machado*

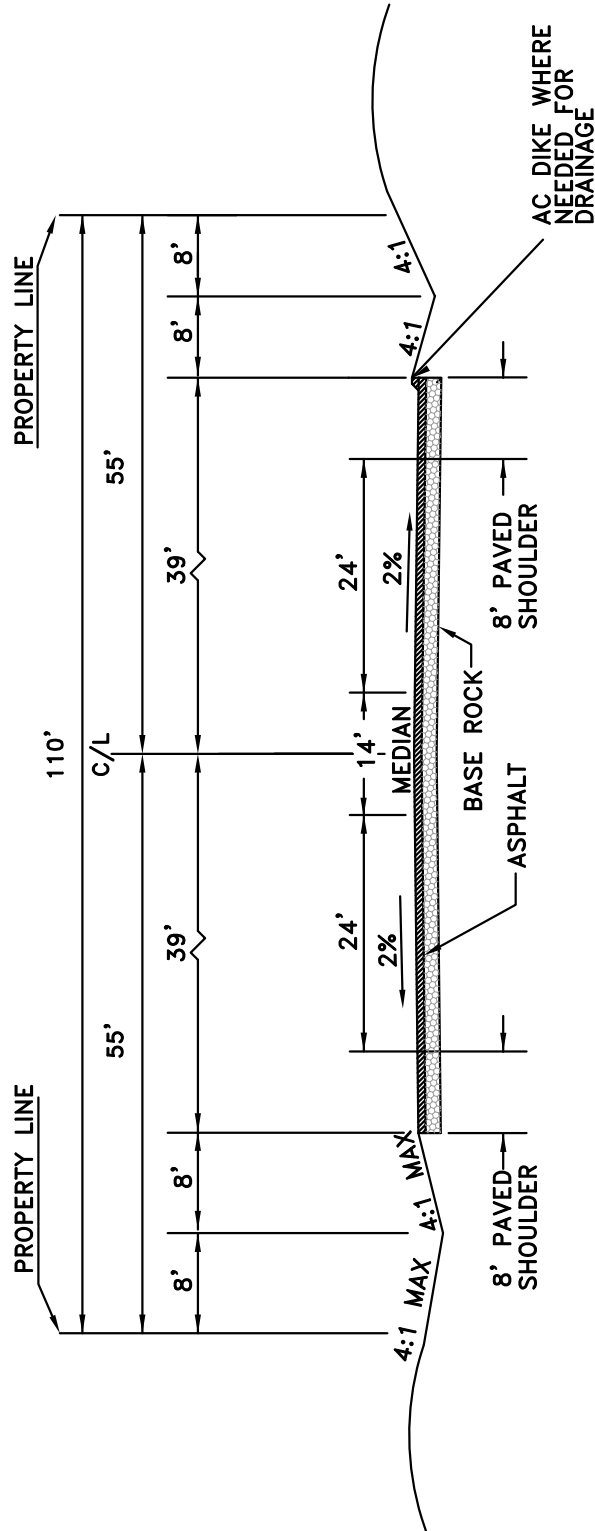
MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A14**

# 110 FT MINOR ARTERIAL (4 LANE RURAL)



NOT TO SCALE

## NOTE:

1. PROVIDE MINIMUM 8 FT PAVED SHOULDER.
2. PAVEMENT CROSS SLOPE SHALL BE 2.0% MINIMUM ON NEW ROAD CONSTRUCTION.
3. ADDITIONAL SLOPE EASEMENTS MAY BE REQUIRED FOR ADEQUATE DRAINAGE.
4. INSTALL AC DIKE WHERE REQUIRED FOR DRAINAGE, SEE CROSS SECTION ABOVE.
5. MEDIAN TO BE RAISED CONCRETE OR STRIPED AS DETERMINED BY COUNTY ENGINEER.
6. UNDERGROUND FRENCH DRAIN MAYBE REQUIRED IN THE SWALE AREA TO HELP CONTROL GRADING AND/OR DRAINAGE.



Revised	By
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH	
CHECKED BY: DAVID LEAMON, RCE	

## 110 FT MINOR ARTERIAL 4 LANE RURAL

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

*Matthew Machado*

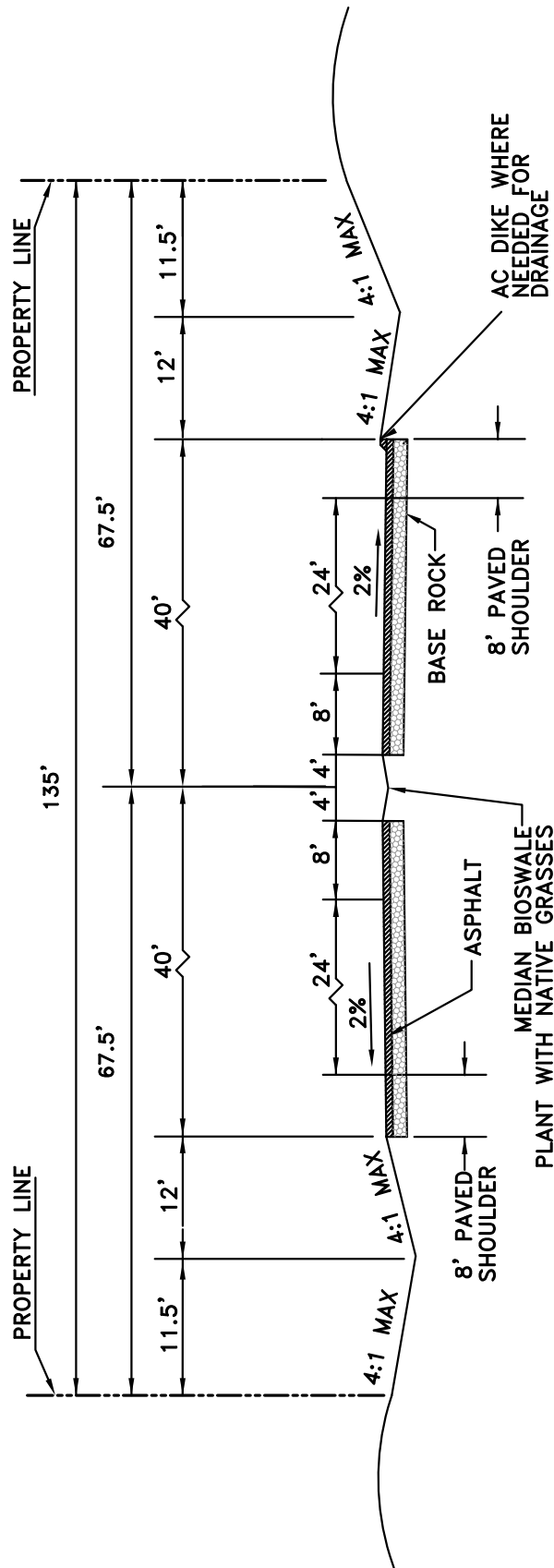
MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A15**

# 135 FT OTHER PRINCIPAL ARTERIAL (4 LANE RURAL EXPRESSWAY)



NOT TO SCALE

## NOTE:

1. PROVIDE MINIMUM 8 FT PAVED SHOULDER.
2. PAVEMENT CROSS SLOPE SHALL BE 2.0% MINIMUM ON NEW ROAD CONSTRUCTION.
3. ADDITIONAL SLOPE EASEMENTS MAY BE REQUIRED FOR ADEQUATE GRADING AND/OR DRAINAGE.
4. INSTALL AC DIKE WHERE REQUIRED FOR DRAINAGE, SEE CROSS SECTION ABOVE.
5. DIVIDE TRAVEL LANES WITH UNPAVED MEDIAN AS SHOWN.
6. UNDERGROUND FRENCH DRAIN MAYBE REQUIRED IN THE SWALE AREA TO HELP CONTROL DRAINAGE AND ENHANCE SAFETY.



Revised	By
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH	
CHECKED BY: DAVID LEAMON, RCE	

## 135 FT OPT 4 LANE RURAL EXPRESSWAY

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

*Matthew Machado*

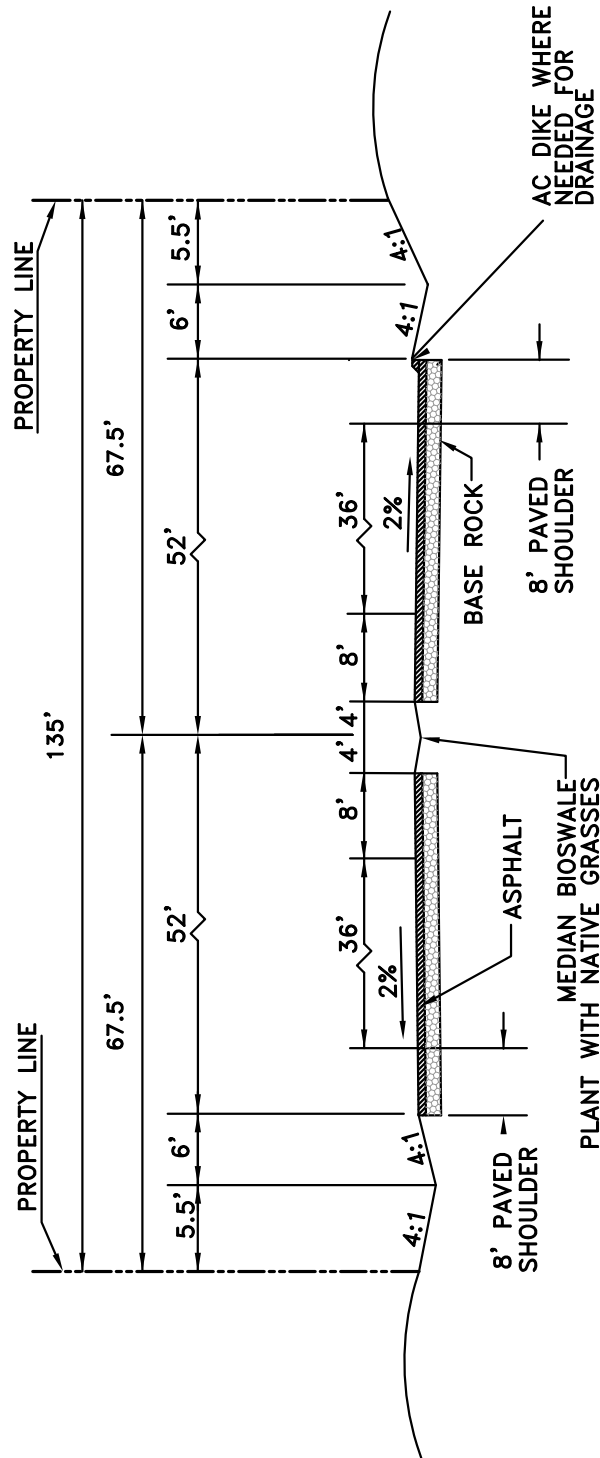
MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A16**

# 135 FT OTHER PRINCIPAL ARTERIAL (6 LANE RURAL EXPRESSWAY)



NOT TO SCALE

## NOTE:

1. PROVIDE MINIMUM 8 FT PAVED SHOULDER.
2. PAVEMENT CROSS SLOPE SHALL BE 2.0% MINIMUM ON NEW ROAD CONSTRUCTION.
3. ADDITIONAL SLOPE EASEMENTS MAY BE REQUIRED FOR ADEQUATE DRAINAGE.
4. INSTALL AC DIKE WHERE REQUIRED FOR DRAINAGE, SEE CROSS SECTION ABOVE.
5. DIVIDE TRAVEL LANES WITH UNPAVED MEDIAN AS SHOWN.
6. UNDERGROUND FRENCH DRAIN MAYBE REQUIRED IN THE SWALE AREA TO HELP CONTROL GRADING AND/OR DRAINAGE.



Revised	By
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH	
CHECKED BY: DAVID LEAMON, RCE	

## 135 FT OPT 6 LANE RURAL EXPRESSWAY

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

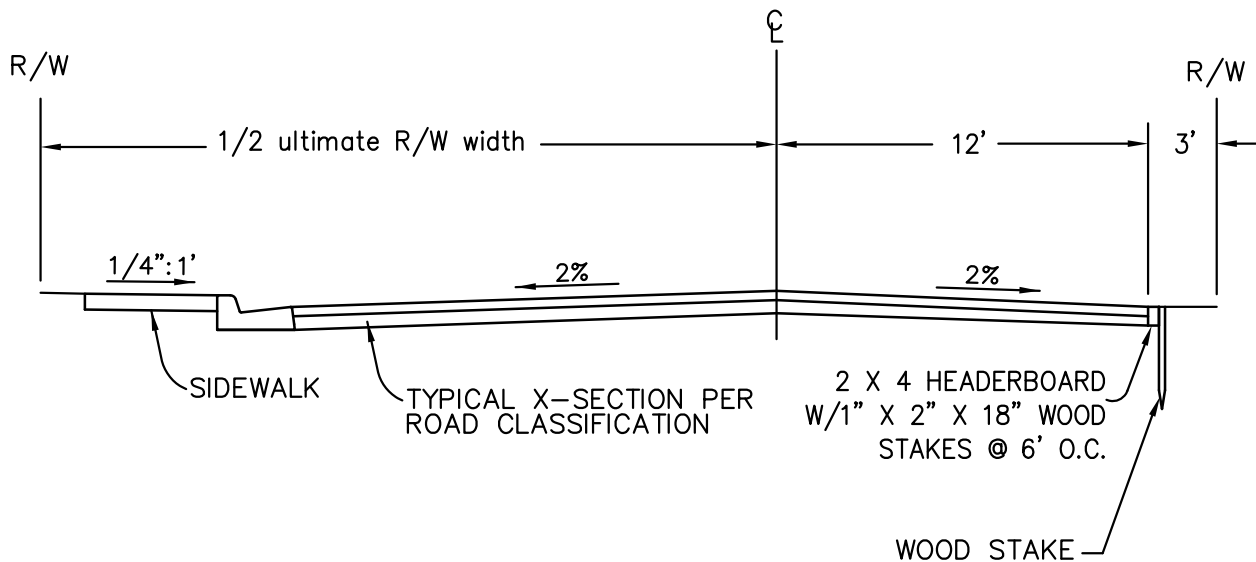
*Matthew Machado*

MATTHEW MACHADO

DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: **3-A17**



**NOTES:**

1. THE PART-WIDTH ROAD IS ONLY PERMITTED ON A FRONTAGE WHERE THE DEVELOPER DOES NOT HAVE OWNERSHIP OR CONTROL OF THE RIGHT-OF-WAY FOR FULL WIDTH ROAD IMPROVEMENTS.
2. DEVELOPER WILL BE REQUIRED TO PROVIDE DRAINAGE FACILITIES FOR THE ENTIRE ROAD SECTION. A 6 INCH ASPHALT DIKE MAY BE REQUIRED ADJACENT TO THE 12 FOOT LANE.
3. HEADERBOARD TO BE REDWOOD OR PRESSURE TREATED DOUGLAS FIR.



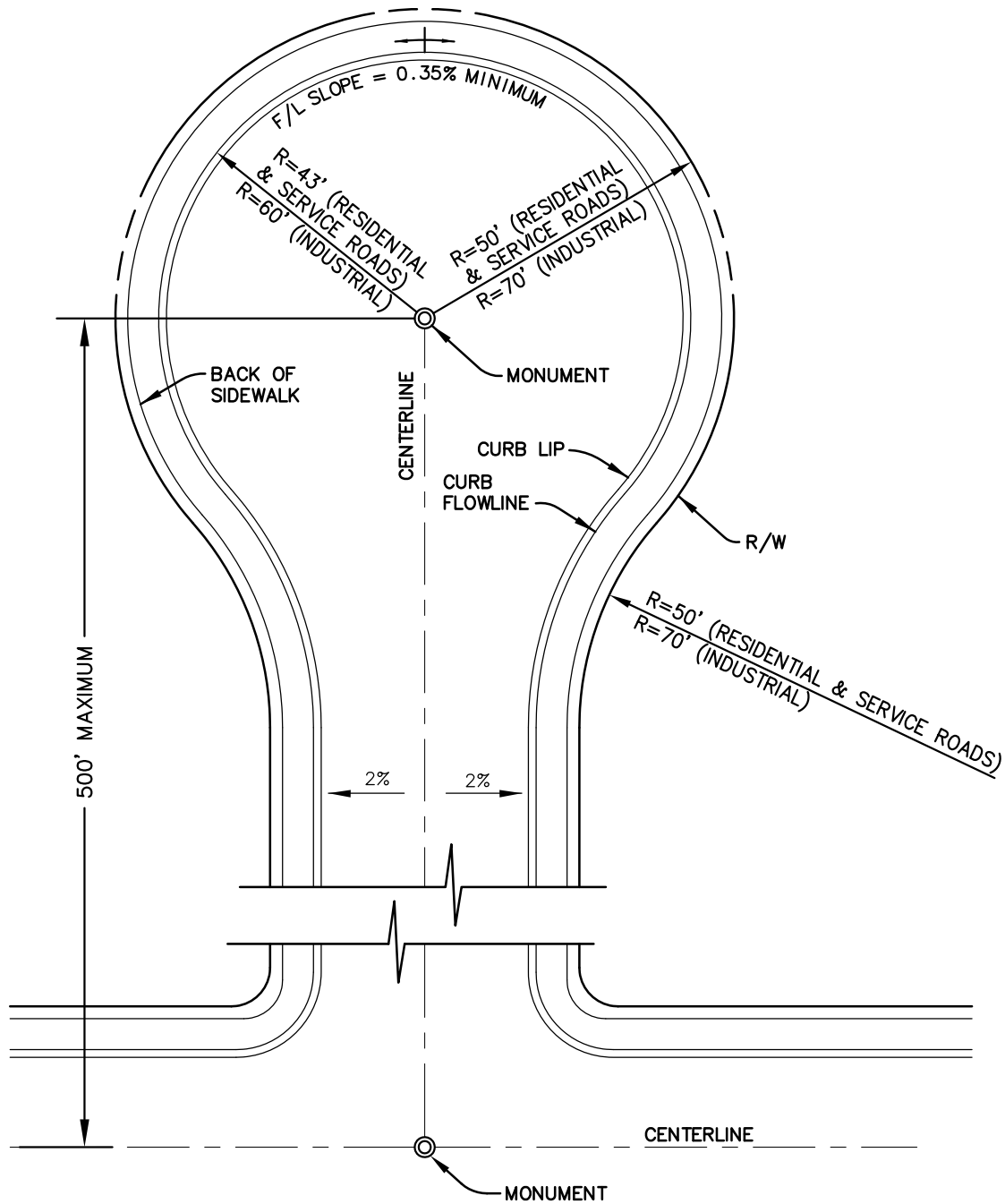
NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH CHECKED BY: DAVID LEAMON, RCE		

PART WIDTH  
ROAD SECTION

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
<i>Matthew Machado</i>
MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
DATE: JUNE 2, 2014
PLATE NO: 3-A18





NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH CHECKED BY: DAVID LEAMON, RCE		

CUL-DE-SAC

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

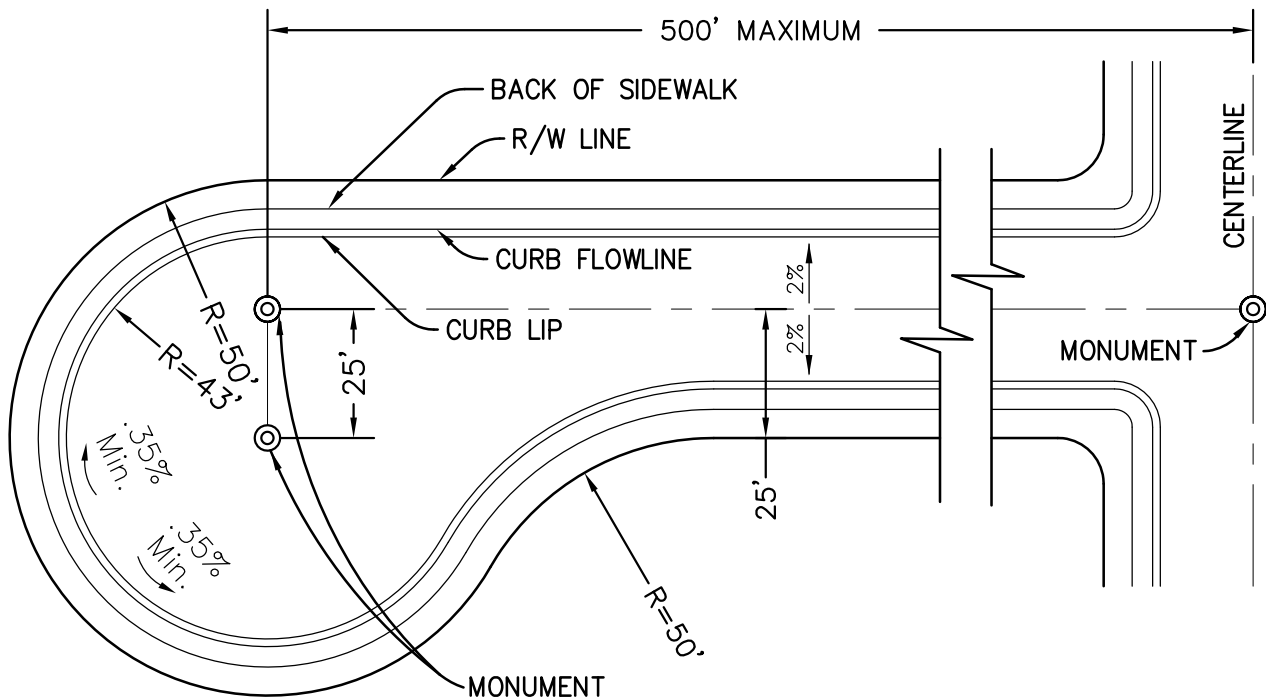
APPROVED BY:

*Matthew Machado*

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-B1



CUL-DE-SAC 50' RESIDENTIAL STREET (SEE DETAIL 3-A1)



NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH CHECKED BY: DAVID LEAMON, RCE		

OFFSET  
CUL-DE-SAC

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

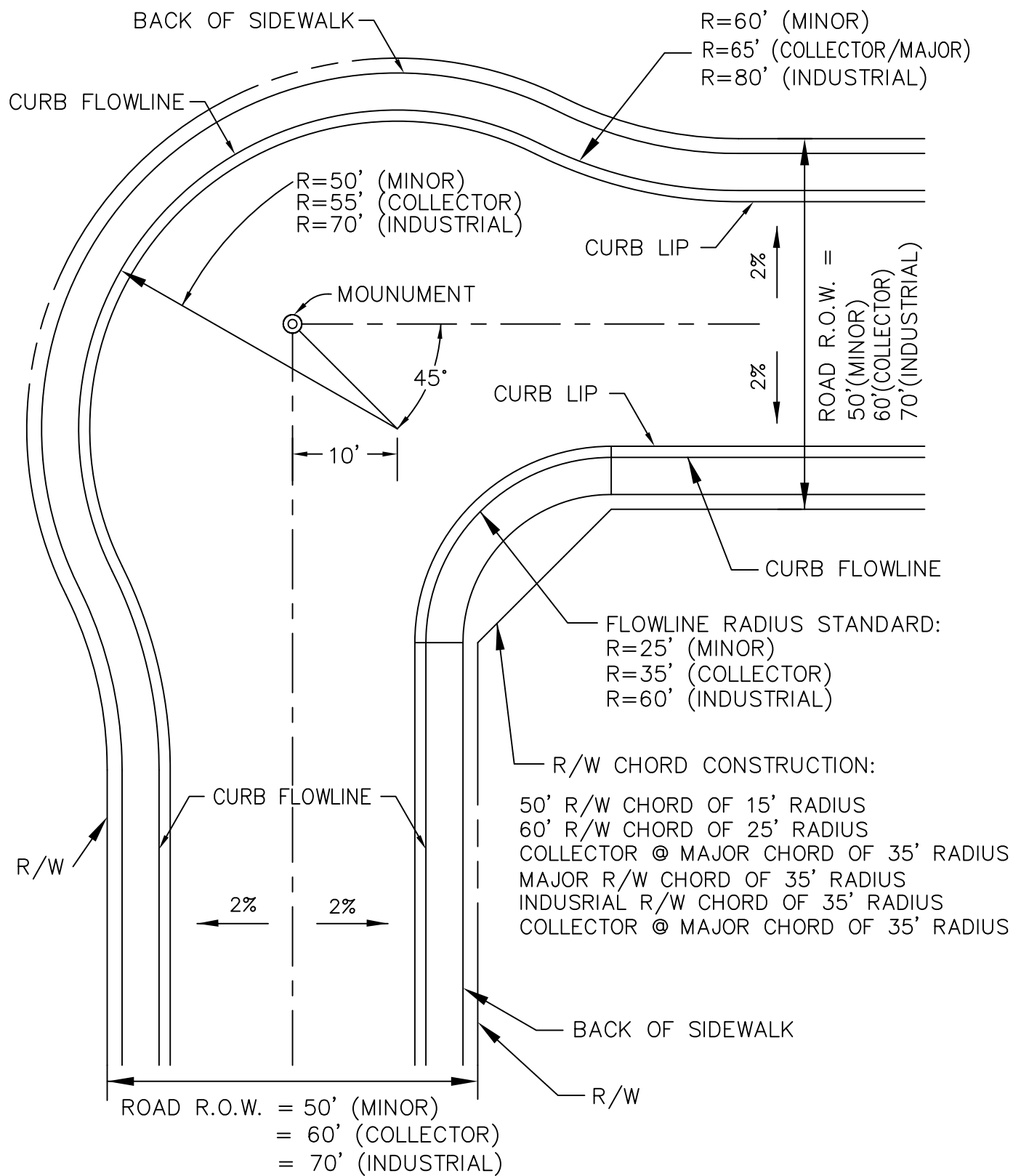
APPROVED BY:

*Matthew Machado*

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-B2

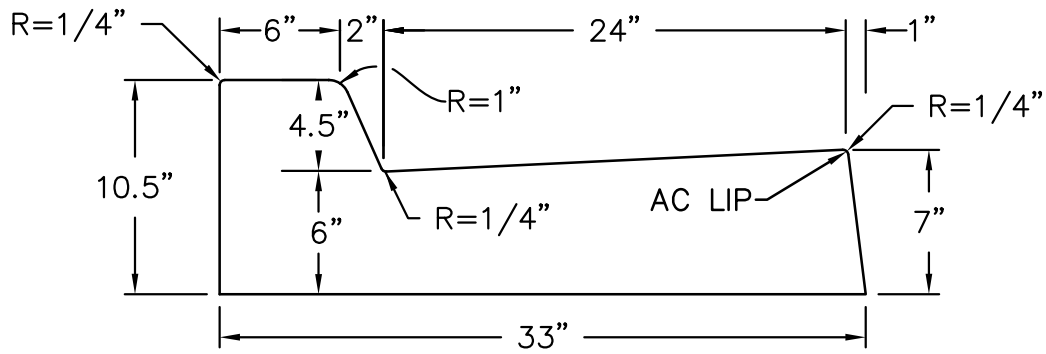


NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH CHECKED BY: DAVID LEAMON, RCE		

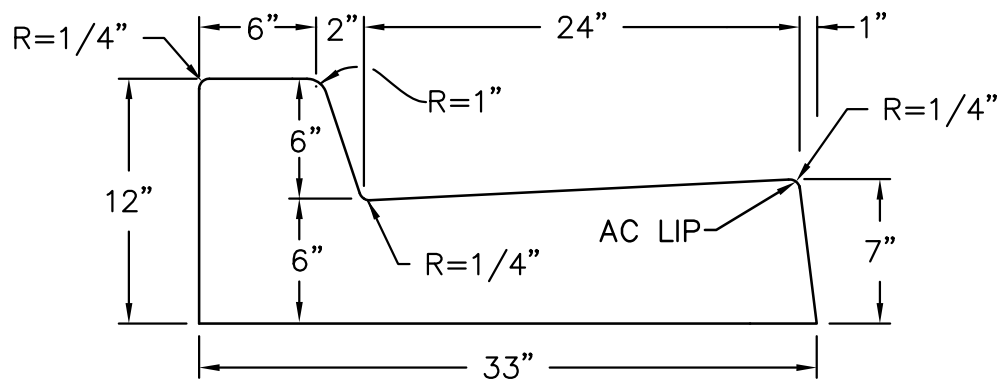
KNUCKLE

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
DATE: JUNE 2, 2014
PLATE NO: 3-C1



4-1/2" VERTICAL FACE  
ADJACENT TO MID-BLOCK CURB INLETS  
AND AT DRIVE-OVER/DRIVE-OVER RETURNS



6" VERTICAL FACE



NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH CHECKED BY: DAVID LEAMON, RCE		

## CURB & GUTTER STANDARDS

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

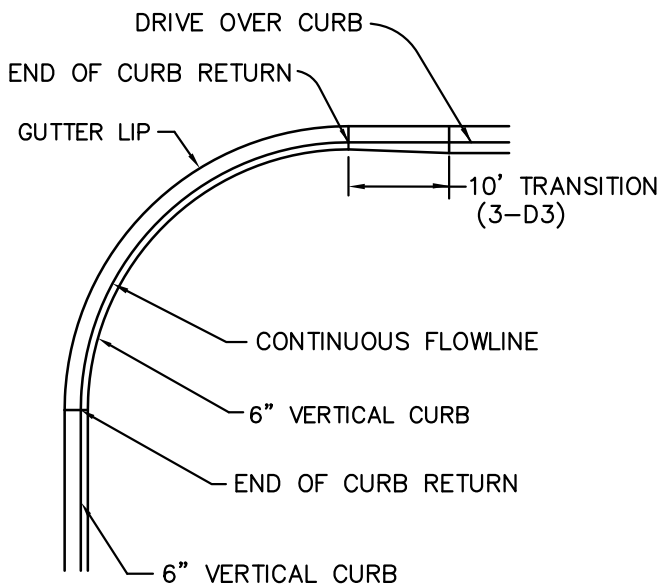
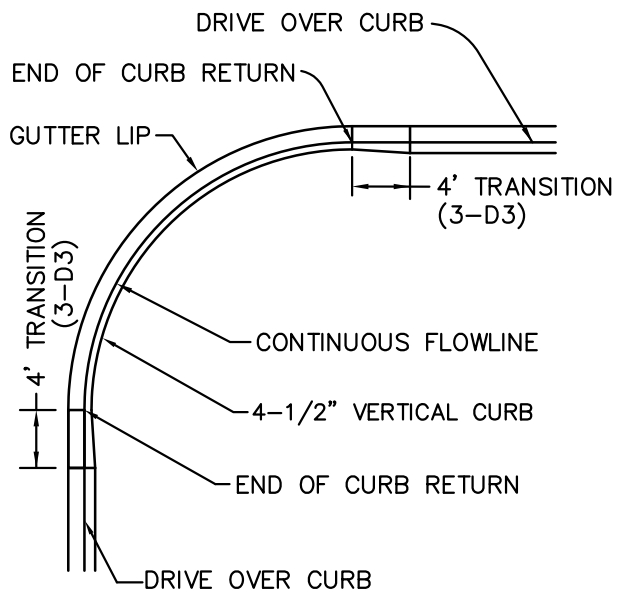
APPROVED BY:

*Matthew Machado*

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

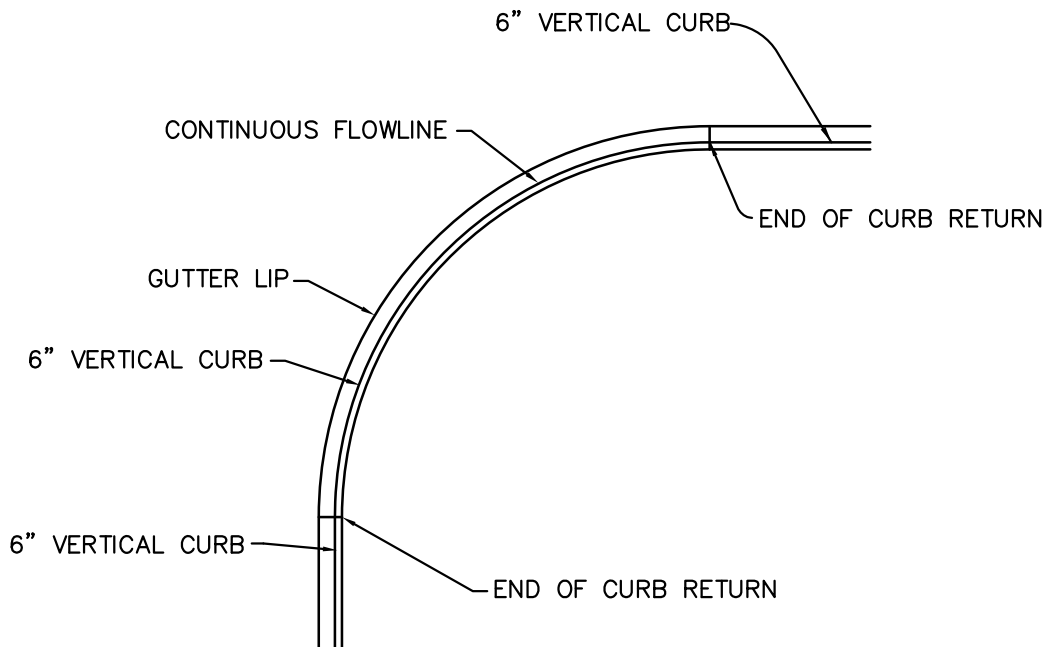
DATE: JUNE 2, 2014

PLATE NO: 3-D1



DRIVE OVER TO DRIVE OVER CURB

VERTICAL TO DRIVE OVER CURB



VERTICAL TO VERTICAL CURB



NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH		
CHECKED BY: DAVID LEAMON, RCE		

## CURB RETURN DETAILS

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

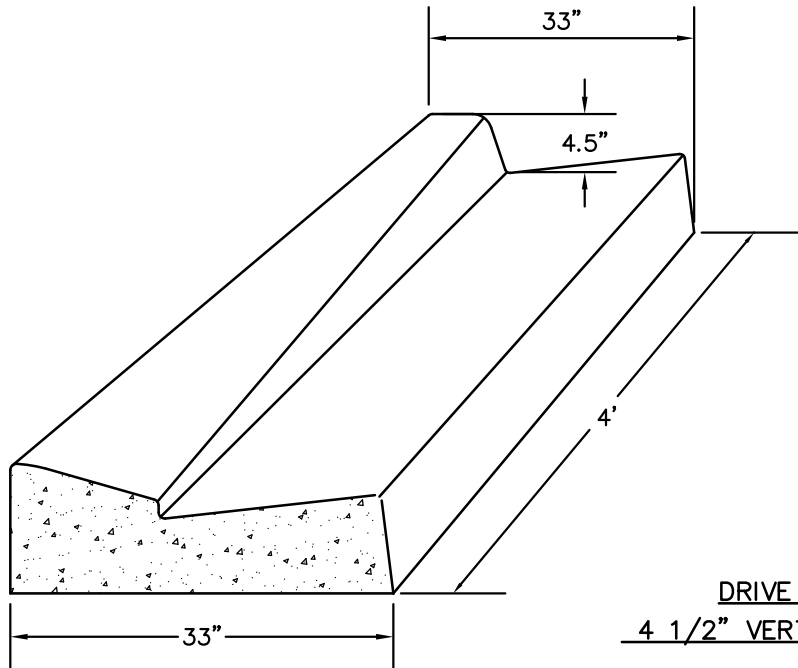
APPROVED BY:

*Matthew Machado*

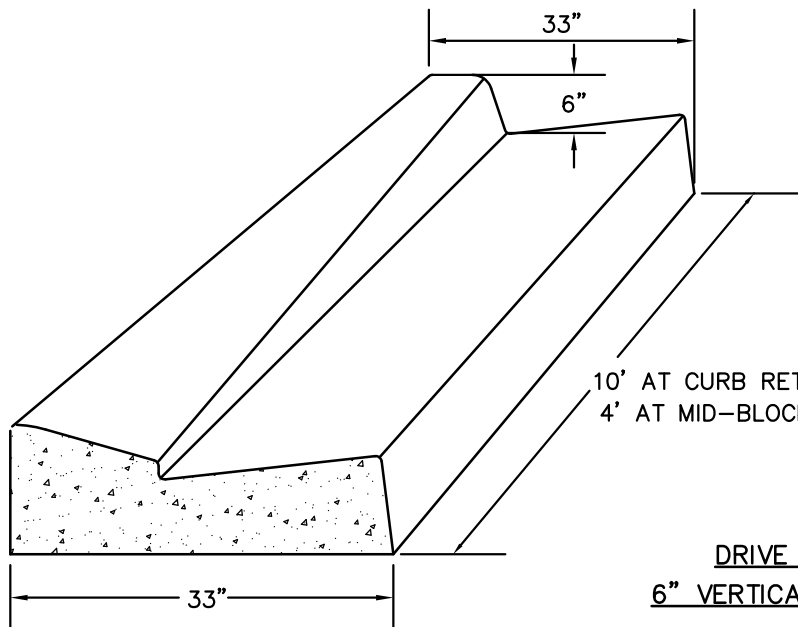
MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-D2



DRIVE OVER CURB TO  
4 1/2" VERTICAL CURB TRANSITION



10' AT CURB RETURNS  
4' AT MID-BLOCK CATCH BASINS

DRIVE OVER CURB TO  
6" VERTICAL CURB TRANSITION



No.	Revised	By
Updated by: Paul Saini		
Checked by: David Leamon		

## CURB & GUTTER TRANSITION

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

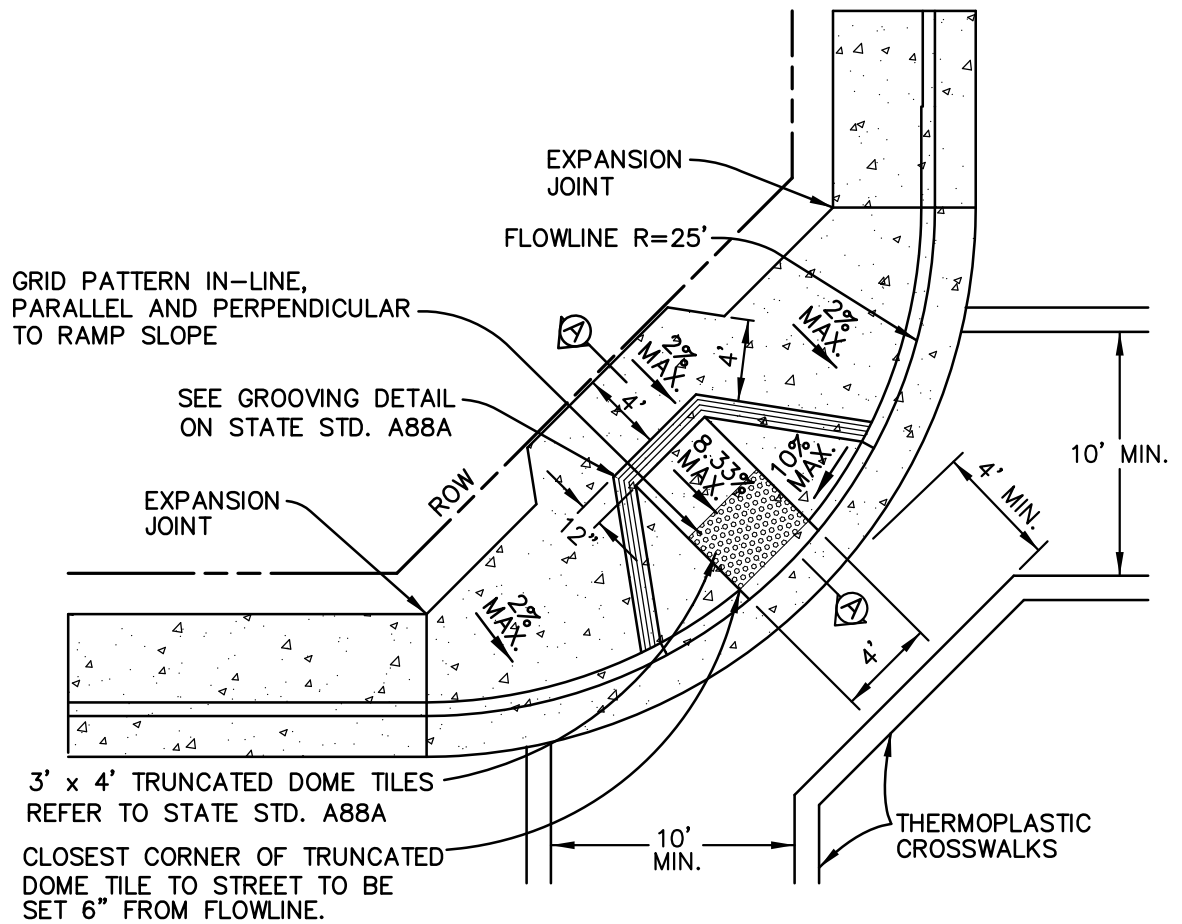
Approved by: Matt Machado

*Matt Machado*

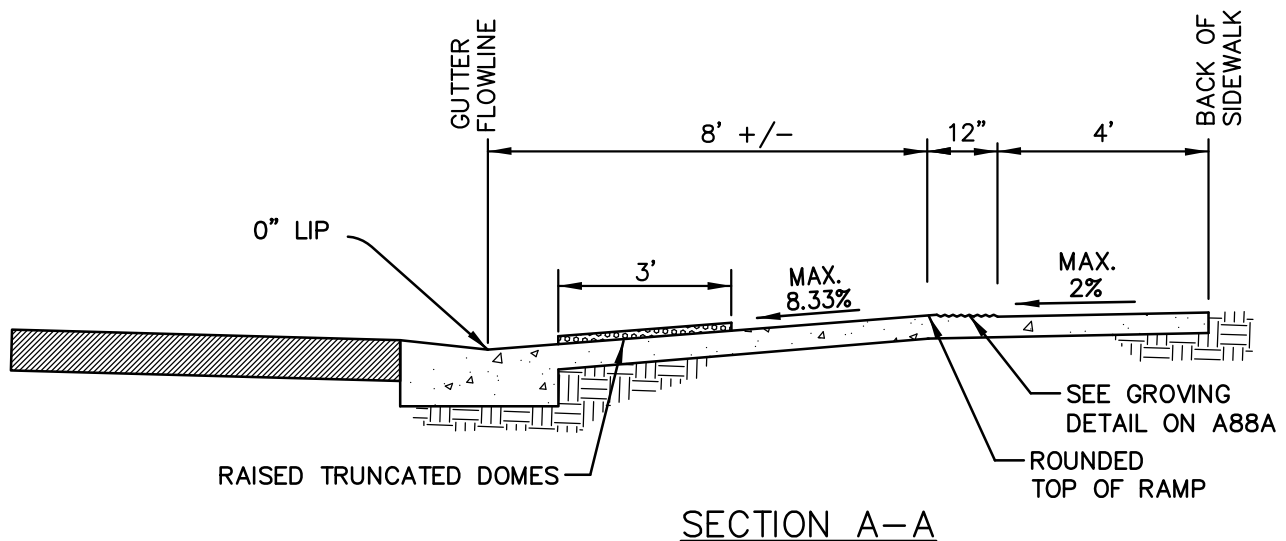
Director of Public Works

Date: January 2, 2014

PLATE NO: 3-D3



NOTE: REFER TO STATE STD. A88A FOR ADDITIONAL CURB RAMP DETAILS



NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH		
CHECKED BY: DAVID LEAMON, RCE		

## CURB RAMP AT 25' RADIUS CURB RETURN

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

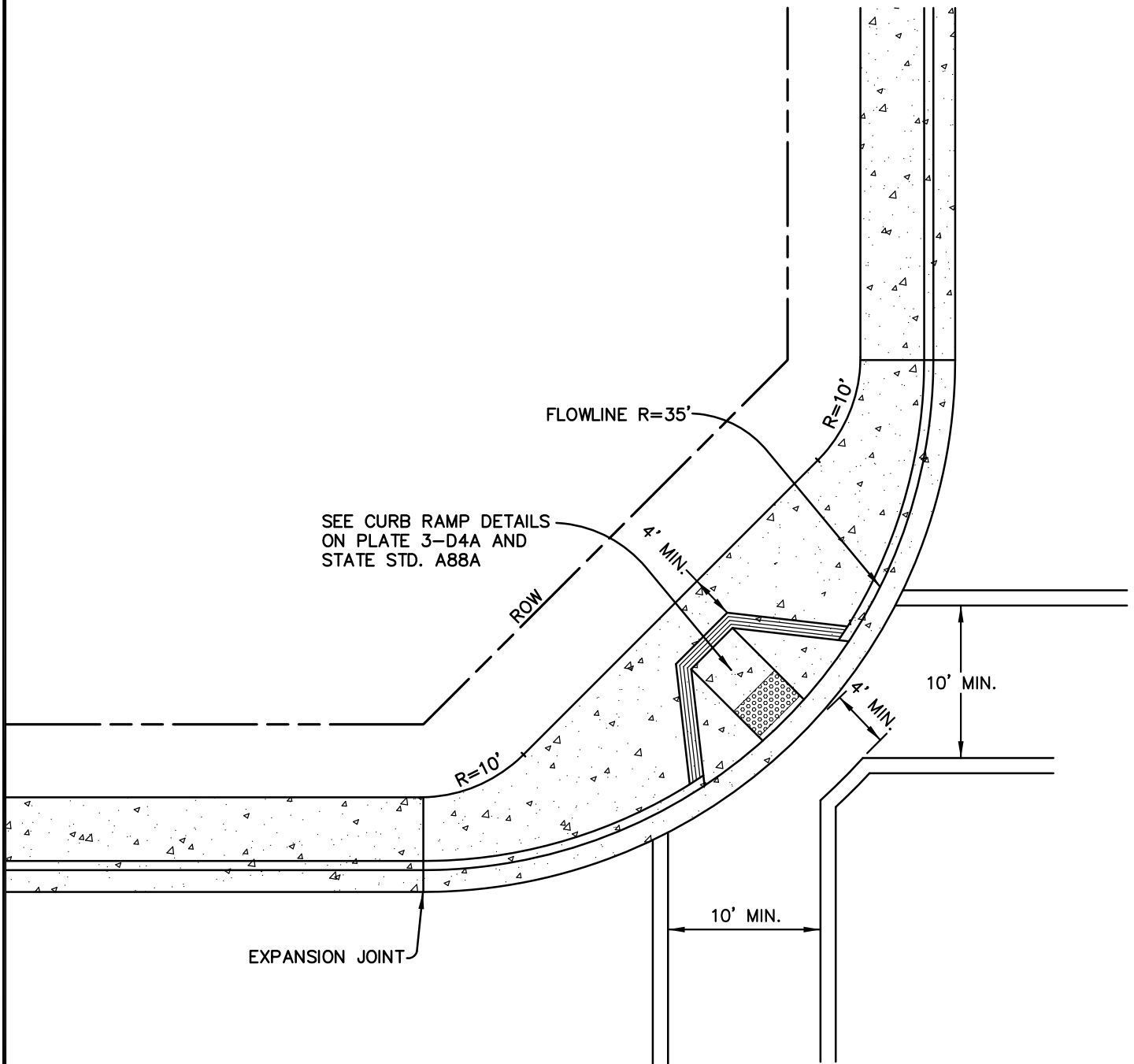
APPROVED BY:

*Matthew Machado*

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-D4A



NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH CHECKED BY: DAVID LEAMON, RCE		

## CURB RAMP AT 35' RADIUS CURB RETURN

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

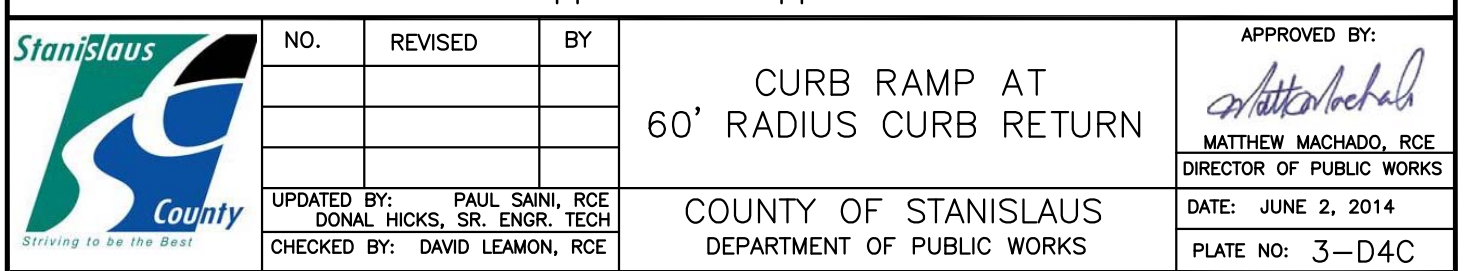
*Matthew Machado*

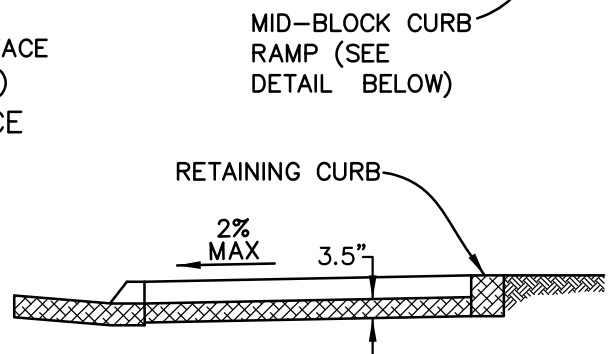
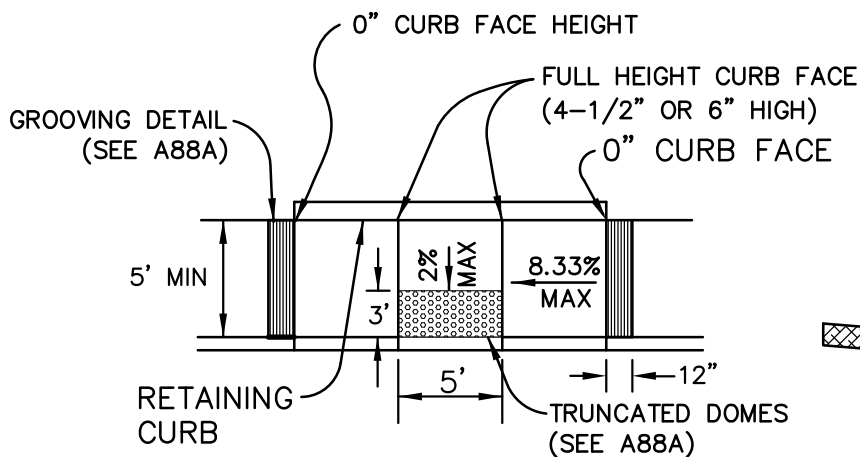
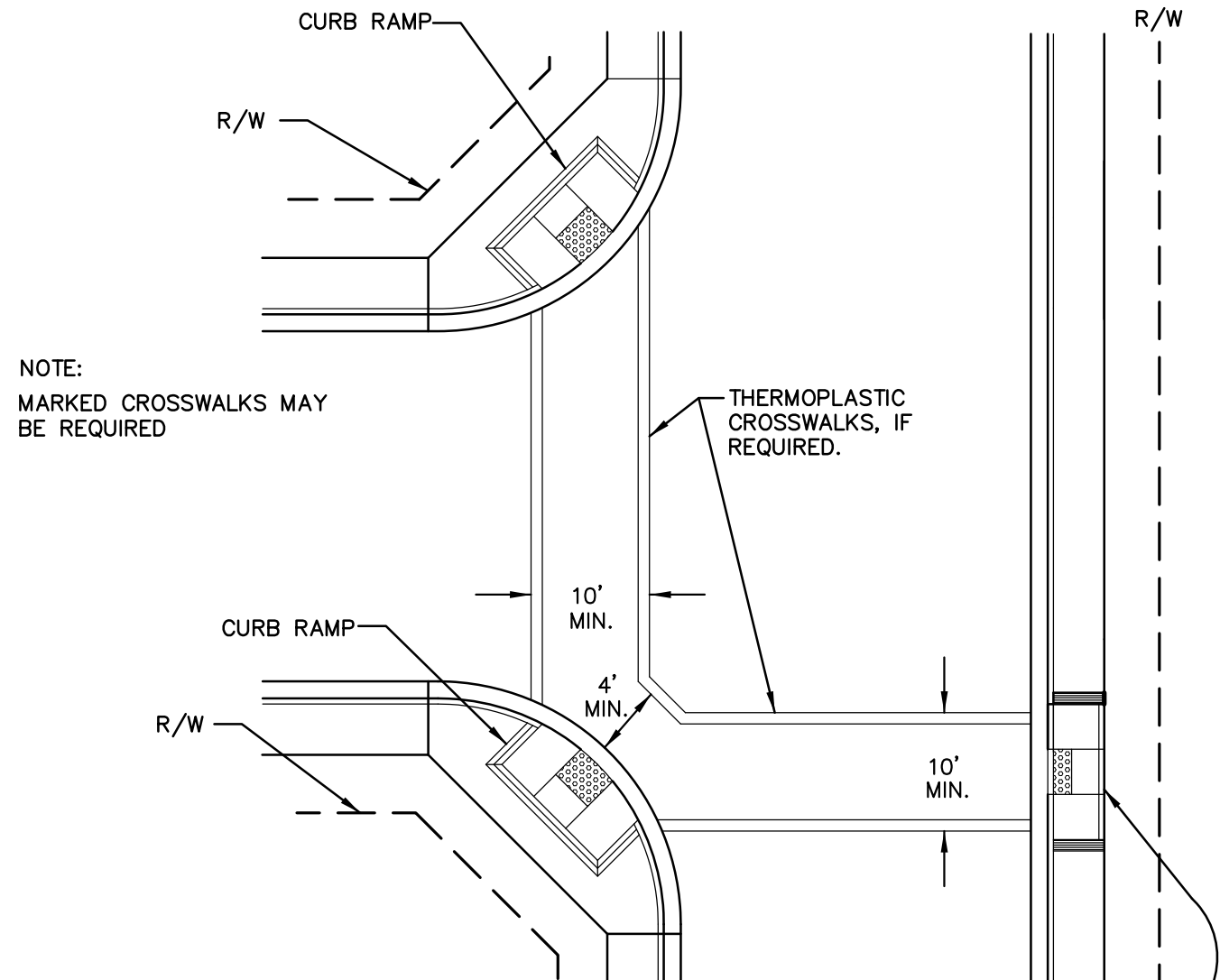
MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-D4B







MID-BLOCK RAMP PLAN  
(SEE STATE ATD. A88A)

MID-BLOCK RAMP SECTION



NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH		
CHECKED BY: DAVID LEAMON, RCE		

## CURB RAMPS AT 3-WAY INTERSECTIONS

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

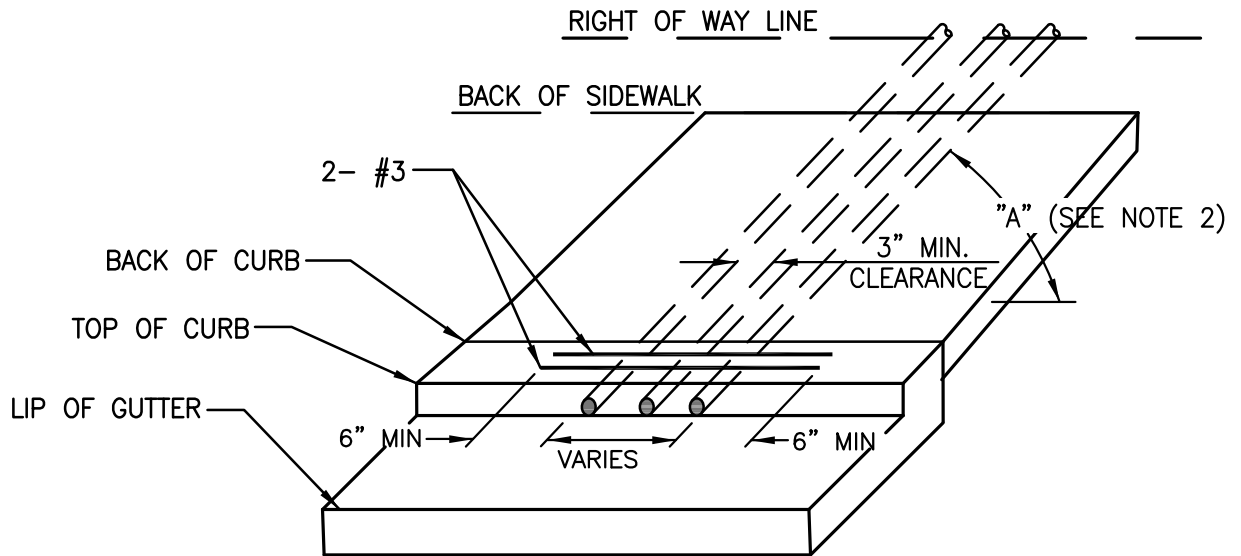
APPROVED BY:

*Matthew Machado*

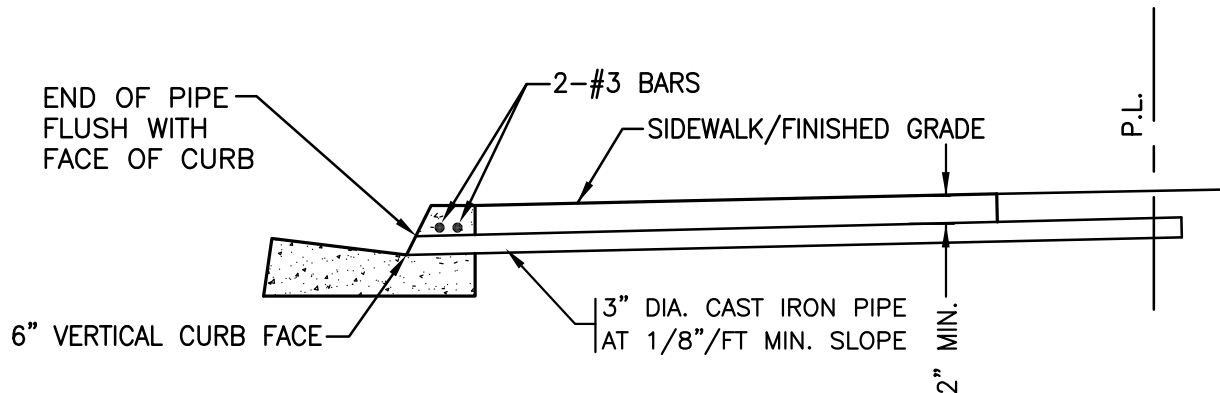
MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-D5



ISOMETRIC



SECTION

NOTES:

1. PIPES WILL NOT BE MAINTAINED BY THE COUNTY.
2. ANGLE "A" = 90 DEGREES WITH CURB, UNLESS APPROVED OTHERWISE.
3. THE NUMBER OF PIPES AT ANY LOCATION SHALL NOT EXCEED 4.

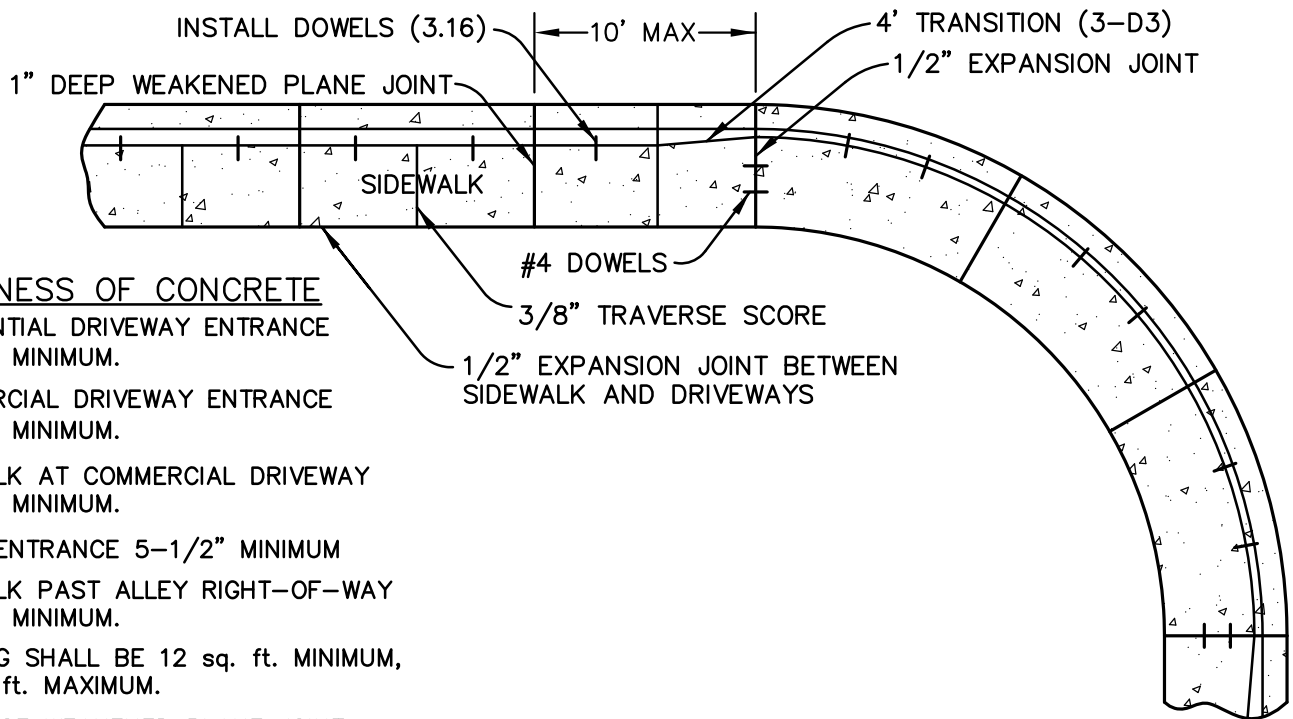


NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH		
CHECKED BY: DAVID LEAMON, RCE		

CURB DRAIN

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
<i>Matthew Machado</i>
MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
DATE: JUNE 2, 2014
PLATE NO: 3-D6



### THICKNESS OF CONCRETE

RESIDENTIAL DRIVEWAY ENTRANCE  
5-1/2" MINIMUM.

COMMERCIAL DRIVEWAY ENTRANCE  
7-1/2" MINIMUM.

SIDEWALK AT COMMERCIAL DRIVEWAY  
5-1/2" MINIMUM.

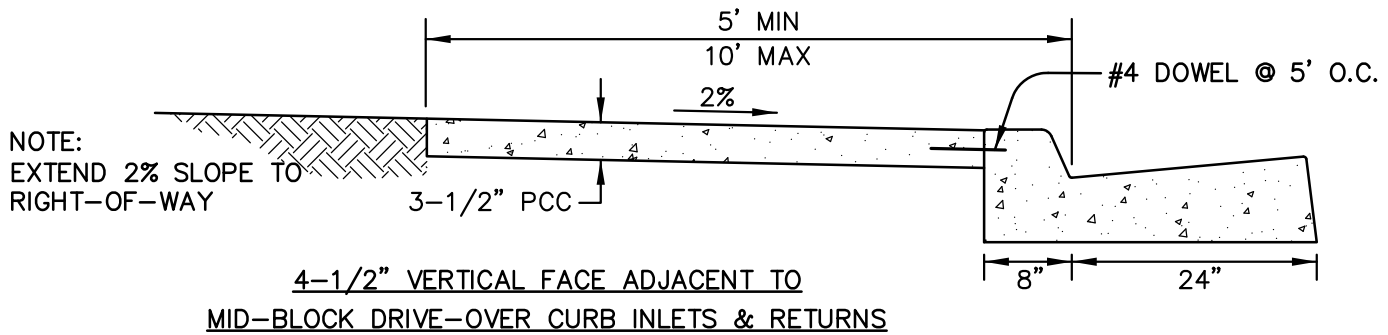
ALLEY ENTRANCE 5-1/2" MINIMUM

SIDEWALK PAST ALLEY RIGHT-OF-WAY  
5-1/2" MINIMUM.

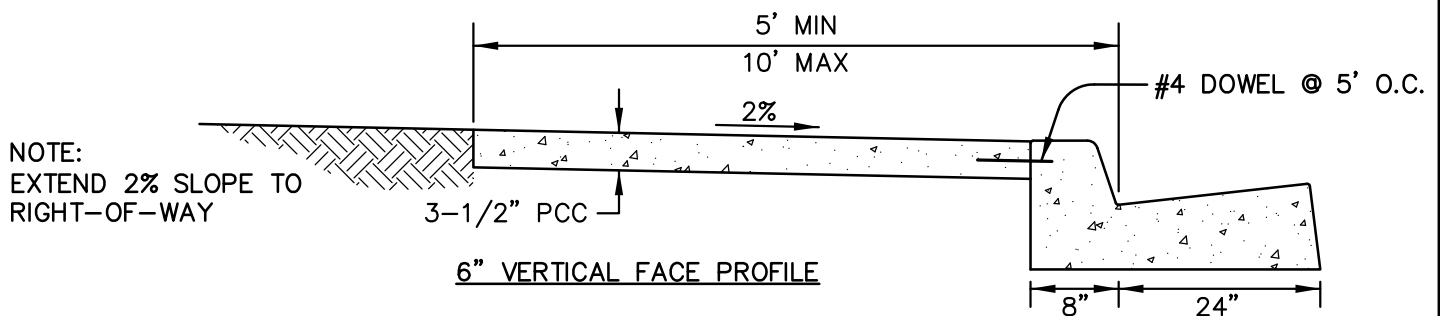
SCORING SHALL BE 12 sq. ft. MINIMUM,  
20 sq. ft. MAXIMUM.

DEPTH OF WEAKENED PLANE JOINT  
SHALL BE THE THICKNESS OF CONCRETE SECTION.

PCC = PORTLAND CEMENT CONCRETE



NOTE:  
EXTEND 2% SLOPE TO  
RIGHT-OF-WAY



NOTE:  
EXTEND 2% SLOPE TO  
RIGHT-OF-WAY



NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH		
CHECKED BY: DAVID LEAMON, RCE		

## SIDEWALK STANDARDS

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

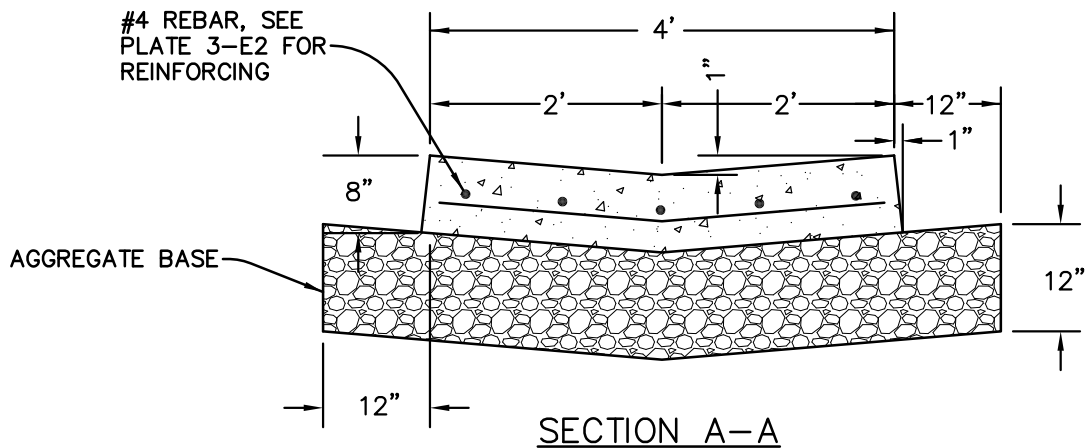
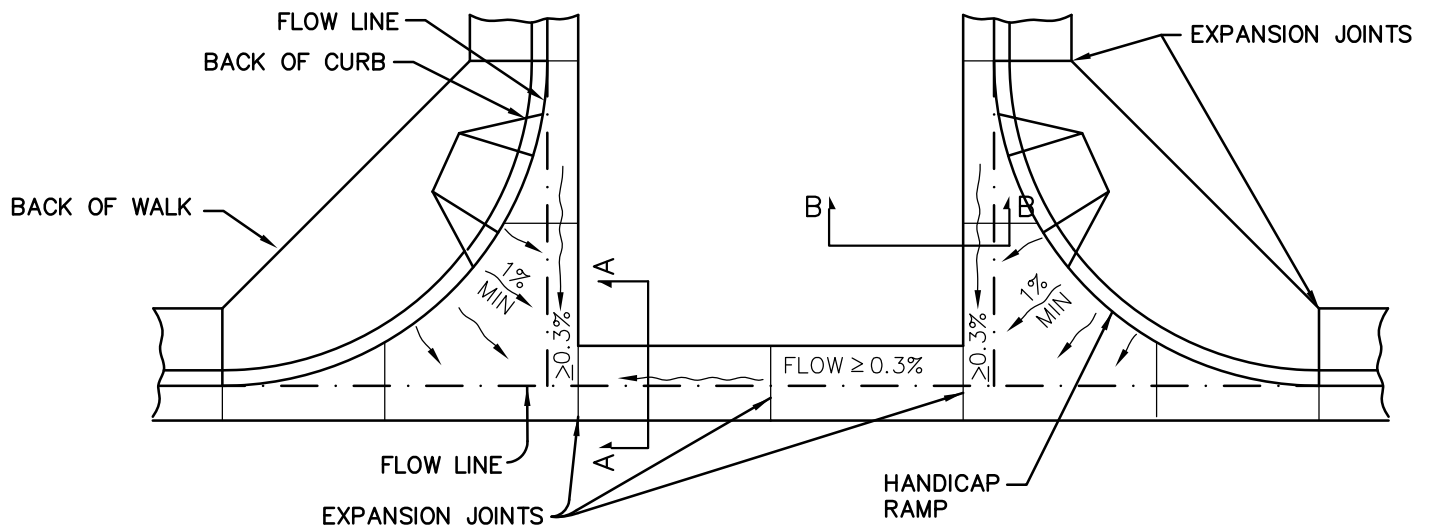
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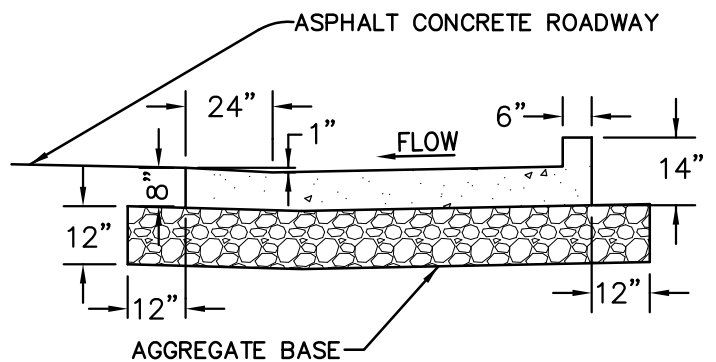
DATE: JUNE 2, 2014

PLATE NO: 3-D7



**NOTES:**

1. ALL CONCRETE TO BE CLASS "A" UNLESS OTHERWISE APPROVED.
2. REFER TO PLATE 3-E2 FOR SPECIFICATIONS ON REINFORCEMENT.
3. THIS CONSTRUCTION PERMITTED ONLY WITH CROSS SLOPE OF INTERSECTION  $0.3\%$  (MIN) AND ONLY WITH APPROVAL OF THE ENGINEER.
4. A EXPANSION JOINT IS REQUIRED AT THE CENTERLINE OF THE STREET.



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**ROADWAY INTERSECTION  
VALLEY GUTTER**

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

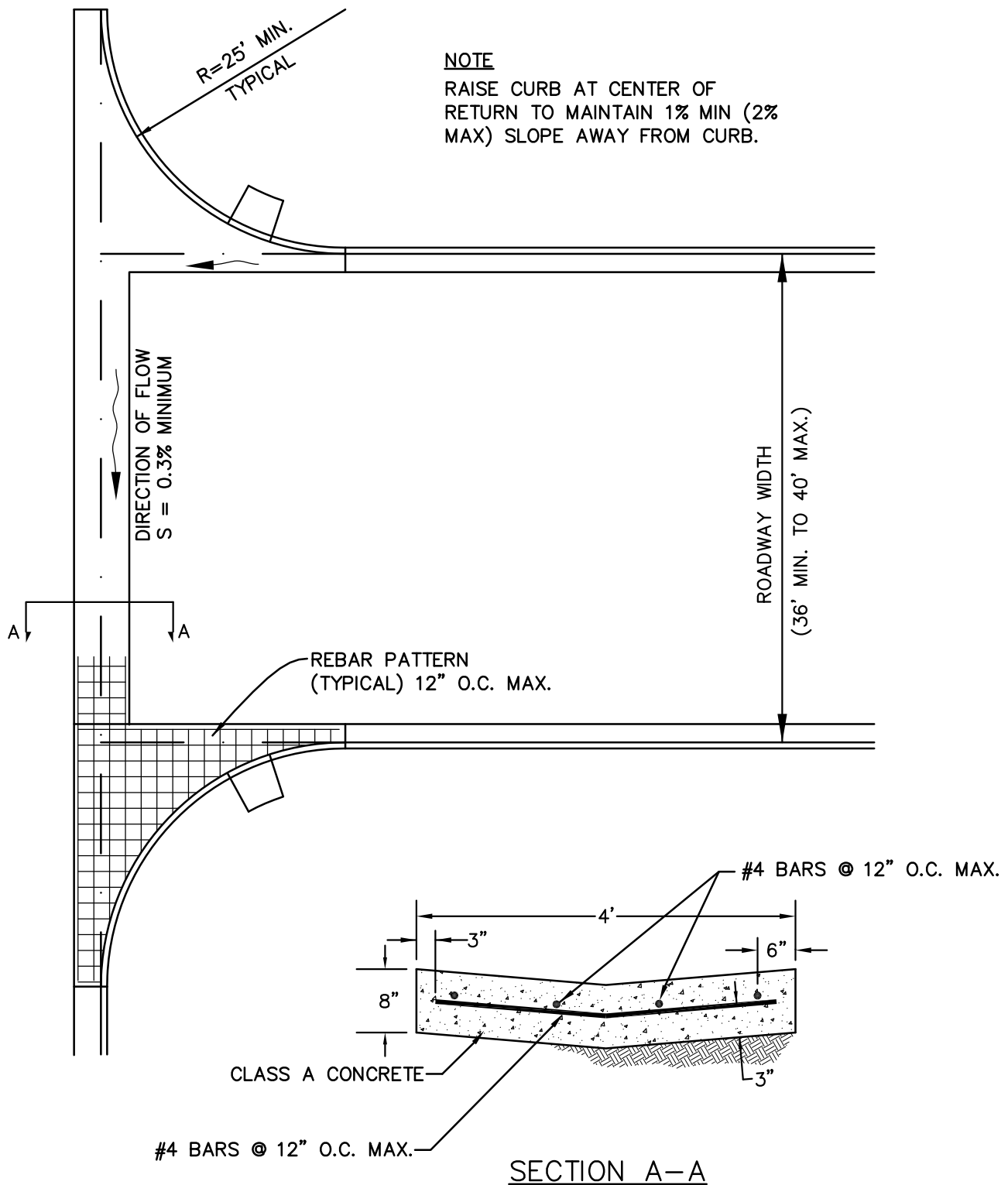
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## REINFORCEMENT FOR VALLEY GUTTER

COUNTY OF STANISLAUS  
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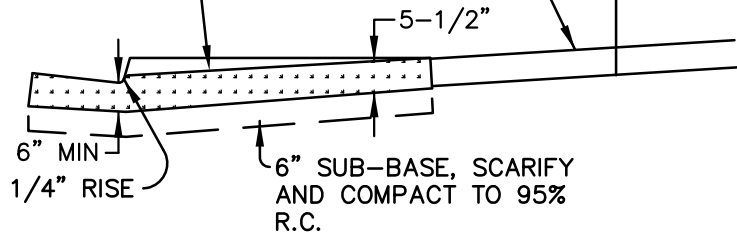
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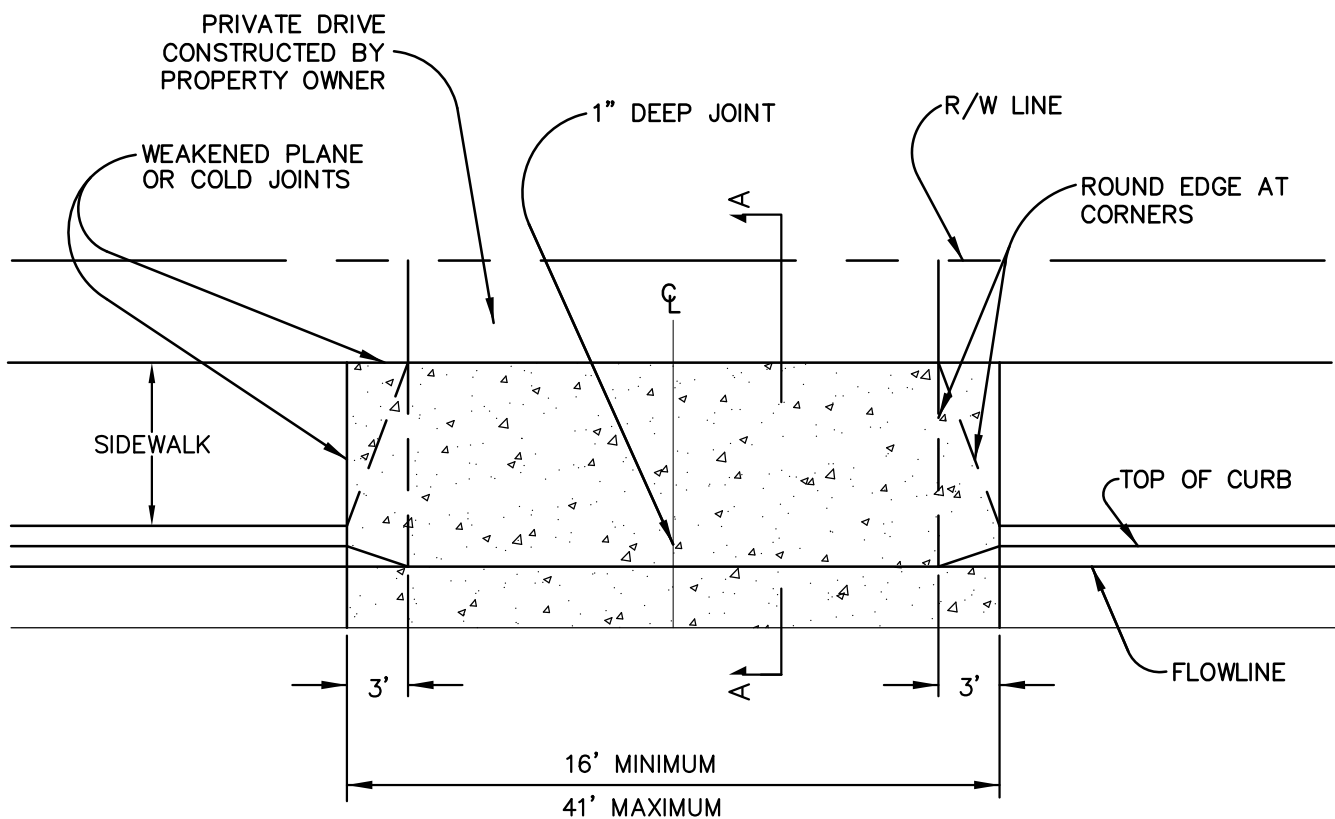
PLATE NO: 3-E2

SLOPE SIDEWALK.  
(1/4" PER FOOT)

PRIVATE DRIVE  
CONSTRUCTED BY  
PROPERTY OWNER



### SECTION A-A



#### NOTES:

1. UNSUITABLE SOIL SHALL BE REMOVED AND REPLACED WITH SAND.
2. NON-MONOLITHIC DRIVE APPROACHES MAY BE CONSTRUCTED WHERE DEPRESSED CURB EXISTS OR WHERE CURB IS PLACED WITH A SLIP FORM MACHINE. DOWELS OR KEY SHALL BE USED IF NON-MONOLITHIC.
3. RESIDENTIAL DRIVEWAYS SHALL BE PLACED A MINIMUM OF 10 FEET FROM CURB RETURNS.



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### RESIDENTIAL DRIVEWAY APPROACH

COUNTY OF STANISLAUS  
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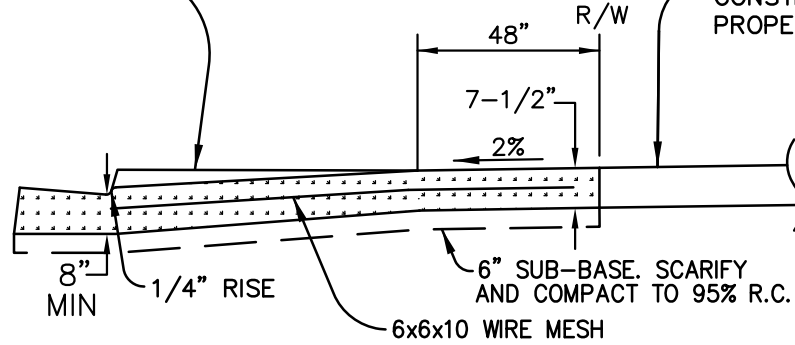
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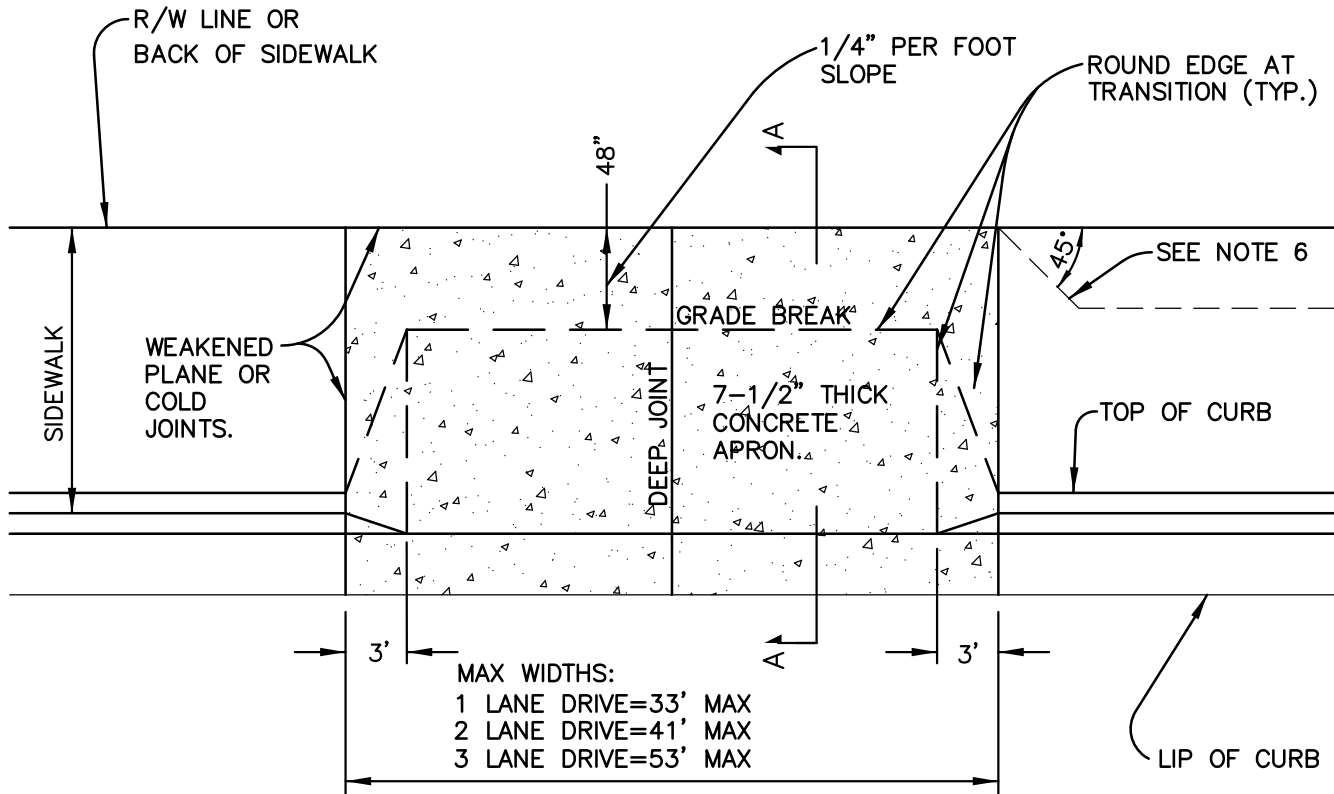
PLATE NO: 3-F1

SLOPE FROM PROPERTY LINE  
(1/4" PER FOOT)

PRIVATE DRIVE  
CONSTRUCTED BY  
PROPERTY OWNER



## SECTION A-A



### NOTES:

- 6X6X10 WIRE MESH REQUIRED.
- UNSUITABLE SOIL SHALL BE REMOVED AND REPLACED WITH SAND THROUGHOUT PROJECT, EXCEPT AS STATED IN NOTE 4
- NON-MONOLITHIC DRIVE APPROACHES MAY BE CONSTRUCTED WHERE DEPRESSED CURB EXISTS OR WHERE CURB IS PLACED WITH A SLIP FORM MACHINE. DOWELS OR KEYS SHALL BE USED WHERE NON-MONOLITHIC.
- COMMERCIAL DRIVEWAYS THAT ACCOMMODATE TRUCK TRAFFIC OR BUILDINGS WITH ROLL UP DOORS SHALL HAVE #4 REBAR INSTALLED 12" O.C. IN BOTH DIRECTIONS.
- COMMERCIAL DRIVEWAYS ON MAJOR OR COLLECTOR ROADS SHALL BE CONSTRUCTED IN ACCORDANCE TO PLATE 3-G3.
- PROVIDE TRANSITION FOR SIDEWALKS THAT ARE LESS THAN FULL WIDTH.



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## COMMERCIAL DRIVEWAY APPROACH

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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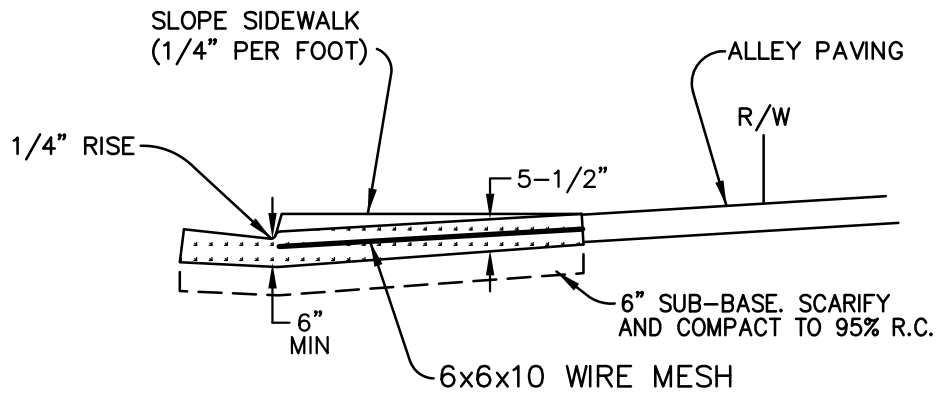
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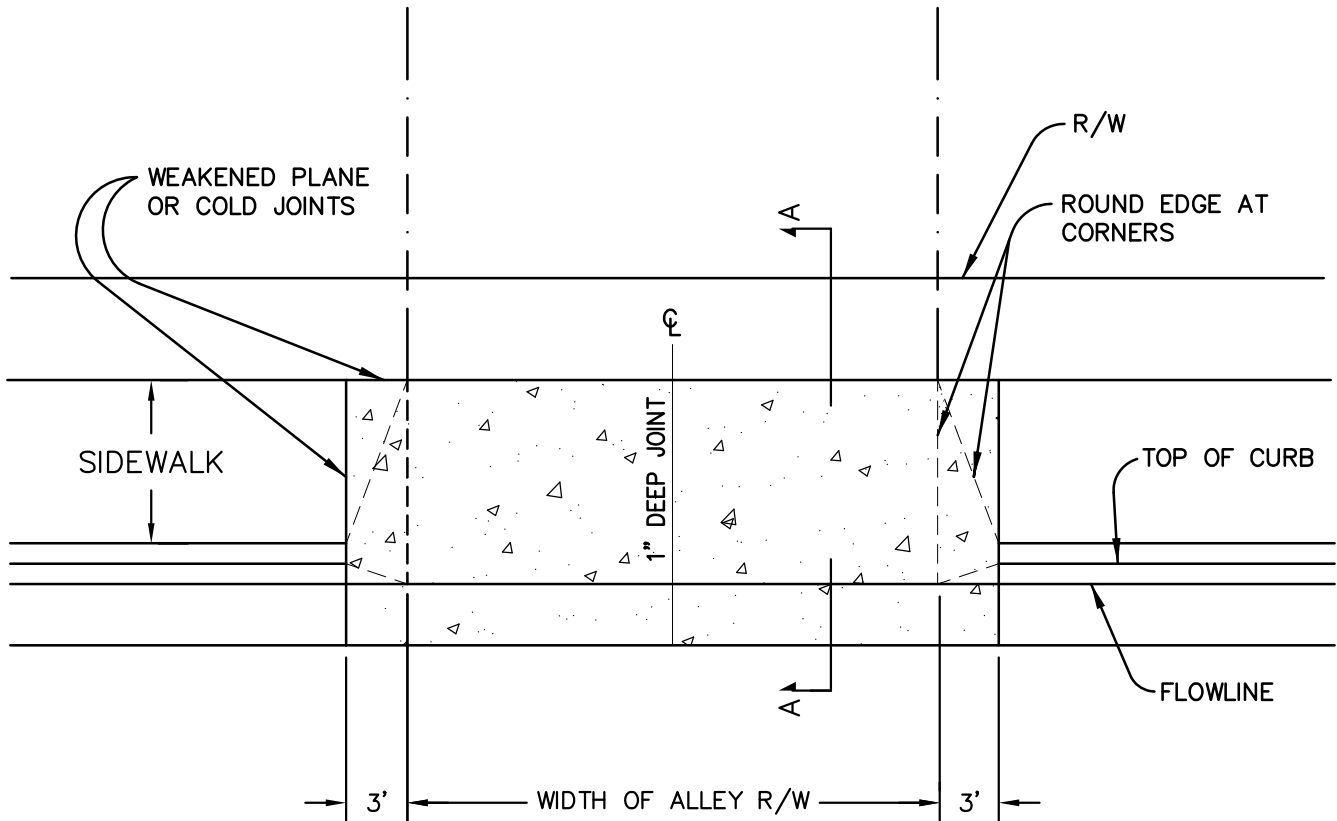
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PLATE NO: 3-F2





SECTION A-A



NOTES:

1. UNSUITABLE SOIL SHALL BE REMOVED AND REPLACED WITH SAND.
2. 6X6X10 WIRE MESH REQUIRED THROUGHOUT APPROACH.
3. ONE-INCH DEEP WEAKENED PLANE SHALL BE INSTALLED AT CENTERLINE OF APPROACH.



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RESIDENTIAL  
ALLEY APPROACH

COUNTY OF STANISLAUS  
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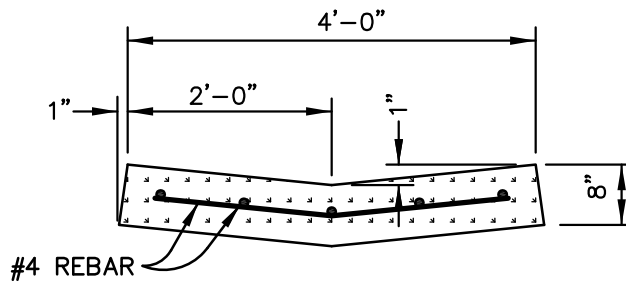
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PLATE NO: 3-F3



SECTION A-A

**NOTE:**

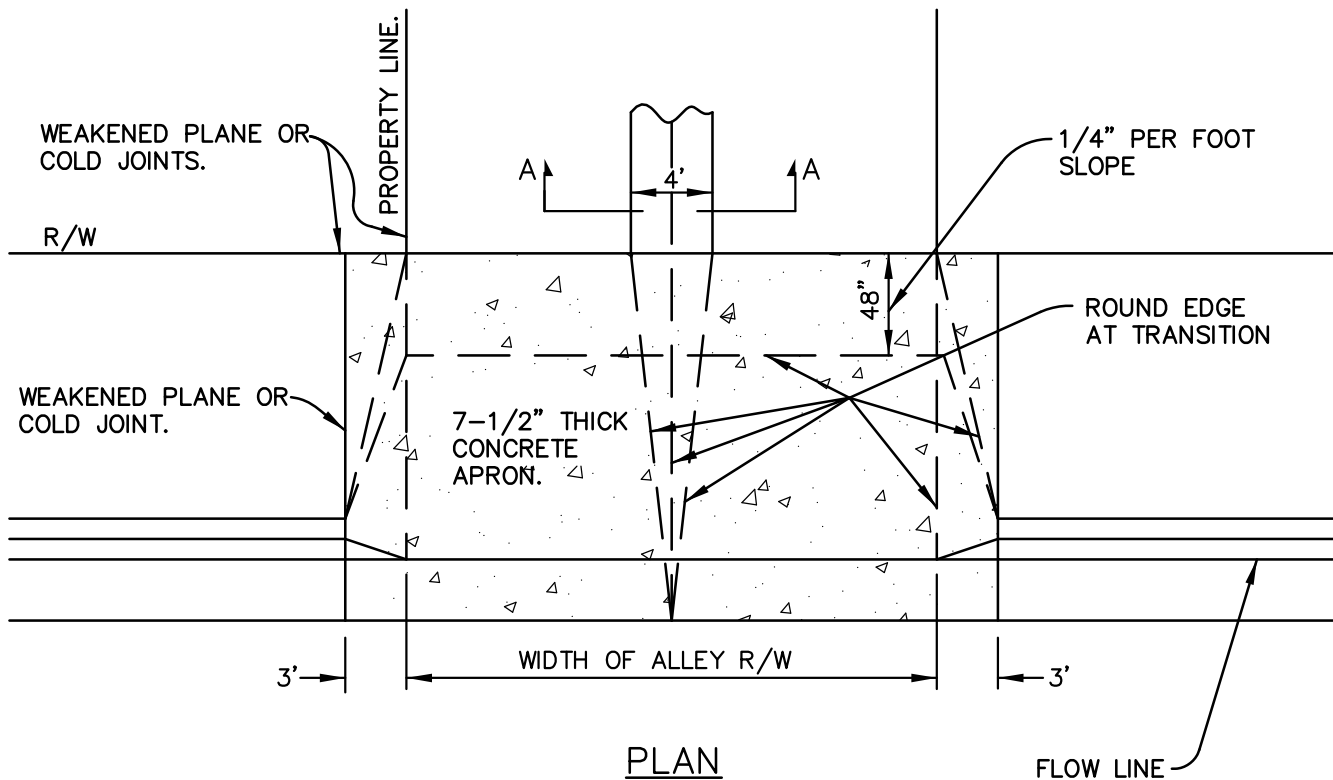
UNSUITABLE SOIL SHALL BE REMOVED AND REPLACED WITH SAND.

2" AC OVER 6" AB OR  
5 1/2" CONCRETE WITH  
6X6X10 WIRE MESH

4' VALLEY  
GUTTER

6" SUB-BASE. SCARIFY  
AND COMPACT TO 95% R.C.

ALLEY SECTION



PLAN

FLOW LINE



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COMMERCIAL ALLEY  
APPROACH

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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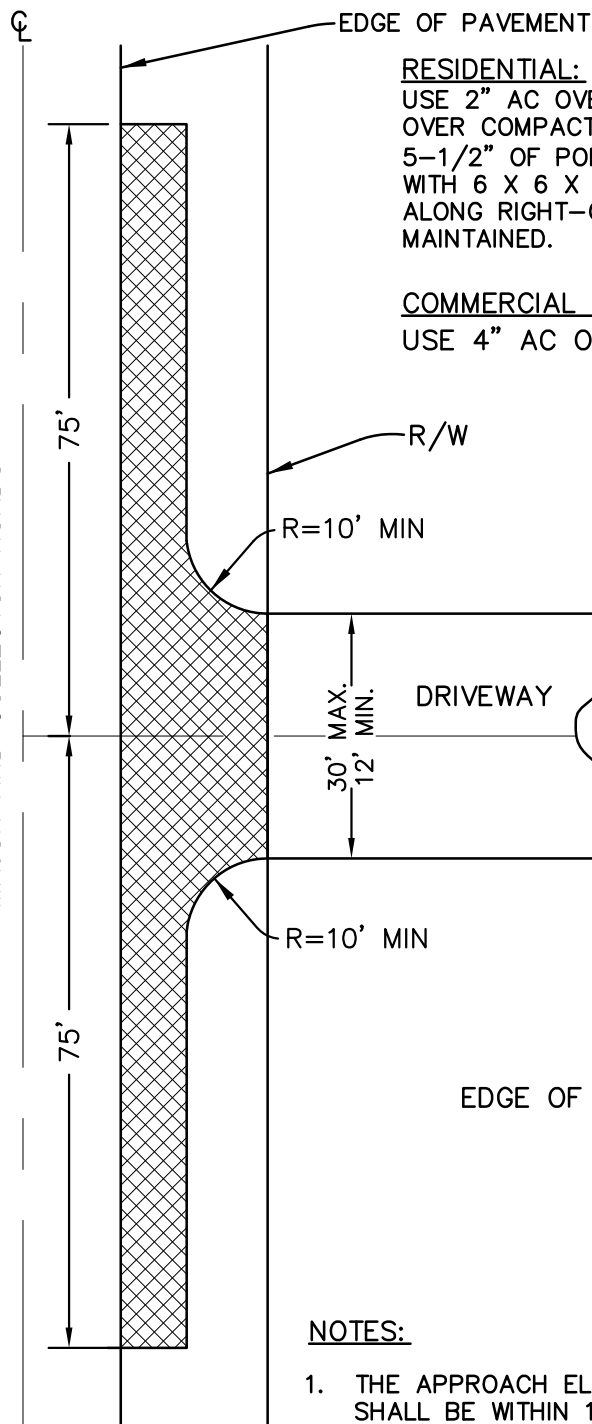
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PLATE NO: 3-F4

MAJOR AND COLLECTOR ROADS

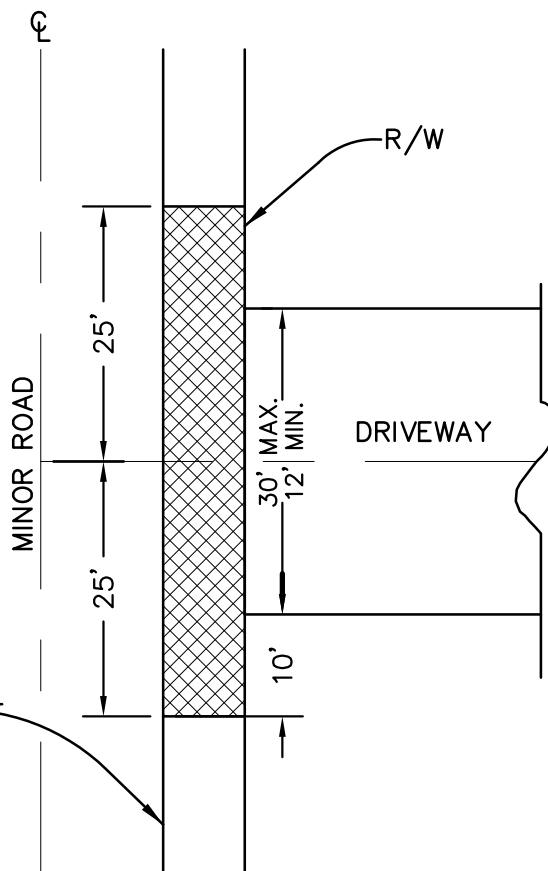


RESIDENTIAL:

USE 2" AC OVER 4" AB OR 3" AC OVER COMPACTED NATIVE SOIL OR 5-1/2" OF PORTLAND CEMENT CONCRETE WITH 6 X 6 X 10 WIRE MESH. FLOW LINE ALONG RIGHT-OF-WAY SHALL BE MAINTAINED.

COMMERCIAL (TRUCK TRAFFIC):

USE 4" AC OVER 6" AB



NOTES:

1. THE APPROACH ELEVATION AT THE ULTIMATE RIGHT-OF-WAY LINE SHALL BE WITHIN 1 FOOT, EITHER ABOVE OR BELOW THE EXISTING ROADWAY CENTERLINE.
2. TOTAL MAXIMUM WIDTH SHALL BE THE GREATER OF 50% OF THE ROAD FRONTAGE ROW OF THE PROPERTY OR A SINGLE APPROACH WIDTH SHOWN ON THIS PLATE.
3. NO CONCRETE (FOR CONCRETE DRIVEWAYS) SHALL BE PLACED WITHIN 16 FEET OF CENTERLINE OF THE ROADWAY FOR 2-LANE ROADWAYS.
4. ENCROACHMENT PERMIT REQUIRED PRIOR TO CONSTRUCTION.



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RURAL DRIVEWAY  
APPROACH

COUNTY OF STANISLAUS  
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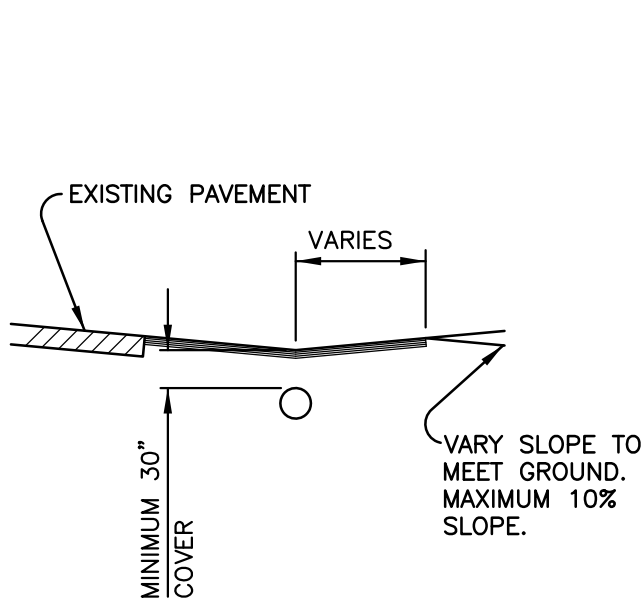
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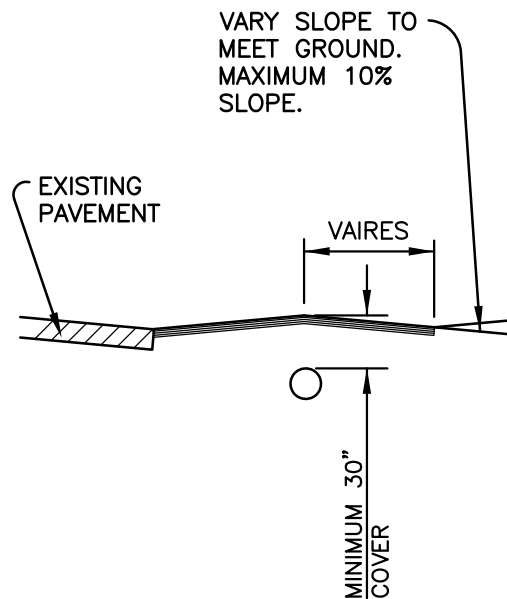
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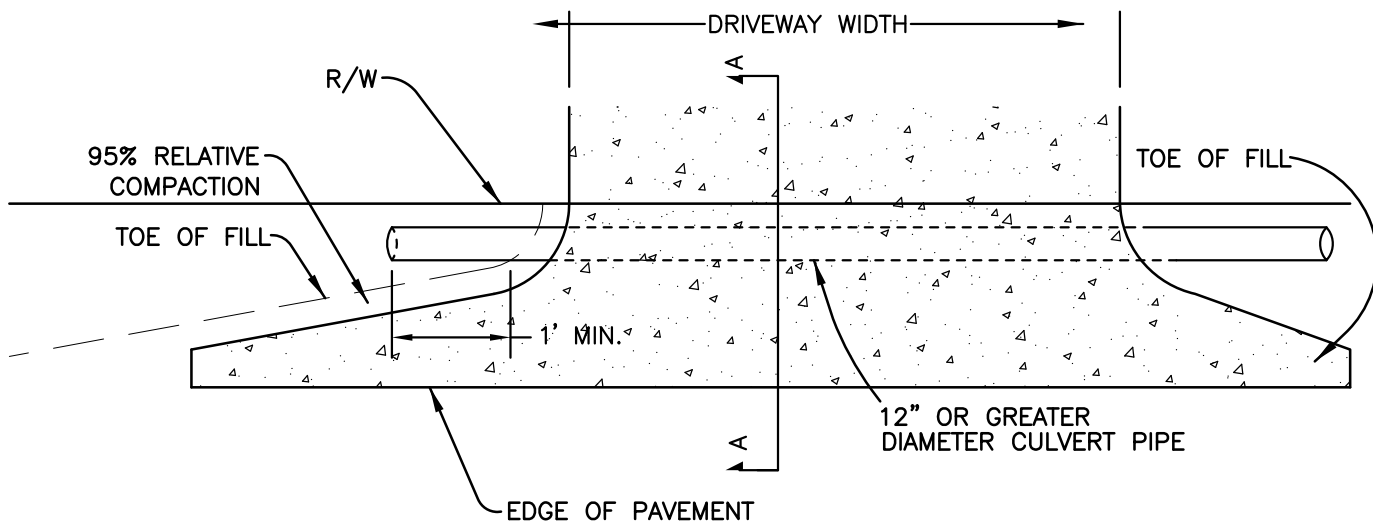
PLATE NO: 3-F5



SECTION A-A



SECTION A-A



**NOTES:**

1. CULVERTS SHALL BE PLACED TO MAINTAIN FLOW.
2. SET PIPE IN LINE WITH EXISTING DITCH AT ELEVATION THAT IT WILL NOT DISRUPT NATURAL DRAINAGE.
3. USE 12 GAUGE MINIMUM FOR ALL METAL PIPE OR HDP PLASTIC PIPE.
4. FOR RCP 24" OR SMALLER, USE A MINIMUM CLASS 3 RCP.
5. FOR PIPE DIAMETER GREATER THAN 24", OR COVER LESS THAN 30" USE CLASS 4 OR BETTER.



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CULVERT PLACEMENT UNDER  
RURAL DRIVE APPROACH

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

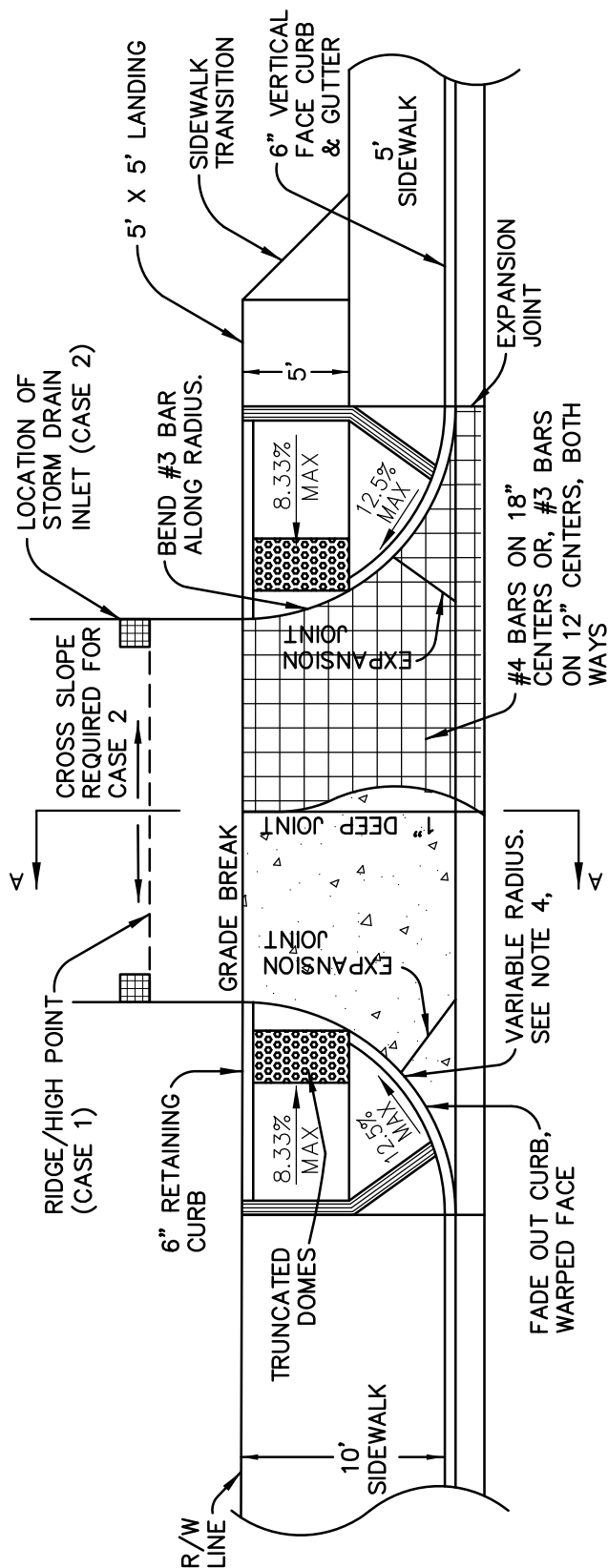
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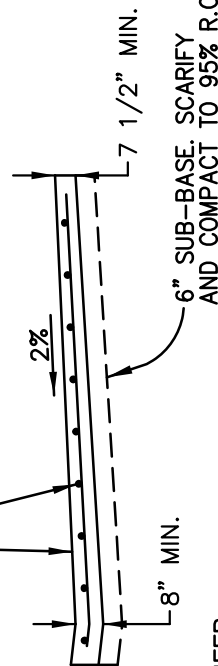
DATE: JUNE 2, 2014

PLATE NO: 3-F6



PLAN VIEW

CLASS 'B' PCC WITH BARS IN THE CENTER OF THE SLAB



SECTION A-A

NOTES:

1. HANDICAP RAMP SHALL BE SLOPED AND GROOVED PER STANDARD PLATE 3-D4A
2. WIDTHS GREATER THAN 50' MUST BE APPROVED BY THE COUNTY ENGINEER.
3. INTERMEDIATE WEAKENED PLANE JOINTS IN ACCORDANCE WITH SECTION 3.17.
4. SEE DETAIL 3-F8 FOR SECTION A-A VIEWS OF CASE 1 AND CASE 2.
5. THE APPROACH AND CURB RADI SHALL BE DESIGNED IN ACCORDANCE WITH DRIVEWAY DESIGN STANDARDS. SEE TABLE 3-1.
6. TRUNCATED DOMES SHALL BE INSTALLED IN ACCORDANCE TO SECTION 3.20



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DROP CURB  
APPROACH

COUNTY OF STANISLAUS  
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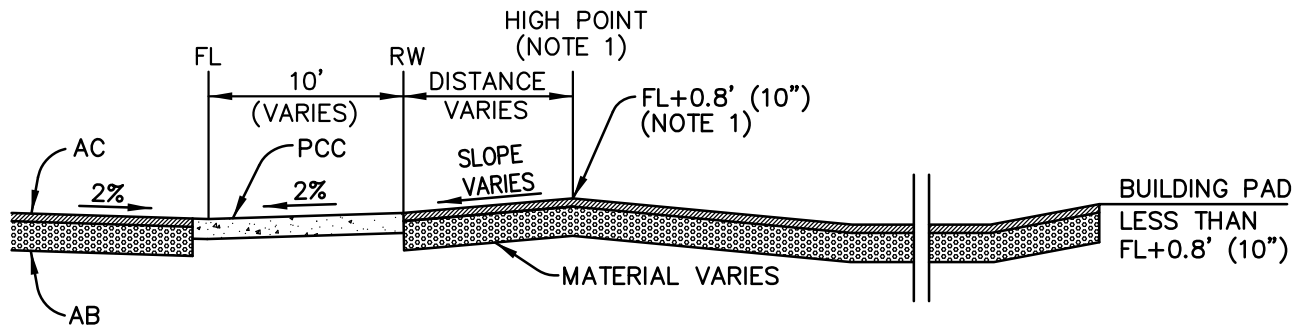
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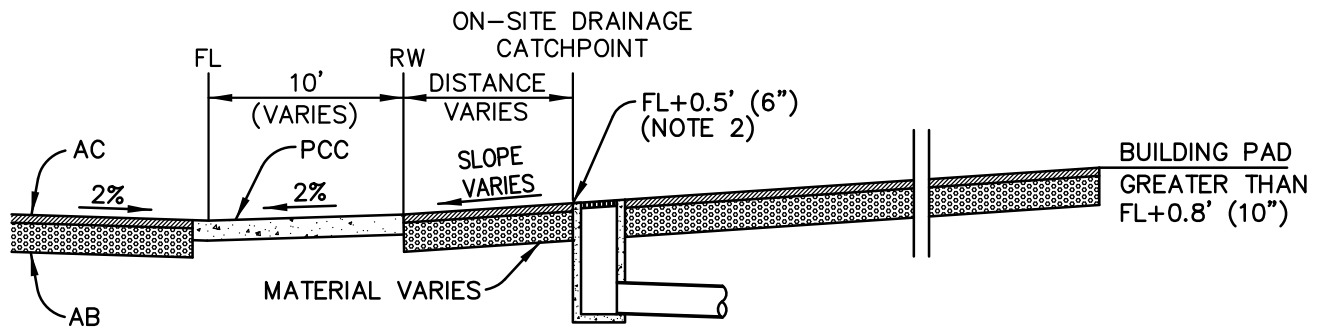
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PLATE NO: 3-F7



### 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 FLOWLINE TO CONTROL STREET FLOODING AND LOT FLOODING. COUNTY 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 OFFSITE FLOODING. COUNTY ENGINEER MAY LOWER STANDARDS IN POSITIVE DRAIN AREAS.



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### DROP CURB APPROACH PROFILE VIEW

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

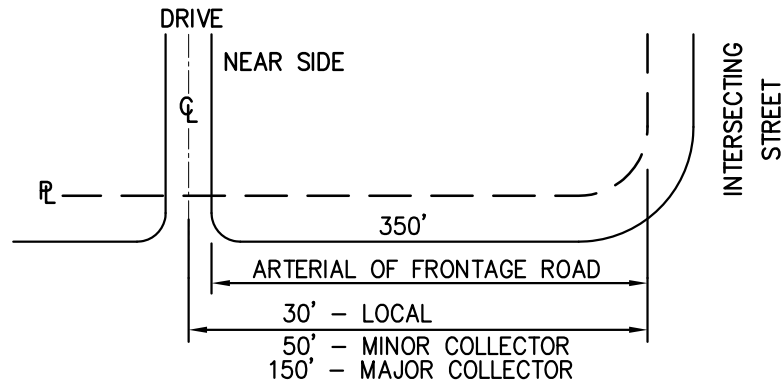
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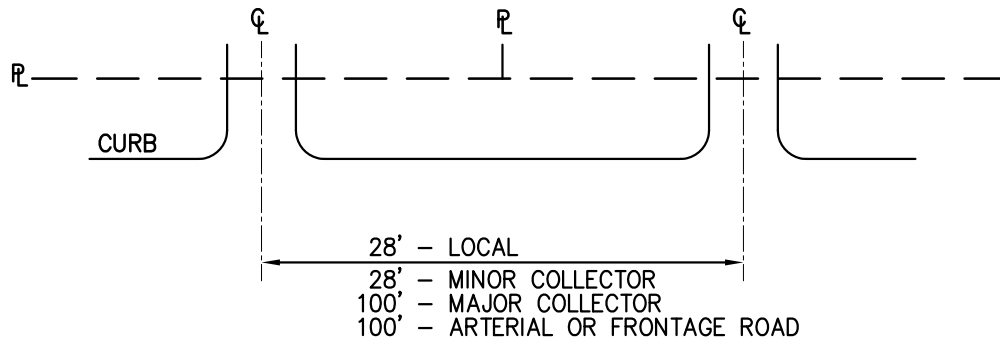
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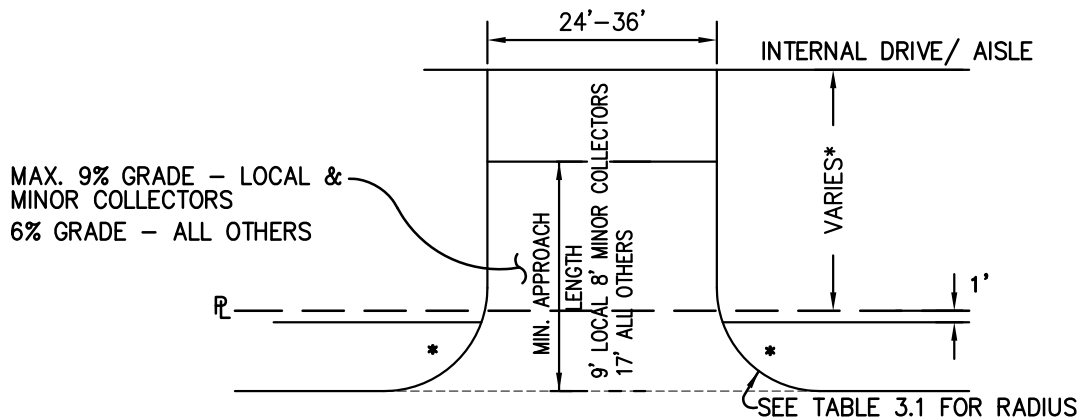
PLATE NO: 3-F8



### MINIMUM DISTANCE FROM INTERSECTION



### MINIMUM SPACING



\* HANDICAP RAMP-WARP TO FIT MAX. SLOPE 12:1

\* SEE TABLE 3.2

### 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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## RESIDENTIAL DRIVEWAYS

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DEPARTMENT OF PUBLIC WORKS

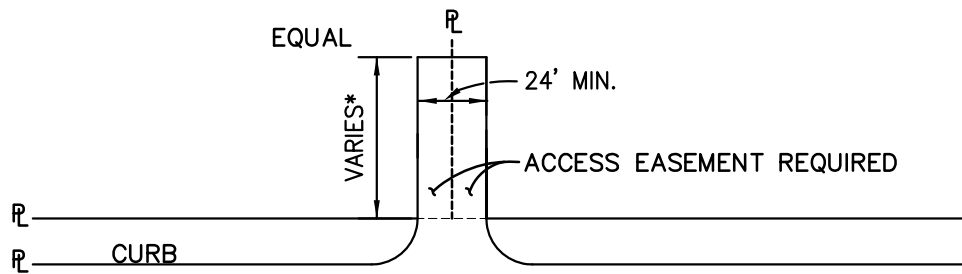
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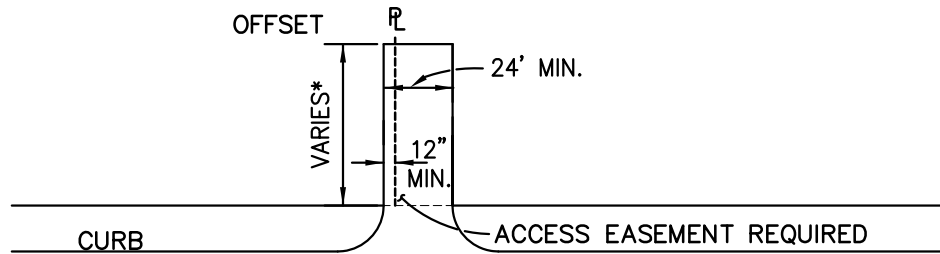
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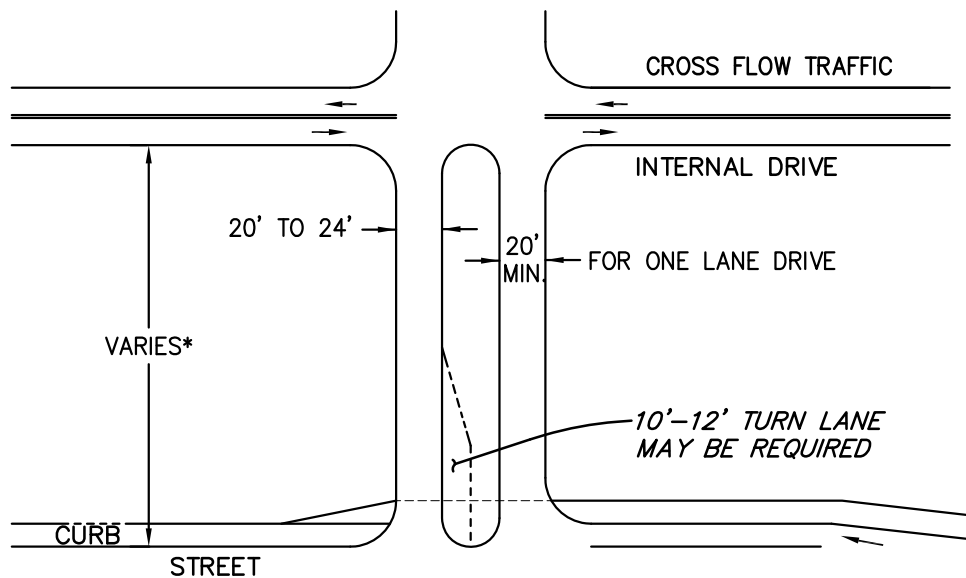
PLATE NO: 3-G1



DROP APPROACH OR FLARED DRIVEWAY



SHARED DRIVEWAYS



DROP APPROACH ONLY FOR LARGE VOLUME DRIVEWAYS  
(OVER 5,000 VEHICLES/DAY)

\* SEE TABLE 3.2



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## NON-RESIDENTIAL DRIVEWAYS

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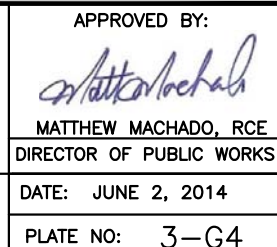
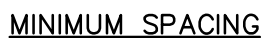
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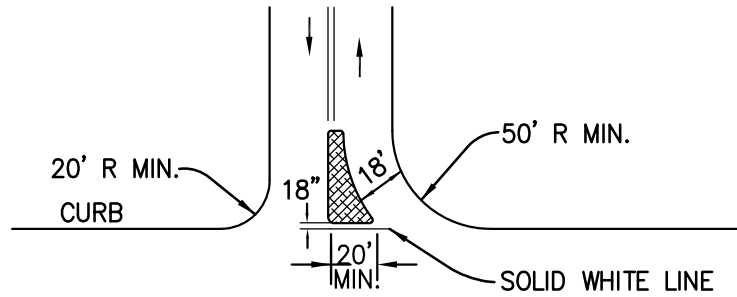
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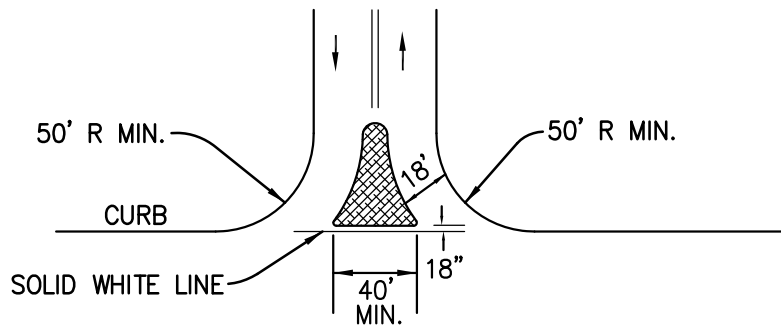


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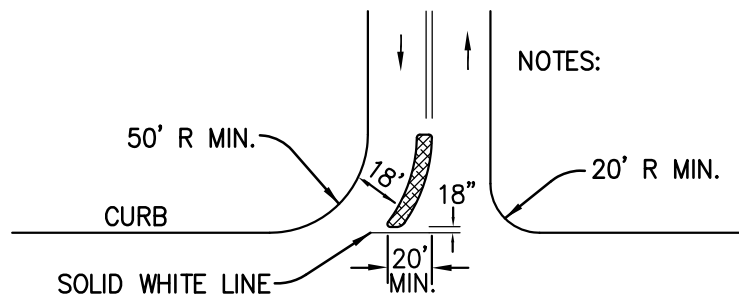




RIGHT-IN, RIGHT-OUT, LEFT-OUT  
ACCESS DESIGN



RIGHT-IN, RIGHT-OUT  
ACCESS DESIGN



RIGHT-IN, RIGHT-OUT, LEFT-IN  
ACCESS DESIGN

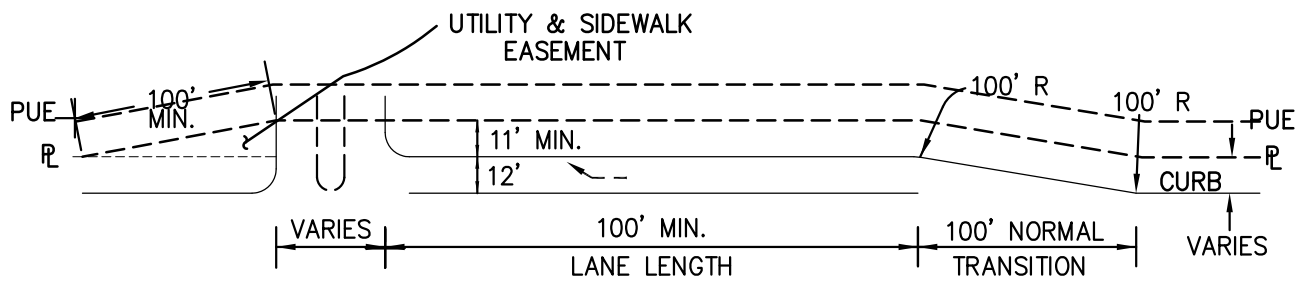


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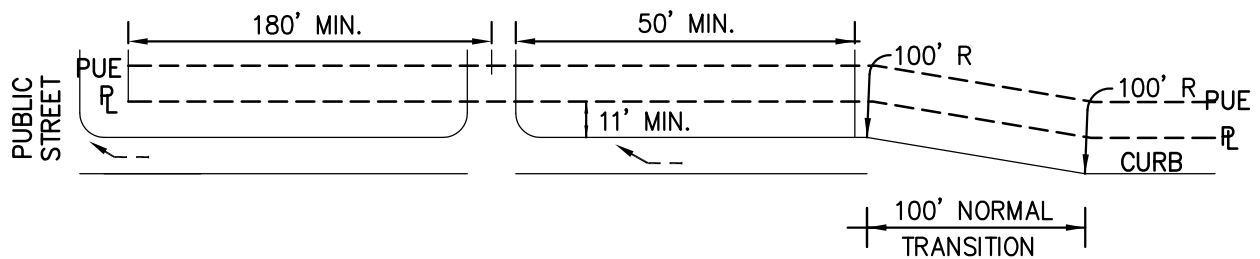
ACCESS DESIGN

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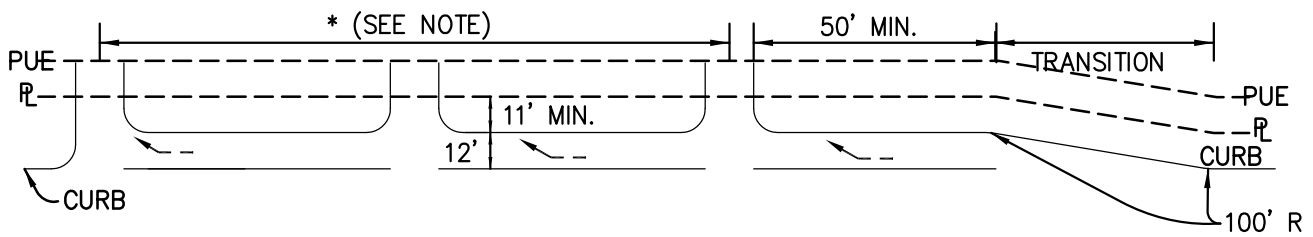
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PLATE NO: 3-G5



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 IN TABLE 3.1.



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DECELERATION LANES  
FOR DRIVEWAYS

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

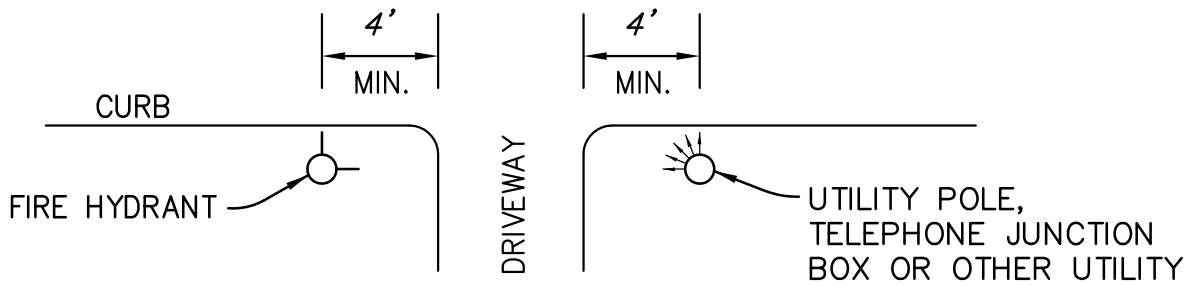
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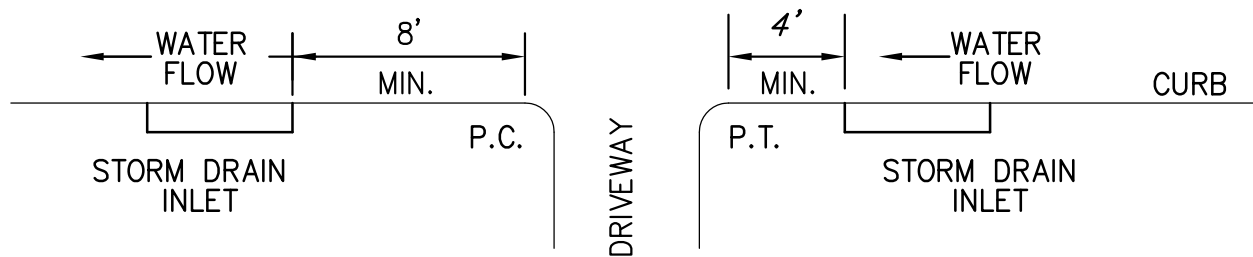
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### ABOVE GROUND UTILITIES



### STRAIGHT CURB INLET

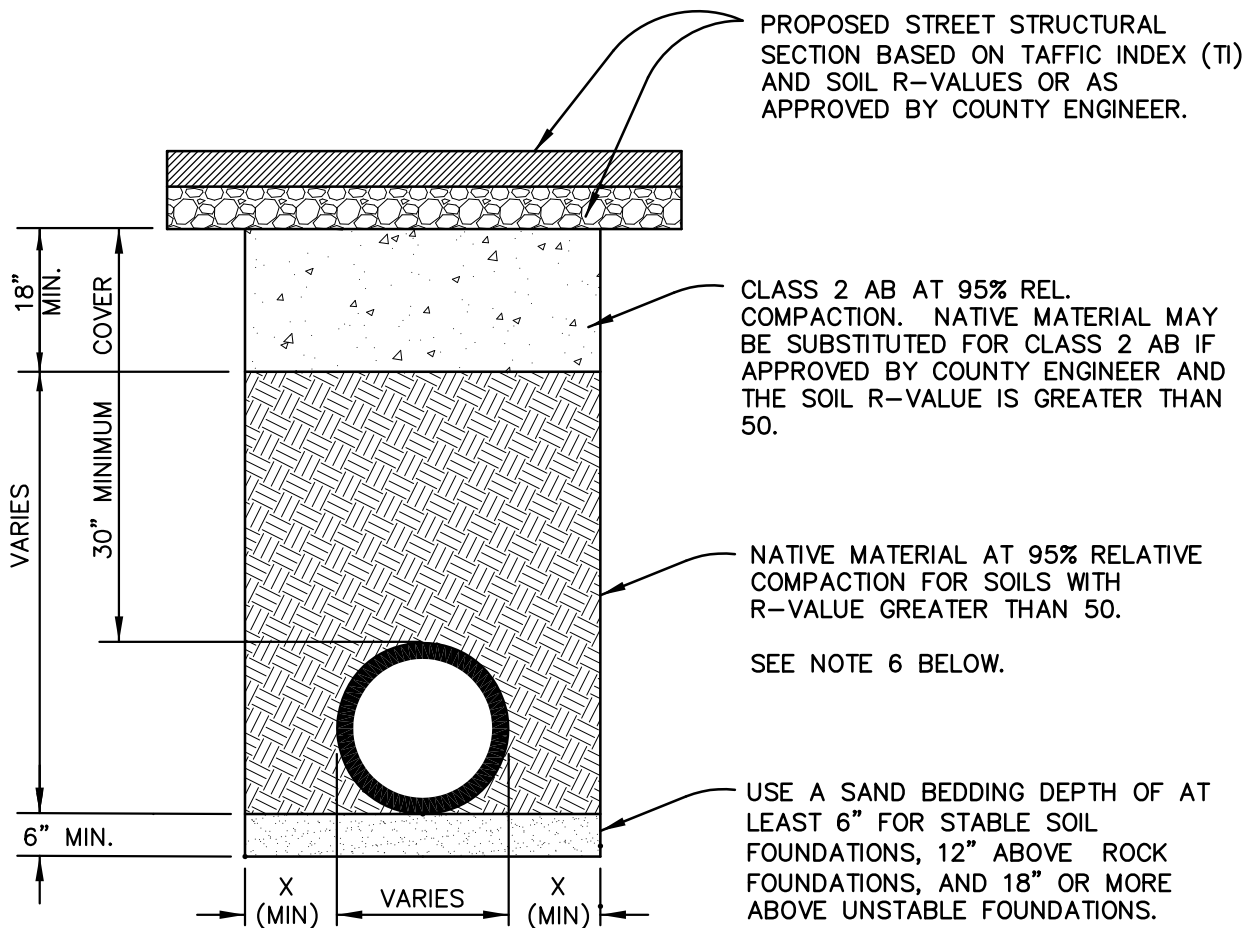


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UTILITES AT  
DRIVEWAYS

COUNTY OF STANISLAUS  
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PLATE NO: 3-G7



PIPE SIZE	≤ 33"	36"–54"	60"–72"
MINIMUM X	10"	12"	18"

#### NOTES

1. PROVIDE 95% COMPACTION IN 8" LAYERS FOR THE ENTIRE DEPTH OF TRENCH.
2. TRENCHES 5 FT OR MORE IN DEPTH MUST BE SHORED AND PROTECTED IN ACCORDANCE WITH CAL OSHA AND OTHER STATE AND FEDERAL SAFETY CODES, REGULATIONS, AND ORDINANCES.
3. ALL PIPES, INCLUDING, BUT NOT LIMITED TO STORM, WATER, GAS, SEWER, CULVERTS, AND LATERALS SHALL BE A MINIMUM OF 30" BELOW SUB GRADE AT EDGE OF PAVEMENT.
4. PONDING OR JETTING WILL NOT BE ALLOWED.
5. COMPACTION TESTS SHALL BE PERFORMED BY CONTRACTOR AND BE SUBMITTED TO (AND APPROVED) BY COUNTY INSPECTOR PRIOR TO PAVING, USING CALTRANS TEST METHOD NO. 216 AND NO. 231.
6. IF SOIL R-VALUE IS LESS THAN 50, USE CLASS 2 AB VERSUS NATIVE MATERIAL.
7. R-VALUE TEST REPORTS MUST BE PROVIDED AT TRENCH LOCATIONS.



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## TRENCHING REQUIREMENTS IN NEW STREETS

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

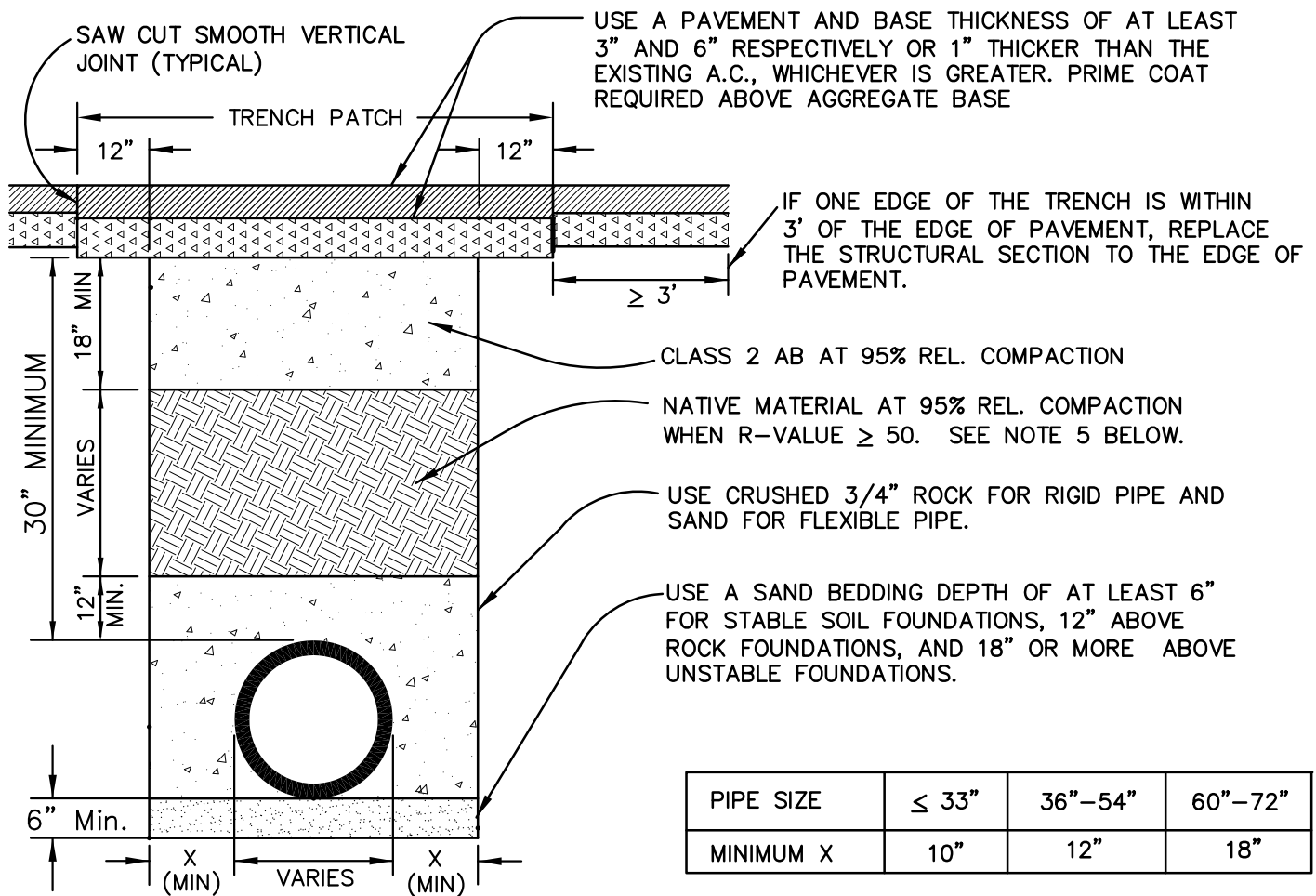
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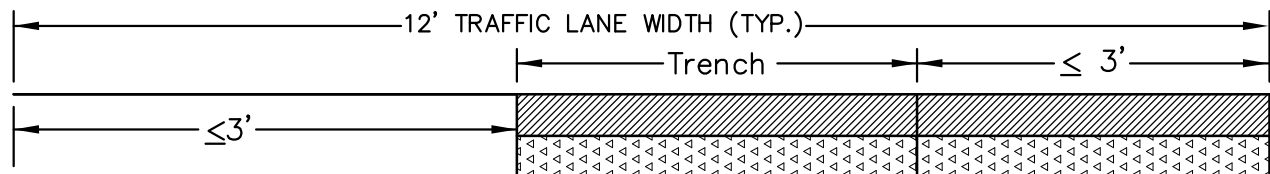
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PLATE NO: 3-H1



#### LONGITUDINAL TRENCHES:



#### NOTES:

- TRENCHES 5 FT OR MORE IN DEPTH MUST BE SHORED AND PROTECTED IN ACCORDANCE WITH CAL OSHA AND OTHER STATE AND FEDERAL SAFETY CODES, REGULATIONS, AND ORDINANCES.
- ALL PIPES, INCLUDING, BUT NOT LIMITED TO, STORM, WATER, GAS, SEWER, CULVERTS, AND LATERALS SHALL BE A MINIMUM OF 30" BELOW SUB GRADE AT EDGE OF PAVEMENT.
- PROVIDE 95% COMPACTION IN 8" LAYERS FOR THE ENTIRE DEPTH OF TRENCH.
- PONDING OR JETTING WILL NOT BE ALLOWED.
- IF SOIL R-VALUE IS LESS THAN 50, USE CLASS 2 AB VERSUS NATIVE MATERIAL.
- COMPACTION TESTS SHALL BE PERFORMED BY CONTRACTOR AND BE SUBMITTED TO (AND APPROVED) BY COUNTY INSPECTOR PRIOR TO PAVING, USING CALTRANS TEST METHOD NO. 216 AND NO. 231.



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#### TRENCHING REQUIREMENTS IN EXISTING STREETS

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

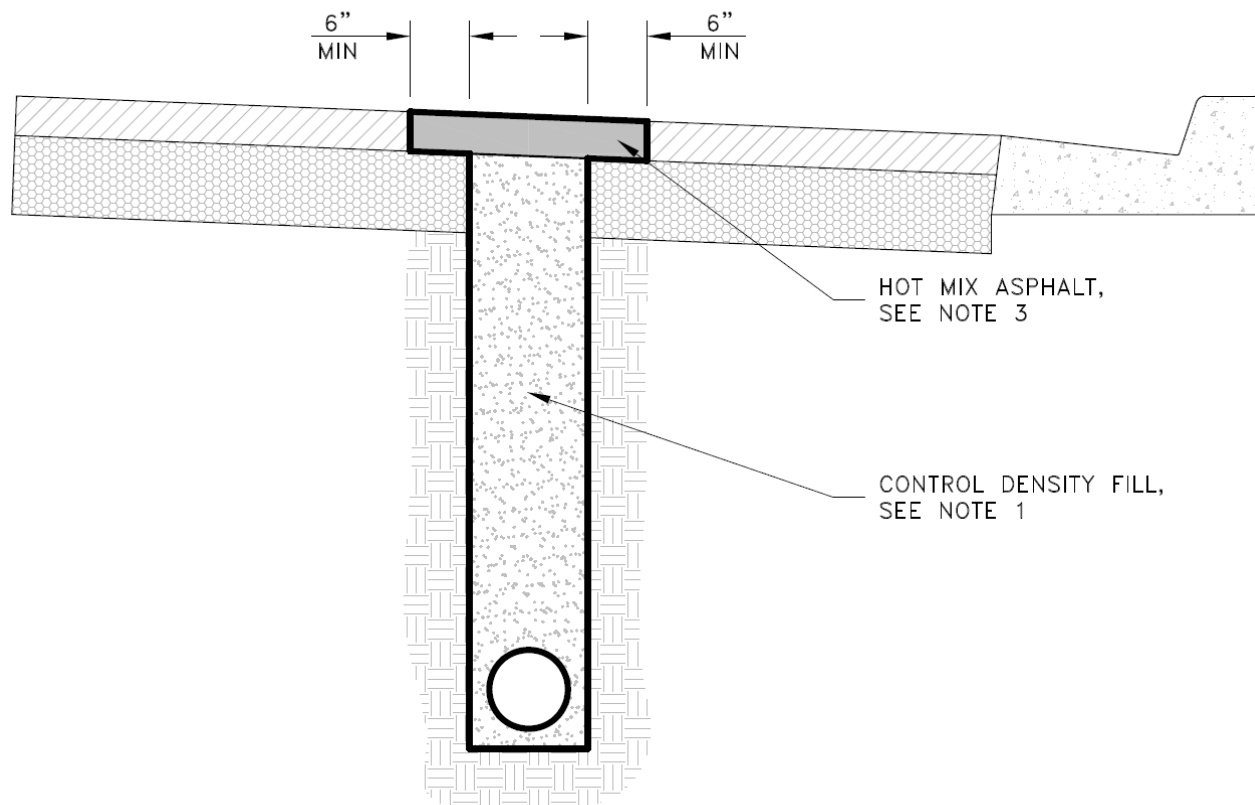
APPROVED BY:

*Matthew Machado*

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-H2



NOTES:

1. TRENCH SECTION SHALL BE BACKFILLED ACCEPTABLE CONTROL DENSITY FILL. CONTRACTOR SHALL FURNISH, INSTALL, COMPACT AND MAINTAIN 2" TEMPORARY PAVEMENT UNTIL PERMANENT PAVEMENT IS PLACED.
2. PRIME COAT REQUIRED ABOVE CONTROL DENSITY FILL.
3. HOT MIX ASPHALT MINIMUM THICKNESS FOR TRENCH RESTORATION SHALL BE DETERMINED BY THE STREET DESIGN CHAPTER OF THESE STANDARD SPECIFICATIONS.



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## POTHOLING FOR DESIGN AND CONSTRUCTION

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

*Matthew Machado*

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-H3



## TRENCH CONSTRUCTION REQUIREMENTS IN COUNTY ROADWAYS

### 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 COUNTY ENGINEER.
2. ALL TRENCHES SHALL BE SHORED OR PROTECTED IN ACCORDANCE WITH OSHA AND OTHER STATE AND FEDERAL SAFETY CODES, REGULATIONS AND ORDINANCES.
3. PLACEMENT OF AGGREGATE BASE SHALL BE IN 12" LIFTS EVENLY PLACED AND MECHANICALLY COMPACTIONED TO RELATIVE DENSITY AS SPECIFIED. COMPACTION TESTS SHALL BE REQUIRED AT THE DISCRETION OF THE COUNTY 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, COMPACTIONED AND RETESTED. IN CASE OF ONE SACK SLURRY MIX OR CONTROLLED DENSITY FILL, NO COMPACTION TEST WILL BE REQUIRED.
4. DROP HAMMER SHALL NOT BE USED TO CUT PAVEMENT.
5. 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 COUNTY ENGINEER AT LEAST 48 HOURS IN ADVANCE. A MINIMUM 48 HOUR NOTICE SHALL BE REQUIRED FOR ALL COUNTY INSPECTIONS.
6. INITIAL CUT IN STREET PAVEMENT SHALL BE EQUAL TO THE WIDTH OF THE TRENCH WITH THE OPTION OF BEING JACK HAMMERED OR SAW CUT.
7. 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.
8. TEMPORARY BITUMINOUS SURFACING (CUT BACK) SHALL BE PLACED AND COMPACTIONED IMMEDIATELY ABOVE THE TRENCH FOLLOWING COMPACTION AND APPROVED BY THE COUNTY INSPECTOR. MINIMUM DEPTH OF CUT BACK SHALL BE 2" OR AS SPECIFIED BY THE COUNTY ENGINEER. CUT BACK SHALL BE MAINTAINED IN A CONDITION SATISFACTORY TO THE COUNTY INSPECTOR UP TO THE TIME THE FINAL PAVING IS PLACED ON TRENCH.
9. FINAL PAVING ABOVE THE TRENCH SECTION SHALL BE PLACED WITHIN 14 DAYS OF ITS BACKFILL AND COMPACTION. EXTENSION MAY BE GRANTED BY THE COUNTY ENGINEER DUE TO WEATHER CONDITIONS. IN THE EVENT PERMANENT PAVING IS NOT DONE WITHIN 14 DAYS, THE COUNTY MAY CONSIDER THIS AS INCOMPLETE WORK AND MAY TAKE NECESSARY ACTION IN ACCORDANCE WITH PREVAILING COUNTY ORDINANCES AND POLICIES.
10. TEMPORARY CUT BACK SHALL BE REMOVED BEFORE PLACEMENT OF FINAL PAVING. FINAL PAVING SHALL BE PLACED ON UNDISTURBED PREVIOUSLY INSPECTED AND COMPACTIONED AGGREGATE BASE OR ONE SACK SLURRY MIX/CONTROLLED DENSITY FILL. RECOMPACTION SHALL BE REQUIRED FOR ANY DISTURBED BASE OR SURFACE.
11. 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 COUNTY ENGINEER.
12. PROPER TRAFFIC CONTROLS AND COVERING OF TRENCHES SHALL BE MAINTAINED IN ACCORDANCE WITH THE CHAPTER 2 OF THE COUNTY STANDARD SPECIFICATIONS.
13. 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 WITHOUT PRIOR APPROVAL OF THE COUNTY ENGINEER. A TRENCH CUT FEE WILL APPLY.



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### TRENCH CONSTRUCTION NOTES 1 OF 2

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-H4

## TRENCH CONSTRUCTION REQUIREMENTS IN COUNTY ROADWAYS

### 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 COUNTY ENGINEER.
14. PROPER TRAFFIC CONTROLS AND COVERING OF TRENCHES SHALL BE MAINTAINED IN ACCORDANCE WITH THE COUNTY STANDARD SPECIFICATIONS – CHAPTER 2.
15. NO TRENCH SHALL BE OPENED IN ANY STREET FOR THE PURPOSE OF LAYING PIPES OR CONDUITS MORE THAN FIVE HUNDRED (500) FEET AT A TIME.
16. ASPHALT CONCRETE SHALL BE IN ACCORDANCE WITH THE COUNTY STANDARD SPECIFICATIONS – CHAPTER 3.
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 WITHOUT APPROVAL OF COUNTY ENGINEER.  
A TRENCH CUT FEE WILL BE DETERMINED AT THE TIME OF ENCROACHMENT PERMIT ISSUANCE.



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### TRENCH CONSTRUCTION NOTES 2 OF 2

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

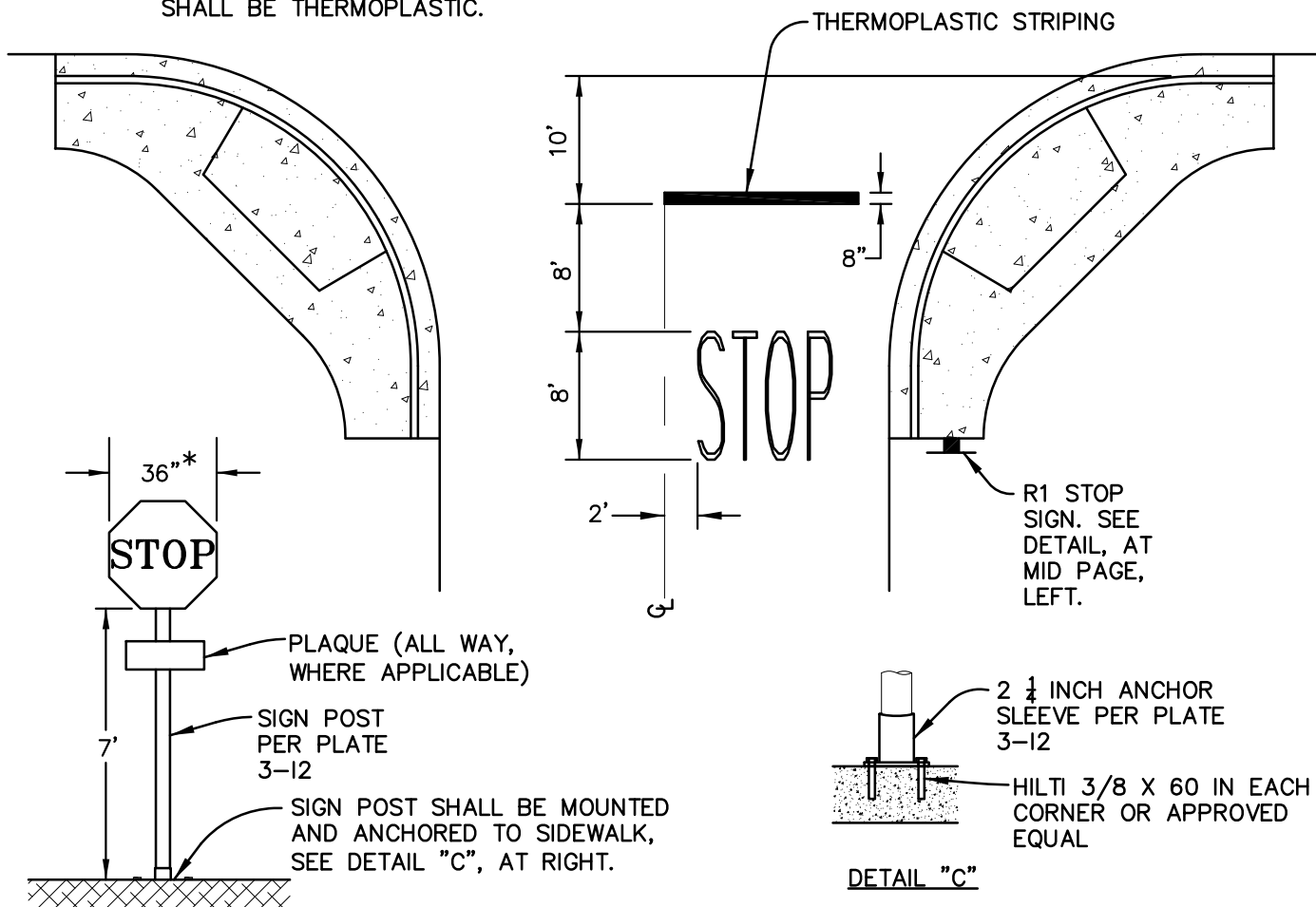
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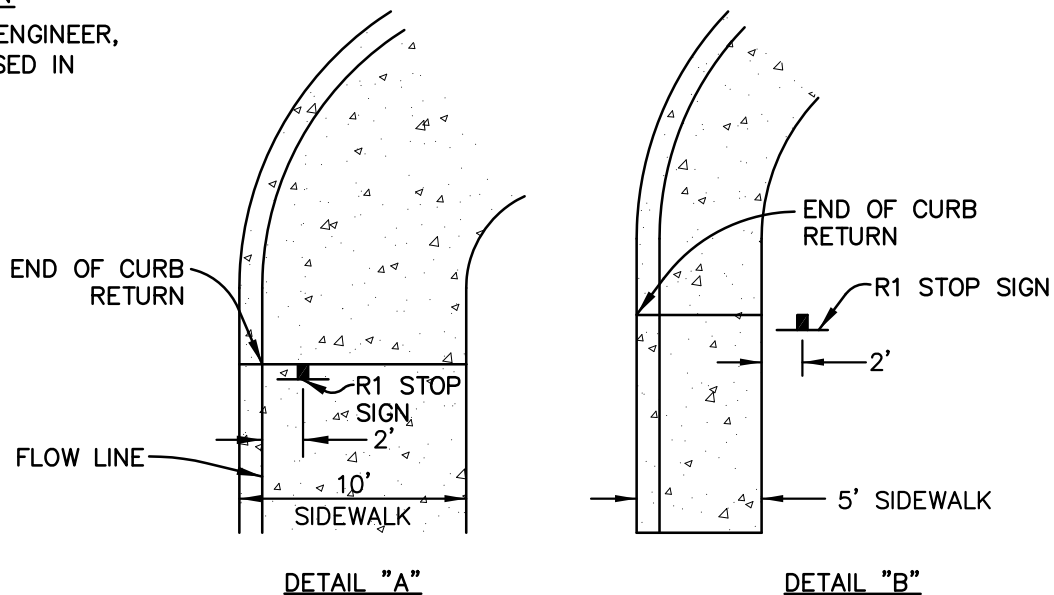
PLATE NO: 3-H5

NOTE: ALL STRIPING FOR CENTERLINE, EDGELINE, STOP BAR, AND OTHER PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.



## R-1 STOP SIGN

\* WITH APPROVAL OF ENGINEER, 30" SIGN MAY BE USED IN RESIDENTIAL AREA



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## STOP SIGN INSTALLATION

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

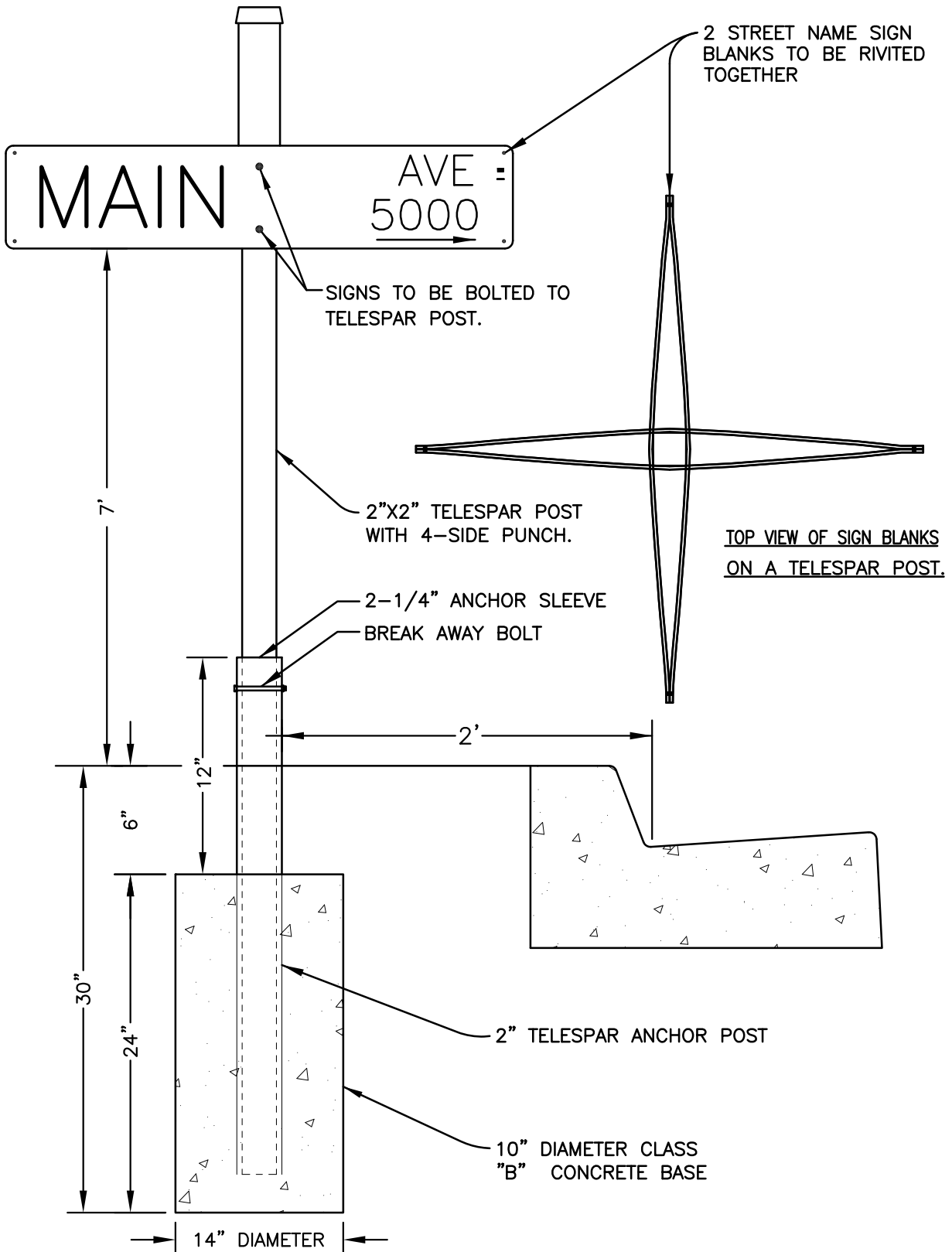
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MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-11



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# SIGN POST (IN NON-SIDEWALK AREAS)

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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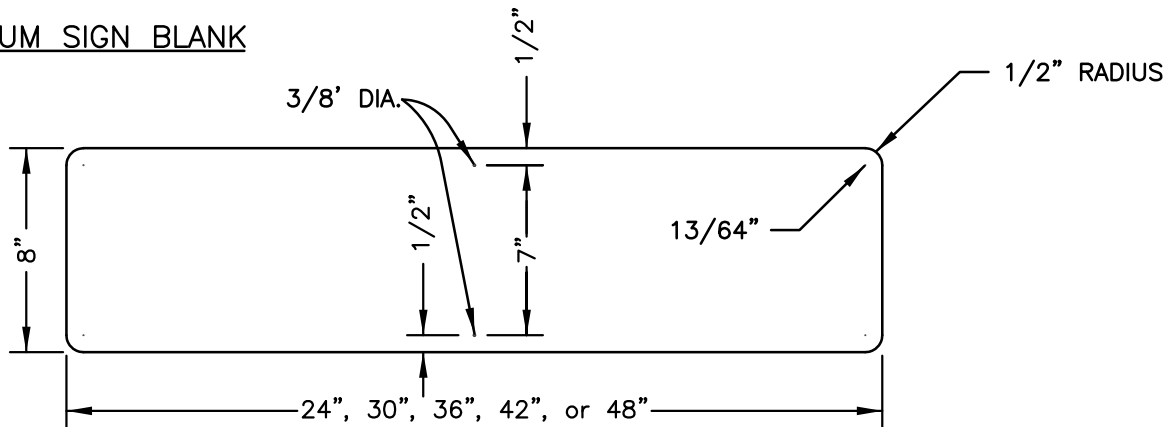
*Matthew Machado*

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-12

## ALUMINUM SIGN BLANK



1. ALL BLANKS TO BE 0.063 GAUGE ALUMINUM ALLOY (6061-TB OR 5155-H3B), DEGREASED AND TREATED WITH ALADDIN 1200.
2. THE SIGN BLANKS SHALL CONFORM TO THE STANDARD B.P.R. SHAPES AND CORNER RADII, EXCEPT THAT HOLE PUNCHING, OR DRILLING, SHALL CONFORM TO THE HOLE SIZES AND LOCATIONS SHOWN HEREON. EACH CORNER SHALL HAVE A 13/64" DIAMETER HOLE.
3. ALL BLANKS SHALL BE 8" HIGH BY 24", 30", 36", 42", OR 48" WIDE. THE 3/8" HOLES SHALL BE CENTERED ON THE VERTICAL CENTERLINE OF EACH BLANK.

## NAME FACE



1. ALL FACES SHALL BE "ENGINEER GRADE" REFLECTIVE SHEETING WITH REFLECTIVE SILVER COPY ON REFLECTIVE GREEN BACKGROUND.
2. EACH SIGN FACE SHALL HAVE SUFFICIENT SPACING PROVIDED TO PERMIT APPLICATION OF A 5-DIGIT NUMBER.
3. NUMERICAL STREET NAMES SHALL BE SPELLED OUT INSTEAD OF USING THE NUMERAL LETTER TYPE ABBREVIATED LEGENDS.



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STREET NAME SIGN

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

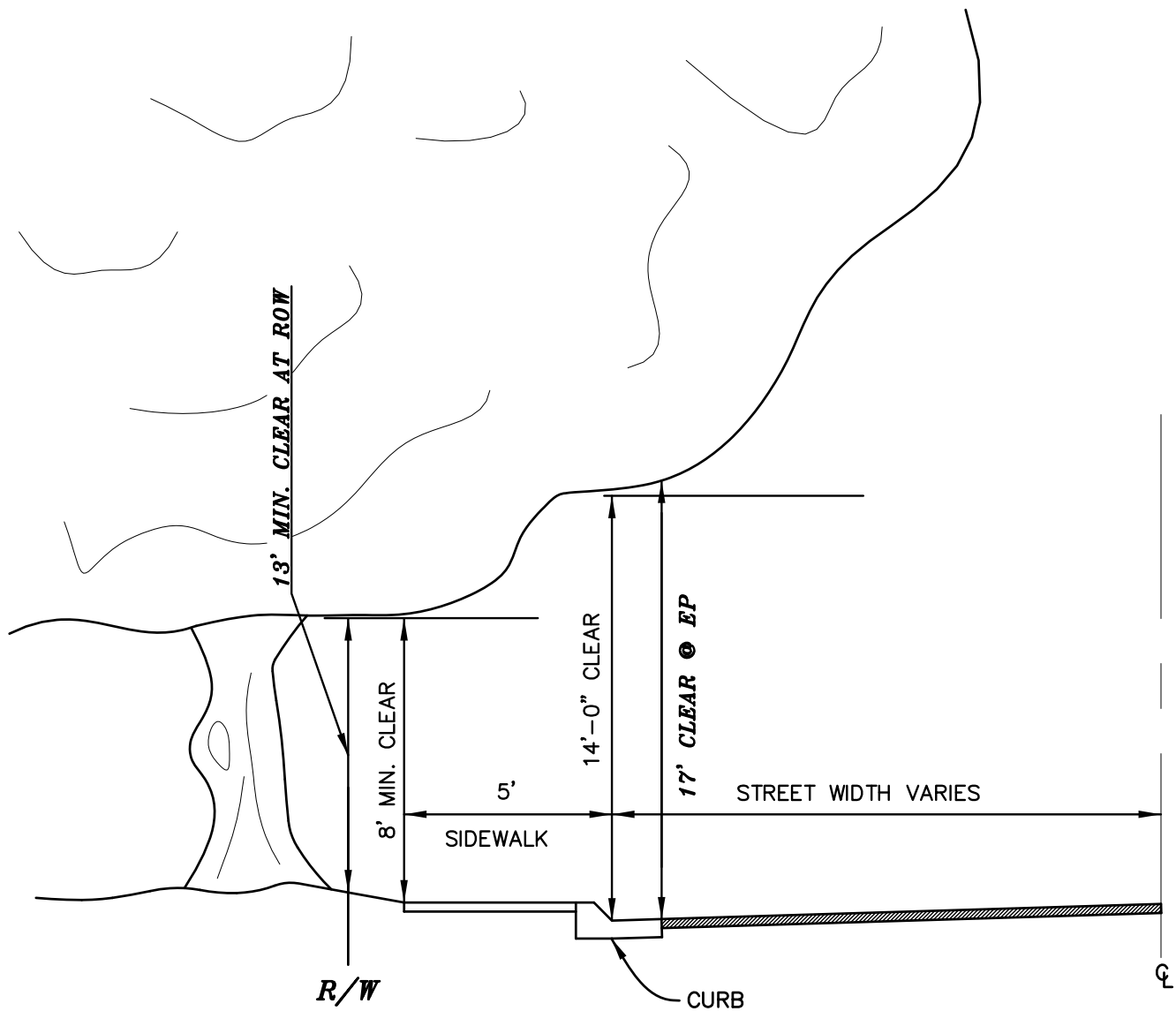
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*Matthew Machado*

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-13

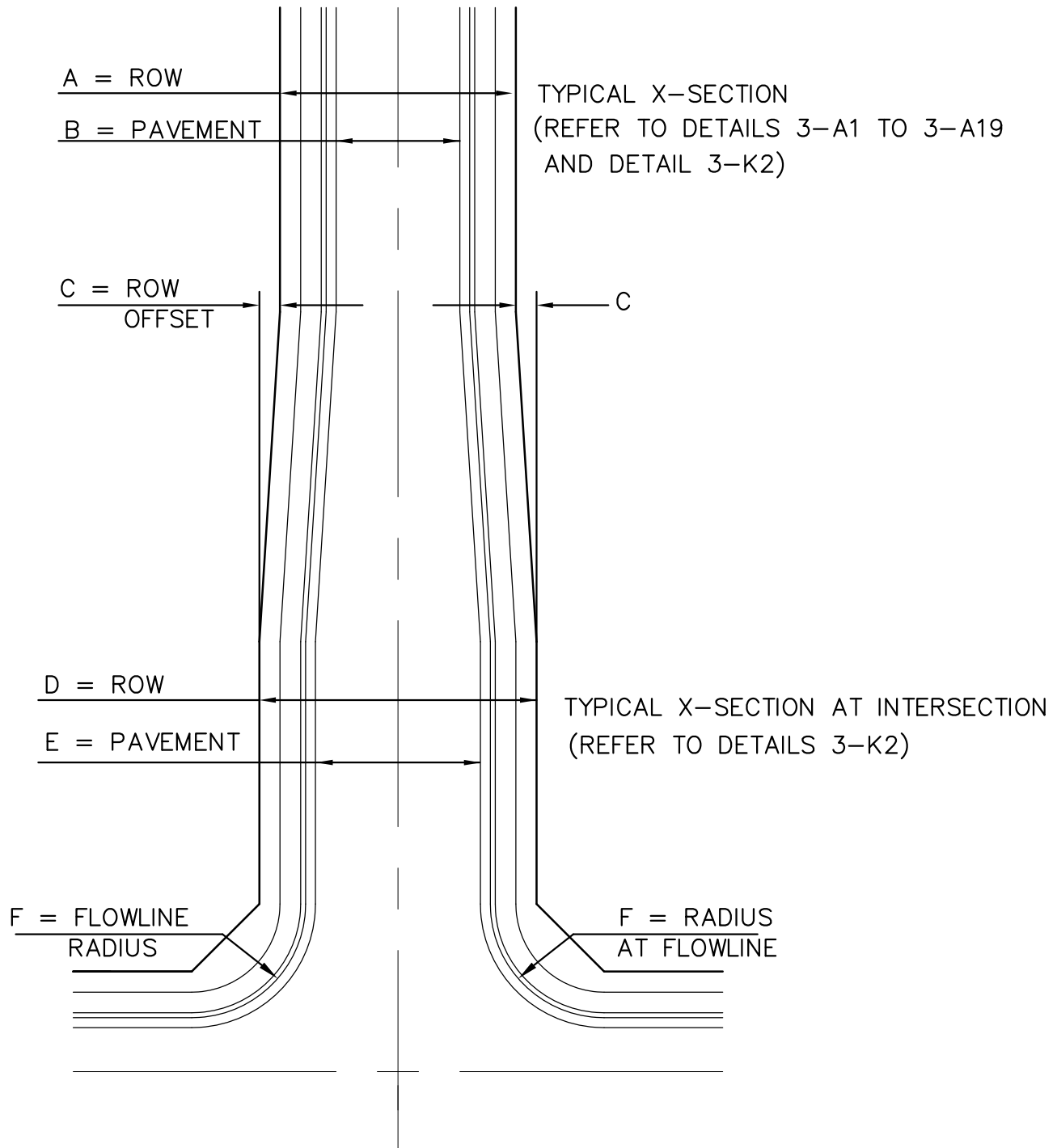


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TREE TRIMMING  
STANDARDS

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
<i>Matthew Machado</i>
MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
DATE: JUNE 2, 2014
PLATE NO: 3-J1



NOTE: LANE CONFIGURATION, TURN POCKET LENGTHS, AND TAPER LENGTHS TO BE DESIGNED IN ACCORDANCE TO LATEST EDITION OF MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND CALTRANS HIGHWAY DESIGN MANUAL.

REFER TO PLATE 3-K2 FOR MINIMUM DESIGN DIMENSIONS.



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## TYPICAL STREET SECTION BY STREET CLASSIFICATION

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

*Matthew Machado*

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-K1

		Typical X-Section Detail Legend Key						
		A	B	C	D	E	F	
STREET CLASSIFICATION	Typical X-Section Detail No.	Typical Right-of-Way Width (ft)	Typical Pavement Width (ft)	ROW Offset (ft)	Right-of-Way Width at Intersection (ft)	Pavement Width at Intersection (ft)	Minimum Curb Radius Return (ft)	Sidewalk Width (ft)
Local (2 Lane Urban)	3-A1	50	32	5	60	44	25	5
Minor Collector (2 Lane Urban)	3-A2	60	36	15	90	72	35	5
Major Collector (2 Lane Urban)	3-A3	80	42	10	100	78	35	5
Major Collector (4 Lane Urban)	3-A4	80	66	25	130	114	35	5
Minor Arterial (4 Lane Urban)	3-A5	110	86	20	150	118	60	10
Minor Arterial (6 Lane Urban)	3-A6	110	96	25	160	142	60	5
OPA (4 Lane Urban Expressway)	3-A7	135	88	2.5	140	116	60	10
OPA (6 Lane Urban Expressway)	3-A8	135	112	22.5	180	152	60	10
Minor Collector (2 Lane Industrial)	3-A9	70	46	15	100	82	60	5
Major Collector (4 Lane Industrial)	3-A10	110	90	15	140	122	60	5
Local (2 Lane Rural)	3-A11	60	32	10	80	44	35	na
Minor Collector (2 Lane Rural)	3-A12	60	40	20	100	76	35	na
Major Collector (2 Lane Rural)	3-A13	80	40	20	120	76	35	na
Major Collector (4 Lane Rural)	3-A14	80	60	25	130	108	35	na
Minor Arterial (6 Lane Rural)	3-A15	110	102	25	160	148	60	na
OPA (4 Lane Rural Expressway)	3-A16	135	80	17.5	170	112	60	na
OPA (6 Lane Rural Expressway)	3-A17	135	104	22.5	180	148	60	na

**Notes:**

1. Proposed Rights-of-Way (ROW) at the intersections are shown as minimum
2. Assume Local Roads will not require an acceleration lane or a right turn lane.
3. Drainage swale widths shall be designed in accordance to Chapter 4 - Drainage. Additional right-of-way may be required to accomodate for the design rain storm. Actual widths will vary depending on soil type, relative density of soil, rainfall intensity, and project storm drainage design requirements.

REFER TO PLATE 3-K1 FOR TYPICAL X-SECTION LEGEND



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TYPICAL STREET SECTION  
BY STREET CLASSIFICATION

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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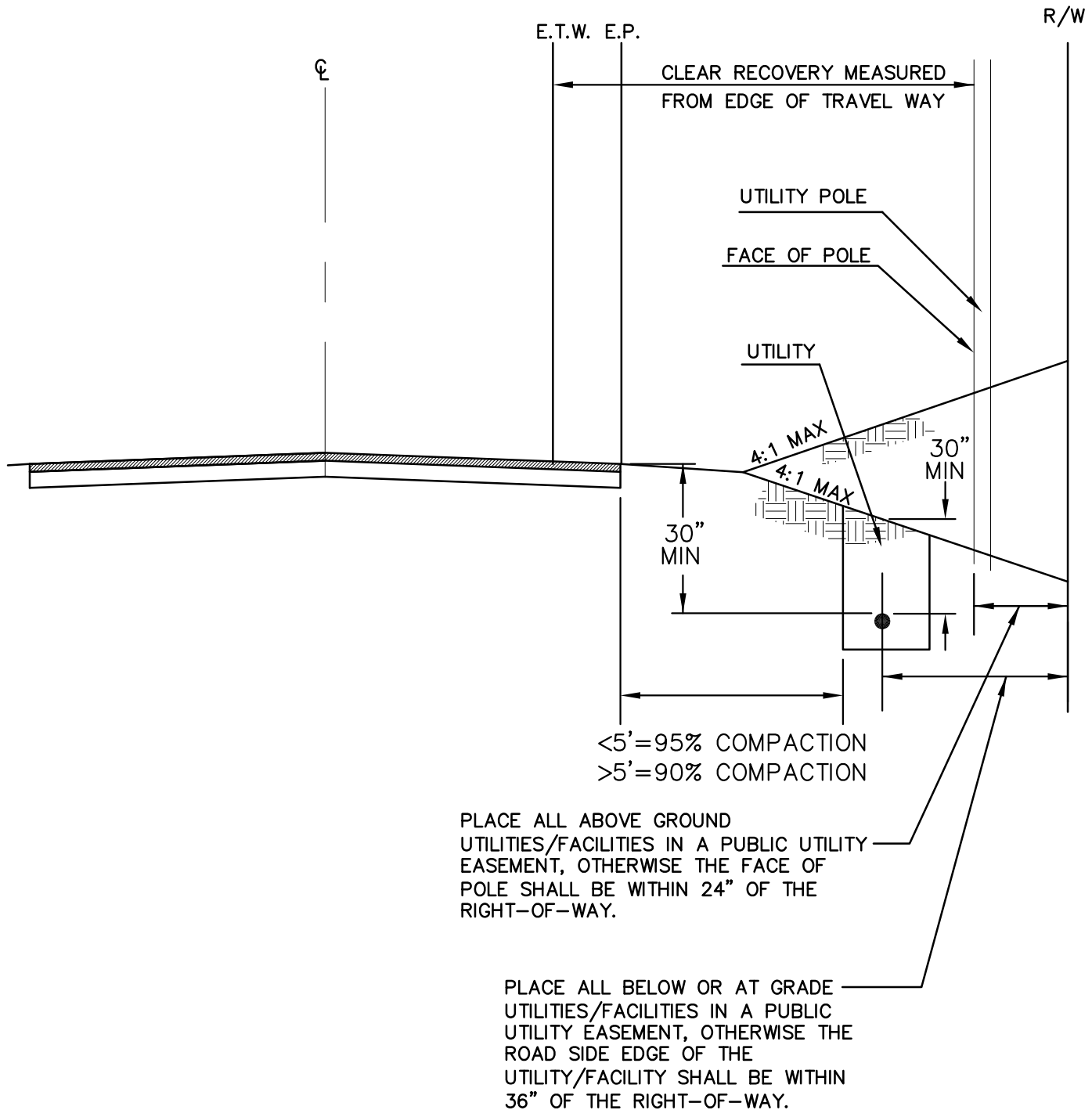
*Matthew Machado*

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DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-K2





**NOTES:**

1. ALL PRIVATE IRRIGATION FACILITIES SHALL BE PLACED IN THE P.U.E. AREA OR OUTSIDE THE R/W.
2. ALL UNDERGROUND UTILITIES SHALL BE PLACED A MINIMUM OF 30 INCHES BELOW THE EDGE OF PAVEMENT ELEVATION OR A MINIMUM OF 30 INCHES BELOW THE SURFACE AT THE POINT OF INSTALLATION, WHICHEVER IS LOWEST.



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**TRENCH & POLE UTILITY  
LOCATION OUTSIDE OF  
PAVED ROADWAY**

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

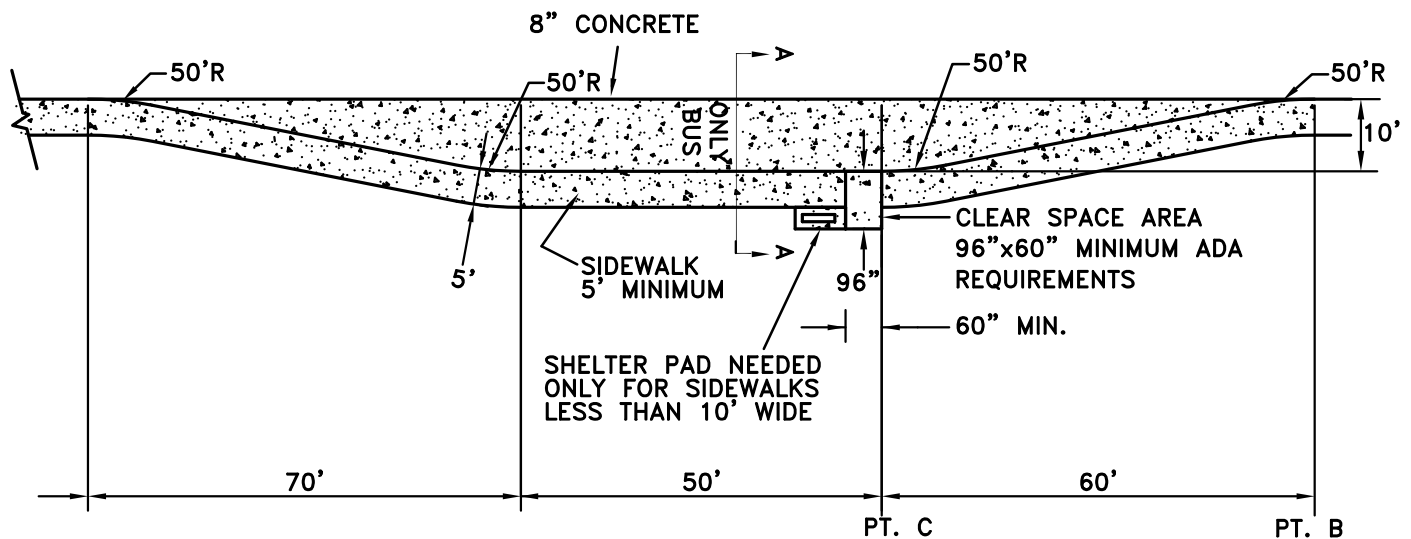
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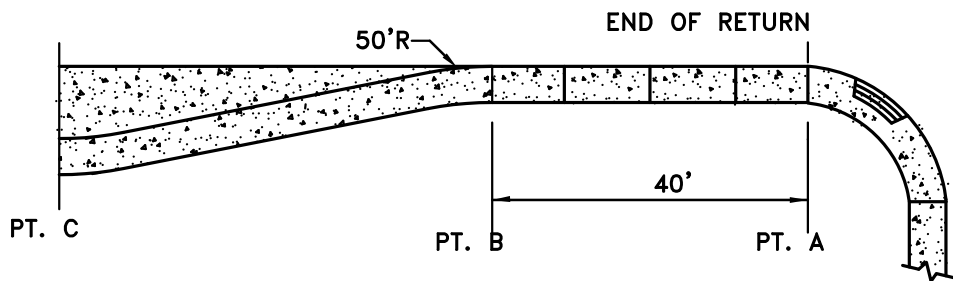
MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-L1



NOTE: REFER TO PLATE 3-M3 FOR TYPICAL CROSS SECTION A-A DETAIL



#### NOTES:

1. NO EXTRA SHELTER PAD NEEDED FOR SIDEWALKS WIDER THAN 10 FEET.
2. SHELTER PAD AND SHELTERS MUST BE WIDE ENOUGH TO MEET ADA REQUIREMENTS 4.0' X 3.0' CLEAR FLOOR AREA WITHIN SHELTER PERIMETER.
3. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED AT TRANSIT LOCATIONS AND INTERSECTIONS.
4. ALL BUS TURNOUT LOCATIONS AND DESIGN SHALL BE COORDINATED AND APPROVED BY THE COUNTY TRANSIT DIVISION.
5. SHELTER PAD AND SHELTERS SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE LATEST EDITION OF ADA STANDARDS FOR TRANSPORTATION FACILITIES (SECTION 810.3). REFER TO SECTION 810 "TRANSPORTATION FACILITIES" AT [WWW.ACCESS.BOARD.GOV](http://WWW.ACCESS.BOARD.GOV)
6. INSTALL STATIONARY BICYCLE RACKS NEAR BUS STOPS AT THE LOCATIONS SPECIFIED AND APPROVED BY THE COUNTY TRANSIT DIVISION.
7. UNSUITABLE SOIL UNDER THE BUS TURN OUT SHALL BE REMOVED AND REPLACED WITH A BEDDING CONSISTING OF SAND OR PEA GRAVEL WITH A MINIMUM THICKNESS THAT CAN ACCOMMODATE BUS TRAFFIC AND BUS LOADING (PER SOIL REPORT'S RECOMMENDATION).



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## NEARSIDE BUS TURNOUT

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

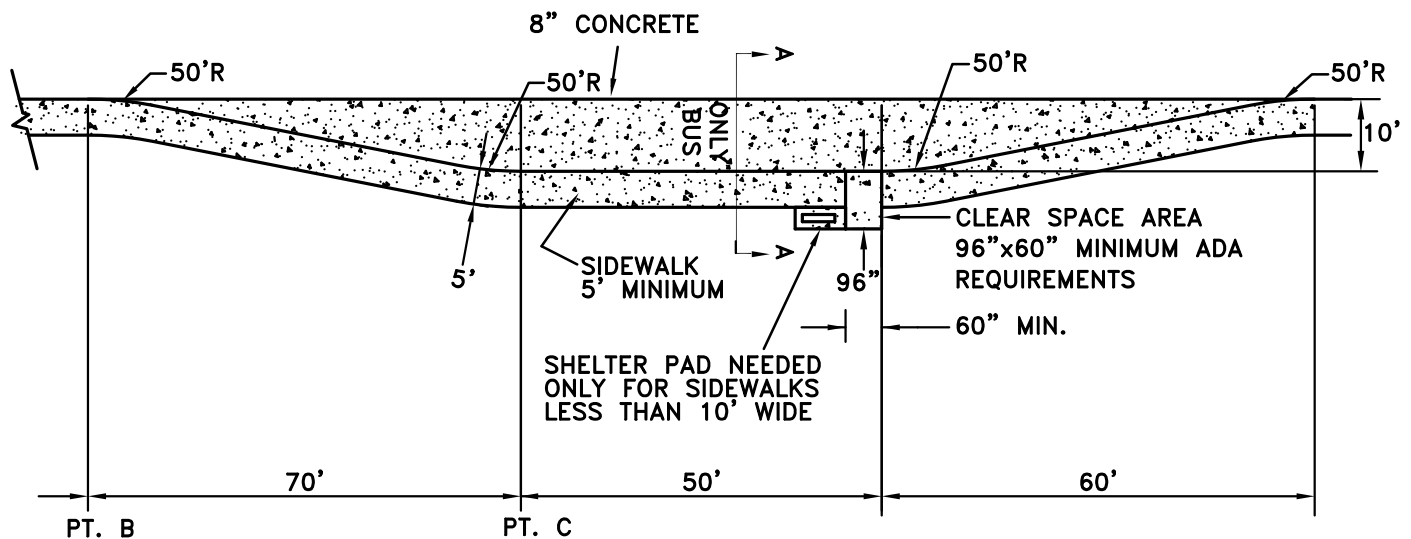
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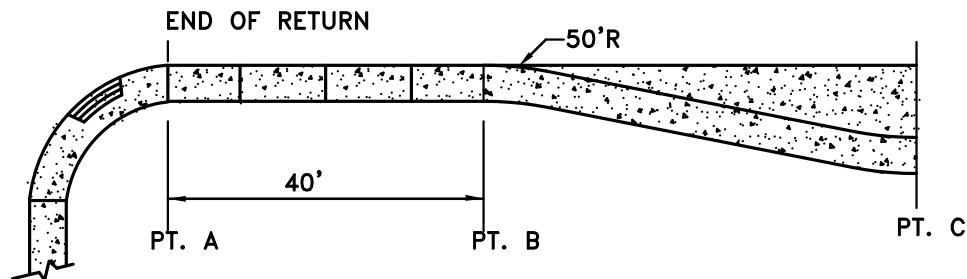
MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-M1



NOTE: REFER TO PLATE 3-M3 FOR TYPICAL CROSS SECTION A-A DETAIL



NOTES:

1. NO EXTRA SHELTER PAD NEEDED FOR SIDEWALKS WIDER THAN 10 FEET.
2. SHELTER PAD AND SHELTERS MUST BE WIDE ENOUGH TO MEET ADA REQUIREMENTS 4.0' X 3.0' CLEAR FLOOR AREA WITHIN SHELTER PERIMETER.
3. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED AT TRANSIT LOCATIONS AND INTERSECTIONS.
4. ALL BUS TURNOUT LOCATIONS AND DESIGN SHALL BE COORDINATED AND APPROVED BY THE COUNTY TRANSIT DIVISION.
5. SHELTER PAD AND SHELTERS SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE LATEST EDITION OF ADA STANDARDS FOR TRANSPORTATION FACILITIES (SECTION 810.3). REFER TO SECTION 810 "TRANSPORTATION FACILITIES" AT [WWW.ACCESS.BOARD.GOV](http://WWW.ACCESS.BOARD.GOV)
6. INSTALL STATIONARY BICYCLE RACKS NEAR BUS STOPS AT THE LOCATIONS SPECIFIED AND APPROVED BY THE COUNTY TRANSIT DIVISION.
7. UNSUITABLE SOIL UNDER THE BUS TURN OUT SHALL BE REMOVED AND REPLACED WITH A BEDDING CONSISTING OF SAND OR PEA GRAVEL WITH A MINIMUM THICKNESS THAT CAN ACCOMMODATE BUS TRAFFIC AND BUS LOADING (PER SOIL REPORT'S RECOMMENDATION).



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FAR SIDE  
BUS TURNOUT

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

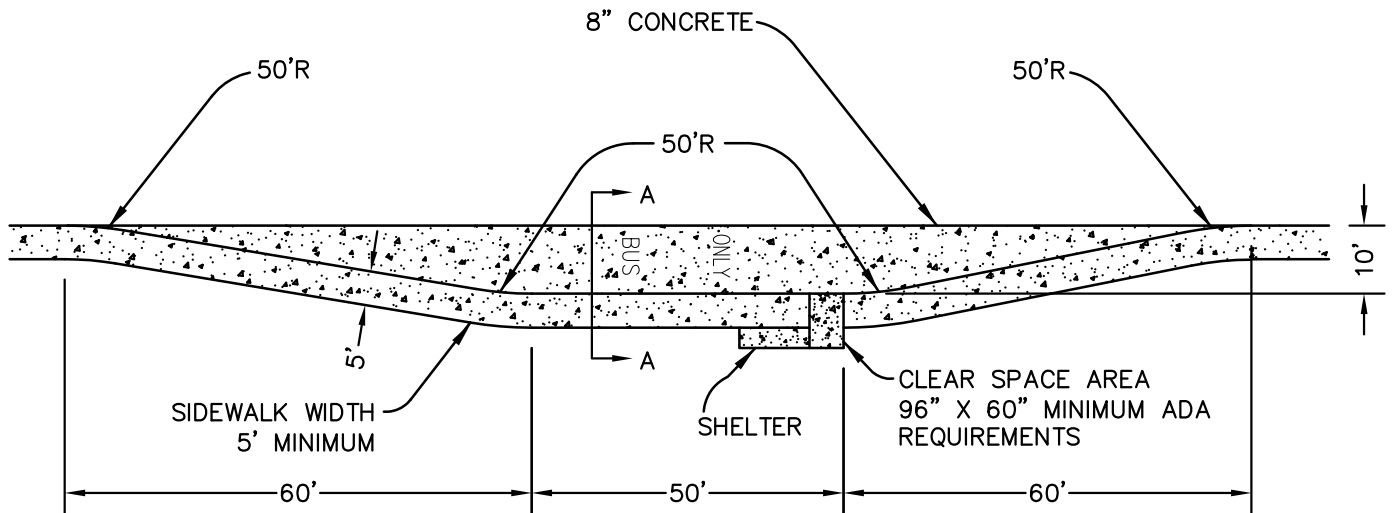
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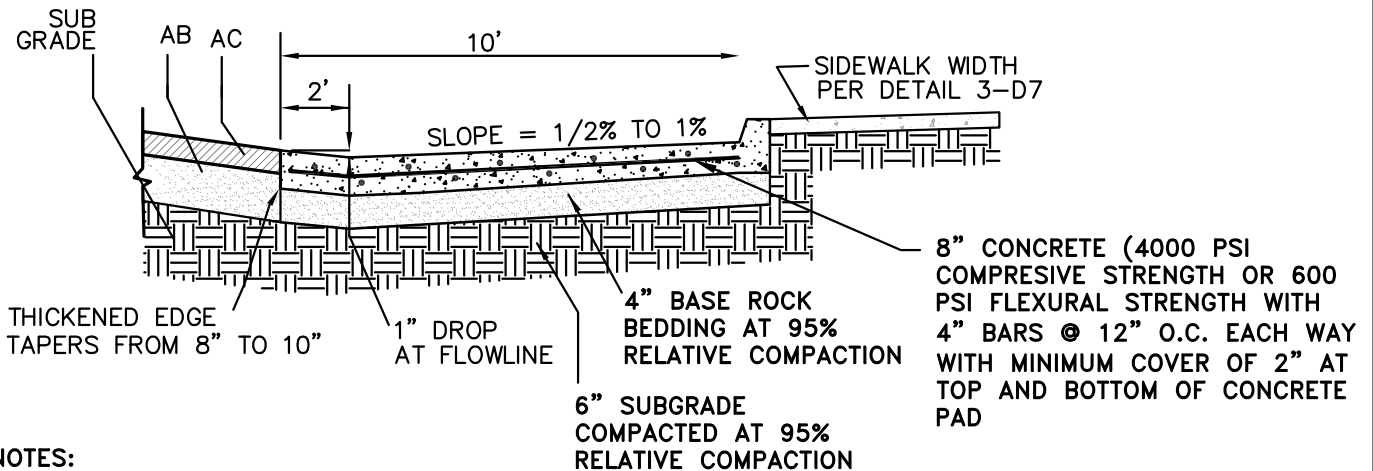
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DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-M2



TYPICAL CROSS SECTION A-A



NOTES:

1. NO EXTRA SHELTER PAD NEEDED FOR SIDEWALKS WIDER THAN 10 FEET.
2. SHELTER PAD AND SHELTERS MUST BE WIDE ENOUGH TO MEET ADA REQUIREMENTS 4.0' X 3.0' CLEAR FLOOR AREA WITHIN SHELTER PERIMETER.
3. ADDITIONAL RIGHT OF WAY MAY BE REQUIRED AT TRANSIT LOCATIONS AND INTERSECTIONS.
4. ALL BUS TURNOUT LOCATIONS AND DESIGN SHALL BE COORDINATED AND APPROVED BY THE COUNTY TRANSIT DIVISION.
5. SHELTER PAD AND SHELTERS SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE LATEST EDITION OF ADA STANDARDS FOR TRANSPORTATION FACILITIES (SECTION 810.3). REFER TO SECTION 810 "TRANSPORTATION FACILITIES" AT [WWW.ACCESS.BOARD.GOV](http://WWW.ACCESS.BOARD.GOV)
6. INSTALL STATIONARY BICYCLE RACKS NEAR BUS STOPS AT THE LOCATIONS SPECIFIED AND APPROVED BY THE COUNTY TRANSIT DIVISION.
7. UNSUITABLE SOIL UNDER THE BUS TURN OUT SHALL BE REMOVED AND REPLACED WITH A BEDDING CONSISTING OF SAND OR PEA GRAVEL WITH A MINIMUM THICKNESS THAT CAN ACCOMMODATE BUS TRAFFIC AND BUS LOADING (PER SOIL REPORT'S RECOMMENDATION)



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MID-BLOCK  
BUS TURNOUT

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

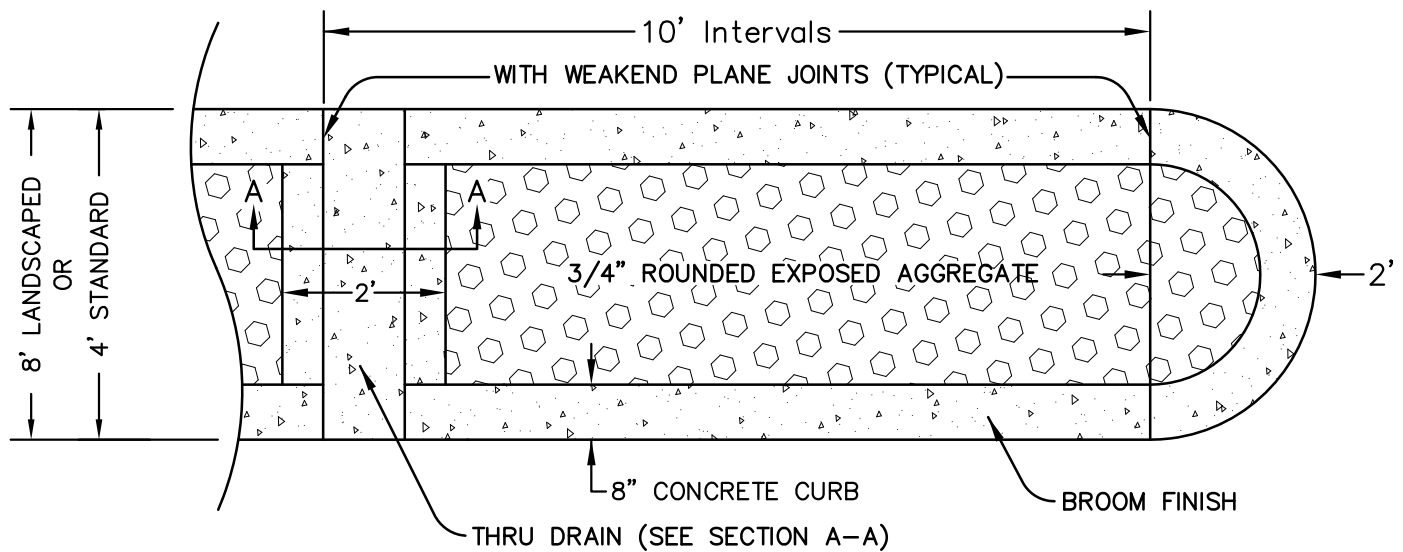
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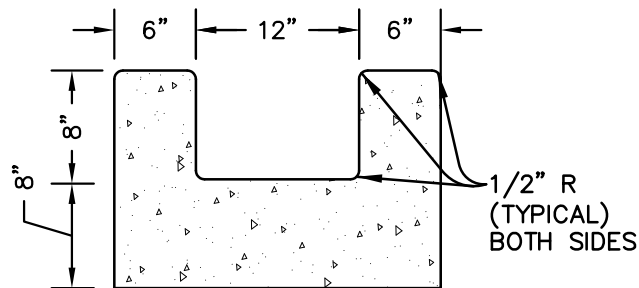
MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-M3



PLAN



SECTION A-A

NOTES:

1. ON LANDSCAPED MEDIANS, THE CURB SHALL EXTEND TO THE BOTTOM OF THE AGGREGATE BASE.
2. PROVIDE WEAKENED PLANE JOINTS EVERY 10 FEET AND AT END OF RETURNS.
3. LANDSCAPED MEDIANS SHALL BE A MINIMUM OF 8 FEET WIDE.
4. REFER TO STANDARD PLATE DETAIL 3-N2 FOR 8" MEDIAN CONCRETE CURB DETAIL



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MEDIAN  
DETAIL

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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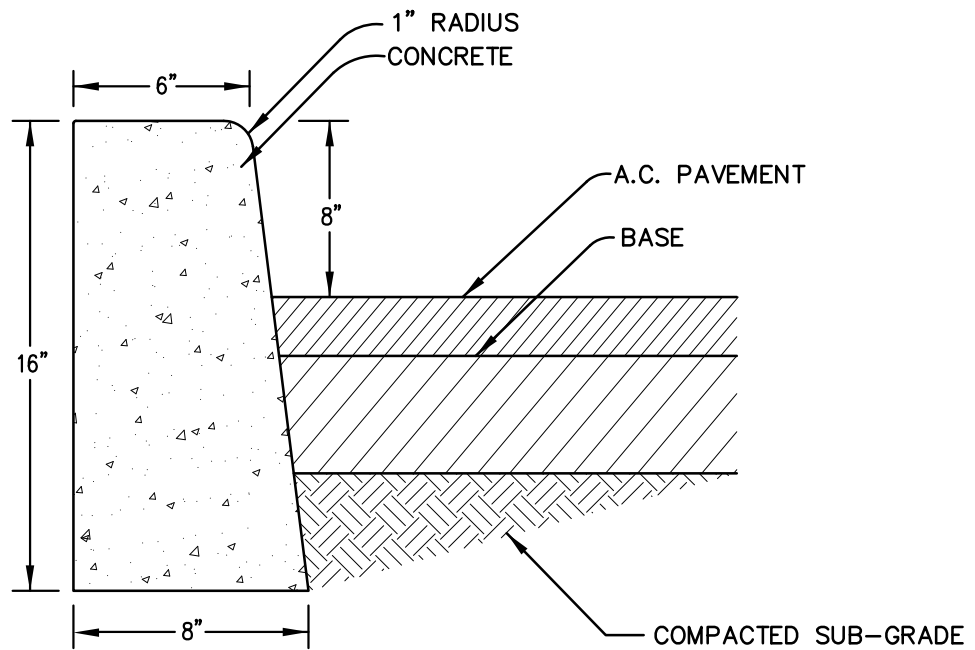
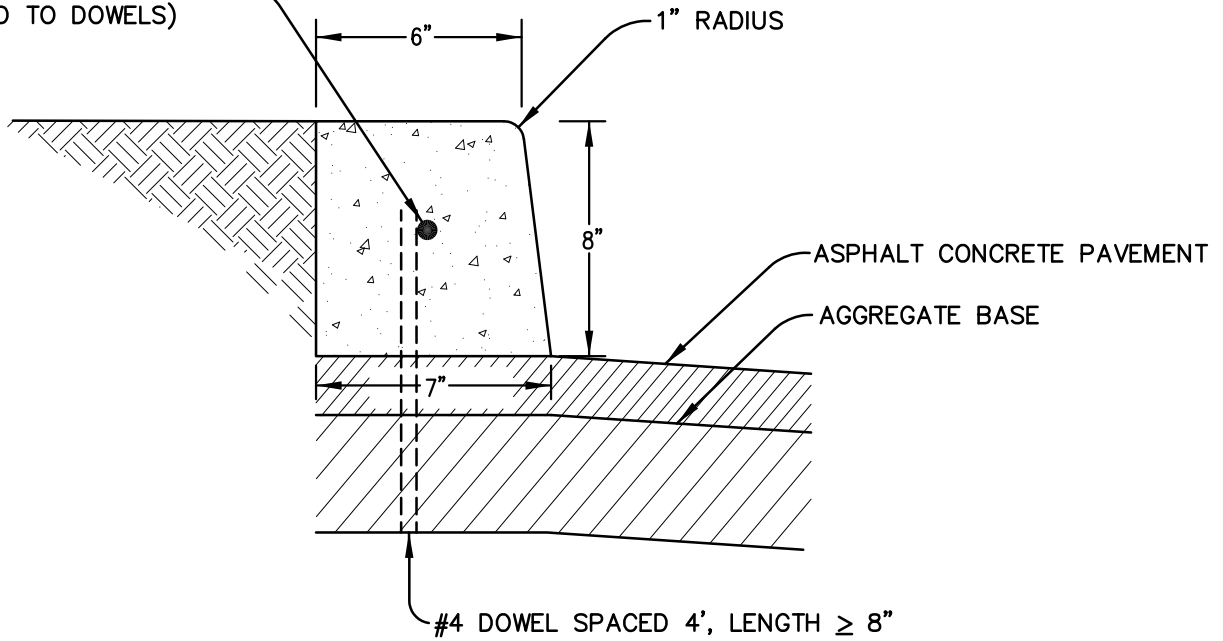
*Matthew Machado*

MATTHEW MACHADO, RCE  
DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 3-N1

#4 LONGITUDINAL BAR  
(TIED TO DOWELS)



NO.	REVISED	BY
UPDATED BY: PAUL SAINI, RCE DONAL HICKS, SR. ENGR. TECH CHECKED BY: DAVID LEAMON, RCE		

## MEDIAN CONCRETE VERTICAL CURBS

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

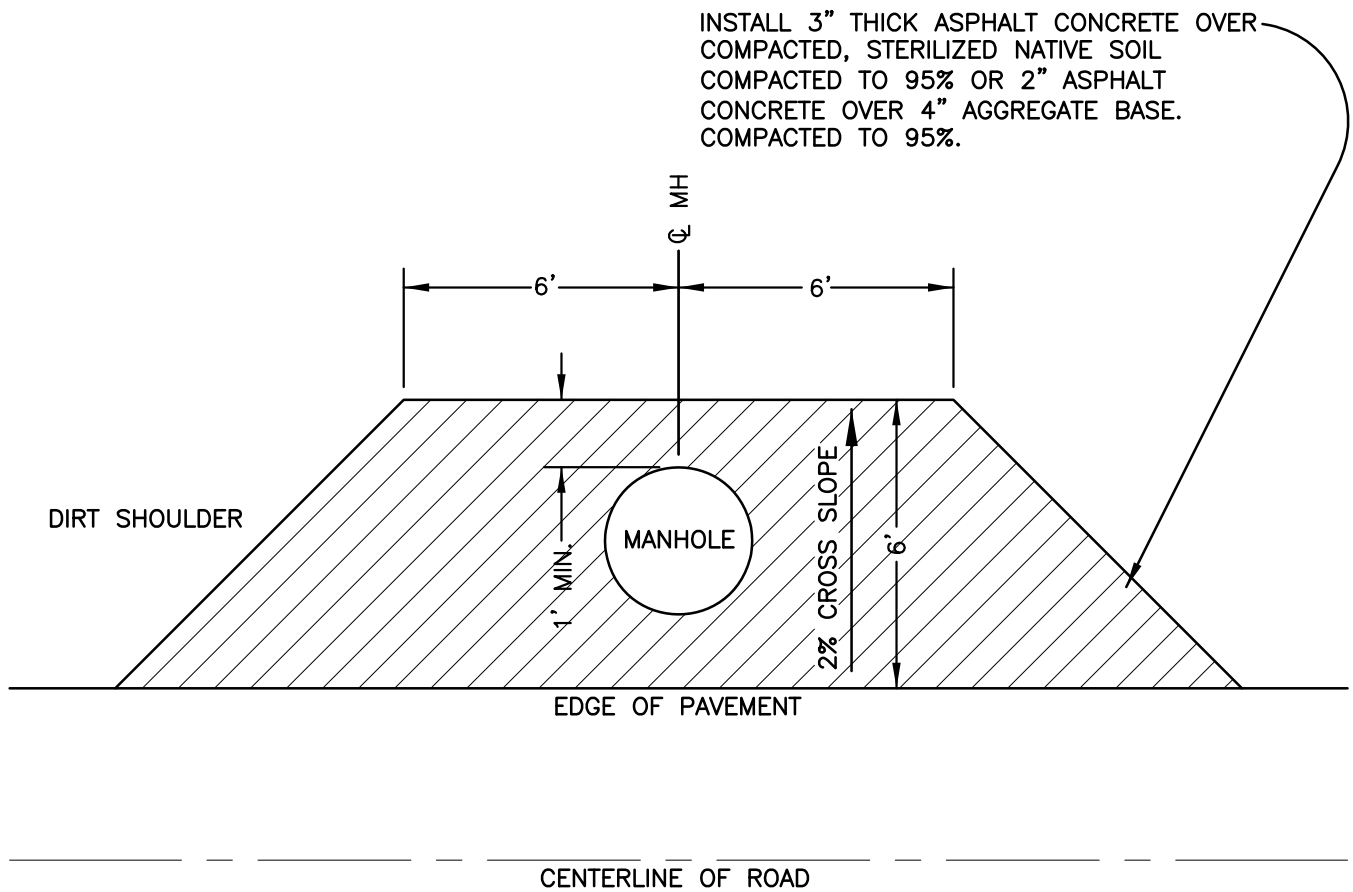
APPROVED BY:

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PLATE NO: 3-N2



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PAVING REQUIREMENT FOR  
MANHOLE LESS THAN 6FT  
FROM EDGE OF PAVEMENT

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

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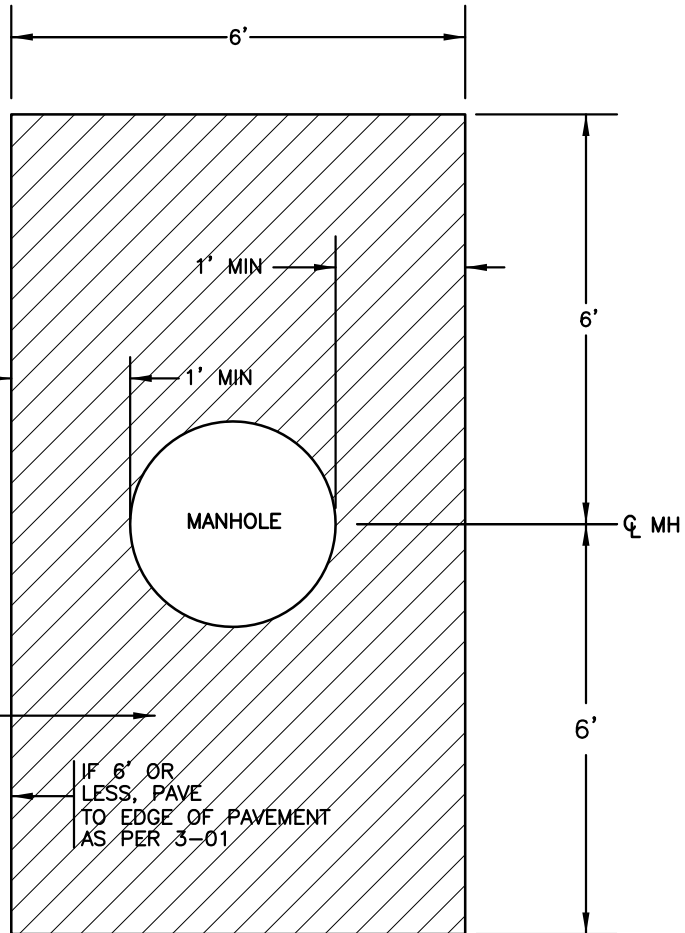
DATE: JUNE 2, 2014

PLATE NO: 3-01

CENTER LINE OF ROAD

EDGE OF PAVEMENT

2% CROSS SLOPE



DIRT SHOULDER

INSTALL 2" THICK ASPHALT CONCRETE OVER COMPACTED, STERILIZED NATIVE SOIL OR 3 1/2" THICK CONCRETE.



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PAVING REQUIREMENTS FOR  
MANHOLE MORE THAN 6FT  
FROM EDGE OF PAVEMENT

COUNTY OF STANISLAUS  
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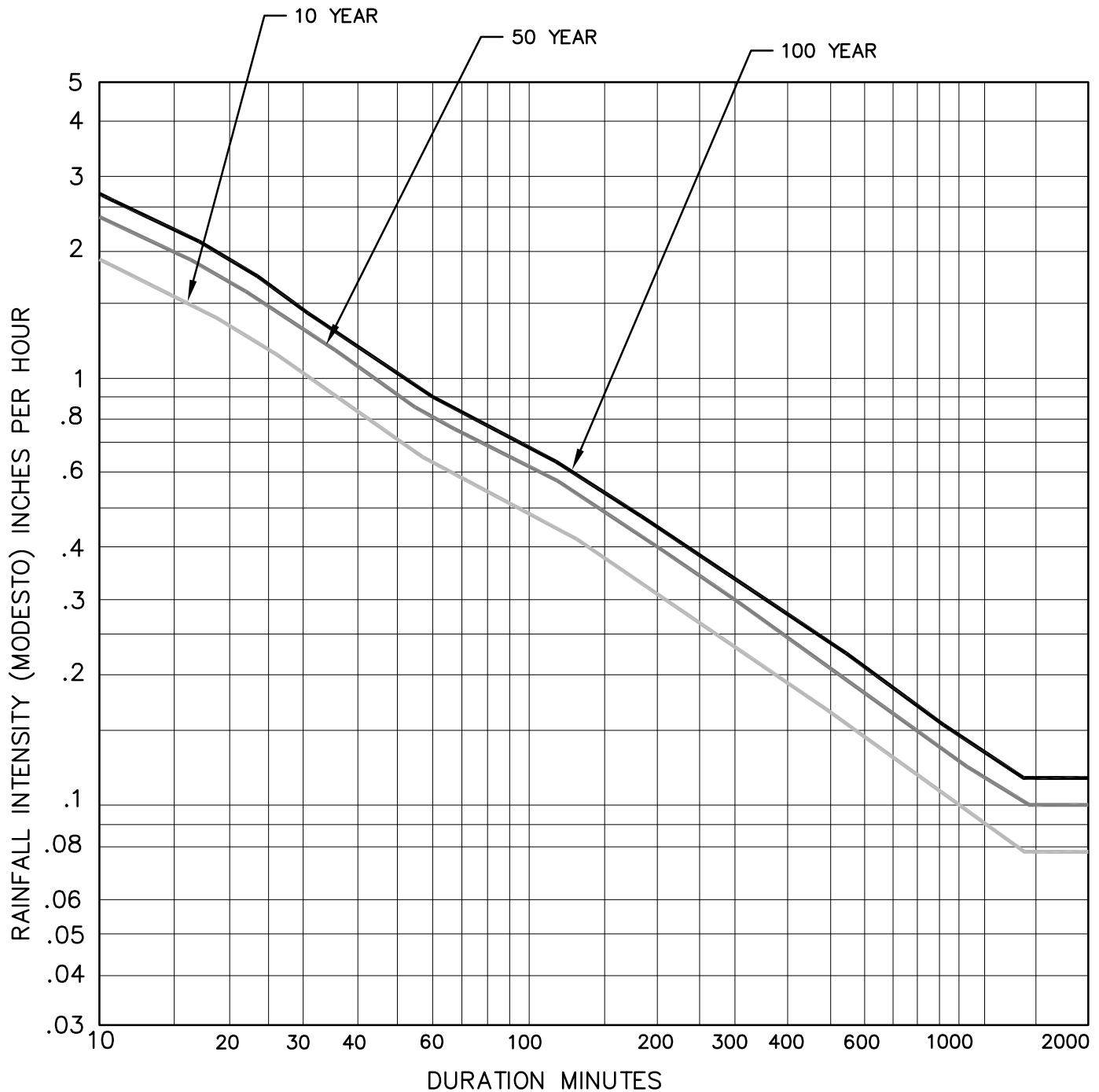
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DATE: JUNE 2, 2014

PLATE NO: 3-02





THESE CURVES ARE BASED ON CALIFORNIA DEPARTMENT OF WATER RESOURCES DATA FROM THE MODESTO RAINFALL GAGING STATION. (MEAN ANNUAL PRECIPITATION = 10.9 INCHES).

TO OBTAIN INTENSITIES FOR LOCATIONS OTHER THAN MODESTO, MULTIPLY INTENSITY ON THIS CHART BY MEAN ANNUAL PRECIPITATION AT THE POINT IN QUESTION DIVIDED BY 10.90.



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## RAINFALL INTENSITY CURVES

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

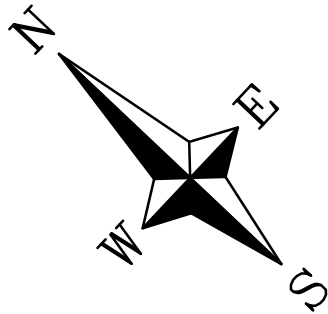
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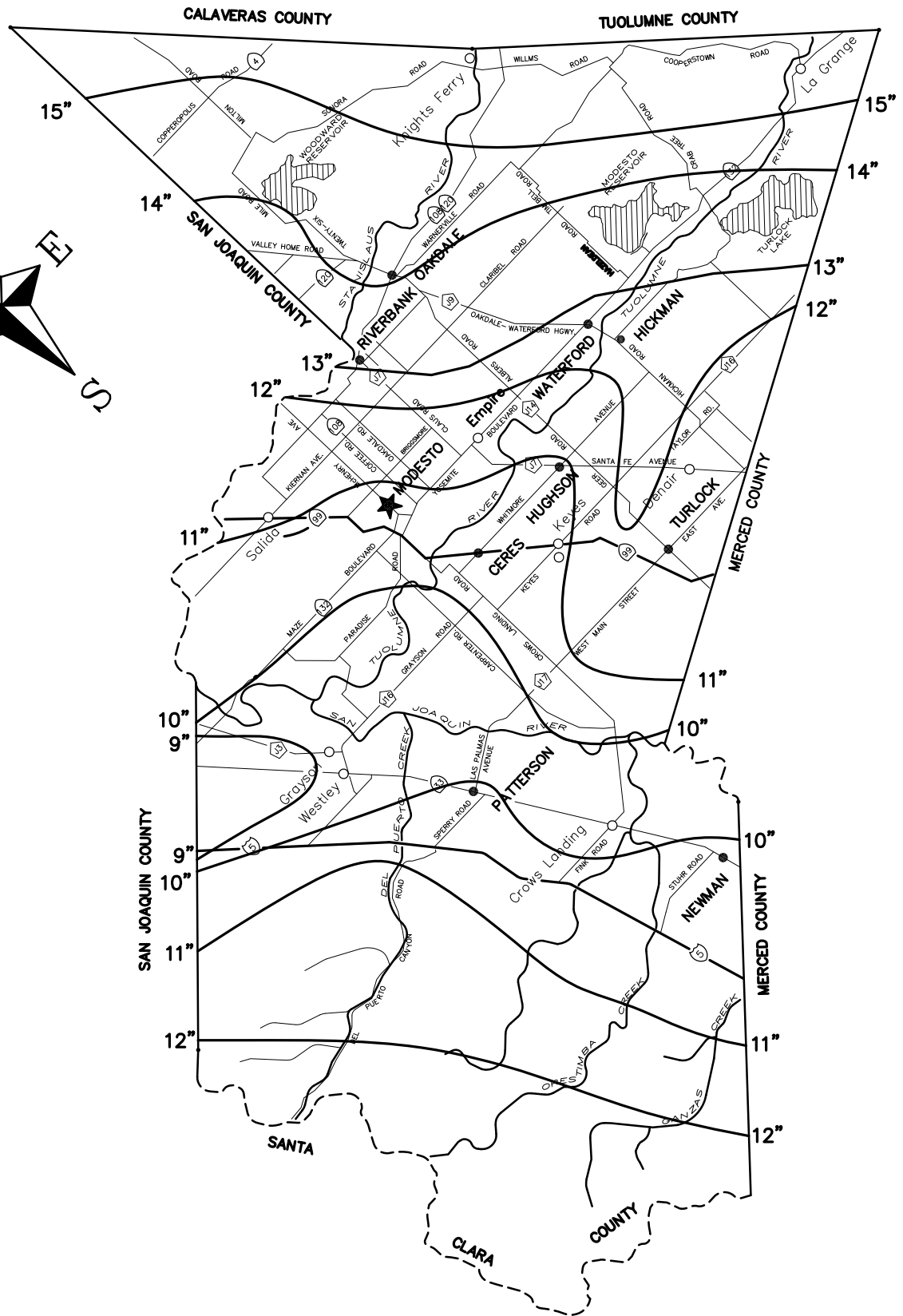
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STANISLAUS COUNTY



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MEAN ANNUAL  
PRECIPITATION

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

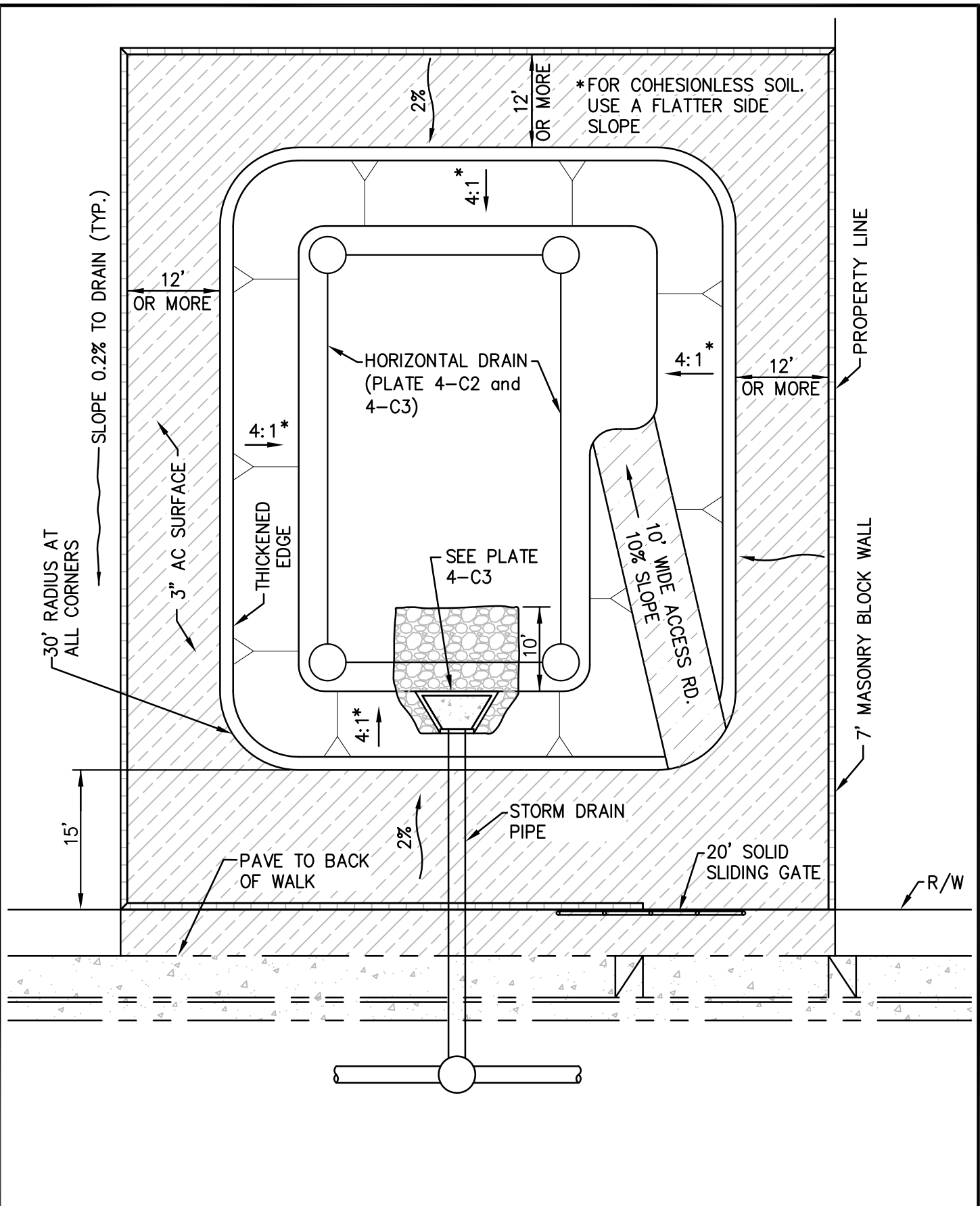
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## RETENTION DRAINAGE BASIN PLAN VIEW

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

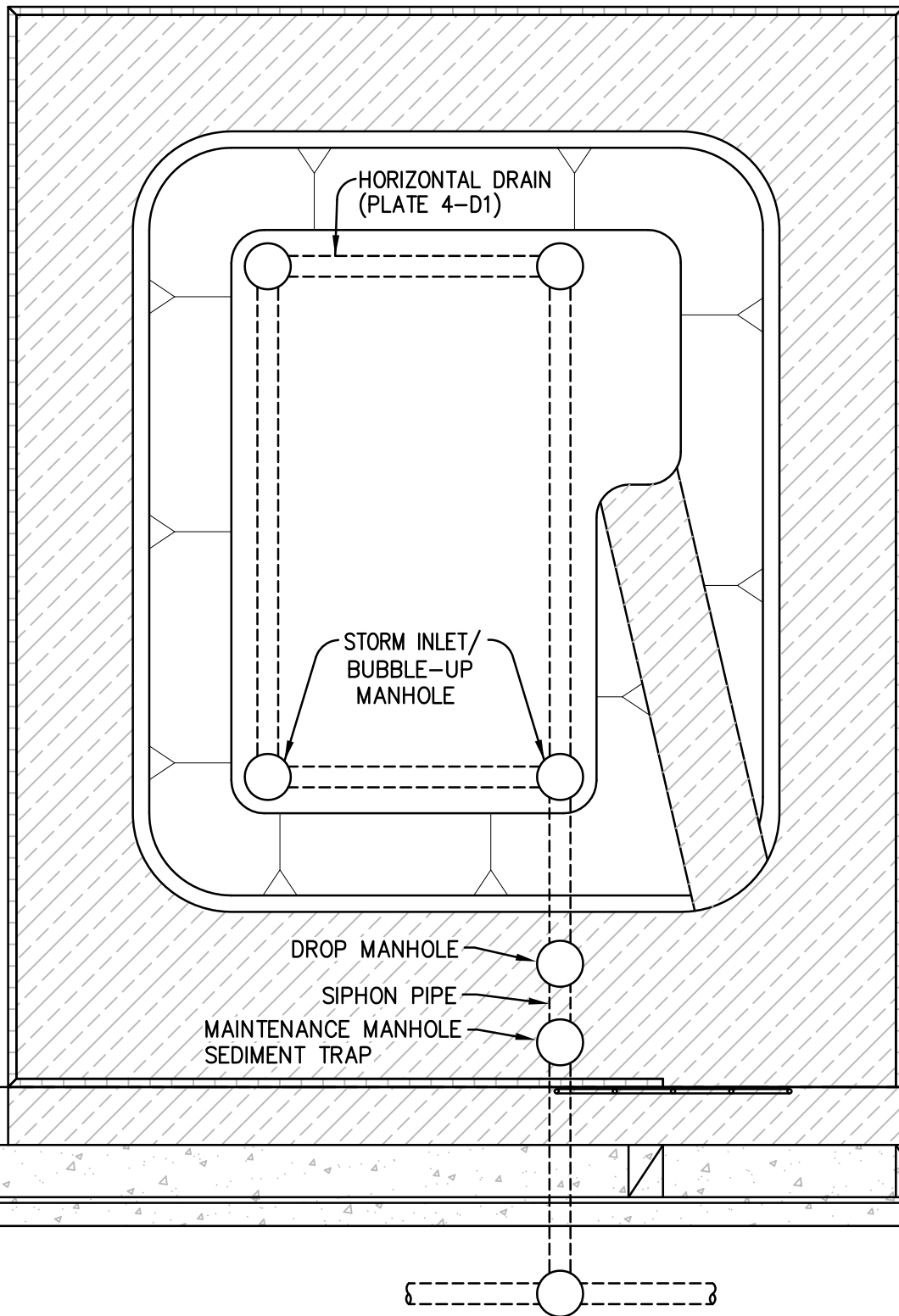
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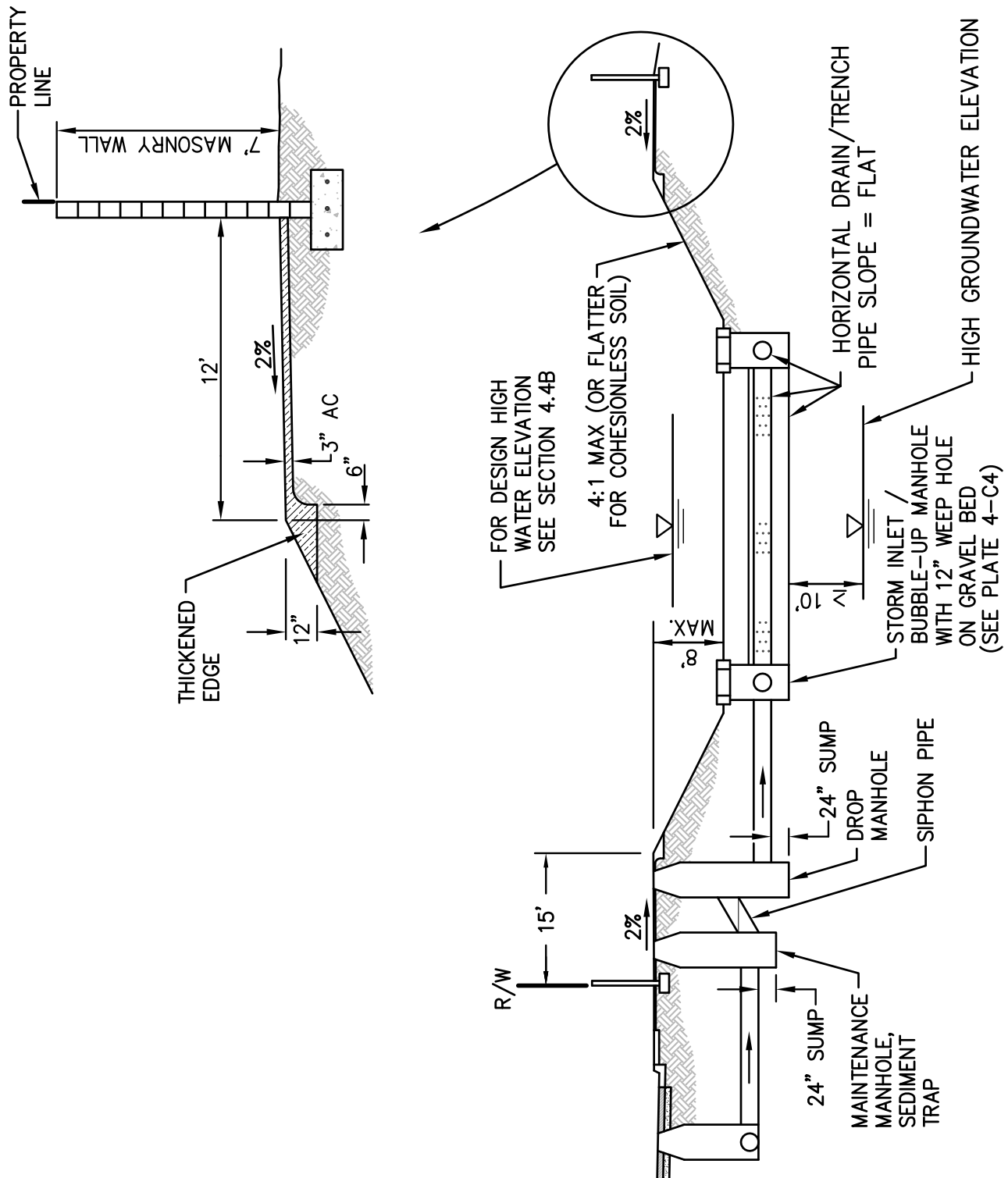


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HORIZONTAL DRAIN  
PLAN VIEW

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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TYPICAL DRAINAGE  
BASIN PROFILE

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

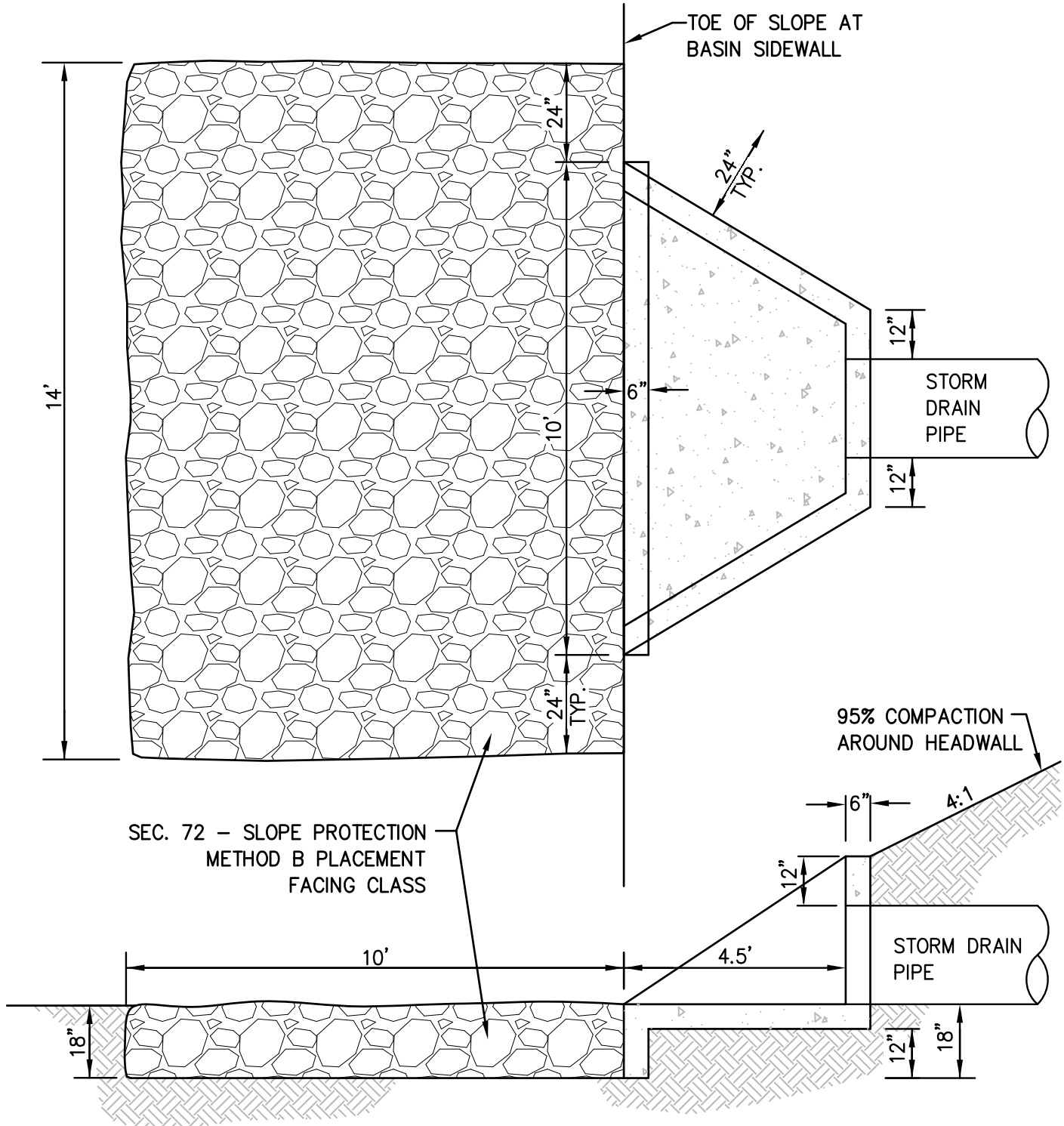
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PLATE NO: 4-C3

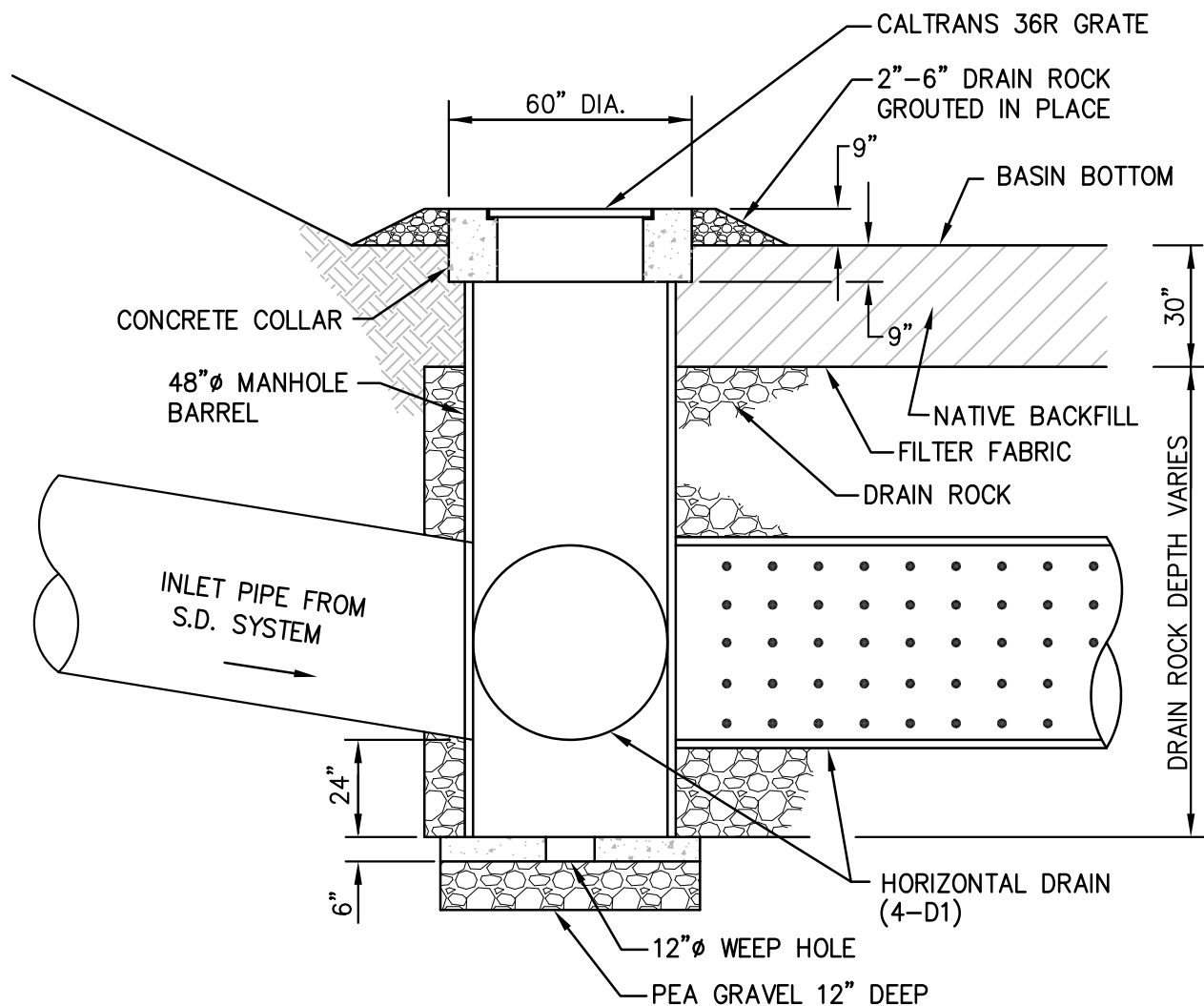


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DRAINAGE BASIN  
SIDE INLET

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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DATE: JUNE 2, 2014
PLATE NO: 4-C4



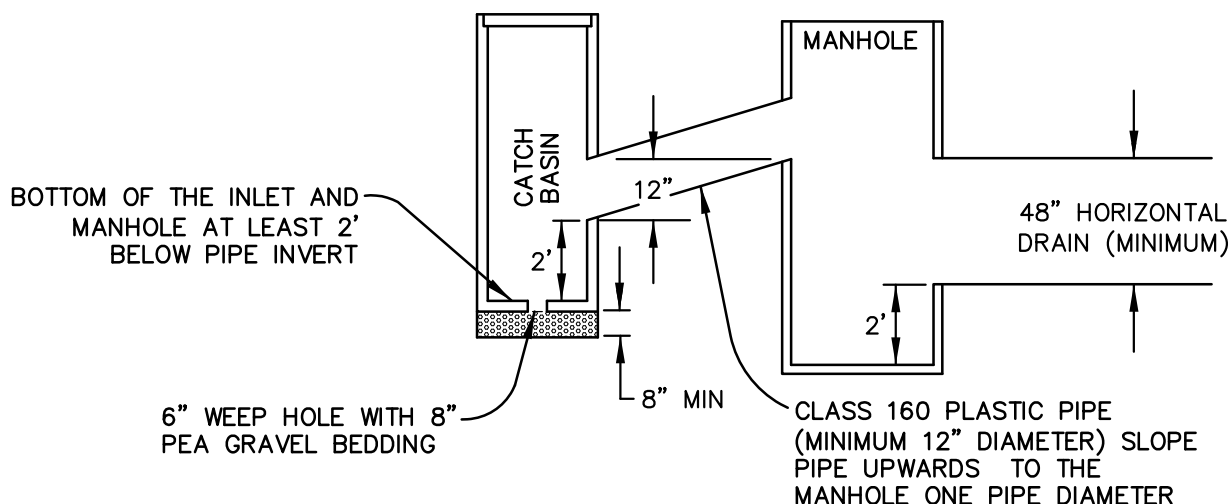
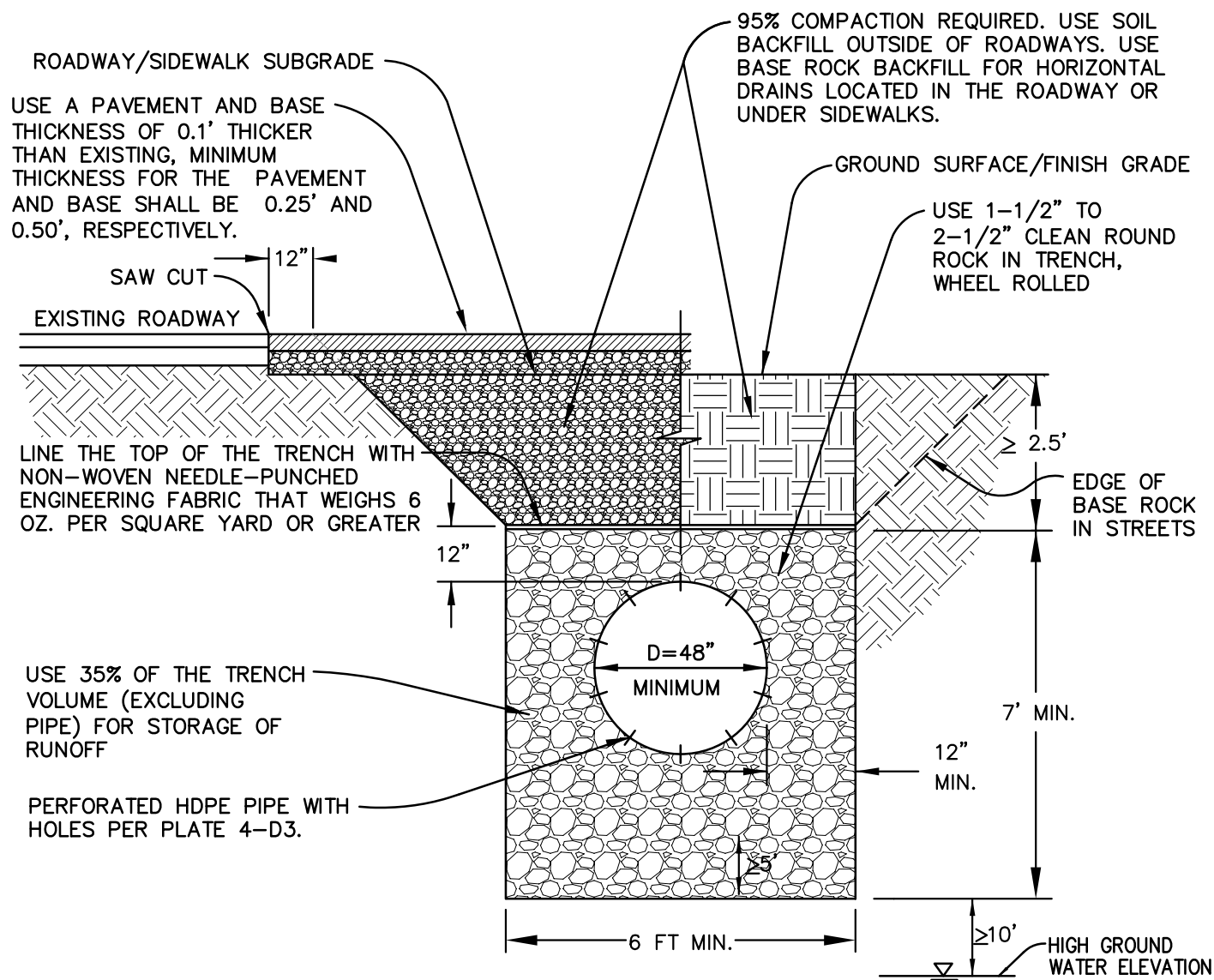
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DRAINAGE BASIN  
BUBBLE-UP INLET

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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PLATE NO: 4-C5






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## TYPICAL 48" HORIZONTAL DRAIN

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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PLATE NO: 4-D1

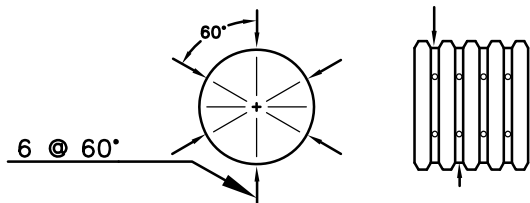


PLATE NO: 4-D2

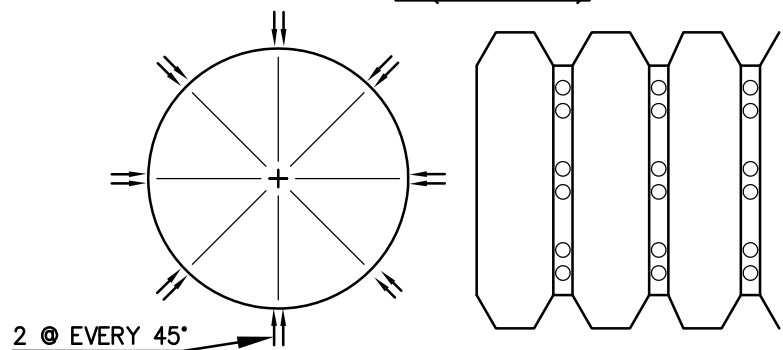
# AASHTO PERFORATION PATTERNS FOR HDPE PIPE

Nominal Dia (in)	AASHTO Specifications	Performance Type	Diameter max (in)	Perforation Configuration
12	M294	Circular	0.375	E
15	M294	Circular	0.375	E
18	M294	Circular	0.375	E
24	M294	Circular	0.375	F
30	M294	Circular	0.375	H
36	M294	Circular	0.375	H
42	M294	Circular	0.375	H
48	M294	Circular	0.375	H
60	M294	Circular	0.375	H

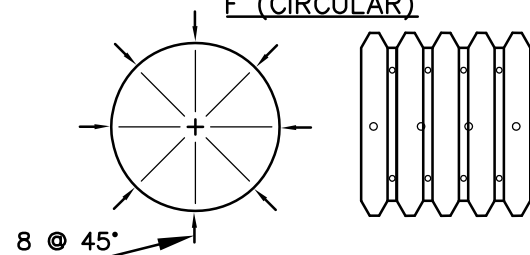
E (CIRCULAR)



H (CIRCULAR)



F (CIRCULAR)



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PERFORATION CONFIGURATION

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

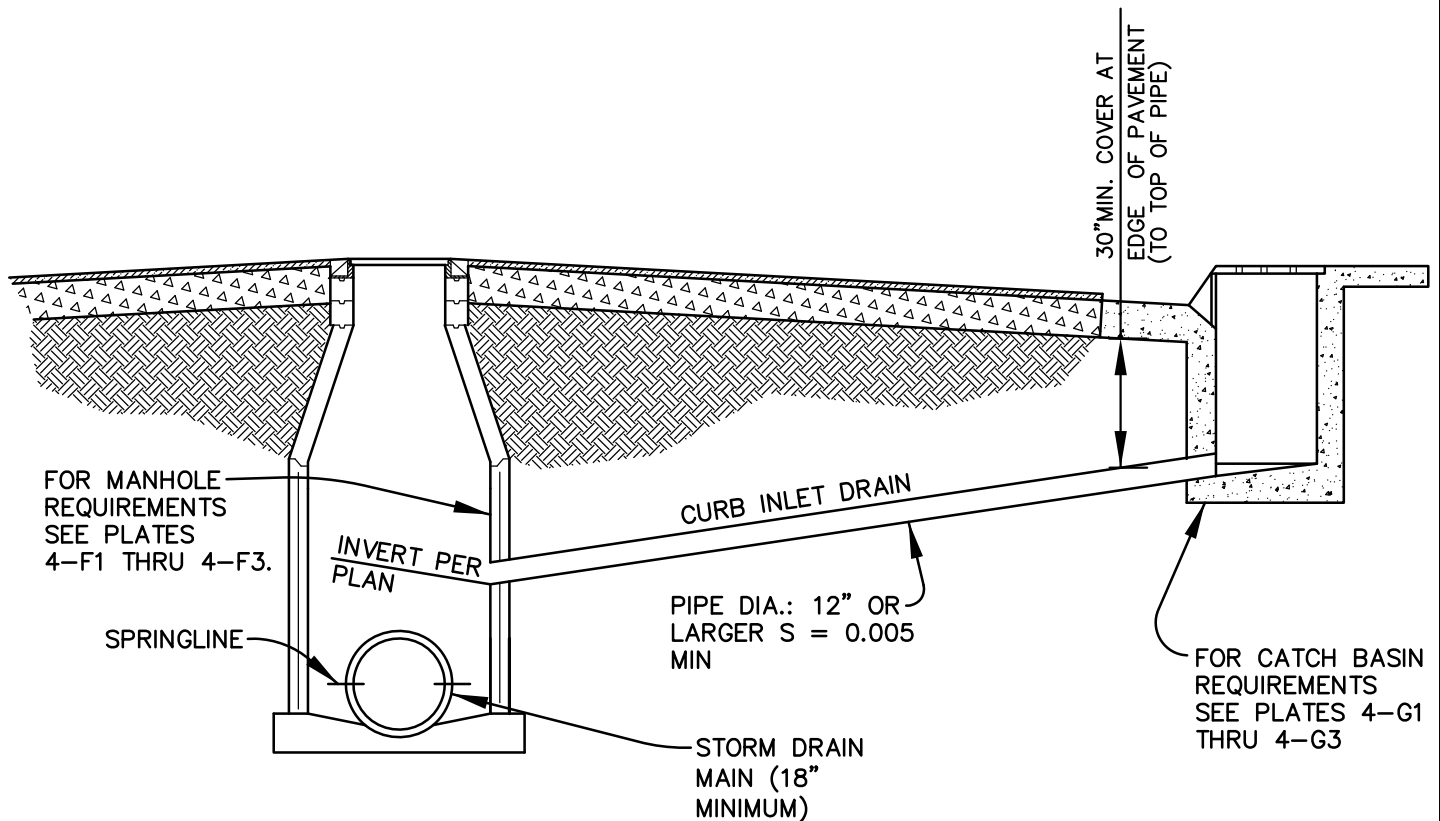
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PLATE NO: 4-D3



**NOTE:**

FOR TRENCHING AND PIPE INSTALLATION  
SEE PLATES 3-H1 AND 3-H2.



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CATCH BASIN TO  
MANHOLE CONNECTION

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

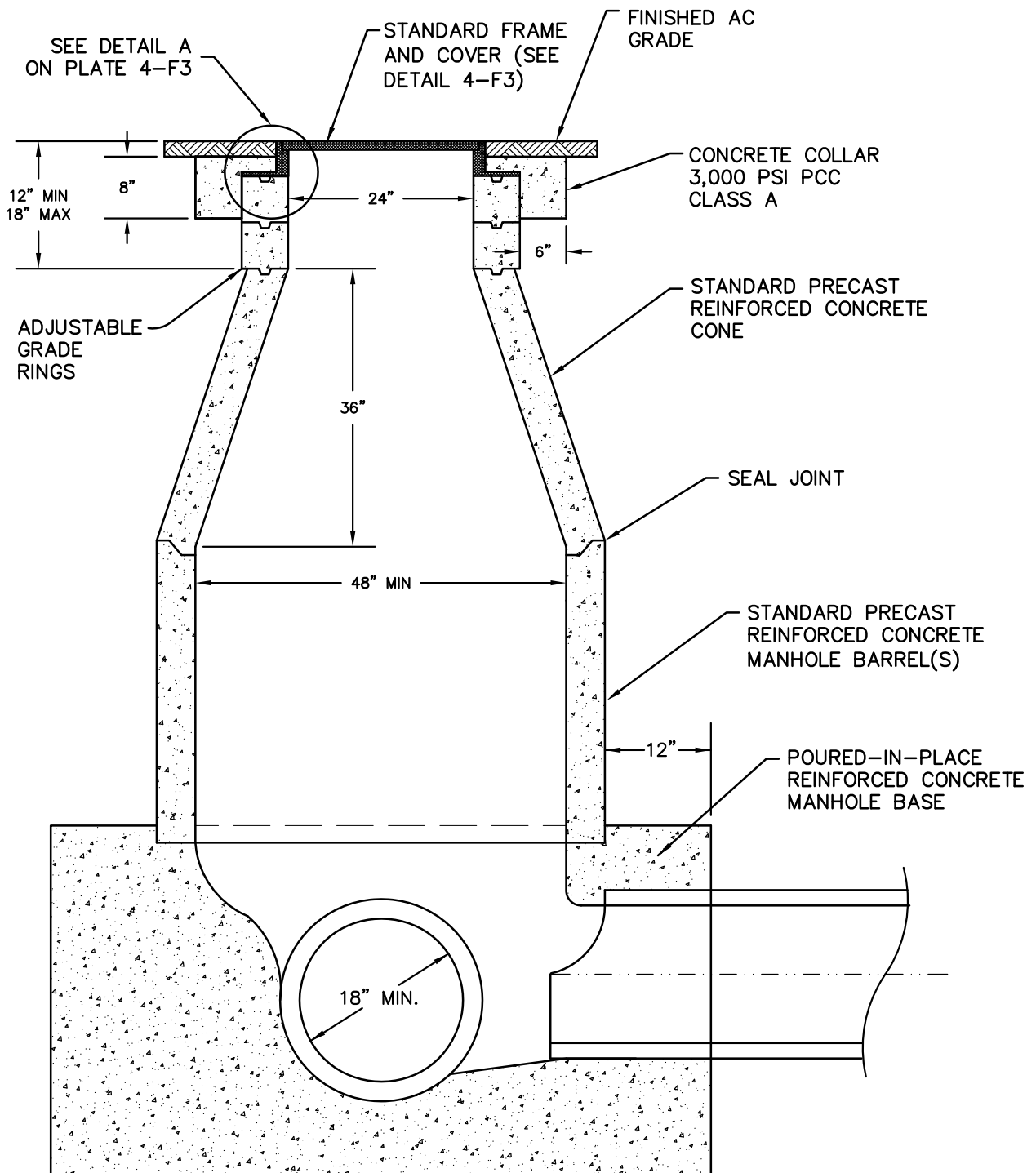
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DATE: JUNE 2, 2014

PLATE NO: 4-E1



**NOTES:**

1. FOR MANHOLE BASE SEE PLATE 4-F2 AND F-2A
2. FOR MANHOLE FRAME AND COVER SEE PLATE 4-F3
3. MINIMUM D = 18" PIPE DIAMETER FOR STORM DRAIN MAINS & 12" DIAMETER FOR LATERALS



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TYPICAL STORM DRAIN MANHOLE

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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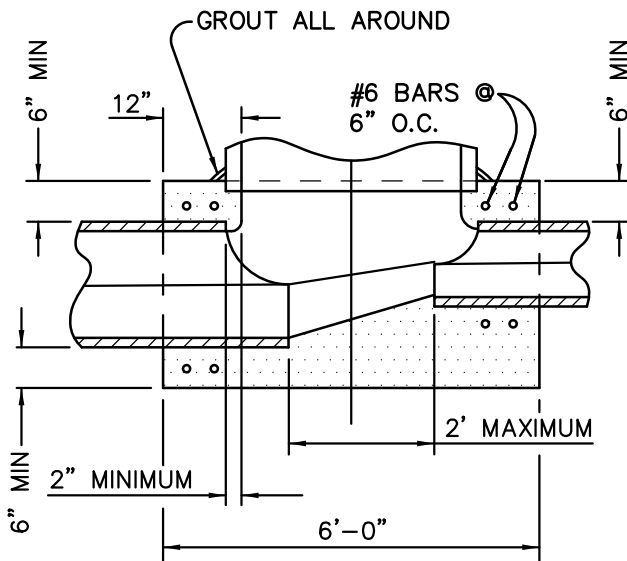
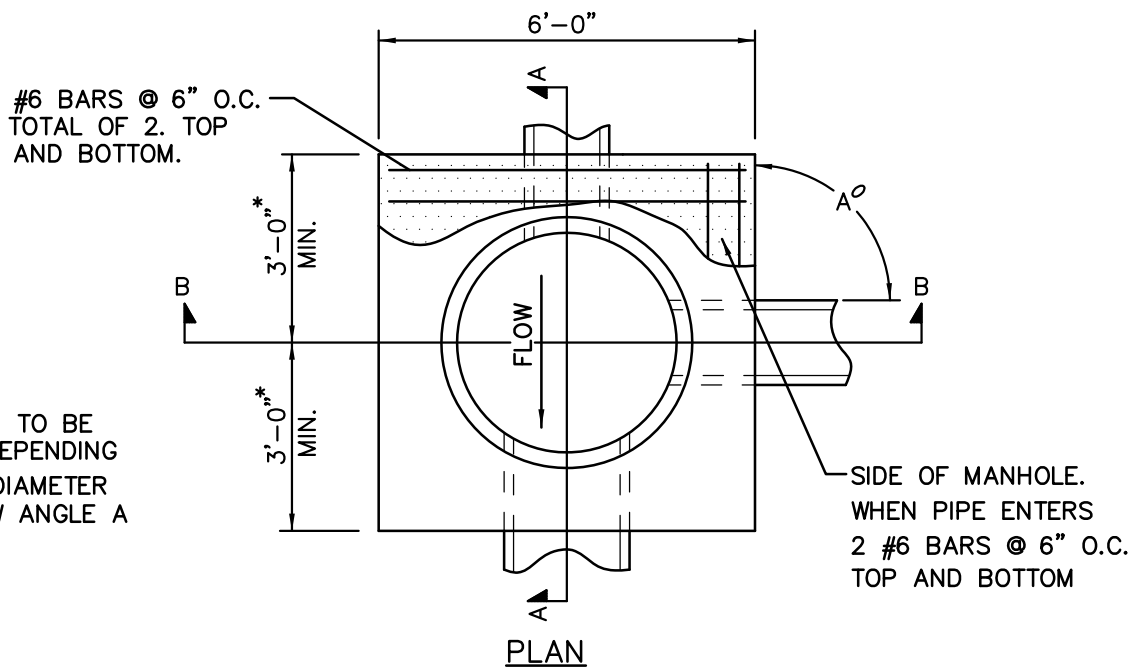
*Matthew Machado*

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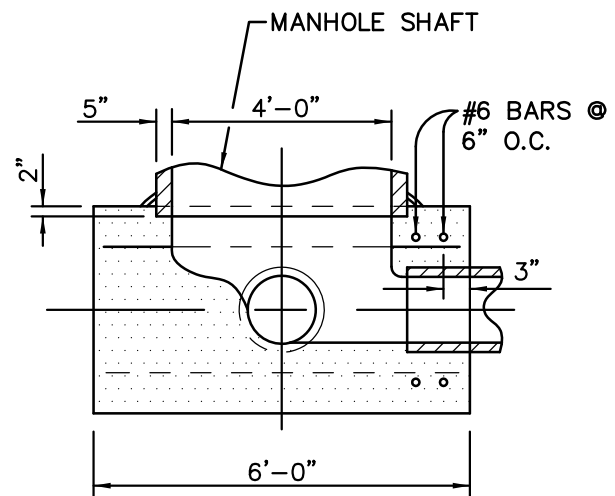
DATE: JUNE 2, 2014

PLATE NO: 4-F1

\*MAY NEED TO BE LONGER DEPENDING ON PIPE DIAMETER AND SKEW ANGLE A



SECTION A-A



SECTION B-B

# NOTES

1. ALL CONCRETE TO BE CLASS "A".
2. MATCH CROWN LINES OF PIPES ENTERING M.H. UNLESS OTHERWISE NOTED.
3. CUT PIPES TO ALLOW SETTING OF 4' DIAMETER CYLINDRICAL FORM FROM 6" ABOVE MAIN LINE PIPE TO SPRING LINE. CUT PIPE 2" LARGER THAN FORM TO ALLOW 2" CONCRETE OVER ENDS OF ALL CUT PIPE.
4. INVERT AND BASE OF M.H. TO BE POURED AND INVERT TO BE SHAPED BY HAND TO MAKE SMOOTH TRANSITION. FINISH WITH RUBBER FLOAT.
5. CENTER M.H. ON PIPE JOINT WHERE PIPE CHANGES SIZES, LEAVING A GAP OF 12" MINIMUM, 24" MAXIMUM.



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STORM DRAIN MANHOLE BASE  
FOR 30" AND SMALLER PIPES

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

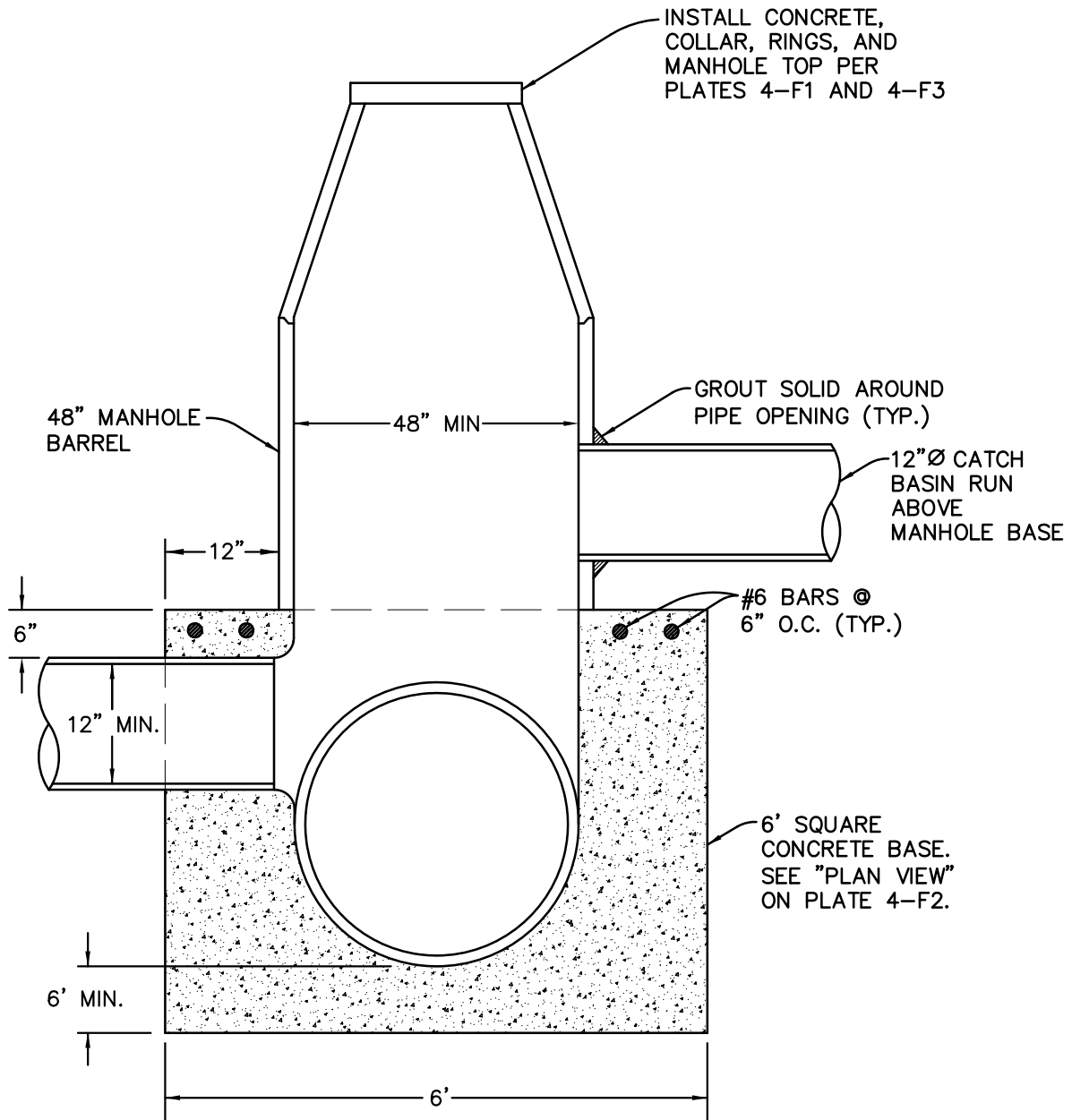
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DIRECTOR OF PUBLIC WORKS

DATE: JUNE 2, 2014

PLATE NO: 4-F2A



**NOTES:**

1. ALL CONCRETE TO BE CLASS A
2. CUT PIPES TO ALLOW SETTING OF 4' DIAMETER CYLINDRICAL FORM FROM 6" ABOVE MAIN LINE PIPE TO SPRING LINE. CUT PIPE 2" LARGER THAN FORM TO ALLOW 2" CONCRETE OVER ENDS OF ALL CUT PIPE.
3. INVERT AND BASE OF MANHOLE TO BE POURED AND INVERT TO BE AND INVERT TO BE SHAPED BY HAND FOR A SMOOTH TRANSITION. FINISH WITH RUBBER FLOAT.
4. CENTER MANHOLE ON PIPE JOINT WHERE PIPE CHANGES SIZE., LEAVING A GAP OF 12" MIN. AND 24" MAX.
5. FOR PIPES LARGER THAN 48" DIAMETER, MANHOLE BASE DETAILS SHALL BE PROPOSED BY THE ENGINEER FOR REVIEW AND APPROVAL BY THE COUNTY.



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STORM DRAIN MANHOLE BASE  
FOR 36" TO 48" PIPES

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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DATE: JUNE 2, 2014

PLATE NO: 4-F2B



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MANHOLE FRAME  
AND COVER

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:

Matthias

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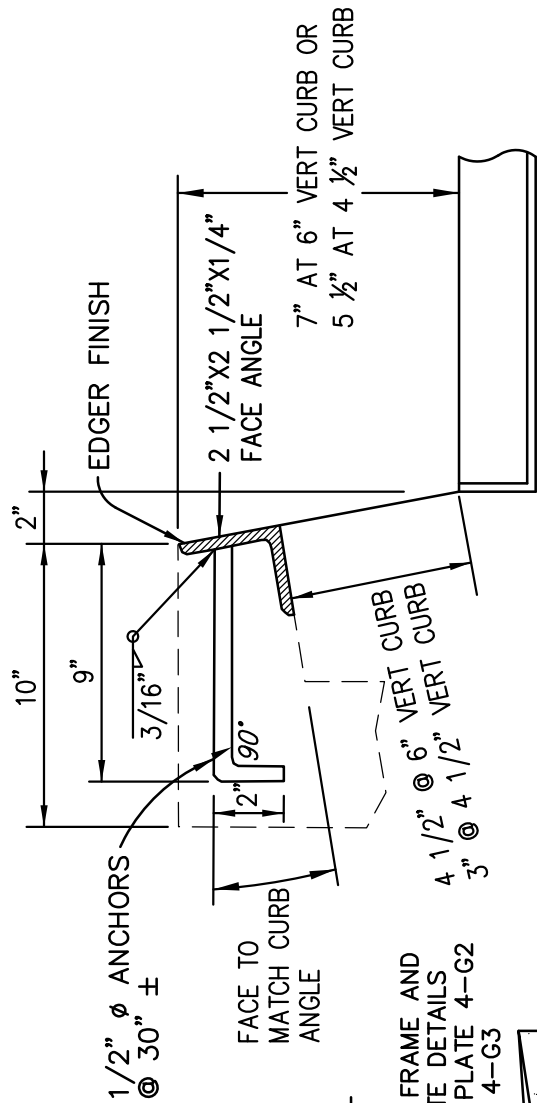
DATE: JUNE 2, 2014

PLATE NO: 4-F3

**NOTE:**

ALL FRAME AND GRATES SHALL BE HOT-DIPPED GALVANIZED.

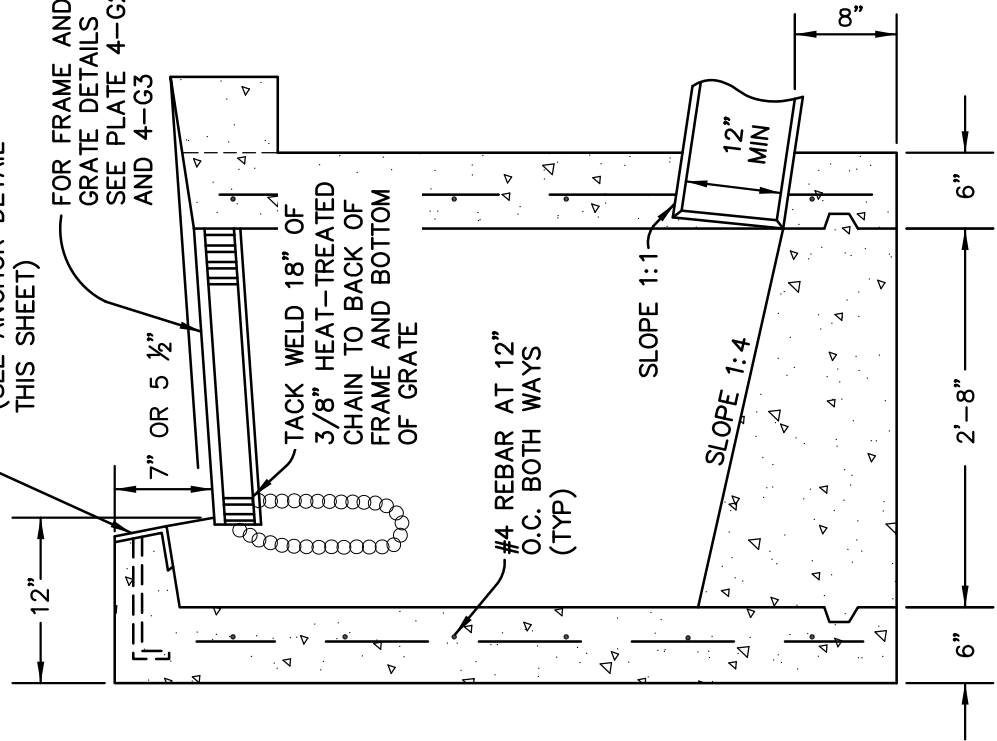
BASIN FRAME AND GRATE SHALL CONFORM TO CALTRANS STANDARD PLATE D74B, TYPE G.O.



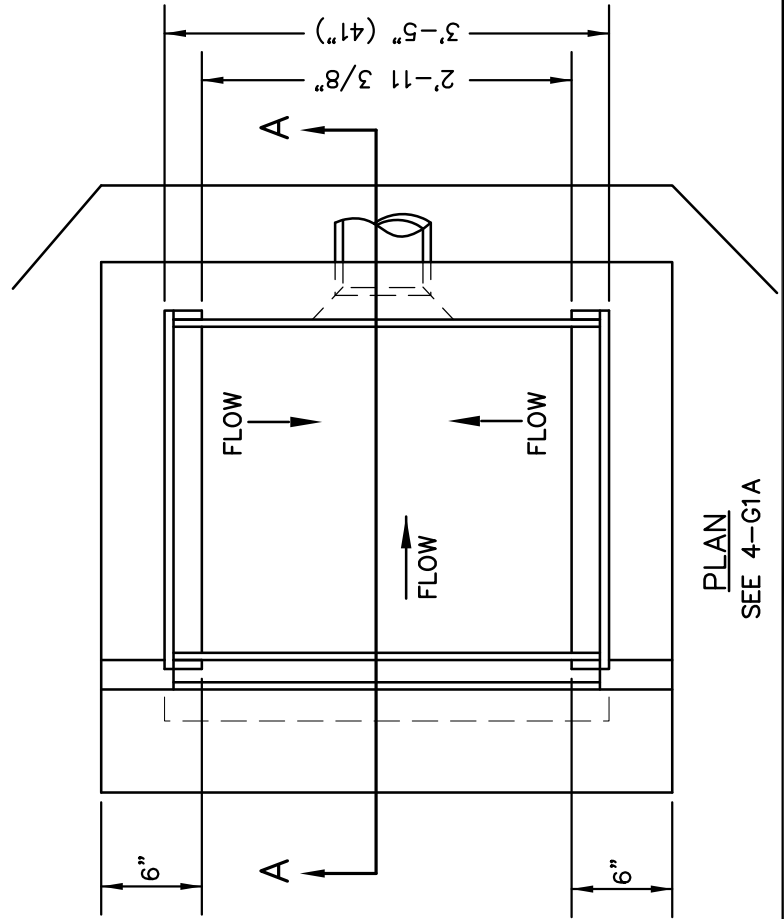
FACE ANGLE ANCHOR DETAIL

FACE ANGLE (SEE ANCHOR DETAIL THIS SHEET)

FOR FRAME AND GRATE DETAILS SEE PLATE 4-G2 AND 4-G3



SECTION A-A



PLAN  
SEE 4-G1A



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GRATE WITH CURB OPENING  
(TYPE G.O.) CATCH BASIN

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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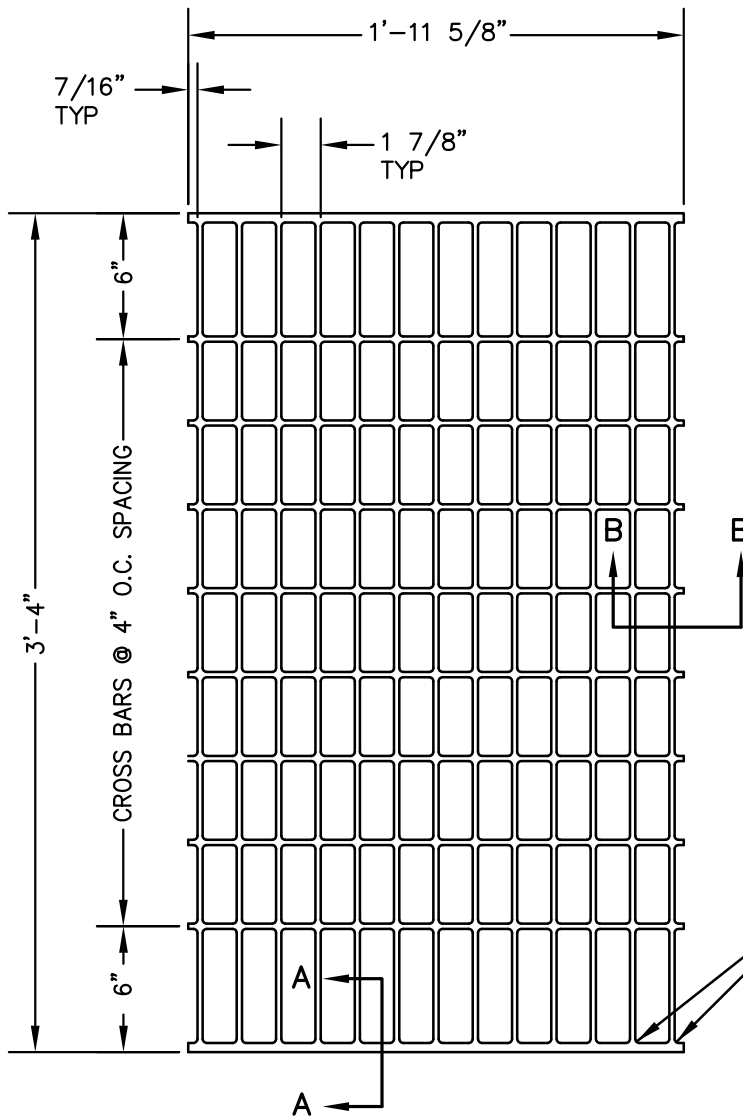
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PLATE NO: 4-G1A



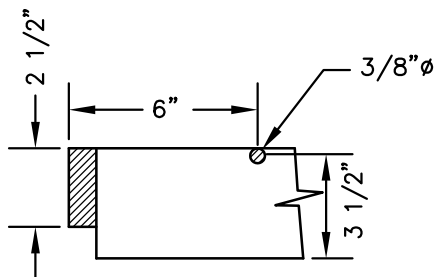
PLATE NO: 4-G1B



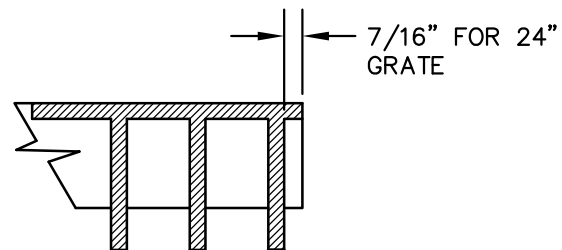
**NOTES:**

1. BEARING BARS TO BE 3 1/2" X 1/4" BARS ON 1 7/8" CENTERS.
2. 3/8"  $\phi$  CROSS BARS MAY BE FILLET WELDED, RESISTANCE WELDED OR ELECTROFORGED TO BEARING BARS.
3. WEIGHT OF 24" GRATE = 141LBS.
4. GRATE SHALL BE CHAINED TO CATCH BASIN.
5. ALL FRAMES AND GRATES SHALL BE HOT-DIPPED GALVANIZED AFTER MANUFACTURE
6. GRATE SHALL CONFORM TO CALTRANS STANDARD PLAN D77B, TYPE 24-13 GRATE.

3/16 FILLET WELD FULL DEPTH  
EACH SIDE ON OUTSIDE BEARING  
BARS AND ON EVERY THIRD  
INTERNAL BEARING BAR.



**SECTION A-A**



**SECTION B-B**



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CATCH BASIN GRATE  
FOR TYPE G.O. CATCH BASIN

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

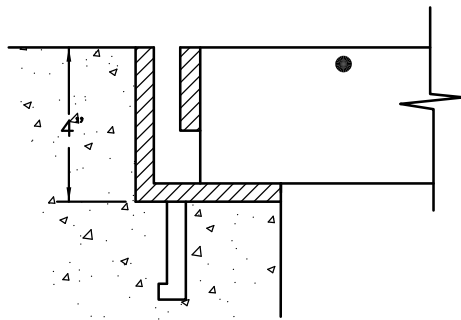
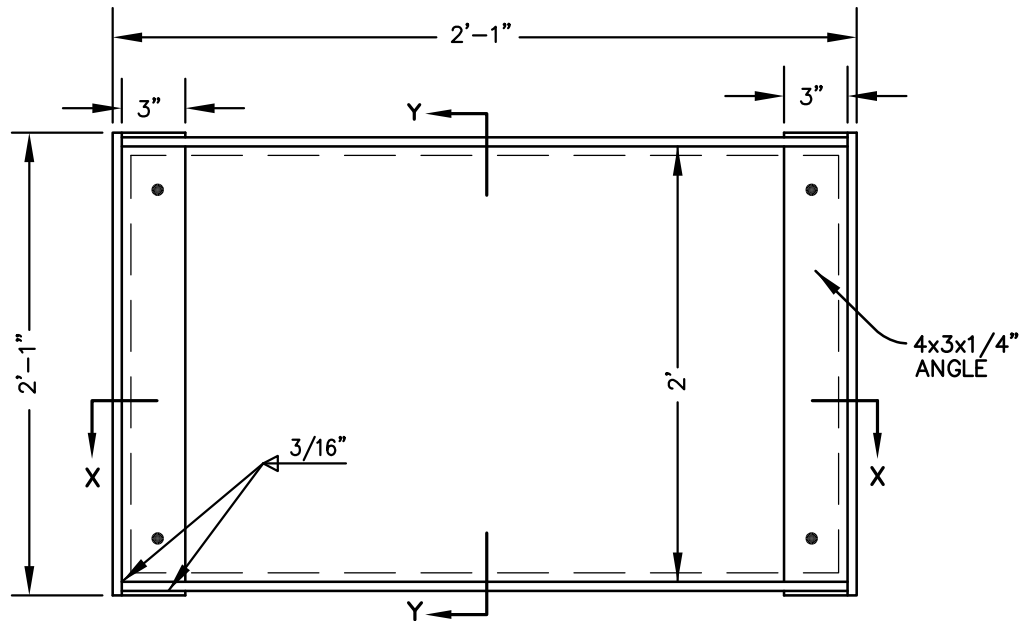
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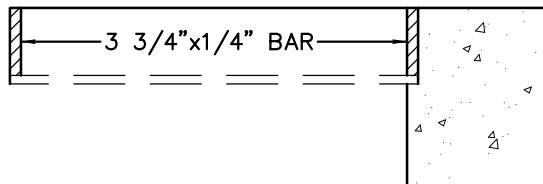
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DATE: JUNE 2, 2014

PLATE NO: 4-G2



X-X



Y-Y

NOTE:

1. ALL FRAMES AND GRATES SHALL BE HOT-DIPPED GALVANIZED AFTER MANUFACTURE.
2. FRAME SHALL CONFORM TO CALTRANS STANDARD PLAN D77A, FOR TYPE 600 GRATE.



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CATCH BASIN FRAME  
FOR TYPE G.O. CATCH BASIN

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

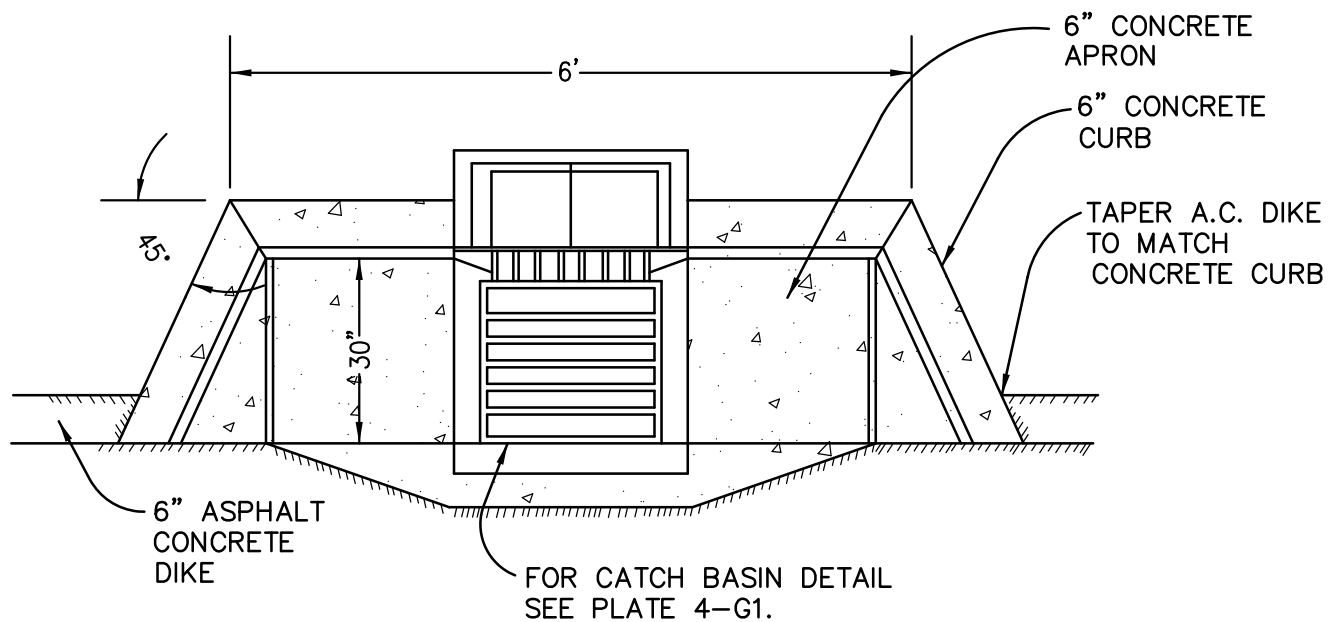
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PLATE NO: 4-G3



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## G.O. CATCH BASIN AT A.C. DIKE

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

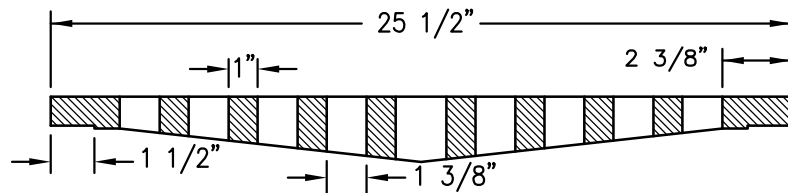
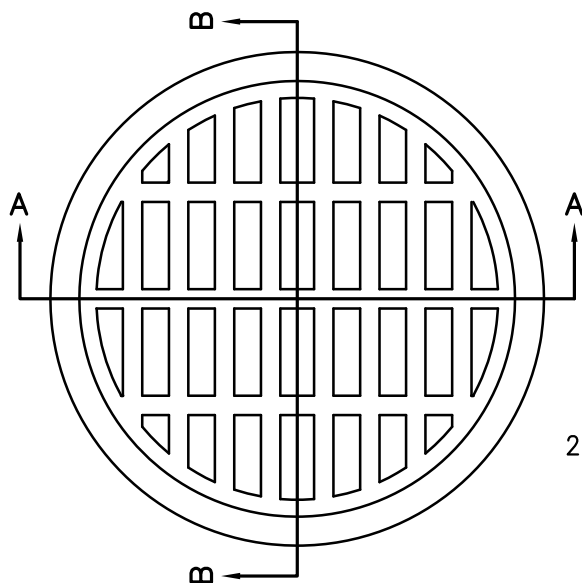
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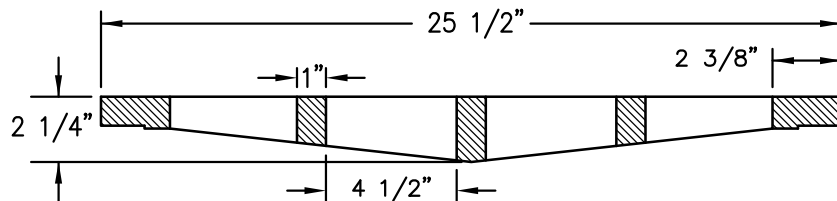
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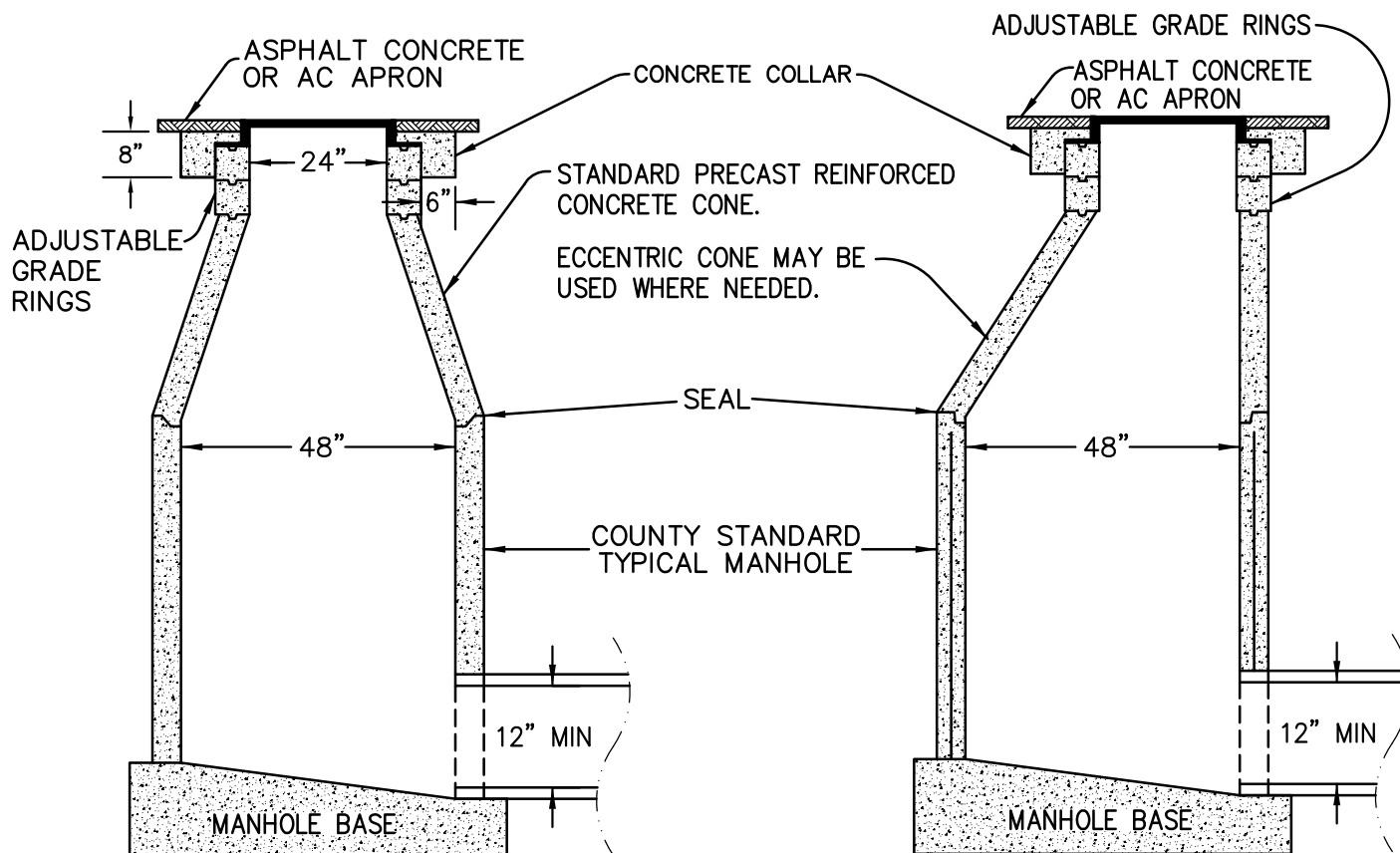
PLATE NO: 4-G4



SECTION A-A



SECTION B-B



**NOTE:**

1. THIS CATCH BASIN IS TO BE USED IN AREAS WITHOUT CURBING OR ASPHALT CONCRETE DIKE.
2. MINIMUM D = 12" PIPE DIAMETER FOR STORM DRAIN LATERAL



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**CATCH BASIN  
ALTERNATIVE**

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

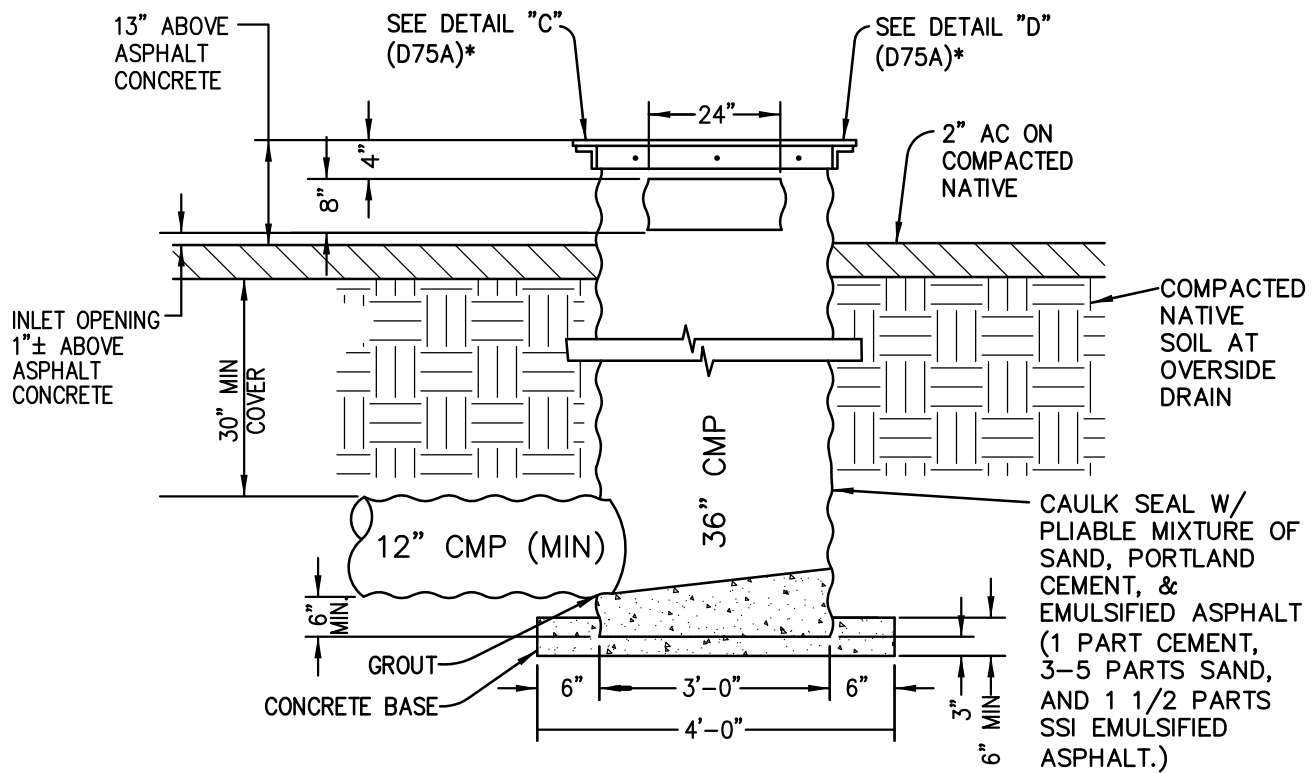
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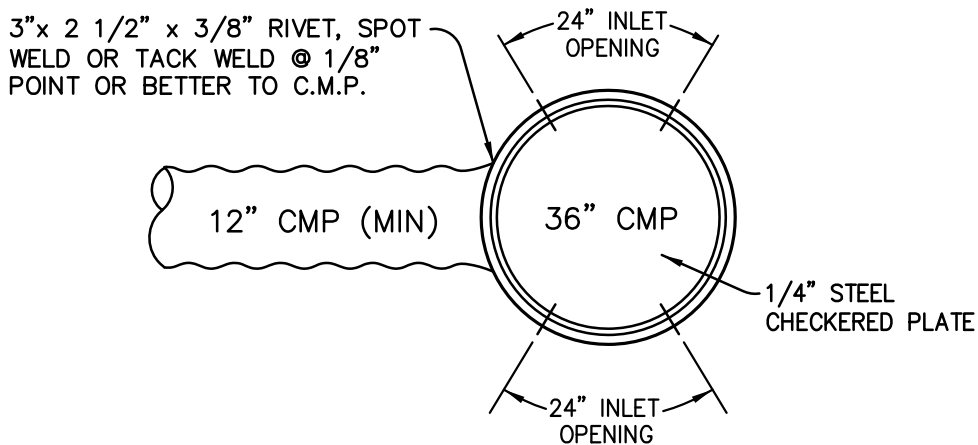
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PLATE NO: 4-G5



SECTION VIEW



TOP VIEW

\* FOR ADDITIONAL DETAILS REGARDING CHECKERED PLATE TOP AND FRAME, REFER TO CALTRANS STD PLAN D75A. WELD HEAT-TREATED CHAIN TO FRAME AND COVER.



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RAISED CMP INLET  
OVERSIDE DRAIN  
SHEET 1 OF 2

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

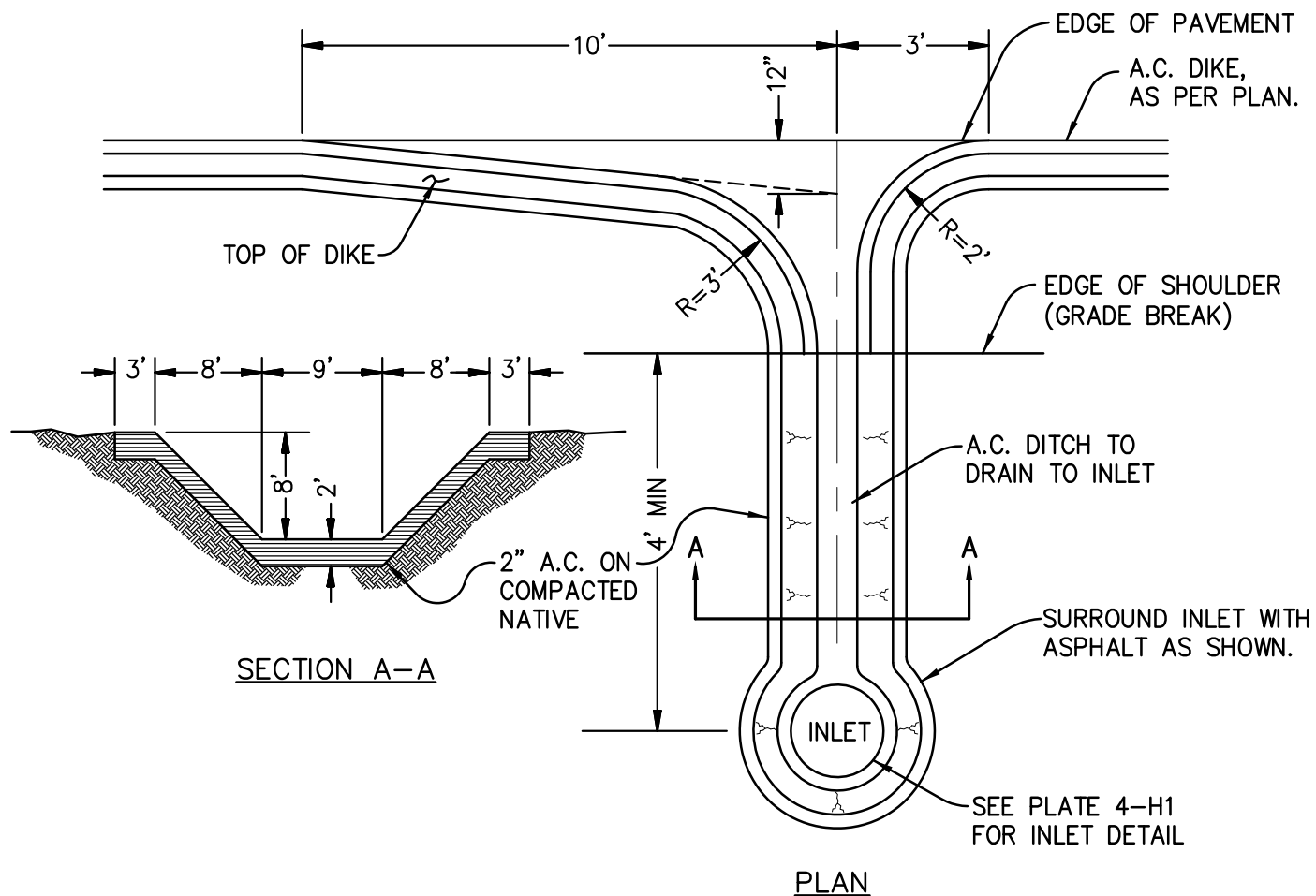
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PLATE NO: 4-H1

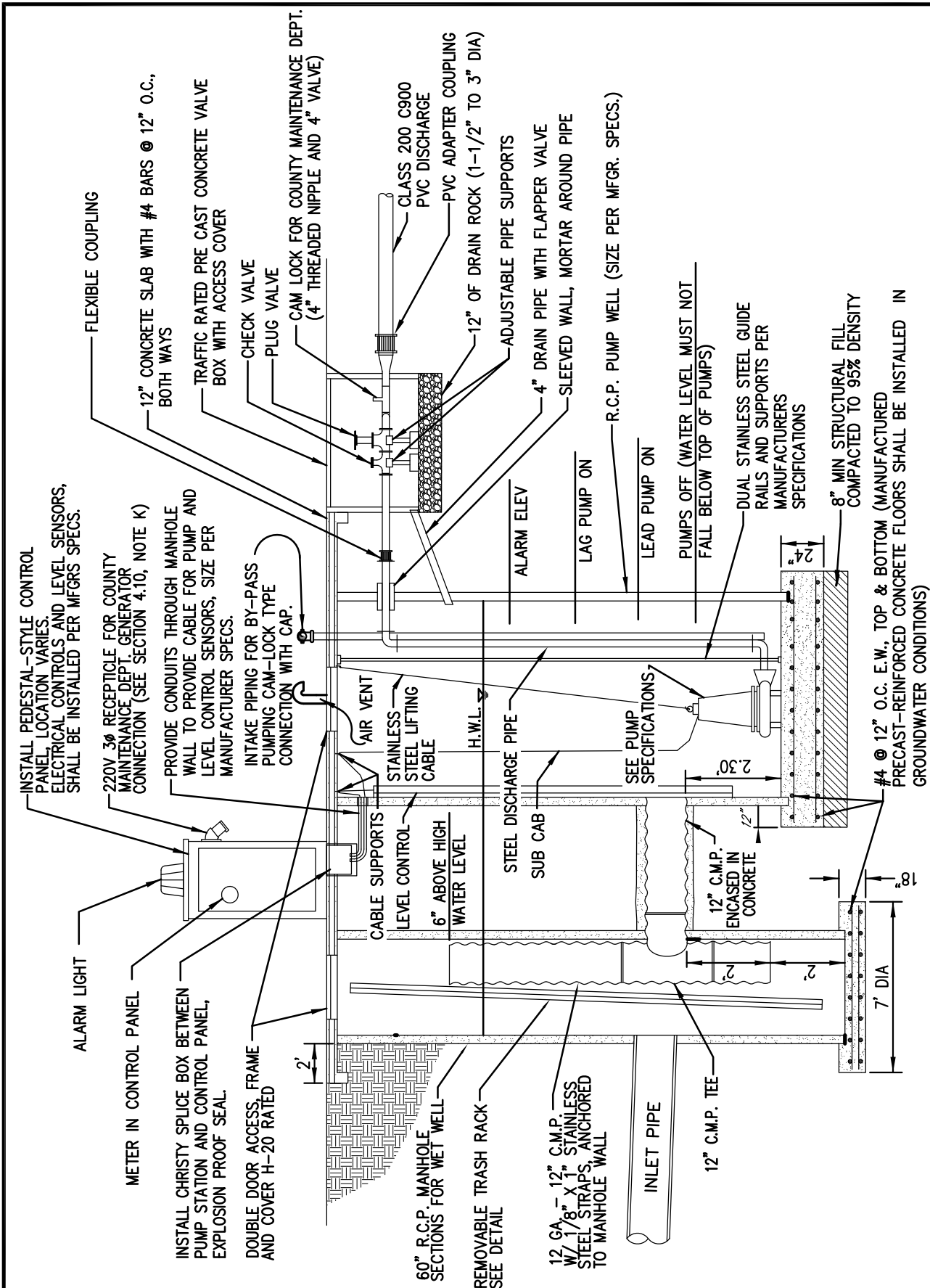


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OVERSIDE DRAIN  
SHEET 2 OF 2

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

APPROVED BY:
<i>Matthew Machado</i>
MATTHEW MACHADO, RCE DIRECTOR OF PUBLIC WORKS
DATE: JUNE 2, 2014
PLATE NO: 4-H2



NOTE: ALL FITTINGS WITHIN WET WELL SHALL BE FLANGED.

STORM DRAIN PUMP STATION



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STORM DRAIN PUMP STATION

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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## STORM DRAIN PUMP STATION PLAN VIEW

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

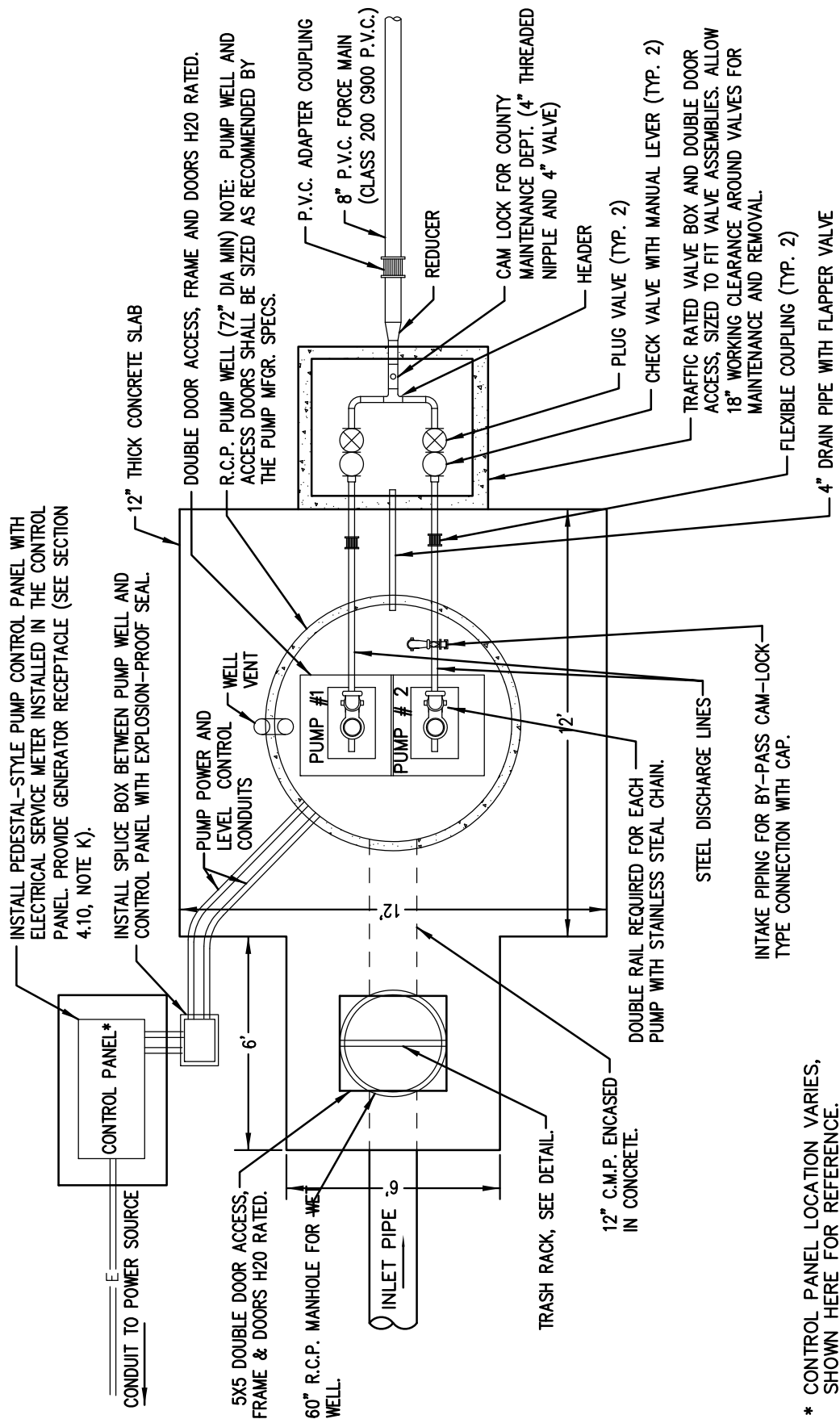
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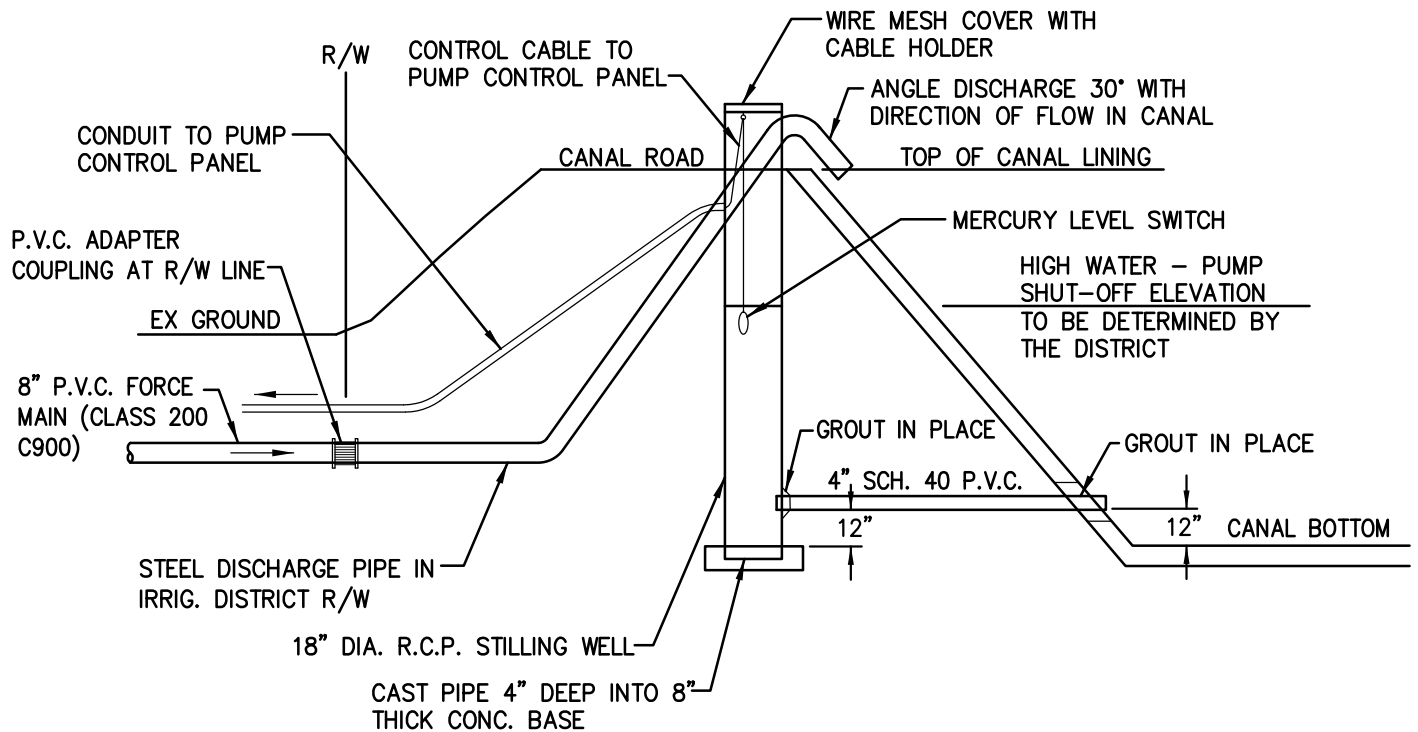
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PLATE NO: 4-13



\* CONTROL PANEL LOCATION VARIES, SHOWN HERE FOR REFERENCE.

STORM DRAIN PUMP STATION PLAN



### DISCHARGE DETAIL AT CANAL

NOTE: REQUIRES IRRIGATION DISTRICT APPROVAL



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### TYPICAL FORCE MAIN DISCHARGE DETAIL

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

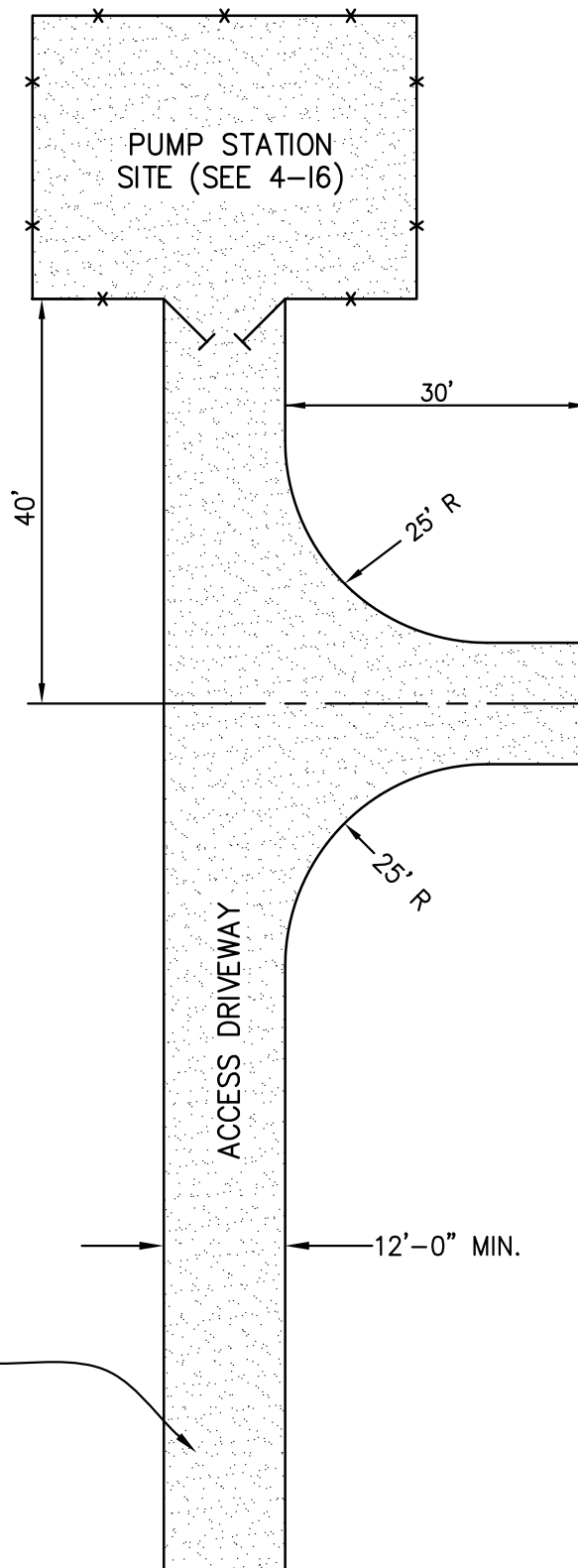
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## ACCESS DRIVEWAY & TURN AROUND AREA

COUNTY OF STANISLAUS  
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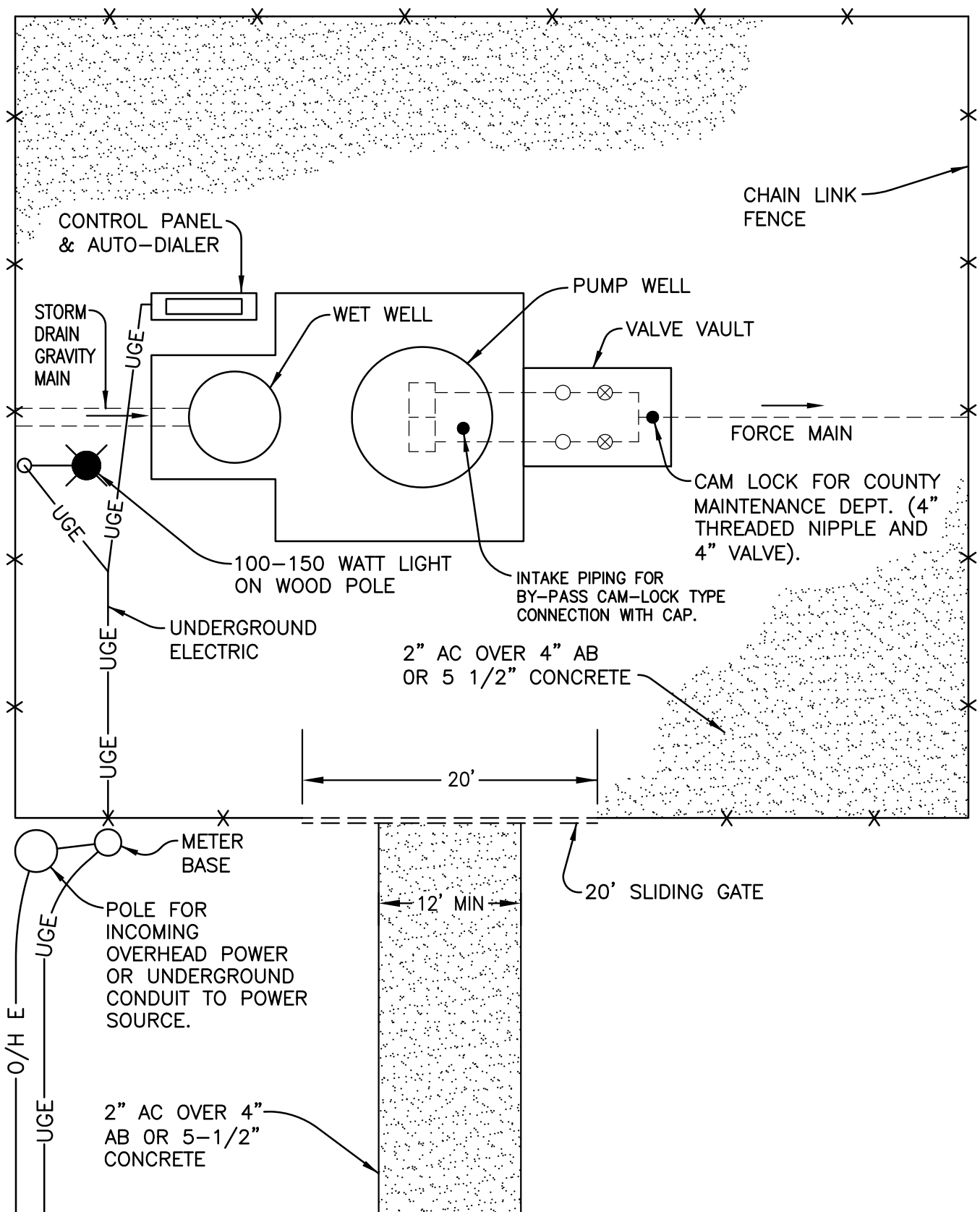
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## TYPICAL PUMP STATION SITE PLAN

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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PLATE NO: 4-16

[illegible]

# STORM DRAINAGE DESIGN SPREADSHEET

[illegible]

STORM DRAINAGE DESIGN SPREADSHEET  
(CONTINUED)



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# STORM DRAINAGE DESIGN SPREADSHEET

COUNTY OF STANISLAUS  
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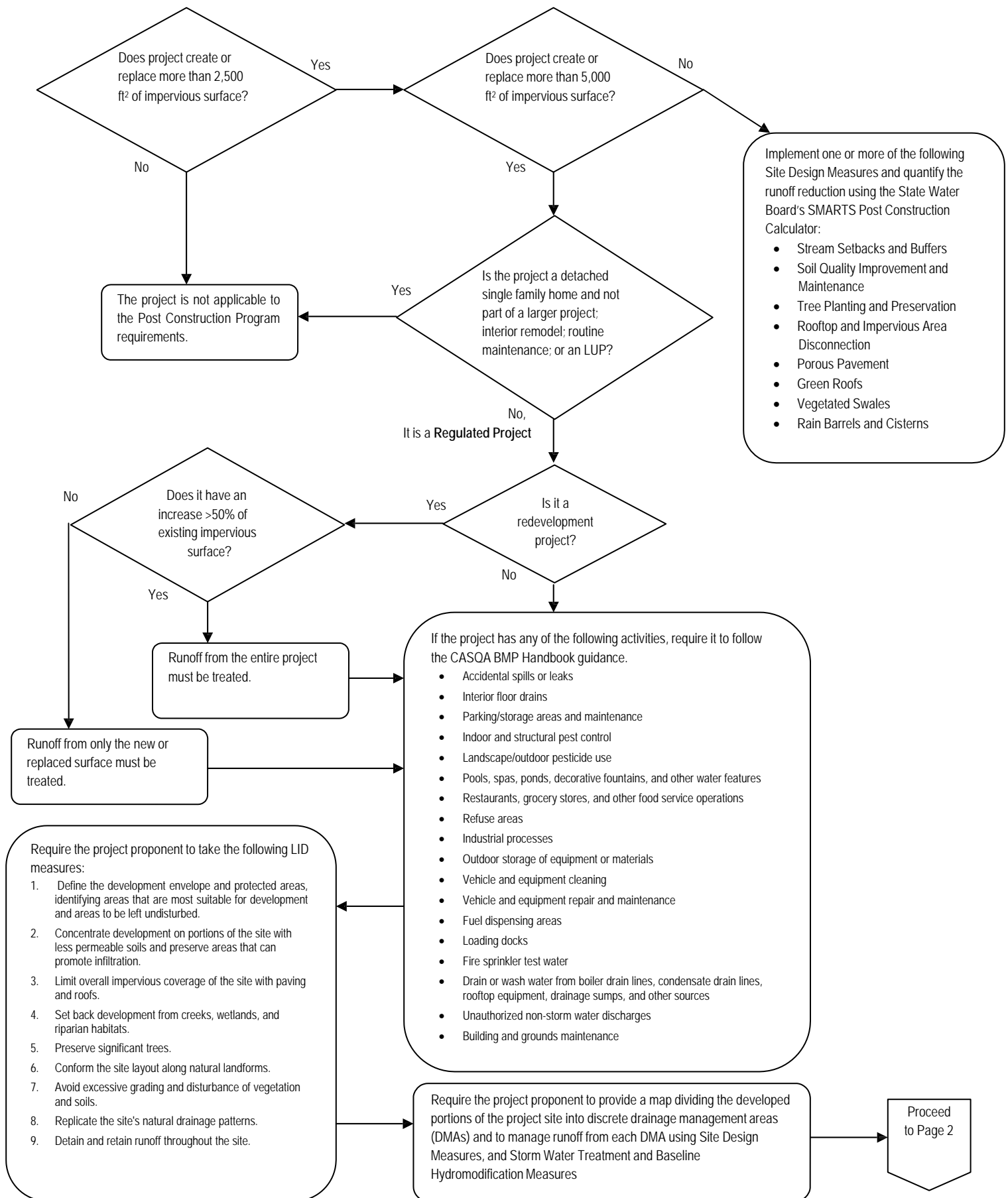
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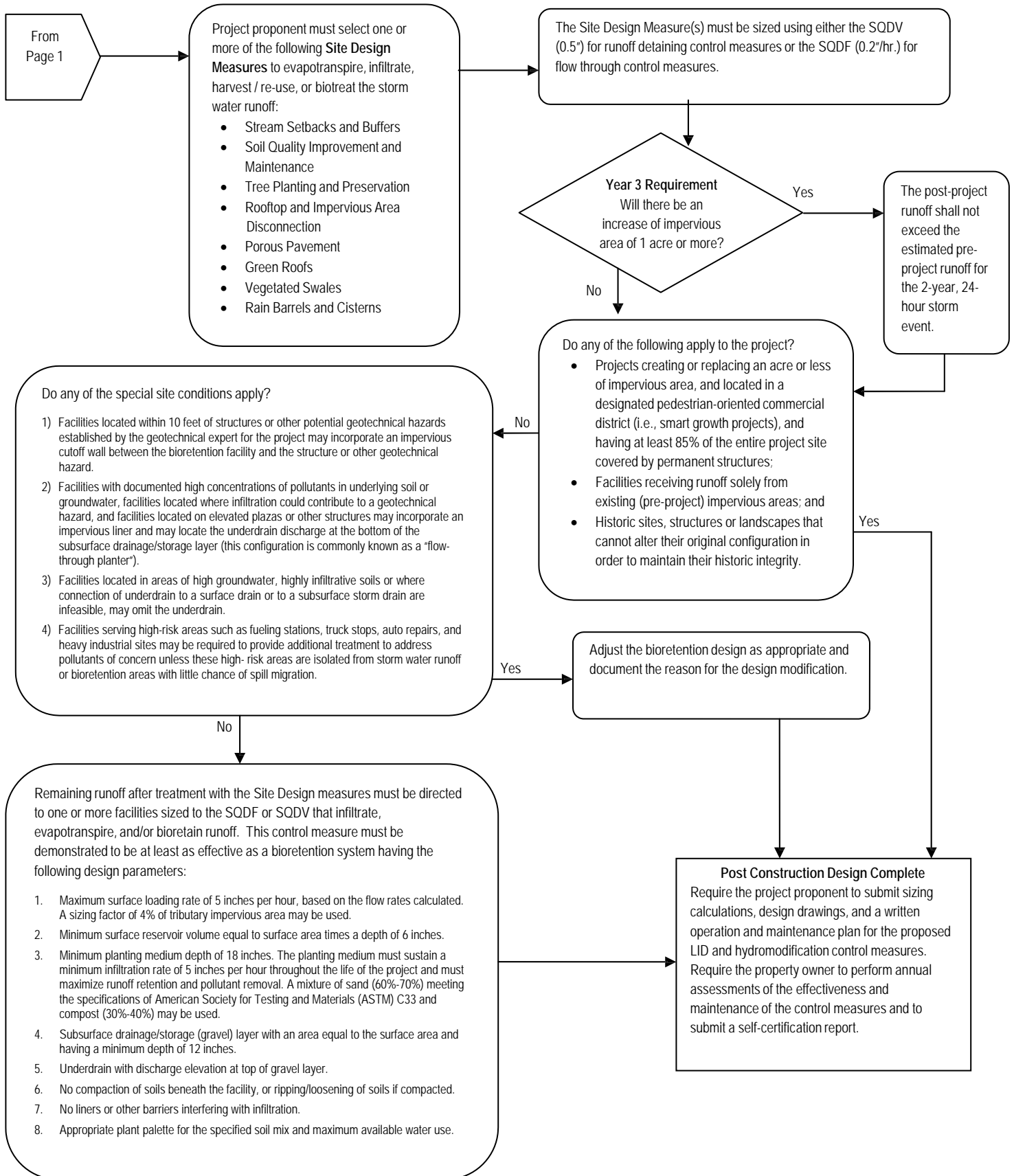
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PLATE NO: 4-J1

## EXHIBIT 4.1: POST-CONSTRUCTION PROGRAM FLOWCHART

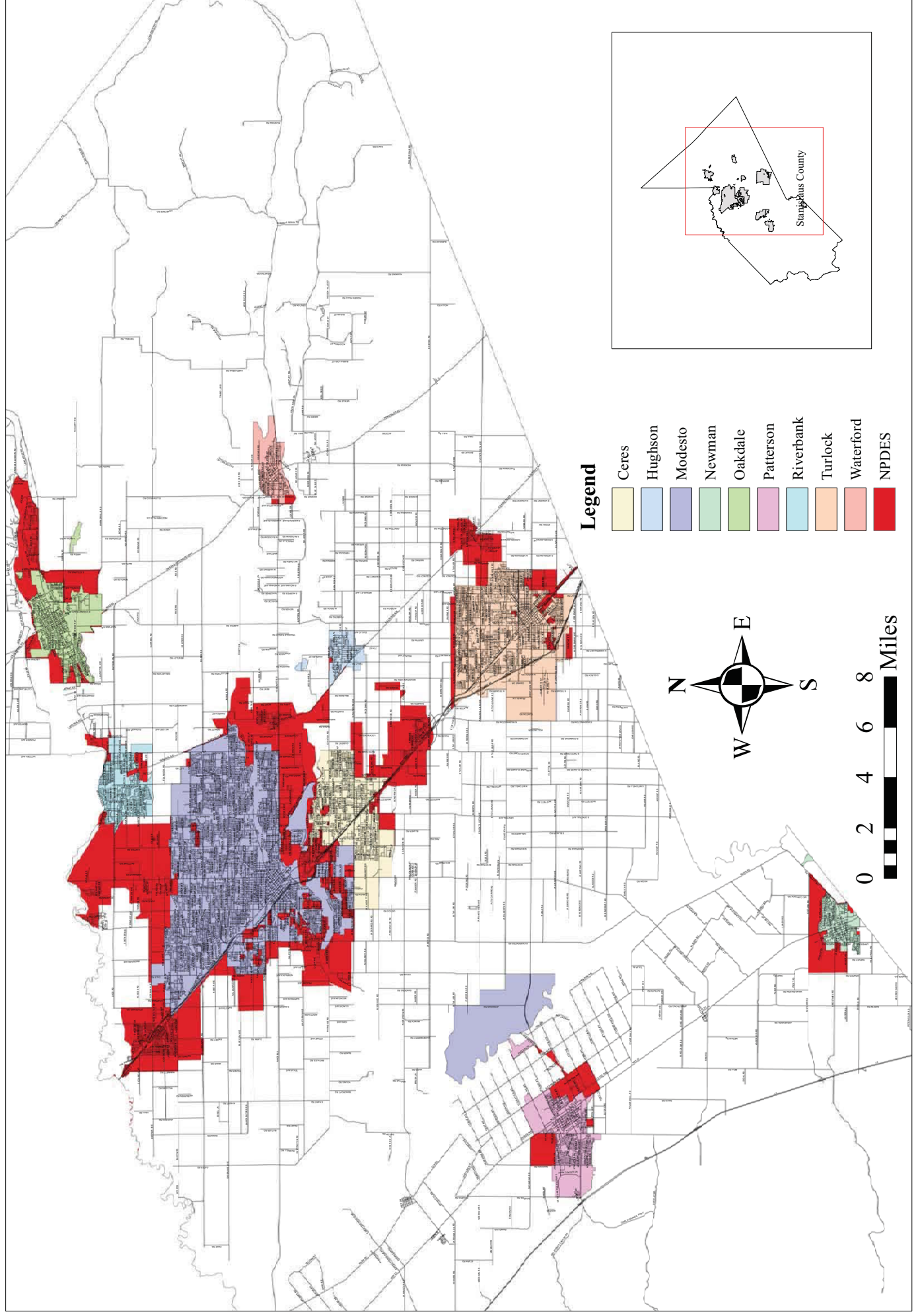


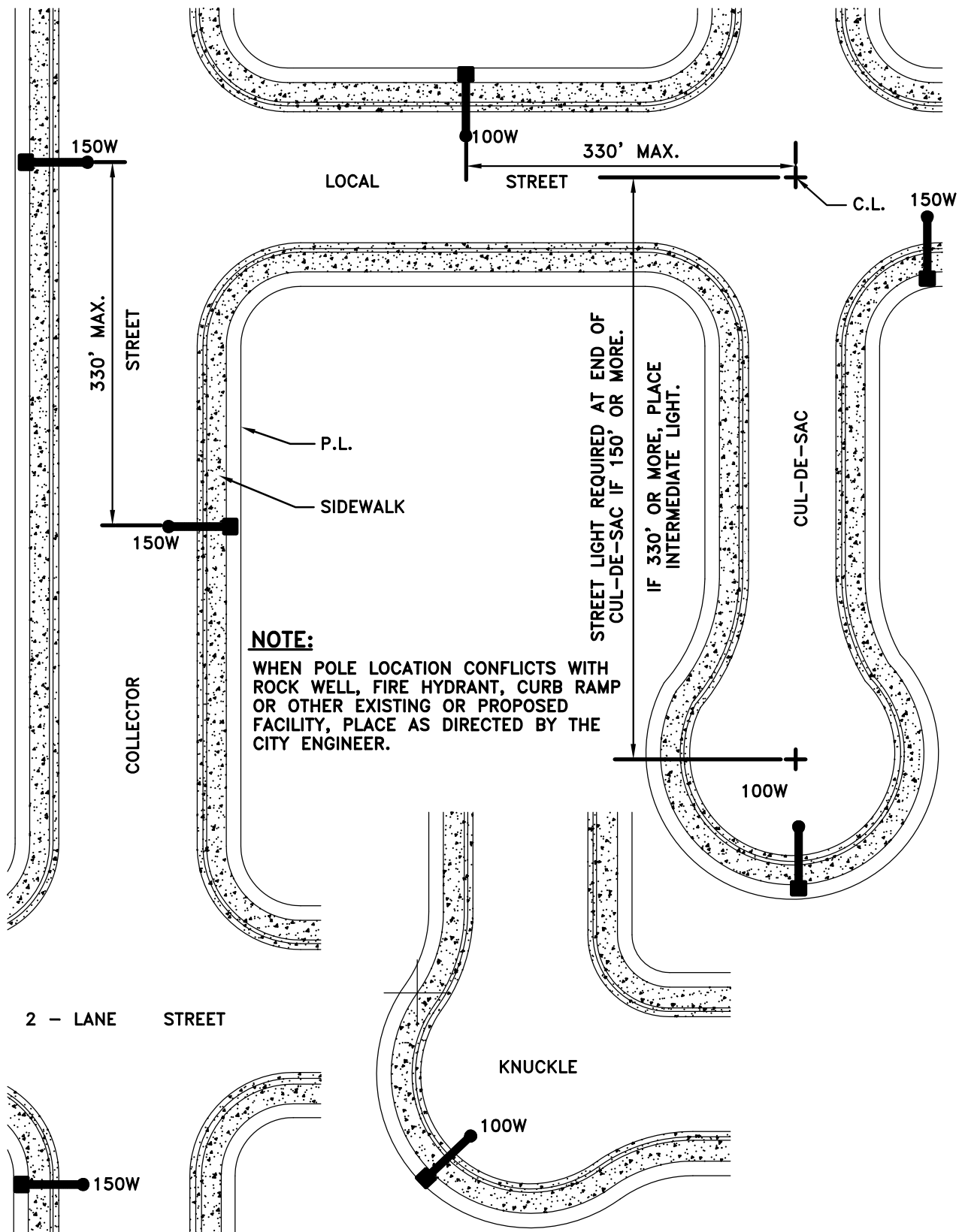
## EXHIBIT 4.1: POST-CONSTRUCTION PROGRAM FLOWCHART





# Stanislaus County NPDES





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## LOCATION OF 25 FT STREET LIGHT POLES

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

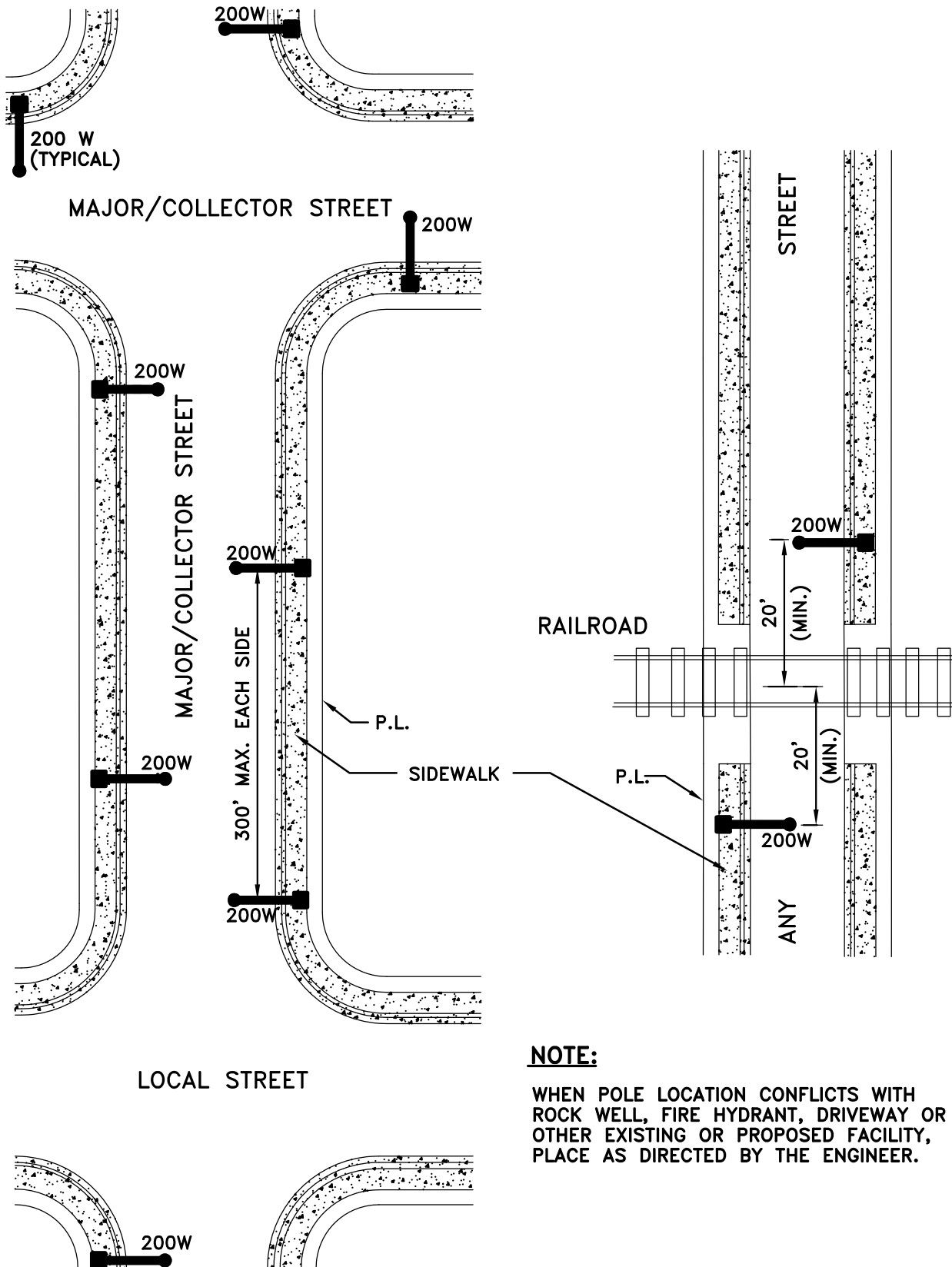
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PLATE NO: 5-A1



**NOTE:**

WHEN POLE LOCATION CONFLICTS WITH ROCK WELL, FIRE HYDRANT, DRIVEWAY OR OTHER EXISTING OR PROPOSED FACILITY, PLACE AS DIRECTED BY THE ENGINEER.



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LOCATION OF 28 FT  
STREET LIGHT POLES

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

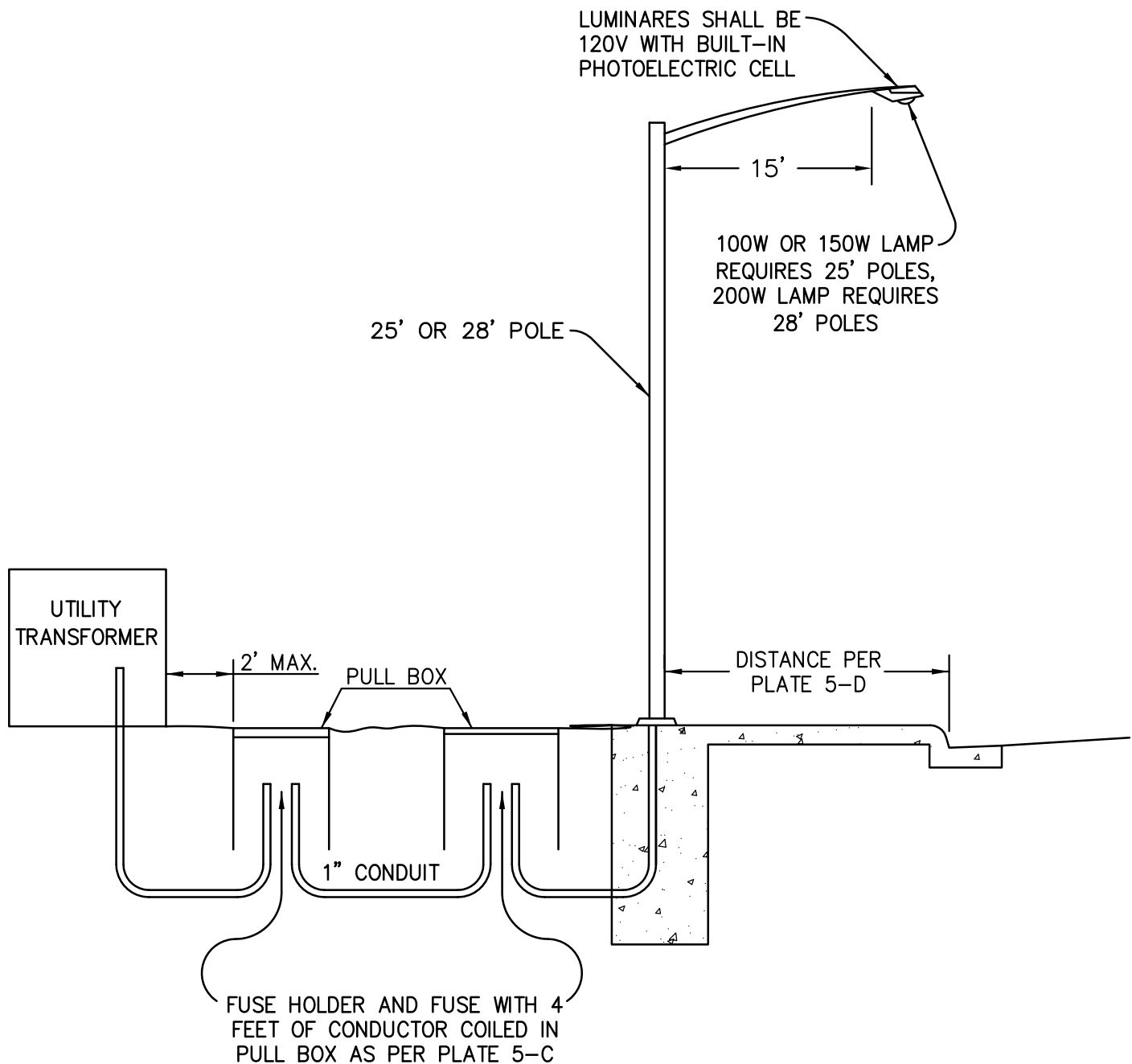
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PLATE NO: 5-A2



**NOTES:**

1. MINIMUM CONDUIT COVER IS 30" IN STREETS, ALLEYS, EASEMENTS, PARK STRIPS, AND PUES.
2. CONTACT UTILITY TO COORDINATE WORK IN AND AROUND THEIR TRANSFORMER.
3. UTILITY WILL COMPLETE CONNECTION OF 120V CIRCUIT UPON RECEIPT OF SIGNED APPLICATION OF SERVICE FROM STANISLAUS COUNTY.



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**LIGHT POLE  
INSTALLATION LAYOUT**

**COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS**

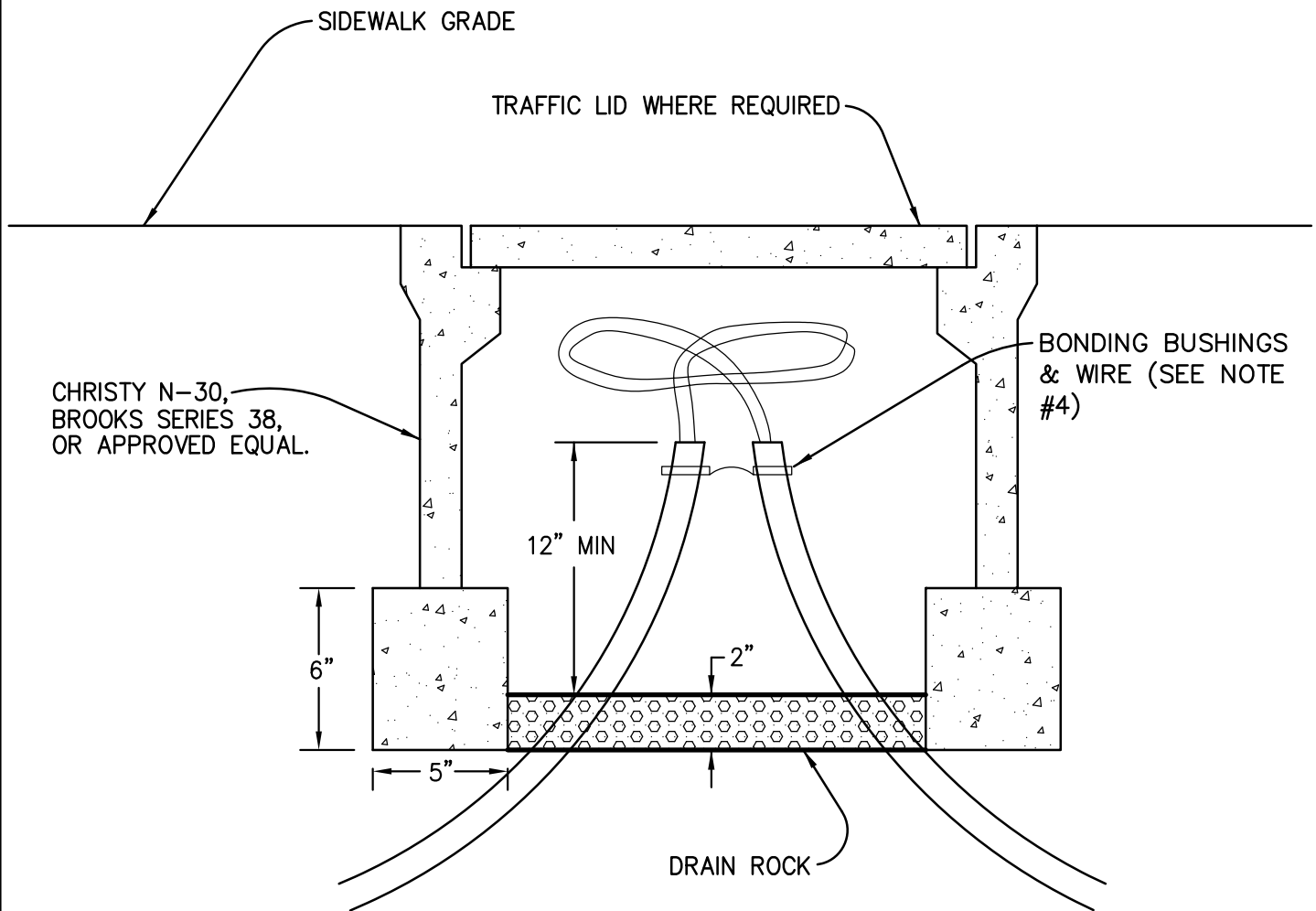
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DIRECTOR OF PUBLIC WORKS**

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PLATE NO: 5-B1



**NOTES:**

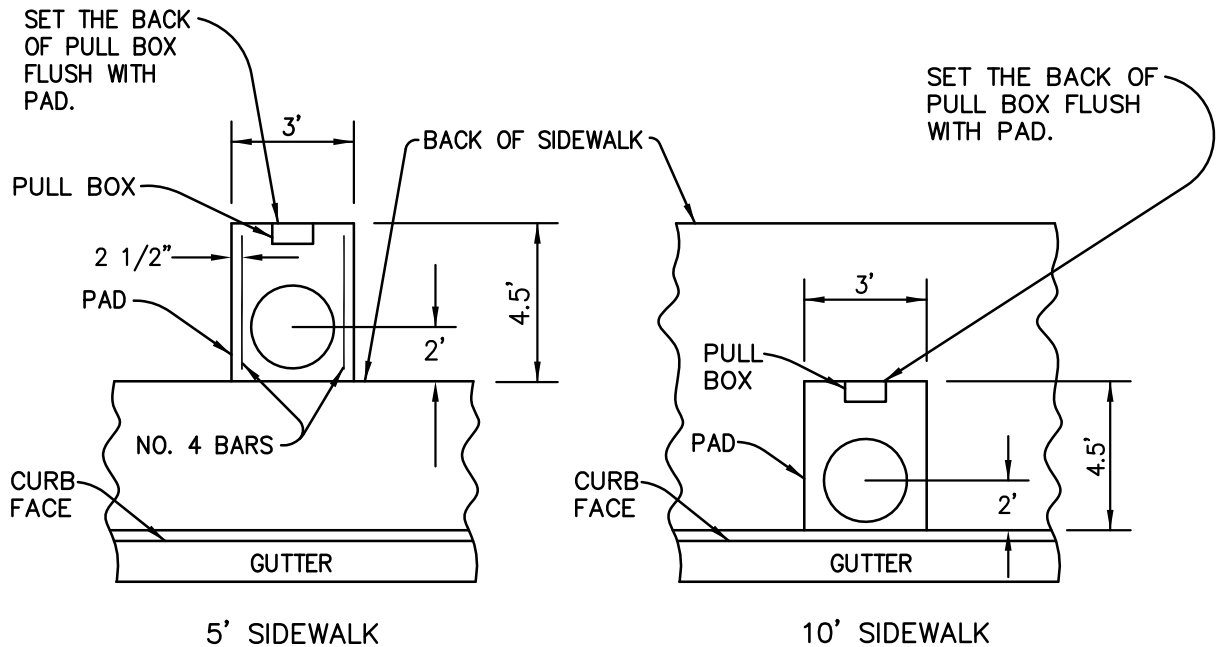
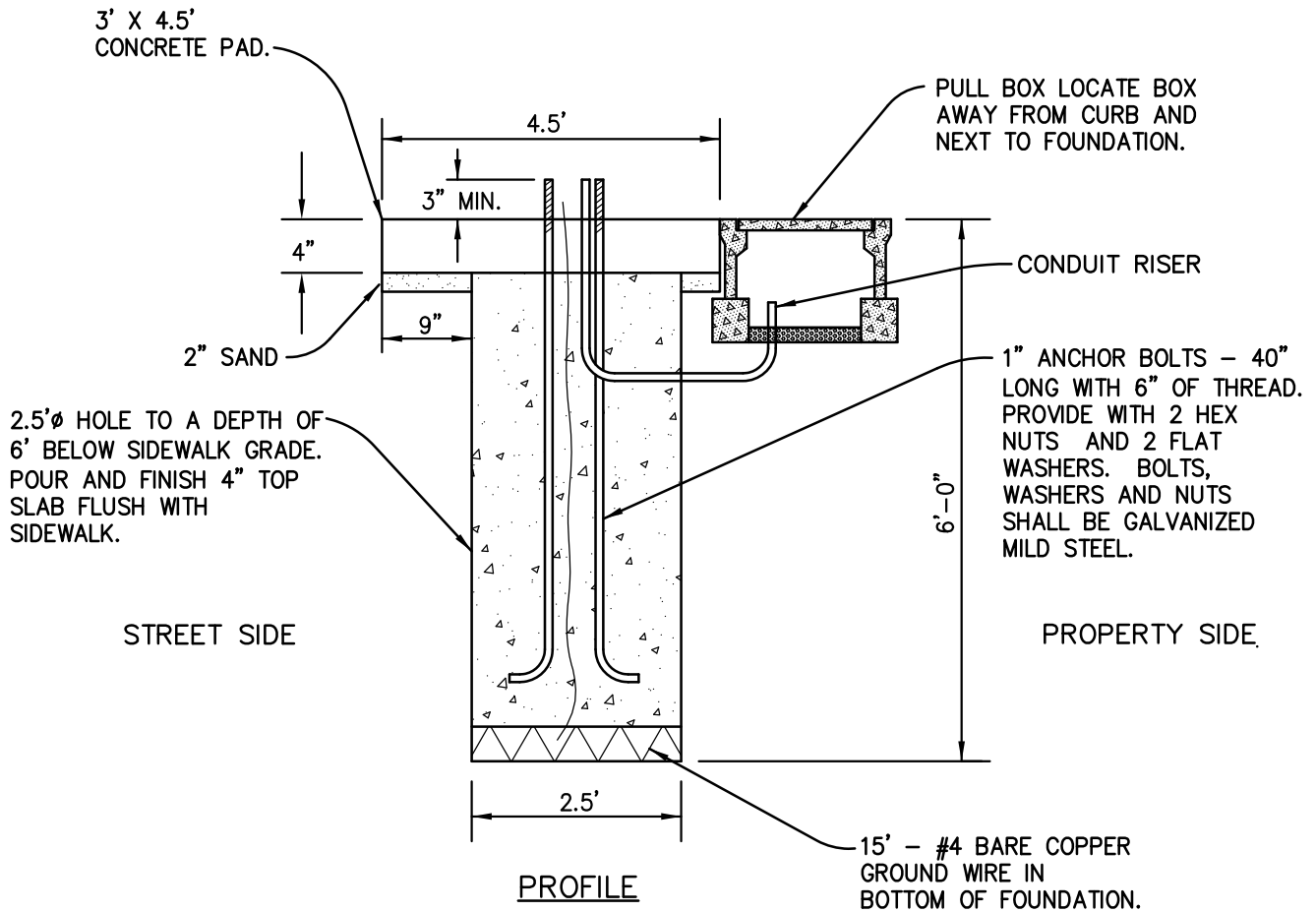
1. IF BOX IS MID-CIRCUIT, LEAVE 4 FT. OF SLACK CONDUCTOR IN BOX.
2. IF BOX IS A CIRCUIT TERMINUS AT POWER SOURCE OR ADJACENT, INSTALL FUSE HOLDER WITH 4 FT OF SLACK CONDUCTOR. TAPE FUSE TO CONDUCTOR IN BOX.
3. CONDUIT ENTERING A UTILITY SERVICE BOX SHALL CONFORM TO UTILITY SPECIFICATIONS.
4. THE BONDING WIRE SHALL BE AT LEAST THE SAME GAUGE AS THE LARGEST CIRCUIT CONDUCTOR. (MIN. NO. 8 AWG COPPER WIRE)
5. LID SHALL BE STAMPED STREET LIGHTS.
6. FOR BACKFILL & COMPACTION REQUIREMENTS, SEE STANDARD DETAIL 5-E.
7. REPLACE SOD IN LANDSCAPE AREAS AS NEEDED.
8. CONDUIT SHALL BE A MINIMUM OF 30" BELOW ALL FINISHED GRADE UNLESS APPROVED BY ENGINEER.



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PULL BOX	
COUNTY OF STANISLAUS DEPARTMENT OF PUBLIC WORKS	

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**PLAN**



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## LIGHT POLE FOUNDATION

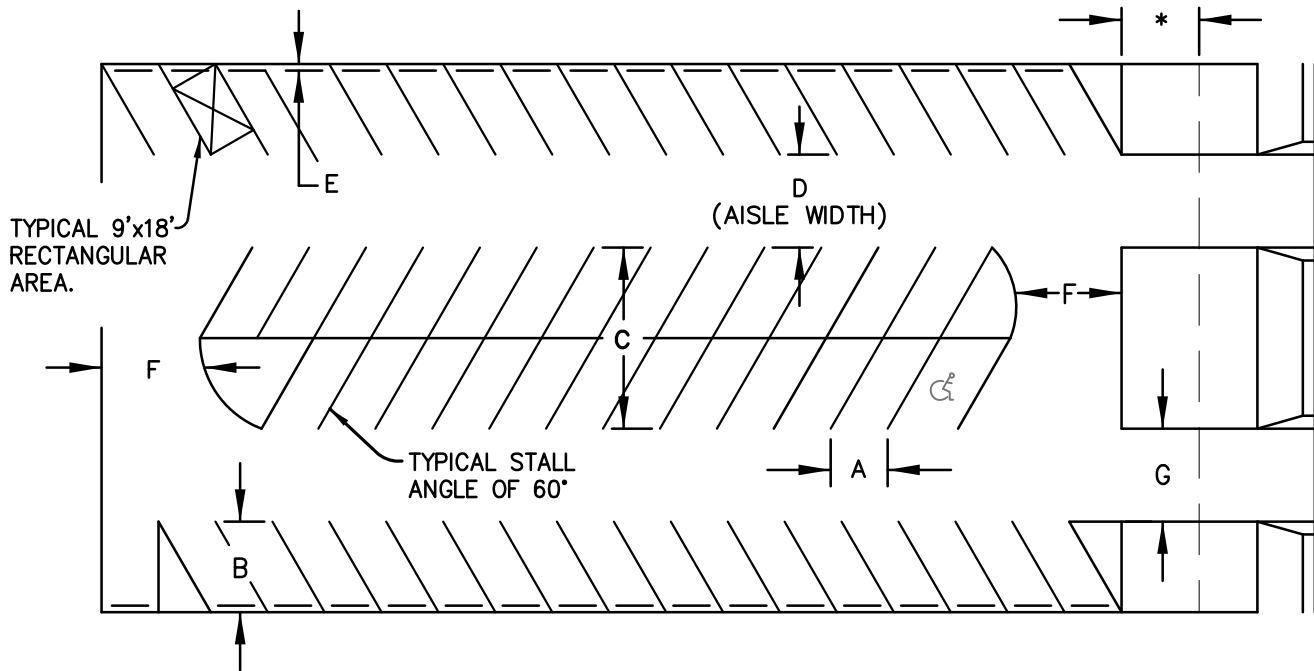
COUNTY OF STANISLAUS  
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PLATE NO: 5-D1



PLATE NO: 5-E1

## TYPICAL PARKING LOT DIAGRAM



PARKING SPACE AND AISLE DIMENSION TABLE

PARKING ANGLE TO DRIVEWAY			45°	50°	55°	60°	70°	80°	90°
SPACE WIDTH	A		12.7'	11.7'	11.0'	10.4'	9.6'	9.1'	9.0'
SPACE DEPTH	B		19.1'	19.6'	19.9'	20.1'	20.0'	19.3'	18.0'
DOUBLE SPACE DEPTH	C		31.8'	33.4'	34.7'	35.7'	36.9'	37.0'	36.0'
AISLE WIDTH	D		8.8'	9.8'	12.2'	15.8'	19.0'	21.7'	24.0'

### NOTES

- FOR ANY GIVEN PARKING ANGLE BETWEEN 45° AND 90° NOT SPECIFICALLY LISTED IN THE ABOVE TABLE, USE A TABLE ANGLE NEAREST THE GIVEN ANGLE.
- THE MINIMUM AISLE WIDTH (D) AT ANY PARKING SPACE ANGLE LESS THAN 45 DEGREES; INCLUDING PARALLEL STALLS, IS 8.8 FEET.
- THE TURNAROUND OR END DRIVEWAY WIDTH (F) SHALL BE A MINIMUM OF EIGHTEEN (18) FEET. IF WHEEL-STOPPS ARE USED, THE WHEELSTOP SETBACK DIMENSION (E) SHALL BE A MINIMUM OF TWO AND ONE-HALF (2.5) FEET FOR ANY PARKING PLAN.
- THE MINIMUM DRIVEWAY WIDTH (G) FOR ONE-WAY TRAFFIC IS 10 FEET AND FOR TWO-WAY TRAFFIC IS 20 FEET.



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### TYPICAL PARKING LOT DESIGN

COUNTY OF STANISLAUS  
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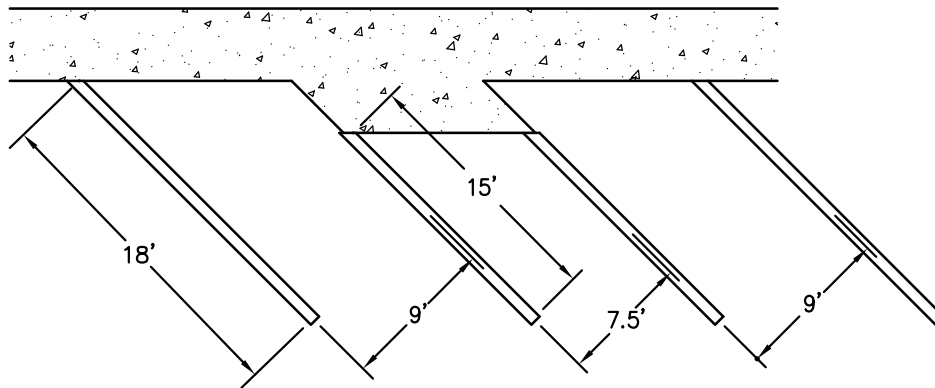
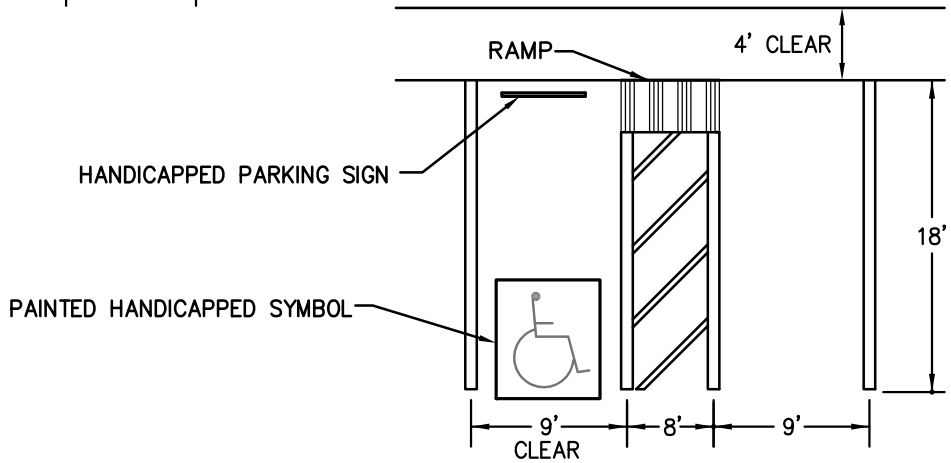
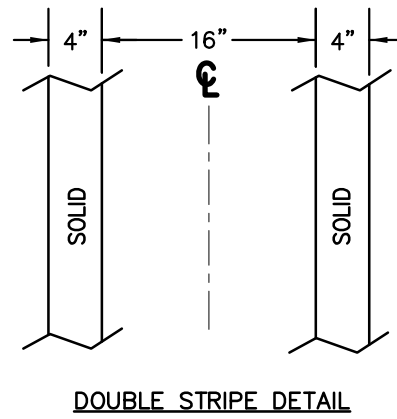
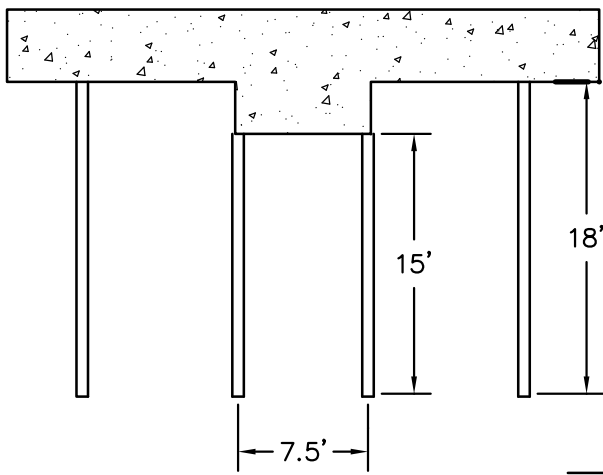
*Matthew Machado*

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## TYPICAL PARKING STALL DETAIL

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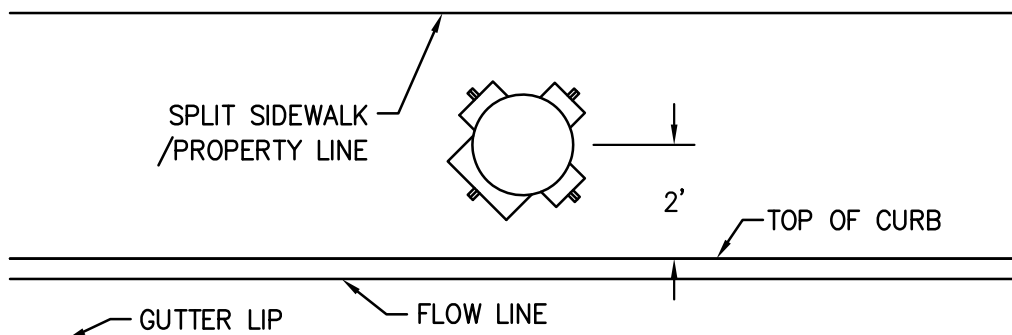
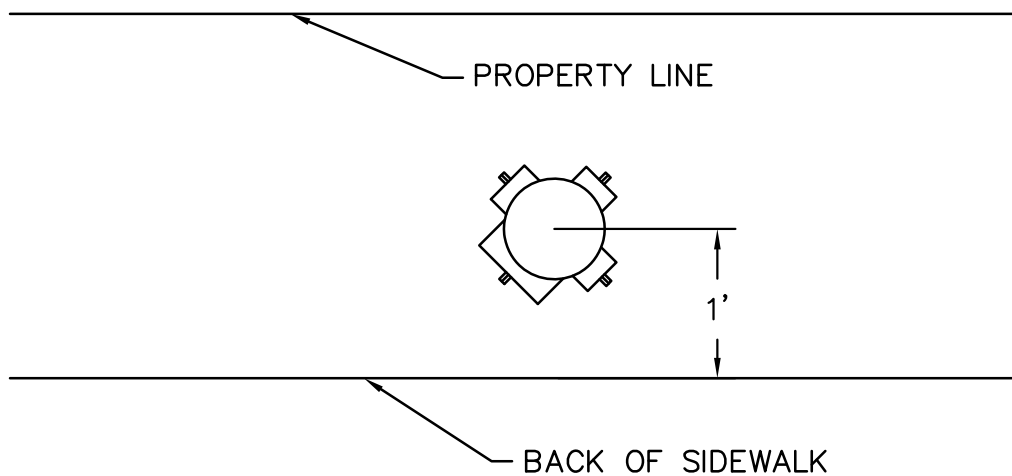
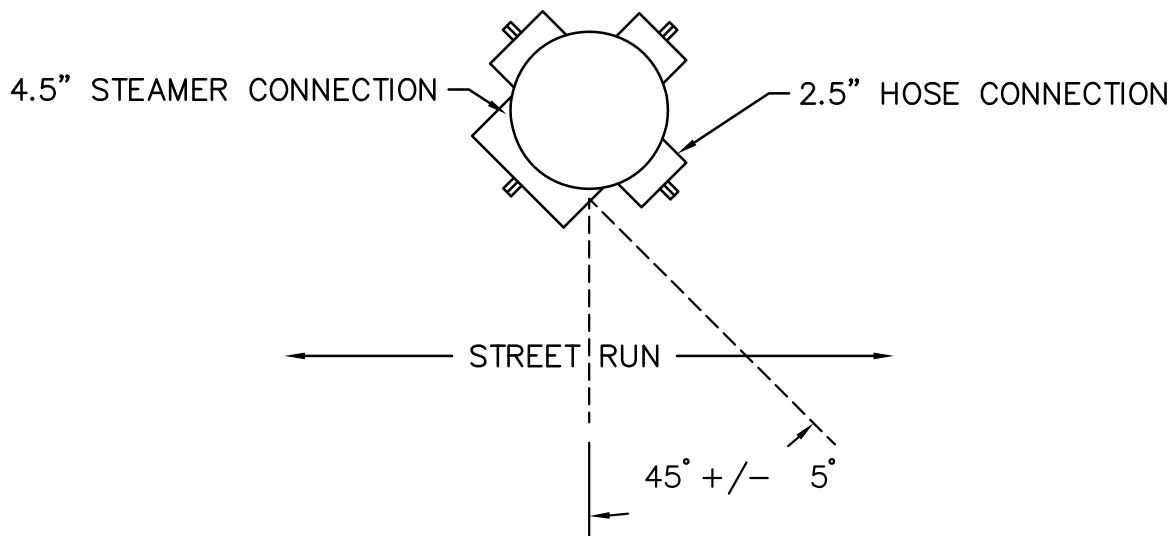
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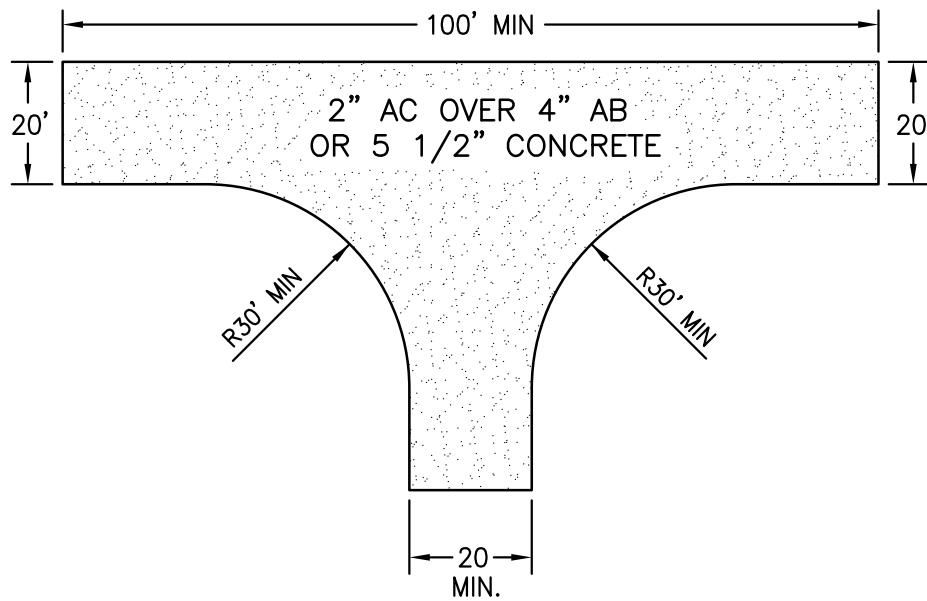


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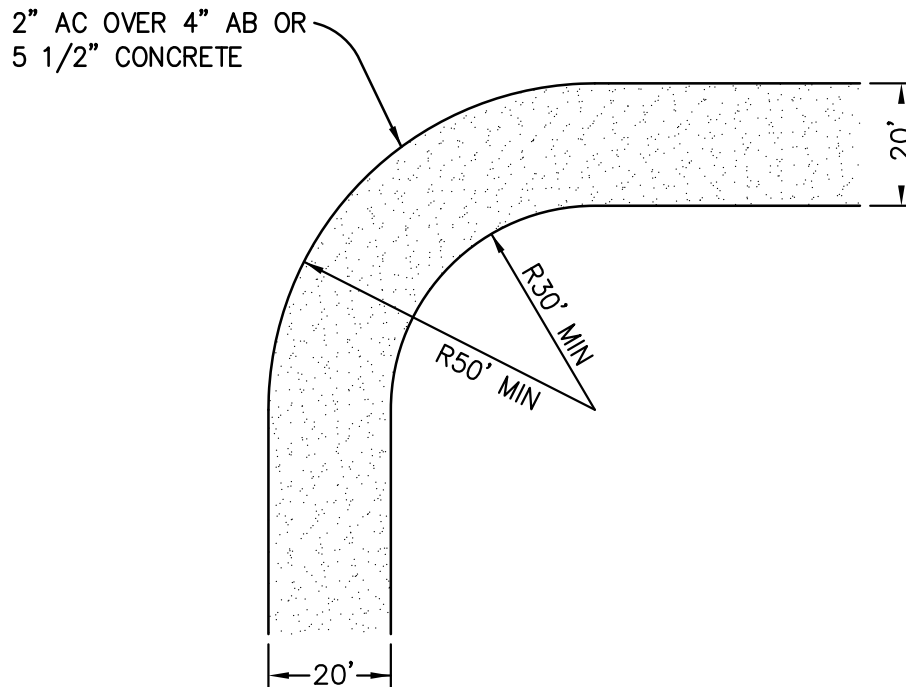
FIRE HYDRANT  
LOCATION

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HAMMER HEAD TURN AROUND TEMPLATE



TURNING RETURN RADIUS TEMPLATE



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# FIRE APPARATUS DESIGN TEMPLATES

COUNTY OF STANISLAUS  
DEPARTMENT OF PUBLIC WORKS

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